STRATEGY TO IMPROVE WETLAND MANAGEMENT in the NORTH SASKATCHEWAN RIVER WATERSHED

FEBRUARY 2024

NSWA
NORTH SASKATCHEWAN WATERSHED ALLIANCE

Elk Island National Park. Photo credit:Bill Trout.

Land Acknowledgment

In the spirit of respect and reciprocity, we acknowledge that the lands within the watershed of the North Saskatchewan River are in Treaty 6, Treaty 8, and the Métis Homeland. These lands are the traditional territories, travelling routes, and gathering places of the Cree, Saulteaux, Blackfoot, Métis, Dene, Stoney, and Nakota Sioux. We recognize the contributions of Indigenous peoples who have cared for this land since time immemorial and whose rich histories, cultures, languages, and presence continue to enrich these sacred lands that we all steward as Treaty People. The NSWA recognizes the role of watershed management and its practitioners in perpetuating a colonial system by excluding and ignoring the perspectives offered by Indigenous culture and science. We make this statement as an affirmation we are committed as an organization to improving the practice of watershed stewardship.

Executive Summary

Wetlands play a critical role in the landscape and provide numerous benefits to humans and wildlife, such that wetlands serve as one of the greatest defenses against climate change (Ramsar Convention on Wetlands, 2021; Strassburg, B.B.N., et al., 2020). In recognition of their value, the Government of Alberta's Wetland Policy (2013) provisions conservation of wetlands and drives the requirement to replace lost wetlands when the situation cannot be avoided. Fees paid by proponents to impact wetlands are then used through government funding programs that help to construct, restore, and enhance wetlands and wetland functions in the watershed from which they were removed. Unfortunately, these policies and programs have come after a century of previous government policies that supported the removal of wetlands for the purposes of settlement and growth, with an emphasis on developing the land for agriculture, transportation, industry, and resource extraction, within the North Saskatchewan River Watershed (NSRW). Thus, the task of the day is not only to prevent further wetland loss, but to conserve those that remain, restore historical wetlands where feasible, and increase the many critical functions they provide, such as improving water quality, reducing erosion, and storing water, among other functions.

Some of the major challenges to restoring wetlands in the watershed are understanding the answers to fundamental questions and having the capacity to effectively conserve and restore wetlands. This is in addition to issues of policy enforcement, education and communication gaps in understanding of the benefits of wetlands, and feelings of general apathy.

The purpose of this *Strategy to Improve Wetland Management in the North Saskatchewan River Watershed* (known also as the "Strategy") is to increase the amount of wetland area in the NSRW, improve the overall condition of wetlands in the basin, and build upon ongoing wetland management through collaboration and partnership. Within this 10-year Strategy, we have identified four strategic areas and 34 goals to address a multitude of capacity gaps that currently exist. The four strategies are to:

Collaborate and Take Action: Set and then achieve wetland restoration targets for the NSR watershed through multi-sector collaborative action.

Build and Mobilize Knowledge: Inform progressive wetland management in the NSR watershed through targeted research, mobilizing relevant knowledge, and augmenting management tools.

Optimize Planning, Policy, and Financial Programs: Align and enhance planning, policy, finance, and compliance actions across muncipal and provincial partners.

Implement Wetland Monitoring: Track and measure wetland status and restoration across the watershed, while expanding opportunities for wetland monitoring by citizens.

The goals and objectives identified within each of these strategic areas were compiled from multiple workshops and conversations (2021-2022) to assess where wetland management could be improved from the perspectives of three regional subwatershed alliances: the Sturgeon River Watershed Alliance, Vermilion River Watershed Alliance, and the Headwaters Alliance. These regional partnerships are composed of municipal staff, government employees, non-profit organizations, academics, and Indigenous organizations in the NSR watershed that come together to collaboratively improve the way in which watershed management and planning occur at a regional level.

Though this Strategy is geared towards making improvements within the NSR watershed, many of the goals identified can be applied at a provincial level, because they enhance current programs and policies, while collaboration and sharing knowledge can extend to provide resources for all wetland management practitioners in Alberta. Successful implementation of the Strategy will require ongoing dialogue among governments, Indigenous communities, industry (including developers), non-profit organizations, stewardship groups, landowners, and the public. Voluntary action by decision-makers, such as municipal councillors and landowners, will be critical to this Strategy's success. In restoring and conserving more wetlands in the NSR watershed, there is a need for efforts to be aligned across jurisdictions, working collaboratively, with a framework from policy to practice, with regulatory and non-regulatory tools, and evidence-based decision-making. Everyone in the NSR Watershed is responsible for improving wetland and watershed health for ourselves, downstream neighbours, and future generations.

Acknowledgements

The North Saskatchewan Watershed Alliance would like to recognize the financial contribution from the Government of Alberta's Alberta Community Partnership grant that funded the development of this Strategy, along with the in-kind partnership from the grant holder, the Summer Village of Silver Sands. We would also like to recognize the Annual Operating Grant provided to the NSWA from the Government of Alberta Water for Life Strategy.

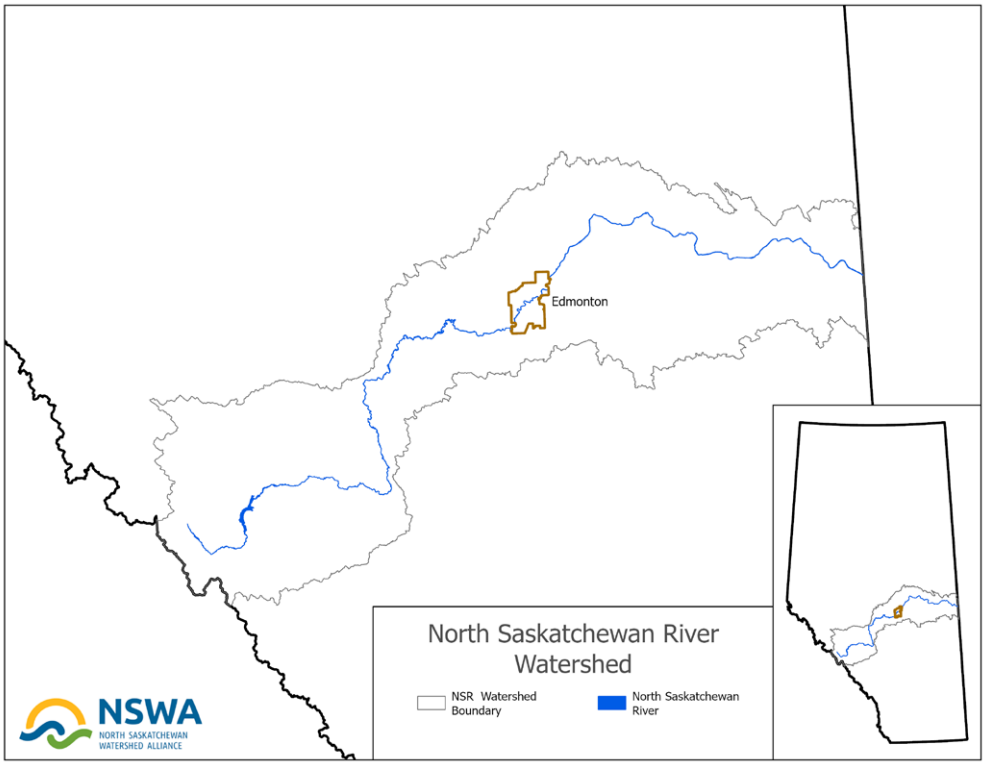
The development of this Strategy would not have been possible without the many in-kind hours donated by government representatives and members of the Sturgeon River Watershed Alliance, the Headwaters Alliance, and the Vermilion River Watershed Alliance. Members of the committees include municipal staff and councilors of over 30 municipalities in the watershed, as well as environmental non-profit staff, and academics. Thank you to all who participated in this endeavor and provided useful insights, brainstormed ideas, and provided editorial help in developing this Strategy.

Table of Contents

Moose are a common wetland species. Photo credit: Bill Trout.

Setting the Scene: The Need for a Wetland Strategy in the North Saskatchewan River Watershed

The North Saskatchewan River Watershed (NSRW) is made up of over 57,000 km² of land in central Alberta that drains into the North Saskatchewan River (NSR), starting at the Saskatchewan Glacier in the Icefields Parkway in Banff, through to the Saskatchewan border (NSWA, 2012).



There are many different boundary lines that can be drawn over the watershed that determine how the land and water are managed and stewarded:

- The NSRW lies within Treaty 6 and Treaty 8 Territories and the Métis Homelands which are the traditional territories, travelling routes, and gathering places of the Cree, Saulteaux, Blackfoot, Métis, Dene, Stoney, and Nakota Sioux Peoples.
- In the NSRW, there are:
  - Traditional Territories
  - 19 First Nations
  - 4 Métis Settlements and the Métis Nation regions 1-4
  - Green (Unsettled)/White (Settled) Provincial Administrative Areas
  - 85 municipalities with municipal lands
  - Crown/Public lands under disposition for a multitude of purposes
  - Private lands under private land title

In Canada, water is managed by Federal, Provincial, Territorial, Indigenous, and Municipal governments. The Federal government has largely passed responsibility for the management of water to the provinces (*Constitution Act*, 1867); however, they do still manage water on Federal lands (e.g., National parks), First Nation reserves, and two out of three of Canada's territories (Nunavut and the Northwest Territories). Furthermore, if a body of water is considered navigable, like many larger wetlands, then the Federal government would be responsible for managing the protections for navigation on these waters via the *Canadian Navigable Waters Act* (R.S.C., 1985, c. N-22).

