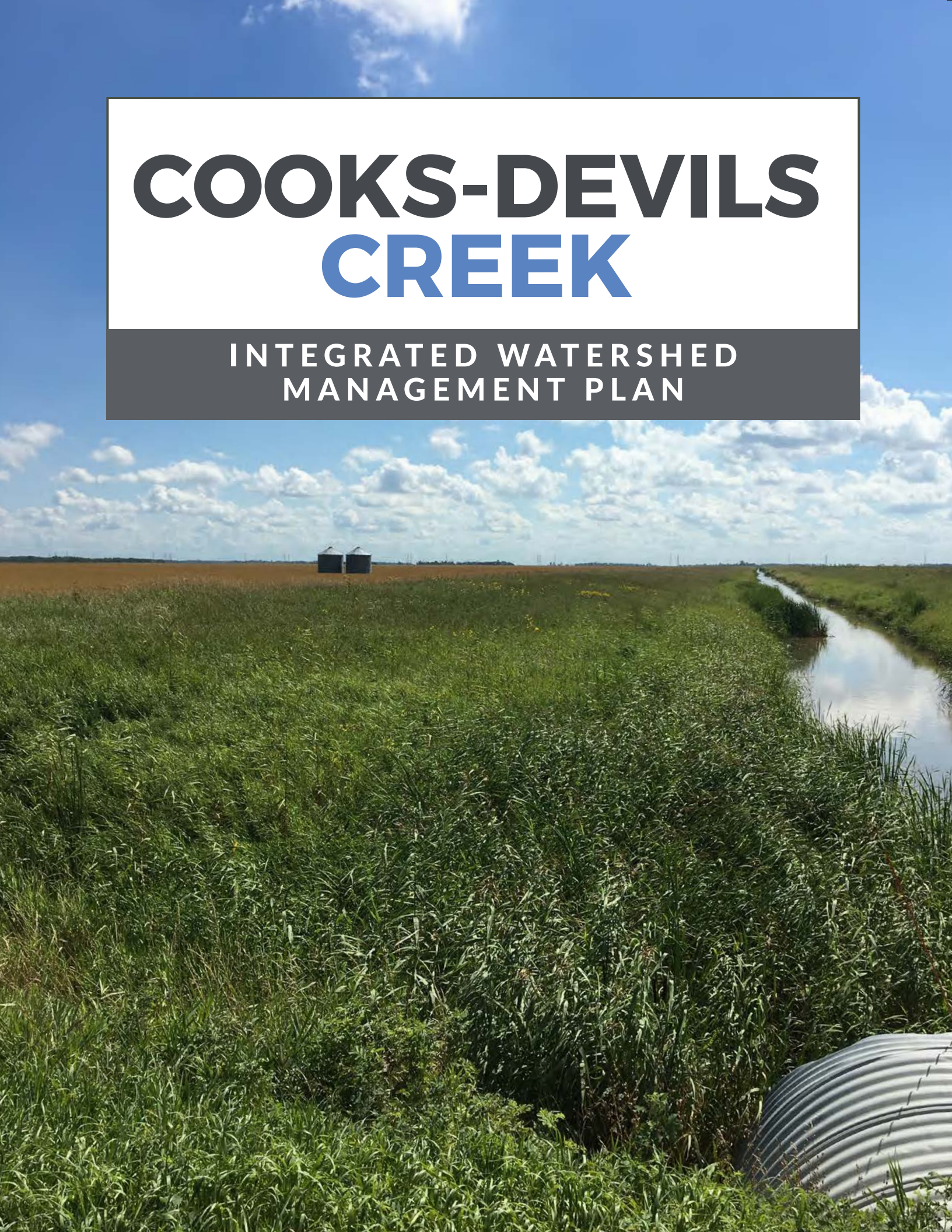
COOKS-DEVILS CREEK

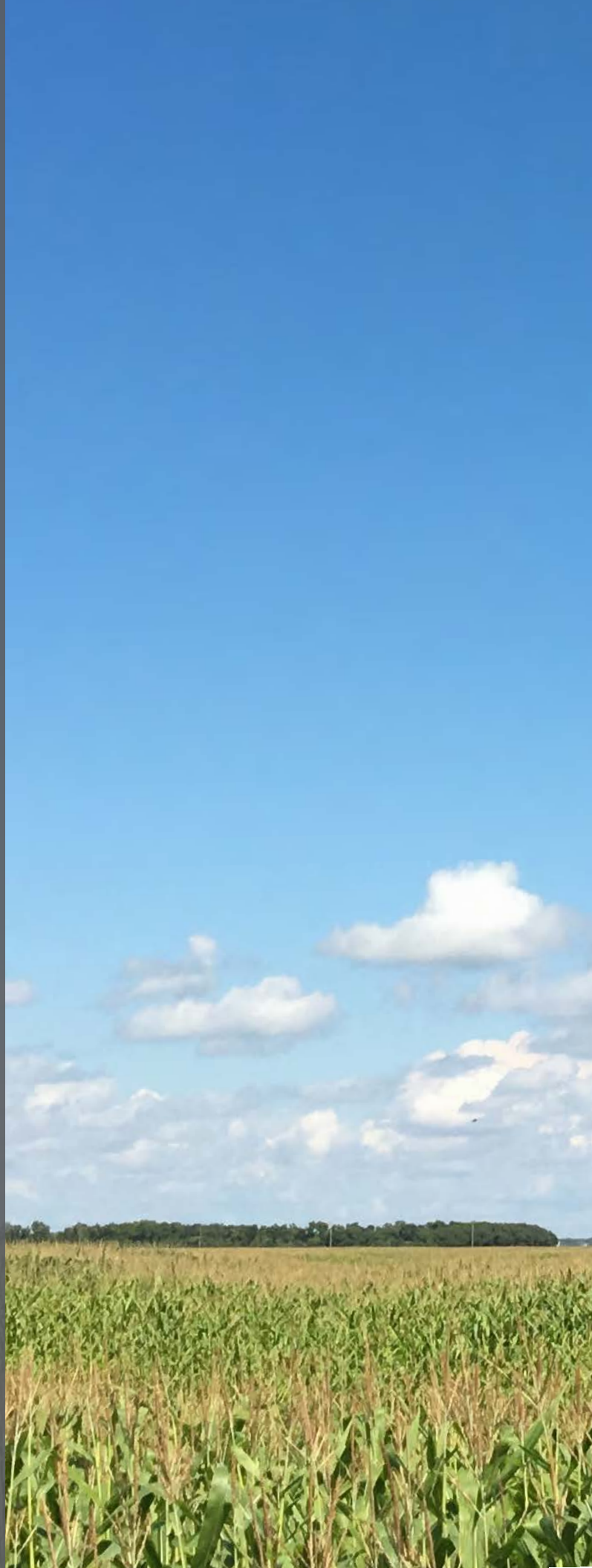
INTEGRATED WATERSHED MANAGEMENT PLAN



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 IWMP focuses on the Cooks and Devils Creek sub-watersheds. The 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.



