

NSERC-CANPOLIN WG1 Activities

Bees

Cory S. Sheffield & Laurence Packer

WG1 Activities - Bees

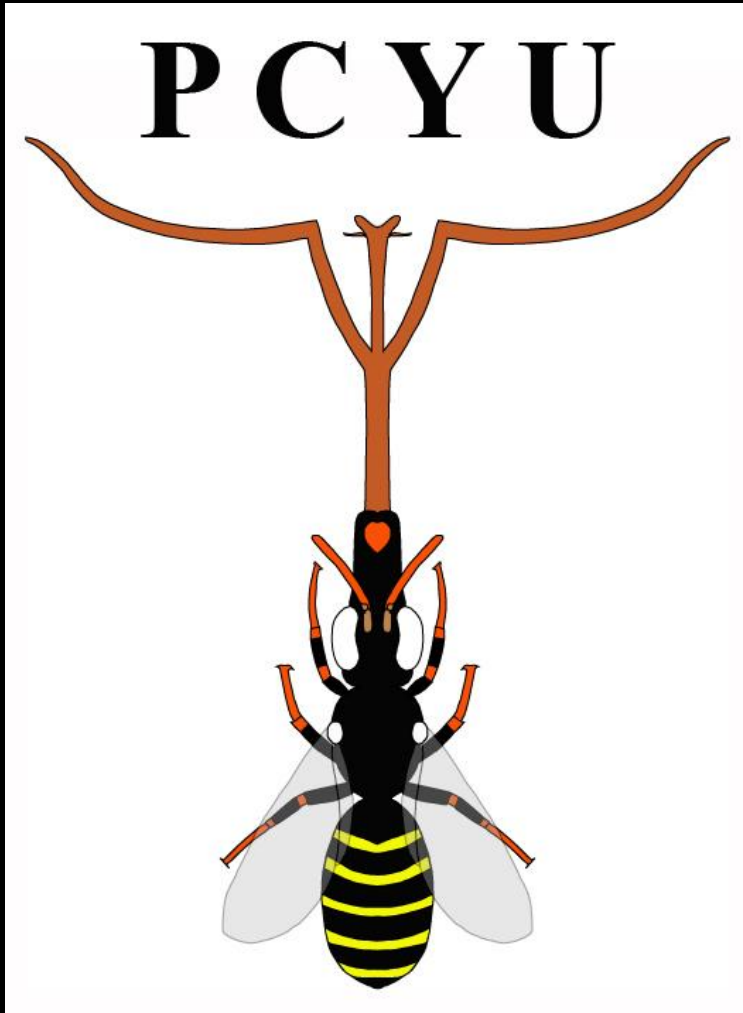
- Offer course(s) on bee taxonomy/biology; training for students doing bee and pollination related studies in Canada
- Develop and test sampling protocols
- Provide taxonomic expertise to CANPOLIN researchers in other WG's
- Produce keys for identification of pollinators

Bee Databasing



- Using Darwin Core compatible database template in MS Excel (i.e., suitable for GBIF, Biota, Specify, etc.)
- All newly collected material from CANPOLIN is being databased with Global Unique Identifiers (GUI's)
- Ultimately, CANPOLIN sponsored data should be available across the network, and publically (e.g., GBIF) at least after publication

Bee Databasing



- Data from:
 - From CANPOLIN Members & Nat. Park Surveys
 - PCYU, UBC, RBCM, RAM, Lethbridge, U Manitoba
 - U Alberta, ROM, CNC (various genera covered)

