

# Mapping how wild bees use Maine's landscape

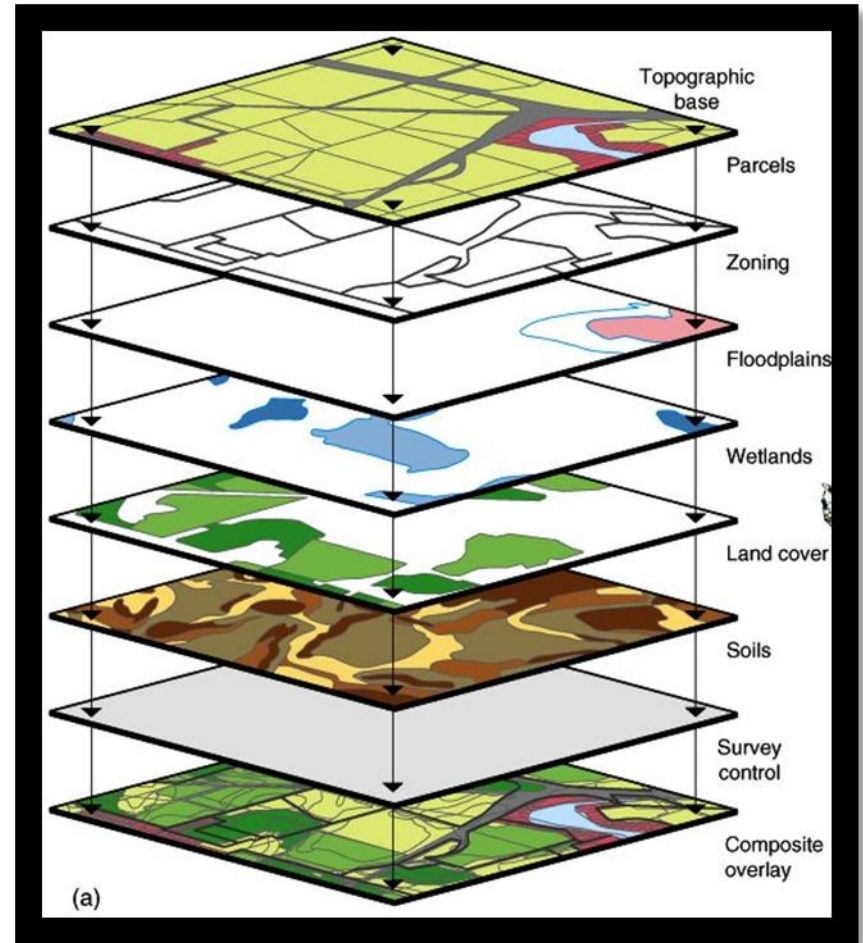
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# Bee landscape ecology



