

# Building Natural Infrastructure Capacity Across Professions and Skilled Trades in the Canadian Prairies

IISD REPORT



Natural Infrastructure  
for Water Solutions



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Natural Infrastructure for Water Solutions (NIWS) is a 5-year initiative (2022 to 2026) led by IISD to scale up natural infrastructure across the Canadian prairies (Manitoba, Saskatchewan, and Alberta). The NIWS initiative aims for natural infrastructure to be well-understood, adopted, financed, and enabled by policy.

While science and policy are the foundation for this work, IISD is also taking a systems view—looking for opportunities and creative approaches to achieve real impact across the region, working with a network of champions, partners, and decision-makers.

## Natural Assets Initiative

The Natural Assets Initiative (NAI) is an award-winning Canadian not-for-profit that is changing the way communities deliver everyday services. The NAI team provides scientific, economic, and municipal expertise to support and guide all levels of governments in identifying, valuing, and accounting for natural assets in their financial planning and asset management programs, and developing leading-edge, sustainable, and climate-resilient infrastructure.

## Building Natural Infrastructure Capacity Across Professions and Skilled Trades in the Canadian Prairies

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Photo: iStock

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## Indigenous Lands and Cultures

The region we refer to as the Canadian Prairies is home to an incredible diversity of Indigenous cultures. Indigenous Peoples of the Prairie region are rightsholders with robust knowledge and close connection to their traditional lands and with jurisdiction over their territories.

The region of focus for IISD's Natural Infrastructure for Water Solutions (NIWS) initiative spans the traditional lands of over 200 Indigenous territories and homelands across the provinces we call Alberta, Saskatchewan, and Manitoba—including the Indigenous territories of the Cree, Assiniboine, Salteaux, Lakota, Dakota, Anishinaabe, Ojibwe, Oji-Cree, Blackfoot, Nakota Sioux, Iroquois Tsuut'ina, Stoney Nakoda, and the homeland of the Métis Nation. Water is life, and we have the responsibility to listen to and learn from the knowledge held by those who have lived here since time immemorial.

At IISD's NIWS, we uphold the agency and autonomy of Indigenous Peoples, supporting their efforts to revitalize and engage with their heritage across traditional, contemporary, and future contexts. We offer respect to those who have long lived with and stewarded lands and waters across the Prairies and recognize the ongoing leadership of First Nations and Métis communities.

We encourage everyone to visit [native-land.ca](https://native-land.ca) to learn more about traditional lands and treaties across the Prairies.



## Executive Summary

As interest in and demand for natural infrastructure grows across the Canadian Prairies, there is a concurrent need to increase the capacity and availability of professionals and skilled trades with the necessary skills and knowledge to support and deliver natural infrastructure projects.

This report explores options to strengthen natural infrastructure capacity across the Canadian Prairies region by enhancing skills, leadership, and knowledge in professional practice and skilled trades. It outlines why it is important to build capacity on the Prairies, provides illustrative examples of existing programs or ideas that might contribute to capacity building and build on existing strengths, and concludes with recommended actions.

The current workforce of water infrastructure-related professionals—like engineers, technologists, and planners—is highly trained to design, build, and operate grey infrastructure, with education and professional development that typically favours it. However, to better enable natural infrastructure as a complement or alternative to grey infrastructure, there is a need to work with more professions—like biologists, agrologists, and horticulturalists—to build capacity with all the professions and skilled trades that influence a project’s life cycle. Without an increase in the availability of skilled trades and professions, backed by effective professional development, grey infrastructure may remain the default option in professional circles. This risks a missed opportunity where natural infrastructure may be better placed to manage the costs and risks of service delivery while also building community resilience to the impacts of climate change.

Based on leading examples and recommendations, alongside interviews with professional experts, our research shows that the skills and expertise required to successfully scale natural infrastructure are diverse.

While there are existing capacity-building programs relevant to the Prairies—such as natural asset management workshops, professional development that links natural infrastructure and climate resilience, facilitated collaboration for rights-based approaches, and mentorship—opportunities remain. Working with professional associations, such as planners, engineers, agrologists, landscape architects, and more, is an essential step to building the field of professionals in a way that is aligned with their needs and priorities. In turn, these

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“There’s not any one person saying, ‘I build natural infrastructure. That’s my full-time job.’ But if everybody involved (planners, public works, engineers, project managers, CAOs [chief administrative officers]) had a basic literacy around natural infrastructure... that would move the needle for sure.”

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professional associations may also support the availability and capacity of skilled professionals and tradespeople to design and deliver natural infrastructure projects by

- increasing educational offerings around natural infrastructure for a broad audience of professionals or skilled tradespeople
- encouraging the use of guidance materials and funding programs with relevant training opportunities
- identifying the linkages between climate resilience and natural infrastructure
- providing educational offerings that support Indigenous rights
- facilitating on-the-job learning and mentorship.



