Pinyon Jay, photo by ©Gordon Karre

Conservation Profile

Species Concerns
Population Declines
Habitat Loss and Alteration
Climate Change (Catastrophic Fire, Prolonged Drought)

Conservation Status Lists	
USFWS[1]	BCC List (BCR 16,34, US) Petitioned for ESA listing
AZGFD[2]	Tier 2
DoD[3]	Yes
BLM[4]	Sensitive Species
PIF Watch List[5b]	Yellow List
PIF Regional Concern[5a]	Regional Concern BCR 16,34; Stewardship Species BCR 16

Migratory Bird Treaty Act
Covered

PIF Breeding Population Size Estimates[6]	
Arizona	90,000 ◑
Global	770,000 ●
Percent in Arizona	11.70%

PIF Population Goal[5b]
Reverse Decline

Trends in Arizona	
Historical (pre-BBS)	Unknown
BBS[7] (1966 – 2019)	-0.53/year ●

PIF Urgency/Half-life (years)[5b]
19

Monitoring Coverage in Arizona	
BBS[7]	Not adequate
AZ CBM	Species-specific survey

Associated Breeding Birds
Hairy Woodpecker, Gray Flycatcher, Ash-throated Flycatcher, Cassin's Kingbird, Gray Vireo, Plumbeous Vireo, Juniper Titmouse, White-breasted Nuthatch, Bewick's Wren, Western Bluebird, Black-throated Gray Warbler, Scott's Oriole

Breeding Habitat Use Profile

Habitats Used in Arizona
Primary: Pinyon-Juniper Woodlands
Secondary: Pine Forest

Key Habitat Parameters	
Plant Composition	Pinyon pine, juniper, sagebrush, ponderosa pine; usually where pinyon or ponderosa pine is dominant[8,9]
Plant Density and Size	Wide range of tree densities, but less common in dense, closed-canopy forests[8]; mature pinyon pine trees (>75 years) required for seed crops
Microhabitat Features	Open old-growth and mid-sized pine woodlands; small, dense groves for roosting; openings and shrub-covered or grassland transition areas for seed caching[8]
Landscape	Woodlands diverse in density patches and ages, canopy openings, and shrub understory; low elevations within pinyon-juniper zone; broad, open woodland-shrubland transition zones[9]

Elevation Range in Arizona
4,600 – 7,800 feet[9]

Density Estimate
Home Range: 5,645 – 15,800 acres[8,10]
Density: unknown

Natural History Profile

Seasonal Distribution in Arizona	
Breeding	February – July[9]
Migration	Non-migratory, but flocks wander widely in search of good pine seed crops
Winter	Larger home range in winter, and may wander to other regions in years of pine seed crop failure

Nest and Nesting Habits	
Type of Nest	Cup[8]
Nest Substrate	Pine or juniper[8]
Nest Height	3 – 115 feet[8,9]

