Exploring Adaptive Capacity for Pygmy Rabbits

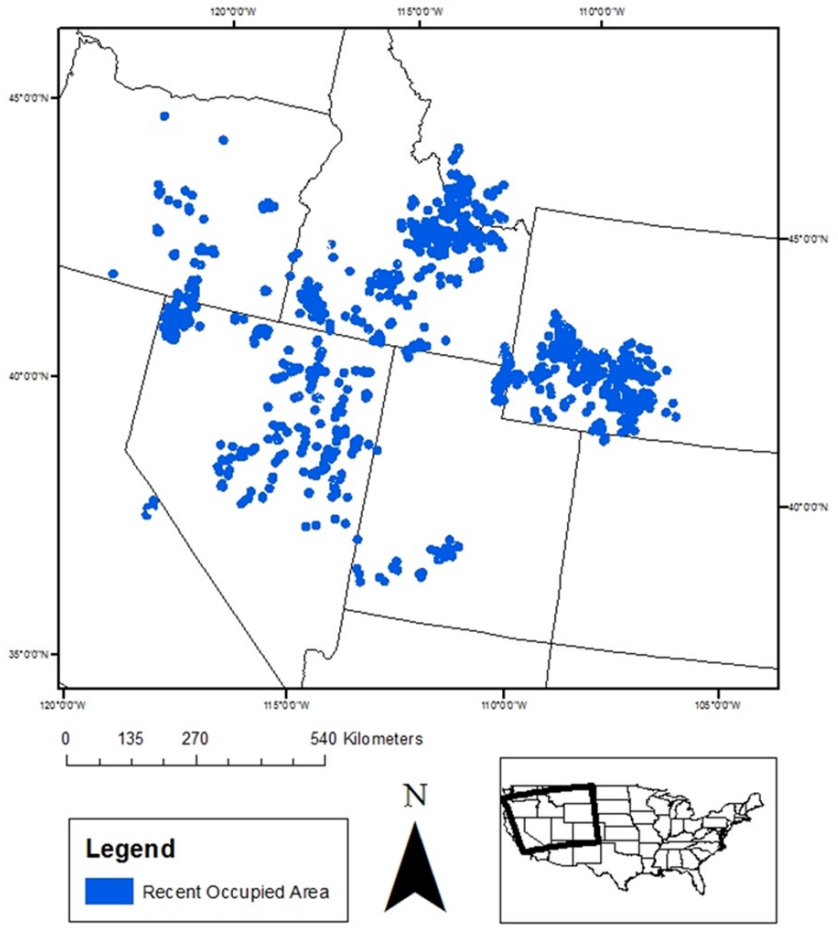
1. Distribution & potential shifts under cc
2. Behavioral plasticity
3. Evolutionary adaptation

