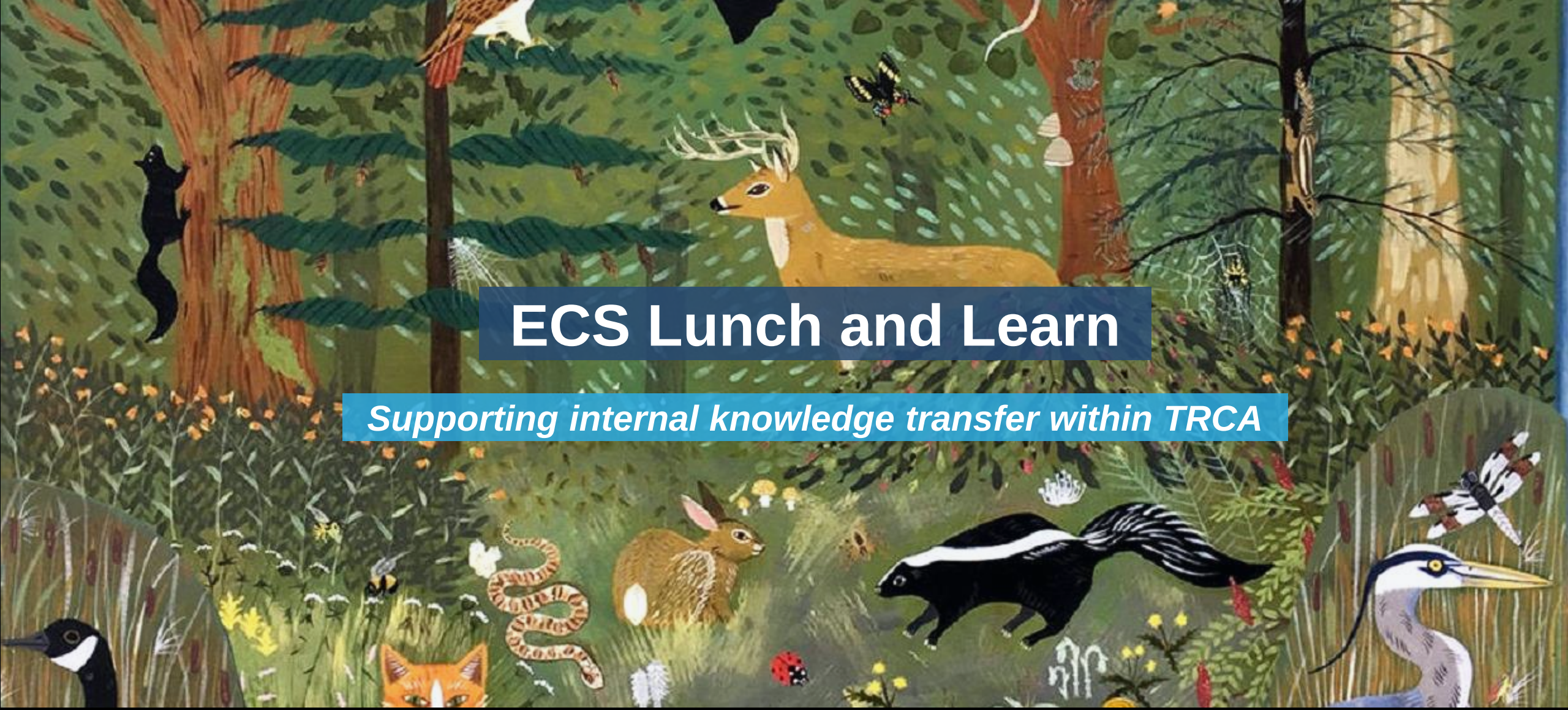


ECS Lunch and Learn

Supporting internal knowledge transfer within TRCA

December 16, 2020

Toronto and Region Conservation Authority

Explore TRCA's Biodiversity

How to get the most from our enormous natural heritage data set.

Presented by: Gavin Miller, Flora Biologist, Paul Prior, Fauna Biologist, and Parth Sheth, GIS Technician.

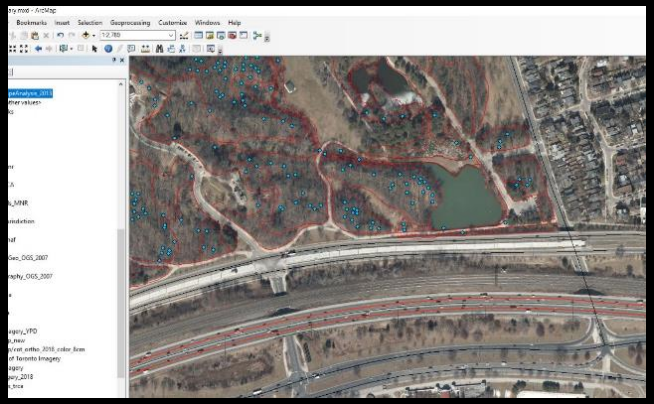
December 17, 2020

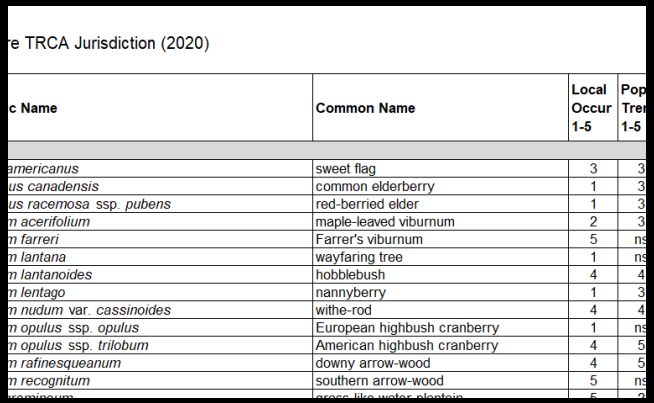
What We Collect

- (Landscape Natural Cover)
- **Vegetation Communities**
- **Flora Species**
- **Fauna Species**
- (Long-term Monitoring Plots)

Data Platforms

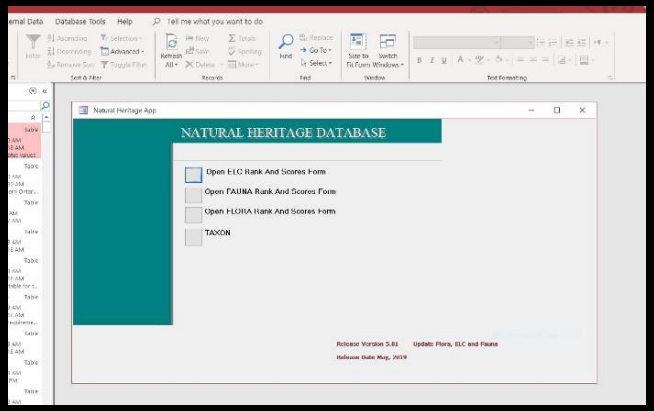
- (Access Database)
- Templates Checklist
- ArcMap (our main topic)
  - ArcMap
  - Web viewer
- (SQL Database)





re TRCA Jurisdiction (2020)

c Name	Common Name	Local Occur 1-5	Pop Tre 1-5
americanus	sweet flag	3	3
us canadensis	common elderberry	1	3
us racemosa ssp. *pubens*	red-berried elder	1	3
m acerifolium	maple-leaved viburnum	2	3
m farreri	Farrer's viburnum	5	ns
m lantana	wayfaring tree	1	ns
m lantanoides	hobblebush	4	4
m lentago	nannyberry	1	3
m nudum var. *cassinoides*	withe-rod	4	4
m opulus ssp. *opulus*	European highbush cranberry	1	ns
m opulus ssp. *trilobum*	American highbush cranberry	4	5
m rafinesqueanum	downy arrow-wood	4	5
m recognitum	southern arrow-wood	5	ns
ramineum	grass-like water-plantain	5	2

