Credit Valley Conservation
inspired by nature

Overview of the Ecological Land Classification System: Baseline Data for Understanding, Assessing, and Protecting Natural Heritage

STEP webinar

March 31, 2022

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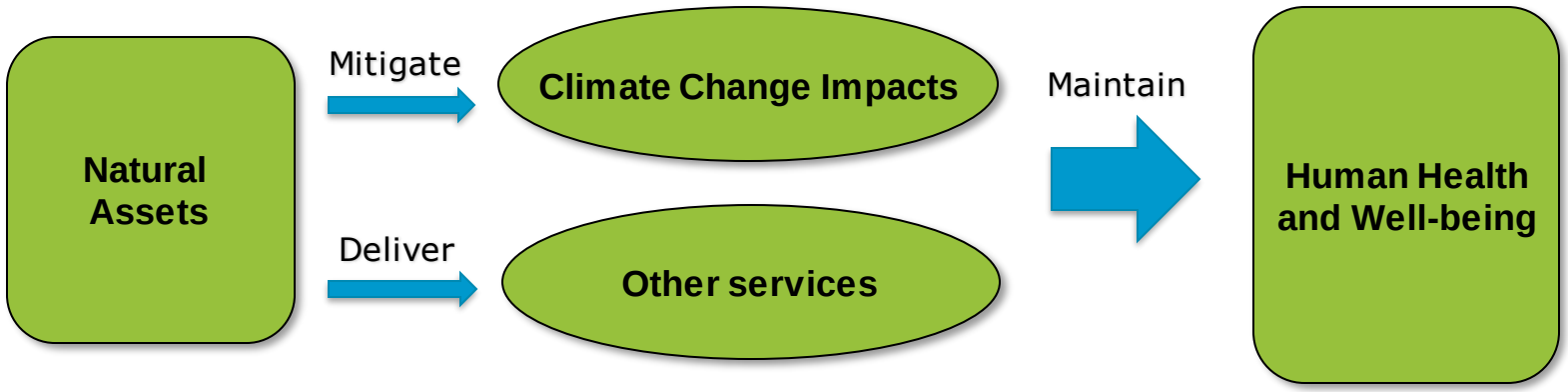
Outline

- Preamble
- **What is ELC?**
- **Dive into ELC data**
- **Example uses of ELC data**
- Wrap up

Climate Change: A Risk Business……

Role of Natural Assets in Addressing Climate Change



Mitigation of Climate Change Impacts	Delivery of Services
• Carbon sequestration and storage • Stormwater management • Urban heat island reduction	• Recreation and tourism • Waste assimilation • Real estate value appreciation • Drinking water quality enhancement

- **Physical**
- **Mental**
- **Social**
- **Economic**

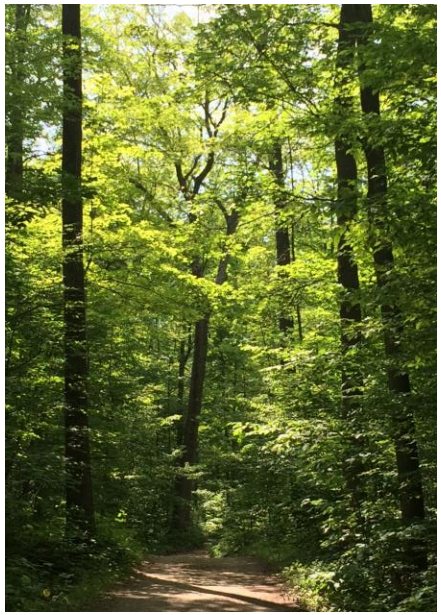
Natural Heritage System Protection and Climate Resilience

Protecting and restoring the natural heritage system is one of the most important climate change actions we can undertake for local ecosystems.

Exactly what is ELC?

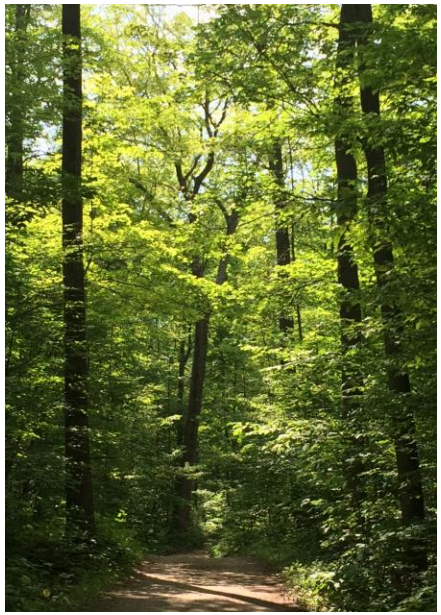
To assess and protect natural heritage features

- Need information about what's on the land
- Need to understand the information




What is ELC

Ecological Land Classification




Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region

System

Community Class

Community Series

Ecosite

Vegetation Type

can be desktop-determined

must be field-determined

Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region – generally deciduous forests or generally mixed forests

System

Community Class

Community Series

Ecosite

Vegetation Type

Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region

System – terrestrial, aquatic, wetland

Community Class

Community Series

Ecosite

Vegetation Type

Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region

System

Community Class – e.g., forests, marshes, swamps

Community Series

Ecosite

Vegetation Type

Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region

System

Community Class

Community Series – e.g., deciduous forest (FOD)

