

Patterns of native bee abundance across a prairie & agriculture landscape 2004-2019

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Pollinator populations are declining worldwide, particularly bees

- The tallgrass prairie is shrinking and being converted to agriculture
- Insecticide and neonicotinoid use has increased since 2000
- We do not know how bee communities are changing in western MN
- Therefore, we collected bees across the landscape over four summers in rural Minnesota



How have bee abundance and species richness changed over time?

Do the amount of agricultural land and grassland correspond to the nearby bee community?



Focus of this presentation:

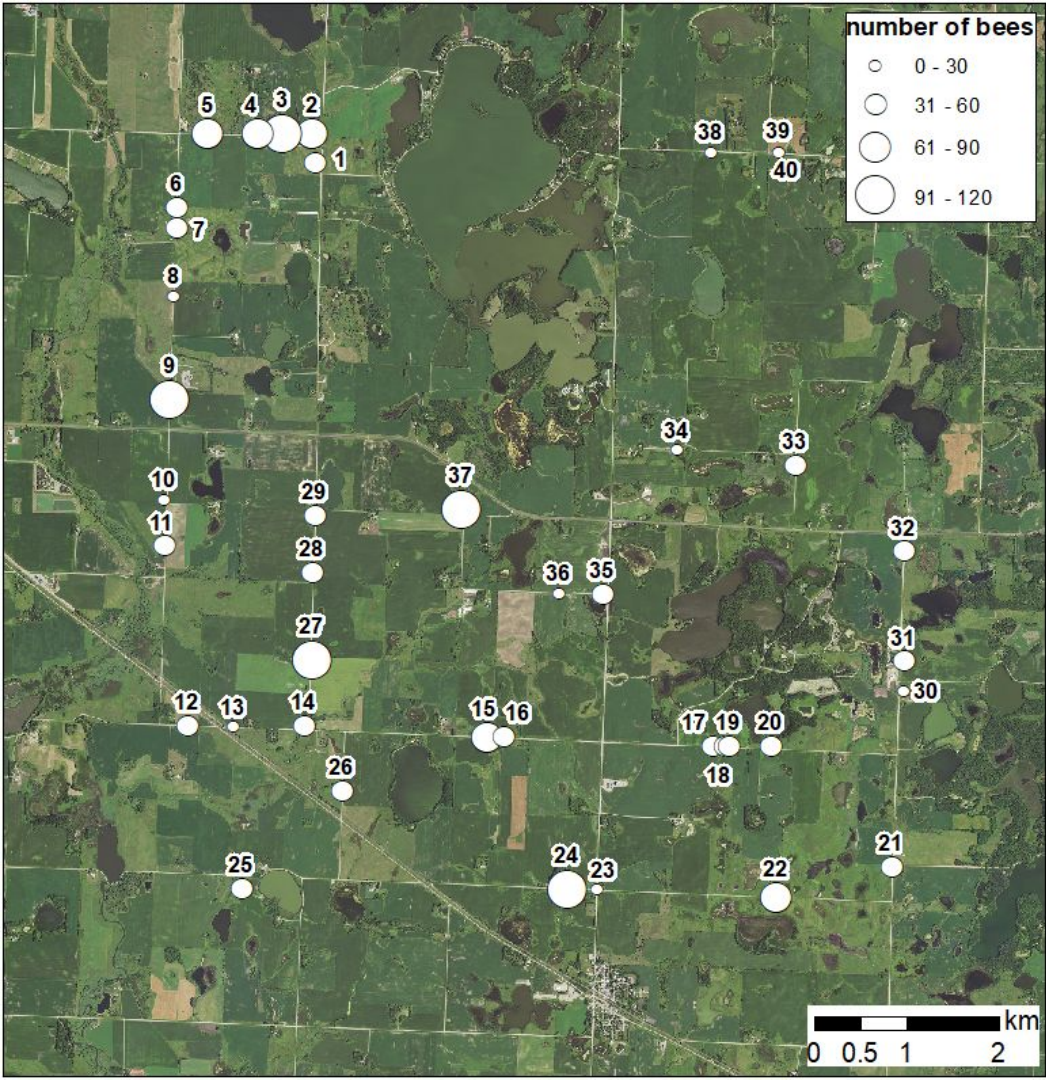
- Is there variation in the number of bees caught over time (within and among years)?
- Did some traps collect more bees than others?

