

COOKS-DEVILS CREEK

INTEGRATED WATERSHED
MANAGEMENT PLAN



INTRODUCTION

The Cooks-Devils Creek Integrated Watershed Management Plan (IWMP) was developed in partnership with the Cooks Creek Conservation District, the Province of Manitoba, stakeholder organizations, and watershed residents. The purpose of this plan is to positively influence the stewardship of land, water, and aquatic ecosystems in the Cooks-Devils Creek Watershed over the next 10 years.

A watershed can be defined as an area of land in which all water drains to a common point. Watersheds are considered the most ecologically and administratively appropriate unit for managing water. Planning based on watershed boundaries provides the opportunity to address land and water management practices beyond the scope of a single jurisdiction.

This plan will influence how decisions are made for water management, land development and drainage. This targeted approach at a watershed level will identify where conservation and waterway infrastructure dollars are best spent.

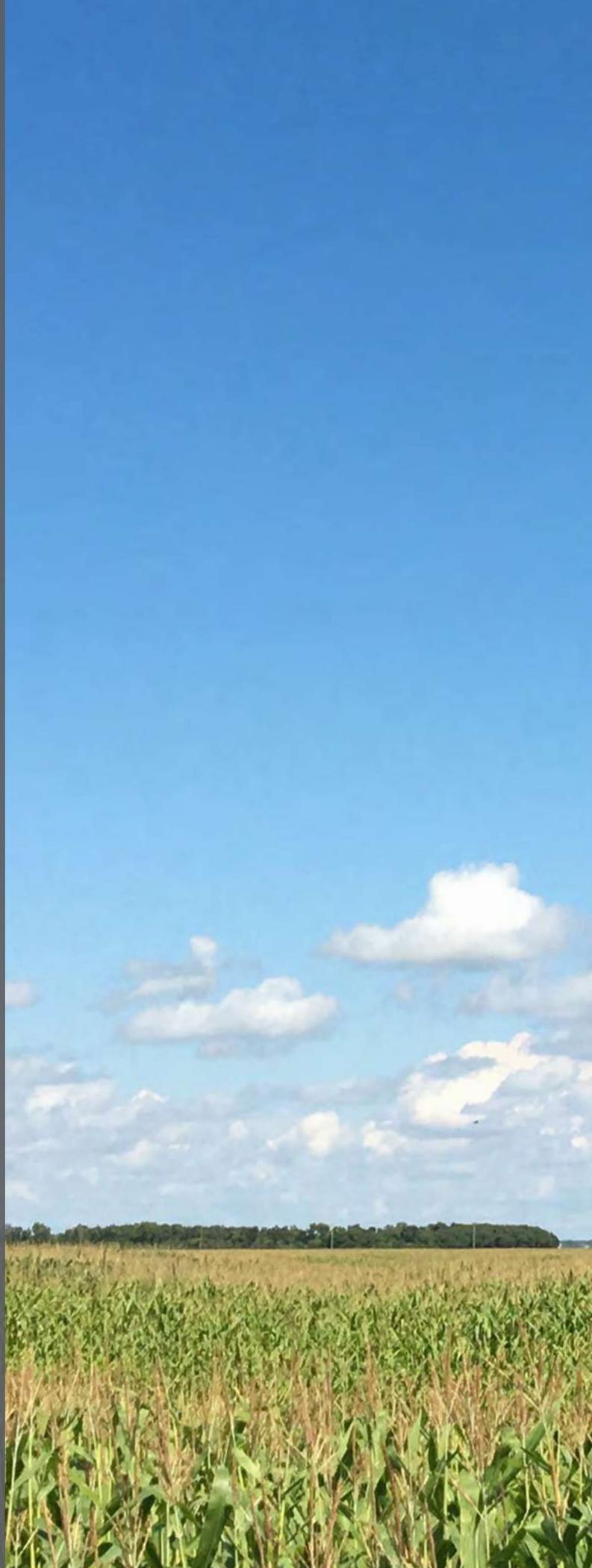




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KEY PLAYERS

Watershed residents are the most important group of individuals in the creation and implementation of this plan. Five public meetings were held in communities throughout the watershed during plan development. These meetings openly addressed local watershed issues and concerns. The information collected at these meetings formed the framework of this plan and led to the establishment of four watershed goals.

Under Manitoba's Water Protection Act, the **Water Planning Authority** is designated with the responsibility of developing an integrated watershed management plan. Through a Memorandum of Understanding, the Province of Manitoba designated the Cooks Creek Conservation District as the Water Planning Authority for the Cooks-Devils Creek Watershed.

The **Project Management Team** (PMT) is a small group of people that serves as the key decision maker and represents public interests in the watershed. The PMT met regularly through plan development, hosted public and stakeholder meetings, collected technical, traditional and local information, and finalized content of the plan.

The **Watershed Team** consists of community representatives and technical experts from stakeholder groups and government. The role of the Watershed Team is to provide technical knowledge and guidance throughout plan development.

Local **Indigenous peoples** have provided valuable insight, traditional knowledge and a local perspective to support key actions in this plan.

PLAN SUMMARY

The Cooks-Devils Creek IWMP was developed through a partnership between the Cooks Creek Conservation District, the Province of Manitoba, Indigenous communities, local government, community stakeholders, and watershed residents. This plan includes actions that address key local concerns, with the goal of positively influencing the

stewardship of land, water, and aquatic ecosystems in the Cooks-Devils Creek Watershed over the next 10 years. The plan strives to balance activities in the watershed which are often viewed as competing interests such as rural residential development, industry, and agricultural production, as well as drainage, wetland restoration, and water retention.



4 WATERSHED GOALS WERE DEVELOPED TO ADDRESS KEY CONCERNS IN THE WATERSHED:

- 1** Coordinate Surface Water Management
- 2** Preserve Groundwater Quality

- 3** Balance Natural Area Preservation and Land Development
- 4** Improve Surface Water Quality

Actions were developed to meet each of the four watershed goals. To foster long-term sustainability of the watershed, each stakeholder has a role in ensuring these actions are implemented throughout the 10-year lifespan of the Cooks-Devils Creek IWMP.

WATERSHED OVERVIEW

The Cooks-Devils Creek Watershed includes two sub-watersheds: the Cooks Creek sub-watershed and the Devils Creek sub-watershed (Figure 1). The watershed is 1,826 km² in size and is home to approximately 22,000 people, excluding the population of the watershed within the City of Winnipeg.

The watershed consists of two major drainage systems; the Cooks and Devils Creeks, their contributing tributaries, as well as the Red River Floodway. These waterways flow in a northwest direction and empty into the Red River north of Winnipeg. Topography consists of several high and low flatlands, and generally slopes downward from the southeast to the northwest. The predominant land use in the watershed is agriculture, with 90% of the watershed being privately owned. Due to its close proximity to the City of Winnipeg, the growth and demand for rural residential properties places extremely high development pressure, threatening existing agricultural lands.

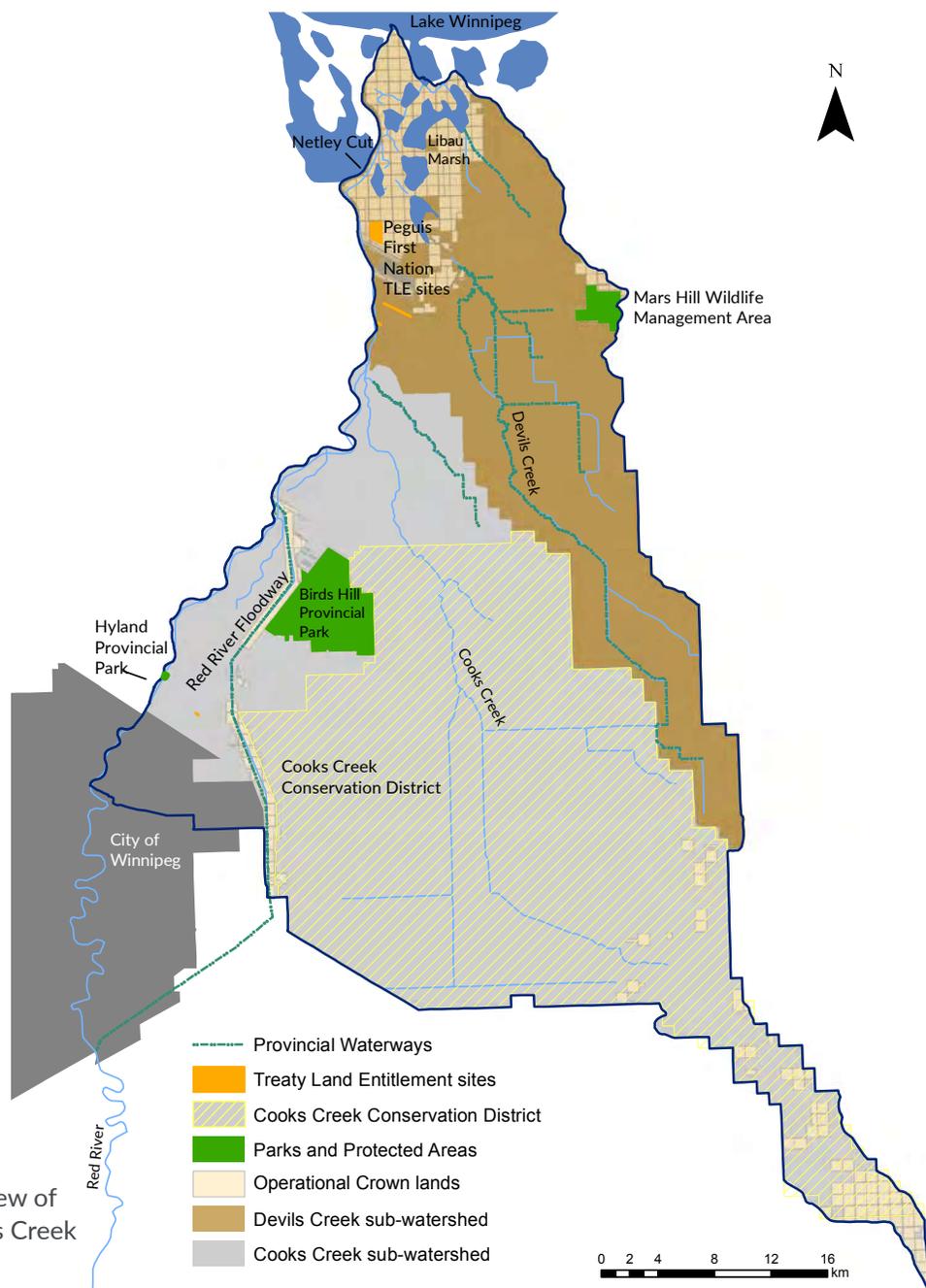


Figure 1 - Overview of the Cooks - Devils Creek Watershed



COOKS CREEK CONSERVATION DISTRICT

As the Water Planning Authority, the Cooks Creek Conservation District (CCCD) led the development of the Cooks-Devils Creek Integrated Watershed Management Plan and will share plan implementation with other groups, including all levels of government, non-government organizations and watershed residents.

Conservation districts are grassroots organizations, governed by a local board and formed through a provincial-municipal partnership. The Cooks Creek Conservation District was established in 1979 to address soil and water conservation issues and manage waterway infrastructure. The CCCD lies east of Winnipeg and includes most of the Cooks Creek Watershed. Municipal partners include most of the Rural Municipality of Springfield and smaller portions of Taché, Ste. Anne, Brokenhead, and Reynolds.



WATERSHED HIGHLIGHTS

The Cooks Creek Conservation District uses local knowledge, technical expertise and board recommendations to address surface water concerns locally.

INDIGENOUS COMMUNITIES OF THE WATERSHED

Peguis First Nation

Peguis First Nation (PFN) is the largest First Nation community in Manitoba. Approximately 10,000 people of Ojibway and Cree descent are part of PFN. Peguis First Nation's reserve land is located north of the watershed, however it has several Treaty Land Entitlement (TLE) sites and traditional territories within the watershed. These areas are located on Treaty 1 land, which encompasses the Cooks-Devils Creek Watershed.

On August 1, 1871, the first of several Treaties was signed in Manitoba. The Treaties indicate that Canada would set aside a specific amount of reserve land, based on reserve populations at the time of signing. To date, not all terms pertaining to treaty land allocation have been met, including the terms for Treaty 1. A shortfall in land allocation is defined as an outstanding TLE. As part of fulfilling Treaty 1 land allocations, a Treaty Entitlement Agreement (TEA) was signed in 2008 by Peguis First Nation, the Province of Manitoba and the Government of Canada. The TEA provides guidelines and timelines for selection and acquisition of several thousand acres of land. Today, land purchases are administered by the Peguis TLE on an annual basis. Key initiatives of the Peguis TLE include selection of Crown lands, acquisition of private lands and the reserve creation process.

Brokenhead Ojibway Nation

Brokenhead Ojibway Nation (BON) is located outside the watershed; however, the community has traditional territories that expand into the northern extent of the watershed, including the Libau Marsh and the Libau Bog Ecological Reserve protected area. BON is a Treaty 1 Nation and an Anishinaabe First Nation. BON is a member of the non-profit organization Debwendon Inc., which recently opened a self-guiding wetland interpretive trail for visitors and community members to explore. The Brokenhead Wetland Interpretive Trail borders Brokenhead Wetland Ecological Reserve, which is a protected area.