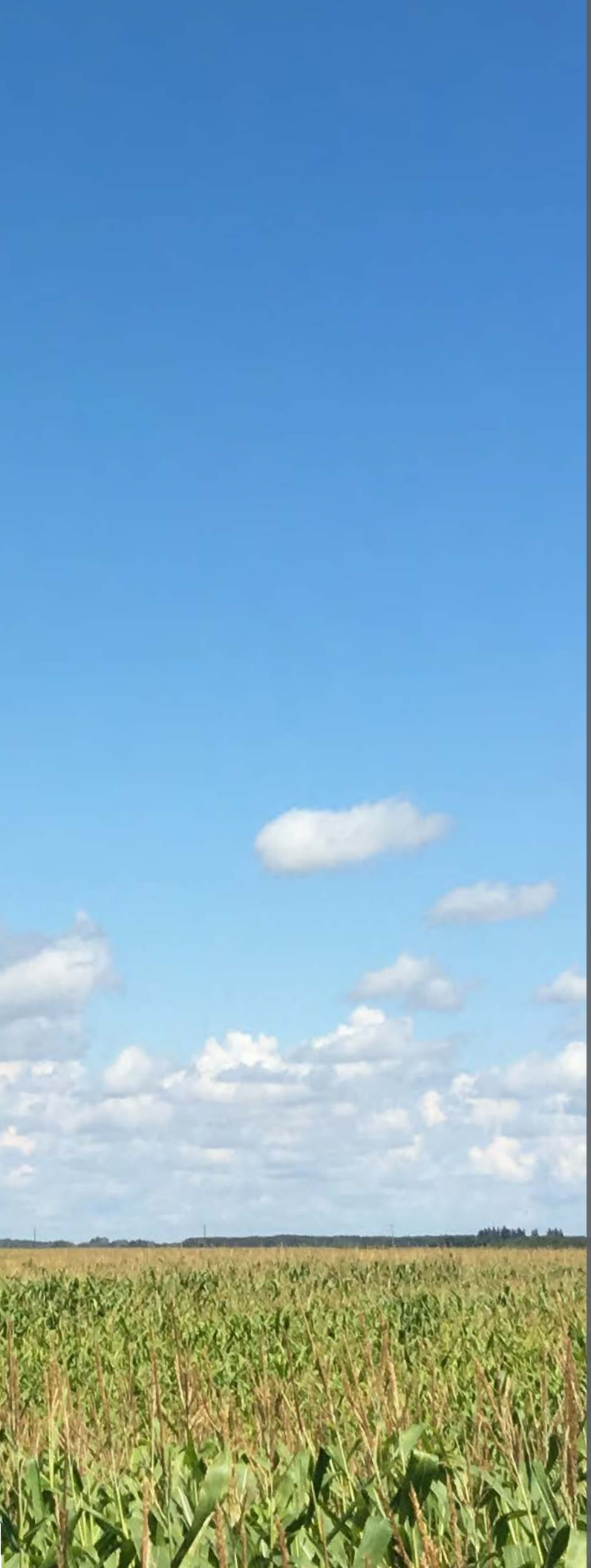


TABLE OF CONTENTS

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 discussed and documented local watershed issues and concerns. The information collected at these meeting 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 serve as the key decision maker and represent 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. Enhance 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 km^2 in size, and is home to approximately 22,000 people, excluding the area 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 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.

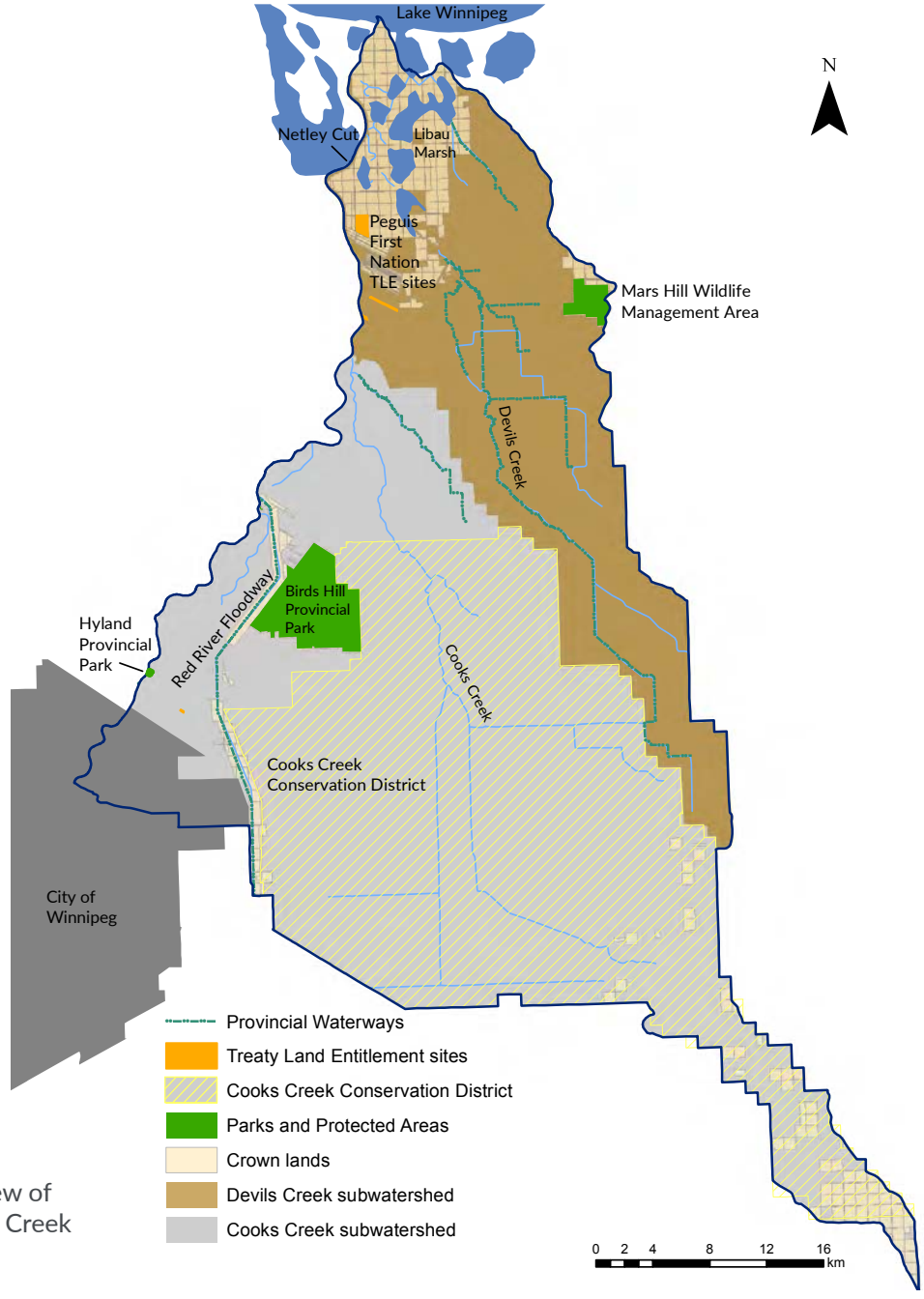


Figure 1 – Overview of the Cooks - Devils Creek Watershed

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, with a waterway infrastructure mandate. 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.

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 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 several thousand acres of land for selection and acquisition. 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 protected area of the Libau Bog Ecological Reserve. BON is a Treaty 1 Nation and an Anishinaabe First Nation. The BON Land Resources Department 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 Elders' 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 ungulates 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. Agriculture producers manage milkweed as a nuisance weed, therefore; spraying for milkweed is a common practice which 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 include the following main concerns:

- Peat and gravel mining
- Fish spawning concerns due to the Netley cut
- Degradation of natural riparian buffers
- Increased surface water flows
- Balancing milkweed management

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 a 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.

Although total precipitation is projected to increase, the timing is expected to change. Less precipitation is anticipated in the summer growing season, additional precipitation is expected during the other 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. However, 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 CAPACITY

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.

