FISHER RIVER

INTEGRATED WATERSHED MANAGEMENT PLAN

A MESSAGE FROM THE CHAIR

The Fisher River Watershed is a special place in Manitoba; it has a rich diversity of culture, heritage, landscapes and challenges. Early challenges focused on growth for communities built on agriculture, fishing, forestry and trapping. Today, in 2015 we need to balance growth with sustainability; we have to consider larger issues such as climate change, the health of Lake Winnipeg, and conscious stewardship of our food, water and energy sources. These resources are intimately linked and actions in one area often have implications in others.

As chair of the Fisher River Integrated Watershed Management Plan (IWMP) Project Management Team (PMT) I am proud to say that the creation of this plan is a significant step in the right direction to a more sustainable watershed. We have excellent teamwork and caring individuals invested in the successful implementation of this IWMP.

The planning process began at the grassroots level with the selection of a balanced, local PMT. The PMT was responsible for leading the plan development, meeting with stakeholder groups, and gathering local knowledge and technical information. Through a balance of science and local knowledge, the PMT developed the watershed goals which you will find on page 7. Action items listed throughout the plan and again at the end of the IWMP support efforts to achieve these watershed goals.

I would like to highlight the section on alvars in this plan on page 12. Historically, these regions hold traditional values for hunting and gathering purposes, and they have been recognized as special areas. Alvars, a unique plant community located on thin soil in the Interlake region, are now listed as endangered under *The Endangered Species and Ecosystems Act*. We hope the initiatives and actions listed in the Fisher River IWMP further support protection of these special places.

The creation of this IWMP has been a remarkable effort by watershed residents, all levels of government and other stakeholders to create a long term plan to protect, restore and better manage land and water resources on a watershed basis. In closing I would like to thank everyone who contributed to the creation of this plan, and I look forward to the implementation of it.

Sincerely,

Dion McKay

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EXECUTIVE **SUMMARY**

The Fisher River Integrated Watershed Management Plan is a 10 year roadmap for the protection, restoration and management of land and water within the Fisher River Watershed. The plan was developed in partnership with the East Interlake Conservation District, the Province of Manitoba, Fisher River Cree Nation, Peguis First Nation, local municipalities, community stakeholders and a vibrant group of watershed residents. The plan includes actions to address four watershed goals which were identified as priorities by watershed residents.

WATERSHED GOALS

1. PROTECT AND RESTORE NATURAL AREAS

2. ENSURE SAFE DRINKING WATER

3. PRESERVE AND IMPROVE WATER QUALITY IN LAKES AND STREAMS

4. COORDINATE SURFACE WATER MANAGEMENT TO PROTECT COMMUNITIES AND AGRICULTURAL LANDS FROM FLOODS AND DROUGHTS

This plan is the fourth Integrated Watershed Management Plan (IWMP) developed by the East Interlake Conservation District. The Icelandic River – Washow Bay Creek IWMP was completed in 2009, the Netley-Grassmere IWMP was completed in 2011, and the Willow Creek IWMP was completed in 2012. Residents in the Fisher River Watershed are concerned about similar issues as residents in these neighbouring watersheds. Efforts have been made to complement and link actions in this plan to the actions in these neighbouring watershed plans for ease of implementation.

Hundreds of thousands of dollars will be directed towards conservation programming in this watershed over the next 10 years. This plan will help ensure that resources will be allocated to areas where it will provide the most benefit. Everyone who lives or utilizes this watershed has a role to play in ensuring this plan is successfully implemented. By developing new partnerships and integrating resources, measurable improvements to watershed health will be experienced in the Fisher River watershed.

INTRODUCTION

The purpose of the Fisher River Integrated Watershed Management Plan is to guide the protection, restoration and management of land and water within the Fisher River Watershed. It incorporates traditional and scientific knowledge to summarize the characteristics of the watershed, identify issues and recommend actions for protecting and restoring watershed health. Development of the plan is just the first step.

The success of the Fisher River Integrated Watershed Management Plan will rely on the watershed residents, local communities, all levels of government, and non-government organizations such as the East Interlake Conservation District to work together to deliver on the goals outlined in the plan.

KEY **PLAYERS**

Watershed residents assisted in the development of the integrated watershed management plan and will be integral to effective implementation. Without the knowledge, input and cooperation of watershed residents, this plan would not have been possible.

The East Interlake Conservation District (EICD) was designated as the **Water Planning Authority** for the Fisher River IWMP under the *Water Protection Act* and officially led the development of this plan. The EICD will also play a lead role in the implementation of the plan, partnering with communities and residents to deliver projects that will protect and restore watershed health.

The **Project Management Team (PMT)** is a group of local residents who act as the lead decision makers responsible for the development of the Fisher River IWMP. The Fisher River IWMP consisted of representatives from Fisher River Cree Nation, Peguis First Nation, Dallas Red-Rose, the Rural Municipality of Fisher, the East Interlake Conservation District, and Manitoba Conservation and Water Stewardship.

The **Watershed Team** is a diverse group of technical experts and local representatives from federal, provincial, and municipal governments, First Nations, the East Interlake Conservation District, non-government organizations, and local residents who contributed technical and local expertise throughout the development of the IWMP.

FISHER RIVER **WATERSHED**

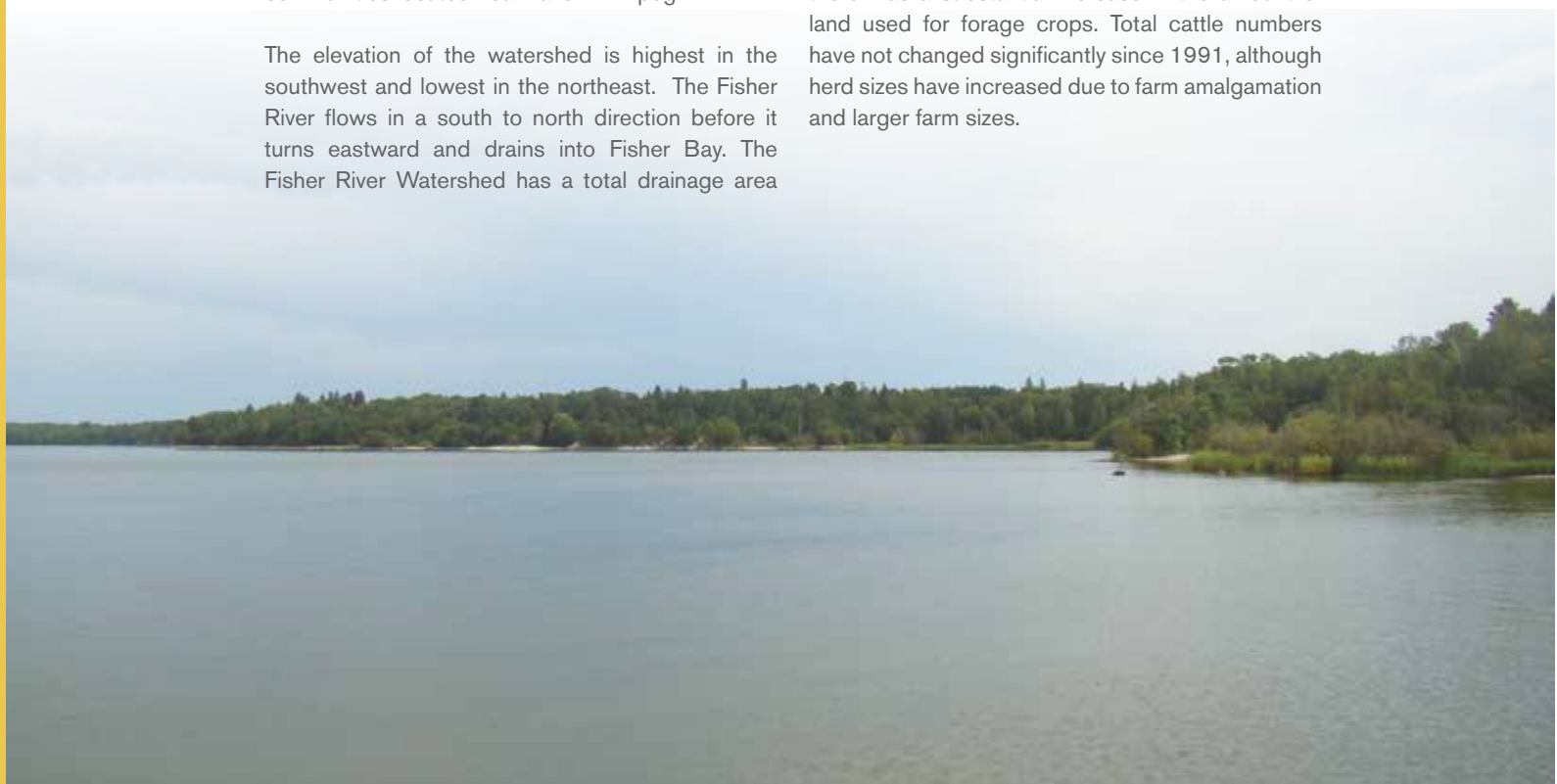
The Fisher River Watershed is located in the Interlake Region of Manitoba. Within the watershed, there are several diverse communities including Fisher River Cree Nation, Peguis First Nation, the Rural Municipalities of Fisher, Bifrost-Riverton and Grahamdale, and the Aboriginal and Northern Affairs communities of Dallas-Red Rose, Matheson Island and Pine Dock. Fisher Bay Provincial Park is located near Fisher Bay, part of Lake Winnipeg, the 10th largest freshwater lake in the world (Figure 1).

The Fisher River Watershed is home to approximately 8,500 people. Land use varies across the watershed with agriculture being the primary land use within the Rural Municipality of Fisher, whereas the portions of the Rural Municipalities of Bifrost-Riverton and Grahamdale included in the watershed are mostly natural and sparsely populated with small pockets of agricultural land. Peguis First Nation and Fisher River Cree Nation are located along the corridor of the Fisher River. Peguis First Nation is the largest First Nation community in Manitoba with over 7,200 band members of Ojibway and Cree descent, of which approximately 3,000 live on the reserve. Fisher River Cree Nation has over 3,000 band members of Cree descent, of which approximately 1,700 live on the reserve. Dallas-Red Rose is a small agricultural community located between Peguis First Nation and Fisher River Cree Nation, while Pine Dock and Matheson Island are commercial fishing communities located near Lake Winnipeg.

The elevation of the watershed is highest in the southwest and lowest in the northeast. The Fisher River flows in a south to north direction before it turns eastward and drains into Fisher Bay. The Fisher River Watershed has a total drainage area of approximately 3,150 square kilometres. The region experiences extreme temperature variation from summer to winter, with an average annual temperature of just over 1 degree Celsius. Peak flows typically occur in April, May and June during the spring melt season.

The Fisher River Watershed contains extensive natural habitat characterized by forests, wetlands, peat bogs, and grasslands which cover 80% of the watershed. Much of this natural habitat supports traditional land uses such as hunting, fishing, trapping, and gathering medicines. Approximately 59% of the watershed is Crown land, with the majority of the Crown land consisting of wetlands and forested areas (since 1991, there has been an increase in the amount of tree cover and a decrease in wetlands, water, and grasslands. These changes have been linked to increases in forages and treed areas (AAFC and MAFRI, 2013)).