1. Distribution

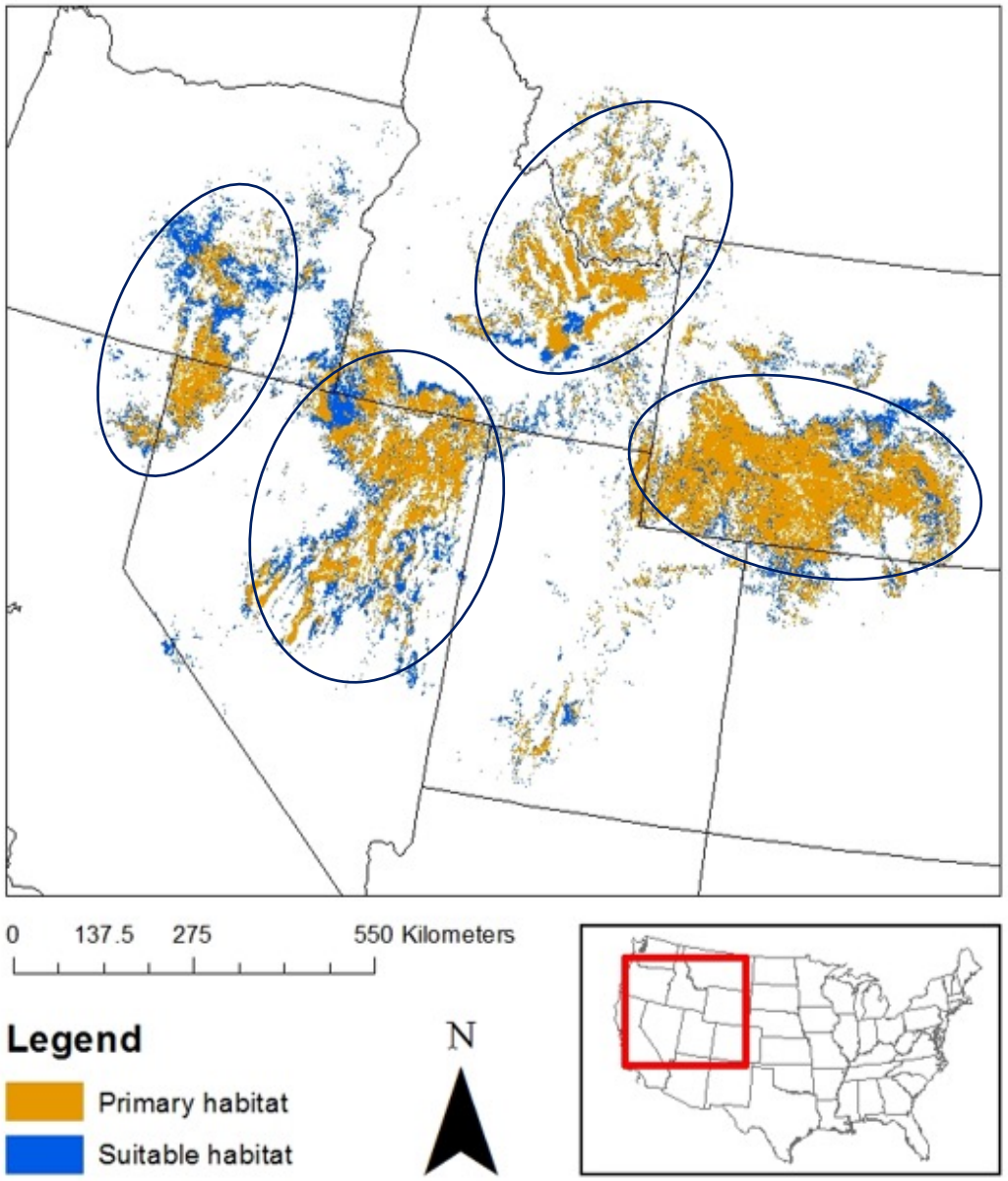
Historical *and* Current Range

(USFWS. 2010. Federal Register)

Known Occurrences (2000-2018)



(Smith et al. 2019. Ecosphere)