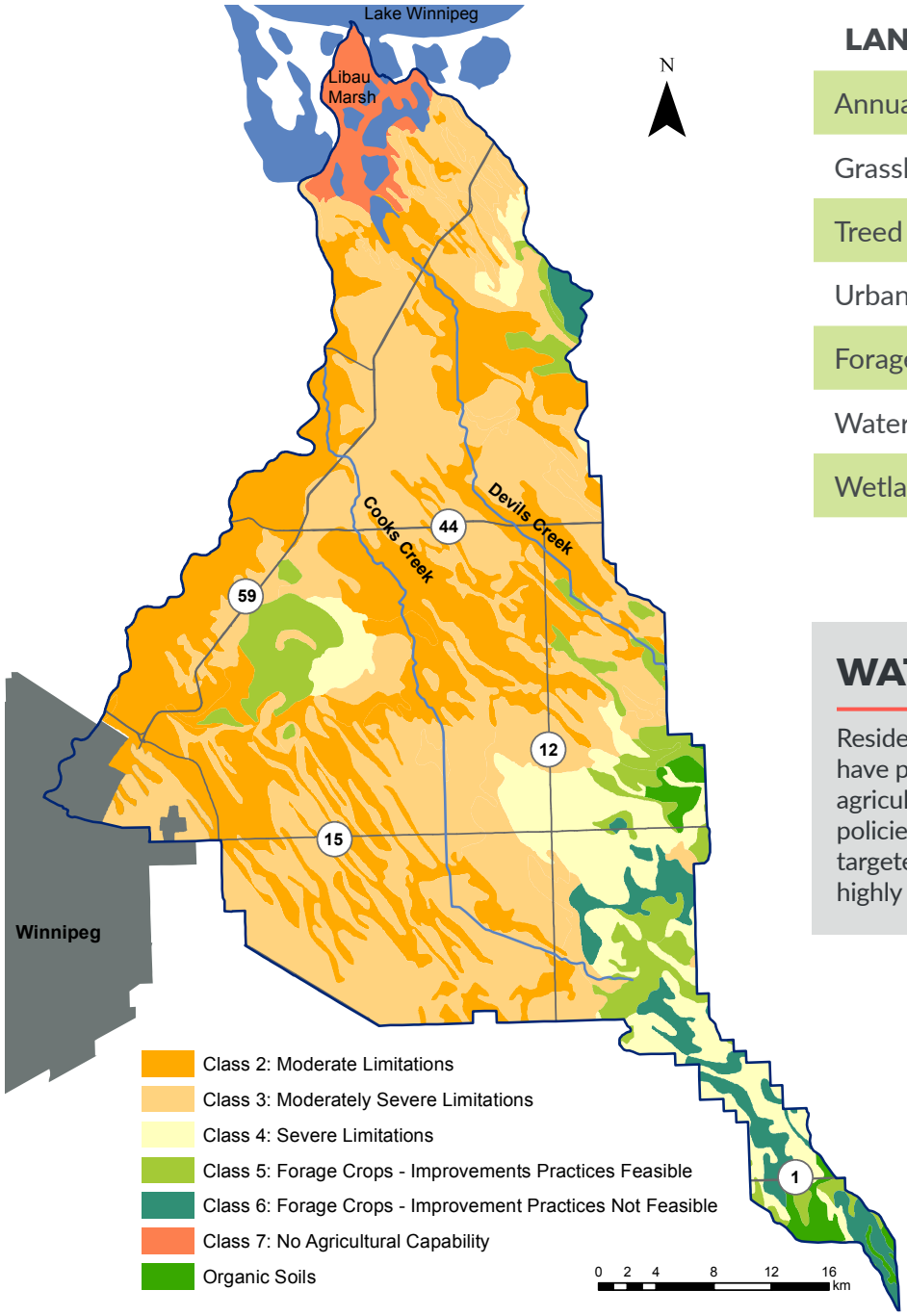


Figure 2 – Canada Land Inventory of agriculturally capable land in the Cooks-Devils Creek Watershed

LAND USE IN THE WATERSHED

Annual cropland	40%
Grassland and pastures	21%
Treed areas	20%
Urban areas	7%
Forages	5%
Water	4%
Wetlands	3%

WATERSHED HIGHLIGHTS

Residential and sub-division developments have placed significant pressure on agricultural lands in recent years. Strong policies for development planning should be targeted to balancing growth while protecting highly productive agricultural lands.

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; while 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 in good quality, with acceptable mineral levels. The City of Winnipeg receives its drinking water from Shoal Lake. 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

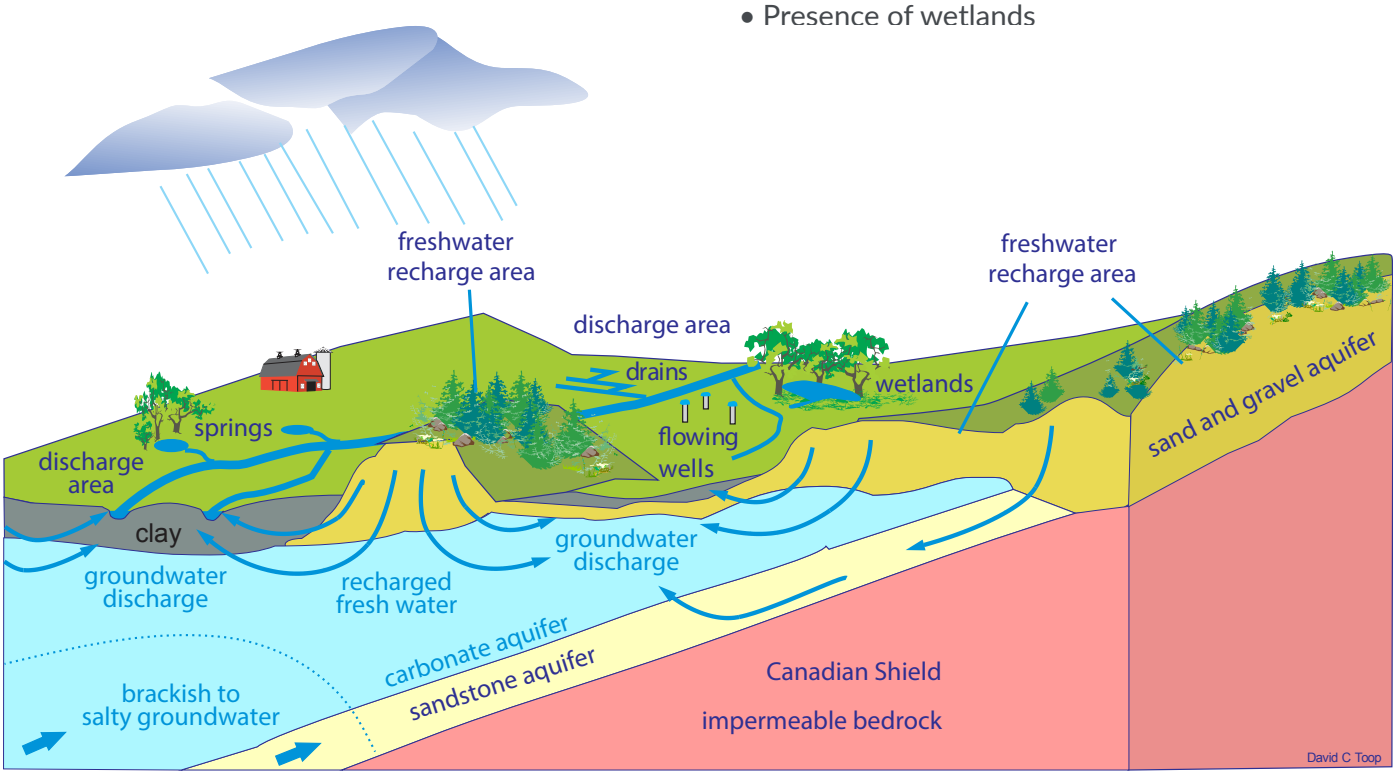


Figure 3 – Groundwater recharge and discharge model for the Cooks - Devils Creek Watershed

SURFACE WATER QUALITY

Two provincial long-term water quality monitoring sites are located along Cooks Creek in the watershed (Figure 4). Data from these sites have been used to calculate the Water Quality Index for Cooks Creek (Figure 5), which has been generally 'fair' to 'good' for the past 14 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 nutrients trends in the Cooks Creek.

