



Exploring Potential Bee Forage Areas

3rd Annual Beekeeper Symposium &
Nova Scotia Beekeepers' Association AGM

February 21, 2020

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NS Department of Agriculture

Bee Forage Area Pilots

Objective

Identify bee forage opportunities in underutilized areas of the province

- alleviate overcrowding
- provide economic opportunity
- Determine processes requirements for hive placement

Basic site criteria:

- Most flowers should be within 3 km radius (bees can fly farther, but less economical)
- Must be accessible
- Must be able to place, service and remove hives without blocking others access
- Suitable adjacent areas including: pasture, forage, cutovers, unmanaged areas
- Contain a diversity of successive flowering plants
- Proximity to freshwater (lakes, brooks, streams)
- Southern exposure
- Should be a reasonable distance from large human populations

Honey Bee Forage Pilot-Trans Canada ROW

Highway Pilot (2017)

- Aerial photography for potential hive locations
 - off highway access and adjacent land use
- 1 site on each of TCH 101 and TCH 103
 - Cooperating beekeepers
- Anecdotal results
- 1 beekeeper utilized ROW again in 2018, the other intends to in future years



Further to this....

- Beekeeper can access ROW for placement of hives pending approvals.
- A permit is required through submitting a “Work Within Highway Right-of-Way Permit” application.
- Partnering with NSBA and TIR, a process document has been prepared to assist in completing a permit application.
- Submit to the local Transportation and Infrastructure Renewal Area Office

Who needs this permit? If you are planning any activity / work on the roadway or within the highway right-of-way, including installing a driveway or erecting a structure within 100 metres of any highway, a permit is required prior to starting the work. Please read the “Information for Work Within Highway Right-of-Way Permit” brochure (brochure) before completing this application.

For Staff Use Only	
Permit Approved _____	(Check here)
Permit Denied _____	(Check here)
Permit #: _____	
Deposit Receipt #: _____	
Deposit Amount: _____	
Permit Valid until: _____	

1 Applicant Information (please print)

Name: _____
Mailing address: _____
Postal code: _____
Daytime phone number: _____ Email address: _____
(if applicable)

2 What type of work will you be doing by the roadside? (check all that apply)

- ☐ Access to a public highway/roadway for the purpose of: ☐ Sewer ☐ Water ☐ Cable ☐ Driveway ☐ Other _____
- ☐ Work will disturb existing road surface. If so, what type? ☐ Asphalt ☐ Concrete ☐ Gravel ☐ Other _____
- ☐ Building a structure within 60 metres of the limit of a controlled access highway
- ☐ Building a structure within 100 metres of centerline of a public highway/roadway

3 Check type of structure or access you require. If not applicable, go to number 4

- ☐ Residential ☐ Agricultural ☐ Commercial ☐ Industrial ☐ Recreational ☐ Institutional ☐ Other _____

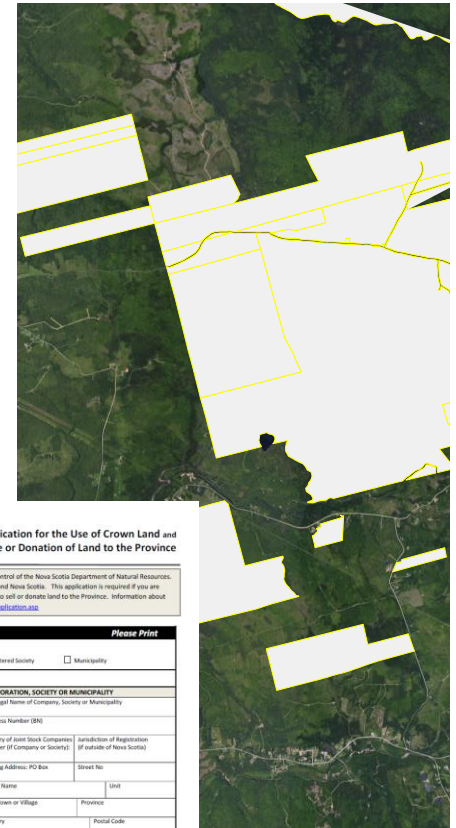
4 Give enough information so our staff can find your property (complete as much as possible)

Name of subdivision: _____ Name of lot owner: _____
Civic or lot number: _____ Property ID #: (if known) _____
Name of community: _____ in _____ County
Name of highway/roadway: _____ on the ☐ North ☐ South ☐ East ☐ West side of highway
Approximately _____ km's _____ of _____
(Distance) (NSWE) (Bridge or any defined point on Highway)
GPS Coordinates: (if known) _____ N _____ E
Distance of nearest part of structure to centerline of highway is _____ metres
Number of lots to be serviced by this access is _____
Distance from centerline of highway to sewer, well, spring, etc. is _____ metres

Bee Forage Pilot-Crown Cut Blocks

Crown Cut Block Pilot (2018, 2019.....)

