

Mule Deer Population Dynamics



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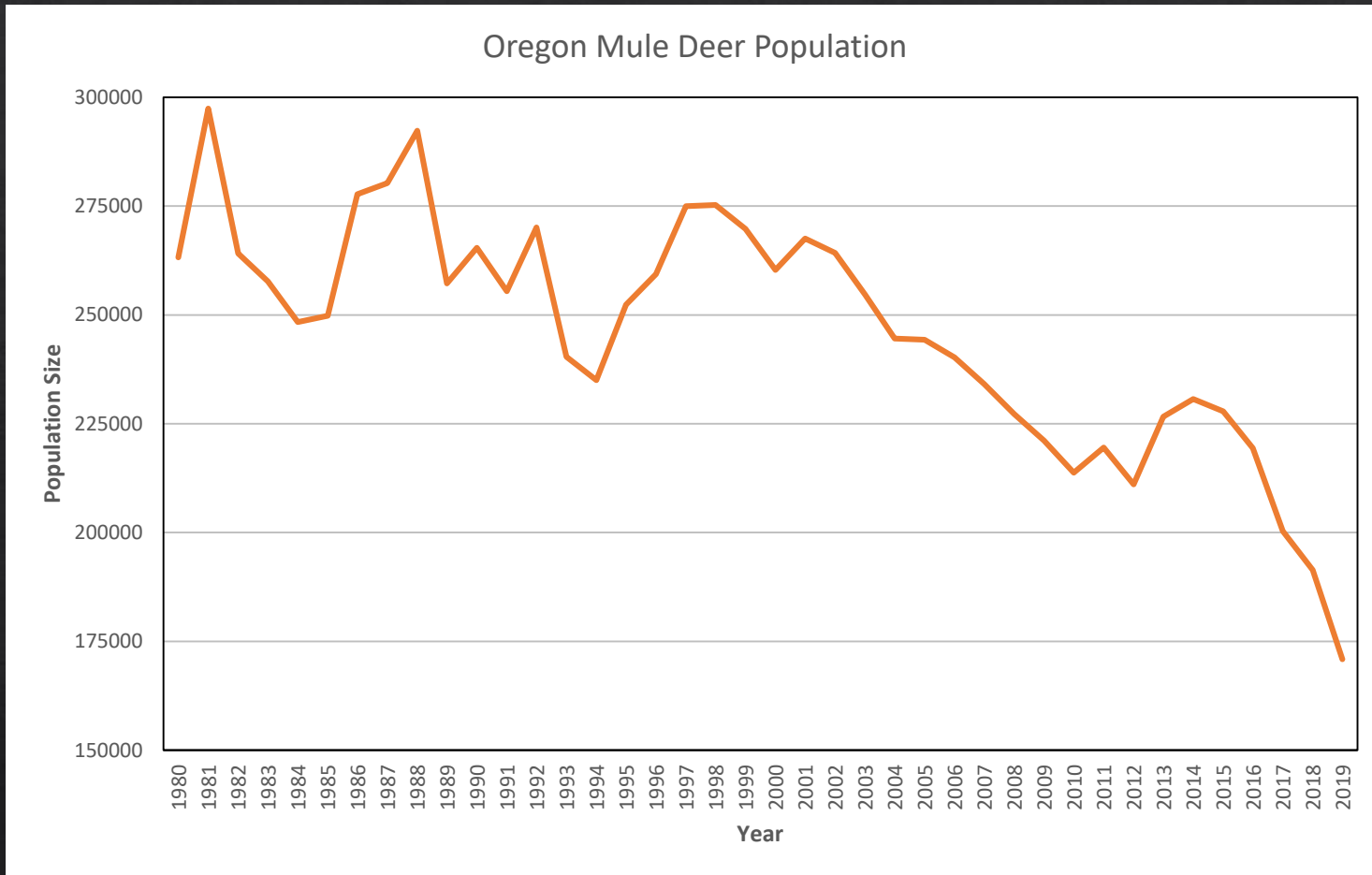
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Salem, OR

Declining mule deer populations

- ◇ Population peaks in the 1930's attributable to increased shrublands
 - ◇ Most common big game species in western North America at the time
- ◇ Population declines observed nearly range wide in the last third of the 20th century
- ◇ 23 states/provinces where population trends are monitored through WAFWA:
 - ◇ Most are below management objectives
 - ◇ Population declines are still ongoing in many states
- ◇ WAFWA Mule Deer Working Group established ~20 years ago to address declines



Oregon's declining mule deer population



~40% population decline since the 1980's
~50% below management objective

Declining mule deer populations

Some compelling hypotheses:

1. Declines in quality and quantity of winter range
2. Inadequate forage on summer range
3. Increased predation from a recovering suite of carnivores
4. Overharvest or poaching
5. Climate change
6. Competition with other ungulates
7. Disease