Work is being undertaken by the Federal government and First Nations to facilitate self-governance, including natural resource management. The *First Nations Land Management Act* (1999) allows First Nations to opt out of the sections of the *Indian Act* (1985) that pertain to management of land and resources on reserve through the *Framework Agreement on First Nations Land Management Act* (2022). In off-reserve lands, First Nations can influence development decisions by working with the Natural Resources Conservation Board (*Natural Resources Conservation Board Act*, RSA 2000, c N-3) through the *Impact Assessment Act* (S.C. 2019, c.28, s.1).

At the provincial level, the Government of Alberta regulates water use and wetland removal, but has also passed the responsibility of managing water on municipal lands to the municipalities, through the most recent update to the Municipal Government Act (MGA, Section 60(1), 2020); however, roles and responsibilities are yet undefined and there has not been a commensurate increase in funding to municipalities to take on additional environmental responsibilites.

Alberta is Canada's only province or territory with Métis Settlements, and the only example of Métis in Canada with a recognized land base. The *Alberta-Métis Settlements Accord* (1989) enabled protection for the Settlement land base under the Alberta Constitution and officially transferred ownership of the Métis Settlements land to the Settlements through letter patent, including ownership of the beds and shores of waterbodies within Settlement boundaries. The Métis Settlements fall under provincial jurisdiction and governance is determined largely by the *Métis Settlements Act* (RSA 2000, c M-14). The Act established Settlement Councils that are elected by and govern each individual Métis Settlement and have the ability to pass by-laws that apply to that Settlement. The Act also created the Métis Settlements General Council (MSGC) which is an overarching governing body for all 8 Settlements. The MSGC is composed of all of the Settlement Councils and has the power to pass policies that apply to all of the Settlements.

Wetlands play a pivotal role in the movement and storage of water across the watershed. Wetlands act as “nature’s sponge”, sometimes called “nature’s kidneys” because they store and filter water and offer an abundance of ecological benefits to us, delivering value across environmental, economic, social, and cultural perspectives (see info box on pg. 11). Perhaps their greatest value is in improving our resilience to the effects of climate change in the watershed (Ramsar Convention on Wetlands, 2021; Strassburg, B.B.N., et al., 2020).

Historically, many wetlands in Alberta have been drained or removed to further colonial settlement and growth, with an emphasis on developing the land for agriculture, transportation, industry, and resource extraction (NSWA, 2012; Locky, D.A., 2011). Estimates for loss in the settled area of Alberta are around 64% (AWC, 2021), with some watersheds impacted more than others, such as the Beaverhills subwatershed in the NSRW, with 68% historic loss (Serran and Creed, 2016) and high unpermitted losses among those (82% - Clare and Reed, 2014). The loss of wetlands across Alberta brings with it the loss of valuable ecological goods and services, including functional loss in mitigating climate change impacts, like flood and drought. A gap remains in understanding the total degree of wetland loss and the impacts of loss to the local hydrological connectedness within the watershed. However, current loss estimates are significant and contribute to the global loss of wetlands, now estimated to be around 21% (Fluet-Chouinard, et al., 2023).

Stock photo of cattails. Pixabay.

In essence, Wetland Management in the NSRW is a complex issue, requiring collaborative partnership and alignment of goals and efforts across all stakeholders to achieve a more resilient and healthier watershed through better management and stewardship. Because of the complexities of water management, the pivotal role wetlands play in the watershed, and the urgency to protect and restore them, there is demand for a strategy to improve wetland management within the NSRW that is collaborative and forward-thinking.

Purpose

The purpose of this Strategy is to:

1. Increase the amount of wetland area in the North Saskatchewan River watershed.
2. Improve the overall condition (health) of wetlands in the basin.
3. Enhance ongoing wetland management in the basin.

Achieving this purpose supports many of the current policies, programs, and water and watershed management plans, such as:

- *Canada's National Adaptation Strategy* (2023);
- Government of Alberta's *Water for Life: Alberta's Strategy for Sustainability* (2003);
- Government of Alberta's *Wetland Policy* (2013) and associated Directives;
- Government of Alberta's Wetland Replacement and Watershed Resiliency and Restoration Programs;
- Achievement of Goal 3 of the *Integrated Watershed Management Plan for the North Saskatchewan River in Alberta* (IWMP) (2012): "Aquatic ecosystem health in the NSR watershed is maintained or improved";
- Many Municipal Development Plans, Intermunicipal Development Plans and other municipal plans and policies;
- Several regional Watershed Management Plans; and,
- Community Stormwater Management Plans.

Approach

In the NSWA's guiding document, the 2012 *Integrated Watershed Management Plan* (IWMP), watershed stakeholders identified wetlands as a priority watershed issue and set goals to maintain or improve aquatic ecosystem health in the NSRW. To address the watershed health goals set out in the IWMP, the NSWA has been engaging municipalities and other stakeholders, particularly through subcommittees within three priority areas: upstream/Headwaters, Sturgeon subwatershed, and Vermilion subwatershed. The NSWA has assembled structured, regional partnerships of local stakeholders, including municipalities, provincial and federal government representatives, non-government organizations, academics, and others into Subwatershed Alliances. These Alliances meet regularly to encourage greater responsibility in watershed management, recognizing that coordinating actions will improve the watershed for everyone. The NSWA has provided a platform for discussions to take place, empowering the Alliances to act in a coordinated fashion.

Representatives of Technical Advisory Committees (TAC) from the Sturgeon River Watershed Alliance, the Headwaters Alliance, and the Vermilion River Watershed Alliance worked with NSWA staff through several workshops (2021-2022) to develop this Strategy. Discussions focused on developing the vision statement and setting goals, based on existing gaps in knowledge, capacity, tools, monitoring, and policy, as well as developing partnerships, policy alignment, and the need to set strategic targets for conservation and restoration in the future. This Strategy intends to align people and their efforts and identify opportunities to build wetland management capacity, so there is no further net loss of wetland area in the NSRW. This document identifies strategic goals for improving wetland management in the NSRW and a review of current wetland management initiatives and tools (see Appendix). Furthermore, this document addresses how the NSWA will track and measure the success of the major components of the Strategy.

Autumn at Chickakoo Lake. Photo credit: Bill Trout.

The Value of Wetlands in the NSRW

(adapted from Cows and Fish, 2003)

Environmental:

- Water storage capacity reduces impacts of flood and drought
- Stabilize flows and decrease erosion
- Provide resiliency to climate extremes, affecting local weather patterns
- Filter excess nutrients and pollutants, improving water quality
- Trap and hold sediment
- Recharge groundwater
- Provide habitat space and increase biodiversity
- Reduce effects of greenhouse gas emissions through carbon storage

Social and Cultural:

- Create recreational opportunities for wildlife watching, fishing, hunting, and other activities
- Essential for indigenous ceremonies, medicines (ATA, 2019), and subsistence gathering (hunting, fishing, and foraging)
- Provide benefits to mental health through opportunities to be out in nature, where wetlands are associated with recreation and trails

Economic:

- Increase crop yields and forage production in watersheds where wetlands have not been drained
- Salinity control, improving conditions for agriculture
- Source of water for off-site watering of livestock
- Can prevent loss of infrastructure due to flooding or erosion (reduced risk and liability, improved safety)
- Provide value as green infrastructure through ecosystem services like water filtration, carbon storage (sequestration), etc.

Issues Affecting Wetlands in Alberta

Various development pressures have resulted in a significant loss of wetlands across the watershed. Since the 1800's, wetlands have been drained and altered for the purposes of developing the land for agriculture and colonial settlement (NSWA, 2012). The Institute of Wetlands and Waterfowl Research estimates that approximately 64% of the slough/marsh wetlands in the settled areas of Alberta no longer exist. Furthermore, losses continue, with an annual estimate of 0.3 to 0.5% loss of the remaining wetland area (AWC, 2008). It is essential to consider further threats to wetlands in the context of the entire watershed.

Some activities that can negatively impact wetlands and their functions include (Locky, D.A., 2011):

- **Dredging, draining, and/or filling wetland areas for conversion to agricultural, industrial, or residential lands, altering the local hydrology and decreasing ecosystem services provided**
- **Population growth and urban development that displaces wetlands and alters their hydrological connections**
- **Industrial processes like sand and gravel mining, dewatering, and mineral extraction activities, timber harvesting and forestry pratices that drain wetlands, and oil and gas exploration activities like infrastructure installation (seismic lines, pipelines, roads) that can disturb wetland ecosystems, habitat space, and groundwater connectivity**
- **Herbicide and pesticide use in agricultural activities, impacting wetland ecosystems**
- **Misuse of Off-Highway Vehicles (OHVs) and recreational activities that disturb sensitive wetland ecosystems (Ouren, D.S., et al., 2007), altering their species composition and leading to potential introduction of invasive species when gear is improperly cleaned.**

Vision for Wetlands in the North Saskatchewan River Watershed

Wetlands in the North Saskatchewan River Watershed are abundant, diverse, functioning, sustainable, hydrologically connected, and recognized as important and valuable - ecologically, culturally, economically, and socially.

Guiding Principles

Collaboration & Partnership: The Collective Impact Framework (National Council of Nonprofits, 2022), is a principle in which participants are individuals representing organizations, governments, or communities coming together on a common vision and commitment to coordinate their work and agree on a shared set of goals.

- The North Saskatchewan Watershed Alliance (NSWA), as a Watershed Planning and Advisory Council, will be the backbone organization that will coordinate the activities and maintain the Strategy's focus.
- Participants are stakeholders and rightsholders in the watershed that will hold each other accountable and maintain open and consistent communication in order to achieve the shared goals most effectively.

Environmental Equity: That fairness and balance is achieved for access to environmental resources (e.g., green spaces), participating in environmental decision-making, and bearing environmental burdens (e.g., climate change impacts).

Intrinsic Value: Wetlands have intrinsic value, independent of their value to humans. Wetlands represent diverse ecosystems and sources of life, worthy of respect.

