

Pinyon Jay

Gymnorhinus cyanocephalus



Photo by Martin Meyers

Habitat Use Profile

Habitats Used in Nevada	
Pinyon-Juniper (Sagebrush)	
Key Habitat Parameters •	
Plant Composition	Pinyon pine, juniper, sagebrush; occasionally Ponderosa or Jeffrey pine
Plant Density & Age	Wide range of tree densities and ages, but less common in very dense, closed-canopy settings ^{1, 3, EO}
Mosaic	Woodlands with stand diversity, large canopy openings, and shrub understory; may prefer proximity to broad woodland / shrubland transition zones over woodland interiors ^{1, 3, EO}
Elevation, Aspect	Lower elevations within pinyon-juniper zone; appear to prefer sunny aspects ^{1, 3, EO}
Distance to Water	No information
Response to Vegetation Removal	Positive to creation of openings in closed-canopy stands, otherwise negative ^{EO}
Area Requirements ○	
Minimum Patch Size	Unknown
Recommended Patch Size	> 3,000 ha [7,400 ac] ³
Home Range	1,400 – 2,000 ha [3,500 – 5,000 ac] ³

Conservation Profile

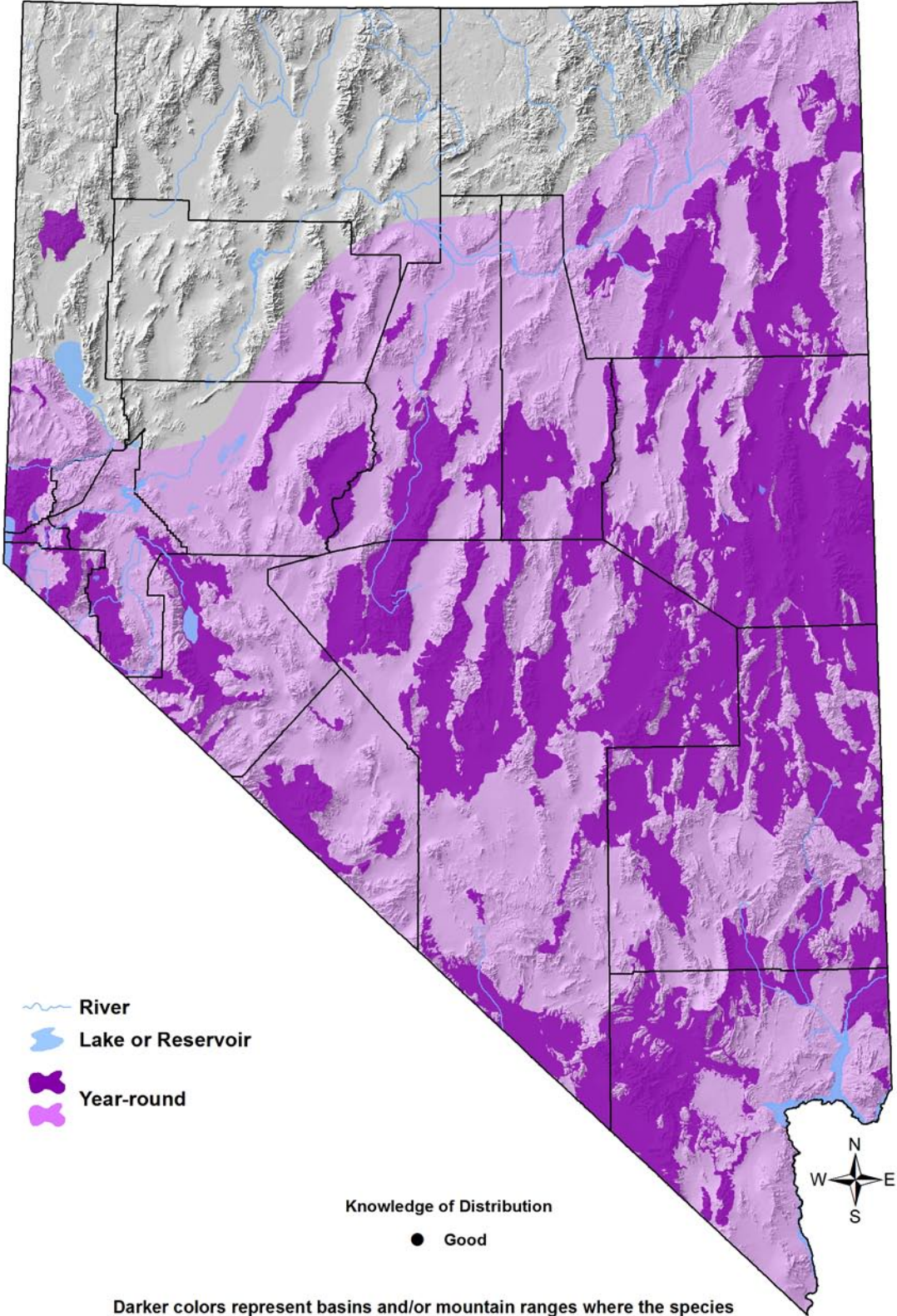
Priority Status	
Conservation Priority Species	
Species Concerns	
Historical and recent declines Habitat threats High stewardship responsibility	
Other Rankings	
Continental PIF Audubon Watchlist NV Natural Heritage USFWS BLM USFS NDOW	Watch List Yellow S3S4 Bird of Conservation Concern, Migratory Bird Sensitive Species None Conservation Priority
Trends	
Historical •	Probable rangewide declines ¹
Recent •	Rangewide declines of 4.4 – 6.4% / year ⁶
Population Size Estimates	
Nevada (NBC) •	428,000
Global ○	4,100,000 ⁵
Percent of Global	> 10%
Population Objective	
Increase by 100% ^{5, EO}	
Monitoring Coverage	
Source	Nevada Bird Count
Coverage in NV	Good
Key Conservation Areas	
Protection	Pinyon-juniper woodland where pinyon pine is present, especially woodland / shrubland transition zones
Restoration	Same, plus woodland interiors that could be thinned to create open stands

