

NUTRITIONAL RESPONSES OF MOOSE TO BEETLE-KILLED FORESTS IN SOUTHEAST WYOMING



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Changing Forests in the Rockies

- The Mountain Pine Beetle has dramatically impacted dominant tree species in Western forests
- It is unknown what the implications are for big game management



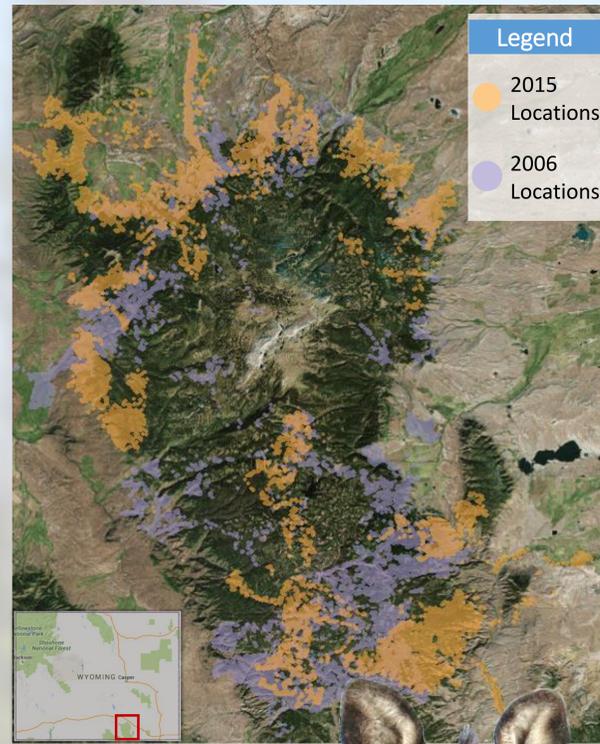
Questions

- How does habitat selection of moose change before and after beetle attack?
- What are the fitness consequences for moose in beetle-killed landscapes?

Methods

- GPS datasets from before (2005 – 2006) and after (2015 – 2017) beetle kill
- Fine-scale habitat classification to measure intensity of tree death
- Recaptures to assess body condition and track calf production