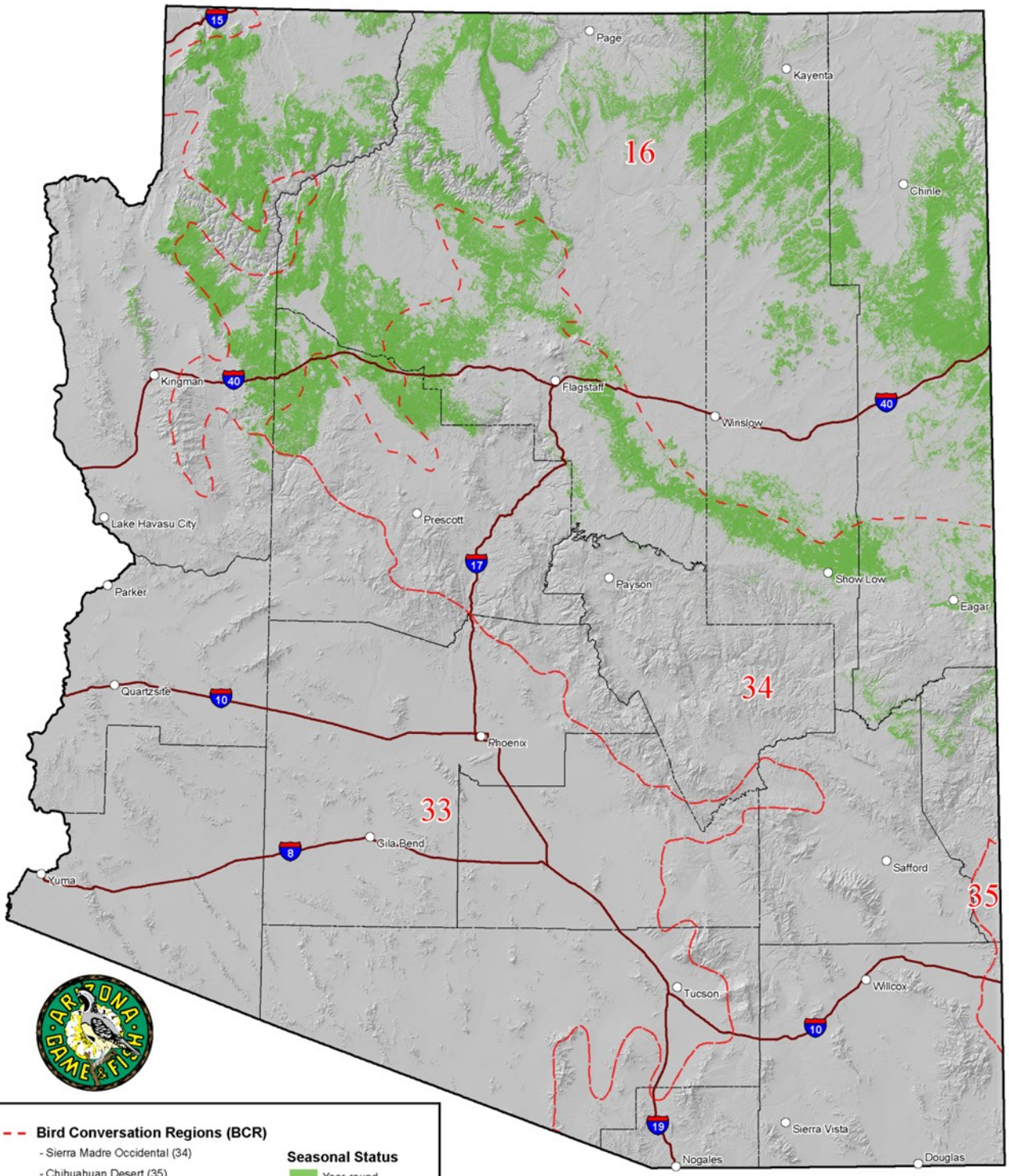
Food Habits	
Diet/Food	Primarily seeds of pinyon pines; other pine seeds; insects, spiders[8]
Foraging Substrate	Cone-bearing trees, shrubs, seed caches in ground[8]

SPECIES ACCOUNT ● *PINYON JAY Gymnorhinus cyanocephalus*

Confidence in Available Data: ● High ◑ Moderate ○ Low ^ Not provided

Last Update: May 2025

Distribution of Pinyon Jay



General Information

Distribution in Arizona

Pinyon Jays are year-round residents throughout the northern half of Arizona, almost exclusively north of the Mogollon Rim and south to Chino Valley in the west (Martin 2005). However, during periodic years of pine seed crop failure flocks may occasionally range in fall and winter as far south as the southeastern sky islands (Martin 2005).

Population Declines

North American Breeding Bird Survey data indicate that Pinyon Jays have been declining at an annual rate of approximately 2% throughout their range (Sauer et al. 2019). The reasons for these declines are unclear, but may include the loss of mixed-age and mixed-density mosaics of pinyon-juniper woodland and a complex shrubland edge (Somershoe et al. 2020, Boone et al. 2021), and possibly declines in pine seed crops due to prolonged drought conditions.