Ecosite

Vegetation Type

Ecological Land Classification is a filing system

- SELC – Southern ELC

Site Region

System

Community Class

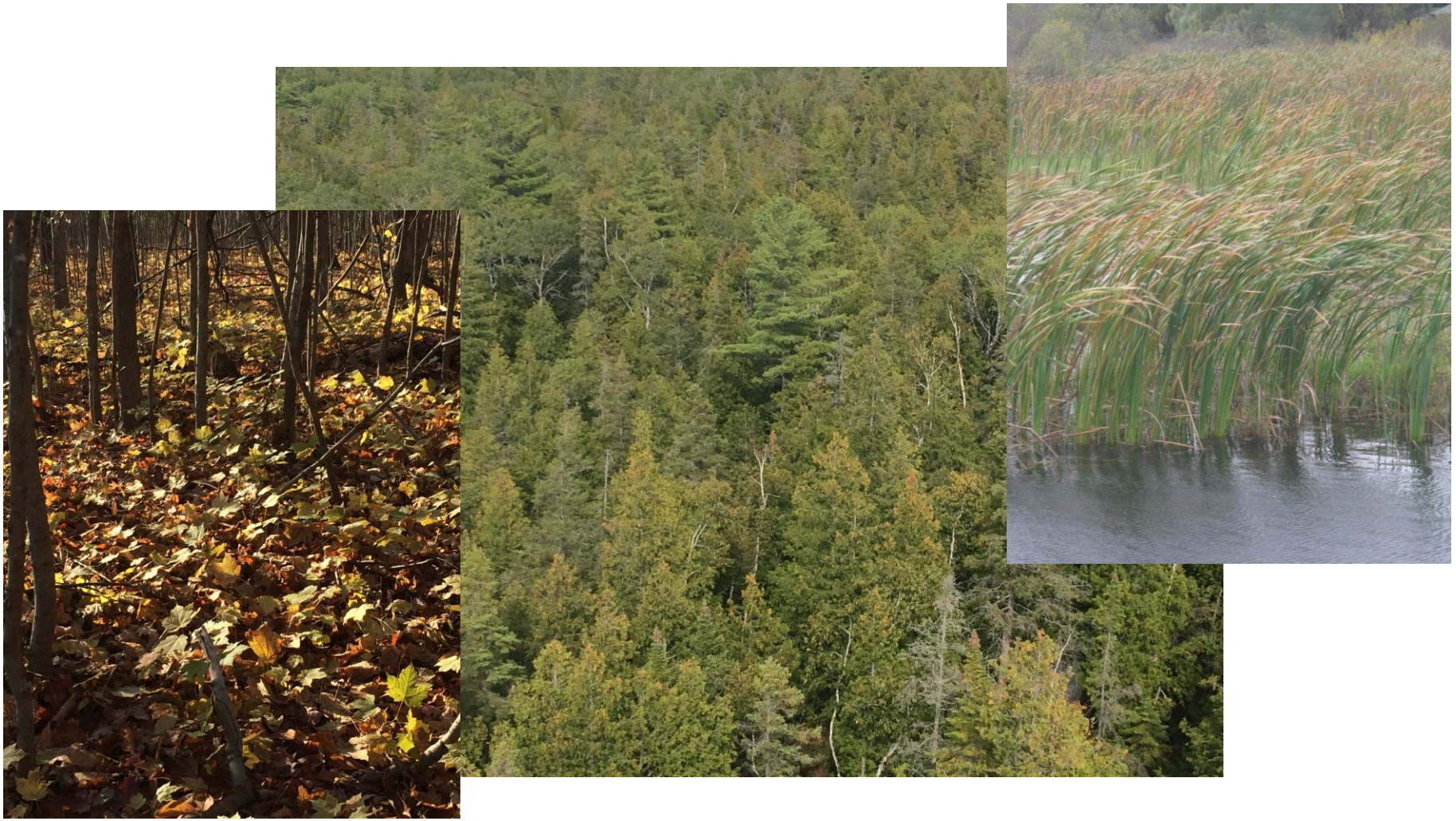
Community Series – (FOD)

Ecosite - Dry-fresh sugar maple deciduous forest (FOD5)

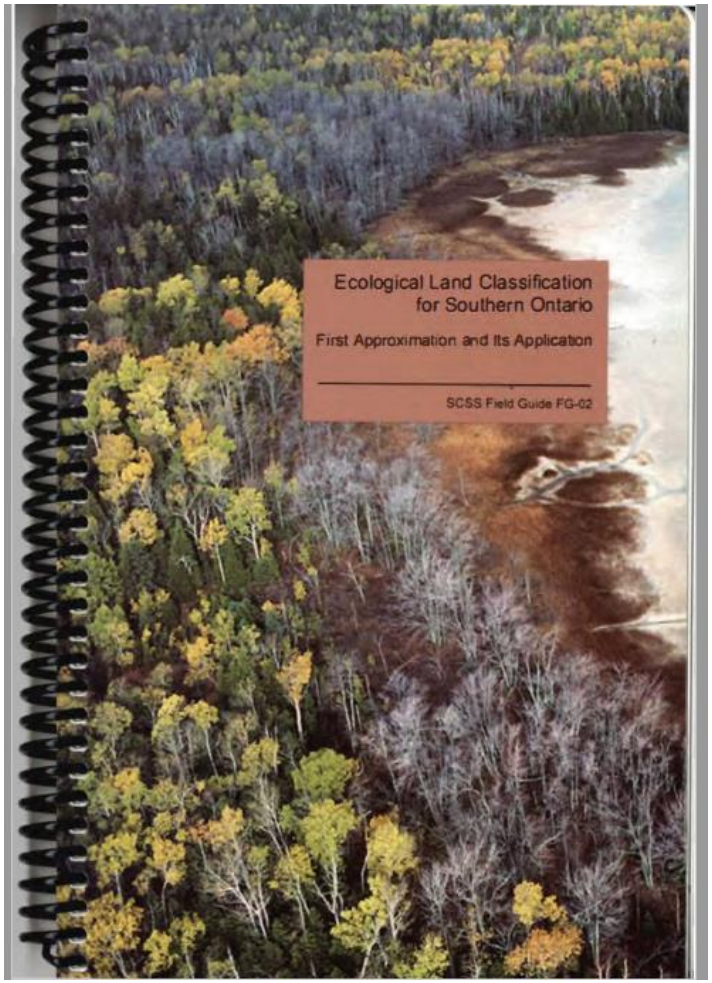
Vegetation Type – Dry-fresh sugar maple (FOD5-1)

- Dry-fresh sugar maple – beech (FOD5-2)