# What do bees need in their landscape?

**Food:**  
pollen and nectar

**Habitat:**  
open soil, dead  
logs and twigs

**Within their  
flight limit**

# Bee flight limit

*Colletes inaequalis*  
Max flight limit: 1096 yd



*Osmia inspergens*  
Max flight limit: 495 yd



*Lasioglossum leucomomum*  
Max flight limit: 31 yd



# What makes good bee habitat?

- Lots of sun
- Some shade
- Some water

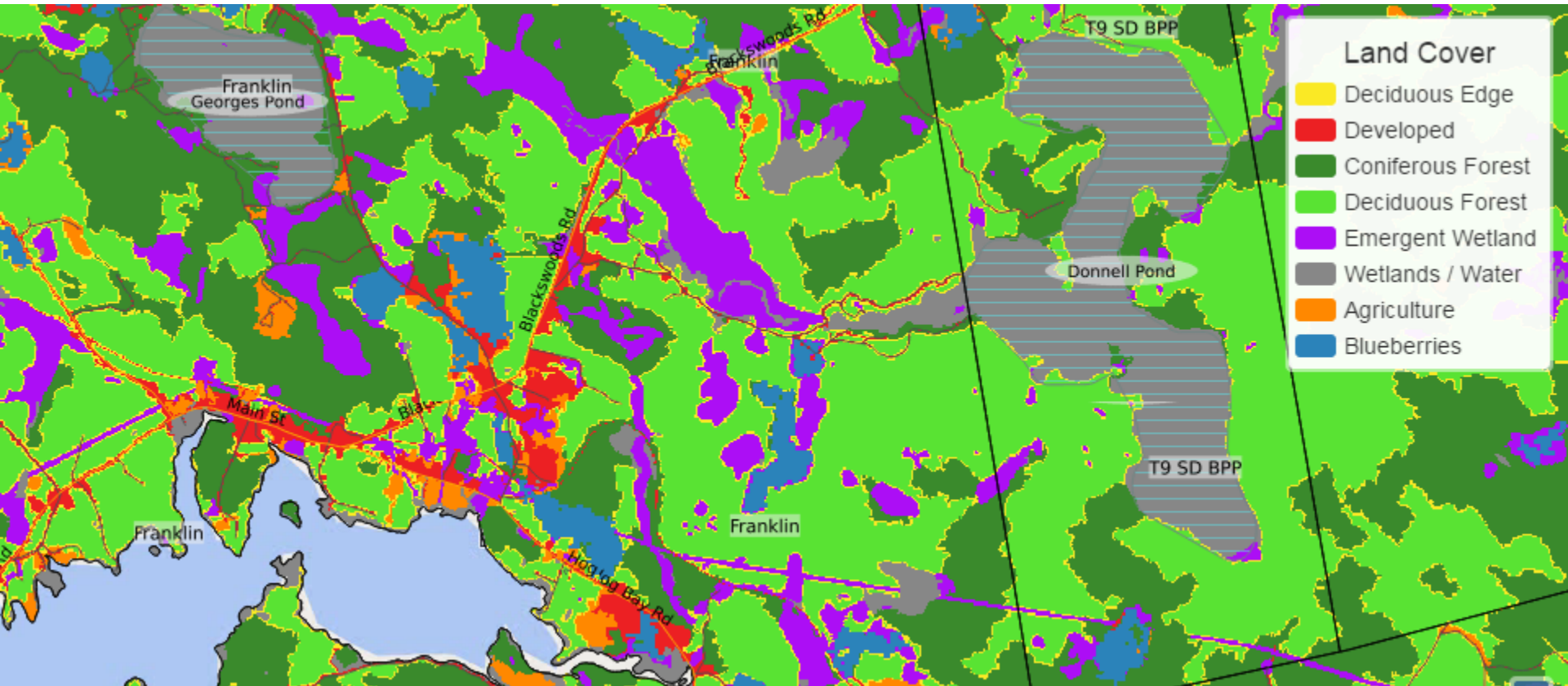


- Woody flowering shrubs
- Well-drained soils

Some types of land are better than others!



