The influence of wildfire on mule deer habitat selection in eastern Oregon

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INTRO
• Fire suppression has drastically altered ecosystems across the western United States, resulting in more frequent, larger, high-intensity wildfires.
• Mule deer are considered a landscape species because they require a mosaic of habitat types, shift habitat requirements based on season or movement behavior, are vulnerable to land use changes, and are of socio-economic value to local communities.
• Understanding how mule deer in a mixed-migration population respond to wildfire can aid in determining conservation or restoration opportunities that are coordinated at a landscape scale.

METHODS
• GPS radio collar data from mule deer (winter, n=148; summer: high n=94; summer: low n=34)
• Wildfire Spatial Data: 5 categories of time since fire: 1-5yr (n=12), 6-10yr (n=13), 11-15yr (n=18), 15+yr (n=10), and no burn
• We calculated 3 separate (winter range; summer: high elevation; summer: low elevation) resource selection functions (RSFs)

RESULTS
• Summer: wildfire had strong negative effects on habitat selection initially (years 1-5 post-fire) but a strong positive effect in years 10-15 following fire in the summer, regardless of elevation
• Winter: wildfire had strong positive effects initially (years 1-5 post-fire) but a strong negative effect 10-20 following a fire.

DISCUSSION
• Recently burned patches may offer better forage, however, the relative attractiveness of forage appears to vary by season and elevation.
• Mule deer use a mosaic of different aged burns throughout the year at a landscape scale. However, many other wildlife species benefit from burn heterogeneity or specialize in specific-aged burns making a patchwork of different-aged burns beneficial for a multitude of taxa

Figure 1 - Odds ratios for time since fire <5 years (Fire 5yr), time since fire 6-10 years (Fire 10yr), time since fire 11-15 years (Fire 15yr), and time since fire 15-20 years (Fire 20yr) obtained from resource-selection functions for adult female mule deer for the winter (Dec-Mar, n=148) and summer range (Jun-Aug), high elevation (n=94), low elevation (n=34) in the Blue Mountain ecoregion Oregon, USA during 2015-2017. Odds ratios indicate the percent change (1 =no change) in odds of use by mule deer for each habitat type relative to when habitat is unburned. Blue symbolizes positive effect and red symbolizes negative effect. Asterisks represent levels of significance: 3 (P<0.0001), 2 (P<0.001), 1 (P<0.01), none (P<0.1).

Figure 2. Map of study area of adult female mule deer winter (Dec-Mar, n=148) and summer ranges (Jun-Aug), migratory (n=94), resident (n=34) in the Blue Mountain ecoregion Oregon, USA during 2015-2017. The cross-hatched polygon in the center is the Phillip Schneider Wildlife Area.

Figure 3. Example of GPS collar data (blue dots) and wildfire remotely sensed data used in RSF model.