But not just a filing system…



ELC resources

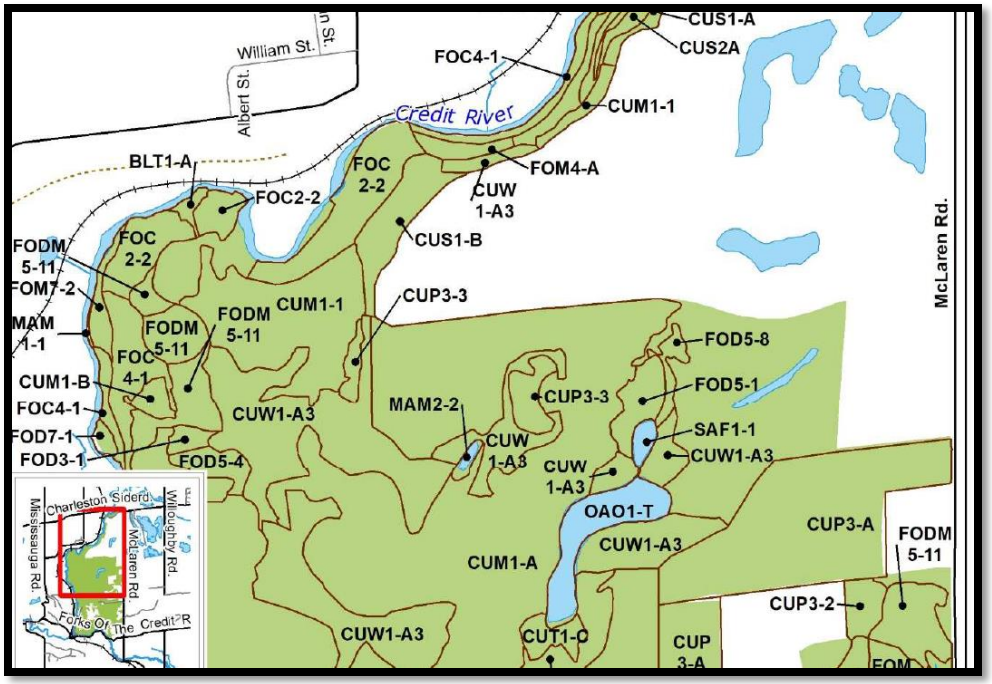


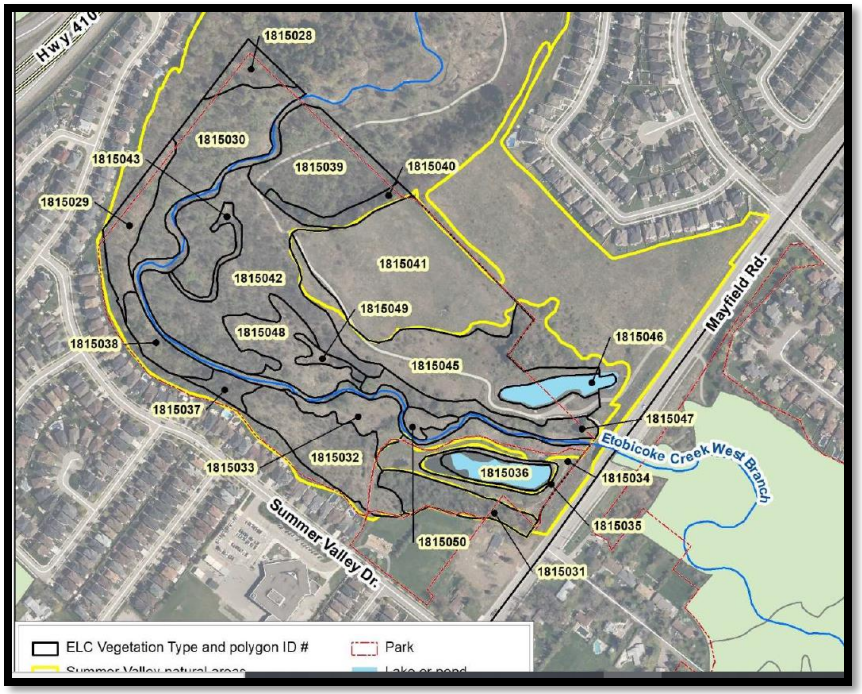
Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

Available online at:

(PDF) Ecological Land Classification for Southern Ontario: First Approximation and Its Application (researchgate.net)

What does ELC data usually look like?

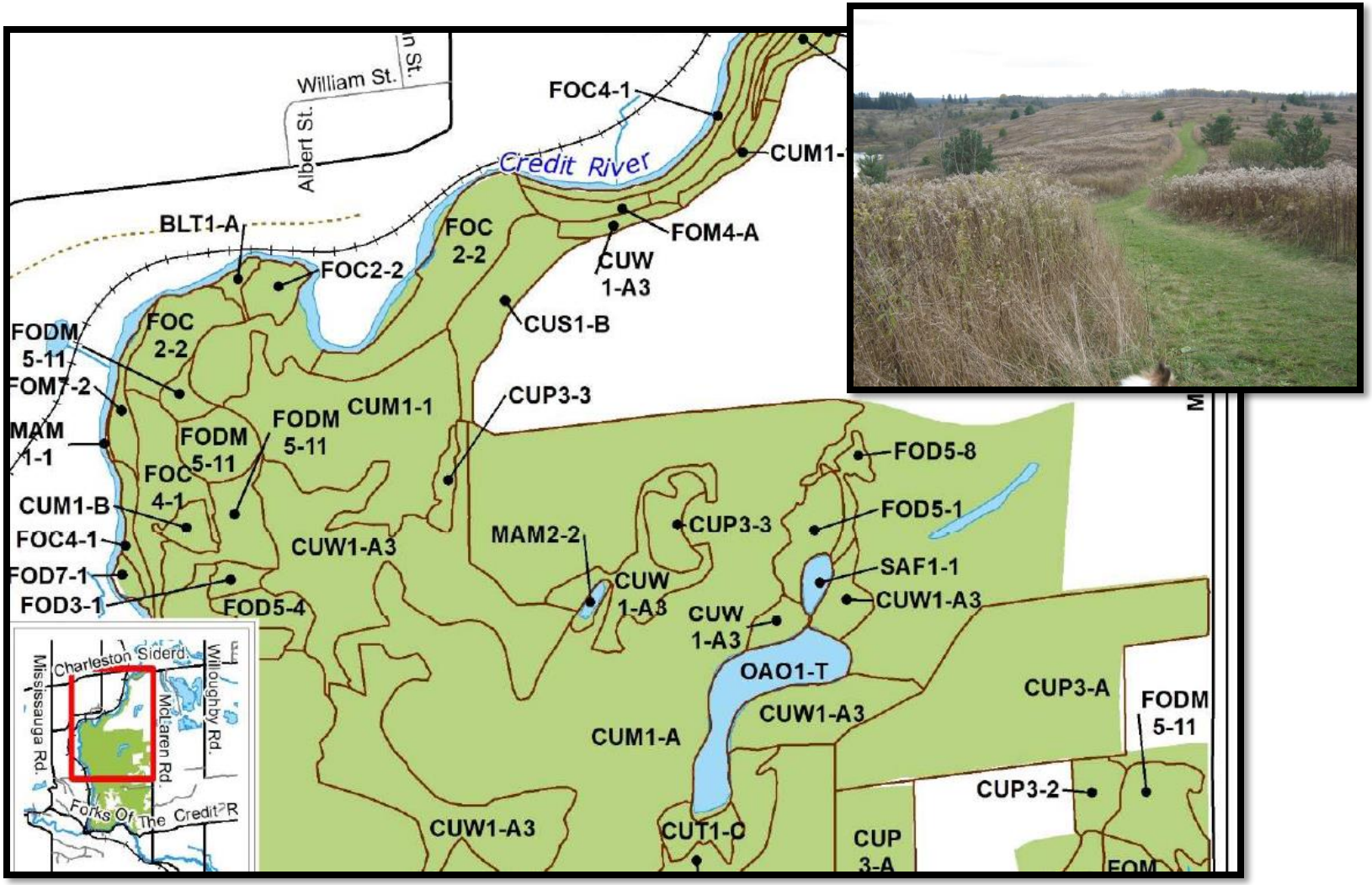




Dive into ELC data

Identifying vegetation community polygons

What does ELC mapping tell you?