We set out yellow pan traps at randomly selected points along roadsides in western MN

- Used yellow bowls filled with soapy water
- Set out traps 6-7 times a year in 4 summers
- Pinned and identified bees to species

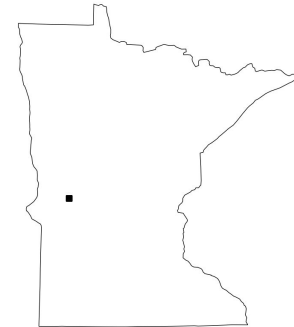
year	bees	traps
2004	551	20
2017	594	40
2018	438	37
2019	405	38
total	1,988	



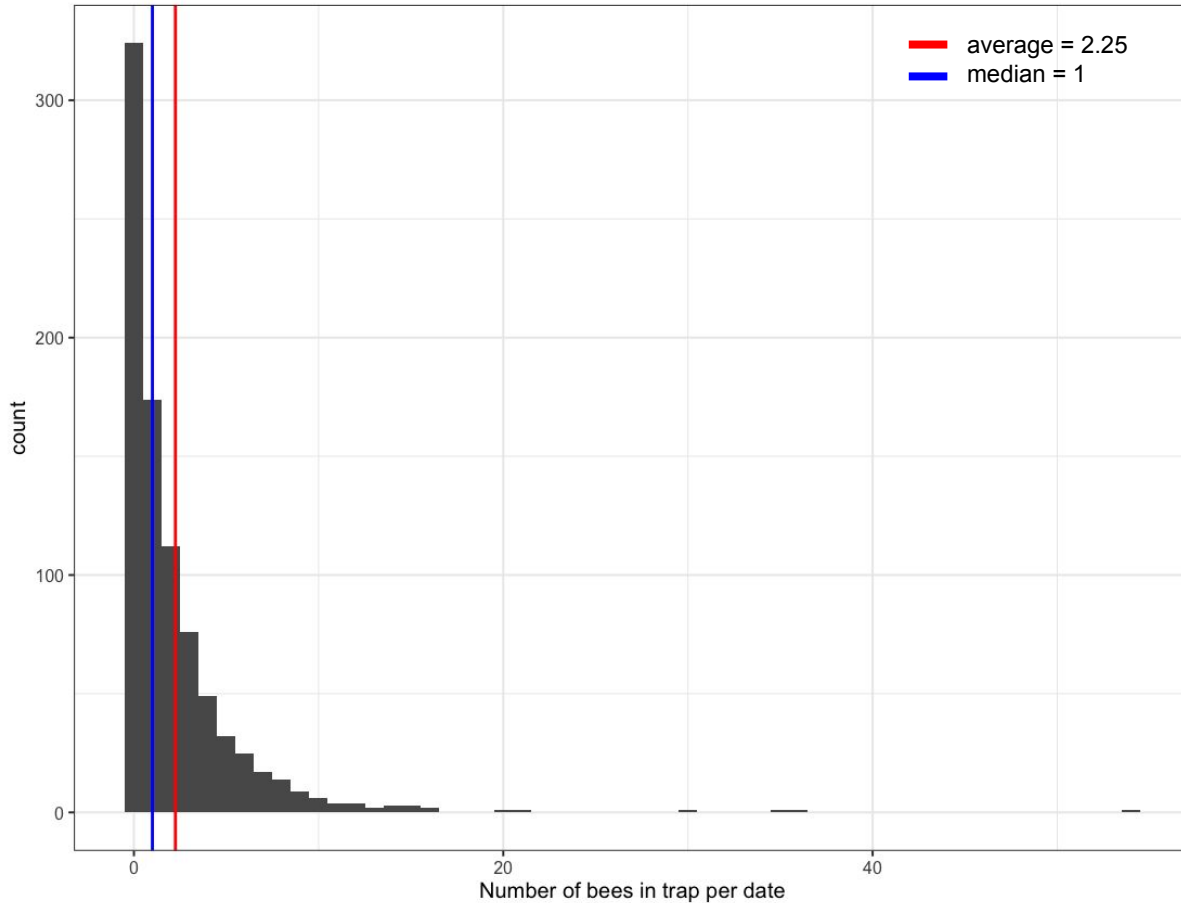


How many bees did each trap catch?