Approx. 100,000 digital records, though taxonomy still lacking on 25%

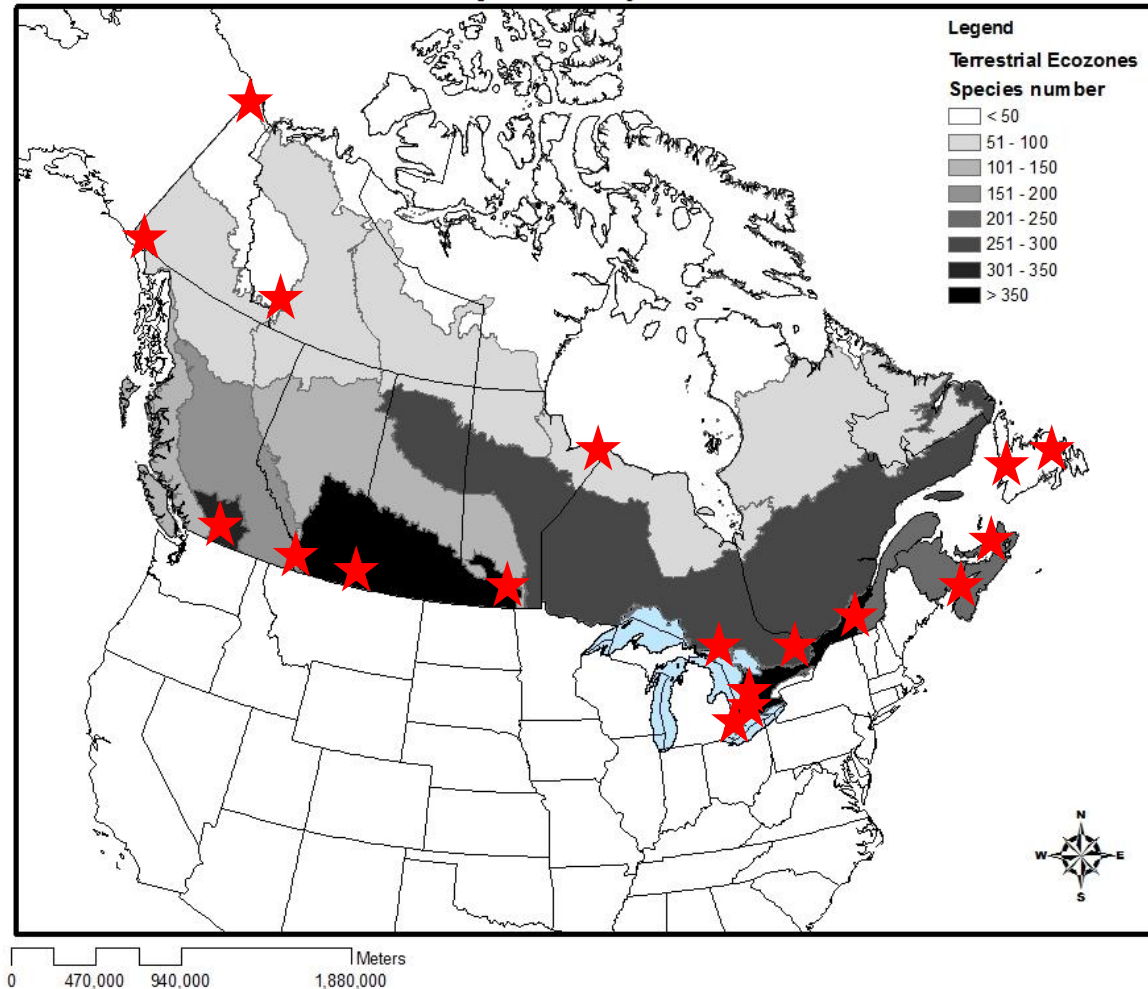
Bee Databasing



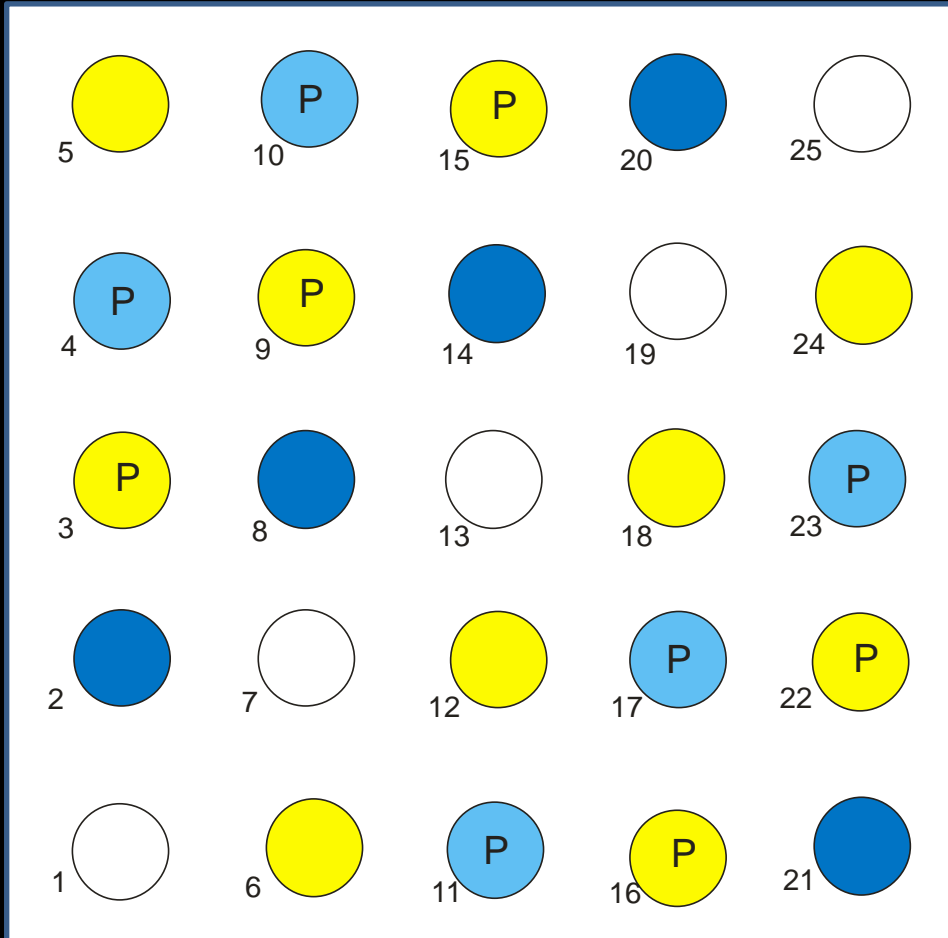
- Need data from:
 - University Guelph
 - McGill University
 - Laval University
 - University of Alberta
- Additional data from various collections in the United States