American White Pelican. Photo credit: Roger Kirchen.

Four Strategic Areas for Improving Wetland Management in the NSR Watershed (NSRW)

Four strategic areas guide the achievement of the vision for wetlands in the NSRW, over the next 10 years: Collaborate and Take Action; Build and Mobilize Knowledge; Optimize Planning, Policy, and Financial Programs; and Implement Wetland Monitoring.

Three themes were identified concerning what actions lead to more effective wetland management in the NSRW: filling knowledge and capacity gaps, enhancing wetland monitoring programs, and working within a community of practice that provides an avenue for sharing lessons learned and guides science into action.

Effective wetland management can be achieved by having the applicable information needed to make informed decisions, the resources and personnel to complete the work, and the connection to the broader community that prioritizes the work while providing the support necessary for long-term care and maintenance.

To better support watershed-scale decision making, there is a need to develop a standardized approach to assessing wetland value/ecosystem services, consistency in messaging to various audiences, consistency in the way programs/projects are delivered, and engaging decision makers within the NSRW.

Communities in the NSRW need wetland data and decision-support tools to support their land development review processes, because the existing data and tool sets are most appropriate for provincial-level decision-making. There is a need to develop a wetland toolbox that includes guidance documents, data, mapping tools, and surveys to help guide decision makers in better understanding where priority wetlands exist and what best management practices to employ.

Collaborate & Take Action

Build & Mobilize Knowledge

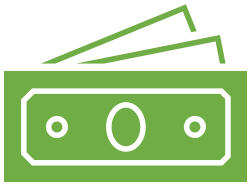
Optimize Planning, Policy & Financial Programs

Implement Wetland Monitoring

Capacity limitations are extensive and a major barrier to improving wetland management in the NSRW. This Strategy aims to identify collaborative ways to fill capacity gaps to make wetland management more streamlined and achievable.

According to Timmer et al. (2007), there are five categories of capacity: Financial, Human Resources, Institutional, Social, and Technical.

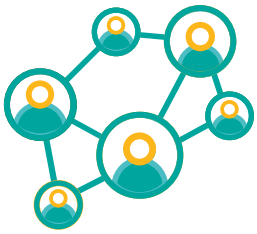
The definitions of each category are as follows:



Financial: The community or organization is able to access and generate funding, obtain adequate resources to complete work, use financial resources sustainably, and demonstrate financial flexibility.

Human Resources: The community or organization is able to have employees dedicated to the completion of work as well as to have or have access to individuals with the required technical training, knowledge, and skills to complete work.

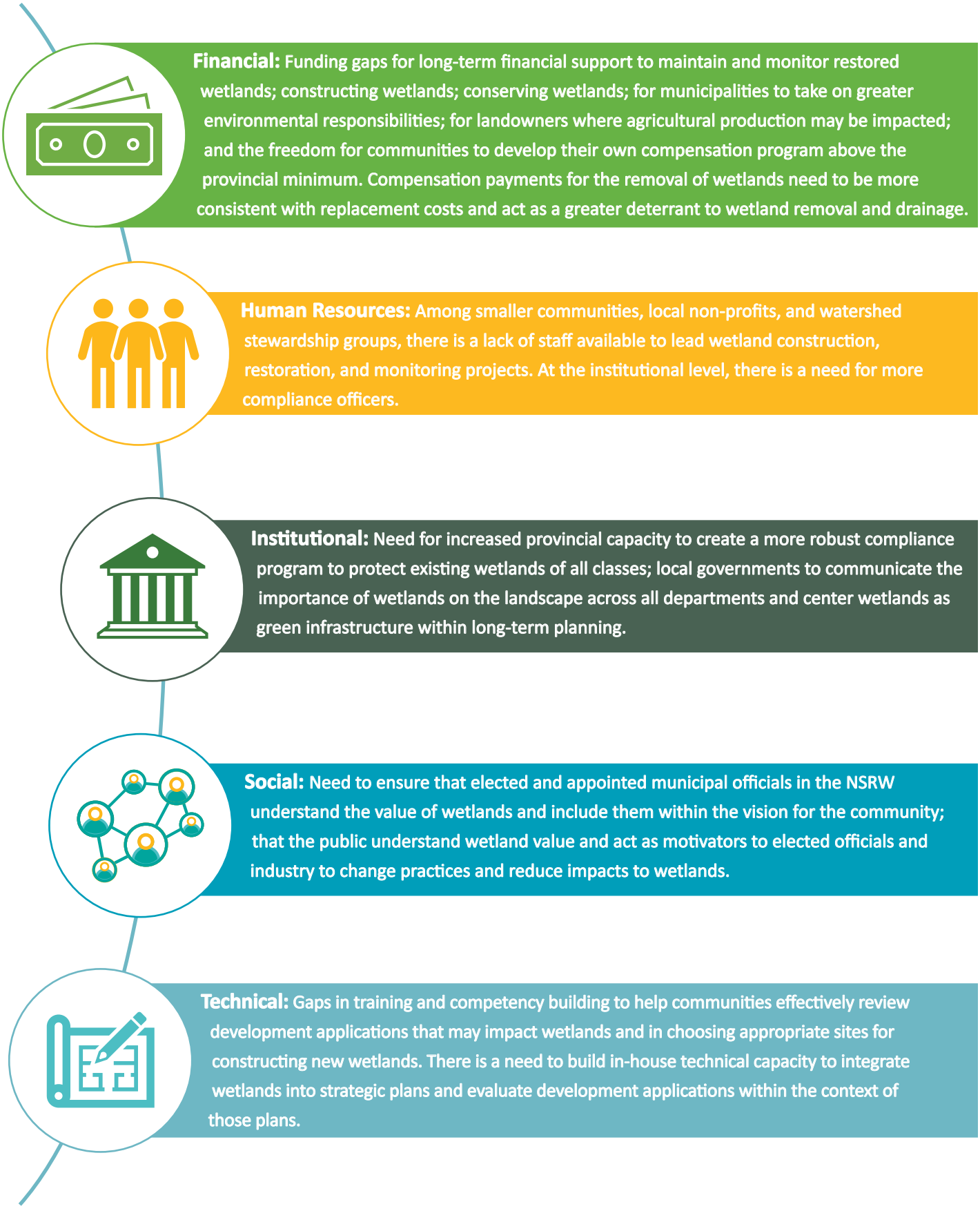
Institutional: The community or organization is able to create policies, legislation, by-laws, and/or strategies that provide guidance and context for work being undertaken.



Social: Includes leadership, partnerships, and communication. Social capacity is high if leaders provide clear vision and direction, partnerships exist between the various levels of government (vertical linkages) and between the community and other communities and organizations (horizontal linkages), and if community support and awareness has been developed through education, outreach, and involvement in decision making.

Technical: The technical capacity of a community relates to access to information and data to inform and support work and decision making.

Based on input/feedback from workshop participants, wetland management capacity gaps were identified and then assigned to a capacity category:



Financial: Funding gaps for long-term financial support to maintain and monitor restored wetlands; constructing wetlands; conserving wetlands; for municipalities to take on greater environmental responsibilities; for landowners where agricultural production may be impacted; and the freedom for communities to develop their own compensation program above the provincial minimum. Compensation payments for the removal of wetlands need to be more consistent with replacement costs and act as a greater deterrant to wetland removal and drainage.

Human Resources: Among smaller communities, local non-profits, and watershed stewardship groups, there is a lack of staff available to lead wetland construction, restoration, and monitoring projects. At the institutional level, there is a need for more compliance officers.

Institutional: Need for increased provincial capacity to create a more robust compliance program to protect existing wetlands of all classes; local governments to communicate the importance of wetlands on the landscape across all departments and center wetlands as green infrastructure within long-term planning.

Social: Need to ensure that elected and appointed municipal officials in the NSRW understand the value of wetlands and include them within the vision for the community; that the public understand wetland value and act as motivators to elected officials and industry to change practices and reduce impacts to wetlands.

Technical: Gaps in training and competency building to help communities effectively review development applications that may impact wetlands and in choosing appropriate sites for constructing new wetlands. There is a need to build in-house technical capacity to integrate wetlands into strategic plans and evaluate development applications within the context of those plans.

Note that these five categories of capacity are interconnected and interact with one another; therefore, to effectively support the overall Strategy, multiple types of capacity will likely need to be developed simultaneously. The following four strategic areas aim to address the capacity gaps identified above through the outcomes of several specific goals. Successful implementation of the goals within these strategies will require the ongoing collaboration and participation by many watershed partners. It is the intention through this Strategy to create a space and opportunity for people to gather on equal ground, have discussions, share ideas, and create solutions together.

Elk Island National Park. Photo credit: Steve Ricketts.

STRATEGY 1: Collaborate and Take Action

Partnerships are critical to implementing a successful and sustainable Wetland Strategy. Opportunities and resources are needed to help communities, governments, and organizations work together to implement a Strategy for wetlands in the NSRW. There is a need to bring leaders and practitioners in wetland management to the same working group to align objectives and to set and achieve desired targets and goals for the whole watershed. Furthermore, inclusion of underrepresented groups in discussions and collaborations is important towards building a healthier and more connected watershed.

As many organizations and programs exist to improve wetland conservation and restoration in the NSRW, this first strategy emphasizes the importance of providing the space and support needed for people to come together to collaborate, assess gaps, and take actions toward improving wetland management and health in the NSRW. Together, it is possible to fill capacity gaps, encourage best management practices, and build more resilient communities through efforts to increase wetland areas in the watershed.