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## Abbreviations and Acronyms

<b>CIER</b>	Centre for Indigenous Environmental Resources
<b>CLI</b>	Collaborative Leadership Initiative
<b>IISD</b>	International Institute for Sustainable Development
<b>NIWS</b>	Natural Infrastructure for Water Solutions





# 1.0 Purpose and Approach

Across Canada, natural infrastructure and natural asset management are gaining momentum as alternative approaches to support water infrastructure needs (e.g., stormwater treatment, flood protection) while providing other social, economic, and environmental co-benefits. However, as the demand for natural infrastructure grows, there may not be enough trained professionals and skilled tradespeople with the unique knowledge required to design, build, maintain, and/or manage natural infrastructure (Méthot et al., 2023).

This report recommends ways to build natural infrastructure capacity across the Canadian Prairies region by enhancing skills, leadership, and knowledge in professional practice and skilled trades. We explore three questions:

1. Why is it important to build natural infrastructure capacity in trained professionals and skilled tradespeople?
2. What are some leading examples of existing efforts that support capacity building?
3. What actions can professional associations take to enhance the capacity and availability of natural infrastructure expertise?

This report is informed by desktop research and interviews with 16 professionals from a range of disciplines to learn about the challenges and opportunities linked to embedding natural infrastructure in professional practice and skilled trades (Box 1). Throughout the report, we share quotes from interviewees.

## Box 1. Background on the interview process

This report builds on interviews led by the Natural Assets Initiative (NAI) with 16 professional experts in a challenge dialogue process (Coulter et al., 2023), who were chosen for their natural infrastructure or environmental expertise through consulting, education, administration, advocacy, or community engagement. Interviewees were based in Alberta (n=5), Saskatchewan (n=4), and Manitoba (n=5), plus specialist interviewees with a national scope who are based in Ontario (n=2). Of the 16 interviewees, five professional planners were interviewed to gain a deeper understanding of one key group.

As part of the International Institute for Sustainable Development's (IISD's) Natural Infrastructure for Water Solutions (NIWS) initiative (Box 2), this report concludes by describing next steps to increase the pool of professionals and tradespeople with natural infrastructure capacity to meet the growing demand.

It is important to acknowledge that the field of professionals and skilled tradespeople linked to natural infrastructure is diverse, transdisciplinary, and driven by emerging best practices



in multiple subjects. This report does not attempt to capture the entire breadth or depth of this network but rather provides illustrative examples of existing programs or ideas that might contribute to capacity building on the Prairies and build on existing strengths.

Ideally, opportunities presented in this report and by others will be considered and implemented with some urgency so communities can keep pace with changing infrastructure needs in the face of climate change.

## Box 2. Natural Infrastructure for Water Solutions



“Taking natural infrastructure from novel to normal.”

NIWS is a 5-year initiative (2022 to 2026) led by IISD to help scale up natural infrastructure for cleaner water and more resilient communities across the Canadian Prairies region. Working with partners, including the Natural Assets Initiative, NIWS aims for natural infrastructure to be backed by evidence, adopted at local scales, financed, and enabled by policy.

IISD’s expertise has contributed to the growing momentum behind natural infrastructure in Canada and internationally. Through the NIWS initiative and affiliated efforts—including IISD’s [Nature-Based Infrastructure Global Resource Centre](#) and [Nature for Climate Adaptation Initiative](#)—IISD and partners will build upon the illustrative work below to help scale natural infrastructure for water solutions, informed by the priorities and needs of key partners and communities across the Prairies.



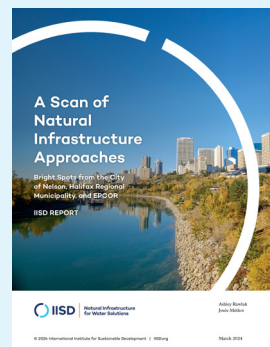
Examining the current implementation of natural infrastructure and suggested paths to scale.

[READ](#)



More investment in natural infrastructure can build greater resilience and increase jobs and GDP.

[READ](#)



Successful natural infrastructure implementation to deliver municipal services in three Canadian municipalities.

[READ](#)



How private capital can finance natural infrastructure, including an assessment of applicability of the finance instruments.

[READ](#)