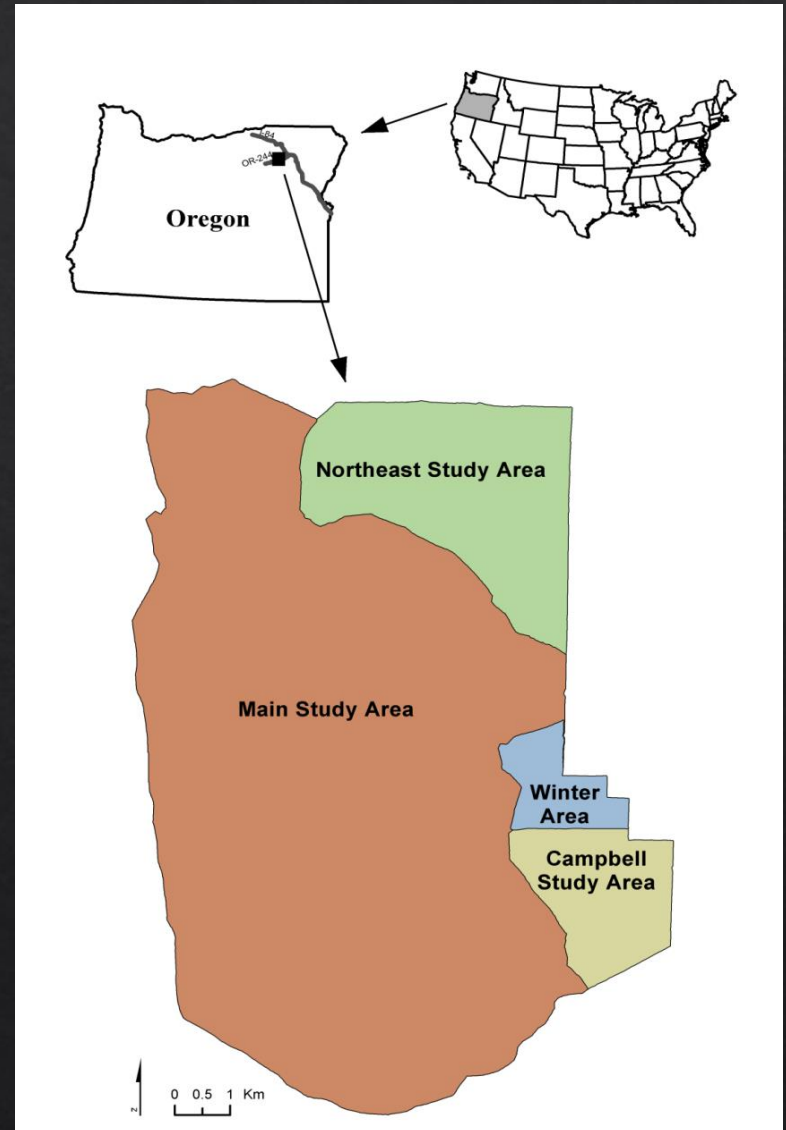
Declining mule deer populations

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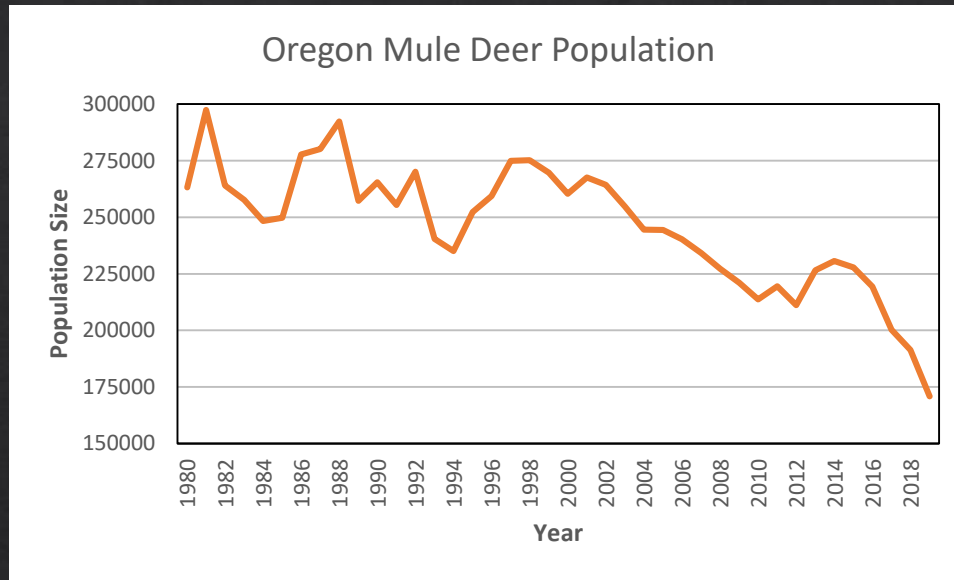
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Starkey Experimental Forest

- ◇ Main Study Area = 30 mi²
- ◇ Ungulate-proof fence allows manipulations of ungulate herds
- ◇ Typical of Blue Mountains in Oregon
- ◇ Elevations moderate (1,100-1,500 m)
- ◇ Rolling topography (slope averages 18%)



Declining mule deer populations



1. Declines in quality and quantity of winter range
2. Inadequate nutritional resources on summer range
3. Increased predation from a recovering carnivores
4. Competition with elk

Controlled Experiment

Phase I – Pre-treatment (2014-2019)

- ◇ Currently 350+ elk in Main Study area.

Phase II – Treatment (2020-2025)

- ◇ Reduce elk population to ~75-100.