ELC mapping tells us:

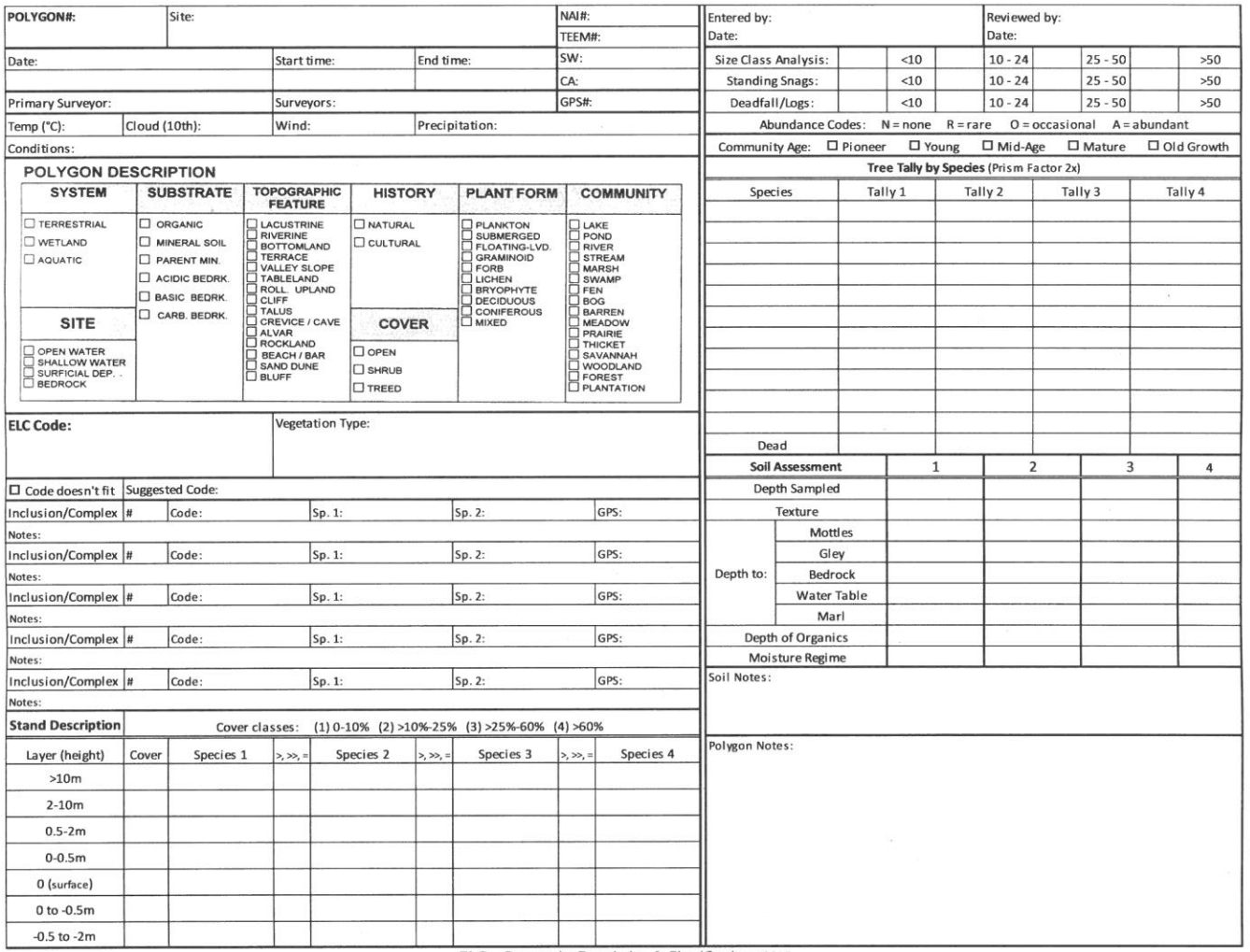
- The dominant vegetation is similar throughout the area enclosed by each polygon boundary
- This means that the detailed data collected for each polygon that describes the community characteristics, is intended to be applied over the whole polygon unless otherwise noted.
- We accept that there may be some variability in different parts of a polygon, but it is the dominating vegetation that holds the polygon together as a recognizable unit.

ELC mapping example

Letters only = desktop interpreted

Letters & numbers = field determined

ELC data card – inclusions/complexes, stand description, size class analysis, soils



POLYGON#:	Site:			NAI#:
				TEEM#:
Date:		Start time:	End time:	SW:
				CA:
Primary Surveyor:		Surveyors:		GPS#:
Temp (°C):	Cloud (10th):	Wind:	Precipitation:	
Conditions:				

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
☐ TERRESTRIAL ☐ WETLAND ☐ AQUATIC	☐ ORGANIC ☐ MINERAL SOIL ☐ PARENT MIN. ☐ ACIDIC BEDRK. ☐ BASIC BEDRK. ☐ CARB. BEDRK.	☐ LACUSTRINE ☐ RIVERINE ☐ BOTTOMLAND ☐ TERRACE ☐ VALLEY SLOPE ☐ TABLELAND ☐ ROLL. UPLAND ☐ CLIFF ☐ TALUS ☐ CREVICE / CAVE ☐ ALVAR ☐ ROCKLAND ☐ BEACH / BAR ☐ SAND DUNE ☐ BLUFF	☐ NATURAL ☐ CULTURAL	☐ PLANKTON ☐ SUBMERGED ☐ FLOATING-LVD. ☐ GRAMINOID ☐ FORB ☐ LICHEN ☐ BRYOPHYTE ☐ DECIDUOUS ☐ CONIFEROUS ☐ MIXED	☐ LAKE ☐ POND ☐ RIVER ☐ STREAM ☐ MARSH ☐ SWAMP ☐ FEN ☐ BOG ☐ BARREN ☐ MEADOW ☐ PRAIRIE ☐ THICKET ☐ SAVANNAH ☐ WOODLAND ☐ FOREST ☐ PLANTATION
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☐ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☐ TREED		

ELC Code:	Vegetation Type:

☐ Code doesn't fit | Suggested Code:

Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					

Stand Description — Cover classes: (1) 0-10% (2) >10%-25% (3) >25%-60% (4) >60%

Layer (height)	Cover	Species 1	>, >>, =	Species 2	>, >>, =	Species 3	>, >>, =	Species 4
>10m								
2-10m								
0.5-2m								
0-0.5m								
0 (surface)								
0 to -0.5m								
-0.5 to -2m								