GOALS:

1. To work collaboratively with communities, governments, and organizations to develop strategic, target objectives for wetland conservation and restoration. For example, to increase the number and total area of wetlands within the NSR watershed.
2. To optimize the coordination and prioritization of on-the-ground, wetland restoration and enhancement activities across the watershed through:
    a. Greater engagement, education, and outreach;
    b. Supporting partner programs; and,
    c. Connecting people with opportunities.
3. To connect, listen, and share ideas with Indigenous community leaders, Elders, Knowledge Holders, youth, and organizations across the watershed to build relationships, better understand where co-creation can occur, and provide additional support for setting and achieving wetland health objectives.
4. To engage with private landowners, urban developers, industrial representatives, and supporting organizations to better understand barriers to wetland conservation and restoration and bridge gaps.
5. To continue to support and work with Subwatershed Alliances, municipalities, and watershed stewardship groups in the NSRW, to investigate capacity gaps, and build bridges of communication across leaders and practitioners of wetland management.

6. To develop or support a Community of Practice (CoP) for Wetland Conservation and Restoration practitioners that encourages greater collaboration, enhances wetland management practices and knowledge, and increases consistency in communication. Facilitated sessions of the CoP may:

    a. Provide a format for sharing knowledge through project showcases, lessons learned, and presentations from experts around the globe on various wetland topics;

    b. Discuss wetland projects and determine where resources may be shared;

    c. Determine the feasibility of developing a shared pool of funding for supporting costs not covered by the Government of Alberta's (GoA) funding programs; and,

    d. Co-create projects and apply for grants to support specific objectives and capacity gaps.

7. To engage with the Alberta Chapter of the North American Waterfowl Management Plan and provide content support to enhance the wetlandsalberta.ca website further, such that all relevant wetland resources are available in one accessible place, for all of Alberta.

Stock photo: Pixabay.

STRATEGY 2: Build and Mobilize Knowledge

Good knowledge is foundational to enhancing education and awareness on the importance of wetland ecosystems, driving local wetland restoration projects, and supporting conservation policy. There is a need to elevate knowledge among local governments, communities, and stewardship groups, so they understand and recognize the essential part wetland ecosystems play within the NSR watershed. There is a need to review available resources and communications tools centered on healthy wetlands and develop an inventory of them, then, identify and develop wetland educational tools and resources to fill knowledge gaps and ensure accessibility across multiple audiences.

Social capacity to implement better policies and plans for wetland management in the NSR watershed can be improved by providing more effective and targeted wetland education and communications. This may also boost a wider adoption of voluntary incentive programs to conserve wetlands, and reduce the need for enforcement.

Furthermore, we need to better understand our regional wetlands and answer fundamental questions, such as:

- How many wetlands are there and what is their classification?
- How big/deep are they?
- What is their ecological, economic, cultural, and social value?
- How many wetlands have we historically lost?
- How many have recently or are currently being drained?
- What are the cumulative impacts of wetland loss?
- How will climate change affect our landscape under different wetland scenarios?
- Are the remaining wetlands in good condition?
- What is the difference between urban and rural pressures on wetlands?
- What and where are wetland connections with groundwater?
- Where are restoration opportunities?
- Where and how much restoration is needed?
- What are available options when restoration is not feasible?
- Where are the best places to replace wetlands?
- What are the barriers to wetland conservation?
- How many wetlands have been constructed for and incorporated into stormwater management systems?
- How do wetlands assist in sensitive species protection and other conservation strategies?

Photo credit: Glen Hvenegaard.

There is also a desire among stakeholders to incorporate wetlands into a larger natural asset management system and to better understand the intricacies of including ecosystem services, ecological processes, and biodiversity into an economic framework. As these topics primarily remain within the academic realm, there is an opportunity to develop strategic studies that may eventually move into pilot projects and other forms of action.

By answering the questions above, it will be possible to generate tools to assist decision makers and planners when forming their own strategic plans and targets around wetland conservation and restoration priorities. Ultimately, these answers are necessary to help set and meet strategic targets to mitigate wetland loss and improve conservation and restoration efforts. Fortunately, the GoA's *Watershed Resiliency and Restoration Program* (WRRP) funding strategy aligns well with these goals, and the settled area of the NSRW lies within their priority areas, making this a potential source of funding to support the achievement of this Strategy.

GOALS:

1. Build wetland knowledge through:
    a. Developing high-quality, GIS inventories and maps of:
        i. existing and drained wetlands,
        ii. wetland catchment areas,
        iii. recharge and discharge areas,
        iv. priority sites for wetland construction, conservation, and restoration opportunities, and
        v. wetland habitat connectivity – to better understand and prioritize areas in need of restoration to support greater biodiversity.
    b. Developing a long-term *Wetland Training Opportunity* that provides incentives for staff of municipalities, Indigenous communities, and organizations to increase their wetland knowledge, monitoring capacity, and enhance sustainable management and decision-making for wetlands within the watershed.
    c. Working with academics, communities, and individuals to better understand cultural and social values associated with wetlands through community-based qualitative research methods.

d. Strategic research questions that build knowledge about the connection between wetlands and the pressures and processes that affect them in the NSRW.

2. Mobilize wetland knowledge through:
    a. Collaboration with wetland practitioners
    b. Data and knowledge sharing
    c. Public education aimed at improving overall awareness and literacy, and
    d. Encouraging and supporting other organizations and partners working to implement this Strategy
    e. Developing strategic communications materials

Photo credit: NSWA.

A landowner restoration project in the Vermilion River Watershed. Photo: NSWA.

STRATEGY 3: Optimize Planning, Policy, & Financial Programs

Wetland management should be a consideration throughout all levels of land use planning: federal, provincial, regional, municipal, intermunicipal, and community-based. Alignment of government policy levels the regulatory playing field among municipalities and enables equitable access to investment and the benefits of effective wetland management.

Wetlands are a natural feature that affect the flow of water from one community to another. Local land use decisions related to wetlands can therefore influence and alter the flow of water and ecosystem services between municipalities. From the municipal perspective, this makes wetlands an intermunicipal asset; yet planning rarely occurs with intermunicipal impacts in mind. There is a need for Intermunicipal Development Plans (IDPs) to specify a shared governance framework for wetland management, with shared goals for restoration and conservation, particularly in priority areas.

Policy alignment is driven by community leadership. As such, the political will of decision-makers was identified as an important aspect of wetland policy alignment, emphasizing the need to support strong, well-informed leadership. Because funding constraints can often impact political decision making, it is vital that efforts are made to help inform political leaders about the use of wetlands as natural infrastructure and the cost savings to be realized.

Stock photo of a prairie stream. Pixabay.

The *Alberta Wetland Policy* (2013) provides a 'strategic framework for conserving, restoring and protecting Alberta's wetlands', while the *Alberta Wetland Mitigation Directive* (2018) is meant "to inform planning and decision-making to avoid and minimize negative impacts to wetlands and, where necessary, replace lost wetland area and value" (GoA, 2013; 2018). While this policy and directive apply to all

wetlands in Alberta, other than those on federal lands, compliance and enforcement actions are implemented at the development approval stage via the Alberta *Water Act* (RSA 2000, c W-3) as the primary regulatory tool. While there is an established provincial compliance program, unpermitted wetland losses are known, in some regions, to be high and presumed to be high in others (Clare and Creed, 2014.) Enforcement by the province continues to be identified as a critical gap by stakeholders. Similarly, stakeholders expressed the need for stricter requirements and adherence to avoiding wetland removal within the "avoid, minimize, replace" hierarchy.

Currently, while there are many voluntary incentive programs available to assist agricultural producers in conserving and restoring wetlands on their properties – for example the Environmental Farm Plan, Alternative Land Use Services (ALUS), and Ducks Unlimited Canada (DUC) – there is no system in place to monitor agricultural activities and their impacts on wetlands or other waterbodies, such that producers are kept accountable within the framework of the *Alberta Wetland Policy*. Likewise, activities occurring during or after development for industrial or residential projects may still be impacting wetlands even if they are not being removed, such as effects from roads and construction processes. Therefore, there is a compliance and enforcement gap that is uniquely impacting our ability to prevent further loss or degradation to wetlands. The need for provincial enforcement on private lands could be limited, or eliminated altogether, if further funds were made available to agricultural producers through incentive programs that balanced economic inputs and outputs, and if further support, such as technical services and extension services were provided to assist producers and landowners in implementing wetland conservation, restoration, and enhancement activities (Piñero, V., et al. 2020). Some funding programs are now available, but could use longer-term structures and/or improved outreach efforts.

The *Wetland Replacement Program* (WRP) is a Government of Alberta financial program, funded through compensation fees from wetland loss during development as part of the *Alberta Wetland Policy*. Funds gathered are meant to replace wetlands in the same watershed they were removed, thereby replacing lost wetland function. Municipalities and non-profit organizations can utilize WRP funds to pay for wetland restoration, constructing new wetlands, or restoring drained wetlands (note that illegally drained wetlands after 2015 are not eligible).

A wetland restoration project in the Vermilion River Watershed. Photo: NSWA.

Individual landowners and producers can access funding from the WRP through DUC, whom pays landowners fair market value for the restored area. Additional funding is now available through the *Resilient Agricultural Landscape Program (RALP) 2023-2028* (GoA, 2023), in which an additional $1000/acre is available for completed wetland restoration and construction projects in addition to implementing other Best Management Practices on agricultural lands. Landowners can access this funding through DUC.

As a non-profit entity, the NSWA does not have any authority over policies, plans, or regulatory tools. However, the NSWA can support communities and governments in further developing these tools to better serve collective efforts to conserve, enhance, and restore wetlands in the NSR watershed. Therefore, the following goals are recommended actions that can support a healthier watershed by specific groups that have legal authority to take those actions. NSWA support is mentioned where feasible within context.

GOALS:

All Communities in the NSR Watershed

Planning & Policy

1. Set wetland conservation and restoration targets in the NSR watershed.
2. Develop Stormwater Management Plans (SMP) that include wetlands among the assets for reducing flooding and improving water quality from stormwater. Leverage the collaborative skills of the NSWA to assist in developing SMPs.

