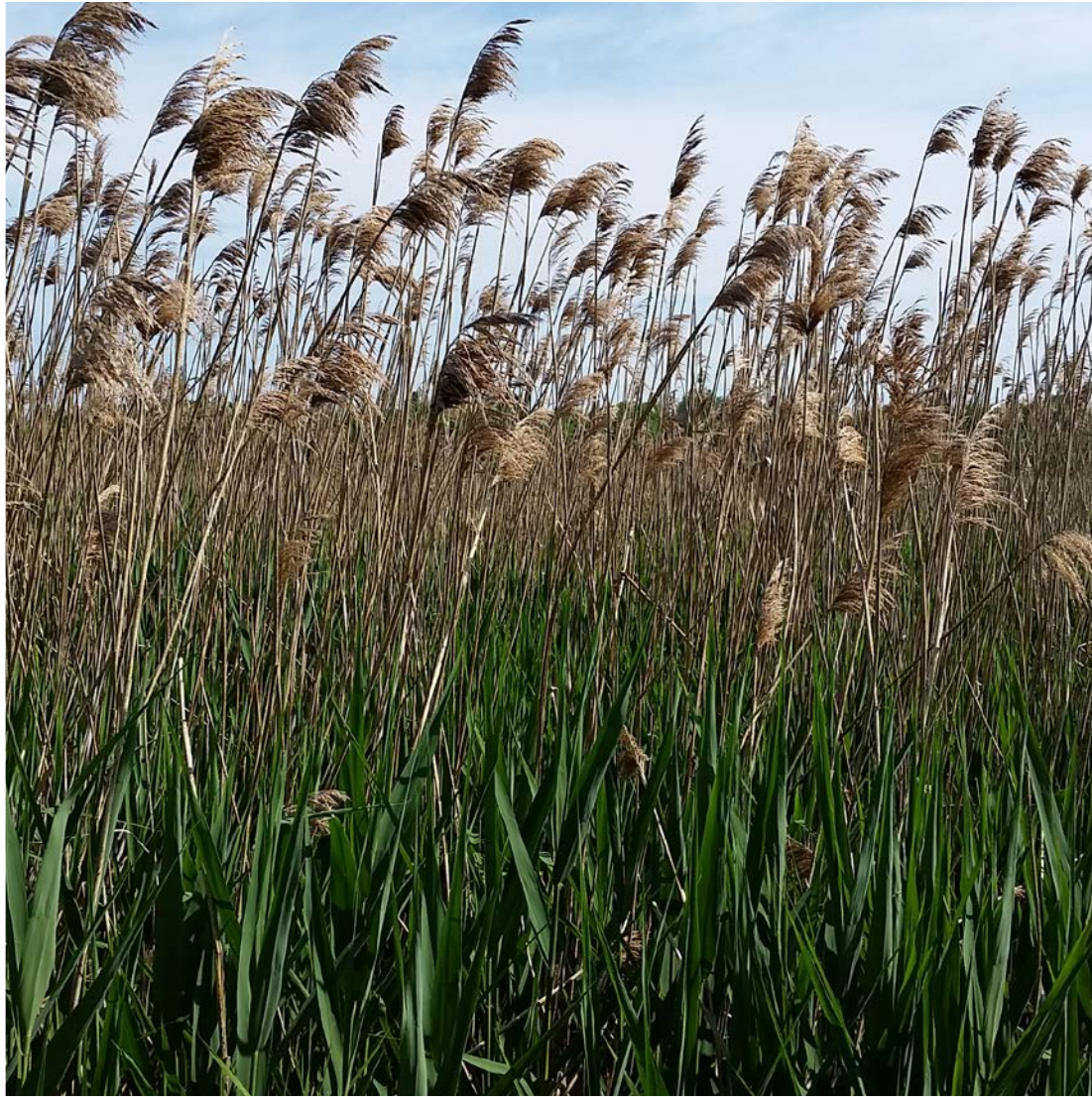


rare Charitable Research Reserve



Managing Invasive *Phragmites* at *rare* Charitable Research Reserve

November 5th 2019

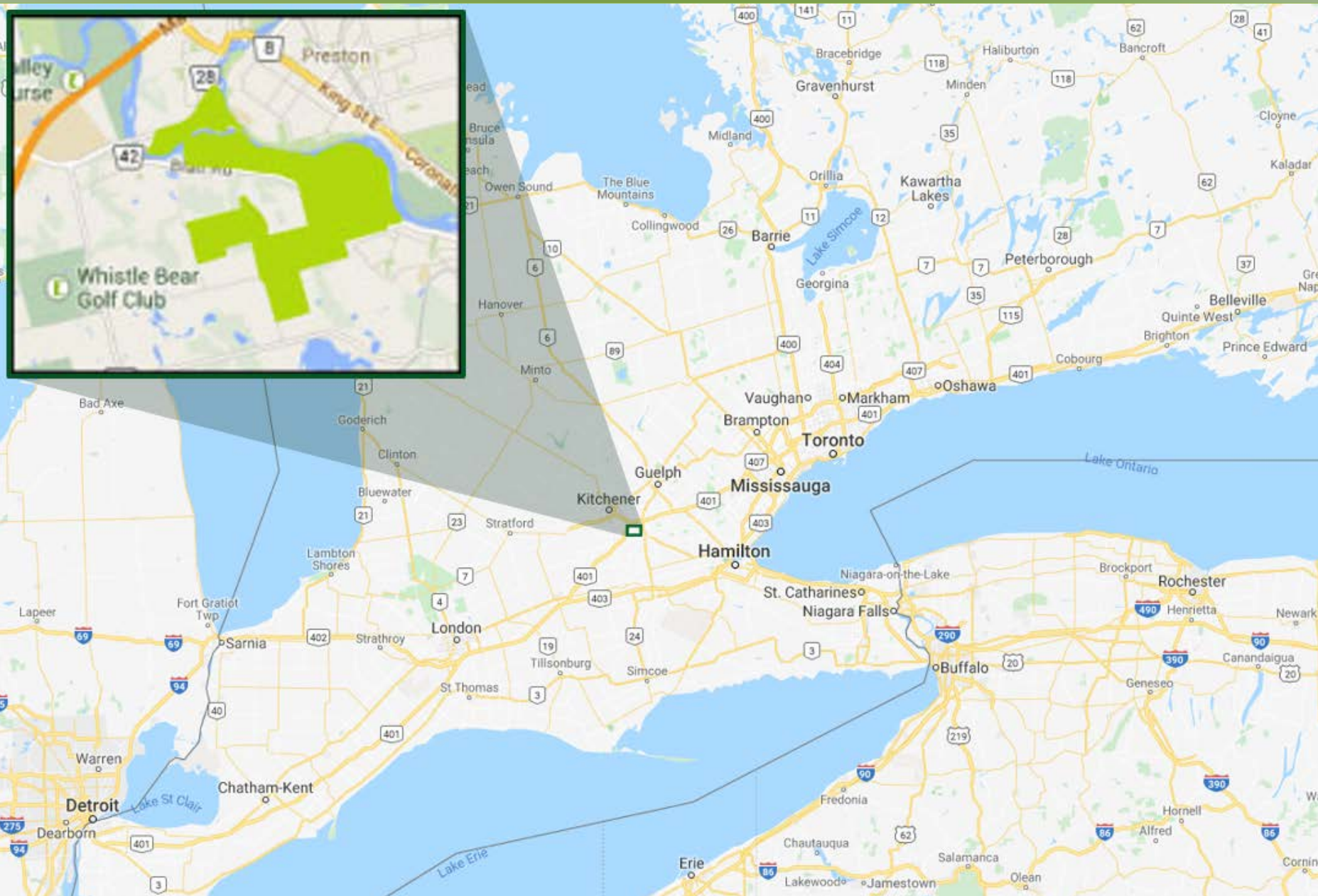
Sarah Marshall
Conservation Technician





Who we are & where we are

ra re



Who we are & where we are





Invasive Plant Management at *rare*



The Region of Waterloo Community Environmental Fund (ROWCEF) Grant

- Established in 2011
- Financial support to community environmental stewardship projects
- “Protect, promote, and enhance our natural environment”
- Stewardship stream → Research related to environmental stewardship





Experimental Design



VS.






Phase 1: *Phragmites* Mapping/Data Collection



Phragmites Patch Designation 2019

Legend

-  Creeks/PSWs
-  Property Boundary
-  Common Reed

Blair Flats population:
"BFPHRAG 1, 2, 3, etc."

East of Cruickston Creek population:
"ECPHRAG 1, 2, 3, etc."

Springbank Farm population:
"SBPHRAG 1, 2, 3, etc."



