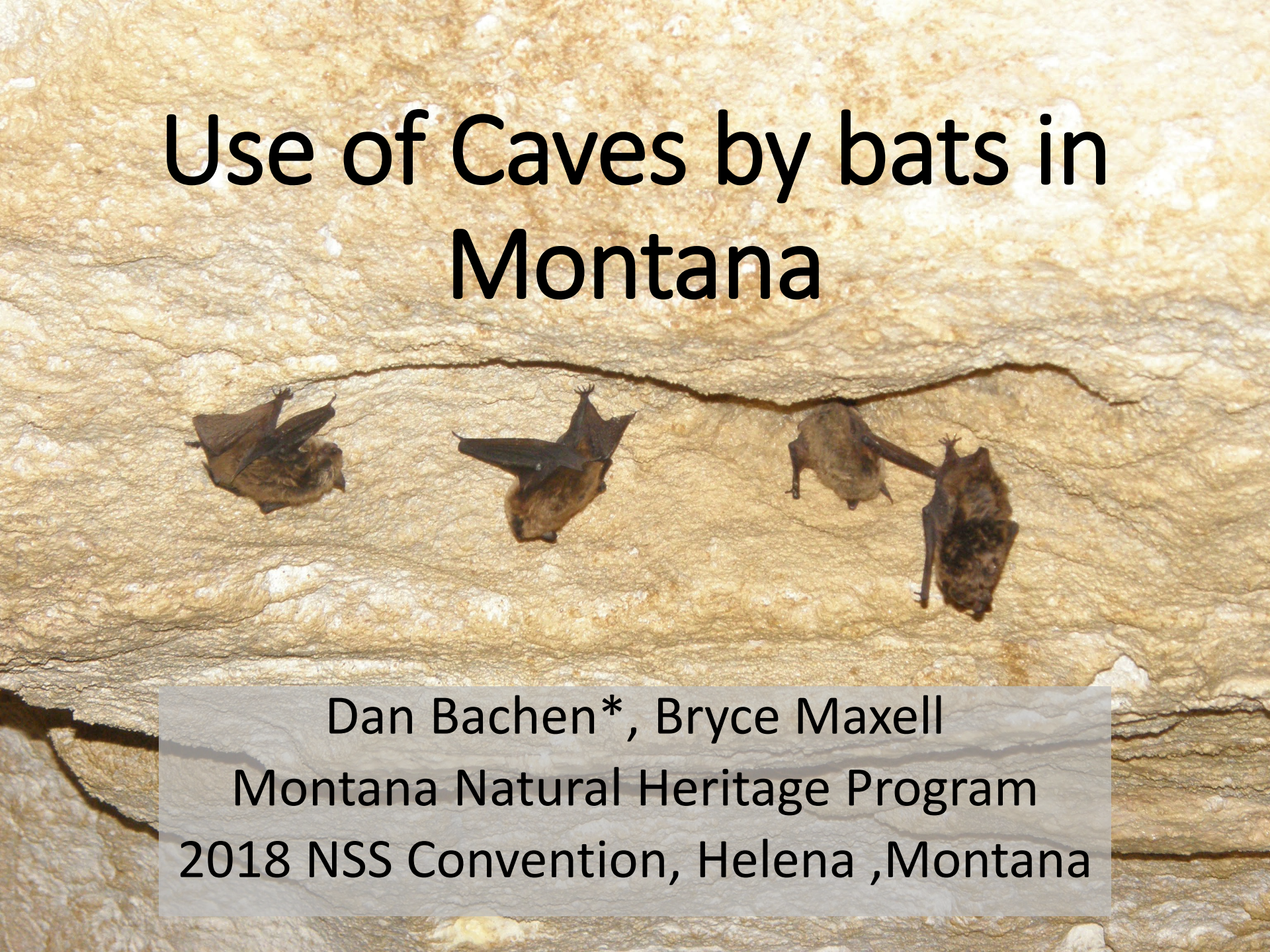
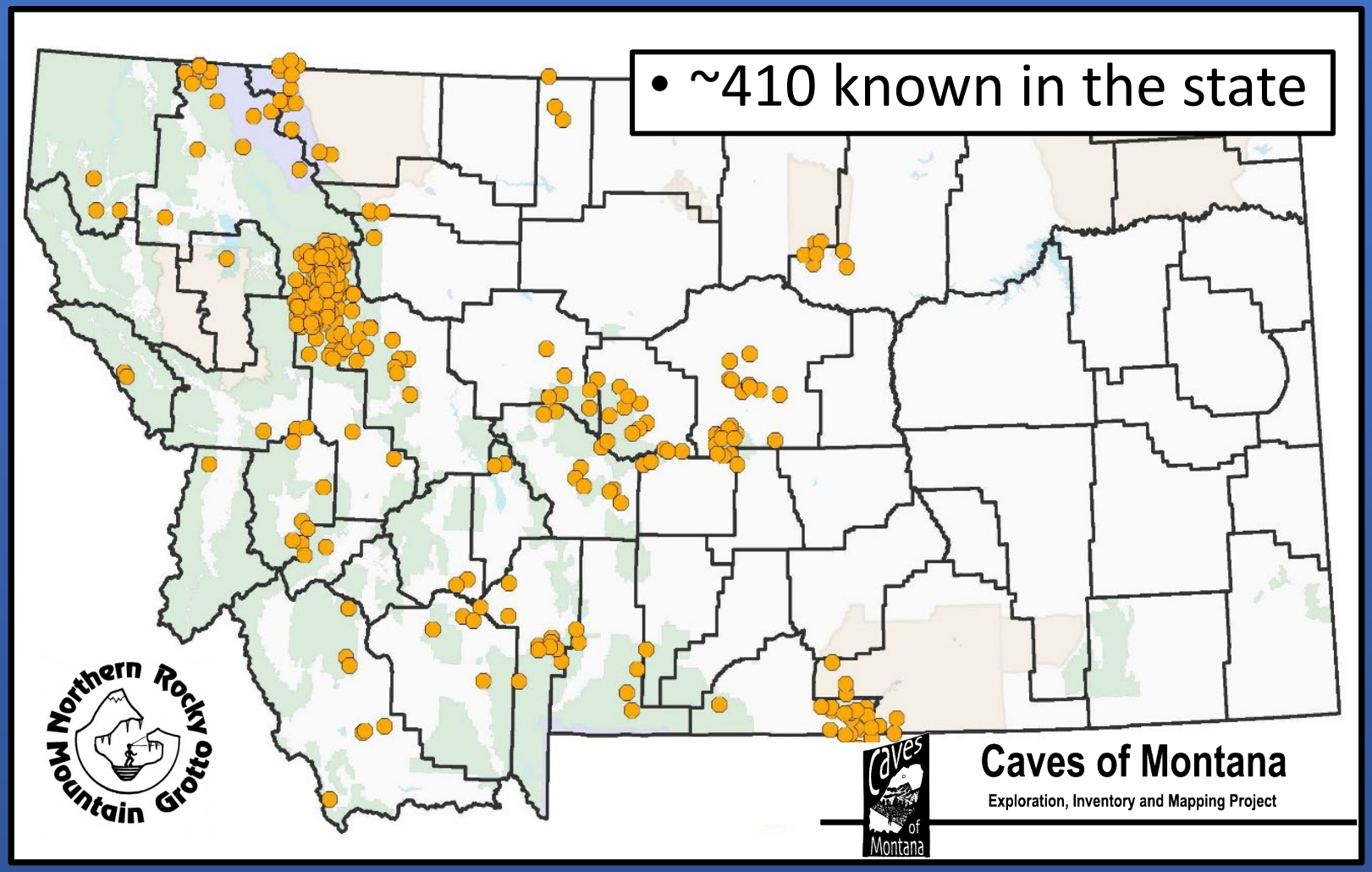
Use of Caves by bats in Montana