Entered by: Date:				Reviewed by: Date:			
Size Class Analysis:		<10		10 - 24		25 - 50		>50
Standing Snags:		<10		10 - 24		25 - 50		>50
Deadfall/Logs:		<10		10 - 24		25 - 50		>50

Abundance Codes: N = none R = rare O = occasional A = abundant

Community Age: ☐ Pioneer ☐ Young ☐ Mid-Age ☐ Mature ☐ Old Growth

Tree Tally by Species (Prism Factor 2x)

Species	Tally 1	Tally 2	Tally 3	Tally 4
Dead				

Soil Assessment		1	2	3	4
Depth Sampled					
Texture					
Depth to:	Mottles				
	Gley				
	Bedrock				
	Water Table				
	Marl				
Depth of Organics					
Moisture Regime					

Soil Notes:

Polygon Notes:

Observation conditions, landscape perspective of the polygon

POLYGON#:	Site:			NAI#:
				TEEM#:
Date:		Start time:	End time:	SW:
				CA:
Primary Surveyor:		Surveyors:		GPS#:
Temp (°C):	Cloud (10th):	Wind:	Precipitation:	
Conditions:				

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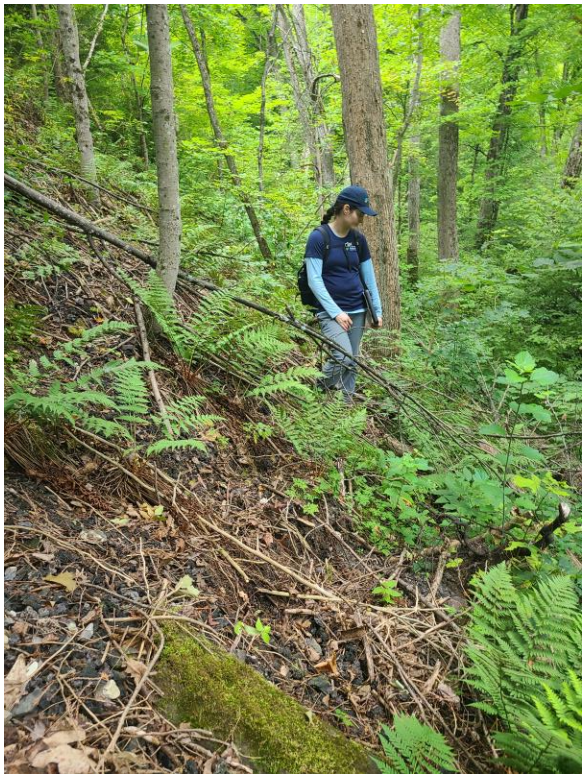
SITE ☐ OPEN WATER ☐ SHALLOW WATER ☐ SURFICIAL DEP. ☐ BEDROCK			**COVER** ☐ OPEN ☐ SHRUB ☐ TREED		

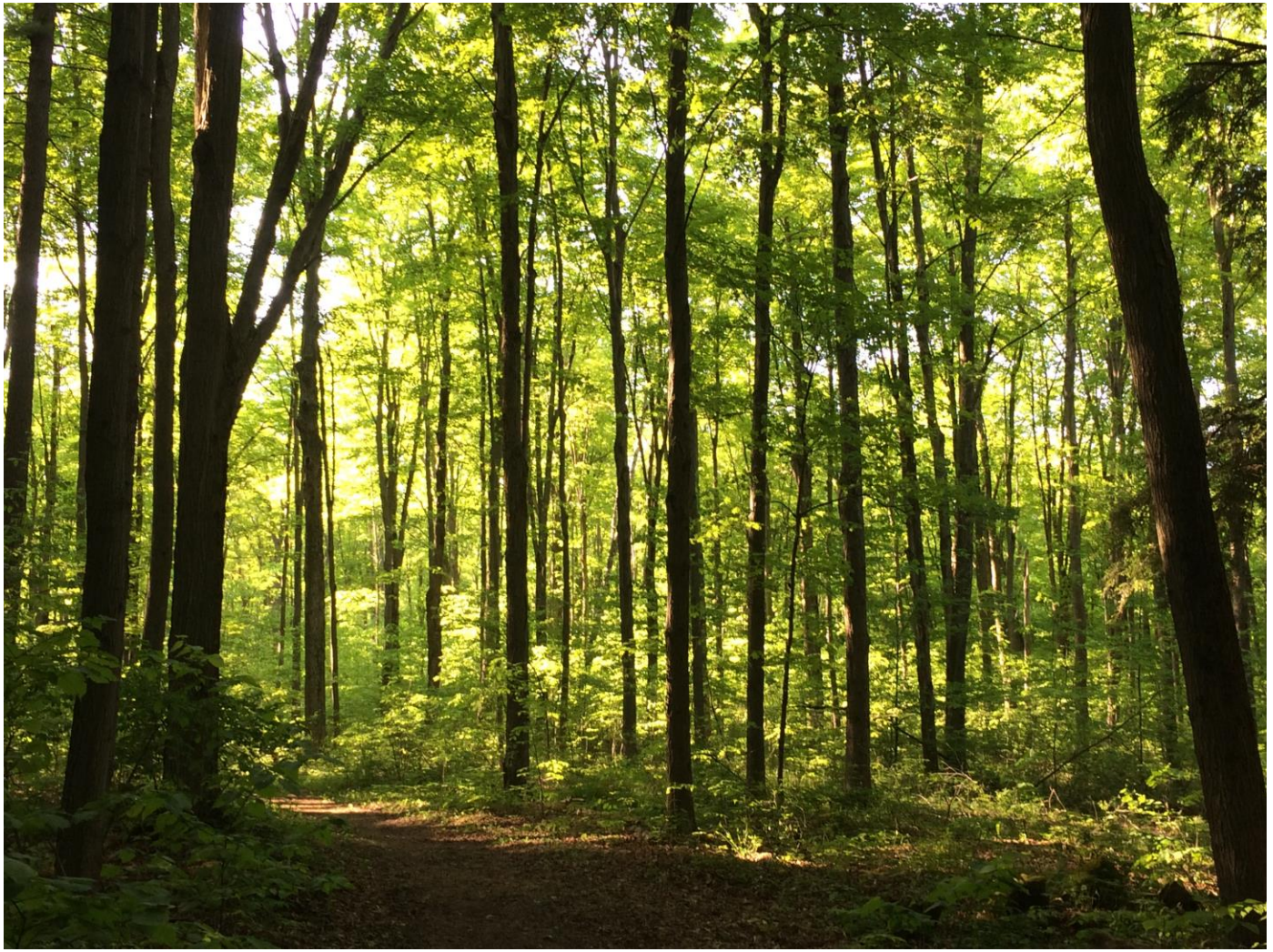


The date matters

Stand description

Stand Description	Cover classes: (1) 0-10% (2) >10%-25% (3) >25%-60% (4) >60%							
Layer (height)	Cover	Species 1	>, >>, =	Species 2	>, >>, =	Species 3	>, >>, =	Species 4
>10m								
2-10m								
0.5-2m								
0-0.5m								
0 (surface)								
0 to -0.5m								
-0.5 to -2m								

