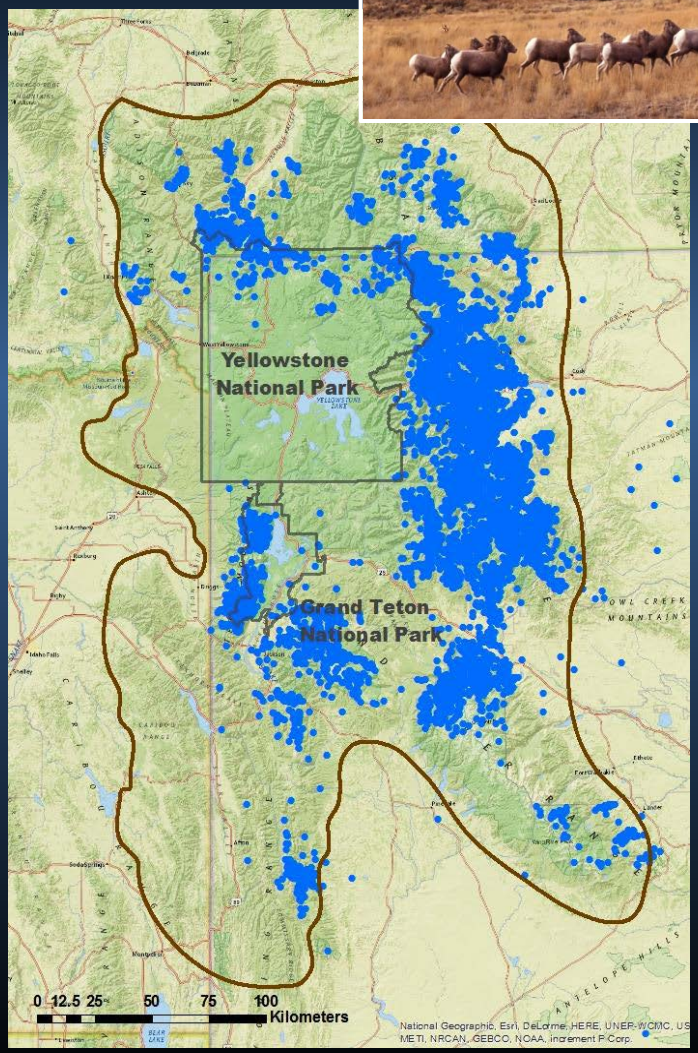
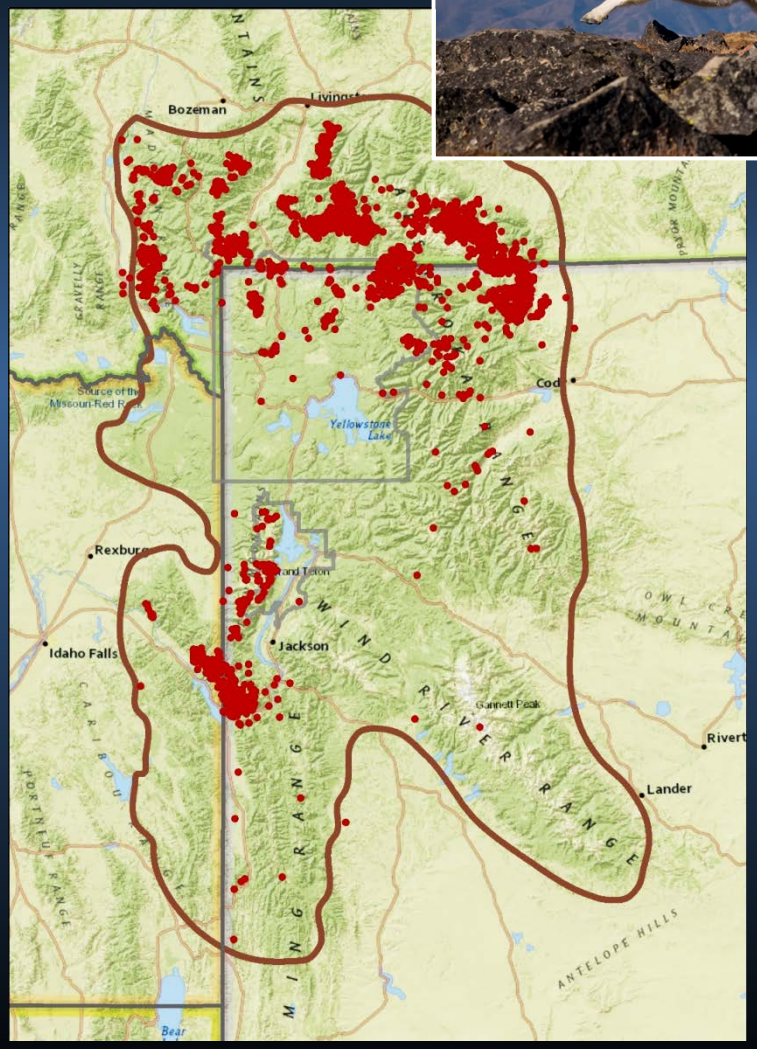
The Greater Yellowstone Area Mountain Ungulate Research Project

R. Garrott, P.J. White, D. McWhirter, A. Pils, S. Stewart, H. Miyasaki, S. Dewey, and B. Lowrey

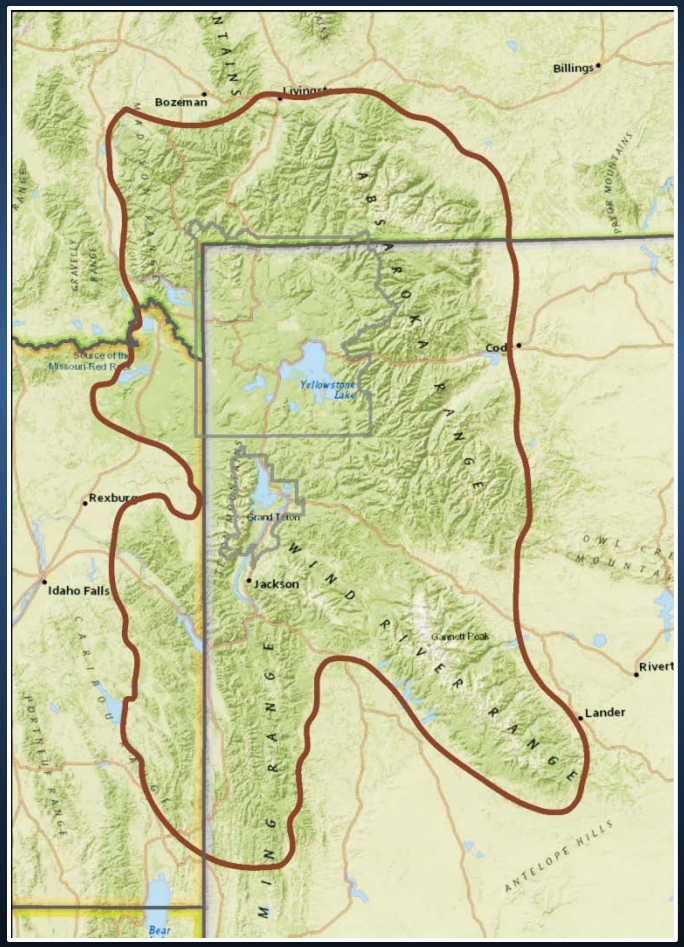
GYA Mountain Ungulate Distributions





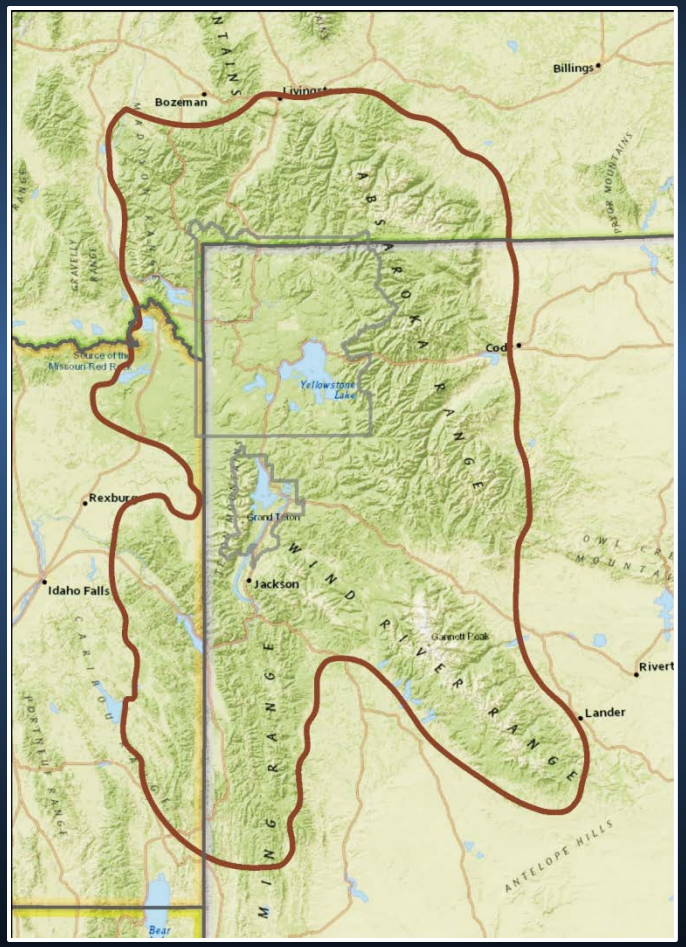
The Greater Yellowstone Area Mountain Ungulate Project

Initiated 2009



22 Biologists and 6 Graduate Students

The Greater Yellowstone Area Mountain Ungulate Project



Funding

NATIONAL PARK SERVICE

Canon

YELLOWSTONE PARK FOUNDATION

IDAHO FISH & GAME

Montana Fish, Wildlife & Parks

WYOMING GAME & FISH DEPARTMENT

WYOMING GOVERNOR'S BIG GAME LICENSE COALITION WGBGLC

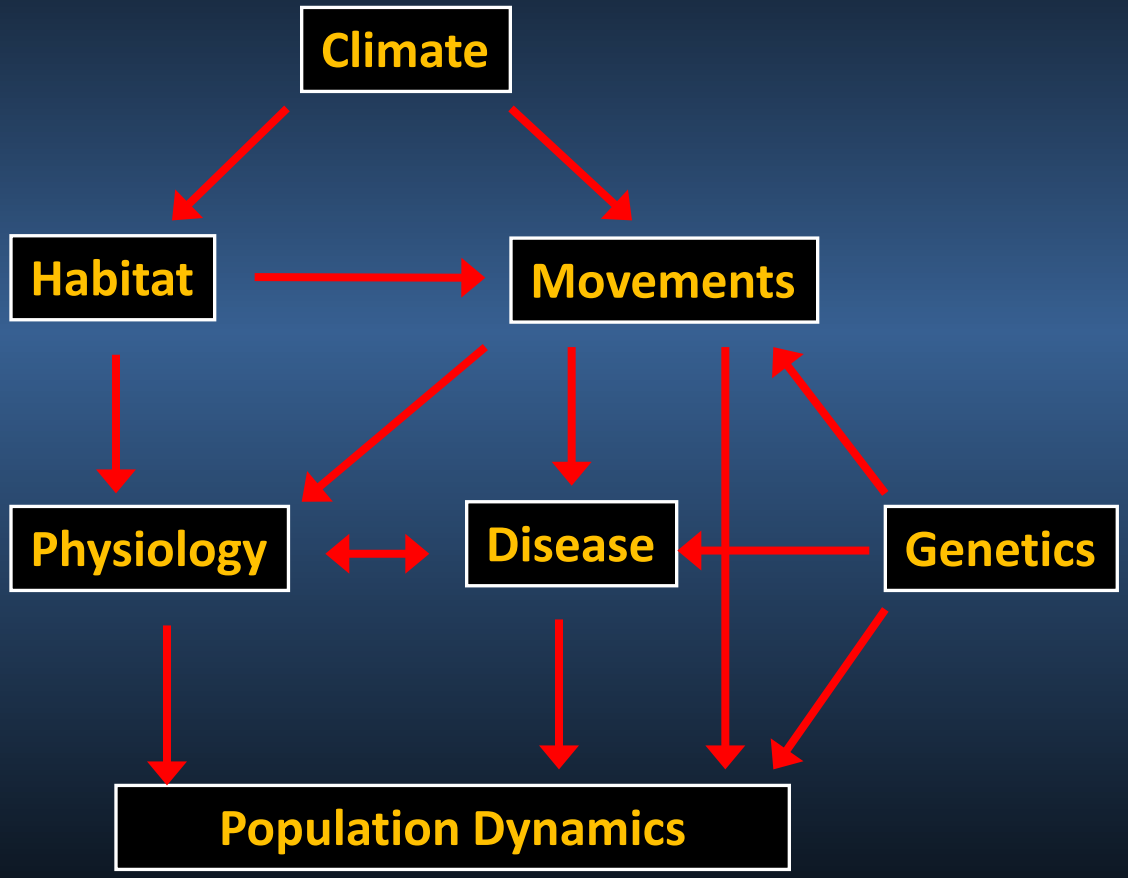
FOREST SERVICE US DEPARTMENT OF AGRICULTURE

Wyoming Wild Sheep Foundation

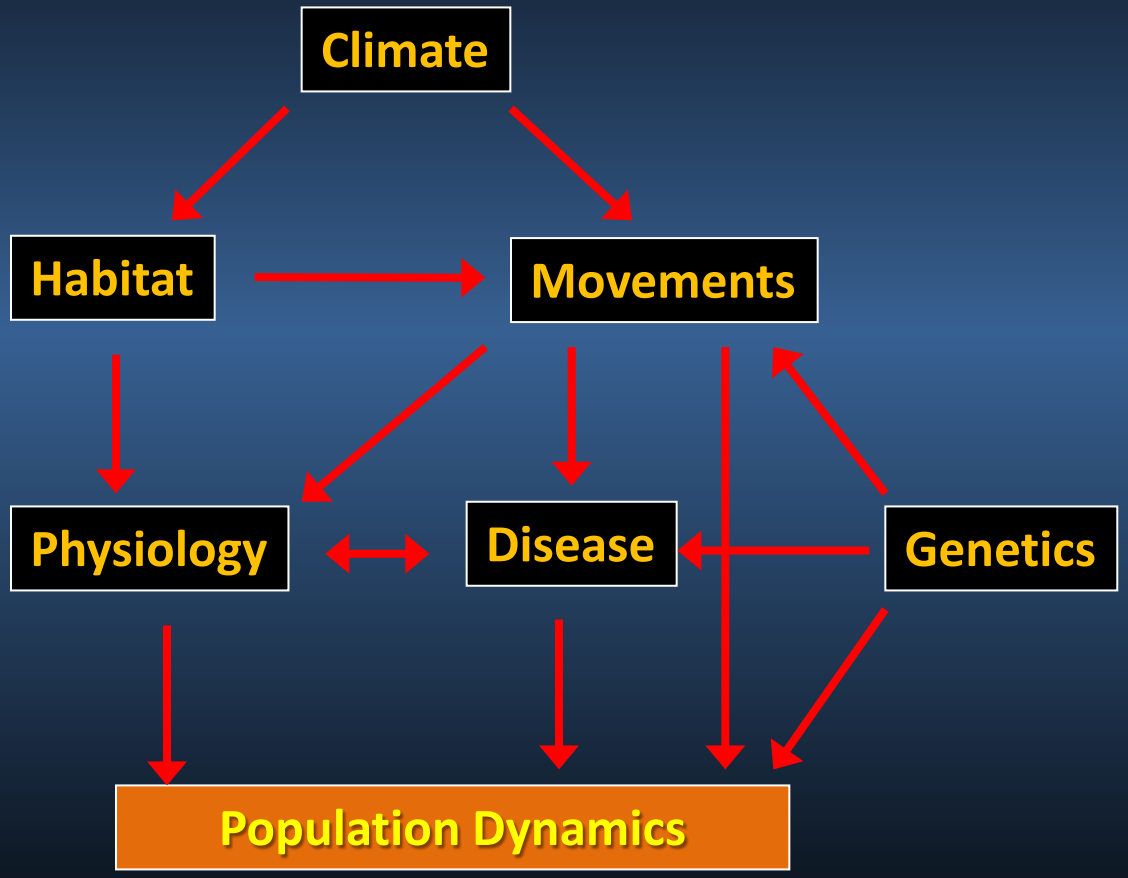
MONTANA STATE UNIVERSITY Mountains and Minds