- Potential cooperating beekeeper
- Site review with Beekeeper
 - Review of maps/photos-shortlist
 - Field reconnaissance-selection
 - Application for the use of Crown Land
 - Letter of Authority
- Monitoring
 - Wild bee traps
 - Floral survey
 - Hive assessment



NOVASCOTIA
Natural Resources

Application for the Use of Crown Land and
Application for Sale or Donation of Land to the Province

Crown Land is all or any part of the land under the administration and control of the Nova Scotia Department of Natural Resources, included in Crown Land is most of the submerged land (the sea bed) around Nova Scotia. This application is required if you are interested in using Crown land for non-forestry purposes or if you want to sell or donate land to the Province. Information about applying for Crown Land is available at: www.novascotia.ca/cnl/land/application.asp

PART 1 - APPLICANT INFORMATION Please Print

1. TYPE OF APPLICANT (please check only one (x))

☐ Individual(s) ☐ Registered Company ☐ Registered Society ☐ Municipality

2. PRIMARY APPLICANT

INDIVIDUAL (Complete Appendix A for additional applicants)		CORPORATION, SOCIETY OR MUNICIPALITY	
Last Name		Full Legal Name of Company, Society or Municipality	
Given Name		Business Number (BN)	
Are you over the age of 18?	Primary Contact? (If No, also complete Section 3 below)	Registry of Joint Stock Companies	Anticipation of Registration Number (If Company or Society) (If outside of Nova Scotia)
<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Mailing Address: PO Box		Mailing Address: PO Box	
Street No.		Street No.	
Street Name		Street Name	
Unit		Unit	
City, Town or Village		City, Town or Village	
Province		Province	
Country		Country	
Postal Code		Postal Code	
Primary Phone Number ()	Secondary Phone Number ()	Primary Phone Number ()	Secondary Phone Number ()
Fax (Optional) ()	Email Address	Fax (Optional) ()	Email Address

3. PRIMARY CONTACT/DESIGNATED REPRESENTATIVE (if different than Section 2 above)

Last Name

Given Name

Describe the relationship of Primary Contact/Designated Representative to Applicant

☐ Trustee ☐ Family Member (describe relationship)

☐ Director ☐ Officer of the Company (describe position)

☐ Solicitor/Legal Counsel ☐ Other (describe)

Mailing Address: PO Box

Street No.

Street Name

Unit

City, Town or Village

Province

Country

Postal Code

Primary Phone Number ()

Secondary Phone Number ()

Fax (Optional) ()

Email

Site Monitoring

Monitoring occurs from late May 30-early September

~ Every 2 weeks

Native pollinators - 2 Blue Vane Traps

- seasonal assessment of native bees and interpretation of honey bees influence

Floral abundance - 2- transects (5m x 25m)

