



# Invertebrate Zoology



Lusha Tronstad, PhD  
[tronstad@uwyo.edu](mailto:tronstad@uwyo.edu)  
307-766-3115



# Topics to cover

- Petitioned and listed invertebrates in Wyoming
- Current projects
- Core products



# Invertebrates with Endangered Species Act status in Wyoming

- Threatened: *Western Glacier Stonefly (Zapada glacier)*
- Proposed Endangered
  - Suckley's Cuckoo Bumble bee (*Bombus suckleyi*)
- Proposed Threatened:
  - Monarch (*Danaus plexippus*)
  - Regal Fritillary (*Argynnis idalia*)



# Substantial 90-day finding

- Western Bumble Bee (*Bombus occidentalis*)
- American Bumble Bee (*Bombus pensylvanicus*)
- Southern Plains Bumble Bee (*Bombus fraternus*)
- Morrison's Bumble Bee (*Bombus morrisoni*)



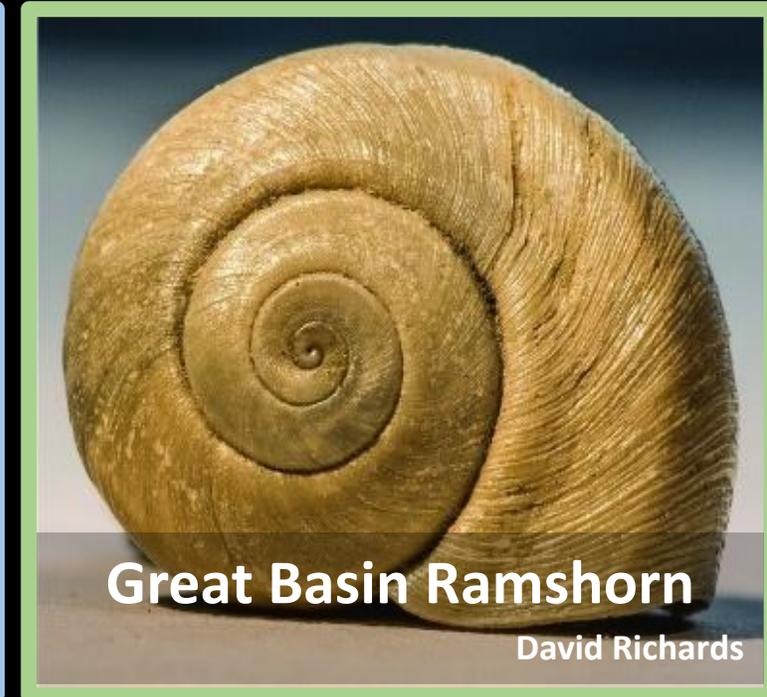
# Substantial 90-day finding

## Butterflies

- Iowa Skipper (*Atrytone arogos iowa*)
- Large Marble (*Euchloe ausonides*)

## Snails

- Great Basin Ramshorn (*Helisoma newberryi*)



# Interested in learning more about invertebrates with ESA status?

## Proposed Threatened

**What is WYNDD doing:** Butterfly and bee surveys in Wyoming

**Coming up:** Continued butterfly and bee surveys thanks to BLM, NPS & Wyoming Governor's Office

### Monarch (*Danaus plexippus*)

**Who:** Insect, Butterfly (Lepidoptera), brushfoot (Nymphalidae)

Petitioned	90-day finding	12-month finding	SSA
2013	2015	2020	2024

12-month finding: Warranted but precluded in 2020

Listing decision: expect December 2025

**Where:** Most of continental United States, migrates annually between southern Mexico and southern Canada. Observed in 2024!



### Regal Fritillary (*Speyeria/Argynnis idalia*)

**Who:** Insect, Butterfly (Lepidoptera), Fritillary (Nymphalidae)

Petitioned	90-day finding	12-month finding	SSA
2013	2015	2024	2023

**Where:** Eastern US, disappeared from eastern portion of range. Eastern Wyoming. Observed in 2024!



## Proposed Endangered

### Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)

Petitioned	90-day finding	12-month finding	SSA
2020	2021	2024	In progress

**Where:** Western United States, throughout Wyoming. Nest parasite of Western Bumble Bee. Not observed for >10 years in US.

