



Habitat Use at Multiple Scales by Pinyon-Juniper Birds on Department of Defense Lands II: Nest and Territory/Colony Scales

Project # 10-425

Background:

Pinyon-juniper woodlands cover approximately 40 million hectares of the western US and represent the dominant woody vegetation and most biodiverse terrestrial habitats on at least six Department of Defense (DoD) installations. Pinyon-juniper habitats on DoD installations are currently threatened by drought, insects, disease, and fire, all of which can be exacerbated by climate change. We are studying



pinyon-juniper habitat use by two Species At Risk (SAR), Pinyon Jay (*Gymnorhinus cyanocephalus*) and Gray Vireo (*Vireo vicinior*), at three scales (landscape, territory/colony, and nest) on three DoD installations.

Pinyon Jays are year-round residents across the southwestern US and in ID, MT, WY, and central OR, where they inhabit woodlands and scrublands containing ponderosa pine, juniper, and chaparral vegetation. They nest colonially on traditional nesting grounds. Pinyon Jays are omnivorous, taking pine seeds, acorns, juniper berries, arthropods, and small vertebrates, but they especially depend on the seeds of pinyon pines. Able to carry up to 50 pinyon seeds at a time, Pinyon Jays are the main long-distance seed disperser for pinyon trees. In return for seed dispersal services, the trees provide mast crops of abundant, highly nutritional seeds. Cached seeds sustain Pinyon Jays over winter, support successful breeding, and increase jay population viability. Due to its unique keystone mutualism with pinyon trees, the Pinyon Jay is an important indicator of pinyon woodland productivity. The Pinyon Jay is a DoD SAR, NM Partners in Flight (PIF) Level 1 Species of Concern, and DoD PIF priority species. Populations of Pinyon Jays range-wide have been declining significantly for over 40 years. In spite of these declines, their use of pinyon-juniper habitat has barely been studied.

Gray Vireos are short-distance migrants that breed in the southwestern US and northwest Mexico. Throughout their range, Gray Vireos use pinyon-juniper, scrubland, or chaparral habitats in arid, mountainous terrain or high plains. Their diet includes large arthropods, such as grasshoppers, cicadas, and caterpillars, and fruit in winter.



Distribution of the Gray Vireo in New Mexico is patchy, and most occupied habitats contain fewer than 10 territories. Territory size is not well known, but a few studies have reported territories ranging from 2–10 ha, and singing males have been reported every 300 m in Texas and Arizona. Gray Vireos are commonly parasitized by Brown-headed Cowbirds (*Molothrus ater*), but the impact on vireo population viability is not well understood. The Gray Vireo is a DoD SAR, DoD PIF priority species, listed as threatened by the state of New Mexico, a US Forest Service Sensitive Species (Region 3), and a NM PIF Level 1 Species of Concern.

Objective:

The objective of this Legacy-funded project is to create habitat models to inform management for both species, in light of military activities and infrastructure. A study of two SAR that differ in seasonal movements, social structure, and foraging habits, viewed at multiple scales and several installations, will provide a broad perspective on the management of pinyon-juniper woodlands for avian SAR.

Summary of Approach:

We are investigating pinyon-juniper habitat use by Pinyon Jay and Gray Vireo. We are collecting and comparing data on habitat use at multiple scales (landscape, territory, and nest) and across multiple installations: White Sands Missile Range (WSMR), Kirtland Air Force Base (KAFB), and Camel Tracks Training Area (CTTA). In Year 2 we modeled habitat use

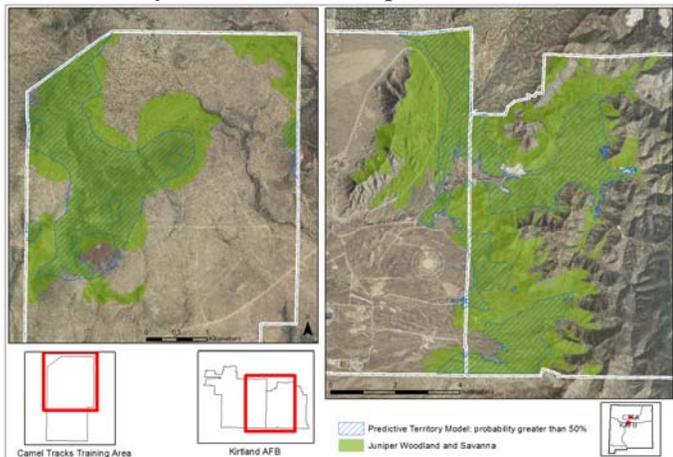


for both species at the nest and colony (Pinyon Jay)/territory (Gray Vireo) scales. We will interpret results in light of military activities and provide habitat management recommendations for both species.