MONTANA WILD SHEEP FOUNDATION

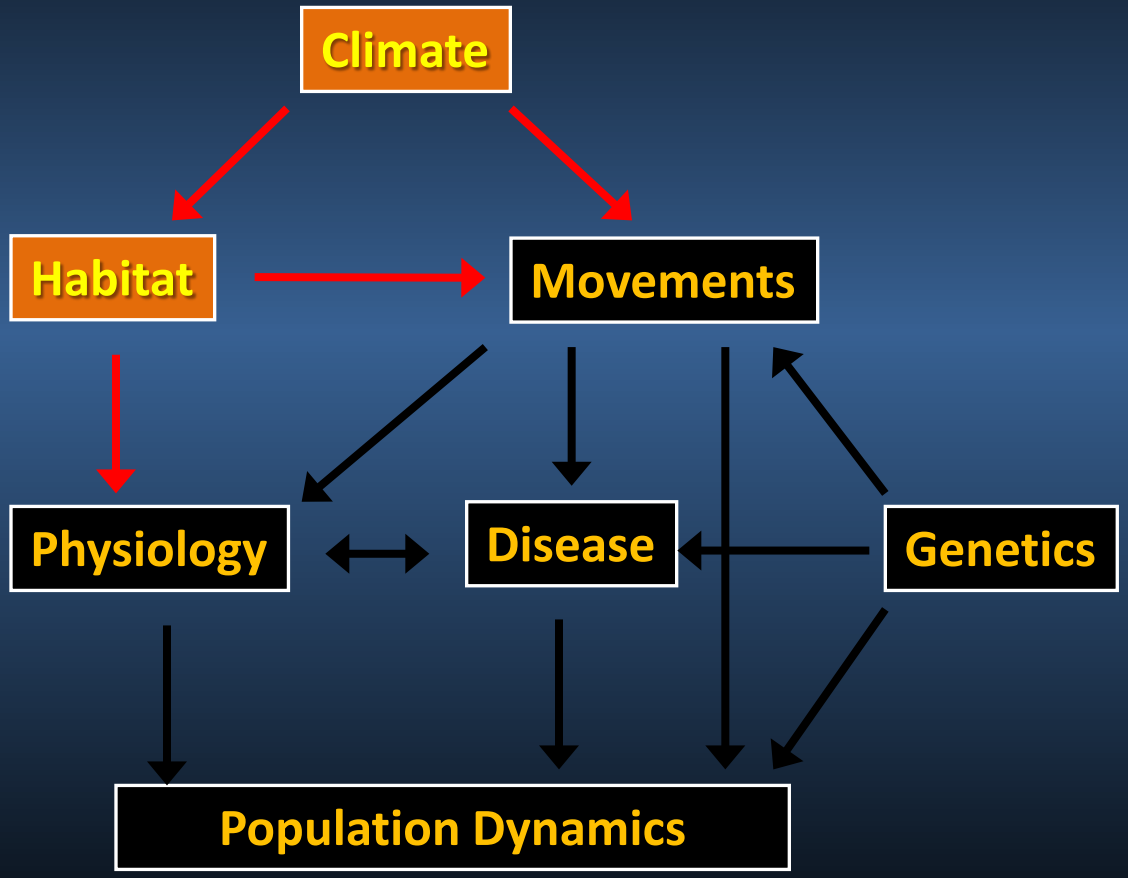
Integrated Mtn Ungulate Research Program



Integrated Mtn Ungulate Research Program



Integrated Mtn Ungulate Research Program



Climate-Habitat

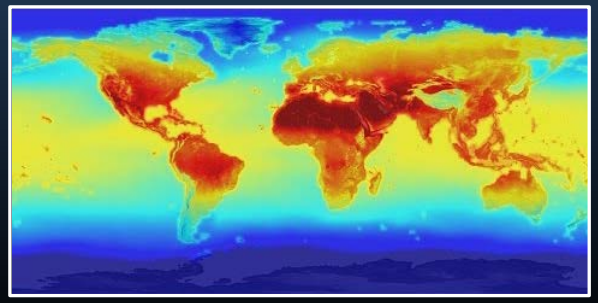
Fire Mgmt – Conifer Encroachment

Competition

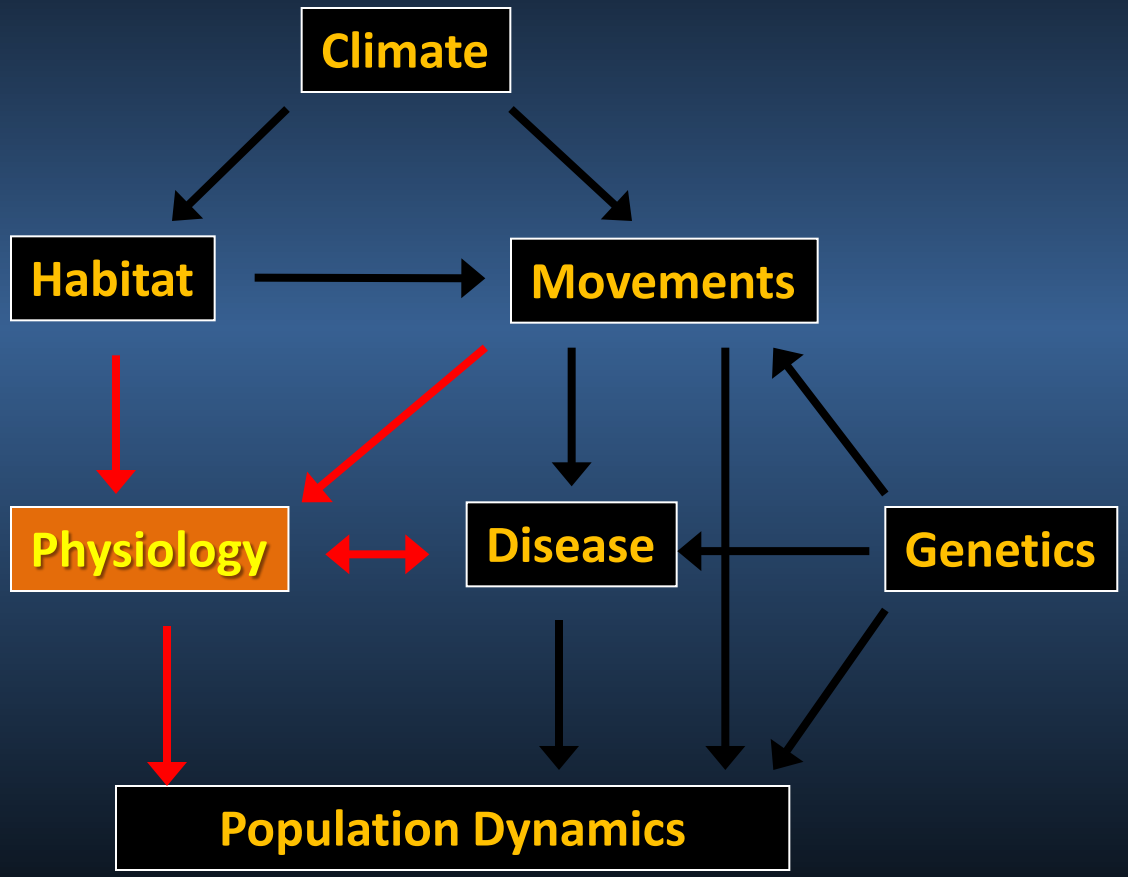
Weeds

Human Population Growth

Climate Change



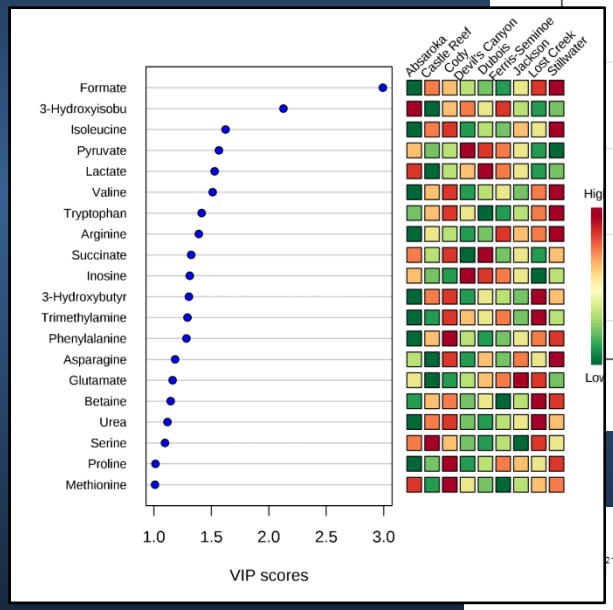
Integrated Mtn Ungulate Research Program

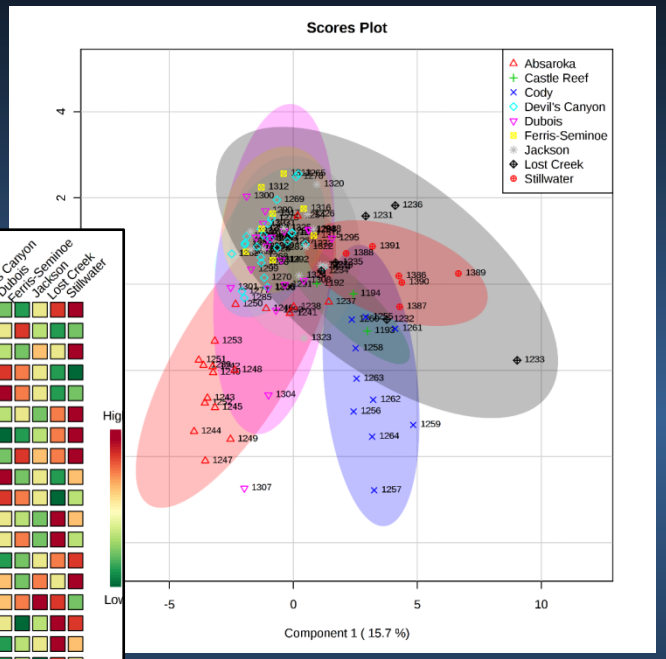


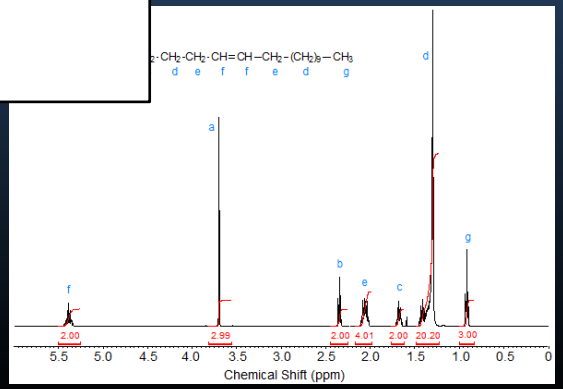
Traditional Physiology Assessments

Emerging Technologies

Nuclear Magnetic Resonance Spectroscopy







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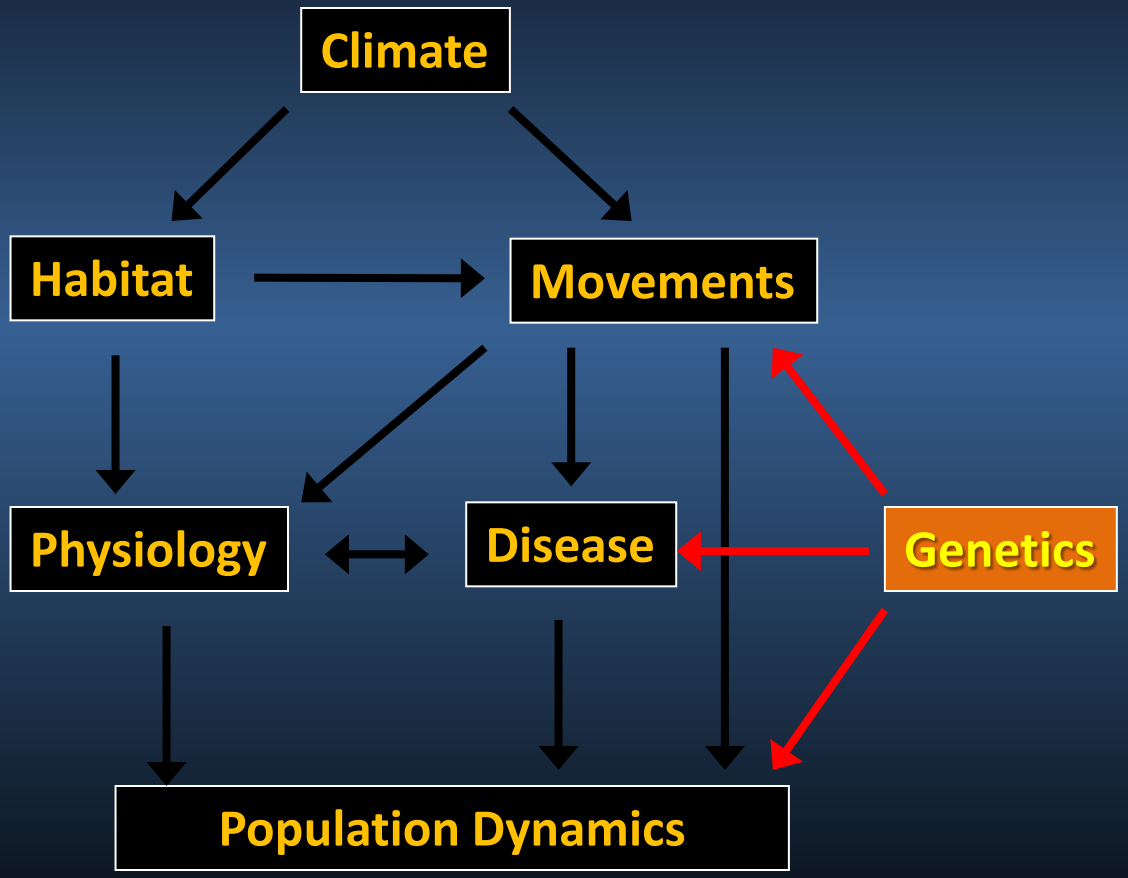


Potential Genetic Considerations:
Translocation Major Tool for Restoration

- Founder effects
- Small population size
- Isolation
- Source/recipient populations

Potential Genetic Considerations:
Native Herd Management

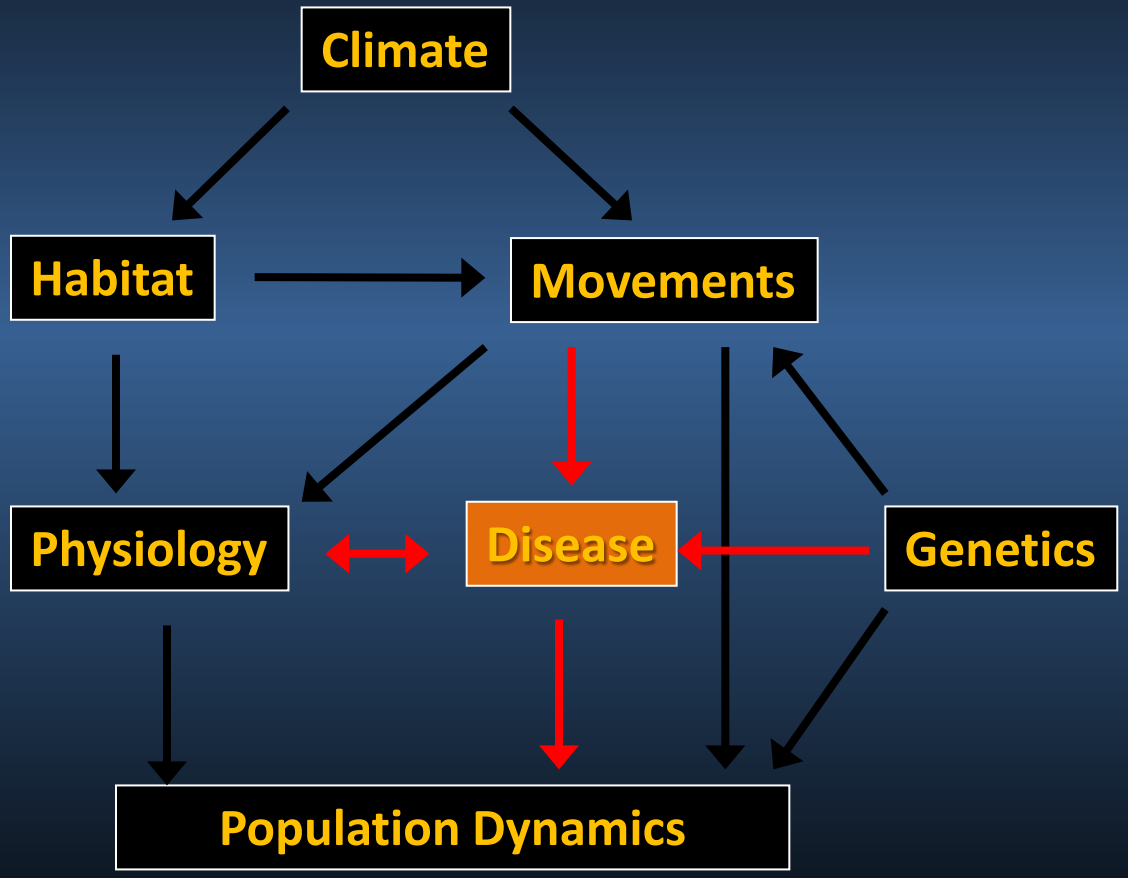
- Connectivity
- Metapopulation dynamics
- Ecotypes (local adaptations)
- Disease-driven natural selection

