

Natural Resiliency to Flood and Drought

Stepping Back from the Water Riparian Setback Calculator

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Alberta Environment and Parks

North Saskatchewan Watershed Alliance
Spruce Grove, October 25, 2018

Today's Presentation

1. AEP approach to flood/drought mitigation and riparian protection “policy framework”
2. WRRP municipal initiatives
3. Stepping Back from the Water Toolkit
 - Model Policies and Bylaws
 - Riparian Setback Calculator

Government of Alberta Approach to Flood and Drought Mitigation

1. Water management infrastructure
2. Prepare Albertans for future events
3. Community structural resilience (ACRP)
4. Long-term watershed resilience (WRRP)

“Framework” for Riparian Protection

- ***Municipal Government Act***
 - ...to provide good government
 - ...to foster the well-being of the environment
 - ...to maintain safe and viable communities
 - ...to preserve the natural features of land
- **LUF Regional Plans**
 - ...encourage municipalities to use SBftW when establishing appropriate setbacks from water bodies

Riparian Value

“As a general rule of thumb, in order of preference, the most cost-effective means to mitigate flood losses utilizing natural systems is to:

- i. retain what you have,
- ii. restore what you’ve lost, and
- iii. build what you must.”

<http://assets.ibc.ca/Documents/Resources/IBC-Natural-Infrastructure-Report-2018.pdf>

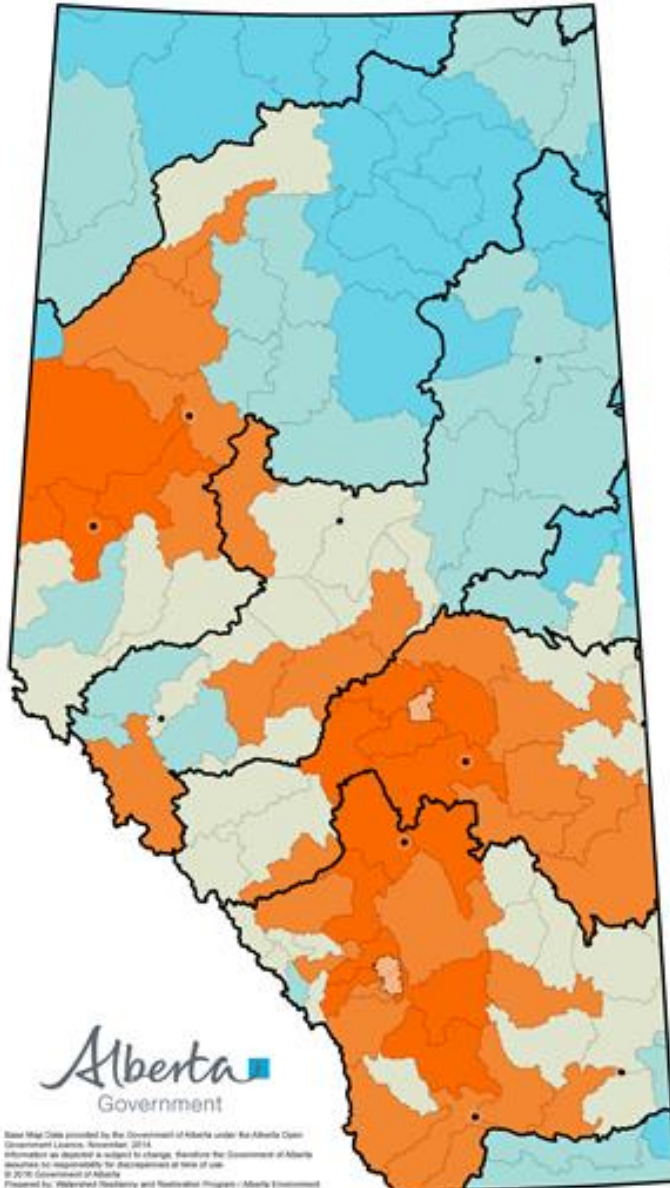
Moudrak, Feltmate, Venema, Osman. September 2018. **Combatting Canada’s Rising Flood Costs: Natural infrastructure is an underutilized option.** Prepared for the Insurance Bureau of Canada. Intact Centre on Climate Adaptation, University of Waterloo.

Internal WRRP Projects

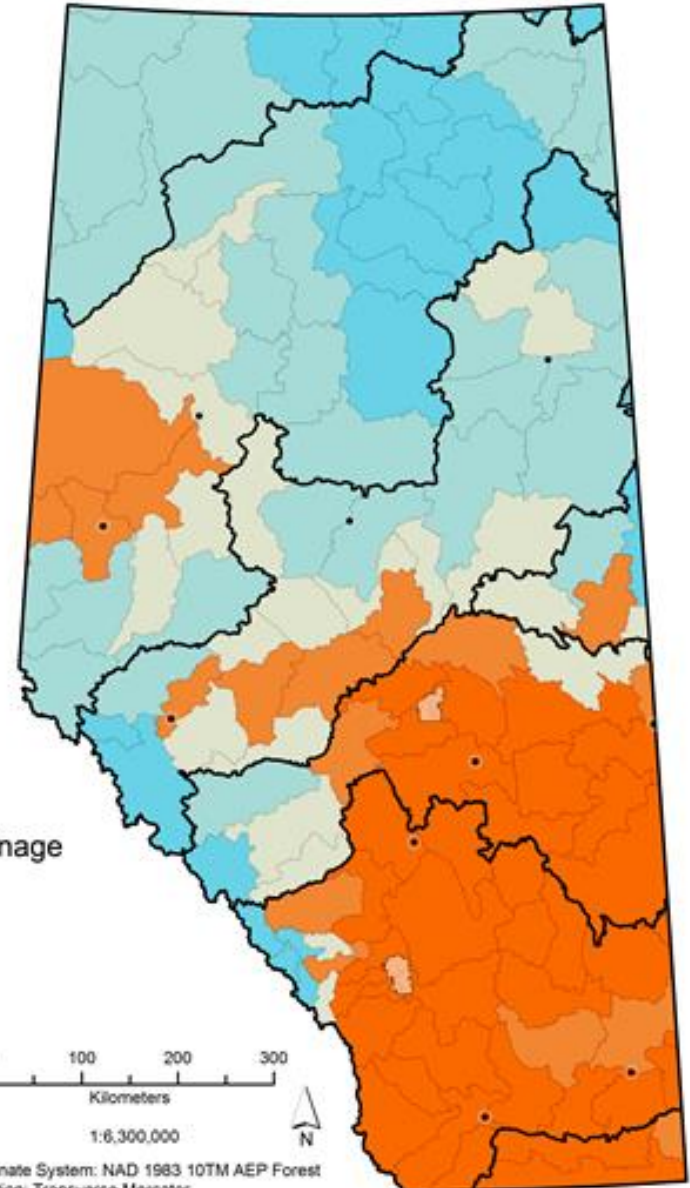
- **Maps** of priority flood + drought watersheds
- **Survey** – municipal needs assessment
...to understand knowledge gaps
- **Toolkit** for “Stepping Back from the Water”
...to respond to municipalities’ needs