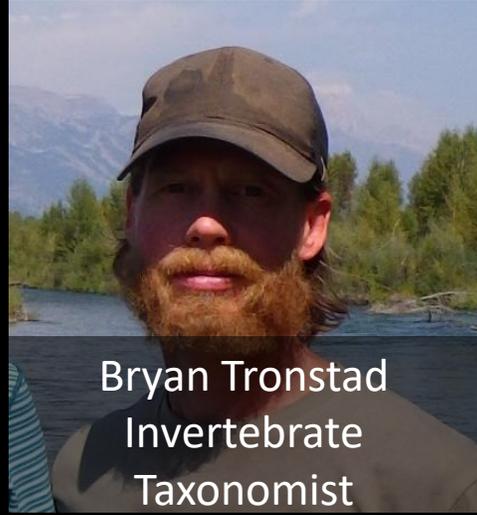


Email me for my updated document  
Tronstad@uwo.edu

# WYNDD Invertebrate Team



Michelle Weschler  
Curator Invertebrate  
Collections



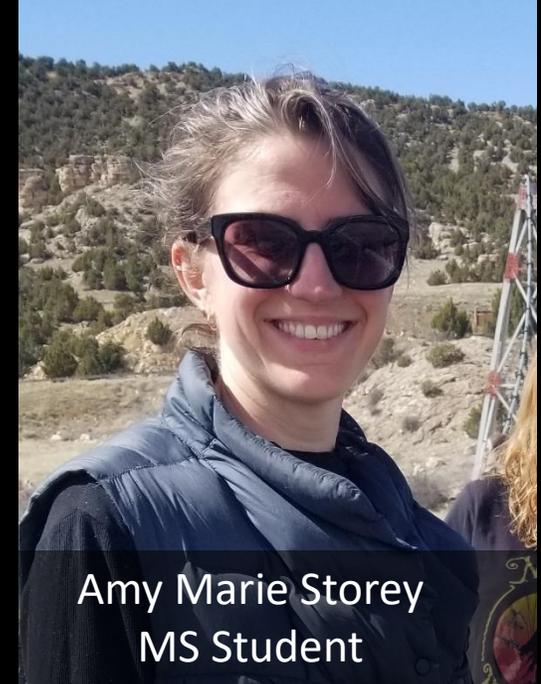
Bryan Tronstad  
Invertebrate  
Taxonomist