Dan Bachen*, Bryce Maxell
Montana Natural Heritage Program
2018 NSS Convention, Helena ,Montana

Overview of Montana's caves

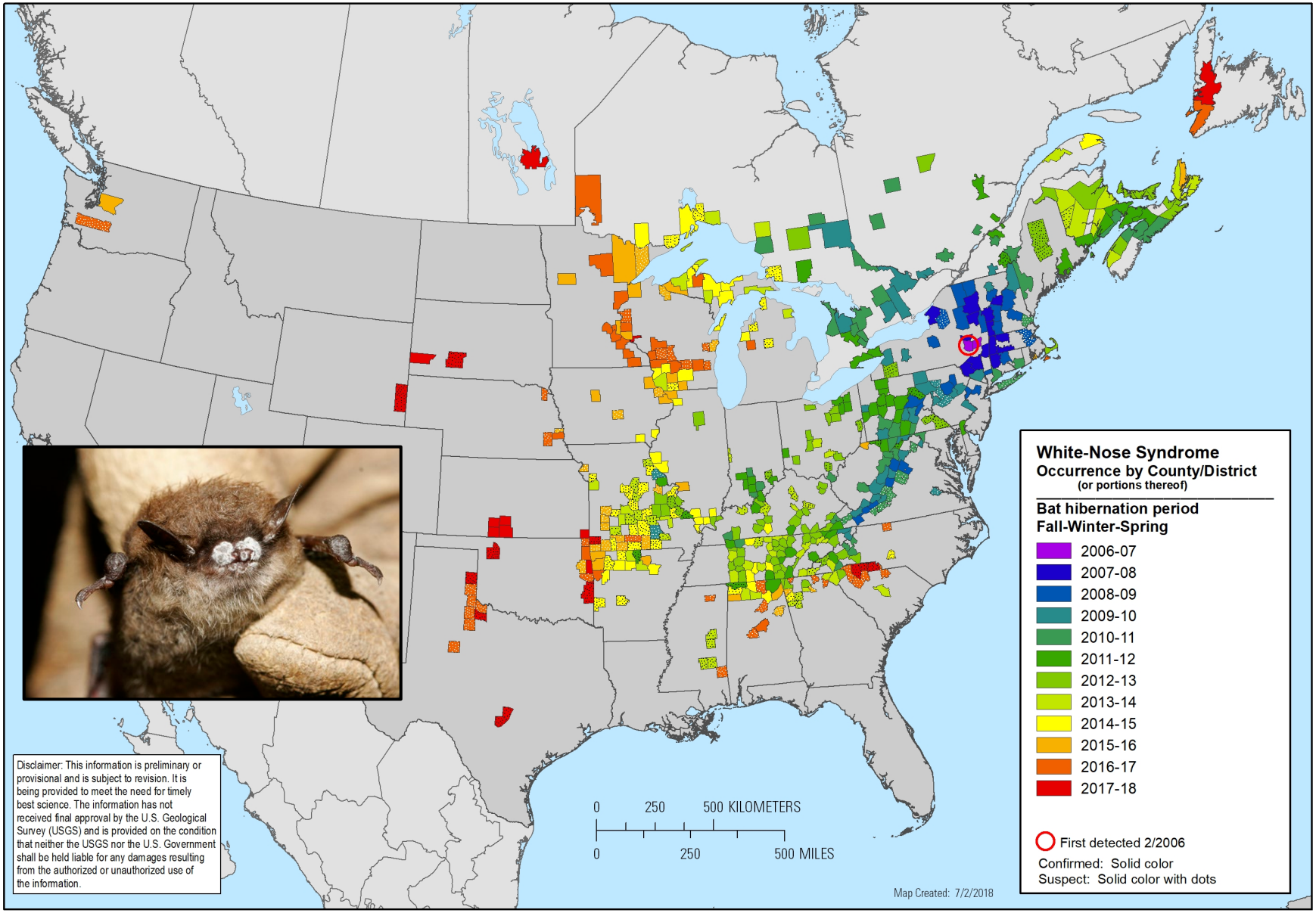


Bats in Montana

- 15 Species in MT
- 11 though to remain in state over winter
- Hibernacula largely unknown