Agriculture is a very important industry with 17% of the watershed consisting of annual and forage crop production. Since 1991, there has been a decline in the number of farms in the watershed by 30%, but the sizes of the operations are growing. Of the land used for annual cropland, only 15% is high quality agricultural land that is designated as Class 1, 2, or 3; this is land deemed productive for agriculture with no to moderately significant limitations. Since 1991, there was a substantial increase in the amount of land used for forage crops. Total cattle numbers have not changed significantly since 1991, although herd sizes have increased due to farm amalgamation and larger farm sizes.



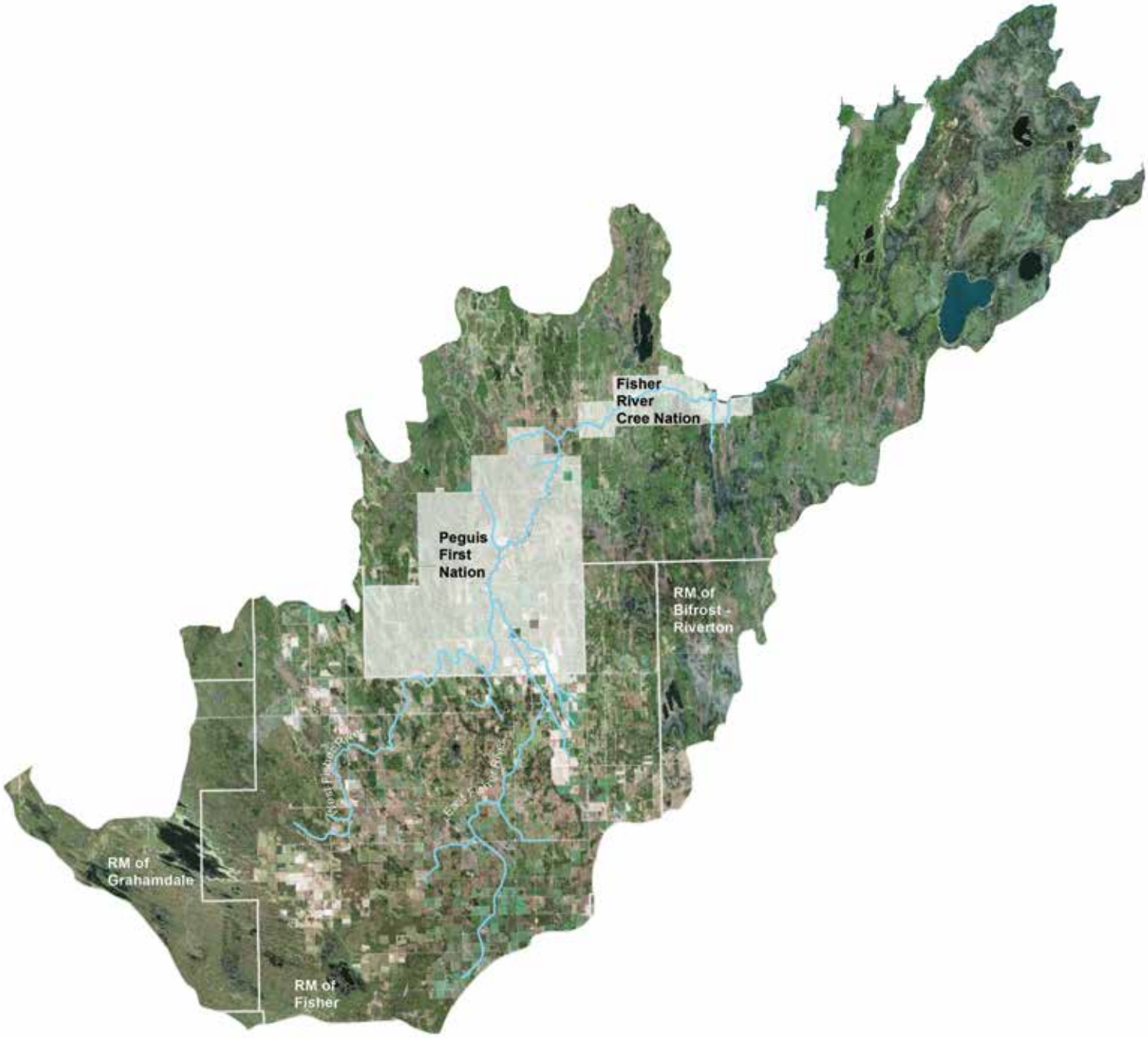


Figure 1: Fisher River Watershed

FIRST NATIONS
TRADITIONAL KNOWLEDGE

Traditional knowledge from Peguis First Nation and Fisher River Cree Nation, and the communities' outlook on the natural world and people's place within it, connects in many ways with integrated watershed management. First Nations people from the Fisher River Watershed explain that in this world we are part of an interdependent cycle. We need the earth to live. We are one tiny speck of creation. For thousands of years, Aboriginal people lived by a policy that you only take what you need, understanding that a healthy, balanced natural world was necessary for survival.

Of great importance to First Nations people in the Fisher River Watershed is their connection with both past and future generations. First Nations elders from Peguis First Nation and Fisher River Cree Nation describe themselves and their communities in terms of seven generations. Currently part of the 4th generation, one can look back three generations and forward three generations. This includes what we can learn from the previous three generations and how today's actions will affect the next three generations.

Councillors, elders and residents of both Peguis First Nation and Fisher River Cree Nation contributed traditional knowledge throughout the development of this plan. Without this valuable information, the planning process would not have been such a success.

WATERSHED GOALS

1. PROTECT AND RESTORE NATURAL AREAS
2. ENSURE SAFE DRINKING WATER
3. PRESERVE AND IMPROVE WATER QUALITY IN LAKES AND STREAMS
4. COORDINATE SURFACE WATER MANAGEMENT TO PROTECT COMMUNITIES AND AGRICULTURAL LANDS FROM FLOODS AND DROUGHTS

The goals of the Fisher River Watershed were determined through a variety of community engagement techniques:

1) Public engagement meetings were held at Fisher Branch, Peguis First Nation, Fisher River Cree Nation, Dallas-Red Rose, and Matheson Island;

2) A watershed team meeting was held in Fisher Branch and included a tour involving technical experts and local residents throughout the watershed;

3) An open house was held by the East Interlake Conservation District in partnership with the Nature Conservancy of Canada in Fisher Branch;

4) Door to door input from residents;

5) Website input through the online surveys;

6) Mail in surveys; and

7) Traditional knowledge interviews with long-time residents and First Nation elders.

The Project Management Team considered the assets and issues identified by local residents and the Watershed Team. Four primary assets were identified: natural areas, drinking water, surface water quality, and protecting agricultural land and communities. The goals of the plan were developed based on these assets and the plan is ordered to reflect these priorities.

PROTECT AND RESTORE NATURAL AREAS

- The Fisher River Watershed contains a rich variety of natural areas including forests, wetlands, grasslands, riparian areas, creeks, rivers, and lakes.
- Natural areas contribute to the health of the Fisher River Watershed. Intact natural areas, particularly wetlands, help to filter water, mitigate flooding, store water for times of drought, and provide habitat for fish and wildlife.
- Residents of the Fisher River Watershed use these natural areas for hunting, fishing, trapping, collecting traditional medicines, recreation and for economic activities such as commercial fishing, forestry and mining.
- Many residents stated during the public engagement meetings that the abundance of natural areas and wildlife habitat contribute to their enjoyment of living in the Fisher River Watershed. There was a strong desire to protect and restore natural areas within the watershed.

Measure of Success	How will this be measured?
The amount of natural areas conserved increases.	As of 2014, the current total area of protected lands (parks, wildlife management areas, Nature Conservancy of Canada lands, and conservation agreements, etc.) is 3.8 million hectares (1.54 million acres), of which only 46 acres are protected in the watershed under a conservation agreement. Future data on the amount of protected land will be compared to this 2014 data. As of 2006, 81% of the watershed is classified as forests, wetlands, water, and grasslands, based on the 2006 land cover data. Future land cover data will be compared to the 2006 data. Observations from watershed residents will also be used to evaluate changes to natural areas.
Degraded natural areas are restored.	Degraded riparian areas are identified within the AAFC and MAFRI 2013 report. Observations will confirm whether these riparian areas have been restored. Agricultural grazing management can be utilized to address the health of wetlands and riparian areas by integrating ecological concerns with beneficial management practices such as rotational grazing and off-site watering practices. The condition of fish habitat was assessed by East Interlake Conservation District in 2008-09 through a riparian assessment report completed by North South Consultants. East Interlake Conservation District will record the number of rehabilitation projects completed within the target areas identified within this report. Local knowledge will also be used to verify improvements.

> *All medicines are needed, but many medicines are dying off because of pollution in the water and the ground.*
>
> *– Cheryl Thomson.*

WETLANDS

- Wetlands including bogs, fens, and marshes play a crucial role in the health of the watershed.
- Different wetlands perform varying levels of ecosystem functions.
- Wetlands can act as 'kidneys' for the watershed, filtering water, slowing the flow of water, storing water, and providing habitat for many different wildlife and fish species.

Changes in Wetlands

- The Fisher River Watershed has seen the overall area of wetlands fluctuate over the last two decades.
- Local accounts indicate that human activities have played a role in wetland loss within the watershed.
- The amount of wetland increases during wet cycles and decreases during dry cycles.
- Wetlands are threatened by agriculture, urban development, and peat mining operations.

Protecting and Restoring Wetlands

- It is valuable to protect and restore wetlands throughout the Fisher River Watershed.
- Wetlands protection and water retention are particularly important in the upstream portions of the watershed due to their impact on improving water quality in the Fisher River and for reducing peak flows.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Protect existing wetlands, particularly in the upstream portions of the watershed
- Explore the potential of biomass harvesting in wetland and water retention areas to further reduce nutrient loading

> *Peat bogs are very important, but are being destroyed. They are the kidneys for the water, and the medicines, insects, animals are all disappearing. Moose habitat is being destroyed.*
>
> *– Roy Thomson.*

PEAT HARVESTING

There are extensive peat bogs in the Fisher River Watershed, particularly throughout the Fisher Bay peninsula. Peat bogs are highly acidic and store large quantities of carbon. Manitoba`s peatlands, including those in the Fisher River Watershed, are primarily mined for horticultural peat products. The peat bog industry in Manitoba annually produces millions in economic value, and thus, is an important industry both provincially and for local communities.

Peat harvesting has a significant impact on the peat bog ecosystem. After being mined, the peat bog cannot return to its original state but it can be restored to a functional wetland over many years. The main impacts to peat bogs as a result of harvesting are habitat alteration and carbon emissions, as the top layer of soil and all the vegetation upon it is removed. There are also some impacts to water quality but these are close to negligible. "Restoring a complex peatland ecosystem to its pre-extraction condition is not possible" (Rochefort & Lode, 2006) but measures ought to be taken to restore key peatland ecosystem functions or rehabilitate the harvested area to serve another beneficial purpose within a human lifetime. "The main long-term objective of post-extraction peatland restoration is to re-establish self-regulatory mechanisms that will enable functional peat accumulation (Quinty & Rochefort, 2003)" (IISD, 2013).