Ovine (domestic sheep) SNP Array

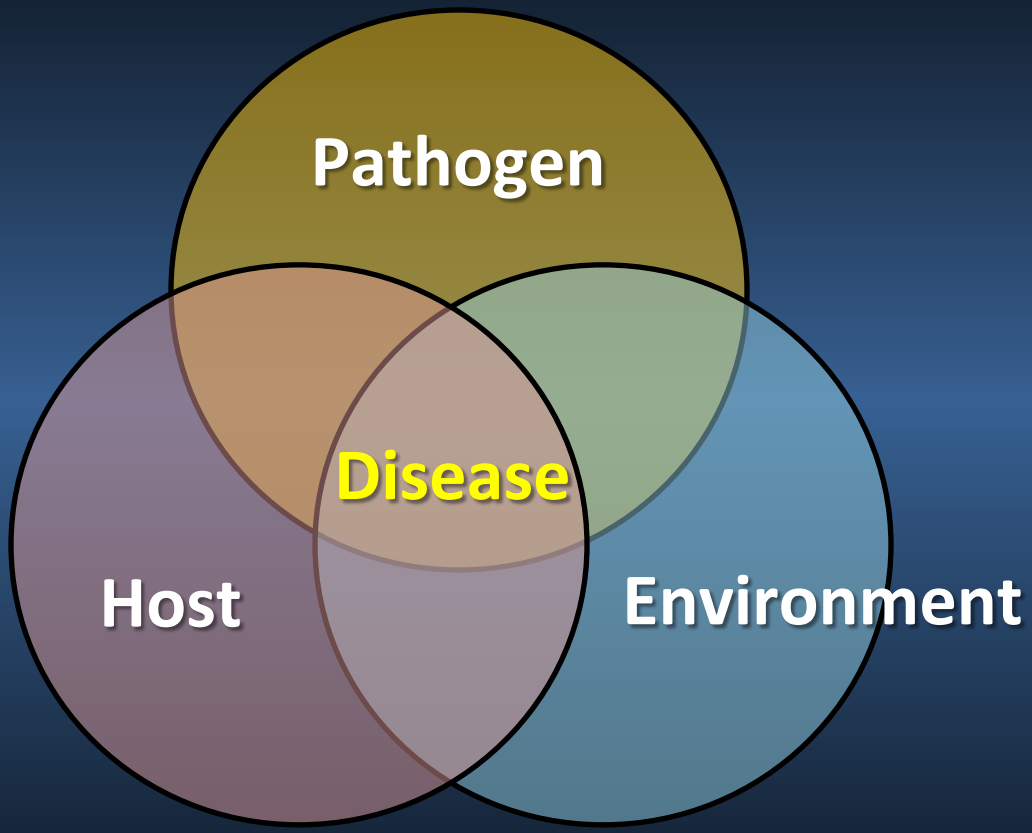
- 24,000 SNPs informative for bighorn sheep
- Can map differences to specific regions / functions

Holly Ernest – U. Wy
Statewide studies

Integrated Mtn Ungulate Research Program



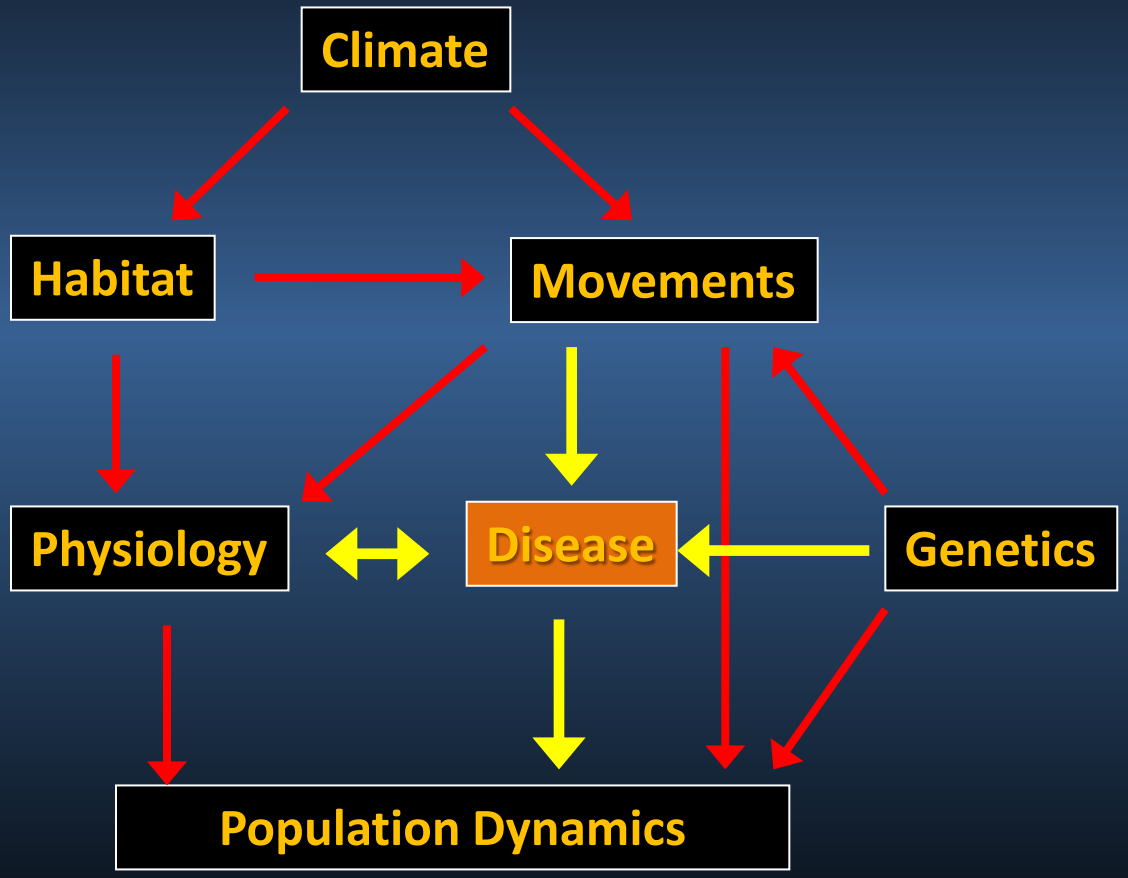
Traditional Model of Infectious Disease Causation



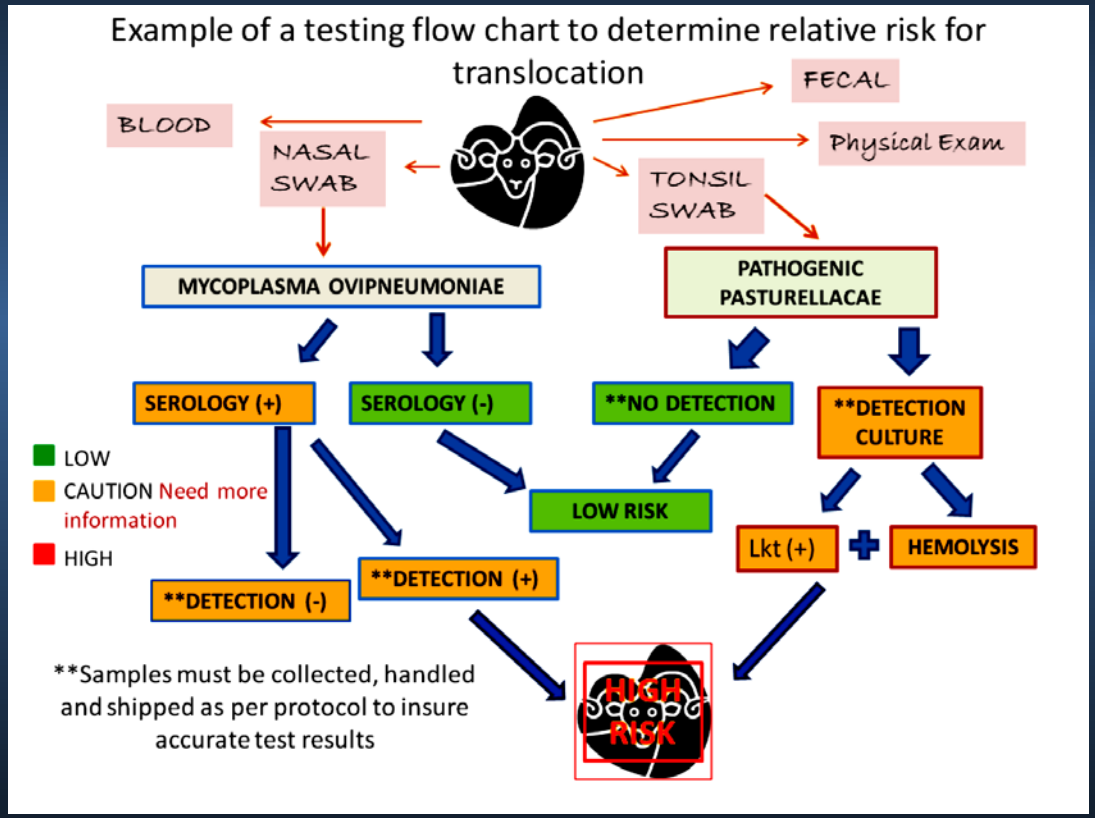
The Epidemiologic Triad

Integrated Mtn Ungulate Research Program

The Epidemiologic Triad



WAFWA Health Monitoring Recommendations



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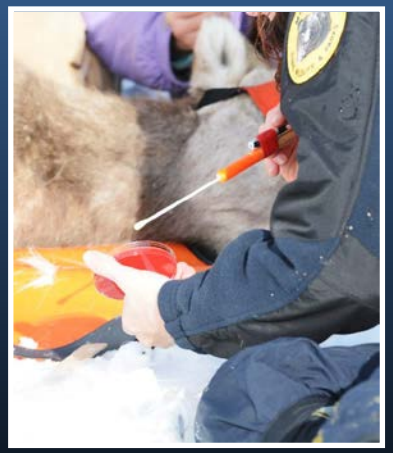
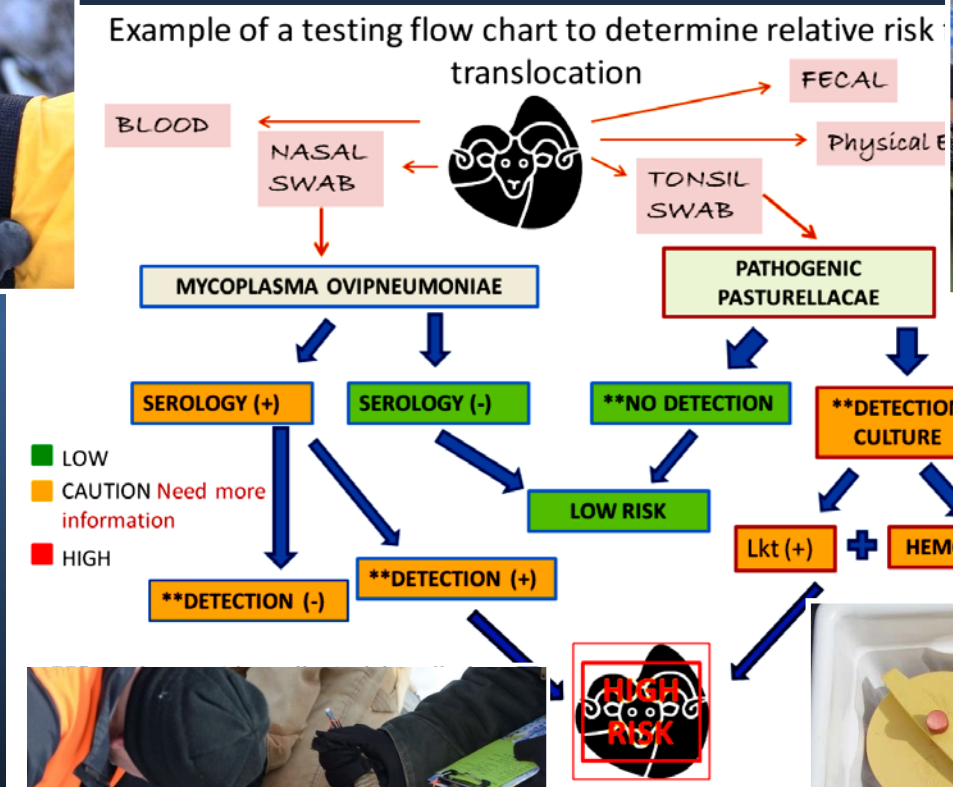
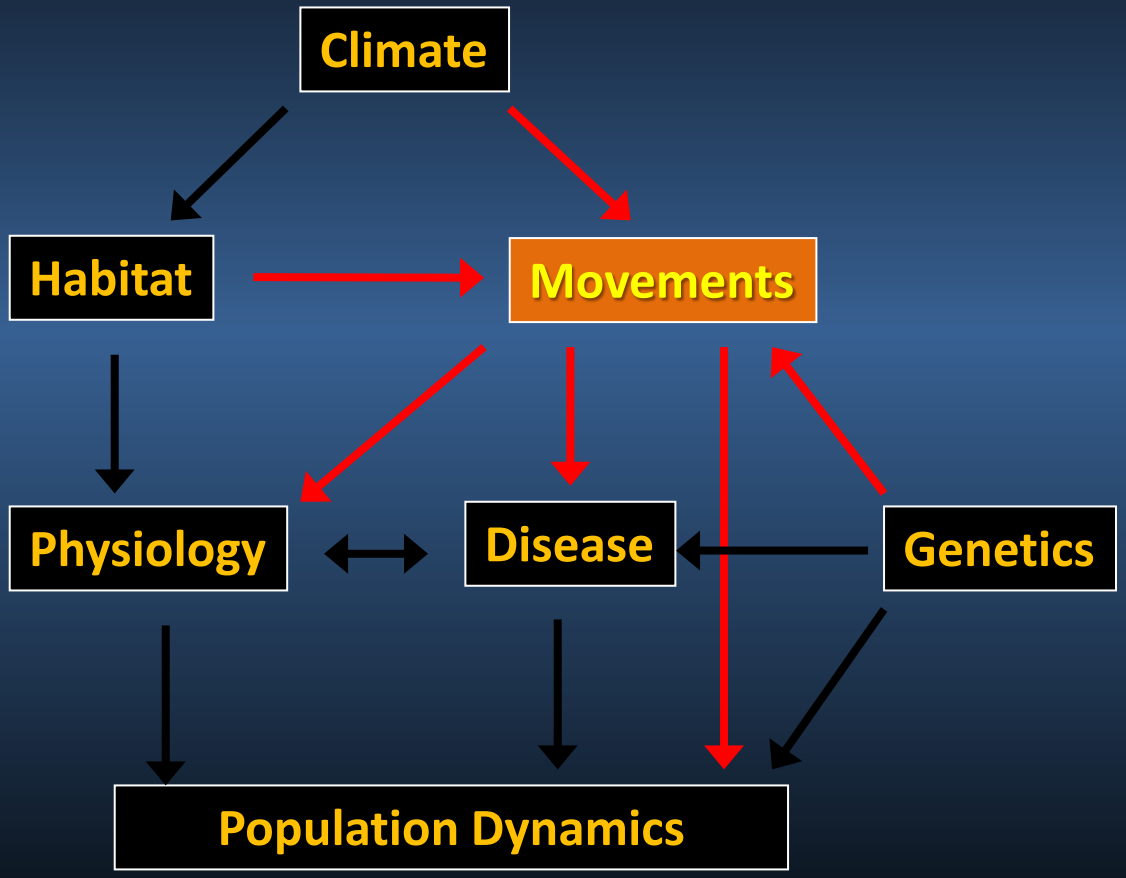