Bats and caves

- Prior to the 2010's we knew very little about how bats were using caves in our region
  - Caves of Montana (Campbell 1978)
  - Few larger caves known to state and federal land managers
  - Data on 25 caves



Citation: White-nose syndrome occurrence map - by year (2018). Data Last Updated: 7/2/2018. Available at: https://www.whitenosesyndrome.org/resources/map.

Goals

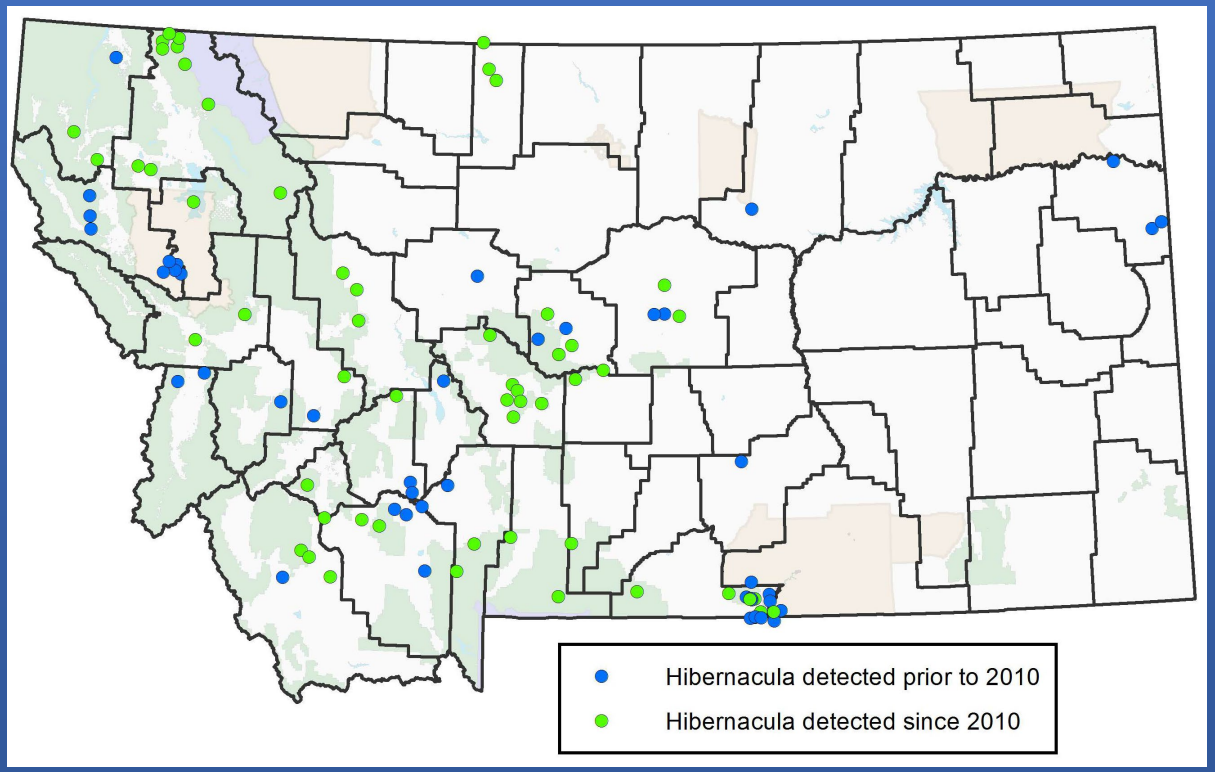
- Assess bat use
  - Numbers
  - Use across year
- Assess climate to determine Pd viability
- Provide baseline data to assess populations (pre-WNS)
- Data to inform management of MT's caves and bats