Priority Watershed Maps

Flood Priority



Drought Priority



Watershed Resiliency and Restoration Program

Priority Score

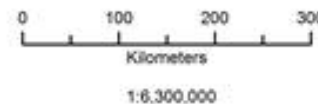


by Hydrologic Unit Code Watersheds (HUC 6)



Alberta
Government

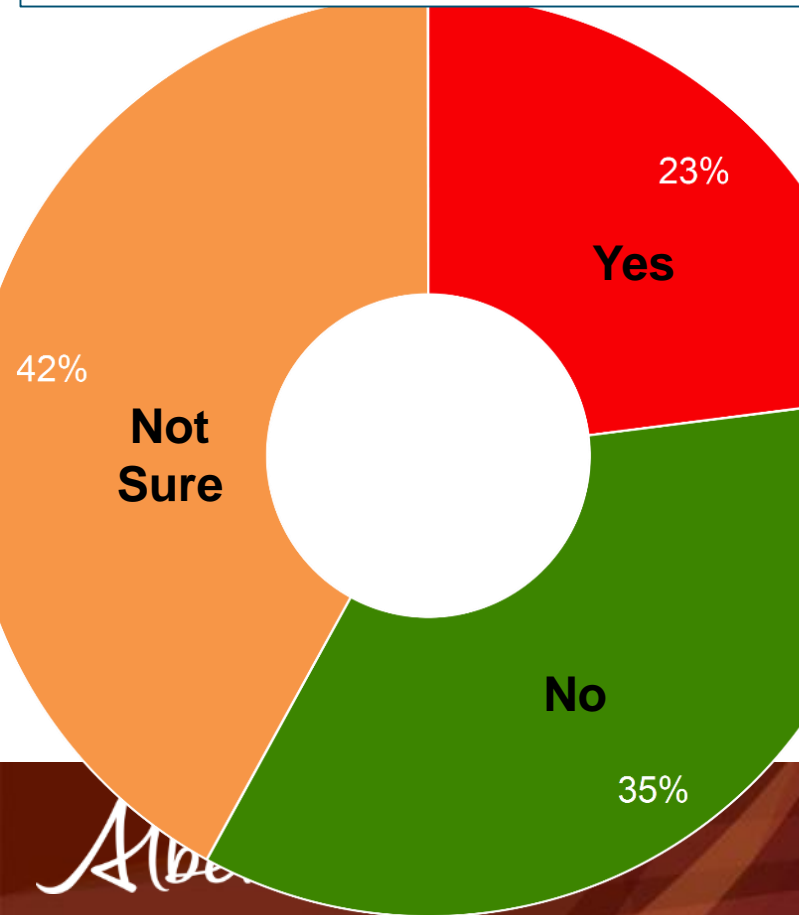
Base Map Data provided by the Government of Alberta under the Alberta Open Government License, November, 2014.
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Prepared by: Watershed Resiliency and Restoration Program - Alberta Environment and Parks (AEP) April 2016.