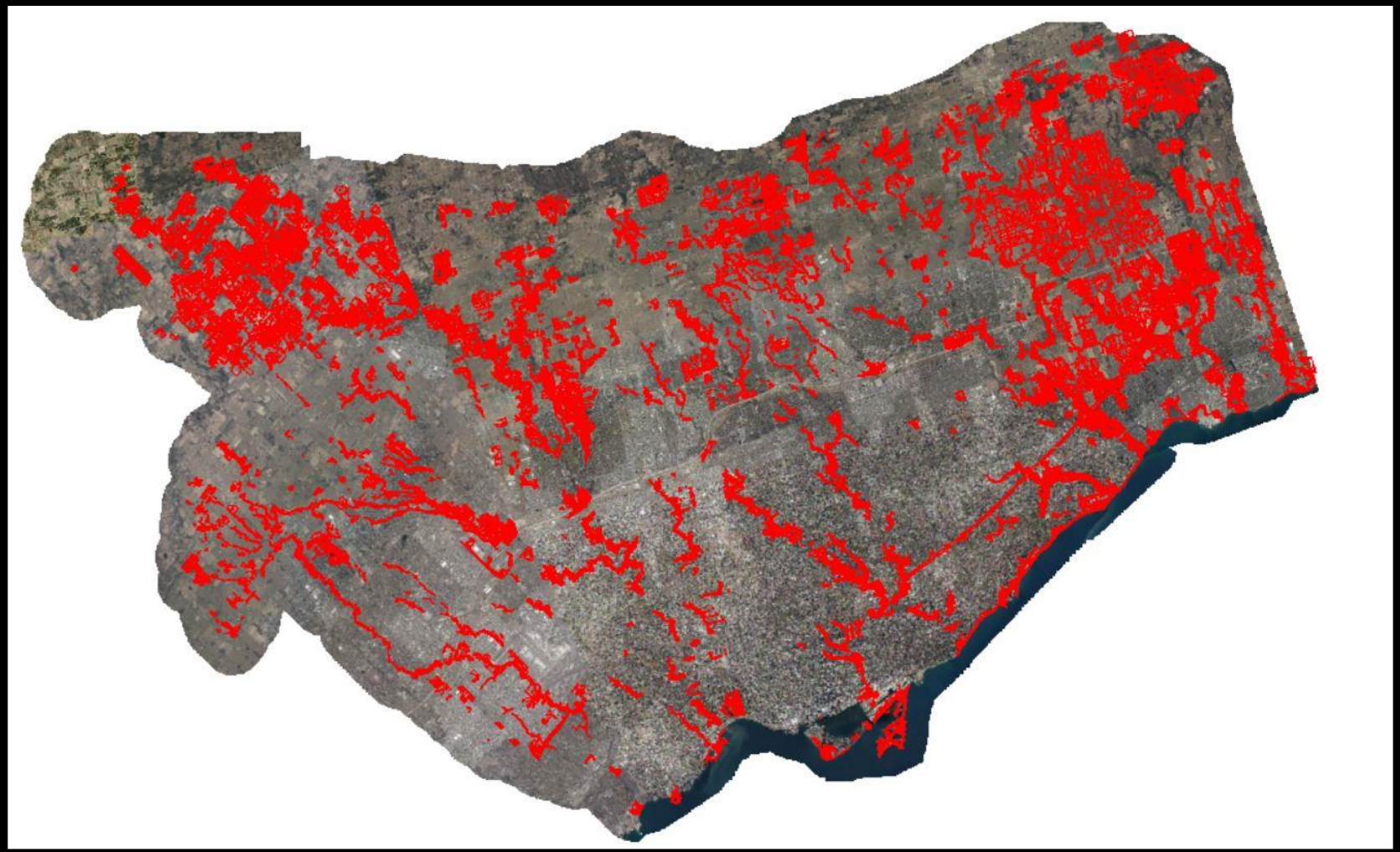


Scoring and Ranking

- Local Conservation Status
- International standard (NatureServe)
- Five-rank system (plus extirpated and exotic)
- Abundance and Sensitivity
- L1-L3 Regional Concern
- L4 Urban Concern
- L5 Secure
- Please refer to protocol

Applications

- Plan Review
- Watershed Planning
- Restoration
  - Habitat plans
  - Seed sourcing
- Data sharing



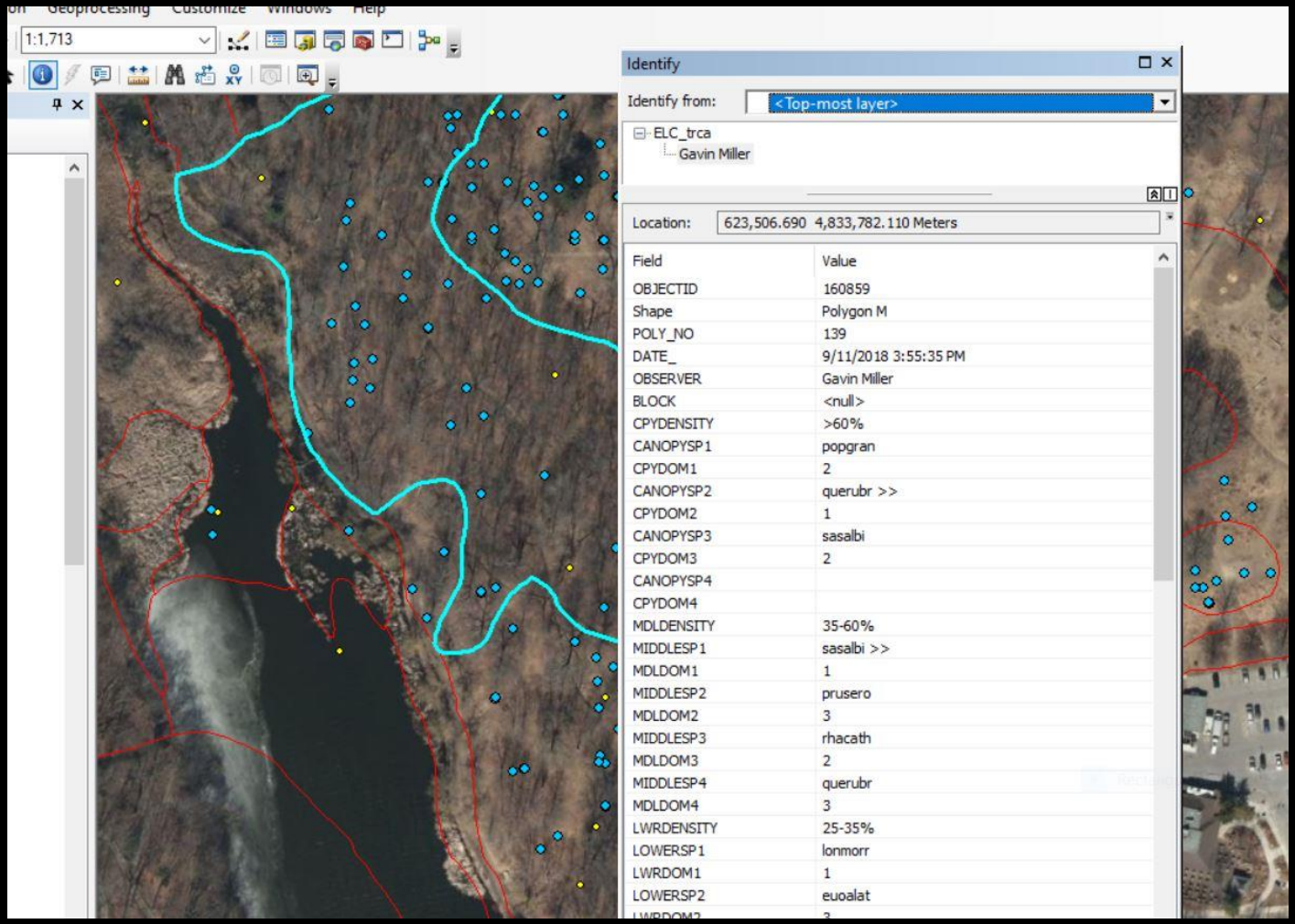
The ELC data layer

Vegetation Community Mapping

- 41,542 ELC polygons as of November 2020.
  - 400 vegetation types in TRCA jurisdiction
  - Almost entirely from annual biological inventories
  - Occasionally data shared from MNRF or other agencies

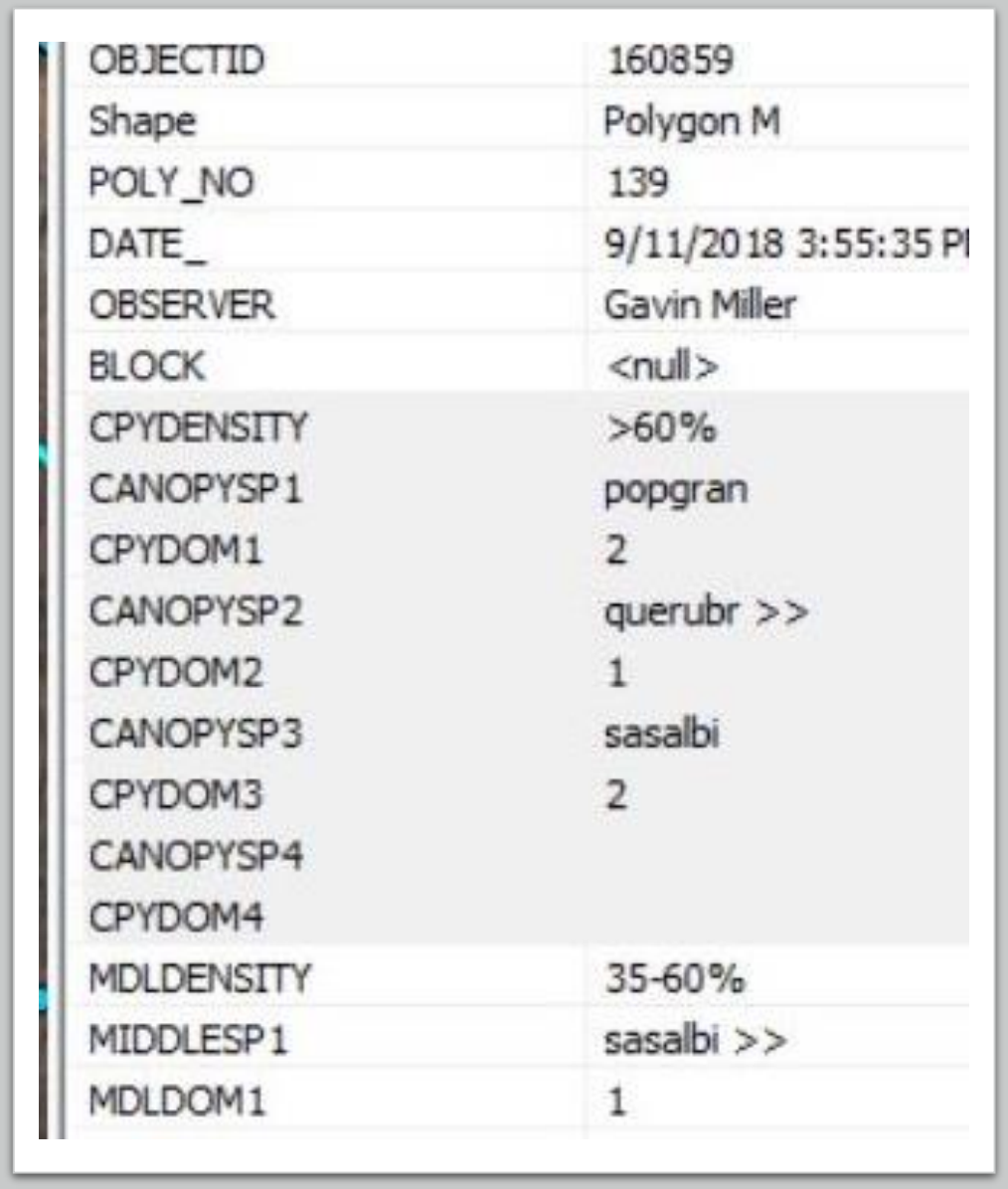
Vegetation Community Polygons

ELC attribute table:



ELC 4 veg layers:

