Pembina River Watershed Shorelines Project

Terms of Reference

Riparian area assessment, restoration, conservation, education, and long-term stewardship initiative in the Pembina River Watershed.

www.awc-wpac.ca

With funding from the Government of Alberta's Watershed Restoration and Resiliency Program (WRRP), Transmountain Pipeline, and Midstream Pipeline.

PROJECT OVERVIEW

Building on data gaps identified in the Athabasca State of the Watershed (SOW) reports, the Athabasca Watershed Council is utilizing funding the Government of Alberta (GOA) Watershed Resiliency and Restoration Program (WRRP) to apply a Geographic Information System (GIS)-based method that will map the riparian areas in the Pembina River Watershed. The information gathered will be used to identify areas of high restoration and conservation priority that can guide current and future watershed planning and management efforts. The focus area of this project is in the Pembina River Watershed as it has been identified as a high priority area in the AWC SOW reports and the GOA's WRRP.

The Pembina River Watershed is large (14,324 km^2) and is a major tributary of the Athabasca River Watershed (Fiera, 2012). The headwaters of Pembina River are located in the Eastern Slopes of the Rocky Mountains. The river flows eastward near the communities of Entwistle, Sangudo, Barrhead, and Westlock before joining the Athabasca River near Flatbush, Alberta. The Pembina River Watershed has the most southern naturally occurring population of Artic grayling in Alberta (Blackburn & Johnson, 2004). Common land use in this region are forestry, agriculture, and oil and gas extraction (Fiera, 2012).

The Athabasca Watershed Council (AWC) recognizes the need for effective management of riparian areas for overall watershed health and the critical role riparian areas play in mitigating flooding and drought conditions. The Athabasca Watershed covers an extensive area of the province and so far, no watershed-scale approach has been taken to assess riparian health in this area.

Fiera Biological Consulting Ltd. (Fiera) has developed a method that can assess and map large areas of land in a cost-efficient way. Fiera successfully applied this riparian assessment to about 9000 kilometers in the North Saskatchewan, Battle, Lesser Slave, Red Deer River watersheds.

This riparian assessment by Fiera will permit the AWC to identify areas in need of restoration, protection, and conservation. This information will be presented to all partners working on riparian management, including counties, NGOs (Non-Government Organizations), and landowners, and

it will be available to the public through the AWC's webpage, the NSWA riparian portal, social media, and newsletters.

The AWC will build long term relationships with the participants and give recognition to the community as responsible stewards of the riparian areas on their lands.

PROJECT BACKGROUND

In the Athabasca State of the Watershed reports completed by the AWC (2011-2014), the Pembina Watershed showed a "High Pressure" rating when it came to cumulative watershed pressure, along with the Lower Athabasca sub-watershed (Figure 1.).

