

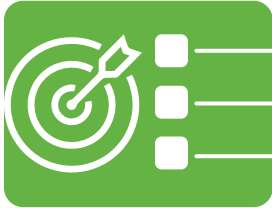
**NORTH  
SASKATCHEWAN  
RIVER**  
WATERSHED  
RIPARIAN  
CONSERVATION &  
RESTORATION  
STRATEGY

September 2021



# Executive Summary

Riparian areas are a critical component of a healthy watershed. They provide goods and services essential for maintaining water quality, water quantity, and aquatic ecosystem health. Riparian areas occur at the intersection of land and water, making them highly complex and dynamic. They are challenging to manage and therefore lack a comprehensive legal framework in Alberta. The North Saskatchewan Watershed Alliance (NSWA) recognized the need to protect riparian lands within our guiding document, The *Integrated Watershed Management Plan* (IWMP, 2012). The four action items identified in the IWMP are paraphrased as:



**3.1.1** Develop health objectives for riparian areas.



**3.3.1** Assess the condition of riparian areas.



**3.3.2** Develop riparian policy guidelines.



**3.3.3** Support incentive programs that promote restoration and conservation of riparian areas.

The *Riparian Conservation and Restoration Strategy* addresses action one (1) of the IWMP. This Strategy sets management goals objectives, and identifies actions required to protect riparian areas in the North Saskatchewan River Watershed.

In a series of workshops between 2019-2021 among key stakeholders, we identified the environmental, social, and economic benefits of riparian areas to communities in the Watershed. We then formulated a vision of riparian health:

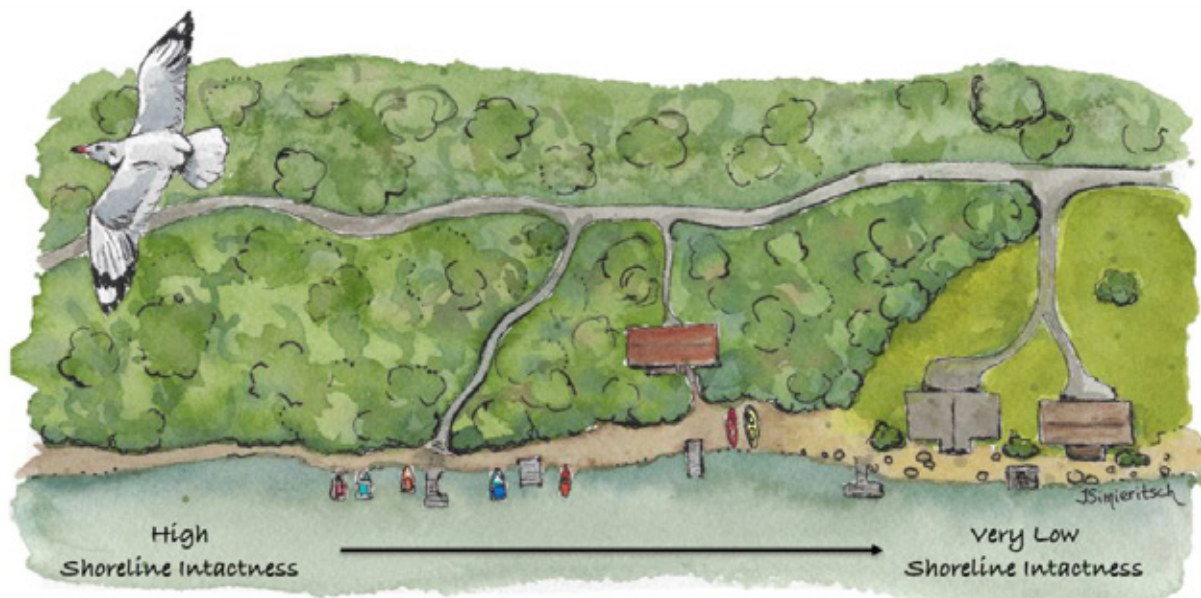
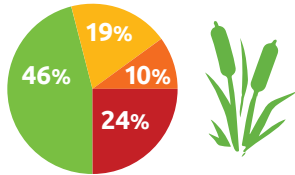


Figure 1: Illustration by Terra Simieritsch

## Vision of Riparian Health

Riparian lands in the North Saskatchewan River watershed are recognized as critical for protecting our source waters and for maintaining the water quality, quantity and aquatic health of the North Saskatchewan River and its tributaries, as well as other water bodies (e.g., lakes, wetlands) in the Watershed. As such, riparian areas are identified and protected from the risks associated with development such that, at any given time:



**Goal 1** Existing (baseline) intact riparian areas are identified, and the proportion is maintained through conservation efforts. Of the riparian areas assessed:

- 46% are categorized as **high intactness**
- 19% are categorized as **moderate intactness**
- 10% are categorized as **low intactness**
- 24% are categorized as **very low intactness**



**Goal 2** Degraded riparian lands are restored such that the North Saskatchewan River watershed and each of its sub-basins has a minimum of 65% highly intact riparian areas.



**Goal 3** Priority water bodies (tributaries, lakes, and wetlands) in each sub-basin also have a minimum of 65% highly intact riparian areas, and also have a maximum of 25% very low + low intact riparian areas.



**Goal 4** Municipalities maintain a minimum of 65% highly intact riparian areas and have a maximum of 25% very low + low intact riparian areas.

The NSWA believes that the goal of 65% high intactness is achievable and ambitious given that over 90% of the waterbodies assessed so far in the North Saskatchewan River basin require some restoration activity to achieve the goal of 65% health. However, it is conservative compared to the 75% health goal recommended to support coldwater fisheries in Eastern Canada.

This Strategy recognizes the need to encourage academic investigation of riparian health targets and environmental outcomes within an Alberta context (Strategy 5.3). Health goals establish a context for comparing current baseline conditions; they can mobilize conservation and restoration activities, and researchers can scientifically monitor the impacts of the activities to test the effectiveness of the initial goal. This cycle is the foundation of adaptive management. We recommended that this Strategy be reviewed regularly (5-year intervals) and amended to reflect new scientific knowledge.

The NSWA assessed the condition (i.e., “intactness”) of approximately 17,300 km of riparian areas located in the North Saskatchewan River watershed through a detailed desktop study of riparian lands. Using these baseline datasets (i.e., intactness data and prioritization data), stakeholders can identify hotspot areas for priority action. A municipality, for example, can use this data to determine their current intactness rating and calculate the amount of restoration required to reach the goal of 65%. They can then direct their restoration budget toward water bodies with the lowest intactness scores within their jurisdiction. Maintaining the condition of existing high intactness areas is also an essential aspect of reaching the 65% target. Therefore, conservation activities are essential. Stakeholders are encouraged to implement incentive programs that promote conservation and target areas identified as a high priority for conservation action.

## THE RIPARIAN CONSERVATION AND RESTORATION STRATEGY PROVIDES A PATH FORWARD WITH FIVE STRATEGIES:

1.



### 1. INCREASE PUBLIC AWARENESS VIA EDUCATION AND OUTREACH

Elevate public awareness of riparian areas and the importance of the ecosystem goods and services they provide. Elected officials and other decision-makers are a crucial audience in any education campaign.



### 2. PROVIDE GREATER SUPPORT TO PRIVATE LAND STEWARDSHIP INITIATIVES

Increase the number of “projects on the ground” that restore damaged riparian areas and conserve good quality riparian areas. We aim to meet our riparian health target of 65% across the Watershed. Program coordinators can target activities in areas identified as a priority for restoration and conservation.



### 3. FACILITATE POLICY ALIGNMENT & INTEGRATED WATER AND LAND USE PLANNING

Increase support for policy and programs that incentivize riparian restoration and conservation.



### 4. ADVOCATE FOR RESTORATION EFFORTS ON CROWN LANDS (WHERE NEEDED)

Apply riparian policy and programs to a spectrum of landowners, including governments who own and lease land.



### 5. PROMOTE RESEARCH AND KNOWLEDGE BUILDING

Support research of riparian areas, especially riparian targets and outcomes. The knowledge will be shared and incorporated into the Strategy through the adaptive management process.

Successful implementation of the Strategy will require ongoing dialogue among Governments, Indigenous communities, industry, stewardship groups, and the public. Voluntary action by decision-makers, such as municipal councillors, will be critical to this Strategy's success. In maintaining riparian health, we recognize the need to be aligned across jurisdictions and work collaboratively, with a framework from policy to practice, with regulatory and non-regulatory tools, and evidence-based decision-making. We all are responsible for maintaining riparian lands and watershed health for ourselves, our downstream neighbors, and future generations.



*Shunda Creek. Photo: Carol Rusinek.*

## Acknowledgements

The North Saskatchewan Watershed Alliance would like to acknowledge the financial assistance from the Government of Alberta, which provided project funds through the Watershed Resiliency and Restoration Program. We would also like to recognize the annual operating grant for the North Saskatchewan Watershed Alliance from the Government of Alberta *Water for Life Strategy*.

We would like to say a special thank you to all the members of the Headwaters Alliance, Sturgeon River Watershed Alliance, and Vermilion River Watershed Alliance for their support and input on the development of this Strategy. Members of the committees include municipal staff and councillors from over 30 municipalities throughout the watershed. Government representatives, NGOs and community groups provided additional support through participation on the alliances. The thoughtful insights offered throughout this process have been invaluable.

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## ACRONYMS AND ABBREVIATIONS

ALUS	Alternative Land Use Services
AWC	Alberta Water Council
BMP	Beneficial Management Practices
GOA	Government of Alberta
IWMP	Integrated Watershed Management Plan
NGO	Non-Governmental Organization
NSR	North Saskatchewan River
NSWA	North Saskatchewan Watershed Alliance
RHAP	Riparian Health Action Plan
WPAC	Watershed Planning and Advisory Council



# Introduction

## THE NORTH SASKATCHEWAN WATERSHED ALLIANCE

The *North Saskatchewan Watershed Alliance* (NSWA) is a not-for-profit charitable organization collaborating with a diverse range of stakeholders to find practical solutions to watershed issues in the North Saskatchewan River watershed in Alberta. Under the Government of Alberta’s *Water for Life* strategy, the NSWA became one of eleven Watershed Planning and Advisory Councils (WPAC) in Alberta in 2005. A Board of Directors, elected annually by NSWA members, guides the NSWA Society. The day-to-day operations of the society are run by the Executive Director and staff. Work of the NSWA is also guided by a vision and mission:

### Vision:



*People working together for a healthy and functioning North Saskatchewan River watershed – today and tomorrow.*

### Mission:



*To protect and improve water quality, water quantity (instream flow) and the health of our watershed by: seeking, developing and sharing knowledge; facilitating partnerships and collaborative planning; and working in an adaptive management process.*



**Figure 1. Map of Watershed Planning and Advisory Councils (WPACs) in Alberta.**

*Top photo: Clifford E Lee  
Nature Preserve, Bill Trout.*



## THE NORTH SASKATCHEWAN INTEGRATED WATERSHED MANAGEMENT PLAN

The first order of business for a WPAC is to assess the health of its watershed in a *State of the Watershed Report*, which the NSWA completed in 2005. Following the recommendations of that report, the NSWA developed an *Integrated Watershed Management Plan* (IWMP) that was released in 2012. Goals of the IWMP are as follows:

- Goal 1** Water quality in the North Saskatchewan River watershed is maintained or improved.
- Goal 2** Instream flow needs of the North Saskatchewan River watershed are met.
- Goal 3** Aquatic ecosystem health in the North Saskatchewan River watershed is maintained or improved.
- Goal 4** The quality and quantity of non-saline groundwater are maintained and protected for human consumption and other uses.
- Goal 5** Watershed management is incorporated into land-use planning processes at all scales in accordance with the recommendations in this report.

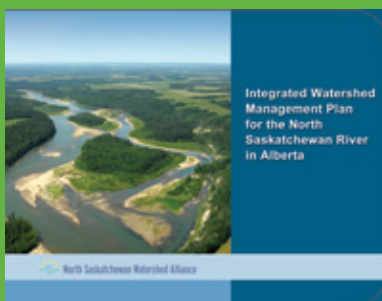


Figure 2. The *Integrated Watershed Management Plan* (IWMP) was created in 2012.



