Factors Limiting Deer Abundance in the Upper Peninsula

Winter Weather

Habitat

Predation

Deer Survival

ESF

Safari Club International
Michigan Involvement Committee

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DEPARTMENT OF NATURAL RESOURCES
DNR
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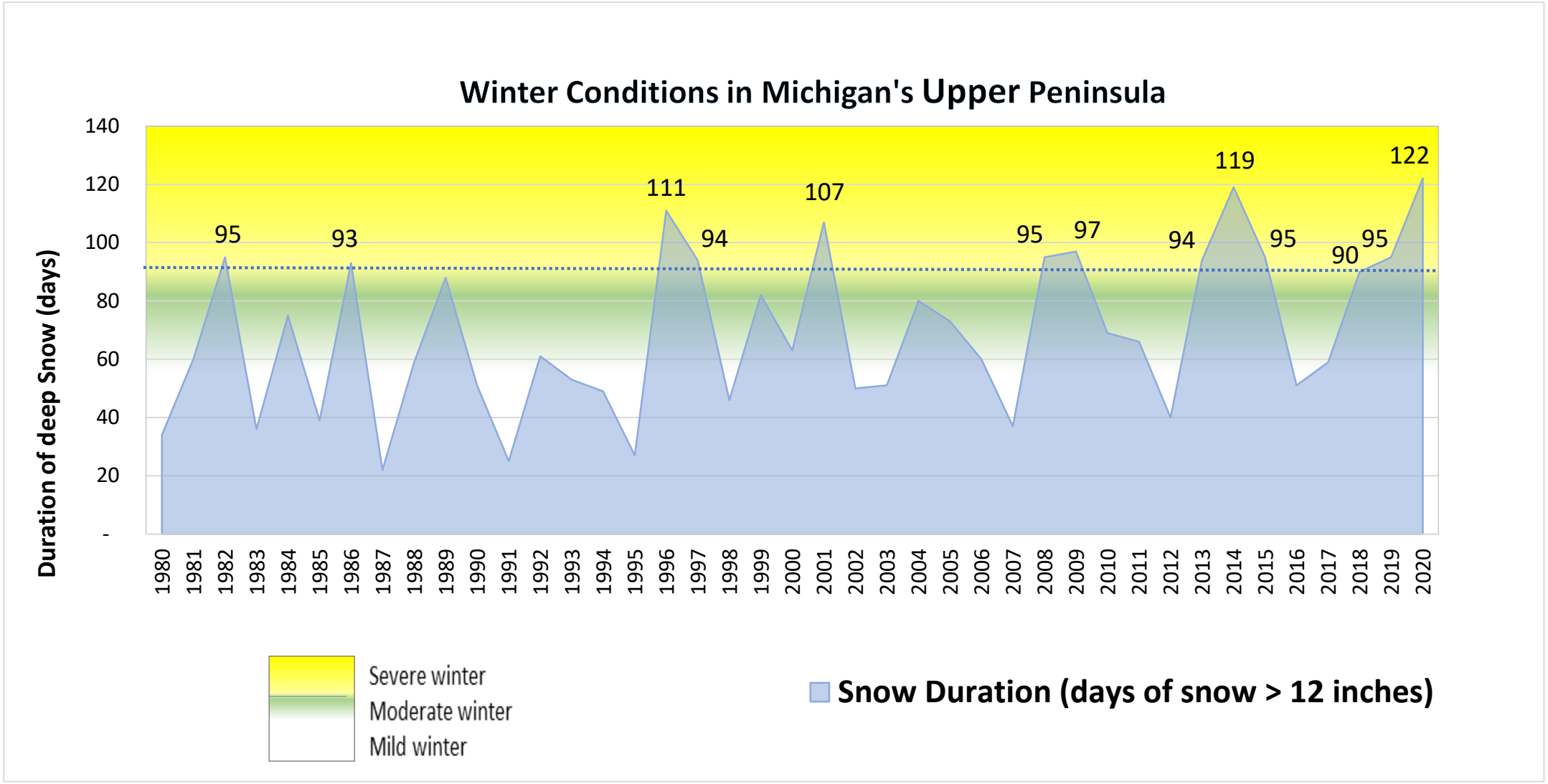
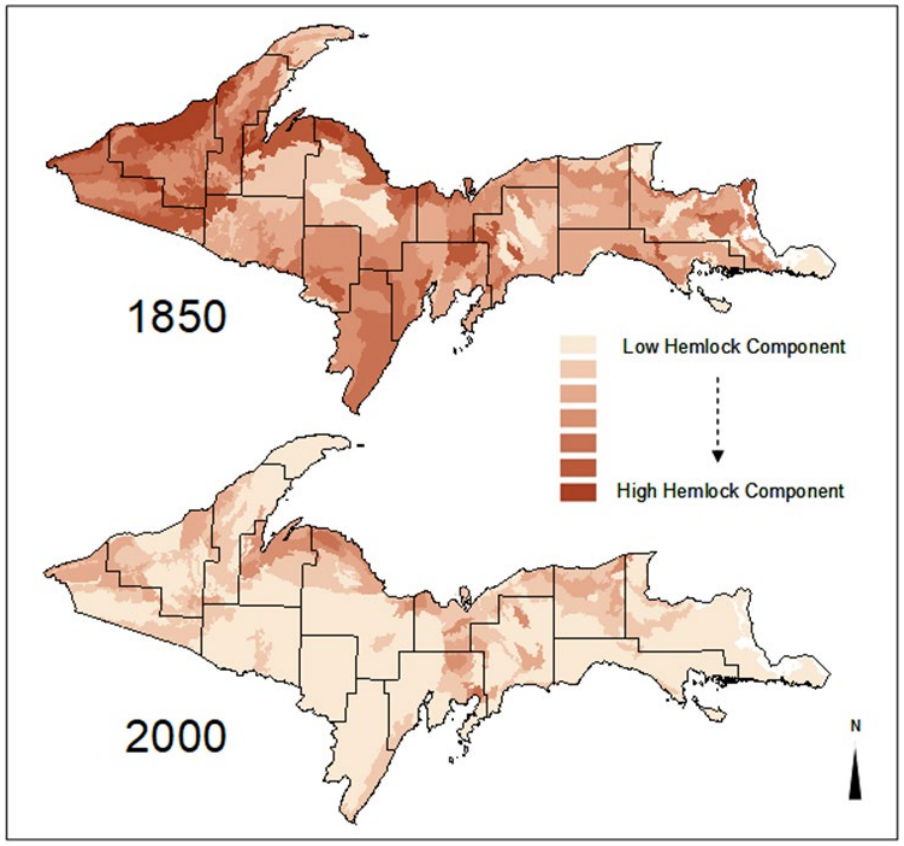
Winter Weather



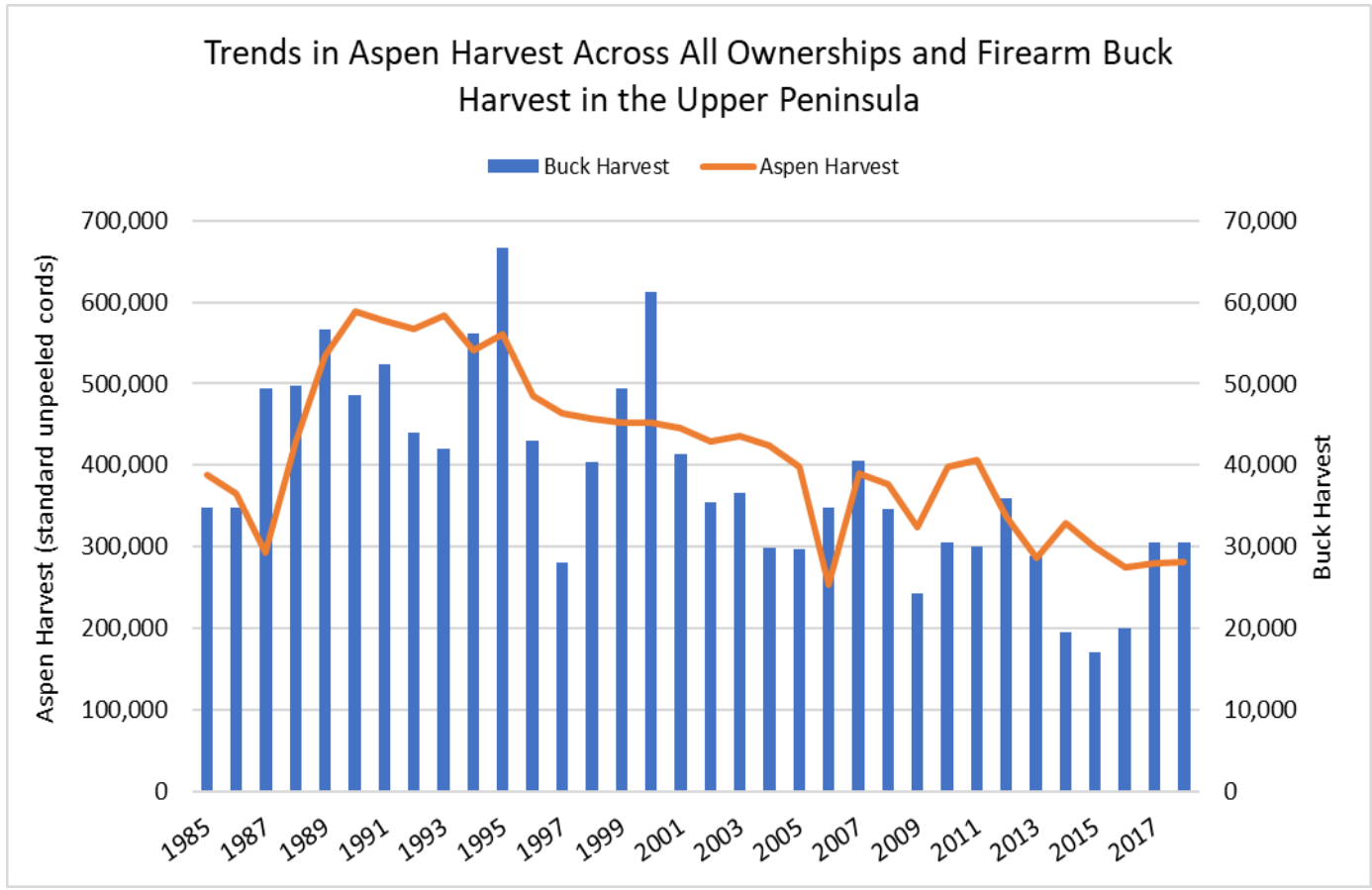
Since 1996, the Upper Peninsula experienced more than three times as many severe winters, along with two instances of back-to-back and two instances of three consecutive severe winters.