> cover
> species
> dominance



OBJECTID	160859
Shape	Polygon M
POLY_NO	139
DATE_	9/11/2018 3:55:35 PI
OBSERVER	Gavin Miller
BLOCK	<null>
CPYDENSITY	>60%
CANOPYSP1	popgran
CPYDOM1	2
CANOPYSP2	querubr >>
CPYDOM2	1
CANOPYSP3	sasalbi
CPYDOM3	2
CANOPYSP4	
CPYDOM4	
MDLDENSITY	35-60%
MIDDLESP1	sasalbi >>
MDLDOM1	1

ELC summary: * **code; *** veg type; * L-rank

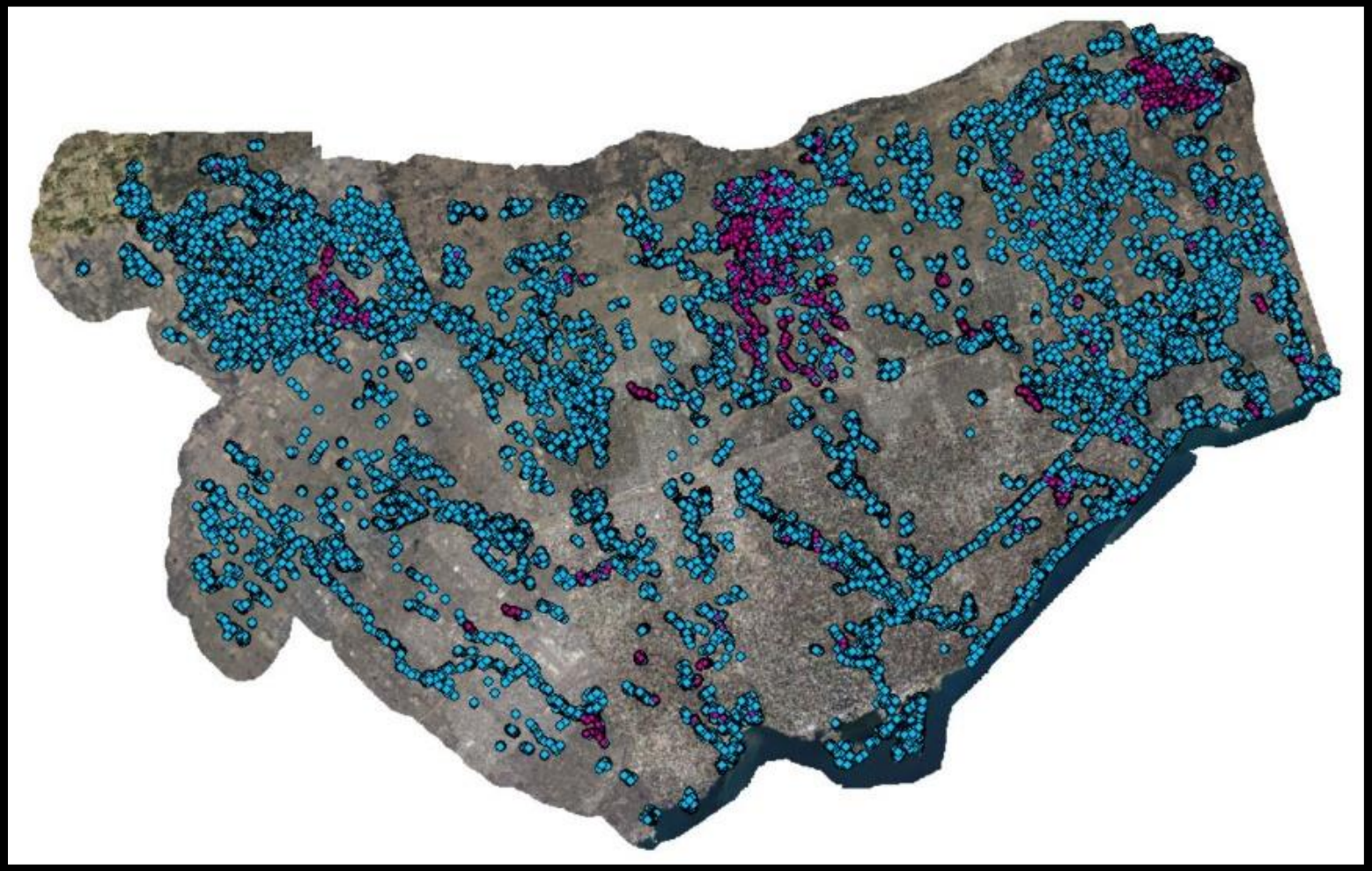
PICTURE	<null>
COMP3SP1	<null>
COMP3SP2	<null>
ELC_CODE	FOD1-1
ELC_Name	Dry-Fresh Red Oak Deciduous Forest
Score_date	<null>
ELC_Local_Rank	L2
Local_Occurrence	<null>
Local_Distribution	<null>
Area_Score	<null>

Other attributes of interest

- Age (wooded)
- Disturbances such as trails, exotics, deer browse, litter
- Soil horizon information and moisture regime
- Vernal pools
- Size of polygon

Comments Section

VERNAL_PL	No
COMMENTS	grasses: festrac pancapi poaprat; grass_spp: andgera panvirg sornuta schscop; undergoing restoration; Pine stumps about 85 years old
QAQC_NAME	Gavin Miller
QAQC_DATE	1/9/2019

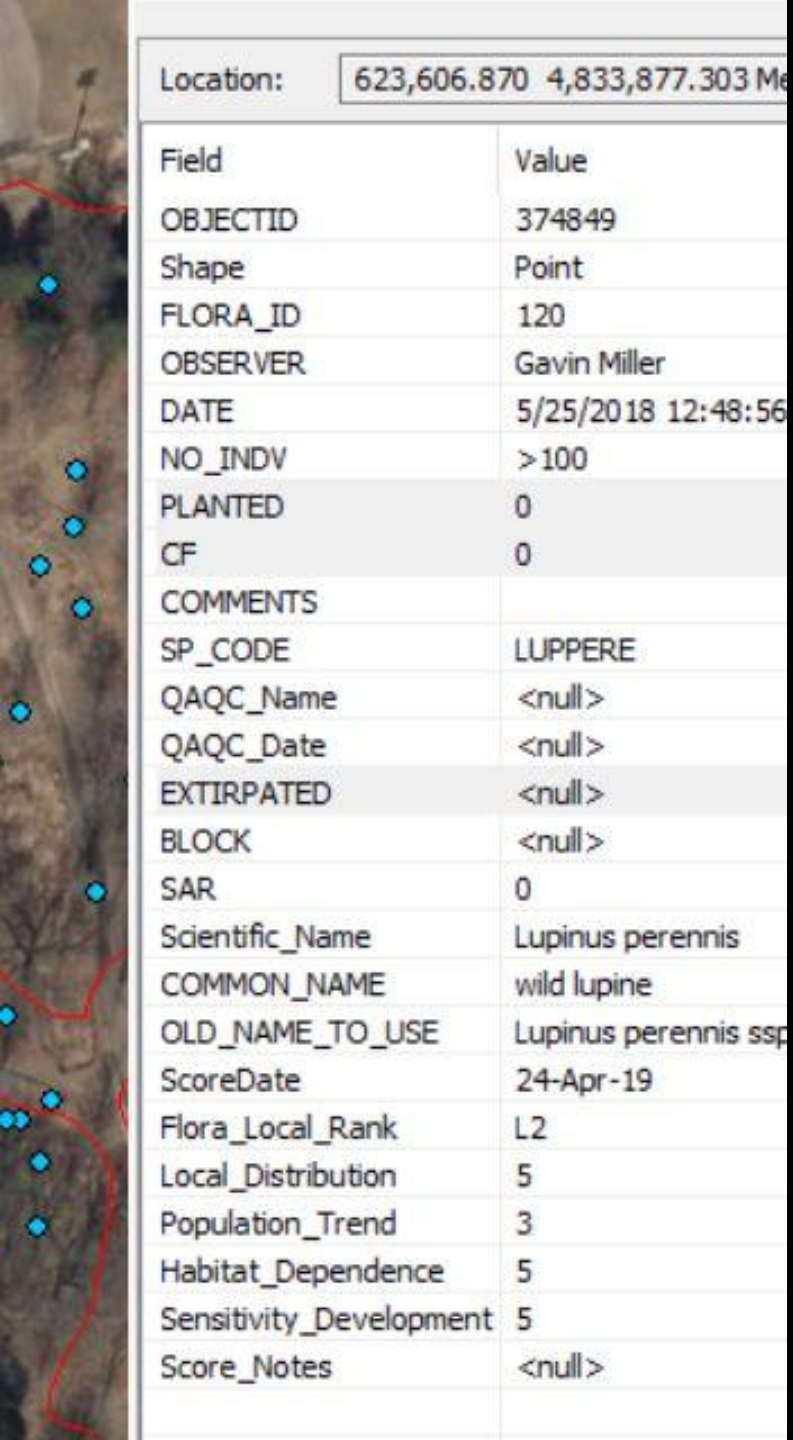


The Flora data layer

- 100,486 data points as of November 2020.
  - 98,163 standard flora records plus 2323 invasive records
  - Majority from TRCA inventory work
  - Additional records from long term monitoring program
  - Incidental observations from staff, MNRF data sharing, consultants, citizen experts

  The database is used for land use planning, protection and restoration, and monitoring.