Natural History Profile

Seasonal Presence in Nevada	
Year-round	
Known Breeding Dates in Nevada	
Late March – August ²	
Nest and Nesting Habits	
Nest Placement	Interior of mature pine or juniper near trunk, often on south-facing slope ¹
Site Fidelity	Unknown
Other	Highly social year-round, including nesting ^{1, 3}
Food Habits	
Basic	Mostly granivorous
Primary Diet	Pinyon pine seeds ¹
Secondary Diet	Arthropods during nesting, other seeds, and feeders where available ¹

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Darker colors represent basins and/or mountain ranges where the species has been recorded within the past 12 years. Lighter colors represent the broader area within which the species is presumed to occur in appropriate habitat types.

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Overview

Pinyon Jays present both a conservation challenge and a paradox. During the same period when the species has been declining at a rapid rate, its preferred habitat, pinyon-juniper woodland, has been expanding. Compounding this management challenge, nearly everything that was known until very recently about Pinyon Jay habitat requirements was based on the long-term study of a single flock in New Mexico, near the southern edge of the species' geographical range.¹

In 2007 the Great Basin Bird Observatory conducted an initial radio-telemetry study of five Pinyon Jay flocks in White Pine County. The data collected during this study indicated that Pinyon Jays prefer a mixed-age mosaic of woodland transitioning into, or interspersed with, sagebrush shrubland. Although Pinyon Jays were observed to roost and build nests within relatively dense groves of trees, these groves were typically located within 2 km [1.2 mi] of the woodland-sagebrush habitat edge. These findings, if representative of all Great Basin populations, would suggest that the large expanses of closed-canopy pinyon-juniper woodland that have become more common in Nevada over the past century are largely unsuitable for Pinyon Jays. Mixed-age woodland mosaics with shrubby openings and a complex habitat edge, in contrast, appear to have decreased in extent during the same period (see Pinyon-Juniper habitat account, p. Hab-16-1).^{4, 7} Thus, one hypothesis for the species' declines involves changes in the age profile and structural features of pinyon-juniper woodlands, not in their overall extent. Another possible factor is the Pinyon Jay's well-known dependence on pinyon pine nut production. Further research on the ecological correlates of pine nut production might generate additional hypotheses for the Pinyon Jay's decline.

