



MacGillivray's Warbler, photo by ©Tom Benson

## Conservation Profile

### Species Concerns

Small Population Size  
 Fire Suppression  
 Climate Change (drought)  
 Excessive Elk Browsing  
 Unsustainable Livestock Grazing

### Conservation Status Lists

USFWS <sup>1</sup>	No
AZGFD <sup>2</sup>	Tier 1B
DoD <sup>3</sup>	No
BLM <sup>4</sup>	No
PIF Watch List <sup>5b</sup>	No
PIF Regional Concern <sup>5a</sup>	No

### Migratory Bird Treaty Act

Covered

### PIF Breeding Population Size Estimates<sup>6</sup>

Arizona	2,300 ○
Global	11,000,000 ●
Percent in Arizona	0.02%

### PIF Population Goal<sup>5b</sup>

Maintain

### Trends in Arizona

Historical (pre-BBS)	Unknown
BBS <sup>7</sup> (1968 – 2013)	-0.12%/year (CO Plateau) ●

### PIF Urgency/Half-life (years)<sup>5b</sup>

>50

### Monitoring Coverage in Arizona

BBS <sup>7</sup>	Not adequate
AZ CBM	Not covered

### Associated Breeding Birds

Virginia's Warbler, Dusky Flycatcher, Green-tailed Towhee, Lincoln's Sparrow

## Breeding Habitat Use Profile

### Habitats Used in Arizona

Primary: Montane Riparian Woodlands  
 Secondary: Montane Shrublands

### Key Habitat Parameters

Plant Composition	Douglas fir, white fir, aspen, pine in overstory; young conifers, maple, willow, locust, Gambel oak in understory <sup>10</sup>
Plant Density and Size	Mixture of coniferous and deciduous trees and shrubs; short dense understory at 0 – 3 feet is critical <sup>10</sup> ; overstory can be very sparse; shrub cover 25 – 65% <sup>13</sup>
Microhabitat Features	Nests on ground or in young firs or broad-leaved trees, always concealed by dense undergrowth; bigtooth maple and white fir favored on the Mogollon Rim <sup>13</sup>
Landscape	Highest densities occur in riparian habitat, stream bottoms, brushy hillsides along canyons <sup>13</sup>

### Elevation Range in Arizona

5,800 – 10,000 feet<sup>10</sup>

### Density Estimate

Territory Size: 2 – 4 acres<sup>13</sup>  
 Density: 20 – 50 males/100 acres<sup>13</sup>

## Natural History Profile

### Seasonal Distribution in Arizona

Breeding	May – July <sup>10</sup>
Migration	Late March – May; August – mid-Oct. <sup>13</sup>
Winter	Absent

### Nest and Nesting Habits

Type of Nest	Cup <sup>13</sup>
Nest Substrate	Understory maple, fir, willow, alder <sup>13</sup>
Nest Height	Mean approx. 2 feet; range 0 – 5 feet <sup>10</sup>