Lake Winnipeg Indigenous Collective

The Lake Winnipeg Indigenous Collective is a partnership between 14 Indigenous communities, including Peguis First Nation and Brokenhead Ojibway Nation, the Lake Winnipeg Foundation, and the Centre for Indigenous Environmental Resources. The Collective was formed in 2014 to identify common concerns and goals for restoring the health of Lake Winnipeg and the Netley-Libau Marsh. Current projects include documenting impacts to fish and fish habitat surrounding Lake Winnipeg. Several actions in the Cooks-Devils Creek IWMP support improving the health and resiliency of traditional territories, Libau Marsh, and ultimately, Lake Winnipeg.



Traditional Knowledge Considerations – from an Elder’s perspective

Traditional knowledge interviews were held with Elders from Peguis First Nation during development of the Cooks-Devils Creek IWMP. Elders noted key values, concerns and recommendations for the watershed, which have been incorporated into this plan.

Water holds significant importance for Indigenous people and is highly regarded. Water is essential for healthy fish and wildlife populations, both of which are crucial for traditional fishing and hunting activities. The ability to hunt, fish, trap and gather medicines and use sacred places for traditional and spiritual purposes are part of community life for people of Peguis First Nation. Continuing forward with these practices is considered valuable by Elders. Threats such as climate change, habitat fragmentation and diminishing water quality may negatively impact these traditional practices.

Increased erosion along waterways, more frequent flooding, and changes to the snow composition have been noted as issues by Elders. The winters are warmer and the snow is notably different with climate change—it is heavier and more compact due to earlier and more frequent periods of melting and freezing. This develops a thick top crust over the snow which deer and moose have a difficult time moving through, negatively impacting their ability to source food and escape predation during the winter months.

Elders also noted a concern in balancing management of milkweed in the watershed. Milkweed is critical in monarch butterfly habitat. Successful rearing of larvae are dependent on milkweed as a food source. Milkweed is considered an agricultural pest and producers commonly spray herbicides to limit its spread. This reduces the available food sources for important monarch butterfly populations.

Members of Peguis First Nation wish to share their story and values for land and water in the watershed. They hope integrating their traditional knowledge into this plan will help to achieve this.

Land and water concerns

Traditional knowledge provided by Peguis First Nation Elders identified the following main concerns:

- Peat harvesting and gravel mining
- Fish spawning concerns due to the Netley Cut
- Degradation of natural riparian buffers
- Increased surface water flows
- Balancing milkweed management so it can be controlled as agricultural pests by producers, but left available outside of agricultural areas for monarch butterfly habitat

These concerns, and the traditional knowledge provided by Elders, have helped to shape recommended actions that will improve the health of the Cooks-Devils Creek Watershed.

WATERSHED HIGHLIGHTS

Peguis First Nation is working to communicate the history of its traditional territories and provide information on the St. Peter’s Band, and how it has become Peguis First Nation. The transition from St. Peter’s Band to Peguis First Nation is an important component of how TLE selection is implemented today. Chief Peguis was instrumental in the history of Peguis First Nation, and its traditional territories within the Red River Valley and the watershed.



CLIMATE CHANGE CONSIDERATIONS

There is general agreement among scientists that climate change is occurring, and in some cases effects are already being felt. Although changes to date may seem relatively small, long term impacts may be much more significant. Climate change projections for this region generally indicate an increase in temperature and more extreme weather events. Impacts may include more extreme precipitation events, an increased average temperature and a higher likelihood of flood and drought occurrences. Climate change impacts have been summarized by the Prairie Climate Centre, and highlight key potential changes. Projected variables are dependent on carbon emission levels, and may change over time, as new climate change data becomes available.

Although total precipitation is projected to increase, the timing is expected to change. Less precipitation is anticipated in the summer growing season, with additional precipitation expected during the remaining seasons. Temperatures are projected to rise, impacting snow levels. Snow pack levels may decrease, or become heavier with more frequent mild periods during the winter months. Periods of extended drought may negatively impact wildlife

habitat and alter migration patterns for sensitive species. Drought may create an environment more susceptible to erosion, forest fires, disease, and invasive species. In terms of agriculture, warmer and longer growing seasons could be beneficial for crop growth, and subsequently shorter and milder winters may be positive for livestock. On the other hand, extreme rainfall events and drought occurrences could significantly decrease agricultural productivity, resulting in significant economic losses. There is also an increased risk of heat stress on livestock and the spread of new agricultural pests and diseases. Flooding may overwhelm water storage and drainage systems during extreme precipitation events.

Although it is difficult to say what the watershed will look like from a changing climate, it is likely that it will become more arid as average temperatures rise and evapotranspiration rates increase. Adaptive techniques such as changes to water management and infrastructure modifications may need to be considered. Indigenous communities and traditional knowledge of Elders should be included in any climate change adaptive strategies.

Projected Annual Climate Variables in the Watershed	1981-2010 average	2021-2050 projections		2051-2080 projections	
		Mid carbon emissions	High carbon emissions	Mid carbon emissions	High carbon emissions
Mean temperature	2.7 °C	4.5 °C	4.9 °C	5.7 °C	7.0 °C
Precipitation	523.2 mm	555.8 mm	553.6 mm	554.3 mm	566.9 mm
Days ≥ 30 °C	8.9 days	18.2 days	21.5 days	27.5 days	41.5 days
Days ≤ -30 °C	10.6 days	5.5 days	4.6 days	2.9 days	1.5 days
Frost-free period	126.7 days	142 days	146.3 days	148.6 days	162.6 days

Source: Prairie Climate Centre

A SNAPSHOT OF WATERSHED FEATURES

LAND COVER AND AGRICULTURAL CAPABILITY

Although the eastern and southern regions of the watershed include forested uplands with limited agricultural activity, the majority of the watershed is relatively flat and extensively developed for agriculture. Several pockets of rural residential properties exist in the watershed, especially in closer proximity to the City of Winnipeg.

A significant portion of the watershed is categorized as Class 2 and 3 agriculturally productive lands, as classified by the Canada Land Inventory (CLI). The CLI is a comprehensive survey of physical land capability for agriculture. The system uses seven classes, with Class 1 land having the highest capability to support agriculture, and Class 7 the lowest. Agricultural capability in the watershed is shown in Figure 2.

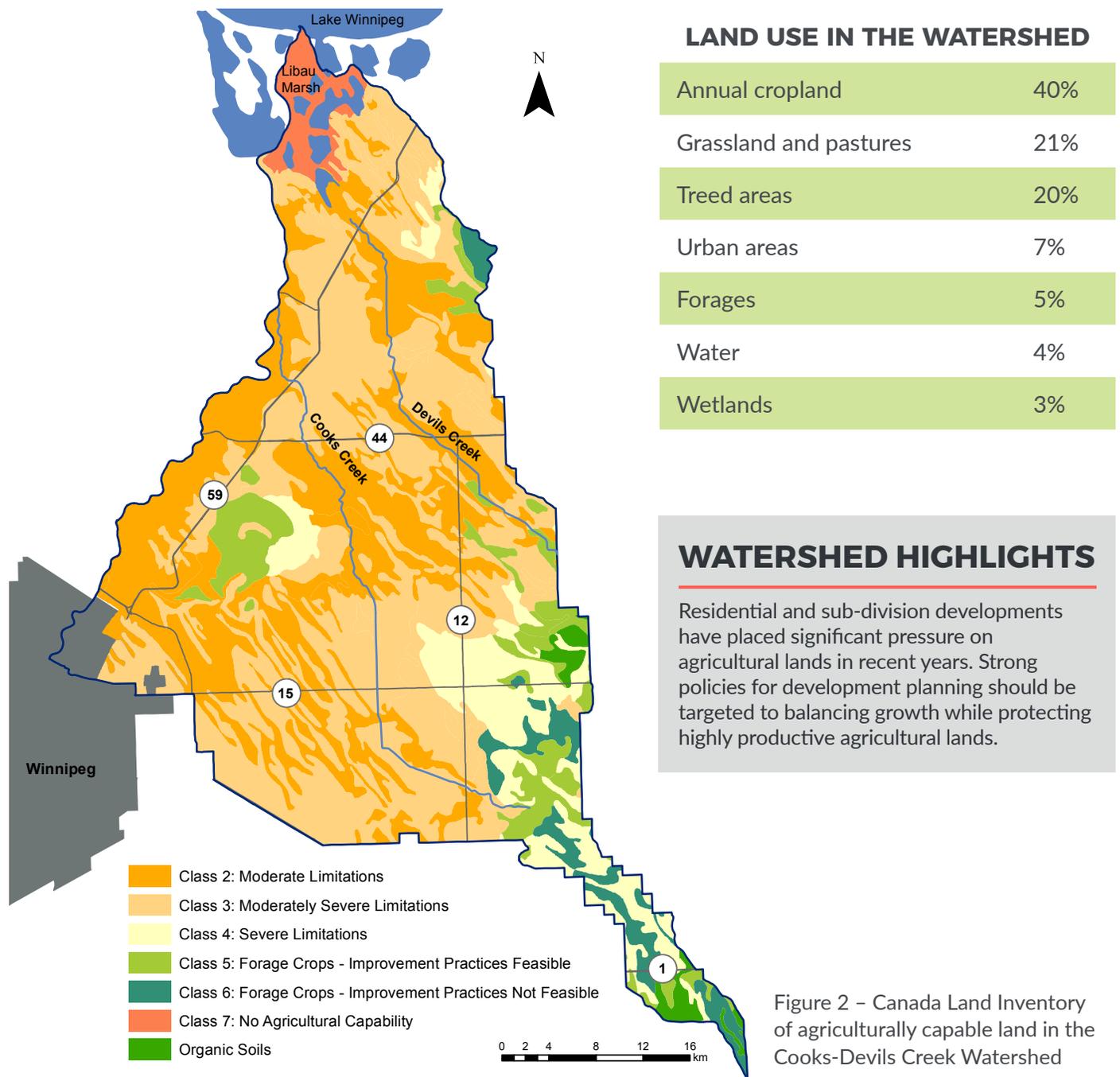


Figure 2 - Canada Land Inventory of agriculturally capable land in the Cools-Devils Creek Watershed

GROUNDWATER

With the exception of the City of Winnipeg, groundwater is the primary source of drinking water for residents of the watershed. Groundwater wells are primarily drilled into the carbonate bedrock aquifer. Other less significant sources include sandstone aquifers beneath the carbonate rock and local deposits of sand and gravel. Although there are some localized groundwater quality issues, in general the water quality from the carbonate bedrock aquifer is good quality, with acceptable mineral levels. The City of Winnipeg receives its drinking water from Shoal Lake, located outside the watershed. Water is transported from the southeast corner of the province via a gravity-fed aqueduct, as Shoal Lake is higher in elevation than the city. Groundwater aquifers are replenished through recharge (Figure 3). Recharge areas provide more direct conduits to the aquifer and therefore may be more susceptible to contaminants from overlying land use activities.

Groundwater recharge and discharge areas can generally be attributed to the following characteristics:

Recharge

- Upland areas, particularly those with thinner overburden cover
- Permeable sand and gravel areas

Discharge

- Low-lying areas
- Presence of lakes, stream and springs
- Flowing (artesian) wells
- Areas with residential, commercial and industrial pumping of groundwater for human use
- Presence of wetlands

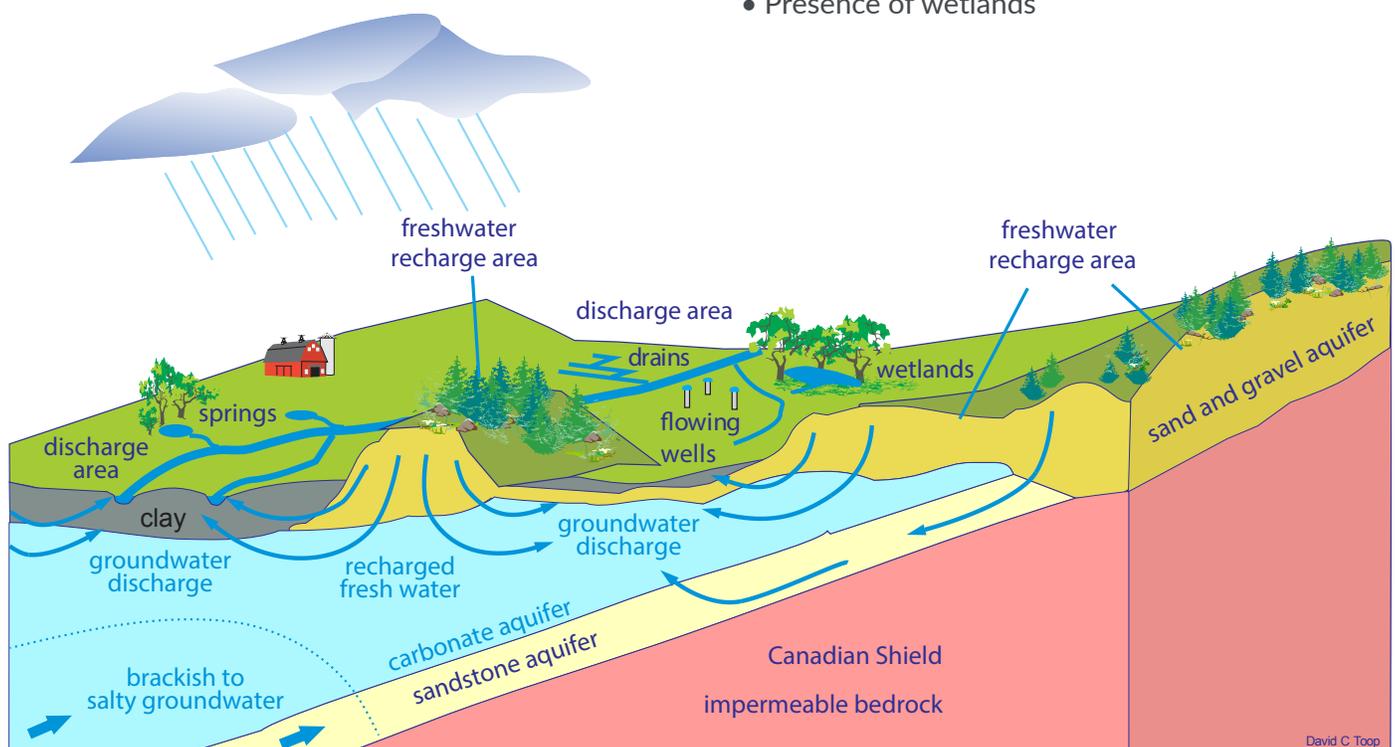


Figure 3 – Generalized model of groundwater recharge and discharge in the Cooks - Devils Creek Watershed

SURFACE WATER QUALITY

Two provincial long-term water quality monitoring sites are located along Cooks Creek in the watershed (Figure 4). Data from the water quality monitoring station near provincial trunk highway 44 is used to calculate the Water Quality Index for Cooks Creek (Figure 5), which has been generally 'fair' to 'good' for the past 20 years. Long-term water quality monitoring data also indicates that phosphorus levels tend to be highest in the lower reaches of the Cooks Creek. The majority of samples exceed the Manitoba Water Quality Guideline for phosphorus and nitrogen in the Cooks Creek, indicating deteriorated water quality conditions which may not be adequate to support healthy aquatic life.