# Put it on a map: Land cover type

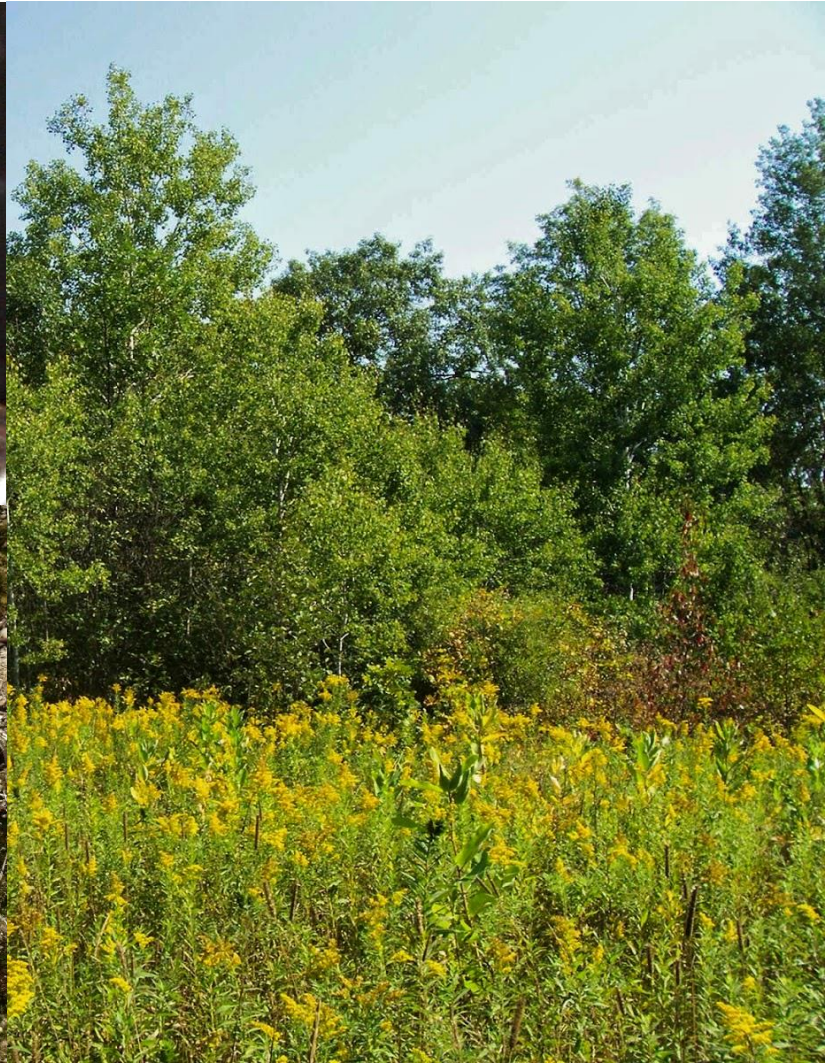
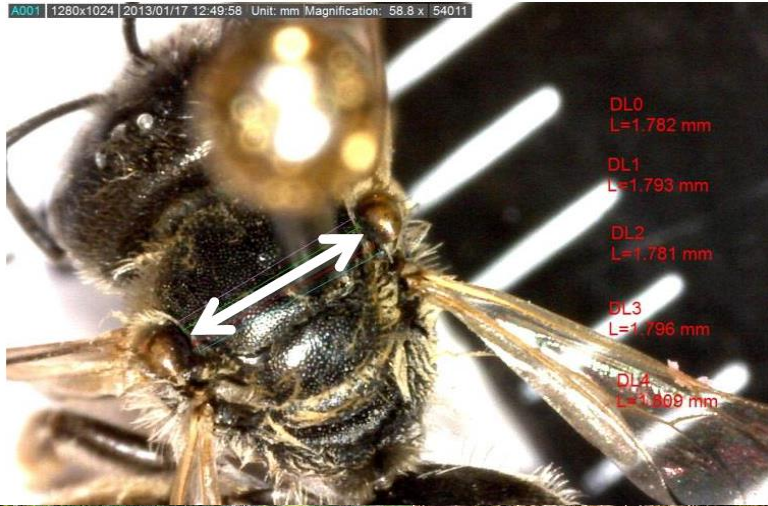


# + suitability values

Table 3. Average ( $\pm$  standard deviation) scaled landcover suitability values assigned through expert opinion.

