

**Evaluation Form and Instructions for Assessing Candidate Sites for Alberta
Transportation's
Wetland Habitat Bank**

Updated March 2014



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More information regarding the "Evaluation Form and Instructions for Assessing Candidate Sites for Alberta Transportation's Wetland Habitat Bank" may be obtained by contacting:

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Acknowledgements

This document has been prepared for Alberta Transportation by Green Plan Ltd. Environmental Consultants.



EVALUATION FORM FOR ASSESSING CANDIDATE SITES FOR ALBERTA TRANSPORTATION'S WETLAND HABITAT BANK - INSTRUCTIONS

1.0 PURPOSE

The purpose of the *Evaluation Form for Assessing Candidate Sites for Alberta Transportation's Wetland Habitat Bank – 'Supplement A'* (Appendix 1), is to provide Alberta Transportation with the necessary information to determine if candidate sites meet the Department's criteria to be transferred into the wetland habitat bank. The form provides a clear and consistent approach to evaluate candidate sites.

Candidate sites are wetlands that have been constructed, enhanced or restored for the purpose of wetland compensation and have the potential to meet Alberta Transportation's (AT) criteria to be transferred and reflected in the Department's wetland habitat bank. Candidate sites may also be wetlands that have naturally evolved from decommissioned borrow or aggregate operations and have the potential to meet AT criteria.

2.0 WHO SHOULD BE COMPLETING THIS FORM?

This evaluation form is intended and instructed to be used by a qualified wetland professional as defined by Alberta Transportation. This document is NOT intended to replace the requirements of a wetland assessment as described in Alberta Environment and Sustainable Resource Development (ESRD) *Provincial Wetland Restoration/Compensation Guide, 2007*. Rather, it is intended to be used as a preliminary decision making tool for AT staff to determine candidate sites potential to be transferred into the wetland habitat bank.

3.0 HOW LONG SHOULD IT TAKE TO COMPLETE THE FORM?

The estimated time to evaluate the site and complete the form is approximately 2-5 hours. The completed evaluation guide is intended to be the final product as there is no requirement to create a report. Once completed, the evaluator will rate the candidate site and will either recommend that the site is transferred into the wetland habitat bank without modifications, or alternatively, provide 'next step' recommendations to achieve wetland targets. This may include minor interventions or the success of more elaborate enhancement measures.

4.0 GENERAL INSTRUCTIONS

Section 1.0 Project Information

Contained within this section is general project information, i.e., legal land location, date of assessment, evaluators name and contact information, major drainage basin, etc.

Section 2.0 General Site Description

The general site description section captures the surrounding land use, site observations pertaining to waterfowl, wetland dependent wildlife, and flora. There is space provided for extra comments.

It is important to note, that in some cases, the assessor may not be able to classify the site because it does not resemble a wetland and is therefore not subject to one of the noted (below) classification systems. If this is the case, include a detailed description.

Classify the candidate site using **one** of the following wetland classification systems:

- Stewart and Kantrud (1971);
- Canadian Wetland Classification System (National Wetlands Working Group, 1977); and
- Draft Alberta Wetland Classification System (when released).

Section 3.0 Candidate Wetland Characteristics

Section 3.0 outlines candidate site characteristics. If applicable, when answering questions C through to J, in addition to providing the required information in the space provided, please include information in Section 6.0 – Site Diagram. If information is not attainable, describe why.

For clarification purposes, and to maintain consistency among users, near bank slope and far bank slope have been defined and depicted below in Figure 1.0.

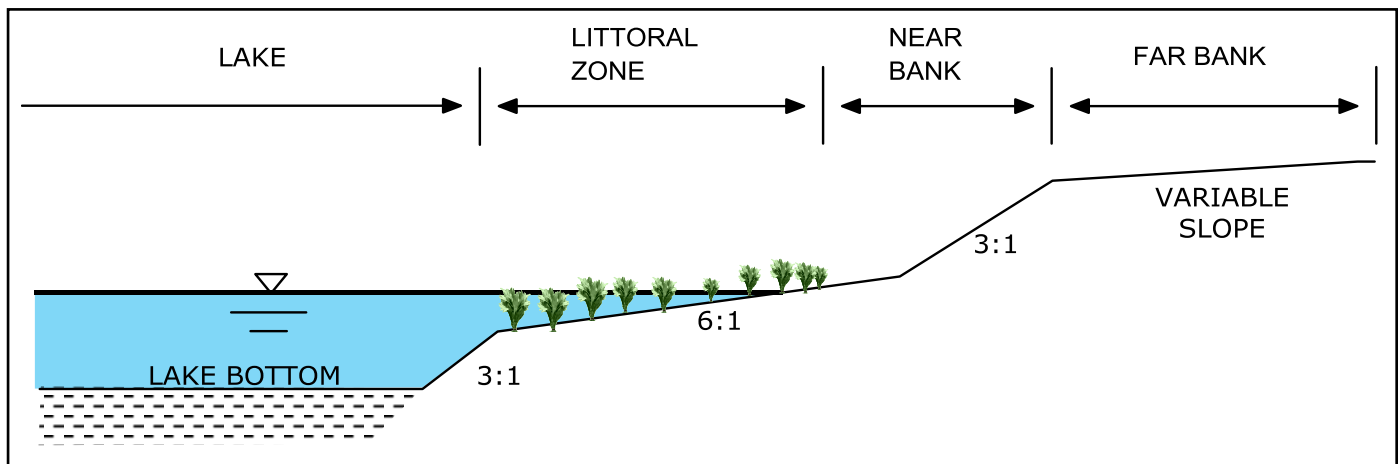
The **near bank slope** is referred to as the slope of the immediate bank. For example, this may be the first 3 – 5 meters (approximately) up from the water line. Refer to Figure 1.0.