The peatlands fall within the treaty notification territories for both Peguis First Nation and Fisher River Cree Nation. Both First Nations use the peat bogs on the Fisher Bay peninsula for a range of contemporary and traditional uses. Government and industry are required to consult with First Nations on natural resource use that falls within their traditional territory. Both Fisher River Cree Nation and Peguis First Nation have indicated that they value the peat bogs within the Fisher River Watershed in their natural state and expect to be properly consulted with regards to any intended mining activities falling within their traditional territories.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Educate the public on the value of traditional lands, the harm of invasive species, and peat harvesting alternatives
- Ensure proper consultation occurs for all proposed peat harvesting activities

Photo by David Toop

RIPARIAN AREAS

- Riparian areas are ecosystems that border creeks, rivers, lakes and wetlands. Here vegetation and soils are strongly influenced by the presence of water.
- Healthy riparian areas with native vegetation help to prevent soil erosion, improve the health of aquatic ecosystems, provide shade, serve as corridors for wildlife movement, and capture and filter nutrients.

Riparian Protection and Restoration

- Efforts should focus on protecting healthy, intact riparian areas and restoring riparian areas that have been degraded
- The implementation of beneficial management practices (BMPs) to improve the health of riparian areas should be encouraged such as: alternative watering systems for livestock, fencing livestock out of creeks, buffer strips, seeding and planting of native plant and tree species, bank stabilization, and the removal or repair of structures that impede riparian health.

Riparian Health Analysis

- Riparian protection and restoration efforts should be targeted to areas identified in the Riparian Health Analysis report. This report identifies riparian areas that are in good, fair, or poor health using remote sensing and geographic information systems and field site visits. (AAFC and MAFRI, 2013).

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Protect riparian areas in good health
- Restore degraded riparian areas through the implementation of BMPs such as exclusion fencing, alternative watering systems, buffer strips, bank stabilization, and planting native vegetation

"There used to be headlands (riparian areas) before the ditches. Lots of wild chickens, rabbits, and other wild animals used to live there. Now most people drive tractors and plow right up into the ditch, lots of dirt goes in the ditch."

– Jerry and David Marcynuik.

ALVARS

The Fisher River Watershed contains areas of a globally rare ecosystem known as alvar. "Alvar is a plant community that grows in soils depths of less than 10 cm over limestone bedrock" (Manitoba Alvar Initiative, 2013). These ecosystems contain plant species found in no other plant communities and are also habitat for a range of wildlife. They contain poor surface drainage and are typically flooded after spring snowmelt or heavy rains, but dry out rapidly. The effect of too much or too little moisture creates a stressful environment that limits the number of plant species that can survive and generally stunts the growth of those that do. The stressful environment eliminates many competitive plants, allowing the establishment of rare or unusual species of plants, birds and invertebrates.

The Fisher River Watershed is home to Manitoba's largest alvar. It is located in a 22 km by 2 km wide region between Fisher Branch and Hodgson. Alvars in the Fisher River Watershed appear to be groundwater recharge areas. The areas are raised above the surrounding landscape and have poor surface drainage. The flat surface area prevents overland drainage. Water ponds on the surface where it creates seasonal wetlands, which form after spring melt or large storms, but dry out later in the season. Water slowly recharges the underlying Carbonate aquifer or is lost to evaporation. Several of the alvars in the Fisher River Watershed are adjacent to biologically rich wetlands which are fed by groundwater discharge originating from the alvars.

Efforts are underway to protect alvars in Manitoba's Interlake Region, including within the Fisher River Watershed. Manitoba Conservation and Water Stewardship is working with the Nature Conservancy of Canada to conserve 4,000 ha of alvar lands. Conservation plans for alvar should include the protection of neighbouring wetlands as they are common areas for groundwater discharge and recharge.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Protect alvars and surrounding wetlands

Photos by Audrey Boitson

"Over the years of fishing, the water goes up and down, very fast. Sometimes you catch a lot of fish and they seem to be very large. In the spring, water is low and in the fall, it is higher. In the winter months, there is much less snow than there has been in the past. I remember very cold weather and this year, it was much warmer and less snow. I've been fishing for 70 years and experienced many changes in fish stocks over this time. In the last five or six years, there has been an increase in fish. More fish than ever before, especially pickerel and whitefish."

– Resident of Matheson Island

FISH HABITAT

- Residents of the Fisher River Watershed value fish habitat. Locals fish both commercially and recreationally.
- At least fourteen species of fish inhabit waterways within the watershed, with the most common being the white sucker, northern pike, central mud minnow, stickleback, and walleye.
- Almost half of the waterways within the Fisher River Watershed were rated as Class A or B in terms of aquatic habitat quality. These are only being minimally to marginally impacted by human activity, a figure that is relatively high for a watershed that contains agricultural lands near waterways. This can likely be attributed to low levels of urban development, the presence of well treed and grassed areas, and the natural meanders found along the Fisher River (North-South Consultants, 2009).

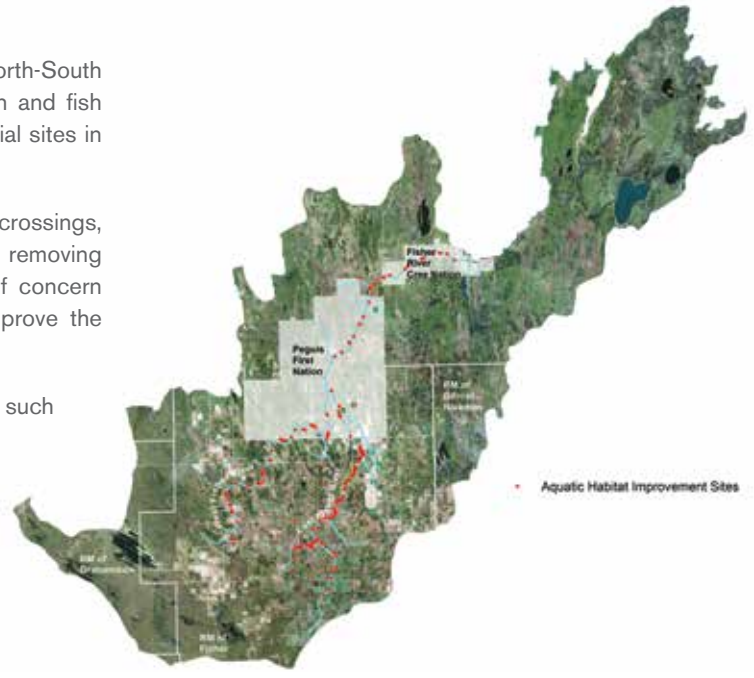
ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Conserve, enhance and rehabilitate fish habitat by completing five of the 44 priority projects identified in the Aquatic and Riparian Habitat Rehabilitation Study
- Find economic incentives to reduce invasive species, such as carp.

Fish Habitat Assessment Study

- The East Interlake Conservation District hired North-South Consultants to conduct an assessment of riparian and fish habitat in 2008-09. This study identified 23 potential sites in need of restoration activities.
- Recommended activities include improving crossings, restricting cattle access, restoring rapids, and removing barriers to fish passage. Addressing the areas of concern through fish habitat improvement projects will improve the health of fish populations in the watershed.
- Fish habitat has been impacted by invasive species such as carp. Locals report that carp have impacted the Fisher River through the removal of vegetation and stirring up of sediment.



WILDLIFE

- Residents of the Fisher River Watershed value wildlife habitat. Locals hunt and trap, and simply enjoy the presence of wildlife where they live.

- Many residents expressed concerns about a decline in moose population and an increase in wolf population.

- A Fisher Bay Provincial Park Management Plan is currently being developed with Fisher River Cree Nation to establish long term goals which address land use, development and resource protection. The treaty and Aboriginal rights to pursue traditional uses are acknowledged and respected within the park.

Photo by Joanne Smith

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Coordinate efforts to address the decline in moose population

- Promote sustainable moose hunting practices

Moose Populations

- Moose populations in the Fisher River Watershed are at risk due to an increase in the amount of mature forest, which results in a lack of younger forest growth. With the absence of wild fires or the ability to effectively use prescribed fire burning, which is the present day case here in Manitoba, moose populations will naturally decline as forest succession advances.

- Over hunting is also an issue in the watershed that both locals and wildlife officials attested to. Reductions in available licensed hunting tags have had little positive effect on moose population.

- Aboriginal and treaty harvest rights should be protected, but sustainable hunting practices should be encouraged locally.

- Local communities and the Province of Manitoba will need to work cooperatively to address concerns regarding the moose population.

"I remember when my dad would take me out hunting, how much deer, moose and elk we would see. Now our hunters basically come back with nothing due to pig farming, mining and other businesses."

– Resident of Peguis First Nation.

ENSURE SAFE DRINKING WATER

- **All of the communities in the watershed are dependent on groundwater as their source of drinking water.**
- **Public drinking water systems serve the communities of Fisher Branch and Pine Dock, managed by the Rural Municipality of Fisher and the community of Pine Dock, respectively.**
- **There are also public drinking water systems in Fisher River Cree Nation and Peguis First Nation that are managed by the federal government and the communities.**
- **Residents that are not connected to a public drinking water system rely on a private well as their drinking water source.**

Measure of Success	How will this be measured?
Source water protection plans implemented for all public drinking water sources.	Actions and protective measures for public drinking water systems are implemented and followed for the four public drinking water systems located within the watershed.
Number of private wells failing to meet provincial drinking water standards decreases, decreases, specifically for E. coli and total coliform levels.	In 2011, the East Interlake Conservation District conducted a well inventory within the upstream regions of the Fisher River Watershed that indicated one in every three private wells failed to meet provincial drinking water standards as a result of high levels of nitrates or bacteria (total coliform or E. Coli). East Interlake Conservation District will continue to monitor well water quality in five year intervals and compare results to determine if the number of wells failing to meet provincial drinking water standards has decreased.

AQUIFERS

- There are three types of aquifers in the Fisher River Watershed: near surface sands and gravel aquifers, the Carbonate aquifer, and the Winnipeg Formation Sandstone aquifer.
- The majority of drinking water, nearly 95%, in the Fisher River Watershed comes from the Carbonate aquifer which consists of limestone and dolomite bedrock.
- The pores, fractures and cavities found in the limestone and dolomite provide a reliable water source that is accessible throughout the watershed. The exception is the area near the Lake Winnipeg shoreline where the Carbonate aquifer is too thin to be a reliable source of drinking water; therefore, the Winnipeg Sandstone becomes the aquifer of choice in this region.
- Wells in the Carbonate aquifer will almost always yield sufficient supply for domestic use.
- Flowing wells can be found in some parts of the watershed, mostly in low lying area located in the northeast region along the main stem on the Fisher River.
- Most groundwater recharge occurs within the watershed or nearby, thus, natural groundwater quality is good.