Habitat

Hemlock



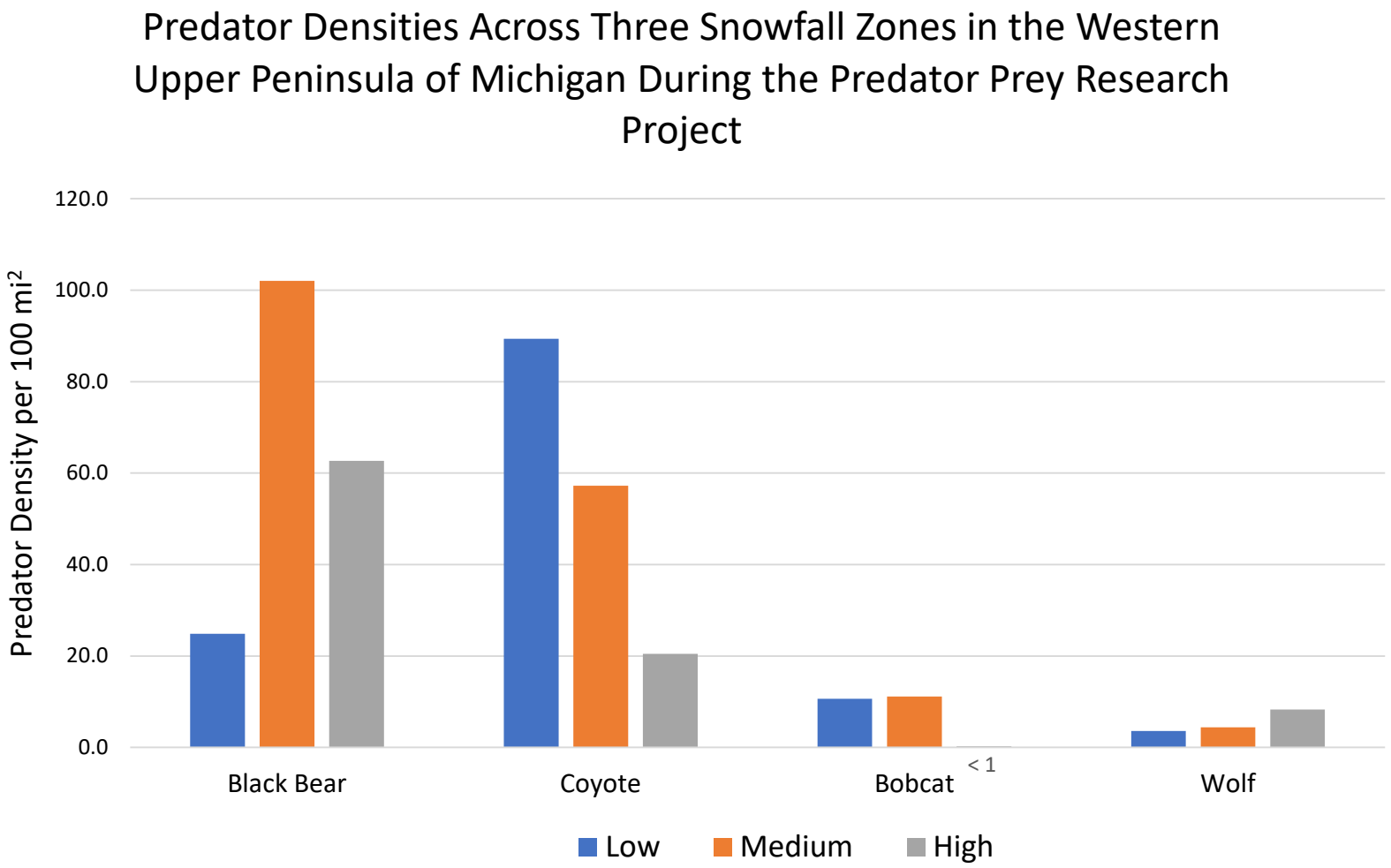
A decline of over 97%



As the aspen harvest declined following the mid-1990's, so did the number of bucks harvested. The high level of aspen harvest isn't sustainable because of the 40 to 50 year harvest rotation.

Predation

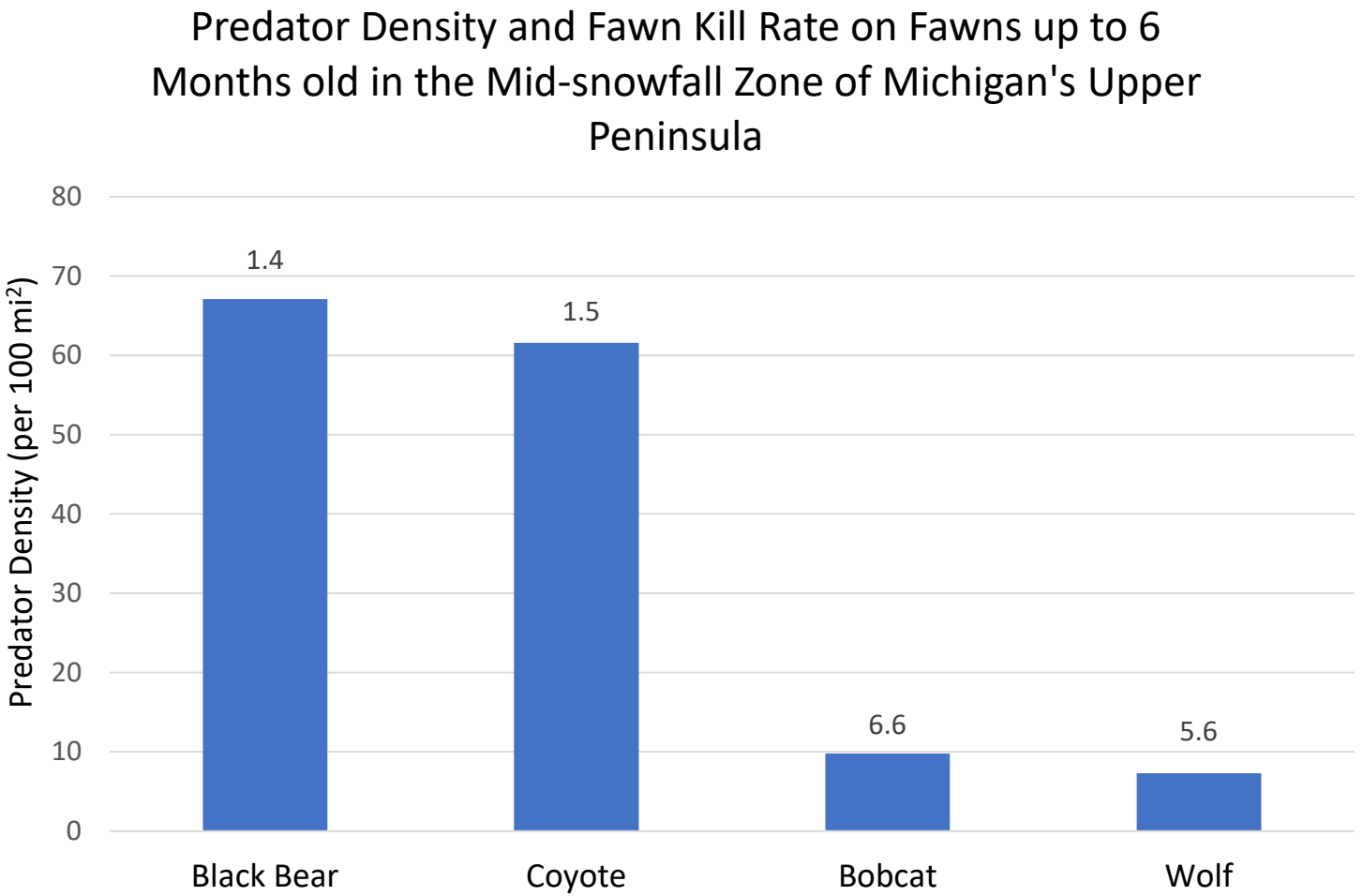
- Predator densities presented here are the number of predators per 100 square miles (mi^2)
- Black bears and coyotes are substantially more numerous than bobcats and wolves in all three snowfall zones.