Coordinate System: NAD 1983 10TM AEP Forest
Projection: Transverse Mercator

Municipal Needs Survey

**Question: Have you used
"Stepping Back from the Water"
to inform development decisions?**

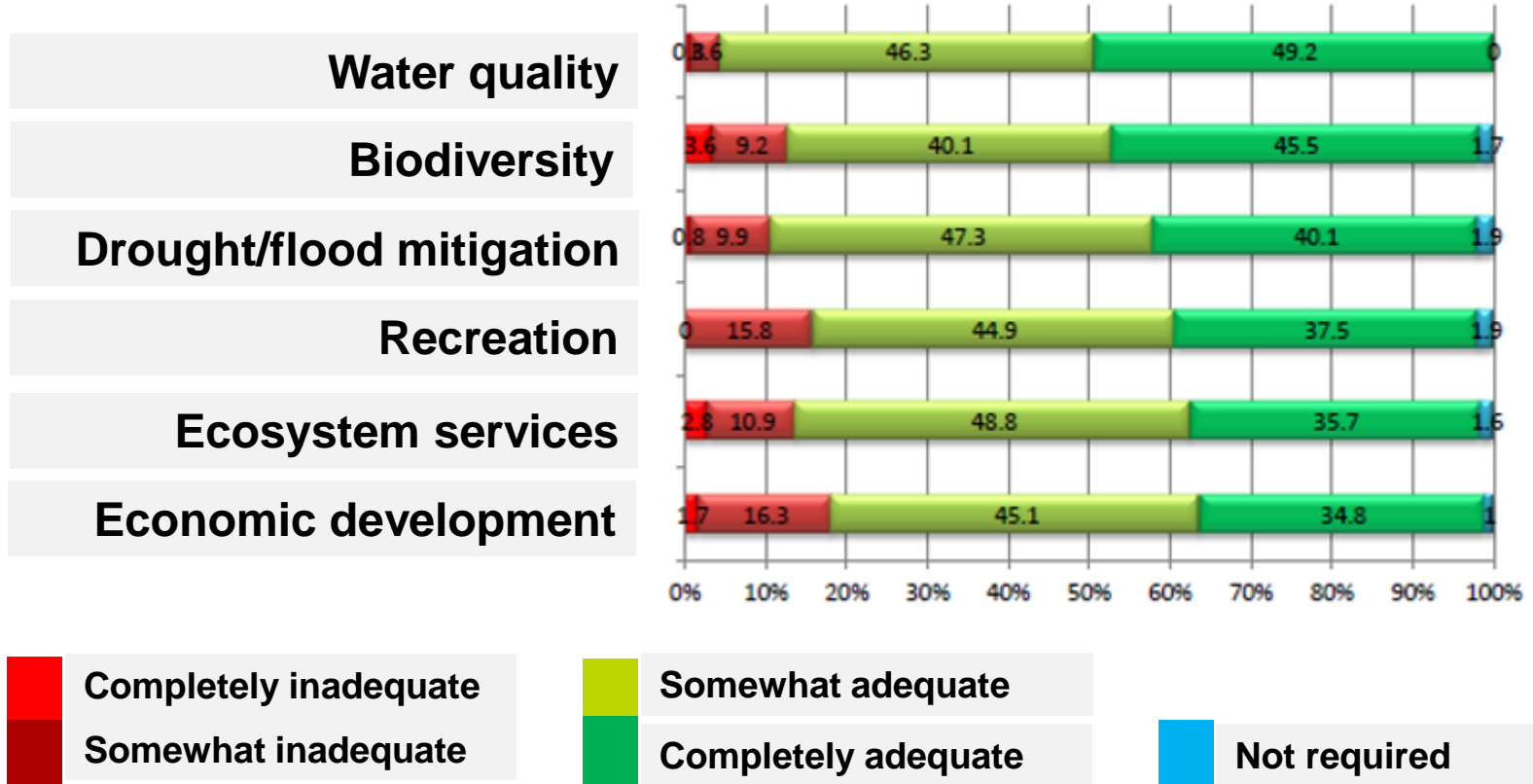


Stepping Back from the Water
A BENEFICIAL MANAGEMENT PRACTICES GUIDE FOR NEW
DEVELOPMENT NEAR WATER BODIES IN ALBERTA'S SETTLED REGION



Municipal Needs Survey

“Adequacy of your knowledge of riparian values regarding...”



Municipal Needs Survey

“Specific aspects of riparian management you’d like to know more about, to assist with your role(s)...”

Clearer direction on policy and legislation	16
Best practices	9
Tools available for riparian conservation	8
Communication and education support	5
Prioritization, evaluation, cost-benefit processes	4
Provincial role re. impacted riparian areas	4
Resources, sources of funding	3
Other	6

Riparian Setbacks

- **How can we protect our water bodies?**
 - ...by adopting policies
 - ...with scientific setbacks
- **How do we calculate setbacks?**
 - ...by using Stepping Back from the Water

Stepping Back from the Water – Toolkit

Model policies and bylaws

LOGO / Name of Municipality XXXX

Policy#: 1111/20XX	Replaces Policy #: 0000/19XX
Policy Title: Riparian Setback Policy	
Date of Council Approval: YYYY-MM-DD	
Resolution #:	
Last Review Date: YYYY-MM-DD	Next Review Date: YYYY-MM-DD
Lead Role: Chief Administrative Officer	
Administrative Responsibility: Director of Planning and Development	
Special Notes and cross-referencing with other municipal policies/bylaws: [examples only] <ul style="list-style-type: none">• Municipal Development Plan• Land Use Bylaw• Wetland Conservation Policy• Environmental Reserve Policy• Etc.	Schedules attached: A “Stepping Back from the Water: A Beneficial Management Practices Guide for New Development Near Water Bodies in Alberta’s Settled Region”

Stepping Back from the Water – Toolkit

Model policies and bylaws

WHEREAS pursuant to the provisions of the *Municipal Government Act*, RSA 2000, c. M-26, Part 2, Sections 7 and 8 and amendments thereto that authorize Council to pass bylaws for municipal purposes respecting the following matters:

- a. the safety, health and welfare of people and the protection of people and property;
- b. people, activities and things in, on or near a public place that is open to the public; and
- c. the enforcement of Bylaws; and

WHEREAS to foster the well-being of the environment is a municipal purpose; and

WHEREAS the Council of **XXXX** has adopted a Riparian Setback Policy and is implementing *Stepping Back from the Water: A Beneficial Management Practices Guide for New Development Near Water Bodies in Alberta's Settled Region*; and

WHEREAS the Council of **XXXX** has identified water bodies in the municipality and mapped those water bodies and a riparian setback from the legal bank of those water bodies; and

WHEREAS the Council of **XXXX** has deemed it necessary to regulate and control the removal of riparian vegetation on private lands in mapped riparian setbacks adjacent to or near the legal bank of identified water bodies within the municipality;

NOW THEREFORE, be it resolved that the council of Municipality **XXXX**, duly assembled, hereby enacts as follows:

Step-by-Step Approach

1. Define scenario

- Water body type, land use, potential impacts

2. Summarize key information

- Substrate, slopes, floodplain, groundwater

3. Determine width of vegetated filter strip

- To prevent pollution (mainly substrate)

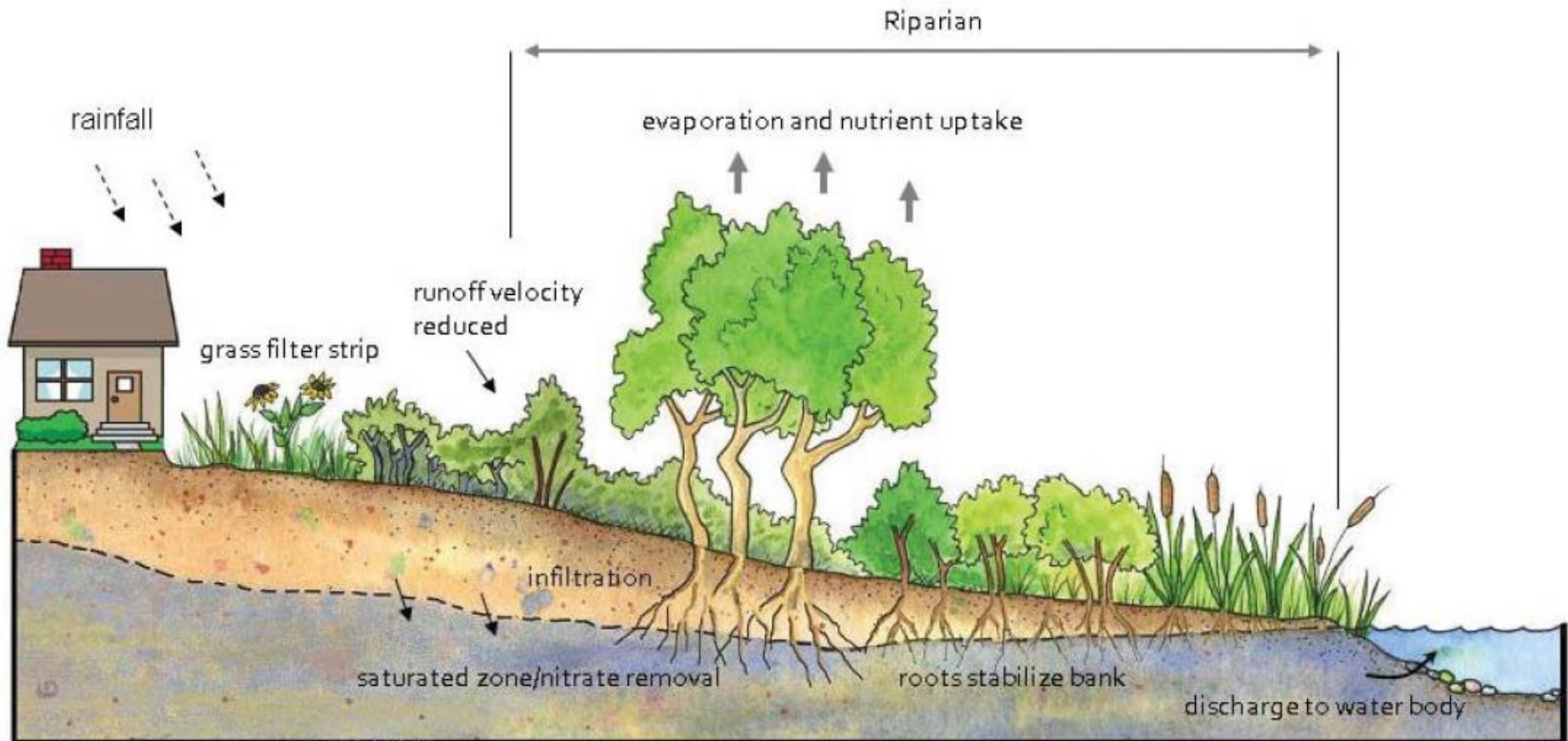
4. Determine setback rel. to site constraints