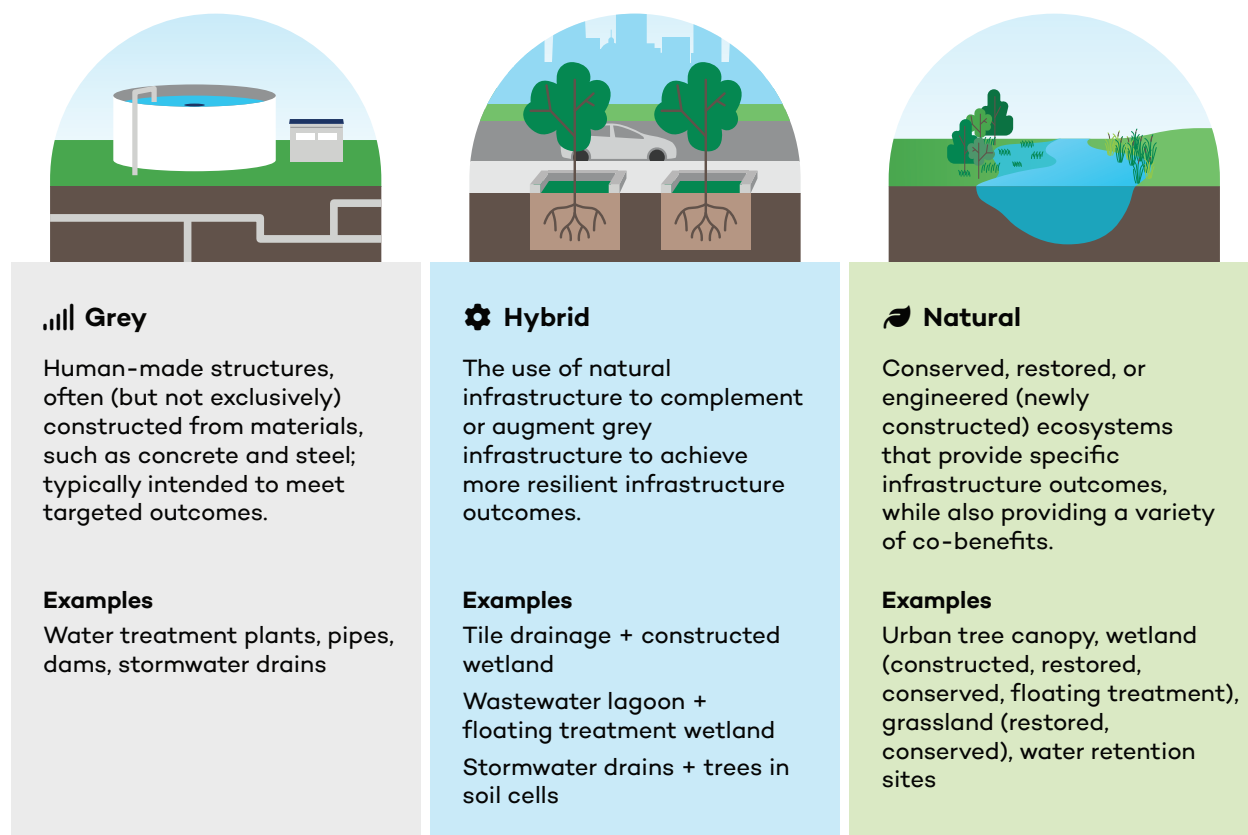


## 2.0 Why Build Natural Infrastructure Capacity in Professional Practice and Skilled Trades?

Natural infrastructure is increasingly recognized as an effective approach to help bridge Canada’s growing water infrastructure gap while strengthening resilience to the impacts of climate change, reversing biodiversity loss, and supporting healthy watersheds (Méthot et al., 2023). Natural infrastructure can be implemented in a variety of ways, using conserved ecosystems (e.g., wetlands), restored ecosystems (e.g., replanted riparian areas), or even nature-based engineered features (e.g., green roofs) to deliver infrastructure services, either independently or alongside grey infrastructure in a hybrid approach (Figure 1).

In this report, we refer to “natural infrastructure”; however, there are related terms and concepts that fit under the same umbrella, e.g., natural asset management<sup>1</sup> and low-impact development.

**Figure 1.** Approaches to natural infrastructure



Source: Méthot et al., 2023.

<sup>1</sup> “Natural asset management helps communities identify the location and type of existing natural assets (e.g., wetlands or urban tree canopies), value the municipal services provided from those assets, and integrate them into asset management plans to monitor, manage, and maintain for better performance (i.e., identify the investments or upgrades that are needed in the future)” (Row et al., 2024, p. 40).



## 2.1 Professions and Skilled Trades That Support Natural Infrastructure

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“I think we want engineering with more of a focus on naturalized solutions. And on the Prairies, we need more focus on hydrology. We have the other stuff. We have the project management, community engagement, the relationships. But that’s what we are lacking. That’s the kind of skill set we’d be after.”

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Currently, grey infrastructure remains the default option for delivering water infrastructure services, like stormwater management, wastewater treatment, flood protection, and drinking water provision. The Canadian Prairies are home to a workforce of experienced professionals and skilled tradespeople, including engineers, engineering technologists, land-use planners, and landscape architects, who are highly trained to design, build, and operate grey infrastructure. Additionally, existing formal education and professional development continue to favour grey infrastructure. However, there is a growing demand for alternative approaches that work with nature to deliver, enhance, or protect infrastructure service delivery.

The shift toward working with nature to deliver infrastructure needs is supported by many occupations, like architecture, engineering, ecology, planning, social science, and construction (Sandanayake et al., 2022). To support the entire project life cycle of natural infrastructure—from the initial idea for projects through design, construction, operation, maintenance, and monitoring—requires professionals already well versed in grey infrastructure, as well as different professions and skilled trades (Figure 2). With hydrology, vegetation, and soil at the heart of natural infrastructure, professionals and skilled tradespeople require specialized, multidisciplinary knowledge that is often different from that involved with grey infrastructure (Canadian Council of Ministers of the Environment, 2018).

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“The engineers are not as important, in a lot of cases, as the operations and maintenance guys, and they’ve been ignored.”