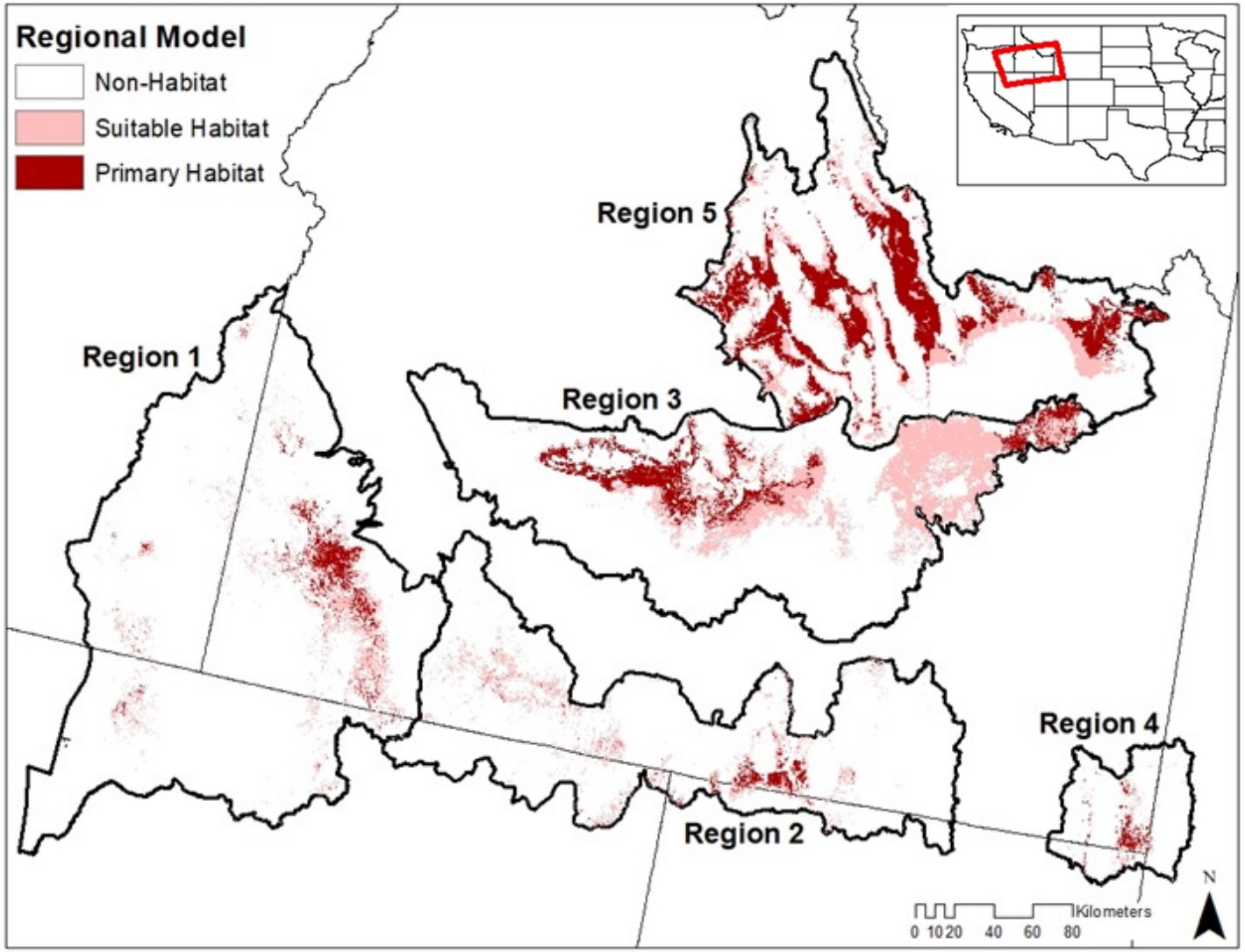


Leona Svancara
Sonya Knetter

- Identified 14.6M ha of primary habitat
- 4 core areas ~ contiguous primary habitat
- Range-wide models overpredict

(Smith et al. 2019. Ecosphere)

