



Saving Ontario's Savannas:

Working Towards A Multi-
Partner Species and Habitat
Recovery Strategy

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Goals

- Create SMART Recovery Strategies and Action Plans;
- Understand the complex geography of the prairie archipelago;
- Understand and support LEK;
- Conserve cultural and natural history;
- Provide recommendations and data for vegetation management plans with 50 – 100 yr horizons.

Open *P. sylvestris* savanna



Methods

Archives, Literature, Existing Databases



Digital Data



Local Involvement



Field Work



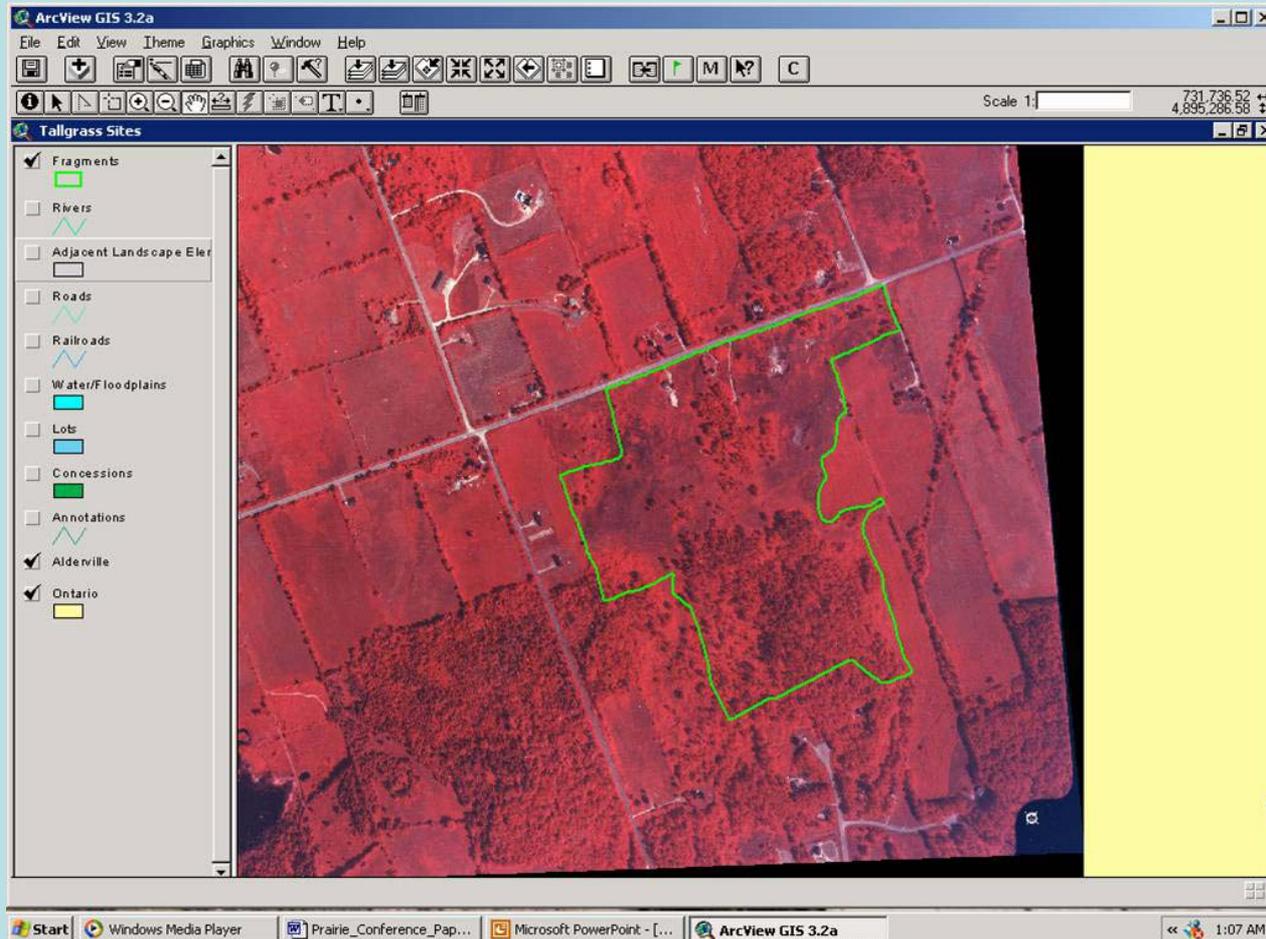
GPS



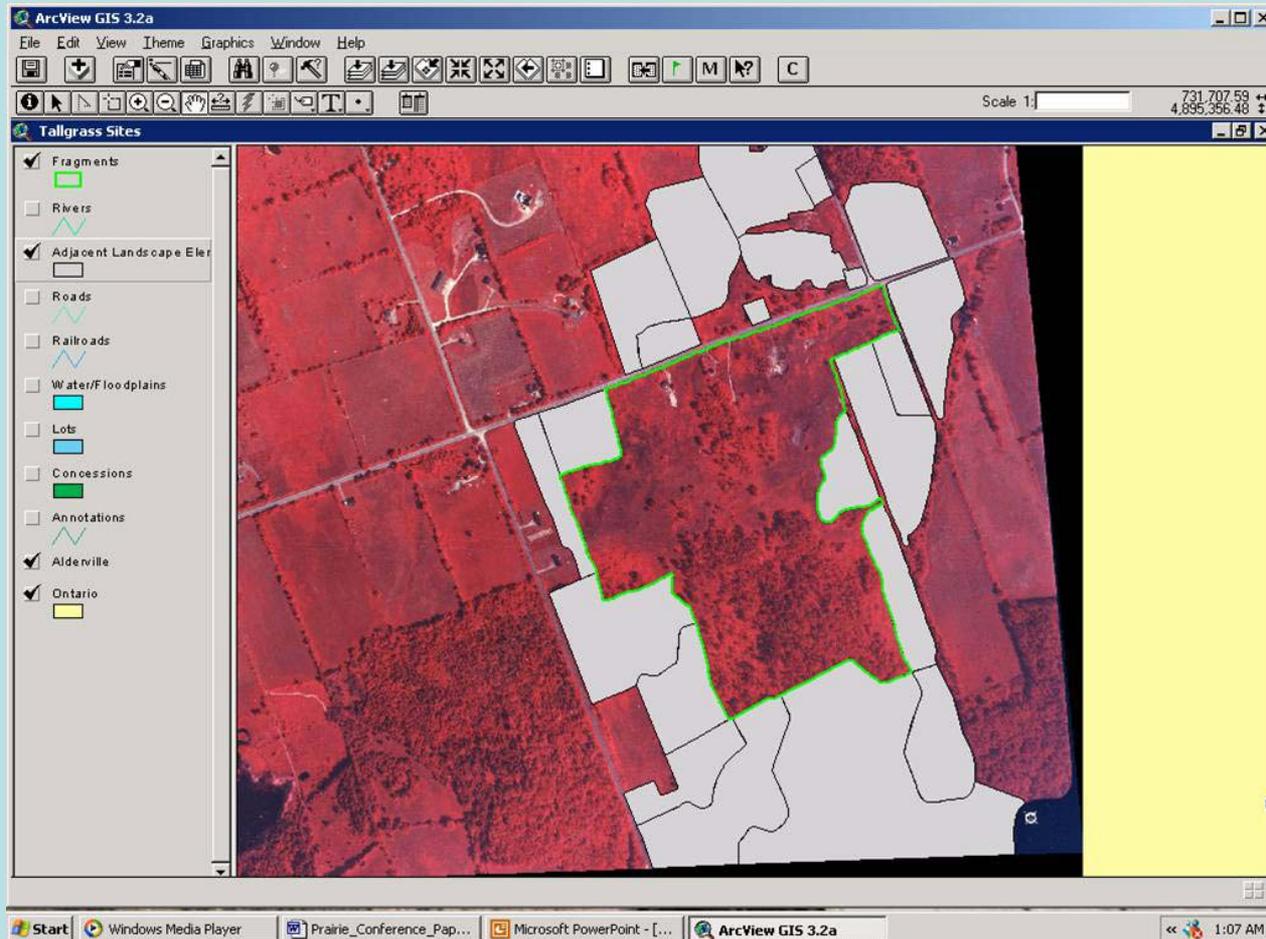
Criteria

- Structurally a prairie, savannah, or woodland according to the Ontario Ecological Land Classification or Curtis (1959);
- Has at least 6 prairie species according to Tallgrass Ontario or Minnesota lists (in addition to trees), or is predominantly prairie grass;
- Is big enough to GPS at 3m accuracy.

