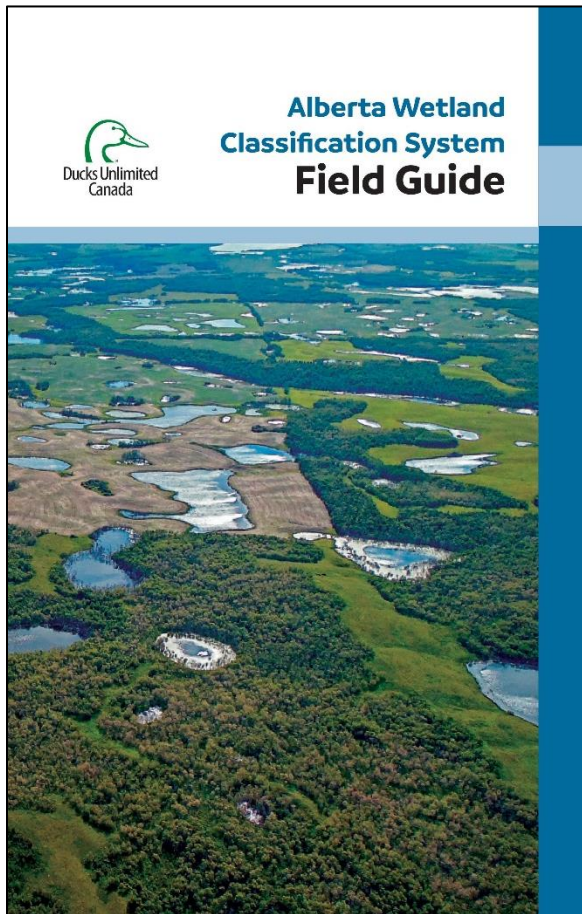


Alberta Wetland Classification System Field Guide

Final Public Report

[Alberta Innovates File #2534]



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Table of Contents

A.	EXECUTIVE SUMMARY	5
B.	INTRODUCTION	6
C.	PROJECT DESCRIPTION	9
D.	METHODOLOGY	11
E.	PROJECT RESULTS	14
F.	KEY LEARNINGS.....	20
G.	OUTCOMES AND IMPACTS.....	21
H.	BENEFITS	22
I.	RECOMMENDATIONS AND NEXT STEPS	25
J.	KNOWLEDGE DISSEMINATION.....	28
K.	CONCLUSIONS	29
L.	REFERENCES.....	31
	Appendix 1 – Project Workplan	32
	Appendix 2 – Key Feedback from each Project Phase	34

List of Tables

Table 1: Project performance metrics	10
Table 2. Public events and feedback surveys circulated throughout the field guide project lifespan	15
Table 3. Project metric results	17
Table 4: A complete summary of all project phases and timelines	32

List of Figures

Figure 1. Field guide marketing flyer distributed to stakeholders during Phase 3 of project	12
Figure 2: Virtual training registrants by sector (310)	16
Figure 3: Outdoor training attendees by sector (22)	16
Figure 4. Survey participants were asked to rate field guide components	34
Figure 5. Edmonton stakeholder engagement session (July 9 th , 2019). Participants were asked: Which component of the Wetlands Fact Sheets do you like or consider to be most valuable?	35
Figure 6. Participants of our July 8 th 2021 training session were asked “What did you learn today?”	36

Figure 7. Participants of our July 8 th 2021 training session were asked “How do you intend to use the AWCS field guide?”	36
Figure 8A. Participants of our July 20 th 2021 training session were asked “How would you rate the following?” <i>before the training was delivered.</i>	37
Figure 8B. Participants of our July 20 th 2021 training session were again asked “How would you rate the following?” <i>after the training was delivered.</i>	37
Figure 9. Participants of our September 23 rd 2021 training session were asked “What did you enjoy about the presentation/what can be improved?”	38

CLEAN RESOURCES FINAL PUBLIC REPORT TEMPLATE
1. PROJECT INFORMATION:

Project Title:	Alberta Wetland Classification System Field Guide
Alberta Innovates Project Number:	2534
Submission Date:	October 29, 2021
Total Project Cost:	\$182,700
Alberta Innovates Funding:	\$137,025
AI Project Advisor:	Dallas Johnson

2. APPLICANT INFORMATION:

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3. PROJECT PARTNERS

Please provide an acknowledgement statement for project partners, if appropriate.

This project would not have been possible without the generous support and funding of Alberta Innovates, Alberta North American Waterfowl Management Plan Partnership, Ducks Unlimited Canada and the Prairie Habitat Joint Venture. In addition, we would like to thank Alberta Environment and Parks for project advice as part of the Steering Committee.

A. EXECUTIVE SUMMARY

Provide a high-level description of the project, including the objective, key results, learnings, outcomes and benefits.

Approximately 20% of Alberta is covered by highly diverse and productive wetlands that play a critical role in maintaining healthy watersheds by providing water storage and infiltration, filtering sediments and contaminants, sequestering and storing carbon, and providing habitat for a diverse array of species. Wetland identification and classification is a necessary first step to be able to avoid or minimize potential impacts to wetlands when working on the landscape; however, the diversity of wetland types in Alberta means that these systems are often challenging to identify. Prior to the release of the Alberta Wetland Classification System Field Guide, there were no visually engaging, accessible wetland classification resources in Alberta that aligned with the Alberta Wetland Classification System (AWCS; ESRD, 2015). This information gap has been noted by several parties, including the Alberta Water Council and several industry partners who work closely with Ducks Unlimited Canada (DUC), as a key missing piece in understanding and communicating how to identify and classify wetlands for avoidance, mitigation and restoration purposes – essentially how to implement the Alberta Wetland Policy requirements. This project had three objectives:

1. Develop one user-friendly field guide to help land users identify and classify wetlands in the field according to the AWCS.
2. Communicate and educate land practitioners about Alberta’s wetlands and the use of the field guide in relation to their activities on the land.
3. Raise awareness and understanding of wetlands and wetland policy and the value of conserving Alberta’s wetlands.

Implemented over 2.5 years, DUC staff have created a publicly accessible, visually engaging Alberta Wetland Classification System Field Guide which introduces key concepts in identifying and classifying wetlands, walks users through the classification steps and confirms or validates user classifications using wetland and common wetland plant species fact sheets. Over 1000 stakeholders have participated in this project to date by purchasing, downloading or attending a wetland classification training session provided by DUC staff. We will build off this success by offering further training events and marketing the guide to target users groups, continuing to promote awareness of Alberta’s vital wetland ecosystems and the ecosystem goods and services they provide.

B. INTRODUCTION

Please provide a narrative introducing the project using the following sub-headings.

- **Sector introduction:** Include a high-level discussion of the sector or area that the project contributes to and provide any relevant background information or context for the project.
- **Knowledge or Technology Gaps:** Explain the knowledge or technology gap that is being addressed along with the context and scope of the technical problem.

Sector Introduction: Water and Wetland Policy

Approximately 20% of Alberta is covered by highly diverse and productive wetlands that provide numerous ecosystem goods and services to Albertans, including capturing and storing enormous amounts of carbon (Gingras *et al.*, 2016). Wetlands also play a critical role in maintaining healthy watersheds by providing water storage and infiltration, filtering sediments and contaminants, and providing habitat for a variety of species, some of which are rare or at-risk (*e.g.* woodland caribou). Although wetlands are abundant in Alberta's forested areas, they are sensitive and highly interconnected systems that even temporary human disturbances can impair. In southern areas of Alberta, there have been high levels of historical wetland loss, and human activities continue to impact wetlands. Because of historic and continuing impacts, wetland conservation, mitigation and restoration practices are important tools to ensure that wetlands continue to support healthy aquatic ecosystems.

There are many policy and regulatory guidance documents pertaining to wetlands in Alberta:

1. Alberta's renewed Water For Life Strategy (2008): A strategy outlining the Government of Alberta's commitments to manage and safeguard Alberta's water resources. The strategy has 3 main goals:
 - safe, secure drinking water supply;
 - healthy aquatic ecosystems; and
 - reliable, quality water supplies for a sustainable economy.
2. Alberta Wetland Policy (2013): The goal of this policy is to conserve, restore, protect, and manage Alberta's wetlands to sustain the benefits they provide to the environment, society and economy (Government of Alberta, 2013). The policy provides the strategic direction, tools and educational resources required to make informed management decisions to reduce the loss and degradation of wetlands while supporting economic growth and development. The policy is supported by a variety of guidelines, directives and other information. Desired outcomes include:
 - Wetlands of the highest value are protected for the long-term benefit of all Albertans.
 - Wetlands and their benefits are conserved and restored in areas where losses have been high.
 - Wetlands are managed by avoiding, minimizing and, if necessary, replacing lost wetland value.
 - Wetland management considers regional context.
3. Various guidance documents and directives are used to implement the Alberta Wetland Policy (not a comprehensive list – visit the [policy implementation website](#) for more details):
 - Alberta Wetland Identification and Delineation Directive

- Alberta Wetland Classification System
 - Alberta Wetland Assessment and Impact Report Directive
 - Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A) Guide
 - Guide to the Alberta Wetland Rapid Evaluation Tool – Actual (ABWRET-A) for the Boreal and Foothills Natural Regions
 - Alberta Wetland Mitigation Directive
 - Alberta Wetland Restoration Directive
4. The Water Act (2000): Under this Act, the Government of Alberta owns all water in the province and provides the legal foundation to regulate wetlands and development, including the implementation of the Alberta Wetland Policy. The Act prohibits any activity that can interfere with water, including wetlands, unless that person has an approval. Activities that remove or disturb ground and vegetation require authorization, including installing crossings, culverts, berms, drainage, or other earthworks resulting in water diversions.
 5. The Public Lands Act (2000): Section 3 of this Act provides the Government of Alberta with ownership to the beds and shores of most permanent and naturally occurring water bodies. A wetland is considered publicly owned if it resides on public land or is a permanent, naturally occurring body of water on private land. Authorization is required under the Act to drain, fill or otherwise convert these wetlands.