Flora Mapping Close-up

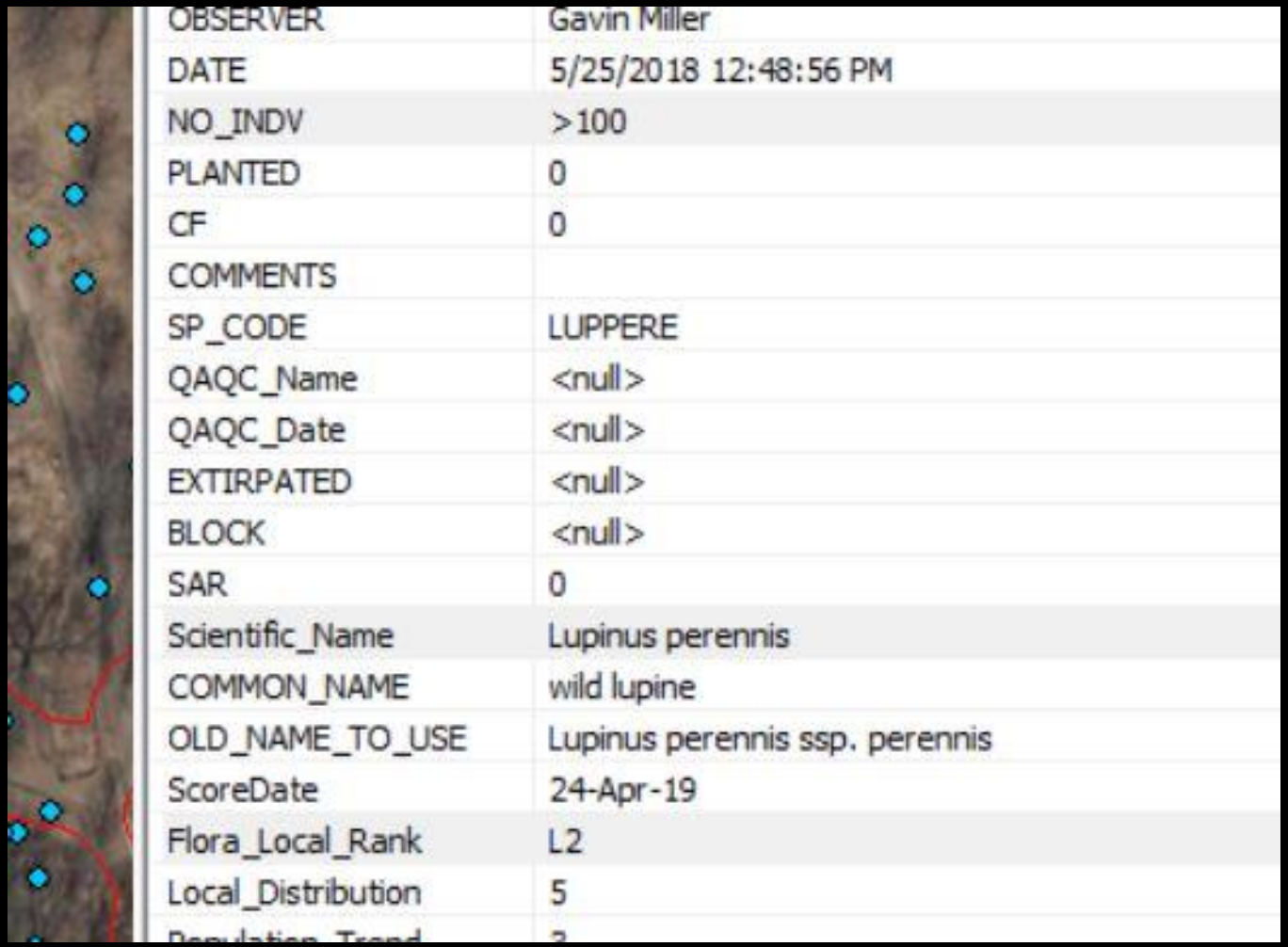


Location: 623,606.870 4,833,877.303 Me

Field	Value
OBJECTID	374849
Shape	Point
FLORA_ID	120
OBSERVER	Gavin Miller
DATE	5/25/2018 12:48:56
NO_INDV	>100
PLANTED	0
CF	0
COMMENTS	
SP_CODE	LUPPERE
QAQC_Name	<null>
QAQC_Date	<null>
EXTIRPATED	<null>
BLOCK	<null>
SAR	0
Scientific_Name	Lupinus perennis
COMMON_NAME	wild lupine
OLD_NAME_TO_USE	Lupinus perennis ssp
ScoreDate	24-Apr-19
Flora_Local_Rank	L2
Local_Distribution	5
Population_Trend	3
Habitat_Dependence	5
Sensitivity_Development	5
Score_Notes	<null>

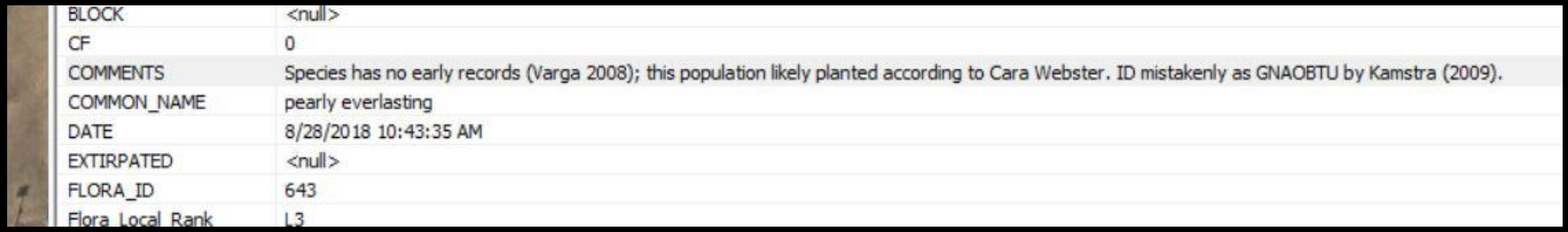
Flora attribute table:

Flora species information:

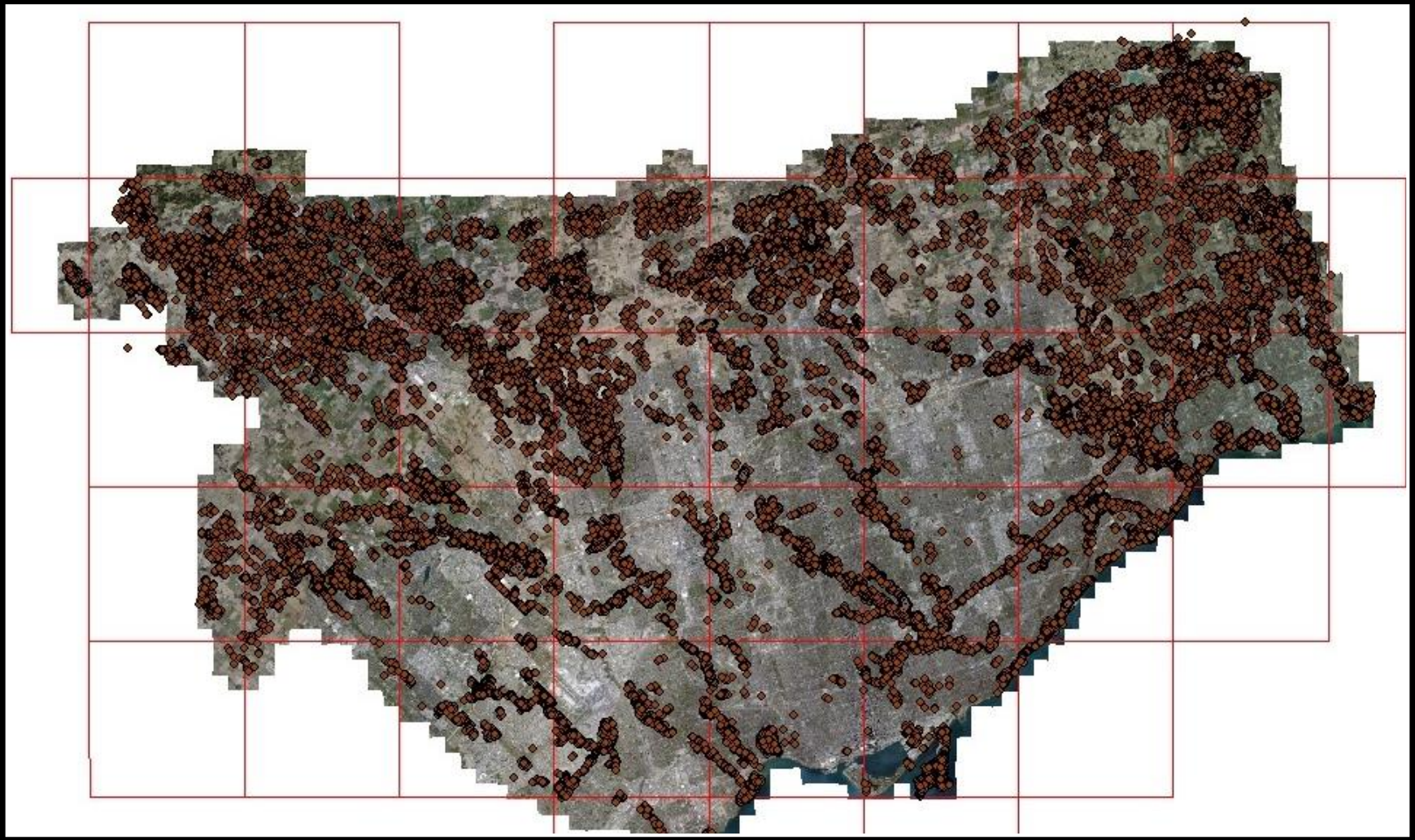


OBSERVER	Gavin Miller
DATE	5/25/2018 12:48:56 PM
NO_INDV	>100
PLANTED	0
CF	0
COMMENTS	
SP_CODE	LUPPERE
QAQC_Name	<null>
QAQC_Date	<null>
EXTIRPATED	<null>
BLOCK	<null>
SAR	0
Scientific_Name	Lupinus perennis
COMMON_NAME	wild lupine
OLD_NAME_TO_USE	Lupinus perennis ssp. perennis
ScoreDate	24-Apr-19
Flora_Local_Rank	L2
Local_Distribution	5

Flora comments:



BLOCK	<null>
CF	0
COMMENTS	Species has no early records (Varga 2008); this population likely planted according to Cara Webster. ID mistakenly as GNAOBTU by Kamstra (2009).
COMMON_NAME	pearly everlasting
DATE	8/28/2018 10:43:35 AM
EXTIRPATED	<null>
FLORA_ID	643
Flora_Local_Rank	L3



The Fauna data layer

What's there?