Predation

- Black bears and coyotes both have lower kill rates on young fawns. However, because they are so much more abundant, the overall predation impact is greater.

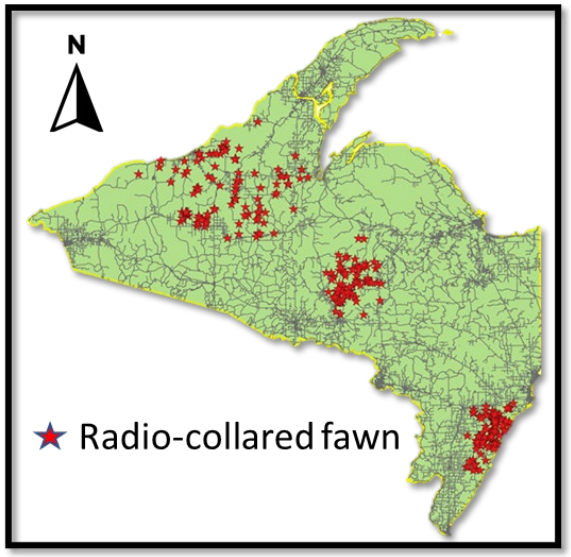
- Bobcats and wolves have higher kill rates on young fawns but because their populations are so much smaller, their overall impact is significantly less than coyotes or bears.

