



THE LANDSCAPE OF FEAR: COUGAR (*PUMA CONCOLOR*) PREDATION IN A NARROW RIPARIAN CORRIDOR IN NEW MEXICO



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INTRODUCTION

Species: *Puma concolor*, known as mountain lions, pumas, panthers, or cougars.

Range: Limited to the western United States, western Canada, and southern Florida (Anderson, 1983).

Prey Consumption: Obligate carnivores, with the majority of their diet consisting of mule deer (*Odocoileus hemionus*) (Logan and Sweanor, 2001).

Habitat Selection: Habitat type influences the success of this species as a stalking and ambushing predator (Hornocker, 1970) that needs dense cover to closely approach a prey item undetected (Holmes and Landré, 2006).

→**Edge Habitat:** Edge habitat is used extensively as a starting point for cougar attacks on prey (Holmes and Landré, 2006).

→**Riparian Habitat:** Riparian habitat is composed of thick vegetation that occurs along river floodplains. Riparian zones have a high proportion of edge habitat.

Past Research: Previously, there has been little focus on cougar habitat selection during predation in such robust riparian zones.

This study attempts to fill in these gaps on predatory cougar behavior in a landscape composed primarily of riparian vegetation. We determine the habitat use for points identified as killsites.

MATERIALS AND METHODS

- **Study Period:** February 2010-February 2011
- **Sample Size:** 3 cougars, 485 killsites
- **Study Site:** Bosque del Apache National Wildlife Refuge (NWR), New Mexico (Fig. 1)
- **Methods:**
 - Study animals collared with a GPS transmitter set to transmit 8 locations daily
 - Plotted locations in ArcGIS (ESRI, Redlands, California, USA)
 - Killsites extrapolated from GPS points by locating clusters of two or more consecutive GPS points within 50 meters of each other using R Statistical Package
 - Identified the habitat type of each initial GPS point within a cluster

