SUMMARY REPORT

Water Quality Improvements Through Riparian Health and Grazing Management Changes

Lake Winnipeg Basin Project (LWBP) 2024-2026

COWS & FISH
RIPARIAN MANAGEMENT SOCIETY

Report No. 060

Project Summary

This summary describes two years of work to improve riparian health, primarily at sites in the Rosebud River watershed in Alberta as part of the larger Lake Winnipeg Basin watershed. The aim of the Lake Winnipeg Basin Project (LWBP) was to improve riparian health, through management changes, as well as improved understanding and stewardship of riparian areas. Collaborating with individual landowners and partners to identify riparian health concerns, develop riparian management changes to address issues, and implement changes were key components of this project. In addition, to support overall learning and increase riparian understanding at the community level, we also delivered education and outreach activities.

The work was initiated by Cows and Fish using financial support from the Government of Canada through the Canada Water Agency's Lake Winnipeg Freshwater Ecosystem Initiative, along with funding from Alberta Beef Producers, Alberta Environment and Protected Areas, Alberta Forestry and Parks, and Samuel Hanen Society for Resource Conservation, in addition to the contributions made by numerous local partnering organizations and by landowners. In particular, key local project partners include Wheatland County, Mountain View County, Legacy Land Trust Society, and individual landowners. In-kind support provided through Cows and Fish included Alberta Agriculture and Irrigation and Alberta Beef Producers. Landowners involved were critical to the success of the on the ground changes made and they contributed time, equipment, materials and cash to their projects.

Riparian Management Improvements

Working with Mountain View County, Wheatland County, Legacy Land Trust Society, ALUS County Vermilion River and others we identified possible site locations and landowners that were keen to implement management improvements. We then narrowed the selection to those projects that met the requirements of the funding. As we had anticipated, this then led to a smaller subset of the initial landowners completing riparian projects with support from Lake Winnipeg focused funding. Those landowners that we were able to complete projects with had a) suitable projects that fit the requirements of the funding (i.e. water quality improvement that would provide cumulative benefits downstream, in the Lake Winnipeg basin); b) the interest and ability to take on the projects in the timeframe available; and c) sufficient resources to at least match the funds we could provide, which were very modest.

LON1. Riparian Health Inventory was completed at four stream sites in the Rosebud River watershed as part of this project including Lone Pine Creek, pictured here. *(Photo: RHIP01LON006)*

CRO39. A diversity of shrubs line the streambank, providing deep binding roots to protect against erosion at this Crowfoot Creek site included as one of the Riparian Health Inventory sites. *(Photo: RHIP36CRO012)*

After consideration of eight potential landowners with project sites, we worked with five landowners or managers to implement riparian restoration management changes that would ultimately impact riparian sites along four stream systems, namely Rosebud River, Serviceberry Creek, Lone Pine Creek, Ten Mile Creek, Carstairs Creek, and Crowfoot Creek. Four of these riparian sites involved agricultural management change projects with private landowners and they received a riparian health inventory to set a baseline from which to monitor riparian health into the future. The fifth agricultural land project site, on Carstairs Creek, was selected in the fall of 2025 and as such baseline monitoring of riparian health could not be completed due to winter conditions. In addition to agricultural management changes, we assisted with the implementation of two restoration planting sites: one along Serviceberry Creek and one adjacent to Rosebud River, where approximately 1700 rooted trees and shrubs and 1100 live stakes were planted.

Riparian Health Inventory is a tool designed to help individuals and community groups evaluate and understand the health of riparian areas within their landholdings and watersheds. This information is intended to document the current state of riparian health and help direct management changes to promote important riparian functions, such as improved water quality, forage production, and fish habitat. In this project, we focused on identifying and supporting changes that would benefit water quality, including erosion and therefore phosphorus reduction, at the site level, and which will ultimately benefit all areas downstream, including Lake Winnipeg. To assess a trend in riparian health, we recommend that riparian health evaluations be repeated every three to five years to track progress and riparian recovery in response to a management change. Given the timeframe of the funding, revisiting sites within the grant period was not possible, since projects were completed in the last two years of the three years of funding, but if future funding is available, revisiting the sites to monitor trends and identify the impacts of the changes, would be valuable. The riparian health inventories done at the beginning of or prior to riparian management changes serve as a baseline to monitor results of making those changes.