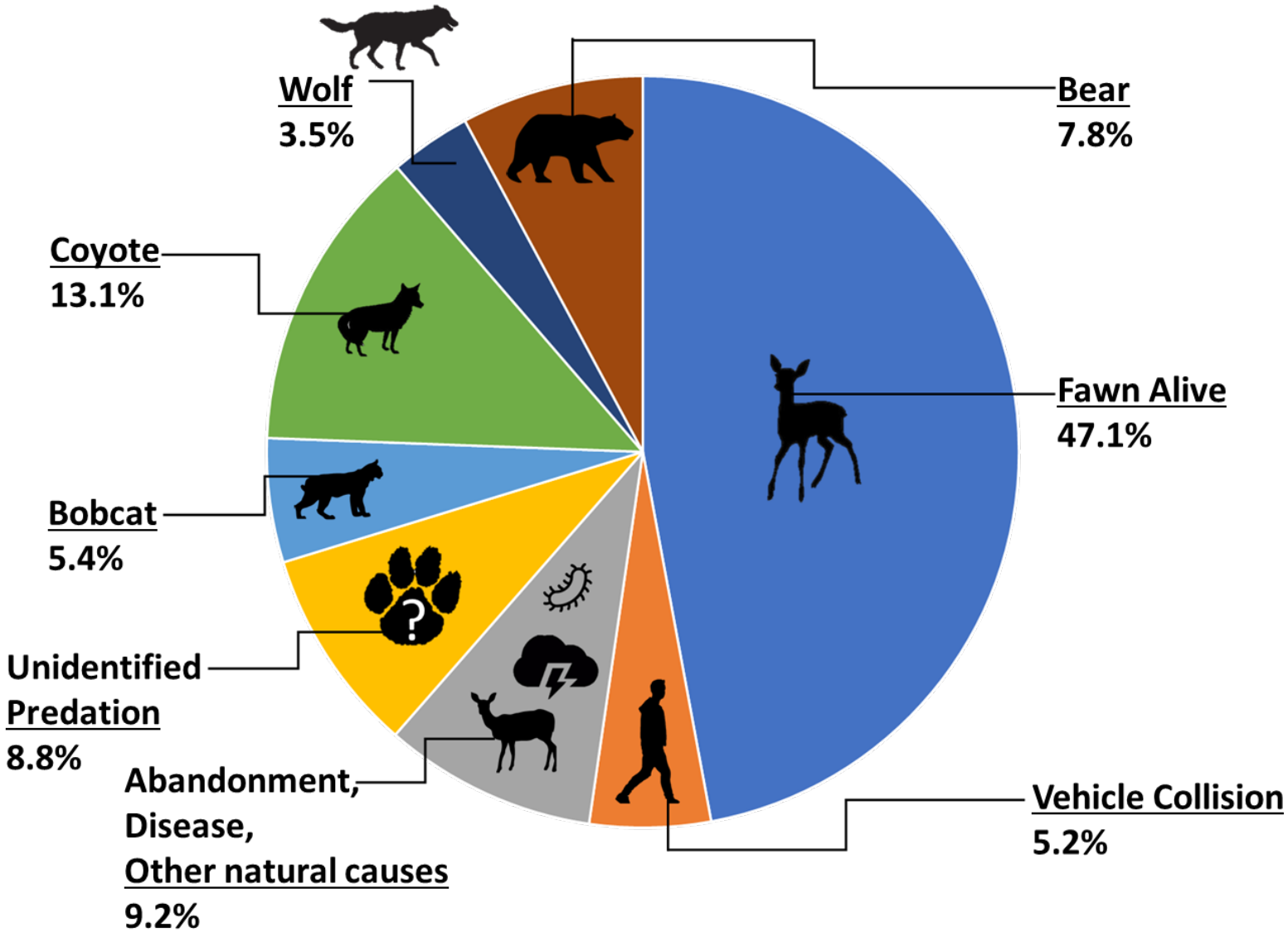


Fawn Survival

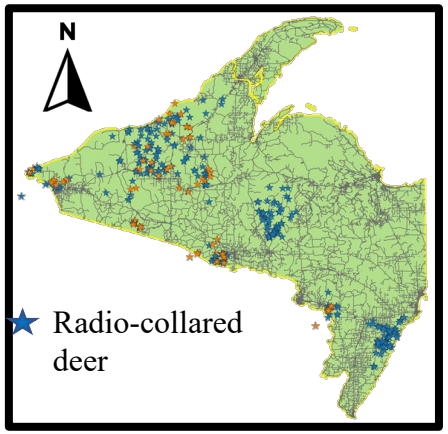
16 weeks post-birth

- 363 radio-collared fawns
- 166 mortality events

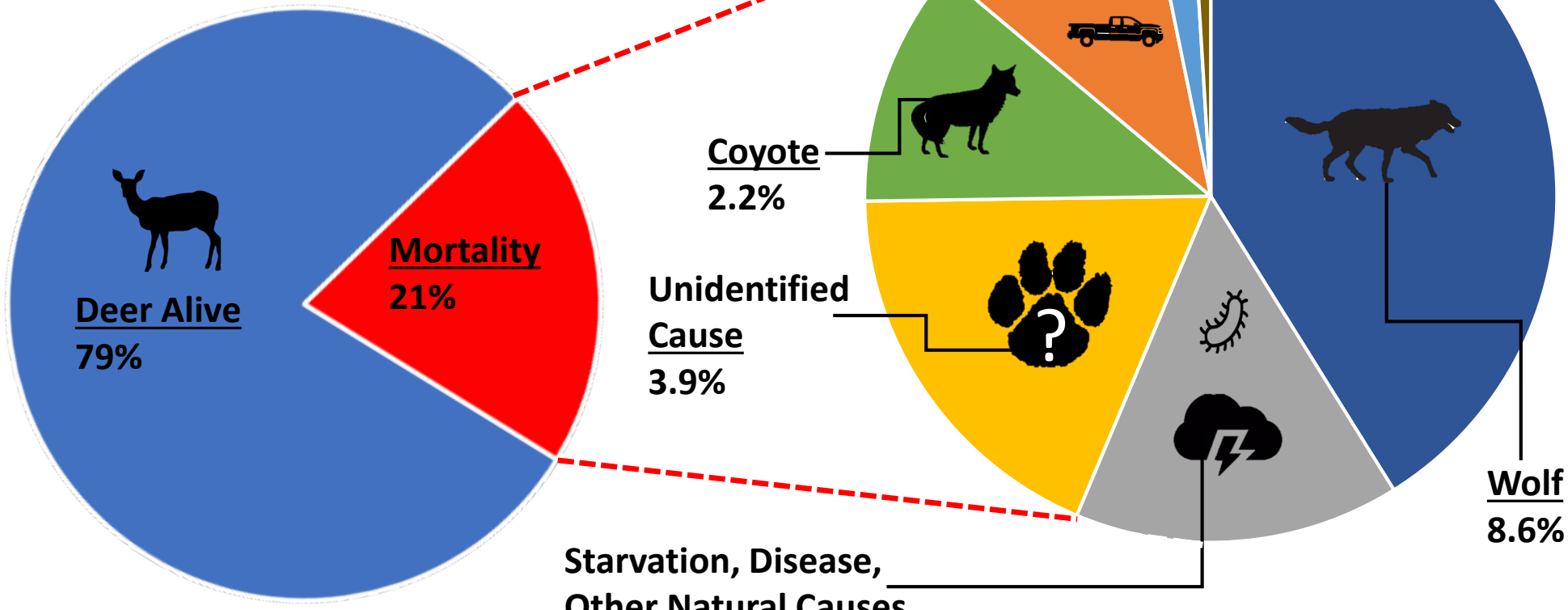




Annual Adult Female Survival



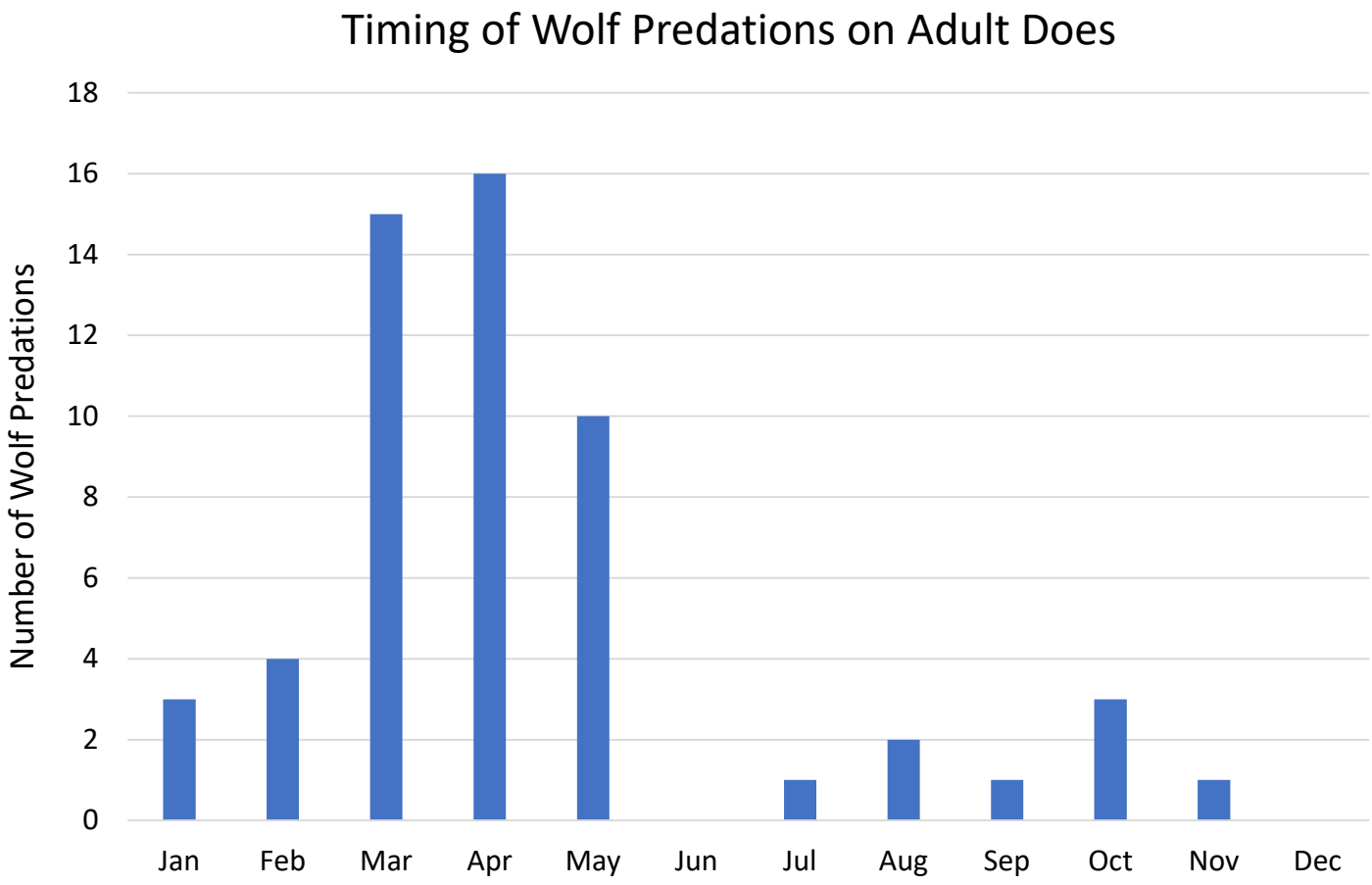
- 423 radio-collared deer



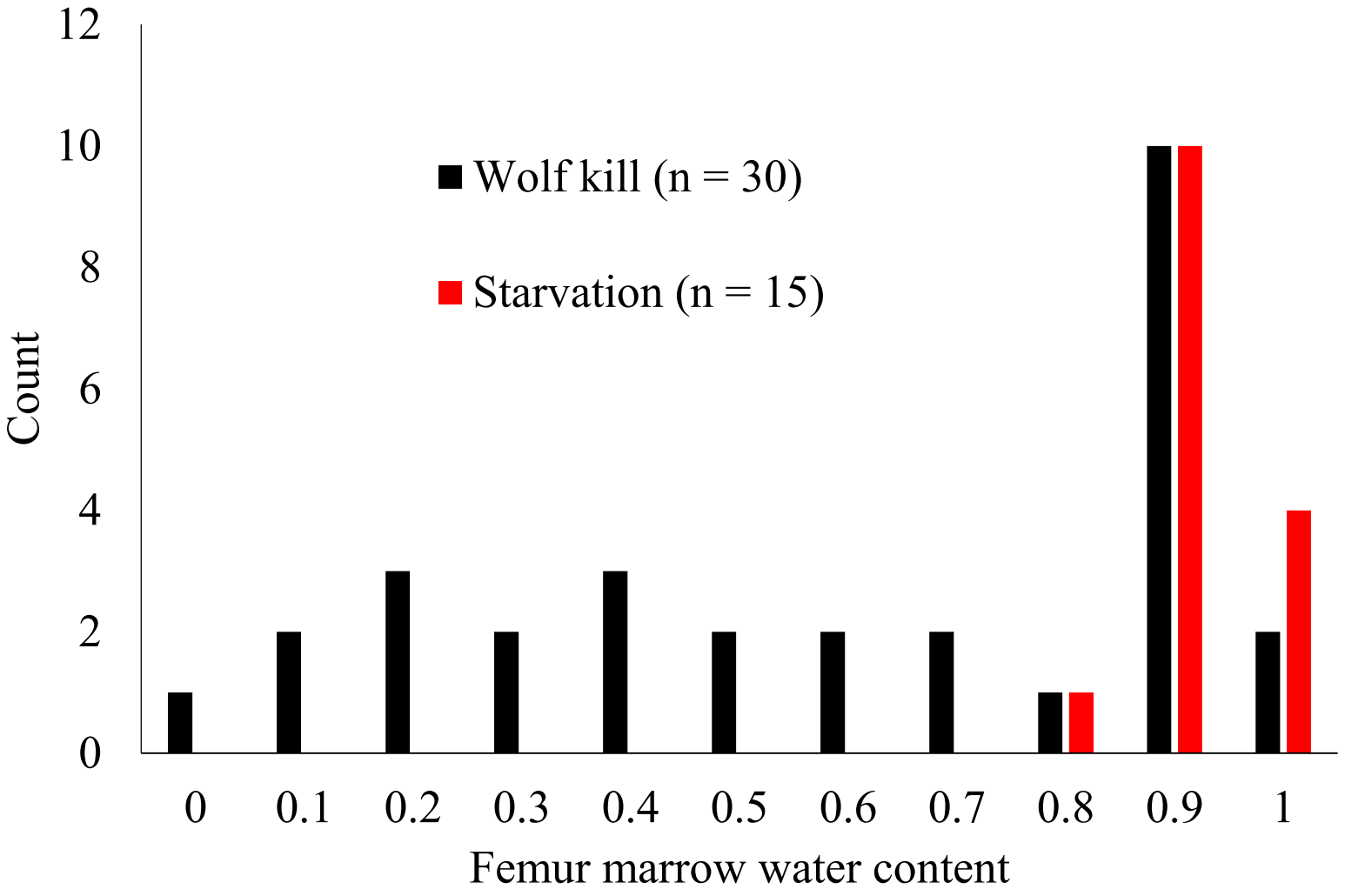
Deer Survival

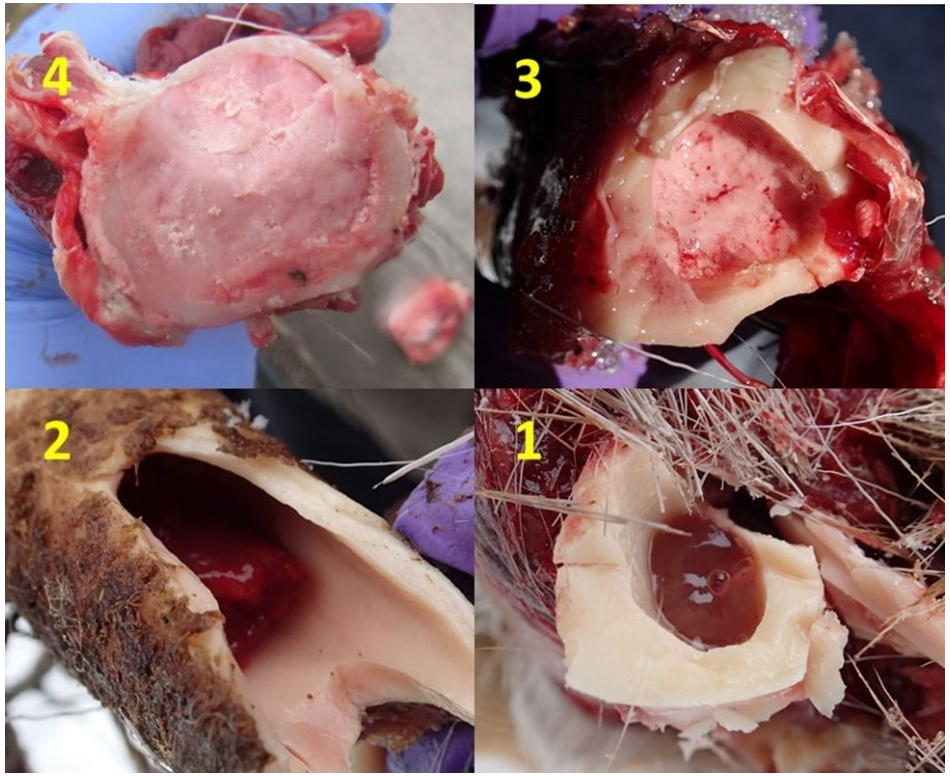