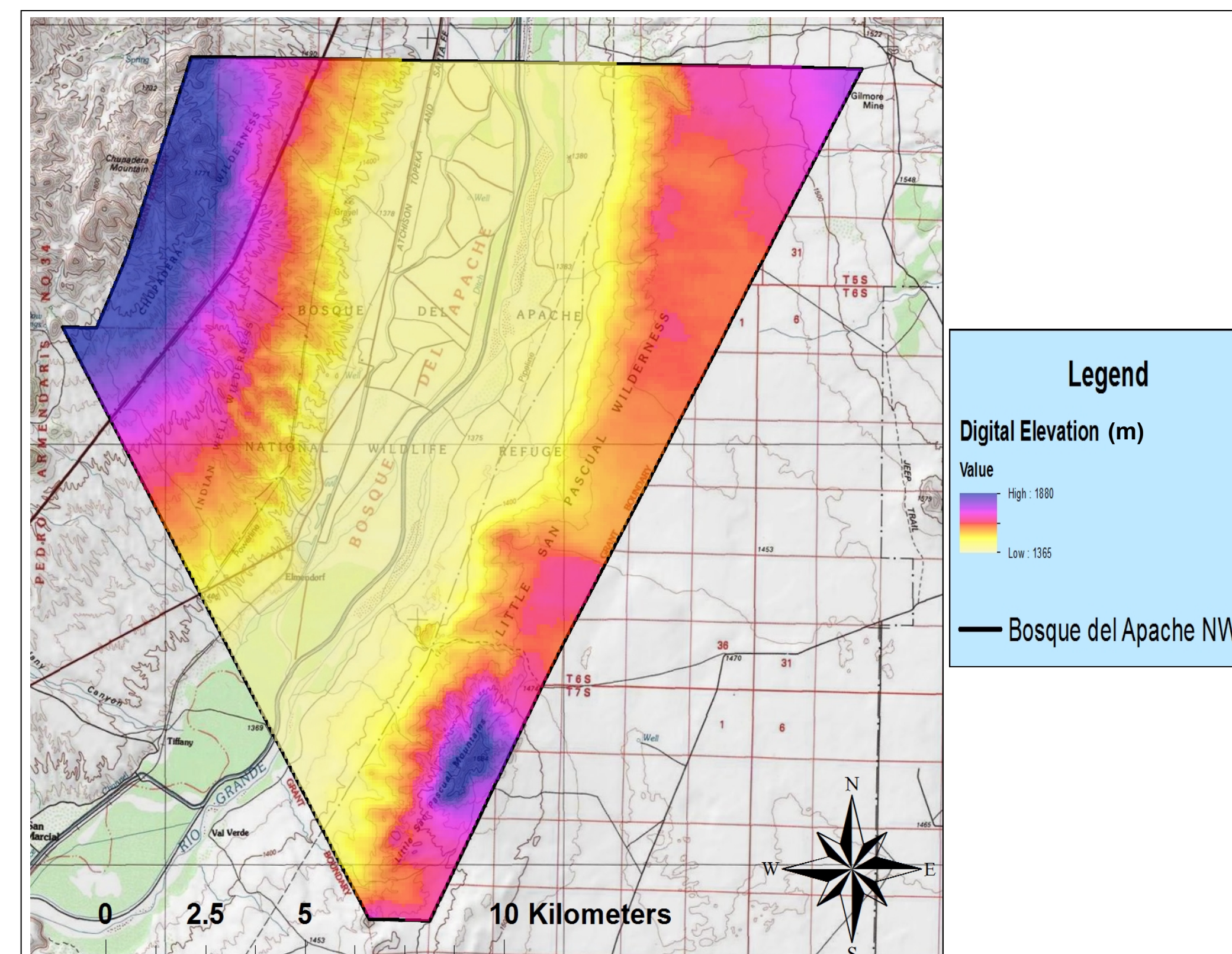


FIG. 1: Bosque del Apache NWR topography and elevation (Transverse Mercator projection).