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**Figure 2.** Examples of professions and skilled trades required to support the entire project life cycle of natural infrastructure



### **Watershed Management**

Restoration ecologist  
Watershed manager  
Hydrologist  
Surveyor  
Agrologist  
Biologist



### **Municipal Natural Infrastructure**

Urban planner  
Arborist  
Engineer and engineering technologist  
Landscape horticulturalist  
Landscape architect



### **Operation, Training, and Capacity Building**

Water and wastewater facility operator  
Heavy equipment operator  
Environmental consultant



### **Regulatory and Public Administration**

Environmental policy analyst  
Conservation officer  
Municipal administrator  
Asset manager  
Accountant

Source: IISD, 2023; ECO Canada, 2024.

## **2.2 Supply of Professions and Skilled Trades Versus the Demand for Natural Infrastructure**

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“We’ve been finding it challenging, in the management plans that we’re developing, to find a consultant that has the conservation and the asset management expertise. It’s not really there yet.”

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The implementation of natural infrastructure is currently limited by an existing workforce that is well versed with the cost, benefits, design, construction, and operation of grey infrastructure. Without a dedicated effort to grow the capacity of professions and skilled trades related to natural infrastructure, grey infrastructure will remain the go-to. There are not enough skilled professionals and tradespeople on the Canadian Prairies with the unique knowledge and skills to take natural infrastructure from novel to normal (Méthot et al., 2023), which hinders further momentum.

Figure 3 illustrates the interplay between the demand for natural infrastructure and the supply of skilled professionals and tradespeople to meet that demand. If there is demand for and interest in natural infrastructure (which is currently the case, as described in Box 3), there is an opportunity to grow the pool of skilled professionals. If there is little demand for and interest in natural infrastructure, there may be less need for additional training in this space. On the other hand, if





there are not enough skilled professionals and tradespeople to help scope, design, and implement natural infrastructure, clients may just default to grey infrastructure.

Currently, there are many efforts to create courses and other content to build capacity amongst key professionals for scaling natural infrastructure and/or nature-based solutions. However, adapting course content or adjusting the course requirements across programs takes effort and time, as does ensuring it is appropriate for the Canadian Prairies. There is already a time lag between the increasing demand for natural infrastructure skills and the ability of formal education to meet this demand. One participant described their difficulties hiring a professional with “the whole package,” combining mapping expertise using LiDAR, hydrology, and geotechnical skills. Even considering degrees in environmental engineering, they were not aware of a specific designation or subset of engineering that currently addresses that mix to meet the demand.

Ensuring that there are enough skilled professionals and tradespeople on the Canadian Prairies will help increase the realization of successful natural infrastructure projects, leading to greater momentum and—potentially—greater demand. Conversely, without the supply of qualified personnel, then interest and momentum, as well as the establishment and performance of natural infrastructure projects, may suffer. This, in turn, can provide bad impressions for potential clients and a decrease in overall demand. A green roof, for example, will not “survive because [the practitioner] planted it, and then we had 2 drought years with extreme heat, and he didn’t increase the watering and maintenance on it to get it established.”