Hank Edwards
& Lab Staff
Mary Wood

Integrated Mtn Ungulate Research Program



Telemetry

Dual Collaring – GPS-SOB and Micro-VHF

Telemetry

Dual collars

Telemetry

Dual collars

Telemetry

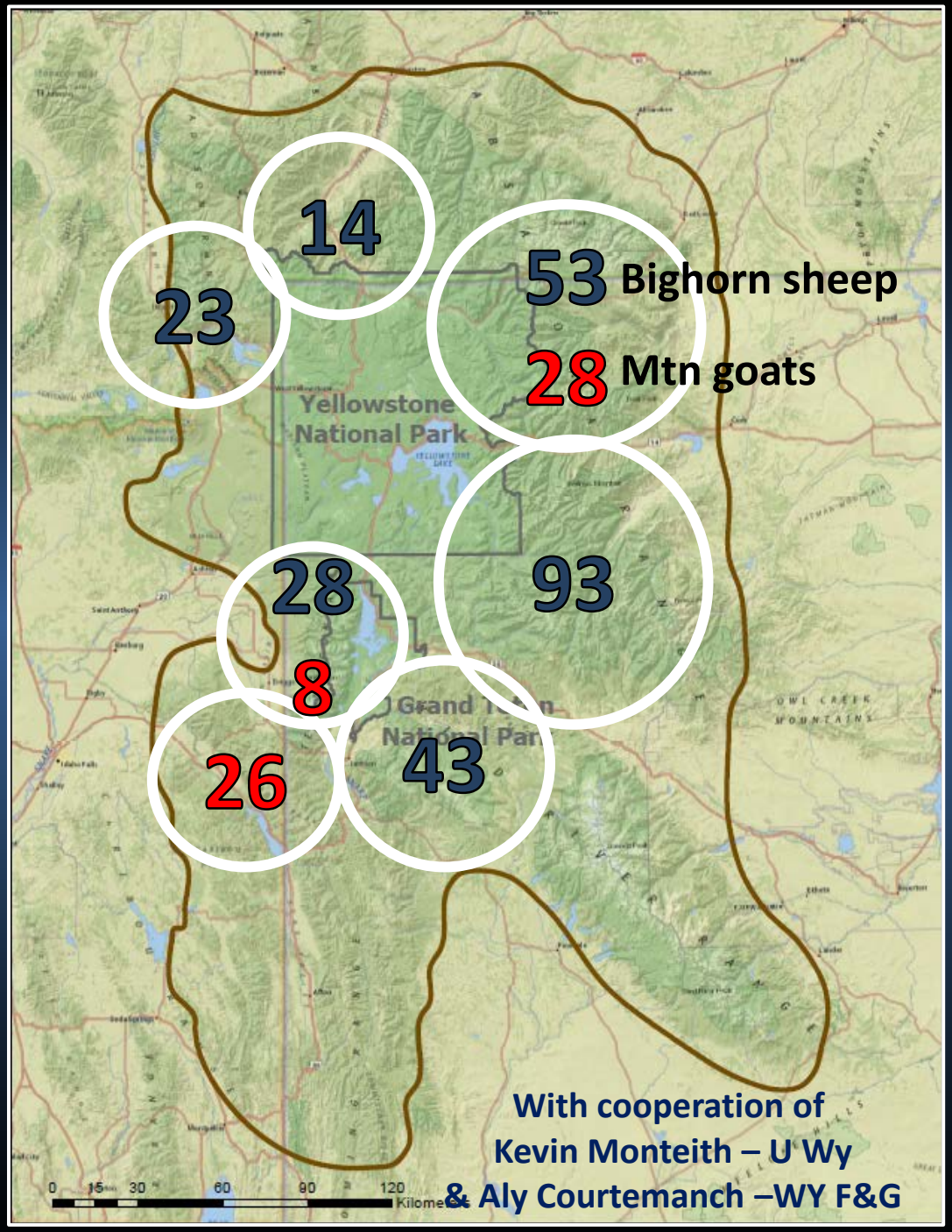
Dual collars

Captures

Number of Animals Radio-collared to Date

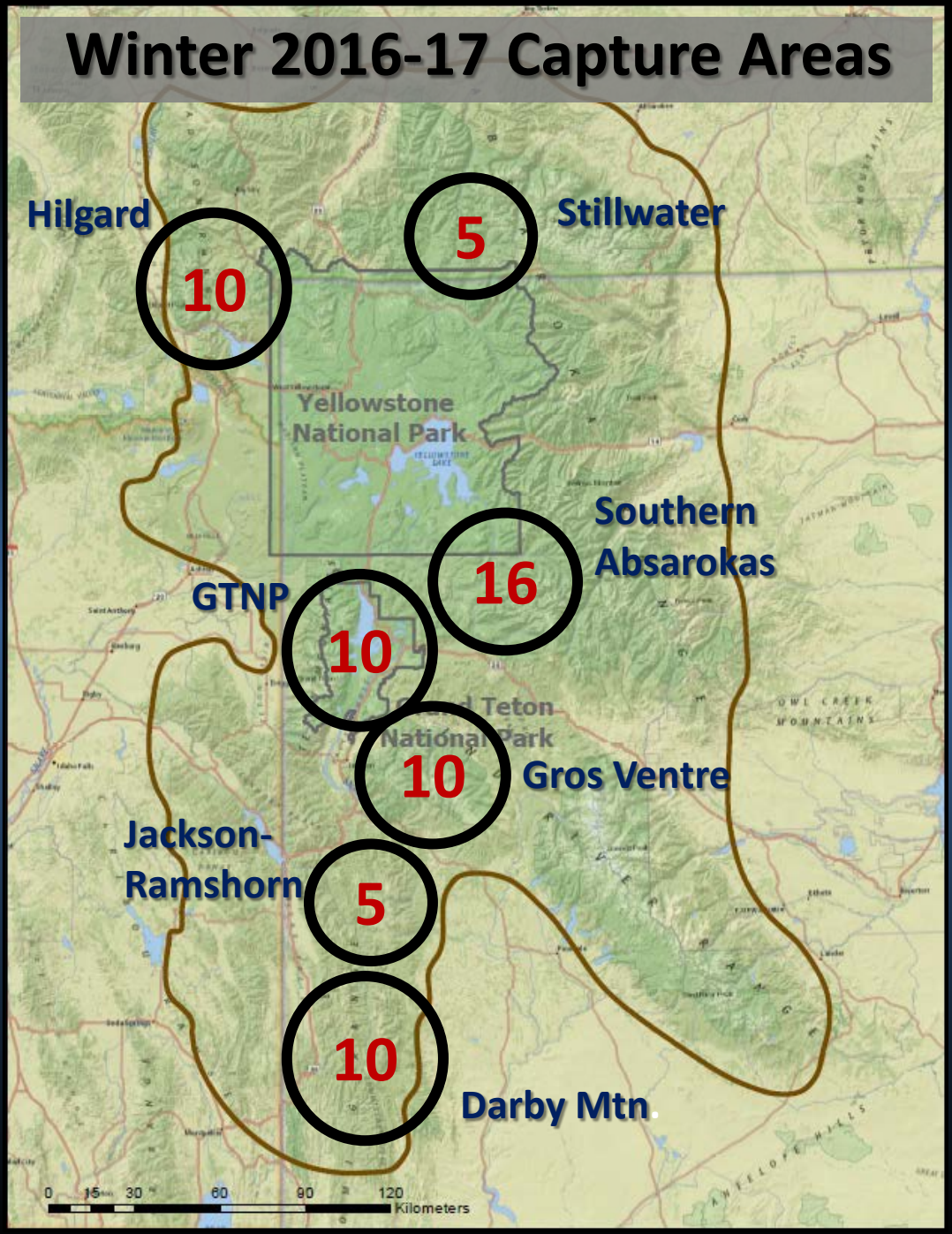
254 Bighorn
62 Mtn goats

316 Total



Anticipated Animals to be Radio-collared this Winter

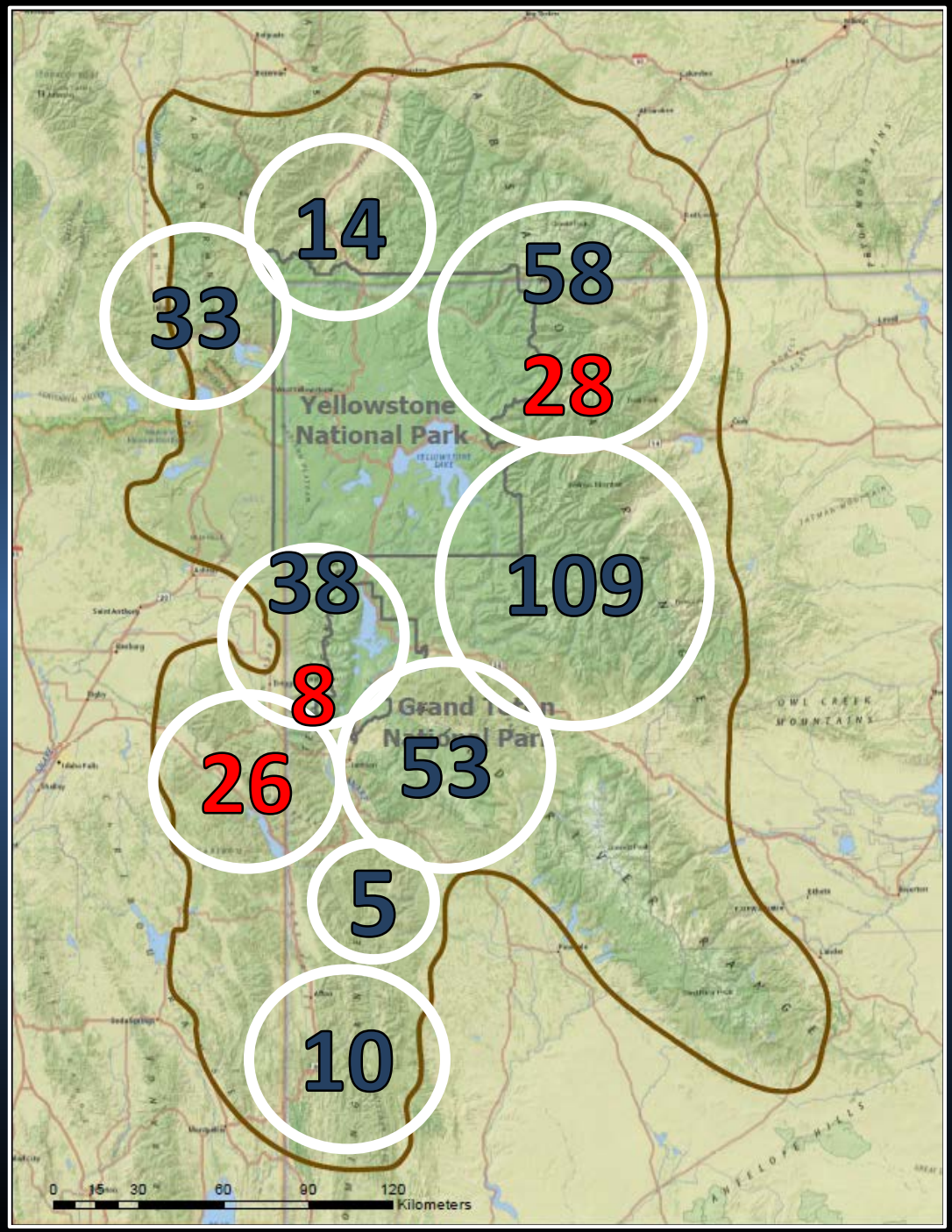
66 Bighorn



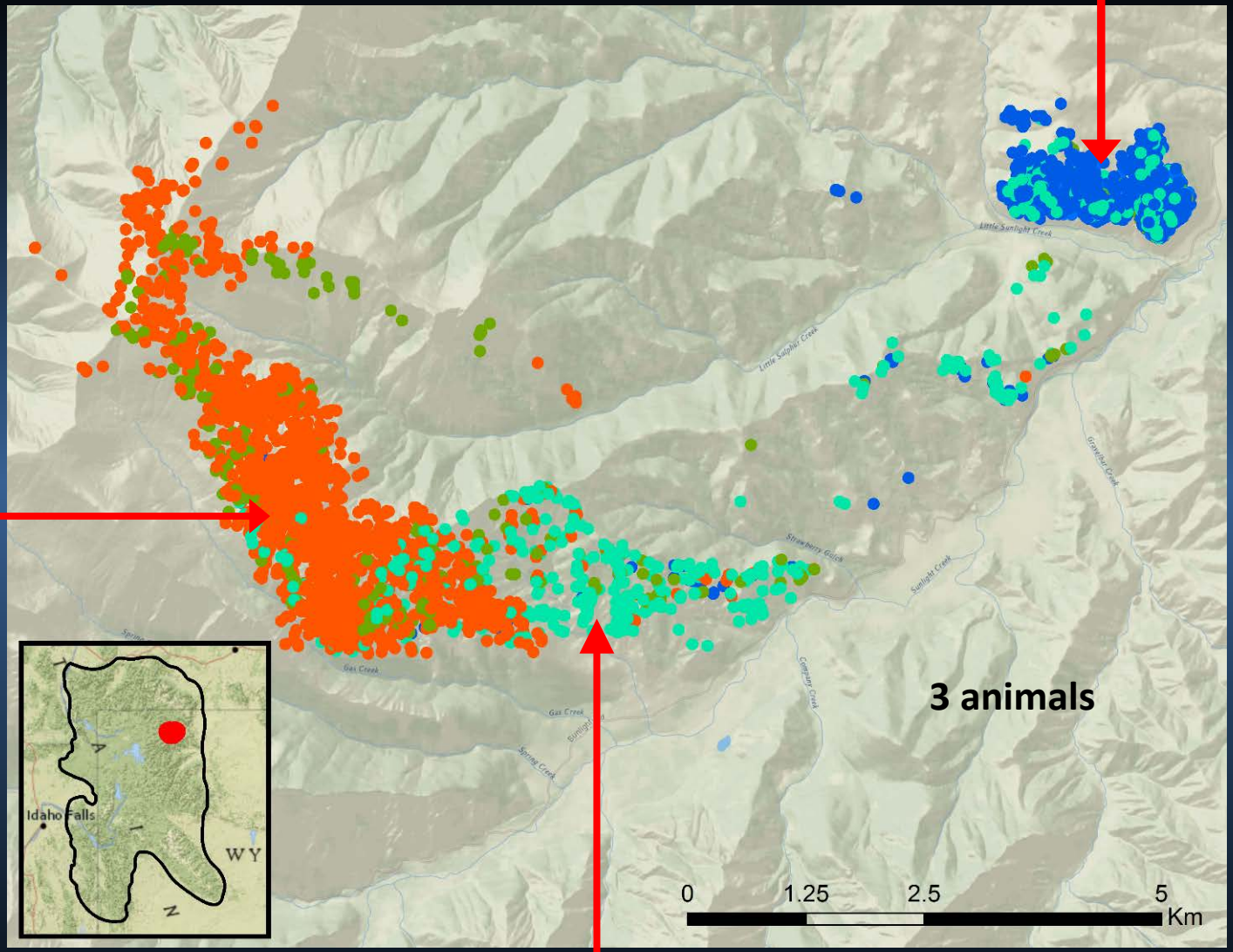
Anticipated GYA Sample of Radio-collared Animals