- Traps 3, 9, 24, 27, and 37 contained the most bees
- There is no clear spatial pattern
- More data analysis is needed!

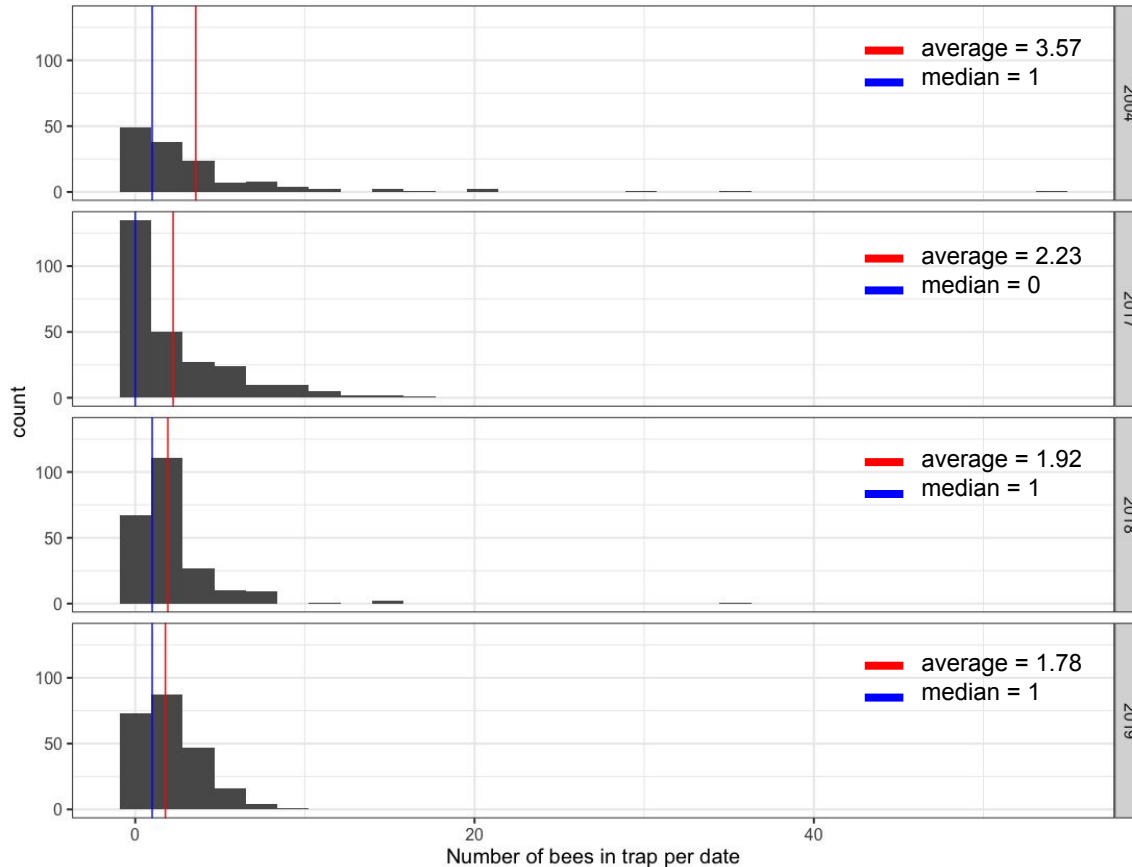


How many bees were caught per trap each day?