### **Box 3. A promising outlook for natural infrastructure and the supporting workforce**

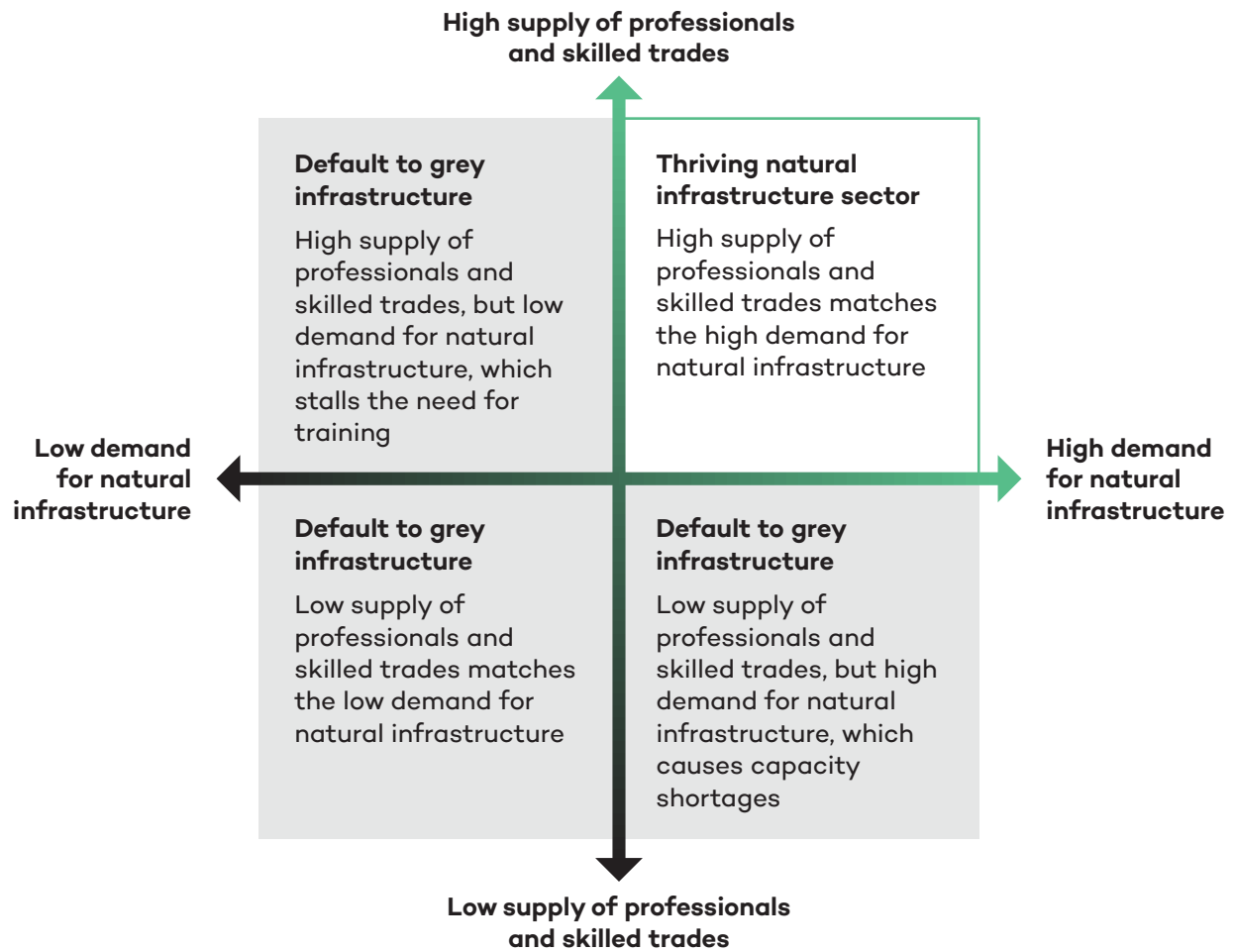
In 2022, the natural infrastructure sector already contributed over CAD 4.1 billion to Prairie-wide GDP and directly employed over 33,400 people (IISD, 2023). If the current rate of growth and investment in natural infrastructure continues, IISD (2023) estimates that jobs in the Canadian Prairies’ natural infrastructure subsector, including watershed management; municipal natural infrastructure; education, training, and capacity building; and regulatory and public administration, have the potential to increase by approximately 13%, and sector GDP could grow by 6% by 2030 compared to 2022.

ECO Canada (2024) has similarly reported strong demand, with the job opportunities for core environmental workers expected to grow by 34% in Alberta, 26% in Saskatchewan, and 33% in Manitoba by 2033, as compared to 2024 employment levels. The core environmental workforce is not exclusive to natural infrastructure but similarly requires environment-specific knowledge, skills, and competencies; it includes careers in public administration, construction, engineering, biology, and more.

Both outlooks demonstrate the need to boost the supply of professions and skilled trades with natural infrastructure capacity.



**Figure 3.** The relationship between demand for natural infrastructure and availability of skilled professionals and tradespeople



Source: Authors' diagram.



## 3.0 Growing Capacity Through Professional Development

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“People with specific knowledge and skills related to natural systems and how they work need to work with the [grey] infrastructure engineers and planners and everybody else to think through bigger picture infrastructure problems and how to solve them at the local government level.”

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For natural infrastructure to produce significant benefits to communities across the Prairies, it should not—and need not—be viewed as an entirely novel and separate practice. Rather, it can build on existing professional development and capacity-building efforts, focusing on strengths.

Professional development,<sup>2</sup> guided by industry associations, is a standard requirement where professionals and tradespeople update skills and knowledge with new and relevant practices and maintain professional designations. Table 1 outlines examples of professional organizations related to natural infrastructure on the Prairies. Some professions are self-regulated and are thus responsible for the training that underpins licensing, accreditation, or the designation of qualified individuals in each province. The natural infrastructure-relevant professions that are self-regulated in all three Prairie provinces are planners, agrologists, engineering technologists, engineers, and geoscientists. In Alberta, biologists and landscape architects are also self-regulated. Non-regulated professions do not have a legal requirement for certification, so there are no restrictions on who can do the work.

Next, this report describes how natural infrastructure might be incorporated into professional development to build the capacity and skills required to meet the growing demand for natural infrastructure. Interviewees described their recent experiences accessing professional development offerings specific to natural infrastructure. These experiences provide opportunities that can be leveraged to support greater implementation of natural infrastructure. While not a comprehensive investigation of professional development linked to natural infrastructure, the report provides four leading examples of current efforts.

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<sup>2</sup> Previous work by Coulter (2023), highlighted the importance of developing a natural infrastructure learning ecosystem, with attention to professional development, formal education, on-the-job learning, broadening perspectives, and changing attitudes. For this report, we focus on one key area: professional development.