Monitor three components:

1. Mule deer demography (e.g., fawn and doe survival, pregnancy)
2. Mule deer nutrition and habitat use
3. Predation and predator densities

Mule Deer Demography

Place GPS collars on does

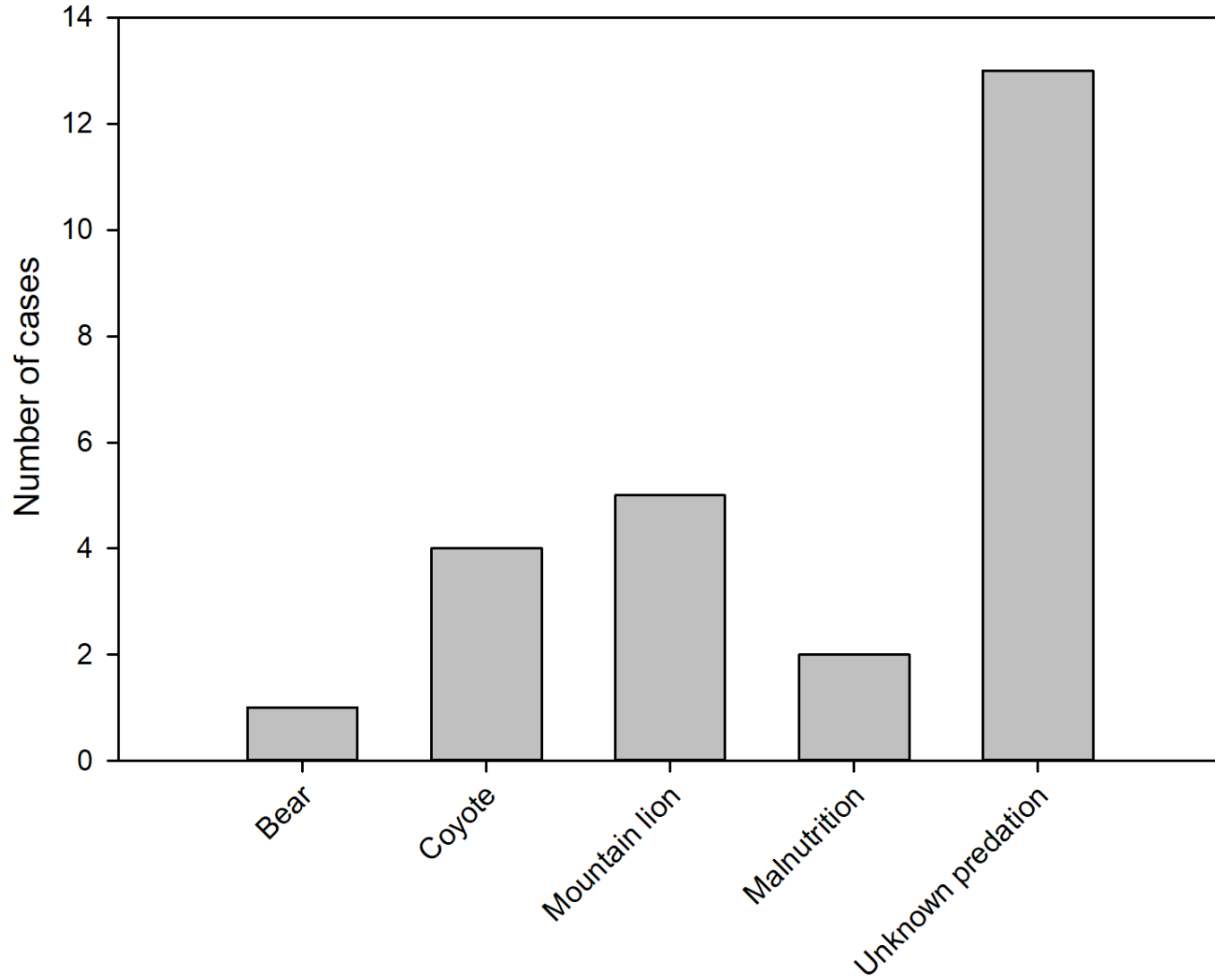
- ◇ Survival and cause specific mortality