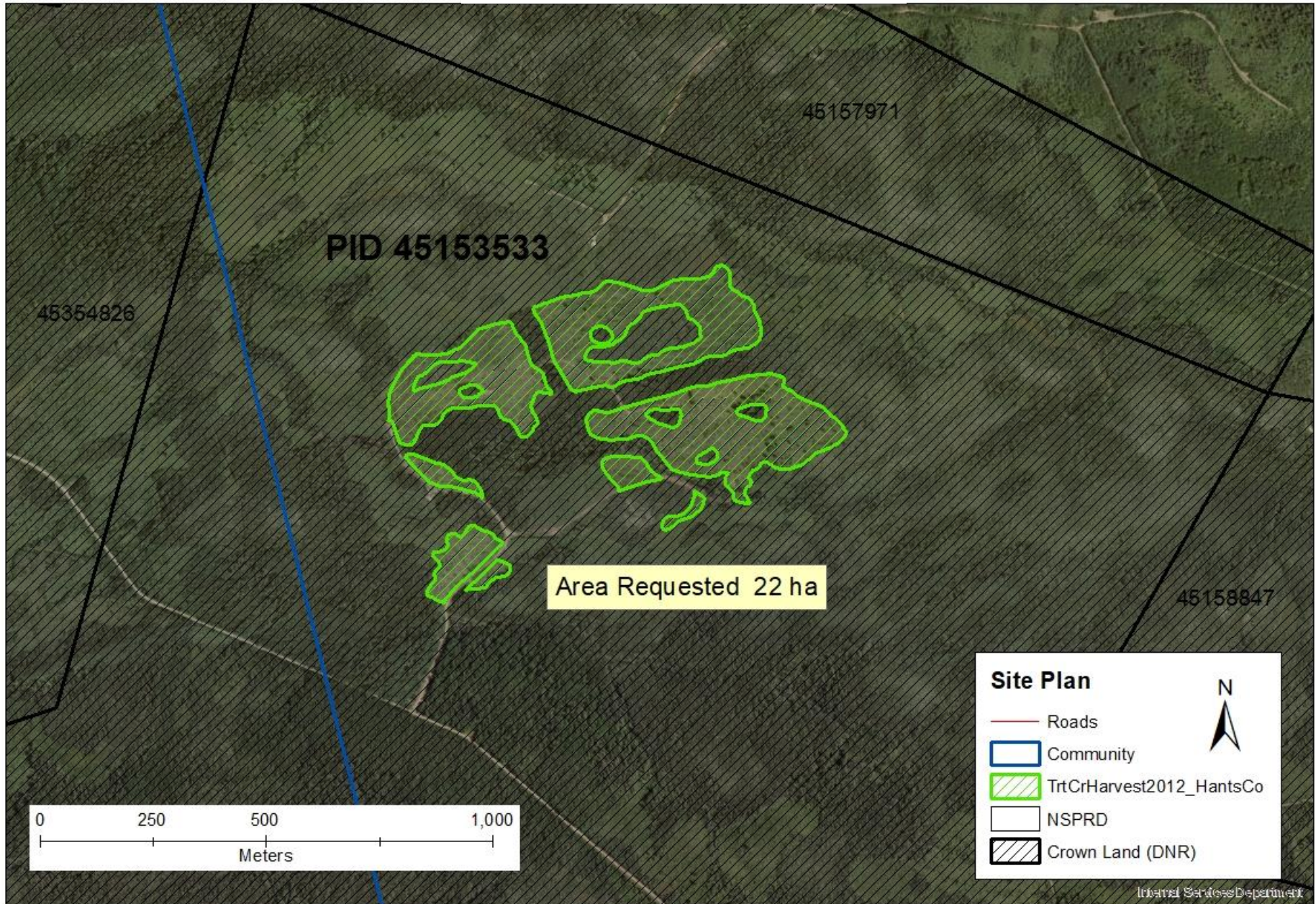
- alignment of floral community with honey bee requirements





Treatment Year 2012 in Hants County

Walton Wind Turbine



General Bee Counts



Twan Leenders | rtrnl.org



Row Labels	Sum of Bombus Count	Sum of Apis Count	Sum of "Other" Count
Walton Wind Turbine	233	2	71
12-Jun	118	0	11
26-Jun	33	0	8
10-Jul	1	1	17
25-Jul	0	0	8
21-Aug	28	1	17
4-Sep	53		10

Transect 1

Latin Name	Common Name	30/May/18	12/Jun/18	26-Jun-18	10-Jul-18	25-Jul-18	21-Aug-18	4-Sep-18
<i>Aronia prunifolia</i>	Purple Chokecherry		1					
<i>Cornus canadensis</i>	Bunchberry				1	1		
<i>Daucus carota</i>	Queen Anne's lace						5	
<i>Drosera rotundifolia</i>	Round-Leaved Sundew					2		
<i>Euphrasia nemorosa</i>	Common Eyebright						7	7
<i>Fragaria virginiana</i>	Wild Strawberry				1			
<i>Kalmia angustifolia</i>	Sheep Laurel		1		7	5		
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife					2		
<i>Odontites vulgaris</i>	Red Bartsia					1		
<i>Platanthera blephariglottis</i>	White Fringed Orchid					2		
<i>Rhododendron canadense</i>	Rhodora	5	1	1				
<i>Rhododendron groenlandicum</i>	Labrador Tea			1				
<i>Rosa spp.</i>	Rose				1			
<i>Rubus hispidus</i>	Bristly Dewberry					1		
<i>Symphotrichum novi-belgii</i>	New York Aster						1	
<i>Vaccinium angustifolium</i>	Lowbush Blueberry	4	1					

