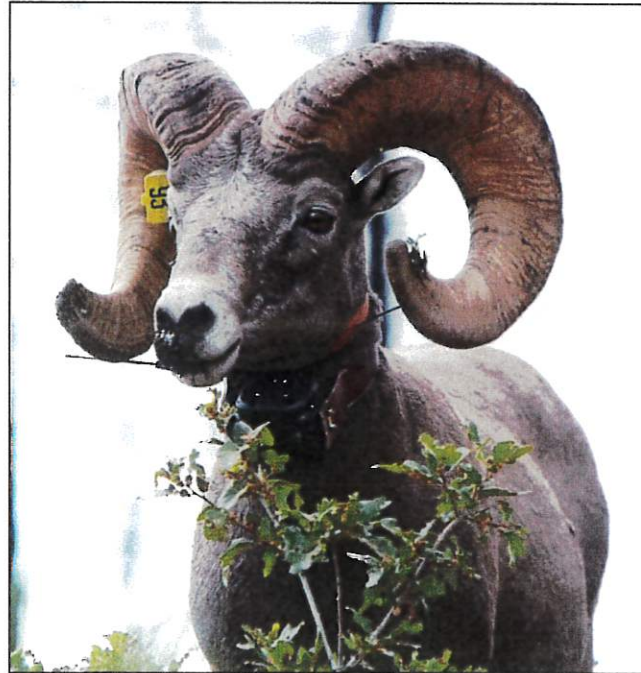


Manzanos Rocky Mountain Bighorn Sheep

Discussion with Tierra Grande Board of Directors

April 23, 2025



Prepared by:
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- Biology & history of bighorn
 - Live to 11-12 years old
 - Several old/large males will breed many females & females have 1 lamb/yr (lamb survival key to population performance)
 - Biology of bighorn allows sustainable harvest of a small number of males annually
 - New Mexico: two subspecies
 - Rocky Mountain & Desert
 - Rocky Mountain bighorn were extirpated (overhunting and disease spread through contact with domestic goats/sheep)
 - The biggest threat to bighorn currently: contact with domestic sheep/goats and resulting disease
 - Mid-1900's bighorn translocated from Banff National Park to NM
 - Strong translocation program with goal of continued restoration
 - Restoration efforts are expensive; have been funded through sale of some of a small number of male hunting opportunities
 - This is how we manage all of our large herbivore wildlife populations in the state (other states are the same)
 - Manzanos herd population estimate: 50-70 bighorn
 - Herd monitoring since 2010
 - In 2010, population estimate was 25
 - Annual ground survey done by biologists
 - Classify sheep into age and sex classes
- Bighorn Global Positioning System collars
 - Winter 2023-2024, collared bighorn (7 females, 3 males) in Manzano herd (helicopter net gunning method)
 - Overall, bighorn spend ~25-65% of their time on Tierra Grande property

- Males, (the sex we hunt), are on TG property ~60% of the time
- Maps are broken down by season and sex
- Hunting
 - Given bighorn biology, we can sustainably hunt males under certain circumstances and at given metrics
 - With the population size at 50-70
 - Anticipate we could sustainably hunt 1 ram per year, maybe sometimes 2 rams, at current population level
 - When bighorn populations reside on private property, often enter into agreements with landowners for hunting opportunities (this is typically done in a 50/50 fashion)
 - 50% of licenses go into the public drawing for tags (random drawing from people applying for the chance at a hunting license)
 - 50% go to private landowner for them do as they please (usually sell hunt)
 - Season length: usually 2 weeks
 - Common practices on other private property where bighorn hunting is allowed:
 - Most property owners have a requirement for someone to accompany a hunter during their hunt
 - May address some safety concerns
 - 17-4-7 NMSA 1978