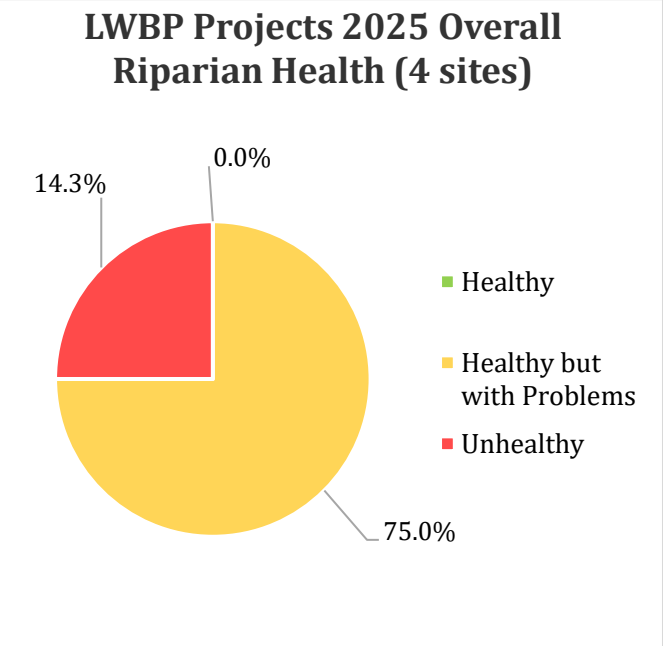

Figure 1 Riparian Health Inventory Score Results for 4 LWBP Project Sites (2025)

The following is a summary of the information from the baseline riparian health of four sites (CRO35, CRO39, LON1, TEI1) included in the project based on data collected in 2025. Information obtained from the Riparian Health Inventory of these sites helped inform and facilitate management planning and encouraged private landowners to understand and improve management of riparian areas under their care.

Overall, of the 4 sites, no sites rated *healthy* (0%), three sites (75%) were *healthy but with problems*, and one site (25%) was *unhealthy* as shown in Figure 1 and Table 1.

The riparian sites examined included four perennial stream sites on private landholdings and encompass 5.2 hectares of riparian habitat and 3.6 kilometers of streambank. The riparian sites were assessed using the *Alberta Lotic Inventory Form*. The *Inventory Form* utilizes a computer-generated derived riparian health assessment score based on field observations. Table 1 lists the health parameters evaluated and how they rate for the four sites.

All the sites are well vegetated with a diversity of riparian plants that help stabilize streambanks and provide cover and forage for livestock and wildlife. Preferred trees and shrubs are present on most stream

sites which help to maintain bank stability and prevent erosion. Human or livestock-caused bare soil is present in limited amounts on all sites, which is positive, but there is still room for improvement in this aspect of riparian health.

Common riparian health concerns on most sites include:

- invasive plants – have limited deep roots to stabilize soil and banks, minimal forage value and decrease the ecological integrity of the landscape;
- disturbance species – have limited deep binding roots to provide bank stability;
- lack of streambank rootmass protection – can increase bank instability and slumping;
- physical alterations, like livestock trailing and soil compaction – can reduce water infiltration and lead to increased erosion; and
- stream channel incisement – can reduce connection to the floodplain due to vertical downcutting, increase erosion, and change site vegetation potential.

Overall, vegetation cover is high and woody plant communities are regenerating, with both tree and shrub species present which is important for overall riparian health. Most of the stream sites had few or no excess standing dead and decadent woody plants. This is evaluated because it can be a signal of declining health resulting from change in water volume or timing changes or long-term grazing impacts.