Methods

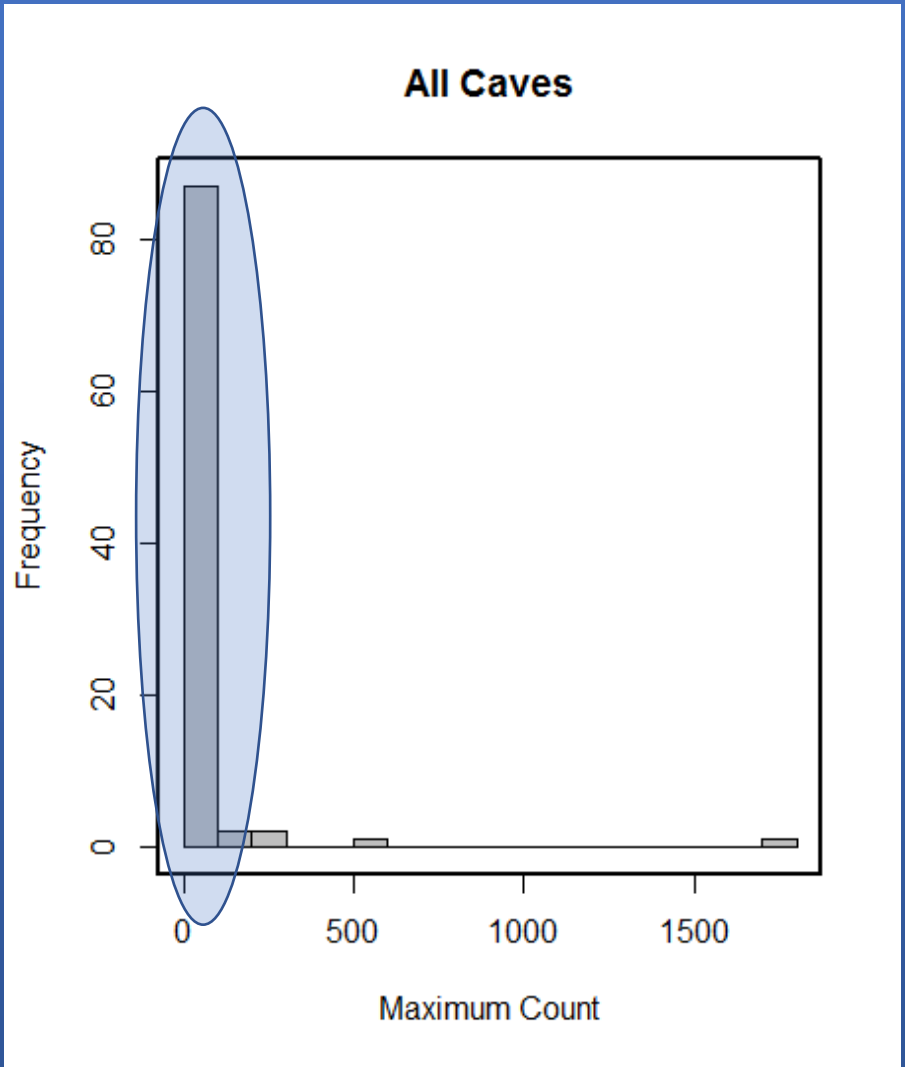
- Partnership with:
  - Northern Rocky Mountain Grotto
  - Bigfork HS Cave Club
  - US Forest Service
  - BLM
  - MT Fish Wildlife and Parks
  - US Fish and Wildlife Service
- Identify cave locations
- Conduct surveys of potential hibernacula/ roosts
  - Formal surveys
  - Incidental surveys
- Deploy
  - Acoustic monitors
  - Temp and Humidity Monitors