RESULTS

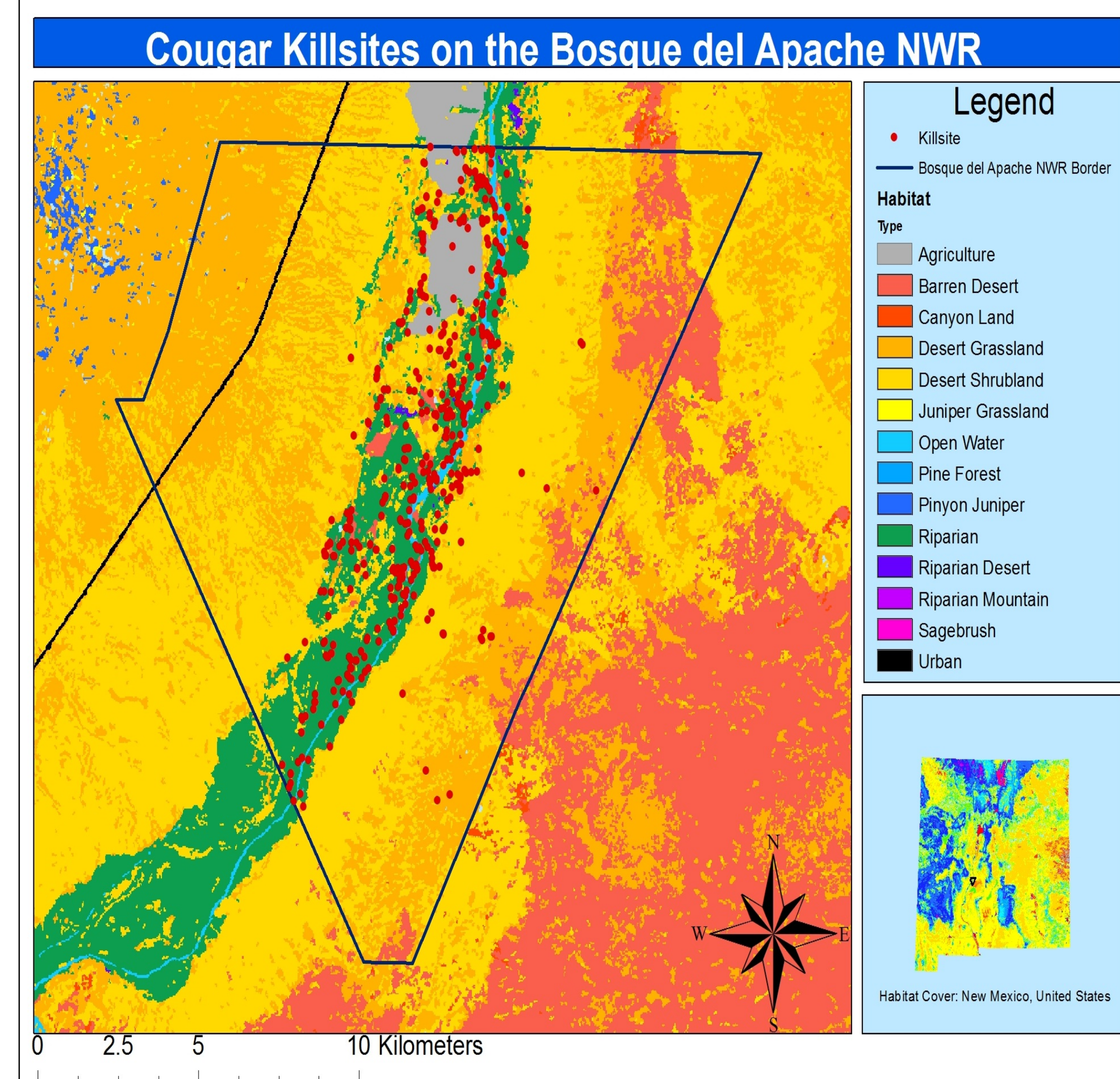


FIG. 2: Cougar killsites by habitat type across the Bosque del Apache NWR. Cougar killsites were found primarily in the center of the site along the Rio Grande floodplain, an area largely composed of willow, salt cedar, and cottonwood thickets. The habitat type layer was developed by Dr. T Perry using state level habitat classification maps (Transverse Mercator projection).