5. Additional considerations

- Other legislation, rare species, ecological significance, etc

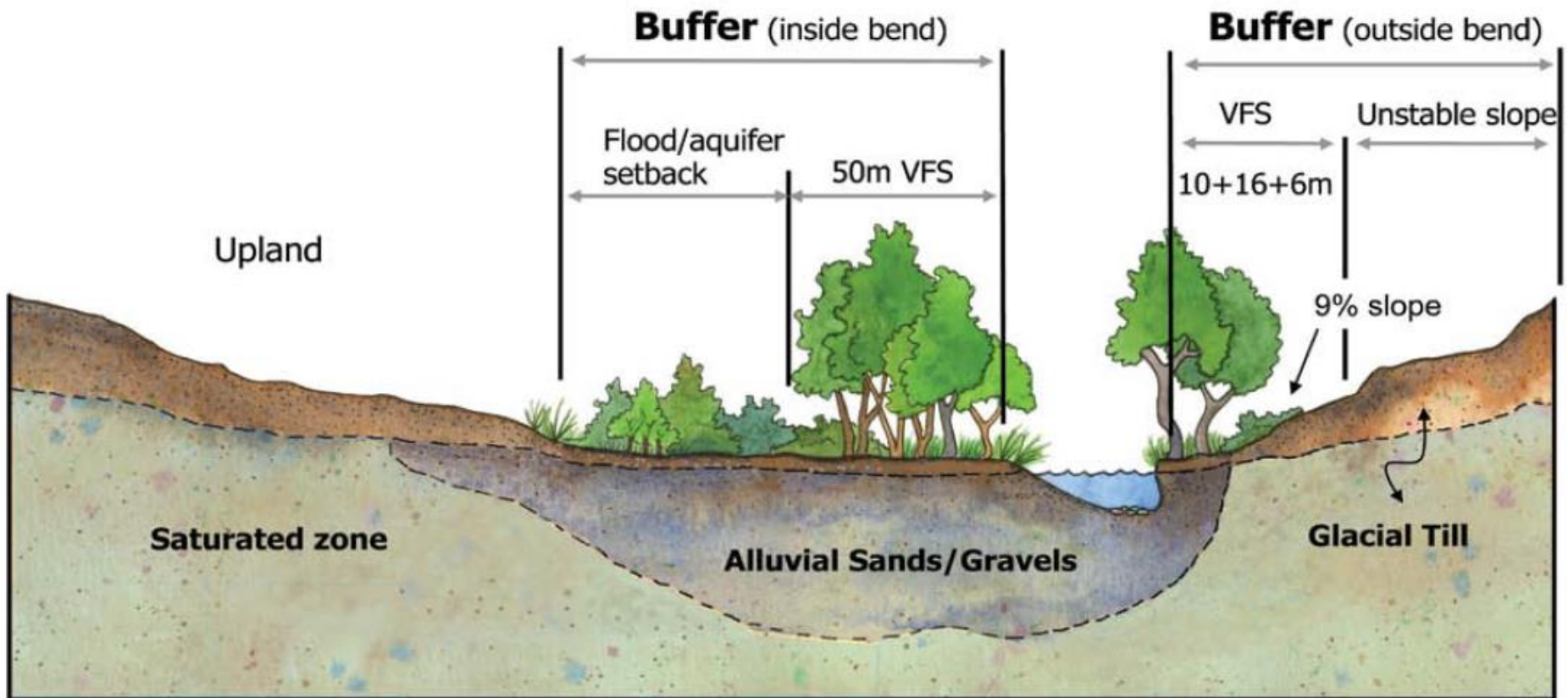
Riparian Areas

Figure 1
Illustration Showing a Riparian Area and Some of Its Interactions with Water