Municipalities

Planning & Policy

1. Incorporate appropriate setbacks from waterbodies, including wetlands, into development review processes, Municipal Development Plans (MDPs), and Land-Use By-Laws (LUBs).
2. Assess and prioritize wetlands whose functions affect multiple municipal jurisdictions (e.g., those near municipal boundaries) as part of IDPs.
3. Develop and adopt policies and by-laws to achieve conservation and restoration targets.

Financial Programs

1. Incorporate an additional fee for developers for the removal of wetlands into development review processes. The additional fee should reflect the municipality's full cost of constructing, restoring, enhancing, monitoring, or conserving wetlands.
2. Create incentive programs and inform landowners about opportunities to conserve, restore, or enhance wetlands on their property (e.g., ALUS program, DUC Wetland Restoration Lease Program).

Government of Alberta

Planning & Policy

1. To work better with municipalities to implement the *Alberta Wetland Policy* and directives by improving communication and the referral process for applications, such that there is alignment of approval timelines and requirements to support cohesive decision making.
2. To clarify how municipal priorities will be considered for conserving high-value wetlands within the *Water Act* approval process.
3. To develop stricter requirements and adherence to avoiding wetland removal by developers to considerably reduce the number of wetlands lost in the NSR watershed.
4. Participate in setting wetland health objectives, monitoring standards, and processes for ensuring wetland functions have been restored on the landscape.
5. Establish performance measures for *Alberta Wetland Policy* implementation.

Financial Programs

1. Provide long-term, financial support for wetland monitoring (above the 5-year requirement) through the *Wetland Replacement Program* to ensure that wetland functions have returned on restored and constructed wetland projects.
2. Ensure fees collected for wetland replacement are sufficient to incentivize wetland restoration and construction.
3. Continue to incentivize agricultural producers to conserve, restore, and enhance wetlands, ensuring that incentive programs balance economic inputs and outputs.
4. Provide further support to producers, such as technical services and extension services to assist in conservation and restoration efforts and decision making.

STRATEGY 4: Implement Wetland Monitoring

Monitoring is an important aspect of wetland management because it is through monitoring that we establish a baseline of wetland extent across the watershed, detect changes, and characterize trends and threats over time. Wetland monitoring can be complicated, as it is expensive, it may occur at a variety of scales, and currently lacks long-term funding. However, the importance of monitoring outweighs the costs and can contribute to cost reductions elsewhere in the management process related to misguided and duplicated efforts.

To realize the value from a wetland restoration project, it is particularly important to follow up with regular monitoring to ensure that wetland functions have been successfully restored. However, wetland monitoring in the NSRW is a new and uncoordinated activity in need of additional tools and capacity. As such, stakeholders identified the need to develop and implement an effective wetland monitoring program. To support this goal, communities and institutions need human resources, technical, and financial capacity to effectively monitor wetlands. Furthermore, a monitoring inventory is needed to gauge the watershed-scale status and trends of wetlands on a regular basis to coincide with state of the watershed reporting.

GOALS:

1. Using knowledge generated in Strategy 2 and strategic conservation and restoration targets developed in Strategies 1 & 3, identify high-priority wetlands in need of continuous monitoring and establish a wetland monitoring inventory to support the development of trend assessments.
2. Identify wetland monitoring programs and opportunities for citizen scientists and support those efforts through cross-promotion and sharing with the Community of Practice and through education and outreach efforts.
3. Engage with organizations and communities conducting wetland monitoring in the NSRW, and seek opportunities to collaborate in defining methods and co-creating indicators for ensuring wetland functions have been restored on the landscape.
4. Coordinate wetland monitoring across the watershed, such that shared resources and responsibility can drive better accountability and fill capacity gaps.

Ruddy duck. Photo credit: Roger Kirchen.

Tracking and Measuring Success

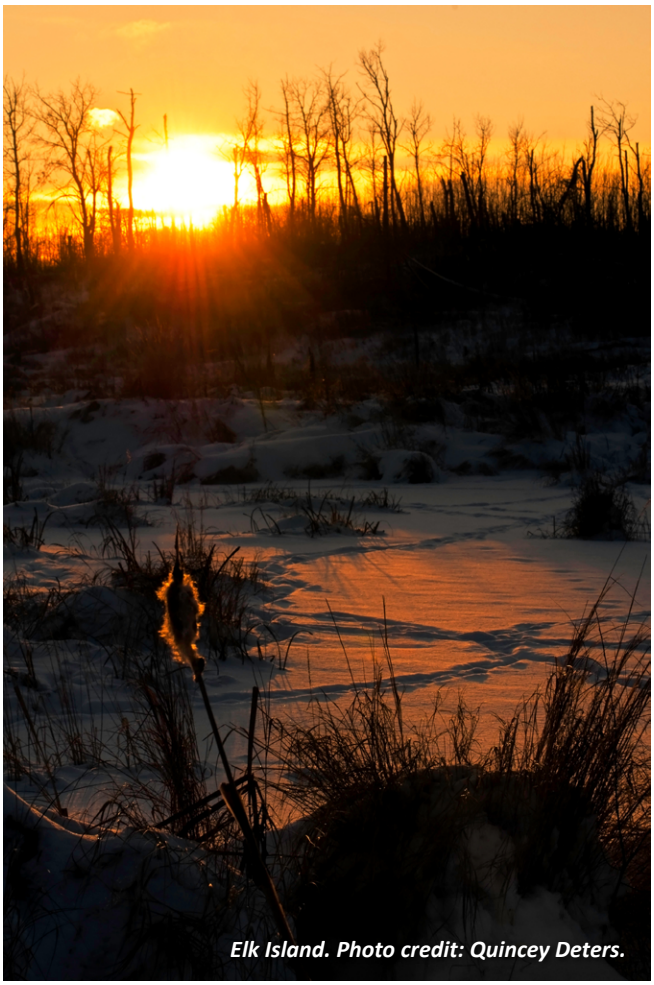
Successful implementation of the *Strategy to Improve Wetland Management for the North Saskatchewan River Watershed* will look like:

- A marked increase in the total number and area of wetlands conserved and restored in the NSRW.
- Wetland management practitioners will feel they have the knowledge, tools, and resources needed to achieve better wetland management. They will feel supported by a Community of Practice and like they have valuable experiences to share.
- Communities will have achievable, strategic goals in place for wetland restoration and conservation, and will have plans in place to implement them along with long-term plans and policies that consider wetlands as valuable and important components to the land.
- Community leaders will have a strong understanding of the importance of wetlands on the landscape and will support actions that improve their abundance and health.
- A marked increase in uptake of government funded programs (WRP and WRRP) to restore wetlands and wetland functions in the NSR watershed.
- A marked increase in collaborative projects and partnerships to improve our greater understanding of wetlands in the watershed, our ability to share knowledge, and monitor wetland health.

Conclusion

Wetlands in the North Saskatchewan River Watershed have been drained and altered since the 1800's, and thus, the watershed's natural hydrology has been largely affected by this change. Wetlands act as natural infrastructure that hold and collect water. If a wetland is removed, water no longer collects where and how it had, and this can cause problems during extreme weather events. With a changing climate and increased weather volatility, landowners and communities are finding themselves facing issues of flooding, having little resiliency to drought, or struggling to maintain their infrastructure (e.g., roads and culverts). Furthermore, evidence points to wetlands as one of the greatest assets towards combatting climate change. Wetlands serve as a carbon sink in addition to their other functions. In essence, current generations have inherited a system that no longer serves them.

Collective impact is our best approach towards improving the state and management of wetlands in the NSR watershed. One agency alone cannot restore what has been lost over the last two centuries. There is much understanding to gain and on-going work to be done. This Strategy aims to initiate the conversation and bring people together, to build foundational knowledge about the state of wetlands in the NSR watershed, to produce opportunities for training and monitoring, to provide support and guidance to decision makers and wetland policy implementers, and improve the way we communicate and educate others. Overall, this Strategy is designed such that fulfillment of the goals within will greatly improve wetland management in the North Saskatchewan River Watershed.



Elk Island. Photo credit: Quincey Deters.

The next step forward is implementation of the Strategy. It is important that communities, organizations, and governments in the NSRW realize their roles as partners and come together to co-create solutions to fill gaps in wetland management. The NSWA will be developing a Strategy Implementation Plan with watershed partners to accompany this Strategy.