ACTIONS

For more details on the implementation of these actions, please see pages *36 - 40.*

- Protect the alvars and surrounding wetlands as they provide groundwater recharge and discharge for the area.
- Seal abandoned wells

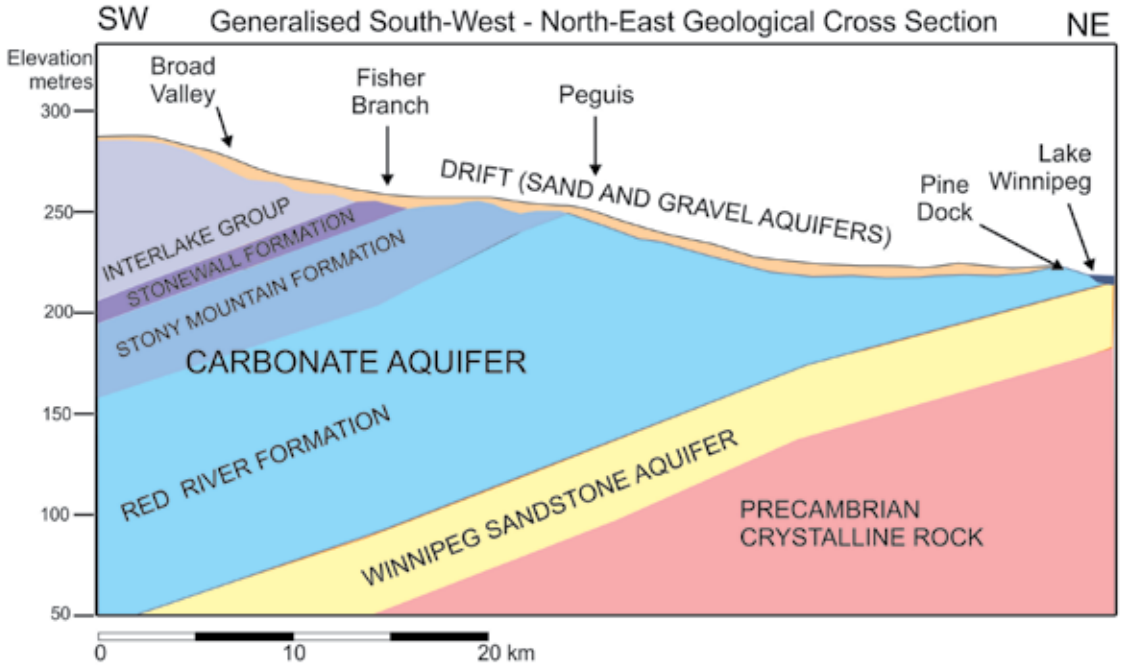


Figure 2: Generalized Regional Cross Section of Aquifers located within the Fisher River Watershed

> *"Water quality for drinking has always been quite stable, with enough available."*
>
> *– Boyd Abas.*

SOURCE WATER PROTECTION PLANS

- **Source water protection plans are part of the multi-barrier approach to protecting public drinking water systems. Source water protection focuses on protecting and improving the source of drinking water before it reaches a water treatment facility.**
- **These plans often include actions to protect the area immediately surrounding the source of drinking water including modifying land use practices to ensure that drinking water sources are not adversely affected by surrounding land uses and activities.**
- **A public drinking water system serves 15 or more connections. There are four public drinking water systems located within the Fisher River Watershed. Source water protection plans have been developed for three of the four public systems.**
- **As part of the developing these source water protection plans, a group of technical experts and community members conducted site visits of the source water protection zone, a 1.5 kilometre area surrounding the well, to identify potential sources of contamination and develop actions to address any threats that pose a high risk of contamination.**

Public Drinking Water System	Jurisdictional Responsibilities	Recommended Actions
Fisher Branch	Rural Municipality of Fisher, Province of Manitoba	• Rural Municipality of Fisher and Manitoba Conservation and Water Stewardship to monitor the integrity of private on-site waste water systems located within in the source water protection zone • East Interlake Conservation District and Rural Municipality of Fisher to seal all abandoned wells located within the source water protection zone
Pine Dock	Pine Dock, Province of Manitoba	• Manitoba Aboriginal and Northern Affairs, the community of Pine Dock, and landowners to seal abandoned wells located within the source water protection zone • Pine Dock to develop an emergency response plan in the event that there is a fuel spill that could affect the quality of drinking water • Pine Dock to repair electrical wiring on the East Well
Fisher River Cree Nation	Fisher River Cree Nation, Government of Canada	• Fisher River Cree Nation to ensure private abandoned wells in the source water protection zone are are sealed properly
Peguis First Nation	Peguis First Nation, Government of Canada	• Peguis First Nation to complete a source water protection plan for its public drinking water system • Peguis First Nation to ensure private abandoned wells in the source water protection zone are are sealed properly

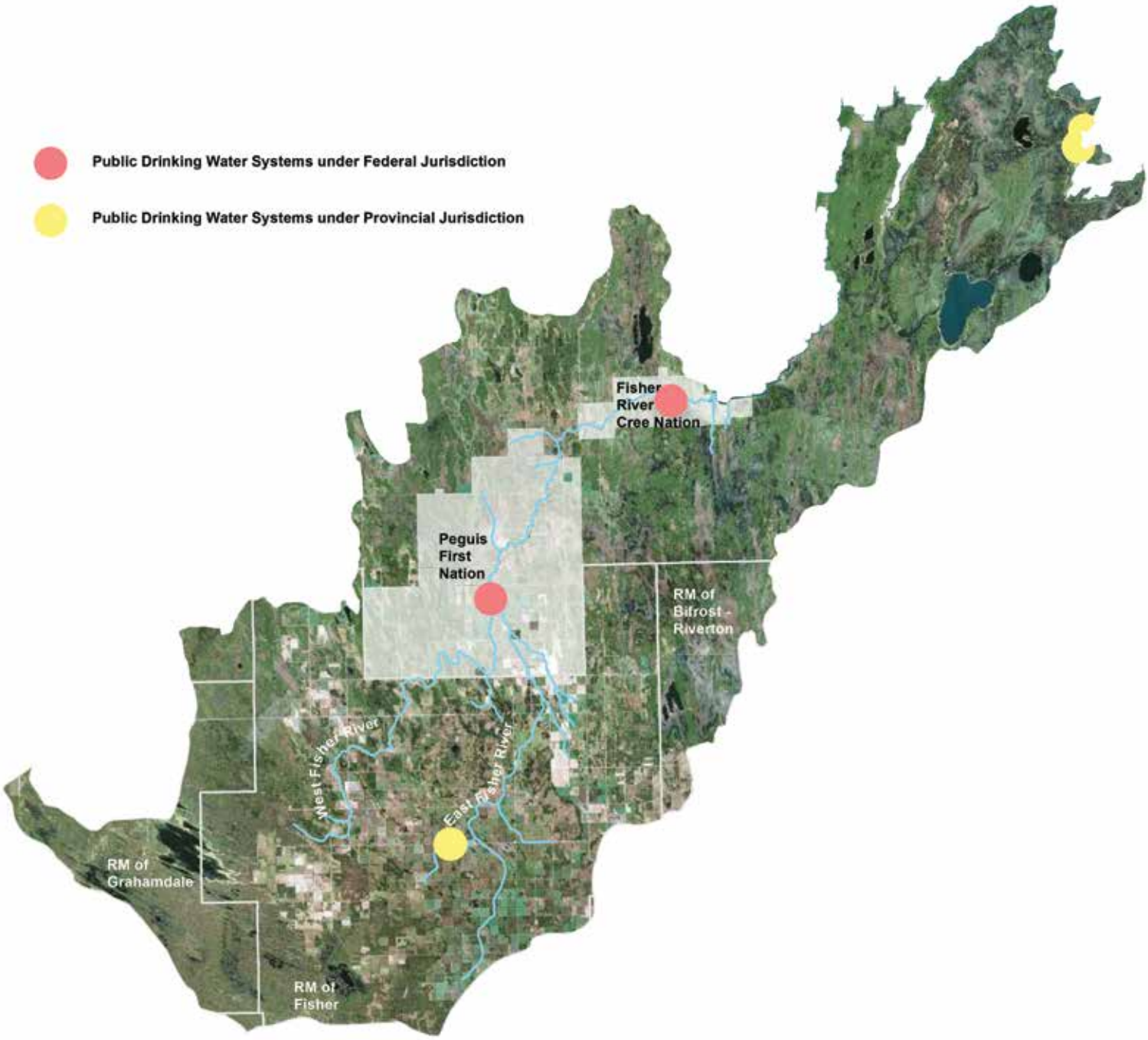


Figure 3: Public Drinking Water Systems

PRIVATE WELLS

- Many residents rely on private wells as their source of drinking water. Provincial records indicate the presence of over 1,500 private wells within the Fisher River Watershed.
- It is the responsibility of the owner of the well to ensure it is properly constructed and maintained, and that the water is safe for drinking. Resources such as the Well Aware booklet can serve as a helpful evaluation tool for owners to assess their private wells.
- East Interlake Conservation District assessed well water quality in the upstream regions of the Fisher River Watershed in 2011 that indicated one in every three private wells failed to meet provincial drinking water standards as a result of high levels of nitrates or bacteria (total coliform or E. Coli).
- Well water contamination can be caused by improperly constructed or poorly maintained wells. Wells and water distribution systems deteriorate over time and require regular monitoring and maintenance.

WELL CONSTRUCTION AND MAINTENANCE

The following measures are recommended to help reduce the risk of well water contamination:

- Retain an experienced and licensed well drilling contractor for the drilling and construction of water well.
- Ensure an experienced and licensed contractor completes the hook up of the water well to the water distribution system.
- Ensure the well pump and water distribution system is disinfected to kill any bacteria that may be present before its first use, and anytime that bacteria is found to be present.
- Inspect wells annually and monitor well water quality regularly through laboratory testing for the presence of bacteria.
- Locate the well at a safe distance from potential sources of contamination and in an area away from surface runoff. It is recommended that drilled wells should be located at a minimum distance of 15 metres from a septic system. For dug or bored wells, it is recommended that wells are located at least 30 metres from a septic system.
- Wells located within a designated flood area should have adequate well head protection to ensure flood waters do not enter directly into the well.
- Ensure abandoned wells are properly sealed.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Continue to monitor wells through a well inventory program
- Educate residents on the importance of regular well monitoring and maintenance

PRESERVE AND IMPROVE WATER QUALITY IN LAKES AND STREAMS

- **Residents of the Fisher River Watershed value good water quality within the waterways and in their watershed, and have expressed concerns about algal blooms on Lake Winnipeg.**

- **Water quality is connected to and affects many different aspects of the watershed. Many of the natural features, including plants, animals and aquatic life that are so valued by residents are dependent on good, clean water for their survival.**

- **Water quality is affected by human activities and changes to the landscape, both positively and negatively. Removal of wetlands, improper nutrient management, livestock in creeks, and poor sewage management can all negatively affect water quality. Water retention, wetland protection, riparian area restoration, and proper waste management can all positively influence water quality.**

Measure of Success	How will this be measured?
Water quality improves over the 10 year implementation period of the IWMP when compared to historical water quality data.	Water quality of the Fisher River has been monitored by the East Interlake Conservation District, in partnership with Manitoba Conservation and Water Stewardship, since 2006. Water quality results gathered over the Fisher River IWMP implementation period can be compared to historical water quality data, understanding that conditions such as flow volumes, runoff amounts and weather may influence water quality results when analyzed over a short period of time such as ten years.
Current and traditional land use activities are able to continue.	Observation from watershed residents can be used to assess whether or not the water is healthy and clean enough for them to use for traditional and current land uses.