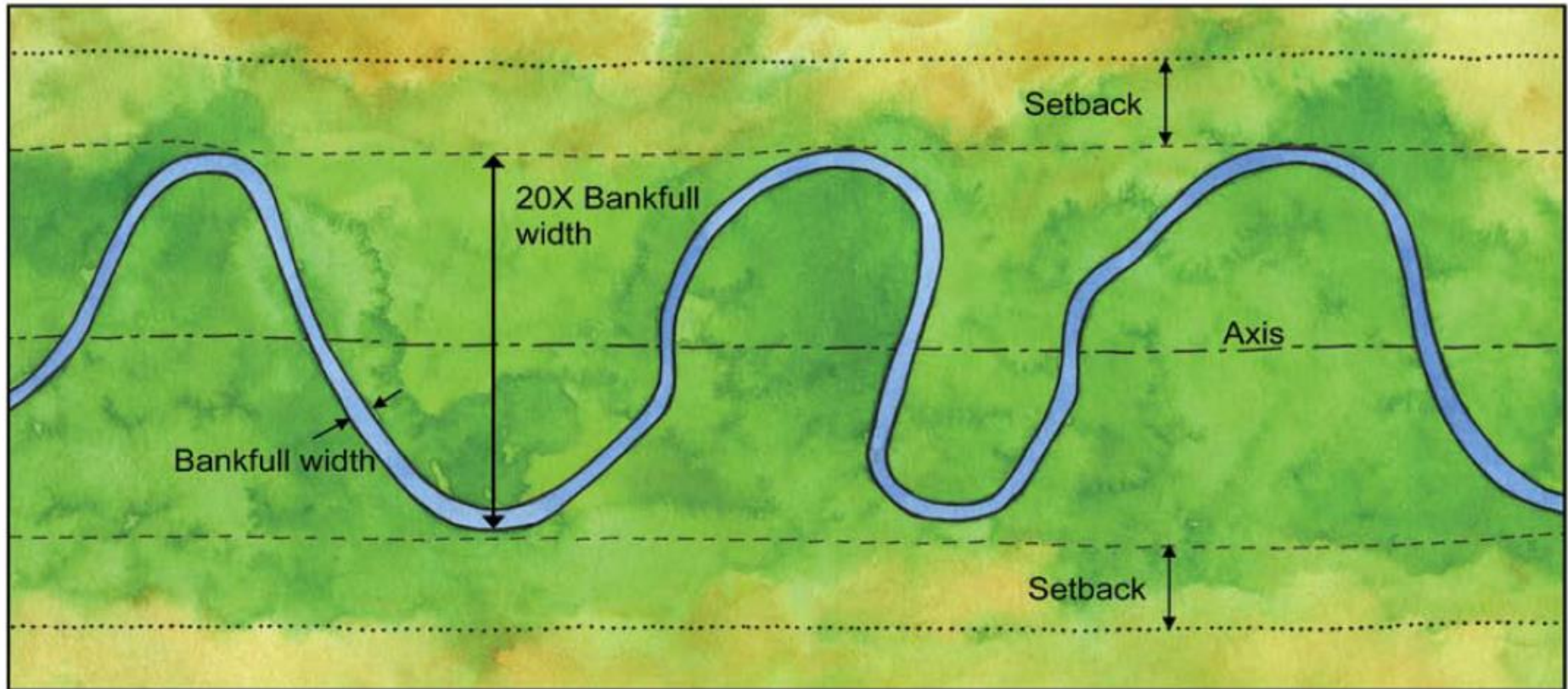
Riparian Areas

Figure 5
River buffers on glacial till and alluvial sands/gravels, comprised of vegetated filter strips, a flood/aquifer setback, and a slope stability setback.



Stepping Back – Meander Belts

Figure 2
Schematic Diagram of a Meander Belt



Stepping Back from the Water – Toolkit

Riparian Setback Calculator

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type		Select waterbody type
Substrate		Enter width in metres of alluvium within 50 m of bank
Slope		Enter the slope in percent for lands within 50 m of the bank
Steep Slopes		Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	0 m	Final calculated setback

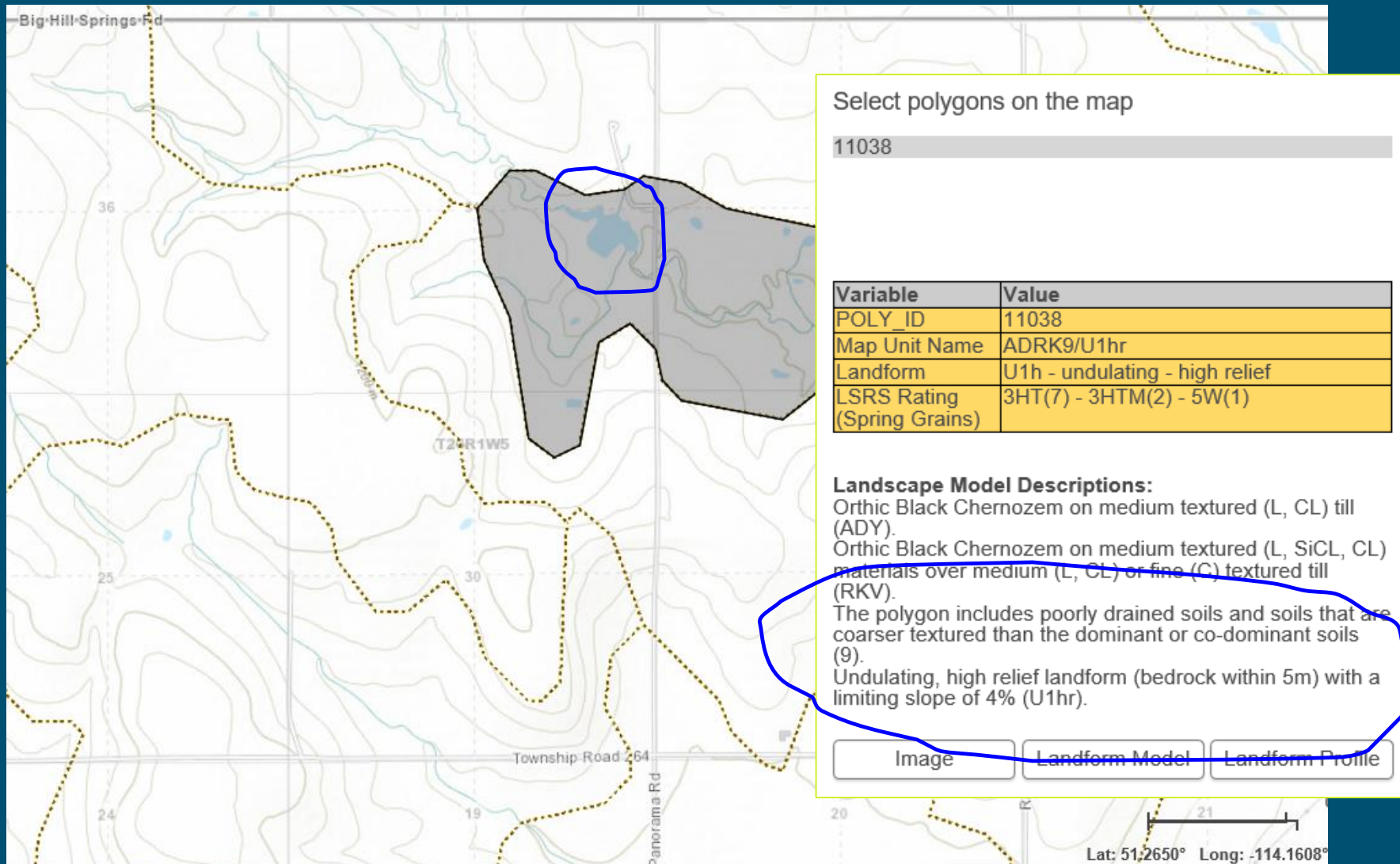
Demonstration

Test case: DeWitt's Pond (west of Airdrie)