320 Bighorn
62 Mtn goats

382 Total



Little Bald Ridge - Sunlight Basin



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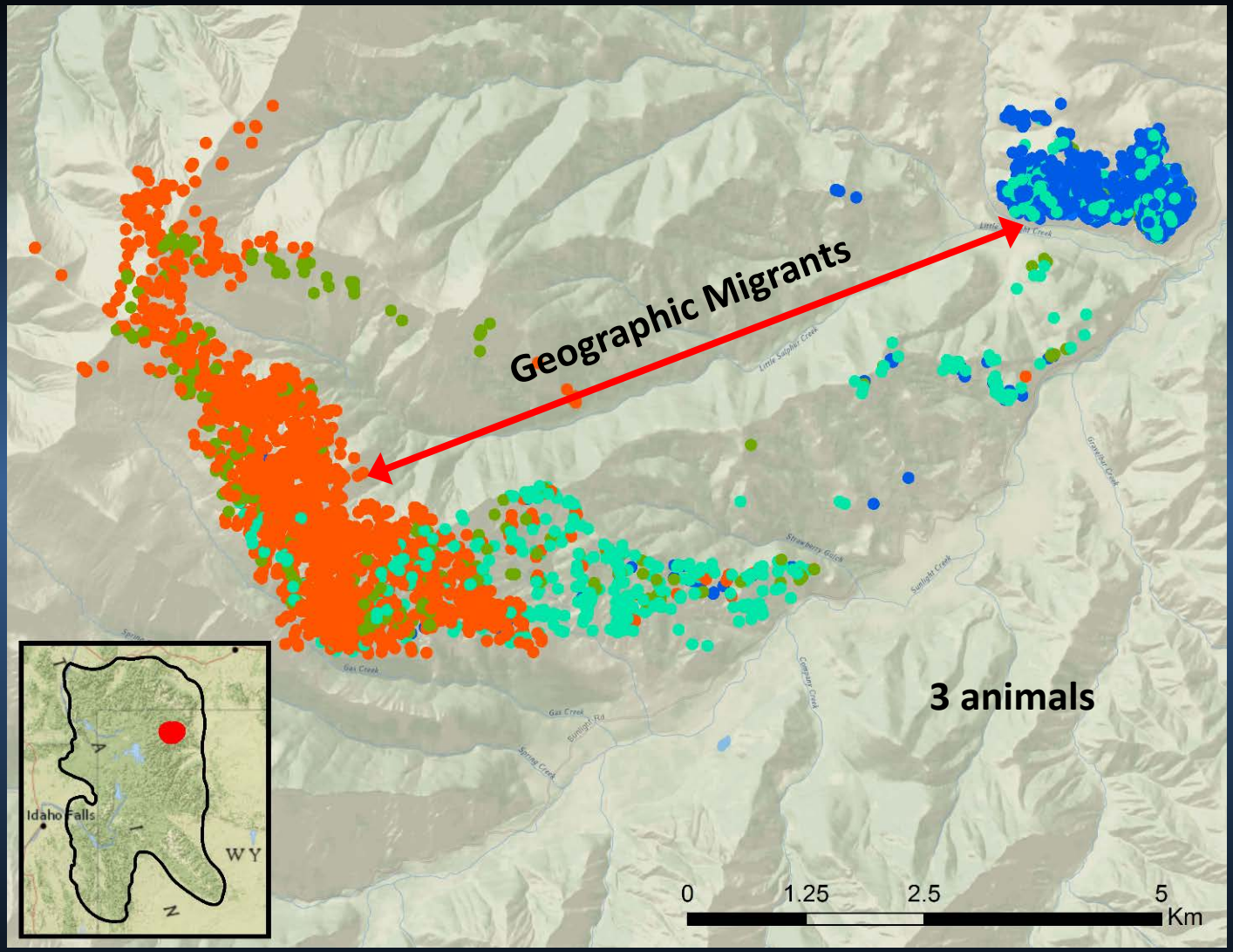

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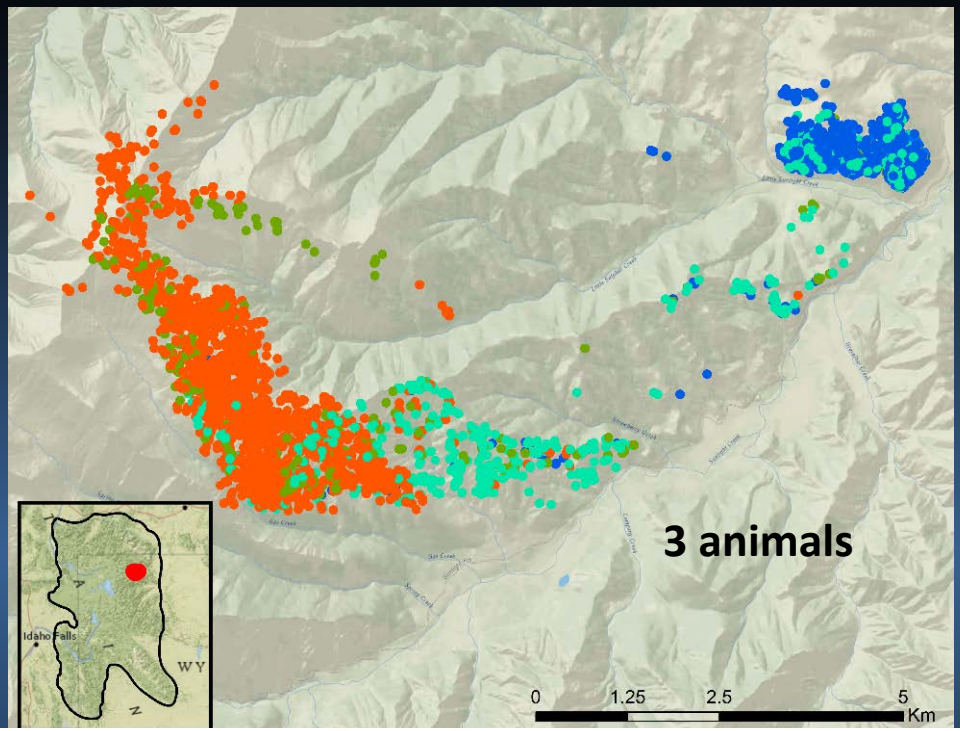
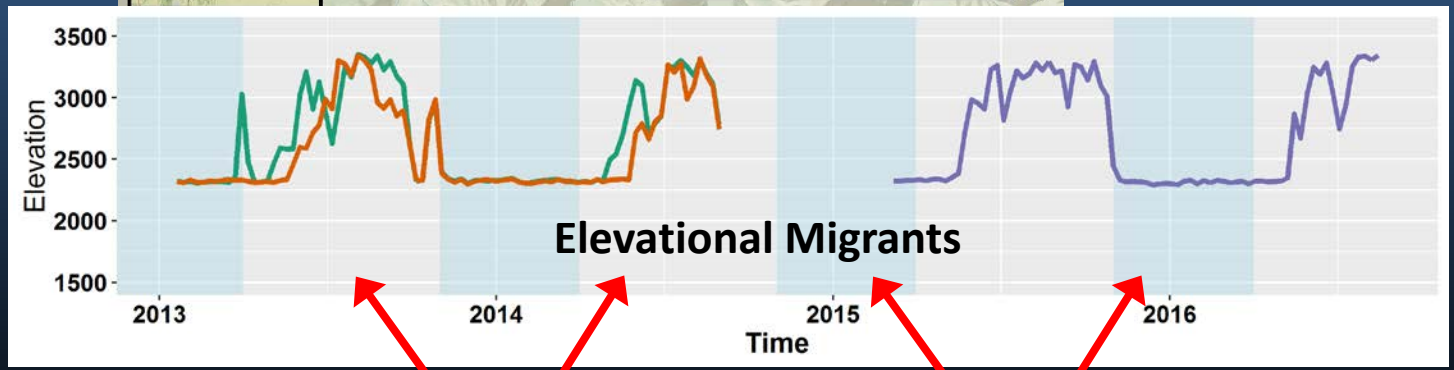
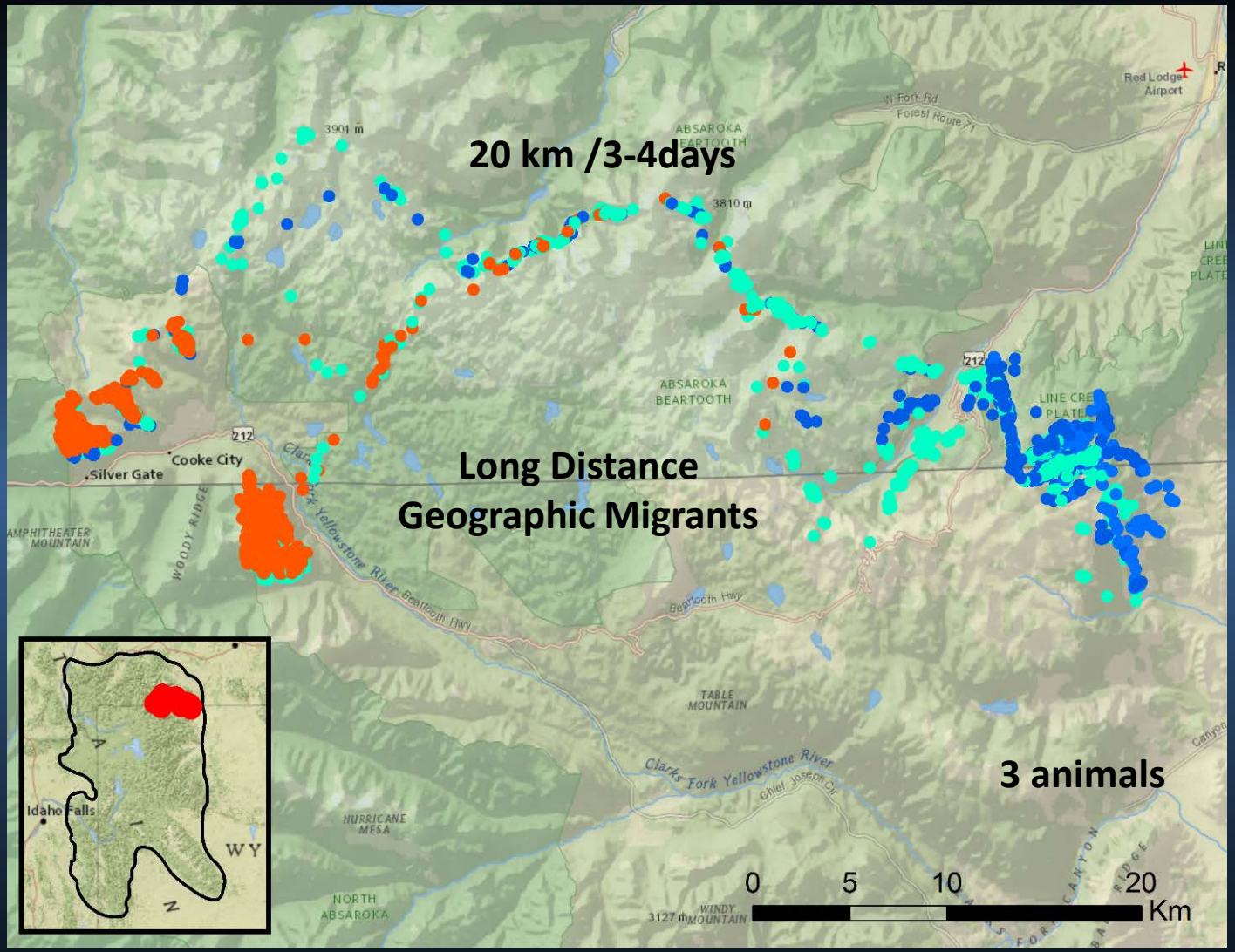