In First Nations culture, women are responsible for caring for the water. Women in Peguis First Nation and Fisher River Cree Nation take part in ceremonial walks and prayers for water. Water has the power to give life and to be destructive. It needs to be in balance with other aspects of creation. Praying for the water is one of the primary ways in which First Nations women care for the water to ensure that it is healthy and gives life. Another spiritual belief is that water is used for holy practices and is a necessity of life for all humans.

> *When the water was high this summer and then it went down, the rocks were just this kind of blue green color. We had never seen that on the rocks before. When the water would go down, you would get that dark mossy green along the shore. Now this year, it was that light blue green colour. I don't know if that was algae or what it was.*
>
> *– Doreen Bennet from Matheson Island.*

WATER QUALITY

- Since 2006, one long-term water quality sampling station in the watershed, at Marcyniuk Bridge has been tested at least four times per year.
- Extensive water sampling was completed along the Fisher River from 1994 to 1996, with 136 samples being collected over this two year period. Sampling indicates the Water Quality Index over this time has been fair to good for recreational guidelines (Figure 4).
- In 2006 and 2007, Total Nitrogen and Total Phosphorus exceeded recreational water quality guidelines.
- From 2008 to 2011, there were also exceedances for metals such as manganese, E. Coli, dissolved oxygen, and total suspended solids.

Water Quality Index - Fisher River (Marcyniuk Bridge near Dallas)

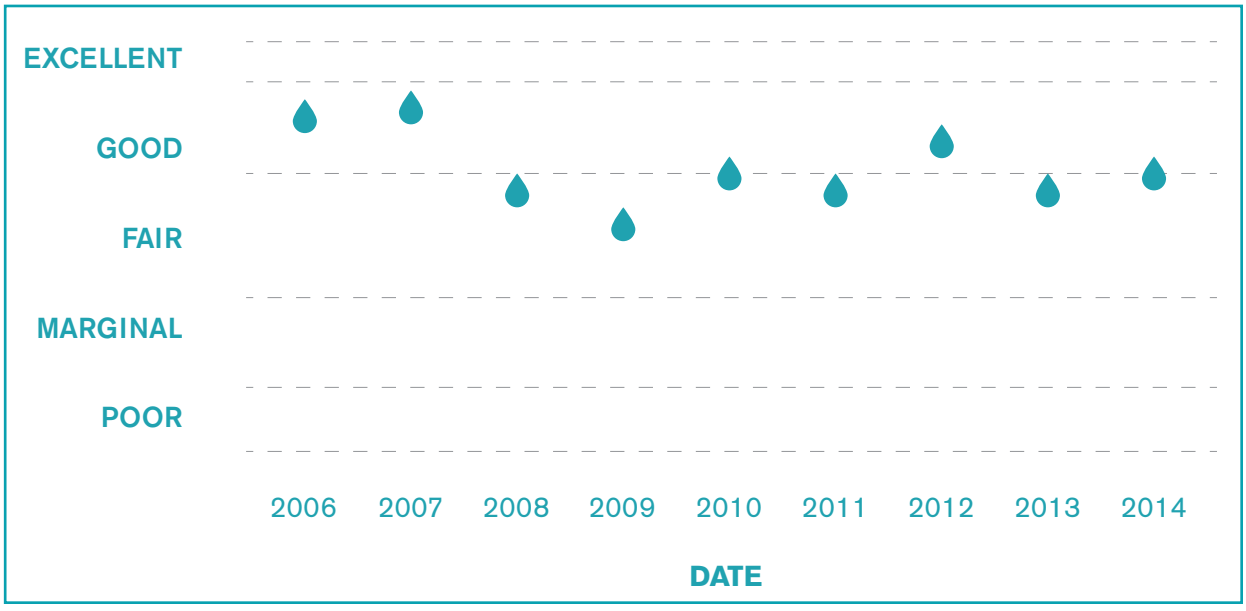


Figure 4: Water Quality Index for the Fisher River

LOCAL ACCOUNTS OF WATER QUALITY CHANGES

While scientific testing of water quality in the Fisher River only goes back to recent decades, there were many accounts from local residents about how water quality in the river has changed over many decades.

I came to area in 1982 to raise cattle. Our branch of the Fisher River is spring fed. Once upon a time, it was beautiful, clean, and healthy. Our children spent their springs, summers, and falls wading, splashing, and sitting on stones. They caught crayfish and frogs and put them back. They followed tracks in the winter of the various animals living nearby. It's gone now. The stream is filled with silt, plugged with weeds and trees, and unfit for the previously mentioned pleasures.

- Resident from the Rural Municipality of Fisher

The rivers went from clear water to murky grey over the last 30 years. And it keeps getting worse each year.

- Resident from the community of Dallas-Red Rose

As a kid, we used to swim in the river and fish. Over the years, I've watched it deteriorate to the state where we can't be in the water. Even the ice that freezes now is brittle and weak.

– Residents from Peguis First Nation

The river has turned dark, black and yellow in the last 10 to 20 years. We can't drink from the river anymore. We can't swim.

- Residents from Peguis First Nation

There have been negative changes in the health of our fish, landscapes and animals. These are all concerns for me and my future generations. We need to start protecting our water.

- Resident from Matheson Island

AGRICULTURE INFLUENCES ON WATER QUALITY

- Agricultural activities can contribute nutrients, particularly nitrogen and phosphorus, and bacteria to waterways and water bodies within the Fisher River Watershed which can deteriorate water quality.
- Activities that reduce nutrient loading are a high priority. BMPs such as nutrient management planning, soil testing, manure testing, improved fertilizer and manure application and riparian area management should be implemented.
- The agricultural application of pesticides is another land management practice which has a negative impact on this watershed. For example, the broad-leaf herbicide MCPA contributed to a lowered Water Quality Index for a majority of the years of record (Figure 4). BMPs that focus on reducing or optimizing the timing of pesticide application would be a benefit to water quality.
- Suspended solids also contributed to poor water quality in several years. BMPs such as livestock exclusion fencing and riparian enhancement would help to reduce erosion and improve water quality.
- Educating landowners through programs such as the Environmental Farm Plan (EFP) Program offered by Manitoba Agriculture, Food and Rural Development should be a priority to assist farmers in identifying actions that improve the efficiency of their operation while reducing risks to water quality.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Implement BMPs that reduce nutrient loading such as nutrient management planning, soil testing, manure testing, improved fertilizer and manure application, and buffer strips
- Implement BMPs that reduce bacteria loading and erosion such as livestock exclusion fencing, the installation of off-site watering systems, the relocation of livestock facilities, and improved manure management
- Promote the use of constructed wetlands to control farm-yard runoff
- Encourage farmers to complete an environmental farm plan

WASTEWATER MANAGEMENT

- Wastewater management is a concern for many residents of the Fisher River Watershed.
- There are two municipal wastewater lagoons located within the watershed, serving the communities of Fisher Branch and Pine Dock, both of which are small class treatment facilities. Small class treatment systems serve 500 people or less and have no mechanical treatment employed.
- Municipal Wastewater systems must be managed according to their operating license and are required to meet recreational water quality guidelines for bacteria before effluent is discharged.
- Municipalities are currently not required to test nutrients levels in lagoons, however municipalities are encouraged to test phosphorus levels before effluent in discharged.
- There are also many residents who use private on-site wastewater management systems such as septic fields, holding tanks or ejectors.
- Wastewater effluent 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, wastewater systems should be inspected regularly to ensure they are working properly.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Promote the proper monitoring and maintenance of private on-site wastewater systems, including the inspection of systems that are more than 20 years old or located near waterways or water bodies
- Expand monitoring of local government wastewater to include phosphorus concentration prior to discharge
- Encourage the use of regional solid waste transfer stations and assess existing transfer stations for contamination issues

"Upstream areas of the Fisher River have changed; there are two human lagoons; and more synthetic fertilizer is being used. Manure is getting flushed off fields by high rainfall and flood events."

- Boyd Abas.

COORDINATE SURFACE WATER MANAGEMENT TO PROTECT COMMUNITIES AND AGRICULTURAL LANDS FROM FLOODS AND DROUGHTS

- The Fisher River Watershed is comprised of one major surface water system - the Fisher River and its tributaries. The Fisher River flows through low lying land within the Rural Municipality of Fisher, Peguis First Nation, Dallas-Red Rose, and Fisher River Cree Nation. The system consists largely of natural waterways, artificial drains, lakes, and wetlands.
- The Fisher River Watershed has a total drainage area of 3,150 square kilometres, of which 2,233 square kilometres of land drains through the Fisher River and the remaining 918 square kilometres drains into the Fisher Bay on Lake Winnipeg.
- Flooding is a natural occurrence in this watershed, but has grown in frequency and intensity over the past decade.
- Flooding is most common along the corridor of the Fisher River, and has caused extensive damage to homes, businesses, infrastructure such as bridges and roads, agricultural land, and wildlife and aquatic habitat.
- It is important that all the communities in the watershed communicate regularly and coordinate surface water management activities to address flooding issues collaboratively.
- The Fisher River Watershed also has the potential to be impacted by drought as seen in past years. There have been times in living memory where conditions were very dry, and these conditions could return again.
- Building community resilience to climate change variability is important to ensuring a healthy economy and environment in the Fisher River Watershed.

Measure of Success	How will this be measured?
Flood damage to property, infrastructure, and agricultural crops is reduced.	Observations from watershed residents and information from compensation and insurance programs will be used to assess whether flood damages have been reduced by comparing data from between 2000-2010 to future 10 year periods.
A no net loss of wetlands policy will be adopted within the watershed.	2006 land cover data shows wetlands covered approximately 14% of the watershed. Future land cover data can be compared to the 2006 data. Observations from residents and efforts to protect and restore wetlands will also be considered. Considerations will be given to climate variability and its impact on wetlands.
Increase upstream water storage to reduce peak flows by 5%.	Activities that retain water such as the construction of small dams and retention ponds will be evaluated to determine the percentage reduction in peak flows.

CLIMATE AND HYDROLOGY

- The Fisher River Watershed is located within the Boreal Plain Ecozone and has an average temperature of just over 1 degree Celsius and an average precipitation amount of just over 500 millimeters per year.
- The watershed is characterized by short, warm summers and long, cold winters. Temperature and precipitation levels vary considerably from year to year.
- With this variation in temperature, there is a freezing of the river and water bodies, an accumulation of snow, and then a spring snowmelt which often leads to significant spring runoff events and high water volumes in creeks and rivers.
- Typically, the highest flows on the Fisher River occur in the months of April and May. On average, over 40% of annual flow of the Fisher River occurs during the month of April, followed by an average of just over 15% in the month of May.
- June to October can also experience higher flow events after periods of heavy summer rains.
- With weather conditions varying greatly from year to year, there is a large variation in the annual volume of water moving through the Fisher River. Over the past decade, the station near Dallas has recorded annual volumes as low as 7,156 dam^3 and as high as 256,070 dam^3.
- With this level of variation from year to year, it is important to be prepared for both flood and drought events. Further variations due to climate change impacts should be considered in future resiliency and adaptation planning.