Demonstration

Test case: DeWitt's Pond (west of Airdrie)



Demonstration

Test case: DeWitt's Pond (west of Airdrie)

The Atlas of Canada - Toporama

▸ Instructions: Keyboard Navigation ⓘ

Toporama

▼ Menu

▸ Search and Map Information ⓘ

▸ Map Layers and Legend(s) ⓘ

▸ Measuring and Drawing Tools ⓘ

▼ Download Maps and Data ⓘ

Raster Maps:

Toporama, CanMatrix Print Ready and Georeferenced maps on Open Government Portal

- [Get all maps for all of Canada](#)

Vector Data:

CanVec data on Open Government Portal

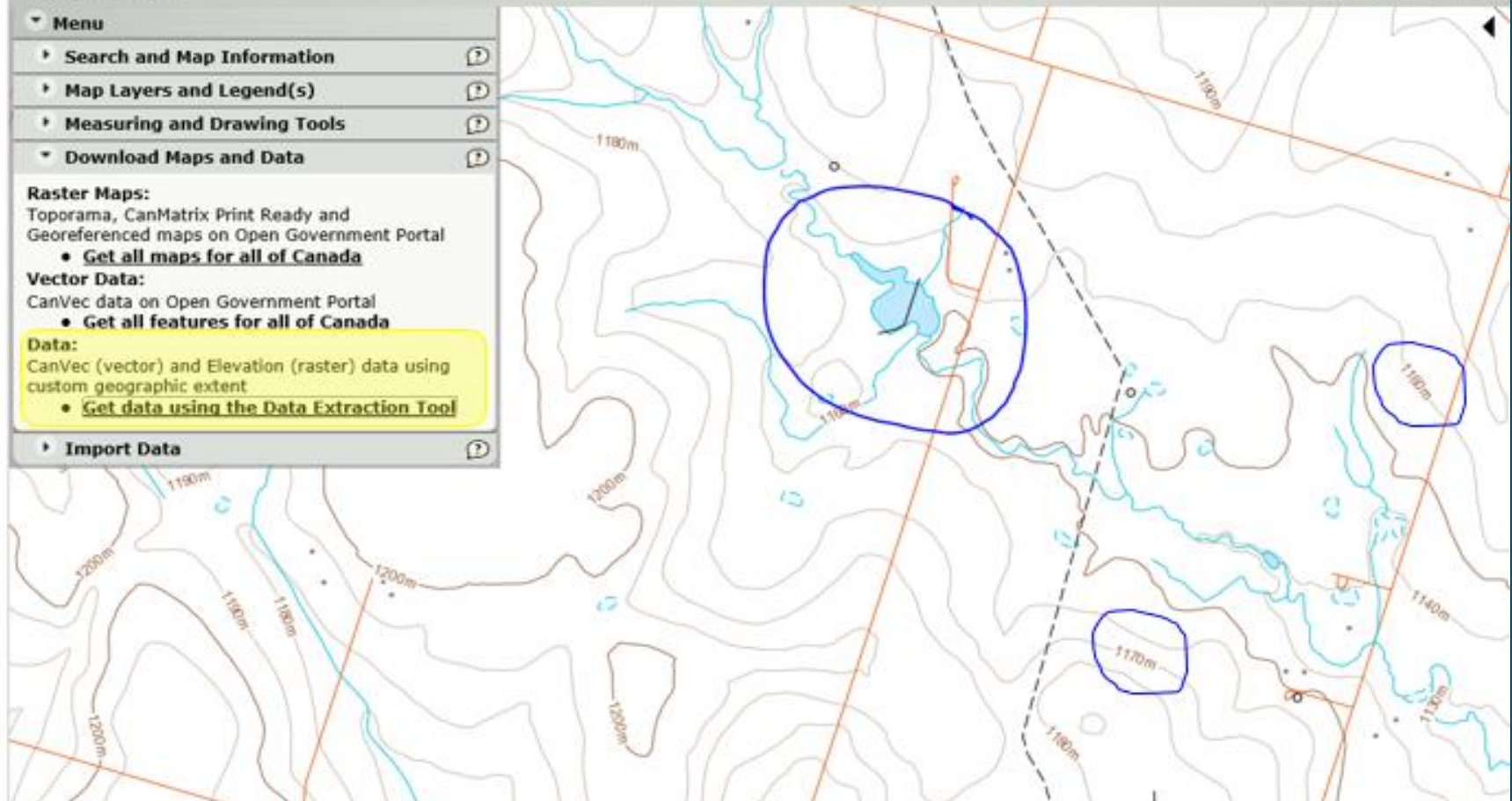
- [Get all features for all of Canada](#)

Data:

