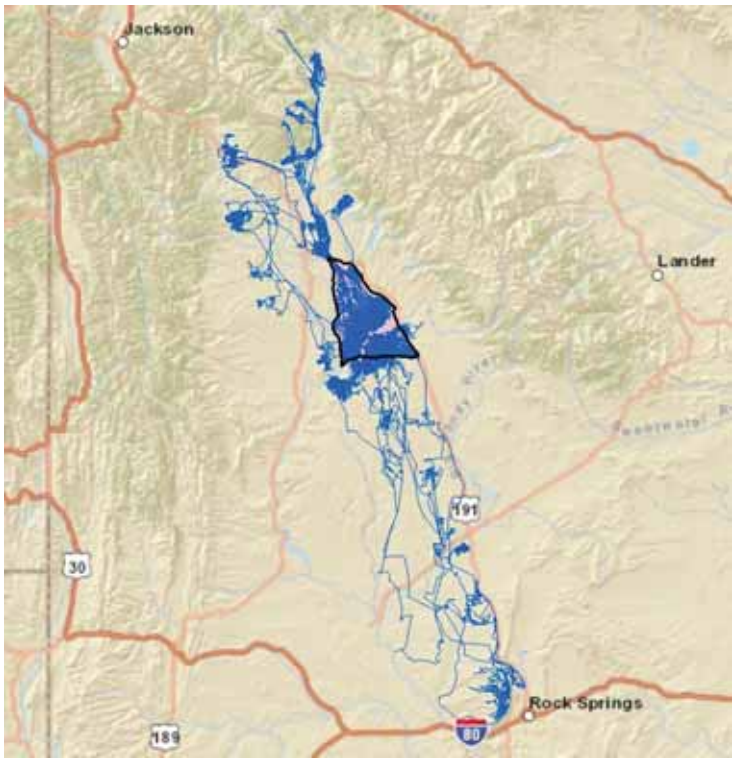
Pronghorn Migration Supplement for the Pinedale Anticline Project Area

Annual Report

January 2012 – April 2013



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OVERVIEW

As part of the PAPO wildlife monitoring, we maintained a sample of Global Positioning System (GPS)-collared pronghorn (*Antilocapra americana*) (~30 animals) to monitor winter distribution as it relates to gas development and annual winter occupancy counts. The GPS data provide additional opportunity to better understand the seasonal movements and migration patterns of the animals in the region. Here, we use GPS data collected from individual animals across multiple years to illustrate the variable movement and migration patterns found in the Pinedale Anticline Project Area (PAPA) and Bench Corral (BC) Study Area populations. These variable and unpredictable movement patterns make it difficult to accurately estimate pronghorn abundance and make meaningful comparisons between study areas, as outlined in the WMMM.

METHODS

We investigated movement and migration patterns of pronghorn during the 2011-12 and 2012-13 winters (January-March). The consecutive years of data collection provided new insight into the annual variability in pronghorn movement and site fidelity. Originally, we attempted to estimate migration routes using Brownian bridge movement models (BBMM), but found many of the collared pronghorn were either non-migratory or nomadic, and some migratory individuals did not have distinct seasonal ranges. So, rather than using the BBMM to visualize movement and migration routes, we simply mapped GPS data collected for individual animals in each study area. To examine winter site fidelity, we were able to use the BBMM to estimate utilization distributions (UD) for each winter and study area. We followed the methods outlined by Sawyer et al. (2009) where the BBMM was used to estimate UD of individual animals and then average those UDs to estimate a population-level UD that reflects the overall winter use.

RESULTS

A total of 20 pronghorn (*n*=8; BC and *n*=12; PAPA) provided location data in both the 2011-12 and 2012-13 winters. In general, pronghorn in the PAPA and the BC migrated anywhere from 5 to 50 miles to summer ranges north of the study areas. Pronghorn from the PAPA and BC migrated as far north as Dell Creek in the Hoback Basin and Fish Creek Park in the upper Green River. Winter movements were not localized to their respective winter ranges. Only 42% (*n*=5) and 12.5% (*n*=1) of the collared animals made large movements south out of the PAPA and BC, respectively, during the 2012-13 winter. Animals from the BC traveled 30 miles south to the Sublette, Sweetwater County border and animals from the PAPA traveled 75 miles south to White Mountain near Rock Springs (Fig. 1). Over the course of the year, pronghorn distribution covered approximately 150 linear miles and 4,047 square miles.

To visualize winter site fidelity across years, we mapped population-level UDs estimated for each winter and study area. The winter use of pronghorn in the PAPA was similar across years, but included considerable winter use outside of the designated study area (i.e., south of Highway 351) (Fig. 2). Winter use in the BC was similar across winters, but like the PAPA, significant levels of winter use was documented outside the study area, especially in 2012-13.