Manzano Bighorn Sheep Locations in Relation to Land Ownership

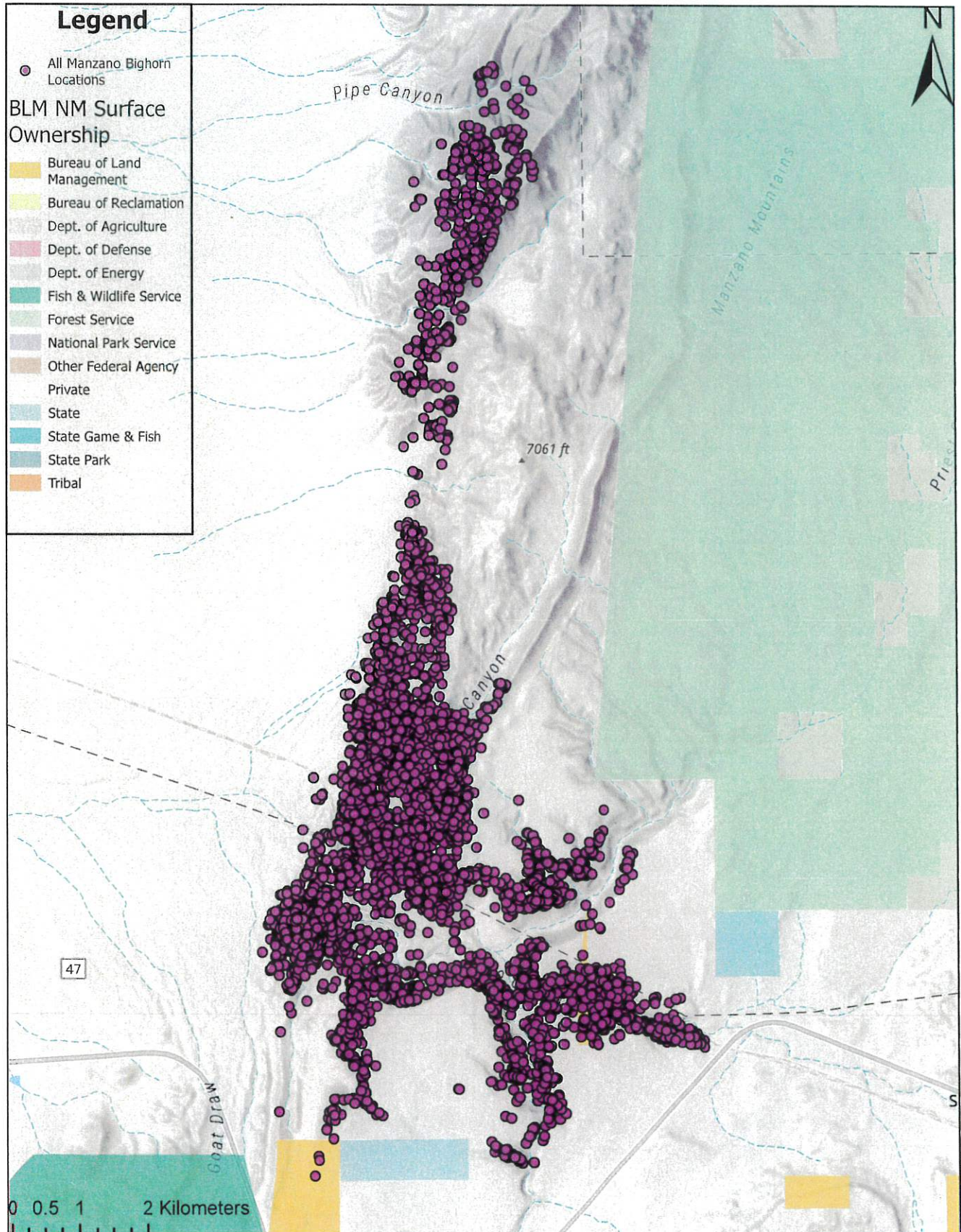


Figure 1. GPS locations ($n = 12,535$) of 10 bighorn sheep (7 females, 3 males) of the Manzano Mountain herd of New Mexico. Locations range from 1 December, 2023 to 25 March 2025 and are overlaid on a surface land ownership map.

Manzano Bighorn Sheep Locations in Relation to Land Ownership

For use by the New Mexico Department of Game and Fish

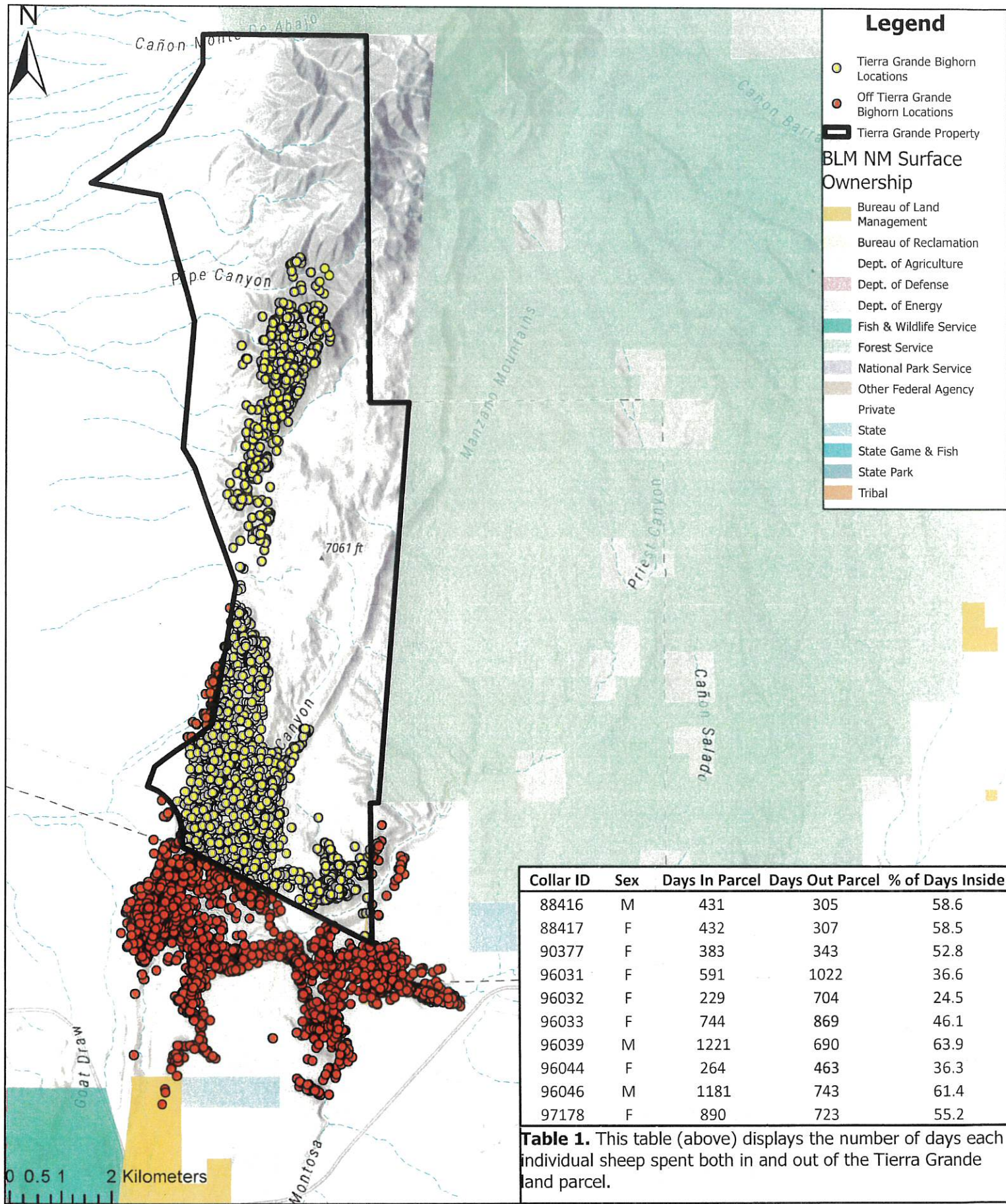


Figure 1. This map displays GPS locations (n = 12,535) of bighorn sheep (n = 10; 7 females = 7, males = 3) of the Manzano Mountain herd of New Mexico. Locations range from 1 December, 2023 to 25 March 2025.