The **far bank slope** is referred to as the ultimate bank slope (i.e., from the edge of the near bank slope to where the land becomes horizontal. Refer to Figure 1.0).

Both the near bank and far bank slope are important indicators of erosion, bank stability, and vegetation.

Note: Bank slopes may be assessed using a clinometer, in degrees, and then converted to a decimal fraction (e.g., 0.20 which would be equivalent to a 5H:1V slope).

Figure 1.0 Near Bank and Far Bank Slope



To assist the evaluator, a wetland vegetation index of common emergent, submergent, floating and shoreline vegetation found in and around wetlands, has been provided in Appendix 2. Please be advised that this is not a complete list and should be used as a guide only.

Section 4.0 Wetland Index; potential wetland value

The following index has been developed based on the premise that the abundance and biodiversity of the shoreline and emergent/floating vegetation are central to the productivity, sustainability and biodiversity of wetlands. The following equation provides an index to which the potential wetland value of candidate sites may be expressed. The higher the wetland index, the higher wetland value the candidate site retains.

$$W = E \times P \times \text{Log}(N+1)$$

Where:

W = wetland index; potential wetland value

E = emergent zone width (m)

P = portion of the pond that has a significant (>0.25m) band of emergent aquatic vegetation (decimal fraction. i.e. 0.25)

N = number of native aquatic plant species observed at the site (numerical, i.e. 13)

For example:

1) Width of the emergent vegetation zone: **E = 1.5 m**

2) Proportion of the pond perimeter where a significant zone (>0.25m) of aquatic vegetation has established: **P = 0.90**

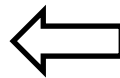
3) Number of native aquatic plant species observed: **N = 7**

$$W = 1.5 \text{ m} \times 0.90 \times \text{Log} (7+1) = 1.22$$

Calculated wetland index = 1.22



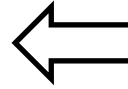
Calculated wetland index = **1.22**





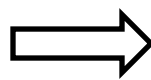
Calculated wetland index = **2.01**

E = 2.5
P = 0.95
N = 6



Calculated wetland index = **0.95**

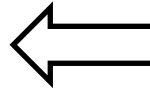
E = 1.5
P = 0.75
N = 6





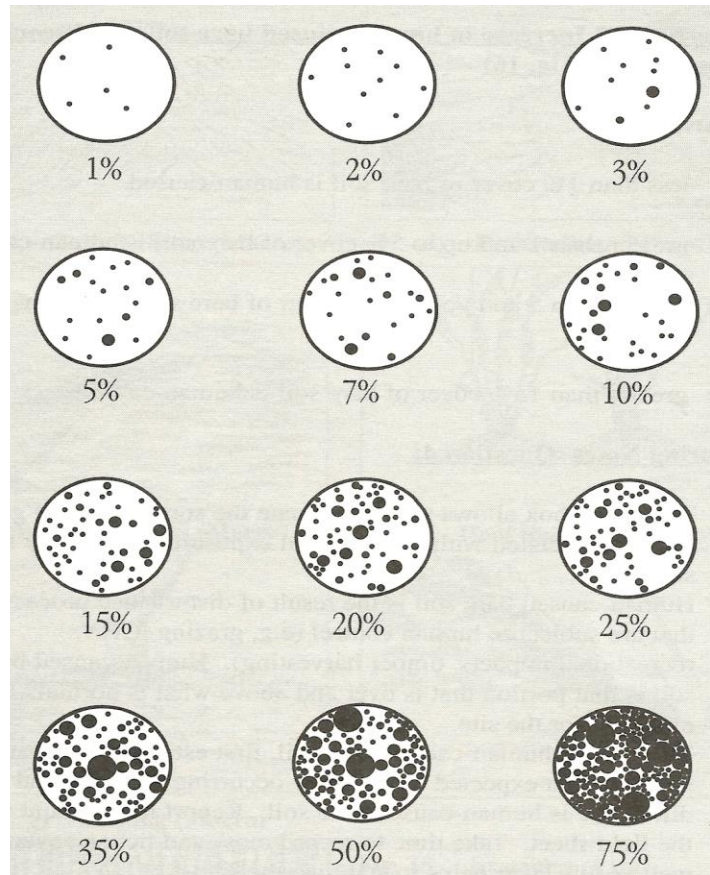
Calculated wetland index = **0.03**

E = 0.1
P = 0.50
N = 3



For consistency purposes, percent cover examples are represented below in Figure 2.0.