Knowledge Gap: Accessible Wetland Classification Resources

As shown, the technical guidance, policy and legislative frameworks exist in Alberta for wetland avoidance, mitigation and restoration. A recent review of the Alberta Wetland Policy by the Alberta Water Council found that there are several pieces missing in implementing the policy, including (Alberta Water Council, 2020):

- clarifying the requirements so that the process is less reliant on expertise and more accessible to non-wetland experts; and
- providing education programs that are similarly more accessible.

In line with these findings, industry and other stakeholders have indicated to Ducks Unlimited Canada (DUC) and our partners (e.g. Alberta North American Waterfowl Management Plan Partnership) that the lack of accessible resources is a significant limitation for meeting the objectives of the Alberta Wetland Policy. We believe that the first fundamental step to wetland conservation is to raise awareness and understanding of wetlands with the groups and individuals responsible for working in these areas: land users and land managers. A simple, plain-language field guide that can be easily used by practitioners who are working in the field is an important tool for identifying and classifying wetlands. A wetland field guide based on the AWCS did not exist prior to this project. The AWCS is a highly technical guidance document that provides excellent descriptions of wetland processes and characteristics, available data, and wetland classes, forms and types; however, it is 66 pages of text descriptions and was not designed as a quick reference document to be used in the field. The Alberta Wetland Classification System Field Guide project was an excellent opportunity to translate the technical information in this document into a plain-language, visually appealing field resource.

This project supports the implementation of the Alberta Wetland Policy in that deliverables enhance proponents' ability to meet legal requirements or guidelines enacted under the policy. The project also supports theme 2 of the Alberta Innovates Water Innovation Program and helps to meet numerous goals and outcomes outlined under the Water for Life strategy, including:

- Albertans are assured that Alberta's aquatic ecosystems are maintained and protected.
- Albertans will be assured that water is managed effectively to support sustainable economic development.
- Albertans will have access to the knowledge needed to achieve safe drinking water, healthy aquatic ecosystems, and reliable quality water supplies for a sustainable economy.

C. PROJECT DESCRIPTION

Please provide a narrative describing the project using the following sub-headings.

- **Knowledge or Technology Description:** Include a discussion of the project objectives.
- **Updates to Project Objectives:** Describe any changes that have occurred compared to the original objectives of the project.
- **Performance Metrics:** Discuss the project specific metrics that will be used to measure the success of the project.

Knowledge Description:

The Alberta Wetland Classification System Field Guide was a 2.5-year project (April 2019 – October 2021) with three main goals:

1. Develop one (for all of Alberta) or two (one for Alberta’s green zone and one for the white zone) user-friendly field guide(s) to help land users identify and classify wetlands in the field according to the AWCS.
2. Communicate and educate land practitioners about Alberta’s wetlands and the use of the field guide(s) in relation to their activities on the land.
3. Raise awareness and understanding of wetlands and wetland policy and the value of conserving Alberta’s wetlands.

The final deliverables for this project included both online (free) and hardcopy (printing cost charge) field guides. To raise awareness of the project deliverables and promote uptake of the guide(s), DUC committed to offering information webinars and field demonstrations to educate potential users on how to use the guide(s).

Updates to Project Objectives:

Beginning with the project launch in April 2019, DUC undertook an extensive partner and stakeholder engagement process to understand end-user needs with respect to a wetland field guide. One of the first questions we engaged stakeholders on was the need for either one field guide which would cover the entire province of Alberta, or two guides (one for the forested green zone and one for the settled or white zone) which might better address the unique wetland classes, forms and types specific to these diverse geographies. Engagement session participants in favour of one guidebook largely spoke about the potential for overlapping or duplicating material, as well as one guide being more convenient for those who work in both areas. Perspectives for two guidebooks largely reflected the desire to only carry material that is relevant to them and acknowledged that people working in the southern part of the province do not require boreal/green zone material. Overall, the majority of stakeholders who participated supported the development of one guidebook that covers the entire province (see Stakeholder Engagement Report, 2019). As a result, objective 1 of the project was modified:

1. Develop one user-friendly field guide to help land users identify and classify wetlands in the field according to the AWCS.

As the project progressed into 2020, along with the onset of the COVID-19 pandemic, in-person meetings were switched to virtual gatherings. With the final product launch in spring of 2021, the steering committee continued to advocate for virtual training events throughout the summer (as a replacement for field training events, with extensive travel). This switch to online learning had no overall impact on the project objectives.

Performance Metrics:

The following performance metrics were adopted to track the success of the Alberta Wetland Classification System Field Guide product launch.

Table 1: Project performance metrics

Metric of Results	Performance
Metric 1: Project deliverable quantity	End users download (electronic) or purchase (hardcopies) at least 500 copies of project deliverables
Metric 2: Project deliverable quality – end-users will be asked to rate the quality of the project deliverables	End users rate the quality of project deliverables as high – very high.
Metric 3: Project deliverable value – end-users will be asked to rate the value of the project deliverables	End users rate the value of project deliverables as high – very high.
Metric 4: Awareness and understanding of Alberta wetlands – end-users will be asked to report on their awareness and understanding of Alberta wetlands before and after downloading/purchasing project deliverables	End users report medium – very high increase in their awareness and understanding of Alberta wetlands.

Further indicators of success have been internally tracked by DUC, including:

- attendance at online and in-person events (stakeholder engagement and training events);
- participation in our public call-out for wetland and wetland plant photographs to use in the guide;
- formal feedback received through polls and surveys; and
- comments received from partners and stakeholders during the review process for the draft guide.

For information pertaining to the stakeholder engagement process (Phase 1 of the project), please refer to the Stakeholder Engagement Report (2019). Formal metrics and indicators from Phases 2 and 3 of the project are summarized below.

D. METHODOLOGY

Please provide a narrative describing the methodology and facilities that were used to execute and complete the project. Use subheadings as appropriate.

To deliver this project, DUC assembled a highly experienced team of professionals to approach the project in three phases:

1. Project launch, planning, and stakeholder engagement (April – September 2019)
2. Field guide development, internal/partner review and external stakeholder review (October 2019 – March 2021)
3. Extension and outreach activities (April 2021 – October 2021).

The project team was guided by the direction of a Steering Committee, consisting of members from Alberta Innovates, Alberta Environment and Parks and DUC. The Steering Committee met five times over the course of the project to review progress, make any adjustments that were needed to timelines and approve oversight decisions such as the addition of information about saline fens that is not included in the current AWCS technical document (ESRD, 2015).

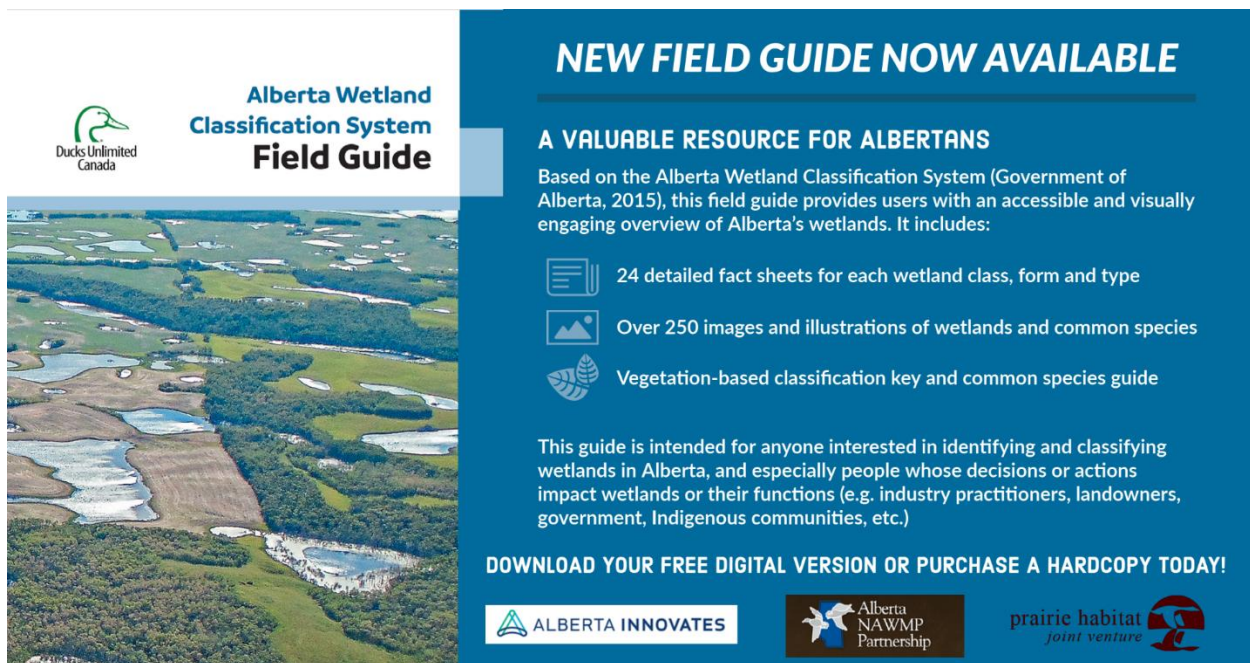
A summary of the complete project work plan (all 3 phases) can be found in Appendix 1. Previous updates have been provided to funders on the outcomes of Phases 1 and 2 of the project (see Interim Reports dated October 2019 and March 2021), as well as a publicly available Stakeholder Engagement Report which summarized Phase 1 activities in 2019.