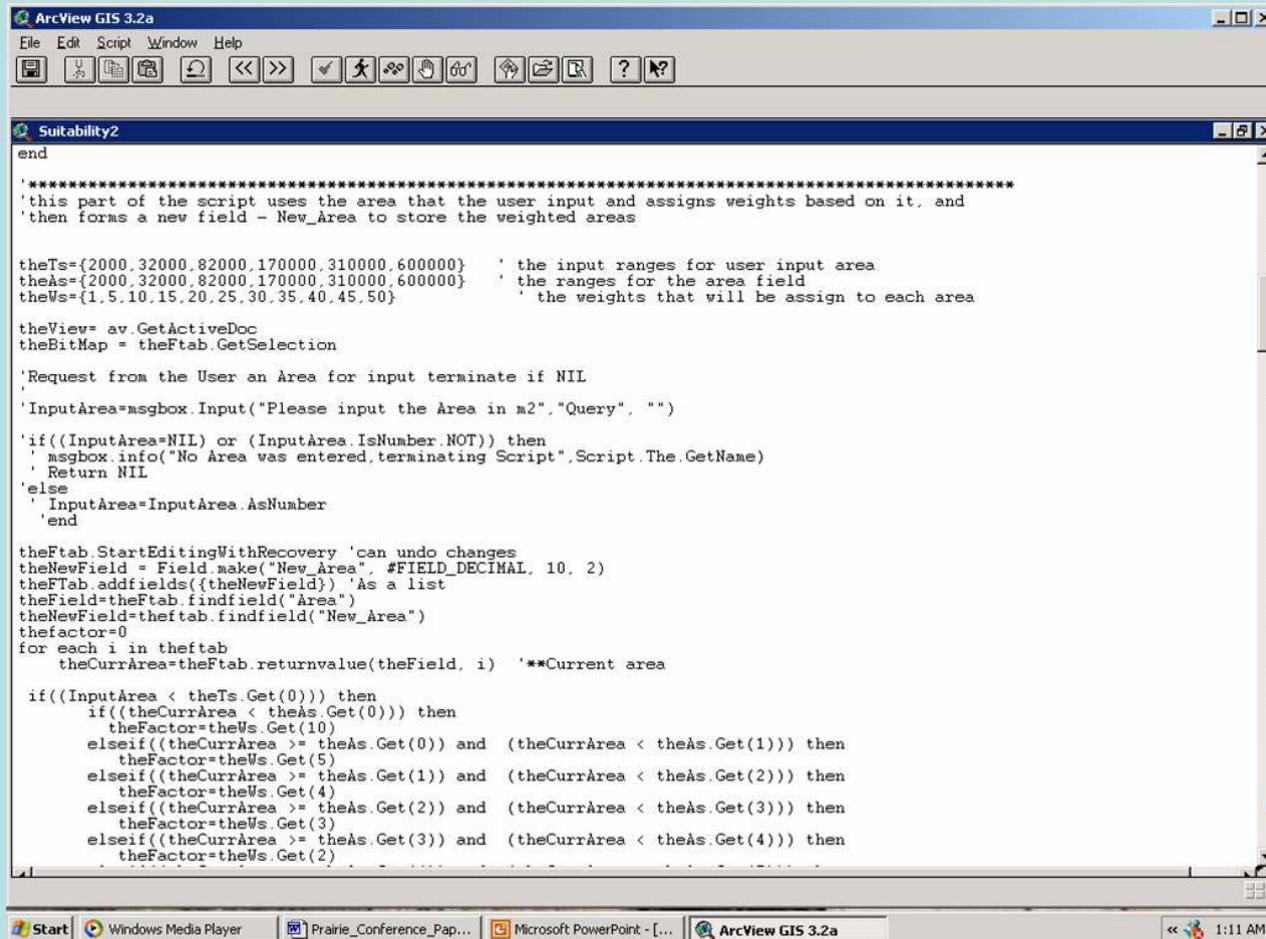
Polygon located on GIS



Adjacent fragments located on GIS



GIS modeling to determine priority polygons



```
ArcView GIS 3.2a
File Edit Script Window Help
[Icons]

Suitability2
end

'*****
'this part of the script uses the area that the user input and assigns weights based on it, and
'then forms a new field - New_Area to store the weighted areas

theTs={2000,32000,82000,170000,310000,600000} ' the input ranges for user input area
theAs={2000,32000,82000,170000,310000,600000} ' the ranges for the area field
theWs={1.5,10,15,20,25,30,35,40,45,50} ' the weights that will be assign to each area

