

FIRE MANAGEMENT

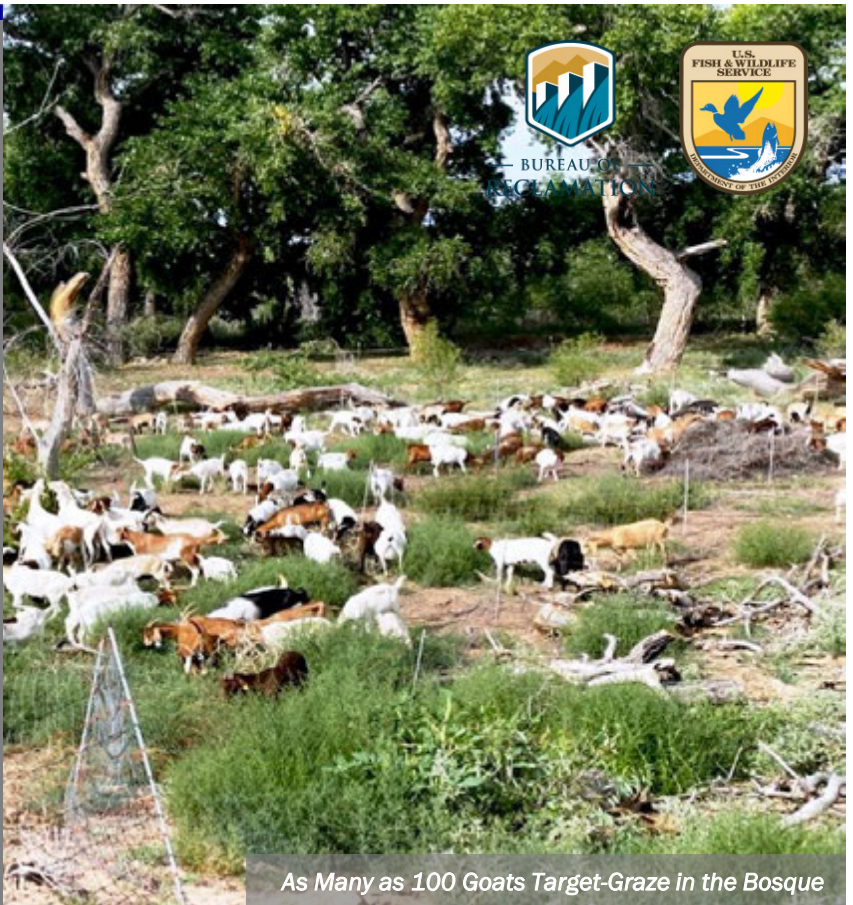
Goats as a Tool for Fire Management on the Pueblo of Sandia



The Sandia Pueblo Reservation is located north of Albuquerque along the Rio Grande. The Tribe's 25,620 acreage includes 700 acres of riparian bosque forest. Changes to the Rio Grande's flow regime, non-native plant introductions, and prolonged drought increased the fuel load and wildfire risk in the bosque. Wildfire risk is especially concerning for neighboring agricultural and suburban areas. The Sandia Pueblo's Environment Department struggles to find appropriate strategies to thin dense vegetation in the bosque habitat they manage. In response to the increased wildfire risk, Sandia Pueblo's Environment Department and Galloping Goat Pumpkin Patch Ranch implemented a goat grazing program in 2021 to reduce fuel loads, create clearings for new growth of native plants, and improve the soil.



Project Location



As Many as 100 Goats Target-Graze in the Bosque

KEY ISSUES ADDRESSED

Channelization of the Rio Grande and drought have decreased water availability within the bosque. As a result, invasive species including Ravenna grass (*Tripsidium ravennae*), Saltcedar (*Tamarix* spp.), Russian olive (*Elaeagnus angustifolia*), and Siberian elm (*Ulmus pumila*) persist in the bosque. The proliferation of invasive plants has increased the fuel load for wildfires to ignite and spread throughout the bosque. Past management efforts, such as vegetation mastication, only marginally reduced the threat of wildfire and compounded the problem by moving the fuel load from standing plants to the ground, causing wildfires to scorch the soil and reduce soil productivity. While individual members of Sandia Pueblo have used goat grazing to thin vegetation for over a century, the Environment Department was unsure of the effectiveness of goat grazing to control invasive plant species.

PROJECT GOALS

- Determine if goats selectively graze invasive plants
- Remove invasive plants using targeted goat grazing in the bosque
- Use goats to reduce accumulation of burnable fuels on the soil

HAPPY HEALTHY GOATS

Participation in the program provides goats with a diverse food pallet and stimulation from exploring the unknown, improving their health and overall alertness.



Goats Grazing Invasive Siberian Elm

PROJECT HIGHLIGHTS

Testing Goat Selectivity: Staff from Galloping Goat Pumpkin Patch Ranch conducted a trial for the first four days of the program to assess which plant species the goats would graze. Each day, ranch staff used portable electric fencing as an enclosure around one target invasive plant species. Goats showed no preference among target invasive species.

Targeted Grazing: Ranch staff transported 100+ goats from their ranch to the bosque. They used portable netwire electric fencing to create a 0.5 acre enclosure within the project sites. The fencing also protected native vegetation from grazing. Ranch staff moved the fencing throughout the area after the goats grazed available vegetation. A herding dog directed the movement of the goat herd.

Reduction of Wildfire Threat: Based on ground observations and before-and-after pictures, goats reduced the biomass of invasive species and cleared overgrown forested areas. Goats grazed vegetation at or near the ground, reducing accumulation of fuel load on the soil and significantly decreasing the fuel base.

Seeding Native Species: Goat hoof indentations may help establish native plants. Goats stomp seeds into the ground creating planter-like indentations with their hooves that retain water and improve establishment.

Funders

- Forest and Watershed Restoration Act through the New Mexico State Forestry Division

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Photos courtesy of Pueblo of Sandia Environment Department

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LESSONS LEARNED

While still developing, the goat grazing program is a promising method for forest wildfire mitigation. As agencies often oversee large swaths of forest, forest management may need to employ several strategies to decrease the threat of wildfire. The goat grazing program shows how cooperation between Tribal technical staff and local ranchers can support multiple techniques to further management goals. The goats have proven to be helpful with clearing areas of dense vegetation. If used in coordination with other vegetation thinning practices throughout the Tribe's boundary, the Environment Department may gain an upper hand on fast-growing invasive plant species.

Project participants learned that they could save time, energy, and money required to transport goats to the site by keeping the goats on location overnight. For the goats to stay overnight, managers could consider using guardian dogs and alpacas to protect the herd from depredation.

NEXT STEPS

- Complement current evaluation methods with monitoring of grazed and seeded areas to measure the reduction of invasive species and new cottonwood growth
- Explore opportunities to use goats in other riparian management programs
- Continue to minimize wildfire risk while also supporting fire as a function of the ecosystem
- Initiate investigation into whether goat feces provide soil nutrients and improve germination of seeded species

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Ranchers Oversee Goats Exiting Their Double-Decker Trailers