Transect 2

<i>Agalinis neoscotia</i>	Nova Scotia Agalinis						3	2
<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	1						
<i>Centaurea nigra</i>	Black Knapweed					4	1	1
<i>Cerastium fontanum</i>	Mouse-Ear Chickweed	4	5					
<i>Daucus carota</i>	Queen Anne's lace					2		5
<i>Drosera rotundifolia</i>	Round-Leaved Sundew				1			
<i>Euthamia graminifolia</i>	Grass-Leaved Goldenrod						2	1
<i>Kalmia angustifolia</i>	Sheep Laurel			1		3		
<i>Leontodon autumnalis</i>	Fall Dandelion						1	1
<i>Leucanthemum vulgare</i>	Oxeye Daisy			3	4	4		
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife				1			
<i>Medicago lupulina</i>	Black Medick	1	5			3	5	
<i>Melilotus albus</i>	White Sweet-Clover				3			
<i>Melilotus officinalis</i>	Yellow Sweet-Clover			2	7	7	2	2
<i>Pilosella caespitose</i>	Meadow Hawkweed			1				
<i>Pilosella officinarum</i>	Mouse-Ear Hawkweed			1	1			
<i>Potentilla spp.</i>	Cinquefoil		1	2	2			
<i>Prunella vulgaris</i>	Common Self-Heal				3	2		
<i>Rhododendron canadense</i>	Rhodora	3						
<i>Rhododendron groenlandicum</i>	Labrador Tea			1				
<i>Sisyrinchium montanum</i>	Strict Blue-Eyed Grass		2					
<i>Solidago uliginosa</i>	Bog Goldenrod						3	4
<i>Spiraea latifolia</i>	Broad-Leaved Meadowsweet						1	1
<i>Stellaria graminea</i>	Grass-Leaved Starwort			2				
<i>Symphotrichum lateriflorum</i>	Calico Aster							3
<i>Symphotrichum novi-belgii</i>	New York Aster						1	1
<i>Taraxacum officinale</i>	Common Dandelion	1						
<i>Trifolium arvense</i>	Rabbit's-Foot-Clover					4	3	
<i>Trifolium aureum</i>	Yellow Clover				6	4	1	
<i>Trifolium pretense</i>	Red Clover		1	2		3	1	1
<i>Trifolium repens</i>	White Clover			6	7	5		
<i>Viola macloskeyi</i>	Small White Violet	1						

Relative Abundance Scale

RA	Count/plot	Count/ha	
		Low	High
1	< 25	80	1920
2	25-50	2000	4000
3	51-100	4080	8000
4	101-200	8080	16000
5	201-500	16080	40000
6	501-1000	40080	80000
7	1001-5000	80080	400000
8	>5000	400080	-

Hive Assessment Criteria

Hive strength:

- Hive weights
- Seems of bees
- No. of brood chambers
- # of frames with >50% capped brood coverage
- Laying queen
- Laying pattern (poor, fair, excellent)
- Food stores (poor, fair, excellent)

Disease:

- Nosema sample(s) – *per hive or yard composite*
- EFB/AFB (<5 cells per frame, 5-10, 10-50)
- Chalkbrood (<5 cells per frame, 5-10, 10-50)
- Sacbrood (<5 cells per frame, 5-10, 10-50)
- Signs of virus (DFW, hairless, shiny bees, paralysis, etc)
- Varroa sampling – *per hive or composite*

Crown Cut Blocks - 2020

Compiling list of species suitable as bee forage

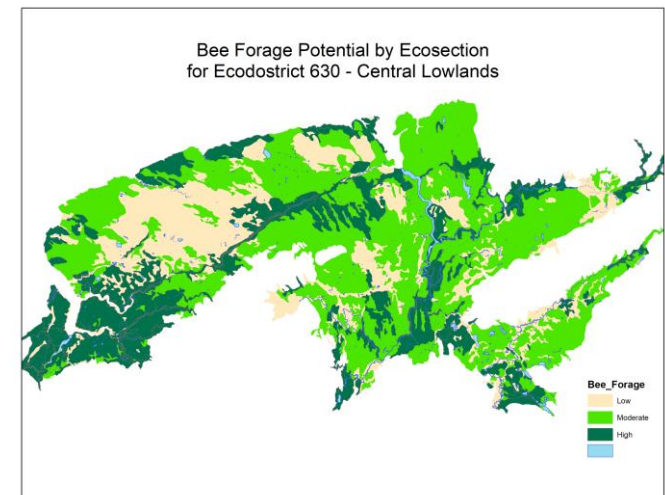
- those most likely to occur in harvested blocks

Identify potential bee forage areas through

- Aerial photography
- Ecological Land Classification (ELC) and Forest Ecosystem Classification (FEC)
- mining historical data ie regeneration study
- Forest cover and Canada Landsat Disturbance Dataset

Get bees on the ground

- Cooperating beekeepers
- Monitor pollinators and plant abundance, hive assessments



Collaborators

Agriculture and Agri-Food Canada

Lands and Forestry

Transportation and Infrastructure Renewal

Atlantic Tech Transfer Team for Apiculture

NS Beekeepers' Association