- 68,958 data points as of November 2020.
  - Primarily from annual fauna inventories
  - Since 2008, large input from long term monitoring program
  - Incidental observations from staff
  - Citizen science platforms such as iNaturalist
- As with the flora data, this fauna data is collected to inform Plan Review – watershed planning, restoration projects, engineering projects, land use decisions, etc.

Field work – acquiring all that data!

Zoom into your subject area …

What's the point?

- each point has an associated attribute table
- within ArcMap there are options to filter for individual or multiple attributes …
- … or to colour code specific values

The attribute table:

Identify from: <Top-most layer>

Fauna_trca_update2019
Tyrannus tyrannus

Location: 623,981.633 4,834,328.701 Meters

Field	Value
OBJECTID	59567
Shape	Point
FAUNAIDNUM	<null>
CODE	EAKI
FIELDOBS	sh
BREEDSTATUS	PO
CALLCODE	<null>
COUNT	<null>
DEAD	<null>
SOURCE	TRCA Inventory
MAPCRITERIA	0
OBSERVER	Dell Tune
DATE	6/28/2018
COMMENTS	<null>
SAR	0
OBJECTID_1	251
NHIC	EAKI
Scientific_Name	Tyrannus tyrannus
COMMON_NAME	eastern kingbird
Score_date	20-Feb-20
Fauna_LocalRank	L4
ABUNDANCE	0
POPULATION_NATURAL	4
POPULATION_TRCA	2

The “Map Criteria” attribute

Provides a quick and easy way of checking for any duplicate records between different years.

Can be used as a filter to create the most up to date species list for a site.

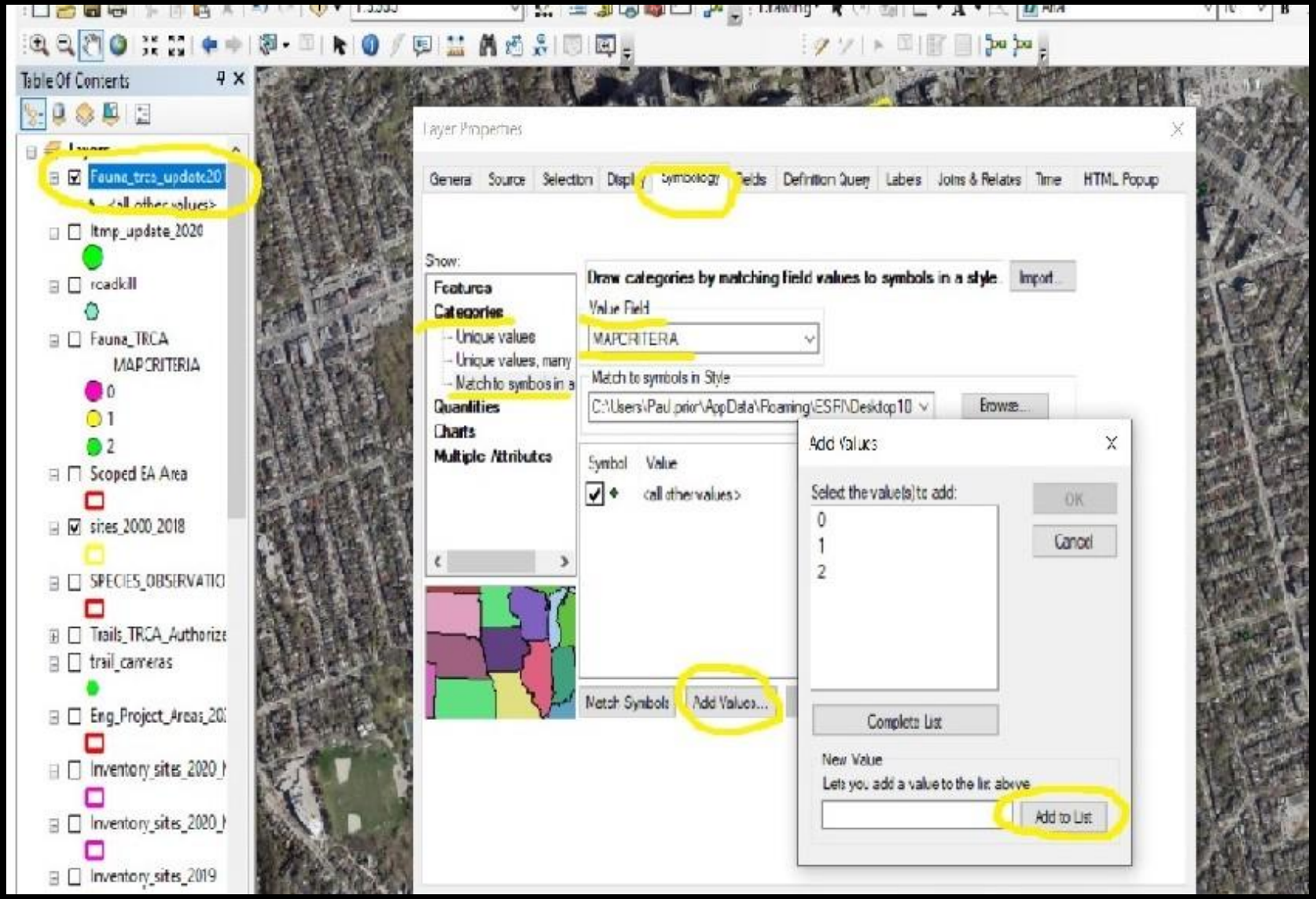
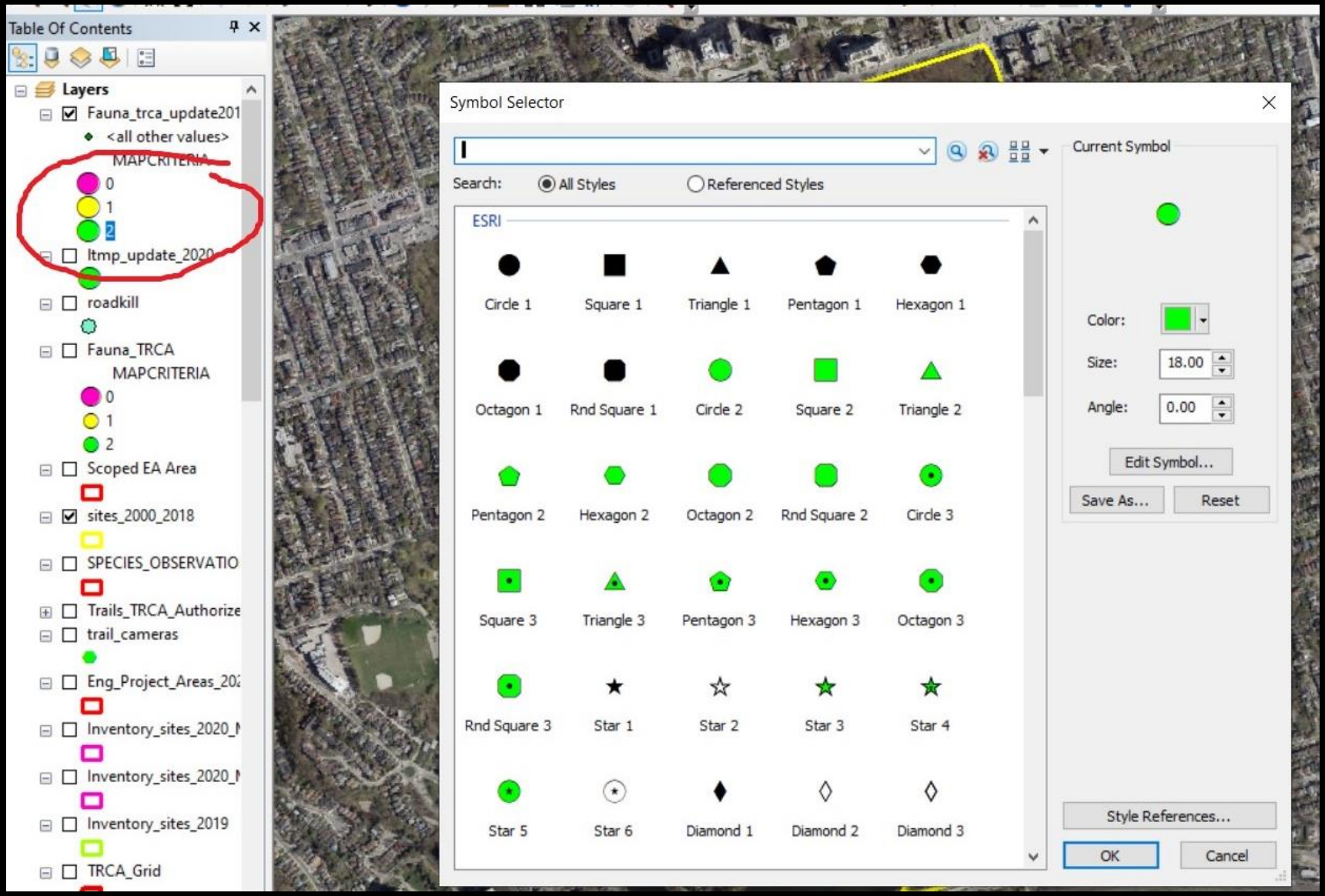


Table Of Contents
Fauna_trca_update20
<all other values>
ltmp_update_2020
roadkill
Fauna_TRCA
MAPCRITERIA
0
1
2
Scoped EA Area
sites_2000_2018
SPECIES_OBSERVATIO
Trails_TRCA_Authorize
trail_cameras
Eng_Project_Areas_20
Inventory_sites_2020_
Inventory_sites_2020_
Inventory_sites_2019
Layer Properties
General
Source
Selection
Display
Symbology
Fields
Definition Query
Labels
Joins & Relates
Time
HTML Popup
Show:
Features
Categories
Unique values
Unique values, many
Match to symbols in a
Quantities
Charts
Multiple Attributes
Draw categories by matching field values to symbols in a style.
Import...
Value Field
MAPCRITERIA
Match to symbols in Style
C:\Users\Paul.prior\AppData\Roaming\ESRI\Desktop10
Browse...
Symbol
Value
<all other values>
Match Symbols
Add Values...
Add Values
Select the value(s) to add:
0
1
2
OK
Cancel
Complete List
New Value
Lets you add a value to the list above
Add to List



Easier to interpret once you've refined the symbols…

Pink Points

- “0” – indicates that the point satisfies all the requirements to be included in a site report map
- species of conservation concern (L1 to L4)
- if duplicate records have occurred the most recent record will be Pink

Yellow Points

- “1” – indicates that the point should not be included in site report maps
- … because the “breeding status” does not reach the required level of certainty …
- or because it is a duplicate of a more recent record
- Why not just delete older records?

