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Ungulate Activity: Effects of Season, Hunting Pressure, and Plant Type

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Ungulate Activity: Effects of Season, Hunting Pressure, and Plant

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Introduction

Quaking Aspen (*Populus tremuloides*) provides critical habitat for wildlife. Unfortunately, aspen populations in western North America have declined due to fire suppression and over browsing (Rogers 2017). Turnbull National Wildlife Refuge in eastern Washington initiated a program of prescribed burning in 1992 to address declining aspen populations. However, aspen growth stimulated by burning was offset by browsing, especially by elk (*Cervus elaphus*). Increasing elk numbers prompted initiation of a limited hunt in 2010, which has been successful in reducing the elk population on the refuge. However, aspen regeneration remains low, prompting the refuge to establish remote video-camera monitoring of all ungulates (hoofed mammals: elk, American moose [*Alces alces*], and deer [*Odocoileus*]) on the refuge. Using the camera data, my research examines the activity of these ungulates with respect to season, response to hunting activity, and browse type.

Materials and Methods

- 5 camera stations were established: 2 no-hunt; 2 hunt; 1 light hunt (Fig. 1).
- Cameras were operated between March 2018–Jan 2019.
- Camera footage was viewed to record, species, number of individuals, time per activity (walk-through, rest, browse), frequency of camera passes, and plant browsed.
- ANOVA to compare mean activity time between 4 seasons.
- T-test to compare mean activity between no hunt zones and each different hunt type (archery, modern firearms)
- Chi-square to compare frequency of camera passes between night and day during 2 months prior to hunt and 2 months of hunt.
- ANOVA to compare mean time browsing at different plant types.

Literature Cited

Rogers, P. C. 2017. Guide to Quaking Aspen Ecology and Management. U.S. Department of the Interior Bureau of Land Management. Utah, USA.

Acknowledgements

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Study Area

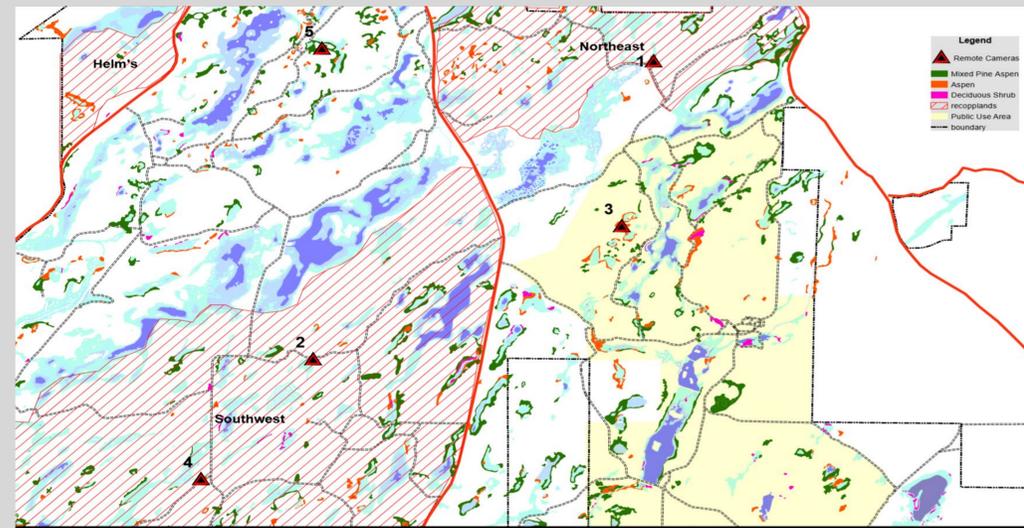


Figure 1. Map of Turnbull National Wildlife Refuge showing location of camera stations and hunt zones.

Field Pictures



Figure 2. Deer walking through Columbia camera station.



Figure 3. Elk browsing at Redgate camera trap.



Figure 4. Moose walking through Auto-tour camera trap.