### Food Habits

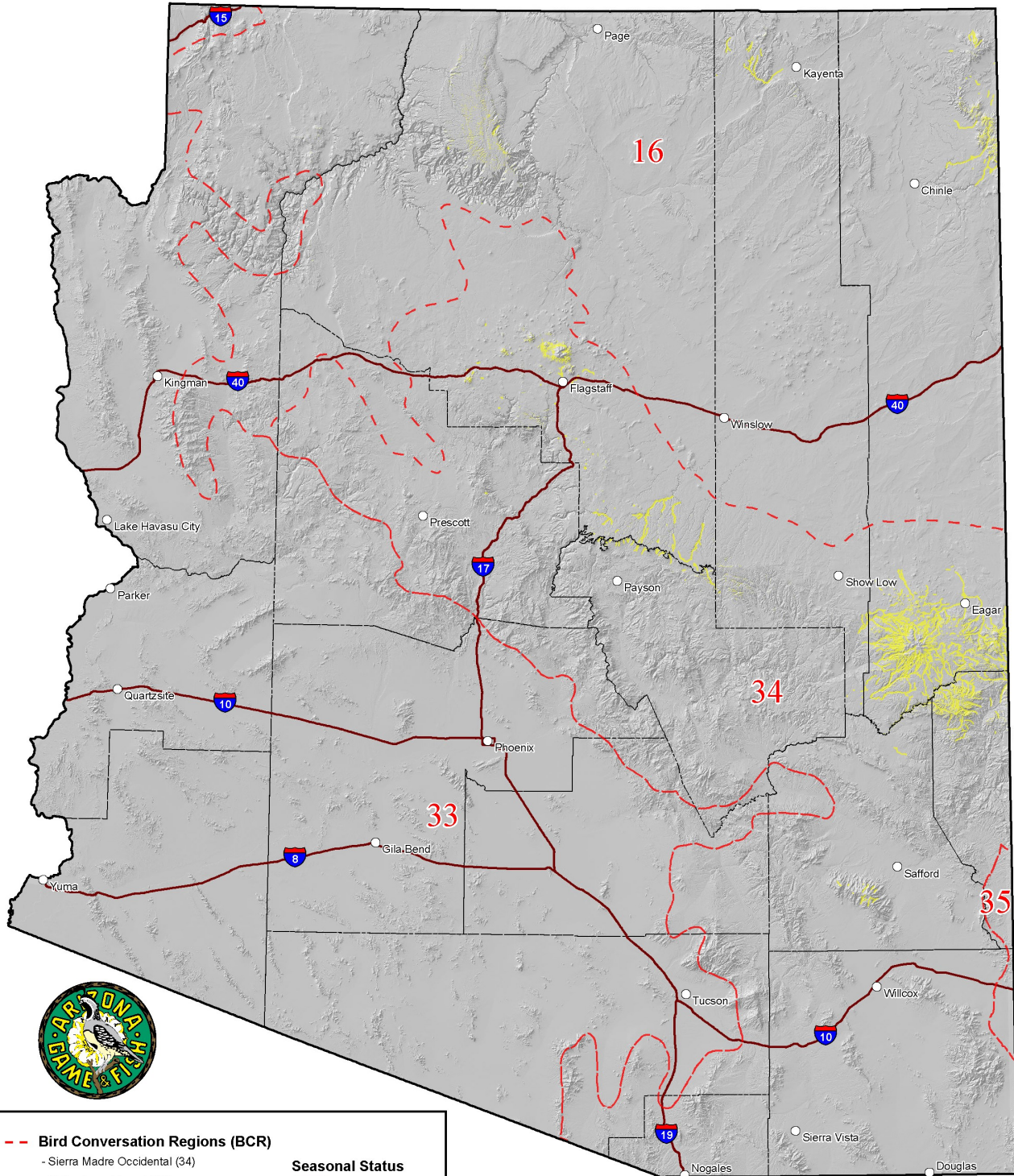
Diet/Food	Insects <sup>13</sup>
Foraging Substrate	Ground, shrubs at ≤ 3 feet height <sup>13</sup>



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

Last Update: October 2023

# Distribution of MacGillivray's Warbler



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



## General Information

### Distribution in Arizona

In Arizona, MacGillivray's Warblers are close to the southern edge of their breeding range, which extends north to the southern Yukon in western Canada (Pitocchelli 2013, eBird 2019). They are a sparse and local breeder in central Arizona from the White Mountains to the San Francisco and Bill Williams mountains, and on the edges of Kaibab Plateau and other highlands in far northern Arizona (McCarthy 2005). MacGillivray's Warblers were also confirmed breeding in the Pinaleno Mountains and may occur in other isolated, undiscovered populations on White Mountain Apache Tribal lands (McCarthy 2005).

### Habitat Description

MacGillivray's Warblers require dense shrubs in the montane riparian zone, montane forests, and dense, early successional forests. This species may be largely restricted to the vicinity of montane riparian and aspen stands and other mesic pockets in Arizona (McCarthy 2005), as it is in Nevada (GBBO, unpubl. data). The key habitat features of breeding areas are dense undergrowth with fairly high (60%) deciduous cover (Pitocchelli 2013). In Arizona, MacGillivray's Warblers occur in canyons that feature Douglas fir, white fir, ponderosa pine, and aspen, with understory species such as bigtooth maple, boxelder, locust, Gambel oak and gooseberry, or else along streams that feature dense willow or alder thickets (McCarthy 2005). In Arizona, they have also been found breeding in dense woody thickets on steep canyons or mountain slopes at higher elevations where the area is recovering from past wildfires (McCarthy 2005). In central Nevada, MacGillivray's Warbler presence is positively correlated with proportion of montane riparian vegetation, number of live aspen, cottonwood, birch trees, and frequency of shrubs (Dickson et al. 2009).