Stand description



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>10m								
2-10m								
0.5-2m								
0-0.5m								
0 (surface)								
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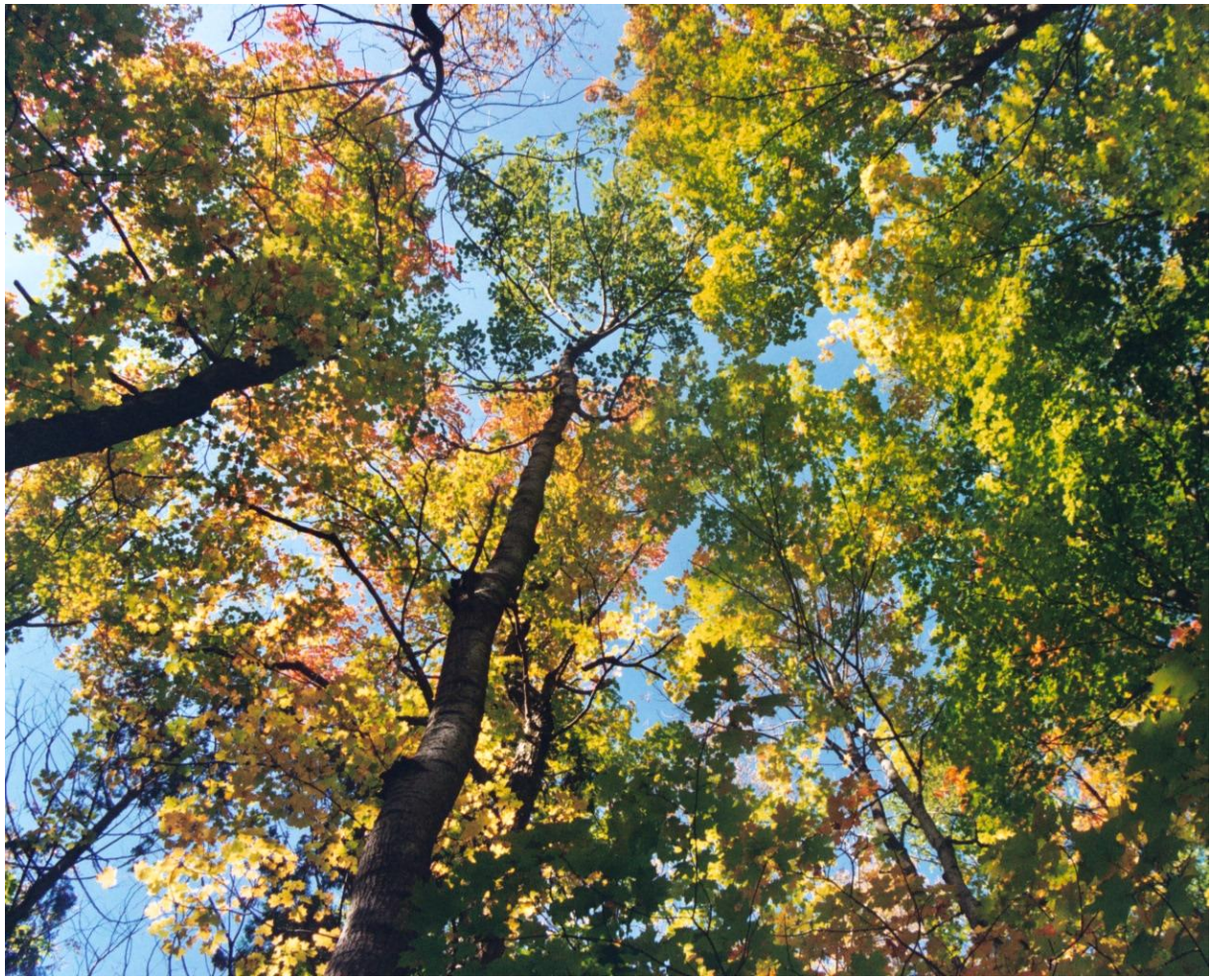
-0.5 to -2m								

Percent cover = ?



For the canopy layer >10m height,
is the % cover:

0-10%?
10-25%?
25-60%?
>60%?

Stand description

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Layer (height)	Cover	Species 1	>, >>, =	Species 2	>, >>, =	Species 3	>, >>, =	Species 4
>10m		Sugar maple	>	White Ash	=	Black Cherry	>>	Red Oak
2-10m								
0.5-2m								
0-0.5m								
0 (surface)								
0 to -0.5m								
-0.5 to -2m								

ELC – Community Description & Classi

Aquatic communities have layers too

Stand description and can we predict future vegetation?

Stand Description	Cover classes: (1) 0-10% (2) >10%-25% (3) >25%-60% (4) >60%							
Layer (height)	Cover	Species 1	>, >>, =	Species 2	>, >>, =	Species 3	>, >>, =	Species 4
>10m	4	Red Oak	>>	White Oak	>	Swamp White Oak	>	White Pine
2-10m	4	Buckthorn	>	Red Ash	>	Grey Dogwood	>	Fly Honeysuckle
0.5-2m	4	Buckthorn	>	Red Ash	>	Fly Honeysuckle	>	Grey Dogwood
0-0.5m	3	Garlic Mustard	>	Buckthorn	>	Wood Avens	>	Thicket Creeper
0 (surface)								
0 to -0.5m								
-0.5 to -2m								

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Layer (height)	Cover	Species 1	>, >>, =	Species 2	>, >>, =	Species 3	>, >>, =	Species 4
>10m	4	Sugar Maple	>	Red Oak	>>	Black Cherry	=	Basswood
2-10m	3	Sugar Maple	>>	Red Ash	>	Beech	>	Hop-hornbeam
0.5-2m	3	Sugar Maple	>	Red Ash	>	Alt-leaved Dogwood	>	Chokecherry
0-0.5m	4	Sugar Maple	>	Multi sedge spp	>	Enchanters Nightshade	>	Herb-robert
0 (surface)								
0 to -0.5m								
-0.5 to -2m								

Size class analysis, soils, inclusions

Size Class Analysis:		<10		10 - 24		25 - 50		>50
Standing Snags:		<10		10 - 24		25 - 50		>50
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Depth to:	Mottles				
	Gley				
	Bedrock				
	Water Table				
	Marl				
Depth of Organics					
Moisture Regime					