Table 1. Riparian Health Parameters Evaluated Within the LWBP Project (4 sites)

Riparian Health Parameter	Overall Riparian Health (%)	Overall Riparian Health Description
VEGETATIVE		
1. Vegetative Cover of Riparian Area	100%	*Healthy*
2a. Invasive Plant Species - Cover	25%	*Unhealthy*
2b. Invasive Plant Species - Density / Distribution	0%	*Unhealthy*
3. Disturbance-Caused Undesirable Herbaceous Species	0%	*Unhealthy*
4. Preferred Tree/Shrub Establishment & Regeneration	92%	*Healthy*
5a. Utilization of Preferred Trees and Shrubs	67%	*Healthy but with problems*
5b. Live Woody Vegetation Removal Non-Browse	100%	*Healthy*
6. Standing Dead and Decadent Woody Material	100%	*Healthy*
VEGETATIVE AVERAGE SCORE	**68%**	***Healthy but with problems***
SOIL/HYDROLOGY		
7. Human-caused Bare Ground	100%	*Healthy*
8. Streambank Root Mass Protection	58%	*Unhealthy*
9. Streambank Structurally Altered by Human Activity	33%	*Unhealthy*
10. Human Physical Alteration to the Rest of Site-Beyond Bank	75%	*Healthy but with problems*
11. Stream Channel Incisement (vertical stability)	58%	*Unhealthy*
SOIL/HYDROLOGY AVERAGE SCORE	**63%**	***Healthy but with problems***
OVERALL AVERAGE SCORE	**65%**	***Healthy but with problems***

	Healthy (80-90%) – Little or no impairment to riparian functions.
	Healthy but with problems (60-79%) – Some impairment to riparian functions due to human or natural causes.
	Unhealthy (<60%) – Impairment to many riparian functions due to human or natural causes.

Riparian management changes on the five agricultural land sites included as part of the LWBP project involved a diversity of projects: the addition of alternative watering systems for livestock, elevated stream crossings for livestock, and riparian area exclusion fencing. The implementation of alternative livestock watering systems will improve livestock distribution away from the sensitive streambanks, provide a consistent source of clean water away from surface water, and lessen livestock-caused bare ground, trailing and trampling especially at old watering access points along streams. Riparian area exclusion fencing will restrict livestock from accessing sensitive riparian zones and provide riparian areas with rest and recovery from livestock use. Elevated (bridge) crossings provide stream crossing locations for livestock without the need to access the streambanks and channel resulting in improved riparian health and decreased physical alterations to riparian areas. Cows and Fish provided, and will continue to do so in the future, expertise and management strategies to the project participants regarding grazing management on both upland and riparian areas.

CRO35. A new elevated bridge to cross the stream is in place at this Crowfoot Creek site. In addition, an alternative solar powered livestock watering system provides a water source for livestock away from the streambanks. *(Photo: RHIP35CRO007)*

DEMOGRAZ100. Example of bank alterations (pugs and hummocks) due to livestock impacts that changes in cattle management (e.g. fencing) can help alleviate *(Photo: DEMO100GRAZ0006)*

Table 2. Riparian Management Improvements for LWBP sites (2024-2026)

	Riparian Management Improvement Implemented				
Site Number	**Alternative Livestock Watering System**	**Elevated Livestock Stream Crossing**	**Riparian Area Exclusion Fencing**	**Trees & Shrubs Planted**	**Riparian Health Inventory**
CRO35 & CRO39	✓	✓	✓	-	✓
TEI1 & LON1	✓	-	-	-	✓
DEMOGRAZ100	Planned for summer 2026	-	✓	-	
DEMOREST076	-	-	-	✓	
DEMOREST077	-	-	-	✓	

✓ - riparian management improvement supported by LWBP grant and others

✓ - riparian management improvement NOT funded by LWBP grant but is part of the overall riparian management project funded by the private landowner and partnering organizations.