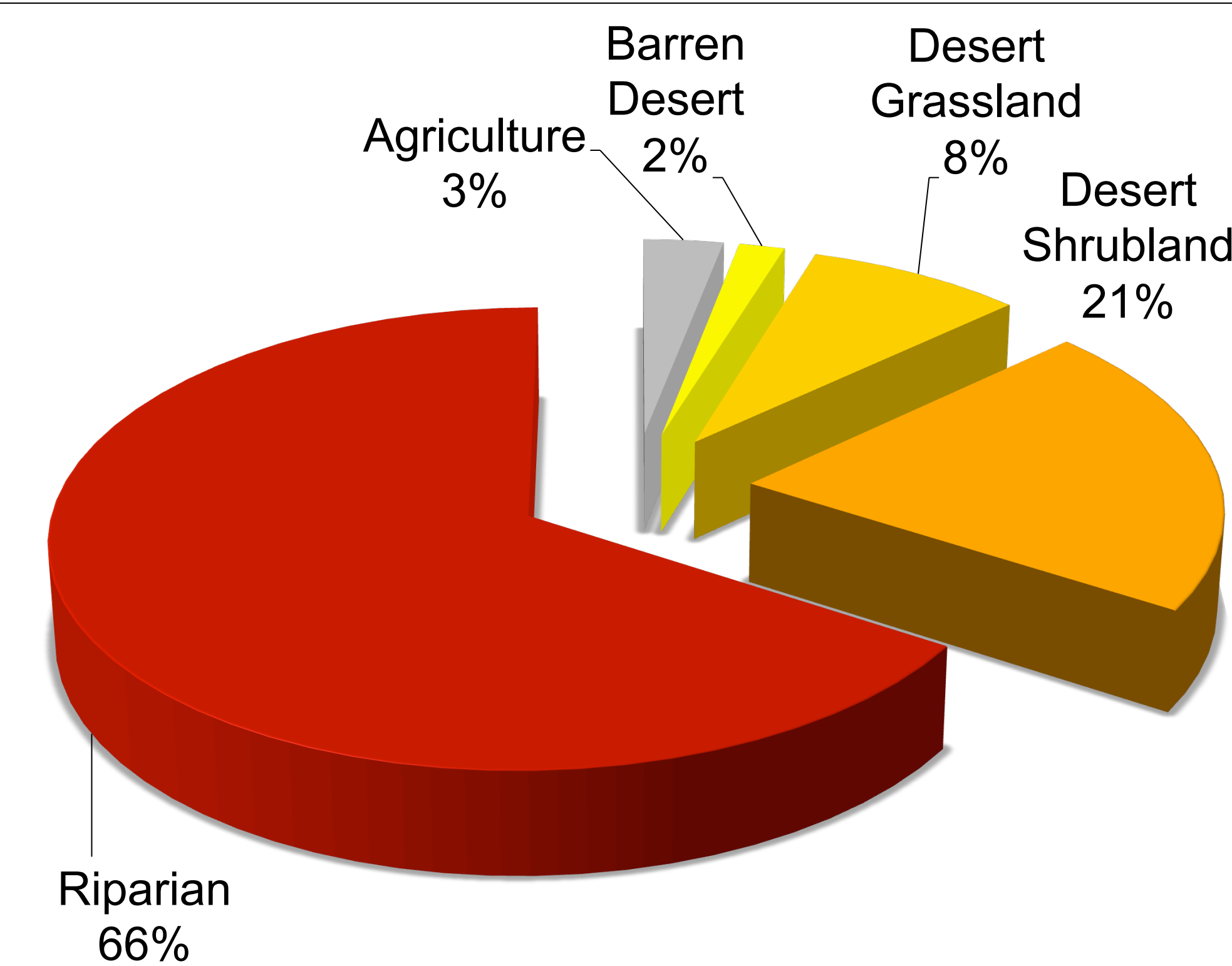


FIG. 3: Percent habitat usage for killsites on the Bosque del Apache NWR by one male and two female cougars combined. Out of 485 killsites recorded during the study period, 66% were found in riparian habitat. Desert shrubland was the next most used habitat type at 21%, followed by desert grassland at 8%, agricultural fields at 3%, and barren desert at 2%. Males and females showed similar usage of these habitats, with the male showing a 4% greater usage of desert grassland and 3% greater usage of desert shrubland.



IMAGE 1: A study animal being fitted with a GPS collar after the taking of biological metrics.



IMAGE 2: Two cougars approaching a riparian killsite at the Bosque del Apache NWR. Both animals are kittens of one of the collared individuals.

DISCUSSION

Conclusion: This study determined that *P. concolor* on the Bosque del Apache NWR use riparian habitat most often during predatory behavior. We also found that the male cougar takes prey more often in desert shrubland habitat than the female individuals, likely due to its greater size that enables it to take down larger prey like oryx (*Oryx gazella*).

Implications:

- Riparian habitat likely provides the best cover for stalking and ambushing prey and could contribute to prey catchability (Holmes and Landré, 2006) by allowing the cougar to get very close to a prey item.

- As cougars recolonize their historic range, predatory habitat use will be valuable in understanding cougar settlement decisions. We expect riparian regions to be prime cougar habitat for future populations.

Future Research: Studies should identify the prey response to the landscape of fear (Brown, Landre and Gurung, 1999) created by abundant riparian vegetation.

Our study shows that riparian habitat is valuable to cougar population persistence by providing the necessary cover to ambush prey.