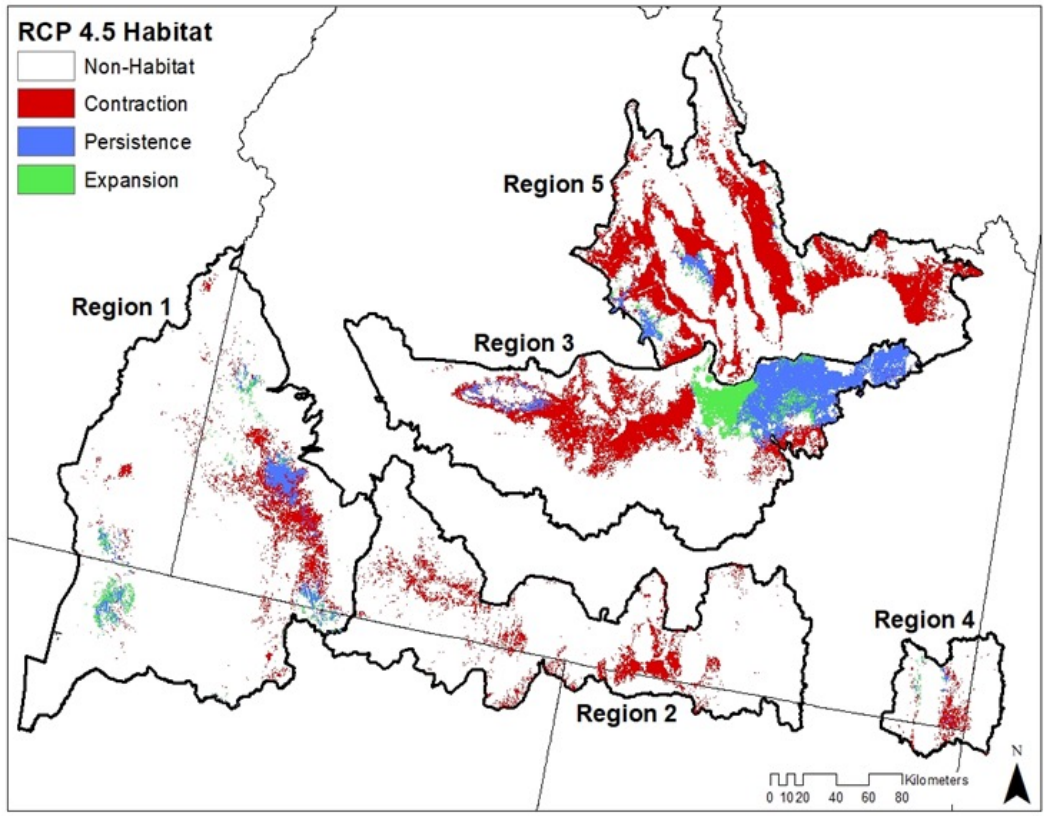
Regional Habitat Models



- Produced smaller estimates habitat
- Habitat associations differed among regions
- Bioclimatic strong predictors
- Project future habitat?

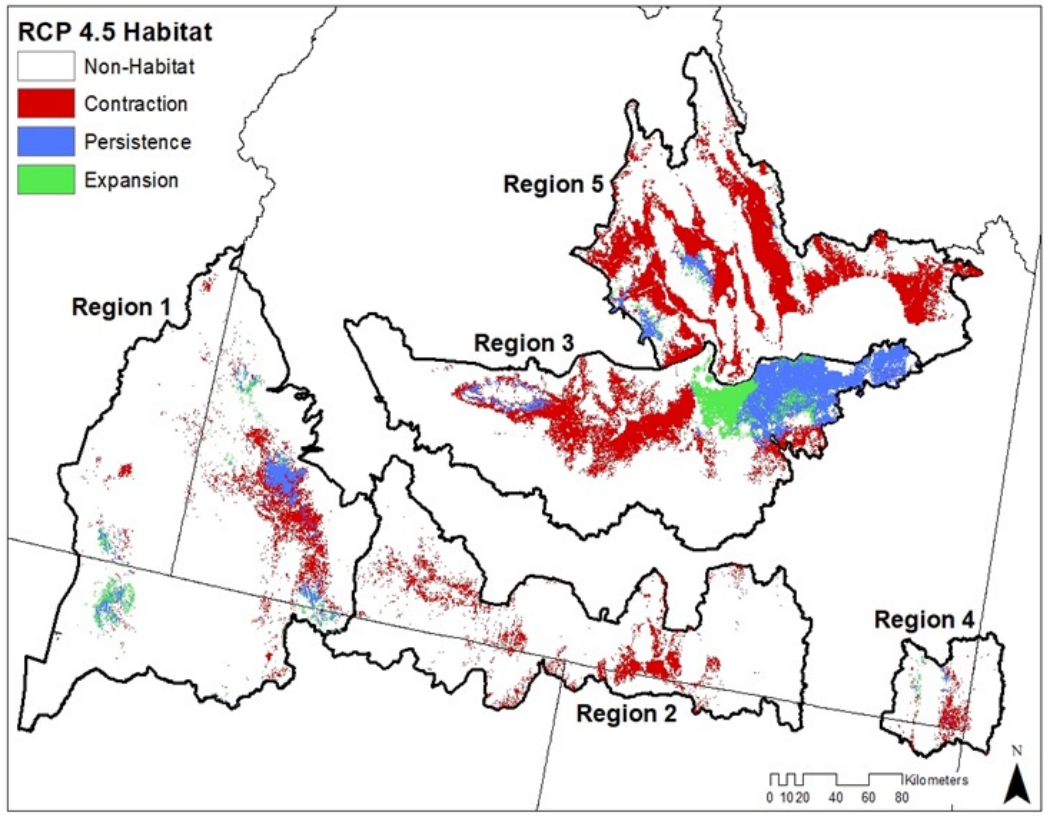
(Rush et al. 2023. Ecosphere)