Seasonal Distribution of Male and Female Bighorn Sheep in the Manzano Mountains, New Mexico

For use by New Mexico Department of Game and Fish.

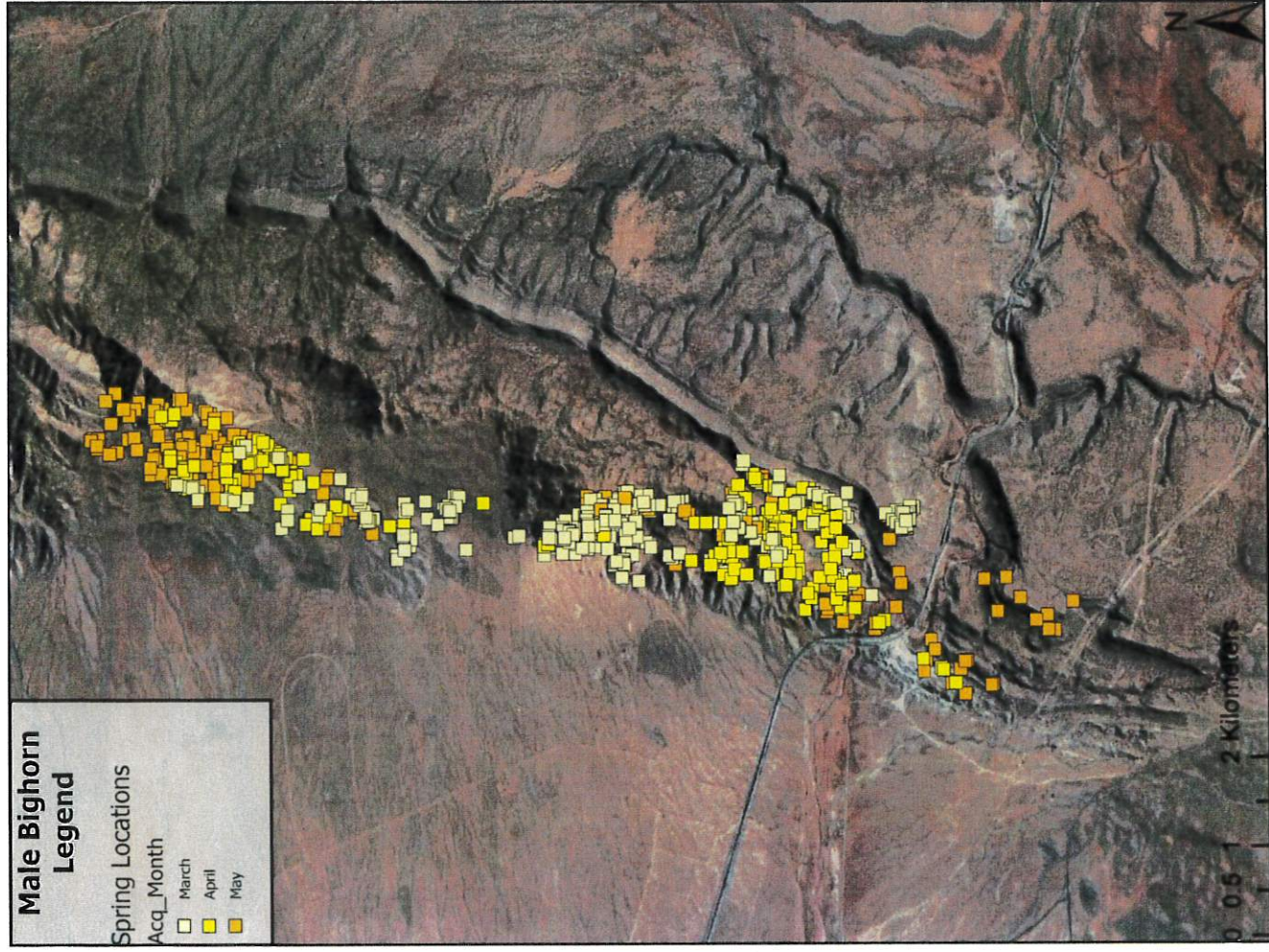


Figure 1. Spring (March, April, May) distribution of male bighorn sheep (n = 3) using GPS locations (n = 1,137) in the Manzano Mountains, New Mexico

