



Gray Vireo, photo by ©Gordon Karre

Conservation Profile

Species Concerns	
Climate Change Silvicultural Practices Fire Suppression Unsustainable Livestock Grazing	
Conservation Status Lists	
USFWS ¹	BCC List (BCR 16,33,34)
AZGFD ²	Tier 1C
DoD ³	Yes
BLM ⁴	No
PIF Watch List ^{5b}	Yes
PIF Regional Concern ^{5a}	Regional Concern/Stewardship (BCRs 16,33,34)
Migratory Bird Treaty Act	
Covered	
PIF Breeding Population Size Estimates ⁶	
Arizona	270,000 ●
Global	560,000 ●
Percent in Arizona	48.21%
PIF Population Goal ^{5b}	
Prevent Decline	
Trends in Arizona	
Historical (pre-BBS)	Unknown
BBS ⁷ (1968 – 2013)	+3.1%/year ●
PIF Urgency/Half-life (years) ^{5b}	
>50	
Monitoring Coverage in Arizona	
BBS ⁷	Marginal
AZ CBM	Not covered
Associated Breeding Birds	
Woodhouse's Scrub-Jay, Gray Flycatcher, Juniper Titmouse, Black-chinned Sparrow, Spotted Towhee, Scott's Oriole	

Breeding Habitat Use Profile

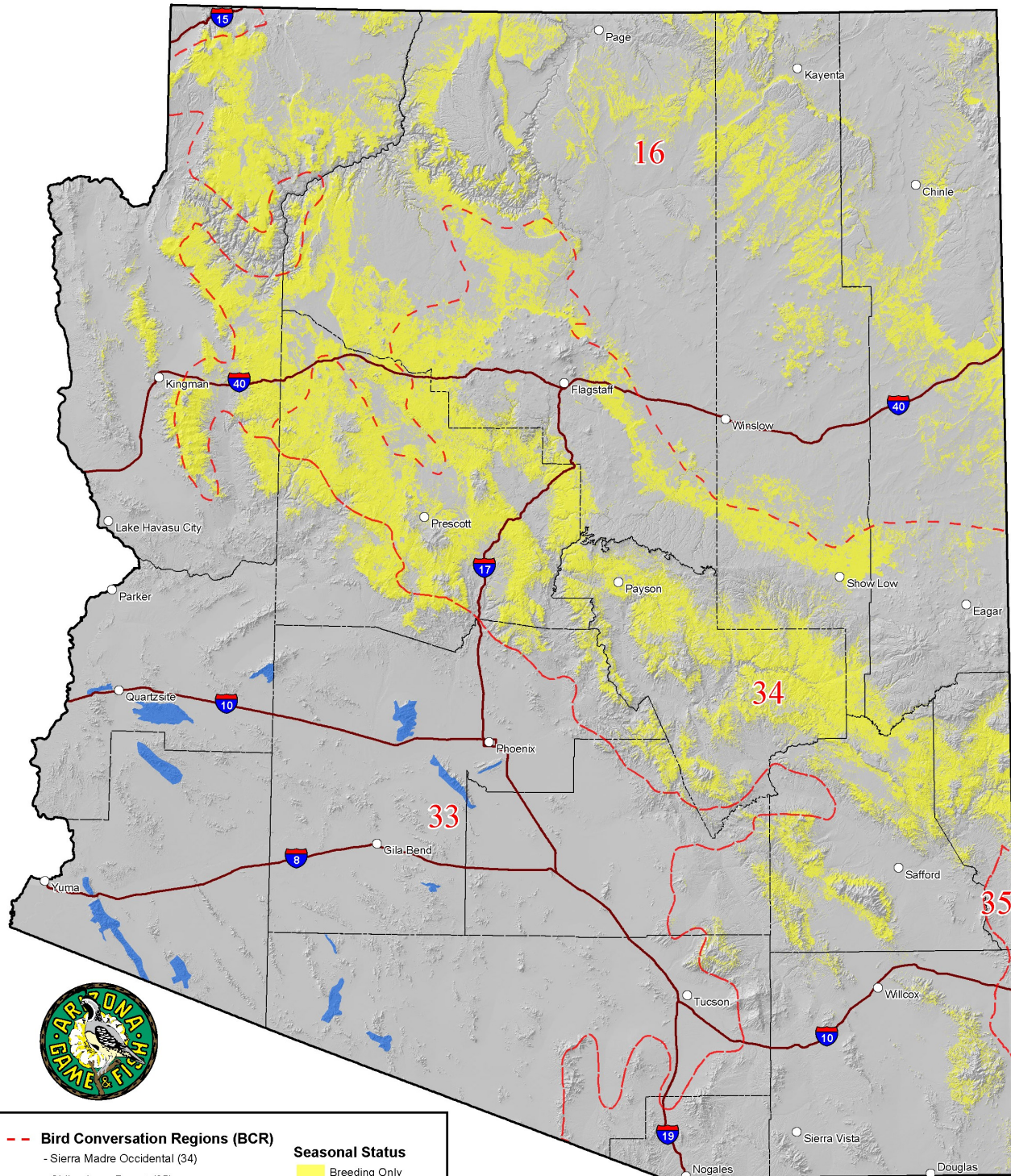
Habitats Used in Arizona	
Primary: Pinyon-Juniper Woodlands Secondary: Interior Chaparral	
Key Habitat Parameters	
Plant Composition	Primarily juniper, some pinyon pine, variety of understory shrubs including sagebrush, serviceberry ¹⁰ , ash, cliffrose, and shrub live oak; in winter: elephant tree ⁹ , ironwood, and other Sonoran desert species ¹⁶
Plant Density and Size	Open woodland with well-developed shrub understory ^{13,16} ; density 40 – 100 trees/acre with canopy closure 5 – 15% ¹⁷
Microhabitat Features	Tree height 5 – 15 feet; shrub height 2 – 7 feet ¹⁶ ; vegetation dense within 3 – 13 feet above ground ¹⁶
