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DECEMBER 2021



The Rapidly Vanishing Pinyon Jays: Understanding Their Habitat Use May Be the Key to Saving Them

The noisy, gregarious, and iconic pinyon jay is one of the most rapidly disappearing birds in the West, having undergone an 80 percent decline in population in the last half-century. This is puzzling because while the birds have been on the decline, the area of pinyon-juniper woodlands that they depend on has been expanding. Pinyon jays live in large flocks and harvest and cache the seeds of the pinyon “pine nuts,” with nearly half of the jay population living in the Great Basin. No one is sure why pinyon jays are declining so rapidly, but one hypothesis is that because of decades of fire suppression, pinyon-juniper woodlands are becoming denser, older, and less vigorous in terms of pine nut production. Increasing temperatures and growing water stress may also be contributing to declines in productivity.

[Recent science](#) published by RMRS research ecologist Chris Witt, John Boone, a Research Coordinator with the Great Basin Bird Observatory, and their colleagues are teasing apart specifically which portions of the pinyon-juniper forests are used by the jays for seed caching, foraging, and nesting to shed some light on possible reasons for the population declines. They also addressed the removal of pinyon-juniper for the purposes of improving greater sage-grouse habitat and mitigating wildfire risk, and how that might impact the jay population.

The researchers studied pinyon jays in three widely separated study areas by using radio telemetry and direct observation. Using the USDA Forest Service’s Forest Inventory Analysis protocol they measured key attributes of their activity sites — as well as a separate set of randomly selected control sites. According to

Witt, “Using FIA methodology to describe pinyon jay habitat features allowed us to track important changes over time and space with little or no additional investment.”

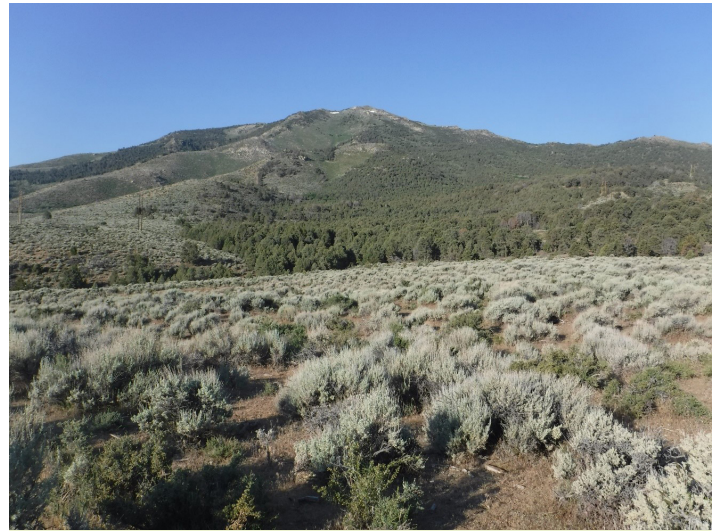
They found that the jays were only using a small proportion of the 43 million acres of pinyon-juniper woodlands across the Great Basin. The jays were found to be active mostly in the lower elevations with a diverse mosaic of young trees, older trees, and shrubs at the woodland-shrub ecotone (the area of transition where two vegetation communities merge). This also tends to be where removal of pinyon-juniper woodlands to improve grouse habitat is concentrated. The more established, mature, high-canopy cover stands appeared to be used primarily during mast years (years when some species of trees and shrubs produce a bumper crop of fruits or seeds).



Pinyon jays have undergone an 80 percent decline in population in the last 50 years. Photo licensed by Adobe Stock.

While it is not clear that pinyon-juniper removal is directly implicated in the decline of pinyon jay populations, this research highlights the importance of considering habitat requirements of the jays when designing vegetation management projects. Explains Witt, “Our work suggests woodland treatments can be tailored to benefit both jays and greater sage-grouse in many instances, and at least can be implemented in a way that minimizes potentially negative impacts to the pinyon jay.”

Witt, as part of a multi-agency/state working group, was also involved in the creation of a [pinyon jay conservation strategy](#), a guide for managers that details how to adopt measures that reduce the likelihood of negative impacts to pinyon jays. The guide includes consideration of the timing and location of woodland treatment projects—while acknowledging that more research is needed develop management actions that would actively improve habitat for these iconic birds.



Pinyon jays were found to be active mostly in the lower elevations of the pinyon-juniper forest, the edge of the woodland-shrub ecotone, which is the area most likely to be targeted for greater sage-grouse habitat management. Courtesy photo by John Boone.

KEY MANAGEMENT CONSIDERATIONS

- The pinyon jay has undergone an 80 percent decline in population in the last half-century, while the area of pinyon-juniper woodlands that they depend on has been expanding. Recent science has sought to tease apart specifically which portions of the pinyon-juniper forests are used by the jays to shed some light on possible reasons for the population declines.
- In multiple sites, the pinyon jays were found to be active mostly in the lower elevations with a diverse mosaic of young trees, older trees, and shrubs at the woodland-shrub ecotone. This also tends to be where removal of pinyon-juniper woodlands to improve grouse habitat is concentrated.
- Woodland removal projects in the Great Basin are often concentrated in the same areas preferred by pinyon jays, so it could be helpful to incorporate conservation measures informed by pinyon jay occurrence patterns into existing woodland management paradigms, protocols, and practices to reduce any potential negative impacts on these birds.

PROJECT LEAD

[Chris Witt](#) is a research ecologist at RMRS, specializing in developing tools that quantify habitat for forest vertebrates listed as threatened, endangered, or of special concern by state and/or federal management agencies.

FURTHER READING

Boone, J.D.; Witt, C.; Ammon, E.M. 2021. [Behavior-specific occurrence patterns of pinyon jays \(*Gymnorhinus cyanocephalus*\) in three Great Basin study areas and significance for pinyon-juniper woodland management](#). PLoS ONE. 16(1): e0237621.

Boone, J.D.; Ammon, E.; Johnson, K. 2018. [Long-term declines in the pinyon jay and management implications for piñon–juniper woodlands](#). In: Shuford, W.D.; Gill Jr., R.E.; Handel, C.M., eds. Trends and traditions: avifaunal change in western North America, studies of western birds 3. Camarillo, CA: Western Field Ornithologists: 190–197.

Somershoe, S.G.; Ammon, E.; Boone, J.D.; Johnson, K.; Darr, M.; Witt, C.; Duvuvuei, E. 2020. [Conservation strategy for the pinyon jay \(*Gymnorhinus cyanocephalus*\)](#). Partners in Flight Western Working Group and U.S. Fish and Wildlife Service, USA.

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