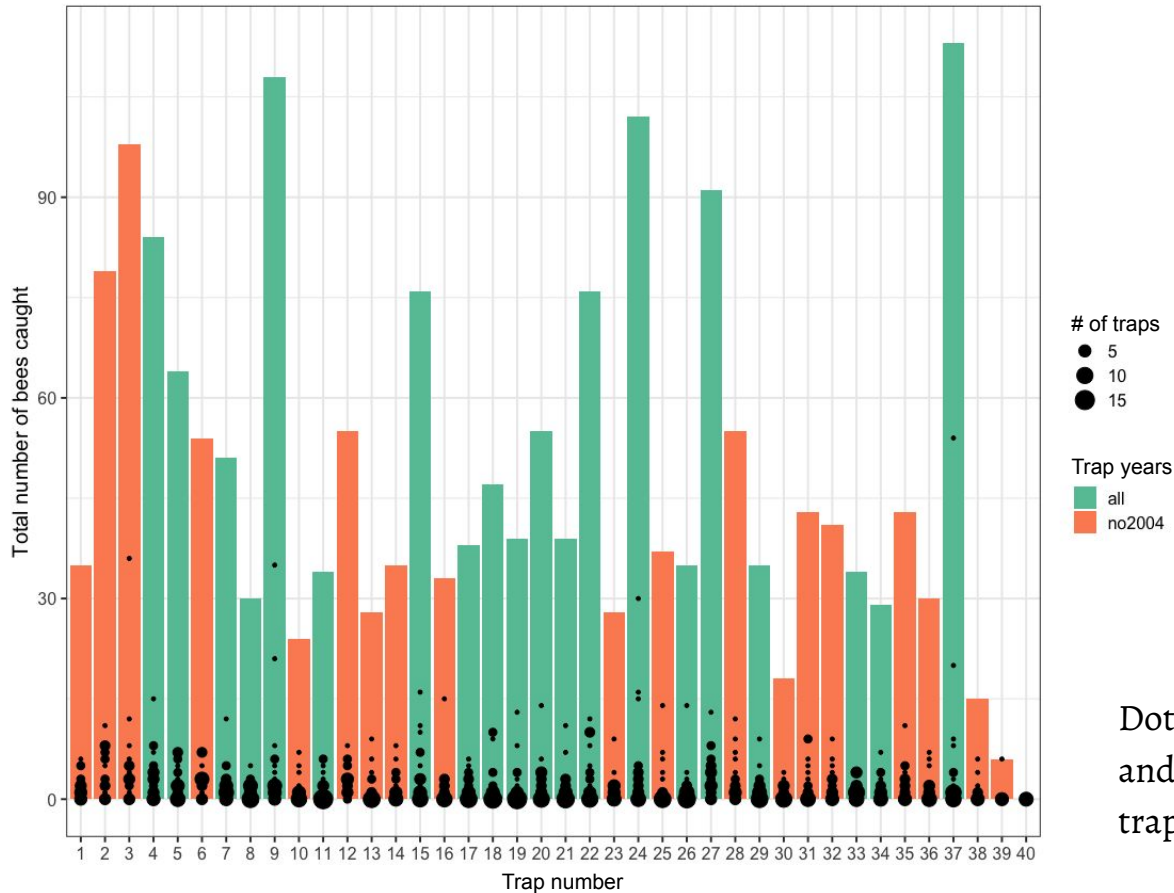
- On average, traps caught 2.25 bees per day
- Traps were empty 324 times
- One trap caught 54 bees in one day

How did bee abundance change across the years?



- The average number of bees decreased over the years
- In 2004, several traps had >20 bees
- In 2017 and 2019, no traps had >20 bees
- 2017 had the most empty traps but also one trap with >20 bees

Did some traps catch more bees than others?



- 20 traps (green) were set out all 4 years
- Trap 37 caught the most bees (113 bees)
- Trap 40 never caught any bees
- Some traps consistently caught low numbers of bees

Dots are each day a trap was set out, and dot size represents the number of traps containing that many bees

Next steps - coming soon!

- Diversity analysis: investigate differences in bee species diversity over the years and between traps
- Landscape analysis: use ArcGIS to analyze the land use surrounding each trap each year
- Combined analysis: learn whether the amount of agricultural land and grassland correspond to the nearby bee community



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Contact us with questions!

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