Figure 2.0 Percent Cover Examples



Source: *Rangeland Health Assessment for Grassland, Forest and Tame Pasture, ASRD*

Section 5.0 Site Photo Description

Attach, at a minimum, four pictures of the candidate site and provide a detailed description of each photo in the space provided. Detailed descriptions may include:

- Picture of site looking southeast across the pond;
- Emergent and submergent vegetation; note transition from willow to marsh reed grass to cattails;
- Close up of emergent zone;
- Ducks on pond; etc.

Section 6.0 Candidate Site Diagram

Section 6.0 provides space for the reviewer to draw (or insert) a detailed diagram of the candidate site. As stated in Section 3.0, please include pertinent information recorded for questions C – J in the site diagram. In addition, for example, the following information may be included:

- Nearby source of water for the candidate site;
- Access;
- Fencing;
- Signs of human induced damage, i.e., ATV use, etc.

Section 7.0 Candidate Site Final Evaluation

Evaluate the candidate site using the information gathered, equated wetland index and professional judgment and experience. The rating system is outlined below:

Good: No modifications or intervention measures required

Moderate: Slight modifications required

Poor: Extensive enhancement and modification measures required

If required, provide recommendations to improve sites that currently do not meet criteria for candidate sites to be transferred into the wetland habitat bank.

Some examples include:

- Re-contouring of shore in some places, to lessen slope banks;
- Removal/control of weeds;
- Restore damage by ATV's;
- Re-vegetate with native wetland species;
- More time required for the site to evolve into a wetland.

Include in this section a description of the wetland potential of the site. For example, the site may not be classifiable as a wetland at the time of the assessment, but exhibits the properties to evolve into a Class III wetland.

5.0 REFERENCES

Adams, B.W., G. Ehlert, C. Stone, M.Alexander, D. Lawrence, M. Willoughby, D. Moisey, C. Hincz, and A. Burkinshaw. Range Health Assessment for Grassland, Forest and Tame Pasture. Public Lands and Forests Division, Alberta Sustainable Resource Development. Pub. No. T/044.

Alberta Environment (2007). Provincial Wetland Restoration/Compensation Guide.

Alberta Transportation (2012), Development of Technical Criteria for Wetland Establishment at Borrow Pit Sites in Alberta.

Ambrose, N., G. Ehlert, k. Spicer-Rawe. 2009. Riparian Health Assessment for Lakes, Sloughs and Wetlands – Field Workbook Second Edition. Modified from Fitch, L., B. W. Adams, and G. Hale, 2001. Riparian Health Assessment for Streams and Small Rivers – Field Workbook. Lethbridge, Alberta. Cows and Fish Program. 96 pages.

APPENDIX 1

Supplement 'A' – Evaluation Form for Assessing Candidate Sites for Alberta Transportation's Wetland Habitat Bank

EVALUATION FORM FOR ASSESSING CANDIDATE SITES FOR ALBERTA TRANSPORTATION'S WETLAND HABITAT BANK

Supplement A

NOTE: This form is intended and instructed to be used by a qualified wetland professional as defined by Alberta Transportation.

1.0 Project Information

Alberta Transportation Project Name: _____ _____	Candidate Wetland Evaluation Form Prepared by: _____ _____
Major drainage basin: _____ _____	Evaluators Contact Information: Ph(office): _____ Cell: _____
Legal land location: ¼ Sec. Twp. Rge. W M	Date of Assessment: _____ _____

2.0 General Site Description

A. Surrounding land use:

Natural
 Cropland
 Hay
 Pasture
 Industrial
 Residential
 Other _____

B. Site Observations:

Waterfowl: _____

Wetland dependent wildlife: _____

Flora: _____

Other: _____

Candidate Site Wetland Classification: _____

*Note: When classifying the wetland, use **one** of the following most appropriate wetland classification systems:*

Stewart and Kantrud (1971), Draft Alberta Wetland Classification System, Canadian Wetland Classification System (National Wetlands Working Group, 1997)

Area of candidate site: _____

Wetted perimeter of pond: _____

3.0 Candidate Site Characteristics

A. What is the source of water for the candidate site?

Nearby River Surface Runoff Ground Water Other (if other, describe)

DESCRIBE: _____

B. What is the average and maximum depth (meters) of the candidate site?

AVERAGE: _____ MAXIMUM: _____

For the following questions, please include information in a site diagram; Section 6.0 (if applicable).