Fluctuations in nitrogen and phosphorus concentrations tend to be closely tied to flow volumes, with higher nutrient concentrations observed in high runoff years. Nutrient inputs to waterways include non-point source run-off from fields and livestock operations, and point sources such as effluent discharge from municipal wastewater treatment facilities. Efforts to reduce nutrient loading, such as the implementation of on-farm beneficial management practices, will help to improve water quality in the watershed. Currently, there are no water quality monitoring sites located along the Devils Creek. Continued long-term water quality monitoring is required to compile larger data sets to more clearly identify nutrient trends in the Cooks Creek.

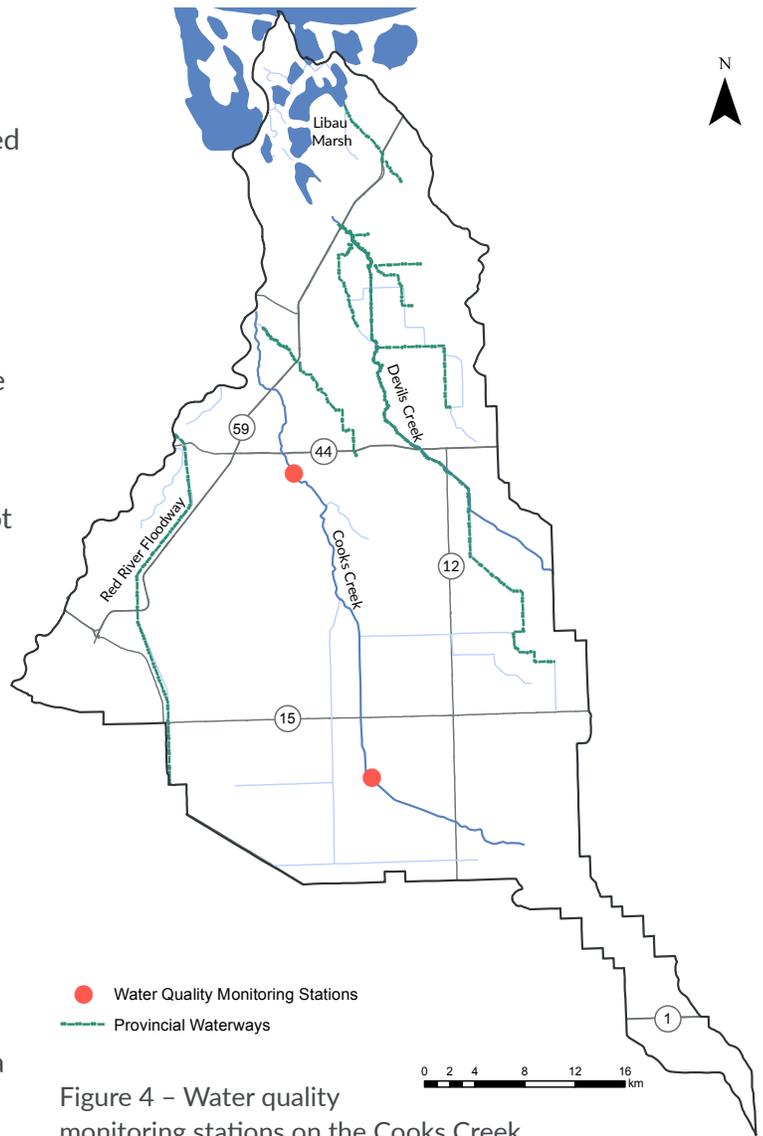


Figure 4 – Water quality monitoring stations on the Cooks Creek

WATERSHED HIGHLIGHTS

The Water Quality Index in the Cooks Creek is generally fair to good. Twenty five parameters are used to calculate the Canadian Council of Ministers of the Environment Water Quality Index. Together these parameters create a score. Categories are scored out of 100 points as follows:

- ▶ Excellent: 95-100
- ▶ Good: 80-94
- ▶ Fair: 60-74
- ▶ Marginal: 45-59
- ▶ Poor: 0-44

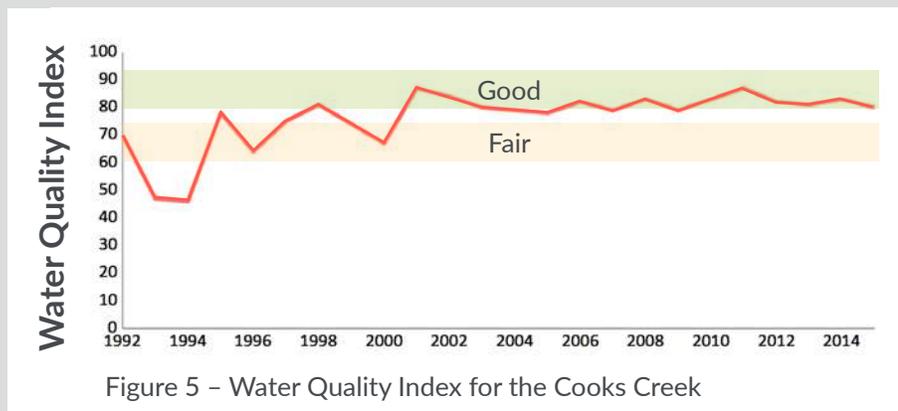


Figure 5 – Water Quality Index for the Cooks Creek

BIODIVERSITY



Birds Hill Provincial Park

Birds Hill Provincial Park is one of Manitoba's most visited parks. The park is located west of the Cooks Creek, along the Red River Floodway, and is classified as a Natural Park. As required under The Provincial Parks Act, a management plan was prepared to establish long-term management directives, including no-net-loss of natural habitat and protecting species unique to and representative of the aspen and oak parklands.

The park and surrounding upland ecosystem support many plant communities, wetland complexes, and tall-grass prairie habitat. Together, these add significant value to the watershed's biological diversity.

Species at Risk

Prairie areas located immediately south of Birds Hill Provincial Park support sizeable populations of two threatened plant species; rough agalins (*Agalinis aspera*) and western silver and silky aster (*Symphotrichum sericeum*). Eleven species of native orchids are located in Libau Bog Ecological Reserve. Thirteen species of orchids are located in Birds Hill Provincial Park. Some of these orchids are very rare and sensitive to development pressures.

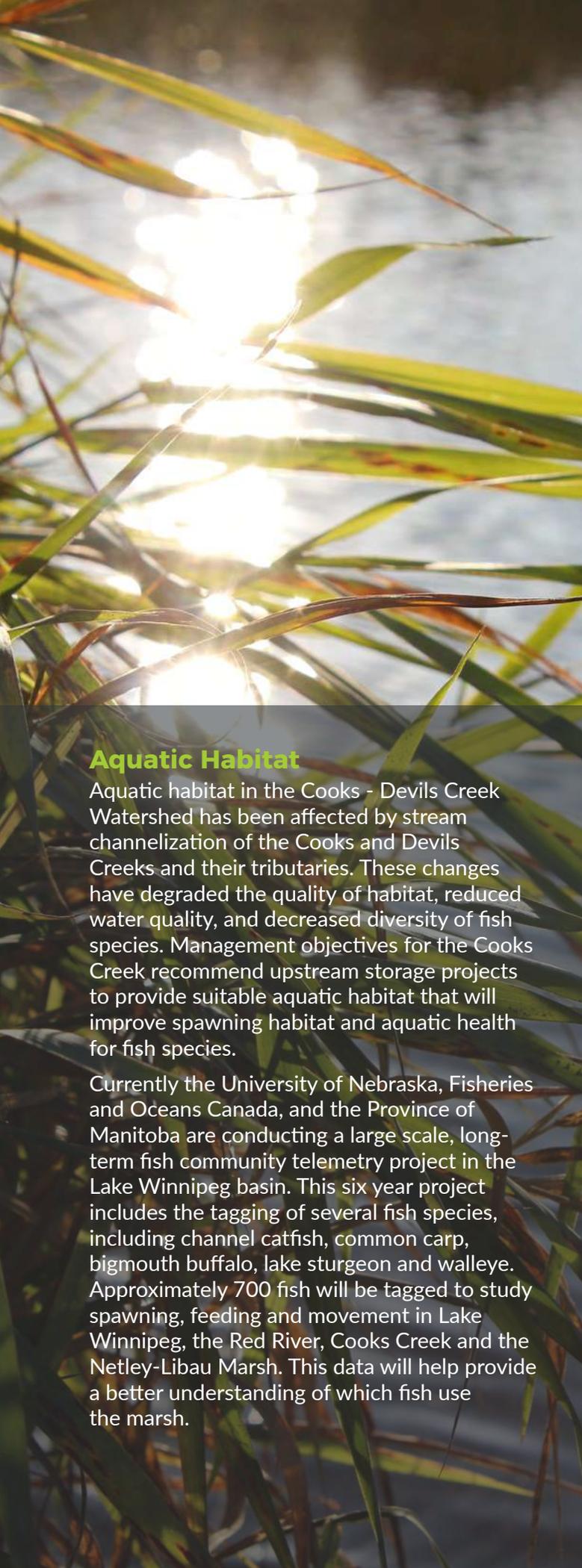
Libau Marsh

Libau Marsh, which is part of the larger Netley-Libau Marsh complex, is located at the northern end of the watershed along the southern shore of Lake Winnipeg. The Netley-Libau Marsh complex is approximately 260 km² in size and is the largest freshwater coastal wetland in North America.

The Red River flows through the marsh prior to entering Lake Winnipeg. From 1884 to 1999, dredging occurred on the Red River to maintain water flows. In 1913, a section of the riverbank was opened to the marsh to increase water flow from the Red River into the marsh, resulting in the 'Netley Cut'.

Healthy marshes require water level fluctuations to support aquatic vegetation. The Netley Cut has caused sediment to accumulate in the marsh, increasing erosion of surrounding lands. This has stabilized water levels, resulting in the loss of emergent vegetation and degraded water quality in the marsh. Emergent vegetation provides a valuable role in filtering water, reducing erosion and providing aquatic and waterfowl habitat.

Local concerns surrounding the health of Netley-Libau Marsh include issues beyond the impacts of the Netley Cut; there is a greater concern for the overall health and resiliency of the marsh complex. Report findings by the Clean Environment Commission (2015) note that although local concerns point to fluctuations on Lake Winnipeg as a result of hydro operations, the Netley Cut began deterioration of the marsh prior to hydroelectric operations on Lake Winnipeg. It is believed that if current conditions continue, only a prolonged drought period will restore emergent vegetation in the marsh.



Aquatic Habitat

Aquatic habitat in the Cooks - Devils Creek Watershed has been affected by stream channelization of the Cooks and Devils Creeks and their tributaries. These changes have degraded the quality of habitat, reduced water quality, and decreased diversity of fish species. Management objectives for the Cooks Creek recommend upstream storage projects to provide suitable aquatic habitat that will improve spawning habitat and aquatic health for fish species.

Currently the University of Nebraska, Fisheries and Oceans Canada, and the Province of Manitoba are conducting a large scale, long-term fish community telemetry project in the Lake Winnipeg basin. This six year project includes the tagging of several fish species, including channel catfish, common carp, bigmouth buffalo, lake sturgeon and walleye. Approximately 700 fish will be tagged to study spawning, feeding and movement in Lake Winnipeg, the Red River, Cooks Creek and the Netley-Libau Marsh. This data will help provide a better understanding of which fish use the marsh.

Aquatic Invasive Species

Invasive species are organisms not native to a region. When introduced they may out-compete native species for available habitat and resources, this may result in negative economic, social, environmental or human health implications. Aquatic invasive species (AIS) can live in freshwater or marine environments and may spread in many ways.

Human related vectors such as the overland movement of watercraft, water-related equipment, water-related aircraft and off-road vehicles can spread AIS to new areas. Preventing the spread of AIS, such as zebra mussels, is important to offset perpetual economic, social and environmental costs.