Phase 1: *Phragmites* Mapping/Data Collection



| Patch ID# | Area (m ²) | Distance from Stream/PSW (m) | 2019 Treatment |
|---|------------------------|------------------------------|-----------------|
| 2019_BFPHRAG1 | 2,654 | 144 | |
| 2019_BFPHRAG2 | 456 | 129 | |
| 2019_BFPHRAG3 | 5,011 | 131 | |
| 2019_BFPHRAG4 | 1,930 | 50 | Infrared |
| 2019_BFPHRAG5 | 379 | 0 | |
| 2019_BFPHRAG6 | 526 | 0 | Spading |
| 2019_BFPHRAG7 | 644 | 0 | |
| 2019_BFPHRAG8 | 54 | 0 | |
| 2019_BFPHRAG9 | 387 | 0 | Spading |
| TOTAL <i>PHRAGMITES</i> MAPPED IN BLAIR FLATS = 12,041 m² | | | |

| Patch ID# | Area (m ²) | Distance from Stream/PSW (m) | 2019 Treatment |
|--|------------------------|------------------------------|----------------|
| 2019_ECPHRAG1 | 95 | 22 | |
| 2019_ECPHRAG2 | 24 | 86 | |
| 2019_ECPHRAG3 | 406 | 62 | |
| 2019_ECPHRAG4 | 74 | 38 | |
| TOTAL <i>PHRAGMITES</i> MAPPED EAST OF CRUICKSTON CREEK = 599 m² | | | |

| Patch ID# | Area (m ²) | Distance from Stream/PSW (m) | 2019 Treatment |
|--|------------------------|------------------------------|------------------|
| 2019_SBPHRAG1 | 128 | 319 | |
| 2019_SBPHRAG2 | 577 | 306 | Grazing |
| 2019_SBPHRAG3 | 600 | 235 | Herbicide |
| 2019_SBPHRAG4 | 136 | 205 | Herbicide |
| 2019_SBPHRAG5 | 318 | 0 | Spading |
| 2019_SBPHRAG6 | 860 | 0 | |
| 2019_SBPHRAG7 | 3,918 | 7 | Control |
| TOTAL <i>PHRAGMITES</i> MAPPED AT SPRINGBANK FARM = 6,537 m² | | | |

- Experimental plots (bolded) were chosen based on:
 - High priority removal sites
 - Ease of access for equipment/goats
 - Distance from Provincially Significant Wetlands (in the case of herbicide)
- Total of **19,177m²** of *Phragmites* mapped on the property!!

Phase 2: Plot Creation and Metric Measuring



Within each of the five chosen patches, created three plots of 3m x 3m. Information collected included:

- UTM coordinates
- Habitat type
- Qualitative “Abundance” (scattered vs. dense)
- Growth Stage
- Stand Density (stem/m²)
- Vegetation growing within the plot
- Vegetation surrounding the plot
- Wildlife observations during survey
- Photographs

Phase 3: Treatment (Spading)

Spading Method to Remove Invasive Phragmites



For more spading information please contact:
Professor Lynn Short, Humber College, lynn.short@humber.ca



Phase 3: Treatment (Spading)



**Thanks
Leon's!!!**





Phase 3: Treatment (Grazing)





Phase 3: Treatment (Grazing)



Phase 3: Treatment (Mow & Infrared)



300,000 BTU!!





Phase 3: Treatment (Herbicide & Mow)