Phase 3 Extension and Outreach Summary:

Phase 3 of the project commenced with the release of the free, downloadable web version of the field guide and an informational webinar advertised and delivered through DUC's Wetland Knowledge Exchange platform on May 18, 2021 entitled "A Very Visual Field Guide for Wetland Classification in Alberta." This version of the guide was considered a draft pending final comment from Alberta Environment and Parks staff on the inclusion of saline fen information that is not currently contained within the 2015 Alberta Wetland Classification System document. DUC staff released the final version of the field guide and sent the guide out for printing in early July 2021. We also held our first two online training events at this time on July 8th and 20th. These events were more comprehensive, half-day training sessions that aimed to provide much more detail on navigating the field guide and, more specifically, identifying and classifying wetlands in Alberta. The events also included interactive and engaging content using the Mentimeter online polling application and a virtual activity that used 360 degree images of wetlands to guide participants through the Classification Decision Key in the field guide. All events were offered at no cost to participants and advertised through our social media accounts, as well as through the Wetland Knowledge Exchange monthly newsletters and other monthly newsletters distributed to environmental professionals in Alberta.

On July 28th, 2021, with the arrival of the final printed field guides to DUC, we conducted a coordinated email outreach campaign to let all stakeholders who had previously engaged in the project know that the guides were available for both downloads and purchase, as well as to distribute a survey seeking feedback on how best to deliver our remaining two training events for the field guide. The following flyer was circulated as part of this effort to over 700 stakeholders representing individuals who had attended an earlier stakeholder engagement session, provided formal feedback or photos to the guide, or otherwise somehow engaged or participated in the project.

Figure 1. Field guide marketing flyer distributed to stakeholders during Phase 3 of project



Following this survey, some stakeholders indicated to us that they would prefer at least one outdoor training event in the Edmonton region, in addition to one further online training event (preferably with a publicly available recording).

In September 2021, DUC staff organized and held two further Alberta Wetland Classification System Field Guide training events:

1. One online, half-day training event on September 23rd. This event was recorded and the link to the recording is available to view here: <https://vimeo.com/wetlandbmpexchange>. There have been over 60 views of the online recording in the first week of its release online.
2. One outdoor training event at Cooking Lake-Blackfoot Provincial Recreation Area east of Edmonton.

This region of the province, known as the Beaverhills Biosphere, is a unique island of boreal forest within the central parkland area with many diverse wetland classes, forms and types, including the opportunity to conduct classification in peatlands, swamps, marshes and shallow open water wetlands. We worked closely with Beaverhills Biosphere staff to obtain access to their detailed wetland inventory of the area and to advertise this event through their member networks (including many Municipal staff in the

region). We also engaged with our DUC provincial team who have conducted extensive wetland restoration work within the Cooking Lake-Blackfoot region and were able to attend and speak to that restoration work for the benefit of participants. The field training day followed all mandated COVID-19 protocols at the time of the event, including screening and physical distancing, to provide a safe experience to DUC staff and attendees. A special event permit was received from Alberta Environment and Parks to conduct this event within the Provincial Recreation Area, including special permission to collect soil samples using our soil auger.

Following the delivery of our four training events, DUC sent one further project email out to our extensive stakeholder list (over 1000 participants who had either downloaded, purchased and/or attended a training session) to thank them for their engagement and to seek feedback on the final field guide product to assist us in reporting on our metrics.

E. PROJECT RESULTS

Please provide a narrative describing the key results using the project's milestones as sub-headings.

- Describe the importance of the key results.
- Include a discussion of the project specific metrics and variances between expected and actual performance.

Given the diversity of wetlands found in Alberta, wetland identification and classification is not a simple task. By developing an accessible, plain-language resource with an emphasis on photos and graphics, we aimed to simplify this task and further the Alberta Wetland Policy implementation across the province, reinforcing regulatory requirements and guidelines relating to wetlands. Practitioners are now better able to make informed decisions about wetland avoidance, minimization and restoration practices.

Field Guide Product Description

The Alberta Wetland Classification System Field Guide provides wetland information clearly and logically, for users to navigate while assessing a wetland in the field. The introductory content of the guide exposes users to wetland classification concepts like the five main wetland classes in Alberta (bog, fen, swamp, marsh, shallow open water) and their associated forms (based on vegetation structure) and types (based on chemical gradients). The guide walks users through wetland classification in three steps:

1. Is it a wetland? Wetland vegetation, soil and hydrology indicators to help differentiate wetlands areas from upland areas, including many photos of these key indicators.
2. Classification decision key, which guides users to the appropriate wetland classification using simple yes/no questions about the vegetation and soil conditions they can easily observe in the wetland.
3. Wetland fact sheets for each wetland class, form and, in the case of marshes and shallow open water wetlands, each wetland water permanence type. Seasonal photographs, indicator plant species and other clues, such as water pH or electrical conductivity, are provided in fact sheets, as well as illustrative diagrams of wetlands and indicator plants.

The final section of the guide includes detailed identification information and photographs for over 80 of the most common wetland plant species in Alberta, including all those listed as key indicators for various wetland classes, forms and types. The plant identification section lists species common and scientific names and organizes species according to their forms (trees, shrubs, forbs, graminoids, aquatic plant species and mosses) and also according to their community assemblages (peatland indicators, marsh wetland zone indicators, etc.). Key introductory illustrations provide important information on certain plant identification terms such as leaf arrangements and shapes, to improve the accessibility of the content.

Stakeholder Engagement

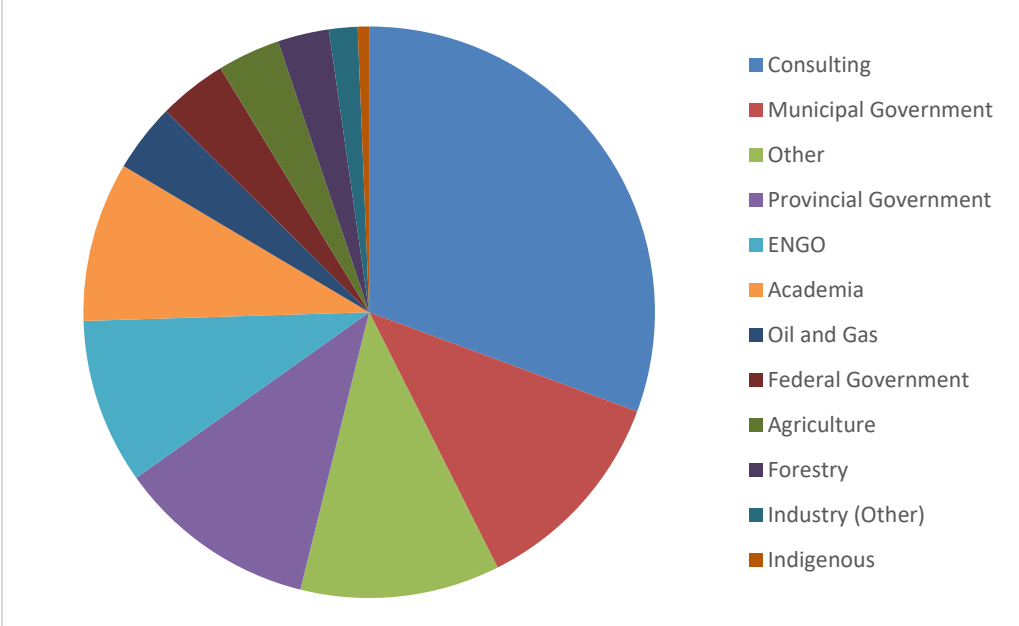
Over the course of the project, DUC staff organized eleven free, public events through which participants could engage, learn about wetland classification resources and skills, and provide valuable feedback that informed both the format and content of the final Alberta Wetland Classification System Field Guide. In concordance with these events, we also released 4 public surveys requesting specific information and feedback through our email networks.