To prevent the spread of AIS, all water-users must take the following steps before moving any watercraft or water-related equipment from one water body into another water body:

- 1 **CLEAN** and **remove** AIS and aquatic plants prior to leaving the shore of a water body
- 2 **DRAIN** all **water** from the watercraft and water-related equipment prior to leaving the shore
 - drain plugs must be kept out while transporting watercraft over land
- 3 **DRY** **completely** or **decontaminate** water-related equipment prior to placing in another water body
- 4 **DISPOSE** of all **bait** used in a provincial-designated control zone water body prior to leaving the shore
- 5 **DECONTAMINATE** if watercraft or water-related equipment were last used in a provincially-designated control zone and **before** placing into another water body

NOTE: the Red River, including the lower reaches of its tributaries and Netley-Libau Marsh are part of the Central Control Zone. This means decontamination is required for watercraft or water-related equipment before use in any other water body.

Cross-section of a water line clogged with zebra mussels, resulting in 40% water flow reduction

Photo credit: AIS Program, Manitoba Sustainable Development



IMPLEMENTATION OF ACTIONS

Surface water management concerns such as flooding, drainage and water retention emerged as the most important issue for people in the watershed. Concerns related to groundwater quality were the second most important issue as most residents are dependent on groundwater for drinking water purposes. Issues related to natural areas such as water quality degradation and the loss of wetlands were also noted by many residents of the watershed. To address these public concerns, actions are listed within each of the following watershed goals.



4 WATERSHED GOALS WERE DEVELOPED TO ADDRESS KEY CONCERNS IN THE WATERSHED:

1 Coordinate Surface Water Management

2 Preserve Groundwater Quality

3 Balance Natural Area Preservation and Land Development

4 Improve Surface Water Quality

Actions have been developed to meet each of the four watershed goals. Each organization listed in the following actions has a role in ensuring the actions are implemented throughout the 10-year lifespan of the Cooks-Devils Creek IWMP. Organizations listed first have been identified as the lead for that particular action. Implementation of listed actions is crucial to long-term sustainability of the watershed.



GOAL 1

COORDINATE SURFACE WATER MANAGEMENT

GOAL STATEMENT

Coordinate surface water management to balance water retention and drainage needs

In Manitoba, surface water is typically managed to reduce or prevent flooding of agricultural, industrial and residential land. Although surface water is largely managed to protect infrastructure from flooding and to remove excess water from agricultural land as quickly as possible, these activities may impact people, property and aquatic ecosystem health downstream.

Incorporating a more holistic approach to surface water management considers aquatic health, water quality, climate change, recreational opportunities and flood mitigation measures. In this section of the plan, actions have been carefully identified to balance the need for drainage and the need to meet water retention targets for flood and drought mitigation, water supply, groundwater recharge and healthy functioning ecosystems.

SURFACE WATER MANAGERS	KM OF DRAINS MANAGED
Cooks Creek Conservation District	500 km
Province of Manitoba <ul style="list-style-type: none">Manitoba InfrastructureManitoba Sustainable Development<ul style="list-style-type: none">Birds Hill Provincial Park	440 km
Municipalities All or parts of: <ul style="list-style-type: none">East St. PaulBrokenheadSpringfieldSte. AnneSt. ClementsTaché	353 km

Surface Water Managers

Within the watershed, management and maintenance of drains, bridges and culvert crossings are managed by Cooks Creek Conservation District, municipalities, and provincial government.

Surface Water Management Issues

In recent years, the largest challenge has been excessive rain during the summer months. Other notable concerns include loss of wetlands, bank erosion, ice jams and rural flood protection. Enhancing water retention capacity and addressing priority drain infrastructure maintenance needs will help to mitigate the effects of flooding in the watershed. Coordination of surface water infrastructure is a priority for a more resilient watershed.



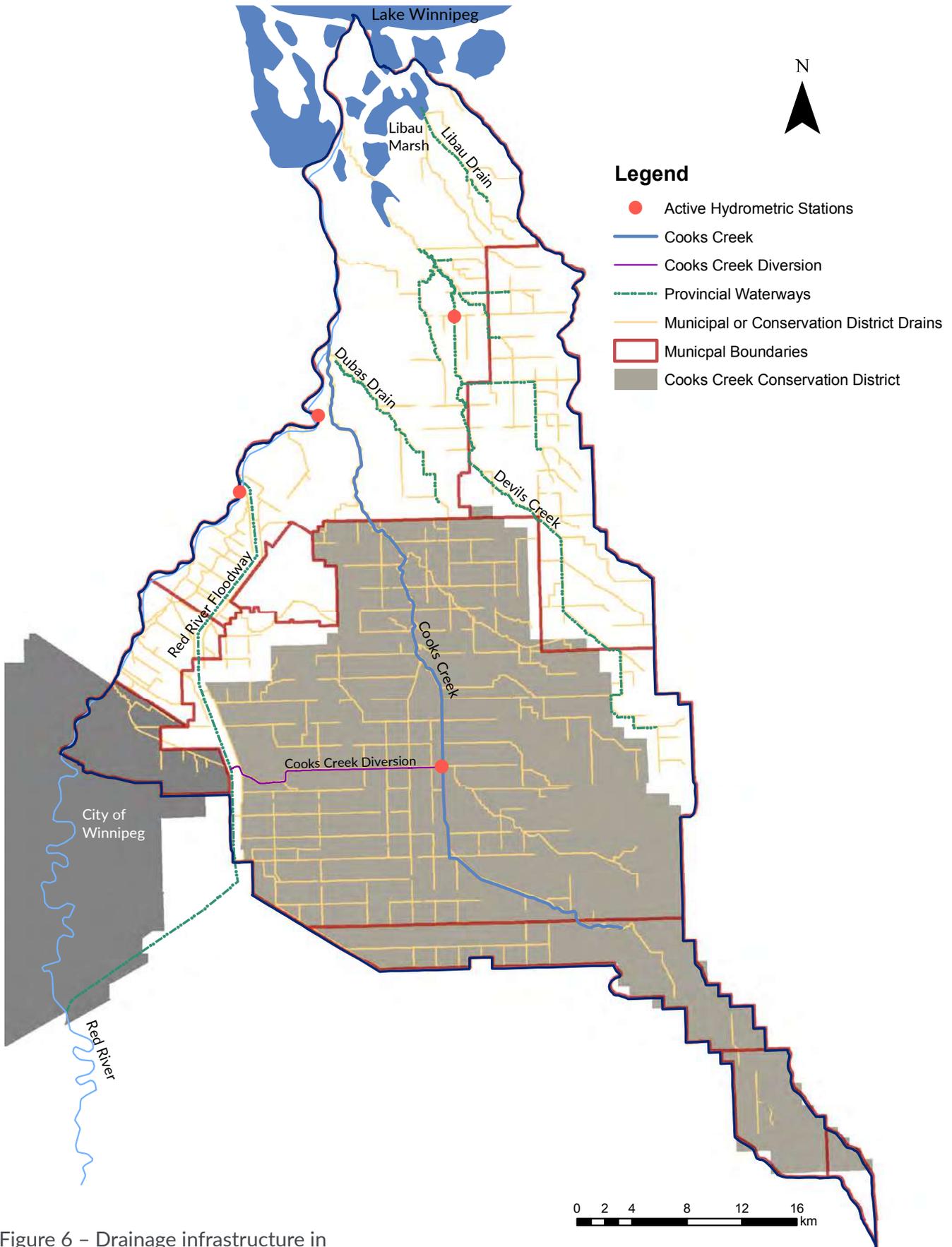


Figure 6 - Drainage infrastructure in the Cooks-Deviils Creek Watershed

Actions to address Surface Water Management concerns

Watershed-wide Actions				
Issue	Action	Target Area	Lead Organizations	Measure of Success
Surface water infrastructure maintenance	1.1. Demonstrate the need for increased funding to the Cooks Creek Conservation District to meet infrastructure management responsibilities.	Watershed-wide	Cooks Creek Conservation District, municipalities	Conduct and present analysis of funding requirements to provincial government for infrastructure activity requirements. Discuss funding concerns and maintenance requirements.
	1.2. Clarify the ownership and jurisdiction for third order and higher drains and associated crossings within the Cooks Creek Conservation District.	Cooks Creek Conservation District	Cooks Creek Conservation District, Manitoba Infrastructure - Water Management, Planning and Standards Branch, Manitoba Sustainable Development - Watershed Planning and Programs Section	Discuss drain and crossing ownership.
	1.3. Establish right-of-way access or easements to ensure proper access to all conservation district drains.	Cooks Creek Conservation District	Cooks Creek Conservation District, Manitoba Infrastructure - Water Management and Structures Branch	Ensure the Cooks Creek Conservation District has proper physical access to all drains the district has drainage authority for.
Coordination of surface water activities	1.4. Improve communication among surface water infrastructure managers to better coordinate water management and reduce flooding impacts.	Watershed-wide	Municipalities, Manitoba Infrastructure - Water Management and Structures Branch, Cooks Creek Conservation District	Consider differing land usage, population and current development needs in drainage and infrastructure plans to reduce flooding.
	1.5. Facilitate surface water management planning with downstream recipients.	Watershed-wide	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure - Water Management and Structures Branch	Coordinate drainage with downstream managers to reduce flooding.
	1.6. Host annual surface water management meetings to discuss drainage concerns, proposed works, and potential retention areas.	Watershed-wide	Cooks Creek Conservation District, municipalities, Manitoba Sustainable Development - Drainage and Water Rights Licensing Branch	Update prioritized drainage works and retention opportunities annually from the surface water management plan.

Watershed-wide Actions				
Issue	Action	Target Area	Lead Organizations	Measure of Success
Surface water management coordination	1.7. Coordinate water movement across municipal boundaries.	Watershed-wide	Municipalities, Cooks Creek Conservation District	Reduce flooding downstream and establish agreed-upon standards for waterway carrying capacity.
Drainage management considerations	1.8. Review drainage applications to ensure they support recommendations of the surface water management plan.	Cooks Creek Conservation District	Cooks Creek Conservation District, Manitoba Sustainable Development – Drainage and Water Rights Licensing Branch	Limit drainage which contributes to increased flooding in other areas of the watershed.
	1.9. Strengthen penalties and enforcement of non-licensed drainage activities.	Watershed-wide	Manitoba Sustainable Development – Drainage and Water Rights Licensing Branch	Increase enforcement of non-licensed drainage.
	1.10. Incorporate water retention into tile drainage projects and release stored water when downstream conditions allow.	Agricultural areas	Agricultural producers, Cooks Creek Conservation District, Manitoba Agriculture - Agri-Resource Branch, Manitoba Infrastructure - Water Management, Planning and Standards Branch	Establish tile drainage projects that reduce peak flows in runoff.
Fisheries management objectives	1.11. Apply beneficial management practices to accommodate appropriate fish passage.	Along waterways	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure - Water Management and Structures Branch	Maintain northern pike and white sucker spawning, rearing and foraging by installing culverts to meet fish passage regulatory requirements.



Drainage Improvement Actions

Issue	Action	Target Area	Lead Organizations	Measure of Success
Adequate surface water capacity	1.12. Assess drainage capacity of the Cooks Creek and the Cooks Creek Diversion to identify maximum flow capacity of these drains.	Cooks Creek and Cooks Creek Diversion	Cooks Creek Conservation District, municipalities	Complete a drainage analysis of the Cooks Creek and Cooks Creek Diversion to identify water flow capacity of these drains in high precipitation events.
	1.13. Demonstrate the need for increased capacity of drop structures into the floodway.	Red River floodway and tributaries	Municipalities, Cooks Creek Conservation District, Manitoba Infrastructure - Water Management and Structures Branch, Manitoba Sustainable Development - Surface Water Management Section, Department of Fisheries and Oceans Canada	Improve capacity of drop structures into the floodway, to address increased capacity needs.
Drain maintenance	1.14. Establish a targeted and rotating system for cleanout of brush, cattails and trees.	Cooks Creek and Cooks Creek Diversion	Cooks Creek Conservation District, municipalities	Identify a concise maintenance plan of waterway reaches, on a rotational basis.
	1.15. Implement drain maintenance so as not to conflict with breeding bird and nesting recommendations outlined in The Migratory Birds Convention Act.	Watershed-wide	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure - Water Management and Structures Branch	Establish best management practices for clearing and brushing of drains outside of noted nesting periods.
Best management practices for drain management	1.16. Encourage practices that strengthen and stabilize streambanks.	Watershed-wide	Cooks Creek Conservation District, municipalities, Manitoba Agriculture - Agri-Resource Branch, Manitoba Sustainable Development - Watershed Planning and Programs Section	Implement practices such as re-vegetation of riparian areas and buffers to reduce erosion.
	1.17. Implement a pilot project to study the feasibility of cattail harvesting in local waterways.	Watershed-wide	Municipalities, International Institute for Sustainable Development, Cooks Creek Conservation District	Reduce nutrient runoff by harvesting cattails in drains.

Site-specific drainage recommendations

Location	Timeline	Lead	Drainage considerations
Plympton Drain	1-3 years, studies have been completed	Cooks Creek Conservation District, RM of Springfield	Upgrade the drain crossings.
Devils Creek	1-3 years	Manitoba Infrastructure	Conduct maintenance work on the provincial waterway, beginning at the downstream end.
Dubas Drain	1-3 years	Manitoba Infrastructure	Conduct maintenance work on the provincial waterway, beginning at the downstream end.
Mile 53	1-5 years	RM of Taché, Cooks Creek Conservation District	Upgrade the drain and crossings to accommodate increased flows from PTH 12, for six miles west.
Swede Drain	2-5 years	RM of Springfield, Cooks Creek Conservation District	Upgrade the crossings.
Donaldson Drain	3-5 years, studies have been completed	RM of Springfield, Cooks Creek Conservation District	Straighten the Donaldson Drain to accommodate increased flows from PTH 12, beginning at the downstream end.
Bridge at PR 207 and Centreline	5 years	Manitoba Infrastructure	Increase bridge flow capacity.
Garven Road Drain	5-10 years, studies have been completed	RM of Springfield	Improve drainage west by connecting to Cooks Creek.