theView= av.GetActiveDoc
theBitMap = theFtab.GetSelection

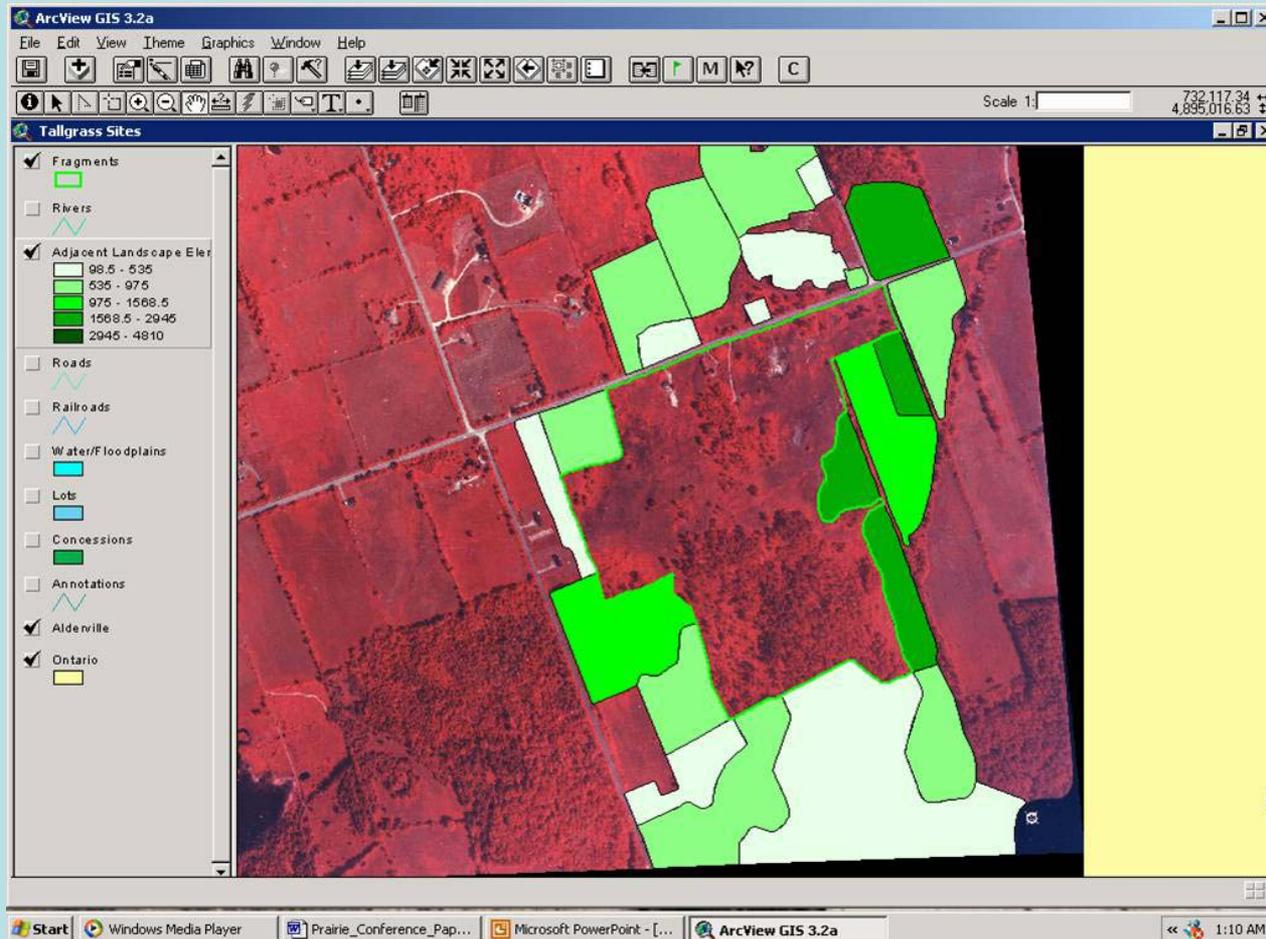
'Request from the User an Area for input terminate if NIL
'InputArea=msgbox.Input("Please input the Area in m2","Query", "")

'if((InputArea=NIL) or (InputArea.IsNumber.NOT)) then
' msgbox.info("No Area was entered,terminating Script",Script.The.GetName)
' Return NIL
'else
' InputArea=InputArea.AsNumber
'end

theFtab.StartEditingWithRecovery 'can undo changes
theNewField = Field.make("New_Area", #FIELD_DECIMAL, 10, 2)
theFtab.addfields({theNewField}) 'As a list
theField=theFtab.findfield("Area")
theNewField=theftab.findfield("New_Area")
thefactor=0
for each i in theftab
theCurrArea=theFtab.returnvalue(theField, i) '**Current area

if((InputArea < theTs.Get(0))) then
if((theCurrArea < theAs.Get(0))) then
thefactor=theWs.Get(10)
elseif((theCurrArea >= theAs.Get(0)) and (theCurrArea < theAs.Get(1))) then
thefactor=theWs.Get(5)
elseif((theCurrArea >= theAs.Get(1)) and (theCurrArea < theAs.Get(2))) then
thefactor=theWs.Get(4)
elseif((theCurrArea >= theAs.Get(2)) and (theCurrArea < theAs.Get(3))) then
thefactor=theWs.Get(3)
elseif((theCurrArea >= theAs.Get(3)) and (theCurrArea < theAs.Get(4))) then
thefactor=theWs.Get(2)
```