*Riparian areas like the lush green belts seen above play a critical role in waterbody health.*  
Photo credit: Cows and Fish. [www.cowsandfish.org](http://www.cowsandfish.org)

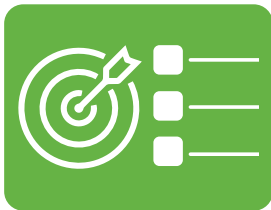
### FOCUS ON RIPARIAN LANDS

To implement the IWMP and to achieve its goals, the NSWA has entered into a number of collaborations, commissioned several studies, and undertaken numerous actions to address the issues affecting watershed health in the North Saskatchewan River watershed. As issues are often complex, work sometimes focusses on specific areas of watershed health. In particular, the NSWA has focused its efforts in recent years on riparian lands. An ecological definition of riparian lands is provided by the Alberta Water Council (AWC)<sup>1</sup> as follows:

*Riparian lands are transitional areas between upland and aquatic ecosystems. They have variable width and extent above and below ground and perform various functions. These lands are influenced by and exert an influence on associated water bodies, including alluvial aquifers and floodplains. Riparian lands usually have soil, biological, and other physical characteristics that reflect the influence of water and hydrological processes.*

<sup>1</sup> See the AWC's [Riparian Land Conservation and Management Report and Recommendations](#) (2013).

Riparian lands are an important component of watersheds and play a significant role in maintaining water quality (IWMP Goal 1) and aquatic ecosystem health (IWMP Goal 3). They can also affect water quantity (instream flows or lake levels) (IWMP Goal 2) and may interact with groundwater flows (IWMP Goal 4). Finally, land use planning (IWMP Goal 5) can have a large impact on riparian functions. Hence to achieve its goals, a key direction of the IWMP is “to maintain and restore riparian areas” (Watershed Management Direction 3.3). Additionally, the plan has several actions focusing on riparian management including the following:



Develop health objectives for riparian areas.



Assess the condition of riparian areas.



Develop riparian policy guidelines.



Support incentive programs that promote restoration and conservation of riparian areas.

## PURPOSE OF A RIPARIAN CONSERVATION AND RESTORATION STRATEGY

While riparian health was an indicator of watershed health identified in the 2005 State of the North Saskatchewan Watershed report, not enough was known about the state of riparian lands at the time to use this indicator effectively. Hence, the NSWA has put significant resources into learning more about riparian health over the past decade. In particular, the NSWA, working with Fiera Biological, has pioneered a desk-top approach to large-scale riparian assessments.<sup>2</sup>

Now, to focus efforts to set and achieve riparian objectives, the NSWA has developed this riparian conservation and restoration strategy. The purpose of this strategy is to:

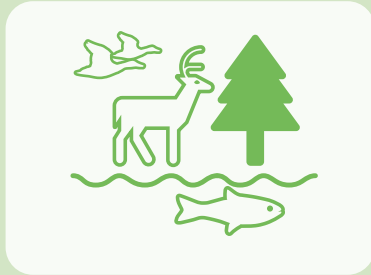
- Develop a shared vision for riparian lands in the North Saskatchewan watershed and advocate for its inclusion in other regional, metropolitan, municipal and other planning initiatives.
- Where it has been developed, use riparian assessment data to set realistic and achievable riparian management objectives and targets for priority water bodies including major tributaries, lakes and wetlands in the North Saskatchewan River Watershed.
- Encourage municipalities, stewardship groups and landowners to set and report on their own riparian management targets.
- Identify riparian management actions required to achieve objectives.
- Collectively work to improve the alignment and effective use of shared riparian management tools (e.g., policies, plans, bylaws, setbacks, education, resources, incentive programs, restoration techniques) and practices.

<sup>2</sup> To see a list of NSWA riparian reports, go to the NSWA homepage and enter ‘riparian’ in the search box.

# BENEFITS

## THE VALUE OF RIPARIAN LANDS IN THE NORTH SASKATCHEWAN RIVER WATERSHED

Riparian lands are important for their own intrinsic value, as a component of a healthy watershed, and for providing numerous social, economic and environmental benefits such as (but not limited to):



### Environmental Benefits

- Safeguarding good water quality by trapping and filtering sediment, nutrients and pollutants and taking up contaminants
- Mitigating floods and droughts and reducing erosion by storing, then slowly releasing water
- Supporting biodiversity by providing habitat and habitat corridors for wildlife
- Providing shade to cool waters for fish and other aquatic species

### Social Benefits

- Protecting our source drinking waters
- Providing aesthetically pleasing areas for recreation (trails, birding, boating, fishing, etc.)
- Providing areas important for cultural and spiritual activities
- Building a sense of community and well-being as 'ribbons of green' that connect neighborhoods and get people out into nature (e.g., Red Willow Trail in St. Albert)

### Economic Benefits

- Provide value as green infrastructure that provides us certain ecological goods and services like water filtration, a carbon sink, etc.
- Important areas for parks, recreation, and other green areas, which in turn can increase the value of nearby real estate (which in turn increases the municipal tax base)
- Can prevent the loss of infrastructure due to flooding or erosion (reduced risk and liability, improved safety)
- Can be utilized for light or late season livestock grazing and woodlot production

## OTHER RIPARIAN MANAGEMENT INITIATIVES

Before developing this riparian strategy, the NSWA looked at work done to date by other jurisdictions and organizations. Federally, the Government of Canada promotes the use of best practices in agricultural areas operating near riparian lands. They also recognize the importance of riparian buffers in forested areas, promoting a natural disturbance approach to forest management.

Provincially, the Government of Alberta (GOA) has instituted a number of rules for protecting riparian areas in forested (Crown) lands. They also released Stepping Back from the Water: A Beneficial Management Practices Guide for New Development near Water Bodies in Alberta's Settled Region (2012) which provides guidance on minimizing the risk of development near water bodies with an emphasis on conserving riparian lands. Additionally, the GOA has supported the Alberta Riparian Habitat Management Society (Cows and Fish) since its inception. In recent years, they have developed the Watershed Resiliency and Restoration Program which has financially supported a number of riparian projects in Alberta.

In 2012, the Alberta Water Council struck a multi-sector project team to look at riparian management in the province. This work resulted in a summary of what is known about riparian lands in Alberta (Fiera 2012). The team also produced their own report with a number of recommendations on how to improve riparian management (AWC 2013).<sup>3</sup>

In particular, the team recommended that the GOA develop a riparian vision and outcomes, and that these outcomes be integrated into regional land use and watershed plans.

While the GOA has not yet developed provincial riparian outcomes, they have started work on a North Saskatchewan Regional Plan. Early stakeholder advice on the plan (provided by the Regional Advisory Council) highlighted the importance of integrating land and water management, as well as the need to manage riparian lands, wetlands and lakes in the North Saskatchewan watershed.

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<sup>3</sup> Note that progress on the implementation of these recommendations can be seen on the AWC's recommendations tracking.

Alberta Urban Municipalities Association included the issue of riparian buffers in their Stormwater policy. They also provide a list of riparian resources and examples of riparian management initiatives available to municipalities.

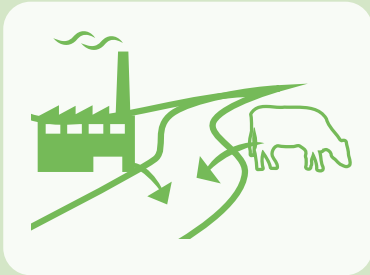
For some time, organizations like ALUS, Cows and Fish, AWES, Highway 2 Conservation, Clear Water Landcare, Land Stewardship Centre (Green Acreages program), Nature Alberta (Living by Water program), Fish and Game Associations and others, often in collaboration with local municipalities and land owners, have worked to protect or restore riparian lands within the North Saskatchewan watershed. The NSWA also looked at other jurisdictions in Alberta (e.g., Battle River and Sounding Creek, Calgary Riparian Areas) and elsewhere (e.g., Cowichan Watershed Board riparian targets, Long Island Sound Study). These and other initiatives (See a list of resources in Appendix 1) have informed the NSWA in the development of this strategy.



Figure 3. Some of the partner organizations that work to restore riparian lands within our watershed and across the province.

## ISSUES AFFECTING RIPARIAN HEALTH IN THE NORTH SASKATCHEWAN RIVER WATERSHED

From the assessments that have been done to date in the North Saskatchewan River watershed, it is clear that a large percentage of riparian lands that border the mainstem river and its tributaries, as well as many lakes and wetlands, have been degraded to some degree. The causes of this degradation are many, for example:



### Environmental Issues

- Point and non-point pollution (sediment, fertilizers, pesticides, waste, etc.) from land use activities (agriculture, forestry, industry, urban expansion, recreation) in the uplands
- Setbacks not being voluntarily used or enforced agricultural areas, acreages, lake properties and urban areas
- Greater pressure on smaller tributaries and smaller water bodies
- Climate change and warmer temperatures leading to warmer waters, changes in timing and intensity of precipitation events, etc.



### Political & Economic Issues

- Jurisdictional fragmentation as well as differences in authority for public and private lands, rural and urban settings
- Cost of securing riparian lands under easements or land trusts and other resourcing constraints (lack of financial and human capacity)
- Insufficient knowledge and tools to manage riparian lands effectively
- Lack of awareness and knowledge of the public good riparian lands provide (riparian areas are viewed as wastelands or obscuring the view)
- Cumulative effects of all the above

If we continue business as usual, we are likely to see continued loss of intactness of riparian lands in the North Saskatchewan watershed, as well as the functions and benefits they provide. Critical functions cannot be performed if riparian lands are severely impacted. Although it may depend on the location, the loss of filtering capability and impact on water quality is a priority concern. However, aesthetics/ biodiversity might also be important in urban and recreational areas. Unfortunately, assessments only provide a 'snapshot' in time. They do not tell us what the rate of decline was in the past, or what it will be in the future. It also does not tell us the specific cause of decline, which is likely influenced by several factors such as the economy, rate of population and economic growth, education and awareness, etc.

## NSWA'S RIPARIAN PILOT PROJECT

The goals of the NSWA's IWMP will be achieved, in part, through implementation of Action 3.1.1: *Develop aquatic ecosystem health objectives for the mainstem of the North Saskatchewan River and for priority water bodies including major tributaries, lakes, wetlands and their associated riparian areas.* However, before we can set riparian objectives (where we want to go), we first need to understand the current state of riparian health in the North Saskatchewan watershed (where we are currently at).

In 2016, the NSWA initiated a project to assess riparian health of tributaries in a pilot region of the watershed. To assess riparian health at a watershed-scale, a new evaluation tool was required. So, the NSWA commissioned Fiera Biological Consulting Ltd. to develop the new methodology that uses satellite imagery instead of helicopter videography. Fiera Ltd developed a methodology which uses satellite imagery to classify and measure vegetation, woody vegetation, and human built footprint along shorelines to determine "riparian intactness". Riparian intactness is defined as the extent to which natural riparian habitat has been altered by human activity. Highly intact shorelines are dominated by natural vegetation and other natural cover types, while shorelines classified as very low intactness are dominated by human-built structures, roads, and manicured or disturbed vegetation.

Using this method, large expanses of riparian shoreline could now be assessed at one time and compared across the landscape to uncover riparian impact "hot-spots". This desktop method is a good complement to field methods: field assessment can provide detail not captured in the aerial assessment, such as presence of invasive plants. Furthermore, field-based methods are a highly effective tool to engage with and provide advice to landowners.

This intactness method was also paired with a watershed pressure assessment, where small catchments (i.e., sub-sub-basins) were assessed to determine the degree of natural and human-caused impacts in the surrounding upland, which may put pressure on the nearby riparian areas. When riparian intactness and catchment pressure are combined, they produce a third dataset which provides valuable guidance for prioritizing restoration and conservation action.