> *"Over the last 15 to 20 years, flooding occurs almost annually. It even flooded once in October. Before, flooding occurred only occasionally."*
>
> *– Cheryl Thomson.*

FLOOD MITIGATION OPTIONS

In 2009, AECOM was hired by the Province of Manitoba to complete a hydrodynamic model and economic analysis study within the Fisher River Watershed. This study explored the effects of land use changes and increased drainage on flooding along the Fisher River, as well as other contributing factors and potential solutions. "This analysis has indicated that land use changes and drainage improvements have little impact on peak water levels or flood duration for extreme flood events at downstream locations in First Nation Communities" (AECOM, 2009). AECOM (2009) found the impacts of drainage were found to be more pronounced in the middle and upstream reaches of the watershed.

The report also acknowledged that Fisher River Cree Nation and Peguis First Nation experience more frequent flooding than other communities in Manitoba and that the watershed is geographically prone to flooding. The key finding of the report is that the only economically justifiable option for flood mitigation is to construct a dyke along the corridor of the Fisher River (AECOM, 2009). This would involve moving homes and reconstructing infrastructure such as bridges at a significant expense. Sealing flowing wells may also be a recommended course of action to prevent ice build up and potentially lessen the occurrence of ice jams (AECOM, 2009). Since the study was completed, the option of flood proofing or relocating homes within flood prone areas along the Fisher River has been explored.

In 2005-06 elevation data was collected for the Fisher River Watershed (Figure 5) known as LiDAR (Light Detection and Ranging). LiDAR is collected by a plane with a GPS and laser unit, the plane sends out a laser which rebounds off the earth and provides elevation data accurate within a few centimeters. This data is being used to develop a watershed planning tool utilizing LiDAR data. The tool will allow EICD to select sites for water retention, wetland restoration, peak flow reduction, and nutrient reduction.

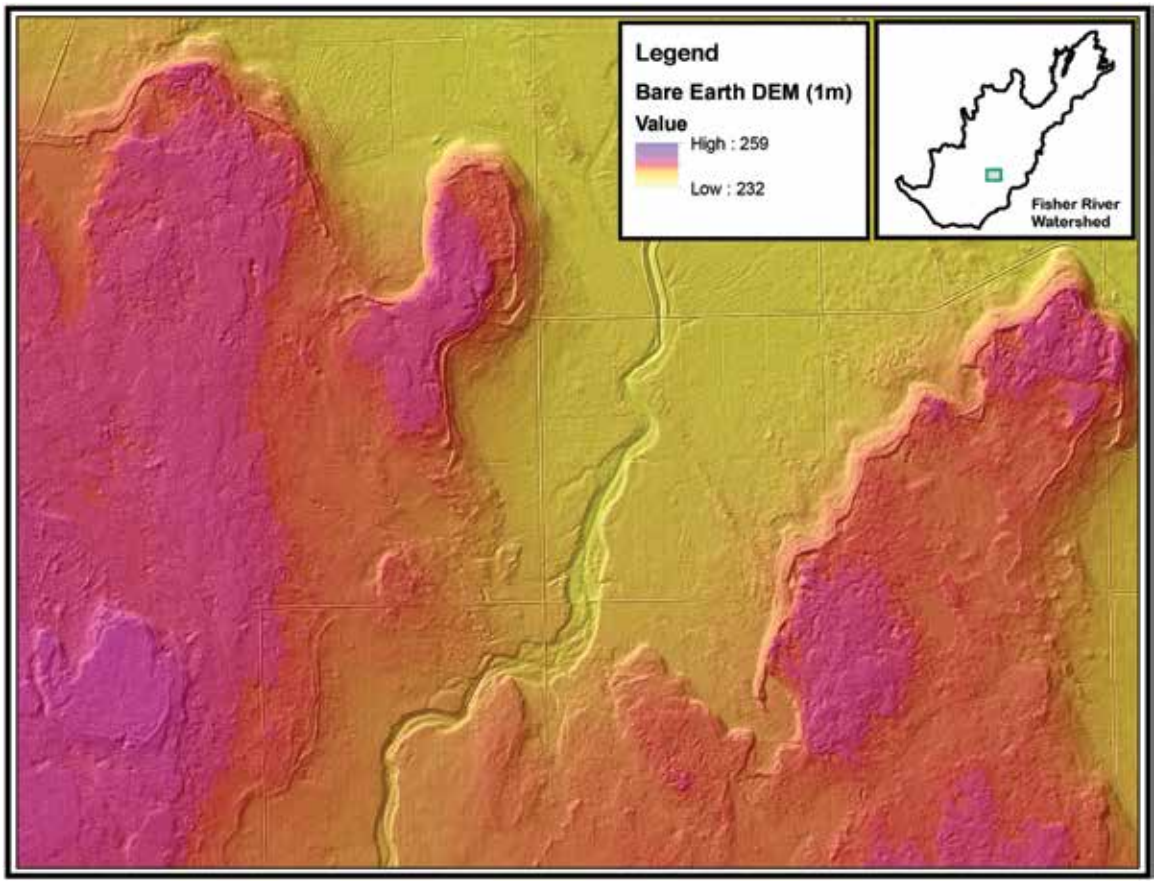


Figure 5: Elevation model for the Fisher River Watershed

UPSTREAM WATER RETENTION

- Upstream water retention is crucial to mitigating the impacts of flooding within the Fisher River Watershed.
- Retaining water in the upstream region of the watershed during spring melt and after heavy summer rainfall events will reduce the volume of water flowing down the Fisher River. This will lower the occurrence and impact of the flooding events on downstream communities.
- When analyzing the benefits of upstream water retention on reducing peak flows, the severity of the flood event must be considered. Upstream water retention will have a larger impact on reducing peak flows during smaller flooding events than during larger flooding events. In times of lighter rains the wetlands and water retention areas have more time to soak up excess rainfall, letting it out slowly afterwards. In times of heavier rains these catchments fill up quickly and the water continues to flow past them, flooding downstream areas.
- Landowners located near water retention sites may experience larger benefits than those that live further downstream.
- For example, with a goal of retaining 6,000 acre-feet of water in the upstream region of the watershed, peak flows would be reduced as follows:
  - a 5% reduction in peak flows for a 1 in 100 year flood event
  - a 10% reduction in peak flows for 1 in 5 year flood event
  - a 15% reduction in peak flows for 1 in 2 year flood event

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Implement upstream water retention projects with a goal of storing 6,000 acre-feet of water

Flood Severity (Return Period)	Reduction in Peak Flows (Storage in Acre-Feet)		
	5%	10%	15%
1 in 100 year flood	6,265	12,529	18,794
1 in 50 year flood	5,762	11,524	17,285
1 in 20 year flood	4,949	9,897	14,846
1 in 10 year flood	4,192	8,384	12,576
1 in 5 year flood	3,280	6,561	9,841
1 in 2 year flood	1,776	3,553	5,329

Table 1: Peak Flow Reduction and Water Storage Analysis for the Fisher River Watershed

> *"We used to be able to drive on fields, land was dry. With the draining of wetlands and little lakes, everything got wet."*
>
> *– Jerry Marcyniuk.*

SURFACE WATER **MANAGEMENT PLAN**

The main purpose of managing surface water in the Fisher River Watershed is to prevent or reduce the impacts of flooding on agricultural and residential land. While flood protection is important, surface water management can also serve to enhance watershed health. Residents of the watershed expressed a need for a more holistic and coordinated approach to managing surface water for a broader range of watershed values where flood protection, drought preparedness, aquatic ecosystem health, water quality, wetlands and recreational enjoyment are all considered when making decisions about managing surface water.

ACTIONS

For more details on the implementation of these actions, *please see pages 36 - 40.*

- Improve the communication and coordination of surface water management activities

In the Fisher River Watershed, the responsibility of maintaining the drainage network is split among farmers, municipalities and the Province of Manitoba. Waterways are classified from 1st order to 7th order, with the 1st order being the smallest and the 7th order being the largest. In the Fisher River Watershed, municipalities maintain 1st and 2nd order drains; whereas Manitoba Infrastructure and Transportation maintain most 3rd order drains and higher. There are approximately 160 kilometres of provincial waterway drains and approximately 516 kilometres of municipal drains in the watershed. Agricultural producers are responsible for the maintenance and construction of drains located on their land. Licences to conduct drainage works can be obtained from Manitoba Conservation and Water Stewardship. Residents expressed many concerns related to the management of surface water, including the lack of regular drain maintenance, poor coordination of drainage activities, excessive drainage in the upstream reaches of the watershed, and illegal drainage activities.

Watershed zones have been identified on the following pages. Goals for surface water management have been developed for each zone and consider the diversity of landscape characteristics in the watershed.

WATERSHED **ZONES**

The watershed was divided into three zones based on landscape characteristics such as land cover, soils, topography, and land use. Each zone is unique, and surface water management activities should vary within each zone to suit its landscape features. Therefore surface water management goals were developed for each of the three zones.