Table 2. Public events and feedback surveys circulated throughout the field guide project lifespan

Event	Date	# Participants
Phase 1: Project launch, planning, and stakeholder engagement (April – September 2019)		
Project Launch Information Webinar	May 22, 2019	~30 live attendees (recorded, posted to website)
Stakeholder Survey	May 25, 2019	56 completed surveys
Edmonton Engagement Event	July 9, 2019	8
Lethbridge Engagement Event	July 14, 2019	3
Calgary Engagement Event	July 15, 2019	8
Slave Lake Engagement Event	August 13, 2019	7
Grande Prairie Engagement Event	August, 14, 2019	6
Phase 2: Field guide development, internal/partner review and external stakeholder review (October 2019 – March 2021)		
Partner review and feedback of drafted field guide	May to August 2020	12 feedback documents
Stakeholder (public) review and feedback of drafted field guide	December 2020 to January 2021	26 feedback documents
Phase 3: Extension and outreach activities (April 2021 – October 2020)		
Field Guide Release Informational Webinar	May 18, 2021	117
Online Field Guide Training Session	July 8 th , 2021	88
Online Field Guide Training Session	July 20 th , 2021	97
Stakeholder Survey	July 28 th , 2021	33 completed surveys
Online Field Guide Training Session	September 23 rd , 2021	125, with 63 views of the recording in the first week of release.
Outdoor Field Guide Training Session – Cooking Lake-Blackfoot PRA	September 24 th , 2021	22
Final Stakeholder Survey	October 18 th , 2021	44 completed surveys

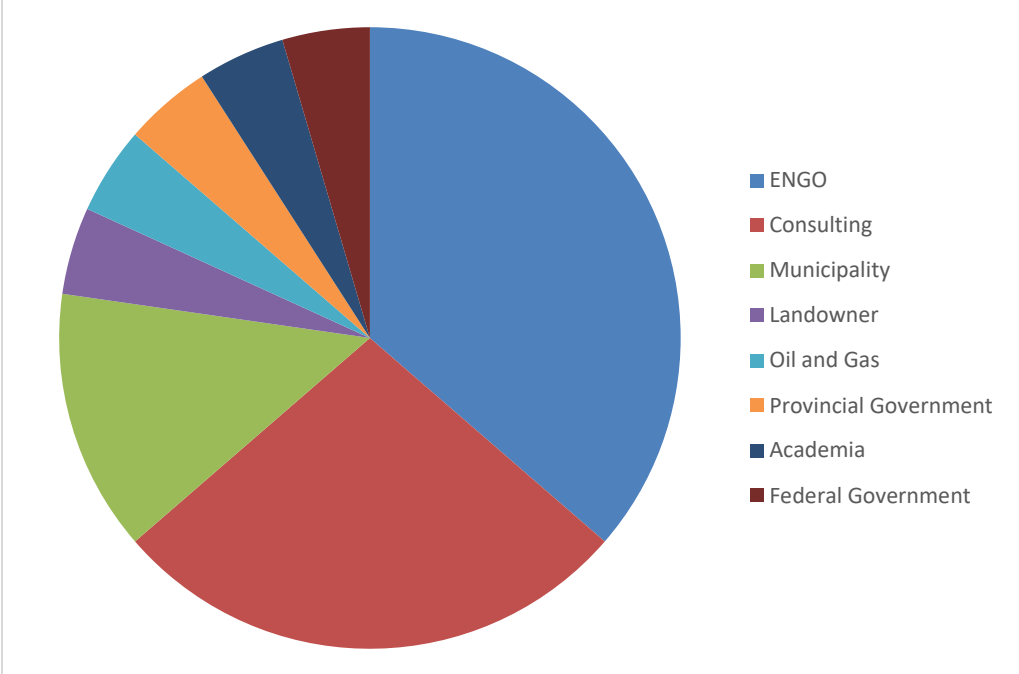
Stakeholders represented a number of diverse industries and end users of the field guide. For example, from our three virtual training events the following groups were represented:

Figure 2: Virtual training registrants by sector (310)



Similarly, for our in-person training event held on September 24th, 2021 we were fortunate enough to have attendees representing many diverse backgrounds and skillsets:

Figure 3: Outdoor training attendees by sector (22)



Engagement with stakeholders also occurred through social media. For example, we posted a public call-out for photograph submissions to the field guide throughout 2020. When the first draft of the guide was completed, DUC staff identified over 200 additional photographs that were needed to complement the content that had been drafted. We internally sourced and captured many of these, however there were numerous generous public submissions of photographs, including 96 which were incorporated into the final guide content (with credit to each photographer). We offer our sincere thanks to every individual who submitted wonderful photographs of Alberta’s wetlands and wetland plant species for inclusion in the guide.

Through the lifespan of this project, DUC staff received feedback from our online polls and surveys regarding the project direction, field guide draft documents, online training events, and the final utility and accessibility of the Alberta Wetland Classification System Field Guide. See Appendix 2 for a few key reviews that we have received during each project phase.

Reporting on Key Project Metrics

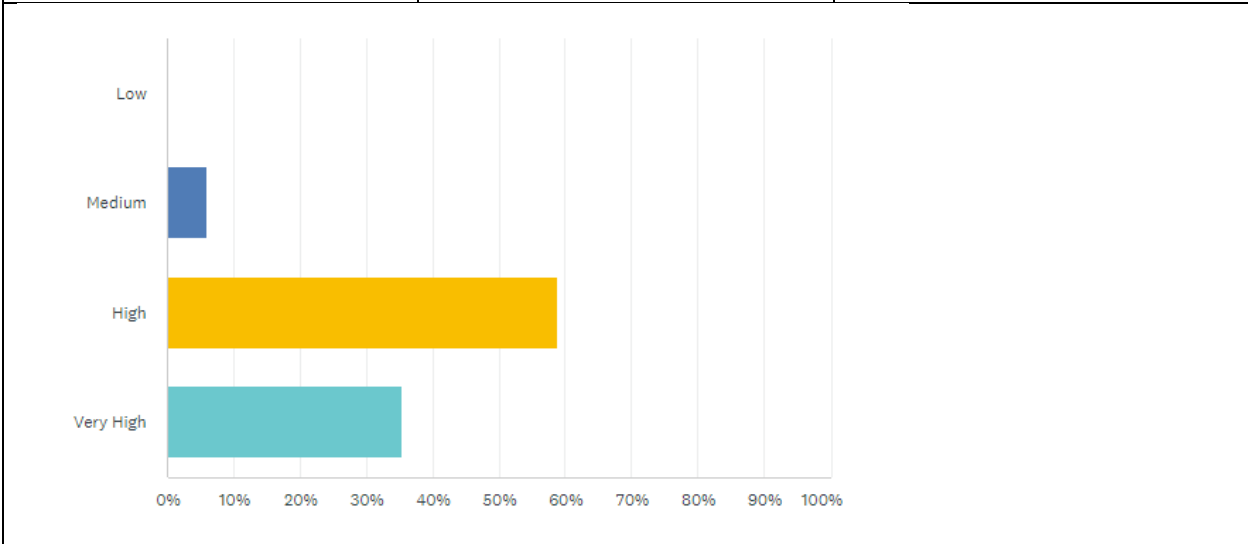
We are pleased to report that the final field guide met all required metrics to consider this project a resounding success. DUC intends to continue its promotion and use of the field guide in the coming years, building off the initial success we’ve received in the first 6 months of the product launch.

Table 3. Project metric results

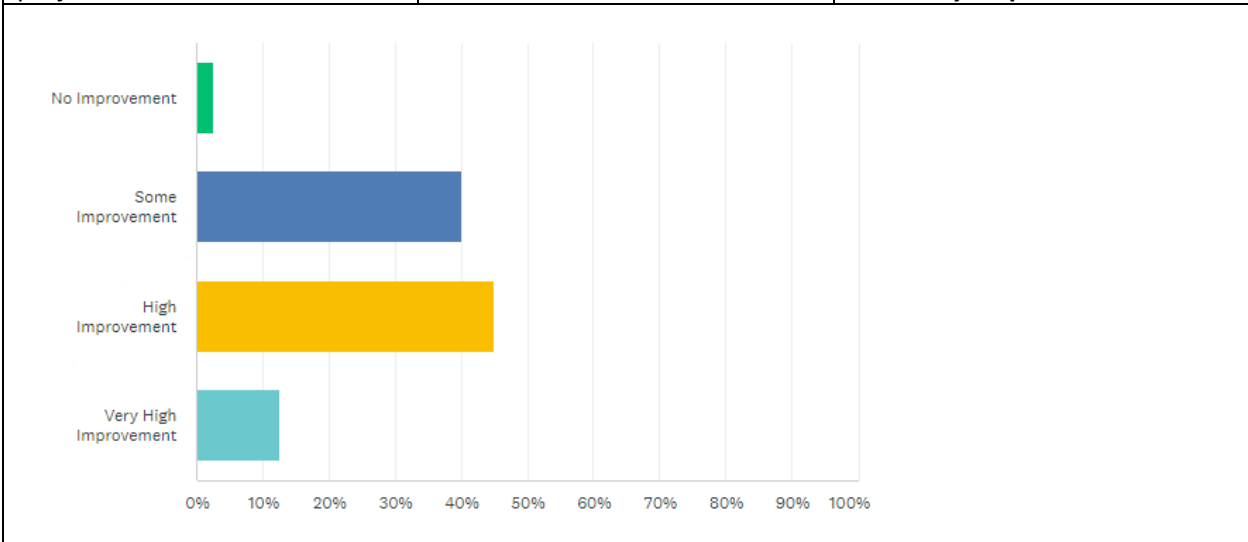
Metric of Results	Performance	Result
Metric 1: Project deliverable quantity	End users download (electronic) or purchase (hardcopies) at least 500 copies of project deliverables	Downloads: 876 Purchases: 110 Total: 986 (A further 85 hardcopies distributed to staff/partners)
Metric 2: Project deliverable quality – end users will be asked to rate the quality of the project deliverables	End users rate the quality of project deliverables as high – very high.	40 survey respondents:

Quality Rating	Percentage
High	65%
Very High	35%
Medium	0%
Low	0%

<p>Metric 3: Project deliverable value – end users will be asked to rate the value of the project deliverables</p>	<p>End users rate the value of project deliverables as high – very high.</p>	<p>17 survey respondents (limited to those who have purchased the field guide):</p>
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<p>Metric 4: Awareness and understanding of Alberta wetlands – end users will be asked to report on their awareness and understanding of Alberta wetlands before and after downloading/purchasing project deliverables</p>	<p>End users report medium – very high increase in their awareness and understanding of Alberta wetlands.</p>	<p>40 survey respondents:</p>
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Some key areas of success that we would like to further highlight:

1. In discussion with several educational institutions, we have heard promising feedback and endorsement from educators who plan to incorporate the field guide into their wetland course curriculum, including Lethbridge College and Lakeland College. In addition, Olds College has stocked the field guide within their bookstore for students and the public to purchase.
2. One of our key target audiences has been Municipal employees tasked with development planning and implementing the Alberta Wetland Policy requirements. Through our training events in 2021, we were able to connect with 37 employees from 19 different municipalities.
3. Similarly, we have connected with 29 training event participants who represent not-for-profit or volunteer-run environmental organizations, predominantly watershed stewardship groups and conservation organizations.
4. Our outreach and engagement efforts have also extended to representatives of the oil and gas, forestry, agriculture, mining, aggregate and power industries.
5. Lastly, we have been fortunate to have the participation of 12 federal government and 35 provincial government employees in our training events.
6. Through a successful grant application to the Sustainable Forestry Initiative and the Forest Resources Improvement Association of Alberta , we received funding to provide 400 copies of the Alberta Wetland Classification System Field Guide (as well as some other key resources) to forestry students and Indigenous communities across Alberta, free of charge. Engagement and initial mail-outs of the training packages for this project have begun in fall 2021.
7. In collaboration with the Alberta North American Waterfowl Management Plan Partnership (NAWMP), key DUC staff from the development of the Alberta Wetland Classification System Field Guide have provided input into a new landowner resource for wetland identification that is in development. This resource refers back to the field guide as a landowner tool. Further, NAWMP have generously provided further funding to DUC to develop two training videos based on the field guide, one geared towards wetland classification and the other to wetland hydrology. When complete, these videos will serve as excellent marketing tools for the field guide.

F. KEY LEARNINGS

Please provide a narrative that discusses the key learnings from the project.

- Describe the project learnings and importance of those learnings within the project scope. Use milestones as headings, if appropriate.
- Discuss the broader impacts of the learnings to the industry and beyond; this may include changes to regulations, policies, and approval and permitting processes.

Stakeholder Engagement

A key portion of the project and the associated timelines was dedicated to conducting a thorough outreach and stakeholder engagement process, including visiting five communities throughout Alberta in 2019 to meet with interested participants and discuss individual needs in their understanding of the Alberta Wetland Classification System. These participants were continuously engaged throughout guide development, including requests for photograph submission and content review, and then similarly re-engaged once the field guide was completed for further training and extension activities. By the end of the project, our stakeholder list had blossomed to over 1000 participants, which translated into direct uptake of nearly 1000 copies of the field guide in the first 6 months of launch. Although we recognize that not every comment or request could be facilitated given the diverse perspectives and needs of different groups, we truly appreciate the time and effort provided by each stakeholder and all ideas and feedback has been filed for potential future products and resources.

Steering Committee and Partner Engagement

Over the course of the project lifespan, the steering committee met five times to provide key input on project direction, budget, timelines and content reviews. These meetings were extremely valuable for both funders and the project team to keep the project on track. Similarly, we engaged a large group of partners both internal to DUC, as well as external through NAWMP, PHJV and Alberta Environment and Parks to review and comment on the draft field guide document. We were flexible in the turnaround time for receiving comments, which ultimately extended our Phase 2 project timelines, however we value the in-kind support provided by these partners greatly and appreciate each representative who provided their feedback.

Target Audience

The field guide was developed as a resource to assist land users and land managers in their work in and around Alberta's wetlands. Throughout the stakeholder engagement process, we did hear feedback from landowners who were looking for introductory wetland identification resources akin to brief fact sheets, as well as wetland experts who require detailed technical information on wetland indicators required for wetland assessment reporting. We believe that the Alberta Wetland Classification System Field Guide has struck the right balance in providing all the resources needed to classify wetlands in a visual, easily digestible format without over-simplifying or over-complicating wetland classification.

G. OUTCOMES AND IMPACTS

Please provide a narrative outlining the project's outcomes. Please use sub-headings as appropriate.

- **Project Outcomes and Impacts:** Describe how the outcomes of the project have impacted the technology or knowledge gap identified.
- **Clean Energy Metrics:** Describe how the project outcomes impact the Clean Energy Metrics as described in the *Work Plan, Budget and Metrics* workbook. Discuss any changes or updates to these metrics and the driving forces behind the change. Include any mitigation strategies that might be needed if the changes result in negative impacts.
- **Program Specific Metrics:** Describe how the project outcomes impact the Program Metrics as described in the *Work Plan, Budget and Metrics* workbook. Discuss any changes or updates to these metrics and the driving forces behind the change. Include any mitigation strategies that might be needed if the changes result in negative impacts.
- **Project Outputs:** List of all obtained patents, published books, journal articles, conference presentations, student theses, etc., based on work conducted during the project. As appropriate, include attachments.

Project Outcomes and Impacts

Prior to the launch of the Alberta Wetland Classification System Field Guide, there were no guidebooks in Alberta that offered visually engaging materials on how to identify and classify wetlands according to the AWCS. This field guide offers the information using plain language, with over 250 photographs and illustrative diagrams included to help users working in or around wetlands in the field. In the 6 months since the web version of the guide was released, we have reached over 1000 individuals who have downloaded, purchased and/or attended a training session for classifying Alberta's wetlands. We hope to continue with this success by conducting further marketing and outreach efforts in the future.

Success of this project was tracked using four metrics relating to the field guide downloads/purchases and participant impressions of the resource (see Table 3). In addition, DUC tracked various statistics relating to stakeholder engagement and training event attendance during the field guide development and launch, maintaining close relationships with partners and stakeholders who provided valuable content, feedback and expertise in the development of this resource. We adapted by conducting virtual meetings and events during the COVID-19 pandemic, however we received feedback from stakeholders who requested at least one outdoor training event be held for a chance to conduct wetland classification on the ground. We were able to safely accommodate this request by holding an outdoor event on September 24th, 2021 at Cooking Lake-Blackfoot Provincial Recreation Area, east of Edmonton.

Project Output

One published book has been produced as a result of this project:

ISBN 978-0-9812303-9-9

Ducks Unlimited Canada (2021). Alberta Wetland Classification System Field Guide. Edmonton, AB.

H. BENEFITS

Please provide a narrative outline the project's benefits. Please use the subheadings of Economic, Environmental, Social and Building Innovation Capacity.

- **Economic:** Describe the project's economic benefits such as job creation, sales, improved efficiencies, development of new commercial opportunities or economic sectors, attraction of new investment, and increased exports.
- **Environmental:** Describe the project's contribution to reducing GHG emissions (direct or indirect) and improving environmental systems (atmospheric, terrestrial, aquatic, biotic, etc.) compared to the industry benchmark. Discuss benefits, impacts and/or trade-offs.
- **Social:** Describe the project's social benefits such as augmentation of recreational value, safeguarded investments, strengthened stakeholder involvement, and entrepreneurship opportunities of value for the province.
- **Building Innovation Capacity:** Describe the project's contribution to the training of highly qualified and skilled personnel (HQSP) in Alberta, their retention, and the attraction of HQSP from outside the province. Discuss the research infrastructure used or developed to complete the project.

Environmental Benefits

Wetland identification and classification is a necessary first step to be able to avoid or minimize potential impacts to wetlands when working on the landscape; however, the diversity of wetland types in Alberta means that these systems are often challenging to identify. The Alberta Wetland Classification System Field Guide is freely available to the public and has the information and capacity to enhance the ability of practitioners in Alberta to identify, classify, and understand ecological and hydrological characteristics of these sensitive wetland ecosystems.

For example, incorporating wetland knowledge into planning, construction, and operational practices will help practitioners avoid or minimize potential negative impacts to wetlands. As an example, in the northern boreal region of the province wetlands occupy approximately 40% of the landscape and store vast carbon reserves within their organic soils. Industry practitioners can better avoid unnecessary impacts to wetlands by recognizing their presence and implementing best management practices such as temporary winter road construction or increased culvert frequency on permanent roads. Saraswati et al. (2019) showed that road crossings through peatlands in boreal Alberta can lead to increased methane (CH₄) emissions caused by changes to the peatland hydrological regime, with road-induced methane emissions up to 212.2 kg CH₄/year for each kilometer of road, creating a significant additional source of anthropogenic greenhouse gas. This is just one example of how better identifying and classifying wetland road crossings (prior to construction) can help inform the implementation of best management practices to avoid disturbances that cause increased greenhouse gas emissions.