The methodology was piloted within the Modeste, Sturgeon, and Strawberry sub-basins located in the

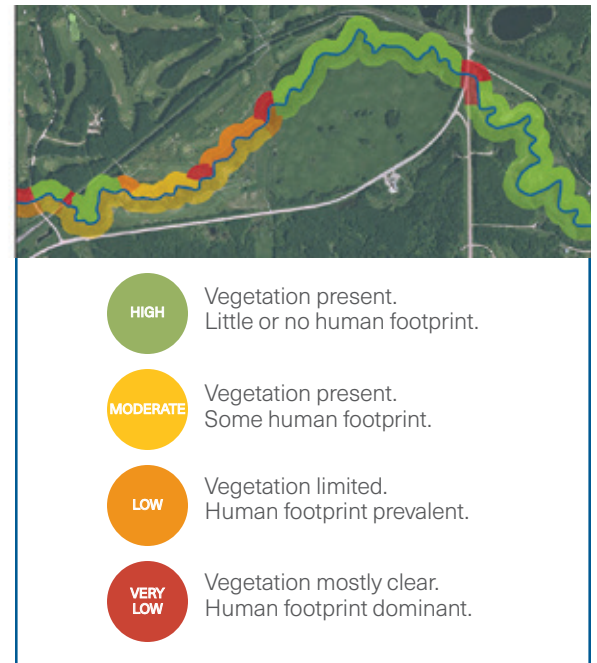


Figure 4. Illustration of the four categories of riparian intactness: high, moderate, low, and very low intactness.

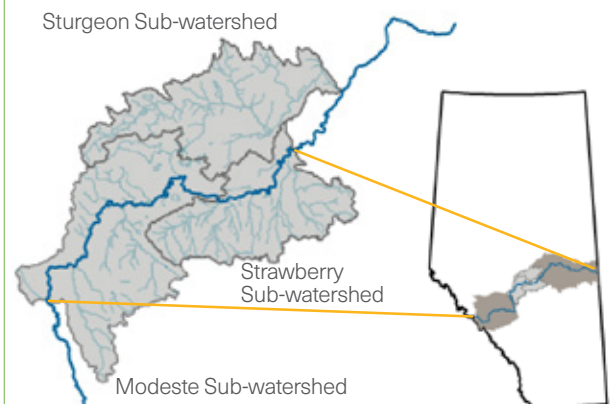


Figure 5. Map of NSWA's Pilot Project Area. This area is comprised of the Modeste, Sturgeon and Strawberry Sub-watersheds.

central portion of the North Saskatchewan watershed.<sup>4</sup> Nearly 6,000 kms were assessed, including both sides of tributary streams and the shores of several lakes. The pilot projects were completed in 2018, and the results were compiled into three separate reports available on the NSWA's website.

<sup>4</sup> Additionally, the GOA used riparian intactness to assess several recreational lakes (i.e., Pigeon, Gull, Sylvan and Buffalo lakes) in the North Saskatchewan Watershed (See Fiera 2018).

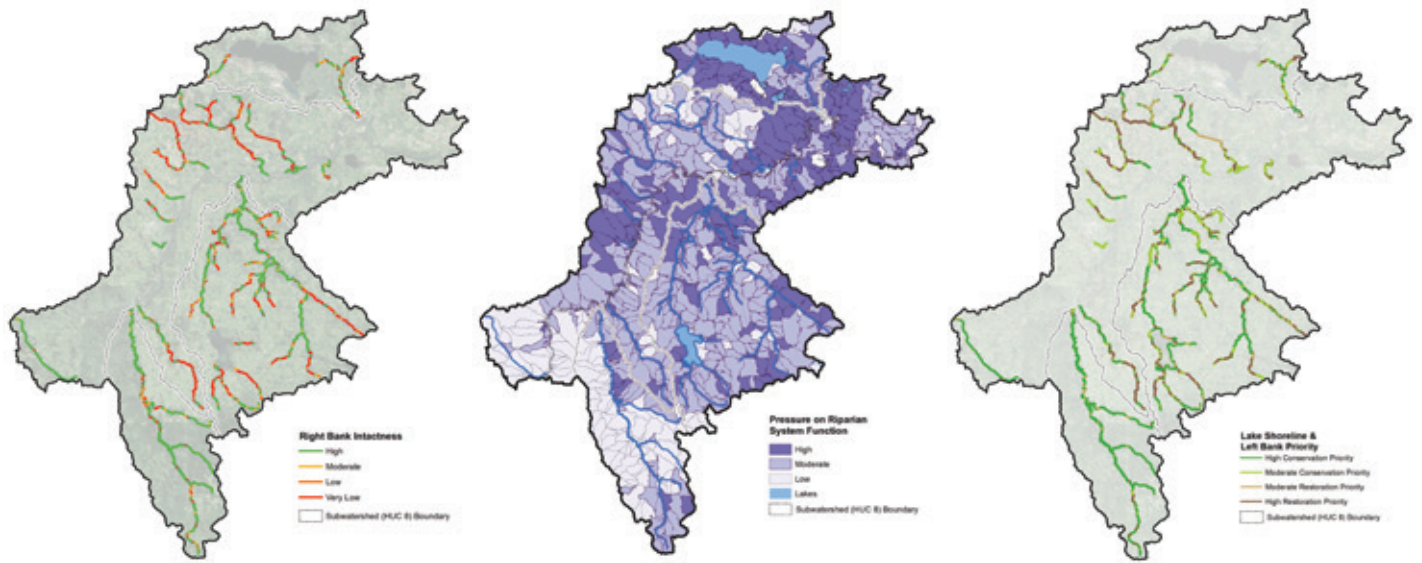


Figure 6. Datasets created in the Riparian Intactness Pilot Project. Datasets include riparian intactness (pictured left), catchment pressure (pictured middle) and restoration & conservation priorities (pictured right).

In 2019, the Government of Alberta commissioned a study to verify the validity of this new method. They compared the assessment results of the satellite method to field-based methods and the result was good correlation between the two approaches. This study verified that these methods produce a reliable tool for evaluating assessments of riparian condition at the watershed-scale.

The same year, the NSWA initiated a new project to expand the intactness assessment into the remaining eastern portion of the NSR watershed and beyond. The Green Area of the watershed was not assessed in this study due to the limitation of assessing under tree canopy. Other WPACs initiated parallel projects; the current extent of mapping projects is illustrated below. Upon completion of the expansion project, over 17,300 km of shoreline will have been assessed in the NSR. Other watersheds are being assessed using this new method, and by the end of 2021, it is estimated that over 40,000 km of shoreline will have been assessed using this new method.

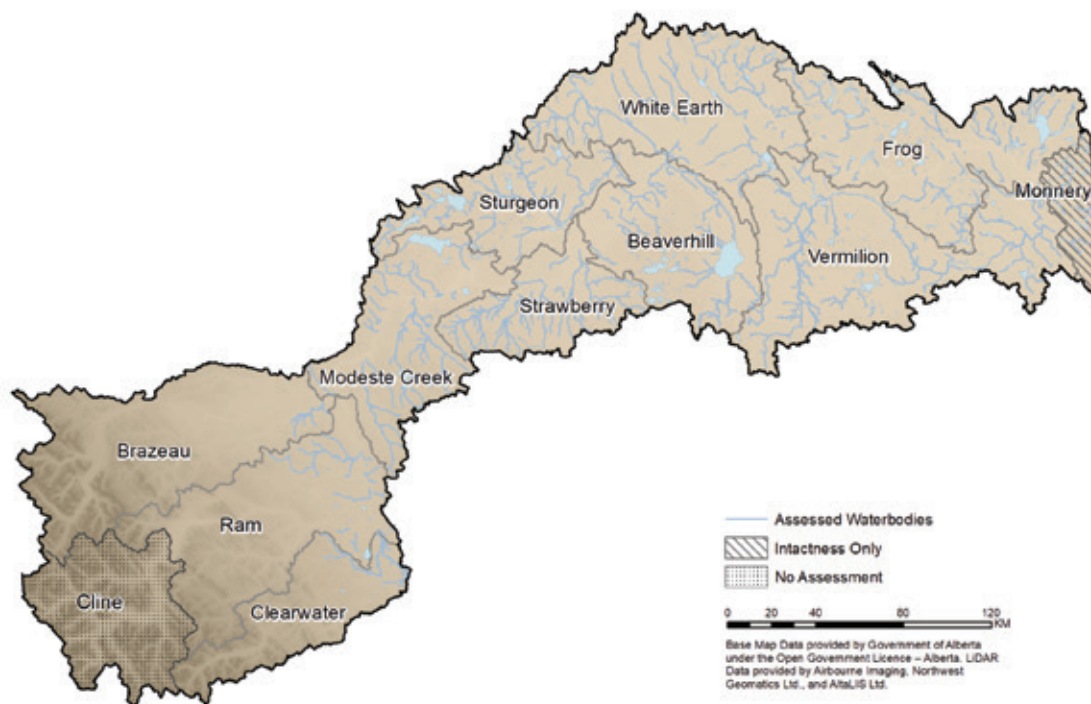


Figure 7. Map of riparian intactness assessed in the North Saskatchewan River Watershed. This includes the 2018 pilot and 2021 expansion project.

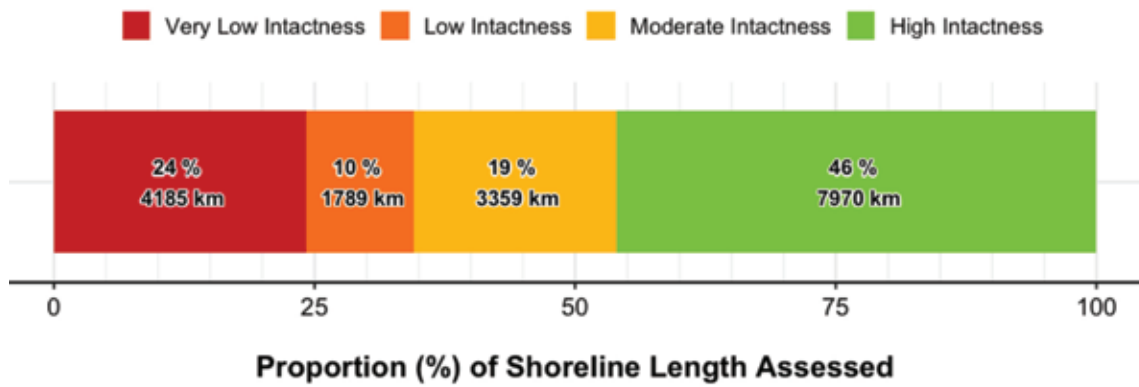


Figure 7. Bar graph of overall intactness results for areas assessed in the North Saskatchewan River Watershed. Graph shows the proportion of shoreline in each of the four intactness categories. Approximately 17,300 km of shoreline were assessed.

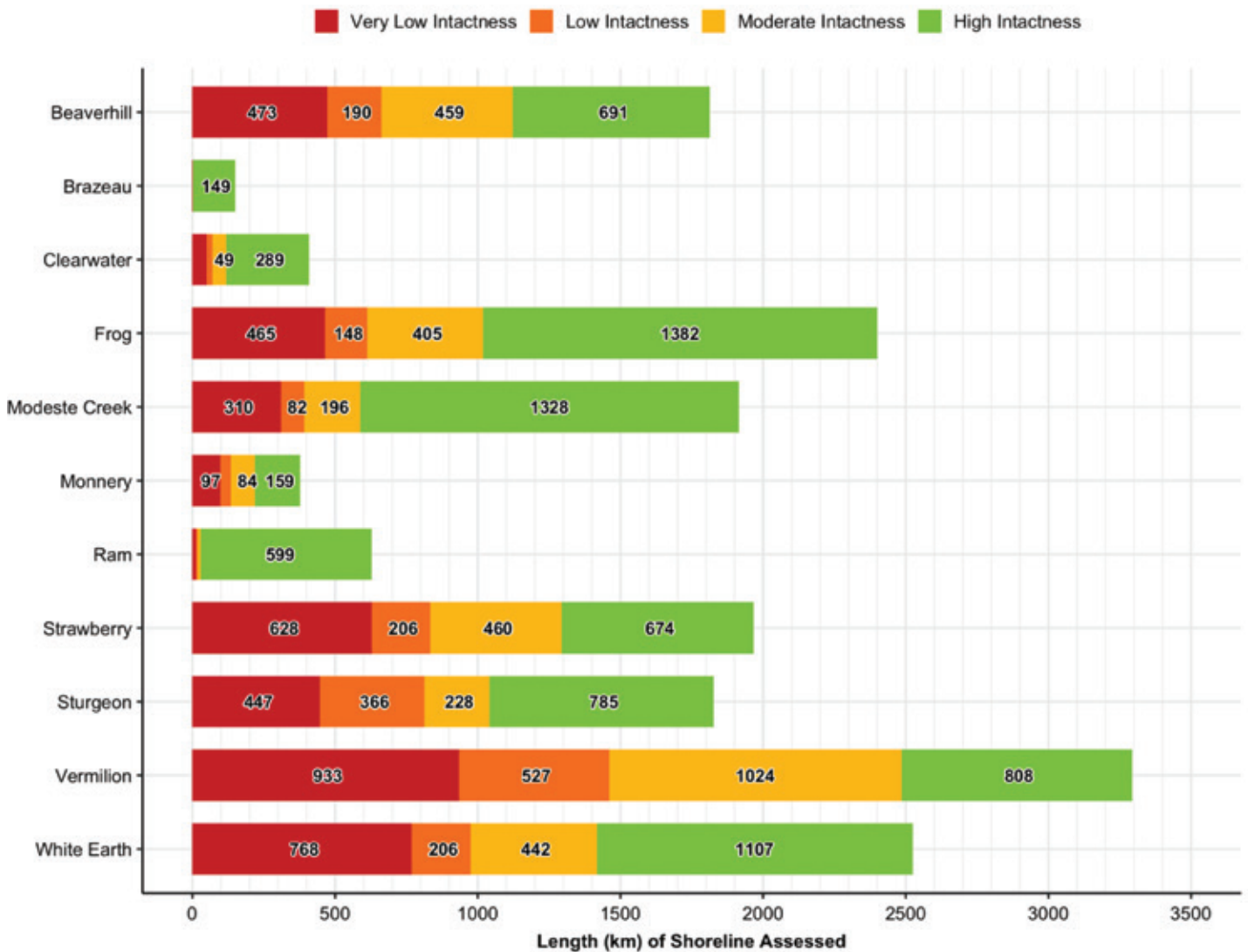


Figure 8. Bar-graph of intactness results for 11 sub-watersheds in the North Saskatchewan River Watershed. Graph shows the length (km) of shoreline in each of the four intactness categories. Over 17,300 km of shoreline were assessed in 11 sub-watersheds.