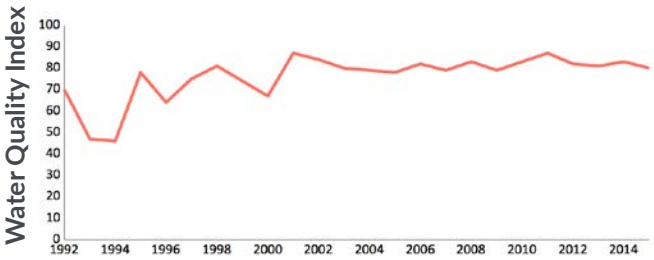


Figure 5 – Water Quality Index for the Cooks Creek

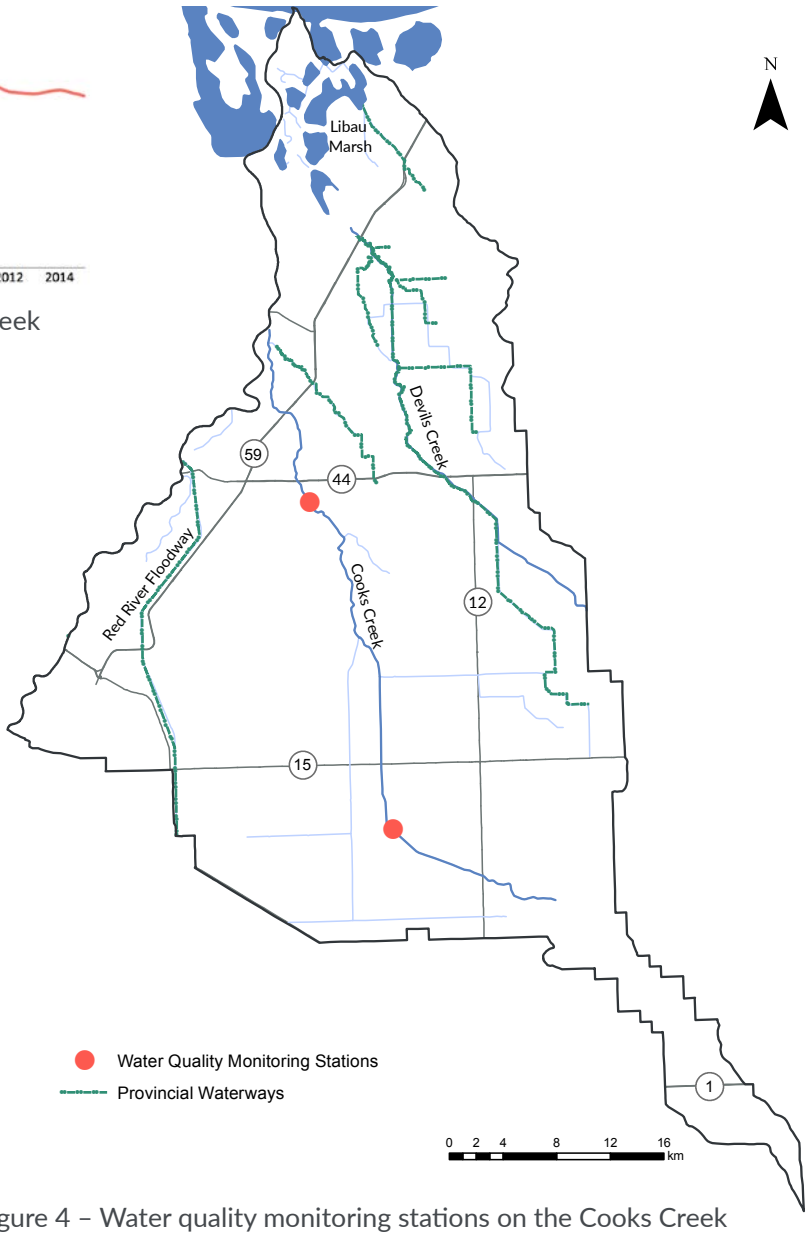


Figure 4 – Water quality monitoring stations on the Cooks Creek

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

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. A management plan was prepared under The Provincial Parks Act to establish long-term management directives, including no-net loss of natural habitat and protecting species unique and representative to the aspen and oak parklands.

The park and surrounding Birds Hill 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;r ough agalins *(Agalinis aspera)* and western silver and silky aster *(Symphyotrichum 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 km^2 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 provide 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 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 hydro 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 altered 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 reside in 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, resulting in negative economic, social, environmental and 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 aircraft and off-road vehicles often spread AIS to new areas they likely would not invade otherwise. 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 it is now the law in Manitoba to clean, drain, dry and dispose. These measures pertain to all water-based conveyances and water-related equipment. Prior to entering or leaving any water body in Manitoba, all water users are required to follow the steps outlined below to prevent the spread of AIS:

1. **Ensure conveyances and water-related equipment are inspected, cleaned and free of AIS, aquatic plants, mud and standing water**
   Water must be disposed on land so it does not drain into a water body
2. **Ensure all drains or plugs are left open during transport**
3. **Drain all water from:**
   a. live wells, bilges, and other compartments that hold water
   b. motors
   c. ballast tanks
4. **Ensure water is drained on land, away from any water body**
5. **Decontaminate in accordance to Schedule B of The Water Protection Act**

Pipe 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. Enhance 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 have a role in ensuring implementation of these actions are met 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

Surface water is typically managed in Manitoba 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 protection measures. In this section of the plan, actions have been carefully identified in recognizing challenges to balance the need for drainage to support agricultural, industrial and residential practices, 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 • Manitoba Infrastructure • Manitoba Sustainable Development - Birds Hill Provincial Park	440 km
Municipalities All or parts of: • East St. Paul • Brokenhead • Springfield • Ste. Anne • St. Clements • Tache	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 the Province of Manitoba.

Surface Water Management Issues

In recent years, the largest challenge has been excessive rain within 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.