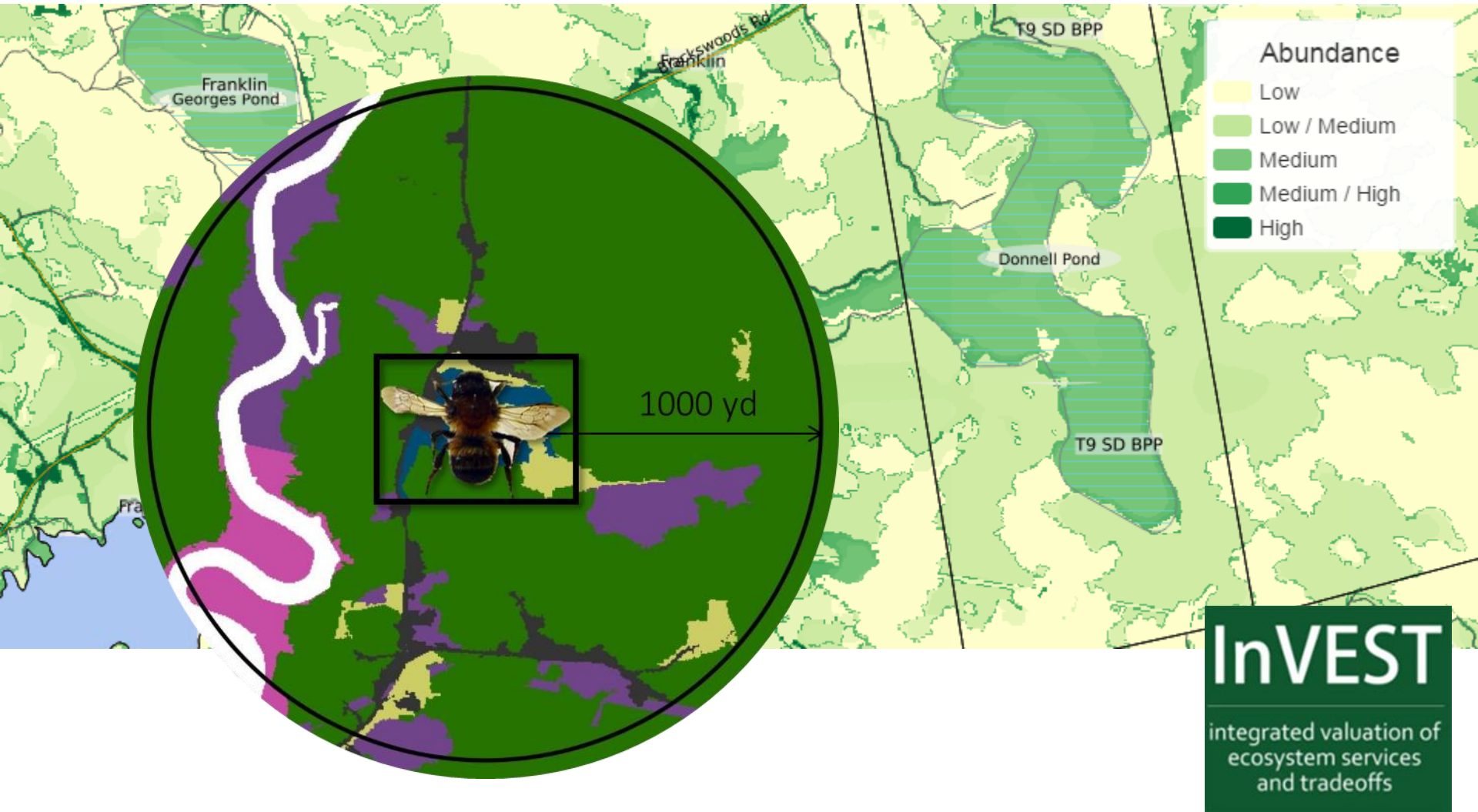
Landcover	Ground nesting	Cavity nesting	Spring forage	Early Summer forage	Late Summer forage
<i>Deciduous/mixed forest, edge</i>	0.9(0.17)	1.0(0.19)	0.9(0.24)	0.9(0.24)	1.0(0.22)
<i>Developed/other</i>	0.9(0.25)	0.6(0.30)	1.0(0.27)	0.9(0.26)	1.0(0.22)
<i>Coniferous forest</i>	0.5(0.23)	0.6(0.28)	0.1(0.24)	0.1(0.21)	0.1(0.29)
<i>Deciduous forest/mixed forest</i>	0.6(0.21)	0.9(0.22)	0.7(0.21)	0.5(0.29)	0.4(0.18)
<i>Emergent wetlands/scrub-shrub</i>	0.2(0.14)	0.4(0.24)	0.7(0.22)	0.6(0.25)	0.6(0.20)
<i>Wetlands/water</i>	0.1(0)	0.1(0.05)	0.3(0.20)	0.2(0.16)	0.5(0.18)
<i>Agriculture/field</i>	0.7(0.29)	0.2(0.18)	0.9(0.31)	0.7(0.27)	0.9(0.33)
<i>Blueberries</i>	1.0(0.25)	0.4(0.26)	0.4(0.29)	1.0(0.28)	0.5(0.26)