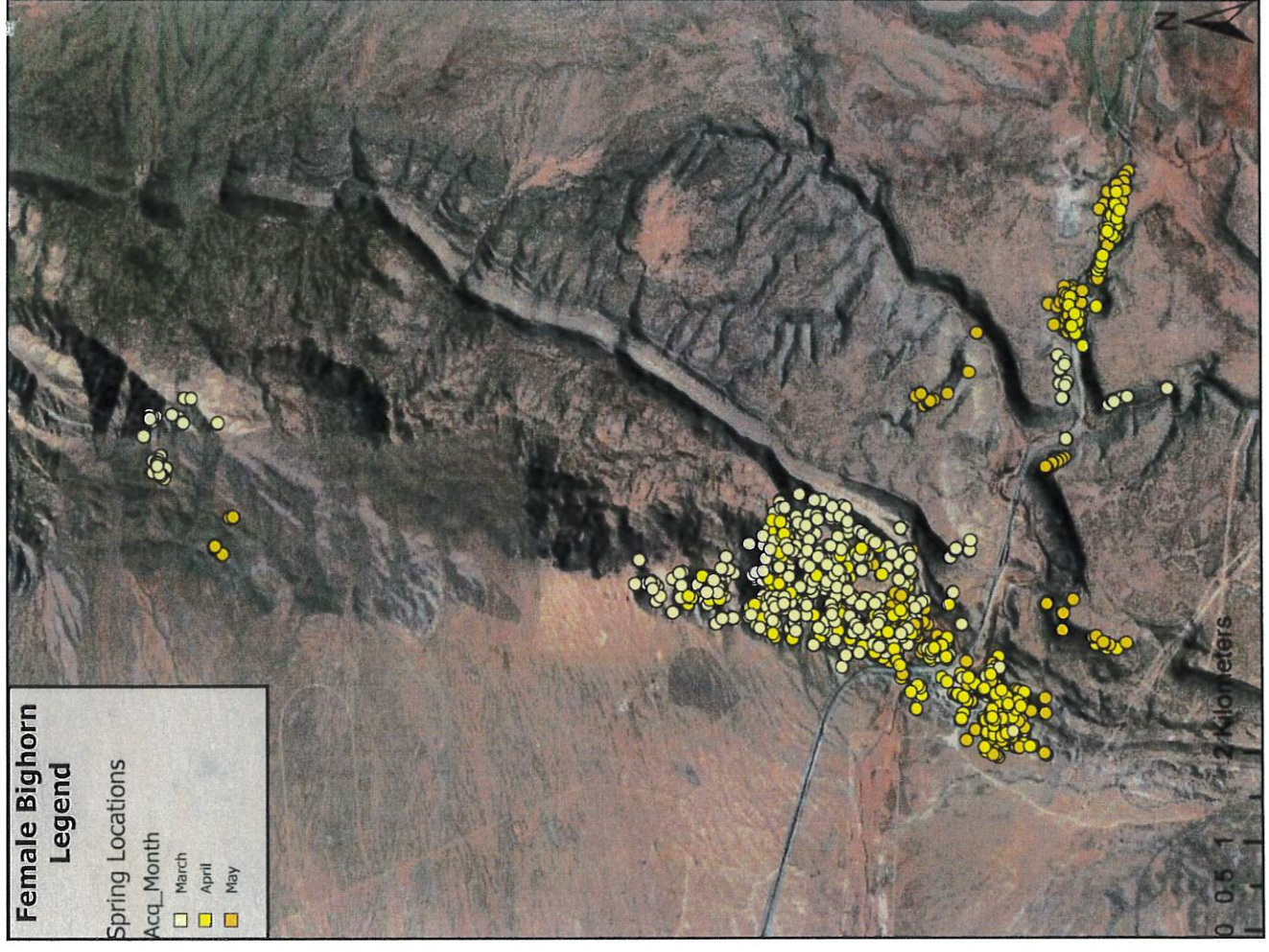


Figure 2. Spring (March, April, May) distribution of female bighorn sheep (n = 7) using GPS locations (n = 7,964) in the Manzano Mountains, New Mexico



Seasonal Distribution of Male and Female Bighorn Sheep in the Manzano Mountains, New Mexico

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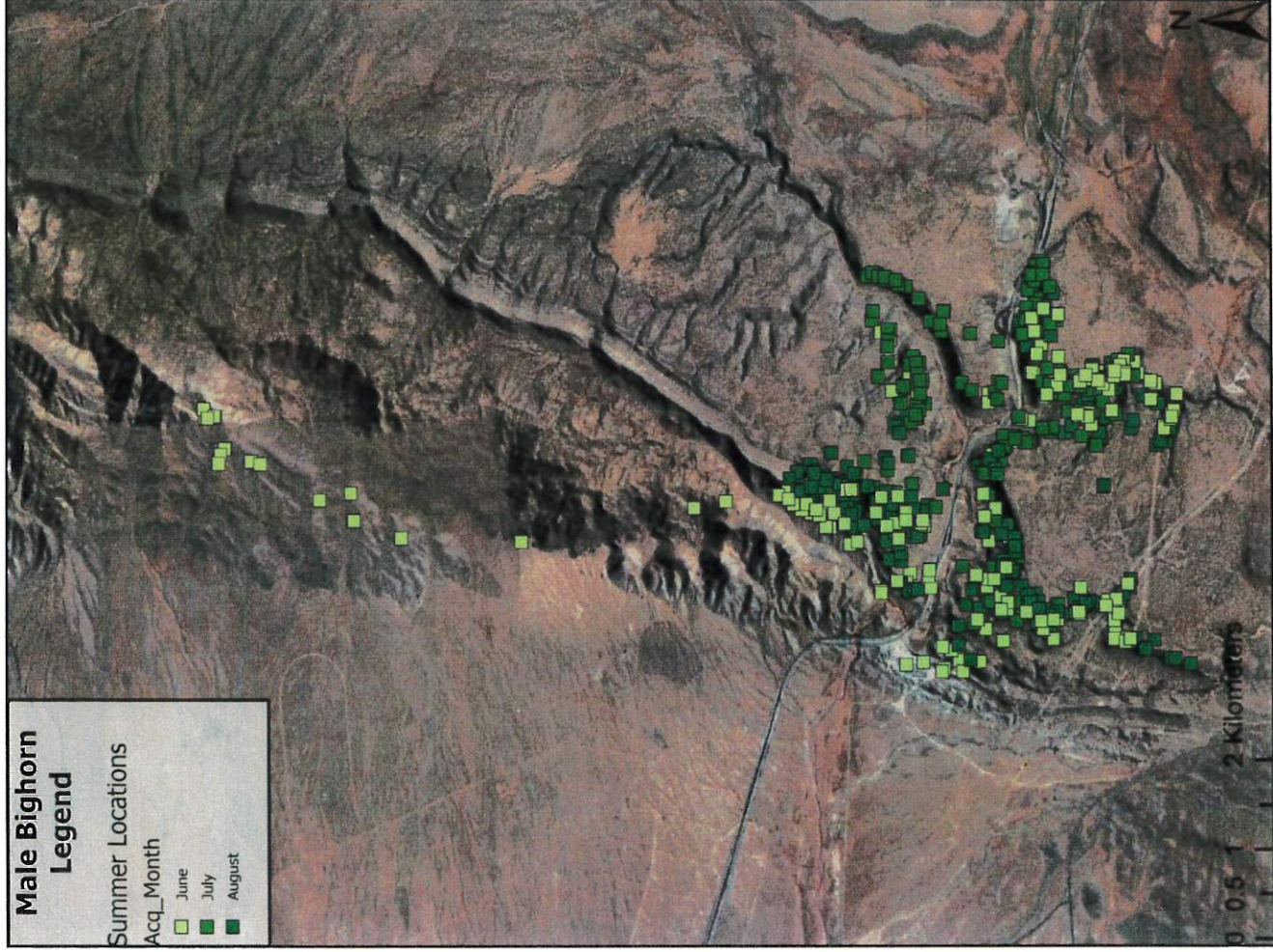