Study Area



Preliminary Findings

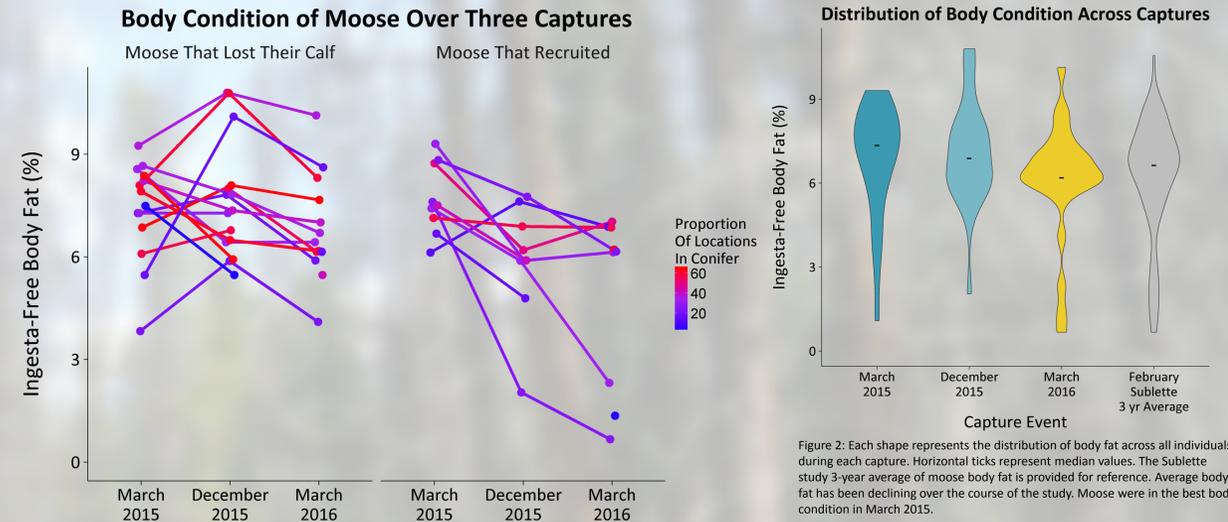


Figure 1: Points represent percent body fat during a capture event as measured by an ultrasound. Lines connect repeated measures of the same individual. Each line is colored according to the percent of total GPS fixes that fall in conifer forest (NLCD land-cover). The left panel shows moose that were pregnant at capture and lost their calf during the following year. The right panel shows moose that recruited a calf from pregnancy to the following capture. Moose are using conifer forest to varying degrees. Nutritional costs of raising a calf are evident; moose that recruited lost more body fat than moose that failed to recruit.

Figure 2: Each shape represents the distribution of body fat across all individuals during each capture. Horizontal ticks represent median values. The Sublette study 3-year average of moose body fat is provided for reference. Average body fat has been declining over the course of the study. Moose were in the best body condition in March 2015.