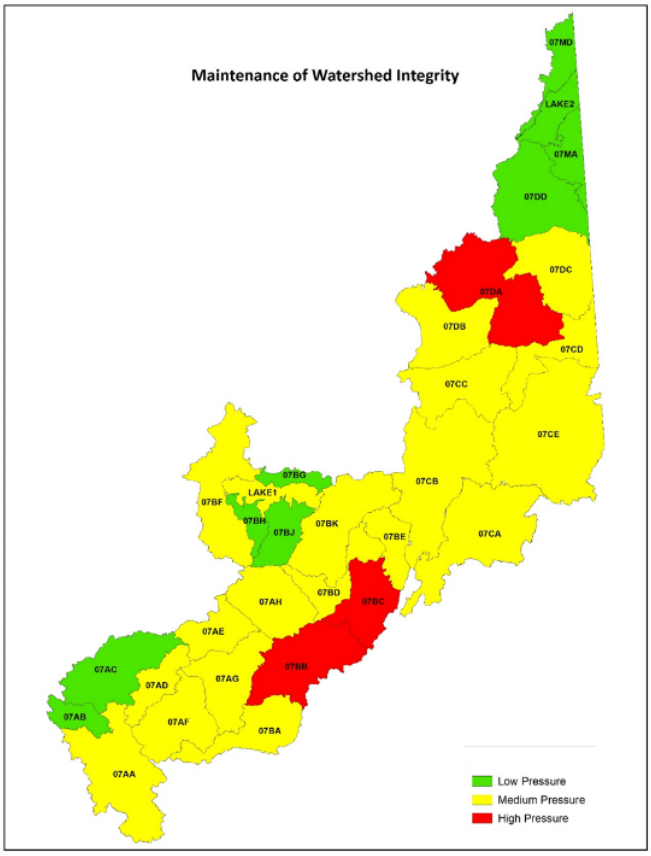

Figure 1. Cumulative watershed pressures shown in the Athabasca Watershed from the state of the Watershed Summary Report. https://awc-wpac.ca/wp-content/uploads/2018/03/AthabascaWatershed-SummaryReport_2018_Press.pdf

The high pressures caused by the human activities have resulted in the Pembina River Watershed being one of the highest impacted, relative to other sub-watersheds in the Athabasca Watershed.

Water levels can be high in June, July and sometimes August due to summer rainstorm events that occur in the upper portion of the Pembina River Watershed (Government of Alberta, 1996). These conditions could become worse with accelerated climate change. With extremely high flows,

flooding can occur that causes serious soil erosion, and from a landowner/producers' perspective, a loss of land.

To build on the information generated by the Athabasca Watershed Council, the WRRP priority areas maps (Figure 2) shows that the Pembina scores 4 on the drought priority map; 4 on the Flood priority map and 5 on the Water Quality.

