

CVC WETLAND SENSITIVITY TO CLIMATE CHANGE

Elizabeth Snell

Snell & Cecile Environmental Research

With Dougan and Associates

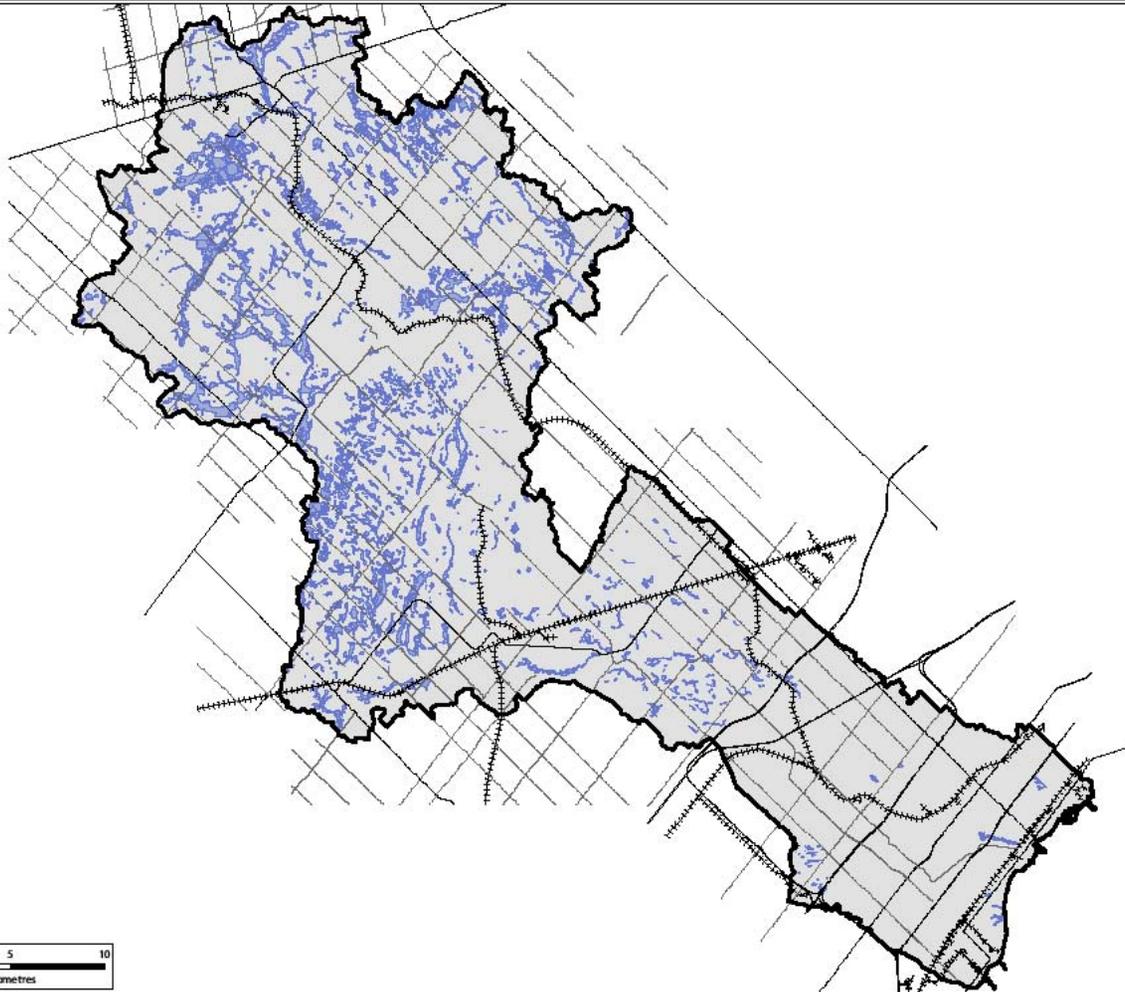
December 11, 2008

Purpose

1. Prioritize CVC wetlands for sensitivity to climate change and for management priority
 - Inform planning and management
2. As part of CVC Wetland Restoration Strategy, prioritize potential wetland sites for sensitivity to climate change
 - More sensitive, lower priority for restoration (among other conditions)

Using existing, watershed-wide GIS data

Wetlands



Legend

2006 Wetlands

2006 Wetlands



PROJECT: D406-23A

CLIENT:

DATE: DECEMBER 2008
SCALE: 1:200,000
DRAWN BY: LW
CHECKED BY:

FIGURE:

1

The information displayed on this map has been compiled from various sources. While every effort has been made to ensure accuracy, the information on this map should not be relied on for any particular purpose without the aid of a surveyor or other professional. The information is provided as a service to the client and is not intended to be used for any other purpose. The user should consult the appropriate legislation of the Government of Ontario for more information.