Economic Benefits

The Alberta Wetland Classification System Field Guide is a tool in ensuring wetlands and water in Alberta are effectively managed while supporting economic development in the province, a key goal of the Alberta Wetland Policy (2013). Without accessible resources that can be used by developers, Municipalities, construction or industry practitioners, to understand how to identify and classify wetlands (including over 250 photographs and illustrations of their appearance and common plant species), they will inevitably be seen as a barrier to development requiring increased survey time and effort to implement the Alberta Wetland Policy requirements. If wetlands are recognized and better incorporated into the project design phase, it is possible that the mitigation hierarchy (avoid, minimize, replace) might be more effectively implemented in earlier project planning phases, namely by designing a new development around the existing wetland resources instead of resorting to costly replacement payments or restoration plans.

From the broader perspective of all Albertans, this field guide has the potential to lead to better recognition of wetlands, their ecological goods and services, and hence their retention on the landscape. Economically, this can benefit the province as conserving and restoring wetlands is our best defense in mitigating future drought (including wildfire) and flood impacts to our environment and economy. Examples include the southern Albertan floods of 2013, where more than 60% of wetlands have already been lost in the southern regions of the province, contributing to the flood volumes and infrastructure losses. Similarly, the Fort MacMurray wildfire of 2017 burned through several areas of drained peatlands, helping fuel this fire as it entered the city, leading to one of Canada's costliest natural disasters in history.

Social Benefits

Albertans are fortunate to enjoy a province rich in natural resources and heritage. It is likely that many Albertans will encounter a wetland in their day to day work or recreational pursuits, however they may not recognize this ecosystem as a wetland and may therefore not understand the ecosystem goods and services wetlands provide. By releasing a publicly-accessible and visually engaging resource for Albertans to identify and classify wetlands, we had the objective of raising awareness and understanding of these vital ecosystems. We engaged with over 1000 Albertans over the course of this project, many who were either employed by or volunteered with watershed stewardship groups or conservation organizations. Others were landowners, employees of various industries (oil and gas, forestry), or governmental organizations. All were interested in learning more about Alberta wetlands and able to either purchase, download or attend a wetland classification training session upon launch of the Alberta Wetland Classification System Field Guide. We will continue these outreach efforts into the future.

Building Innovation Capacity

Many stakeholders and participants in the development of the Alberta Wetland Classification System Field Guide are considered experts, or Authenticating Professionals, capable of conducting and signing off on the various tools and reports required under the Alberta Wetland Policy and associated guidelines (Wetland Identification and Delineation Directive, Alberta Wetland Rapid Evaluation Tools, etc). Our primary aim was to provide a resource accessible to all Albertans, and not just wetland specialists, however we received feedback and participation from many wetland professionals (e.g. 95 individuals

from over 70 different consulting firms attended our summer 2021 training events). We have heard anecdotally that this resource is a great training tool within these organizations for introducing new or junior level staff to wetland assessments and concepts. Furthermore, we have engaged with over 40 individuals representing various industry organizations (agriculture, forestry, oil and gas and mining), who have attended our training sessions, downloaded and/or purchased a field guide, ideally with the goal to increase internal capacity within their organizations for identifying and classifying wetlands.

I. RECOMMENDATIONS AND NEXT STEPS

Please provide a narrative outlining the next steps and recommendations for further development of the technology developed or knowledge generated from this project. If appropriate, include a description of potential follow-up projects. Please consider the following in the narrative:

- Describe the long-term plan for commercialization of the technology developed or implementation of the knowledge generated.
- Based on the project learnings, describe the related actions to be undertaken over the next two years to continue advancing the innovation.
- Describe the potential partnerships being developed to advance the development and learnings from this project.

Future Training Events

In our final stakeholder survey distributed in October 2021, we asked participants in the Alberta Wetland Field Guide project what further training events, resources and opportunities they would like to see in relation to learning how to identify and classify Alberta’s wetlands using the Alberta Wetland Classification System Field Guide. 90% of those surveyed indicated they would attend a future training event, with the majority opting for in person (outdoor) training as their preferred option. Several respondents indicated that they are located where DUC staff were unable to provide field training events due to the COVID-19 pandemic in 2021. We have also heard from our internal project partners, including DUC and NAWMP staff members, that they would like to receive further wetland classification training in the field in summer 2022, to learn how to implement the AWCS in their day to day activities. DUC will continue to seek grants and opportunities to support these training needs and increase uptake of the Alberta Wetland Classification System Field Guide amongst Albertans who work or recreate in and around wetlands.

Outreach to Target User Groups

Through a successful grant application to the Sustainable Forestry Initiative and the Forest Resources Improvement Association of Alberta, we received funding to provide 400 copies of the Alberta Wetland Classification System Field Guide (as well as some other key resources) to forestry students and Indigenous communities across Alberta, free of charge. Engagement and initial mail-outs of the training packages for this project have begun in fall 2021. We hope to build from the success of this effort by submitting further grants for similar initiatives to other target groups, including municipal staff, watershed stewardship organizations and agricultural groups. We are similarly keen to continue working with post-secondary educational institutions who offer wetland courses in adopting the Alberta Wetland Classification System Field Guide as formal course materials.

Future Projects

Over the course of developing the Alberta Wetland Classification System Field Guide, we heard many innovative ideas for how to better provide and disseminate wetland knowledge and resources to Albertans. Some examples are below:

1. We have worked with the Alberta Biodiversity Monitoring Institute to discuss the creation of a Wetland Biodiversity Browser, a resource to be hosted online which provides information on wetland plant and animal species, including key identifying details, habitat requirements and photographs.
2. DUC staff from across the prairie provinces have worked on developing resources for landowners and land managers to use in identifying and classifying wetlands in particular geographic regions (eg. Field Guide for Boreal Wetland Classes in the Boreal Plains Ecozone of Canada, Manitoba Prairie Wetland Classification Guide). We would like to assimilate this breadth of information across the prairie provinces into an online, interactive and highly visual wetland platform, including photos of the various wetland classes, forms and types and links to resources including policy and guidance documents, plant and soil identification and descriptions, etc.
3. Throughout the stakeholder engagement portions of this project, the idea of developing a mobile phone app to assist in wetland classification and plant identification in the field was brought up countless times. There are wetland-specific apps that exist in the United States to guide practitioners through the regulatory requirements that are needed to conduct wetland assessments, similarly many plant identification and monitoring apps exist such as iNaturalist. There remains a gap in Alberta in providing an easily digestible, highly visual app that conveys information on wetland identification and classification (essentially an online translation of the field guide).
4. This project informed us of a large knowledge gap that exists in communicating wetland annual and seasonal changes – namely, wetland water level fluctuations. This is a key concept to communicate to Albertans who may encounter wetlands in a dry season or a dry year and not immediately recognize that the area is flooded only temporarily to seasonally but is still considered a wetland none-the-less, with important ecosystem functions and related regulatory requirements if there are any proposed disturbances. We purchased a drone specifically to capture aerial imagery of wetlands to fill some of these key communication gaps in the field guide. We would like to further our efforts to obtain more visual extension and outreach materials by conducting a more formal wetland seasonal change monitoring project using aerial drone imagery and remote wildlife cameras positioned at key sites on-the-ground.
5. There remains a gap in wetland training in Alberta geared towards industry practitioners or land managers who want to interpret wetland mapping inventories and apply the information to their on-the-ground practices. DUC provides wetland inventories for the boreal region of Alberta and has collaborated closely with many forest management companies on training and outreach initiatives. We see further room for providing wetland classification training activities to all industries, including oil and gas as well as their construction contractors. This is a target audience we hope to collaborate with further in our future outreach efforts. Ideally we could also work closely with the Wetland

Specialists within Alberta Environment and Parks to help disseminate information about how to apply Alberta Wetland Policy requirements to the boreal region of Alberta, where wetlands are extensive ecosystems covering large swaths of the landscape and disturbances can be very challenging to avoid.

6. A key finding of the Alberta Water Council's Alberta Wetland Policy Implementation Review Report (2021) found that there is a large gap in resources available to Indigenous communities, who are often not included in the dialogue around wetland policy implementation. They encourage facilitation of ongoing, open, and meaningful dialogue with Indigenous peoples in decision making around wetlands and that education programs be expanded to consider the needs of Indigenous peoples, organizations, and partners and their accessibility to information. DUC acknowledges that Indigenous dialogue was not a targeted effort of the Alberta Wetland Classification System Field Guide project and that we were very fortunate to receive advice and guidance from some select Indigenous perspectives along the way, despite not targeting these groups. We hope to improve on this in the future by conducting further knowledge exchange activities with Indigenous communities across Alberta, learning about their perspectives on wetland functions and values and perhaps working to co-create content and resources for Albertans to enjoy. This may include future guidebooks, interpretive signage at a number of our current wetland conservation projects, developing website or digital resources, etc. We won't understand the needs or priorities of the communities until we build the relationships from the ground-up and we are committed to doing this work in the spirit of reconciliation.
7. Lastly, DUC recognizes that there will be future updates to the Alberta Wetland Classification System which may include addressing current gaps in wetland science such as swamp water permanence and chemistry regimes. We will endeavour to keep the field guide up to date as new changes are released or as constructive feedback is received from users.