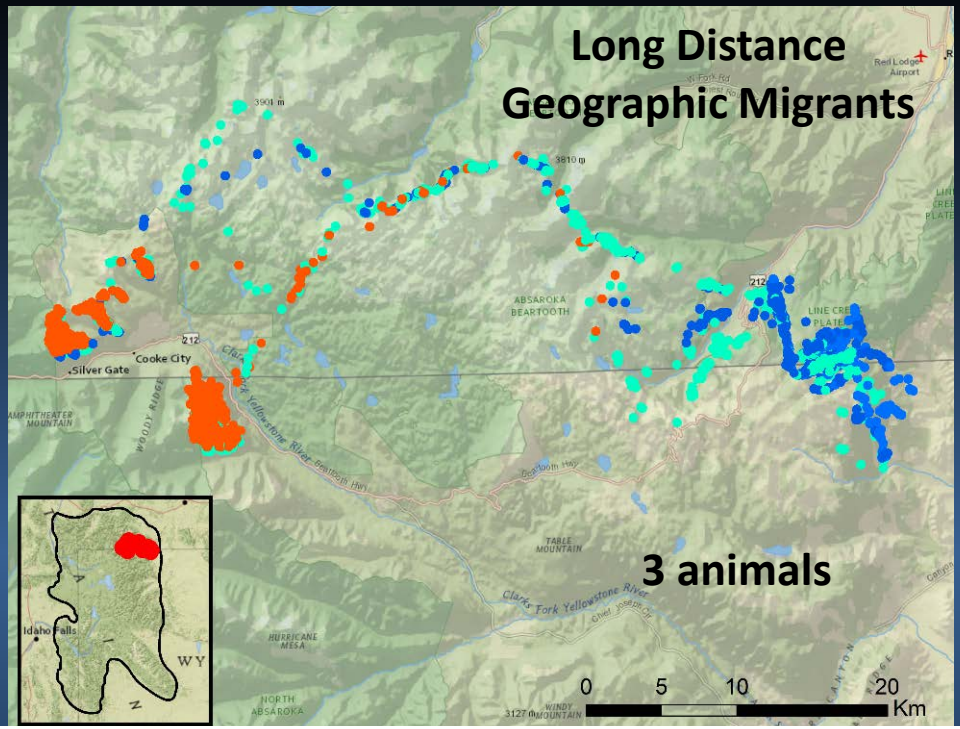
Summer

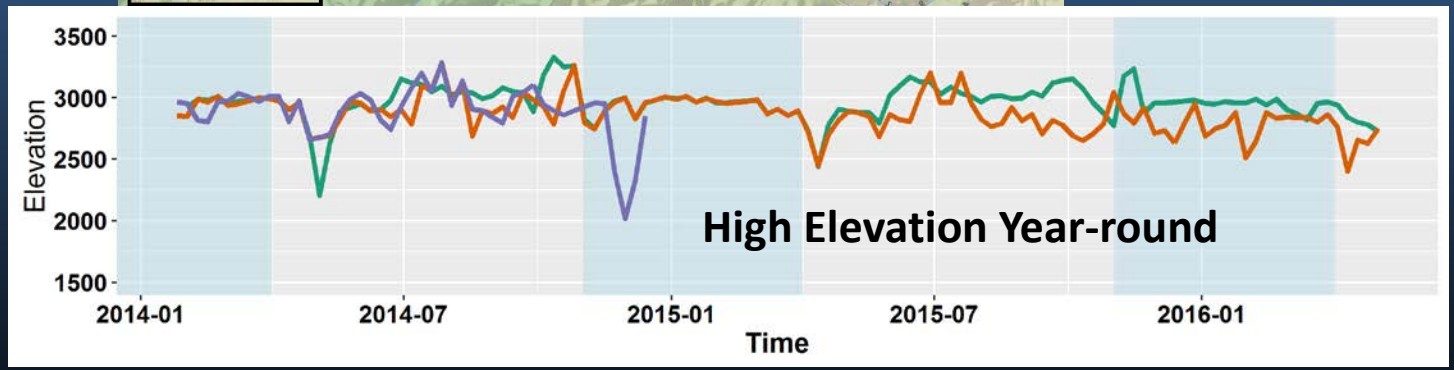
Winter

Line Ck /Cooke City - Beartooth Plateau

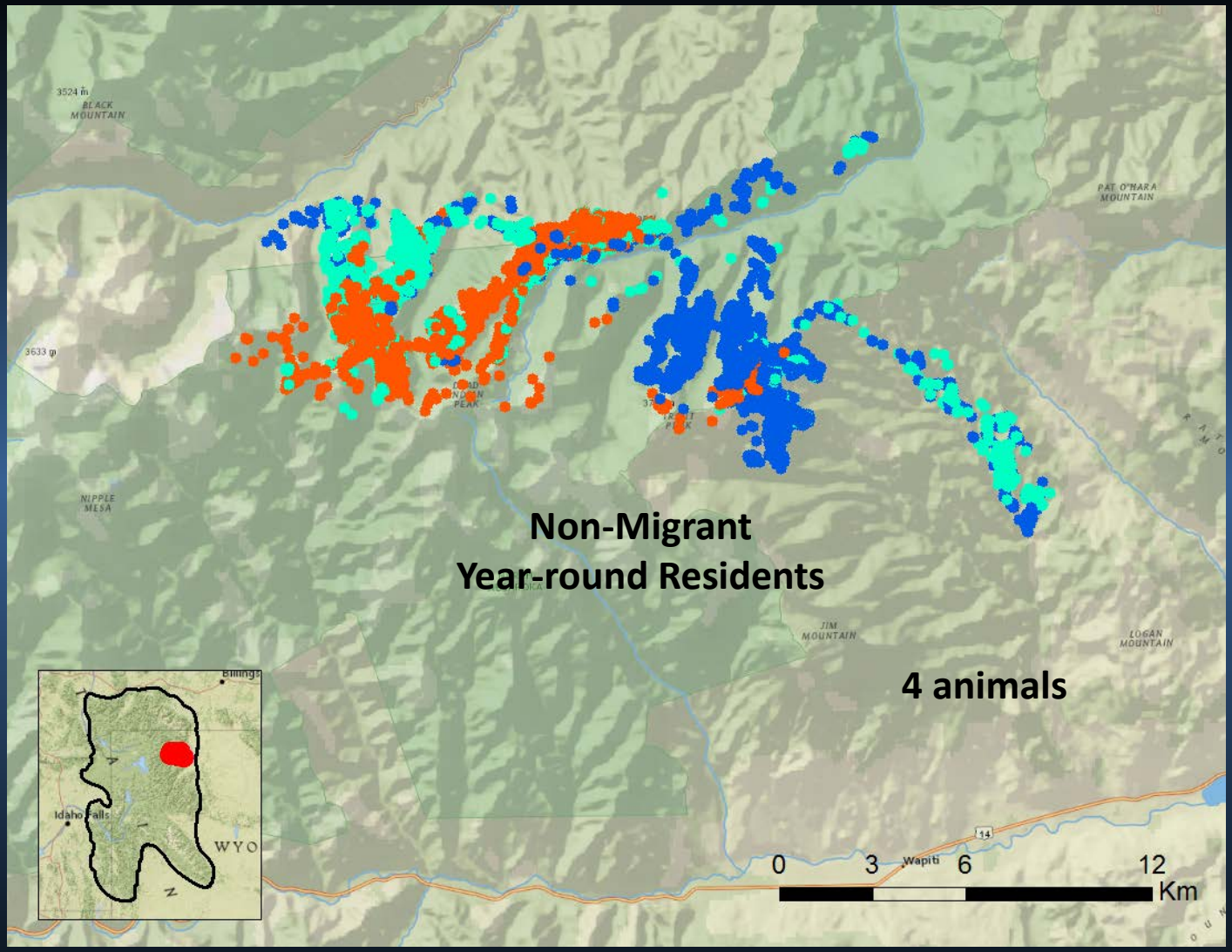


Line Ck /Cooke City - Beartooth Plateau





Trout Peak (between Sunlight Basin an North Fk Shoshone)



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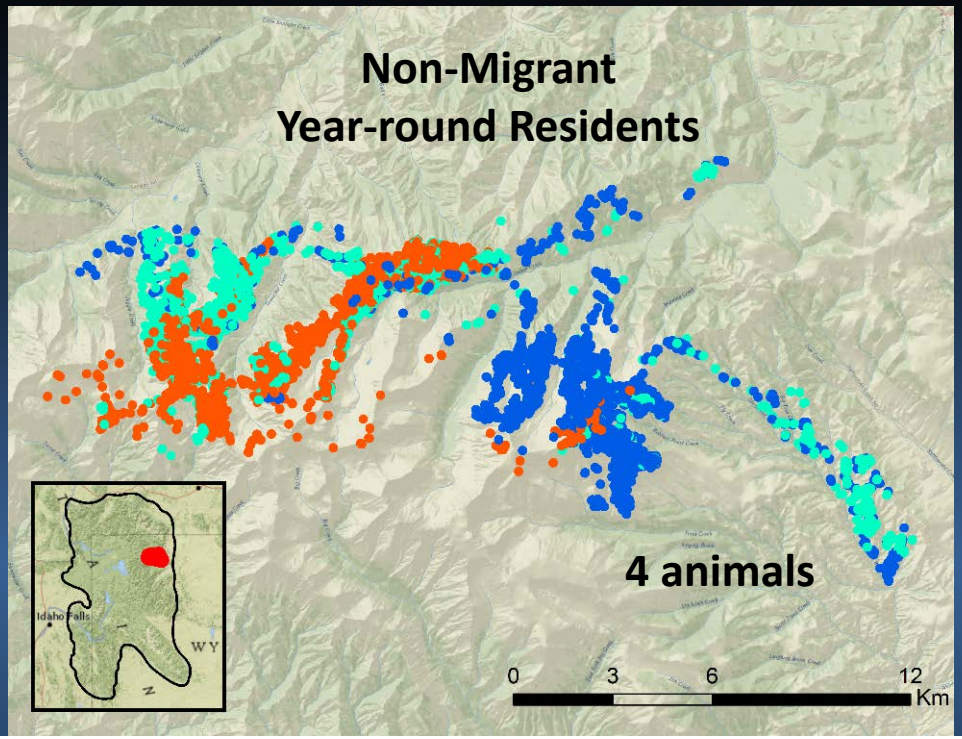

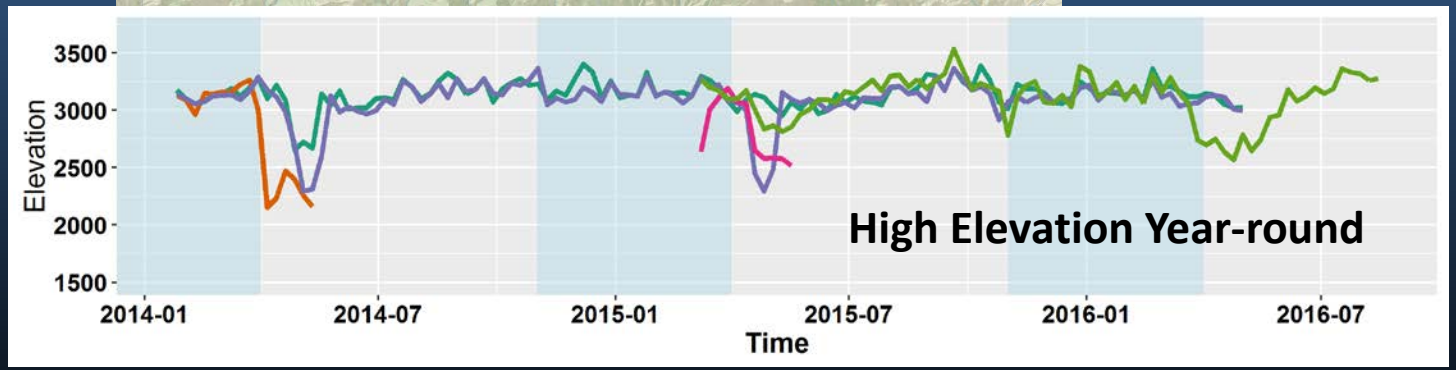

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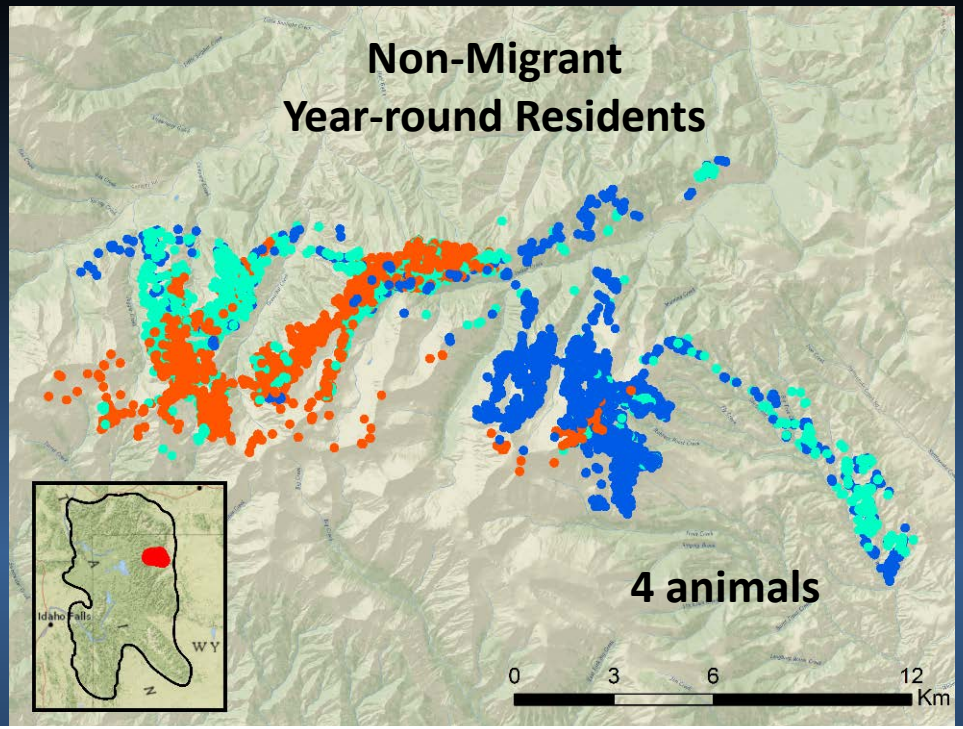
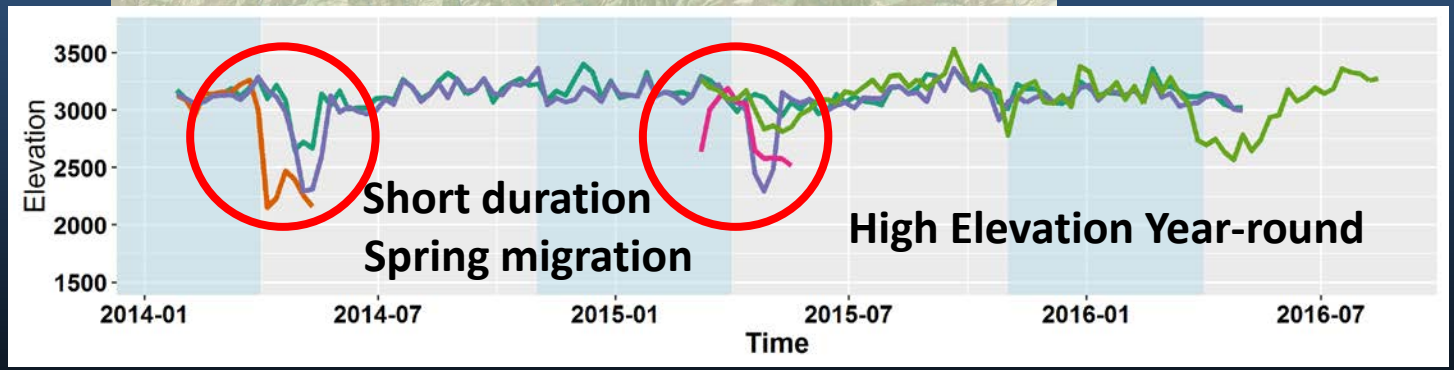
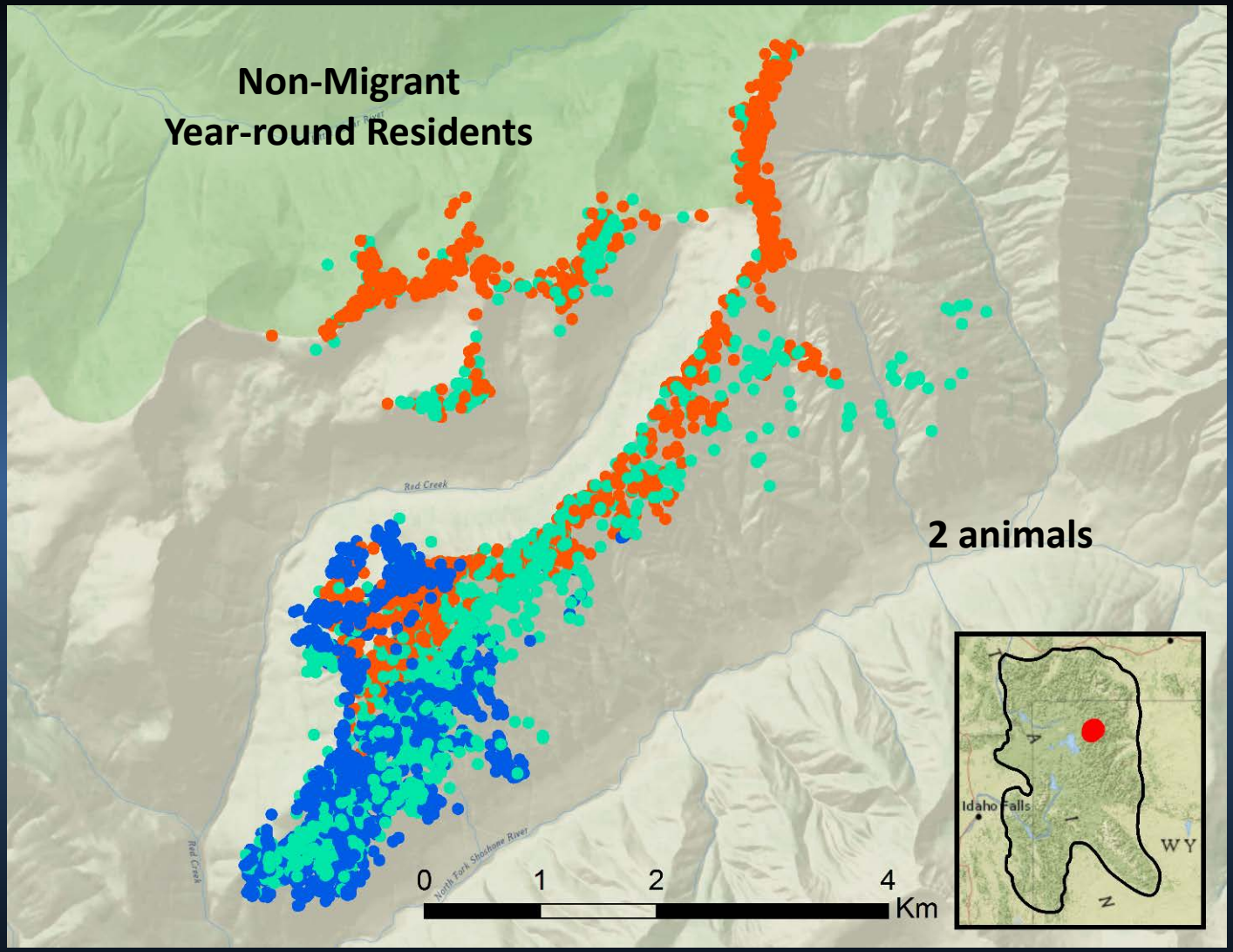