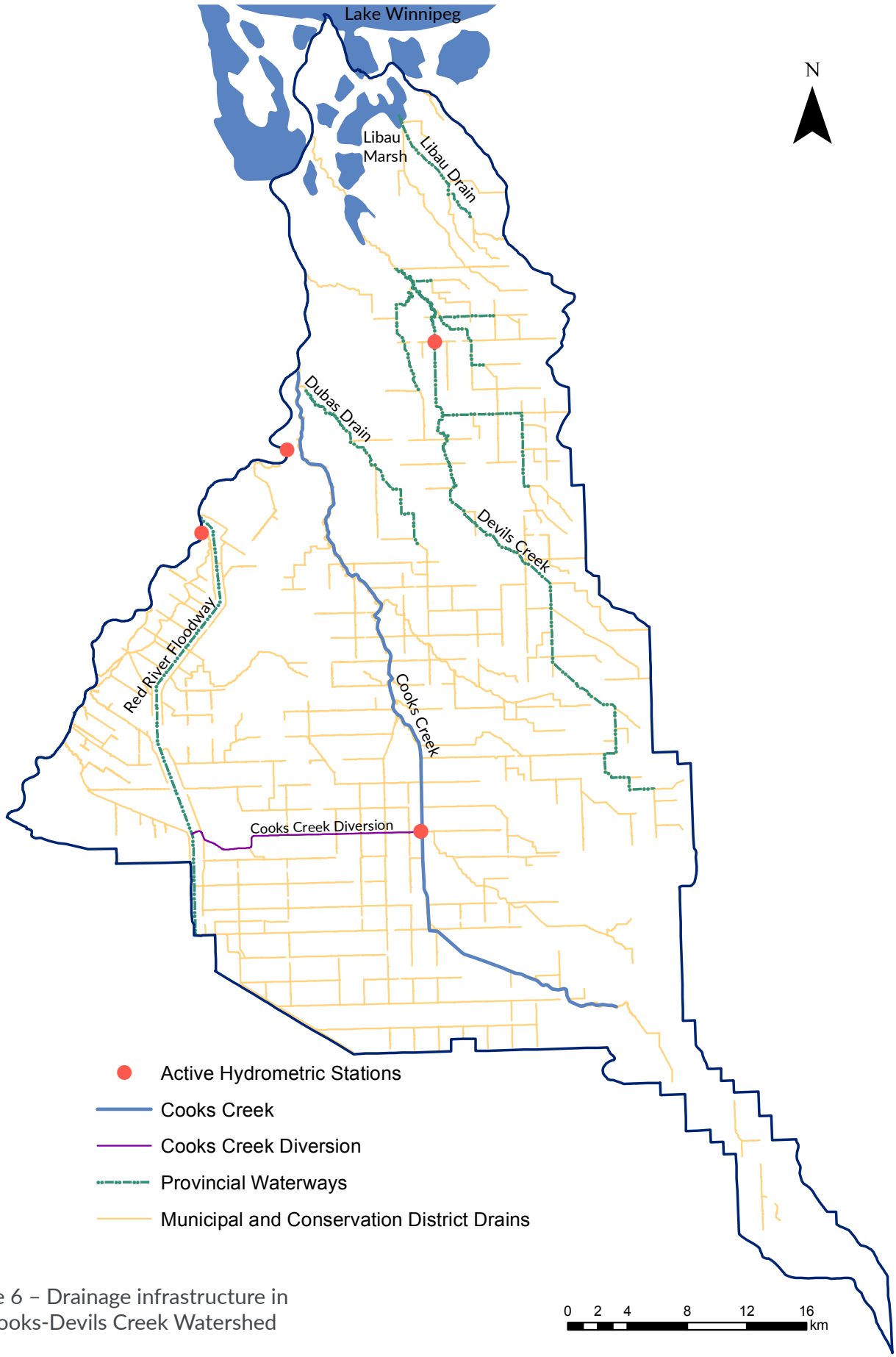


Figure 6 – Drainage infrastructure in the Cooks-Devils Creek Watershed

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 for infrastructure activities.
	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, Manitoba Infrastructure, Manitoba Sustainable Development - Watershed Planning and Programs	Discuss drain and crossing ownership, funding concerns, and maintenance requirements.
	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	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, 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	Municipalities, Manitoba Infrastructure, Cooks Creek Conservation District	Coordinate drainage with downstream managers to reduce flooding occurrences.
	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 – Water Control and Licensing	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 fall in line with recommendations of the surface water management plan.	Cooks Creek Conservation District	Cooks Creek Conservation District, Manitoba Sustainable Development – Water Control and Licensing	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 – Water Control Licensing.	Enhance 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	Establish tile drainage projects that reduce peak flows in runoff to Cooks Creek Conservation District drains.
Fisheries management objectives	1.11. Apply beneficial management practices to accommodates appropriate fish passage.	Along waterways	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure	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	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, Manitoba Sustainable Development	Add required drop structures to 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 drain sections on a rotational basis.
Best management practices for drain management	1.15. Encourage practices that strengthen and stabilize streambanks.	Watershed wide	Cooks Creek Conservation District	Implement practices such as re-vegetation of riparian areas and buffer establishment to reduce erosion.
	1.16. Support pilot project programming and feasibility review of a cattail harvesting program.	Watershed wide	Municipalities, International Institute for Sustainable Development	Reduce nutrient loading 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 works on the provincial waterway, beginning at the downstream end.
Mile 53	1-5 years	Tache, 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	Springfield, Cooks Creek Conservation District	Upgrade the crossings.
Donaldson Drain	3-5 years, studies have been completed	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	5-10 years, studies have been completed	Springfield	Improve drainage west by connecting to Cook's Creek.

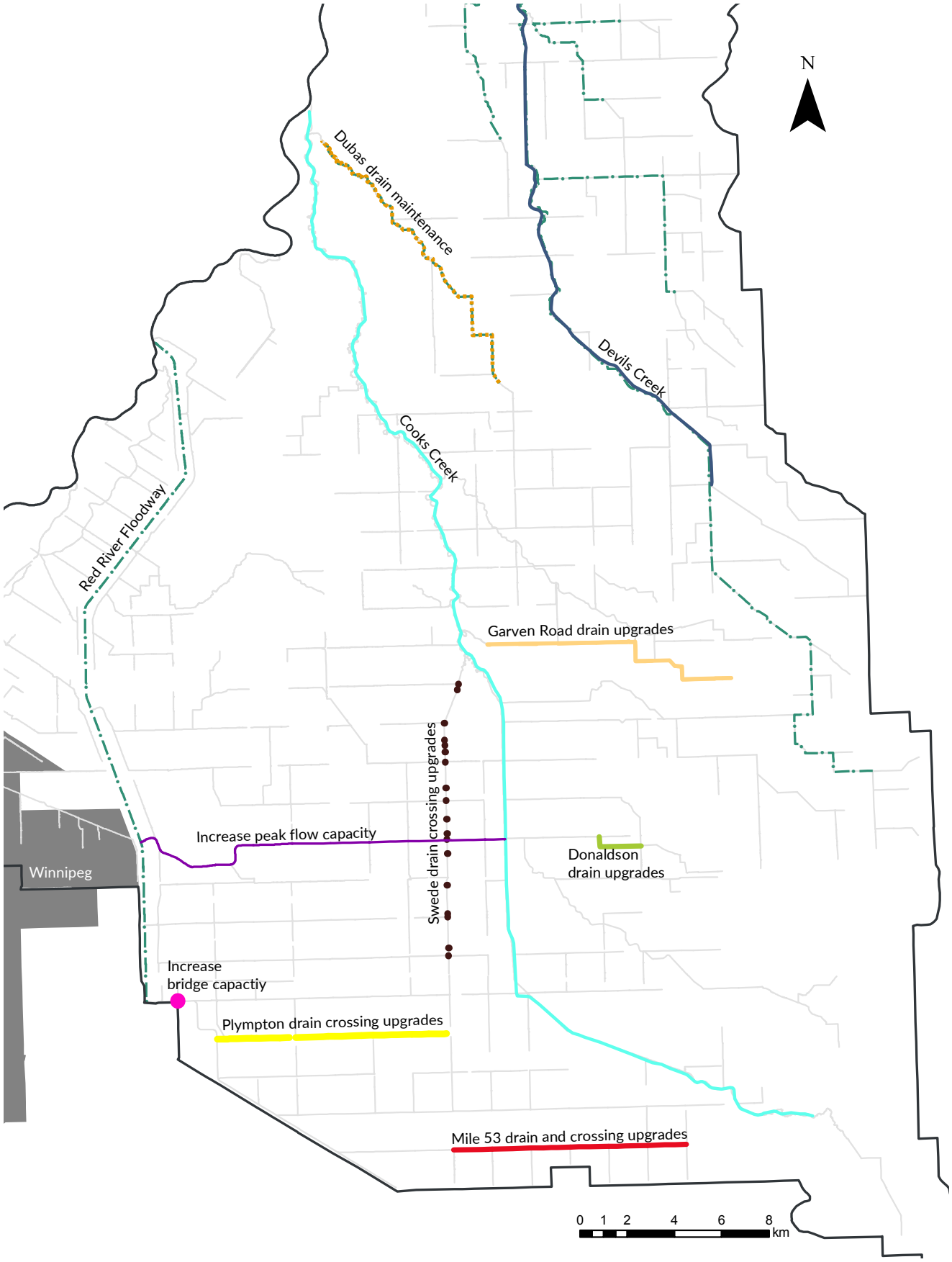


Figure 7 – Site-specific drainage recommendations in the Cooks-Devils Creek Watershed