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Notes:					
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Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					
Inclusion/Complex	#	Code:	Sp. 1:	Sp. 2:	GPS:
Notes:					

Inclusions

Disturbance, special features

EXTENT OF GAPS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
LIVESTOCK (GRAZING)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF LIVESTOCK	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
ALIEN SPECIES	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF ALIEN SPECIES	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
PLANTING (PLANTATION)	NONE	OCCASIONAL	ABUNDANT	DOMINANT	
EXTENT OF PLANTING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS/ROADS	
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
DUMPING (RUBBISH)	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DUMPING	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
EARTH DISPLACEMENT	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF DISPLACEMENT	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
RECREATIONAL USE	NONE	LIGHT	MODERATE	HEAVY	
EXTENT OF REC USE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	
NOISE	NONE	SLIGHT	MODERATE	INTENSE	
EXTENT OF NOISE	NONE	LOCAL	WIDESPREAD	EXTENSIVE	

Other Features	
☐ Snags	
☐ Fallen Logs	
☐ Tree Cavities	
☐ Stick Nests	
☐ Hibernacula	
☐ Dens	
☐ Animal trails/corridors	
☐ Seeps/Springs	
☐ Streams	
☐ Vernal Pools	
☐ Heritage Trees	
☐ Restoration Potential	
☐ Encroachments/Structures (ie. deer stands, bridges)	

Plant and animal species

ELC data caveats

- **ELC provides a snapshot in time.**
- ELC summary is subjective, and nature is variable. The detailed ELC data resolves differences.
- Be aware of shortcuts. Get the detailed data.

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Example uses of ELC data

ELC is used in natural assets assessment and valuation

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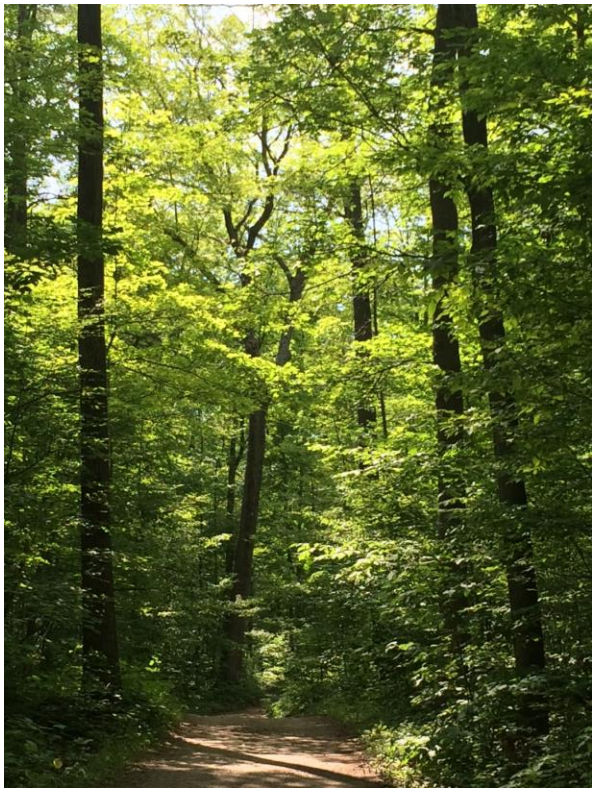

ELC informs property management

ELC notes disturbances that can be addressed

TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS/ROADS
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE

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TRACKS AND TRAILS	NONE	FAINT TRAILS	WELL MARKED	TRACKS/ROADS
EXTENT OF TRACKS/TRAILS	NONE	LOCAL	WIDESPREAD	EXTENSIVE

ELC species data informs property management

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ELC species data informs property management

ELC data can inform restoration planting

Location of forests vulnerable to diseases

VEGETATION TYPE	Layer 1	Layer 2
Dry-Fresh White Ash Deciduous Forest (FOD4-2)	White Ash > Bitternut Hickory = Eastern Hop-hornbeam = Northern Red Oak	European Buckthorn > Hawthorn species > White Ash > Common Apple
Dry-Fresh Sugar Maple - White Ash Deciduous Forest (FOD5-8)	Sugar Maple > White Ash >> Eastern White Cedar > White Elm	White Ash > Sugar Maple > Basswood = Eastern Hop-hornbeam
Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)	Willow species	Manitoba Maple > Black Ash > Basswood
Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)	Hybrid Crack Willow > White Elm > Red Ash	Manitoba Maple > European Buckthorn > Red Ash > Multiple Dogwood species

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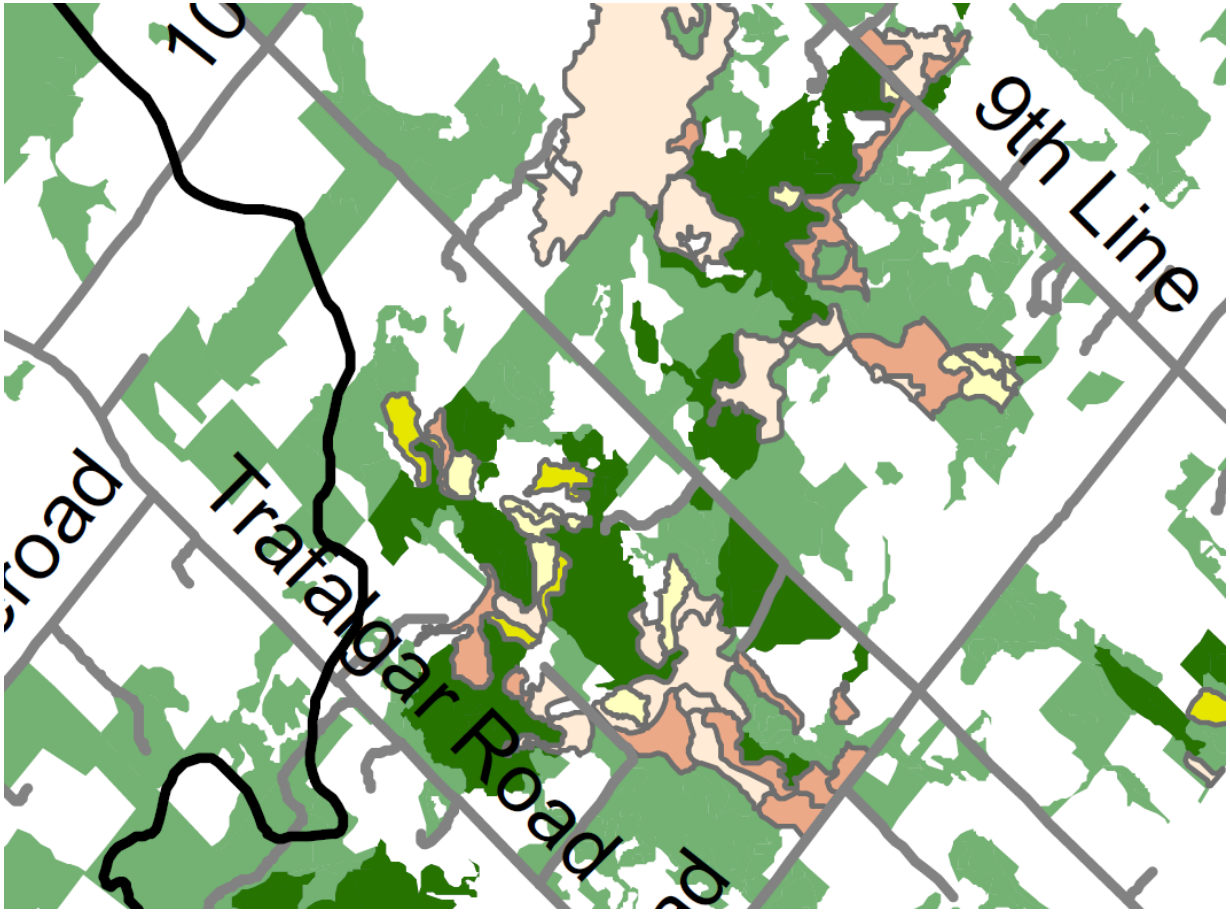
Dry-Fresh Sugar Maple - White Ash Deciduous Forest (FOD5-8)	Sugar Maple > White Ash >> Eastern White Cedar > White Elm	White Ash > Sugar Maple > Basswood = Eastern Hop-hornbeam
Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)	Willow species	Manitoba Maple > Black Ash > Basswood
Fresh-Moist Willow Lowland Deciduous Forest (FOD7-3)	Hybrid Crack Willow > White Elm > Red Ash	Manitoba Maple > European Buckthorn > Red Ash > Multiple Dogwood species