Figure 1. Summer (June, July, August) distribution of male bighorn sheep (n = 3) using GPS locations (n = 904) in the Manzano Mountains, New Mexico.

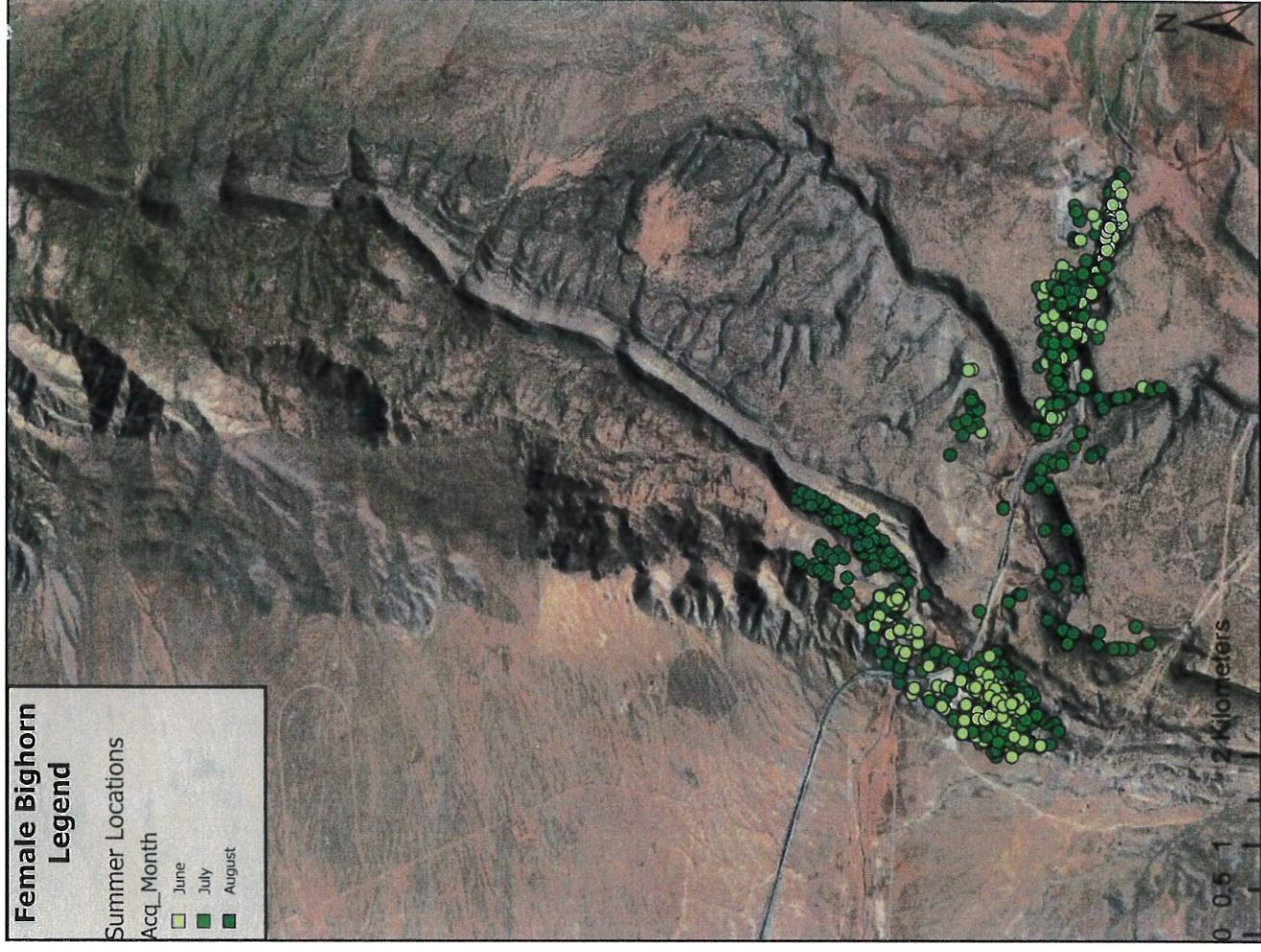


Figure 2. Summer (June, July, August) distribution of female bighorn sheep (n = 7) using GPS locations (n = 2,113) in the Manzano Mountains, New Mexico.