Upper Watershed



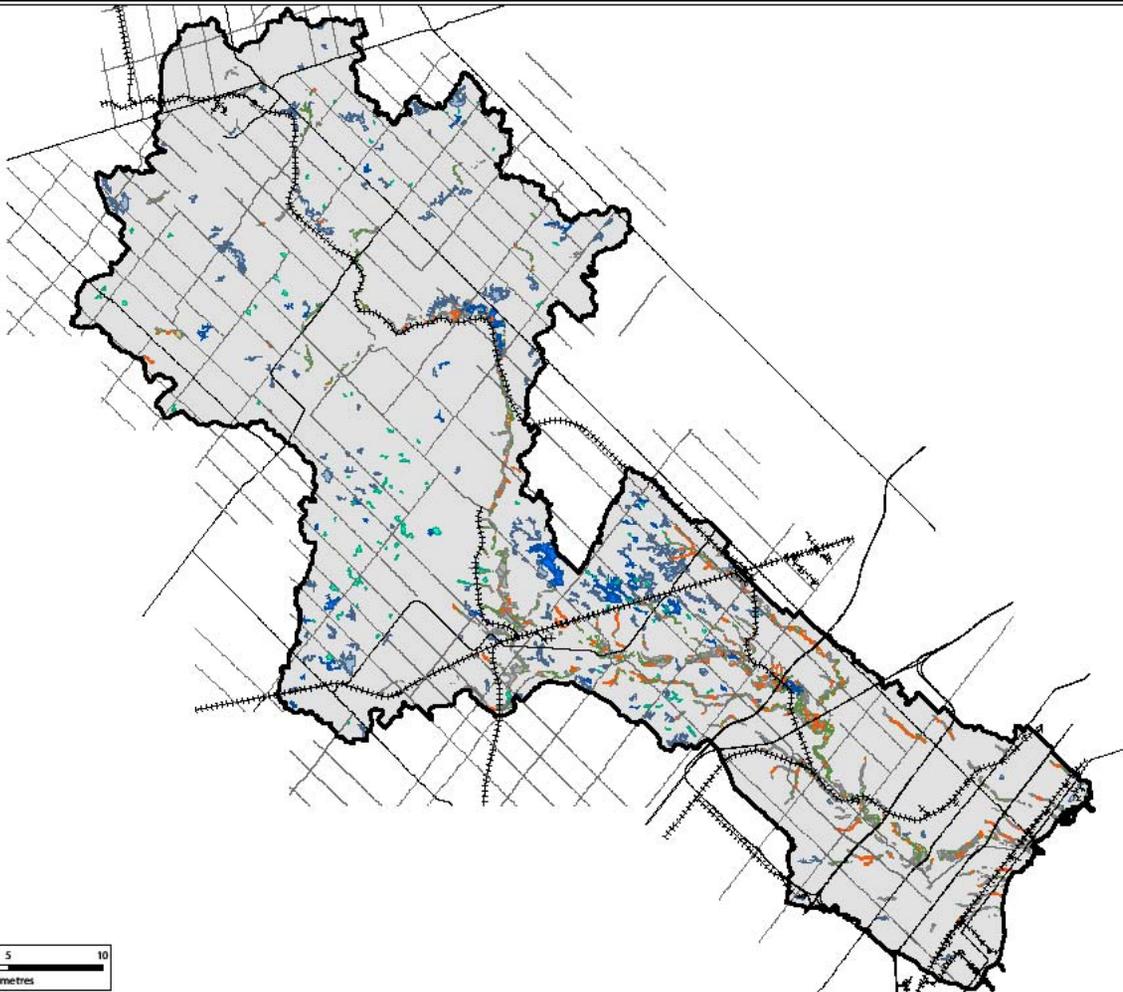
Lower Watershed



Potential Wetland Sites

Legend

-  CVC Boundary
-  Headwater Swales
-  CVC Wet Meadow
-  GL Wetlands - Enhancement Opportunity
- Alluvial without Natural Cover**
-  Settlement Land Systems
-  CU₁ in ELC