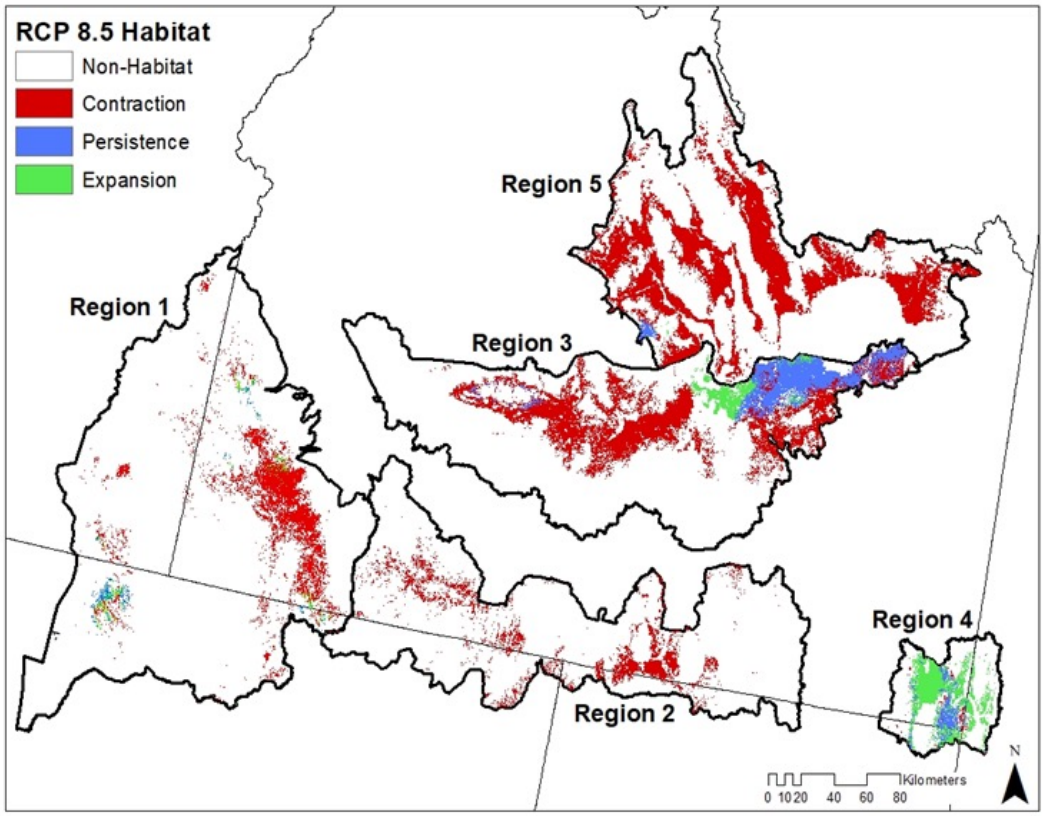
Modeled changes in suitable habitat based on climate projections:



(Rush et al. 2023. Ecosphere)

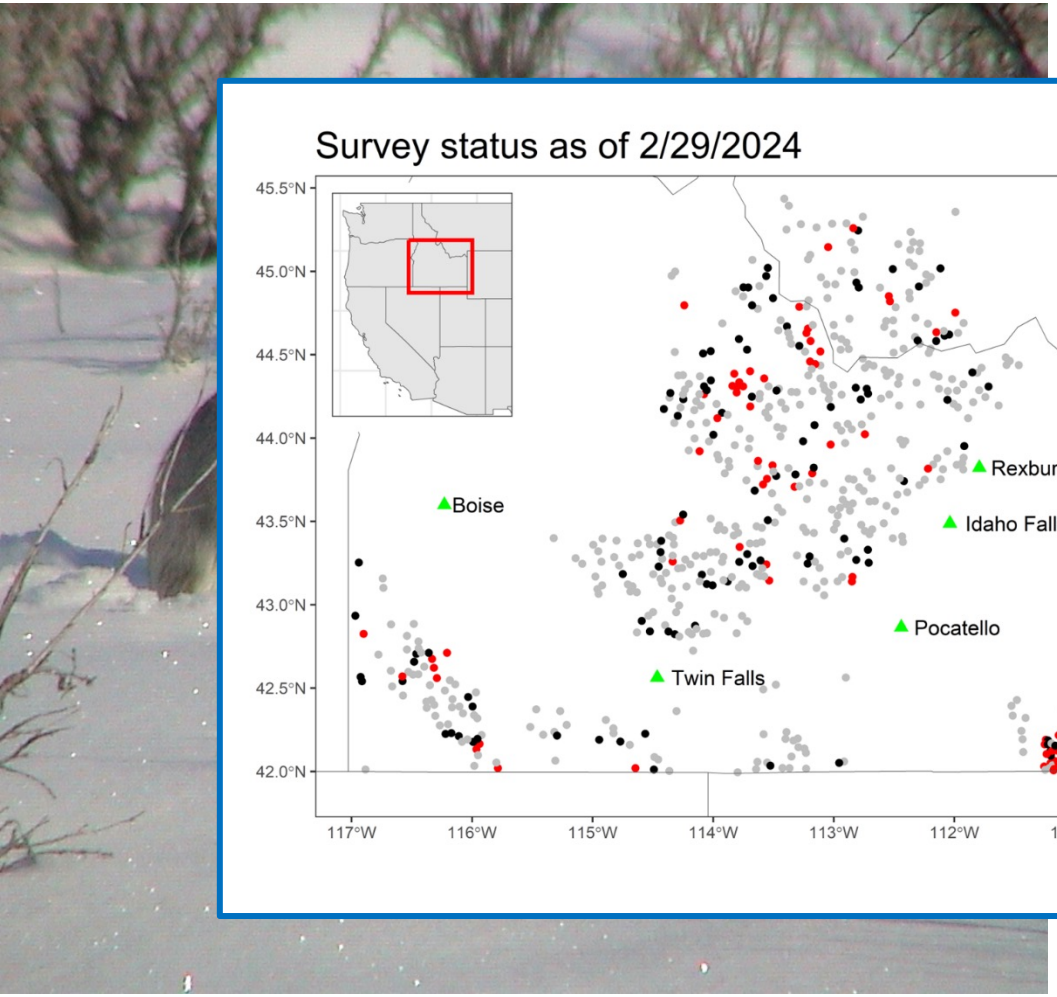
Modeled changes in suitable habitat based on climate projections:





(Rush et al. 2023. Ecosphere)

Occupancy Surveys & Modeling



Fiona McKibben
Leona Svancara

- Collaborative: ID & MT
- Winter surveys
- DNA species confirmation
- Estimate occupancy

Burrows = thermal refuges?