Seasonal Distribution of Male and Female Bighorn Sheep in the Manzano Mountains, New Mexico

For use by New Mexico Department of Game and Fish.

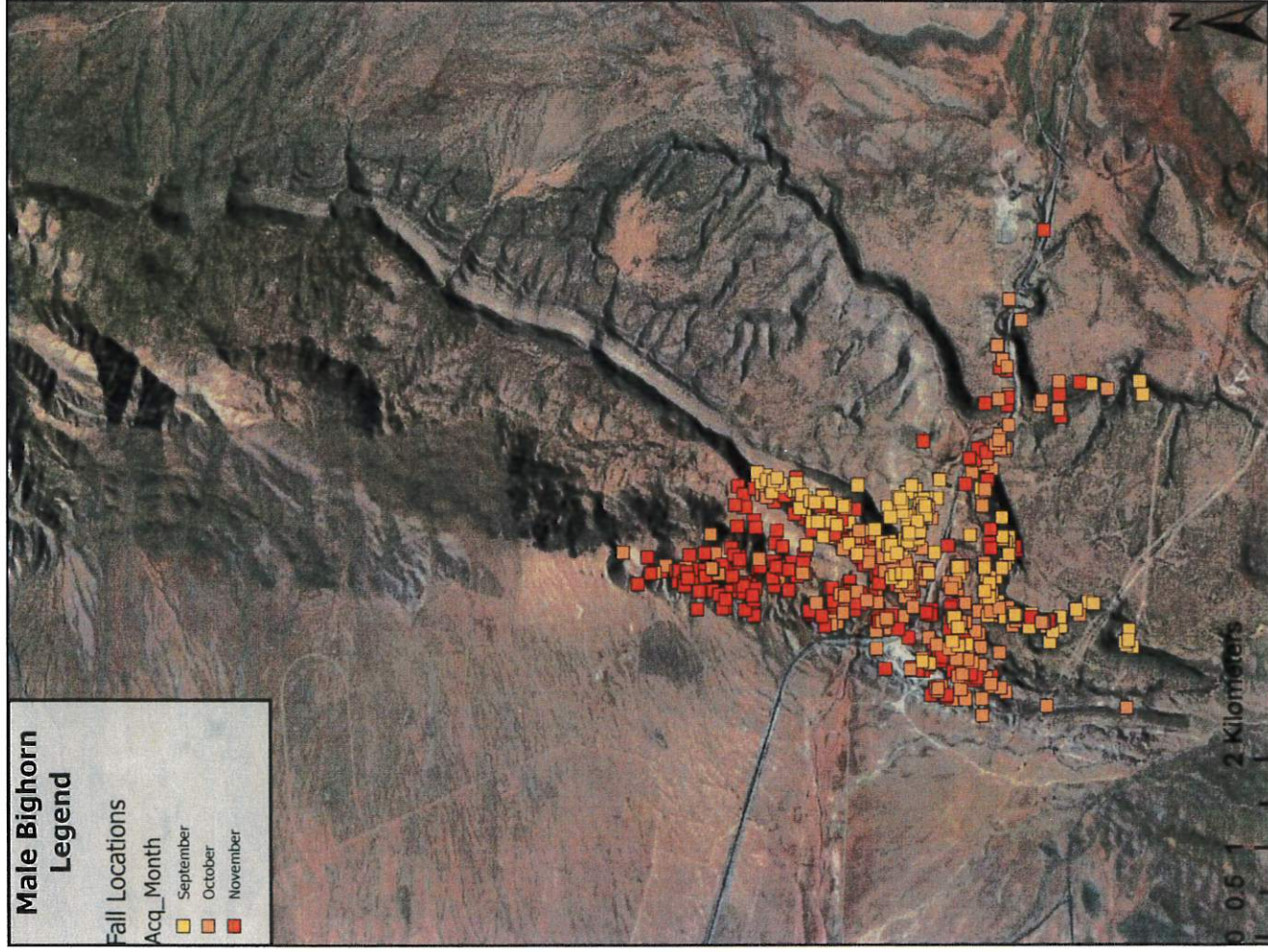


Figure 1. Fall (September, October, November) distribution of male bighorn sheep (n = 3) using GPS locations (n = 894) in the Manzano Mountains, New Mexico.