## NSWA'S RIPARIAN HEALTH ACTION PLAN

Today, the NSWA is continuing to build on this initial work via its Riparian Health Action Plan (RHAP), which has three phases:

- PHASE 1** Continue to assess the condition of remaining riparian areas in the North Saskatchewan watershed.
- PHASE 2** Assess the programs, policies, and bylaws in place to guide restoration and conservation of priority areas, including identifying types of landowners adjacent to riparian areas, conducting an intermunicipal review of bylaws and other senior policies and setting targets on riparian health.
- PHASE 3** Help landowners to conserve healthy riparian area and restore degraded areas. While numerous municipalities and NGOs are taking the lead on implementing on the ground programs, the NSWA will help support this work by developing a Riparian Web Portal.<sup>5</sup>

Through the commissioning of the intactness study in **Phase 1**, we now have an important foundation of scientific evidence upon which to build an adaptive framework for riparian management. Formalization of such a framework for action will include a consideration of the current conditions (baseline) and determination of achievable outcomes and measurable targets, which can then inform relevant collective action by key stakeholders.

To support **Phase 2**, the NSWA has hosted a series of engagement sessions with our sub-watershed stakeholders to establish a shared vision and goals for the future state of riparian health in the North Saskatchewan River Watershed. That information has been summarized here in the Riparian Conservation and Restoration Strategy. In addition, the NSWA is pursuing a suite of projects to support the development of riparian health targets. These projects include:

- Riparian literature review on targets and by-laws
- Landownership profile and gap analysis of policy and programs across the watershed
- Development setback guidance based on *Stepping Back from the Water*
- Riparian restoration scenarios through modelling

To implement **Phase 3** of the Riparian Health Action Plan, the NSWA is supporting existing riparian on-ground incentives and programs by developing an online platform, the Riparian Web Portal, to connect with landowners. The primary objectives of the Riparian Web Portal are:

- Purpose 1. Share the riparian intactness dataset
- Purpose 2. Share examples of riparian restoration projects
- Purpose 3. Share educational information and useful resources to enable landowners

The Riparian Web Portal is designed to connect landowners to riparian health information, including the riparian intactness data, summarization tools and conservation options. The conservation options include connections to institutions and programs that enable landowners to gain resources needed to put projects on the ground. The portal provides a consistent platform to celebrate existing projects on the ground, and to promote collaboration. This will also be a platform to educate and engage the public about riparian management and inform respective parties about current practices and opportunities. This is an Alberta-wide project, hosting all riparian intactness datasets created in Alberta.



Figure 9. Logo of the Riparian Web Portal. This web tool is the focus of Phase 3.

<sup>5</sup> Riparian web portal: see <https://riparian.info/#/nav>

# Setting Riparian Objectives in the North Saskatchewan Watershed

## RIPARIAN PRINCIPLES AND CRITERIA

Given what we know today about the state of riparian lands in the North Saskatchewan watershed, and to inform the setting of riparian management goals and objectives, the following shared principles were identified by the NSWA and its partners as follows:

- A healthy watershed includes healthy, functioning riparian lands with enough space for natural processes, like flooding, to occur.
- Riparian lands have inherent social, economic, and ecological value and provide benefits to the people who live, work, and play in the North Saskatchewan River Watershed.



*Balancing the intersecting social, economic, and ecological values of riparian areas is pivotal for ongoing stewardship.*

- We all have a responsibility to maintain riparian lands and watershed health for ourselves, our downstream neighbors, and future generations.
- In maintaining riparian health, we recognize the need to be aligned across jurisdictions and to work collaboratively, with a framework from policy to practice; with both regulatory and non-regulatory tools and evidence-based decision-making.
- We also recognize the need to share our learnings through effective communication about the need for a healthy riparian land so that our communities are well informed and share a sense of stewardship.

Looking through social, cultural, economic and environmental lenses, we also identified a number of criteria that should inform riparian management objectives. That is, objectives should be:

- SMART (specific, measurable/ evidence-based, achievable/ implementable, relevant, timely)
- Scale-able (e.g., watershed, sub-basin, municipal, lake)
- Sensitive to different land types and equitable to different landowners (Green and White areas, public and private, urban and rural communities) recognizing that everyone has a role to play
- Reflective of riparian functions, public good and community values

Note that 'intactness' is used as a proxy for 'health' unless ground truthing or other health assessment data exists. Finally, we note that a systematic and adaptive framework for riparian habitat management in the Watershed is needed and that this framework includes several elements (as suggested by Fiera 2018) including:

**OBJECTIVES:** High-level statements of desired future conditions (outcomes).

**Measures:** Specific metrics that can be quantified to assess the progress towards, and the degree to which, desired future conditions have been achieved.

**Targets:** Values of measurable items (metrics) that indicate the attainment of a desired condition.

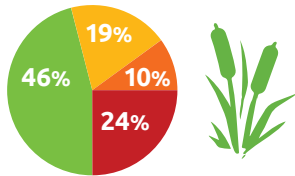
**Actions:** Management actions, plans or policies for achieving stated objectives.

## RIPARIAN VISION FOR THE NORTH SASKATCHEWAN WATERSHED

As the cumulative effects of climate change, population growth and land use development intensify, it is more important than ever before that all of our riparian lands are healthy and providing the functions needed to protect our water quality, quantity and biodiversity. However, we recognize that even in nature, riparian areas surrounding pristine water bodies can be disturbed from time to time from natural processes such as fire, flood, and grazing wildlife.

Today, in addition to natural processes, we also have to allow for some built infrastructure (e.g., roads, water intakes) to affect some riparian lands. Additionally, pressures may be more intense in some areas than in others. Hence, it can be a challenge to identify a reasonable riparian vision for the entire North Saskatchewan watershed. The IWMP suggests that, at a minimum, we should “*maintain and restore riparian areas*” (Watershed Management Direction 3.3). Given their importance, and what we have learned in the eight years since the IWMP was released, it seems like we need to expand further on this statement. Hence our renewed riparian vision is:

**Vision:** Riparian lands in the North Saskatchewan River watershed are recognized as critical for protecting our source waters and for maintaining the water quality, quantity and aquatic health of the North Saskatchewan River and its tributaries, as well as other water bodies (e.g., lakes, wetlands) in the Watershed. As such, riparian areas are identified and protected from the risks associated with development such that, at any given time:



**Goal 1** Existing (baseline) intact riparian areas are identified, and the proportion is maintained through conservation efforts. Of the riparian areas assessed:

- 46% are categorized as **high intactness**
- 19% are categorized as **moderate intactness**
- 10% are categorized as **low intactness**
- 24% are categorized as **very low intactness**



**Goal 2** Degraded riparian lands are restored such that the North Saskatchewan River watershed and each of its sub-basins has a minimum of 65% highly intact riparian areas.



**Goal 3** Priority water bodies (tributaries, lakes, and wetlands) in each sub-basin also have a minimum of 65% highly intact riparian areas, and also have a maximum of 25% very low + low intact riparian areas.



**Goal 4** Municipalities maintain a minimum of 65% highly intact riparian areas and have a maximum of 25% very low + low intact riparian areas.

## OBJECTIVES AND TARGETS

Once we conduct a riparian assessment, we know which riparian areas are intact and which are not. Armed with this knowledge, we can then set more detailed management objectives to help us achieve our vision of 65% intactness. In general, assessments are done at the sub-basin scale. Hence it makes sense to set objectives for each sub-basin. The data also lets us look at priority water bodies (tributaries, lakes and wetlands) within each sub-basin.

Looking at each sub-basin, management objectives might include objectives for conserving intact areas, restoring degraded areas or reducing external pressures on riparian catchments. That is, management objectives might look like this:

**Objective 1:** Conserve high quality riparian habitat in the Modeste sub-watershed. Habitats identified as high conservation potential will be conserved first.

**Measure:** Proportion (%) of shoreline assessed as high intactness.

**Target:** x% of high-quality riparian habitat is conserved.

**Objective 2:** Restore riparian habitats that have been impacted or impaired.

**Measure:** Proportion (%) of shoreline assessed as very low and/or low intactness.

**Target:** x% of impacted or impaired riparian habitat is restored.

## TAKING A CLOSER LOOK: Setting Targets for Highly Intact Sub-watersheds

Of the areas that were assessed, 4 of 11 sub-watersheds meet and exceed the management vision of 65% riparian health. For example, the Modeste sub-basin, with 69% of its riparian areas highly intact, already meets our watershed goal of 65%. Hence, efforts in this sub-watershed might focus on conserving these intact areas.

### Example: Modeste sub-watershed

**Objective 1:** Conserve high quality riparian habitat in the Modeste sub-watershed. Habitats identified as high conservation potential will be conserved first.

**Measure:** Proportion (69%) of shoreline assessed as high intactness.

**Target:** 65% of high quality riparian habitat is conserved.

To achieve this objective, riparian managers might first conduct a study to identify riparian landownership (public or private), then tailor their actions accordingly. Crown land managers might work with lessees to make sure riparian buffers are being observed. Municipal managers might make sure private land stewardship programs are available to private landowners and that they have the tools and knowledge to conserve their riparian areas. See more about potential management actions in the next section.

Looking further at the assessment data for this sub-basin, one might note that while the sub-basin overall meets the 65% goal, several priority water bodies are below the goal, and may require some restoration activities. Hence, additional objectives might be set for each water body.

## TAKING A CLOSER LOOK: Setting Targets for Low Intact Sub-watersheds

In contrast to the Modeste sub-basin, riparian lands in several (7/11) NSR sub-watersheds assessed are below our vision of 65% highly intact. For example, Sturgeon sub-basin, at 43% highly intact, is well below our vision of 65%. Hence initial focus in this area should probably take a two-pronged approach, with education and awareness around the need for riparian conservation of existing healthy riparian lands, and on the ground programs to restore degraded areas.

To focus our conservation and restoration efforts, we can again look at priority water bodies in this sub-basin.

### Example: Sturgeon sub-watershed

**Objective 1:** Conserve high quality riparian habitat in the Sturgeon sub-watershed. Habitats identified as high conservation potential will be conserved first.

**Measure:** Conserve existing (43%) high-quality riparian habitat.

**Target:** 65% of high quality riparian habitat is conserved.

**Objective 2:** Restore riparian habitats that have been impacted or impaired in the Sturgeon sub-watershed. Habitats identified as high restoration potential will be restored first.