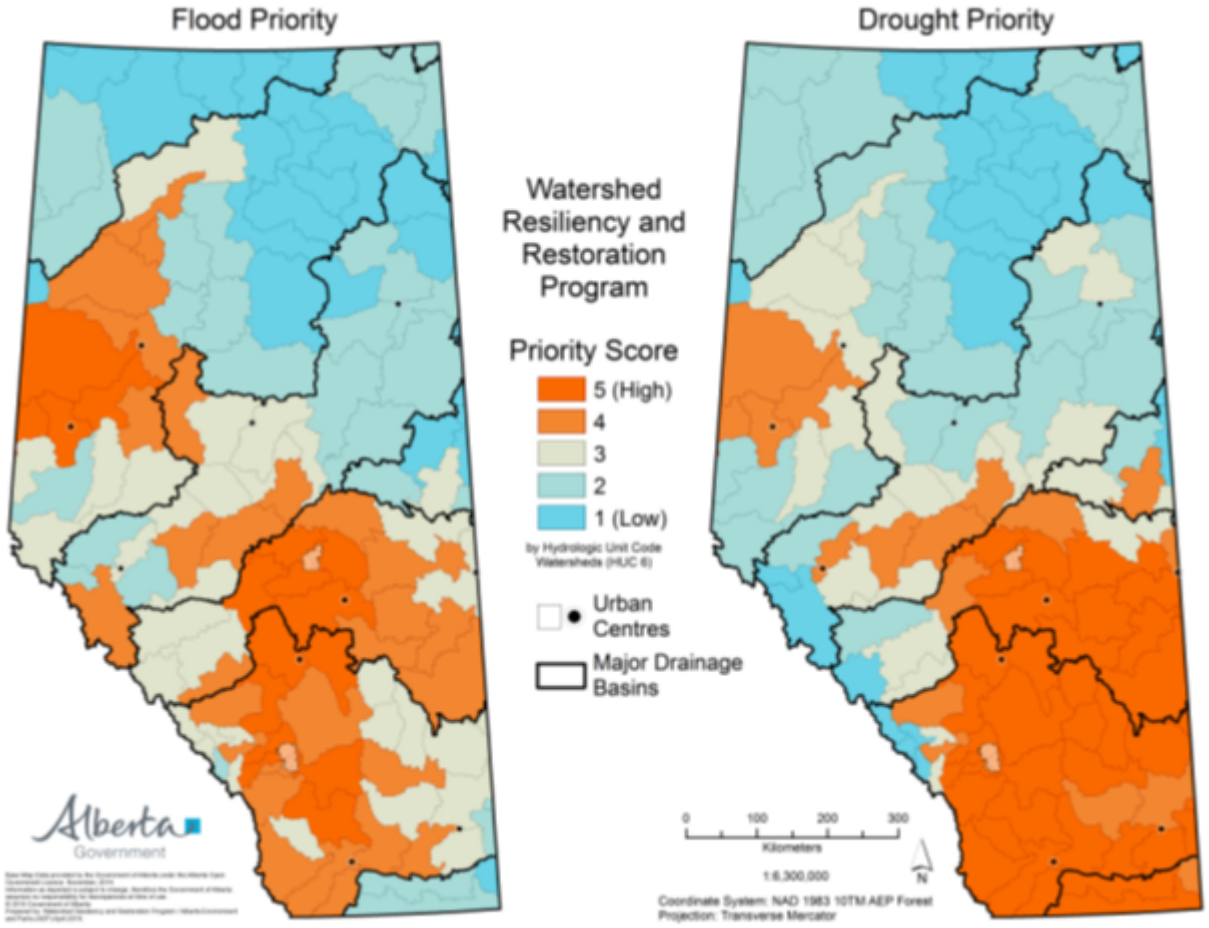

Figure 2. Flood and drought priority area maps for the Watershed Resiliency and Restoration Program (WRRP). https://open.alberta.ca/publications/watershed-resiliency-and-restoration-program-priority-areas-maps

The AWC is committed to using the WRRP funds to address data gaps identified in the SOW for the Pembina sub-watershed, one of the highest impacted, relatively to the other sub-watersheds in the Athabasca Watershed. The AWC can use the generated GIS layers, landowner/community outreach and referred restoration projects to improve riparian health and public awareness where it is most needed to obtain long-term resiliency to flood, drought and securing source drinking water supply for the coming generations.

PROJECT GOAL

To improve flood and drought resiliency, as well as aquatic ecosystem health in the Pembina River Watershed through riparian area assessment, education, restoration, and conservation.

PROJECT OBJECTIVES

- To apply a GIS-based method for mapping riparian intactness in the Pembina River watershed to identify areas of high restoration and conservation priority that can be used to guide current and future watershed planning and management efforts.

- To connect residents to existing programs for improving their riparian area and build community capacity to continue this work in the future.

- To initiate and assist with multiple restoration programs, working with on-the-ground partners, focusing on areas of high priority where restoration and conservation that would be of most benefit to mitigating floods and drought.

- To create complementary outcomes through restoration, including improving fish/wildlife habitat, water quality, and community outreach opportunities.

PROJECT STAGES

This project consists of three stages:

Stage One: GIS assessment of riparian areas in the Pembina Watershed,
Stage Two: Educate and inform affected communities and build interest in restoration,
Stage Three: Recruitment and referral of landowners for riparian restoration projects.

Stage One – Riparian Health GIS assessment

In the past years, GIS methodologies have been improved and now can be used to rapidly map and assess riparian areas and pressures on riparian system function over large spatial scales. These methods have been shown to be reliable and complementary to traditional ground-based or aerial videography methods. The method has been applied successfully to map riparian health in sub-watershed of the North Saskatchewan watershed and on lakes south of Edmonton.

In this project, a GIS-based riparian intactness assessment will be carried out by Fiera Biological Consulting. The assessment will be performed on the Pembina River Watershed in its entirety. (Figure 3.). The outcomes of this project component will be used to support outreach and education activities and to target restoration programming.

The riparian intactness data will be added to the North Saskatchewan Watershed Alliance (NSWA) online Riparian Web Portal. This portal will connect municipalities and landowners to riparian health information and data. In addition, it will provide a platform for existing riparian projects

within Alberta. This will give local landowners and land managers the information needed to sustainably manage riparian areas now and in the future with long lasting benefits to riparian health, communities, and biodiversity.