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 will be more efficient at reducing peak flows during moderate than larger flooding events. In times of moderate spring melting or rainfall events, wetlands and water retention areas have more time to capture excess moisture, releasing water slowly afterwards. In times of intense and heavier rains these catchment areas fill up quickly, and the 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	1.16. Assess water retention requirements for 2050, based on climate change projections.	Watershed-wide	Manitoba Sustainable Development - Surface Water Management	Provide retention recommendations to reduce peak flows by 2% for 2050.
	1.17. Implement effective drainage management plans to store water for short term retention.	Watershed wide	Cooks Creek Conservation District, landowners, planning districts, municipalities, Manitoba Agriculture	Implement short-term retention opportunities that will not negatively impact agriculture.
	1.18. 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.
	1.19. Implement retention projects which reduce peak flows.	Watershed wide	Cooks Creek Conservation District, municipalities	Maintain peak flows at prairie level for a 1 in 100 year flood.
Wetland protection and restoration	1.20. Develop a work plan to identify target areas for conservation easements that protect wetlands.	Areas which are continuously wet and along creeks	Conservation agencies, landowners, Cooks Creek Conservation Districts, municipalities	Conserve ten of acres of wetlands by 2025.
	1.21. Implement a wetland restoration program.	Watershed wide	Cooks Creek Conservation District	Restore two previously drained wetlands to increase the number of wetlands in the watershed.
	1.22. Develop a moratorium on wetland loss.	Watershed wide	Manitoba Sustainable Development	Implement no net loss of wetlands.

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	1.2	99
	Queens Valley	Y		Y		Y	1050	851.2	1.7	612
	Oakwood Road	Y	Y				725	587.8	0.6	1150
	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	1200	972.9	3.8	339.5
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	2.4	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

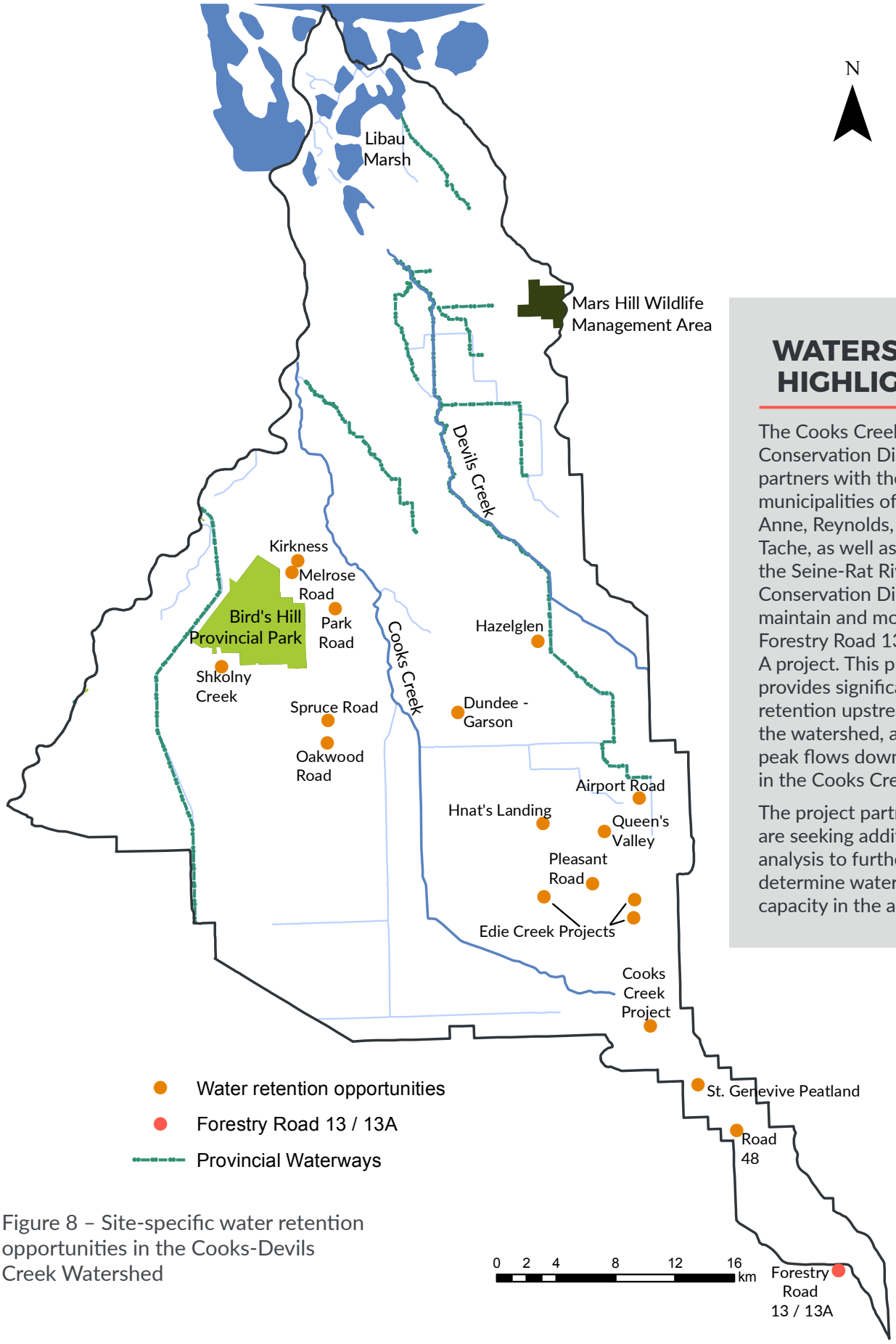


Figure 8 – Site-specific water retention opportunities in the Cooks-Devils Creek Watershed

WATERSHED HIGHLIGHTS

The Cooks Creek Conservation District partners with the municipalities of Ste. Anne, Reynolds, and Tache, as well as the Seine-Rat River Conservation District to maintain and monitor the Forestry Road 13 /13 A project. This project provides significant water retention upstream of the watershed, alleviating peak flows downstream in the Cooks Creek.

The project partners are seeking additional analysis to further determine water storage capacity in the area.

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 mining, 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.

Peat harvesting and 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.

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 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. Ensure private wells are regularly tested for bacterial water quality parameters.	Watershed wide	Private well owners, Manitoba Sustainable Development – Office of Drinking Water, Cooks Creek Conservation District, municipalities	Implement a regular drop off service, with transportation to an accredited lab for private well sampling.
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 leech water soluble contaminants in recharge areas.	Upland areas with sandy soils	Cooks Creek Conservation District, municipalities	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.