Landscape	Open woodlands with variable ages and densities of trees and shrubs; shallow drainages at base of sloping terrain often preferred
Elevation Range in Arizona	
3,500 – 6,800 feet (breeding) ⁸ ; 550 – 2,900 feet (winter)	
Density Estimate	
Territory Size: 2 – 13 acres ⁸ ; 5-25 acres ¹⁸ Density: 2 – 14 pairs/100 acres ⁸ ; 2-4 birds/100– acres ^{13,18}	

Natural History Profile

Seasonal Distribution in Arizona	
Breeding	April – mid-August ⁸
Migration	March – early May, August – November
Winter	September – March; southwestern AZ only
Nest and Nesting Habits	
Type of Nest	Cup ¹⁶
Nest Substrate	Primarily juniper, or pinyon pine, oak,
Nest Height	3 – 17 feet ⁸
Food Habits	
Diet/Food	Insects; also fruits in winter ¹⁶
Foraging Substrate	Shrub and tree foliage



Distribution of Gray Vireo



This map represents the predictive distribution for an individual species. AZGFD warrants no guarantees of accuracy or currency of the data represented.

SPECIES ACCOUNT ● GRAY VIREO *Vireo vicinior*



General Information

Distribution in Arizona

Gray Vireos breed in mid-elevation woodlands across northern and central Arizona, and south from the Mogollon escarpment and into the southeastern portions of the state (Corman 2005). They occur throughout most of Gila, Graham, and Greenlee counties in suitable habitats, but are sparse and locally distributed in Pima and Cochise Counties (Corman 2005). In winter, Gray Vireos are locally distributed and relatively sparse in the Sonoran desert regions of southwestern Arizona, including La Paz, Maricopa, Pima, and Yuma counties (Arnett 2011, eBird 2019).