+ wild bee life history characteristics

= predicted wild bee abundance



# BeeMapper

- Aim: to help growers assess wild bee habitat around their wild blueberry fields
- Target audience: Maine wild blueberry growers
- Features:
  - Maps
    - Land cover
    - Predicted wild bee abundance
    - Navigational aids
  - User's guide
  - Links for further reading

lat, lon / zipcode / address

Go

Satellite Road Legend

### Abundance

- Low
- Low / Medium
- Medium
- Medium / High
- High

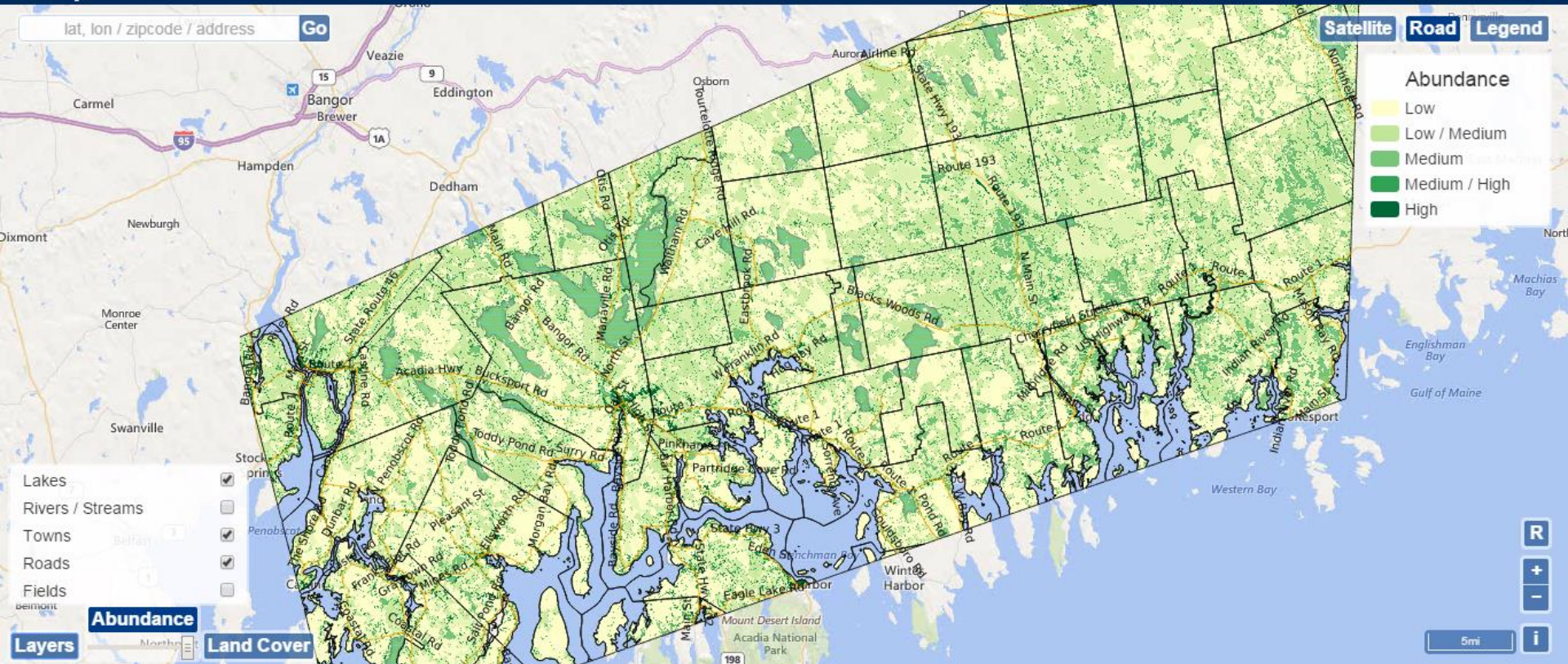
- Lakes
- Rivers / Streams
- Towns
- Roads
- Fields

