

Effects of forest thinning treatments and wildfire on black bear habitat use in the White Mountains of eastern Arizona

Throughout the Southwest, forests are often thinned to reduce fuel loads and wildfire risks along the interface of urban areas and wildlands. Recently, intense catastrophic wildfires have increasingly impacted forest habitats in the region. It is not known, however, how these habitat alterations influence black bears (*Ursus americanus*). Although previous research on black bear habitat use has provided information on their responses to forestry practices and wildfire, findings have been ambiguous with regards to selection or avoidance of regenerating areas, making it difficult to determine if forest thinning treatments or lands significantly altered or damaged by wildfire constitute potential losses to black bear habitat. Information on the effects of forest thinning treatments and wildfire on black bear habitat use is needed to better inform land management decisions in the face of climate change and increasing wildfire potential so that impacts to wildlife can be mitigated.



Objectives

1. Determine the relative influence of forest thinning treatments on black bear habitat use at a landscape scale.
2. Examine black bear habitat use in relation to micro-site characteristics (e.g., forage availability, vegetation cover, forest structure).
3. Compare micro-site habitat characteristics (e.g., forage availability, vegetation cover, forest structure) of treated sites and black bear use sites to understand mechanisms driving bear habitat use relative to forest thinning.
4. Determine the relative influence of wildfire severity on black bear habitat use at a landscape scale.
5. Examine black bear habitat use in relation to micro-site characteristics (e.g., forage availability, vegetation cover, forest structure) within a mosaic of burned and unburned post fire conditions.

Location

This project took place between 2006 and 2012 in the White Mountains of east-central Arizona near the Arizona-New Mexico border adjacent to the towns of Greer, Nutrioso, and Alpine. In May of 2011, the Wallow Fire, the largest wildfire in Arizona history, broke out in the south-central part of the study area and radically altered the forest habitat. Data collected before May of 2011 was used to address objectives 1-3 and data collected after that will be used to address objectives 4 and 5.

Approach

This study was designed to investigate movements and habitat use patterns of black bears in and around forest thinning treatments near the towns of Alpine, Nutrioso, and Greer, Arizona. Initially, we used location data from GPS collars deployed on black bears to determine effects of forest thinning treatments at the “Wildland-Urban Interface” on black bear habitat use. We also measured habitat characteristics at bear use sites and in treated forest areas to determine what factors bears were selecting for in used areas. Our additional objectives to monitor the effects of wildfire on black bears came after the Wallow fire in 2011 roared through our study area and significantly impacted a majority of the forested habitat inhabited by our collared black bears. Again we used location data from bears fitted with GPS collars to characterize bear use of burned and unburned areas and to compare burned habitat characteristics with locations used by bears after the Wallow Fire. Data collection in the field was completed in 2012, and final analysis and report writing is now in progress.

Preliminary Results

Preliminary analysis of movement data demonstrated that bears in the White Mountains traveled across great distances throughout the year to access resources. Most of these seasonal movements appear to be independent of forest thinning treatments. However, black bears generally avoided forest thinning treatments throughout the study area. Reasons for this avoidance could include reasoning that treated areas lacked the canopy and mid-level hiding cover that bears appear to select for in their daily activities.

Preliminary analysis of post-fire habitat selection suggested that black bears moved back into burned areas after the summer rains provided for increased forage production. While these areas provided the best forage available after the fire, the entire study area was likely less productive that season than if it had not burned. All of our collared black bears survived the Wallow Fire and were able to find resources to allow them to hibernate the first winter post-fire. However, cub production was severely reduced that year as females were likely unable to store enough fat reserves to bring a pregnancy to full term.

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