GREEN POINTS

- “2” – indicates that the point does not need to be included in site report maps
- these “green” points refer to L5 and L+ species
- such species need to be included in site lists, but abundance is not recorded (ie. no count for number of territories recorded on site)

xd - ArcMap

Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:13,104 Drawing Arial 10

Editor

Attributes

ther values>
PCRITERIA

a_trca

OBJECTID *	SHAPE *	FAUNAIDNUM	CODE	FIELDOBS	BREEDSTATUS	CALLCODE	COUNT	DEAD	SOURCE	MAPCRITERIA	OBSERVER	DATE	COMMENTS	NHIC	Scientific_N
34305	Point	34556	WOTH	sm	PO	<Null>	<Null>	<Null>	<Null>	0	Sue Hayes	6/9/2012	<Null>	WOTH	Hylocichla mustelina
34306	Point	34557	WOTH	sm	PO	<Null>	<Null>	<Null>	<Null>	1	Sue Hayes	6/9/2012	<Null>	WOTH	Hylocichla mustelina
34307	Point	34558	SNTU	sh	PR	<Null>	<Null>	<Null>	<Null>	0	Sue Hayes	6/5/2012	<Null>	SNTU	Chelydra serpentina se
51639	Point	51909	GHOW	fy	CO	<Null>	<Null>	<Null>	<Null>	1	Sue Hayes	5/1/2017	<Null>	GHOW	Bubo virginianus
51640	Point	51910	AMTO	dead	PR	<Null>	<Null>	<Null>	<Null>	1	Sue Hayes	5/1/2017	dead on trail	AMTO	Anaxyrus americanus
51641	Point	51911	AMTO	sm	PR	3	<Null>	<Null>	<Null>	0	Meaghan Eas	4/30/2017	<Null>	AMTO	Anaxyrus americanus
51986	Point	52256	CARW	t	PR	<Null>	<Null>	<Null>	<Null>	0	Sue Hayes	7/7/2017	heard singing throughout May and J	CARW	Thryothorus ludovician
51987	Point	52257	WOTH	ne	CO	<Null>	<Null>	<Null>	<Null>	1	Sue Hayes	6/28/2017	re-nest or second clutch?	WOTH	Hylocichla mustelina
55558	Point	<Null>	BBBA	sh	Status Uncertain	<Null>	<Null>	<Null>	<Null>	1	Dell Tune	5/2/2018	specific ID uncertain/unconfirmed	BBBA	Eptesicus fuscus
55559	Point	<Null>	AMTO	sh	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	5/2/2018	<Null>	AMTO	Anaxyrus americanus
55560	Point	<Null>	AMTO	dead	PR	<Null>	<Null>	Yes	TRCA Inve	0	Dell Tune	5/2/2018	on road	AMTO	Anaxyrus americanus
55561	Point	<Null>	AMTO	sh	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	5/2/2018	along duck pond wall	AMTO	Anaxyrus americanus
55562	Point	<Null>	EAWP	t	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	EAWP	Contopus virens
55563	Point	<Null>	EAWP	t	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	EAWP	Contopus virens
55564	Point	<Null>	BGGN	t	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	BGGN	Polioptila caerulea
55565	Point	<Null>	BGGN	fy	CO	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	BGGN	Polioptila caerulea
55566	Point	<Null>	GRCA	sm	PO	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/13/2018	<Null>	GRCA	Dumetella carolinensis
55567	Point	<Null>	REVI	sm	Status Uncertain	<Null>	<Null>	<Null>	TRCA Inve	1	Dell Tune	6/13/2018	Pos Mig	REVI	Vireo olivaceus
55568	Point	<Null>	SNTU	sh	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/13/2018	<Null>	SNTU	Chelydra serpentina se
55569	Point	<Null>	COYO	sh	PR	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/13/2018	scat	COYO	Canis latrans
55570	Point	<Null>	BGGN	fy	CO	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	BGGN	Polioptila caerulea
55571	Point	<Null>	WODU	fy	CO	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	WODU	Aix sponsa
55572	Point	<Null>	GRFR	sm	PR	1	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	<Null>	GRFR	Lithobates clamitans
55573	Point	<Null>	WODU	fy	CO	<Null>	<Null>	<Null>	TRCA Inve	0	Dell Tune	6/28/2018	4 y	WODU	Aix sponsa

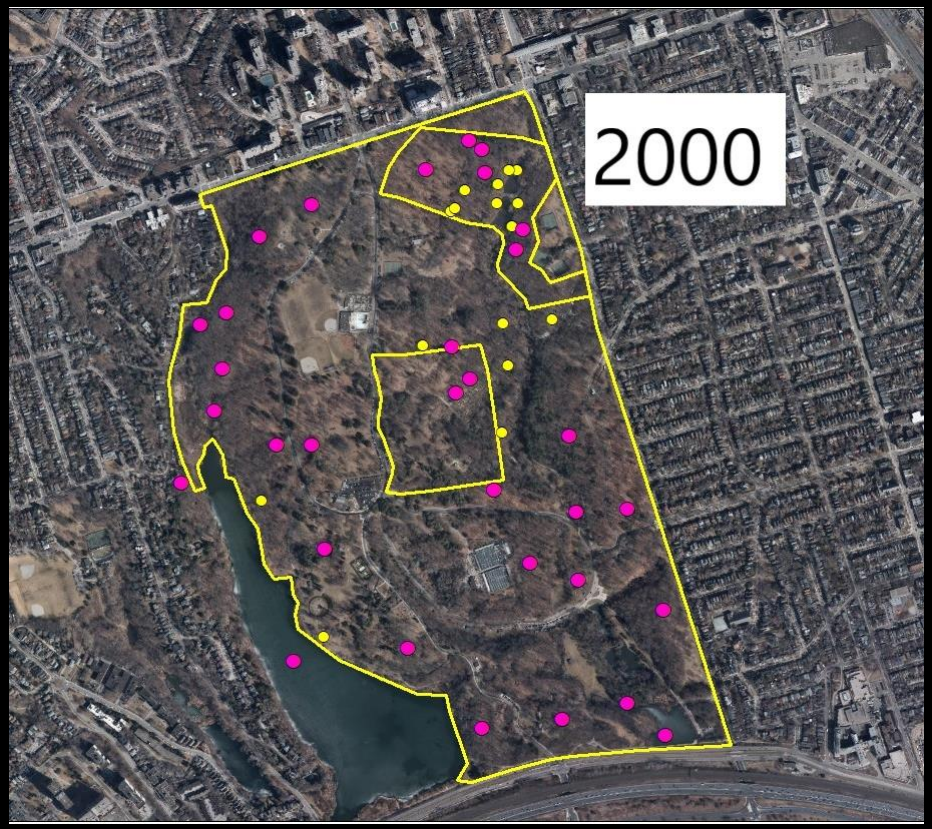
1 (239 out of 60185 Selected)

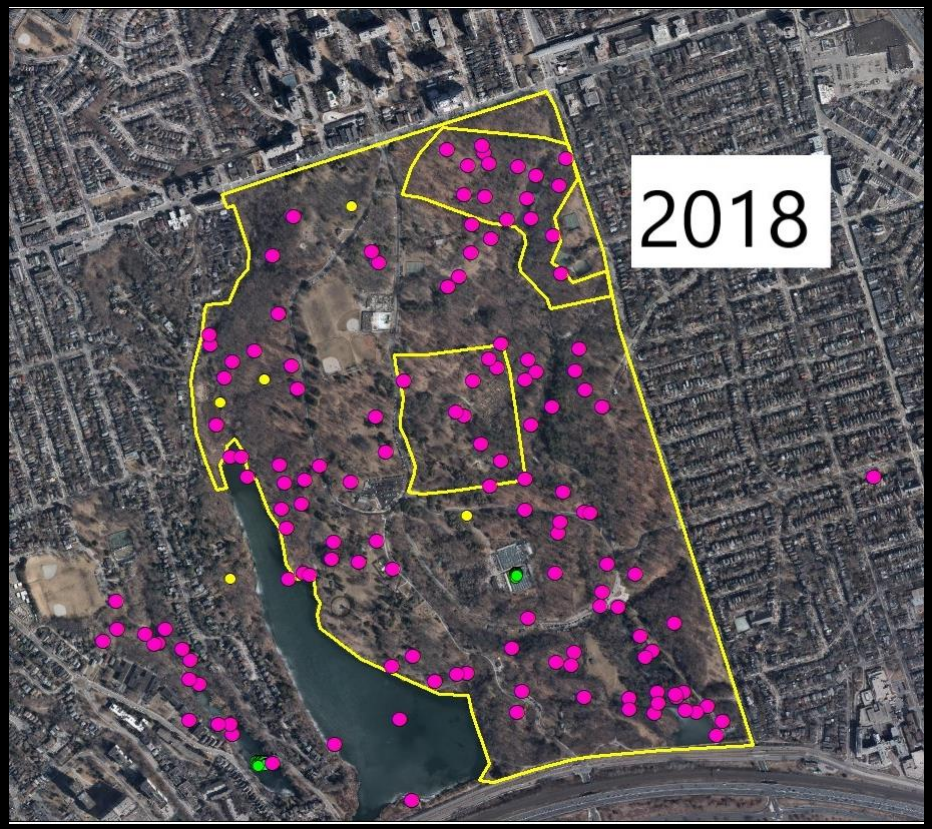
Create Features

be here to search

7:33 AM
11/25/2020

Comparison of site list over time:





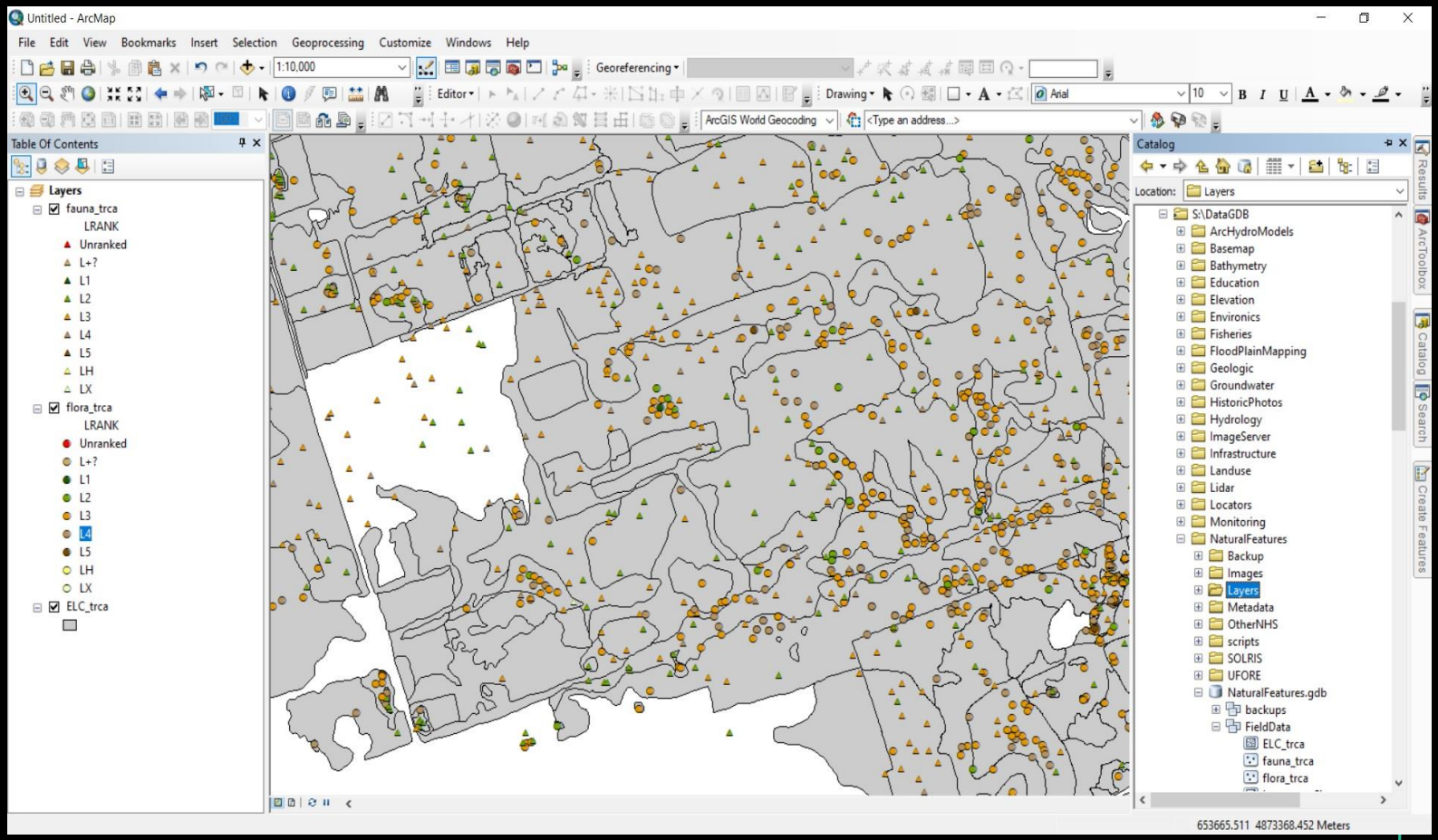
FIELDOBS and BREEDSTATUS

- the names of these attributes are somewhat self-explanatory but users will need the codes
- FIELDOBS generally informs BREEDSTATUS
- an indication of certainty: Possible, Probable and Confirmed
- only 5.7% of **records** are listed as “Confirmed”
- but 48% are “Probable”; this is a relatively easy standard to achieve

Breeding Level	Breeding Code	Interpretation
Possible	sh*	Species observed in its breeding season in suitable nesting habitat.
	sm*	Singing male present, or breeding calls heard, in suitable nesting habitat in breeding season.
Probable	p	Pair observed in suitable nesting habitat in nesting season.
	t	Permanent territory presumed through the registration of territorial behaviour (e.g. song, etc.) on at least two dates, a week or more apart, at the same location.
	d	Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.
	v	Visiting probable nest site.
	a	Agitated behaviour or anxiety calls of an adult.
	n	Nest-building or excavation of a nest-hole.
Confirmed	dd	Distraction display or injury feigning.
	nu	Used nest or eggshells found (occupied in the period of the survey).
	fy	Recently fledged young.
	ae	Adult leaving or entering nest site in circumstances indicating occupied nest; the parent bird is seen to enter and remain at nest (as opposed to the code “v”).
	fs	Adult carrying fecal sac.
	cf	Adult carrying food for young (includes observation of young being fed)
	ne	Nest containing eggs.
	ny	Nest with young seen or heard.

Accessing Data

- ArcMap: S:\DataGDB\NaturalFeatures\NaturalFeatures.gdb

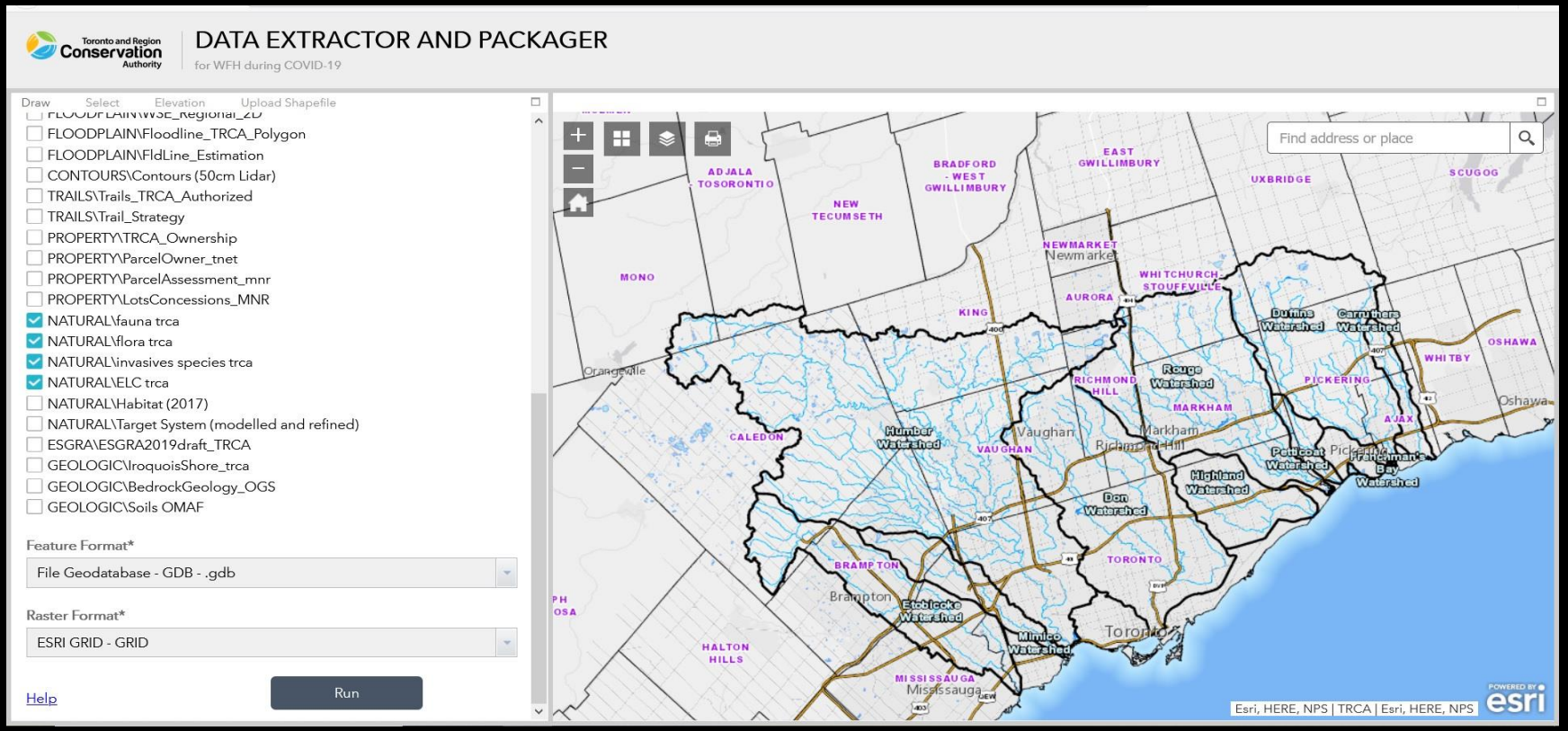


Accessing Data

- [TRCA Viewers]