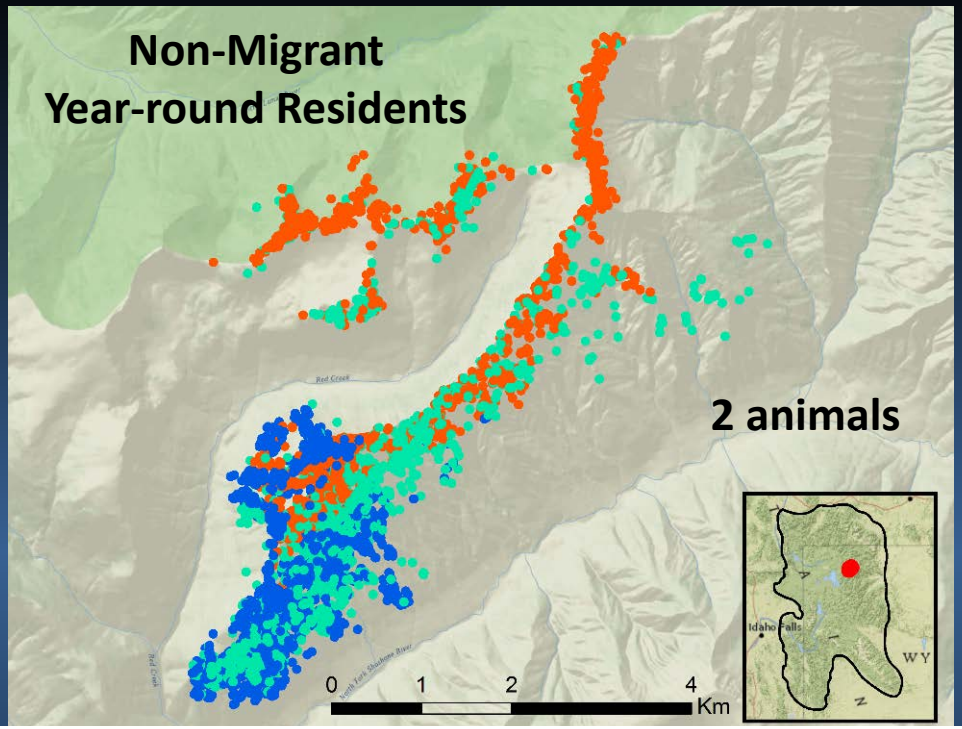


Grand Teton National Park – Aly Courtemanch

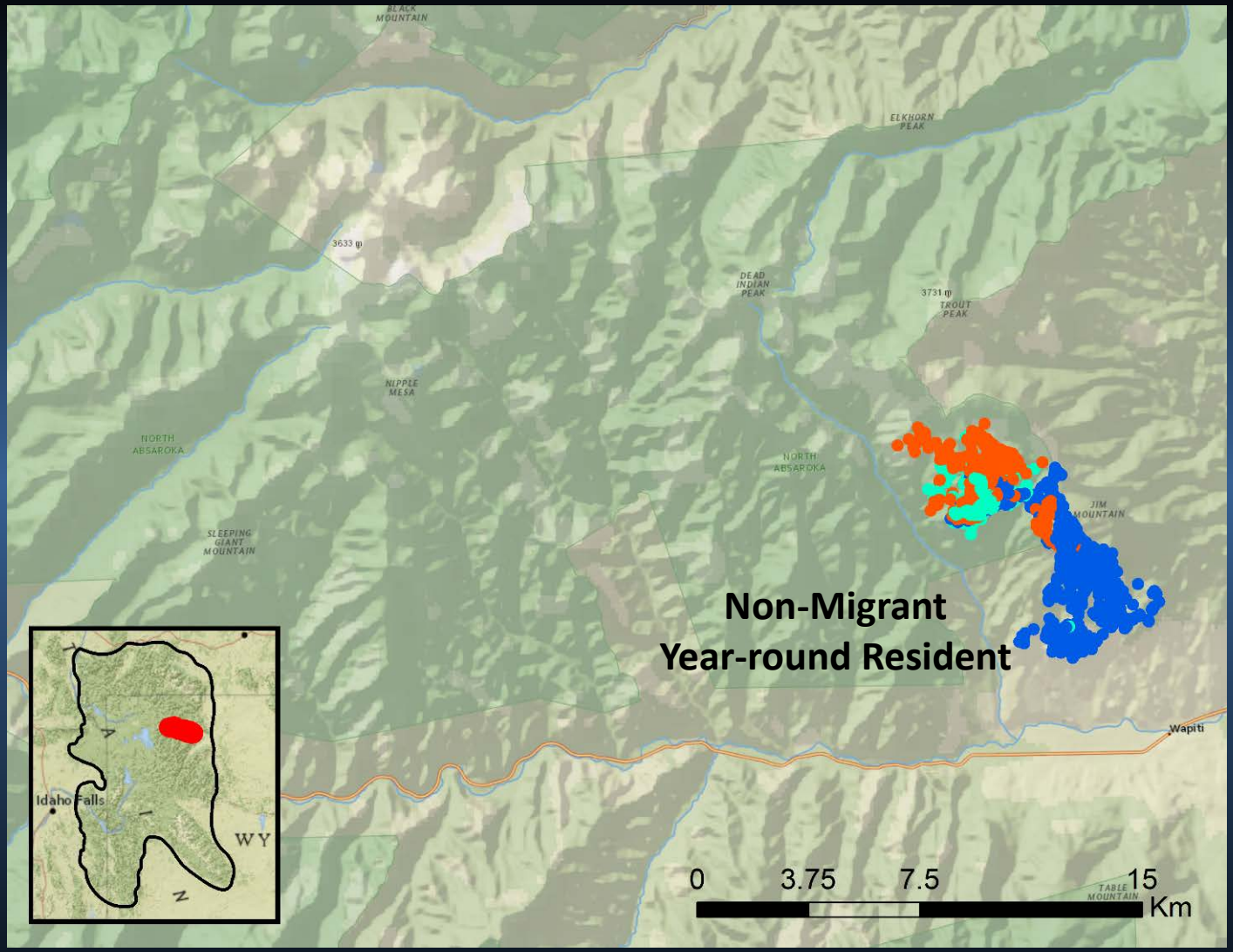
Saddle Mtn – North Fk Shoshone



Saddle Mtn – North Fk Shoshone



Shared Winter Range – Different Movements



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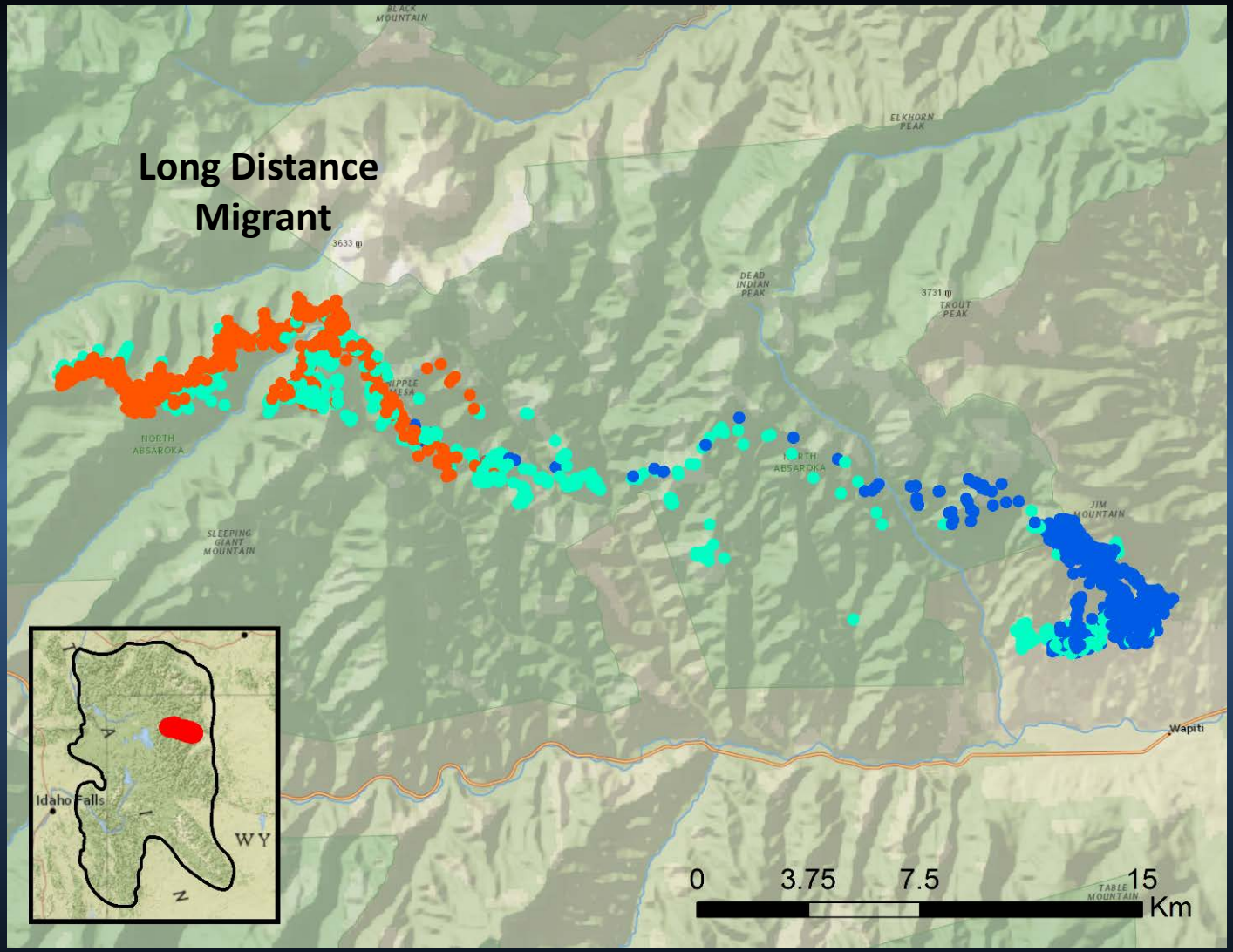
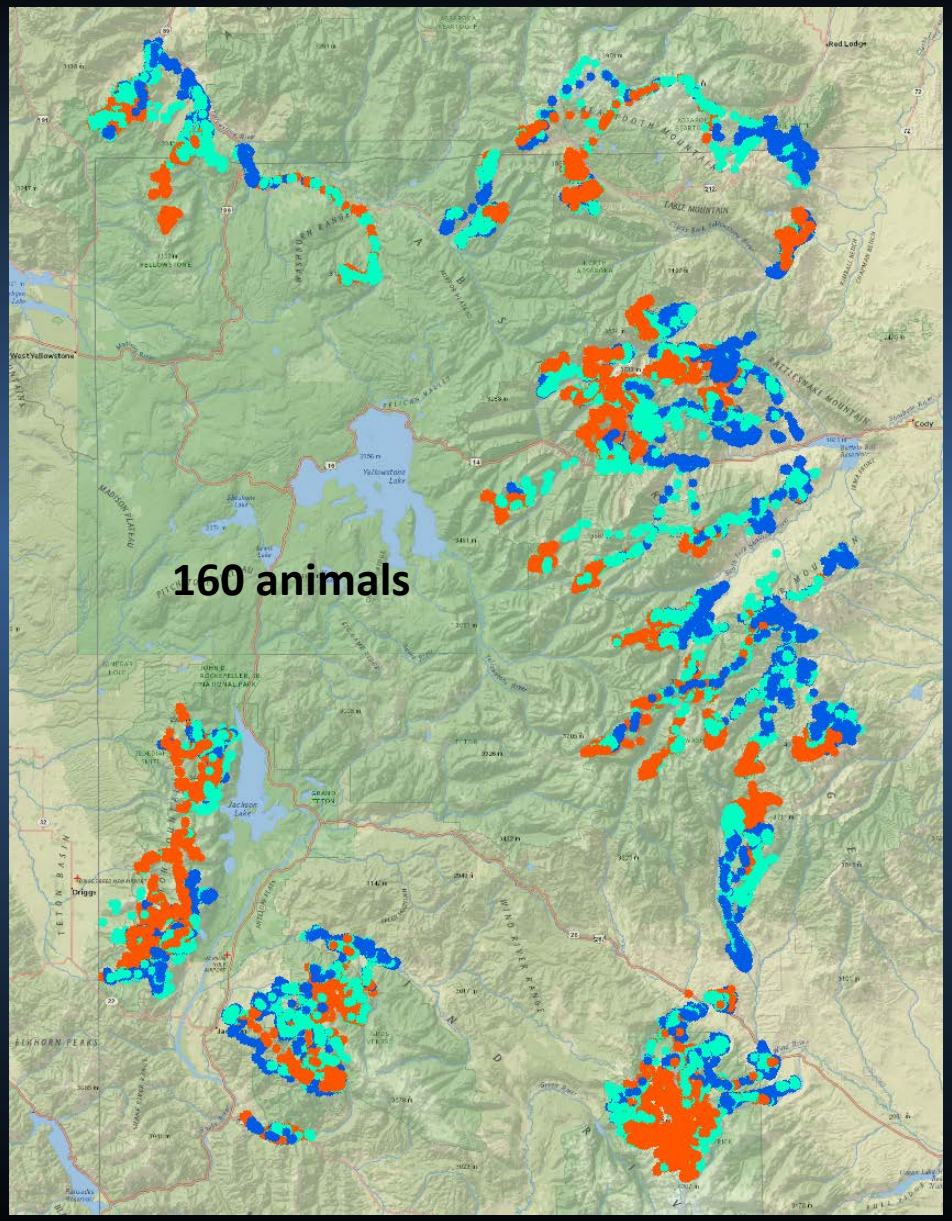


All GPS Data Recovered to Date



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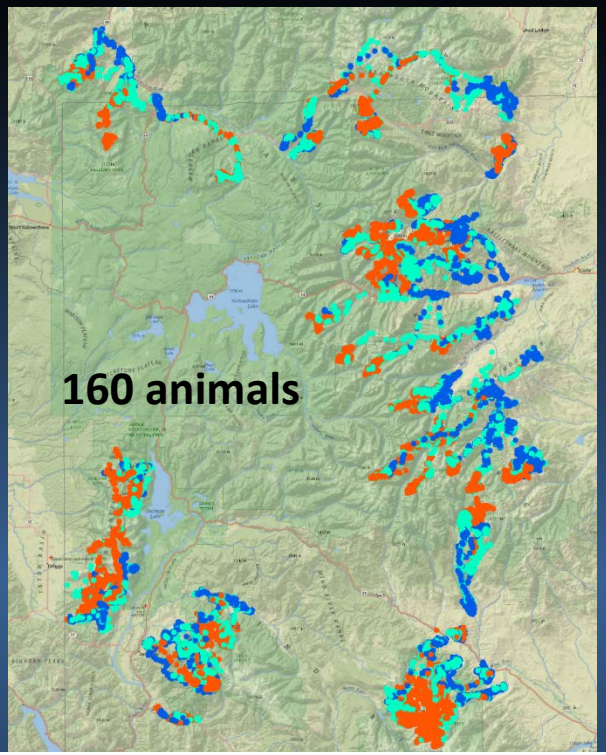
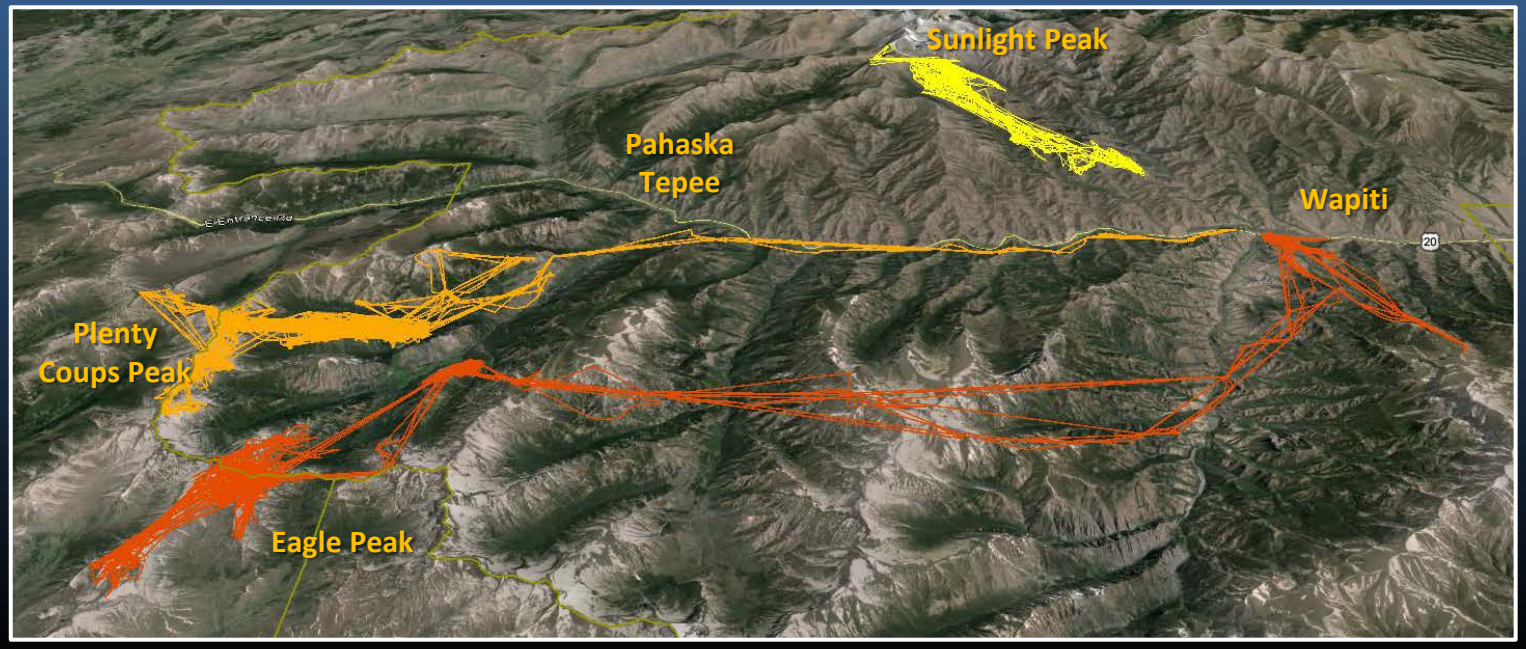