References

1. Alberta-Metis Settlements Accord. 1989. Accessible online at https://msgc.ca/alberta-metis-settlements-accord/
2. Alberta Teacher's Association (ATA). 2019. Stepping Stones: First Nations Traditional Plants and Uses. In: Walking Together: Education for Reconciliation. Accessible online at https://legacy.teachers.ab.ca/SiteCollectionDocuments/ATA/For%20Members/ProfessionalDevelopment/Walking%20Together/PD-WT-16i%20-%209%20First%20Nations%20Traditional%20Plants%20and%20Uses-2019%2001%2028.pdf
3. Alberta Water Council (AWC). 2008. Recommendations for a New Alberta Wetland Policy. Alberta Water Council. Edmonton Alberta.
4. Alberta Water Council (AWC). 2021. Alberta Wetland Policy: Implementation Review. Perspectives Report. The Alberta Water Council. Edmonton, Alberta.
5. Canada Water Act (R.S.C., 1985, c. C-11), https://laws-lois.justice.gc.ca/eng/acts/c-11/FullText.html#:~:text=-Canada%20Water%20Act%20(%20R.S.C.%20%2C%201985,C%2D11), retrieved on April 21, 2023.
6. Canadian Navigable Waters Act (R.S.C., 1985, c. N-22), https://laws-lois.justice.gc.ca/eng/acts/N-22/ retrieved on 2023-05-01.
7. Clare, S. and Creed, I.F. 2014. Tracking wetland loss to improve evidence-based wetland policy learning and decision making. Wetlands Ecology and Management 22, 235-245.
8. Constitution Act, 1867 (UK), 30 & 31 Vict, c 3, reprinted in RSC 1985, App II, No 5.
9. Cows and Fish. 2003. Cows and Fish Fact Sheet: Value of Wetlands. Available online at https://cowsandfish.org/product/value-of-wetlands/
10. DeLancey E.R., Simms J.F., Mahdianpari M., Brisco B., Mahoney C., Kariyeva J. 2020. Comparing deep learning and shallow learning for large-scale wetland classification in Alberta, Canada. Remote Sensing, 12(1):2.
11. Edmonton and Area Land Trust (EALT). 2023. Conservation Easements. Accessed online April 25, 2023 from https://www.ealt.ca/conserve-nature/
12. Environmental Law Centre. 2021. Environmental Reserves and Environmental Reserve Easements: A discussion of regulatory context and application. Accessed online April 24, 2023 from https://www.communityconserve.ca/environmentalreserveeasement/
13. First Nations Land Management Act (S.C. 1999, c. 24).
14. Fluet-Chouinard, E., Stocker, B.D., Zhang, Z., et al. 2023. Extensive global wetland loss over the past three centuries. Nature 614, 281–286. https://doi.org/10.1038/s41586-022-05572-6
15. Framework Agreement on First Nation Land Management Act (S.C. 2022, c. 19, s. 121), available at https://laws-lois.justice.gc.ca/eng/acts/f-31.46/FullText.html, accessed 02/24/2024
16. Government of Alberta (GoA). 2003. Water for life: Alberta's strategy for sustainability, November 2003.
17. Government of Alberta (GoA). 2013. Alberta Wetland Policy. Available online at https://open.alberta.ca/publications/9781460112878
18. Government of Alberta (GoA). 2015. Alberta Wetland Identification and Delineation Directive. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta.
19. Alberta Environment and Sustainable Resource Development (ESRD). 2015. Alberta Wetland Classification System. Water Policy Branch, Policy and Planning Division, Edmonton, AB.
20. Government of Alberta (GoA). 2017. Alberta Wetland Assessment and Impact Report Directive. Water Policy

Branch, Alberta Environment and Parks, Edmonton, Alberta.

21. Government of Alberta (GoA). 2018. Alberta Wetland Mitigation Directive. Available online at https://open.alberta.ca/publications/9781460130025

22. Government of Alberta (GoA). 2018b. Directive for Permittee-Responsible Wetland Construction in Alberta. Water Policy Branch, Alberta Environment and Parks. Edmonton, Alberta.

23. Government of Alberta (GoA). 2023. Resilient Agricultural Landscape Program. Available online at https://www.alberta.ca/resilient-agricultural-landscape-program

24. Government of Canada. 2022. Canada's National Adaptation Strategy: Building Resilient Communities and a Strong Economy (for comments). Accessible online at https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/national-adaptation-strategy/full-strategy.html

25. Impact Assessment Act (S.C. 2019, c. 28, s. 1), <https://laws.justice.gc.ca/eng/acts/I-2.75/index.html> retrieved on 2023-05-01

26. Indian Act, RSC 1985, c I-5, <https://canlii.ca/t/5439p> retrieved on 2022-12-20

27. Land Stewardship Centre. 2022. If You Build It They Will Come: Constructing Wetlands for Biodiversity. Accessed online April 24, 2023 from https://www.landstewardship.org/news-stories/stories/post/if-you-build-it-they-will-come-constructing-wetlands-for-biodiversity

28. Land Stewardship Centre. 2023. Watershed Stewardship Grants. Accessed online April 24, 2023 from https://www.landstewardship.org/enable/programs/watershed-stewardship-grants

29. Land Stewardship Centre. 2023b. Green Acreages. Accessed online April 24, 2023 from https://www.landstewardship.org/enable/programs/green-acreages

30. Locky, D.A. 2011. Green Paper Presented at the Annual Conference of the Alberta Institute of Agrologists, Banff Alberta March 16, 2011. https://www.albertaagrologists.ca/document/6287/Green%20Paper%202011.pdf

31. Metis Settlements Act, RSA 2000, c M-14, <https://canlii.ca/t/560qr> retrieved on 2023-07-19

32. Municipal Government Act, RSA 2000, c M-26.

33. Natural Resources Conservation Board Act, RSA 2000, c N-3, <https://canlii.ca/t/55xvm> retrieved on 2023-05-01

34. North Saskatchewan Watershed Alliance (NSWA). 2012. Atlas of the North Saskatchewan River Watershed in Alberta. The North Saskatchewan Watershed Alliance Society. Edmonton, Alberta.

35. North Saskatchewan Watershed Alliance (NSWA). 2012. Integrated Watershed Management Plan for the North Saskatchewan River in Alberta. The North Saskatchewan Watershed Alliance Society, Edmonton, Alberta. Available on the internet at http://nswa.ab.ca/Printed June, 2012

36. Ouren, D.S., Haas, C., Melcher, C.P., Stewart, S.C., Ponds, P.D., Sexton, N.R., Burris, Lucy, Fancher, Tammy, and Bowen, Z.H. 2007. Environmental effects of off-highway vehicles on Bureau of Land Management lands: A literature synthesis, annotated bibliographies, extensive bibliographies, and internet resources: U.S. Geological Survey, Open-File Report 2007-1353, 225 p. Retrieved from https://pubs.usgs.gov/of/2007/1353/report.pdf

37. Piñero, V., et al. 2020. A scoping review on incentives for adoption of sustainable agricultural practices and their outcomes. Nature Sustainability, 3, 809-820.

38. Ramsar Convention on Wetlands. 2021. The Global Wetland Outlook: Special Edition 2021. Secretariat Of The Convention On Wetlands, Switzerland. Available online at https://www.global-wetland-outlook.ramsar.org/report-1.

39. Serran, J.N. and Creed, I.F. 2015. New mapping techniques to estimate the preferential loss of small wetlands on prairie landscapes. Hydrological Processes, 30 (3), 396-409.

40. Strassburg, B.B.N., Iribarrem, A., Beyer, H.L. et al. 2020. Global priority areas for ecosystem restoration. Nature 586, 724–729. https://doi.org/10.1038/s41586-020-2784-9

41. Timmer, D.K., de Loe, R.C., and Kreutzwiser, R.D. 2007. Source water protection in the Annapolis Valley, Nova Scotia: lessons for building local capacity. Land Use Policy, 24, 187-198.

42. Water Act, RSA 2000, c W-3, <https://canlii.ca/t/56190> retrieved on 2023-07-19

Appendix: Current Wetland Management Initiatives

Provincial Government

Policies, Plans, & Funding Programs

Alberta Wetland Policy 2013

- Under the provincial *Water for Life* strategy, a new wetland policy and supporting implementation plan was developed in 2013–2014. The purpose of the *Alberta Wetland Policy* is to reverse the trend of wetland loss, ensure the wise use and management of this resource, inventory provincially significant wetlands, create wetland education initiatives, and support wetland restoration projects.
- The *Alberta Wetland Policy* was developed to apply equitably across Alberta. Where development activities have the potential to impact wetlands, the Policy promotes Avoidance and Minimization as the preferred course of action. Where impacts to a wetland cannot be avoided or minimized and permanent loss is incurred, wetland replacement is required – under both the Approvals and Compliance Programs.
- **Alberta Environment and Protected Areas' (AEPA) Compliance Program** adheres to a regulatory assurance framework which guides compliance activities. The Compliance program is based on three pillars: Education, Prevention and Enforcement.
    - Education is used to increase awareness, motivate change and encourage stakeholders to voluntarily comply with regulatory requirements. Compliance strives to work with municipalities and other interested parties to inform the public of their responsibilities as landowners and about the applicable legislation that may impact their operations. Specifically, around all activities conducted either by the municipality or its constituents that impact wetland areas, the Compliance Program helps identify those activities, regulated under the Water Act and/or Public Lands Act that are subject to approval before activities can proceed.
    - Prevention promotes compliance by building capacity and willingness within the regulated community to comply with regulatory requirements. AEPA proactively identify risks to the environment through inspections, audits, and risk assessments. Based on findings from these activities, AEPA can work with regulated parties to help identify measures to reduce the potential risk of non-compliance.
    - Enforcement actions are considered if it is deemed necessary to compel compliance when voluntary compliance cannot be achieved.
- Wetland management decisions occur under AEPA's Approvals Program and the Compliance Program. These decisions include consideration of the *Alberta Wetland Policy* and associated guides and directives when undertaking program activities including enforcement actions.
- AEPA's Compliance Program receives information on environmental concerns, non-compliances, and emergencies (including wetland issues) through either industry self-reporting or reports from members of the Public. This information is normally reported through the 24-hour Energy and Environment Response Line. ***AEPA strongly encourages anyone with knowledge of a potential unauthorized impact to a wetland to report the issue to AEPA through the response line 1-800-222-6514.***

Alberta Wetland Identification and Delineation Directive 2015

- The purpose of this Directive is to provide identification and delineation standards to improve consistency of wetland boundaries, area, and assessments.
- The standards within this Directive must be used for any identification and delineation of wetlands in Alberta, including fully restored and constructed wetlands (GoA, 2015).

Alberta Wetland Restoration Directive 2016

- The purpose of this Directive is to provide assurance to the Department that wetland restoration actions are meeting intended outcomes to restore wetland area and function. This Directive provides direction to Wetland Replacement Agents (WRA) who undertake wetland restoration actions. This Directive applies only to restoration of mineral wetlands (i.e. marshes, shallow open waters, and swamps) (GoA, 2016).