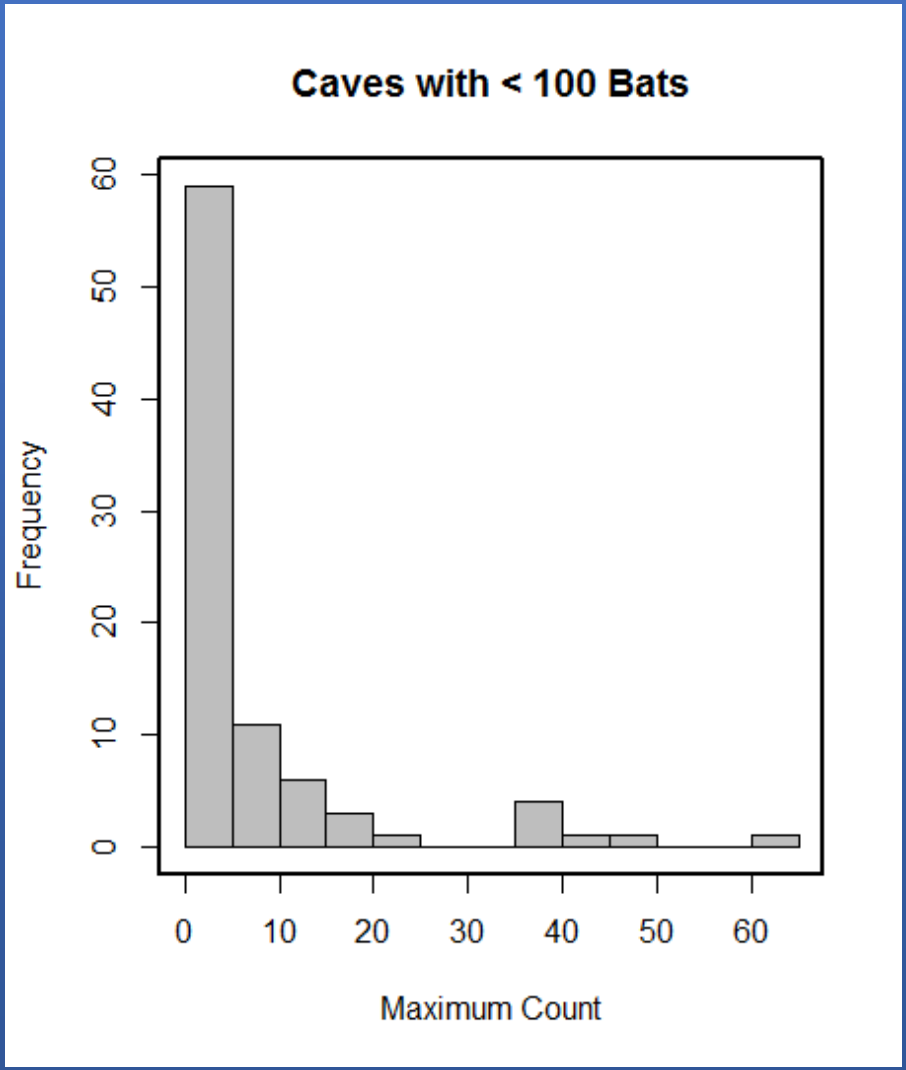
Results

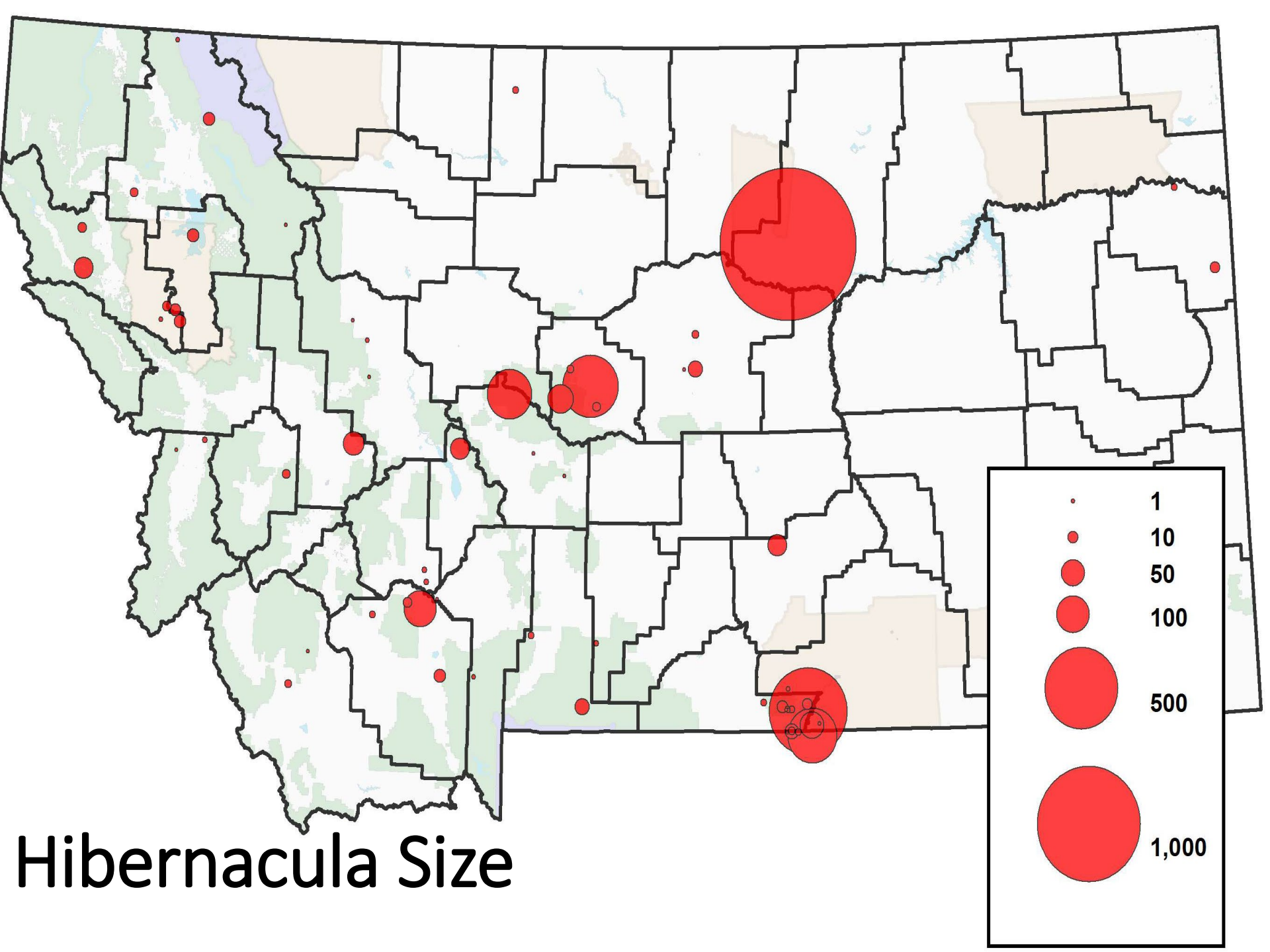
- 105 Caves surveyed (326 surveys)
- 46 hibernacula (44%)
- 23 active season roosts (21%)
- 37 no evidence of use (35%)
- Note: use statistic biased high due to survey prioritization