**Measure:** Restore 22% of riparian habitats that have been impacted.

**Target:** 65% of high quality riparian habitat is conserved.

**Table 1. List of intactness levels by sub-watershed, and restoration opportunity (%) required to meet the 65% high intactness goal.**

Sub-watershed Name	Total Length Assessed (km)	Intactness Scores				Improvement (%)
		Very Low (%)	Low (%)	Moderate (%)	High (%)	
Beaverhill	1,814	26	10	25	38	27
Brazeau	150	0	0	0	100	
Clearwater	408	12	5	12	71	
Frog	2,400	19	6	17	58	5
Modeste	1,916	16	4	10	69	
Monnery	378	26	10	22	42	22
Ram	628	2	1	2	95	
Strawberry	1,967	32	10	23	34	31
Sturgeon	1,826	24	20	13	43	22
Vermilion	3,293	28	16	31	25	40
White Earth	2,524	30	8	18	44	21
<b>Watershed Total</b>	<b>17,302</b>	<b>Avg 24%</b>	<b>Avg 10%</b>	<b>Avg 19%</b>	<b>Avg 46%</b>	

**TAKING A CLOSER LOOK:  
Setting Targets for  
a Waterbody**

The management target of 65% is scalable and can be applied to all waterbodies within a sub-watershed to help us achieve our overall objective of 65% intactness in the North Saskatchewan River Watershed. Understanding which waterbodies do not yet meet the overall target of 65% can help direct a management response toward those waterbodies. Furthermore, this is useful information for Watershed Stewardship Groups, regarding how their chosen waterbody fits within the larger scale of management priorities. Through the riparian intactness project, it was found that 281/2607 (~10%) of the waterbodies assessed are >65% highly intact.

For example, Wabamun Lake, at 29% highly intact, is well below our vision of 65%. Hence, we recommend the following two objectives:

**Example: Wabamun Lake**

**Objective 1:** Conserve high quality riparian habitat along Wabamun Lake. Habitats identified as high conservation potential will be conserved first.

**Measure:** Conserve existing (29%) high-quality riparian habitat.

**Target:** 65% of high quality riparian habitat is achieved.

**Objective 2:** Restore riparian habitats that have been impacted or impaired along Wabamun Lake. Habitats identified as high restoration potential will be restored first.

**Measure:** Restore 36% of riparian habitats that have been impacted.

**Target:** 65% of high quality riparian habitat is achieved.

See the Appendix for a comprehensive list of intactness results for waterbodies in each sub-watershed. The prioritization maps included in the appendix can be used to emphasize which reaches of the waterbody could be prioritized for conservation (that is, where riparian intactness is high and catchment pressure is low) as well as restoration (where riparian intactness is low and catchment pressure is high). Upon request by program and project coordinators, the prioritization maps are available through the Riparian Web Portal or direct GIS file transfer.

**TAKING A CLOSER LOOK:  
Setting Targets  
for a Municipality**

Finally, the scalable target of 65% can be applied to municipalities to help us achieve our overall objective of 65% intactness in the North Saskatchewan River Watershed. Municipalities can use their rating to evaluate their need to invest in programs and policies to help protect and restore riparian areas in their jurisdiction.

For example, Parkland County, at 53% highly intact, is below our vision of 65%. Hence the two-pronged approach could work here as well.

**Example: Parkland County**

**Objective 1:** Conserve high quality riparian habitat in Parkland County. Habitats identified as high conservation potential will be conserved first.

**Measure:** Conserve existing (53%) high-quality riparian habitat.

**Target:** 65% of high quality riparian habitat is achieved.

**Objective 2:** Restore riparian habitats that have been impacted or impaired in Parkland County. Habitats identified as high restoration potential will be restored first.

**Measure:** Restore 12%, or 107 km, of riparian habitats that have been impacted.

**Target:** 65% of high quality riparian habitat is achieved.

Municipalities will be provided with an executive summary report that outlines the Riparian Intactness, catchment pressure and prioritization for their municipality. This report will also recommend the highest priority lakes and creeks in their jurisdiction. When waterbodies are trans-boundary, as in they cross multiple municipal jurisdictions, it is recommended that municipalities work together to reach their conservation and restoration goals.



*Riparian plants along an Alberta river. Stock photo.*

# Management Actions to Achieve Objectives

Alberta continues to see a decline in healthy functioning riparian lands. Hence, in order to *maintain or improve what we currently have, or to achieve a more specific vision of seeing 65% of intact riparian lands in the North Saskatchewan watershed*, we likely need to do something different in how we currently manage this resource. This does not necessarily mean that we need new or different management tools or resources, only that we may need to better apply the tools that we currently have.

Hence, in the following sections, we revisit a number of tools and set some management actions to improve their use in the next several years. Although some actions can be rolled out by the NSWA for the entire North Saskatchewan at the same time (e.g., educational initiatives such as riparian brochures, websites, portals), others might be undertaken by sub-basin groups and targeted to specific priority areas (e.g., shoreline restoration/plantings on Little Egg Creek undertaken by the SRWA). Still others may be undertaken by municipalities, conservation groups, or individual landowners.

## STRATEGY 1. INCREASE PUBLIC AWARENESS VIA EDUCATION AND OUTREACH



**Rationale:** Given the right information and tools, most of us (including farmers, ranchers, acreage owners, recreational lake lot owners, urban residents) will do the best thing possible to keep our land, communities and watershed healthy and sustainable. Hence, the greatest asset available to the NSWA is public awareness, which can be increased through the use of education and outreach tools. Once they are made aware of their importance, including the links between healthy natural areas and the benefits to humans (ecological goods and services), many individuals will do what they can to conserve or restore riparian lands voluntarily.

### Action 1.1

Get information into the hands of residents of the North Saskatchewan watershed, moving them from awareness of the importance of riparian lands, through the development of knowledge, attitudes and skills to steward riparian lands appropriately.

- Make presentations to municipal councils, Ag Service boards, Ag and landowner groups, lake groups, etc.
- Perform a *riparian landowner profile* to better understand audiences and appropriate outreach strategies
- Encourage all landowners to adopt Best Management Practices suited to their land-use designation



*Educating people about riparian areas through public events is key for raising awareness and connecting people to resources. Photo credit: Cows and Fish. [www.cowsandfish.org](http://www.cowsandfish.org)*





Education and outreach play a key role in equipping residents and landowners to conserve riparian areas. Photo: NSWA.



Online workshops can provide valuable riparian tools for municipal leaders, landowners, and land managers.



Naming and placing sign along small creeks can highlight their importance. Photo: Cows and Fish. cowsandfish.org

- Make existing and, if needed, new materials (e.g., how-to videos, factsheets) easily accessible
- Create a riparian webpage on the NSWA website (riparian portal)
- Create a riparian brochure that drives readers to a webpage
- Distribute the riparian brochure broadly by including it in ratepayer mailouts or county newsletters, etc.
- Work with NGOs to host more riparian stewardship workshops for landowners
- Develop educational videos on riparian 101, land-owner projects, intactness methods and the Web Portal

### Action 1.2

Create opportunities to share techniques, lessons learned, barriers and opportunities to managing riparian lands.

- Organize riparian forum/workshops targeted at specific groups (Ag groups, lake groups, etc.)
- Create easy-to-read guides to share on the Riparian Web Portal
- Work with local greenhouses and other companies to establish a network of restoration supplies

### Action 1.3

Provide greater awareness of where our riparian lands are. Unnamed creeks are in much poorer condition than named. These unnamed creeks are much smaller, and more difficult to notice.

- Find ways to name, map, and add signage to creeks and other named and unnamed water bodies, building awareness of their importance / contribution to overall watershed health
- Use the landowner profile to delve into a deeper understanding of the land uses adjacent to unnamed creeks
- Promote awareness of unnamed creeks through a series of articles
- Highlight unnamed creeks in a riparian video series

## STRATEGY 2. PROVIDE GREATER SUPPORT TO PRIVATE LAND STEWARDSHIP INITIATIVES

**Rationale:** Most of the land in the North Saskatchewan watershed is private. Private landowners (including farmers, ranchers, acreage owners, lake cottage owners, commercial and industrial landowners) may need knowledge, tools and support to be effective at managing their riparian lands. While there are a number of tools and programs available, not everyone is aware of these programs, or they may not be available where they are needed most.



Phase 3 of the NSWA's RHAP program will help support this work by developing a Riparian Web Portal that identifies what tools and programs are available and makes assessment and other information public, including where projects have/are occurring throughout the watershed. Additionally, a number of municipalities and NGOs are taking the lead on implementing on-the-ground programs. However, greater effort and financial support is needed to link landowners to programs, and to ensure programs have capacity in the areas where they are needed.

### Action 2.1

Encourage more recreational lake property owners to restore their shorelines by promoting and getting more capacity to lake groups and lake programs (e.g., Living by Water, WWMC, LILSA) to in turn:

- Provide how-to workshops
- Develop demonstration sites with signage
- Promote/provide tours of demonstration sites

### Action 2.2

Get more private landowners doing on-the-ground riparian *restoration* projects by collaborating with existing initiatives to build capacity to expand into areas where projects are currently absent. Local initiatives include:

- ALUS Canada
- County Ag Fieldmen
- Environmental Farm Plan program
- Green Acreages program
- Clear Water Landcare
- Highway 2 Conservation
- Trout Unlimited
- Fish & Game Associations
- Canadian Agricultural Partnership



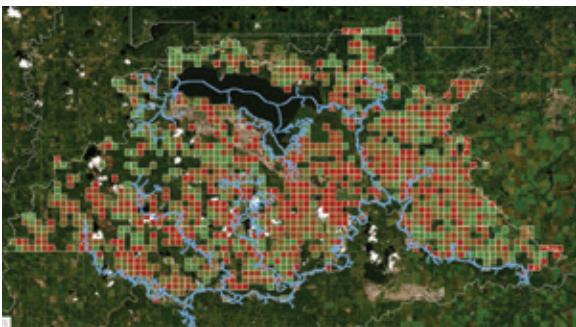
*Signage about eco buffers and demo projects create awareness about how residents or lakeshore groups can invest in their shorelines.*



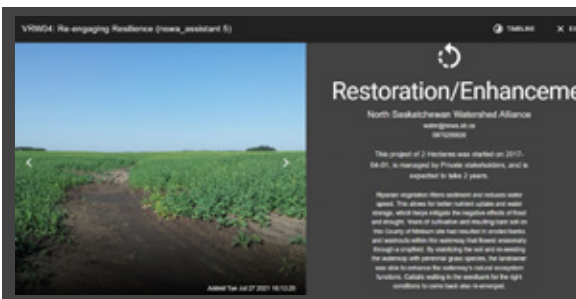
*Demonstration sites generate landowner and public awareness about riparian and revegetation work.  
Photo: NSWA.*



*On-the-ground conservation projects protect intact areas that already exist on a farm or lakeshore. Conservation efforts usually focus on areas that are relatively intact and may already have an initiative in place. Photo: NSWA.*



*The Integrated Modelling for Watershed Evaluation of BMPs is a scientific model that examines the cost and ecological benefits of nature-based infrastructure such as riparian buffers and revegetation. Photo courtesy of University of Guelph and ALUS.*



*The Riparian Web Portal showcases on the ground projects to inspire communal and private landowner initiatives. Screenshot: riparian.info*

### Action 2.3

Get more private landowners doing on-the-ground riparian *conservation* projects by collaborating with existing initiatives and advocating for the development of new initiatives where programs are limited. Examples of local conservation programs include:

- Land Trust Organizations (e.g., Edmonton Area Land Trust, Nature Conservancy of Canada, Alberta Fish and Game Association, some municipalities etc.)
- Alberta Conservation Association
- Ducks Unlimited
- Municipalities that offer a tax incentive for conservation agreements (i.e., conservation easement)

### Action 2.4

Continuously demonstrate the value of local project sponsorship by senior government.

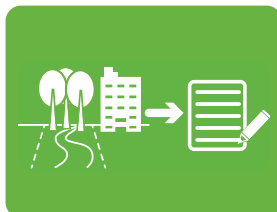
- Showcase local projects that lead to increased ecosystem services to human communities
- Engage in research projects that demonstrate the cost benefits of investing in natural infrastructure.
- Utilize the Riparian Web Portal to showcase successful projects on the ground throughout the watershed

### Action 2.5

Highlight areas needing work and work that has been done by:

- Video interviews/ newspaper stories / tours of restored sites / etc.
- Use the NSWA Riparian Web Portal to show where different types (fencing, watering, plantings) of projects exist and where more projects can be done

### STRATEGY 3. FACILITATE POLICY ALIGNMENT & INTEGRATED WATER & LAND USE PLANNING



**Rationale:** To be better at managing riparian areas in the future, we need to use existing tools more effectively. This can include streamlining policies and management plans such that they are consistent across jurisdictions managing the same watershed. We also need to improve coordination and collaboration, in order to leverage capacity for the amount of work that needs doing.