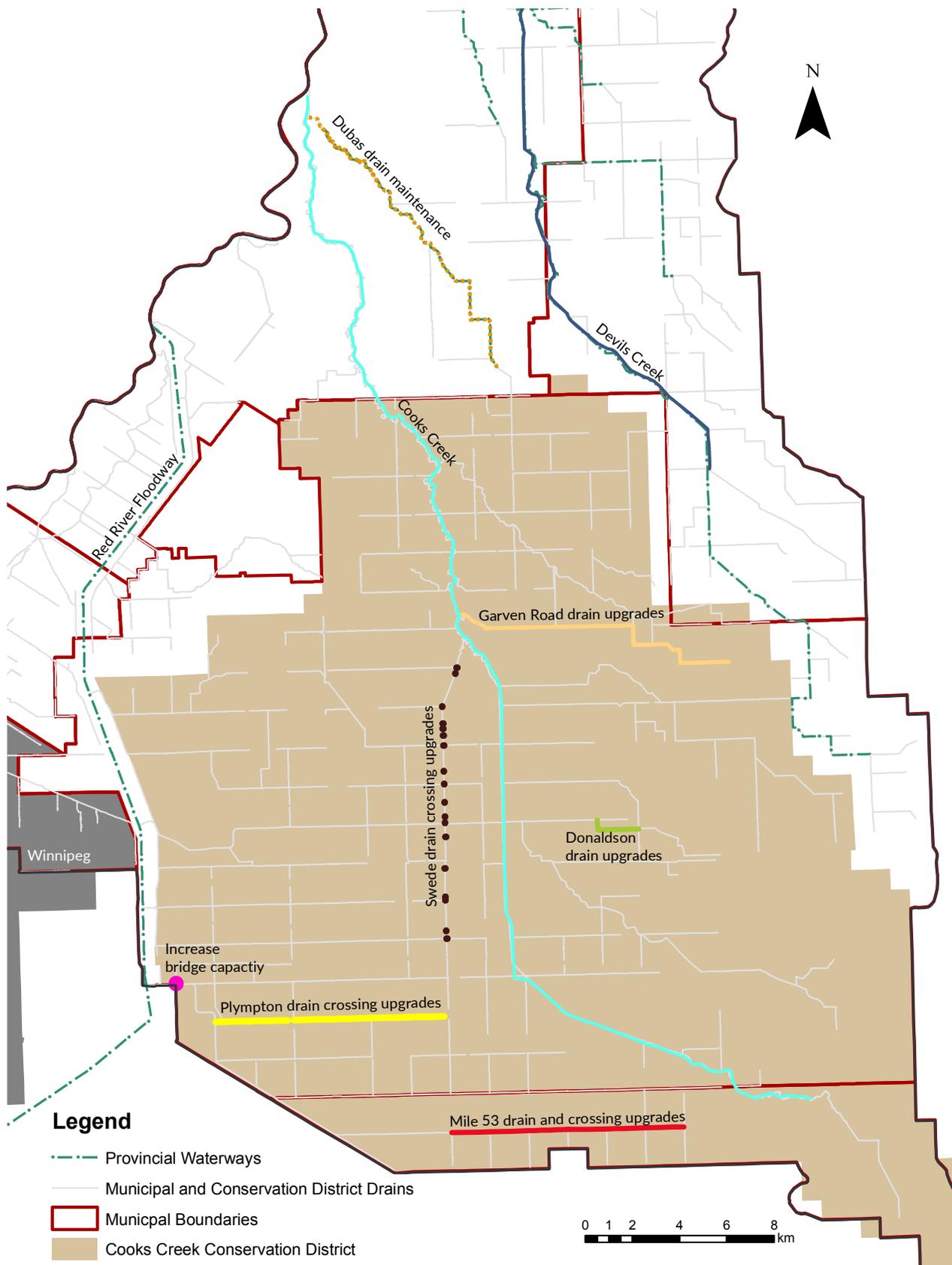


Figure 7 - Site-specific drainage recommendations in the Cooks-Devils Creek Watershed

Water Retention Considerations

Stream flows vary considerably throughout the year in the watershed, typically peaking in the spring months. On average, 75-80% of runoff occurs between March and May. Although spring flooding is more significant than flooding due to summer precipitation events, climate change impacts may result in more frequent and severe summer flooding events. Targets to reduce peak flows have been identified for the watershed to address these concerns.

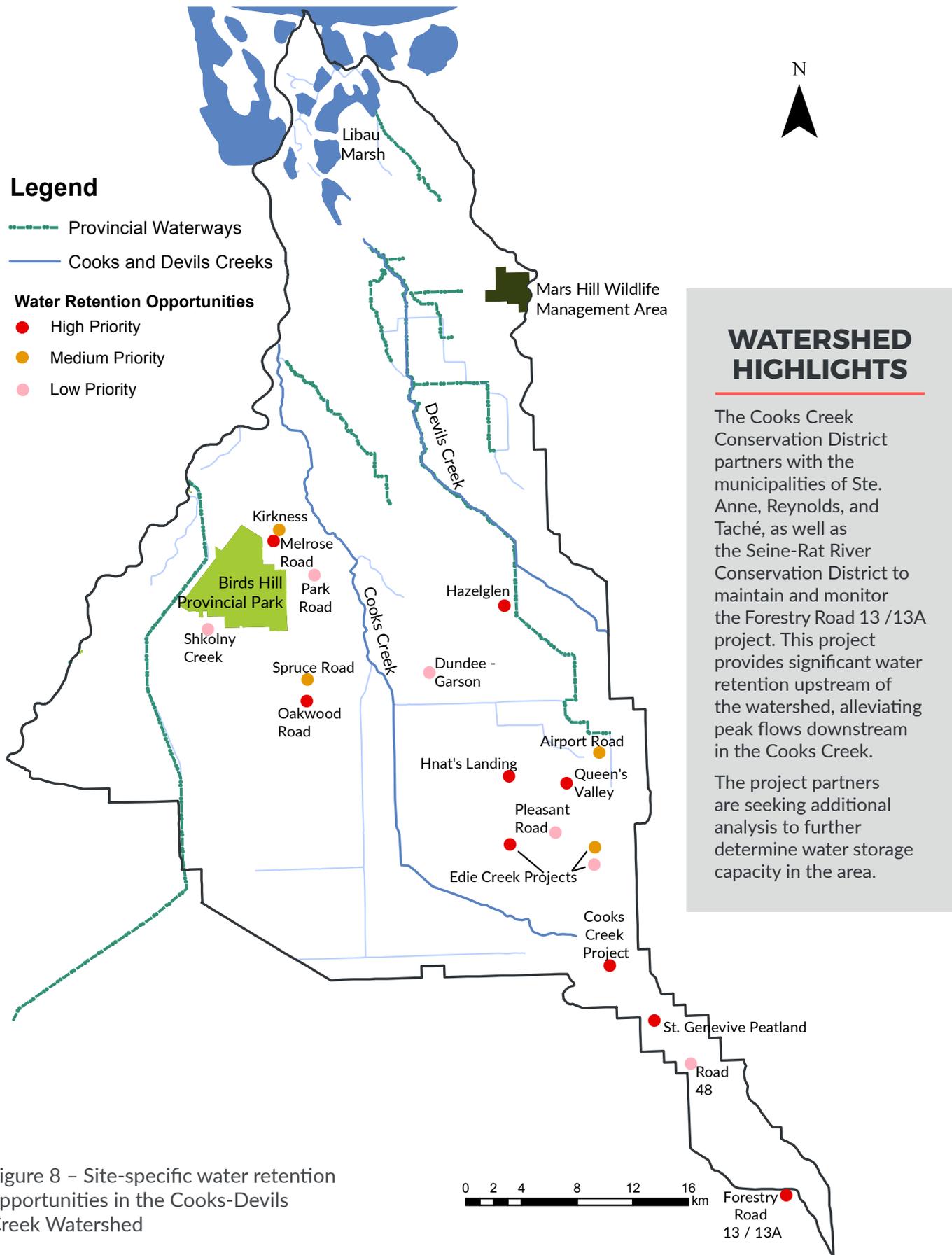
Upstream water retention areas are most efficient at reducing peak flows during moderate spring melting or rainfall events, when wetlands and water retention areas have more time to capture excess moisture, and release water slowly afterwards. In times of intense flooding due to heavier rains, these catchment areas fill up quickly and water continues flowing past them, flooding downstream areas. To review retention opportunities, a thorough water retention analysis was conducted for the Cooks – Devils Creek Watershed using LiDAR (Light Detection and Ranging) data collected for the watershed.



Water Retention Actions				
Issue	Action	Target Area	Lead Organizations	Measure of Success
Peak flow reduction	1.18. Assess water retention requirements for 2050, based on climate change projections.	Watershed-wide	Manitoba Sustainable Development - Surface Water Management Section	Provide retention recommendations to reduce peak flows by 2% for 2050.
	1.19. Implement effective drainage management plans to store water for short term retention.	Watershed-wide	Cooks Creek Conservation District, landowners, planning districts, municipalities, Manitoba Agriculture - Agri-Resource Branch	Implement short-term retention opportunities that will not negatively impact agriculture.
	1.20. Improve water retention capacity of the Forestry Road 13 / 13A project using LiDAR data.	Forestry Road 13 / 13A	Cooks Creek Conservation District	Reduce flooding downstream and enhance drought resiliency.
	1.21. Implement retention projects which reduce peak flows.	Watershed-wide	Cooks Creek Conservation District, municipalities	Maintain peak flows at prairie level for larger floods, such as one in 20 year flood or larger.
Wetland protection and restoration	1.22. Develop a work plan to identify target areas for conservation agreements that protect wetlands.	Areas which are continuously wet and along creeks	Conservation agencies, landowners, Cooks Creek Conservation District, municipalities	Conserve ten acres of wetlands by 2025.
	1.23. Implement a wetland restoration program.	Watershed-wide	Cooks Creek Conservation District, Manitoba Agriculture - Agri-Resource Branch, Manitoba Sustainable Development - Watershed Planning and Programs Section	Restore two previously drained wetlands in the next five years.
	1.24. Develop a moratorium on wetland loss.	Watershed-wide	Manitoba Sustainable Development - Drainage and Water Rights Licensing Branch	Achieve no-net-loss of wetlands.

Site-Specific Water Retention Opportunities

Priority	Project Name	Purpose					Maximum Storage Capacity		Drainage Area (km ²)	Depth of Runoff Retained (mm)
		Flood Control	Water Supply	Wildlife	Recreation	Water Quality	dam ³	acre feet		
High Priority	Cooks Creek	Y	Y	Y		Y	120	97.3	67.0	0.1
	Queen's Valley	Y		Y		Y	1050	851.2	1.7	612
	Oakwood Road	Y	Y				725	587.8	6.9	105
	Hnat's Landing	Y					700	567.5	9.5	74
	Edie Creek 1	Y		Y		Y	665	539.1	15.2	15
	Melrose Road	Y					77	62.4	2.1	37
	Hazelglen	Y					175	141.9	6.0	29
	St. Genevieve Peatland	Y				Y	1280	1037.7	3.8	340
Medium Priority	Airport Road	Y		Y			500	405.4	16.0	31
	Edie Creek 2	Y		Y		Y	200	162.1	16.2	13
	Kirkness	Y					60	48.6	1.4	43
	Spruce Road	Y					76	61.6	2.5	31
Low Priority	Pleasant Road	Y		Y			545	441.8	1.7	321
	Edie Creek 3	Y		Y		Y	105	85.1	6.0	17
	Road 48N	Y		Y			45	36.5	37.3	1
	Shkolny Creek	Y		Y			20	16.2	0.7	27
	Park Road	Y					35	28.4	0.2	147
	Dundee-Garson Road	Y					35	28.4	1.1	32



GOAL 2

ENHANCE GROUNDWATER QUALITY

GOAL STATEMENT

Ensure safe drinking water for the health and prosperity of communities within the watershed

Groundwater is a primary source of drinking water for most residents of the watershed. Many landowners use private wells to access drinking water, while others have access to semi-public or public drinking water systems. In general, groundwater quality is good within the Cooks-Devils Creek Watershed.

Groundwater Issues

Groundwater quality can be impacted by certain land-use activities, including peat harvesting, gravel pit operations, landfill sites, agricultural activities, and rural and urban development. Activities that could negatively impact groundwater quality should be limited or closely monitored in areas known to provide groundwater recharge, including areas with sand and gravel, and those with shallow overburden.

Gravel extraction activities may threaten or even change the natural course of groundwater movement. For example, certain wells located in the Rural Municipality of Springfield are now recorded as GUDI (groundwater under the direct influence of surface water) due to neighbouring gravel pit activity. Wells recorded as GUDI are more vulnerable to surface water contamination, and may impact groundwater quality.

Flowing wells are primarily located along the Cooks and Devils Creeks and Birds Hill Provincial Park. These wells may discharge an uncontrolled amount of water, depleting groundwater resources and causing localized flooding.