Habitat Description

Pinyon Jays are most closely associated with pinyon pine and juniper woodlands, but they also locally use ponderosa pine, particularly in Arizona (Ligon 1978, Johnson and Balda 2020). Other habitat types used for foraging include sagebrush, scrub oak, chaparral, and grasslands, but usually only when they are adjacent to stands of pinyon pines and juniper (Johnson and Balda 2020 , Martin 2005). Pinyon Jays use open woodlands that have a significant shrub understory, multiple age classes, and a mosaic of tree densities and ages (Somershoe et al. 2020, Boone et al. 2021).

Microhabitat Requirements

Pinyon Jays generally nest in colonies of 30 – 50 nests in mature, open pine woodland through much of their range. Preliminary data indicate that nest distribution in colonies in Arizona is more scattered, with approximately 3 – 6 nests located in several nearby trees, and the rest of the nests dispersed in smaller clusters throughout the colony's extent, as far as approximately 600 feet away (GBBO unpubl. data). Within colonies, birds typically construct only one nest in a single tree, but additional active nests may be found in immediately adjacent trees (Johnson and Balda 2020). In Arizona, more than 50% of nests were documented on the south-facing side of tree (Balda and Bateman 1972, Marzluff and Balda 1992). Compared to areas used for caching and foraging, studies in the southwest by Johnson et al. (2012) suggest that Pinyon Jays usually nest in areas with denser tree cover. The same pattern has been noted in the Great Basin (Boone et al. 2021). Published photos of Arizona colony sites (Johnson and Balda 2020) also suggest that open pine stands with an ample understory are used. Foraging sites include mostly pine trees that have green and ripened pine cones. During nesting, birds forage on the ground and in the woodland understory and nearby open shrublands for insects, spiders, and other invertebrates (Johnson and Balda 2020). Cache sites are located in loose soils and in peeling bark of trees within the home range of the colony, and caches are retrieved throughout the year (Johnson and Balda 2020). In Nevada, Pinyon Jays use dense groves of conifers for roosting, usually within 0.25 mile of the nesting colony (Somershoe et al. 2020, Boone et al. 2021).

Landscape Requirements

Access to pine crops, particularly those of pinyon pine and ponderosa pine, is among the most important factors determining home range and colony site selection (Gabaldon 1979). Pinyon Jays require a variety of stand densities to meet their needs, and a typical flock of 200-300 birds occupies a home range of 5,683 – 15,800 acres (Balda and Bateman 1971, Marzluff and Balda 1992, Somershoe et al. 2020). Further studies are needed to more specifically characterize size of flocks and home ranges in Arizona.

Data collected for one study in Nevada suggested that pine forests used by Pinyon Jays include mid-to-late successional woodlands for foraging and dense patches of young conifer stands for roosting and nesting. These groves were typically located within 1.2 mi of the woodland-sagebrush habitat edge that was also used for foraging and seed catching (GBBO 2010).

Conservation Issues and Management Actions

Threats Assessment

This table is organized by Salafsky et al.'s (2008) standard lexicon for threats classifications. Threat level is based on expert opinion of Arizona avian biologists and reviewers. We considered the full lexicon but include only medium and high threats in this account.

Threat	Details	Threat Level
Residential and Commercial Development		
• Housing and urban areas	Pinyon Jay habitat adjacent to housing	Medium
Agriculture		
• Livestock grazing	Reduction of understory	Medium
Transportation and Service Corridors		
• Roads and off highway vehicles	Habitat fragmentation	Medium
Biological Resource Use		
• Fuelwood harvesting	Loss of pine-nut bearing trees	Medium
Natural System Modifications		
• Fire and fire suppression	Increase in fire frequency and/or intensity; fire suppression (clearing of pinyon-juniper)	High
• Other ecosystem modifications	Treating invasive juniper	Medium
Climate Change		
• Ecosystem encroachment • Changes in precipitation and hydrological regimes (drought)	Decreased range and stand diversity of pinyon-juniper woodlands	High

In the following section we provide more detail about threats, including recommended management actions. Threats with similar recommended actions are grouped.