#### Action 3.1

As per Phase 2 of the Riparian Health Action Plan, assess the programs, policies, and bylaws in place to guide restoration and conservation of priority areas, including:

- Identifying types of landowners adjacent to riparian areas,
- Conducting an intermunicipal review of bylaws and other senior policies and offering advice on where it makes sense to align such policies (see some examples of policy tools in Appendix 2)
- Advocating for updates to municipal plans and policies
- Identifying opportunities to improve senior government policies, such as those that govern agricultural practices near waterbodies

#### Action 3.2

Ensure local governments are knowledgeable about the benefits riparian lands provide and about trade-off costs by:

- Developing a business case/ cost benefit analysis / narrative about retaining green infrastructure for elected officials and senior bureaucrats
- Develop a Planner's Guide to Riparian Management (i.e., see Manitoba example)

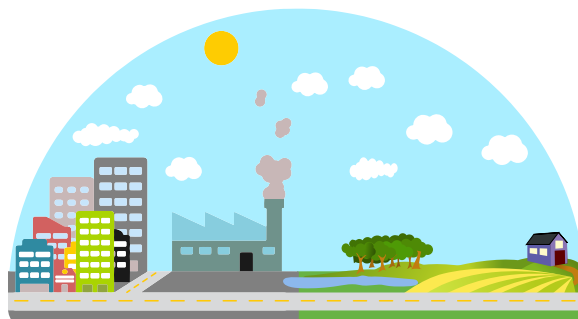
#### Action 3.3

Improve compliance and enforcement of existing laws and regulations protecting riparian lands by:

- Outlining the risks of liability to municipalities
- Advocating for greater enforcement capacity
- Advocate for opportunities to set environmental standards at a provincial level
- Improve municipal bylaws around riparian areas to enable sufficient enforcement and graduated sanctions

#### Action 3.4

Submit a Statement of Opportunity to the Alberta Water Council to investigate riparian regulations in other jurisdictions (BC, Manitoba) to see how a similar regulation might benefit Alberta.



*Land use planning that considers setbacks, municipal policies, and landowners living close to waterbodies are all key ways to protect and improve watershed and riparian health.*



*Municipal leaders and land managers and environmental planners are a critical part of enacting solid riparian policies and advocating for green infrastructure. Stock photo.*



Riparian areas on Crown land face pressure from recreational use, industry, and livestock.  
Photo credit of the Ram River: Carol Rusinek.

## STRATEGY 4. WHERE NEEDED, ADVOCATE FOR RESTORATION EFFORTS ON CROWN LANDS



**Rationale:** The Government of Alberta is responsible for the bed and shore of most permanent water bodies in the province. They are also responsible for managing Crown lands, even though these lands may be leased for forestry, agricultural or used for other purposes such as recreation. The GOA is also responsible for managing water quality and quantity via the *Water Act* and *Environmental Protection and Enhancement Act*. Given these responsibilities, it seems incongruent that riparian areas on public lands may not be healthy. Nevertheless, riparian degradation on public lands does occur, and may need to be addressed in some sub-basins.

### Action 4.1

Identify highest priority areas for riparian restoration and work with provincial and public land managers to address these areas:

- Utilize the Landowner Profile to identify highly impacted Crown Lands and advocate for restoration through the responsible department
- If available, such as it is in the Sturgeon watershed, use the information in the Aquatic Ecosystem Assessment report to ensure municipalities are aware of where bridge and culvert remediation work is needed to improve riparian health, and support provincial and municipal efforts to map and protect flood plains, shorelines, etc.

### Action 4.2

Ensure that all senior government policies and codes of practice for permitted uses of Crown Lands reflect modern Best Management Practices regarding riparian lands.

## STRATEGY 5. PROMOTE RESEARCH AND KNOWLEDGE BUILDING



**Rationale:** Despite the considerable amount of work done to date, we still have data and information gaps that need to be filled.

### Action 5.1

As per the RHAP Phase 1 initiative, continue to assess the condition of remaining riparian areas in the North Saskatchewan River watershed. As such assessments are completed, set sub-basin riparian objectives, and use these five strategies to achieve the set objectives. Repeat assessment work at regular intervals to identify “hot-spots” of rapid deterioration.

### Action 5.2

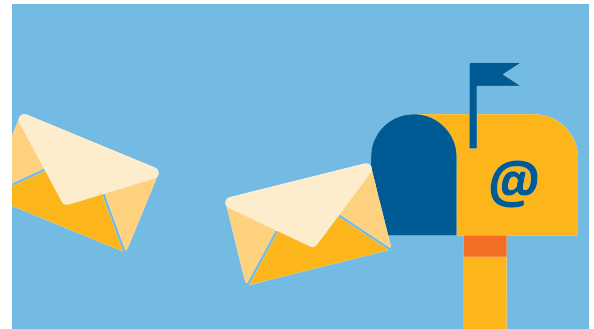
Survey residents to understand attitudes as well as values towards riparian indicators.

### Action 5.3

Encourage academic researchers to investigate the connection between riparian health targets and environmental outcomes within an Alberta-context.



*Local academic research plays a critical part in understanding the intersection of health targets and environmental outcomes. Photo credit: Dr. Glen Hvenegaard.*



*Surveys clarify resident awareness and attitudes about riparian and shoreline health.*

# Tracking and Measuring Success

Progress on achieving riparian objectives in the North Saskatchewan River watershed will be tracked via the following measures:

- Riparian Intactness levels will be reassessed every 10 years. A net improvement of riparian condition will be seen at each scale- watershed, sub-watershed, waterbody and municipality.
- Municipal policies and plans addressing riparian management have been reviewed for alignment and harmonize with the goals of this strategy whereby the integrity of riparian health is protected.
- There is an increase in the number of riparian restoration and conservation projects on the ground. This will be measured through an increase in the uptake of programs and resources offered through government and non-profit organizations.
- The Riparian Web Portal is found to be a useful tool by landowners, program managers and planners. This will be measured through the number of access login requests and projects displayed on the map will increase each year.



*Riparian areas are a source of habitat for wildlife and provide people with many recreational opportunities. Photo credit: Clayton Reitzel.*



*On-the-ground projects like riparian fencing ensure shoreline and water health. Photo credit: NSWA.*

# Conclusion

Riparian lands are recognized as critical for protecting source waters and for maintaining the water quality, quantity and aquatic health of the North Saskatchewan River and its tributaries, as well as other water bodies (e.g. lakes, wetlands) in the watershed.

Through a detailed desktop-study of riparian lands, the NSWA assessed the condition (i.e. “intactness”), of approximately 17,300 km of riparian areas located in the central and eastern regions of the North Saskatchewan River watershed. The current baseline condition of the areas assessed were:

- 46% are categorized as **high intactness**
- 19% are categorized as **moderate intactness**
- 10% are categorized as **low intactness**
- 24% are categorized as **very low intactness**

The meaning of these results (i.e. where we are at) is relevant within the context of a management goal (i.e. where we want to go). In a series of workshops that occurred between 2019-2021 among key stakeholders, we formulated a vision of riparian health within the watershed and set a riparian management goal that seeks to achieve a minimum of 65% high intactness and a maximum of 25% low + very low intactness across the watershed.

The Riparian Conservation and Restoration Strategy provides a path forward with five strategies:

- Strategy 1** Increase Public awareness via education and outreach
- Strategy 2** Provide greater support to private land stewardship initiatives
- Strategy 3** Facilitate policy alignment & integrated water and land use planning
- Strategy 4** Advocate for restoration efforts on crown lands where needed
- Strategy 5** Promote research and knowledge building

The North Saskatchewan Watershed Alliance will continue to work with the Headwaters, Sturgeon and Vermilion River sub-watershed alliances to implement the action items in the Riparian Conservation and Restoration Strategy.

Through this strategy, we encourage all landowners, decision makers, stewardship groups and the public to adopt the riparian management goal and harmonize the recommendations from this report with the strategic goals of every organization that affects riparian areas. In maintaining riparian health, we recognize the need to be aligned across jurisdictions and to work collaboratively, with a framework from policy to practice, with both regulatory and non-regulatory tools, and evidence-based decision-making.



*An aerial shot of the landscape captures just how vital these green buffers are for wildlife, birds and maintaining water quality. Photo credit: Cows and Fish. [www.cowsandfish.org](http://www.cowsandfish.org)*





Photo credit: *Bill Trout.*

# Appendix 1. Riparian Resources

Agroforestry and Woodlot Extension Society (several riparian publications including a riparian management workbook: go to publications page and enter 'riparian' in the search box) <https://www.awes-ab.ca/publications/>

Alberta Conservation Association: Riparian conservation: A Landowner Guide. <https://www.ab-conservation.com/programs/land/riparian-conservation-a-landowner-guide/> and Riparian conservation program reports: <https://www.ab-conservation.com/programs/land/projects/riparian-conservation/>

Alberta Water Council. Riparian Project Team reports. <https://www.awchome.ca/projects/riparian-land-conservation-management-19/>

Alberta Urban Municipalities Association riparian management webpage and Policy on Riparian Areas <https://auma.ca/advocacy-services/programs-initiatives/water-management/watershed-management/riparian-area-management>

Bow River Project. 2002. Protecting Riparian Areas: Creative Approaches to Subdivision Development in the Bow River Basin: A Guide for Municipalities, Developers and Landowners [https://www.brbc.ab.ca/index.php?option=com\\_content&view=article&id=45&Itemid=170](https://www.brbc.ab.ca/index.php?option=com_content&view=article&id=45&Itemid=170)

City of Calgary. 2013. Riparian Strategy. <https://www.calgary.ca/UEP/Water/Pages/Watersheds-and-rivers/Riparian-areas.aspx>

Cochrane Wetlands and Riparian Areas Conservation and Management Plan <https://www.cochrane.ca/DocumentCenter/View/501/A-WETLANDS-AND-RIPARIAN-AREAS-CONSERVATION-PLAN?bidId=>

Cowichan Watershed Board [riparian targets](#)

Cows and Fish (Alberta Riparian Habitat Management Society). <http://cowsandfish.org/>

Crowsnest Pass. Agricultural and Environmental Services. Riparian Area Health Brochure <https://www.crowsnestpass.com/public/download/documents/4807> and Factsheet <https://www.crowsnestpass.com/public/download/documents/4808>

Edmonton and Area Land Trust riparian webpage <https://www.ealt.ca/blog/riparian-areas>

Government of Alberta:

- Stepping Back from the Water <https://open.alberta.ca/publications/stepping-back-from-the-water-a-beneficial-management-practices-guide-for-new-development>
- Shorelands Riparian Areas website <https://www.alberta.ca/shorelands-riparian-areas.aspx>
- Grazing and range management – Riparian Areas <https://www.alberta.ca/grazing-and-range-management-riparian-areas.aspx>

Government of Canada. Riparian Areas Management website. <http://www.agr.gc.ca/eng/agriculture-and-climate/agricultural-practices/soil-and-land/riparian-areas/riparian-area-management/?id=1187631191985>

Government of Manitoba. Planning for the Protection of Riparian Areas. [https://www.gov.mb.ca/mr/plups/pdf/riparian\\_area\\_guide.pdf](https://www.gov.mb.ca/mr/plups/pdf/riparian_area_guide.pdf)

[Long Island Sound Study](#)

Okotoks Living Soils Filtration project. <https://www.okotoks.ca/sustainability/our-corporate-initiatives/living-soils-filtration-project>

Penn State Extension. Live-staking. A How to Guide. Video. <https://extension.psu.edu/live-staking-a-how-to-guide>. (Note: to see other videos, articles and materials, go to <https://extension.psu.edu/> and enter riparian or watershed in the search function.)