ZONE 3 - NATURAL AREA ZONE

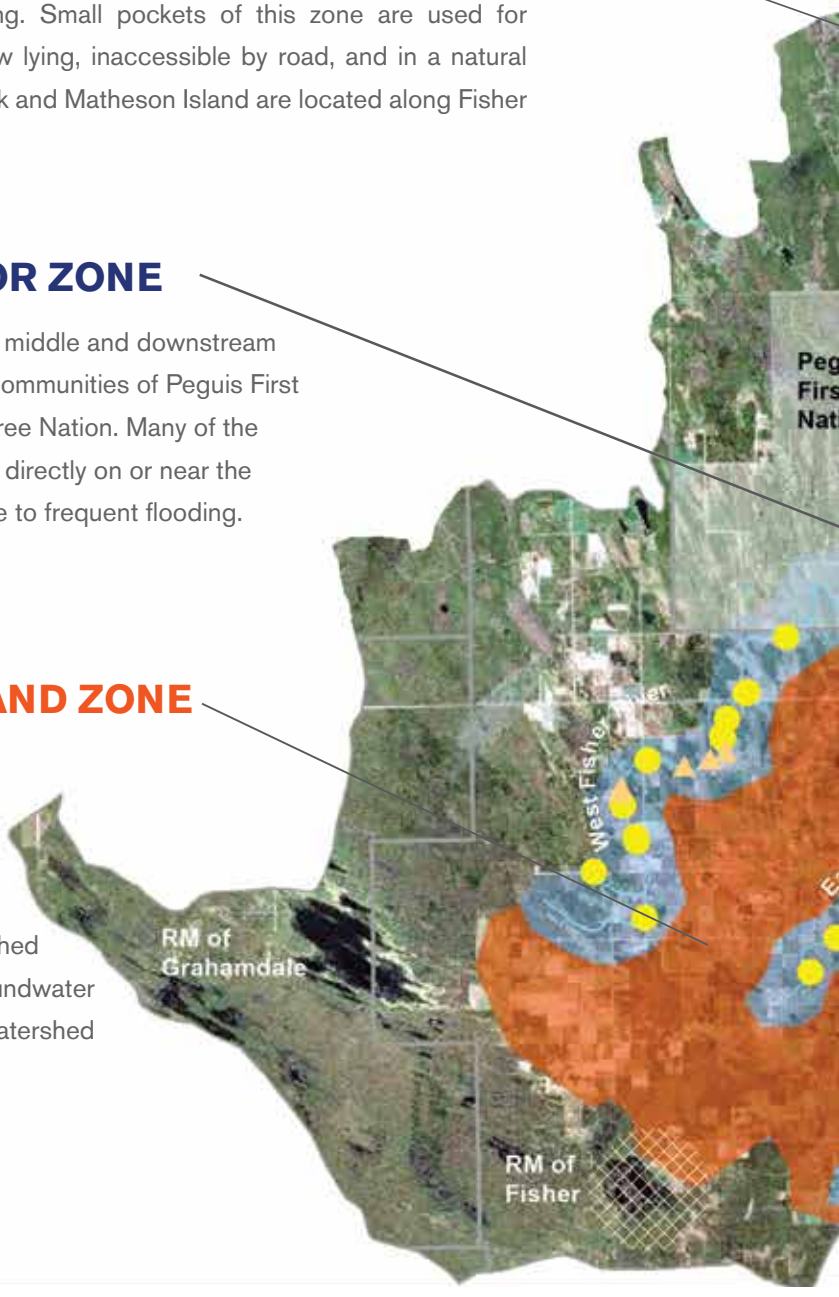
The Natural Zone occupies the largest portion of the Fisher River Watershed. This zone consists of natural areas such as forests, grasslands, wetlands, peatlands, and lakes. This zone is used for hunting, collecting traditional medicines, forestry and peat mining. Small pockets of this zone are used for agriculture. Much of this zone is low lying, inaccessible by road, and in a natural state. The communities of Pine Dock and Matheson Island are located along Fisher Bay Peninsula.

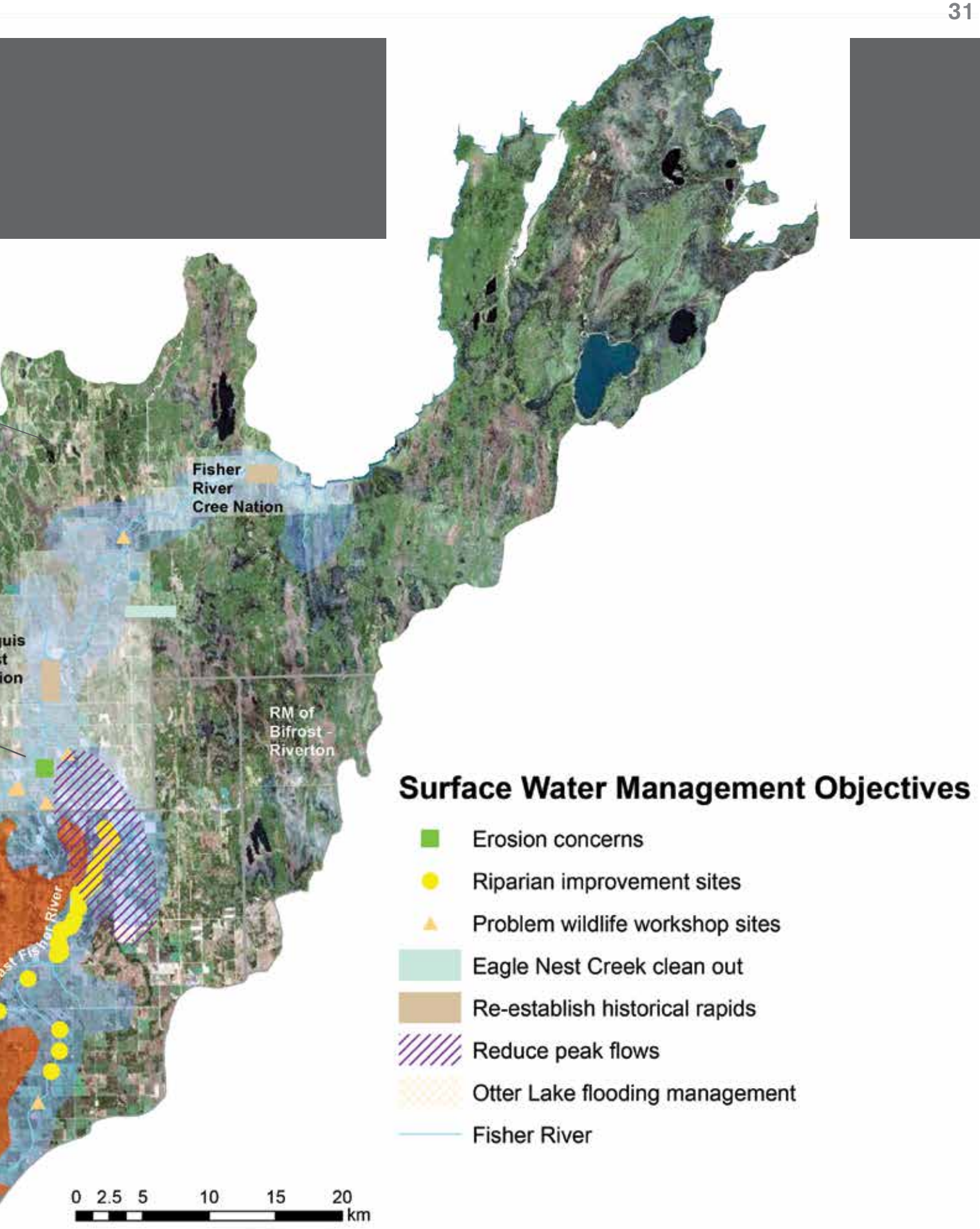
ZONE 2 - RIVER CORRIDOR ZONE

The River Corridor Zone is located along the middle and downstream reaches of the Fisher River and contain the communities of Peguis First Nation, Dallas-Red Rose, and Fisher River Cree Nation. Many of the homes and community amenities are located directly on or near the Fisher River. This zone is low lying and prone to frequent flooding.

ZONE 1 - ACRICULTURAL UPLAND ZONE

The Agricultural Upland Zone is characterized by higher topography, areas with low overburden of soil (including alvars), and high quality agricultural lands. Water from this zone flows north from two branches of the Fisher River. This zone of the watershed has the most undulating topography, is an area for groundwater recharge, and serves as the agricultural base for the watershed with a mix of livestock and annual crop operations.




Fisher
River
Cree Nation
RM of
Bifrost -
Riverton
Surface Water Management Objectives
Erosion concerns
Riparian improvement sites
Problem wildlife workshop sites
Eagle Nest Creek clean out
Re-establish historical rapids
Reduce peak flows
Otter Lake flooding management
Fisher River
0 2.5 5 10 15 20
km

ZONE 1 - AGRICULTURAL UPLAND ZONE

ISSUES

- Flooding of agricultural land during spring melt and heavy summer rainfall events
- A lack of regular maintenance of the drainage network
- Erosion and siltation, contributing to poor water quality
- Degradation of riparian areas from agricultural activities

GOALS

- Protect wetlands through conservation agreements and land purchases
- Implement water retention projects
- Protect and restore riparian areas
- Implement erosion control projects
- Re-naturalization of drains and creeks
- Facilitate cooperative consultation on surface water management activities
- Conduct drain maintenance and reconstruction with consideration of downstream impacts
- Discourage unlicensed drainage
- Maintain artesian wells and equip wells with flow control devices to ensure they do not adversely affect drainage infrastructure
- Manage beavers to reduce impacts on property and infrastructure
- Educate residents on the importance of adapting to climate change variability
- Build community resiliency for climate change variability through flood and drought preparedness

ZONE 2 - RIVER CORRIDOR ZONE

ISSUES

- Flooding frequency has increased in recent years along the river
- Homes and businesses within Peguis First Nation and Fisher River Cree Nation experience significant impacts from flooding events
- Degradation of riparian areas and aquatic habitat from agricultural activities
- Erosion and siltation along the Fisher River, contributing to poor water quality

GOALS

- Flood proof or relocate buildings located within flood prone areas
- Adopt development restrictions within the flood plain of the Fisher River
- Protect and restore riparian areas
- Implement erosion control projects
- Improve communication and coordination of surface water activities with upstream jurisdictions
- Restore degraded aquatic habitat
- Preserve existing rapids and restore previously destroyed rapids
- Educate residents on the importance of adapting to climate change variability
- Assess culvert needs through LiDAR analysis

ZONE 3 - NATURAL ZONE

ISSUES

- Peat mining activities near the Fisher Bay Peninsula
- Shoreline erosion from cottage development along Lake Winnipeg
- Loss of wetlands and forested areas due to development

GOALS

- Protect natural areas including forests, grasslands, wetlands and riparian areas through conservation agreements and land purchases
- Ensure proper consultation practices are followed when reviewing proposed development activities

PLAN **LINKAGES**

In addition to the Fisher River IWMP, the East Interlake Conservation District has developed Watershed Management Plans for three other watersheds is their district: the Icelandic-Washow Bay, Netley-Grassmere and Willow Creek Watersheds.

There are a number of groups that are responsible for development planning within the Fisher River Watershed - the Fisher-Armstrong Planning District and the Eastern Interlake Planning District, as follows:

- Municipal Planning Authorities:
  - Fisher-Armstrong Planning District
  - East Interlake Planning District
  - RM of Grahamdale
- First Nations:
  - Fisher River Cree Nation
  - Peguis First Nation
- Aboriginal and Northern Affairs Communities:
  - Dallas-Red Rose
  - Pine Dock
  - Matheson Island
- Crown Lands:
  - Province of Manitoba

The following recommendations should be considered by development planning authorities when creating or amending their development plans:

1. Develop policies that restrict intensive and high-pollution risk developments (developments, activities, land uses and structures that have a high risk of causing pollution and include but are not limited to chemical/fertilizer storage and application, septic systems, petroleum storage, waste disposal grounds, industrial factories and wastewater facilities) in source water protection zones around all public drinking water systems and in areas with less than six meters of overburden.

2. Establish restrictions to new developments in flood prone areas, especially along the corridor of the Fisher River, to a minimum of one metre above the 100 year flood event level.

3. Establish development restrictions along the shoreline of Lake Winnipeg to a minimum of 100 meters from Lake Winnipeg.

4. Include East Interlake Conservation District as a commenting agency for all applications pertaining to new drainage works, the sale of Crown lands, new or expanding livestock facilities, new residential and subdivision developments, and conditional use licenses that may have an impact on water management within the Fisher River Watershed.

5. Protect existing wetlands on Crown lands by restricting drainage activities.

6. Consider adopting a regulatory or policy framework to ensure that existing and future homes, buildings and developments are adequately flood proofed, thus greatly reducing future flood damages. This could be accomplished by regulating development in a manner similar to the regulations used in Designated Flood Areas that are designated under *The Manitoba Water Resources Administration Act*. The key elements of these Designated Flood Area regulations are:

   o A flood area is designated and flood protection levels are set, typically using the 100 year flood event.

   o Flood protection levels and certain minimum flood protection criteria are established for structures within the Designated Flood Area. Additional guidelines for the construction of flood protection works are also provided.