- Nearly 70% of the wolf predations of adult does occurred in the late winter and spring months when body condition of deer was at its poorest.

- Further investigation into the body condition of adult does killed by wolves in the high snowfall zone found that nearly half (43%) were in extremely poor nutritional condition and likely would not have survived the winter even if they were not preyed upon.



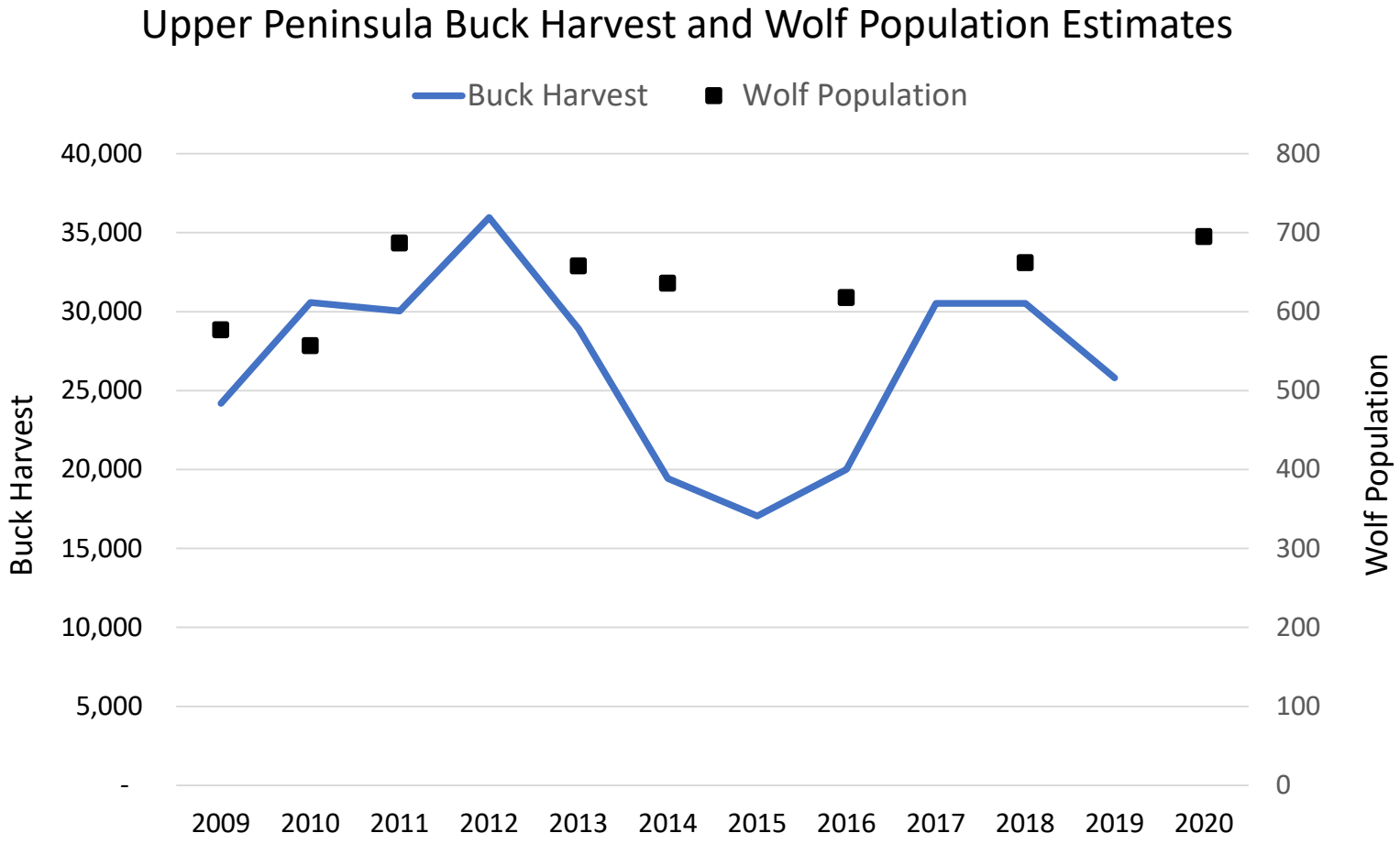
Nutritional condition of adult female deer killed by wolves