**Table 1.** List of professional associations related to natural infrastructure in Alberta, Saskatchewan, Manitoba, and nationally

<b>Profession</b>	<b>Alberta</b>	<b>Saskatchewan</b>	<b>Manitoba</b>	<b>National</b>
<b>Agrologist*</b>	<a href="#"><u>Alberta Institute of Agrologists</u></a>	<a href="#"><u>Saskatchewan Institute of Agrologists</u></a>	<a href="#"><u>Manitoba Institute of Agrologists</u></a>	<a href="#"><u>Agrologists Agronomes Canada</u></a>
<b>Asset management</b>	No association in Alberta	No association in Saskatchewan	No association in Manitoba	<a href="#"><u>Canadian Network of Asset Managers</u></a>
<b>Biologist</b>	<a href="#"><u>Alberta Society of Professional Biologists*</u></a>	Biologists in Manitoba and Saskatchewan can apply to meet the requirements of the <a href="#"><u>Alberta Society of Professional Biologists</u></a>		<a href="#"><u>Canadian Society of Environmental Biologists</u></a>
<b>Engineering technologist*</b>	<a href="#"><u>Association of Science and Engineering Technology Professionals of Alberta</u></a>	<a href="#"><u>Technology Professionals Saskatchewan</u></a>	<a href="#"><u>Certified Technicians and Technologists Association of Manitoba</u></a>	<a href="#"><u>Technology Professionals Canada</u></a>
<b>Engineer and geoscientist*</b>	<a href="#"><u>Association of Professional Engineers and Geoscientists of Alberta</u></a>	<a href="#"><u>Association of Professional Engineers and Geoscientists of Saskatchewan</u></a>	<a href="#"><u>Engineers Geoscientists Manitoba</u></a>	<a href="#"><u>Engineers Canada and Geoscientists Canada</u></a>
<b>Environmental services</b>	<a href="#"><u>Environmental Services Association of Alberta</u></a>	No association in Saskatchewan	<a href="#"><u>Manitoba Environmental Industries Association</u></a>	<a href="#"><u>Canadian Environmental Certification Approvals Board</u></a>
<b>Forestry</b>	<a href="#"><u>Association of Alberta Forest Management Professionals</u></a>	<a href="#"><u>Association of Saskatchewan Forestry Professionals</u></a>	Professionals in Manitoba can apply to meet the requirements of the <a href="#"><u>Forest Professional Regulators of Canada</u></a>	<a href="#"><u>Canadian Institute of Forestry / Institut forestier du Canada and Forest Professional Regulators of Canada</u></a>
<b>Landscape architect</b>	<a href="#"><u>Alberta Association of Landscape Architects*</u></a>	<a href="#"><u>Saskatchewan Association of Landscape Architects</u></a>	<a href="#"><u>Manitoba Association of Landscape Architects</u></a>	<a href="#"><u>Canadian Society of Landscape Architects</u></a>



Profession	Alberta	Saskatchewan	Manitoba	National
<b>Municipal administrator</b>	<a href="#"><u>Local Government Administration Association of Alberta</u></a>	<a href="#"><u>Urban Municipal Administrators Association of Saskatchewan</u></a>	<a href="#"><u>Manitoba Municipal Administrators Association</u></a>	<a href="#"><u>Canadian Association of Municipal Administrators</u></a>
<b>Professional planner*</b>	<a href="#"><u>Alberta Professional Planners Institute</u></a>	<a href="#"><u>Saskatchewan Professional Planners Institute</u></a>	<a href="#"><u>Manitoba Professional Planners Institute</u></a>	<a href="#"><u>Canadian Institute of Planners</u></a>
<b>Water and wastewater operator</b>	<a href="#"><u>Alberta Water &amp; Wastewater Operators Association</u></a>	<a href="#"><u>Saskatchewan Operator Certification Board</u></a>	<a href="#"><u>Manitoba Water and Wastewater Association</u></a>	<a href="#"><u>Canadian Water and Wastewater Association</u></a>

\*These associations are regulated.

### 3.1 Offer More Professional Development Training and Make It Available Across Different Professions and Skilled Trades

While some professional development around natural infrastructure is available, there is a need for more. Providing more training opportunities in natural infrastructure will “result in [professionals] staying educated on natural infrastructure ... allowing them to communicate that with all parties, including their clients, employers, and other industries.”

Additionally, these training opportunities must be available across the broad array of professions that are involved throughout the project life cycle, helping to ensure everyone understands their role and how they fit into the overall process. “There’s not any one person saying, ‘I build natural infrastructure. That’s my full-time job.’ But if everybody involved (planners, public works, engineers, project managers, CAOs) had a basic literacy around natural infrastructure ... that would move the needle for sure.” Coordination and collaboration are both important for successful natural infrastructure implementation.

Professional associations can be central in promoting and providing continued education about natural infrastructure. This can be achieved through the required completion of relevant offerings in continuing education and the accreditation requirements obtained during post-secondary training. Capacity could be built through the development of “more specific and accessible training [with] a program that hits all the conferences to keep it part of an ongoing professional conversation [that] permeates at the academic level so that people entering the profession have a background in natural infrastructure.”

There are already professional development offerings to help people grow their skills in asset management (e.g., the [Asset Management Professional Certification Program](#) through the





PEMAC Asset Management Association of Canada; training and mentorship through [NAMS Canada](#)). Within a municipality (and depending on their structure and available resources), those trained and involved in asset management vary: they might be administrators, finance specialists, planners, public works staff, engineers, GIS analysts, information technicians, or an external consultant. Ultimately, it is not the responsibility of a single staff member but takes coordination among all departments.