C. What is the grade of the shoreline (near-bank) slopes?

D. What is the grade of the shoreline (far-bank) slopes?

E. What proportion of the candidate site has littoral slopes of:

10:1 _____	7:1 _____	4:1 _____	1:1 _____
9:1 _____	6:1 _____	3:1 _____	>10:1 _____
8:1 _____	5:1 _____	2:1 _____	

DESCRIBE: _____

F. Are there signs of erosion? If so, describe.

YES NO Describe: _____

G. Are there signs of contamination or other disturbances? If so, describe.

YES NO Describe: _____

H. Describe the riparian vegetation around the shore in terms of *species, density, and cover*.

SPECIES: _____

DENSITY: _____

I. Describe the vegetation on the upland slopes around the candidate site, in terms of *species, density, and cover*.

SPECIES: _____

DENSITY: _____

J. Are there any significant weed infestations within the upland or the riparian vegetation community? If so, describe.

Upland: YES NO Describe: _____

Riparian: YES NO Describe: _____

4.0 Wetland Index; potential wetland value

$$W = E \times P \times \text{Log}(N+1)$$

Where:

W = wetland index; potential wetland value

E = emergent zone width (m)

P = portion of the pond that has a significant (>0.25m) band of emergent aquatic vegetation (decimal fraction. i.e. 0.25)

N = number of native aquatic plant species observed at the site (numeral, i.e. 13)

Using the information gathered below, determine the potential wetland index value of the candidate site.

A. Width of the emergent vegetation zone: (m) _____

B. Proportion of the pond perimeter where a significant zone (>0.25m) of aquatic vegetation has established (decimal fraction):