Pregnant does fitted with VIT

- ◇ Locate and collar fawns
- ◇ Survival and cause specific mortality

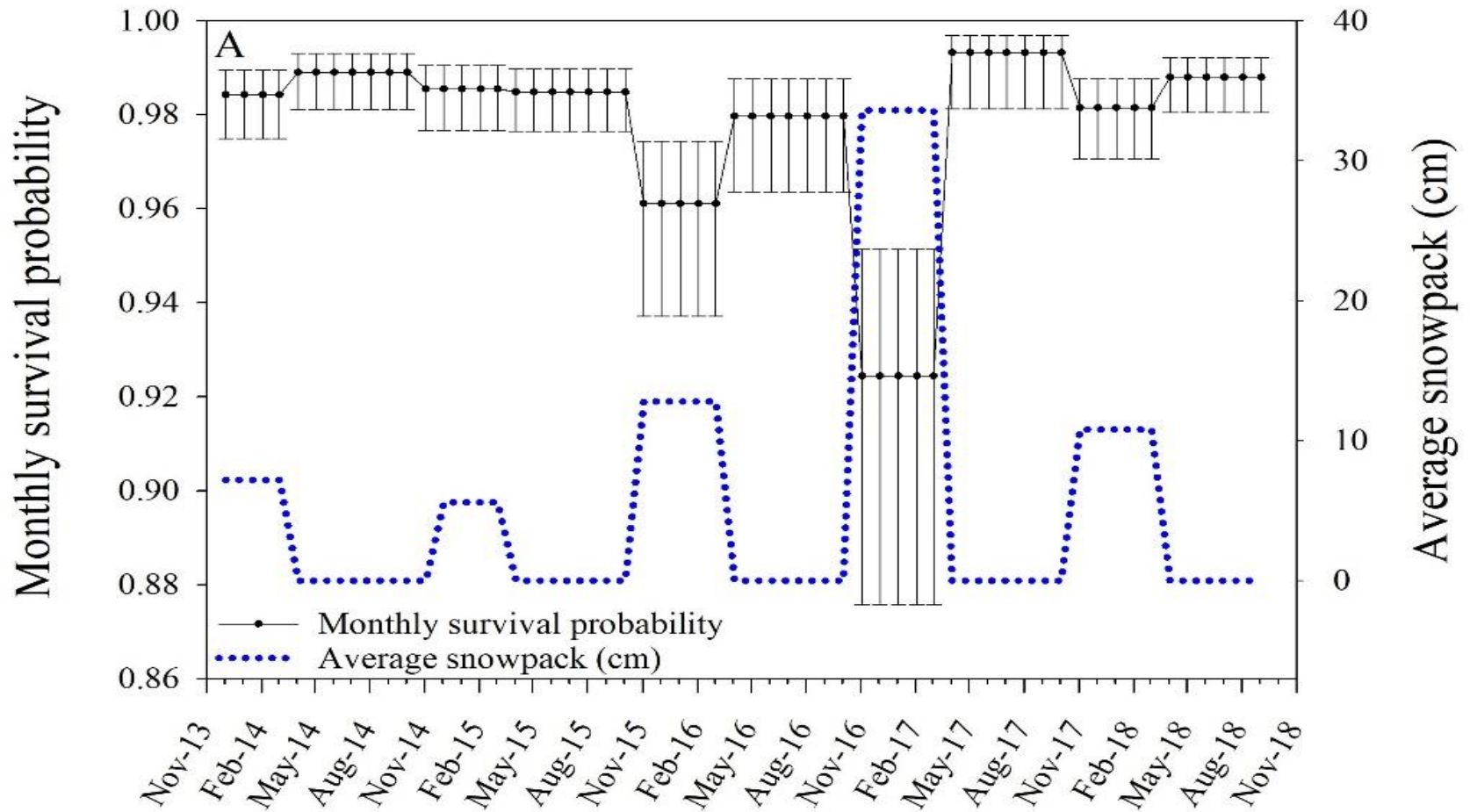


Doe Causes of Mortality



Doe survival

Increased winter snowpack reduces survival



Mule Deer Habitat Use and Nutrition

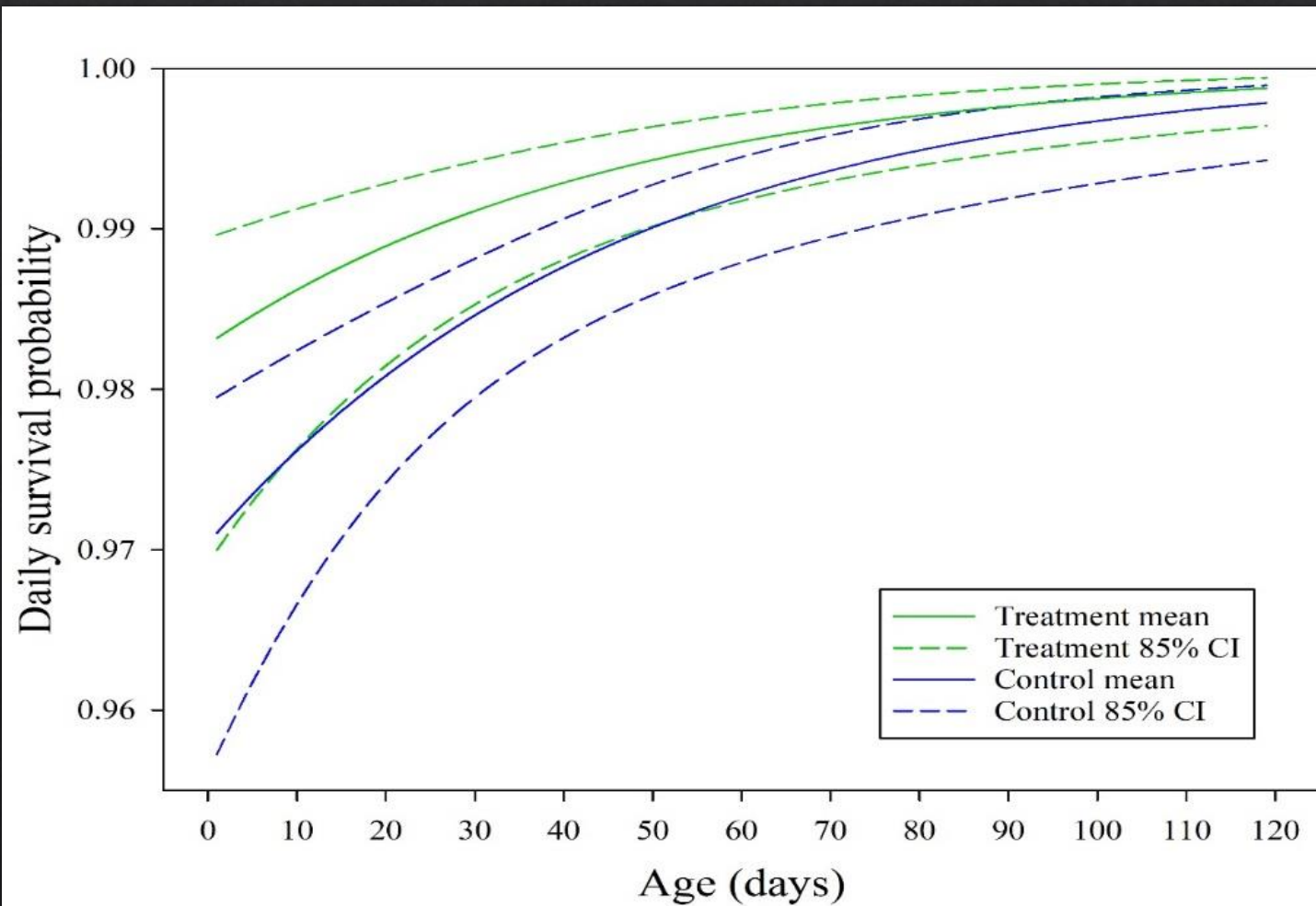
