

## **Pinyon Jay Surveys in the Gila National Forest Progress Report to Share With Wildlife**

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The Pinyon Jay (*Gymnorhinus cyanocephalus*) is an immediate priority Species of Greatest Conservation Need in New Mexico (NMDGF 2016). It is listed as vulnerable on the Red List of Threatened Species by the International Union for the Conservation of Nature (IUCN), suggesting that it is at risk of extinction in the medium-term future (Birdlife International 2017). It is a US Fish and Wildlife Service (USFWS) species of conservation concern (USFWS 2019) and is the fastest declining bird of piñon-juniper habitats (Boone et al. 2018). Its rangewide population has declined an estimated 3.69% annually from 1967 to 2015; similar annual declines (3.46%) have been documented in New Mexico (Sauer et al. 2017).

Breeding Bird Survey data (Sauer et al. 2017) suggest the Gila National Forest (Gila NF) in New Mexico may be an area of Pinyon Jay population stability or increase; however, prior to our Share with Wildlife (SwW) supported surveys reported here, systematic survey of the area had not been conducted. As of June 2021, field surveys have been completed and surveys of blocks, 25 km<sup>2</sup> in size, are mapped. Data have been entered and preliminary analyses are complete. Occupancy analysis is in progress and will be provided in the final report.

### **Methods**

We conducted vehicle and walking surveys for Pinyon Jay flocks in previously identified suitable habitat. The criteria for identifying these priority areas were developed from known New Mexico nesting areas and required at least 10% piñon and/or juniper woodland cover (from the LANDFIRE 2016 Existing Vegetation Type layer; <https://www.landfire.gov>) within the circular 25 km<sup>2</sup> area. We first placed a 5 km grid over areas of suitable habitat within the Gila NF. Each 5 × 5 km (25 km<sup>2</sup>) block was divided into four smaller, 2.5 × 2.5 km sub-blocks. Within each block, we placed survey points at least 1 km apart along public roads. Additional survey points were added in the field when adjacent suitable habitat was identified. Survey points were removed when habitat was unsuitable or poor road conditions limited access. Pinyon Jay surveys followed the general protocol outlined in Petersen et al. (2014) and Johnson et al. (2020). This protocol is based on driving surveys through targeted areas. The surveyor drove slowly, listening for Pinyon Jay calls and watching for jays flying over. All Pinyon Jays detected while driving were recorded on data sheets.

The surveyor also stopped at each pre-designated survey point and watched and listened for 6 min. Number of Pinyon Jays detected, distance estimates, and minute detected were recorded, as well as behaviors and general woodland composition (e.g., piñon, juniper, ponderosa pine). When Pinyon Jays showed breeding calls (rattle, piping rattle, begging) or behaviors (courtship

chases or feeding, begging by females, nest construction, copulation, fledglings) suggesting that the birds were nesting nearby, the surveyor attempted to follow them to nesting colonies by vehicle or on foot.

In March 2021, surveys began in the southern part of the Gila NF. Finding almost no Pinyon Jays in the south, the surveyor moved to the northern part of the study area, where Pinyon Jays were abundant (Figure 1). Finally, priority blocks in the east, between the southern and northern areas, were filled in. Surveys were completed in late April 2021.