C. Number of native aquatic plant species observed: _____

Wetland Index (potential wetland value): _____

5.0 Site Photo Description

A. Attach (at a minimum) 4 pictures of the site. Provide a detailed description of each photo below.

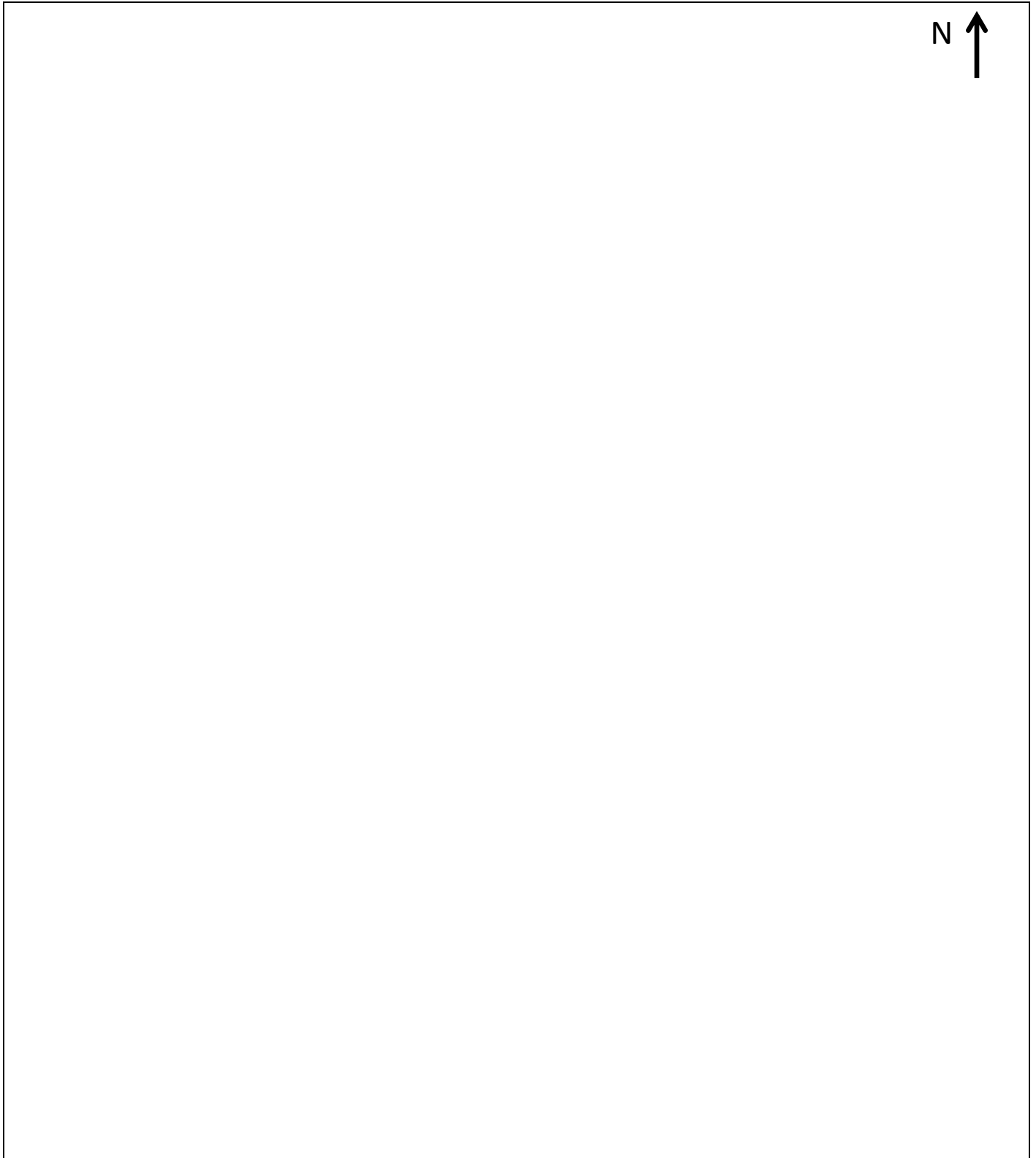
Picture A: _____

Picture B: _____

Picture C: _____

Picture D: _____

6.0 Candidate Site Diagram



7.0 Candidate Site Final Evaluation

Evaluate the candidate site using the information gathered, calculated wetland index value and your professional judgment and experience. Once rated, provide intervention recommendations (if required).

- Good: No modifications or intervention measures required
- Moderate: Slight modifications required
- Poor: Extensive enhancement and modification measures required

CONCLUSIONS & RECOMMENDATIONS: _____

APPENDIX 2

*Wetland Vegetation Index – Common Emergent, Submergent and Shoreline Vegetation
Found in and Around Wetlands*

**Wetland Vegetation Index – Common Emergent, Submergent and Shoreline
Vegetation Found in and Around Wetlands**



Populus tremuloides - Trembling aspen



Betula papyrifera – White birch



Picea mariana - Black spruce



Corlyus cornutum – Beaked hazelnut



Salix exigua – Sandbar willow



Salix spp. – Willow spp.



Cornus stolonifera – Red-osier dogwood



Aster spp. – Aster spp.



Calamagrostis – Marsh reed grass



Equisetum spp. – Horsetail



Rumex aquaticus – Western dock



Scirpus spp. – Bulrushes spp.



Typha latifolia - Cattails



Prunus virginiana – Choke cherry



Viburnum opulus – Highbush cranberry



Deschampsia caespitosa – Tufted hair grass



Ledum groenlandicum – Labrador tea



Glyceria grandis – Tall manna grass



Caltha palustris – Marsh marigold



Senecio congestus– Marsh ragwort



Mentha arvensis – Wild mint



Sagittaria cuneata - Arum-leaved arrowhead



Carex spp. – Sedge spp.



Deciduum sidus – Shooting star



Beckmannia syzigachne – Slough grass



Sium suave – Water Parsnip



Alisma plantago-aquatica – Broad-leaved water-plantain



Fragaria vesca – Woodland strawberry



Ribes americanum – Wild black currant



Habenaria hyperborea – Northern green bog-orchid

APPENDIX 3

*Sample – ‘Supplement A’ Evaluation Form for Assessing Candidate Sites for Alberta
Transportation’s Wetland Habitat Bank.*

EVALUATION FORM FOR ASSESSING CANDIDATE SITES FOR ALBERTA TRANSPORTATION'S WETLAND HABITAT BANK

Supplement A

SAMPLE

NOTE: This form is intended and instructed to be used by a qualified wetland professional as defined by Alberta Transportation.

1.0 Project Information

Alberta Transportation Project Name: Pit# 7 East side of Hwy 43 <hr/>	Candidate Wetland Evaluation Form Prepared by: Jack Smith <hr/>
Major drainage basin: Athabasca river basin <hr/>	Evaluators Contact Information: Ph(office): (780) 999-9999 Cell: (780) 111-1111 <hr/>
Legal land location: <u>SW ¼ Sec. 03 Twp .061 Rge. 7 W 5 M</u> <hr/>	Date of Assessment: Aug 9, 2011 <hr/>

2.0 General Site Description

A. Surrounding land use:

Natural Cropland Hay Pasture Industrial Residential Other _____

B. Site Observations:

Waterfowl: redhead, american widgeon, canvasback, pintail

Wetland dependent wildlife: waterfowl, ungulates, small mammals (beaver and muskrat)

Flora: bog orchid, wild rose, goldenrod, purple aster

Other: well vegetated (presence of Canada thistle and clover)

Candidate Site Wetland Classification: Class III (Stewart & Kantrud)

*Note: When classifying the wetland, use **one** of the following most appropriate wetland classification systems:*

Stewart and Kantrud (1971), Draft Alberta Wetland Classification System, Canadian Wetland Classification System (National Wetlands Working Group, 1997)