Summer and Winter:

Burrow temp (T_b)

Environmental temp (T_e) at micro-sites above ground

Charlotte Milling

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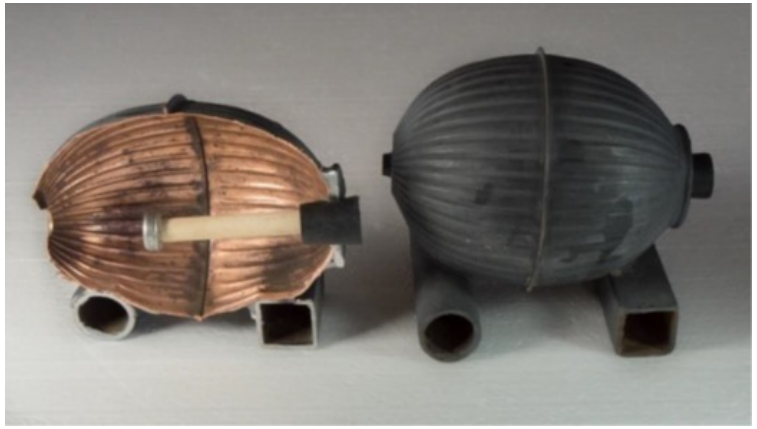
Summer and Winter:

Burrow temp (T_b)

Environmental temp (T_e) at micro-sites above ground



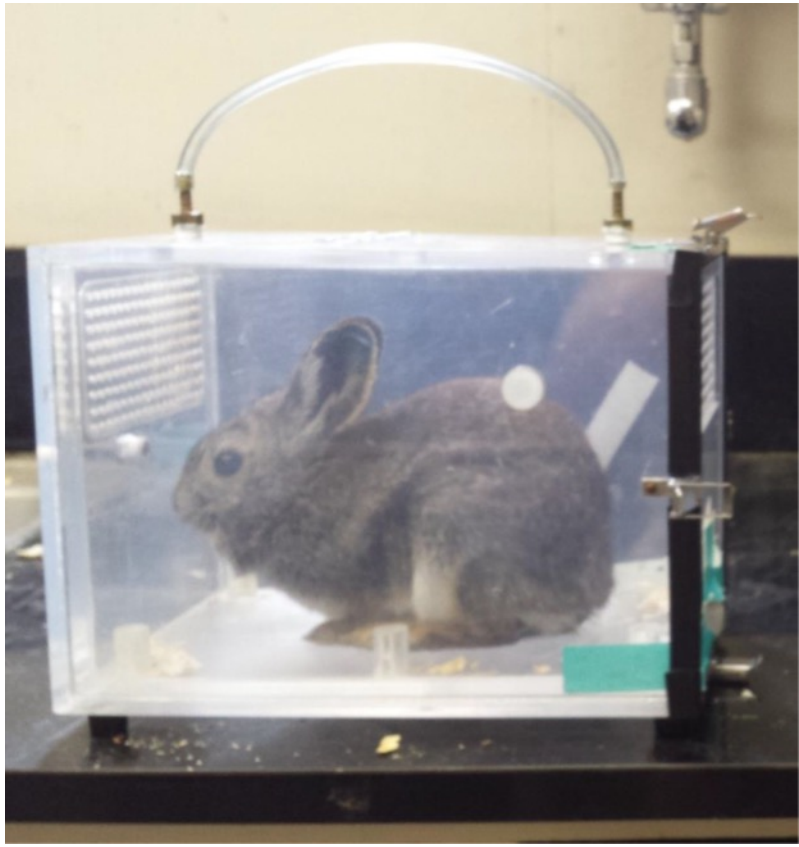
Burrows = thermal refuges?

Summer and Winter:

Burrow temp (T_b)

Environmental temp (T_e) at micro-sites above ground

Estimated energy expenditure (respirometry)



Burrow = thermal refuge?