Katrina Cook  
Zoologist



Audrey Lindsteadt  
PhD Student



Amy Marie Storey  
MS Student

Thanks to help from undergraduate students  
and technicians

**A team effort!**



Nina Crawford  
PhD Student



Walker Bensch  
MS student



Bella Sadler  
PhD Student



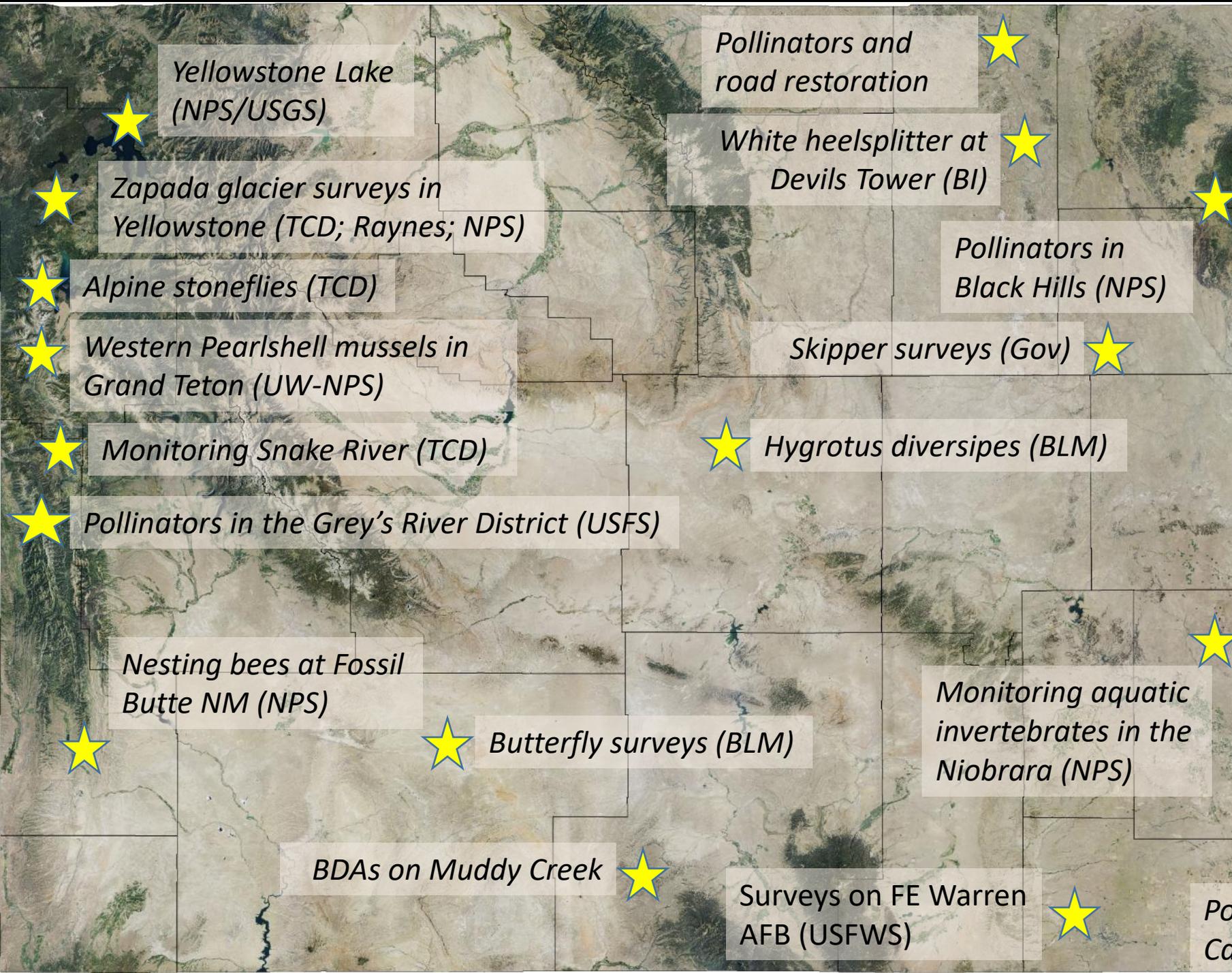
Alexis Hollander  
PhD Student



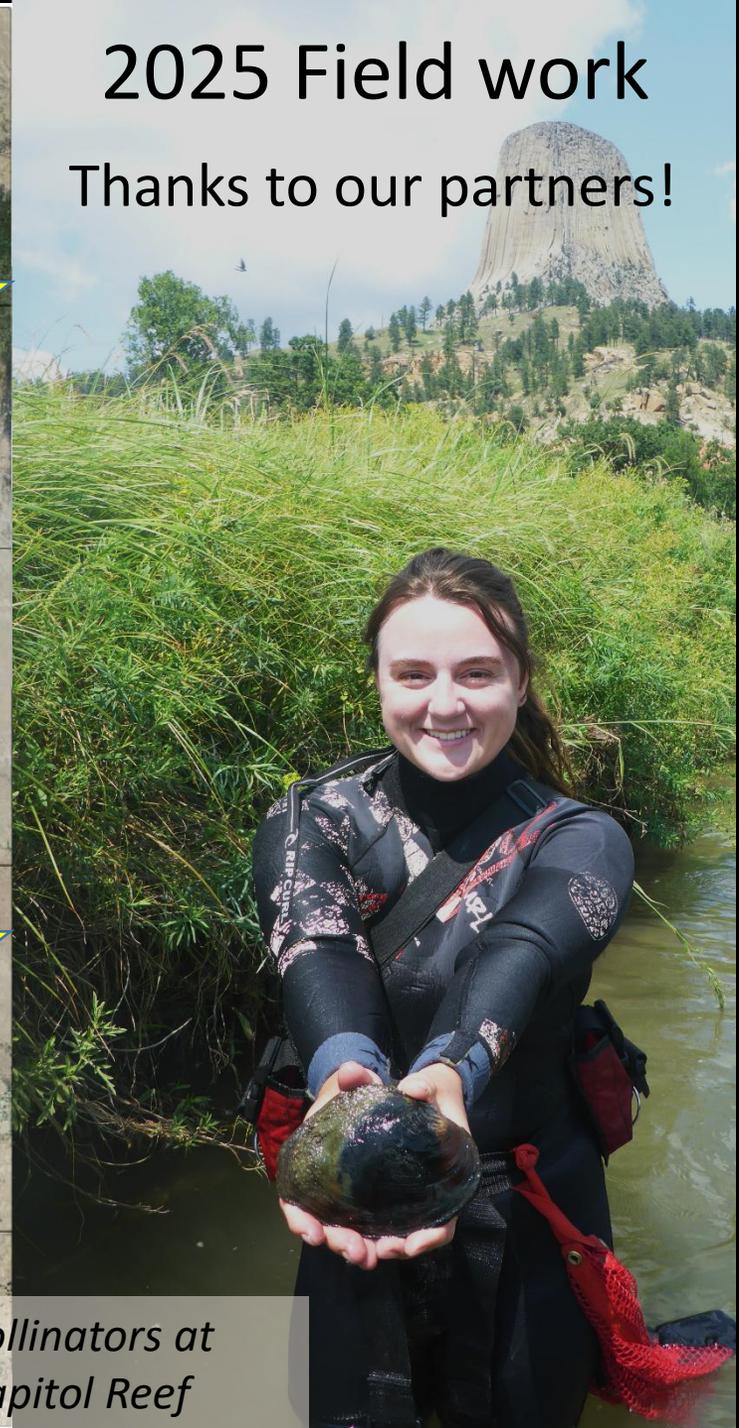
Miles Milbrath  
MS student



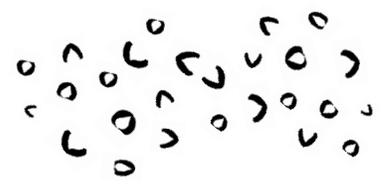
Samantha Poratti  
Graduated



2025 Field work  
Thanks to our partners!



**Total mussels observed:**  
*California floater* 179  
*Western pearlshell* 1378



**EXPECTED** (solid line)  
**OBSERVED** (dashed line)

**75,000 to 3 million**  
 glochidia released per adult  
 Source: Kat 1984

<i>California floater</i>	<i>Western pearlshell</i>
0 to 9,000 glochidia	0 to 68,000 glochidia
1 m	1 m

**0-90%**  
 glochidia survive  
 Source: Cope et al. 2008

**0.007%** attachment success rate  
 Source: Jansen & Hanson 1990

**50%**  
 assumed female

**Dispersing glochidia**

0 to 17 glochidia
1 m

**Adult mussels**



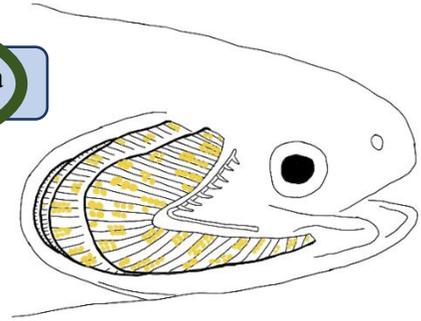
≤4 adult mussels
1 m

<i>California floater</i>	0.22 mussels
1 m	
<i>Western pearlshell</i>	0.40 mussels
1 m	