Pinyon Jays make heavy use of pine nut crops during their production period (early to late fall), but rely for the rest of the year on seed caches or other food sources. Seed caches are usually located in the woodland-shrubland transition zone, or in pure shrublands within ~ 2 km [1.2 mi] of the woodland edge (GBBO unpublished data). It therefore seems likely that the Pinyon Jay's association with edge habitat is at least partly related to the location of cache sites.

Abundance and Occupancy by Habitat

Birds / 40 ha on NBC Transects in the Great Basin and Mojave Regions

Primary Habitat at Transect	Transects Occupied	Birds/40 ha (95% C.I.)
Great Basin		
Pinyon-Juniper	41% (29/70)	6.0 (2.4 – 9.6)
Sagebrush	6% (2/33)	6.4 (n/a)
Mojave		
Pinyon-Juniper	67% (8/12)	14.0 (0.0 – 36.0)

- Pinyon Jays are usually detected in the form of flocks that occur sporadically across the landscape. Mean density within areas where flocks are present during

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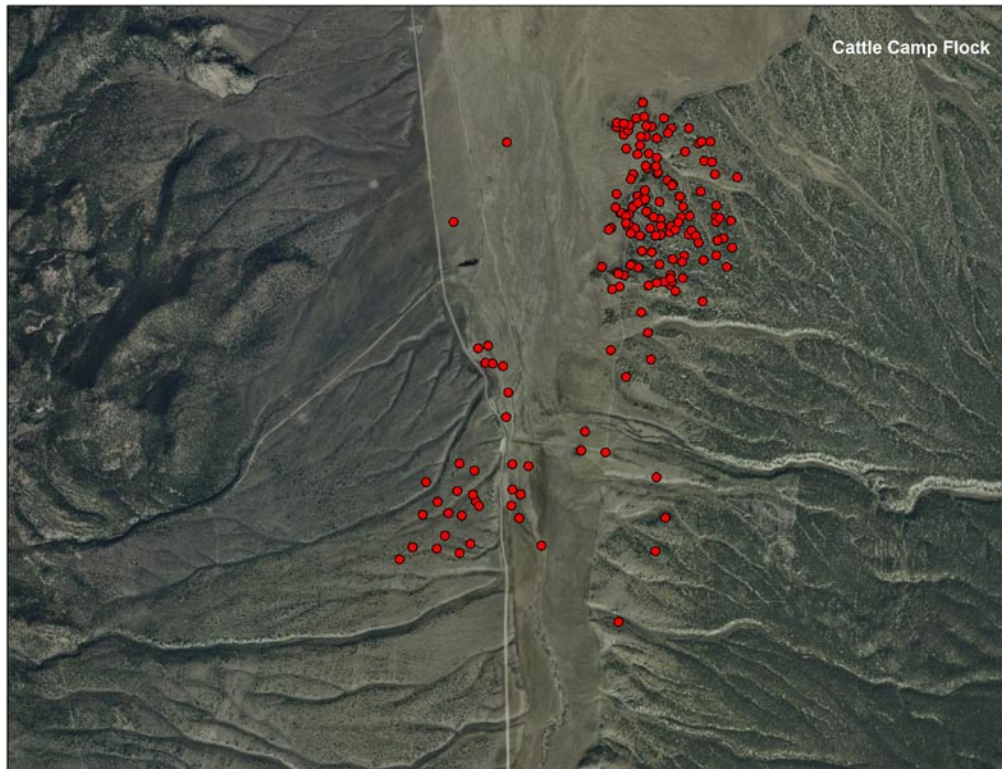
- the survey period are not representative of average density across the landscape. NBC density estimates in the table above should be interpreted accordingly
- Transects with any pinyon-juniper present are classified as Pinyon-Juniper in the table above, even if they contained a substantial amount of sagebrush cover
 - Pinyon Jays were also detected on at least 10% of NBC transects classified as Montane Shrub (both Great Basin and Mojave), and Montane Riparian (Mojave)
 - The BBS-derived population estimate for Pinyon Jays in Nevada is 1,650,000,⁵ considerably larger than the NBC-derived estimate of 428,000. The NBC-estimate is extrapolated from more sampling points and is therefore probably more accurate