Seasonal Activity

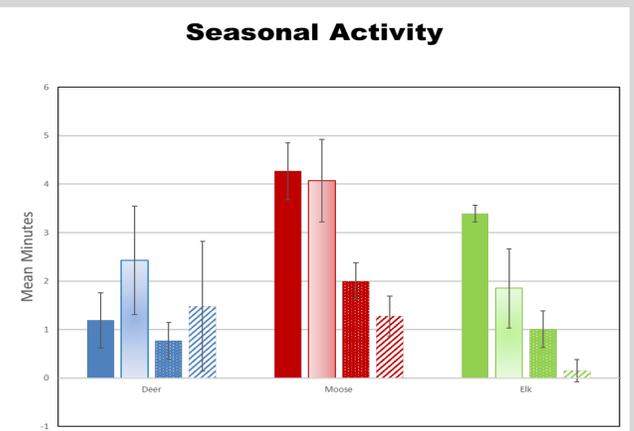


Figure 5. The mean time in minutes ungulate species were detected from Mar-May (solid), Jun-Aug (light), Sep-Nov (dots), and Dec-Jan (stripes)

Pre-hunt vs. Hunt

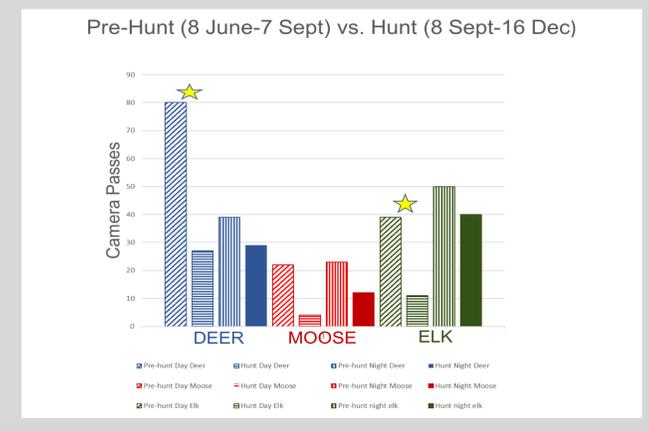


Figure 6. Frequency of camera passes occurring day and night during the pre-hunt and hunt seasons.

Browsing

Plant Type

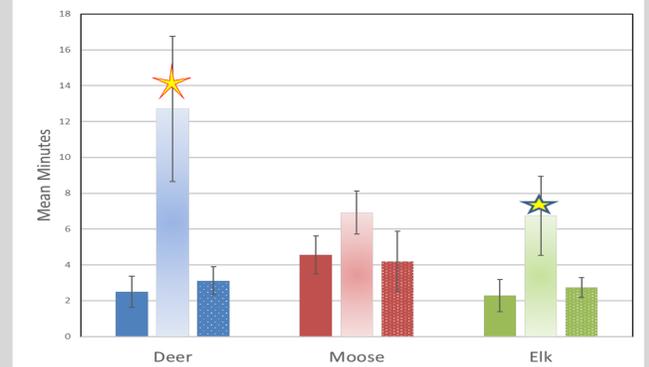


Figure 7. The mean time in minutes ungulate species browsed on aspen (solid), dogwood (light), and grass (stippled).

Results

- 480 total camera passes: deer (Fig. 2) – 228; elk (Fig. 3) – 153 ; moose (Fig. 4) – 99.
- There was no difference in mean activity between the 4 seasons for deer ($F= 1.52, df= 3, P= 0.21$); elk ($F= 0.87, df= 3, P= 0.06$), or moose ($F= 0.45, df= 3, P\text{-value}= 0.45$). However, elk activity tended to be less in winter. (Fig. 5)
- There was no difference in mean activity in no hunt zones or hunt zones during any of the hunt type periods (archery, modern firearms, and muzzleloader).
- However, for both elk ($\chi^2= 6.0564, df = 1, P= 0.02$) and deer ($\chi^2= 5.0212, df = 1, P= 0.0003$), the frequency of camera passes decreased during the night from the pre-hunt to the hunt period (Fig. 6)
- Elk ($F= 4.02, df= 2, P= 0.01$) and deer ($F= 8.91, df= 2, P= 0.02$) averaged more time browsing on red osier dogwood (*Cornus sericea*) than other plant types (Fig. 7).

Discussion

- Lower elk activity during the winter is consistent with observations that elk move off refuge in January.
- Although there was no difference in mean activity in hunt vs no-hunt areas, analysis of timing of frequency of camera passes suggests that elk are deer are shifting to more nighttime activity during the hunt period. In contrast, moose activity did not change.
- The greater time that deer and elk spent browsing on dogwood could be due either to nutrition or plant availability.