Abundance

Land Cover

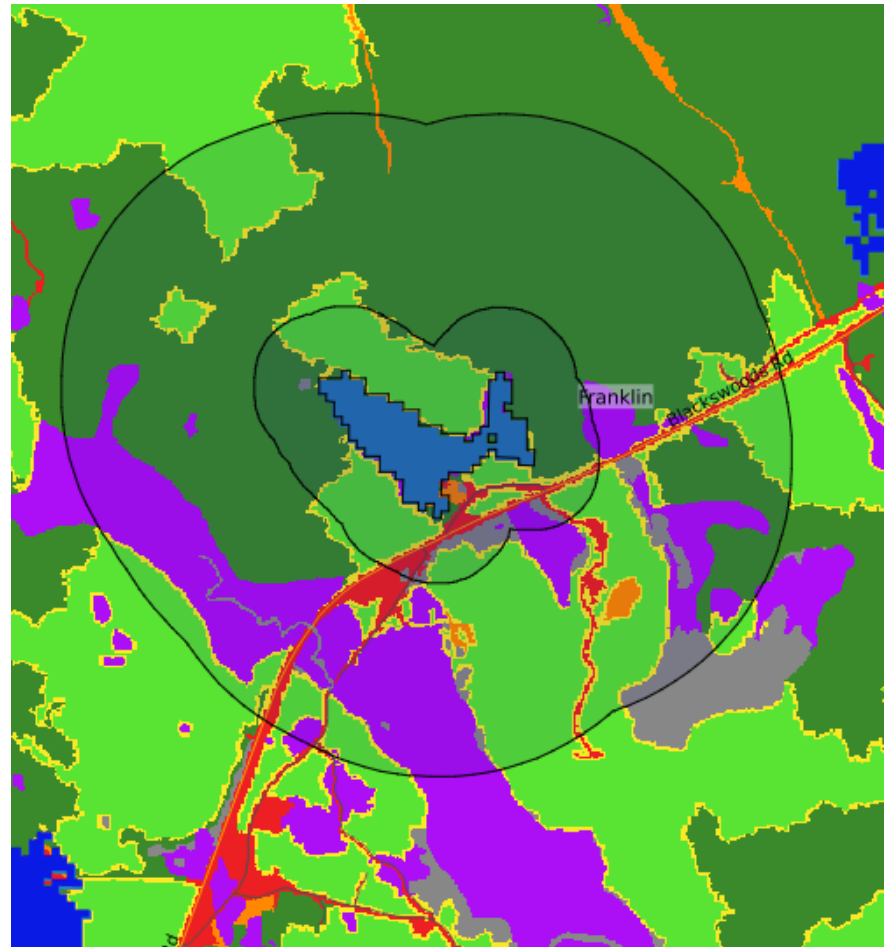
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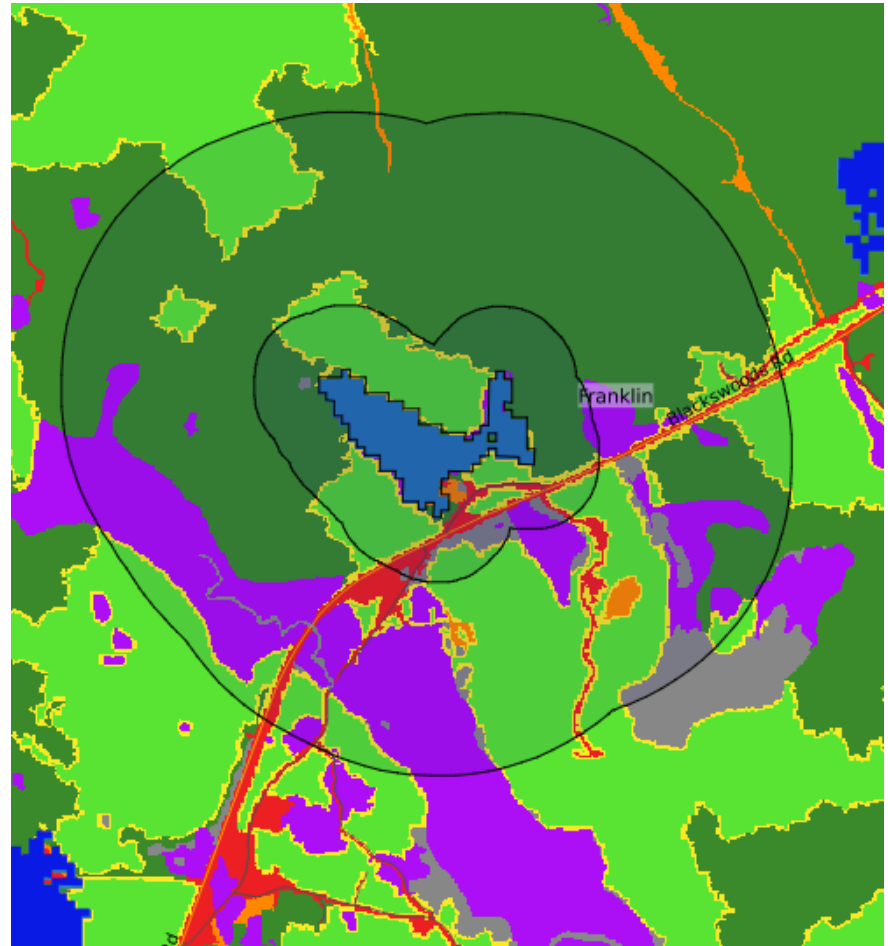
# What can we do with bee maps?