Winter use of pronghorn captured in the BC extended south of the study area and east into the PAPA (Fig. 2).

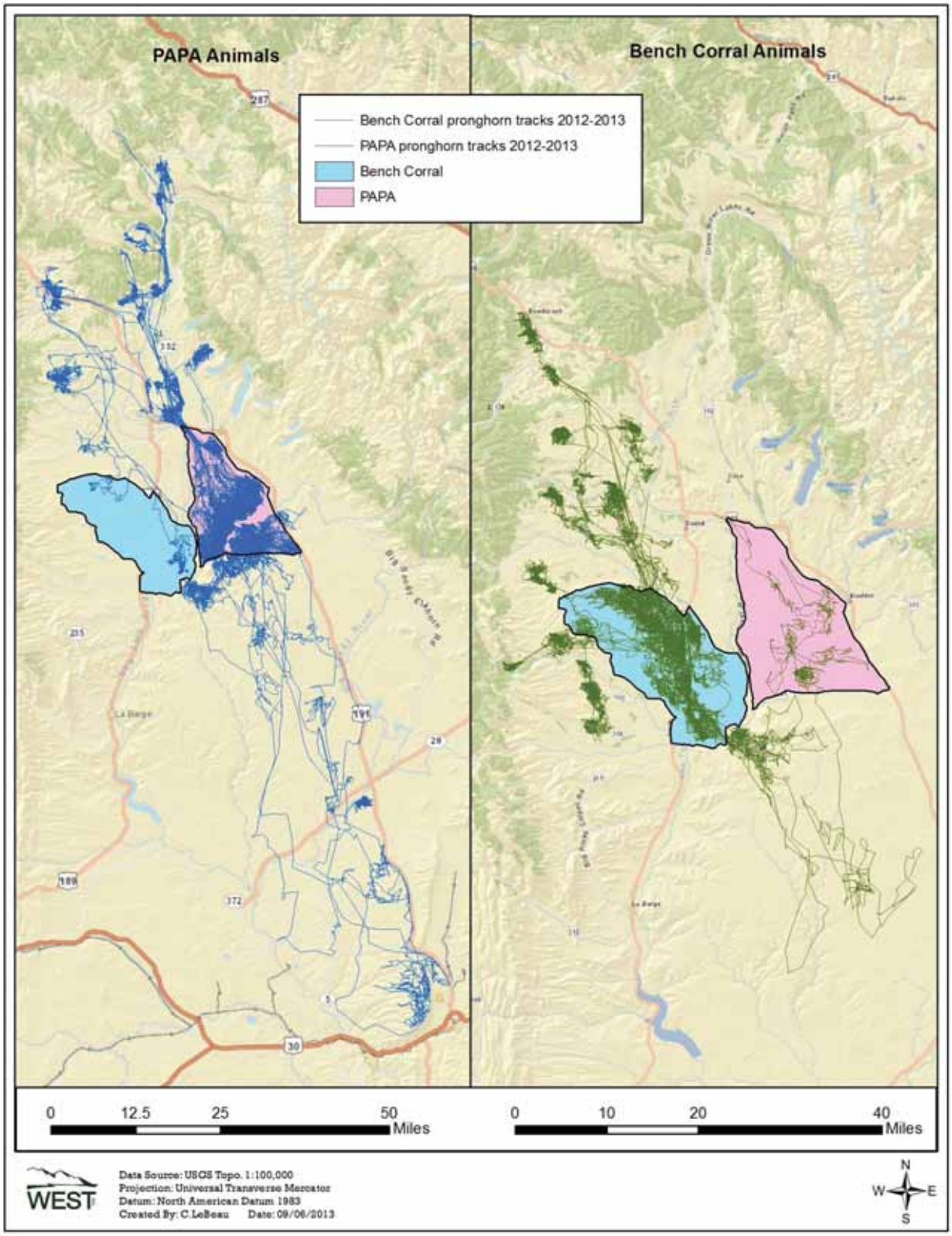

Figure 1. Pronghorn movements of animals captured in Pinedale Anticline Project Area and Bench Corral study areas from 2012-2013.