CanVec (vector) and Elevation (raster) data using custom geographic extent

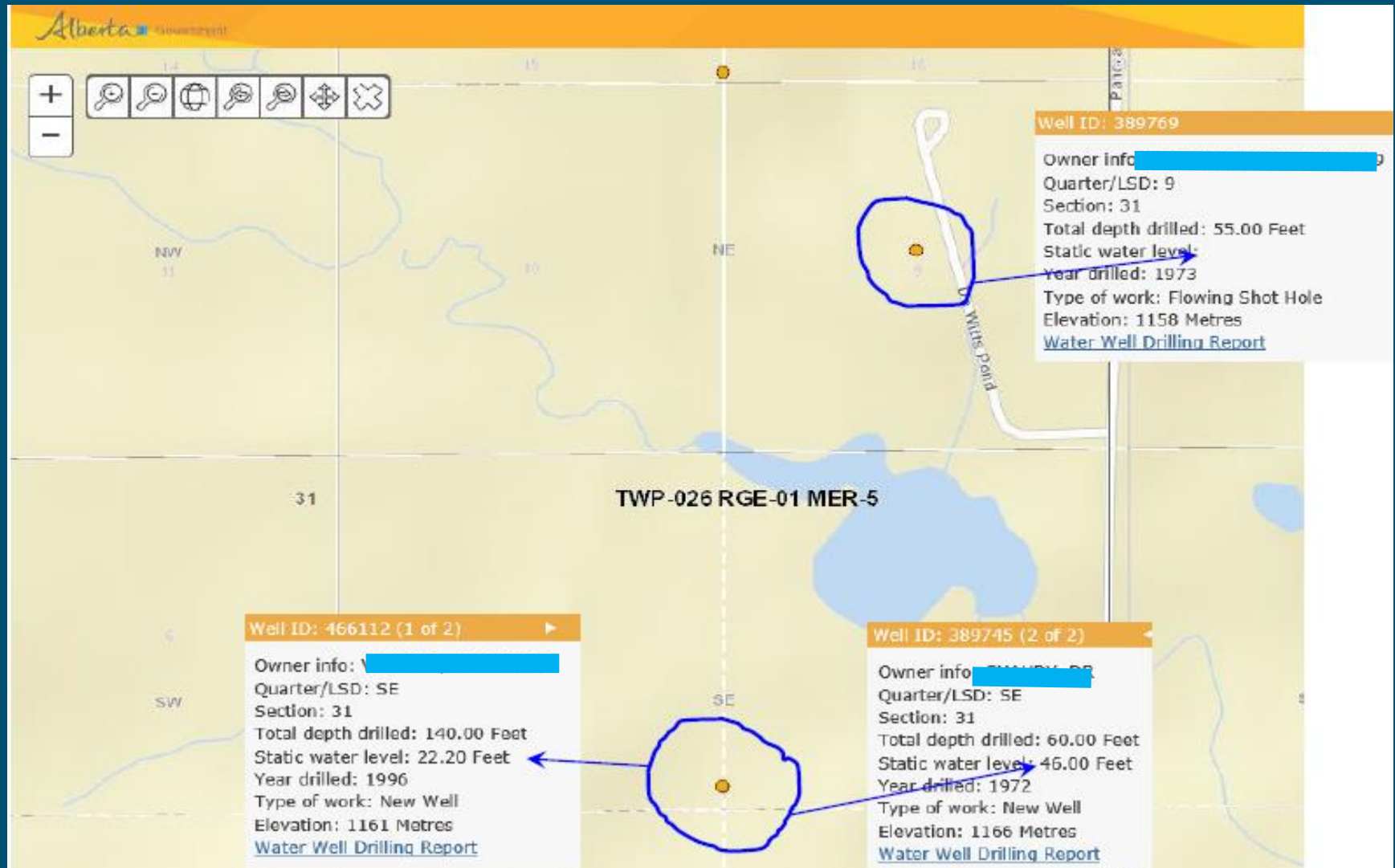
- [Get data using the Data Extraction Tool](#)

▸ Import Data ⓘ



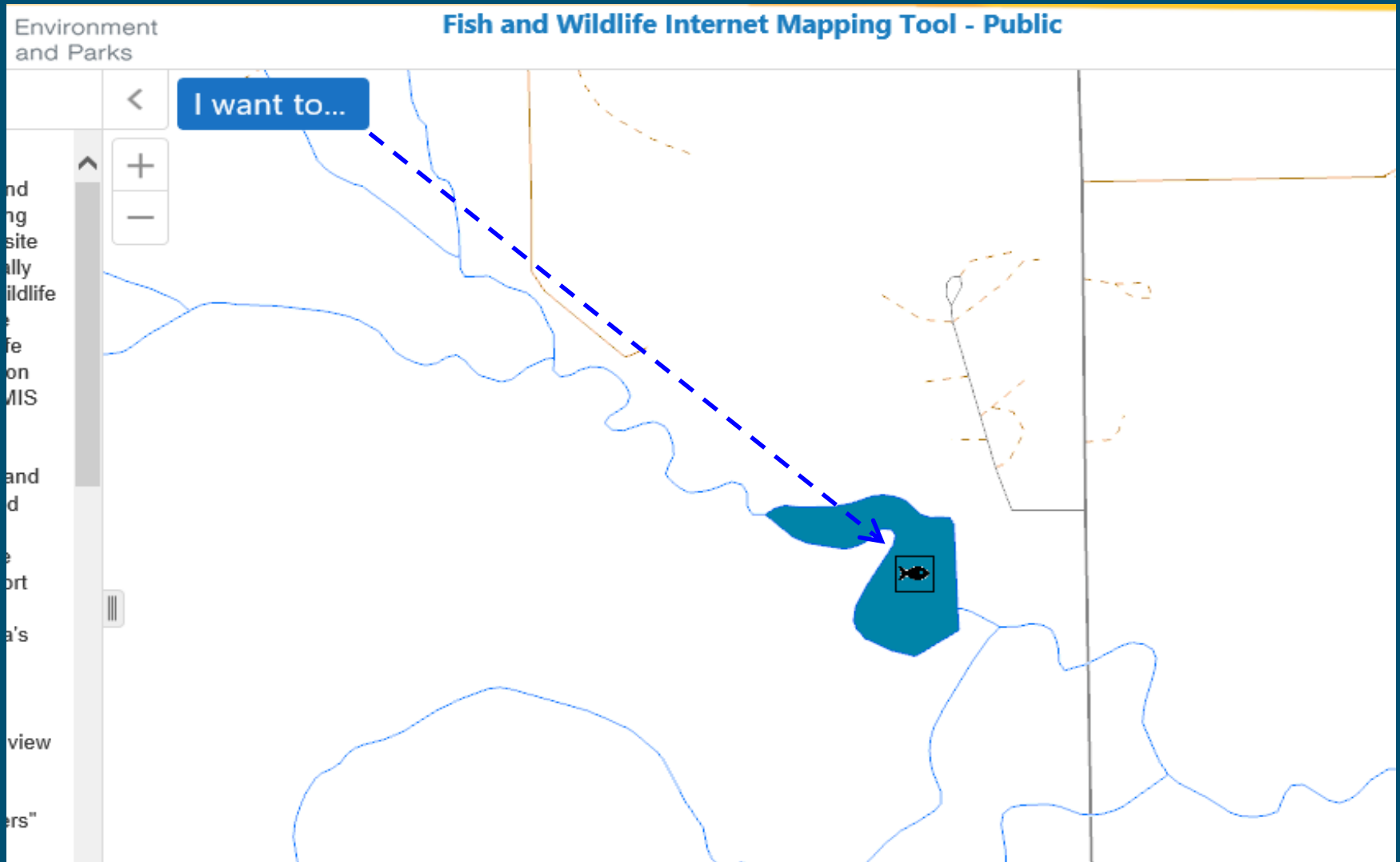
Demonstration

Test case: DeWitt's Pond (west of Airdrie)