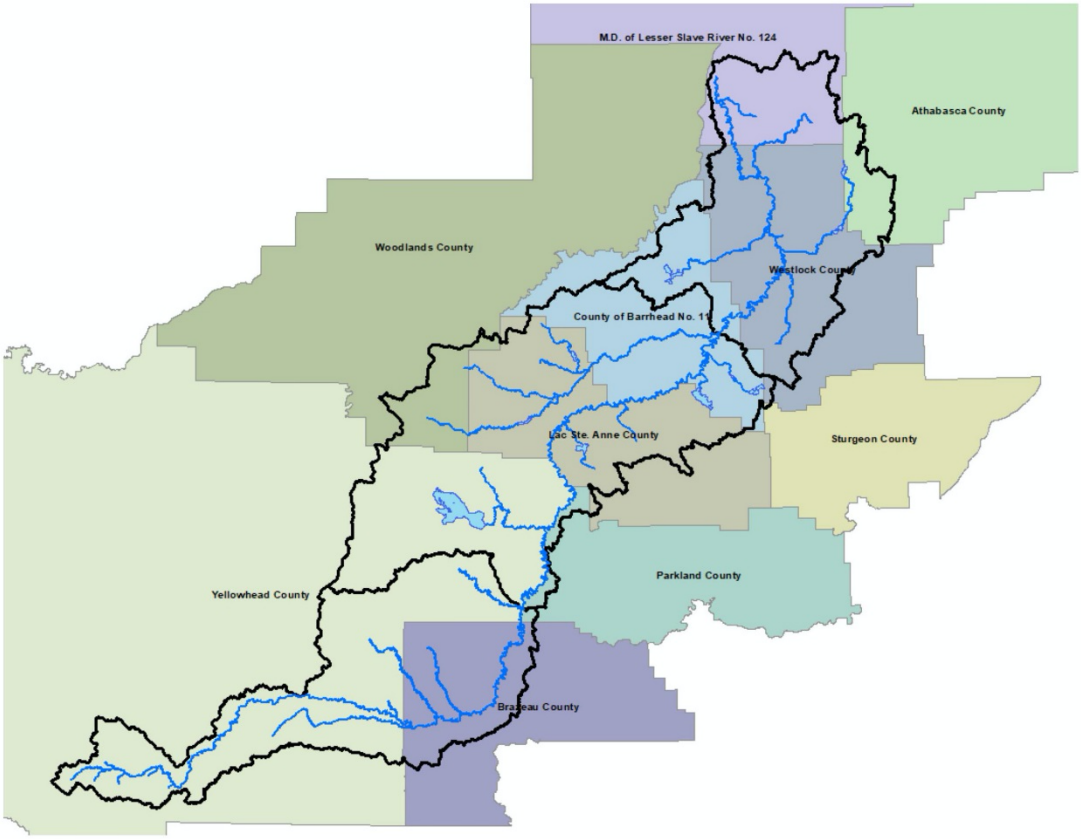

Figure 3. The stream, creek, and river shorelines that will be included in the riparian assessment of the Pembina River Watershed. https://open.alberta.ca/publications/watershed-resiliency-and-restoration-program-priority-areas-maps

Stage Two – Community Outreach and Engagement

Starting in May 2021, the AWC will consult with partners conducting restoration work in the area on their experience with landowners. The AWC will ask partners to refer one or more landowners that have done riparian restoration and use their experience to communicate to their peers through digital and display materials (posters, signage, social media, newsletters, and website). Outreach will be tailored to the needs of each municipality and group.

Community-level events tailored to the needs of each municipality and group will be held in 2021. Display materials and digital content will be created for these events. The purpose of these events is to inform the communities about this project, spark engagement, and to gather more information on creating the relationships needed to build trust in the targeted areas. The goal is to make

connections with interested landowners for further consultation and uptake of restoration conservation programs.

Stage Three – Recruitment, Referral and Restoration

The next step will be to meet with interested landowners one on one, to assess what their restoration/conservation program might look like. The AWC will collect information on issues regarding flood and drought impacts on the parcel of land and consult with partners on the best approach to build site specific flood/drought resiliency with riparian restoration.

The AWC will choose multiple landowners to assist with their restoration/conservation programs in the summer of 2021 and 2022. The AWC will work with our partners on the ground and assist them in coordination and execution of the landowner restoration projects.

All the participants in the program will be recognized with signage appropriate for their project and operation. They will have the option to be included in media stories featuring their projects and the legacy they are building through restoration/conservation. All outreach and on-the-ground activities will be documented, and content created around the process, to build an information database on local restoration and for future projects and relationship building.