WATERSHED HIGHLIGHTS

Water rights use licensing is administered under Manitoba's Water Rights Act. The Act outlines targets to balance human and environmental needs for sustainable water use. At the core of the licensing process is the requirement for water to be legally appropriated; licensees must demonstrate beneficial use for their water projects.

Currently 53 registered water use projects are licensed in the Cooks-Devils Watershed. These licenses are for industrial, agricultural, irrigation and municipal purposes. Current allocations are below the sustainable yield of major waterways and aquifers in the watershed. Manitoba Sustainable Development's Water Use Licensing Section evaluates the sustainability of proposed water use projects by requiring information regarding well and aquifer evaluations for new project applications.

Actions to Address Groundwater Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Maintain private well integrity and prevent groundwater contamination	2.1. Continue the practice of sealing and mapping all known abandoned wells.	Source Water Protection Zones (1.5 km radius) of public drinking wells	Cooks Creek Conservation District, landowners, Manitoba Sustainable Development – Groundwater Management Section, municipalities	Seal all abandoned wells in source water protection zones to reduce groundwater contamination.
	2.2. Ensure proper well maintenance practices are followed.	Watershed-wide	Private well owners, Manitoba Sustainable Development – Groundwater Section, Cooks Creek Conservation District	Protect the integrity of private well sources.
	2.3. Implement a regular drop off service, with transportation to an accredited lab for private well sampling.	Watershed-wide	Cooks Creek Conservation District, private well owners, Manitoba Sustainable Development – Office of Drinking Water, municipalities	Ensure private wells are regularly tested for bacterial water quality parameters.
Aquifer recharge protection	2.4. Restrict practices that may pollute community drinking water systems.	Source Water Protection Zones (1.5 km radius) of public drinking wells	Municipalities, landowners	Limit surface use of chemicals near public wells.
	2.5. Restrict new approvals of activities that may leach water soluble contaminants in recharge areas.	Upland areas with sandy soils	Municipalities, Cooks Creek Conservation District	Protect groundwater recharge areas by reducing sources of hazardous waste and contamination.
	2.6. Assess and monitor mining operations, extraction practices, and development operations that may pose a risk to drinking water.	Watershed-wide	Municipalities, residents	Identify risk reduction measures, including inspections, to reduce groundwater quality impacts from mining resource extraction and development.

Actions to Address Groundwater Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Aquifer recharge protection	2.7. Meet environmental obligations for the Hillside waste disposal site.	Hillside Waste Disposal Grounds	RM of Springfield	Implement closure and post-closure care activities for the Hillside waste disposal site.
	2.8. Promote safe and sustainable livestock management practices.	Recharge areas	Livestock producers, industry, Manitoba Sustainable Development - Environmental Compliance Enforcement Branch, Manitoba Agriculture - Agri-Resource Branch	Increase public awareness and enforcement of the Livestock Manure and Mortality Management Regulations.
Aquifer integrity monitoring	2.9. Assess groundwater quality changes and the potential for off-site migration of contamination.	Hillside Waste Disposal Grounds	RM of Springfield	Continue existing groundwater monitoring until 2022.
Enhance public education and awareness	2.10. Distribute educational materials outlining proper chemical use practices.	Source water protection zones (1.5 km radius) of public drinking wells	Cooks Creek Conservation District, landowners, municipalities	Raise awareness of groundwater resources and recharge areas for residential and drinking water purposes.
	2.11. Educate residents on groundwater vulnerability and proper private well care.	Watershed-wide	Manitoba Sustainable Development - Groundwater Section, Cooks Creek Conservation District, residents, Manitoba Sustainable Development - Office of Drinking Water	Facilitate successful uptake of groundwater protection activities.

WATERSHED HIGHLIGHTS

In 1998, the RM of Springfield closed the Hillside Waste Disposal Grounds. The disposal site was established as an un-lined facility in close proximity to a gravel quarry. Located in a groundwater recharge area, the RM of Springfield is taking steps to reclaim the site and implement groundwater monitoring in the area.

SOURCE WATER PROTECTION PLAN

Clean, potable drinking water is critical for human life and prosperous, sustainable communities. Protecting water at its source, before it arrives at treatment facilities is a preventative approach to water management. This approach is less expensive and more ecologically sound than remediating water quality in treatment facilities. Manitoba has adopted a grassroots approach to source water protection in which a group of local, technical and non-technical representatives conduct assessments for each public well in the watershed.

Source water assessments are completed in three steps:

1. Map Source Water Protection Zones

The location of each public drinking water system is mapped, along with possible threats in a 1.5 km buffer around each well. This 1.5 km buffer is called the Source Water Protection Zone.

2. Site Visits

A group of local and technical experts ground truth mapped Source Water Protection Zones. Ground truthing includes a careful review of conditions and land use activities near the withdrawal location and identification of potential threats.

3. Summary Meeting

The assessment team discusses site visit observations, historical information, including construction details and boil water advisories, and prioritizes contamination threats. Recommendations are then developed to protect each public drinking water system.

Public Drinking Water Systems in the Cooks-Devils Watershed

Source water assessments were completed for all 15 public drinking water systems in the watershed. The Office of Drinking Water defines a public water system as having 15 or more connections for drinking water purposes. It is also important to note that there is a number of semi-public systems, which consist of more than one but less than 15 connections. Thousands of private wells are also located in the watershed.

Recommended Actions for all Systems

1. Cooks Creek Conservation District should seal all abandoned wells in Source Water Protection Zones.
2. Municipalities, planning districts and developers should provide careful consideration of the impacts of development activities within Source Water Protection Zones and in areas with less than six meters overburden.
3. Municipalities should decommission old wastewater treatment lagoons and landowners should decommission abandoned or faulty onsite wastewater systems, such as septic fields and old septic tanks.
4. Municipalities should properly maintain and monitor the integrity of wastewater treatment lagoons and landowners should properly inspect and maintain onsite wastewater systems.



Site-Specific Recommendations for Public Drinking Water Systems

Public System	Site-Specific Recommendations
Birds Hill Provincial Park (Province of Manitoba) ▸ 7 wells	<ol style="list-style-type: none"> 1. Decommission old outhouses (no longer in use) within the Source Water Protection Zone at the Folk Festival and Group Use 2 wells. 2. Monitor the integrity of in-use outhouses and septic fields. 3. Treat the ant infestation in the well house at Group Use 2 in the most environmentally sensitive manner. 4. Monitor the integrity of the public washrooms located in close proximity to the Group Use 1, site 1-7 wells, south side.
Pine Ridge Trailer Court (privately owned, within the RM of St. Clements)	<ol style="list-style-type: none"> 1. Properly fill in the well pits. 2. Raise well heads to a minimum of 40.6 cm (16") above the ground surface. 3. Build new well houses. 4. Provide proper mounding to ensure water does not pool around the wells.
East St. Paul (RM of East St. Paul)	<ol style="list-style-type: none"> 1. Monitor the environmental impacts of gravel pits with the Province of Manitoba 2. Continue to restrict the use of ATVs on and near the floodway.
East Selkirk (RM of St. Clements)	No site-specific recommendations.
Tyndall / Garson (RM of Brokenhead) ▸ 2 wells	<ol style="list-style-type: none"> 1. Monitor the integrity and environmental impacts of the wastewater lagoon with the Province of Manitoba 2. Monitor the environmental impact of gravel pits, in partnership with the Province of Manitoba.
Anola (RM of Springfield)	<ol style="list-style-type: none"> 1. Ensure an emergency response plan includes preparation and mitigation strategies for any potential rail line spills or gas station incidents.
Oakbank and Dugald (RM of Springfield) ▸ 2 wells	<ol style="list-style-type: none"> 1. Seal all abandoned wells in the Source Water Protection Zone. 2. Monitor the environmental impact of gravel pits, in partnership with the Province of Manitoba. 3. Ensure an emergency response plan includes preparation and mitigation strategies for any potential rail line spills or gas station incidents
Oasis Campground (privately owned, within the RM of Springfield)	<ol style="list-style-type: none"> 1. Monitor the integrity of onsite wastewater systems within the campground. 2. Ensure an emergency response plan includes preparation and mitigation strategies for any potential rail line spills or gas station incidents.
Rock Garden Campground (privately owned, within the RM of Ste. Anne)	<ol style="list-style-type: none"> 1. Monitor the integrity of onsite wastewater systems within the campground. 2. Ensure an emergency response plan includes preparation and mitigation strategies for any potential rail line spills or gas station incidents.
Wild Oaks Campground (privately owned, within the RM of Ste. Anne)	<ol style="list-style-type: none"> 1. Monitor the integrity of onsite wastewater systems within the campground. 2. Ensure an emergency response plan includes preparation and mitigation strategies for any potential rail line spills or gas station incidents. 3. Monitor the environmental impacts of the waste disposal site, or relocate it so it is located outside of the Source Water Protection Zone. 4. Extend the well casing to a minimum of 40.6 cm (16") above the ground surface.

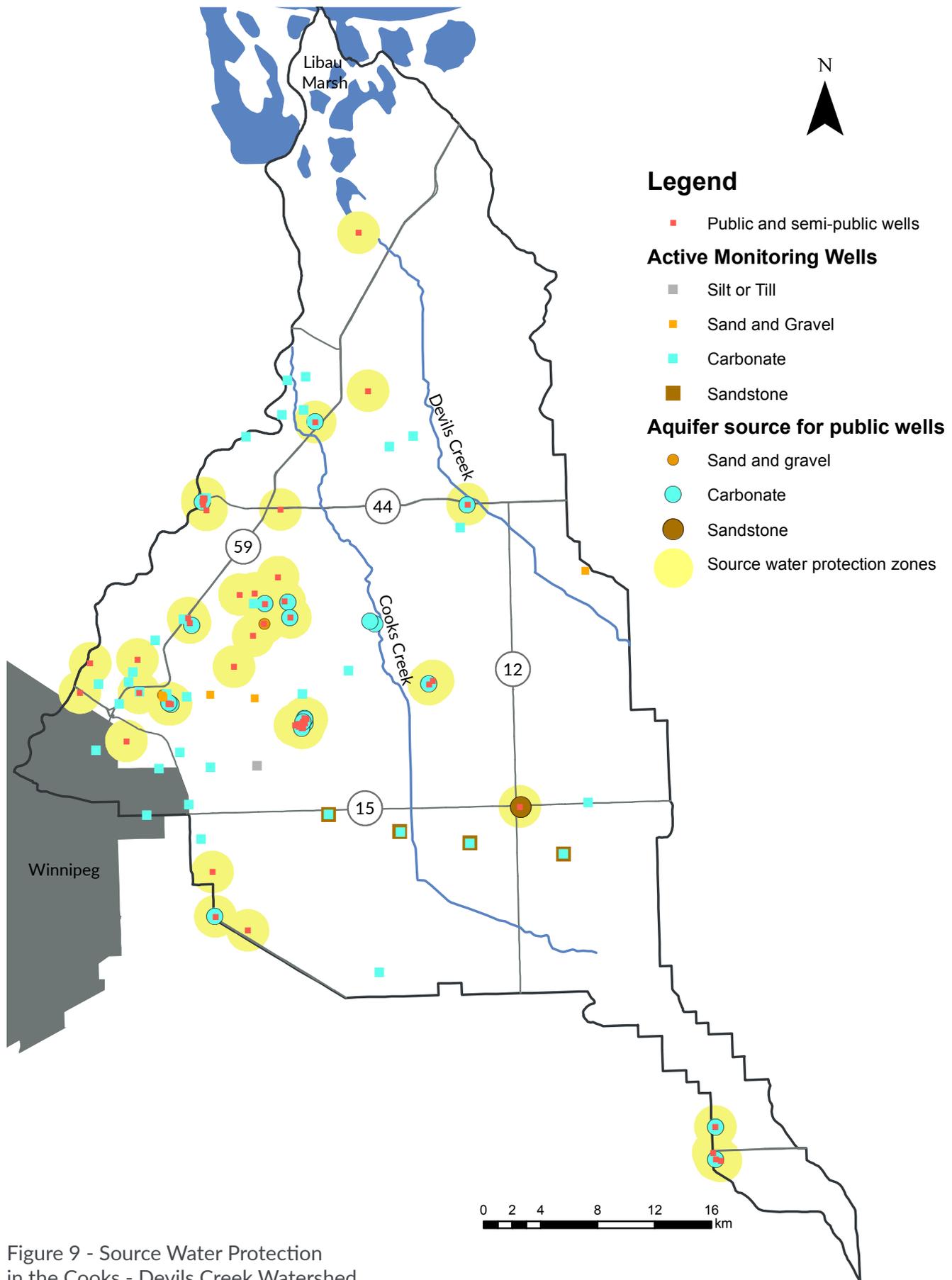


Figure 9 - Source Water Protection in the Cooks - Devils Creek Watershed

GOAL 3

BALANCE NATURAL AREA PRESERVATION AND LAND DEVELOPMENT

GOAL STATEMENT

Strive to balance human and ecological interests by conserving and restoring natural features on the landscape

The watershed is host to diverse landscape practices, including agriculture, parks, traditional use, residential development, and industrial activities. The watershed's close proximity to the City of Winnipeg makes it very attractive for residents wishing to live outside of city limits. Towns such as Oakbank and Dugald have seen especially high residential growth in recent years (Figure 10). Local authorities and planning districts are working to protect agricultural land, while accommodating development where feasible. Strong development planning policies are necessary to balance residential growth, industrial activities, and land development with the natural landscape of the watershed.