Dramatic Behavioral Heterogeneity in Seasonal Movments

Management Insights From Telemetry

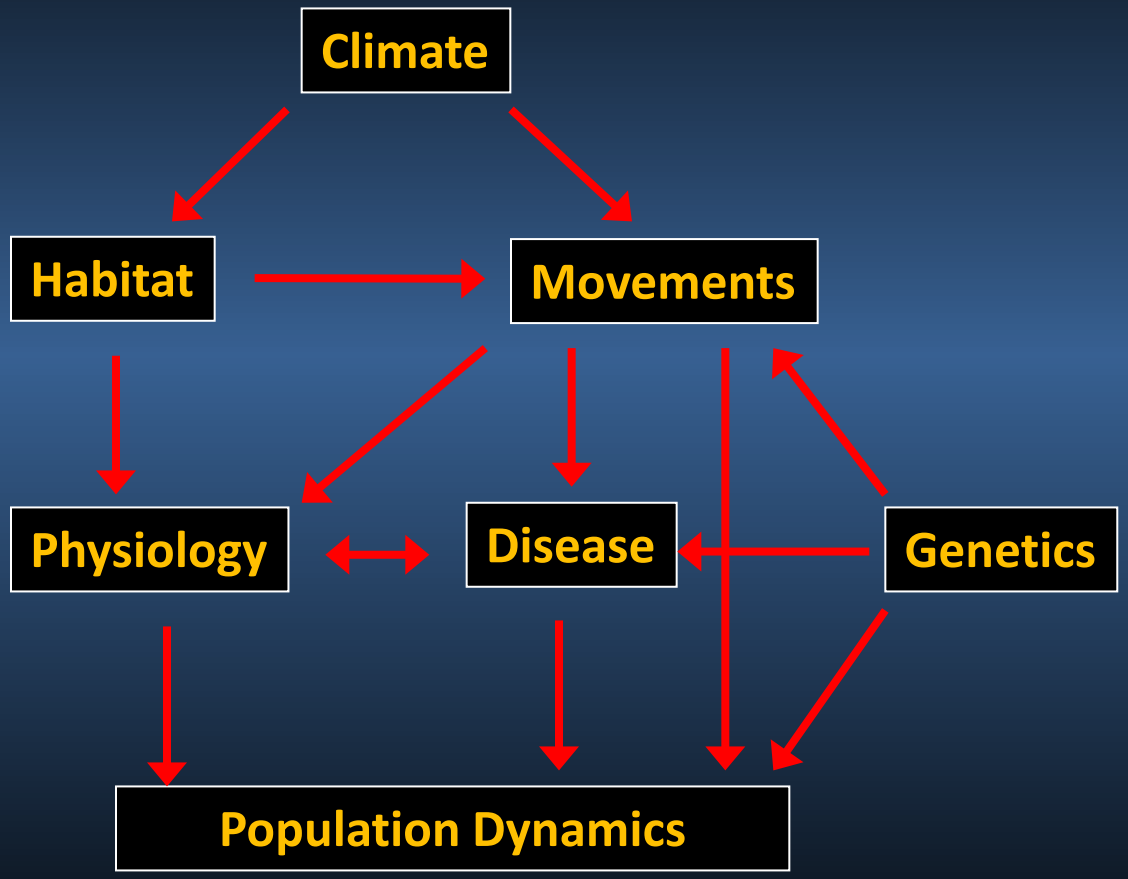
- Seasonal ranges
- Migratory/non-migratory animals and herds
- Migration routes
- Connectivity or Isolation of herds
- Habitat models
- Identify potential areas for new herds
- Improved population monitoring protocols
- Causes of mortality
- Estimate survival rates

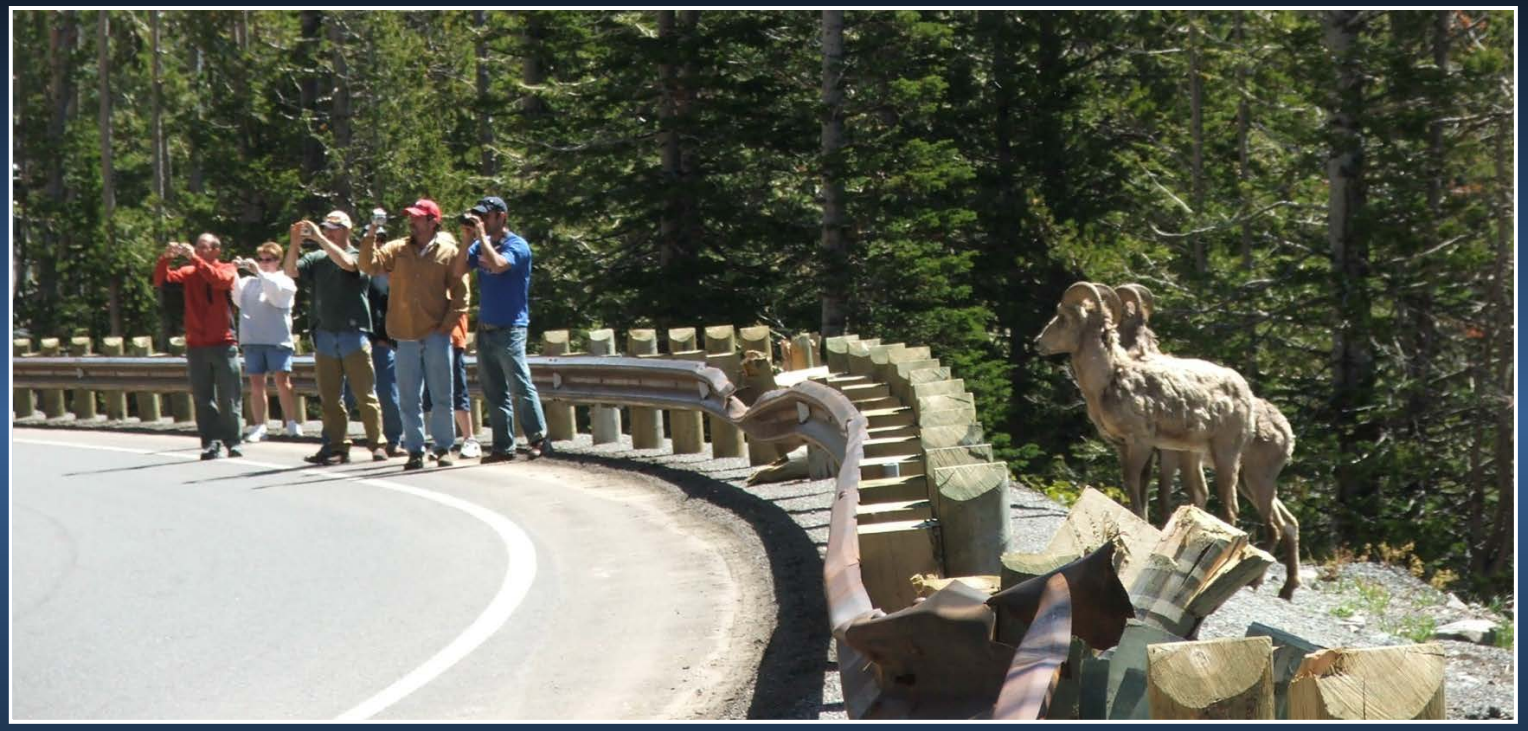


Integrated Mtn Ungulate Research Program

Contribute to a better ecological understanding

Conservation
Management
Restoration





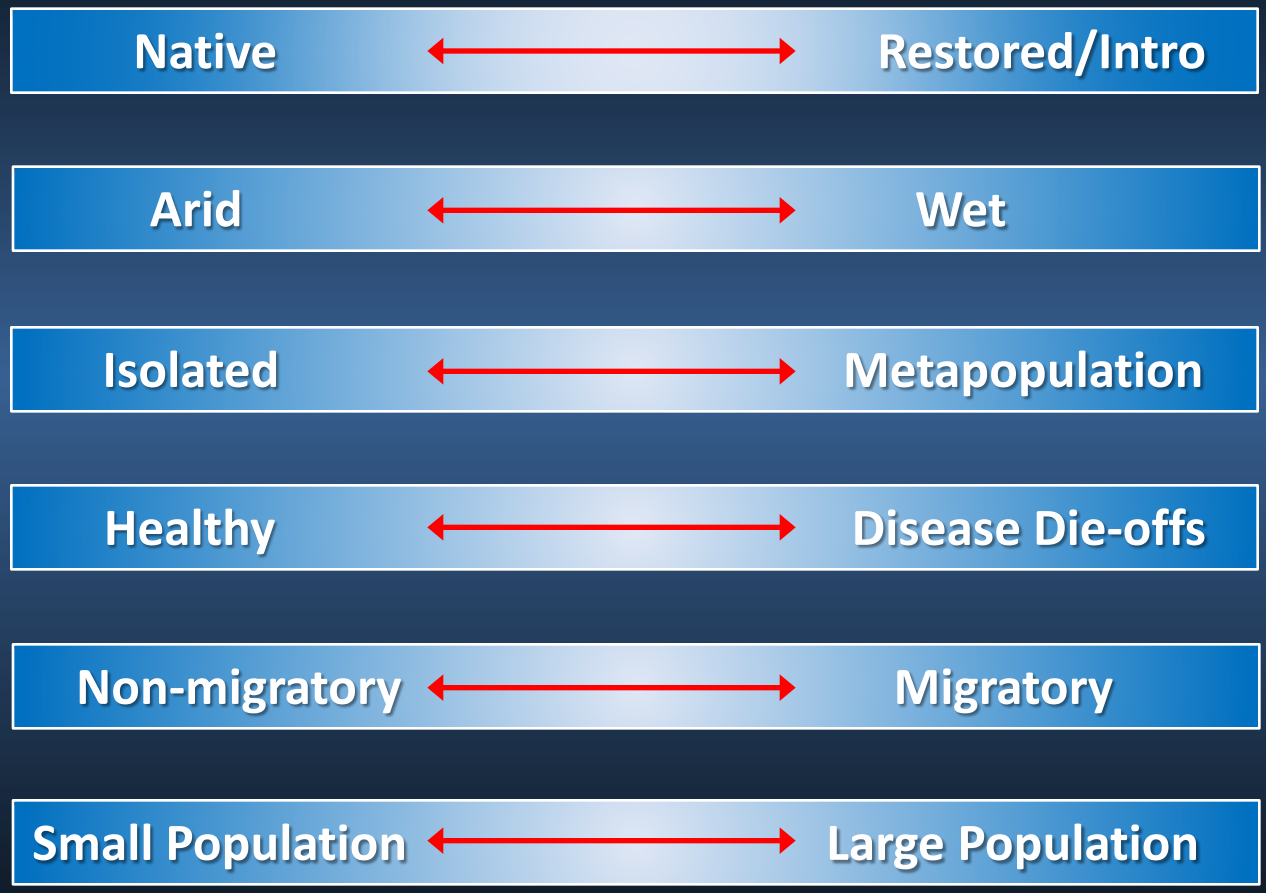
Thanks for your attention

Designing Informative Wildlife Research Projects

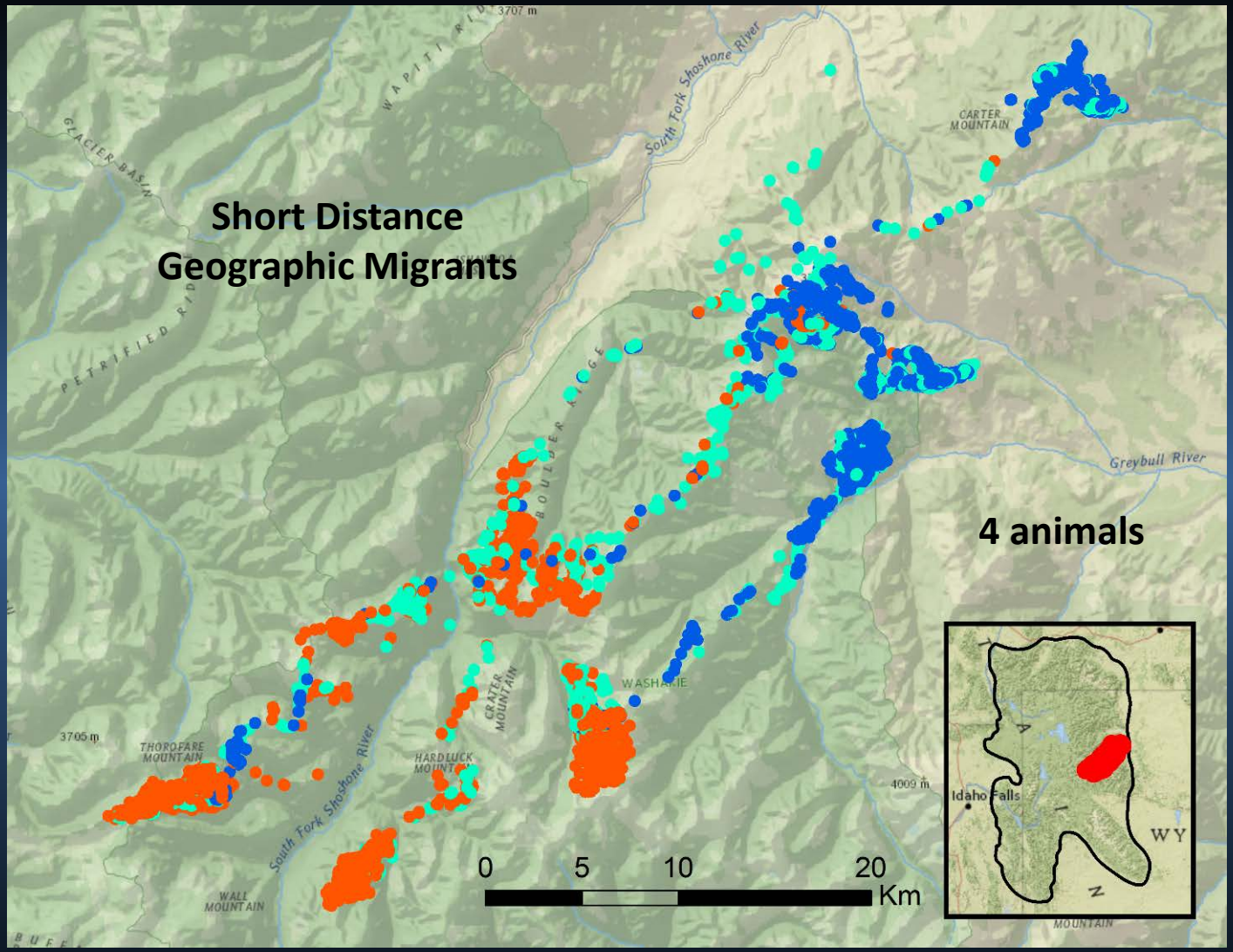
THE MODEL

- Multiple populations in diverse ecological settings
- Long duration (5-10 years)
- Multiple research objectives
- Multiple and competing alternative hypotheses
- Collaborative

Herd Attributes



Carter Mtn (between Grey Bull and South Fk Shoshone)



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