J. KNOWLEDGE DISSEMINATION

Please provide a narrative outlining how the knowledge gained from the project was or will be disseminated and the impact it may have on the industry.

A key focus of this project was knowledge translation with the goal of adoption by practitioners, thereby increasing public awareness and understanding of Alberta's wetlands. As outlined in the work plan, we carefully and deliberately developed the Alberta Wetland Classification System Field Guide in three stages; each stage designed to help ensure the wide-spread use and application of the final product by end users. We conducted an extensive stakeholder engagement process from the outset of this project to understand end user needs and to create space for stakeholders to provide ideas, content and to review draft versions of the guide as it was developed. Support and endorsement of the project from project partners (including internal DUC and NAWMP staff), has also helped accelerate the distribution and uptake of the field guide among our networks.

In summer of 2021, DUC staff provided four Alberta wetland classification training events, free of charge, for participants to learn more about the Alberta Wetland Classification System Field Guide resource and how they can apply the information in the field to wetlands that they own, manage or enjoy for recreational purposes. We had approximately 350 people register for our training events and nearly 1000 people have downloaded or purchased the field guide. We hope to continue our efforts in the future, and we are currently working on several further knowledge dissemination and marketing projects including information videos.

Information about this project, with links to purchase or download the final field guide, is hosted on our website: <https://boreal.ducks.ca/alberta-wetland-classification-system-field-guide/>

K. CONCLUSIONS

Please provide a narrative outlining the project conclusions.

- Ensure this summarizes the project objective, key components, results, learnings, outcomes, benefits and next steps.

Despite covering approximately 20% of Alberta’s landbase (or approximately 40% in the northern boreal regions), wetlands remain underrecognized and undervalued ecosystems. Prior to the launch of the Alberta Wetland Classification System Field Guide, there were no guidebooks in Alberta that offered visually engaging materials on how to identify and classify wetlands according to the AWCS. This project had three main objectives:

1. Develop one user friendly field guide to help land users identify and classify wetlands in the field according to the AWCS.
2. Communicate and educate land practitioners about Alberta’s wetlands and the use of the field guide in relation to their activities on the land.
3. Raise awareness and understanding of wetlands and wetland policy and the value of conserving Alberta’s wetlands.

Over 2.5 years and three deliberate phases (1. Project launch, planning and stakeholder engagement; 2. Field guide development and review; and 3. Extension and outreach activities), DUC staff delivered on these objectives by producing a comprehensive, visually engaging field guide for identifying and classifying Alberta’s wetlands by providing:

1. Introductory content which exposes users to wetland classification concepts like the five main wetland classes in Alberta (bog, fen, swamp, marsh, shallow open water) and their associated forms and types.
2. Is it a wetland? Wetland vegetation, soil and hydrology indicators to help differentiate wetlands from upland areas, including many photos of these key indicators.
3. Classification decision key, which guides users to the appropriate wetland classification using simple yes/no questions about the vegetation and soil conditions they can observe in the wetland.
4. Wetland fact sheets for each wetland class, form and, in the case of marshes and shallow open water wetlands, each wetland water permanence type. Seasonal photographs, indicator plant species and other clues, such as water pH or electrical conductivity, are provided in fact sheets, as well as illustrative diagrams of wetlands and indicator plants.
5. Common wetland plant identification with over 80 wetland plant species highlighted, organized according to their forms (trees, shrubs, forbs, graminoids, aquatic species and mosses) and according to their community assemblages.

We consulted with over 1000 stakeholders over the course of this project, seeking input, advice and feedback, and leading stakeholder engagement and eventual wetland classification training events. We have similarly had success with nearly 1000 downloads or purchases of the field guide in the first 6 months of release, with approximately 350 of these users attending a formal training session with DUC over the summer of 2021. We hope to continue with this success by conducting further marketing and outreach efforts in the future, including continuing to offer training events to select groups (funded through future grant revenue) and by seeking opportunities to disseminate the guide to target users such as agricultural groups, watershed associations, municipal staff and industry contractors.

Through this project we learned the value of open, honest and early stakeholder engagement. By bringing interested stakeholders into the content development and guide formatting conversation, we were able to produce a product that met the needs of users and included the kinds of accessible and visually engaging content that applies to a wide variety of end-users. Following our formal feedback survey, we were pleased to see that users of the field guide reported both the guide quality and value as high to very high. Similarly, users reported an overall increase in their awareness and understanding of Alberta's wetlands upon reviewing the field guide or attending a DUC-led wetland classification training session. We were also fortunately guided by a project steering committee, including representatives from Alberta Innovates (key funder) and Alberta Environment and Parks (subject matter experts) to ensure the project remained on schedule and budget, while providing key oversight in crucial content decisions.

There are many next steps which should be taken to continue to build off the success of this project, namely by disseminating the guide to end-users who can use the content and information to better implement the Alberta Wetland Policy in their day to day activities. In particular, we hope that planners, developers and construction and operations personnel might be better able to implement the mitigation hierarchy (avoid, minimize, replace as a last resort) as they begin to better recognize wetlands and their vital functions earlier in the project planning process. Opportunities to incorporate wetlands into project design (new developments) or mitigate impacts by carefully choosing crossing locations and construction techniques (winter, frozen conditions) are effective means of mitigating wetland impacts only if the wetlands are recognized by the on-the-ground personnel responsible for these activities. DUC will continue to offer training and extension activities to promote the uptake of the Alberta Wetland Classification System Field Guide to any interested end-users in the future.

L. REFERENCES

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Appendix 1 – Project Workplan

Table 4: A complete summary of all project phases and timelines

Phase 1 Activity	Timeline	Outcome
Project workplanning	April to May, 2019	
Project launch webinar	May 22, 2019	1 online webinar
Stakeholder survey	May 25, 2019	50 responses
Blog post	May 27, 2019	Online update to the project
Communications plan	Jun 12, 2019	A document outlining the plan for project communications/guide launch
Steering committee meeting	Jun 17, 2019	Project launch and review of stakeholder survey results
Website launch	Jun 20, 2019	A website dedicated to the project launched on the DUC Boreal website
Social media activity	Jun to Aug, 2019	Ongoing project communications as applicable
Stakeholder engagement sessions	Jul 9 to Aug 14, 2019	A report that summarizes findings/needs from stakeholders in a field guide
Interim report	Sep 30, 2019	An interim report outlining Phase 1 activities
Steering committee meeting	Nov 6, 2019	Overview of Phase 1 activities
Phase 2 Activity	Timeline	Outcome
Draft and develop content	Sep 2019 to Apr 2020	Created the first version of the guide
Steering committee meeting	April 16, 2020	Review of drafted content (to date) and illustrations
Reviewer feedback (round 1)	May 1 to Aug 31, 2020	Collected 12 feedback documents
Guide update (round 1)	Sep 2020	Updated the guide based on feedback
Steering committee meeting	Oct 21, 2020	Approved timeline adjustments
Reviewer feedback (round 2)	Dec 11 to Jan 31, 2021	Collected 26 feedback documents
Update guide (round 2)	Feb 1 to 16, 2021	Updated the guide based on feedback
Steering committee meeting	Feb 11, 2021	Approved timeline adjustments and online delivery of Phase 3 activities
AEP feedback	Feb 18 to Mar 4, 2021	Checked consistency between the guide and future AWCS updates
Update guide (round 3)	Mar 5 to 31, 2021	Updated the guide based on feedback from AEP
Interim report	Mar 1, 2021	An interim report outlining Phase 2 activities

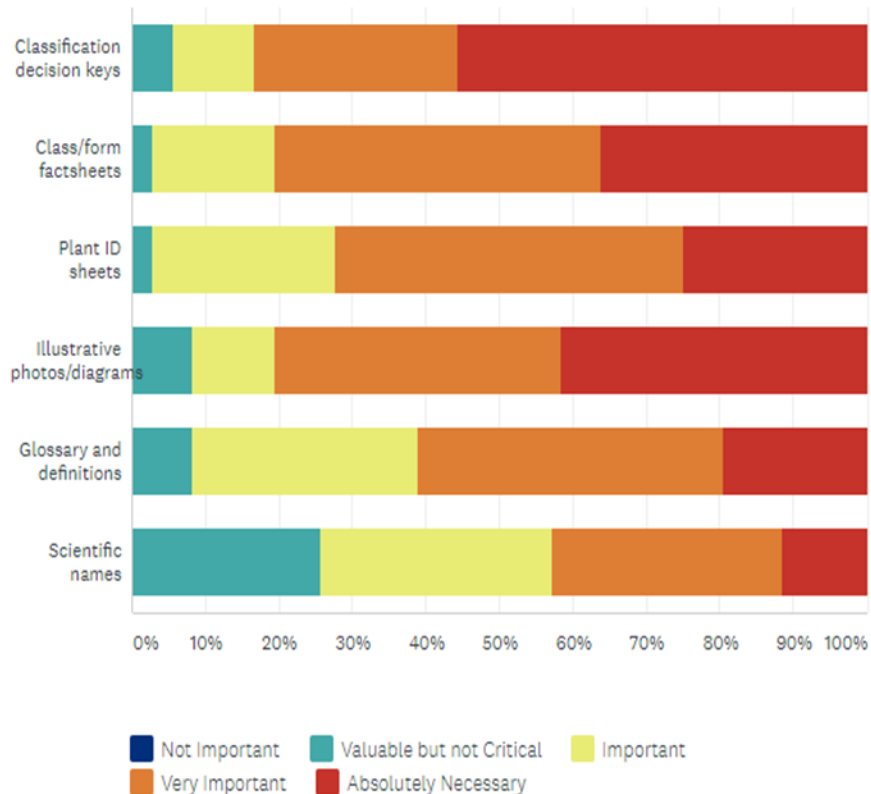
Phase 3 Activity	Timeline	Outcome
Revisit communication plan	Apr to May, 2021	Review communication plan to ensure success of guide launch
Web version released with information webinar	May 18, 2021	Web version of field guide launched with information webinar
Print hardcopies for sale	Jul 28, 2021	Hardcopies of the field guide were made available to stakeholders for purchase
DUC delivers virtual and field training sessions	Jul 8, 2021 Jul 20, 2021 Sep 23, 2021 Sep 24, 2021	DUC developed and delivered 3 online training courses and 1 in-person, outdoor training event
Final report	Oct 30, 2021	DUC staff submitted final report to project partners and Alberta Innovates