Residential and Commercial Development:
- Housing and urban areas

Recommended Actions:

1. Promote public appreciation of healthy pinyon-juniper woodlands and Pinyon Jays. Speak to the aesthetics of trees, sustainable pine nut harvest, importance of native understory vegetation, and threats from off-road vehicle recreation and weed invasion.
2. Discourage expansion of new housing developments and new or upgraded roads and utility lines that could eliminate or degrade nesting, roosting, or foraging habitats.
3. Identify primary Pinyon Jay nesting, roosting, and foraging areas near residential and rural areas and strive to conserve those areas from future human-made habitat alterations.

Transportation and Service Corridors:
- Roads and railroads

Recommended Actions:

1. Support travel management plans on public lands.

Biological Resource Use:
- Logging and wood harvesting

The selective removal of trees for a variety of reasons can be an issue for Pinyon Jays that rely on a particular stand structure or particular trees.

Recommended Actions:

1. Avoid wood harvesting areas on public lands in known Pinyon Jay roost and nesting sites.

Natural System Modifications:
- Fire and fire suppression

The historical role of fire in pinyon-juniper woodlands is not well understood and likely varies with location and woodland type (Romme et al. 2009). Nevertheless, increased density of tree canopies and invasive grass species may lead to widespread crown fires and a decline in the extent of these woodlands. Land managers implement vegetation thinning or prescribed fire treatments to reduce fuels and fire risk in these pinyon-juniper woodlands.

- Other ecosystem modifications

Since 1950 and extending into the late 1990s, pinyon-juniper expansion appears to have decreased or ceased, likely due to a prolonged dry period across most of the range (Miller at al. 2008). Multiple management agencies and private landowners have removed or thinned pinyon-juniper habitat over the last 70 years (Somershoe et al. 2020). In Arizona, woodlands and adjacent grassland are primarily managed for game species (such as pronghorn) by removing encroaching juniper from historical grasslands to maintain and enhance migration corridors and winter habitat. Some woodland treatment projects are also implemented for watershed restoration and reduction of fuels and fire risk.

Habitat treatment objectives vary, and the cumulative effects of multiple treatments (at the landscape scale) on Pinyon Jays have not been studied (Somershoe et al. 2020). As more information becomes available, treatment planning can incorporate measures that benefit Pinyon Jays and reduce the likelihood of negative impacts to the species.

Recommended Actions:

The *Conservation Strategy for the Pinyon Jay* provides general management considerations for fuels management and woodland thinning projects (Somershoe et al. 2020). Key considerations from the strategy are as follows:

1. If thinning in persistent pinyon-juniper woodlands or wooded shrublands, creating a patchy-clumpy mosaic of suitable nesting habitat within the treated area, as opposed to evenly spaced thinning, allows for shifting colony locations. Further, thin and/or retain Phase I and/or II woodlands rather than closed canopy woodlands (Phase III) to provide woodland conditions preferred by Pinyon Jays.
2. Maintain mature stands of pinyon pines capable of producing cones now (old and very old trees) and for future cone production (moderate age trees).
3. Maintain stands on north- and east-facing slopes as they are projected to better survive future climate change scenarios. Sites with lower heat load (north-facing) are also favored for Pinyon Jay colony sites.
4. Large and densely crowned trees are particularly valuable for Pinyon Jay nesting, particularly when they occur within areas of higher tree density.
5. Create “feathered” transition zones (versus sharp, well-defined edges) between dense woodlands and shrublands, including along the bottom 1/3 of steep terrain bordering grassland valleys when undertaking pinyon-juniper treatment projects.
6. Retaining and promoting native grasses, forbs, and shrubs in the understory may increase available invertebrate prey for Pinyon Jays.
7. Maintain or increase the proportion of pinyon-juniper woodland with mixed-age structure, woodland openings, interspersion with sagebrush or other shrublands, and which features an overall well-developed shrub understory.
8. Consider using the Arizona Project-Level Protocol (AZP) for Pinyon Jay Clearance and Discovery Surveys (Colegrove et al. 2023), which is designed to determine Pinyon Jay presence or absence in project areas where vegetation treatments may occur. The protocol has two specific applications: a) it can be used to conduct “clearance” surveys for Migratory Bird Treaty Act compliance that focus on breeding presence and nest colony location(s), and b) it can be used to conduct surveys to determine presence or absence during any season.
9. Vegetation treatments should be planned and performed outside of the peak breeding season (March 1 through May 30) to minimize impacts to Pinyon Jay breeding colonies within a project area. If vegetation removal must occur during the peak breeding season, surveys for nesting Pinyon Jays (using the