Bee Diversity in Canada

Bee Diversity Hotspots in Canada



Bee Diversity in Canada



- In addition to National Park surveys, we have a project investigating pan trap preferences of pollinators in different Ecoregions in Canada

Bumble Bee Projects

- Honours project completed:
 - using morphology data and DNA barcoding to distinguish *Bombus terricola* and *Bombus occidentalis*
- COSEWIC (Committee of the Status of Endangered Wildlife in Canada)
- Additional work on the subgenus *Bombus* in progress (4 of 5 North American species are currently facing trouble)

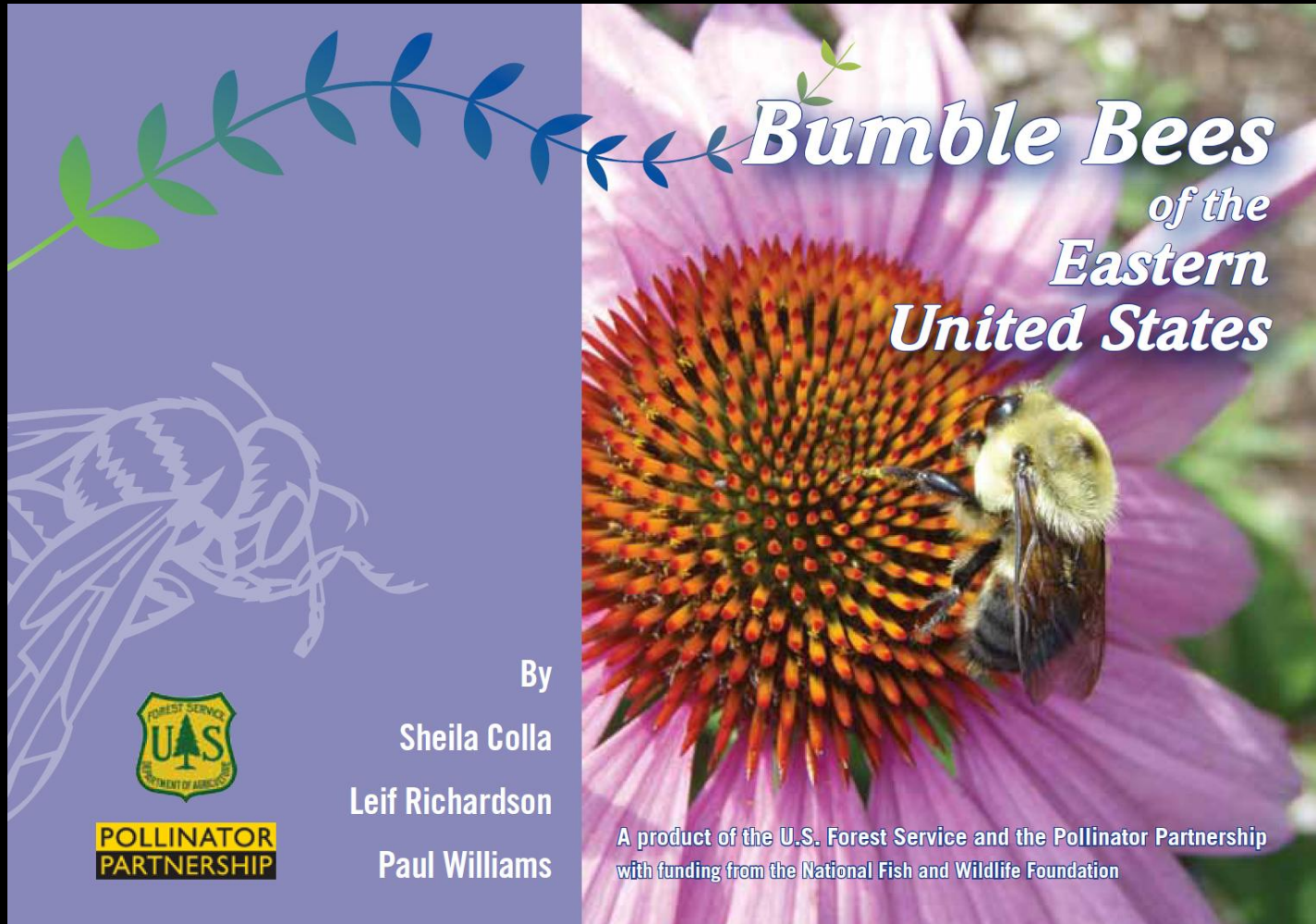


Bumble Bee Projects



- New colour morph of *Bombus rufocinctus* from Vancouver
- Preparing ms reviewing these colour morphs
- Paper in preparation on this subgenus globally with Paul Williams

Bumble Bee Projects



By

Sheila Colla

Leif Richardson

Paul Williams

A product of the U.S. Forest Service and the Pollinator Partnership
with funding from the National Fish and Wildlife Foundation

DNA Barcoding Bees

- 54 genera, 823 species in Canada
 - 510 species with sequences (62%)
 - 109 clusters without specific nomenclature (13%)
- 75% of Canadian bee species barcoded
- Ca 40-50% North American bee species barcoded

Bee-BOL



Megachile of Canada

- Accepted in *Canadian Journal of Arthropod Identification* (Sheffield *et al.*, in press)
- Fully illustrated interactive keys, diagnoses, descriptions and images of female mandibles and male genitalia



Megachile of Canada

13a



13b



- 8 (6) a) Cheek in posteroventral view with a prominent robust tubercle protruding downward (Figure 13a)...*M. (Sayapis) pugnata* Say
- b) Cheek in posteroventral view uniformly convex, without tubercle (Figure 13b)...9

Megachile of Canada

- Since the manuscript was accepted:
 - Found the remaining undescribed sexes of 2 species
 - Associated the sexes of a species (resulting in a synonymy)
 - Discovered that two North American species are actually Holarctic (therefore synonymies of Old World species)