Priority polygons on GIS – higher importance = darker color



Results

- Portable GIS with data, digital imagery, and modeling capabilities;
- Over 60% of the original (+/-) 150 sites either no longer exist or no longer meet the structural definition;
- The largest sites are under public control;
- Folks want tallgrass habitat;
- We need more information and people are excited to provide it;
- Management options;
- Data.

Latin	Common	Moisture code	Virgin Prairies	Quetico 1	Quetico 2	Stanely TWP	Rainy Lk
<i>Agropyron smithii</i>	Western wheat grass	Dry			1		
<i>Allium stellatum</i>	Prairie onion	Dry	1				1
<i>Andropogon gerardi</i>	Big bluestem	Dry		1	1		
<i>Anemone canadensis</i>	Canada mayflower	Mesic		1	1		
<i>Antennaria neglecta</i>	Pussy toes	Mesic		1			
<i>Apocynum androsaemifolium</i>	Spreading dog bane	Mesic			1		
<i>Aquilegia canadensis</i>	Wild columbine	Mesic		1			
<i>Artemisia ludoviciana</i>	Prairie sage	Dry				1	
<i>Aster simplex</i>	Panicked aster	Wet		1			
<i>Aster umbellatus</i>	Flat-topped aster	Wet		1			
<i>Bromus kalmii</i>	Kalm's brome	Mesic	1				1
<i>Calamagrostis canadensis</i>	Blue joint grass	Wet		1	1		
<i>Caltha palustris</i>	Marsh marigold	Wet		1			
<i>Campanula rotundifolia</i>	Harebell	Mesic		1			
<i>Carex pensylvanica</i>	Pennsylvania sedge	Dry		1			
<i>Cicuta maculata</i>	Water hemlock	Wet		1			
<i>Cirsium discolor</i>	Pasture thistle	Mesic		1	1		1
<i>Elymus canadensis</i>	Canada wildrye	Mesic			1		1
<i>Epilobium angustifolium</i>	Fire weed	Mesic		1			
<i>Equisetum arvense</i>	Common horsetail	Wet		1	1		
<i>Eupatorium maculatum</i>	Joe-pye weed	Wet		1			
<i>Eupatorium perfoliatum</i>	Boneset	Wet		1			
<i>Fragaria virginiana</i>	Wild strawberry	Mesic		1	1		1

Tallgrass plant data collected in NW Ontario

- Virgin prairie = indicator species
- Quetico 1 = historical record
- Quetico 2 = SOS 4 sighting
- Stanely TWP = NHIC record circa Thunder Bay
- Rainy LK = NHIC record circa Rainy Lake

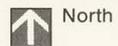
Latin	Common	Moisture code	Virgin Prairies	Quetico 1	Quetico 2	Stanely TWP	Rainy Lk
<i>Galium boreale</i>	Northern bedstraw	Mesic		1			
<i>Glycyrrhiza lepidota</i>	Wild licorice	Mesic	1				1
<i>Habenaria psycodes</i>	Purple fringed orchid	Mesic	1	1			
<i>Helenium autumnale</i>	Sneezeweed	Wet			1		
<i>Helianthus maximiliani</i>	Maximilian sunflower	Mesic		1			
<i>Heuchera richardsonii</i>	Alumroot	Dry	1	1		1	
<i>Hierchloe odorata</i>	Sweet grass	Wet		1			
<i>Iris versicolor</i>	Blue flag iris	Wet		1	1		
<i>Juncus tenuis</i>	Path rush	Dry		1			
<i>Koeleria macrantha</i>	Junegrass	Dry					1
<i>Lathyrus venosus</i>	Showy vetchling	Wet				1	
<i>Lilium philadelphicum</i>	Wood lily	Mesic	1	1			
<i>Lithospermum canescens</i>	Hoary puccoon	Dry	1	1		1	
<i>Lobelia spicata</i>	Pale spiked lobelia	Mesic					1
<i>Muhlenbergia richardonis</i>	Mat muhlygrass	Wet					1
<i>Muhlenbergia sp</i>	Muhly grass	Dry		1			
<i>Opuntia fragilis</i>	Brittle prickly pear	Dry	1				1
<i>Opuntia humifusa</i>	Prickly pear	Dry	1	1			
<i>Panicum leibergii</i>	Prairie panic grass	Mesic	1				1
<i>Panicum perlongum</i>	Long stalked panic	Dry		1			
<i>Panicum virgatum</i>	Switch grass	Mesic					1
<i>Penstemon gracilis</i>	Slender penstemon	Dry	1				1
<i>Physostegia virginiana</i>	False dragonhead	Mesic		1			