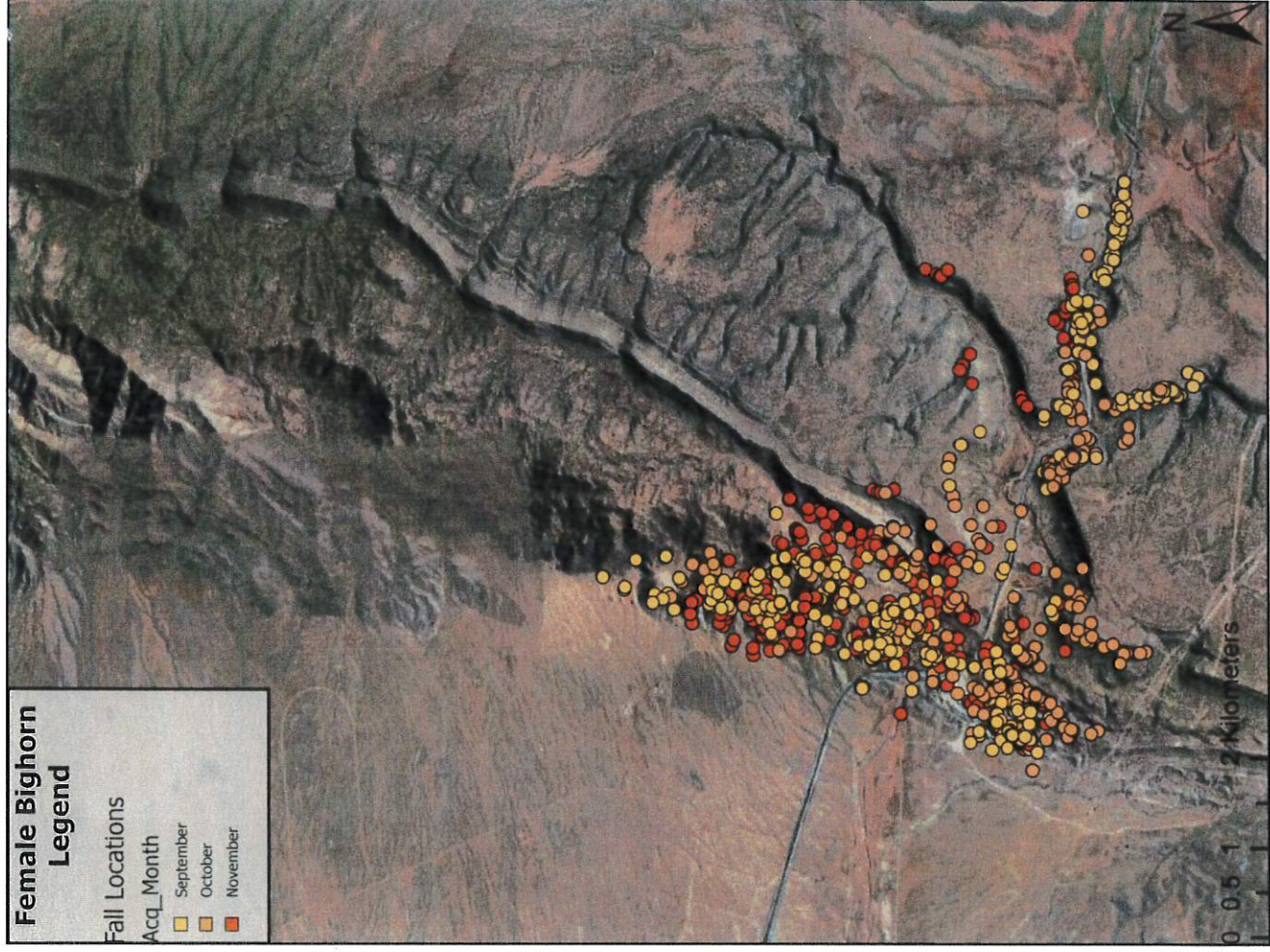


Figure 2. Fall (September, October, November) distribution of female bighorn sheep (n = 6) using GPS locations (n = 1,567) in the Manzano Mountains, New Mexico.



WINTER DISTRIBUTION OF MALE AND FEMALE BIGHORN SHEEP in the Manzano Mountains, New Mexico

For use by New Mexico Department of Game and Fish.