Module 1: Potential Wetland Restoration Sites



PROJECT: DA08-23A

CLIENT:

	DATE: DECEMBER 2008
	SCALE: 1:200,000
	DRAWN BY: LW
	CHECKED BY:

FIGURE:

1

Best information displayed on this map has been compiled from various sources. We disavow all cartographic accuracy except the information on this map. It should not be relied on for any particular course of action, business, or health, nor is a guide to navigation. Reproduction permitted by Queen's Printer with the addition of any details or product identification constitute an endorsement by the Queen's Printer or the Ontario Government of such products.

Climate Change Scenario

- ▣ Warmer
- ▣ Similar precipitation
- ▣ More extreme events: flooding and droughts
- ▣ Less snow
- ▣ Drier ecosystems – more evapo-transpiration
- ▣ Warmer water
- ▣ Lower Lake Ontario
- ▣ Changes in flood pulses
- ▣ More erosion and sedimentation

Wetland Sensitivity: Water Source

Factors

- ▣ Rain-fed: most
- ▣ Stream-fed
- ▣ Waterbody-associated
- ▣ Groundwater-fed
least

Indicators

- % in **waterbody**
- <100 m from a **stream**
(not swale or order 0)
- Low permeability
sites that not above:
rain-fed
- Remainder or any on
slope >2%:
groundwater-fed

Wetland Sensitivity: Landscape

Factors

- ▣ Flat slopes
- ▣ Wetland size
- ▣ Location

Indicators

- ▣ <2% slope in 100 m buffer
 - ▣ Area
 - ▣ % alluvial in Lower Watershed
- OR On Peel Plain (more vernal pools)

Wetland Sensitivity: Other

Factors

- ▣ Wetland forest
- ▣ Lack of wetland links
- ▣ Nearby stressors

Indicators

- ▣ % of wetland that forest
- ▣ Wetland that >500 m to nearest wetland polygon AND outside floodplain
- ▣ % urban or intensive agriculture or pit/quarry or Road in 200 m buffer

Wetland Sensitivity: “Cancel”

- ▣ Borderline wetlands (mineral soils) closer to wetland threshold as water tables down
+ organic soils lose structure and P as dry
= All soils sensitive
- ▣ Threshold of south extreme of Great Lakes Forest Region (above Escarpment)
+ barrier to northward migration (urban + Lake plus “leeward” = below Escarpment)
= all wetlands

Wetland Services Importance

Factor

- ▣ Absolute value
- ▣ Relative value: rarity
- ▣ Subwatershed service needs level

Indicator

- ▣ PSW; LSW or field confirmed; unrated
- ▣ Wetland polygon area as % of wetland in subwatershed
- ▣ Subwatershed priority for improved wetland function (module for restoration strategy)

Differences for Sensitivity of Potential Wetland

Simpler because no vegetation factors and no set outside boundary – if only part restored

- ▣ No wetland forest factor
- ▣ No size factor (though add in hummocky moraine as indication that has to be small)
- ▣ No surrounding flat slopes – indicator requires outside boundary
- ▣ No waterbody water source option because no potential sites set there, unless shoreline
- ▣ No services importance

Synthesis

- ▣ Each factor rated into 3 ranges: 2 points to more sensitive, 1 to moderate, 0 to low
- ▣ Spreadsheet by polygon
- ▣ Add for total rating/wetland polygon
- ▣ If factors weighted differently, can incorporate

End products

- ▣ Maps rating each wetland polygon for:
 - sensitivity to climate change
 - importance of wetland services
 - priority for management
- ▣ Map rating each potential wetland polygon for sensitivity to climate change (one of several inputs for setting restoration priority)

Some Limitations

- ▣ Uncertainties of climate change effects on complex & variable wetlands (or potential ones!)
- ▣ Lack of weighting
- ▣ Interactions
- ▣ Lack of testing
- ▣ All relative. Even Low's may suffer