Peat Harvesting

Peat harvesting activities can have significant impacts on peatland ecosystems. Once harvested, these areas may be restored to functioning peatlands if appropriate techniques are applied, but this can take many years. The main impacts to peatlands as a result of harvesting are habitat alteration and increased carbon emissions, as the top layer of soil and vegetation is removed.

Peat harvesting activities are limited to the very southern edge of the watershed. The Peatlands Stewardship Act outlines measures required to protect sensitive peatland ecosystems and restore key peatland ecosystem functions.



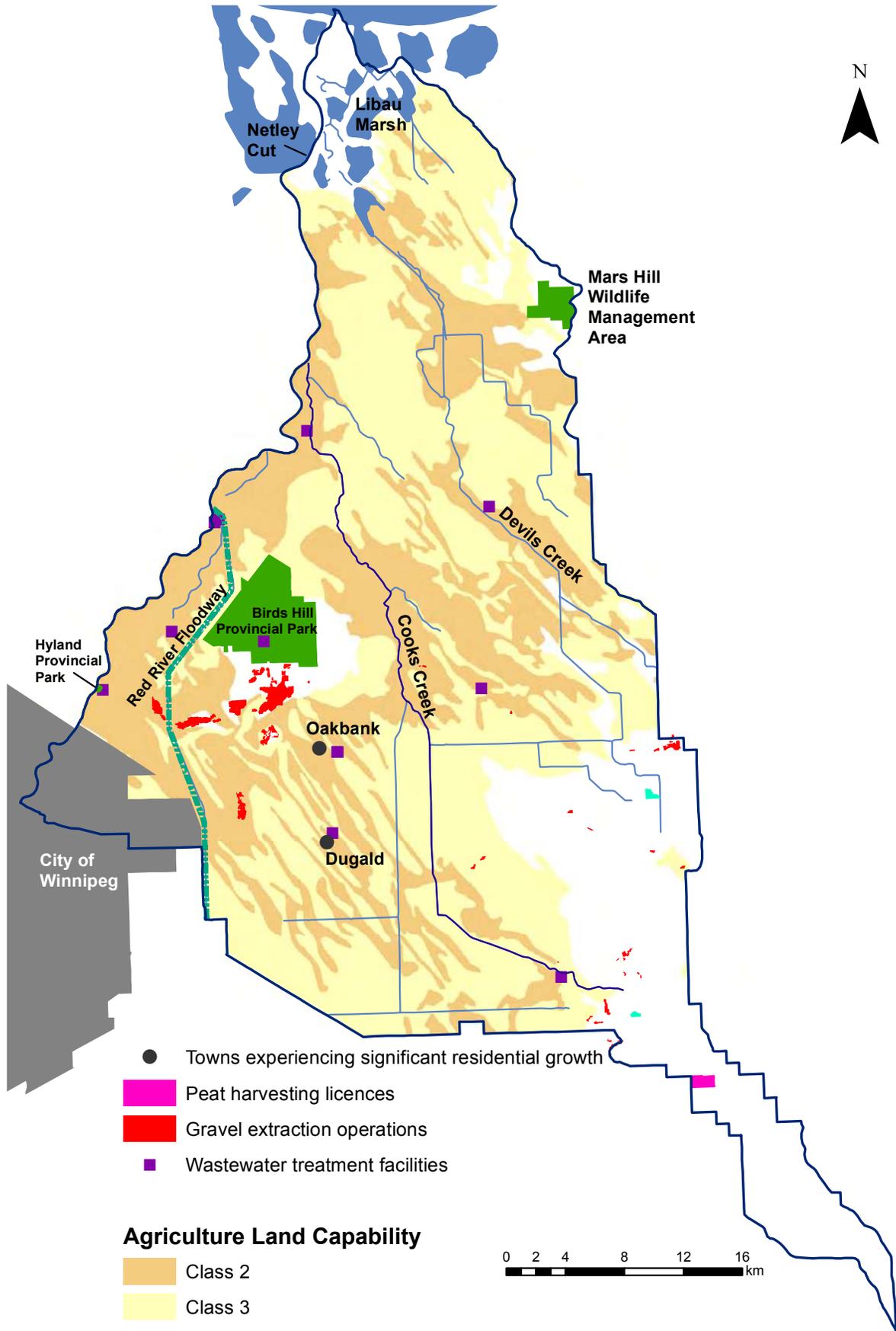


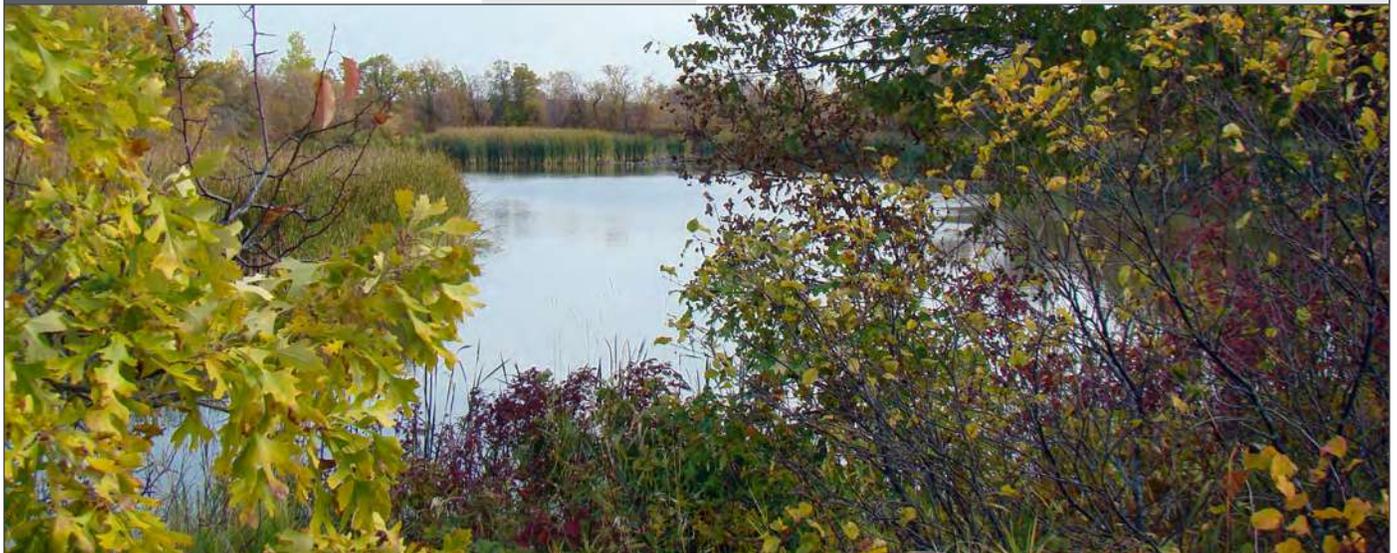
Figure 10 – Natural area and development considerations in the Cooks-Devis Creek Watershed

Actions to Address Natural Area Protection and Land Development Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Natural area protection	3.1. Preserve and maintain natural areas in the watershed.	Wetlands, riparian areas and forested areas	Non-governmental conservation organizations, landowners, Cooks Creek Conservation District	Enhance conservation of natural areas which hold back water during times of significant rainfall and flooding.
Sustainable agricultural initiatives	3.2. Provide education to residents on agricultural practices in the watershed.	Watershed-wide	Manitoba Agriculture, Cooks Creek Conservation District, residents	Educate residents through avenues such as Open Farm Day and school field trips to farms within the watershed.
	3.3. Restore and protect vegetated buffers along drainage ditches and natural waterways.	Along waterways	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure - Water Management and Structures Branch, landowners, Manitoba Agriculture - Agri-Resource Branch	Reduce erosion along the banks of waterways and improve water quality.
Industry and development considerations	3.4. Ensure that appropriate consultations occur prior to peat harvesting activities.	Watershed-wide	Manitoba Sustainable Development - Forestry and Peatland Branch, industry, municipalities, Peguis First Nation, Cooks Creek Conservation District	Ensure all stakeholders, including municipalities, landowners and Indigenous communities have an opportunity for proper consultation and input on peat harvesting activities.
	3.5. Develop an action list to improve peat harvesting operation and reclamation activities.	Watershed-wide	Manitoba Sustainable Development - Forestry and Peatland Branch, municipalities, Cooks Creek Conservation District	Identify restricted and sensitive sites which should not be harvested, and provide guidelines for creating retention opportunities in depressions left by peat harvesting.
	3.6. Ensure peat harvesting operations follow best-management and recovery activities	Watershed-wide	Manitoba Sustainable Development - Forestry and Peatland Branch, industry	Identify restricted and sensitive sites which should not be harvested, and ensure the industry follows the prescribed guidelines identified in The Peatlands Stewardship Act

Actions to Address Natural Area Protection and Land Development Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Industry and development considerations	3.7. Limit development activities in flood prone, low-lying areas.	Watershed-wide	Municipalities, Municipal Relations -Community and Regional Planning, Manitoba Infrastructure - Water Management and Structures Branch, Cooks Creek Conservation District	Utilize LiDAR to identify low-lying areas prone to regular flooding and restrict development or require adequate flood protection.
	3.8. Include the Cooks Creek Conservation District in commenting for conditional use mining license applications.	Watershed-wide	Municipalities, Cooks Creek Conservation District, Manitoba Growth Enterprise and Trade - Mineral Resources Branch	Limit conditional use licenses for new gravel pits within Source Water Protection Zones.
	3.9. Consider amendments to The Environment Act so that gravel pits require an Environment Act license.	Watershed-wide	Manitoba Sustainable Development - Environmental Compliance and Enforcement Branch, and Environmental Approvals Branch, Manitoba Growth Enterprise and Trade - Mineral Resources Branch	Include gravel pit operations under Manitoba's Environment Act licensing requirements by 2025.
	3.10. Consider groundwater recharge in development planning.	Watershed-wide	Planning districts, industry, municipalities	Identify development in sensitive groundwater recharge areas, on which development should be limited.



Actions to Address Natural Area Protection and Land Development Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Indigenous community concerns	3.11. Protect the Peguis First Nation cemetery remains at the Anglican Church.	St. Peter's Old Stone Church Cemetery	Anglican Church Diocese, Peguis First Nation, Manitoba Sport, Culture and Heritage - Historic Resources Branch	Protect this site from erosion and development for cultural and traditional reasons.
	3.12. Explore and seek options to secure access to the ceremonial grounds located at Little Peguis.	Little Peguis	Peguis First Nation, Rural Municipality of St. Clements	Establish sufficient access to Little Peguis through options such as a regular maintenance schedule by the municipality or possibly transfer authority through TLE selection for the access route.
Heritage Resource Reporting	3.13. Survey and record heritage resources.	Cooks and Devils Creeks	Manitoba Sport, Culture and Heritage - Historic Resources Branch, community stakeholders, residents	Increase the number of heritage resources reported, monitored and protected.
Natural habitat protection and wildlife considerations	3.14. Recommend that milkweed be protected from spraying outside of agricultural areas.	Watershed-wide	Springfield – Taché Weed District, Manitoba Agriculture - Agri-Resource Branch	Milkweed habitat is protected from spraying activities outside of agricultural areas to support monarch butterfly populations.
	3.15. Conserve existing wetlands.	Wetlands on private land	Landowners, Cooks Creek Conservation District, conservation agencies	Develop a list of target wetlands and preserve wetlands with conservation agreements
	3.16. Maintain a natural riparian buffer along waterways.	Cooks and Devils Creeks	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure - Water Management and Structures Branch, Manitoba Agriculture - Agri-Resource Branch	Slow erosion to mitigate phosphorus from entering waterways.
	3.17. Compile fisheries management objectives for the watershed.	Watershed-wide	Manitoba Sustainable Development - Wildlife and Fisheries Branch, Cooks Creek Conservation District	Integrate fisheries management objectives into conservation district programming initiatives by 2023.

Actions to Address Natural Area Protection and Land Development Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Libau Marsh restoration	3.18. Support the Red River Basin Commission and the International Institute for Sustainable Development in their efforts to restore wetland function of the Netley-Libau Marsh.	Netley-Libau Marsh	Red River Basin Commission, International Institute for Sustainable Development, Cooks Creek Conservation District	Restore the bank and river channel at the location of the Netley Cut.
Community engagement and awareness	3.19. Implement community tree planting outside of native prairie habitat. 3.20. Support an educational anti-littering campaign.	Parks, community areas, private land Watershed-wide	Landowners, Cooks Creek Conservation District, municipalities Residents, municipalities	Plant 5,000 native trees by 2023. Provide education on proper waste management and enforce more strict littering penalties.



WATERSHED HIGHLIGHTS

The Red River Basin Commission (RRBC) is exploring potential benefits in re-establishing dredging on the Red River. Dredging can impact fish habitat, but it creates a clearer channel for water flow and ice movement, reducing flooding pressures locally. Dredged silt can be used to build sediment islands in the marsh, providing substrate for emergent vegetation growth.

Improving Netley-Libau Marsh will enhance wildlife and bird populations and restore Indigenous traditional use opportunities. A bathymetric survey will be conducted to target suitable dredging locations and identify where sediment islands can be constructed to restore a healthy marsh complex.

LINKING TO DEVELOPMENT PLANNING

Development plans designate areas and restrictions for specific land use, including agriculture, residential, commercial, recreational and industrial uses. They also incorporate local and provincial land use policies to ensure consistent and organized development of land resources.