**OBSERVED**

**Encysted glochidia**

0 to 12 glochidia on fish
1 m



≤5 glochidia on fish
1 m

**98%**  
 suitable substrate in Bear River

**90%**  
 juveniles survive to the adult stage  
 Source: Vilella et al. 2004

**Juvenile mussels**

≤4 juveniles
1 m



**5 - 81%** glochidia on fish metamorphose into juveniles  
 Source: Jansen & Hanson 1990; Skorupa et al. 2022

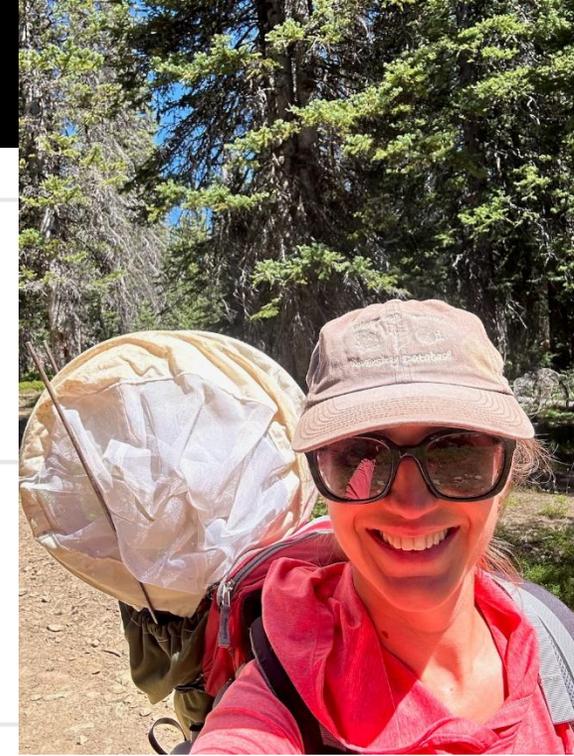
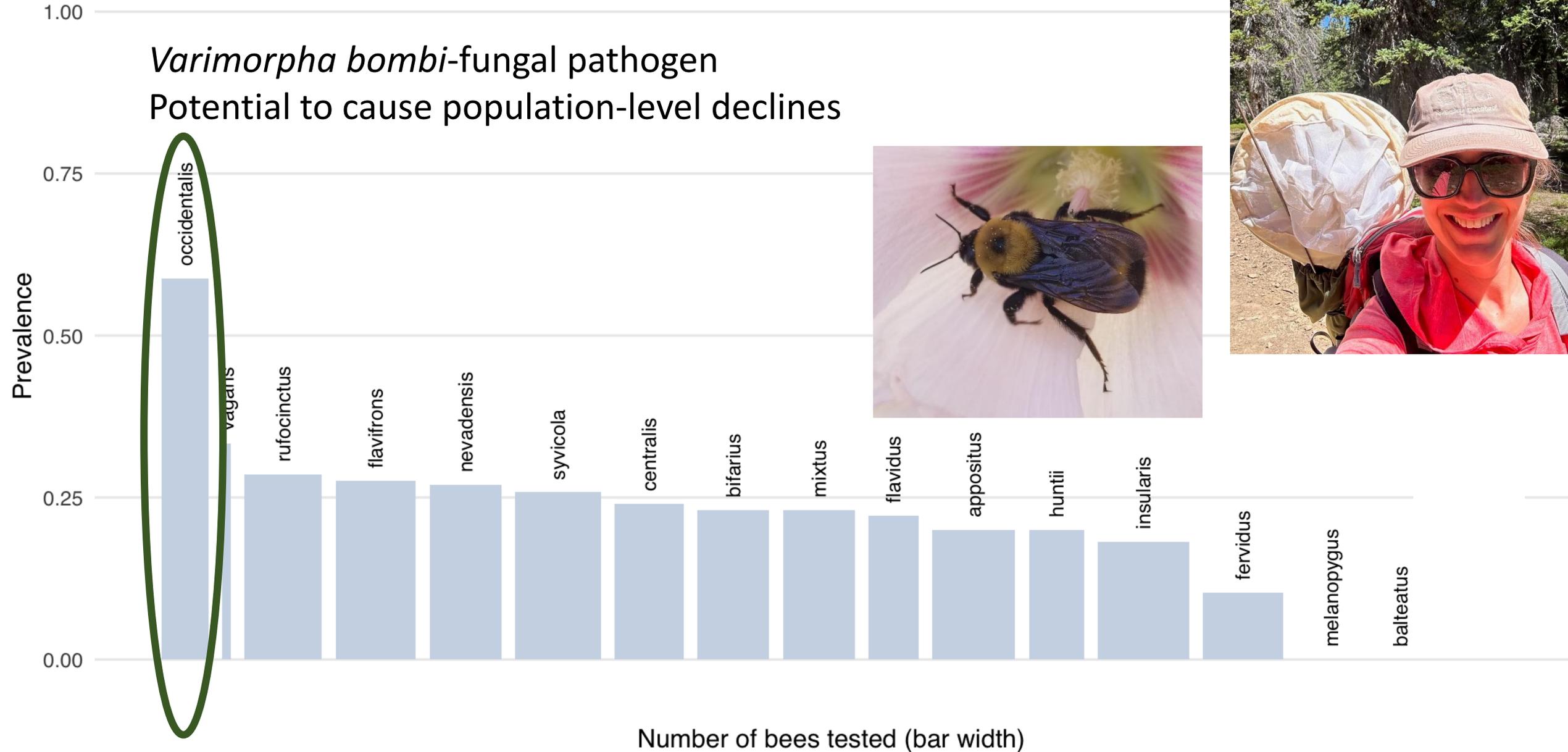
**EXPECTED**



Measured each life stage of California Floater and Western Pearlshell in Bear River

# Pathogens in Wyoming Bumble Bees

*Varimorpha bombi*-fungal pathogen  
Potential to cause population-level declines