Nevada-Specific Studies and Analyses

Habitat Requirements (unpublished GBBO radio-telemetry study, White Pine County)

Study of radio-tagged Pinyon Jays in White Pine County in 2007-2009 produced the following findings:

- Foraging Pinyon Jays appeared to favor transitional areas where pinyon-juniper woodland is interspersed with sagebrush
- During daytime, jays were usually found within 800 m [2,600 ft] of the woodland edge, and always within 2 km [1.2 mi] of the edge, as shown in the figure below.



Telemetry locations for a Pinyon Jay flock in South Steptoe Valley, White Pine County, over a one-week period in August 2009. Darker areas on the aerial photo are pinyon-juniper woodland, lighter areas are sagebrush.

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- For roosting and nesting, jays went deeper (but usually no more than 3 km [1.8 mi]) into the woodland interior to denser trees stands
- Jays were nearly always found in areas with diverse woodland canopy closure and age structure; they were not observed in large contiguous areas of mature, dense woodland
- Although very large flocks have been reported elsewhere, we most often observed smaller subflocks (< 30 birds) that periodically joined other subflocks to form flocks of 50-100 birds.
- Sub-flock home ranges were < 20 km² [5,000 ac] in all cases
- Findings were similar for all five flocks studied, regardless of whether they had access to urban feeders
- Presumably, Nevada flocks wander more widely when local food supplies are insufficient,¹ though such vagrant movements were not detected during the study

Landscape Associations (NBC)

Logistic regression analysis confirmed the importance of Pinyon-Juniper habitat to this species, but added little additional insight (*Appendix 3*). Given the manner in which landcovers were assigned in the GIS map (i.e. areas with any pinyon-juniper present were classified as “Pinyon-Juniper”, regardless of the amount of sagebrush cover they contained) we could not yet quantify the importance of sagebrush microhabitat within the woodland mosaic

Main Threats and Challenges

Habitat Threats

- Preliminary data suggest that Pinyon Jay declines may be at least partly related to substantial increases in the acreage of closed-canopy, mature (or senescent) woodland with a poor shrub understory, coupled with a corresponding loss of mixed-age woodland mosaics with openings and a complex shrubland edge. These landscape scale changes are largely the result of altered fire regimes, although grazing pressure and invasive plants may be contributing factors.

Research, Planning, and Monitoring Challenges

- Monitoring is challenging because flocks are irregularly distributed across the landscape
- The factors controlling pinyon pine nut production, and their short and long-term impacts on jay populations, need further study
- Lack of clear strategies that make pinyon-juniper habitat treatment programs compatible with the habitat requirements of Pinyon Jays

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Conservation Strategies

Habitat Strategies

- The Pinyon-Juniper (p. Hab-16-1) habitat conservation strategy benefits this species
- Maintain or increase the proportion of pinyon-juniper woodland that is characterized by mixed-age structure, woodland openings, interspersions with sagebrush habitat, and well-developed shrub understory. An ideal landscape would contain (within a patch size of ~ 3,000 ha [7,400 ac]) mature cone-bearing trees, some dense closed-canopy stands near the woodland edge, and large numbers of younger trees interspersed with shrubland
- Pinyon-juniper treatment projects should try to avoid creating a sharp, well-defined edge between dense woodland and recovered shrubland

Research, Planning, and Monitoring Strategies

- Continue monitoring for population trends
- Additional studies need to be conducted to confirm, refine, or revise the preliminary findings derived from the radio-telemetry studies described above
- In-depth studies of the landscape-scale successional processes that may impact or control pinyon pine nut production would be valuable. The possible impact of climate change on pinyon nut production also deserves consideration and study

Public Outreach Strategies

- None identified

References: ¹Balda (2002); ²GBBO unpublished Atlas data; ³GBBO unpublished telemetry data; ⁴Miller et al. (2008); ⁵Rich et al. (2004); ⁶Sauer et al. (2008); ⁷Tausch et al. (1981);
^{EO} Expert opinion