Natural asset management is similar, requiring expertise and buy-in among a variety of professions and municipal roles. While interest is growing and a handful of offerings are available (Box 4), widespread capacity does not yet exist.

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“We need to talk about how managing natural assets helps people do their job. Because if I ask someone to take on more work, they say, ‘Go away, I am busy.’ But if I say, ‘This helps you do the things you’re already doing,’ then they’re engaged.”

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#### **Box 4. 🌱 Leading Example: Professional development to promote natural asset management**

Natural asset management is gaining momentum as local governments seek to better manage their grey infrastructure assets with the enhanced benefits of natural assets. Some examples of resources and offerings facilitated by professional associations and non-profit organizations include the following:

- NAI has supported over 100 local governments in Canada to consider natural assets in their financial planning and asset management programs, with training developed for specific professions, including planners, engineers, and geoscientists.
- Local governments across Canada who are just beginning to incorporate natural asset management can apply to work with NAI, who will guide them through the [Natural Asset Management Roadmap](#) program. The program requires a minimum of three staff across different departments (e.g., elected officials, administration, finance, public works, sustainability) to participate in capacity-building workshops and to collaborate on the roadmap, helping to share this expertise across the different professions and skilled trades in the municipality.
- NAI regularly delivers workshops and training to multidisciplinary groups through a [Natural Asset Management Fundamentals course](#) delivered through Royal Roads University and through funding from the Federation of Canadian Municipalities. NAI also has a growing body of publicly available guidebooks and case studies that can be used to build awareness and capacity on natural asset management.
- Engineers Geoscientists Manitoba hosted an online session called “[Nature-Based Infrastructure Solutions to Enhance Resilience](#)” for their members to provide a basic understanding of how natural infrastructure can build resilience to climate change.



### **Box 5. 💡 Idea: Micro-credentials course that combines training with federal funding**

The growing field of natural infrastructure practitioners can learn from existing programs with strong professional development approaches. For example, Lakeland College and Olds College of Agriculture & Technology have collaborated to deliver industry-recognized micro-credentials to professional agrologists and certified crop advisors. These [three courses](#) are aligned with the federal On-Farm Climate Action Fund, which supports farmers in implementing beneficial management practices to store carbon and reduce greenhouse gas emissions, including the

- cover cropping
- nitrogen management
- rotational grazing.

By completing these courses, practitioners will be able to work with farmers to promote the On-Farm Climate Action Fund program and to ensure the beneficial management practices qualify for funding.

Professionals and skilled tradespeople might benefit from a similar offering where the training is aligned with a federal funding program. For example, if a program directly funding natural infrastructure becomes available (like the fully allocated [Natural Infrastructure Fund](#)), it offers a prime chance to develop and deliver professional training that supports the concepts required to apply for this funding and deliver projects.

## **3.2 Provide Training so Professionals and Skilled Trades Can Use Existing Guidance Tools About Natural Infrastructure and Climate Resilience**

The creation of guidance materials is useful, but it will not be effective if the intended users do not have the necessary knowledge to use it. For example, “having a guidance book that’s a fairly substantive document might be good, but I feel like those kinds of documents won’t go anywhere if they’re not mobilized. Meaning, you need to have workshops and mobilize that knowledge.”

In Canada, the National Research Council of Canada and the Standards Council of Canada, among other organizations, create guidance tools and standards on many different areas, including natural infrastructure and climate resilience. While these tools offer a wealth of information, they are less likely to be used if professionals and tradespeople are not aware



of them or do not understand how to apply them. Professional development courses and workshops can be built around some existing offerings such as:

- [CSAW218](#) Specifications for natural asset inventories
- [Guidelines](#) on undertaking a comprehensive analysis of benefits, costs and uncertainties of storm drainage and flood control infrastructure in a changing climate
- [CSAW200:18](#) Design of bioretention systems
- [CSAW201:18](#) Construction of bioretention systems

### 3.3 Promote the Linkages Between Natural Infrastructure and Climate Resilience

Climate change is increasing municipal interest in natural infrastructure to improve resilience to weather-related events. Many local governments and communities of varying sizes are developing and implementing climate adaptation plans, often including nature-based solutions or natural infrastructure approaches as ways to reduce risks in the face of events like flooding, drought, or extreme heat. Embedding natural infrastructure training within broader efforts linked to climate adaptation and resilient infrastructure is a prime opportunity to grow the field while also helping to move climate adaptation efforts from planning to action.

A key example of capacity building at the intersection of climate change and resilient infrastructure is presented by the training programs of the Climate Risk Institute (Box 6).