# UWYO

Volume 27, Number 2, Winter 2026

The Magazine for Alumni and Friends of the University of Wyoming

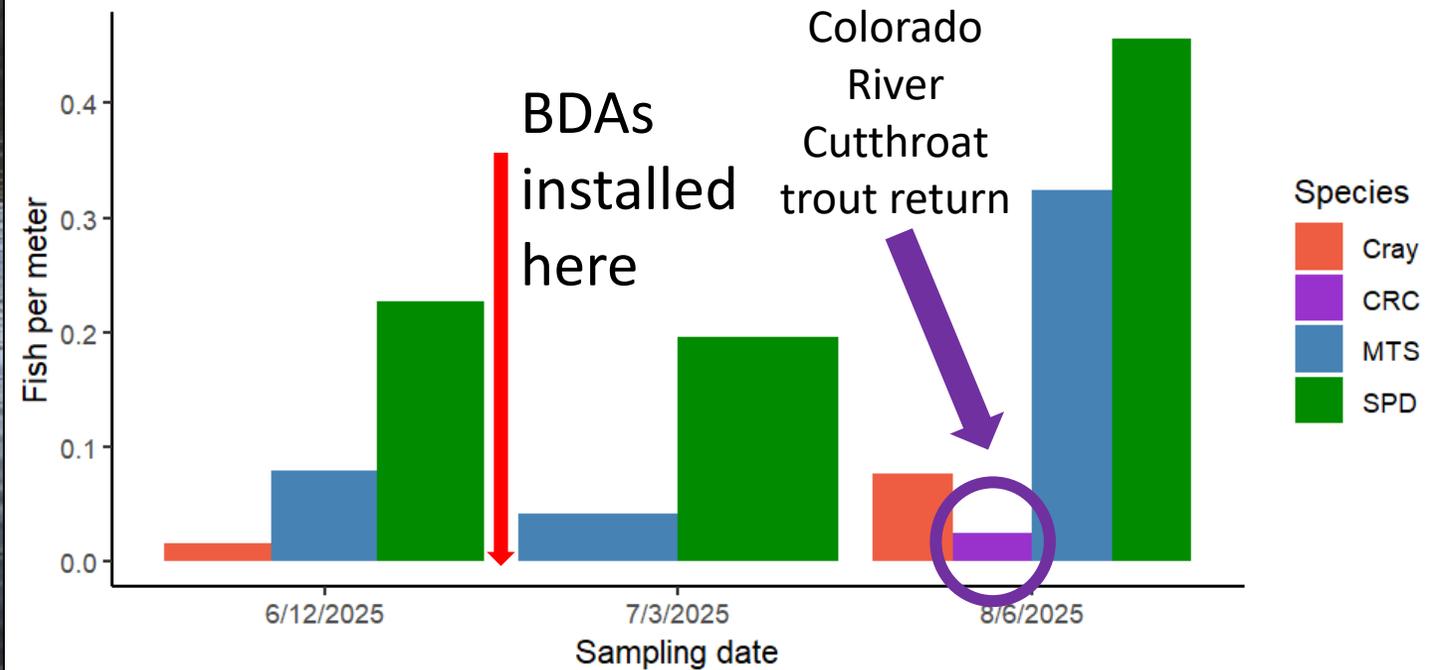


## LEARNING THROUGH EXPERIENCE

UW TAKES HANDS-ON LEARNING TO THE NEXT LEVEL



## Beaver dam analogs





# Habitat Associations, Habitat Selection and Long-Term Monitoring of Land Snails: Quantifying Measurements to Better Detect Trends

Lusha M. Tronstad<sup>1,2,3\*</sup>, Katrina A. Cook<sup>1</sup> and Bryan P. Tronstad<sup>1</sup>

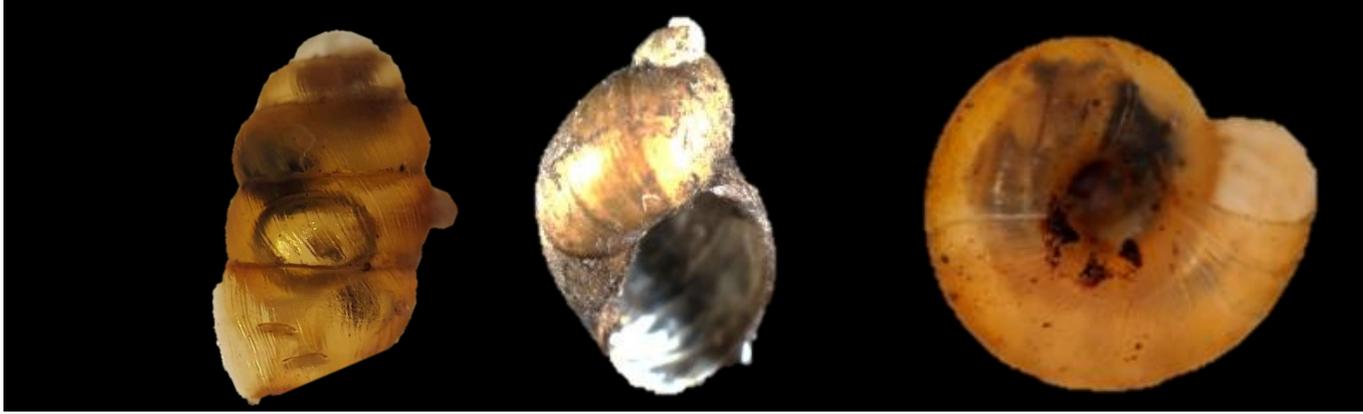
<sup>1</sup> Wyoming Natural Diversity Database, University of Wyoming, Laramie, WY 82071, USA

<sup>2</sup> Department of Zoology and Physiology, University of Wyoming, Laramie, WY 82071, USA

<sup>3</sup> Program in Ecology and Evolution, University of Wyoming, Laramie, WY 82071, USA

\* Author to whom correspondence should be addressed.