## Results

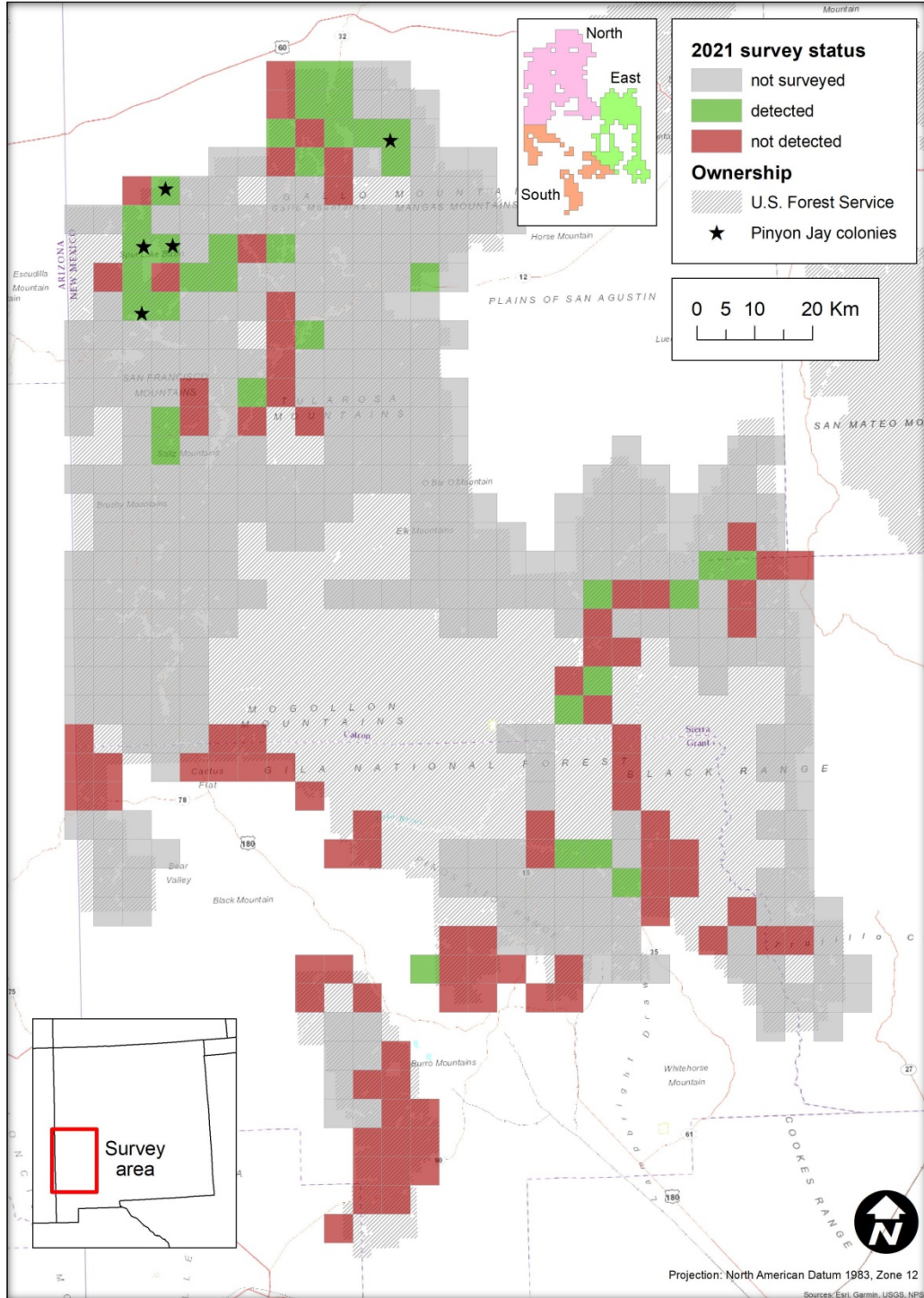
The surveyor completed surveys of 124 blocks, 25 km<sup>2</sup> in size, including 514 point surveys, each 6-min long. Thirteen 25 km<sup>2</sup> blocks were not surveyed because they were inaccessible. Of 124 blocks surveyed over the entire study area, Pinyon Jays were detected in 36 (29%). The southern part of the survey area was dominated by flocks of Mexican Jays (*Aphelocoma wolbeberi*), with Woodhouse's Scrub-jays (*A. woodhouseii*) and Steller's Jays (*Cyanocitta stelleri*) also present. In 48 blocks surveyed in the south area, Pinyon Jays were detected on only 2% (Table 1). Pinyon Jays were moderately abundant in the east area (Table 1) and were detected on 25% of 36 blocks. Of the 44 northern blocks, Pinyon Jays were detected in 59.1%. A similar pattern emerged at the 2.5 × 2.5 km sub-block and point scales, with the northern area having the highest number of detections. Numbers and group sizes of Pinyon Jays were also higher in the north, followed by the east, with the fewest jays in the south (Table 1).