- 13.4 hours/day
- ~ 56 %

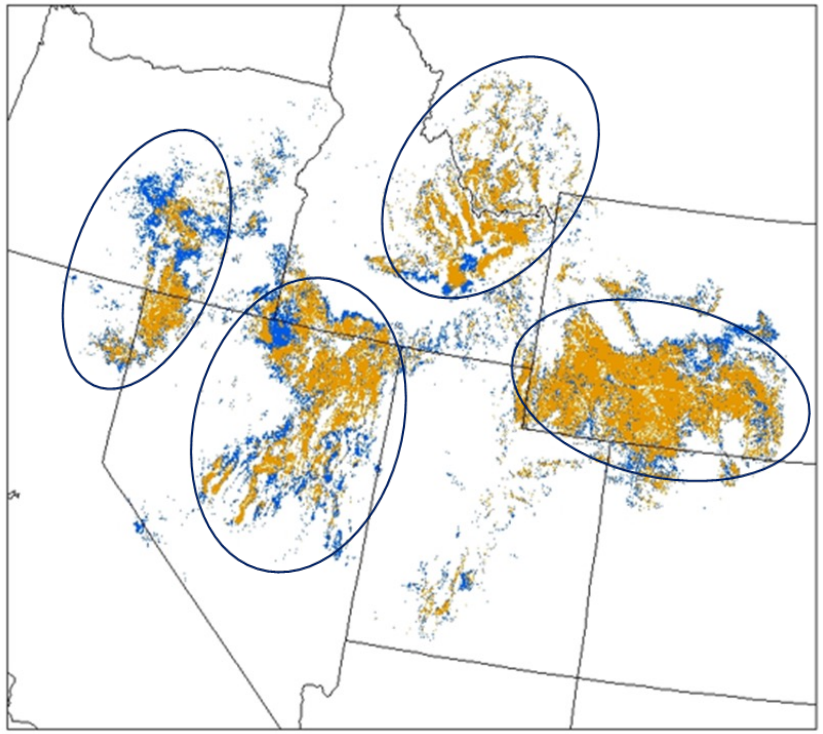
- 2.5 hours/day
- ~ 10 %

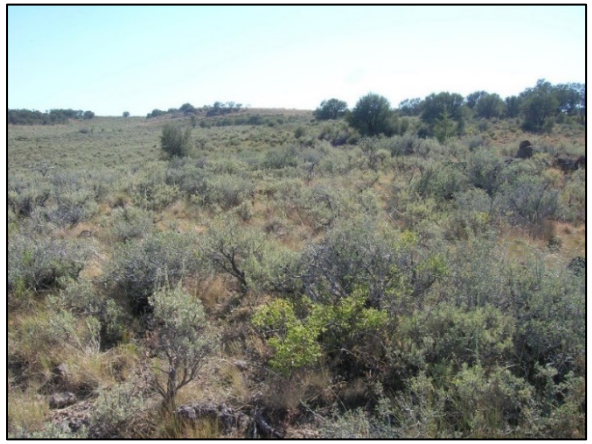
Shuttling thermoregulation?

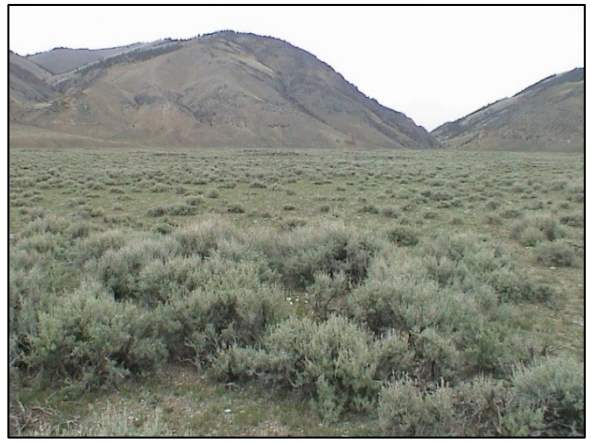
?

(Milling et al. 2018. PeerJ)

3. Evolutionary adaptation







- Adaptive genomic variation
- Traits associated with energetics & thermal tolerance

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