### **NATIVE POLLINATORS:** Grazing Treatments and Rangelands in Montana Gabrielle Blanchette<sup>1</sup>, Casey Delphia<sup>2</sup>, Craig Carr<sup>1</sup>, Mike Ivie<sup>3</sup>, and Hayes Goosey<sup>1</sup> **MONTANA STATE UNIVERSITY**

# **NTRODUCTION**

- Pollinators are economically and environmentally critical to native landscapes
- Approximately 4,000 native bee spp. within the U.S. contribute to 75% of food crops and 80% of flowering plant pollination
- 70% of native bees nest in underground galleries susceptible to livestock trampling
- 70% of the Western U.S. land is managed with livestock grazing
- MT is 66% range/pasture lands which in 2016 produced \$1.4mm in cow-calf receipts

**Objective:** Produce a *Genus* level Hymenopteran inventory from two rest-rotation grazing programs implemented in sage-brush steppe and mixed-grass prairie habitats



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- **Total Pollinator Catch:**



### 25 20— 15 p = 0.63Sidney

- 1. Weekly sampling May-July
- 2. Yellow, blue, white colored pan traps filled with soapy water deployed at each location
  - Variable colors capitalize on the visual preferences of pollinators
- 3. Samples were returned to MSU, cleaned, and stored in 95% ethanol
- 4. Hymenoptera specimens were mounted and identified to Genus
- 5. Differences in treatment least squared means were calculated using Proc MIXED (SAS<sup>®</sup> v9.2) with random sampling location

- Fig. 2. Box plots of 2017 catches per trap
- This sub-genera is highly speciose
- Social species may have as little as 2 workers, to more than 100
- May have multiple generations per season
- Underground nest most abundant end of spring
- Younger bees tend to eat the most pollen
- Geographic range primarily N. U.S.- S. Canada (Western hemisphere)
- Sociality ranging from solitary, communal, aggregate nesting, eusocial
- Branched underground nests, open mostly-bare ground
- Active spring-summer

### METHODS

*p* < 0.02 Roundup

Sociality ranging from solitary to primitively eusocial

# SAMPLING SITES

**ROUNDUP, MONTANA:** SGI, NSGI, and LMWR pastures

**SGI:** Sage-Grouse Initiative • 18 month rest-rotation grazing (NRCS)

**NSGI:** Not enrolled in SGI Grazing set by owner/lessee

LMWR: Lake Mason Wildlife Refuge

• 7+ years no livestock grazing



# DISGUSSION

Pollinator catches did not differ at Sidney in 2016 (p = 0.97) or 2017 (p = 0.63) suggesting that treatment floral resources, architecture, reproductive galleries and microhabitats were similar.

Pollinator catches differed at Roundup in 2016 (p < 0.04), and 2017 (p < 0.05) suggesting differences exist among treatment floral resources, architecture, reproductive galleries and/or microhabitats.

Lasioglossum (Dialictus) and Agapostemon sweat bees are typically abundant Hymenopteran pollinators that are unaffected by livestock grazing. Our data supports these findings.

Native bees differ in their response to livestock grazing and further analyses and specimen collections will supplement these findings.

SIDNEY, MONTANA: Winter, Spring, Fall, Rest, and **Off-Easement pastures** 

Pastures A1, B1, C1: Fall graze (2016), Rest (2017)

Pastures A2, B2, C2: Rest (2016), Spring graze (2017)

Pastures A3, B3, C3: • Spring graze (2016), Fall graze (2017)

W Pasture: Winter grazed (2016)

## CONCLUSION

Pollinator catches did not differ either year at Sidney and catches at Roundup were lowest both years on the LMWR, which has not experienced livestock grazing in over seven years. These data, when combined with our 2018 collections, could begin to suggest that moderate livestock grazing is a benign to useful tool for native bee conservation.

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