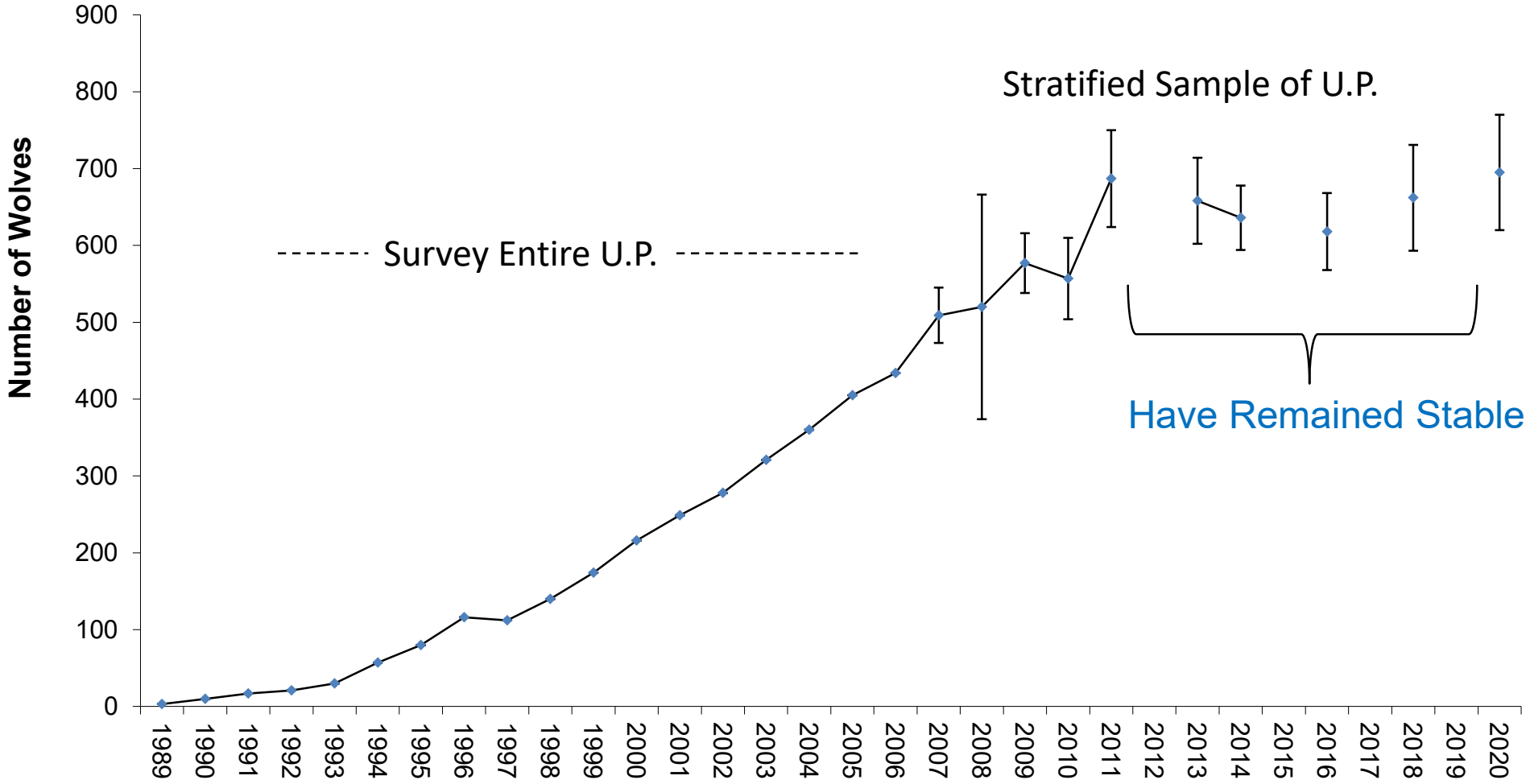


Summary

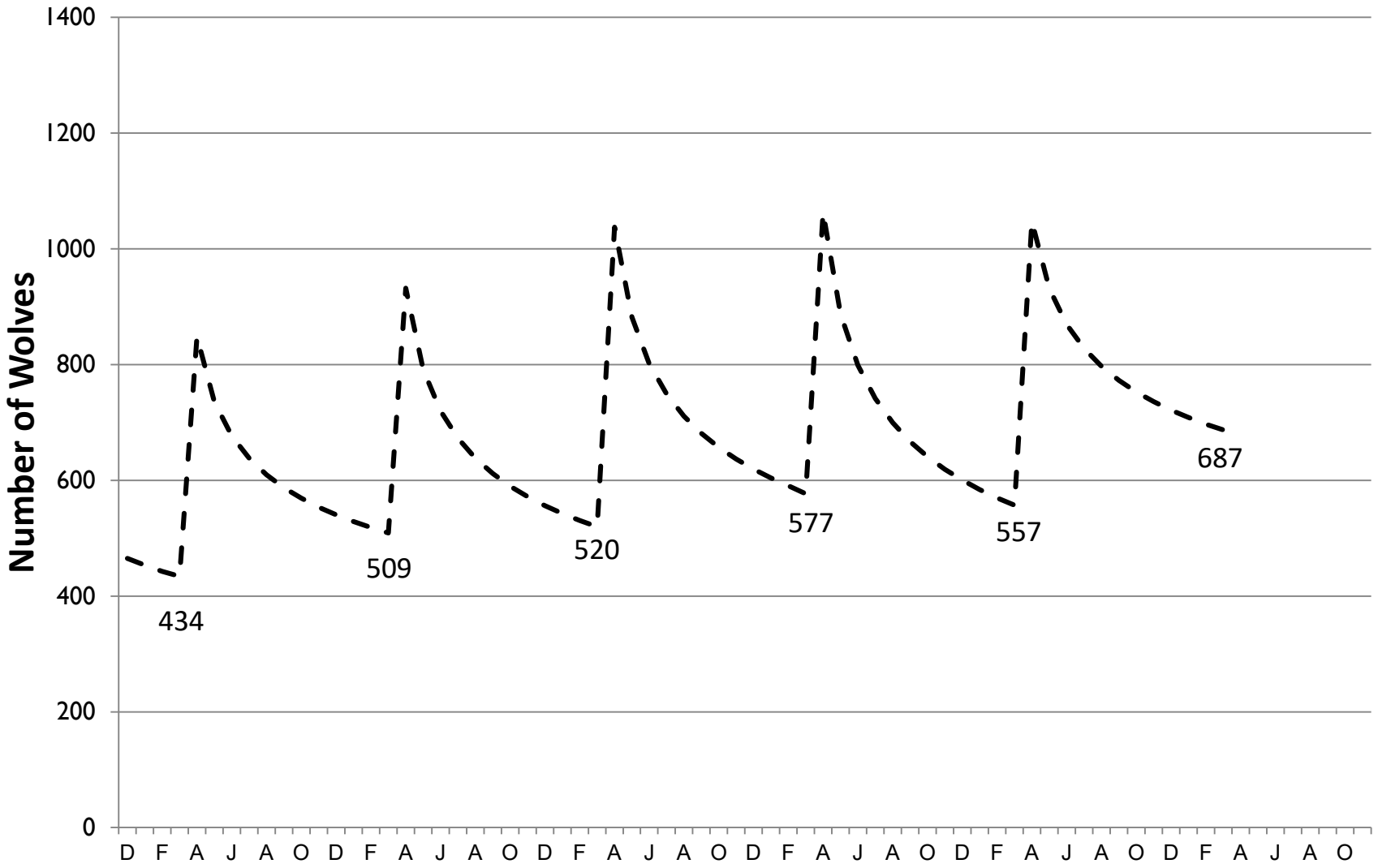
- This data shows that changes in the Upper Peninsula deer population are not primarily driven by wolf population levels or wolf predation.
- Wolf predation, winter weather, predation by other species, habitat quality, changes to deer harvest regulations, declining hunter numbers, and changes in timber harvest all play a combined role in changes to the deer population in the Upper Peninsula.
- Predation from wolves is simply one portion of what impacts our deer herd in the Upper Peninsula, they are not solely responsible for the variation.



Minimum Winter Estimates of Wolf Abundance in the Upper Peninsula



Wolf Population Annual Cycle



Wolf Biology and Ecology

- Apex predator feeding primarily on ungulates
- Mean weight: males ~ 40 kg; females ~34 kg
- Lives in packs—mated pair and offspring
  - Mean pack size varies (generally) with prey size (e.g., deer–5.7, moose–6.5, elk–10.2) Michigan 4.8
- Breeds once per year (typically only the alpha's)
- Annual survival of adults is ~75%, pups lower/variable
- Most wolves disperse from natal territory
- Territorial
  - Average territory ~259 km^2 (98 mi^2) in MI

Back of the Envelope Calculations Based on Wolf Ecology

If we have estimates of:

1. Territory size
2. Occupied range
3. Pack size

We could get a ballpark estimate of wolf abundance with the following formula:

Abundance = (Occupied range/Territory size) x Pack size

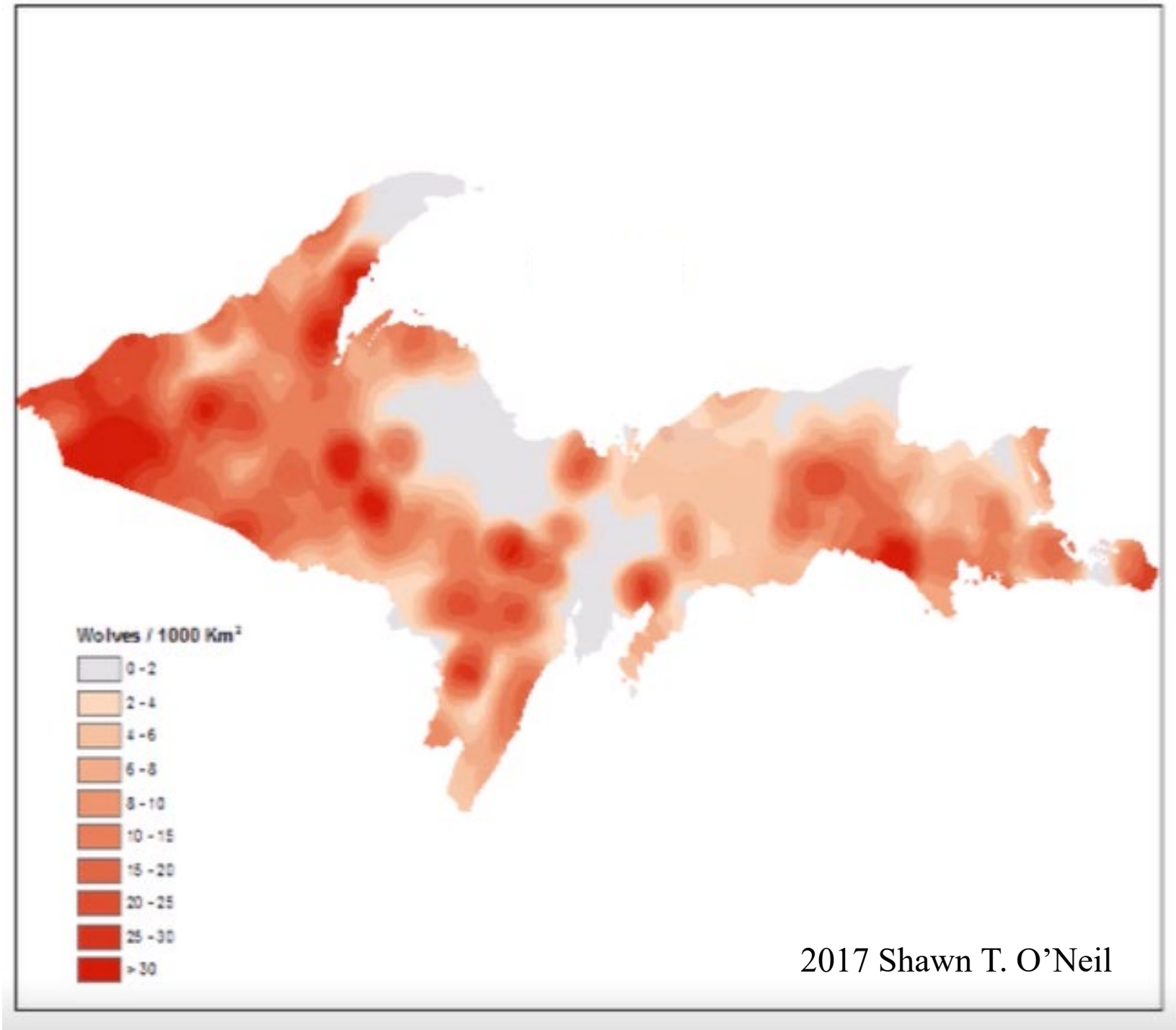
Occupied range

Potvin et. al 2005

- Estimated that 64% of the UP was suitable wolf habitat.