*Environments* 2026, 13(2), 89; <https://doi.org/10.3390/environments13020089>



## Land snails of Black Hills, Wyoming and South Dakota, USA



Monitoring since 1990

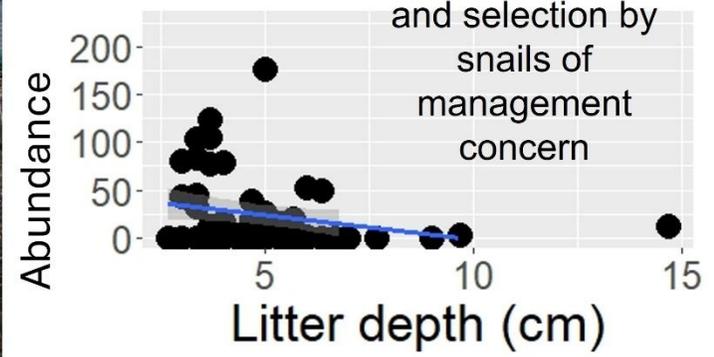
Black Hills, USA



Combined litter samples and visual encounter surveys best detected small to large snails

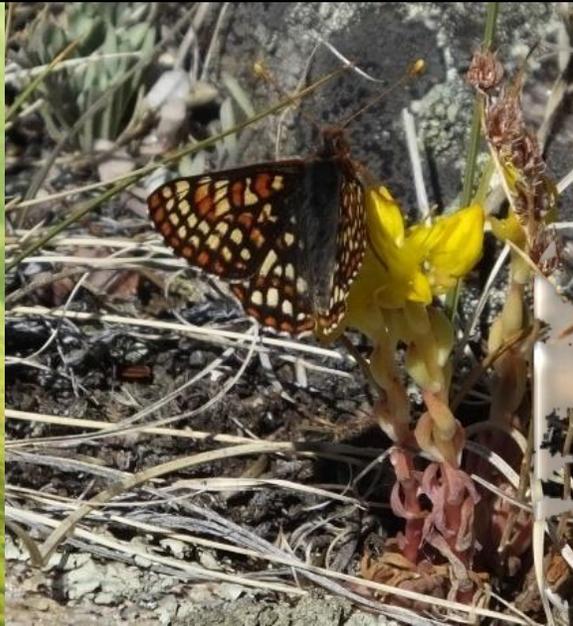


Habitat associations and selection by snails of management concern



# Want to hear more?

- For more information, please attend the
  - Aquatic Ecology session at 1 pm today
  - Pollinators and Land Snail session at 3 pm today
- Provide feedback on priorities

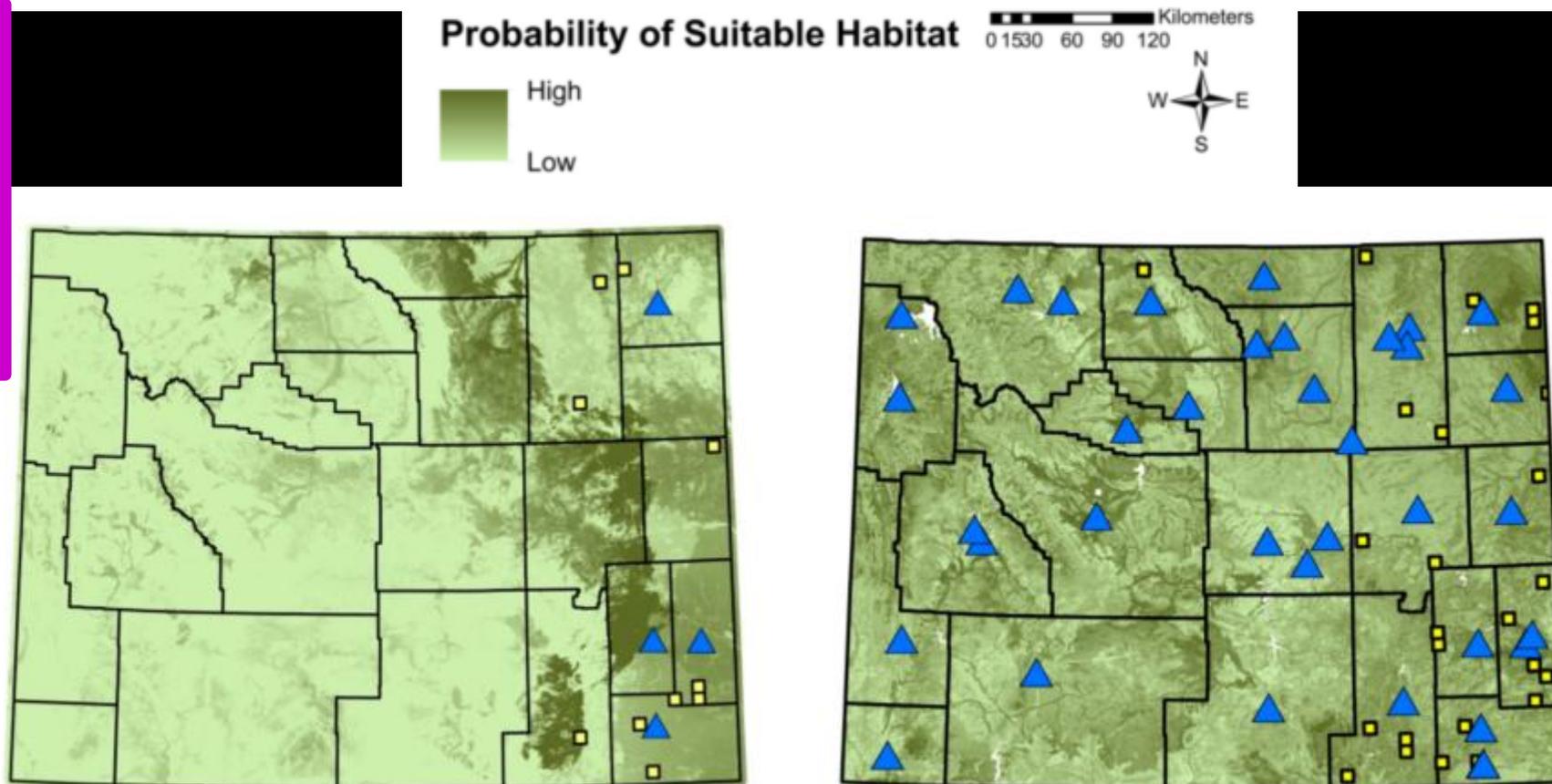


# Publications highlights in 2025

Article

## Filling in the Gaps: Working in Un-Surveyed Areas to Create Baseline Data, Habitat Use and Abundance Estimates for Butterflies in Eastern Wyoming, USA