Benefit:

This project:

- supports installation Integrated Natural Resource Management Plans and pinyon-juniper management;
- assesses potential impacts of military activities on two SAR;
- shares research protocols and management information with other DoD installations and non-DoD land managers who have responsibility for these two SAR;
- supports implementation of the DoD/ USFWS MOU for Migratory Bird Conservation and the USFWS Final Rule for Take of Migratory Birds by the Armed Forces; assists in compliance with the North American Migratory Bird Treaty Act and Sikes Act; helps avoid listing of both species under the Endangered Species Act;
- supports priorities of several national conservation plans to which DoD is a partner;
- through improved management, benefits other DoD sensitive pinyon-juniper species and SAR: *Oscura Mts. chipmunk*, *Black-throated Gray Warbler*, and *Juniper Titmouse*.



Accomplishments:

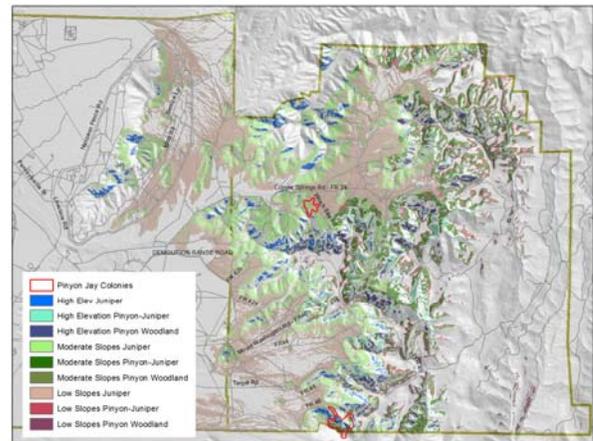
In Year 2, we collected nest-scale habitat data on both species at three installations and created statistical models of nest site selection. Gray Vireos selected nest sites on more southward-facing aspects having more trees and higher (but not too high) mean tree heights relative to non-unused random plots within each territory. Pinyon Jays nested in trees with greater total

canopy cover, larger root crown diameters, and higher litter cover on the ground within 5 m of the nest, relative to non-nest trees within the colony. We collected GIS data on colony-scale measures for Gray Vireo at CTTA and KAFB and for Pinyon Jay at KAFB and WSMR. We then created GIS predictive models at the territory scale for Gray Vireos at CTTA and KAFB and at the colony scale for Pinyon Jays at KAFB and WSMR (see figures, this page).

Management for Pinyon-Juniper Birds:

Gray Vireos generally nested and established territories farther from buildings and closer to roads than random. We recommend that KAFB and CTTA continue to restrict training activities in the Gray Vireo nesting areas during the breeding season and that all three installations avoid constructing new roads or infrastructure closer to territories than what currently exists. Fire and thinning are not recommended management practices for Gray Vireo habitat.

We did not find that Pinyon Jays avoided roads or buildings at the nest scale, but they did avoid people on foot. We recommend that no new roads or infrastructure be constructed any closer to traditional Pinyon Jay colonies than what currently exists. We recommend that in past years, ground training activities not be conducted within 1 km of traditional Pinyon Jay colony sites from March- July or in seed harvesting areas. Fire is not recommended, and thinning should be strictly experimental and controlled.



Contact Information:

Kristine Johnson, PhD, Research Associate Professor, Natural Heritage NM, UNM Biology Department, MSC03 2020, Albuquerque NM 87131. Phone: 505-277-3822, Fax: 505-277-3844, kjohnson@unm.edu

Lynn Wickersham, M.S., Animas Biological Studies, 138 Overlook Dr. Durango, CO 81301. Phone: 970-382-2769, Fax: 970-382-2769, lynn@animasbiological.com