Area of candidate site: 0.40 ha

Wetted perimeter of pond: 276 m

H. Describe the riparian vegetation around the shore in terms of *species*, and *density*.

SPECIES: cattails, sedges, harigrass, timothy, marsh reed grass

DENSITY: cattails are dominant

I. Describe the vegetation on the upland slopes around the candidate site, in terms of *species* and *density*.

SPECIES: brome, wheatgrass, clover, Canada thistle, trembling aspen and balsam popular

DENSITY: brome and wheatgrass dominant

J. Are there any significant weed infestations within the upland or the riparian vegetation community? If so, describe.

Upland: YES NO Describe: Some Canada thistle present (not significant)

Riparian: YES NO Describe: _____

4.0 Wetland Index; potential wetland value

$$W = E \times P \times \text{Log}(N+1)$$

Where:

W = wetland index; potential wetland value

E = emergent zone width (m)

P = portion of the pond that has a significant (>0.25m) band of emergent aquatic vegetation (decimal fraction. i.e. 0.25)

N = number of native aquatic plant species observed at the site (numeral, i.e. 13)

Using the information gathered below, determine the potential wetland index value of the candidate site.

A. Width of the emergent vegetation zone: (m) 7 m

B. Proportion of the pond perimeter where a significant zone (>0.25m) of aquatic vegetation has established (decimal fraction):