Lusha M. Tronstad \*<sup>1</sup>, Madison Mazur, Zoë Short and Christine Bell

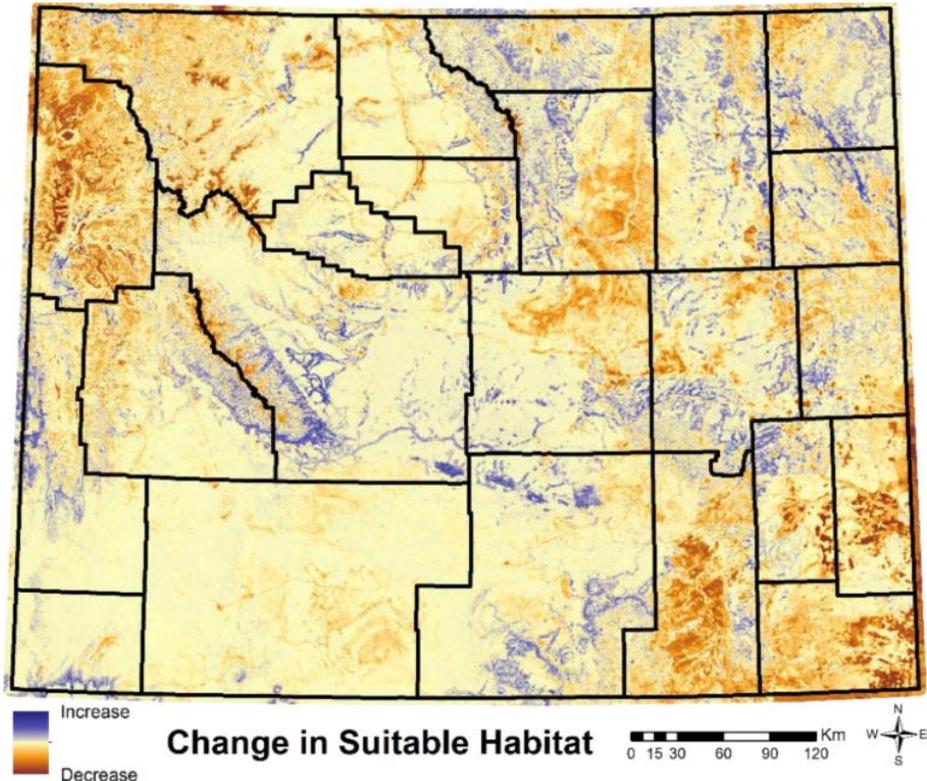


# Publications Highlights in 2025

Article

## Using Species Distribution Models to Assess the Status of the Declining Western Bumble Bee (*Hymenoptera: Apidae: Bombus occidentalis*) in Wyoming, USA

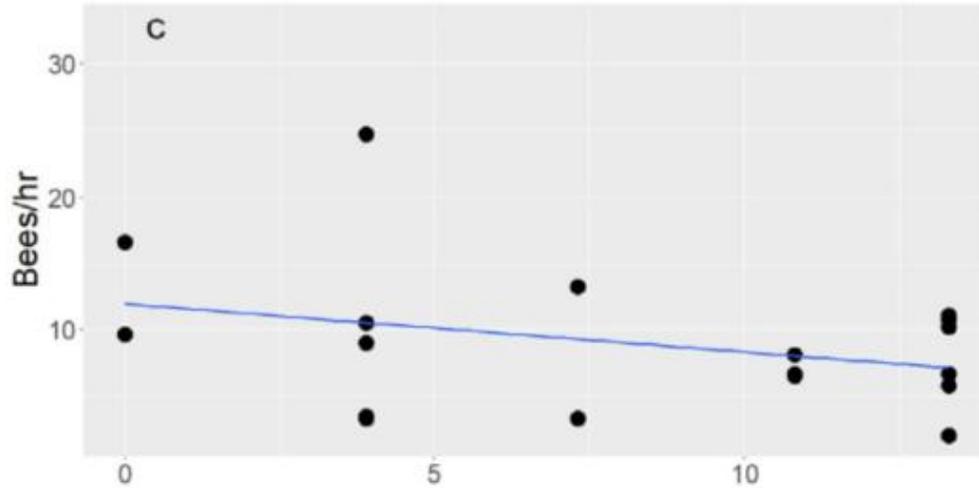
Lusha M. Tronstad <sup>\*</sup>, Christine Bell, Katrina Cook and Michael E. Dillon 



Article

# Infrasound-Altered Pollination in a Common Western North American Plant: Evidence from Wind Turbines and Railways

Lusha M. Tronstad <sup>1,2,3,\*</sup> , Madison Mazur <sup>1,2</sup>, Lauren Thelen-Wade <sup>1</sup>, Delina Dority <sup>1,2</sup>, Alexis Lester <sup>1,2</sup>, Michelle Weschler <sup>1,2</sup>  and Michael E. Dillon <sup>2,3</sup> 