Pigeon Lake Watershed Alliance. Alberta Clean Run-off Action Guide. <http://www.plwmp.ca/clean-runoff-guide-2/>

Review of Riparian Management Policy in Alberta's Forests. [https://friresearch.ca/sites/default/files/null/HLP\\_2009\\_12\\_Prsnttn\\_InfoSessionReviewofRiparianManagementPolicyinABsForests\\_Statd.pdf](https://friresearch.ca/sites/default/files/null/HLP_2009_12_Prsnttn_InfoSessionReviewofRiparianManagementPolicyinABsForests_Statd.pdf)

Rocky View. Riparian Policy. <https://www.rockyview.ca/Portals/0/Files/BuildingPlanning/Planning/ASP/ASP-Greater-Braqq-Creek-Appendices.pdf>

Shoreline Assessment Factsheets <https://talkaep.alberta.ca/the-water-channel/widgets/41575/documents>

## Appendix 2. Examples of Riparian Land Policy and Planning Statements

\* This is not an exhaustive list of policy tools

Document	Description	Example
North Saskatchewan Regional Plan	One of seven regional plans created for the province under the <i>Alberta Land Stewardship Act</i> . Both the plan and its supporting regulations can address issues affecting water quality, quantity and aquatic ecosystem health.	Not yet completed.
South Saskatchewan Regional Plan		<p>8.23 Utilize or incorporate measures which minimize or mitigate possible negative impacts on important water resources or risks to health, public safety and loss to property damage due to hazards associated with water, such as flooding, erosion and subsidence due to bank stability issues, etc., within the scope of their jurisdiction.</p> <p>8.24 Incorporate measures in future land-use planning decisions to mitigate the impact of floods through appropriate flood hazard area management and emergency response planning for floods.</p> <p>8.25 Prohibit unauthorized future use or development of land in the floodway in accordance with the Flood Recovery and Reconstruction Act and the Floodway Development Regulation under development, which will control, regulate or prohibit use or development of land that is located in a floodway and define authorized uses.</p> <p>8.26 Identify and consider, based on available information including information from the Government of Alberta, the values of significant water resources and other water features, such as ravines, valleys, riparian lands, stream corridors, lakeshores, wetlands and unique environmentally significant landscapes, within their boundaries.</p> <p>8.27 Determine appropriate land-use patterns in the vicinity of these significant water resources and other water features.</p> <p>8.28 Consider local impacts as well as impacts on the entire watershed.</p>

		<p>8.29 Consider a range of approaches to facilitate the conservation, protection or restoration of these water features and the protection of sensitive aquatic habitat and other aquatic resources.</p> <p>8.30 Establish appropriate setbacks from waterbodies to maintain water quality, flood water conveyance and storage, bank stability and habitat.</p> <p>8.31 Assess existing developments located within flood hazard areas for long-term opportunities for redevelopment to reduce risk associated with flooding, including human safety, property damage, infrastructure and economic loss.</p> <p>8.32 Facilitate public access and enjoyment of water features, to the extent possible.</p> <p>8.33 Use available guidance, where appropriate, from water and watershed planning initiatives in support of municipal planning.</p>
<p>Alberta's Water for Life Policy</p>	<p>The Water for Life strategy outlines the Government of Alberta's commitments to manage and safeguard Alberta's water resources, now and in the future.</p>	<p>The Government of Alberta intends to improve and maintain the health of our aquatic ecosystems by managing the cumulative impacts of point and non-point sources, promoting watershed management, and establishing water conservation objectives on all major basins. We will enforce protection on known critical aquatic ecosystems and take action to improve the health of significantly impacted aquatic ecosystems. Through these initiatives, the assimilative capacity, in-stream requirements, and riparian needs of our water bodies will be addressed.</p>
<p>NSWA IWMP</p>	<p>A document developed cooperatively by the NSWA and its stakeholders to address watershed issues. IWMPs include critical water-related information and should be consulted by other planning authorities to ensure consistency. Similarly, where they exist, sub-basin plans should also be consulted where relevant.</p>	<p><i>Watershed Management Direction 3.3: Maintain and restore riparian areas.</i> (Actions include inventorying, assessing health, developing set-back guidelines, incentives, support programs (NSWA IWMP))</p>
<p>EMRB Growth Plan</p>	<p>The Growth Plan is a statutory document that defines policies for growth within municipalities in and around the Edmonton Metropolitan Region. In this plan, development is balanced with</p>	<p>Policy 2.2.1 (c) "The provincial Water for Life and Alberta's Strategy for Sustainability will guide statutory plans, regional plans and regional infrastructure projects to protect, enhance, and restore the water quality in the Region. Statutory plans, regional plans and regional infrastructure projects will include policies and initiatives to</p> <p>a) Conserve natural areas along waterways</p>

	environmental and social concerns.	<ul style="list-style-type: none"> <li>b) Improve water quality and quantity</li> <li>c) Incorporate best practices to minimize soil erosion protect and enhance riparian zones, and conserve and enhance areas that contain habitat for significant, rare or endangered plant species.</li> <li>d) Conserve wetlands with sufficient buffers to maintain their water quality and hydraulic function, as well as upland habitat necessary to support the life cycle needs of the wetland ecosystem.”</li> </ul>
IDP	An intermunicipal development plan (IDP) is a high-level statutory plan jointly developed by two or more neighbouring municipalities. IDPs ensure that land use decisions within the IDP area are thoughtfully considered through a cooperative planning approach to support the long-term interests of both municipalities.	<p>Environmental Policy</p> <p>7.2 Environmental Reserve – Both Counties shall follow Provincial regulations as it pertains to the dedication, classification and use of Environmental Reserve, Municipal Reserve, and Conservation Reserve in an effort to maintain the integrity of the systems identified.</p> <p>7.3 Setbacks from Natural Areas and Hazardous Landscapes – Through respective Land Use Bylaws, both municipalities shall enforce appropriate development setbacks from the North Saskatchewan River, waterbodies, watercourses, and hazardous landscapes. The governing municipality may require the applicant to supply recommendations, prepared by a qualified professional, regarding development setbacks and/or other required mitigation measures.</p> <p>7.4 Ecosystem Health – Both municipalities will promote environmental stewardship and the health of the regional ecosystem, watersheds, wetlands, and environmentally significant areas within the Plan Area.</p> <p>7.7 Watershed Management – Both municipalities shall recognize the importance of wetlands, riparian areas, watercourses and waterbodies, and will collaborate when reviewing proposals which may impact watershed(s) within the Plan Area. Participation by both municipalities in regional watershed alliance groups will be encouraged, and information and recommendations provided may be considered, where appropriate.</p> <p>Extracted form Section 7 of the IDP between Parkland County and Brazeau County</p>
MDP	A land-use planning policy document that guides development in the planning area. An MDP can inform the basis of	Policy: Riparian areas be identified and protected from risks associated with development, particularly high pollution risks:

	<p>managing development on or near riparian areas with specific policies for the protection, retention and, where needed, restoration of riparian areas. All municipalities must have a development plan that meets MGA requirements and is generally consistent with the corresponding Regional Plan under ALSA.</p> <p>Riparian areas and water bodies should be identified in the MDP (as a map or link to a map).</p> <ul style="list-style-type: none"> <li>Such facilities that may already exist in riparian areas will be managed so as to phase their relocation to more suitable areas over time.</li> </ul>	<ul style="list-style-type: none"> <li>Wastewater treatment facilities, fuel tanks and fertilizer storage are prohibited in riparian areas due to the possible contribution of nutrient or deleterious chemicals directly into the riparian area.</li> </ul> <p>Policy: Development setbacks are required along water bodies, including drains, retention ponds and ephemeral streams, to ensure protection, retention or rehabilitation of riparian areas. Within these setbacks, the natural vegetative cover must be retained or rehabilitated.</p> <p>Policy: Areas bordering streams, lakes, rivers, and other watercourses. These areas have high water tables and support plants requiring saturated soils during all of part of the year and are to be protected from development according to <b>Section 4.4.1.3</b> of the MDP. (City of Spruce Grove)</p> <p>“Restrict development in wetlands, riparian zones and flood-prone areas.” <b>Section 4.4.1.3</b> of the MDP, City of Spruce Grove</p> <p>Policy: prohibit removal of the natural riparian buffer. <b>Section 9.10.7</b> of Lac Ste. Anne County</p>
LUB	<p>Land Use Bylaws generally identify land use districts or zones and/or where development will or will not occur.</p> <p>For example, an LUB can state that riparian areas should be zoned for non-intensive uses that will minimize disturbance or pollution to the riparian area. It can identify appropriate uses of land adjacent to riparian areas as: • Floodplain • Natural environment • Park and open space • Commercial recreation • Managed livestock grazing.</p> <p>An LUB might identify riparian zones on a map/overlay to be included in the bylaw to clearly indicate where the policy applies, where development can occur, hence minimizing confusion for landowners and developers.</p>	<p>Bylaw: A riparian statement is included in the MDP, which in turn is a bylaw in the LUB. Bylaw C-960-16 City of Spruce Grove</p> <p>Bylaw: No permanent building is permitted within 20.0 m of the top of bank of any water body, or the top or bottom of a slope that exceeds a 15% Grade as outlined...in the LUB. City of Spruce Grove</p>

	<p>Zoning by-laws also enable Councils to prohibit or restrict development for a use permitted in that zone if the area has been identified by Council or other agencies as being subject to certain conditions. These include: flooding, erosion, bank instability, landslides, subsidence, is marshy or unstable, or otherwise hazardous or unsuitable for the proposed development and use by virtue of its location, soil or topography.</p> <p>Re-zoning—such as rezoning from agricultural lands to residential, industrial, recreational or commercial—can be an opportunity to apply special designations like "Direct Control" or "Overlay Districts". These may include environmental overlay maps.</p>	
<p>Secondary Plans (ASP / ARP / Sub-division plans)</p>	<p>Secondary plans concern development issues at a smaller scale by focusing on a particular part of a municipality or a topic area. It can deal with development matters, such as subdivision design and road patterns as well as economic development or the enhancement or protection of heritage resources or sensitive lands. For example, a municipality could prepare a secondary plan for an area of shoreland that contains ecologically sensitive areas. Municipalities may have more than one secondary plan. All must be consistent with their MDP.</p> <p>Secondary plans should identify the water bodies on a map included in the plan. It should establish setback distances from water bodies and show the setback lines on a map and identify these as 'riparian areas'.</p>	<p>Might include several general statements about maintaining and enhancing shoreline vegetation, defining what constitutes 'natural vegetative cover' that is appropriate for that area (this may vary depending on the water body and according to slope, water level fluctuation, etc.) May also indicate what cover will be applied to where.</p> <p>May adopt a policy restricting development in hazard lands and sensitive areas.</p> <p>May establish a policy of dedicating public reserves as part of subdivision process and indicate types of uses to be restricted and uses to be considered adjacent to the riparian area provided beneficial management practices are implemented (ex: management of storm drainage).</p>