Actions to address Groundwater concerns				
Issue	**Action**	**Target Area**	**Lead Organizations**	**Measure of Success**
Aquifer recharge protectionn	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, Manitoba Agriculture	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	Protect 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	Cooks Creek Conservation District, residents	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. Mapping Source Water Protection Zones

The location of each public drinking water system is mapped, along with threats in a source water protection zone. Source water protection zones are a 1.5 km buffer around a groundwater well Source water protection zones are a 1.5 km buffer around a groundwater well.

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 for each public drinking water system.

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 field 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.

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 a potable supply of drinking water with 15 or more connections. It is also important to note that there are 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.

Site-specific Recommendations for Public Drinking Water Systems	
Public System	**Site-Specific Recommendations**
Birds Hill Provincial Park (Province of Manitoba) ‣ 7 wells	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 wells 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)	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)	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	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)	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	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)	1. Monitor the integrity of on-site 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)	1. Monitor the integrity of on-site 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)	1. Monitor the integrity of on-site 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.

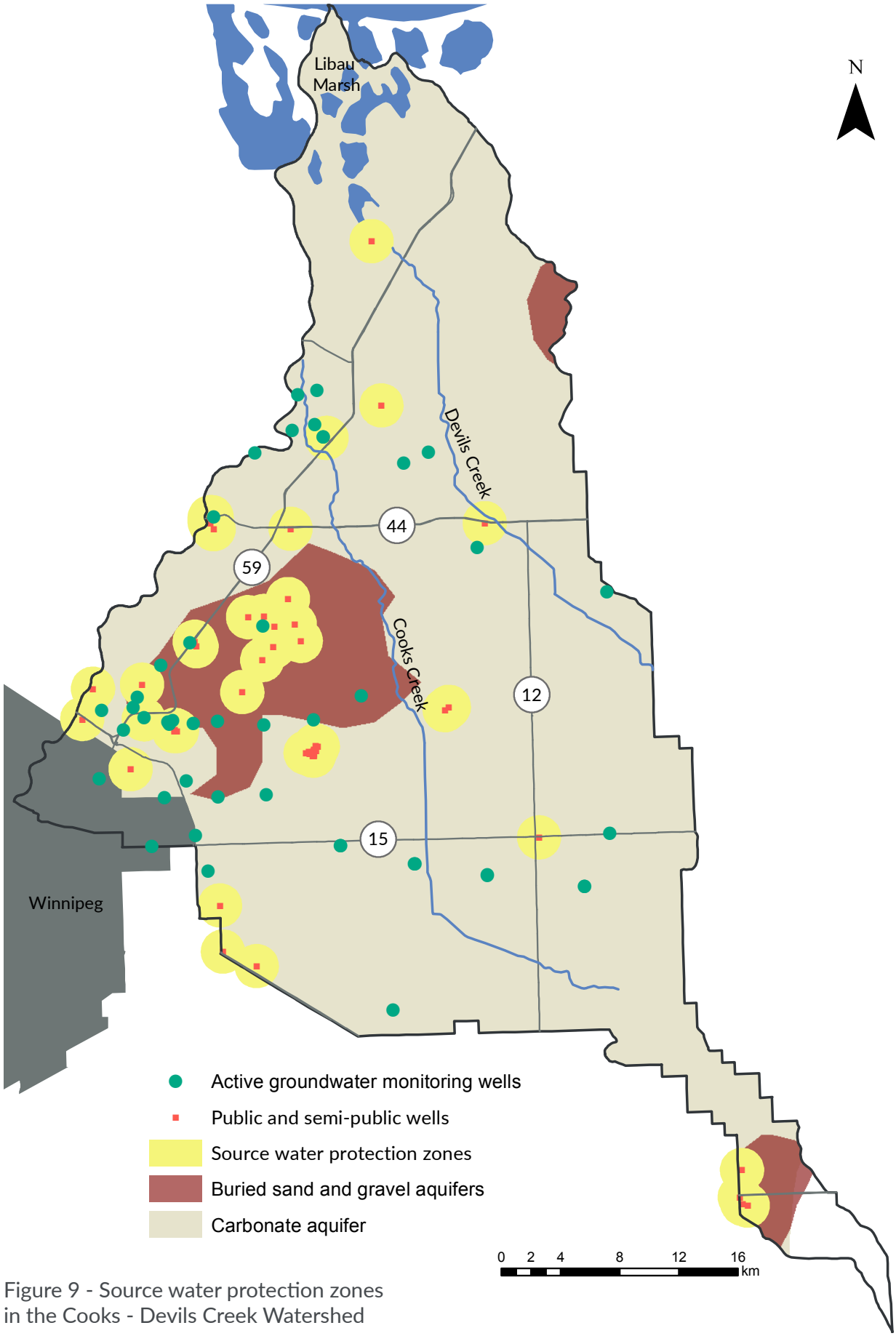


Figure 9 - Source water protection zones in the Cooks - Devils Creek Watershed

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 a diversity of landscape practices, including agriculture, parks, traditional use, residential development, and industry 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. 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 Mining

Peat harvesting activities have a significant impact on the peat bog ecosystem. Once 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 increased carbon emissions, as the top layer of soil and vegetation is removed. Measures should be taken to protect sensitive peat bog ecosystems and restore key peatland ecosystem functions. Peat harvesting activities have been focused in the southern, upland reaches of the watershed to date.