#### Box 6. Leading Example: Professional development that links climate resilience and natural infrastructure

The Climate Risk Institute offers professional development through Royal Roads University to deliver increased knowledge and competency to further climate-resilient approaches for the planning, design, and management of infrastructure, including concepts around understanding climate projections and impacts, natural asset management, and natural infrastructure. There are interesting past and current options geared toward engineers and planners:

- The [Infrastructure Resilience Professional](#) credential includes six online courses targeted for professional engineers but also open to other practitioners. This designation was originally launched by Engineers Canada in 2015.
- The [Climate Change Adaptation Training for Prairie Region Planners](#) includes five modules to help planners incorporate climate change adaptation into practice. It is delivered in partnership with the Alberta Professional Planners Institute, Saskatchewan Professional Planners Institute, Manitoba Professional Planners Institute, and Canadian Institute of Planners.



## 3.4 Strengthen Training Related to Rights-Based and Equity-Based Approaches to Natural Infrastructure

In alignment with the principles of Canada’s National Adaptation Strategy, natural infrastructure projects must “respect jurisdictions and uphold Indigenous rights” and “advance equity and environmental justice” (Government of Canada 2023, p. 17). Strengthening training linked to understanding Indigenous rights and treaties across Canada, working effectively with rightsholders, and designing projects with an equity lens will support overall capacity building (Box 7).

### Box 7. 🦋 Leading Example: Facilitated collaborations with the Collaborative Leadership Initiative

With Prairie governments building commitments to reconciliation, relationships between First Nations and municipalities are changing, as the two levels of government find ways to collaborate on shared priorities. The Collaborative Leadership Initiative, facilitated by the Centre for Indigenous Environmental Resources (CIER), is a government-to-government approach that includes chiefs from Treaty One territory and mayors and reeves from the Winnipeg Metropolitan Region. Leaders from the Collaborative Leadership Initiative worked to co-develop a framework to inventory assets natural assets in Treaty One territory, including Indigenous approaches and ways of knowing, which were previously not considered in the nascent field of natural asset management.

The lessons learned are shared in [\*The Journey So Far: Reconciling First Nations Worldview and Perspectives with Natural Asset Management\*](#) (Bear & Bill, 2023).

CIER also offers a [free online course](#) on collaborative consent, where participants will gain knowledge and tools to advance collaborative decision making between Indigenous and non-Indigenous governments.

Building on this successful effort, CIER is adapting the Collaborative Leadership Initiative approach to the [Okanagan](#) region in British Columbia and the [Fort Smith](#) region in the Northwest Territories.

## 3.5 Facilitate Mentorship, On-the-Job Learning, and Collaboration

With mentorship and on-the-job learning, new skills, shared perspectives, and expanded knowledge are obtained through hands-on experience. Because natural infrastructure is often an emerging area of practice, this is especially valuable and happens throughout the workday with observation, experimentation, and collaboration, facilitated by student internships, apprenticeships, or facilitated collaboration.



Mentorship can help further the development of more skilled natural infrastructure practitioners as part of a structured program within a profession or workplace or even through casual workplace interactions (Box 8). This can also include visits to demonstration sites, where seeing the benefits firsthand makes the knowledge more relevant and understandable in relation to familiar practices.

### **Box 8. 🌱 Leading Example: Workplace mentorship**

A workplace mentoring program through the [Canadian Network of Asset Managers](#) helps professionals improve their skills through guidance from more experienced professionals. Experienced asset management practitioners are involved in knowledge management and are expected to support staff in asset management training by coaching or mentoring others. Within a work environment, support for shadowing someone who is experienced can be a very cost-effective method for transferring knowledge and skills. Alongside recognized workplace mentoring programs, this also gives the opportunity to observe and ask focused questions while strengthening working relationships between coworkers.

Within professional associations, existing mentoring programs can be expanded to include more natural infrastructure-specific opportunities in existing mentorship programs hosted by the Alberta Professional Planners Institute, the [University of Saskatchewan College of Engineering](#), and the [Canadian Network of Asset Managers](#).





## 4.0 Recommendations

The growing momentum for nature-based solutions and natural infrastructure presents a prime opportunity to expand professional development offerings to include the required specialized skills and knowledge. A key avenue to match supply and demand is to build on strengths by identifying existing capacity-building efforts on the Prairies and expanding their reach.

This report highlighted examples of existing capacity-building programs relevant to the Prairies, alongside some ideas drawn from professional development in other topics. The following actions can also support the availability and capacity of skilled professionals and tradespeople to design and deliver natural infrastructure projects.

Professional associations can

- increase educational offerings around natural infrastructure and make them available for other professions or skilled tradespeople to attend outside of the professional association;
- support increased usage and uptake by providing educational offerings around existing guidance materials and federal funding programs;
- clearly identify the linkages between climate resilience and natural infrastructure for more interest and as a viable alternative to grey infrastructure;
- provide educational offerings linked to understanding Indigenous rights and treaties across Canada, working effectively with rightsholders, and designing projects with an equity lens will support capacity-building overall and align with the principles of Canada's National Adaptation Strategy for the implementation of natural infrastructure projects;
- facilitate on-the-job learning and mentorship through intentional programs led by professional associations or within the workplace, which is particularly important because natural infrastructure is an emerging area of practice.

To accelerate the adoption of natural infrastructure and foster the right conditions to achieve landscape-level outcomes, governments on the Canadian Prairies need to prioritize and invest in the capacity and development of professionals and skilled tradespeople.



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