During the entire process, community partners such as municipalities, conservation organizations and provincial departments will receive updates and information, including the GIS report, project progress and positive outcomes.

PROJECT DELIVERABLES

Deliverable	Status
✓ Contract a consultant company to apply the GIS-based riparian intactness mapping method to the Pembina River watershed to identify the state of riparian zones in the main stem and selected tributaries, creeks and lakes.	Complete
✓ Hire a Science Coordinator or Watershed Planner to manage the project and provide the education and outreach.	Complete
Use the resulting GIS layers on riparian intactness and catchment pressure to identify area where restoration and conservation will have the greatest benefit to flood and drought resiliency.	In-progress
Work with partners to create and execute restoration programs in the identified priority areas, with landowner participants.	In-progress
Identify four to eight landowners who want to take on restoration projects and consult with them on which course of action would be best suited to their operation or business.	In-progress

Share these reports and GIS layers, final report, and maps publicly and with all involved partners and on the Riparian Web Portal.	In-progress
Add the GIS layer to the North Saskatchewan Watershed Alliance riparian portal and other publicly available data platforms. (especially any municipalities with GIS capability if desired)	In-progress
Acknowledge areas with high conservation value and encourage continued conservation by including landowners in a watershed legacy program using positive media releases and with appropriate signage.	To be completed
Create newsletters, factsheets, webinars, and local newspaper ads based on local landowner's current experience around restoration projects, to be delivered digitally and at outreach events, to communicate the benefits of restoration, spark interest and recruit project participants.	In-progress
Build the partnerships needed to initiate a Stewardship group in the area or identify an existing group that will provide the long-term stewardship initiatives and projects.	In-progress

PROJECT BUDGET

See Appendix A.

PROJECT WORKPLAN

See Appendix B and C.

PROJECT PARTNERS

- Agroforestry & Woodlot Extension Society (AWES)
- Alternative Land Use Services (ALUS) Brazeau County
- ALUS Lac Ste. Anne County
- Alberta Conservation Association (ACA)
- Alberta Environment and Parks (AEP)
- Alberta Riparian Habitat Management Society (Cows and Fish)
- Highway 2 Conservation (H2C)
- Lac La Nonne Enhancement and Protection Society (LEPA)
- Midstream Pipeline
- North Saskatchewan Watershed Alliance (NSWA)
- Transmountain Pipeline

- Yellowhead Synergy Group (YSG)
- West Central Forage Association (WCFA)

MUNICIPAL PARTNERS

- Athabasca County
- Brazeau County
- County of Barrhead
- Lac Ste. Anne County
- M.D. of Lesser Slave River
- Parkland County
- Westlock County
- Woodlands County
- Yellowhead County

POTENTIAL PARTNERS

- ALUS Parkland County
- Green Acreages Stewardship for Small Acreages
- Land Stewardship Center
- Nature Alberta
- Northern Lights Fly Fishers (Trout Unlimited Canada)

AGRICULTURAL SOCIETIES

- Athabasca District Agricultural Society
- Barrhead Exhibition Association and Agricultural Society
- Clyde & District Agricultural Society
- Mayerthorpe & District Agricultural Society
- Pembina Agricultural & Recreational Society
- Sangudo & District Agricultural Society
- Westlock & District Agricultural Society

FISH AND GAME SOCIETIES

- Athabasca Fish & Game Society
- Barrhead Fish & Game Society

WATERSHED RESILIENCE AND RESTORATION PROGRAM

In response to the 2013 flooding events, the Alberta Government has invested in several immediate and ongoing funding programs to improve watershed resilience to flooding. One of those programs is the Watershed Resiliency and Restoration Program (WRRP). WRRP focus is creating and restoring natural systems. Its aim is to increase watershed resilience primarily through wetland and riparian habitat restoration and implementation of best practices.

Their goals are to:

1. Reduce the potential severity and effects of future flooding and drought;
2. Improve water quality.

This effect will create healthier wetlands and riparian systems that can improve retention of excess precipitation, with release of the retained water over longer periods, resulting in more balanced, sustainable releases of higher-quality water through time. Riparian restoration also reduces bank erosion by increasing bank strength to filter sediment from upland sources.

For more information, please contact:

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