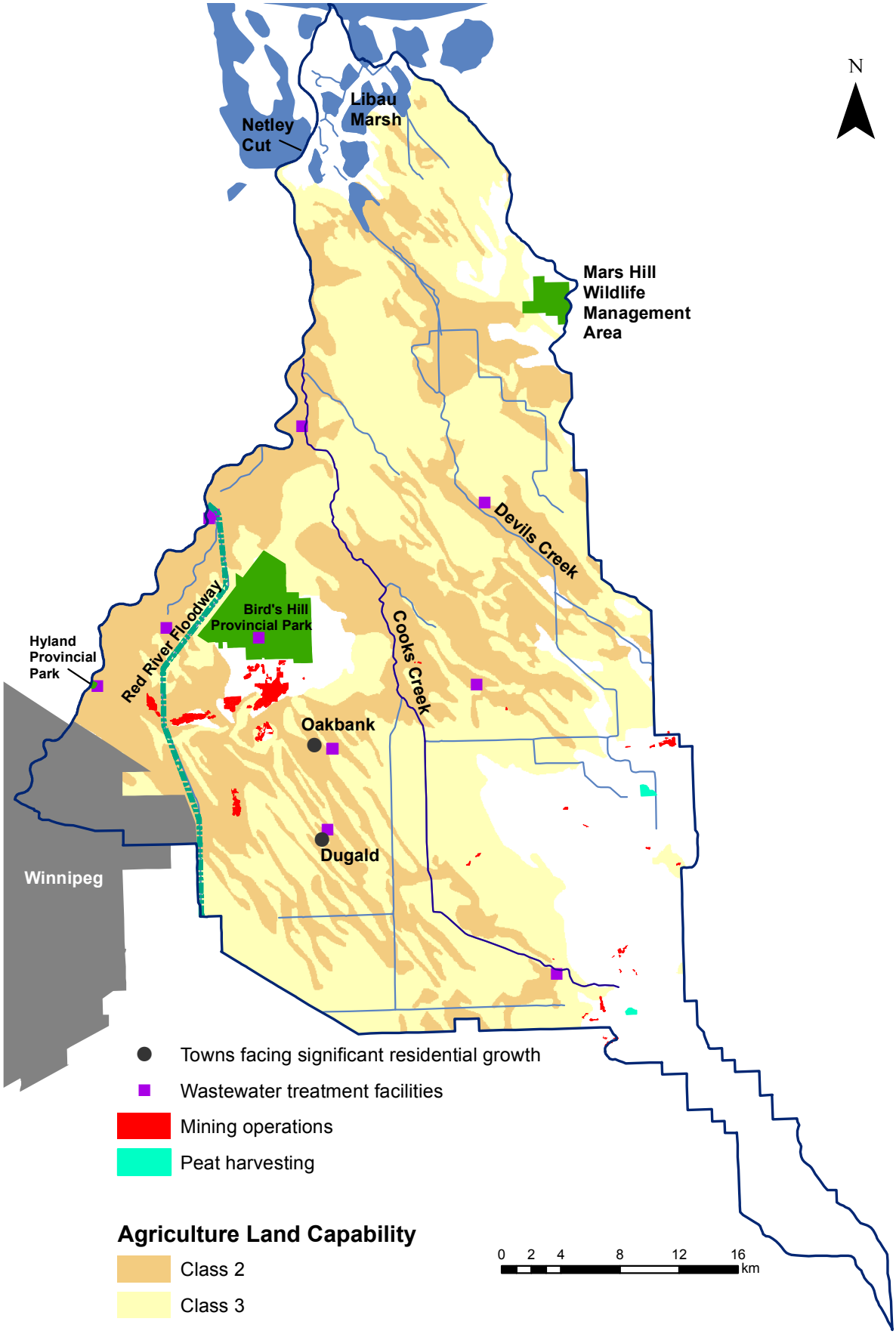


Figure 10 – Natural area and development considerations in the Cooks-Devils Creek Watershed

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 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. Regulate land use changes so they do not negatively impact agricultural areas.	Watershed wide	Municipalities, Cooks Creek Conservation District, Municipal Relations - Community and Regional Planning, residents	Establish a commenting system for the Cooks Creek Conservation District and the public to comment on and suggest changes for new sub-division developments that may impact productive agricultural lands.
	3.4. Restore and protect vegetated buffers along drainage ditches and natural waterways	Along waterways	Cooks Creek Conservation District, municipalities, Manitoba Infrastructure, landowners	Reduce erosion along the banks of waterways and improve water quality.
Industry and development considerations	3.5. Recommend that appropriate consultations occur prior to peat harvesting activities.	Watershed wide	Manitoba Sustainable Development, 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.
	3.6. Develop an action list to improve peat harvesting operation and reclamation activities.	Watershed wide	Manitoba Sustainable Development, 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.

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, Cooks Creek Conservation District	Utilize LiDAR to identify low-lying areas prone to regular flooding and restrict development or require adequate flood protection is incorporated.
	3.8. Include the Cooks Creek Conservation District in commenting for conditional use mining license applications.	Watershed wide	Manitoba Sustainable Development, Cooks Creek Conservation District, Manitoba Growth Enterprise and Trade - Mineral Resources	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, Manitoba Growth Enterprise and Trade - Mineral Resources	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	Limit development in sensitive groundwater recharge areas.

Actions to address Natural Area Protection and Land Development concerns				
Issue	**Action**	**Target Area**	**Lead Organizations**	**Measure of Success**
Indigenous community concerns	3.12. 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.
	3.13. 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.
Natural habitat protection and wildlife considerations	3.14. Recommend that milkweed be protected from spraying outside of agricultural areas.	Watershed wide	Springfield – Tache Weed District	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 easements.
	3.16. Maintain a natural riparian buffer along waterways.	Cooks and Devils Creeks	Cooks Creek Conservation District, municipalities	Slow erosion to mitigate nitrogen and phosphorus from entering waterways.
	3.17. Compile fisheries management objectives for the watershed.	Watershed wide	Manitoba Sustainable Development - Fisheries Branch, Cooks Creek Conservation District	Integrated 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.	Parks, community areas, private land	Landowners, Cooks Creek Conservation District, municipalities	Plant 5,000 native trees by 2023.
	3.20. Support an educational anti-littering campaign.	Watershed wide	Residents, municipalities	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 creates a clearer channel for water flow and ice movement, reducing flooding pressures locally. Dredged siltation 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.

Development planning authorities

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

PLANNING AUTHORITIES	DEVELOPMENT PLANS IN THE WATERSHED:
MUNICIPAL: • Red River Planning District (East St. Paul and St. Clements) • Brokenhead • Springfield • Ste. Anne • Tache • Reynolds	• 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 Tache 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: • Peguis First Nation	
PROVINCIAL: • Sustainable Development-Crown Lands • Municipal Relations - Community and Regional Planning	

Watershed wide considerations

The following recommendations should be considered by development planning 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 to a minimum of one metre above the 200 year flood event level.

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, grey-water 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. Recommendation that the Province of Manitoba 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, such as gravel extraction and peat harvesting 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 waste water 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 quality supply.

9. To prevent significant surface water quality and drinking water quality deterioration, developments in or near surface waters and riparian areas will be restricted, or limited, 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 not do 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.

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 board commenting.

Cooks Creek Conservation District commenting guidelines for development in the watershed	
Development type	**Commenting considerations**
Drainage	The Cooks Creek Conservation District will comment on all drainage applications that may: • Result in increased drainage requirements downstream • Result in increased flows within drains managed by the Cooks Creek Conservation District The Cooks Creek Conservation District may recommend retention opportunities to offset drainage works
Industry	The Cooks Creek Conservation District will comment on all industry applications that may: • Result in groundwater contamination risks • Result in negative impacts to natural areas and wetlands The Cooks Creek Conservation District may recommend development restrictions within groundwater recharge areas
Residential development	The Cooks Creek Conservation District will comment on all development applications that may: • Result in negative impacts to natural areas and wetlands • Result in groundwater contamination risks The Cooks Creek Conservation District may recommend natural habitat offset opportunities, including no-net loss of wetlands

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, specially in areas in close proximity 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 Tache:** 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 acres 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.

Recommendation 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 & 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

Water quality is notably an essential resource. Good water quality is required for healthy drinking water sources, 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 and lead to a healthier watershed overall. Healthy waterways, wetlands and riparian areas are crucial for sustainable water quality across the watershed.

Water Quality Issues

Threats to water quality include, but are not limited to, erosion, loss of wetlands, degraded riparian areas, unsustainable peat moss and 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	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 inputs in the watershed.	Cooks and Devils Creeks	Cooks Creek Conservation District, Manitoba Agriculture, landowners	Reduce erosion and nutrient runoff potential to align with the 10% nutrient reduction goal of the Lake Winnipeg Action Plan.
	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, landowners	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	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	Investigate options such as effluent irrigation, trickle discharge, constructed wetland treatment, or chemical treatment to reduce nutrient loading.
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. Establish a long-term water quality monitoring station on the Devils Creek by 2020.	Devils Creek	Manitoba Sustainable Development – Water Quality	Promote long-term water quality monitoring on the Devils Creek.
	4.8. Continue long term water quality monitoring on the Cooks Creek.	Cooks Creek	Manitoba Sustainable Development – Water Quality	Maintain long-term water quality data on the Cooks Creek.
Community awareness and engagement	4.9. Provide education on responsible use of phosphorus-based fertilizers in urban areas.	Private residences	Manitoba Sustainable Development, Watershed residents	Reduce or eliminate the use of phosphorus-based fertilizers on lawns, gardens and at cottages.
	4.10. Establish urban rain gardens and urban wetlands to slow storm water runoff.	Urban areas	Municipalities, Cooks Creek Conservation District	Reduce nutrients from entering 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 agricultural and 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 Conservation District if you would like more information on watershed planning in the Cooks-Devils Creek Watershed

66 156 Pineridge Road,
Box 11, Grp, 561 RR #5
Winnipeg MB R2C 2Z2
(204) 777-2223
cookscreekcd.com