- Strategically place honey bee hives



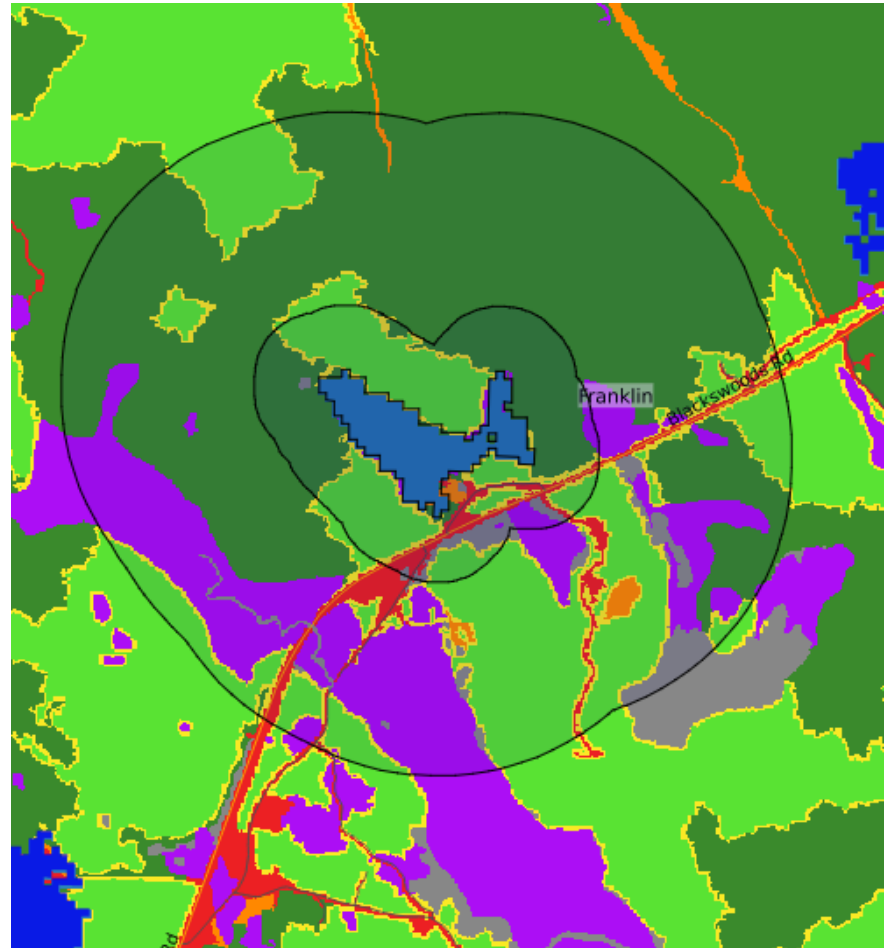
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- Strategically place honey bee hives
- Determine existing lands for conservation