Individual Site Management Improvement Summary

TEI1 and LON1 – Ten Mile and Lone Pine Creeks

The goal of this project is to provide a secure and stable source of water for livestock away from Ten Mile Creek (TEI1 site), to improve livestock distribution away from sensitive streambanks, and change grazing management timing to avoid the early spring season when soils are saturated. In 2025, a portable solar powered pumping system was purchased to pump from an existing well (drilled in 2024) to a trough to provide a water source for livestock. Previously, cattle had watered at Ten Mile Creek. This pasture is fenced separately from the adjacent cropland and is a riparian pasture that is grazed in rotation with other nearby pasture units in the summer with approximately 65-75 cows. The solar powered watering system from the well will help to maintain water quality and support riparian health along 1,450 meters of Ten Mile Creek in this 30-hectare riparian pasture. The solar watering system is portable and may also be used to pump water from Lone Pine Creek (LON1 site) as well. A minimum estimated length of stream and riparian area along Ten Mile Creek that is benefitting is 1,450 m of channel and 5 m width, for a minimum of 7,250 m^2. An additional area is likely to benefit along Lone Pine Creek.

In 2025, Cows and Fish completed a baseline riparian health inventory at TEI1 on Ten Mile Creek and at LON1on Lone Pine Creek and provided site specific reporting and discussion on continued beneficial management of these riparian areas. The project was completed in partnership with the landowner, Mountain View County, and Cows and Fish.

CRO35 and CRO39 – Crowfoot Creek

This project included an elevated bridge crossing built in 2024 to allow livestock to access upland pasture on both sides of the creek without requiring direct access to surface water. The livestock bridge crossing, directly benefitting 25 m of channel and 125 m^2, was the final element of a much larger riparian management project that started in 2021 when approximately 3,500 meters of new riparian pasture fence encompassing Crowfoot Creek was installed to restrict livestock from accessing approximately 11.5 hectares of riparian habitat along the creek. In addition, a solar off-site watering system was purchased to pull water from Crowfoot Creek for livestock use and restrict livestock from accessing the stream for water at crossing locations. Both improvements completed in 2021 were funded in part by Wheatland County. In 2024, a second solar off-site watering system was purchased by the landowner with funding from Wheatland County. The addition of the elevated bridge crossing for livestock enables better utilization of upland pastures due to increased rest and rotation and will allow livestock access and crossing points along the stream to recover.

Riparian health inventories were completed in 2025 at a site previously inventoried by Cows and Fish in 2021 (CRO39) where we were able to capture photo monitoring data to demonstrate health trends. In addition, a baseline riparian health inventory was completed adjacent to the new elevated crossing location (CRO35). Individual site reports summarizing the riparian health inventories were completed to provide the landowner and project partners with a summary of riparian health and note any trends associated with our photo monitoring of the 2021 site. The project was completed in partnership with the landowner, Wheatland County, and Cows and Fish.

CRO39_2021. A livestock trail present along the banks of Crowfoot Creek resulting in bare soil and compaction. Photo taken in 2021 during a riparian health inventory after the addition of alternative livestock watering and some partial exclusion fencing. This demonstrates the long-term commitment of this landowner to make continued changes to riparian management and monitor success. *(Photo: RHIP34CRO015)*

CRO39_2025. Since the 2021 photo was captured (image to the left), the livestock trail has revegetated. In addition to earlier management changes at this site, including livestock exclusion fencing and alternative watering options, a new elevated bridge crossing is in place to allow access for livestock to pastures on both sides of the creek and prevent stream channel and bank impacts. *(Photo: RHIP39CRO017)*

DEMOGRAZ100 – Carstairs Creek

This project involved the planning and purchase of materials to construct approximately 2,150 meters of riparian exclusion fence along Carstairs Creek to exclude 25 cow/calf pairs from grazing within the riparian area. Approximately 1.4 km of stream length along Carstairs Creek will be protected and 6.3 hectares of riparian habitat. Materials have been purchased for a 4-strand high tensile electric fencing at wildlife friendly heights to encompass Carstairs Creek to be installed prior to grazing starting. The site currently has a perpetual conservation easement on the uplands and riparian habitat with Legacy Land Trust Society on approximately 45 hectares of pastureland. Some tree planting in the riparian area has occurred in the past. Historically, the site has been summer grazed with livestock watering from the creek.

As a second phase of the project, not funded by LWBP, a solar alternative watering system will be purchased in the spring of 2026 to pull water from Carstairs Creek for livestock use, preventing the need for direct livestock access to the stream for water. Additional cross fencing will be installed in the uplands to create a multi-pasture livestock grazing rotation to improve utilization of upland forage and distribution of livestock throughout the pastures. Water will be pumped from the central livestock watering location to upland pastures fenced separately for the planned rotation.