Hibernation counts



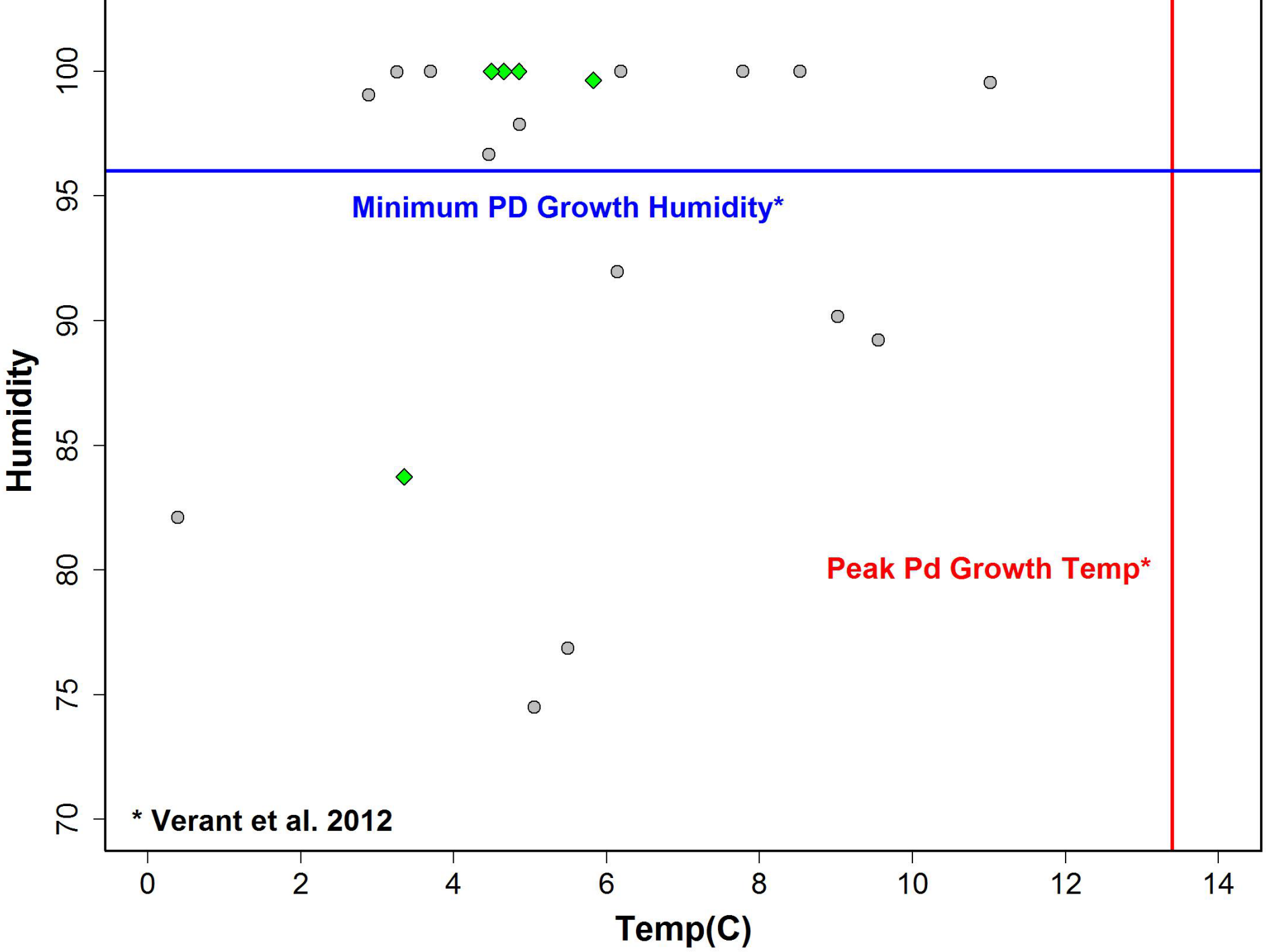


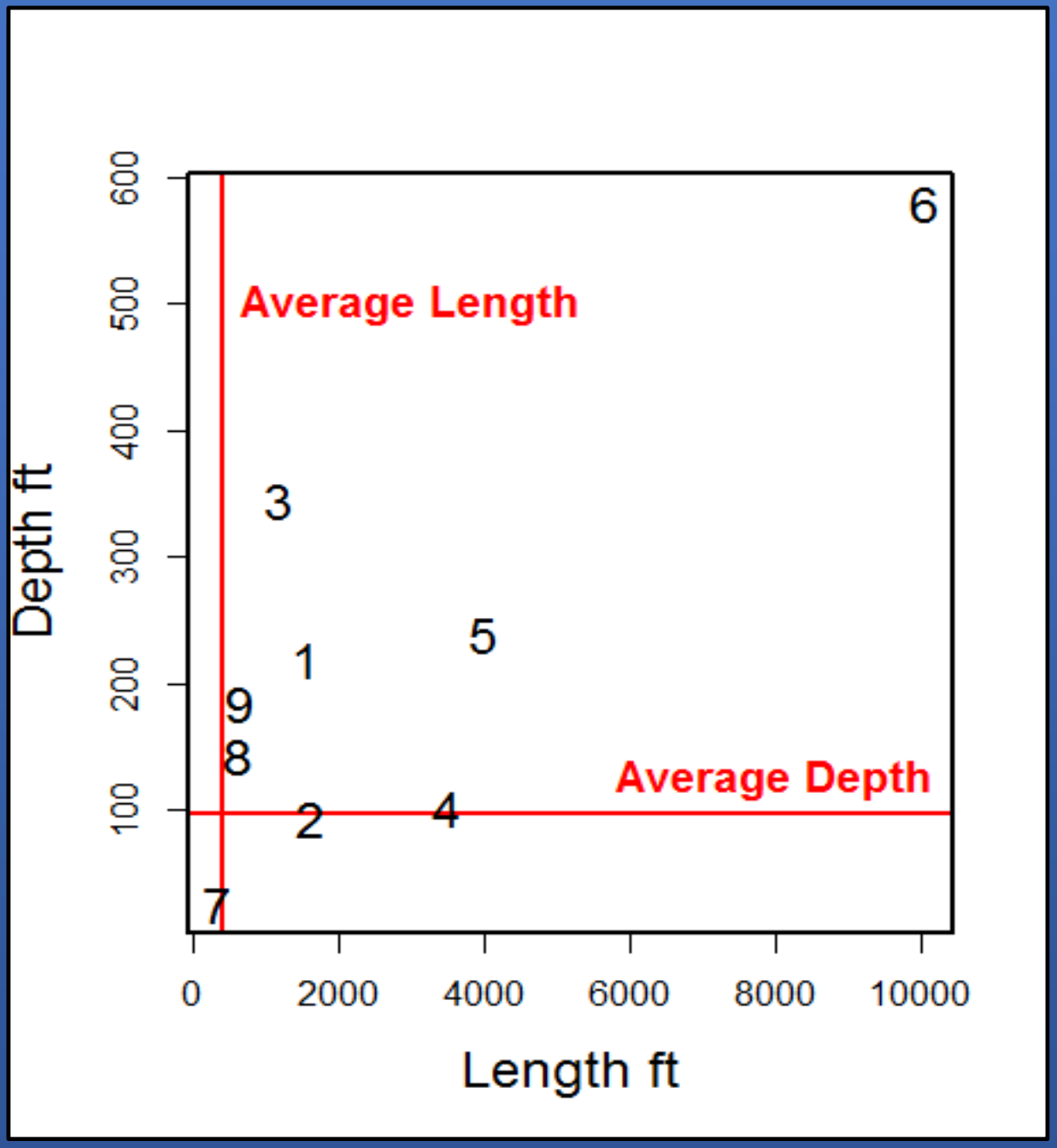


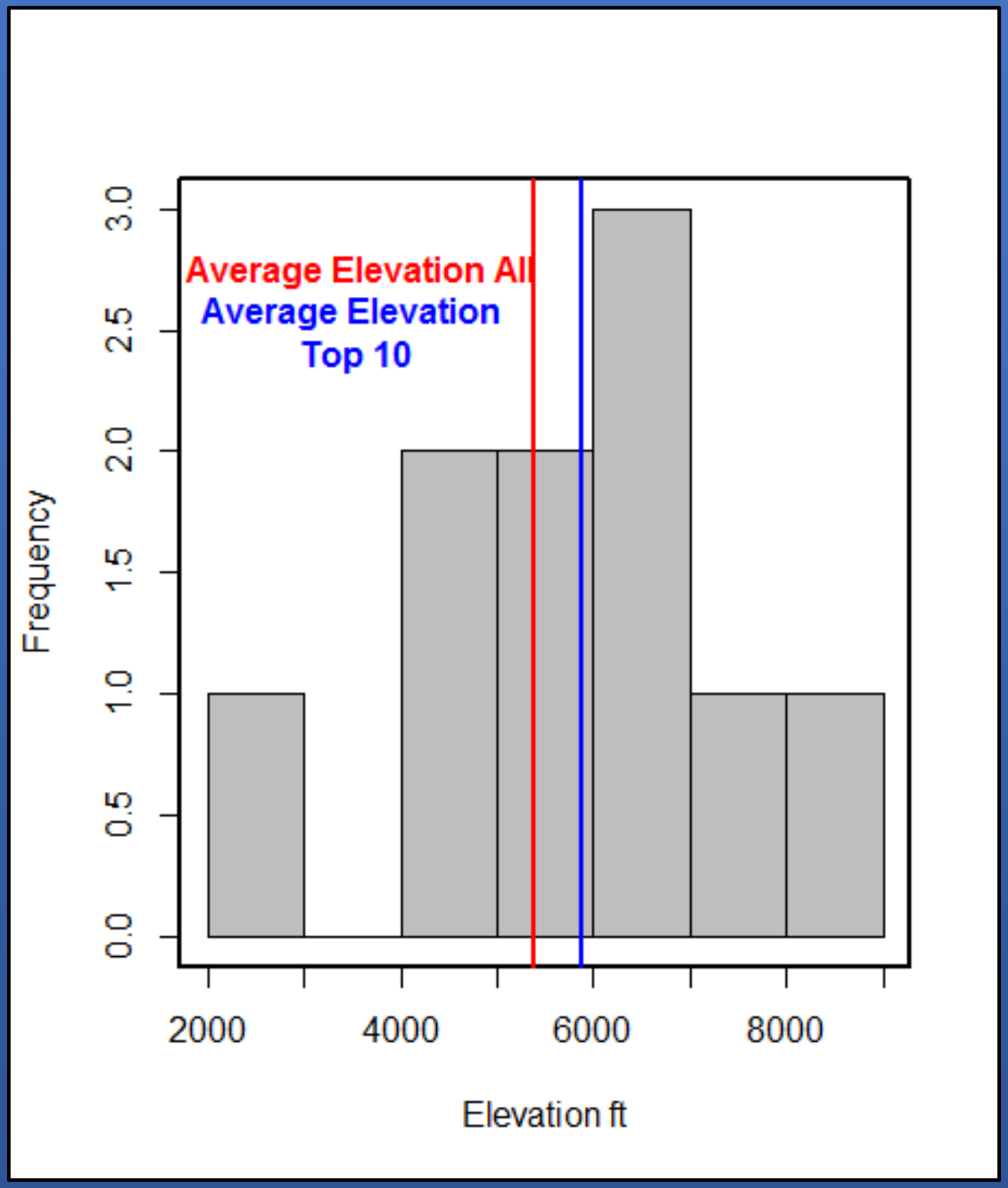
Hibernacula Size

Species using caves

1. Townsends Big-eared Bat (31 caves, 11.73 bats/count)
2. Little Brown Myotis (11 caves, 34.00 bats/count)*
    1. Biased by large hibernacula
3. Western Small-footed Myotis (11 caves, 2.86 bats/count)
4. Long-legged Myotis (6 caves, 1.4 bats/count)
5. Long-eared Myotis (5 caves, 1.17 bats/count)
6. Big Brown Bat (4 caves, 2.57 bats/count)
7. Fringed Myotis (2 caves, 1.5 bats/ count)


Humidity
100
95
90
85
80
75
70
0
2
4
6
8
10
12
14
Temp(C)
Minimum PD Growth Humidity*
Peak Pd Growth Temp*
* Verant et al. 2012