Winter Nutrition/Habitat

- ◆ Some deer receive supplemental feed during winter

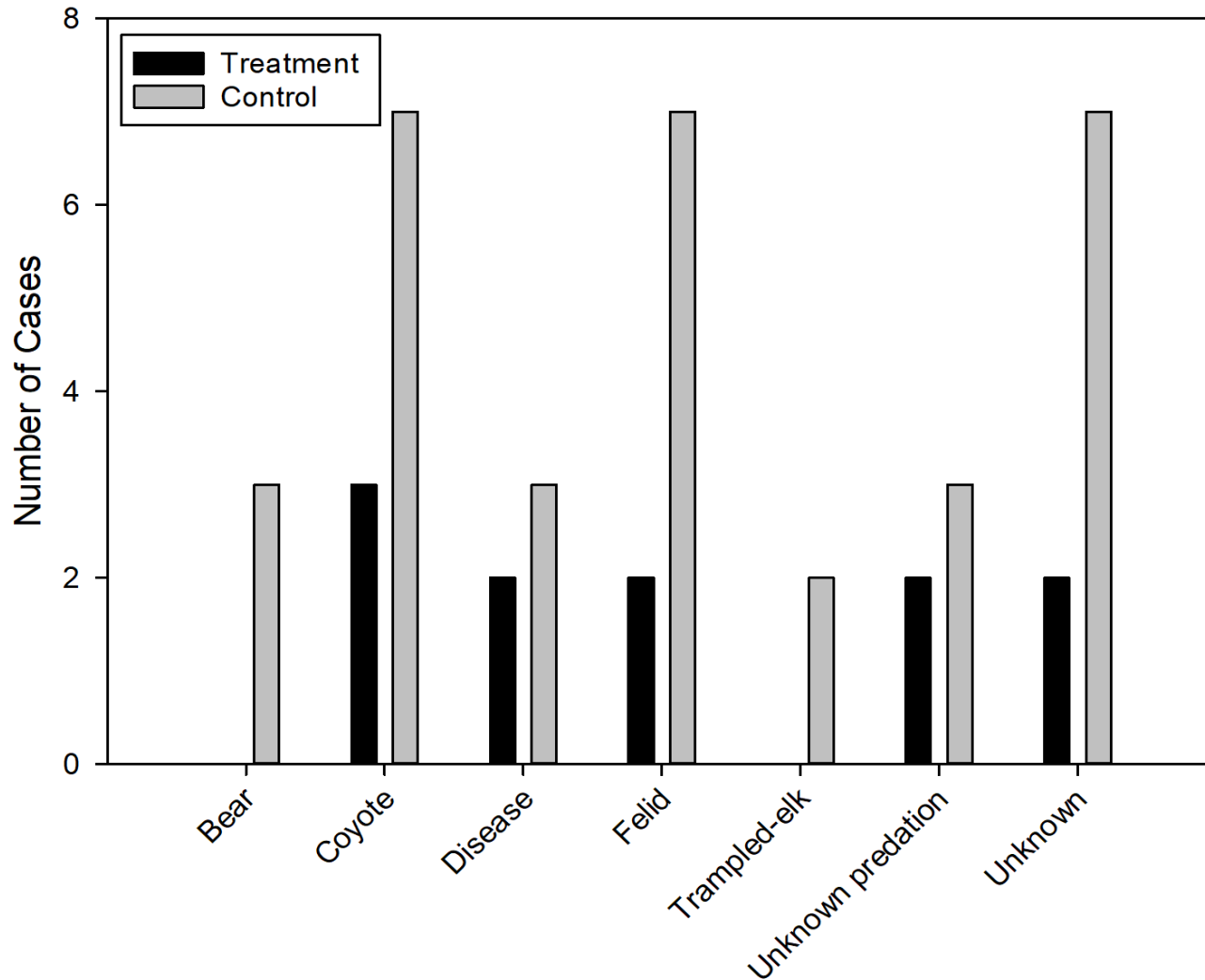


- ◆ Compare pregnancy and survival rates of does and their fawns that are fed or not fed during winter
- ◆ If there is a difference, winter habitat may be limiting