 - Discovered another species introduced to North America
 - Added 3 additional species for Canada, the most recent 2 weeks ago



Dufourea of Canada

- Accepted with *Canadian Journal of Arthropod Identification* (Dumesh and Sheffield, in press)
- Described all sexes
- Report large range extensions for several species





Dufourea novaeangliae on *Pontederia*

Cory S. Sheffield & Laurence Packer
CANPOLIN AGM 2011



Dufourea monardae on *Monarda*

Ceratina of Eastern North America

- Paper in *Zootaxa* (Rehan and Sheffield 2011, in press)
- Describe new species, *Ceratina mikmaqi*
- Paper in press on nesting ecology of this species with *Canadian Entomologist* (Vickruck *et al.* 2011)



Nomada in North America



Zootaxa 2661: 1–32 (2010)

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Article

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ZOOTAXA

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New synonymies in the bee genus *Nomada* from North America (Hymenoptera: Apidae)

SAM DROEGE¹, MOLLY G. RIGHTMYER^{2,3}, CORY S. SHEFFIELD⁴ & SEÁN G. BRADY³

- Several synonymies
- More work in progress with many undescribed species



Lasioglossum (Dialictus) of Canada



- Jason Gibbs
- *Zootaxa* 2010
- 382 pages
- One of the largest and most difficult group of bees in Canada
- 84 species covered
- 19 new species described



Stay Tuned for...

- Bee genera of Canada (CANPOLIN Course)
- Catalogue of the Bees of Canada
- Review of Provancher's bees (70 species)
- *Osmia* of Eastern North America (Rightmyer, Arduser and Sheffield)



Stay Tuned for...

- Anthophorine bees of Canada (*Anthophora*, *Habropoda*)
- Melectine bees of Canada (*Melecta*, *Xeromelecta*, *Zacosmia*)
- Osmiine bees of Canada (excluding *Osmia*)
- *Coelioxys* of Canada (Nicholai de Silva)



General Status Report of Bees in Canada – Wild Species 2015



- Assign all bee species in Canada to Ecoregions
- Assign status to bees species for each province and territory, and nationally
- Updated every five years