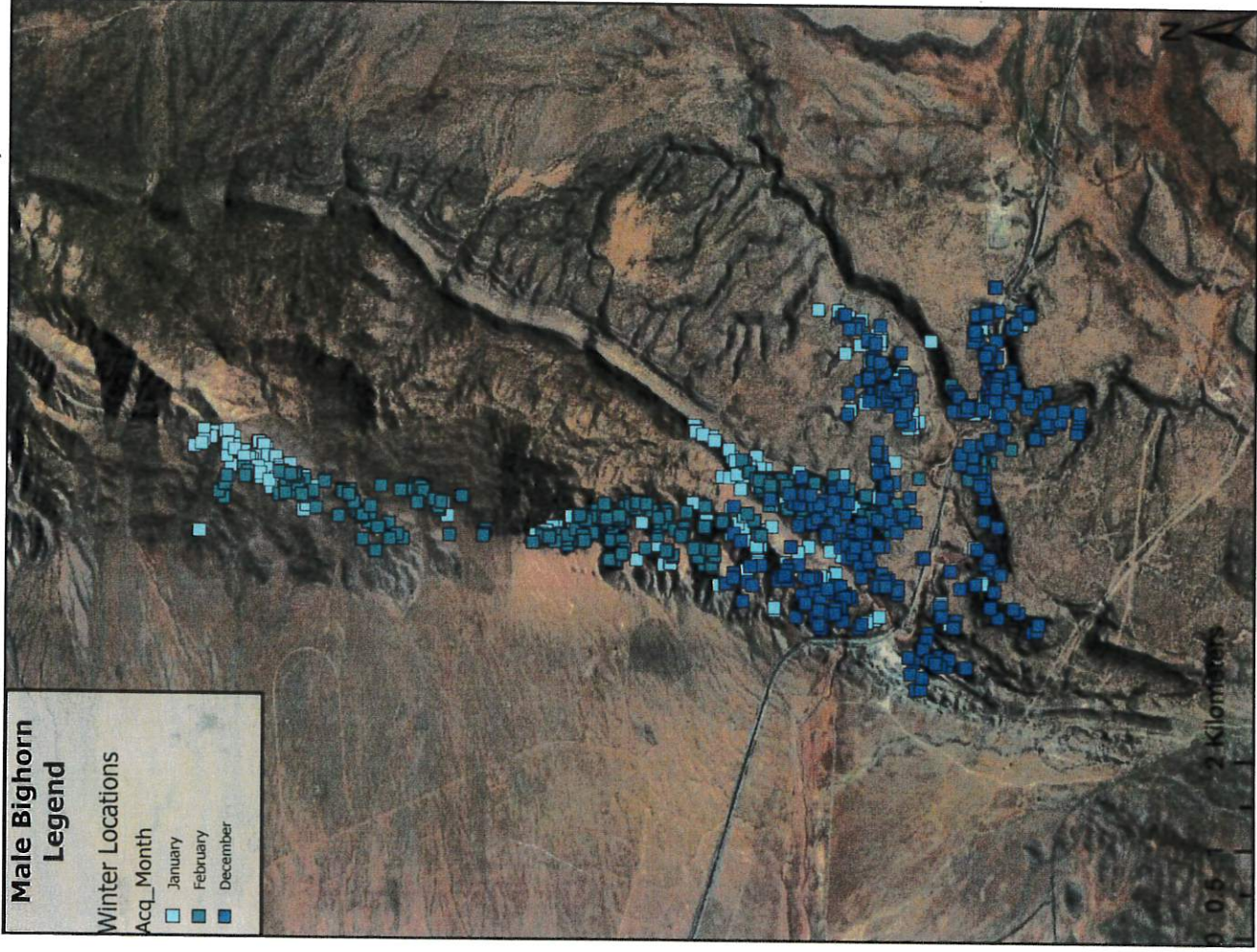


Figure 1. Winter (December, January, February) distribution of male bighorn sheep ($n = 1,636$) using GPS locations in the Manzano Mountains, New Mexico.

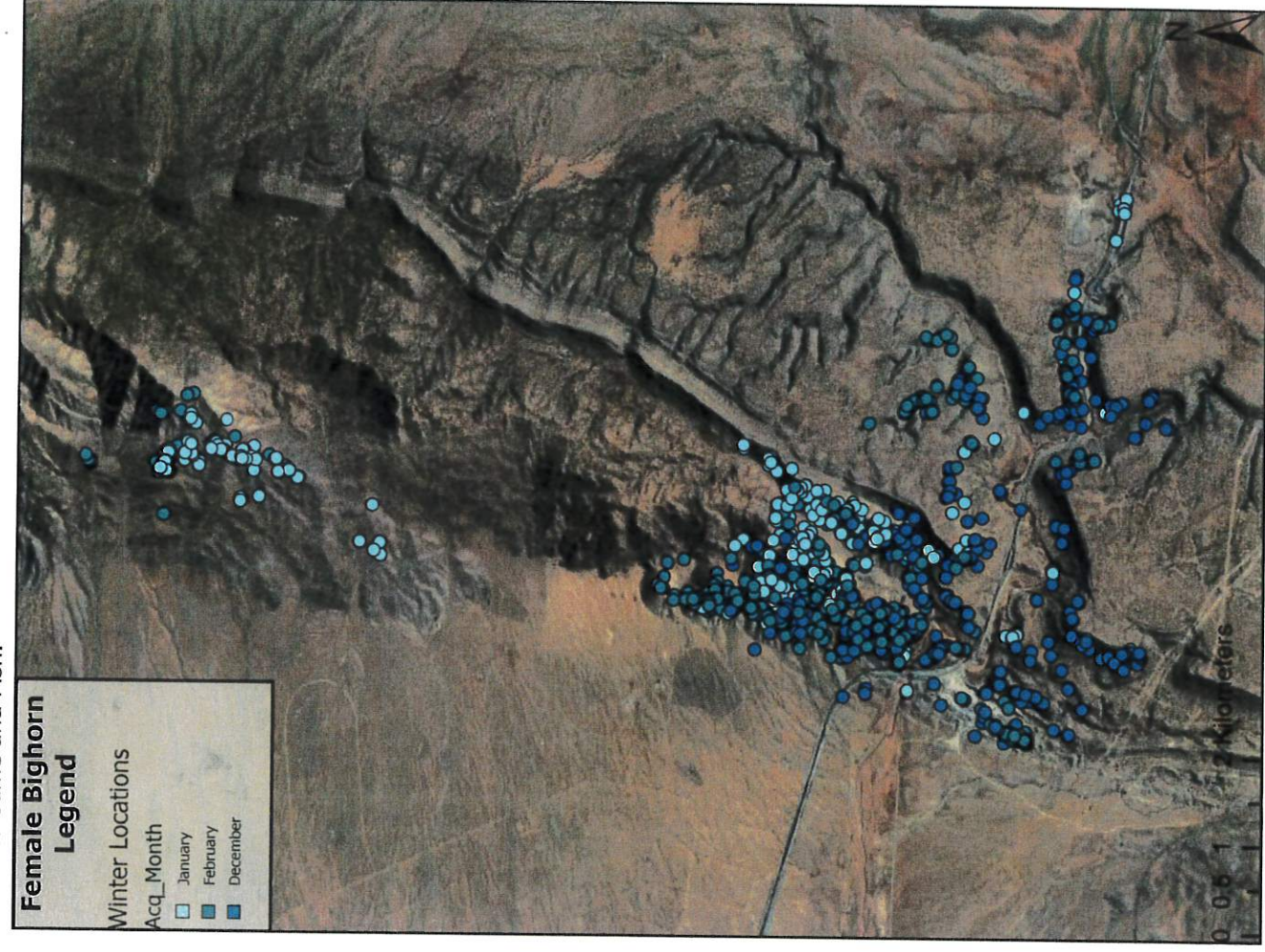


Figure 2. Winter (December, January, February) distribution of female bighorn sheep ($n = 7$) using GPS locations in the Manzano Mountains, New Mexico.