Fawn survival



Fawn Causes of Mortality



Mule Deer Habitat Use and Nutrition

Summer Nutrition

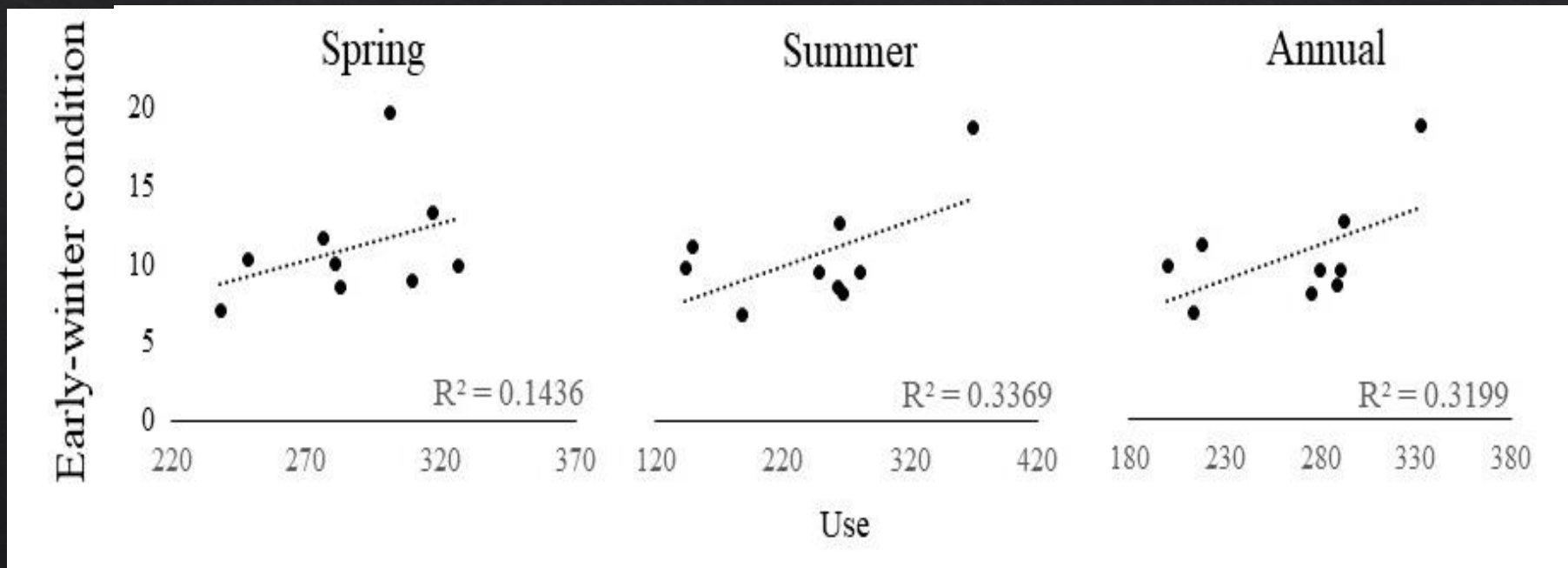
- ◇ Is body condition entering winter linked to use of areas with higher nutrition?
- ◇ Do deer change habitat use following elk population reduction?
- ◇ Do changes in habitat use increase mule deer populations?



Mule Deer Habitat Use and Nutrition

Summer Nutrition

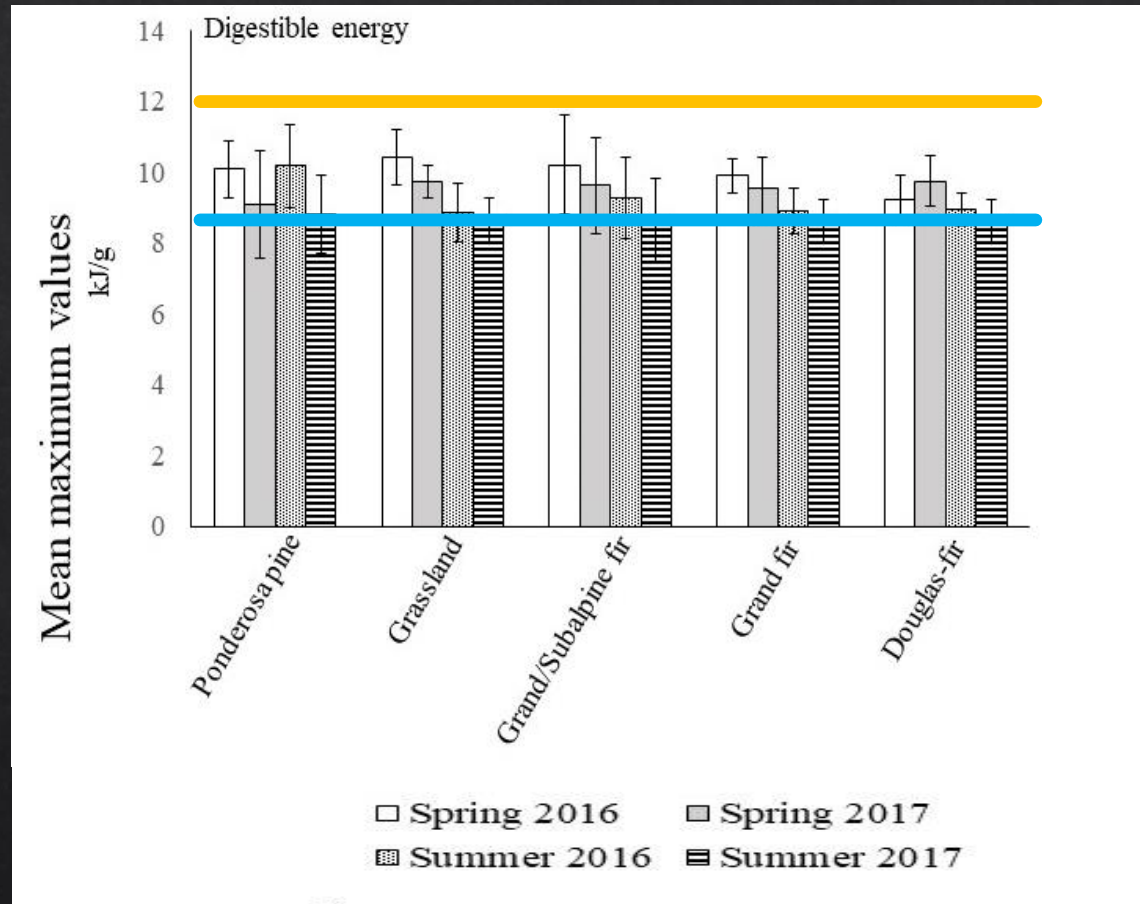
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Mule Deer Habitat Use and Nutrition

Summer Nutrition

- ◇ Insufficient to support a lactating female.
- ◇ Sufficient to support energetic demands of a non-lactating female.
- ◇ Better forage required on summer range.