Habitat Description

In Arizona, breeding Gray Vireos typically inhabit open pinyon-juniper, chaparral-juniper, and are locally found in oak-juniper woodlands with well-developed shrub understories (Barlow et al. 1999, Corman 2005). They prefer sites where juniper is dominant and often on sloping terrain (Corman 2005, Schlossberg 2006). Within the pinyon-juniper zone, Gray Vireos primarily occur in mid-to-low elevation sites, where canopies are typically more open and junipers are more dominant (Schlossberg 2006, Frei and Finley 2009). Average densities of junipers in Gray Vireo territories are 40 trees/acre with a canopy cover of 5 – 15% (Johnson et al. 2012). In northeastern Arizona, Gray Vireos were absent from woodland stands with > 112 trees/acre (LaRue 1994). A common habitat feature of Gray Vireo territories is a continuous shrub cover 2 – 6 feet in height (Barlow et al. 1999). In northeastern Arizona, the broadleaf shrub component is typically comprised of Utah serviceberry and single-leaf ash (LaRue 1994), and on the Colorado Plateau, Gray Vireos nest in open juniper-dominated sites with a dense shrub cover that often contains sagebrush, greasewood, cliffrose, and scrub live oak (Corman 2005, Schlossberg 2006).

In winter in Arizona, Gray Vireos primarily inhabit the few desert mountain canyons and warmer south and west-facing slopes with stands of elephant trees which provide a stable fruit food source through the winter (Bates 1992, Corman 2005, Arnett 2011). Individuals have also irregularly been detected wintering in a few desert washes with ironwood and palo verde, but lacking elephant trees (eBird 2019).

Microhabitat Requirements

In northwestern New Mexico, Gray Vireos select nest sites on south-facing slopes with intermediate slope angles (Johnson et al. 2012). Although they preferred nesting in areas with trees in this study, Gray Vireos avoided the tallest trees available in their territories (Johnson et al. 2012). In other studies, Gray Vireo territories were in younger age-class pinyon-juniper stands with fewer tall trees, shorter trees (< 7 feet) and less woody debris than randomly selected sites (Wickersham and Wickersham 2009).

Gray Vireo nests are usually located on west and north-facing tree forks of juniper or other coniferous species at an average height of about 6 feet off the ground (Barlow et al. 1999). Most foraging takes place in shrubs and small trees at heights of 3 – 12 feet, where birds glean insects from leaves and branches. Other microhabitat criteria are currently unknown, including information on plant species for foraging habitat.

Landscape Requirements

Area requirements and responses to landscape disturbances have not been studied for Gray Vireos.



Conservation Issues and Management Actions

High Stewardship Responsibility

Nearly half of the global population of Gray Vireos breeds in Arizona (PIF 2019), which means that management of the species is most importantly influenced by decisions by Arizona. This stewardship responsibility also offers opportunities to generate tangible and measurable benefits at the population level, which is often impossible when species' ranges only touch a state peripherally. While the species is currently considered stable, Gray Vireo winter dietary specialization (Bates 1992) and its tendency to occur in low densities (Schlossberg 2006) makes this species vulnerable to population declines from landscape-scale changes to their preferred habitats.

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
Agriculture • Livestock farming and ranching	Overgrazing can reduce shrub diversity and density	Medium
Biological Resource Use • Gathering terrestrial plants • Logging and wood harvesting	Large-scale conifer removal may impact populations	Medium
Natural System Modifications • Fire and fire suppression		High
Invasive and Problematic Species • Problematic native species		Medium

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

Agriculture:

- Livestock farming and ranching

Because Gray Vireos are dependent on a healthy shrub understory, they are negatively affected by livestock grazing at levels that decrease shrub density or diversity.

Recommended Actions:

1. Examine the grazing levels in areas occupied by Gray Vireos and determine sustainability of shrub understory, particularly in areas considered important strongholds of the species.