	2015	2016
Adult Survival		79%
Pregnancy	77%	85%
Recruitment	30%	53%

Time Series of Adult Mortality

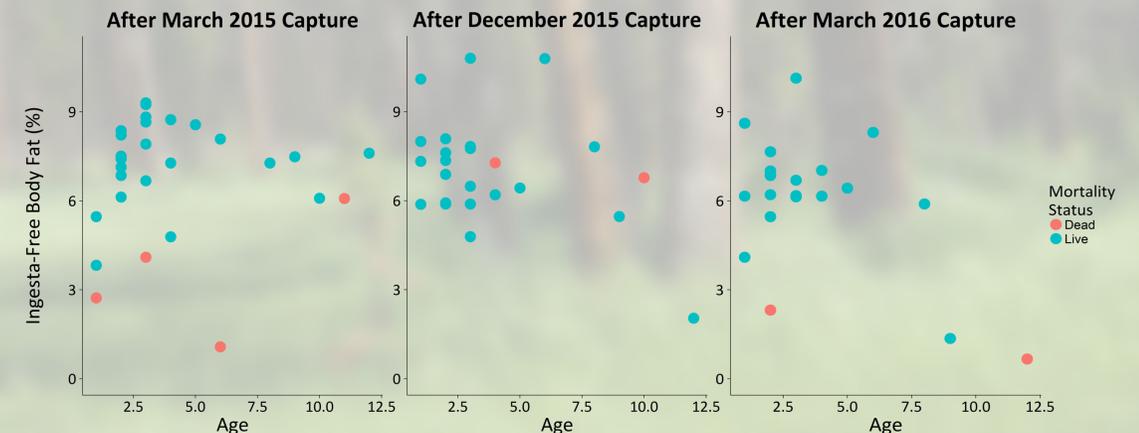
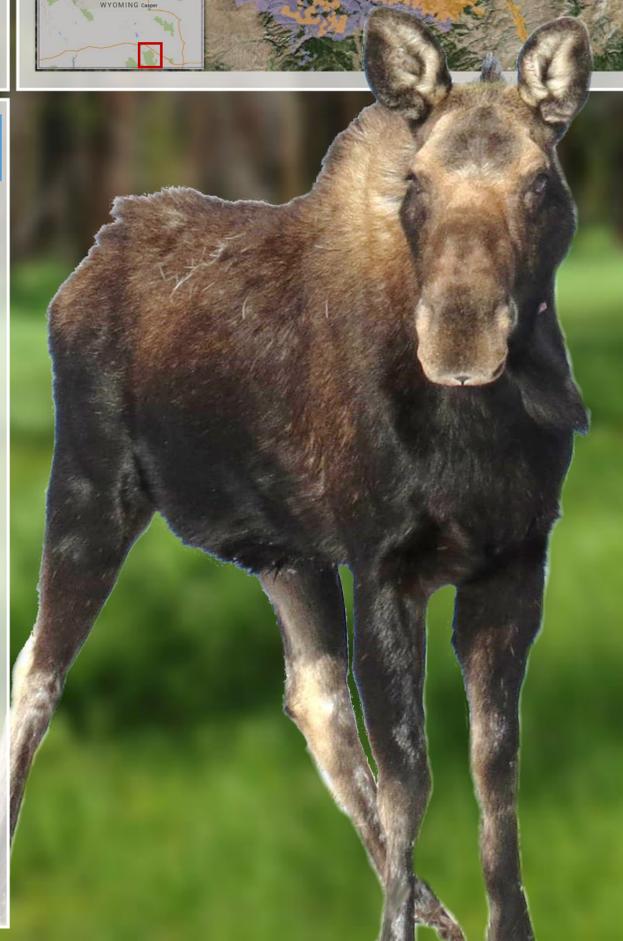
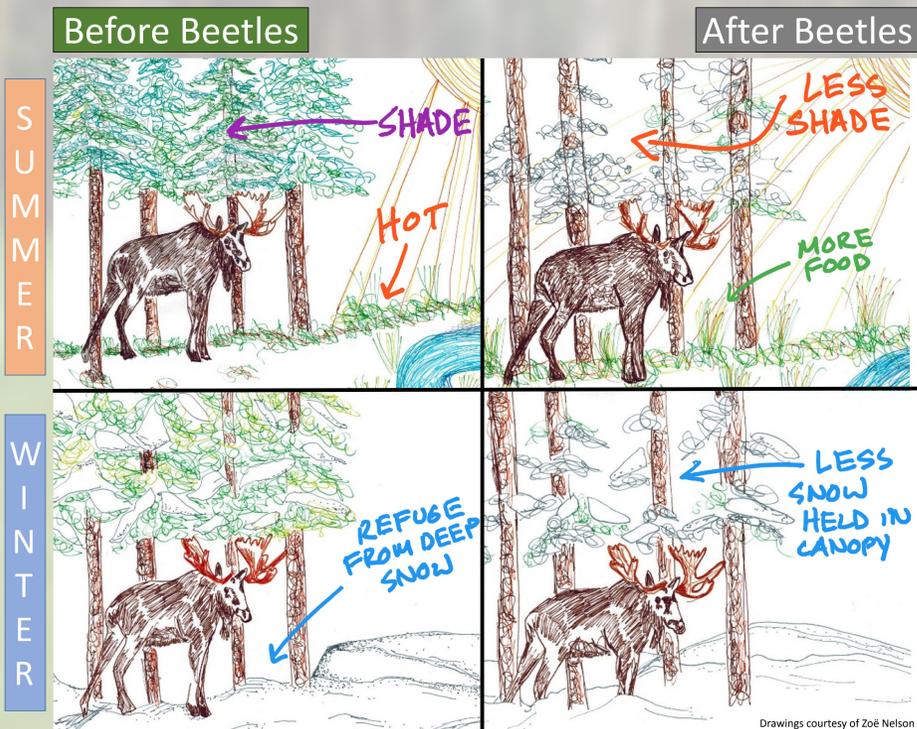


Figure 3: Each point represents an animal during a capture event. Age refers to the age of the animal when it entered the study. A moose that died following that capture event but prior to the next capture is colored red. Overall, the older moose and the moose in poorer body condition are struggling to survive; stark declines in condition are visible among older individuals across the three plots.

Predictions



Conclusions and Future Directions

- Evidence from the first year of this study suggests that moose in the Snowy Range are experiencing resource limitation. Adult survival is lower than expected for a growing population.
- Examining the role of beetle kill in shaping moose behavior and fitness could reveal mechanisms for potential moose declines in the Snowy Range.

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