Effects of Predation

- ◇ How many carnivores are on the landscape?
- ◇ Is deer survival linked to varying carnivore densities?
- ◇ Which carnivores are most likely to eat mule deer?
- ◇ Does predation affect mule deer populations?



Bushnell

ODFW15

42 F 5 °C

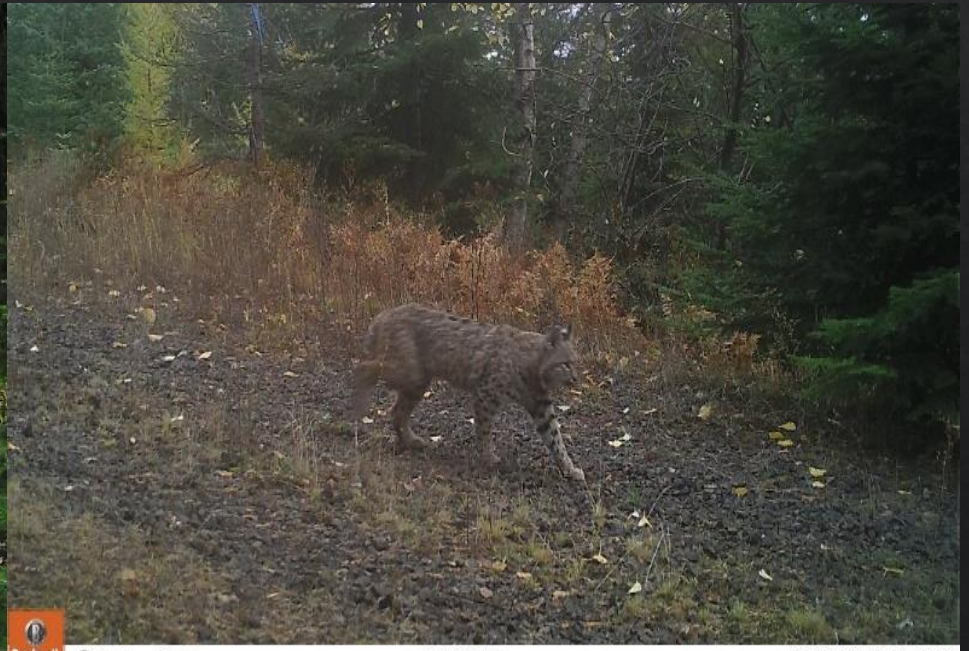
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Bushnell

CameraName

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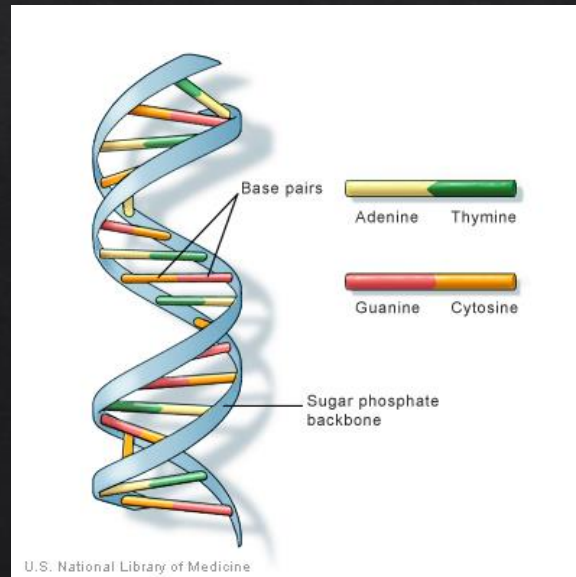
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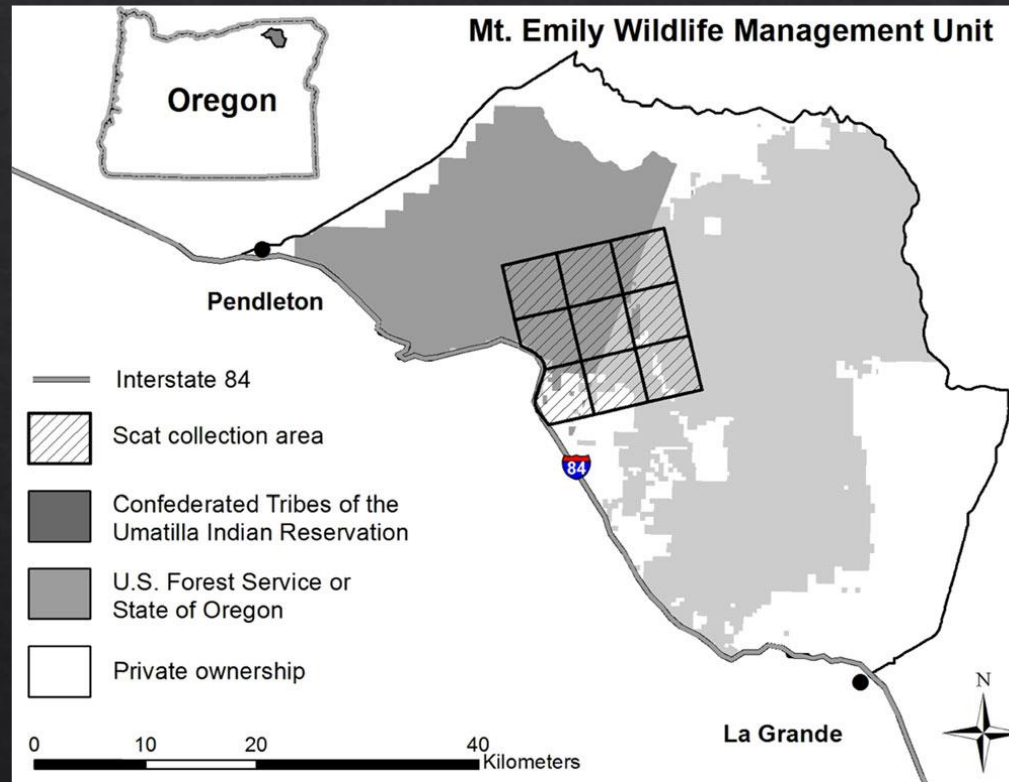