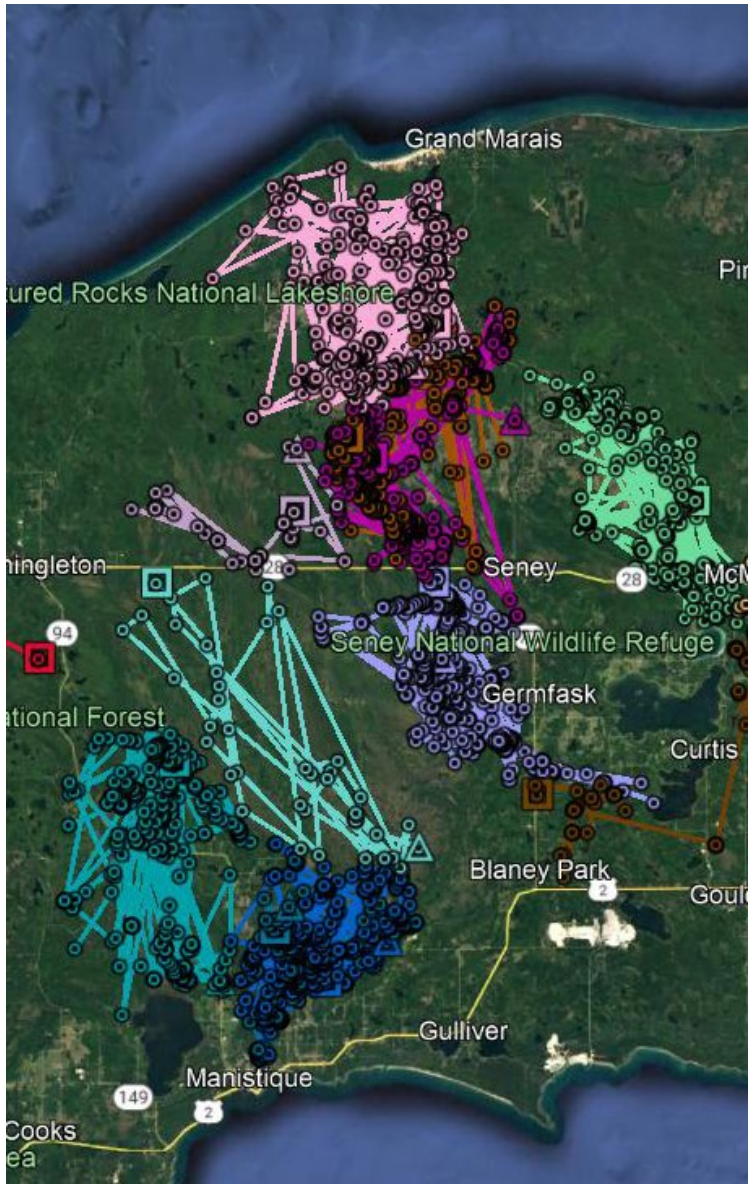
O'Neil 2017

- Estimated the 63% of the UP was occupied by wolves

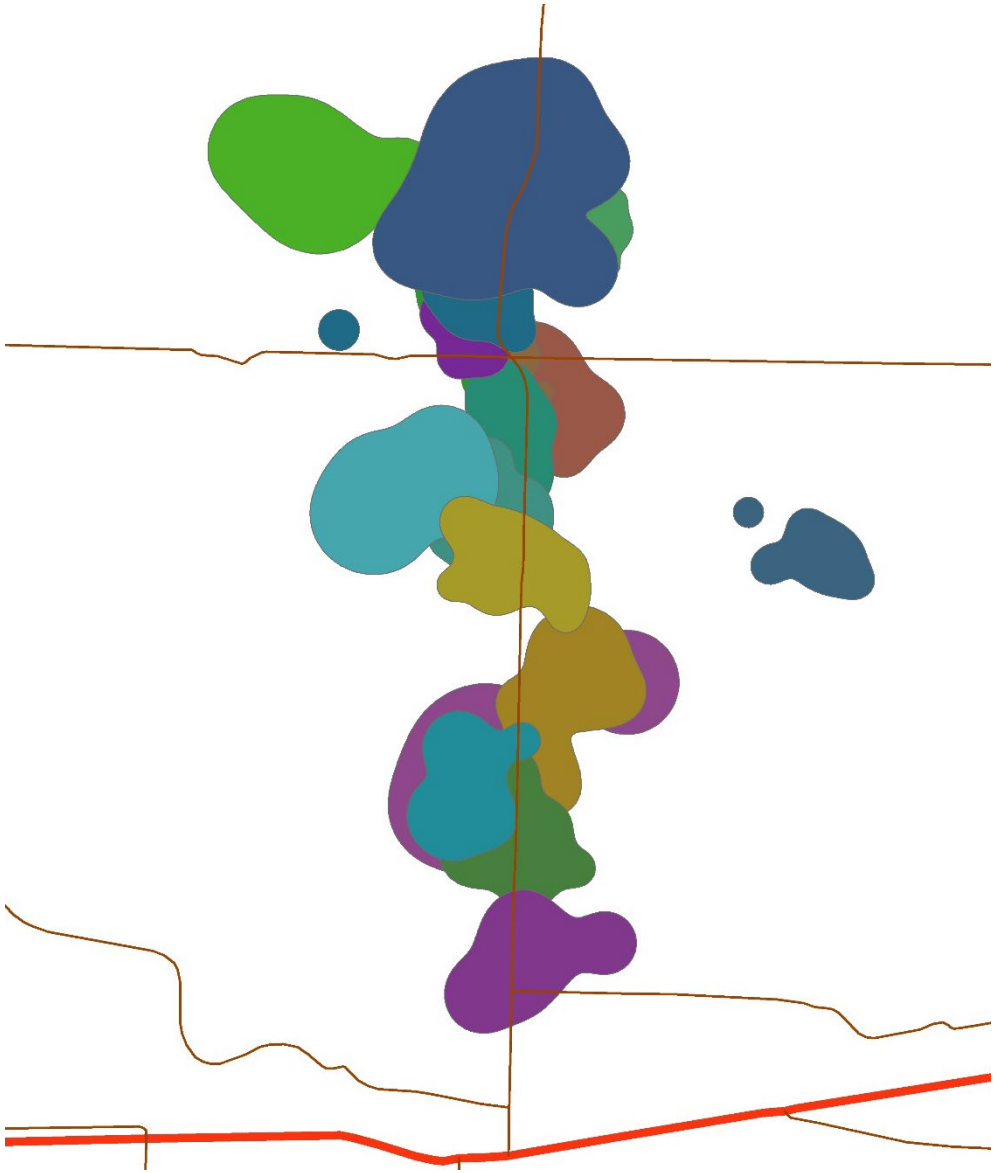


Home Range vs Territory

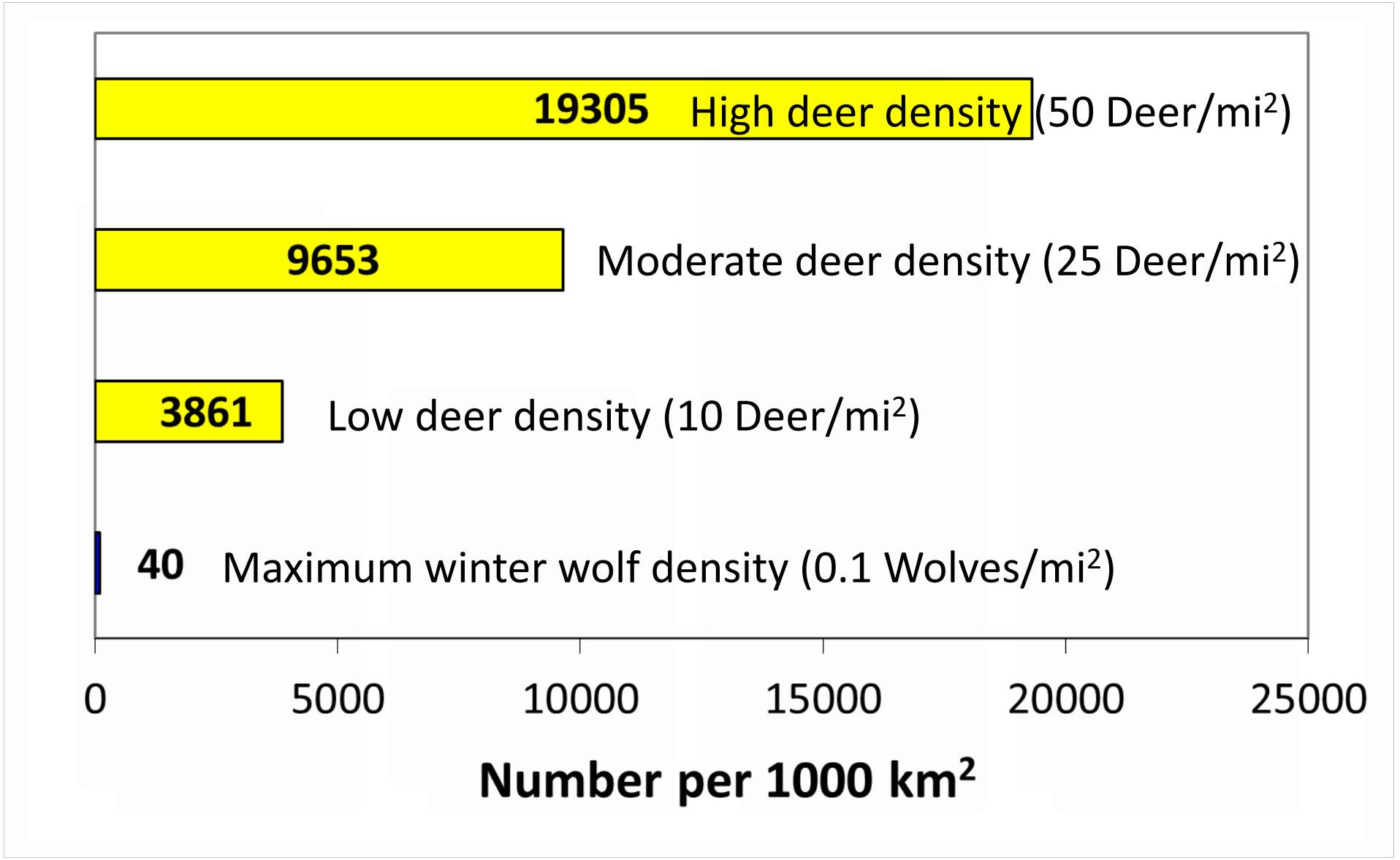
Wolves



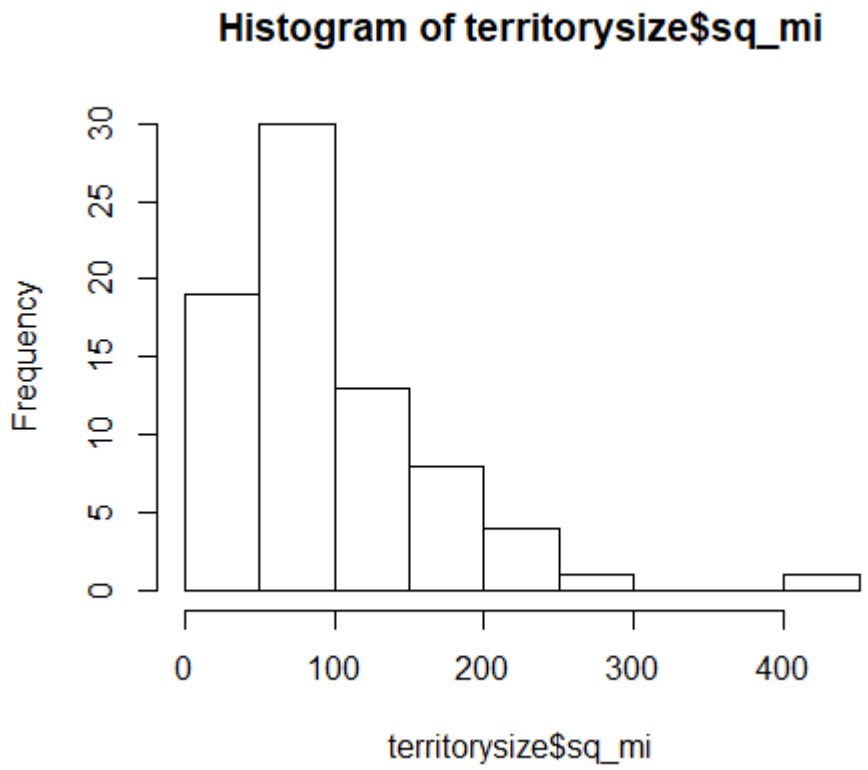
White-tailed Deer



Deer Density vs Wolf Density



Wolf Territory Size



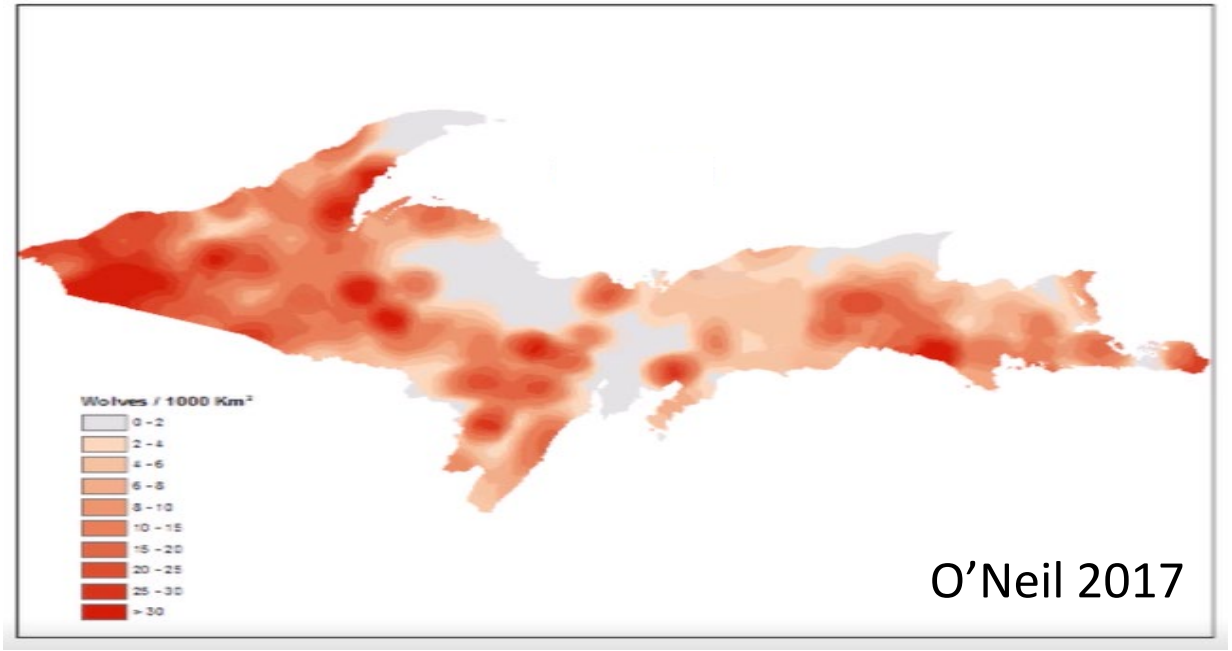
Mean = 98 mi^2

Median = 82 mi^2

Abundance = (Occupied range/Territory size) x Pack size

Abundance = (Occupied range/82) x Pack size

Occupied Wolf Range



63% occupied= 10,395 mi^2

Back of the Envelope Calculations Based on Wolf Ecology

Abundance = (Occupied range/Territory size) x Pack size

Abundance = (10,395 /82) x 4.8 = 608