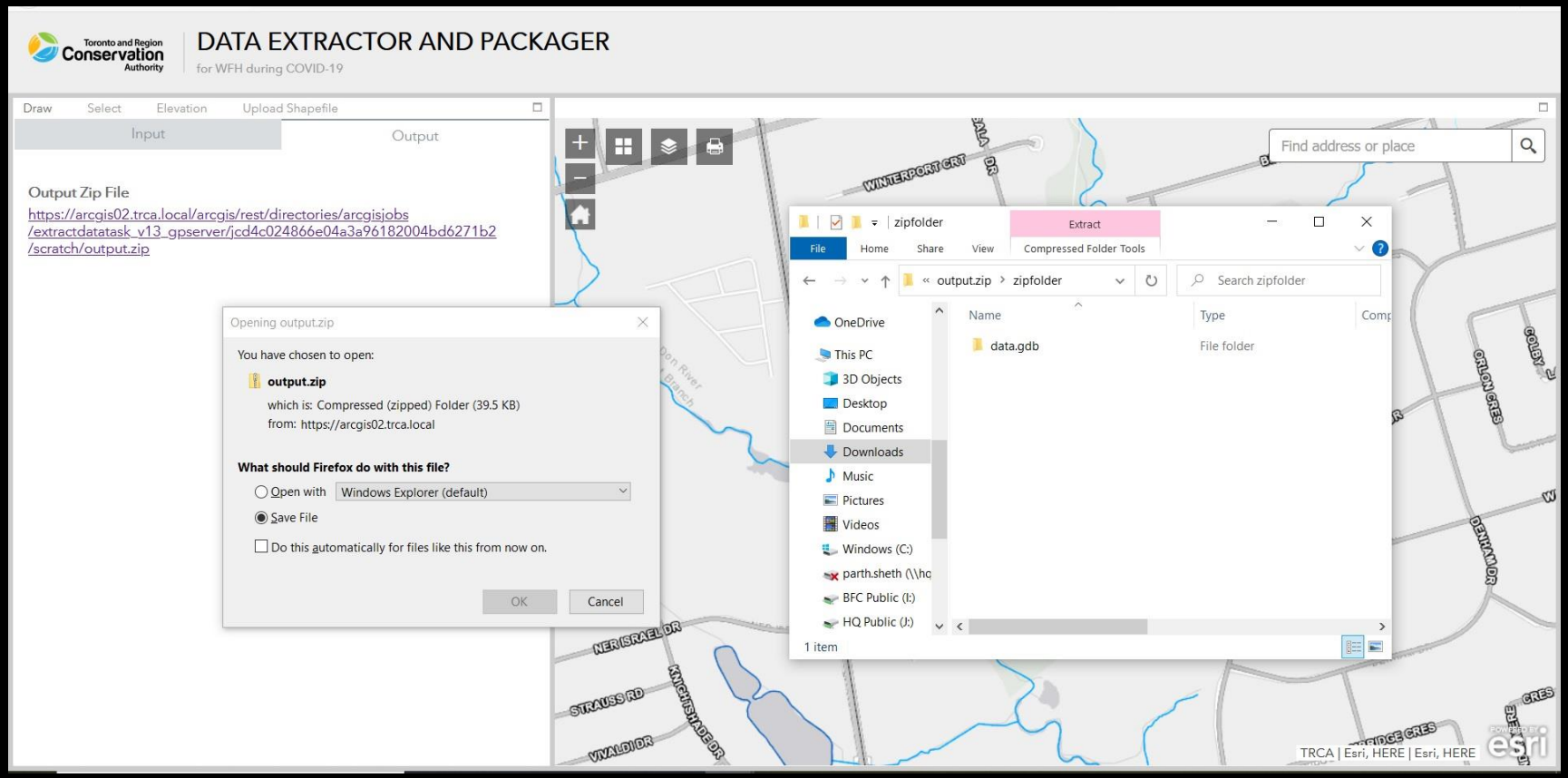
Accessing Data

- Data Extractor Tool
- Internal Use Only



Accessing Data

- Data Extractor Output




Thank you to everyone!

More ECS Lunch and Learns in 2021!

Thursday, January 14
11:30am-12:30pm

Toronto Waterfront Fish Habitat Restoration

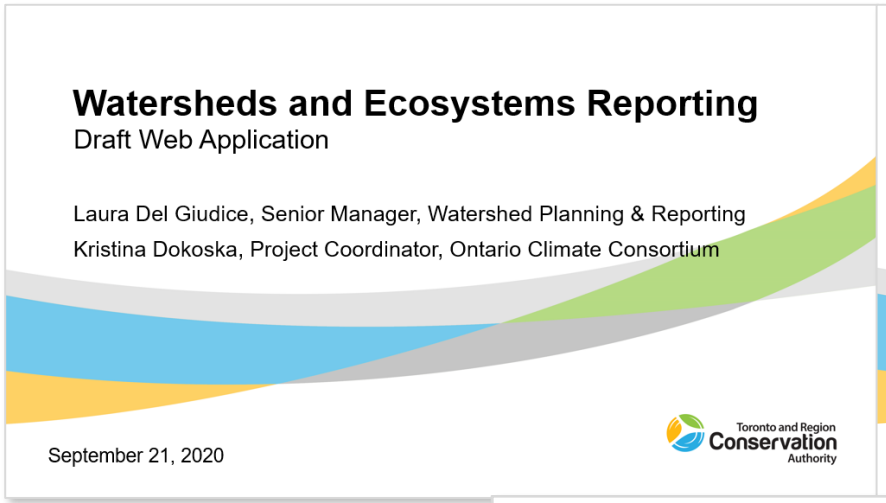
By Rick Portiss and Lyndsay Cartwright

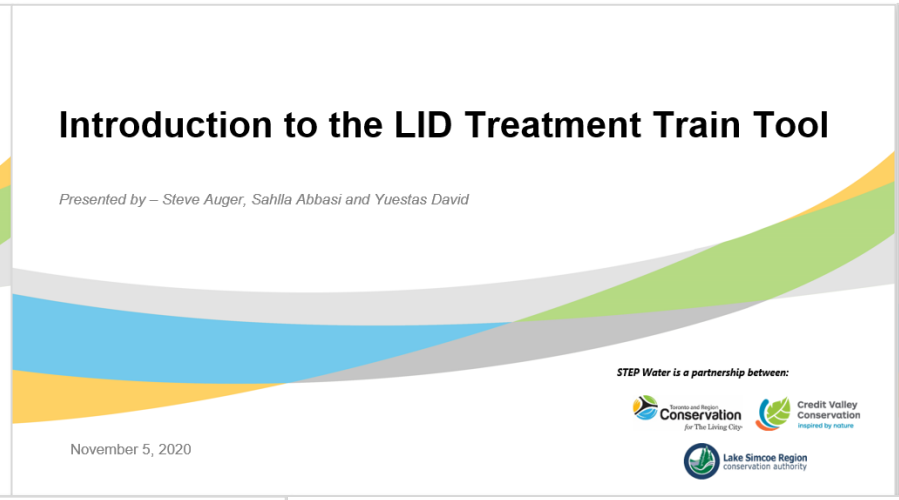
Wednesday, January 27
11:30am-12:30pm

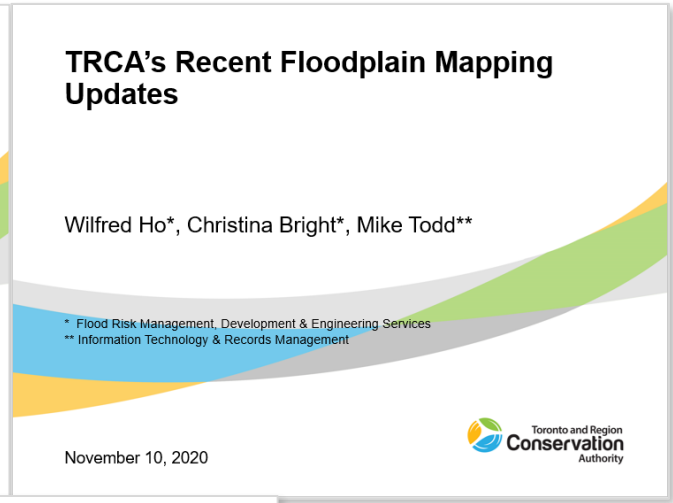
Erosion Risk Management

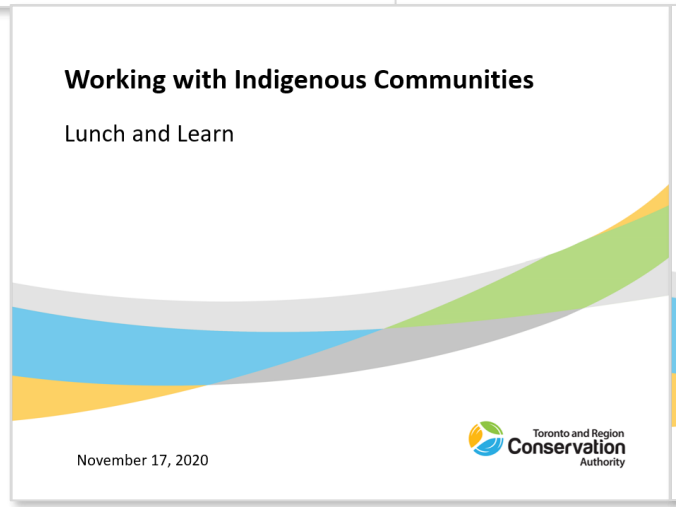
By Matt Johnston and David Gingerich

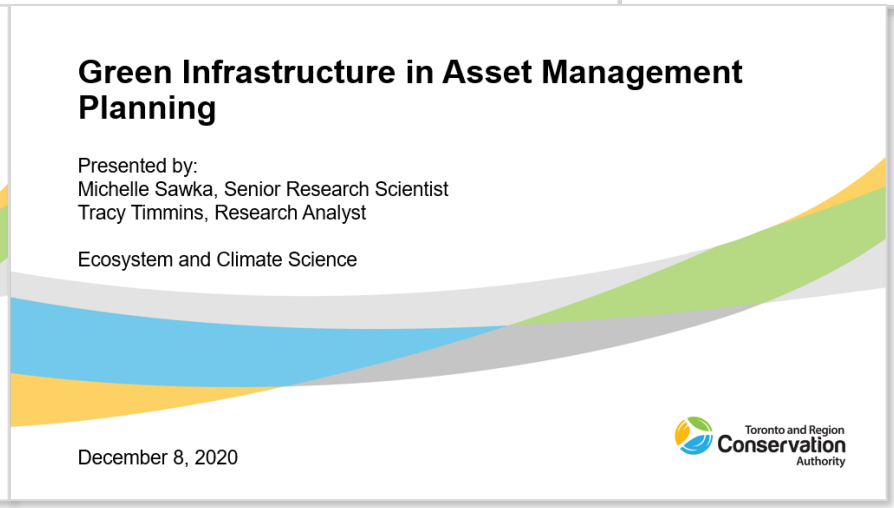
Past Recordings











Thank you

For questions about the ECS Lunch and Learn Series, please contact:

Sharon Lam
sharon.lam@trca.ca

Toronto and Region Conservation Authority