Latin	Common	Moisture code	Virgin Prairies	Quetico 1	Quetico 2	Stanely TWP	Rainy Lk
<i>Polygala senega</i>	Seneca snakeroot	Dry	1			1	
<i>Potentilla arguta</i>	Prairie cinquefoil	Dry		1			
<i>Ranunculus pensylvanicus</i>	Bristly buttercup	Wet		1			
<i>Rosa sp</i>	Prairie rose	Mesic		1	1		
<i>Rudbeckia hirta</i>	Black-eyed susan	Mesic		1	1		
<i>Schizachyrium scoparium</i>	Little bluestem	Mesic					1
<i>Scirpus validus</i>	Great bulrush	Wet		1			
<i>Solidago graminifolia</i>	Grass-leaved golden rod	Mesic		1			
<i>Solidago missouriensis</i>	Missouri goldenrod	Mesic	1	1			
<i>Solidago nemoralis</i>	Gray goldenrod	Dry		1	1		
<i>Spartina pectinata</i>	Prairie cord grass	Mesic		1	1		
<i>Spirea alba</i>	Meadow sweet	Wet		1			
<i>Thalictrum dasycarpum</i>	Tall meadow rue	Mesic	1	1		1	
<i>Vicia americana</i>	American vetch	Dry		1	1		
<i>Zizia aptera</i>	Heart leaved golden alexander	Mesic					1
Totals			14	42	16	6	15

Additional (Western) Prairie Species (from NHIC)

Stanely TWP	9 species
<i>Ambrosia psilostachya</i>	Western ragweed
<i>Artemisia frigida</i>	Pasture sage
<i>Cirsium dummondii</i>	Drummond's Thistle
<i>Cirsium flodmannii</i>	Flodmann's Thistle
<i>Erigeron glabellus</i>	Smooth Fleabane
<i>Festuca halii</i>	Hall's fescue
<i>Helianthus rigida</i>	Rigid sunflower
<i>Leucophysalis grandifolia</i>	Large White-flowered Ground cherry
<i>Stipa comata</i>	Needle grass

Rainy LK / L 'o' W	19 species
<i>Asclepias ovalifolia</i>	Oval Milkweed
<i>Campanula rotundifolia</i>	Harebell
<i>Carex bicknellii</i>	Bicknell's Sedge
<i>Carex haydenii</i>	Long-scaled Tussock Sedge
<i>Carex laeviconica</i>	Long-toothed Lake Sedge
<i>Carex praticola</i>	Large-fruited Oval Sedge
<i>Cirsium flodmannii</i>	Flodmann's Thistle
<i>Cyperus schweinitzii</i>	Rough Sand Sedge
<i>Danthonia spicata</i>	Poverty grass
<i>Hudsonia tomentosa</i>	Sand Heather
<i>Juncus interior</i>	Inland Rush
<i>Lobelia spicata</i>	Pale-spike Lobelia
<i>Muhlenbergia richardsonis</i>	Richardson's Muhly
<i>Panicum leibergii</i>	Leiberg's Panic Grass
<i>Panicum virgatum</i>	Switchgrass
<i>Scutellaria parvula</i>	Leonard's Small Skullcap
<i>Selaginella densa</i>	Prairie spikemoss
<i>Viola adunca</i>	Sand Violet
<i>Woodsia oregana</i>	Western woodsia



Management options

- Chainsaws;
- Mowing;
- Haying;
- Seeding;
- Grassland agriculture;
- Flooding;
- Complex fire.

Future Work

- Tallgrass SWAT Teams;
- Seed bank studies for management;
- Begin looking at leafhoppers, palynology, glacial geomorphology;
- DNA analysis;
- Scientifically valid Recovery Plans for TG habitats and roughly seven species done within 18 months.

Thanks for the generous support of:

- Ontario Ministry of Natural Resources
- NHIC
- Ontario Parks
- Royal Canadian Geographical Society
- Legacy Forest Project
- Lakehead University
- Trent University
- Donner Foundation
- Trillium Foundation
- Canadian Wildlife Service
- Royal Ontario Museum
- Nature Ontario
- World Wildlife Fund
- Volunteers
- Township offices
- Conservation Authorities
- Sir Sanford Fleming College
- Agriculture Canada
- Stewardship Committees
- ????
- Environment Canada
- Minnesota Extension Division
- Wisconsin DNR
- USGS
- The Nature Conservancy
- The Nature Conservancy of Canada
- Field Naturalist Societies
- Carolinian Canada
- Tim Horton's

Questions?