2. Explore options for conservation easements or government incentives to keep stock rates at levels that maintain the shrub understory in these areas.

Biological Resource Use:

- Gathering terrestrial plants
- Logging and wood harvesting

Natural System Modifications:

- Fire and fire suppression

Conifer encroachment is a west-wide phenomenon that leads to the closing of the canopies of existing pinyon-juniper woodlands and expansion of pinyon-juniper into other habitat types, particularly grasslands and sagebrush scrublands. The causes of conifer encroachment are generally attributed to fire suppression, unsustainable livestock grazing practices, and a warming and drying climate. However, this successional environmental change likely has established preferred Gray Vireo breeding habitat in new areas, particularly on sloping terrain. In Arizona, pinyon-juniper woodlands at these elevations are locally thinned or cleared for grassland restoration and other uses, such as livestock grazing. Another source of potential habitat loss is the legal and illegal cutting of pinyon and juniper for firewood for both private and commercial use (C. Beardmore, pers. comm.) In a study in Grand Staircase Escalante National Monument of southern Utah, mechanical thinning significantly reduced the abundance of pinyon-juniper birds, and Gray Vireos disappeared entirely from treatment sites in which about 90% of trees were removed (Crow and van Riper 2010).

Recommended Actions:

1. Maintain open pinyon-juniper woodland with a shrubby understory, especially at low elevations and on moderate slopes.
2. Experiment with pinyon-juniper thinning in areas where canopy closure exceeds 35% and where the potential for invasive weeds is low or manageable.
3. Monitor treatment effectiveness on occupancy of Gray Vireo and other pinyon-juniper obligate species.
4. Raise awareness about the ecological functions of pinyon-juniper habitat.
5. Develop and promote recommendations for wood-cutting and clearing of pinyon-juniper to avoid impacts to pinyon-juniper obligate birds.
6. Explore stewardship options for protecting breeding Gray Vireo and other pinyon-juniper obligate species while accommodating other land uses.
7. Manage fire to maintain existing Gray Vireo habitat and explore options for using prescribed fires as treatment for conifer infill (closing of pinyon-juniper canopies) and restoring shrub understories.
8. Determine and manage for fire regimes that maintain optimal breeding habitat for Gray Vireo.

Invasive and Problematic Species:

- Problematic native species

Gray Vireos are a host of the nest-parasitic Brown-headed Cowbird, although little information exists about parasitism rates in Arizona. In one study in New Mexico, brood parasitism accounted for 17 – 62% of failed nesting attempts by Gray Vireos (Frei and Finley 2009). Brown-headed Cowbirds are known to travel long distances (e.g., 1.5 – 4 miles, Lowther 1993) from foraging areas to host nests used for parasitism, so local densities are often a poor indicator of parasitism rates. However, at a landscape scale, their densities in-



crease with increased fragmentation of forests and prevalence of agricultural areas (Lowther 1993). Unfortunately, if cowbird parasitism is a major cause of reproductive losses, counter-measures are difficult, expensive, and have mixed success rates.

Recommended Actions:

1. Determine abundance of Brown-headed Cowbirds, parasitism rates, and effects of parasitism on nest outcomes in Gray Vireo breeding areas.
2. Designate occupied Gray Vireo areas that are far from agricultural operations as high-priority areas for stewardship action.

Research and Monitoring Priorities

1. Continue and expand multi-species monitoring protocols and efforts to determine Gray Vireo population status and trends in Arizona for breeding and wintering periods.
2. Determine the effects of Brown-Headed Cowbird parasitism on Gray Vireo populations in Arizona.
3. Clarify habitat requirements, shrub floristics and structure, and landscape requirements of Gray Vireo in Arizona for both breeding and wintering.
4. Delineate areas of greatest value for current Gray Vireo populations for consideration of focused conservation action.
5. Investigate fire regimes in successful breeding areas of Gray Vireo.

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