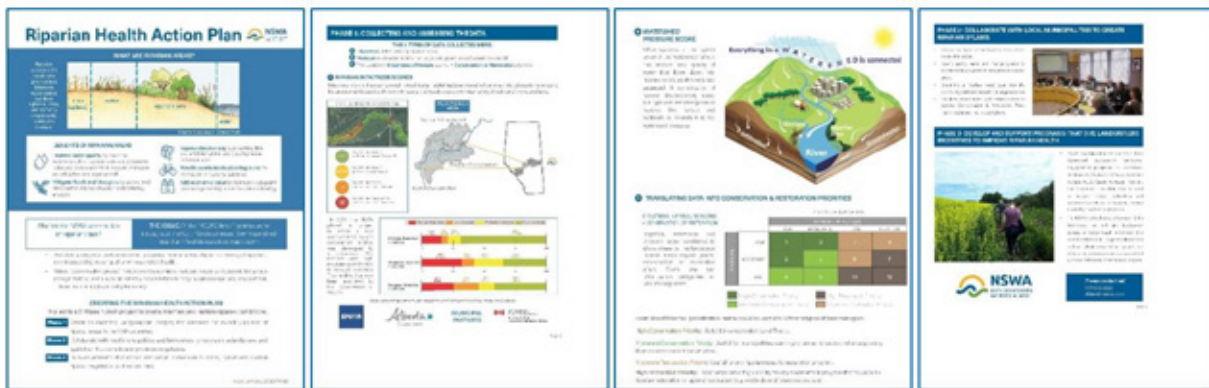


<p>Subdivision plan Review</p>	<p>The subdivision review process enables the municipal council to carefully review and consider the potential impacts of new development before it occurs. A subdivision must be consistent with the zoning by-law and development plan, but may also be required to meet certain conditions. Council may place conditions on approval of a proposed subdivision that will minimize potentially detrimental effects of development in a riparian area.</p>	<p>Examples of conditions which a council may require before a subdivision application is approved:</p> <ul style="list-style-type: none"> <li>• That the applicant dedicate land for environmental reserve purposes along the shoreline of the property to protect sensitive areas while at the same time enabling public access and maintaining continuity of the shore.</li> <li>• conditions that limit, regulate or prohibit any use, activity or development on the lands within a specified distance of the shoreland or riparian area.</li> <li>• That the proponent maintains the existing vegetation and, in circumstances where native vegetation is limited or absent, that vegetation is re-established. This applies in particular to proposed subdivisions for agricultural land, existing farmyards, or residual parcels of agricultural lands containing a water body or waterway. Note that some conditions would require on-site evaluation for specific development sites.</li> </ul>
<p>Design or Engineering Guidelines</p>	<p>Another opportunity to implement development plan policies to protect riparian areas at the subdivision stage is to ensure all subdivision proposals meet a minimum design standard. This can be achieved by adopting subdivision design guidelines for the planning area and enforced through zoning or development agreements. Cumulatively, linear development that surrounds a water body, such as a lake, may have detrimental long-term effects on riparian areas. Therefore, when designing development near riparian areas, it can be beneficial to cluster some development away from riparian areas.</p>	<p>Minimize detrimental effects of vehicular traffic on riparian areas such as direct runoff pollution from roads by locating residential development between the main access road and water body. Guide some development away from the lakeshore and have few lots with access directly from main roads. For example, arrange lots in clusters with road access from cul-de-sacs. This will lower the intensity by which the shoreline is developed, thus reducing the harmful effects of development directly on riparian areas, such as runoff pollution, riverbank erosion and instability. Carefully locate and design roads and buildings to respond to natural vegetation and landforms, so as to create minimal disturbance. Ensure there is no net loss of drainage capacity as a result of development, so that water is retained and runoff is slowed following a rainfall. Require retention ponds or wetlands as a part of every development proposal. Access trails to the shoreline should have a minimal impact on riparian areas. Design public pathways and trails to be narrow and made of porous material such as gravel instead of solid surfaces. Encourage launching and docking facilities to be clustered in a central location rather than strung along the waterfront, to reduce shoreline disturbance from development. Note that federal and provincial regulations do exist for such facilities and must be consulted and followed.</p>
<p>Setbacks from Hazard lands</p>		<p>Building setbacks from "hazard lands" should be as follows:</p> <p><i>"(a) A minimum of 30.0 m;</i></p> <p><i>(b) A minimum of 50.0m, in industrial land use districts</i></p> <p><i>(c) A lesser distance specified in a geotechnical analysis required pursuant to Subsection 11.3.2; or</i></p>

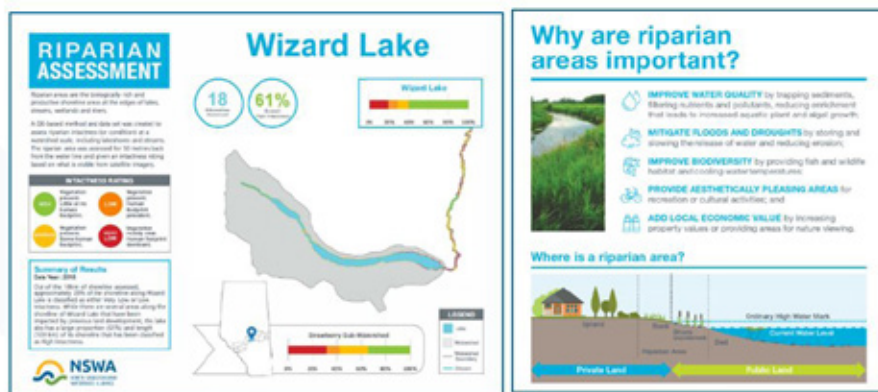
		<p><i>(d) A lesser distance that in discretion of the Development Authority, is considered acceptable, from the top of bank, as determined pursuant to Subsection 11.3.2, or any other escarpment or steep slope where the grade exceeds 30%.”</i> Parkland County</p> <p>For the purposes of Environmental Risk Management, setbacks are not given a specific distance. <b>Table 1. Setback Determination Criteria</b> of the MDP classifies criteria in terms of conditions such as slope, groundwater, floodplain, and vegetation, etc. and provides professional qualifications for those involved in setback determination. Sturgeon County</p> <p>A minimum setback distance of 6 meters from the top-of-bank is required and will be considered as Municipal Reserve (MR). Town of Gibbons</p> <p><b>Section 4.11.2</b> does not permit any permanent buildings within 6.0 metres of the top of the bank of any water body nor any development within 6.0 m of the top or bottom of an escarpment bank or slope where the grade exceeds 15 percent. Town of Onoway</p>
<p>Using RSMM to determine setback / set Environmental Reserve (based on Stepping Back from the Water Guidelines)</p>	<p>A public reserve where title is in the name of the municipality is under the administration and control of the municipal authority. Reserves are held for the purposes of public use, including a public park, recreation area, natural area, or planted buffer strip separating incompatible land uses. Councils can require that the subdivision applicant dedicate up to 10% of the land area being subdivided for public reserve or shoreland reserve purposes at no cost to the municipality. For the purposes of riparian area protection, a public reserve can be useful because the municipality can set its own parameters around the use of the land and the nature of development in or along it. If these public reserves are kept as natural areas, the land and</p>	<p>The Parkland County Riparian Setback Matrix Model is used to determine the area of Environmental Reserve between water bodies and urban development but has been applied limitedly. Parkland County; RSMM also adopted by Sturgeon County and Lac Ste. Anne County.</p> <p><b>Section 110.2.21</b> shows the adoption of the Riparian Setback Matrix Model (RSMM). According to County Administration, the RSMM is regularly used. However, according to <b>Section 9.11.25</b> of their MDP, apart from CFOs the RSMM does not apply to agricultural operations, thereby deregulating the interface between agricultural operations and water bodies. Lac Ste. Anne County</p> <p>Urban Development Setback from the River Valley and Ravine System (or Environmental Reserve in this case) is determined by the Urban Development Line (UDL). The UDL is largely determined by the Estimated Long Term Line of Stability, subsurface conditions (mines), excavations or sinkholes, or flooding or any other lands contemplated as Environmental Reserve under the MGA. City of Edmonton</p>

	<p>associated ecosystems and wildlife can be protected, and public access to the water body can be facilitated. Particularly in cottage regions, pressure on riparian areas can be intense and public access to shorelands can be limited and in high demand. It is important for a municipality to keep any riparian areas that are currently under local jurisdictions and continue to expand them along shorelines as new areas are proposed to be subdivided. A municipality is responsible for maintaining the public reserve, but in the case of riparian areas, where most of the land is left in its natural state, the maintenance costs are low.</p>	<p>MDP broadly mentions environmental goals where wetlands, water courses, and water bodies <i>and their associated riparian areas</i> require protection, enhancement and conservation through "<i>environmental reserve dedication and conservation easements, donations and bequests,</i>" Town of Stony Plain.</p>
<p><b>Conservation Easement</b></p>	<p>A conservation reserve or conservation easement is another tool that municipalities can use to implement riparian area protection policies in a development plan. A conservation agreement is typically held between a landowner and a government agency or qualified conservation organization (the agreement holder), such as Ducks Unlimited, Manitoba Habitat Heritage Corporation, or a Conservation District. Municipalities also can hold conservation agreements themselves. The agreement restricts development and certain other activities on a property to a mutually agreed-upon level, for conservation purposes. These restrictions are tied to the land, even when there is a change of ownership.</p>	<p>See EALT or Manitoba Habitat Heritage Corporation <a href="https://www.mhhc.mb.ca/our-programs/">https://www.mhhc.mb.ca/our-programs/</a></p>

# Appendix 3. Examples of Communication Products Available Through the Riparian Health Action Plan



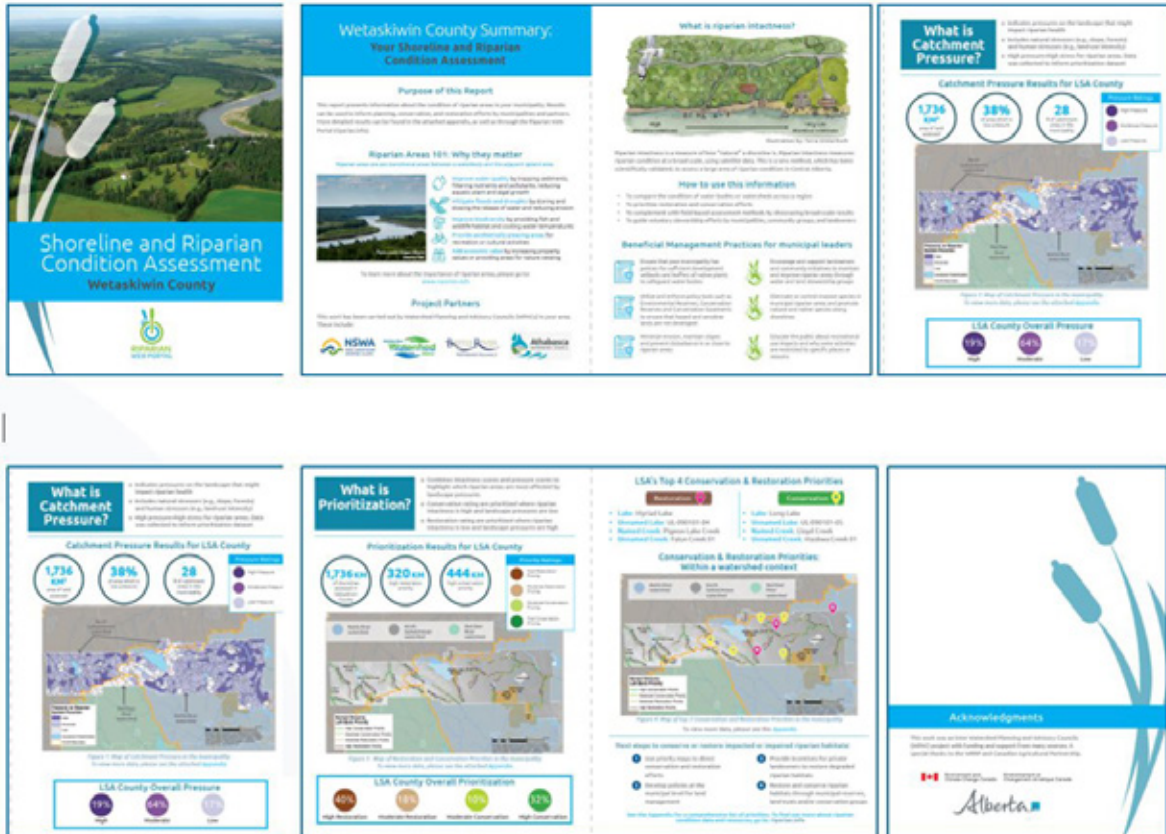
**Example 1:** Briefing note describing NSW’s 3-phase Riparian Health Action Plan. This briefing note was created in 2019 for public engagement.



**Example 2:** Waterbody summary factsheet. The factsheet describes intactness outcomes of specific lakes and creeks. Designed as an outreach tool for Watershed Stewardship Groups, the template can be used by any group and is available on the Government of Alberta’s *Water Channel*.



**Example 3:** Watershed Summary factsheet. This factsheet was created in 2019 to convey riparian intactness results for specific sub-watersheds. The intended audience are the sub-watershed alliance members to facilitate conversation about setting health targets.



**Example 4:** Municipal executive summary factsheet. The factsheet conveys riparian intactness results for specific municipalities, intended for elected officials and municipal staff. Combining intactness results from intactness projects that span major watersheds, each summary will also include an appendix of detailed results for each waterbody in the municipality. The template was created in 2021 as an inter-WPAC initiative.



**Example 4:** Riparian Web-portal (riparian.info). This online tool has 3 purposes: 1) showcase riparian data in a user-friendly format; 2) showcase restoration projects on the ground; and 3) provide resources such as examples of Best Management Practices (BMPs) and links to incentive programs.



Photo credit: *Bill Trout.*

**Get in touch:**

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