Forests vulnerable to EAB



Ash Density (%)

- <30 (low risk)
- 30-60 (moderate risk)
- 60-80 (high risk)
- >80 (extreme risk)

ELC stand descriptions used to identify treed habitats with high vulnerability to climate change

Project by CVC Ecologist Laura Timms

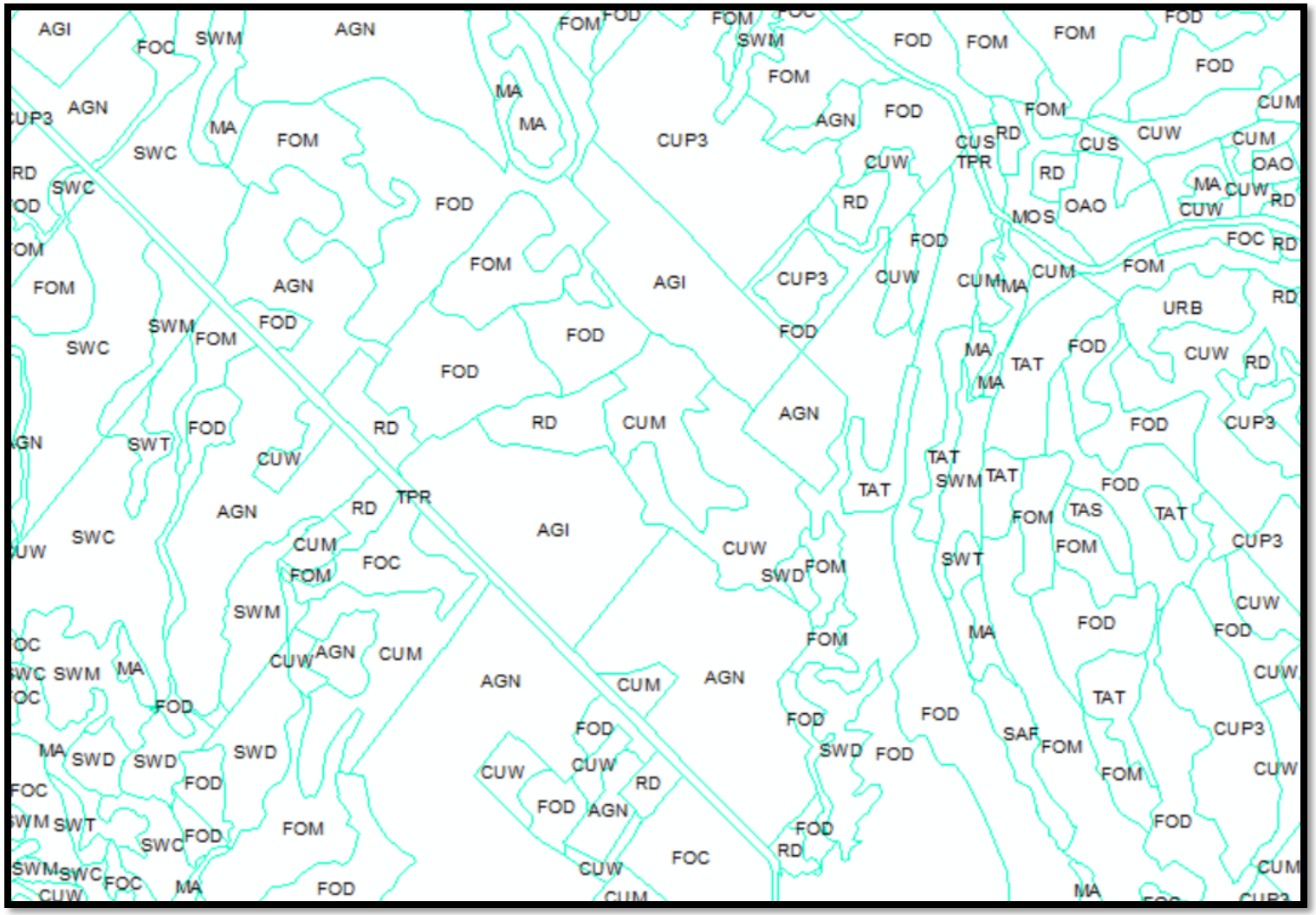
Climate change vulnerability scores for 55 tree species

ELC stand description data for Layers 1 and 2 for treed habitats

Cumulative vulnerability score

6% assessed areas **extremely** vulnerable to climate change
43% assessed areas **highly** vulnerable
51% assessed areas **low – moderate** vulnerability

What if you don't have field-generated ELC data?



ELC relates to flood resilience

My final messages

- ELC is not just mapping with labels
- Get the detailed ELC information
- ELC can help shed light on a wide variety of questions that are relevant for municipal land managers

We are always happy to help with your ELC questions – ask us

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inspired by nature

questions?