AZP) should be conducted prior to removal of vegetation. If surveys detect active nests, the area of the nesting colony should be avoided by delineating a perimeter around the nests with a 550-yard buffer (Somershoe et al. 2020). In Arizona, where nest clusters within a colony tend to be more dispersed (GBBO unpubl. data), smaller buffers around each cluster may be considered on a case by case basis.

Climate Change:

- Ecosystem encroachment
- Changes in precipitation and hydrological regimes (drought)

The range of pinyon-juniper habitat is predicted to contract significantly in Arizona and neighboring states under current climate change models (Johnson et al. 2012). Upland vegetation, such as pinyon-juniper and ponderosa pine woodlands, may respond to prolonged drought conditions with die-offs and reduced vigor. In fact, pinyon pines have already experienced widespread mortality in northern Arizona and elsewhere due to drought and subsequent bark beetle infestations (Martin 2005, Clifford et al. 2011). These changes not only affect availability of colony sites, but may reduce pine seed crops and insect availability, as well as increase catastrophic fires that lead to habitat loss at a landscape scale.

Recommended Actions:

1. Delineate current extent and density/age classes of pinyon-juniper woodlands to identify highly suitable areas for Pinyon Jays for stewardship action, and to set a baseline for monitoring spatial changes in available habitat.
2. Evaluate the processes that promote pinyon-juniper expansion and woodland infill, and the inter-relationship of these factors with fire regimes and fire risk in order to determine the most beneficial management actions.

Research and Monitoring Priorities

The *Conservation Strategy for the Pinyon Jay* provides a comprehensive list of research and monitoring needs for Pinyon Jays (Somershoe et al. 2020). Below is an abbreviated list of priorities for Arizona.

1. Continue efforts to develop and implement monitoring methodologies to document and analyze spatial and temporal patterns of Pinyon Jay distribution and occurrence, landscape use and determine trends. Consider using the *Survey Protocol for Landscape Applications* which describes how to collect standardized Pinyon Jay data for larger-scale applications that require a sampling approach (Boone et al. 2023).
2. Explore use of new technologies for monitoring or survey of the species (e.g., Autonomous Recording Units, Motus) and habitat (e.g., LiDAR and other remotely sensed data).
3. Delineate and characterize Pinyon Jay flocks, home ranges, and nesting colonies.
4. Delineate current extent and density/age classes of pinyon-juniper woodlands to identify highly suitable areas for conservation action for Pinyon Jays and set a baseline for monitoring spatial changes in available habitat.
5. Investigate landscape-scale processes that may impact pinyon pine nut production and factors preventing age class diversity in pinyon-juniper woodlands, including climate change impacts. More specifically, assess and quantify habitat structure, composition, and pinyon nut availability within Pinyon Jay home ranges.

6. Assess Pinyon Jay responses (e.g., occupancy, abundance or density, nest success, productivity, survival) to vegetation management within home ranges, and develop beneficial management practices for Pinyon Jays, as new research becomes available.
7. Investigate Pinyon Jay responses to disturbances. Very little is known about how sensitive Pinyon Jays are to physical disturbances associated with management and multiple-use activities, such as infrastructure development, infrastructure operation, recreation, and noise.
8. Develop and promote community science programs that engage volunteers in gathering data to support research and monitoring needs.

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