Land use planning authorities

The following groups are responsible for land use planning within the Cooks-Devils Creek Watershed:

PLANNING AUTHORITIES	DEVELOPMENT PLANS IN THE WATERSHED:
MUNICIPAL: <ul style="list-style-type: none"> • Red River Planning District (East St. Paul and St. Clements) • Brokenhead • Taché • Springfield • Reynolds • Ste. Anne 	<ul style="list-style-type: none"> • Brokenhead River Planning District Development Plan, By-Law No. 138-09 • Rural Municipality of East St. Paul Development Plan, By-Law No. 2007-14 • The Rural Municipality of Ste. Anne Development Plan, By-law No. 13-2007 • Rural Municipality of Springfield Development Plan, By-law No. 98-22 • The Rural Municipality of Taché Development Plan, By-Law No. 5-2016 • Whitemouth Reynolds Planning District Development Plan, By-Law No. 27-10 • Selkirk and District Development Plan, By-Law No. 190/08
INDIGENOUS: <ul style="list-style-type: none"> • Peguis First Nation 	
PROVINCIAL: <ul style="list-style-type: none"> • Sustainable Development - Lands Branch • Municipal Relations - Community and Regional Planning 	

Watershed-wide considerations

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

Recommendations for new development

1. Establish environmental mitigation measures to offset impacts of new development within municipal or town boundaries.
2. Establish restrictions for new developments in flood prone areas, especially along corridors of the Cooks and Devils Creeks. Development should be built at one metre above 200 year flood event levels.
3. Adopt policies for future development projects to incorporate low-impact, environmentally conscientious concepts into planning and development to minimize pollution loads and improve water-use efficiency. Utilize and

promote practices such as storm water retention, environmentally friendly drainage construction, greywater recycling, low flow water fixtures and water saving appliances.

4. Adopt policies for a minimum set-back distance of 30 m for new development or buildings along shorelines to protect natural vegetation along waterways and streambanks.
5. Adopt policies to limit the removal or degradation of riparian habitat within 30 m of a natural waterway for all new developments.
6. Strengthen development plan policies for retention of agricultural lands, pasture lands, and wooded areas to prevent loss of productive lands and to support a strong local economy.
7. Review lot sizes to determine where minimum two acre lot sizes are applicable for septic wastewater systems.

Recommendations for all public drinking water sources

8. Intensive and high-pollution risk development activities, including gravel extraction, should be restricted in public drinking water Source Water Protection Zones.

- a. Development activities with a high pollution risk include chemical fertilizer storage, disposal fields, fuel tanks, waste disposal grounds, and wastewater treatment facilities.
- b. The following considerations should be met where restriction is not possible:
 - i. the proponent proves adequate engineering or hydro-geological investigation that the proposed activity will not cause pollution of the public drinking water supply or;
 - ii. ensure appropriate precautionary measures are taken to sufficiently mitigate the risk of endangering the public drinking water supply.

9. Prevent significant surface water quality and drinking water quality deterioration, by limiting or restricting development in or near surface waters and riparian, particularly if they:

- a. lead to the contribution of nutrients, pathogenic organisms, deleterious chemicals or materials to these waters;

- b. accelerate erosion and bank instability;
- c. cause the removal of natural vegetative cover; and/or
- d. have an impact on in-stream flows required to maintain healthy aquatic ecosystems.

10. Adopt policies for the mandatory sealing of wells in areas that become serviced by public water systems.

11. Seal unused, abandoned wells that do not meet provincial standards within a Source Water Protection Zone.

12. Ensure a current emergency response plan is developed for each public water system.

Ecological considerations

13. Install barriers and signs to restrict snowmobile and all-terrain vehicle (ATV) traffic in ecologically sensitive areas.

Traditional knowledge considerations

14. Identify and restrict development on ecologically sensitive areas.

15. Incorporate Traditional knowledge into development plans throughout the watershed.



Cooks Creek Conservation District commenting guidelines for development in the watershed

To address development concerns, the Cooks Creek Conservation District Board will comment on development activities which may impact watershed resilience. The table below provides a guideline for commentary.

Development type	Commenting considerations
Drainage	<p>The Cooks Creek Conservation District will comment on all drainage applications that may:</p> <ul style="list-style-type: none"> • Result in increased drainage requirements downstream • Result in increased flows within drains managed by the Cooks Creek Conservation District <p>The Cooks Creek Conservation District may recommend retention opportunities to offset drainage works.</p>
Industrial	<p>The Cooks Creek Conservation District will comment on all industrial applications that may:</p> <ul style="list-style-type: none"> • Result in groundwater contamination risks • Result in negative impacts to natural areas and wetlands <p>The Cooks Creek Conservation District may recommend development restrictions within groundwater recharge areas.</p>
Residential development	<p>The Cooks Creek Conservation District will comment on all development applications that may:</p> <ul style="list-style-type: none"> • Result in negative impacts to natural areas and wetlands • Result in groundwater contamination risks <p>The Cooks Creek Conservation District may recommend natural habitat offset opportunities, including no-net loss of wetlands.</p>



Agricultural land use policies

Development policies for agricultural land planning have largely been created as a result of significant fragmentation and increased pressure for rural residential development, especially in areas close to the City of Winnipeg. Retention of agricultural lands is important for sustainable food production and economic activity.

Within the watershed, various policies exist pertaining to existing agricultural lands:

- **The RM of East St. Paul:** includes the fewest remaining parcels of agricultural lands due to its very small size, land fragmentation, and proximity to the City of Winnipeg.
 - No new livestock operations are permitted.
- **The RM of Brokenhead:** places an emphasis on maintaining agricultural lands in large parcel sizes, as well as designating land for livestock development opportunities.
- **The RM of Taché:** includes objectives to protect agricultural lands, including:
 - Protect prime lands from encroachment of non-compatible uses;
 - Maintain the producers' ability to expand operations;
 - Minimize conflicts between producers and residents; and,
 - Accommodate non-agricultural development when it can be demonstrated that it does not diminish the overall agricultural capability of the land in the long-term
- **The RM of Springfield:** includes many areas designated as agricultural, but several are highly fragmented by rural residential development.
- **The RM of St. Clements:** includes two designations related to agricultural land:
 - The resource and agriculture designation places greater emphasis on maintaining agricultural lands, including maintaining parcel

sizes in 80 acre minimums for agricultural purposes, and encouraging consolidation of smaller parcels, as a condition of approval.

- The "agriculture-restricted" designation focuses more on rural residential development, with less focus on agricultural preservation. Areas of this designation are typically located along transportation corridors and existing settlement areas.
- **The RM of Ste. Anne:** has strong pressure on agricultural lands for development, however a higher level of protection is generally placed on land suited to cultivation. Land of lower agricultural capability classes is generally less restricted in policies for rural residential development. Designations of agricultural land include:
 - The rural agriculture designation sets minimum parcel sizes at 80 acres, and includes most of the cultivated land.
 - The rural mixed use designation generally has lower quality soils which are better suited to grazing. Rural residential use is allowed in this area, notably as smaller hobby farms of 5-10 acres.

Recommendations for Planning Districts and Rural Municipalities for new agricultural land use policies

1. Set larger parcel sizes for agriculturally designated lands where applicable.
2. Restrict non-agricultural yard development in land designated for agricultural use.
3. Consolidate residual lots where possible, to support minimum parcel size for agricultural purposes. If residential lots are subdivided, efforts should be made to sell remaining agricultural lands for agricultural purposes.
4. Restrict subdivision of prime Class 1, 2 and 3 agricultural lands for non-agricultural purposes.



GOAL 4

IMPROVE SURFACE WATER QUALITY

GOAL STATEMENT

Promote and implement beneficial management practices that aim to protect and improve surface water quality

Good quality water is an essential resource required for drinking water purposes, productive aquatic environments, and sustainable wildlife populations. It is also required to support agricultural, industrial and residential development. Adequate wetland and riparian areas assist in filtering water, leading to sustainable water quality and a healthier watershed overall.

Water Quality Issues

Threats to water quality include, but are not limited to, erosion, loss of wetlands, degraded riparian areas, unsustainable peat harvesting, gravel extraction activities, livestock manure management, and nutrient and pesticide runoff into waterways. Due to increasing residential development, local concerns have been raised regarding proper management of private septic systems.



Actions to Address Surface Water Quality Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Nutrient reduction	4.1. Strategically restore lost or degraded wetlands.	Wetlands, Watershed-wide	Cooks Creek Conservation District, Manitoba Agriculture - Agri-Resource Branch , Manitoba Sustainable Development - Watershed Planning and Programs Section	Restore five drained wetlands by 2025 to reduce flooding and filter runoff.
	4.2. Implement beneficial management practices such as cover crops and shelterbelts to reduce erosion and nutrient transport in the watershed.	Cooks and Devils Creeks	Cooks Creek Conservation District, Manitoba Agriculture - Agri-Resource Branch, landowners , Manitoba Sustainable Development - Watershed Planning and Programs Section	Reduce erosion and nutrient runoff by 10% into Lake Winnipeg.
	4.3. Implement beneficial management practices to exclude livestock from direct access to water bodies.	Cooks and Devils Creeks	Cooks Creek Conservation District, Manitoba Agriculture - Agri-Resource Branch, landowners , Manitoba Sustainable Development - Watershed Planning and Programs Section	Implement five livestock exclusion projects by 2023 to decrease bacterial contamination and nutrient loading in surface waters.

Actions to Address Surface Water Quality Concerns

Issue	Action	Target Area	Lead Organizations	Measure of Success
Nutrient reduction	4.4. Implement beneficial management practices, such as seeding banks and creating vegetative buffers to reduce soil erosion along stream banks.	Cooks and Devils Creeks	Cooks Creek Conservation District, municipalities, Manitoba Agriculture - Agri-Resource Branch, Manitoba Sustainable Development - Watershed Planning and Programs Section	Target three soil erosion projects along the Cooks and Devils Creeks by 2025.
	4.5. Evaluate options for reduction of nutrients from municipal wastewater treatment systems.	Watershed-wide	Municipalities, Manitoba Sustainable Development - Environmental Compliance and Enforcement Branch, and Environmental Approvals Branch	Investigate options such as effluent irrigation, trickle discharge, constructed wetland treatment, or chemical treatment to reduce nutrient in effluent.
Natural area programming	4.6. Support development and implementation of a watershed-based approach to ecological goods and services programming.	Watershed-wide	Cooks Creek Conservation District	Compensate landowners to hold water temporarily during times of snow melt and significant precipitation events.
Water quality monitoring	4.7. Continue long term water quality monitoring on the Cooks Creek.	Cooks Creek	Manitoba Sustainable Development – Water Quality Management Section	Maintain long-term water quality data on the Cooks Creek.
Community awareness and engagement	4.8. Provide education on responsible use of phosphorus-based fertilizers in urban areas.	Private residences	Municipalities, watershed residents	Establish better use practices for phosphorus-based fertilizer application on lawns, gardens and at cottages.
	4.9. Establish urban rain gardens and urban wetlands to slow storm water runoff.	Urban areas	Municipalities, Cooks Creek Conservation District	Reduce nutrient effluent in storm drains and municipal ditches.

NEXT STEPS

The most important aspect of the Cooks-Devils Creek Integrated Watershed Management Plan is implementation. Without a concerted effort to implement recommended actions, this plan would be no more than a list of good intentions. The Cooks Creek Conservation District, municipalities, government, Indigenous communities and local residents must strive to work together to ensure the recommendations outlined in this plan are implemented successfully.

Implementation progress and plan success will be assessed regularly over the next ten years. After five years the priorities of this plan will be revisited. An interim assessment of plan implementation progress will be conducted and shared with stakeholders, all levels of government and watershed residents. A new plan will be developed in ten years.



Summary of Key Watershed Priorities and Actions

Coordinate Surface Water Management (pages 17 – 27)

- Improve communication between the Province of Manitoba, municipalities, and Cooks Creek Conservation District to better coordinate surface water management and reduce flooding impacts.
- Coordinate water movement across municipal boundaries.
- Demonstrate the need for increased funding to infrastructure conservation districts to meet their surface water management responsibilities.
- Establish right-of-way access or easements for proper access to all conservation district drains.

Enhance Groundwater Quality (pages 28 – 33)

- Educate residents on groundwater vulnerability.
- Limit industrial activities in aquifer recharge areas.
- Implement recommendations from the source water protection assessments.

Balance Natural Area Preservation and Land Development (pages 34 – 43)

- Limit inappropriate activities in flood prone, low-lying areas.
- Conserve existing wetlands.
- Explore and seek options to secure adequate road access to the ceremonial grounds located at Little Peguis.

Improve Surface Water Quality (pages 44 – 45)

- Implement beneficial management practices to exclude livestock from direct access to water bodies.
- Implement beneficial management practices to reduce soil erosion along stream banks.
- Establish a long-term water quality monitoring station on the Devils Creek by 2020.

REFERENCES AND PLAN LINKAGES

- Aquatic Invasive Species in Manitoba
gov.mb.ca/waterstewardship/stopais/
- Cooks Creek Conservation District
cookscreekcd.com
- Changes in the Emergent Plant Community of Netley-Libau Marsh Between 1979 and 2001
<https://home.cc.umanitoba.ca/~ggoldsb/deltamarsh/occasional/04/op4.pdf>
- Climate Change Report Cards
prairieclimatecentre.ca/videos-downloads/climate-change-report-cards/
- Watershed Management Planning in Manitoba
gov.mb.ca/waterstewardship/iwmp/index.html
- Lake Winnipeg Regulation Report 2015 – Manitoba Clean Environment Commission
cecmanitoba.ca/resource/hearings/33/LWR_WEB.pdf
- Red River Basin Commission
redriverbasincommission.org



Please contact the Cooks Creek
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