Alberta Wetland Assessment and Impact Report Directive 2017

- The purpose of this Directive is to outline the pre-disturbance wetland assessment and reporting requirements of the Alberta Wetland Policy (GoA, 2017).
    - For minimal permanent impacts or short-term activities with reclamation, the Proponent must submit a Wetland Assessment and Impact Form.
    - For all other activities, the Applicant must submit a Wetland Impact Assessment Report that includes the following:
        - General project information
        - Wetland identification, delineation, and classification
        - Relative Wetland Value
        - Species surveys and other potential surveys (i.e., water quality)
        - Description of impacts on wetlands, and
        - Mitigation Proposal

Alberta Wetland Mitigation Directive 2018

- The purpose of this Directive is to inform planning and decision-making to avoid and minimize negative impacts to wetlands and, where necessary, replace lost wetland area and value (GoA, 2018).
    - "The wetland mitigation hierarchy establishes the following management approach to wetland impacts in Alberta:
        1. Avoidance – The primary and preferred response is to avoid wetland impacts
        2. Minimization – Where avoidance is not possible, applicants are expected to minimize wetland impacts
        3. Replacement – As a last resort, and where avoidance and minimization efforts are not feasible or prove ineffective, wetland replacement is required”

Directive for Permittee Responsible Replacement 2018

- This Directive outlines the reporting requirements for constructing wetlands in Alberta.
  "The following steps outline the process for permittee-responsible wetland construction:

    1. A site assessment determines the suitability of the site for wetland construction.
    2. A Wetland Assessment and Impact Report or Form for the activity proposing to impact wetlands is submitted with a Water Act application. It includes a mitigation proposal demonstrating how wetland impacts will be avoided, minimized and reclaimed, as well as justification for permanent wetland impacts
    3. Once permanent impacts are reviewed, and the regulatory body agrees to the applicant’s desire to complete a permittee-responsible wetland construction or restoration project, the applicant submits a detailed wetland restoration or construction plan
    4. All provincial authorizations, including a Water Act approval, are obtained (at this point, the applicant becomes an approval holder)

5. The approval holder completes the wetland construction or restoration project
6. The approval holder submits a validation report, by the date set in the Water Act approval condition, demonstrating that the wetland was constructed according to the design plan
7. The approval holder completes four years of monitoring and submits a verification report, by the date set in the Water Act approval condition, demonstrating whether the wetland is on trajectory towards a healthy, functioning ecosystem
8. After the regulatory body reviews and accepts the verification report, the wetland replacement obligation is fulfilled." (GoA, 2018b)

Alberta Watershed Resiliency and Restoration Program 2014

- This program was established in 2014 by the Government of Alberta to fund projects that help build greater watershed resiliency to flood and drought through restoration and enhancement of watershed functions. This includes wetland restoration, creation, and enhancement of wetland health/ functionality.
    - The WRRP focuses on projects that will contribute to meeting the following overall program outcomes:
        - Advancing flood and drought resiliency in priority areas within watersheds in Alberta;
        - Restoring and enhancing ecological connectivity and function in critical areas;
        - Increasing knowledge, awareness and tools that enhance watershed resiliency.
    - This program offers a broad focus on watershed resiliency, recognizing that beyond projects on-the-ground, there are additional ways in which we can improve resiliency, including:
        - Activities that have a clear and demonstrable benefit to the watershed's flood or drought mitigation abilities;
        - Education, outreach, data collection, research or other planning activities related to long-term projects that are directly tied to watershed restoration and resiliency, and on-the-ground projects;
        - Projects developed as partnerships with non-governmental organizations, First Nations, local authorities, landowners and producers.

Alberta Wetland Replacement Program 2021

- This program aims to re-establish wetlands in partnership with Albertans by providing payment for collaborative restoration projects across the province.
    - The WRP will offset wetland area lost, due to activities on the land, with the priority to replace wetlands within municipalities and watersheds that have had the highest amount of lost wetland area since 2015, as well as areas of high historic loss.
    - Wetland replacement includes the following activities:
        - Wetland Restoration
            - Returning natural/historic area and functions to a former or degraded wetland.
            - Wetlands that were drained illegally after implementation of the Alberta Wetland Policy are ineligible for compensation through this program (post-2015).
        - Wetland Construction
            - Creating a wetland on a site that was historically non-wetland.

Federal Government

Environment and Climate Change Canada Environmental Damages Fund

- The Environmental Damages Fund (EDF) is a specified purpose account that directs funds received from fines, court orders, and voluntary payments to environmental projects across Canada. While funding is not exclusive to wetlands, restoration and enhancement of wetlands has been funded by the program.
- Funds directed to the EDF are used to support projects in the following four categories, listed in priority order:
    - Restoration
    - Environmental quality improvement
    - Research and development
    - Education and awareness

Non-Profit Organizations

Ducks Unlimited Canada

- Is a non-profit organization stewarding Canada's wetlands through conservation and restoration efforts, research, education, and more. In Alberta, DUCs has several programs for landowners such as the Forage Program, the Hay and Graze Tender Program, the Revolving Land Conservation Program, Wetland Restoration Lease Program, and Conservation Easements which incentivize landowners to conserve or restore wetlands through farming best management practices and land leases.
- DUC is a partner and MOU holder with the GoA's Wetland Replacement Program and restores about 600 – 900 acres of wetlands per year in Alberta under the MOU.
- Through the Wetland Restoration Lease Program more than $4 million is paid out to landowners directly each year for the ecosystem services the restored wetland on their land provides. There is no cost to the landowner for construction and maintenance during the 10 year term. The landowner maintains ownership of the land and can continue to hay or graze the wetland areas. More information on the program can be found here: https://ag.ducks.ca/program/restoring-wetlands/.

The Alberta Chapter of the North American Waterfowl Management Plan (ABNAWMP)

- Canada is a signatory of the North American Waterfowl Management Plan – an international action plan to conserve migratory birds and their habitats throughout North America. In Alberta, focus has been on conserving and restoring wetland and upland habitats through the Alberta NAWMP Partnership. The program utilizes various tools to implement conservation across the province, such as land acquisition, wetland and upland restoration, and conservation easements.

Alternative Land Use Services (ALUS)

- ALUS is a charitable organization with an innovative community-developed and farmer-delivered program that produces, enhances, and maintains ecosystem services on agricultural lands, including wetland restoration and enhancement. The delivery of the ALUS program is intended to complement existing conservation programs, including federal and provincial government policy frameworks. Farmers and ranchers who choose to participate in the ALUS program have flexible agreements that suit their operation and offer them financial compensation for their ecosystem management.
- Currently, the following municipalities in the NSR watershed have an ALUS Program:
    - Brazeau County
    - Parkland County

- Sturgeon County
- County of Vermilion River
- County of Two Hills
- County of Wetaskiwin

Land Stewardship Centre (LSC)

- Is a non-profit organization that aims to connect people and build an engaged, dynamic, and supported stewardship community. The LSC provides information like best management practices, provides programs and funding, and shares tools and resources.
- Watershed Stewardship Grants
    - Stewardship and synergy groups, naturalist organizations, First Nations and Métis communities, recreational and community associations, and other non-profits can apply for up to $20,000 to fund projects that help to restore Alberta's valued water resources.
    - "Since 2006, more than 180 groups, from communities across Alberta, have received in excess of $2,500,000 to deliver more than 360 projects that help ensure a safe, secure drinking water supply, healthy aquatic ecosystems and reliable, quality water supplies for a sustainable economy." (LSC, 2023)

Green Acreages Program

- "The Green Acreages program offers publications, workshops and incentives developed especially for acreage, hobby farm and recreational property owners to help them implement stewardship practices that conserve and protect the valuable natural assets, such as air, land, water, wildlife, associated with their properties." (LSC, 2023b)
- "Through this initiative, eligible projects may be funded 50:50 up to a maximum of $2500 per project on a cost-share basis (i.e., property owners must contribute the same or greater cash or in-kind value to the projects). To be eligible, cost-share projects must incorporate beneficial management practices that will lessen the impacts of flooding and drought incidents." (LSC, 2023b). Funding for this program comes from the Alberta Government's Watershed Resiliency and Restoration Program.
- "Through the Green Acreages program, landowners can access valuable information and cost-share funding to support them in restoring and building wetlands, which have countless benefits for both landowners and the environment." (LSC, 2022)

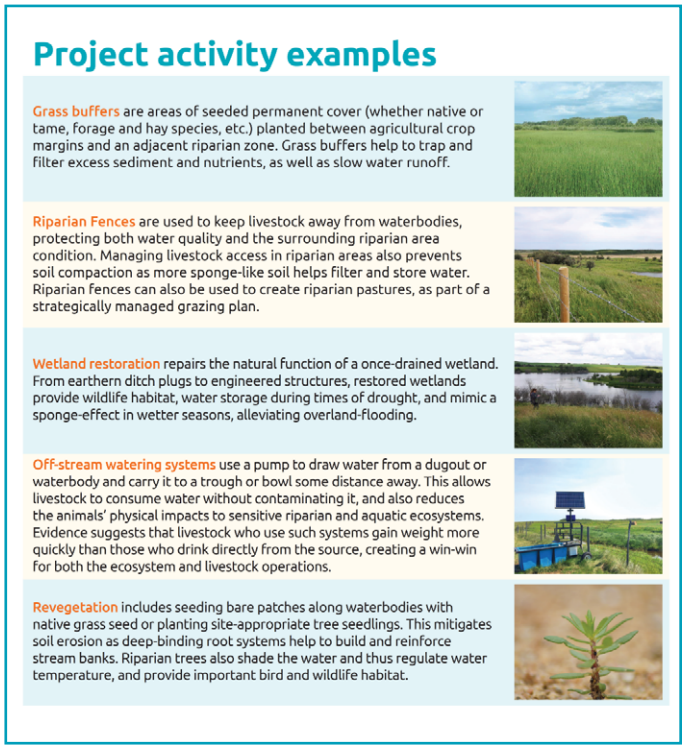
Cows and Fish (a.k.a. Alberta Riparian Habitat Management Society)

- Is a non-profit organization that works across Alberta to help landowners, communities, and stewardship groups:
    - Understand riparian area function and value,
    - Access technical and advice and educational materials,
    - Examine and monitor health of riparian areas, and
    - Evaluate and suggest management strategies.