Phase 4 (ongoing): Site Monitoring & Reporting



***Phragmites* stems re-growing
8 weeks after spading**



Phase 4 (ongoing): Site Monitoring & Reporting



**Diverse vegetation and
Phragmites growing 10
weeks after grazing**



Phase 4 (ongoing): Site Monitoring & Reporting



**Still bare soil 5 weeks after
infrared treatment (2019)**



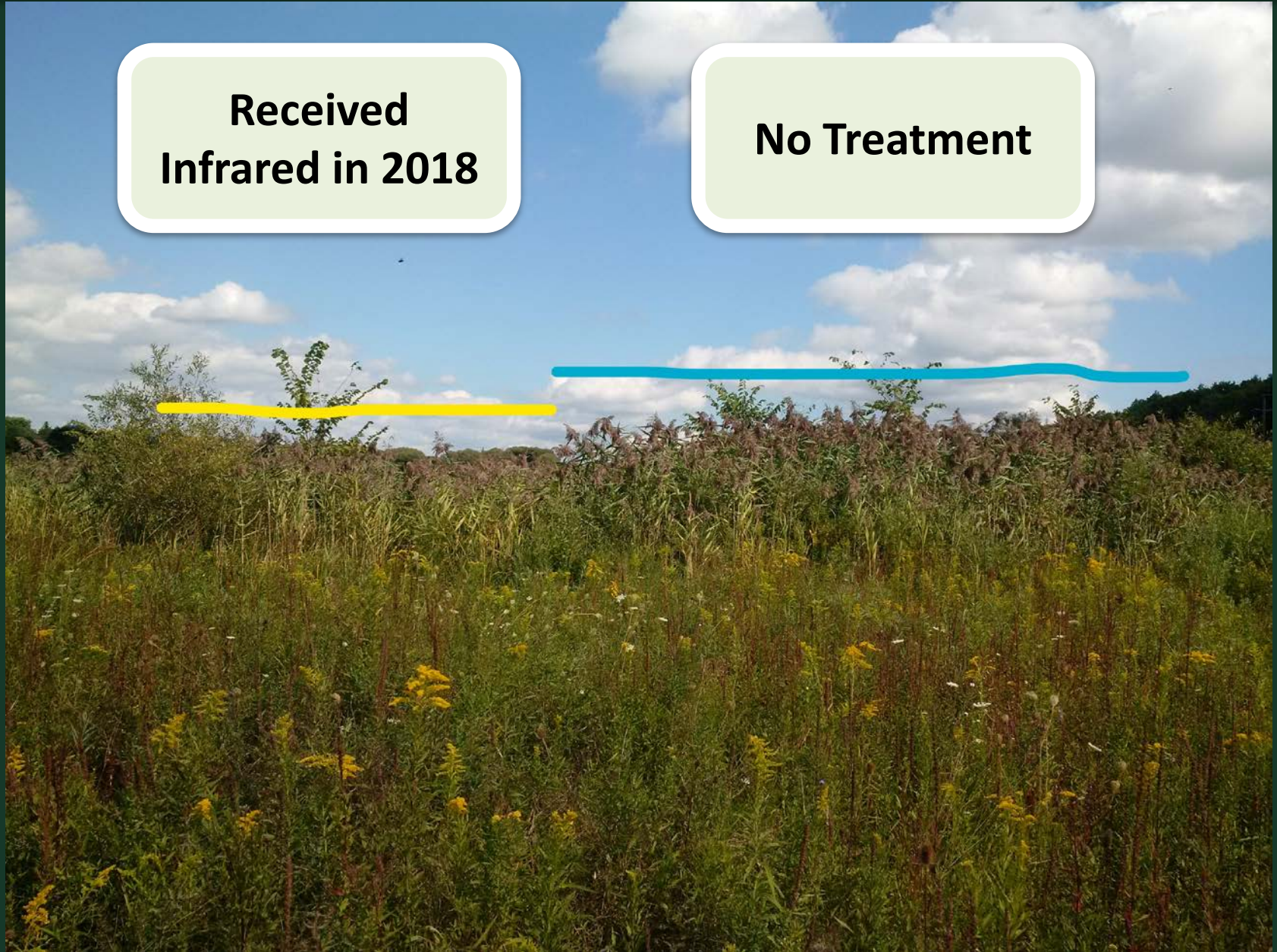


Phase 4 (ongoing): Site Monitoring & Reporting



**Received
Infrared in 2018**

No Treatment





Phase 4 (ongoing): Site Monitoring & Reporting

**Only dead stems 5 weeks after
spraying (3 weeks after mow)**



Phase 4 (ongoing): Site Monitoring & Reporting



What we know so far... SUMMARY

| | Spading | Grazing | Infrared | Herbicide |
|-----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Ease of Acquisition | ✓ | | | |
| Site Accessibility | ✓ | | | ✓ |
| Aquatic Accessibility | ✓ | | | |
| Affordability | ✓ | ✓* | | ✓ |
| Organic | ✓ | ✓ | ✓ | |
| Damage to Rhizomes | ✓ | | ✓** | ✓ |
| Dead Stems Consumed | | ✓ | | |
| Approx. Labour Requirement | 1.63 person-hours/m ² | 0.41 person-hours/m ² | 0.43 person-hours/m ² | 0.22 person-hours/m ² |
| Non-target vegetation destruction | Medium | High | Very High | Medium |
| Soil Disturbance | Medium | Low | Very High | Low |
| Regrowth of native plants | Medium | High | Some*** | None yet |

*Grazing is affordable once the fencing structure has been purchased

**Theoretically

***Based on results from 2018 treatment

What's Next? Moving into 2020...

- Evaluate *Phragmites* stem density to determine overall success next season
- Evaluate changing diversity of non-target species in plots over multiple years post-treatment
- Repeat testing over multiple years? Depends on funding
- Updating our **Invasive Species Management Plan** for 2020-2025!
Much to consider!
 - New prioritization system (based largely on CVC's work)
 - Realistic goals
 - Native Species Planting
 - **Integrated Pest Management Approach** taking opportunities for research when possible





THANK YOU!



Region of Waterloo

Growing Hope
Farm



ONTARIO
INVASIVE PLANT
COUNCIL