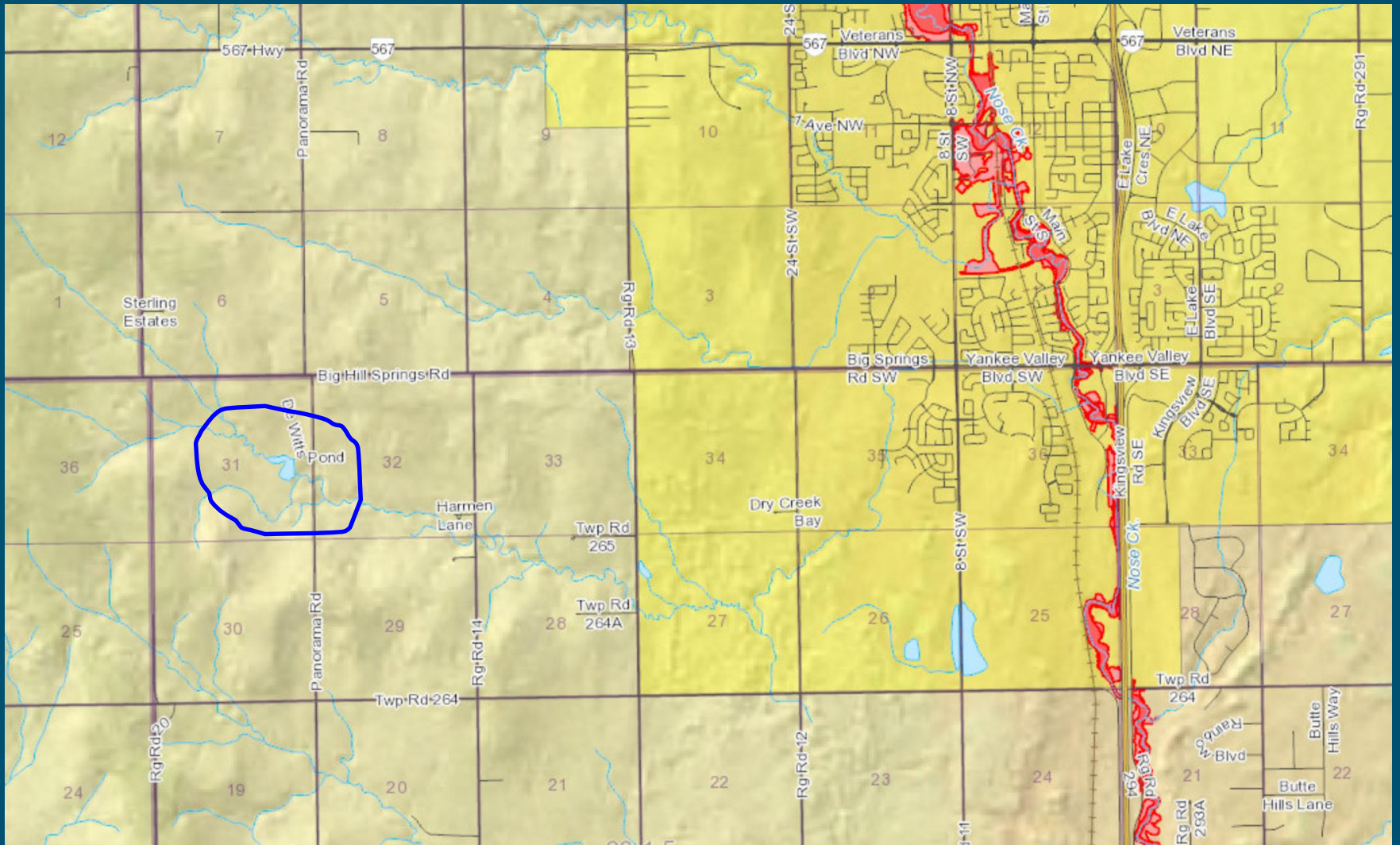
Demonstration

Test case: DeWitt's Pond (west of Airdrie)



Demonstration

Test case: DeWitt's Pond (west of Airdrie)



Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type		Select waterbody type
Substrate		Enter width in metres of alluvium within 50 m of bank
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Steep Slopes		Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	0 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate		Enter width in metres of alluvium within 50 m of bank
Slope		Enter the slope in percent for lands within 50 m of the bank
Steep Slopes		Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	20 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate	2	Enter width in metres of alluvium within 50 m of bank
Slope		Enter the slope in percent for lands within 50 m of the bank
Steep Slopes		Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	21.2 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate	2	Enter width in metres of alluvium within 50 m of bank
Slope	8	Enter the slope in percent for lands within 50 m of the bank
Steep Slopes		Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	25.52 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate	2	Enter width in metres of alluvium within 50 m of bank
Slope	8	Enter the slope in percent for lands within 50 m of the bank
Steep Slopes	0	Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater		Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	25.52 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate	2	Enter width in metres of alluvium within 50 m of bank
Slope	8	Enter the slope in percent for lands within 50 m of the bank
Steep Slopes	0	Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater	5	Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status		Is the waterbody fish-bearing?
Flood Plains and Flood Levels		Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	30.52 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)

SETBACK FACTOR	CONDITION	PARAMETER DETAIL
Waterbody type	Permanent	Select waterbody type
Substrate	2	Enter width in metres of alluvium within 50 m of bank
Slope	8	Enter the slope in percent for lands within 50 m of the bank
Steep Slopes	0	Enter total length in metres of slopes exceeding 25% that start within 50 m of bank
Shallow Groundwater	5	Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
Fish-Bearing Status	Fish-Bearing	Is the waterbody fish-bearing?
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Active Channel/Meander Belt		For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	30.52 m	Final calculated setback

Demonstration

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Shallow Groundwater	5	Enter total width in metres of areas with groundwater shallower than 1.8 m starting within 50 m of bank
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Flood Plains and Flood Levels	5	Distance from bank to limit of 1:100 year flood plain or flood level
Active Channel/Meander Belt	0	For streams and small rivers with an active channel/evident meander belt, enter channel bankful width in metres
FINAL SETBACK	30.52 m	Final calculated setback

Demonstration

Test case: DeWitt's Pond (west of Airdrie)



Stepping Back Toolkit – Next Steps

- Finalize toolkit components and pilot with interested municipalities
 - Model Policies and/or Setback Calculator
- WRRP is limited – Round 6 application deadline: October 30
- Municipalities have the ability and the tools to carry on this work . . .



Watershed Resiliency
and Restoration Program

Questions?

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www.WRRP.alberta.ca