0.95 m

C. Number of native aquatic plant species observed: 6

Wetland Index (potential wetland value): 2.01

5.0 Site Photo Description

A. Attach (at a minimum) 4 pictures of the site. Provide a detailed description of each photo below.

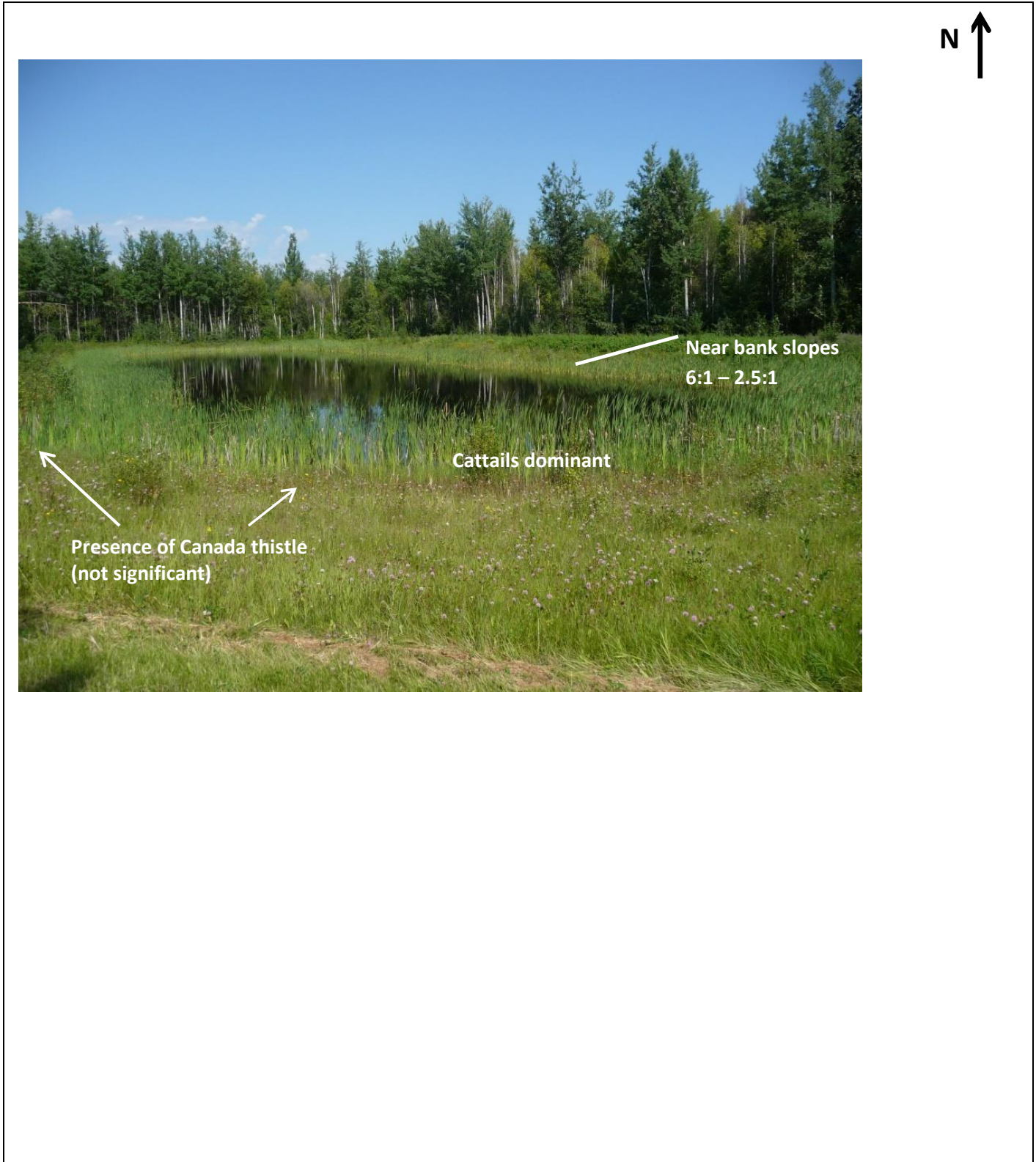
Picture A: Site 7: looking north

Picture B: Site 7: snails recovered from pond

Picture C: Site 7: looking west from east of pond

Picture D: Site 7: dragonfly skin

6.0 Candidate Site Diagram



7.0 Candidate Site Final Evaluation

Evaluate the candidate site using the information gathered, calculated wetland value index and your professional judgment and experience. Once rated, provide intervention recommendations (if required).

- Good: No modifications or intervention measures required
- Moderate: Slight modifications required
- Poor: Extensive enhancement and modification measures required

CONCLUSIONS & RECOMMENDATIONS: _____

_____ - Site has a well-established submergent and emergent vegetation zone.

_____ - Site supports a diverse amount of waterfowl (observed on site)

_____ - Site supports wildlife; beaver, muskrat, moose, and deer (observed on site)

_____ Recommend the site is transferred into the wetland habitat bank with minor modifications;

_____ Canada thistle controlled to limit spread.

APPENDIX 4

Detailed description and analysis of the wetland index; potential wetland value

1.0 PURPOSE AND USE OF THE WETLAND INDEX

1.1 Purpose

After reclaimed borrow area reaches the end of its operational life, provided there is sufficient water, it may begin to evolve into a wetland of some form through natural processes of erosion, vegetative establishment/growth and the various biochemical reactions that occur in the water and substrate. The sides erode, causing the pond to accumulate sediments, and vegetation begins to establish around the banks and in the shallow zones around the shores. Along with this process, more types of habitats ("niches") form, and a greater biodiversity of plants becomes established. Animals such as waterfowl and shorebirds, as well as a wide assemblage of aquatic insects and other creatures become more numerous and diverse, over time.

The same plants will inhabit the pond area over time in most cases, but the rate at which the area will evolve into a ecologically functioning wetland depends upon the way the site is decommissioned, as well as the rate of change. This is so that progress toward ecological targets that are agreed to between the operator and Alberta Transportation can be gauged. The Guidelines document spells out the methods and parameters to decommission a pit in a way that will encourage evolution of the site into a functioning wetland.

A monitoring method has therefore been devised, which uses the "wetland index" as a measuring tool. This is described in more detail below.

1.2 Description of the Wetland Index

The index expresses the wetland habitat and overall ecological value of a given pit that has evolved, or been reclaimed into a wetland. The development of the index is based on the productivity and the biodiversity of aquatic and riparian plants that are typically associated with naturally occurring wetlands in central Alberta.

The index contains the following variables:

- maximum width of the emergent vegetation zone¹ (E);

¹ maximum width of emergent vegetation zone that covers at least 10% of the shoreline.

- proportion of the perimeter of the pond where a significant zone of aquatic vegetation had established² (P); and
- the number of native aquatic plant taxa (see above species list) that were observed at the site during the site reconnaissance (N).

The index (W) is computed in the following way:

$$W = E \times P \times \text{Log} (N+1)$$

where:

W = wetland index;

E = emergent zone width (m);

P = portion of pond perimeter that has a significant band of emergent aquatic vegetation (decimal fraction); and

N = number of species of aquatic plants observed at the site (numeral).

1.3 Examples Using Existing Borrow Pits

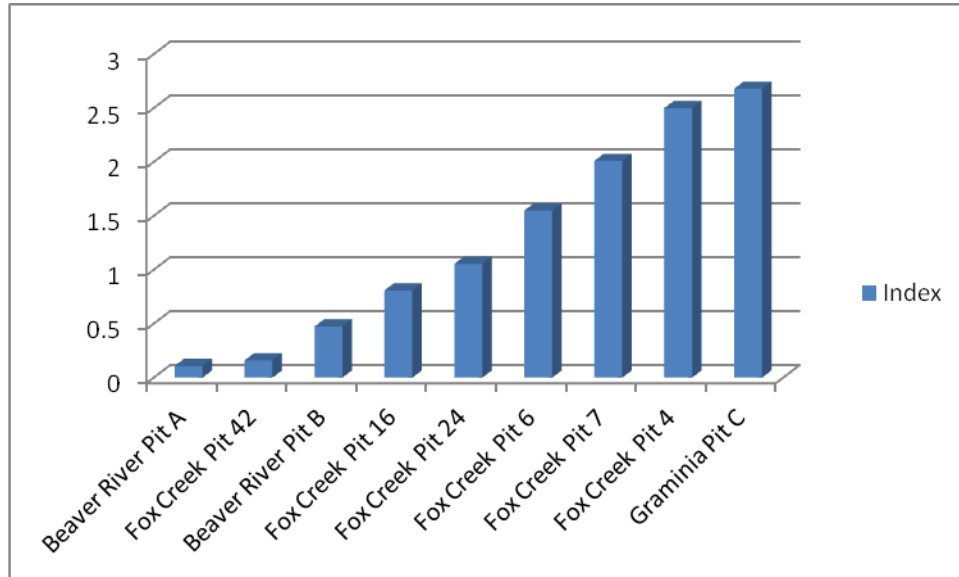
By way of illustration, nine existing pit ponds from different sites from north-central Alberta were selected, ranging from a relatively low wetland index value (0.11) to a relatively high index value (2.68). Photographs of each of the ponds follow this section.