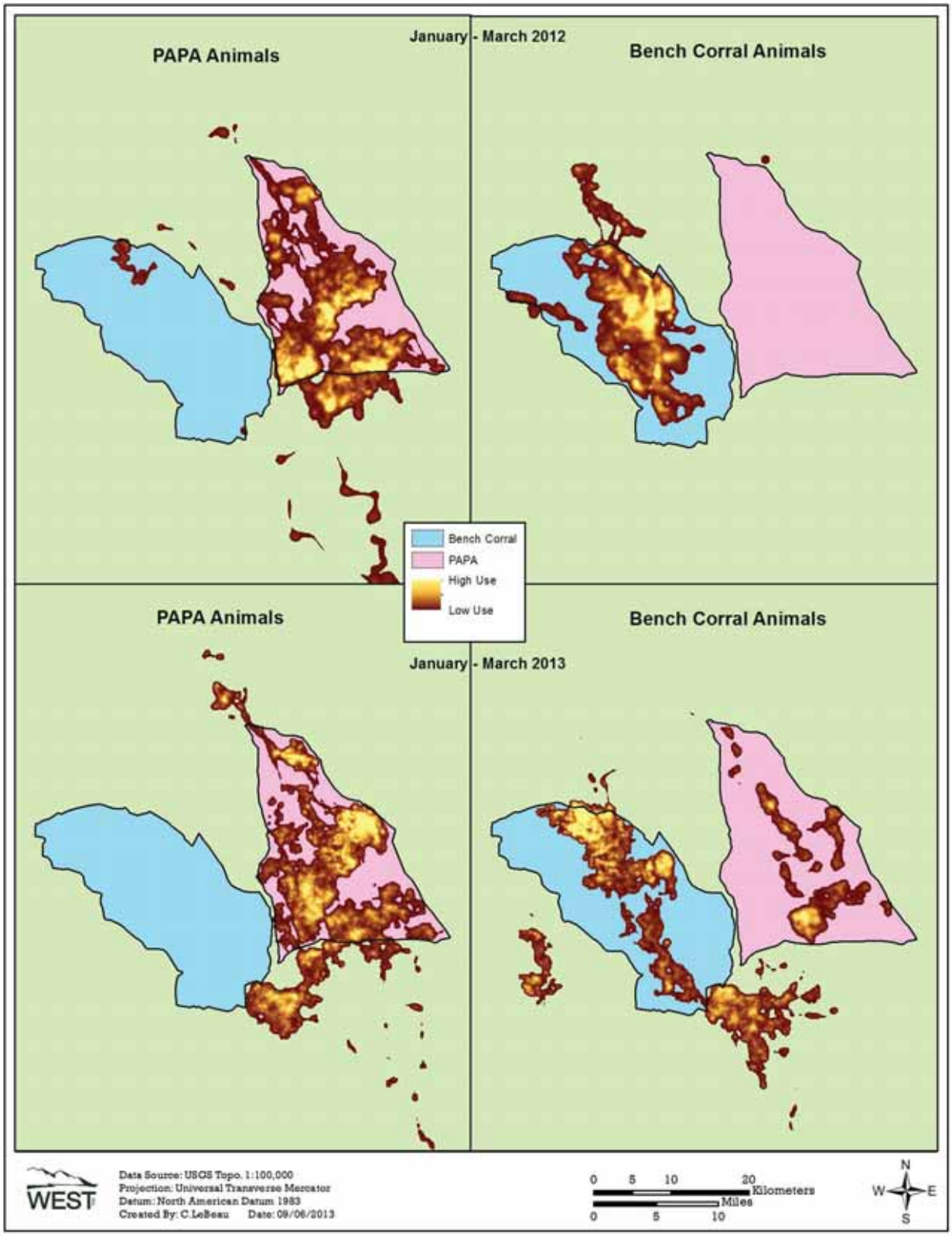

Figure 2. Utilization distributions for pronghorn that collected GPS data for consecutive years in the Pinedale Anticline Project Area and the Bench Corral study area during the 2011-12 to 2012-13 winter (January-March).

SUMMARY

Advances in GPS technology allowed us to collect 2 years of GPS data from individual pronghorn captured in the PAPA and BC. These data show that pronghorn movements were wide-ranging and unpredictable. Additionally, pronghorn fidelity to winter range appears to have been variable and unpredictable across years. These findings certainly improve our understanding of pronghorn in the region and have important management implications. However, given the long-range movements and unpredictable winter use patterns, pronghorn are clearly not bound to the study areas identified in the WMMM. This helps explain why winter occupancy counts are so variable within winters and across years. However, this is problematic for implementing a long-term monitoring scheme that is capable of accurately estimating abundance and making meaningful comparisons between study areas.

LITERATURE CITED

Sawyer, H., M. J. Kauffman, R. M. Nielson, and J. S. Horne. 2009. Identifying and prioritizing ungulate migration routes for landscape-level conservation. Ecological Applications 19:2016-2025.