Due to the late fall timing of the project design and implementation a baseline riparian health inventory was not completed, but pending funding is planned for 2026 to allow for future monitoring. The project was completed in partnership with the landowner, Mountain View County, Legacy Land Trust Society, and Cows and Fish.

DEMOREST076 – Rosebud River

This restoration project was initiated and led by Wheatland County with labor and support provide by volunteers and Cows and Fish staff. The Hamlet of Rosebud (pop. ~115) is an arts hub within Wheatland County and receives around 40,000 visitors throughout the year. An unused parcel of land, adjacent to the

Rosebud River, and formerly the site of the septic field for the hamlet had been reclaimed to perennial grass and hayed for a number of years. Based on historic mapping, the parcel of land has alluvial connections to the Rosebud River, which also once flowed through the site before the river channel was relocated for the railway. Remaining on site are many water-filled ox-bow wetlands. The objective of this tree and shrub planting project is to establish a diverse eco-buffer on 7 acres of County owned land over a 2-3 year time period. The established project will contribute to riparian health, increase biodiversity, add structure and complexity to the riparian plant community, as well as creating a place for community members and tourists to recreate.

A tree and shrub planting event was held on October 23rd, 2024 with a total of 40 people in attendance, including students and teachers from the Rosebud School of the Arts, Cows and Fish staff, Wheatland County staff, Red Deer River Watershed Alliance staff" and other members of the community. In total, 1,294 native trees and shrubs were planted. An infiltration type wet well has been installed which will be used for irrigation purposes during the first few years of establishment. In addition, wood mulch has been added to the site which will increase moisture retention, soil organic matter and will help to suppress weeds during establishment.

DEMOREST077 – Serviceberry Creek

This restoration project was initiated and led by Wheatland County and the Red Deer River Watershed Alliance with support provided by Cows and Fish staff, volunteers and the landowners. The intent of this project is to establish native riparian tree and shrub species by planting and live willow staking to improve bank stabilization, increase deep binding rootmass along streambanks, and lessen erodibility of banks. Historically, trees and shrubs were more abundant in this watershed, however long-term livestock grazing and impacts to streamflow due to irrigation addition and extraction, have resulted in changes to the riparian plant communities along Serviceberry Creek.

A tree planting event was held on October 16, 2024, with 14 volunteers, including staff from Cows and Fish, and the farm family, to help plant 420 rooted plants and place 1,100 live willow stakes in the riparian area. In addition to volunteers, a contractor was hired by Wheatland County to increase planting efficiency.

In addition to this tree and shrub planting project, this family-owned farm located on Serviceberry Creek has taken many steps to protect the banks of their section of the creek. Over time, they fenced the entire length of the creek on both sides to limit livestock access, installed multiple off-site watering systems and have installed an elevated bridge crossing for livestock.

Extension and Outreach

As part of the LWBP project, extension events, including in-person presentations, field tours, and workshops were held to educate and improve management skills related to grazing and impacts on water quality. Between 2024-2026, we were able to interact with at least 151 people in five events (Table 3).

Table 3 Extension and Outreach Summary

Activity	Location	Date	Number of People
Presentation - Growing Opportunities	Lethbridge, AB	March 12, 2025	42
Presentation and Riparian Restoration Presentation and Planting Workshop	Mountain View County	May 3, 2025	13
Restoration Site Field Tour and Presentation – ALUS Western Hub Conference	Wheatland County	September 18, 2025	50
Restoration Site Field Tour and Discussion	Wheatland County	October 17, 2025	6
Presentation and Display – State of the Watershed Engagement Session	Vermilion, AB	January 30, 2026	40
Total Activities: 5			**Total number of people: 151**

DEMOREST074. Community members and volunteers attended a riparian restoration workshop which included an indoor learning opportunity followed by an outdoor live willow staking workshop. *(Photo: DEMO74REST004)*

COWS & FISH
RIPARIAN MANAGEMENT SOCIETY

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Participating Landowners

SINCE 1969 Alberta Beef Producers