Appendix 2 – Key Feedback from each Project Phase

1. Project launch, planning, and stakeholder engagement

An initial project launch survey was distributed in May 2019 to assist in scheduling stakeholder engagement events and to receive initial feedback on the field guide format and content.

Figure 4. Survey participants were asked to rate field guide components



In addition, some general comments that were received through this initial survey effort included:

- “I would use this guide daily. Guide would need to be waterproof.” *Wetland Consultant*
- “This field guide may be able to be used by our construction field teams during the scouting/surveying new projects to better enable wetland avoidance.” *Oil and Gas Industry Rep*
- “As a provincial government employee functioning as a subject matter expert for regulatory compliance, I would share this field guide with stakeholders/ landowners and fellow colleagues to assist with wetland identification for project planning, land use decision making or to inform colleagues on when to refer a file to me as a wetland specialist for consideration.”

Throughout our online engagement sessions, we used the Mentimeter website to conduct polls of the audience, below represents some of the feedback received.

Figure 5. Edmonton stakeholder engagement session (July 9th, 2019). Participants were asked: Which component of the Wetlands Fact Sheets do you like or consider to be most valuable?



2. Field guide development, internal/partner review and external stakeholder review

The field guide was reviewed by project partners (May to August 2020) and external stakeholders (December 2020 to January 2021), culminating in the submission of 38 detailed feedback surveys. Here are some of the positive comments received as a result:

- “I find it an eminently useful guide with an easily understandable and well laid-out format. The illustrations are attractive and useful. I look forward to using it in the field, and I hope it will continue to be available in a digital form - my iPad is much lighter than a pack full of books, and my back will thank you.”
- “This guide is going to be an invaluable tool for us at [redacted], but also for our stakeholders. I’m very excited about it and want to express my appreciation for all the work that has gone into making it.”
- “Wow. This is an incredible resource and what an amazing job you and the boreal team (and our honorary boreal team member Jane) did on this field guide! Having worked on a really boring and too long field guide – I appreciate how succinct, accessible, and informative this guide is and something that anyone can use easily in the field. Mission accomplished. Great job.”
- “The guide is quite thorough, simplistic but clear. Good wetland photos are what has been missing all this time! Love the photos, well done.”
- “What a work you have done! This guide is very complete and I really like the fact that it covers a wide range of information concerning wetlands (formation, hydrology, vegetation, classification, etc).”
- “Excellent draft – wonderful drawings, well-written, and nice art design and organization.”

3. Extension and outreach activities

Phase 3 involved one online product launch webinar, 3 online, half-day field guide training sessions and 1 outdoor, in-person training session. For our online training sessions, we continued our use of the Mentimeter website to engage participants and collect valuable feedback on the field guide.

Figure 6. Participants of our July 8th 2021 training session were asked “What did you learn today?”



Figure 7. Participants of our July 8th 2021 training session were asked “How do you intend to use the AWCS field guide?”

Permitting requirements	In the field	Decision making in the field
An easy-to-carry field reference	to complement the OGRs for timber harvesting	reference
as a reference	In the field	As a reference
wetland practitioner	ID areas to avoid disturbance	Consistent communication
Fun	Decisions in the field	in the field and as a reference during recreational hikes
Reference. Comparison with other classifications.	reference and field guide	City setting, to check for complexity

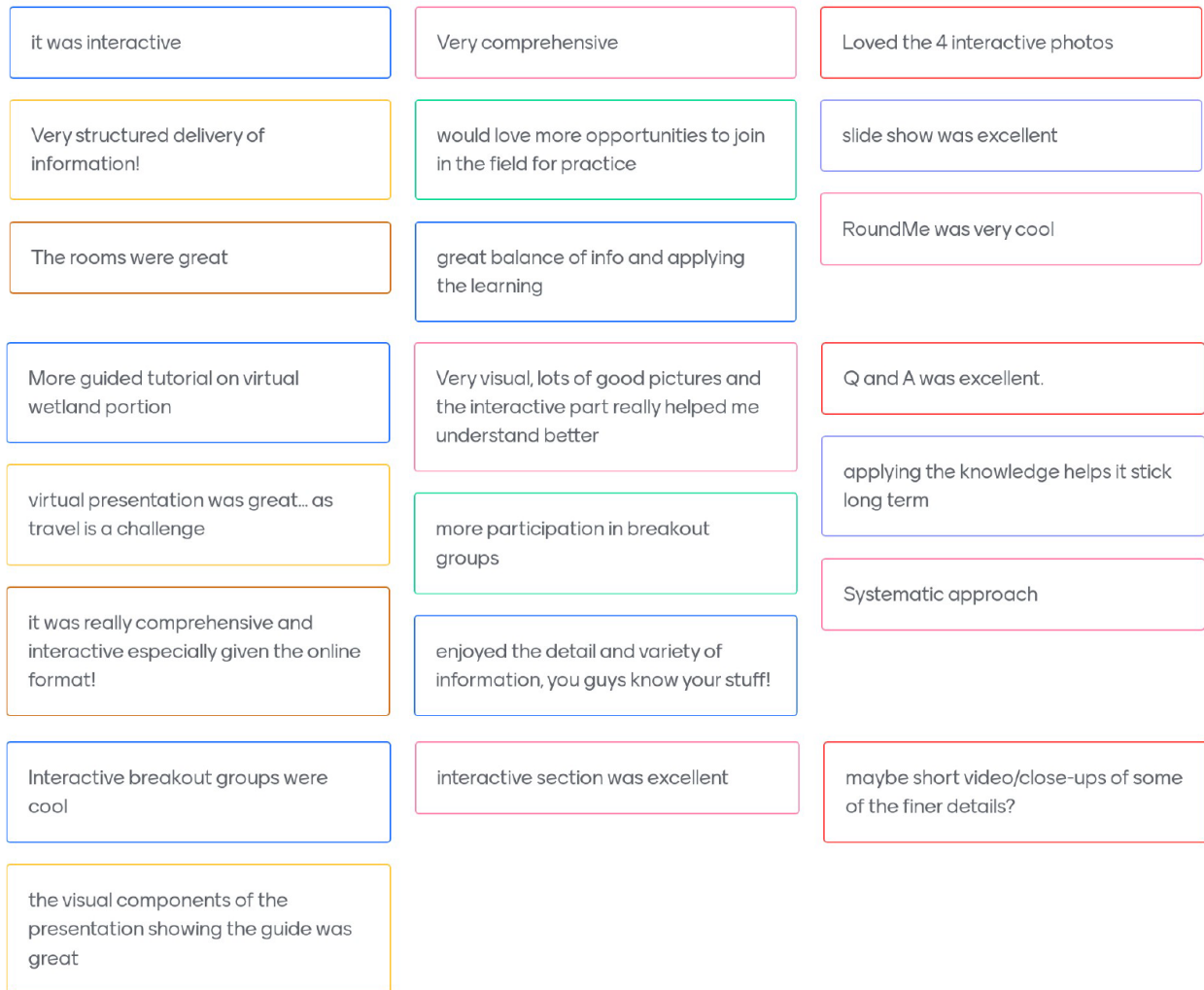
Figure 8A. Participants of our July 20th 2021 training session were asked “How would you rate the following?” *before the training was delivered.*



Figure 8B. Participants of our July 20th 2021 training session were again asked “How would you rate the following?” *after the training was delivered.*



Figure 9. Participants of our September 23rd 2021 training session were asked “What did you enjoy about the presentation/what can be improved?”



Finally, from our stakeholder survey released in October 2021, we received some further positive feedback on the final product:

- “Really nice publication – thanks for all the hard work putting it together!”
- “Thank you for a great free guide! It was very useful for my fieldwork this summer.”
- “Like the way it is laid out.”
- “Love it!”
- I will use this guide to “classify wetlands and wetland plants at work and on the farm.”
- I will use this guide to “see how the classification system can inform wetland policy implementation.”
- I will use this guide to “understand the classification of wetlands around me so I can have an idea of what might happen to them.”