- o Structures include buildings, dikes, lagoons and storage tanks. Wells, open air structures and private sewage systems are not included.
- o Building floor elevations are set for structures by way of a two permit system. The first permit is issued for the foundation, the foundation is inspected and, if it complies, a second permit is issued for the structure.
- o The permits are in addition to, not instead of, building permits, permits for sewage disposal, etc. and do not specify construction standards.
- o Inspectors set floor elevations, establish reference marks and inspect the structures and flood protection works for compliance.
- o Remedies for non-compliance are identified including stop work orders, caveats advising of non-compliance and withholding of future flood damage assistance.
- o Applications for permits are declined if the structure and flood protection works cannot be safely constructed due to, for example, unstable foundation conditions or inadequate space.
- o A database of completed flood proofing works is maintained.

7. Work in conjunction with other planning authorities in the watershed to consider integrating climate change resiliency, preparedness strategies and actions in support of climate sensitive land use planning and sustainability of future water resources.

IMPLEMENTATION

The most important aspect of any Integrated Watershed Management Plan is its implementation. Without it, the plan is no more than a list of good intentions. In the case of the Fisher River Integrated Watershed Management Plan, a concerted effort from residents, stakeholder organizations, First Nations, municipalities and the Province of Manitoba is necessary to ensure the recommendations outlined in plan are implemented successfully. As such, many organizations have committed to implementing the actions outlined in this plan. Progress and success of the plan's implementation will be assessed on an annual basis. Progress updates will be distributed to residents every three to five years.

A summary of all watershed recommendations is provided on the following pages.

TABLE 2: IMPLEMENTATION PLAN FOR FISHER RIVER

GOAL 1: PROTECT AND RESTORE NATURAL AREAS

RECOMMENDATIONS	LEAD & SUPPORT ORGANIZATION(S)*	TARGET AREA(S)**	EVALUATION OF SUCCESS	MORE INFO
Protect existing wetlands, particularly in the upstream portions of the watershed	EICD, NCC, MHHC, DUC, MCWS - Drainage Licensing	Watershed, with focus on Zones 1 and 3	One wetland is protected each year	Page 09
Explore the potential of biomass harvesting in wetland and water retention areas to further reduce nutrient loading	IISD, EICD	Watershed	A pilot project is established	Page 09
Ensure proper consultation occurs for all proposed peat harvesting activities	Industry, MCWS, Peguis First Nation, Fisher River Cree Nation	Watershed	Consultation occurs on all proposed peat harvesting activities	Page 10
Educate the public on the value of traditional lands, the harm of invasive species, and peat harvesting alternatives	Peguis First Nation, Fisher River Cree Nation, MCWS	Watershed	One educational event is held each year	Page 10
Protect riparian areas in good health	EICD, MHHC, NCC, Peguis First Nation, Fisher River Cree Nation, landowners	Watershed	Five projects are completed in 10 years	Page 11
Restore degraded riparian areas through the implementation of BMPs such as exclusion fencing, alternative watering systems, buffer strips, bank stabilization, and planting native vegetation	EICD, MAFRD, NCC, Peguis First Nation, Fisher River Cree Nation, landowners	Watershed	One project is completed each year	Page 11
Protect the alvars and surrounding wetlands	EICD, NCC, MHHC, MCWS	Watershed	Two projects are completed in 10 years	Page 12
Conserve, enhance and rehabilitate fish habitat by completing five of the 44 priority projects in the Riparian and Aquatic Habitat Study	EICD, Peguis First Nation, Fisher River Cree Nation, MCWS	Locations identified in EICD Riparian and Aquatic Habitat Study	Five projects are completed in 10 years	Page 13
Find economic incentives to reduce invasive species, such as carp	Commercial fishing industry, entrepreneurs	Watershed	A pilot project is established	Page 13
Coordinate efforts to address the decline in moose population	MCWS, Peguis First Nation, Fisher River Cree Nation	Watershed	A strategy is developed	Page 14
Promote sustainable moose hunting practices	Peguis First Nation, Fisher River Cree Nation	Watershed	One activity is completed each year	Page 14

GOAL 2: ENSURE SAFE DRINKING WATER

RECOMMENDATIONS	LEAD & SUPPORT ORGANIZATION(S)*	TARGET AREA(S)**	EVALUATION OF SUCCESS	MORE INFO
Protect the alvars and surrounding wetlands as they provide groundwater recharge and discharge for the area.	Planning Districts, RMs, MCWS, ANA communities, Peguis First Nation, Fisher River Cree Nation	Watershed	Two projects are completed in 10 years	Page 16
Seal abandoned wells	EICD, Health Canada, Peguis First Nation, Fisher River Cree Nation, ANA communities	Watershed with focus on source water protection zones	Five wells are sealed each year	Page 16
Monitor the integrity of private on-site waste water systems located within in the source water protection zone of the Fisher Branch Public Drinking Water System	RM of Fisher, MCWS	Fisher Branch Public Drinking Water System	Private on-site waste water systems are monitored regularly	Page 17
Develop an emergency response plan in the event that there is a fuel spill that could affect the quality of drinking water for the Pine Dock Public Drinking Water System	Pine Dock, MCWS	Pine Dock Public Drinking Water System	A plan is developed	Page 17
Repair electrical wiring on the East Well of the Pine Dock Public Drinking Water System	Pine Dock, MCWS	Pine Dock Public Drinking Water System	Well is repaired	Page 17
Continue to monitor wells through well inventory program and testing for E. coli and total coliforms	EICD	Watershed	Wells are monitored every five years	Page 19
Educate residents on the importance of regular well monitoring and maintenance	EICD, MCWS, Peguis First Nation, Fisher River Cree Nation, Health Canada	Watershed	Five educational activities in 10 years	Page 19

PRIORITY 3: PRESERVE AND IMPROVE WATER QUALITY IN LAKES AND STREAMS

RECOMMENDATIONS	LEAD & SUPPORT ORGANIZATION(S)*	TARGET AREA(S)**	EVALUATION OF SUCCESS	MORE INFO
Implement BMPs that reduce nutrient loading such as nutrient management planning, soil testing, manure testing, improved fertilizer and manure application, and buffer strips	EICD, MAFRD	Livestock operations	One project is completed each year	Page 23
Implement BMPs that reduce bacteria loading and erosion such as livestock exclusion fencing, the installation of off-site watering systems, the relocation of livestock facilities, and improved manure management	EICD, MAFRD	Livestock operations	One project is completed each year	Page 23
Promote the use of constructed wetlands to control farm-yard runoff	EICD, MAFRD	Livestock operations	Two activities in 10 years	Page 23
Encourage farmers to complete an environmental farm plan	MAFRD, EICD	Watershed	Program is advertised	Page 23
Promote the proper monitoring and maintenance of private on-site wastewater systems, including the inspection of systems that are more than 20 years old or located near waterways or water bodies	MCWS Environmental Compliance and Enforcement, Health Canada	Septic fields more than 20 years old and/ or located close to rivers and creeks	Three activities in 10 years	Page 24
Expand monitoring of municipal wastewater to include phosphorus concentration prior to discharge	Manitoba Conservation and Water Stewardship, Health Canada, RM of Fisher, First Nations	All public wastewater systems comply with provincial standards for phosphorus	Phosphorus testing occurs for wastewater lagoons prior to discharge	Page 24
Encourage the use of regional solid waste transfer stations and assess existing transfer stations for contamination issues	Manitoba Conservation and Water Stewardship	Watershed	Contamination issues will be addressed	Page 24

GOAL 4: COORDINATE SURFACE WATER MANAGEMENT TO PROTECT COMMUNITIES AND AGRICULTURAL LANDS FROM FLOODS AND DROUGHTS

RECOMMENDATIONS	LEAD & SUPPORT ORGANIZATION(S)*	TARGET AREA(S)**	EVALUATION OF SUCCESS	MORE INFO
Implement upstream water retention projects with a goal of storing 6,000 acre-feet of water	EICD, MIT, MCWS, RMs of Fisher and Grahamdale	Zone 1	6,000 acre-feet of water retention is created	Page 28
Improve the communication and coordination of surface water management activities	RMs, MIT, MCWS, Peguis First Nation, Fisher River Cree Nation, ANA communities, EICD	Watershed	Communication and coordination is improved	Page 29
Implement the Surface Water Management Plan for Zone 1 by supporting the following activities: - Protect wetlands through conservation agreements and land purchases - Implement water retention projects - Protect and restore riparian areas - Implement erosion control projects - Implement vegetated buffer strips - Re-naturalization of drains and creeks - Facilitate cooperative consultation on drainage activities - Conduct drain maintenance and reconstruction with consideration of downstream impacts - Discourage unlicensed drainage - Maintain artesian wells and equip with flow control devices to ensure they do not adversely affect drainage infrastructure - Manage beavers to reduce impacts on property and infrastructure - Educate residents on the importance of adapting to climate change variability - Build community resiliency for climate change variability through flood and drought preparedness	RMs, MIT, MCWS, NCC, Peguis First Nation, Fisher River Cree Nation, ANA communities, EICD	Zone 1	All surface water management activities align with the surface water management plan	Page 32

Continued on next page

RECOMMENDATIONS	LEAD & SUPPORT ORGANIZATION(S)*	TARGET AREA(S)**	EVALUATION OF SUCCESS	MORE INFO
Implement the Surface Water Management Plan for Zone 2 by supporting the following activities: - Flood proof or relocate buildings located within flood prone areas - Adopt development restrictions within the flood plain of the Fisher River - Protect and restore riparian areas - Restore natural rapids along Fisher River - Implement erosion control projects - Improve communication and coordination of surface water activities with upstream jurisdictions - Restore degraded aquatic habitat - Preserve existing rapids and restore previously destroyed rapids - Educate residents on the importance of adapting to climate change variability - Assess culvert needs through LiDAR analysis	RMs, MIT, MCWS, NCC, Peguis First Nation, Fisher River Cree Nation, ANA communities, EICD	Zone 2	All surface water management activities align with the surface water management plan	Page 33
Implement the Surface Water Management Plan for Zone 3 by supporting the following activities: - Protect natural areas including forests, grasslands, wetlands and riparian areas through conservation agreements and land purchases - Ensure proper consultation practices are followed when reviewing proposed development activities such as peat mining licenses - Provide beaver management workshops and programming	RMs, MIT, MCWS, Peguis First Nation, Fisher River Cree Nation, ANA communities, EICD	Zone 3	All surface water management activities align with the surface water management plan	Page 33

*Lead and support organizations are included, lead organizations are listed first.
**Refer to maps founds on pages 8-28 and 30-33.

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All quotes included in the Fisher River Integrated Watershed Management Plan are personal concerns and views of those interviewed through this planning process.

WILDFLOWERS OF THE WATERSHED


Showy Ladyslipper


Ramshead Ladyslipper


Woodlilly


Gallardia


Prairie Crocus


Three Flowered Avens


Northern Bluebell

Supporting technical information can be found on the
East Interlake Conservation District website: www.eicd.ca