This suggests that the northern Gila NF contains a healthy population of breeding Pinyon Jays, in agreement with Breeding Bird Survey summary results. Because Pinyon Jays were quite abundant in the northern areas, the surveyor elected to devote the majority of survey time to covering additional blocks, as searching for nesting colonies is quite time-consuming. Despite limited time for colony searches, we detected five new nesting areas, as indicated by Pinyon Jay behavior, active or old nests, or fledglings (Figure 1). If additional funds are secured for 2022 surveys, more time will be spent delineating colonies.

The habitats used by Pinyon Jays are of interest. Areas with abundant jays were frequently covered in ponderosa pine (*Pinus ponderosa*) woodland. This is the first area of occurrence in New Mexico where we have found Pinyon Jays using ponderosa pine habitat, as colonies found previously were in piñon-juniper (*P. edulis*, *Juniperus* spp.) woodland or juniper savanna habitats. Threats to the Gila NF population include climate impacts to habitat and wildfires, which are currently active over large areas of the Gila NF.

The final report for this survey will include flock sizes, occupancy analysis, and detailed maps showing nesting colonies. We have applied for a second year of SWW funding for this project. In year 2, we will survey remaining priority blocks and incorporate resulting new data into the occupancy model.

Figure 1. Survey area, Gila National Forest, NM, and survey results from March – April 2021. Squares are 25 km<sup>2</sup> blocks, indicating Pinyon Jay (*Gymnorhinus cyanocephalus*) presence or absence. \* indicates locations of nesting colonies. Inset shows three regions with differing numbers of Pinyon Jay detections.



**Table 1. Results of Pinyon Jay (*Gymnorhinus cyanocephalus*) surveys, 2021 at: points, 2.5 km sub-blocks, and 5 km blocks. Data are shown by three areas with differing Pinyon Jay abundances and all areas combined. Birds detected per point/sub-block/block indicates the sum of minimum values from estimates when a range was estimated; e.g., 1-4 birds.**

<b>Points</b>	<b>North (n = 201 points)</b>		<b>South (n = 162 points)</b>		<b>East (n = 148 points)</b>		<b>All areas (n = 511 points)</b>	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Statistic								
PIJA detected (% of points)	23.4	—	0.6	—	9.5	—	12.1	—
Birds detected per point (n)	1.35	0–32	0.02	0–3	0.39	0–20	0.65	0–32
Flock size (n, points with PIJA only)	5.8	1–32	3.0	3–3	4.1	1–20	5.3	1–32

<b>Sub-blocks</b>	<b>North (n = 116 sub- blocks)</b>		<b>South (n = 96 sub- blocks)</b>		<b>East (n = 80 sub- blocks)</b>		<b>All areas (n = 292 sub- blocks)</b>	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Statistic								
Points surveyed (n, per sub-block)	1.7	1–5	1.7	1–3	1.9	1–4	1.8	1–5
PIJA detected (% of sub-blocks)	31.9	—	1.0	—	13.8	—	16.8	—
Birds detected per sub-block (n)	2.34	0–39	0.03	0–3	0.71	0–20	1.13	0–39

<b>Blocks</b>	<b>North (n = 44 blocks)</b>		<b>South (n = 48 blocks)</b>		<b>East (n = 36 blocks)</b>		<b>All areas (n = 124 blocks)</b>	
	Mean	Range	Mean	Range	Mean	Range	Mean	Range
Statistic								
Points surveyed (n, per block)	4.6	1–6	3.7	1–7	4.1	1–6	4.1	1–7
PIJA detected (% of blocks)	59.1	—	2.3	—	25.0	—	29.0	—
Birds detected per block (n)	6.16	0–59	0.07	0–3	1.58	0–34	2.67	0–59

## Literature Cited

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