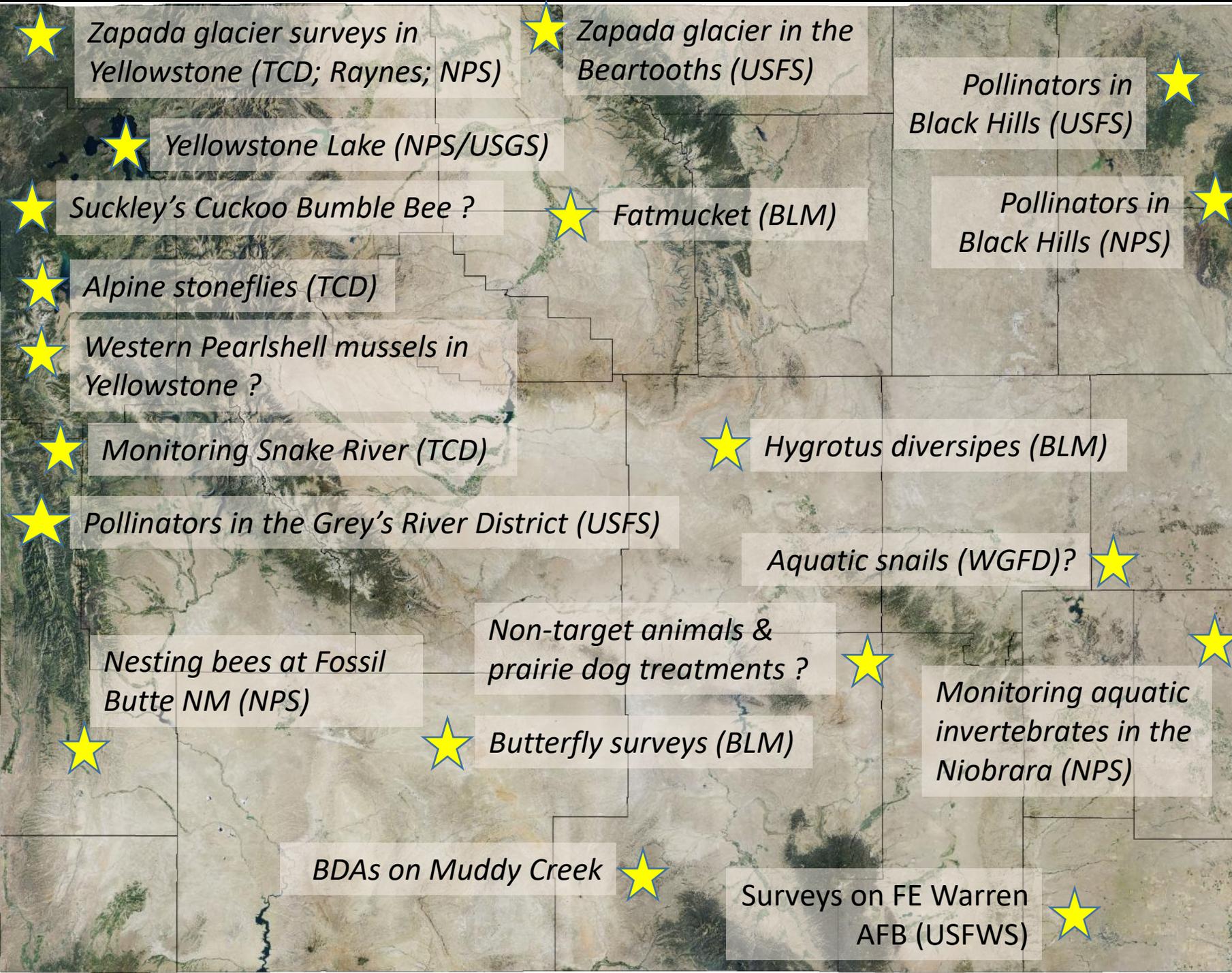
Publications  
Highlights in  
2025



Article

# Vibrations from Wind Turbines Increased Self-Pollination of Native Forbs, and White Bases Attracted Pollinators: Evidence Along a 28 km Gradient in a Natural Area

Lusha M. Tronstad <sup>1,2,3,\*</sup> , Michelle Weschler <sup>1,2</sup> , Amy Marie Storey <sup>1,2</sup>, Joy Handley <sup>1</sup>  and Bryan P. Tronstad <sup>1</sup>



# Core Products

## Invertebrates in the database

- 6992 species and 3573 genera in database
- 268,330 records in database
- Adding new records frequently
- Developing methods to rank large groups



# Exciting observations

- *Trachusa zebrata*
  - 1959 - Glendo
  - 1974 - Wheatland
- Not observed for 51 years!
- Only WY species in genus
- Observed in Cheyenne at the base



Trachusa zebrata female

# Exciting observations

- *Augochloropsis sumptuosa*
  - 1965-near Torrington
  - Not observed for 59 years!
  - 2024- Near Casper



Augochloropsis  
sumptuosa

Exciting  
observations

*Northeastern WY*



*First genus observation in WY*

Xenoglossa  
albata female

# Exciting observations

- Two-spotted bumble bee
- *Bombus bimaculatus*
- 26<sup>th</sup> bumble bee species in WY
- Common eastern species
- Cheyenne





# Invertebrate Collection

- New room for collection!
- Clean space to store specimens
- Pursuing NPS repository status
- Digitizing pollinators of Greater Yellowstone Ecosystem
- Collections critical for:
  - Comparisons with past
  - Update taxonomy
  - Continued studies (DNA, pollen, morphology, etc.)
- Learn more in the pollinator session

Contact me with  
questions about  
Wyoming invertebrates

Lusha Tronstad  
tronstad@uwyo.edu

307-766-3115