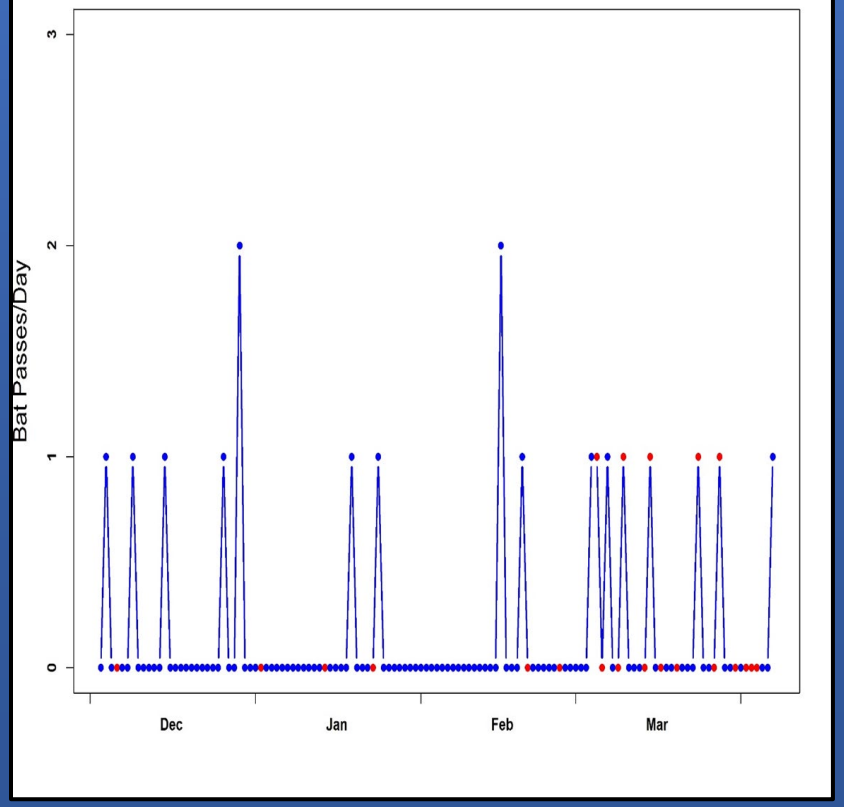

Depth ft
100
200
300
400
500
600
Average Length
Average Depth
6
3
5
1
9
8
2
4
7
0
2000
4000
6000
8000
10000
Length ft


Average Elevation All
Average Elevation
Top 10
Frequency
0.0
0.5
1.0
1.5
2.0
2.5
3.0
2000
4000
6000
8000
Elevation ft

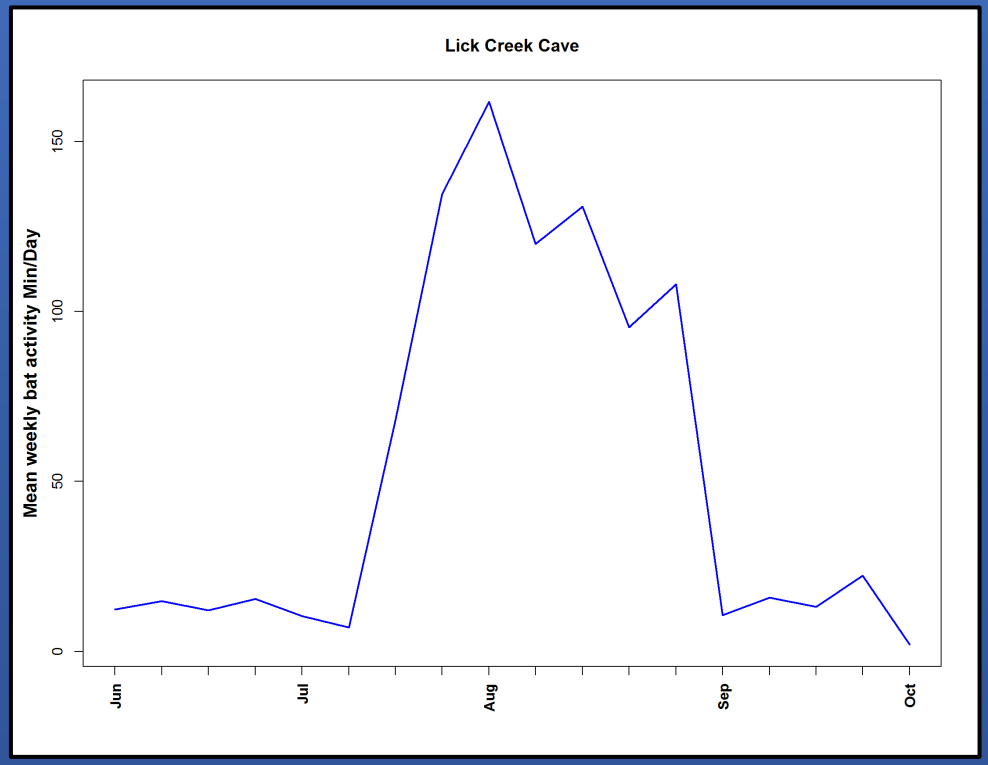
Seasonal use

- Counts at caves decrease in the summer, but recorded activity increases

Hibernation



Active Season



Summary

- Established a robust pre-WNS baseline
- WNS is possible and likely in our caves
- Most caves used by few if any individuals, but some important hibernacula
  - Most bats are hibernating elsewhere
- Geographic location most predictive
  - Weak selection for longer, deeper caves

Questions?

Thanks to our partners:

Northern Rocky Mountain Grotto

FOREST SERVICE US DEPARTMENT OF AGRICULTURE

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

U.S. FISH & WILDLIFE SERVICE

Montana Fish, Wildlife & Parks