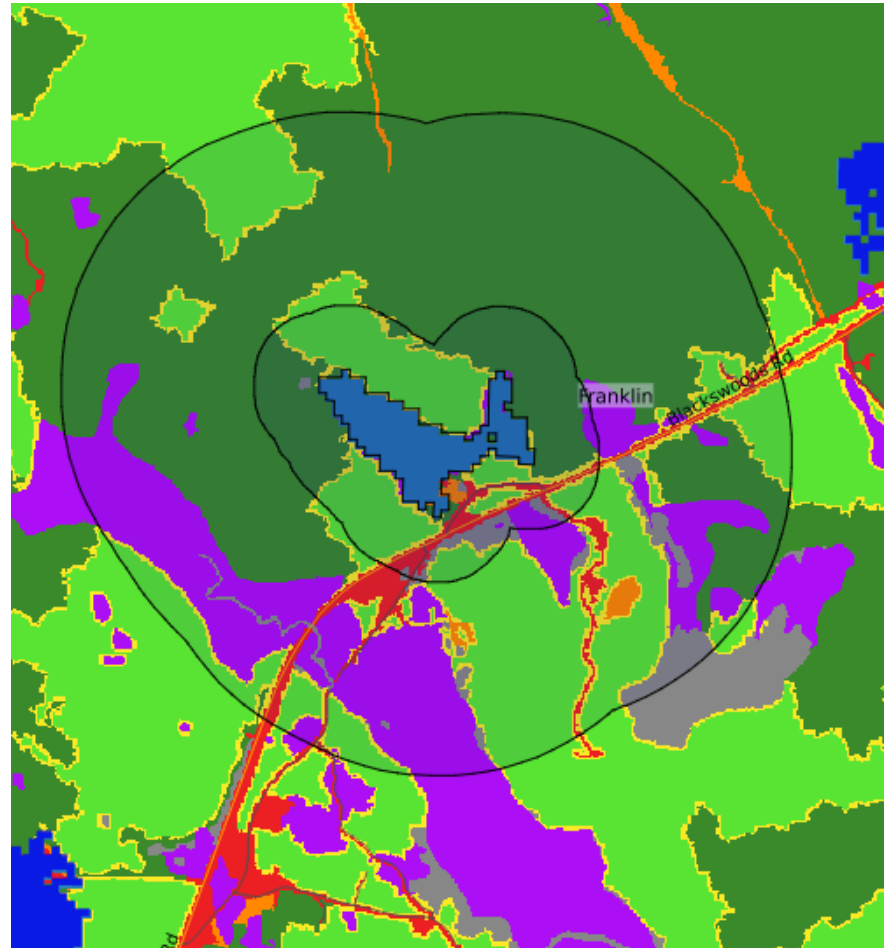
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- Find potential sites for pollinator plantings



# What can we do with bee maps?

- Strategically place honey bee hives
- Determine existing lands for conservation
- Find potential sites for pollinator plantings
- Targeted to growers, but can be used by everyone





# Making the maps better

- Expert opinion varies widely
- Summer 2015 bee survey—sites in each land cover type
- Sample throughout the summer



# Acknowledgments

- Research Team:
  - Samuel Hanes
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