- Though the organization's focus is on riparian areas, they often work in wetland ecosystems because of the associated riparian areas around them, and because of the connection to management activities on private lands.
- Cows and Fish also host a number of in-the-field and online workshops and webinars on various topics, from restoration activities to plant identification and beyond.

Vermilion River Watershed Alliance Landowner Projects

Since 2016, the Vermilion River Watershed Alliance has partnered with the NSWA to restore and enhance wetlands and riparian areas in the Vermilion River Watershed as part of the Vermilion River Watershed Restoration & Enhancement Project (VRWREP). With funding from the Government of Alberta's Watershed Resiliency and Restoration Program, the Alliances have collaborated with local landowners and other non-profit organizations to complete six years of on-the-ground restoration and enhancement activities as well as accompanying outreach events and educational initiatives.



From "The Vermilion River Watershed Restoration & Enhancement Project" Report.

Other Organizations

Alberta Biodiversity Monitoring Institute – Alberta-wide Wetland Inventory 2021

- The Alberta Biodiversity Monitoring Institute (ABMI) province-wide wetland inventory is divided into three project areas representing ecoregions of Alberta with distinct wetlands. These three regions are: (i) the boreal and foothills region, which is characterized by large peatland complexes; (ii) the prairie region with wetlands usually occurring in small depressional potholes, and (iii) the Rocky Mountain region where wetlands are constrained to narrow valleys.
- This product represents the most up to date wetland data set created by the ABMI for Alberta/Canada and can provide users with high quality data to meet their needs.
- This dataset was developed and generated by the ABMI's Geospatial Centre under the Advanced Landcover Prediction and Habitat Assessment (ALPHA) Program (DeLancey, et al., 2020).

City of Edmonton Wetland Strategy 2012

- This Wetland Strategy pulls together the array of City policies, plans and implementation tools that relate to Edmonton's wetlands and unites them all in a single document, complete with Council-approved strategic commitments, and tools for implementation.
    - "During all phases of natural areas conservation and management, the City aims to consider individual natural sites in terms of their connection with Edmonton's broader ecological network. For example, through the ecological network lens, a single wetland may be viewed as a stepping stone, wildlife corridor, or core biodiversity area, with important contributions to

the broader natural system. Similarly, the placement of a constructed wetland can strengthen the ecological network when the surrounding natural context is considered. This systems-based approach sustains the ecological quality of both individual sites as well as the whole of Edmonton's natural system.

- The three main goals of the City of Edmonton Wetland Strategy:
  1. Secure Edmonton's wetlands as part of the city's ecological network.
  2. Manage Edmonton's wetlands to maximize their ecological function.
  3. Engage Edmontonians to support wetland conservation." (City of Edmonton, 2012)

Tools for Wetland Conservation

Wetland conservation is made possible through a network of strategies, partnerships, and programs that have been developed over the last few decades in Alberta. There are several tools available for wetland conservation, including:

Protected Areas

- Careful stewardship of wetlands through protected area designation can help safeguard highly sensitive or significant areas for the future. For example, an **Ecological Reserve** preserves and protects natural heritage in an undisturbed state for scientific research and education. A **Natural Area** preserves and protects sites of local significance and provides opportunities for low-impact recreation and nature appreciation activities. **Indigenous Protected and Conserved Areas** are lands that Indigenous Nations identify for conservation and protection. IPCAs can take many forms and have various management structures; however, they share 3 common elements: 1) they are Indigenous-led; 2) they are a long-term commitment to conservation; 3) Elevate Indigenous governance, rights, and responsibilities.

Conservation Easements

- A conservation easement is a legal agreement under the Alberta Land Stewardship Act (sections 28-35), in which a landowner can choose to preserve the land's natural value (e.g., wetland value), either indefinitely or for a specific period of time, to ensure the conservation of their land, yet continue to use it and have the ability to sell it in the future.
- "CEs are protective notations that can help landowners assure the future stewardship of their lands by granting agreed rights to a land trust such as [Edmonton and Area Land Trust] EALT, to safeguard environmental, scenic, or other values of all or part of the land. The easement is registered on title and stays with the land, regardless of who owns it in the future.
- The Conservation Easement agreement includes restrictions that describe what is and isn't allowed on the land. Some restrictions are very common, such as not allowing further subdivision, draining wetlands, or removing trees." (EALT, 2023)

Environmental Reserves (ER) and Environmental Reserve Easements (ERE)

- Environmental Reserves and Environmental Reserve Easements are legal tools under Alberta's Municipal Government Act (MGA). "Put simply, an ER is land that is transferred from the landowner to the municipality in the subdivision process, for one or more applicable reasons. Meanwhile, an ERE is another form of ER that gives an interest in the land to the municipality while permitting ownership to stay with the landowner. Both ER and ERE are important planning tools that can help municipalities "foster the well-being of the environment" by preserving natural features of land and preventing water pollution, as well as permit public access to water bodies and prevent development in unsafe or unstable areas." (Environmental Law Centre, 2021)

- Per the requirements set-out by the MGA, ER (and ERE) must be used for one of the following purposes:
    - "(a) To preserve the natural features of land (referred to in s. 664(1) subsection (a), (b) or (c)), where, in the opinion of the subdivision authority, those features should be preserved;
      (b) To prevent pollution of the land or of the bed and shore of an adjacent body of water;
      (c) To ensure public access to and beside the bed and shore of a body of water lying on or adjacent to the land;
      (d) To prevent development of the land where, in the opinion of the subdivision authority, the natural features of the land would present a significant risk of personal injury or property damage occurring during development or use of the land." (Environmental Law Centre, 2021)
- ER and EREs are therefore great tools for municipalities to conserve wetlands.

Ecological Gifts

- The Ecological Gifts program is a federal program in which private and corporate landowners can make donations of ecologically sensitive land (e.g., wetland areas), or interests in these lands, and receive tax benefits.
- Some organizations that accept donations of land as Ecological Gifts include Nature Conservancy Canada, Nature Alberta, and Edmonton and Area Land Trust.

Municipal Bylaws

- The MGA guides and empowers municipalities to make urban and rural land-use development decisions through the creation of land-use bylaws. By-laws can be used to prohibit or regulate developments that may negatively impact wetlands. The MGA also provides for the creation of Municipal Reserve and Environmental Reserve lands, which may offer some protection to wetlands.

First Nation Land Codes and Bylaws

- The First Nations Land Management Act S.C. 1999 c.24 allows for the enactment of land codes on-reserve. First Nations Land Management enables First Nations to opt out of the 40 sections of the Indian Act that relate to land management. After opting out, First Nations take over control and administration of First Nation land and can develop their own laws about land use, the environment, and natural resources.
- If a First Nation has not opted into the First Nations Land Management Act, section 81, 83, and 85.1 of the Indian Act enable First Nation councils to pass bylaws. Land Use Bylaws are used to protect lands and regulate permitted activities, including around wetlands.

Metis Settlement Bylaws

- The Metis Settlements Act, RSA 2000, c M-14 part 13 enables a Settlement Council to create bylaws for the settlement area in many areas, including planning, land use, and development.

Other Provincial Wetland Tools

Stepping Back from the Water (2012)

- A beneficial management practices guide for new development near water bodies in Alberta's settled region.

Alberta Merged Wetland Inventory (1998-2015)

- The inventory digitally depicts wetlands for the 5 major classes in the Canadian Wetland Classification System: bog, fen, marsh, swamp, and shallow open water.

Professional Practice Standard for Wetland Science, Design and Engineering (2016)

- To provide assurance to Albertans that wetlands are being managed to the highest possible professional standard.

Alberta Guide to Wetland Construction in Stormwater Management Facilities (2018)

- Provides guidance on how to construct wetland habitat within a stormwater management facility.

Alberta Wetland Classification System (2015)

- Incorporates and merges information from existing wetland classification systems to provide a holistic classification system for Alberta. The guide is tailored specifically for wetlands in Alberta, providing suites of key indicators that in conjunction will help to classify different wetlands, particularly in the field. Overall, the intent of the guide is to achieve a standardized provincial wetland classification system (GoA, 2015b).

Upcoming Wetland Inventories

Alberta Wetland Maps

- In 2020, Ducks Unlimited Canada (DUC) and the Alberta Biodiversity Monitoring Institute (ABMI) announced the signing of a Memorandum of Understanding to collaborate on building the next generation of wetland maps in Alberta. In their joint statement, they say "The intent is to produce a science-based, publicly available, seamless wetland map for the province of Alberta over the next three years. This product will establish the baseline information to more effectively track changes in wetlands in response to land use change, including reclamation, and understand the ongoing impacts of climate change... With the recent availability of earth observation data (e.g., data from the European Space Agency's Sentinel missions), and new analytical tools such as machine and deep learning, this is a good time to create a new generation of wetland products that enhance our understanding of wetland distribution, type, and variability."

Wetlands near Corkscrew Mountain. Photo credit: Bill Trout.

Get in touch:

North Saskatchewan Watershed Alliance
www.nswa.ab.ca
Email: water@nswa.ab.ca

NSWA
NORTH SASKATCHEWAN
WATERSHED ALLIANCE