Estimation From Genetics

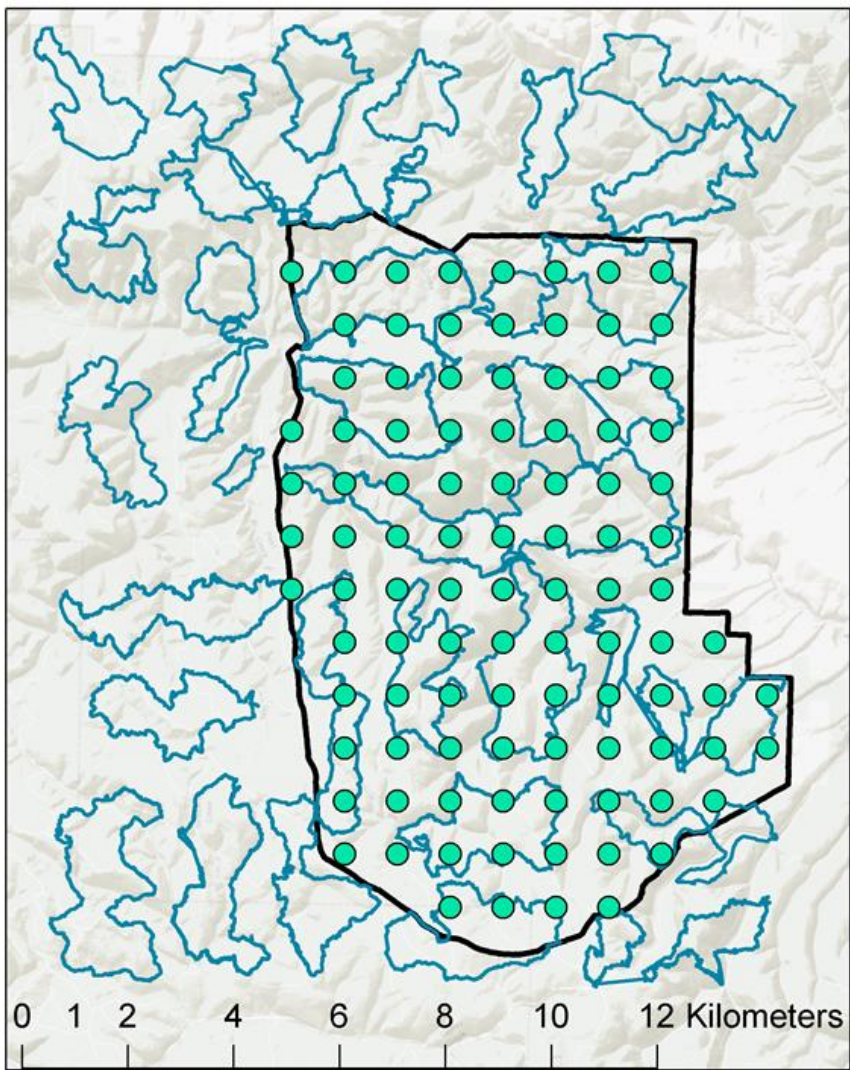


Estimation From Genetics

- ◇ 0.8-2.0 cougars/10 mi² -> 70-90 cougars in the Mt. Emily WMU
- ◇ Similar estimates obtained in two years of surveys



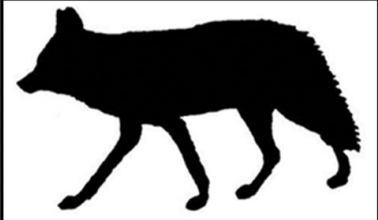
- ◇ Fairly expensive and hard to conduct at large spatial extents
- ◇ Are better or less expensive methods available?



- Camera locations
- Detection dog tracks
- ▭ Starkey Experimental Forest boundary



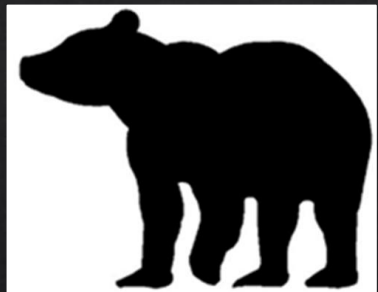
Estimated carnivore densities (2017)



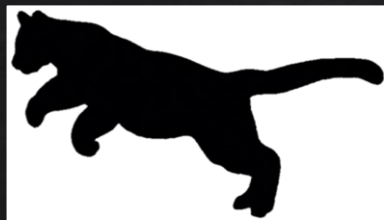
◇ 5.9-8.4 coyotes/10 mi²



◇ 2.3-3.9 bobcats mi²



◇ 1.3-2.8 bears/10 mi²



◇ 0.25-0.80 cougars/10 mi²

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Factors Influencing Mule Deer

No published studies identified predation as the main driver of mule deer populations.

Quality of habitat and subsequent nutrition condition of females have a strong effect on mule deer populations.

Climate (drought and winter severity) can have large effects on mule deer populations.

Questions?