Table 1: Showing the wetland index values for nine pit ponds at different sites, and the parameters used to calculate them. The size of the wetland is also given.

Borrow Pit	Size (ha)	E	P	N	Wetland Index
Beaver River Pit A	2.16	1.0	0.14	5	0.11
Fox Creek Pit 42	1.18	1.0	0.20	5	0.16
Beaver River Pit B	4.61	1.0	0.61	5	0.47
Fox Creek Pit 16	0.34	1.5	0.50	11	0.81
Fox Creek Pit 24	0.9	2.5	0.50	6	1.06
Fox Creek Pit 6	0.23	2.5	0.65	8	1.55
Fox Creek Pit 7	0.4	2.5	0.95	6	2.01
Fox Creek Pit 4	0.76	2.5	1.00	9	2.50
Graminia Pit C	0.39	2.0	1.00	21	2.68

² i.e., of width at least 0.25 m.

Fig. 1: Showing the wetland index values for each of nine borrow pit ponds.



Studies of more than 50 pit ponds in north-central and southern Alberta showed that the rate at which a pit pond evolves into an ecologically functioning wetland depends on a number of factors including the slope of the shoreline, the slope of the bed near the shore, the configuration of the shoreline and features such as islands or peninsulas, and the density of riparian vegetation around the shore. These are all factors that can be determined by the operator within the decommissioning and reclamation plan, and they are set out in the Guidelines.

A list of vascular plant species for the Graminia site is provided as Attachment 1. Photographs of various sites and their calculated wetland index value is provided as Attachment 2.

ATTACHMENT 1

Vascular plant species list – Graminia Site C

List of aquatic and riparian vascular plant species observed at Site C, Graminia wetlands, August 2010

Species Name	Common Name	Species Name	Common Name
Aquatics		<u>Sedges, Spike Rushes, Bulrushes</u>	
<i>Alisma plantago</i>	water plantain	<i>Carex diandra</i>	two-stamened sedge
<i>Potamogeton sp.</i>	pondweed	<i>Carex utriculata</i>	beaked sedge
<i>Sagittaria cuneata</i>	arum leaved arrowhead	<i>Eleocharis palustris</i>	creeping spike-rush
<u>Aster Family</u>		<i>Scirpus microcarpus</i>	small-fruited bulrush
		<u>Rush Family</u>	
<i>Senecio congestus</i>	marsh ragwort	<i>Juncus nodosus</i>	knotted rush
<i>Senecio eremophilus</i>	cut-leaved ragwort		
<u>Carrot Family</u>			
<i>Sium suave</i>	water parsnip		
<u>Grasses</u>			
<i>Agrostis scabra</i>	rough hair grass		
<i>Alopecurus aequalis</i>	short-awned foxtail		
<i>Beckmannia syzigachne</i>	slough grass		
<i>Glyceria grandis</i>	tall manna grass		
<i>Phleum pratense</i>	timothy		
<i>Poa palustris</i>	fowl bluegrass		
<u>Horsetail Family</u>			
<i>Equisetum fluviatile</i>	swamp horsetail		
<u>Mint Family</u>			
	western water		
<i>Lycopus asper</i>	horehound		
<i>Mentha arvensis</i>	wild mint		
<i>Stachys palustris</i>	marsh hedge nettle		

ATTACHMENT 2

Photographs –calculated wetland index values



1. Beaver River Pit A. $W = 0.11$



2. Fox Creek Pit 42. $W = 0.16$



3. Beaver River Pit B. $W = 0.47$



4. Fox Creek Pit 16. $W = 0.81$



5. Fox Creek Pit 24. W = 1.06



6. Fox Creek Pit 6. W = 1.55



7. Fox Creek Pit 7. W = 2.01

8. Fox Creek Pit 4. W = 2.50





9. Graminia Pit C. W = 2.68



10. Graminia Pit C. W = 2.68