During migration, MacGillivray's Warblers use similar habitats as they do for breeding. However, they also commonly occur in low elevation riparian areas and most other vegetation types that feature dense shrubs, including artificial landscapes (Pitocchelli 2013).

### Microhabitat Requirements

MacGillivray's Warblers nest and forage almost exclusively within three feet of the ground in very dense shrub layers, and nests are built on or near the ground in thickets that provide all-around concealment (Pitocchelli 2013).

### Landscape Requirements

Area and landscape requirements of MacGillivray's Warblers have not been sufficiently studied. While they defend relatively small territories, it is unknown what landscape mosaics are necessary for territory selection. Therefore, landscapes that feature the vegetation types described above, particularly within wet areas such as riparian and aspen, should be considered high priority for the protection of this species.



## Conservation Issues and Management Actions

### Small Population

MacGillivray's Warblers are declining at a moderate rate in the southern Rocky Mountain and Colorado Plateau region (Sauer et al. 2012). However, they are restricted in their habitat use and occur in widely dispersed small populations in Arizona, which makes them vulnerable to local extirpation. They are also at the southern edge of their breeding distribution.

### 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
<b>Agriculture</b>		Medium
<ul style="list-style-type: none"> <li>Livestock farming and ranching</li> </ul>		
<b>Biological Resource Use</b>	Birds prefer shrubby understories with mesic component	High
<ul style="list-style-type: none"> <li>Logging and wood harvesting</li> </ul>		
<b>Natural System Modifications</b>		Medium
<ul style="list-style-type: none"> <li>Fire and fire suppression</li> </ul>		
<b>Climate Change</b>		Medium
<ul style="list-style-type: none"> <li>Changes in precipitation and hydrological regimes (drought)</li> </ul>		

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

Livestock grazing may affect both nesting and migration habitats of MacGillivray's Warbler. Keeping montane breeding and lowland migrant populations of this species should be considered when wildlife benefits of intact riparian areas and grazing impacts are discussed.

#### Recommended Actions:

- Negotiate stocking rates that preserve shrub undergrowth, regeneration of deciduous plants, and riparian vegetation in stronghold areas for breeding MacGillivray's Warblers.
- Offer public outreach materials for landowners that highlight the importance of intact riparian areas for people and wildlife.
- Use grazing exclosures or conservation easements that limit grazing to conserve MacGillivray's Warbler breeding areas and migration stopover areas.



**Biological Resource Use:**

- Logging and wood harvesting

Creating early successional stages and shrub undergrowth may positively impact MacGillivray's Warbler populations (Pitocchelli 2013). This species readily uses shrub-covered clearcuts, but is often found more abundantly in partially cut stands. In Arizona, these may only attract MacGillivray's Warbler if they also have mesic components.

*Recommended Actions:*

1. Conduct practices that retain shrub cover and only involve small clear-cuts or partial logging.
2. Consider periodic tree thinning in MacGillivray's Warbler breeding areas as a habitat enhancement measure to promote and maintain shrub cover characteristic of early successional stages.
3. Maintain a mosaic of multiple seral stages and shrub covers.
4. Avoid single-species and single-age plantings.
5. Discourage removal of undergrowth in MacGillivray's Warbler habitat.

**Natural System Modifications:**

- Fire and fire suppression

Fire is a natural disturbance that leads to the early successional habitats favored by MacGillivray's Warbler. Managed fire regimes that mimic natural fires in extent and intensity are most likely to maintain MacGillivray's Warbler habitats in the long-term.

*Recommended Actions:*

1. Evaluate fire regimes and fire management practices in areas occupied by MacGillivray's Warblers.
2. Adjust fire management to approximate natural fire regimes in terms of extent and intensity.
3. Evaluate extent to which conifer encroachment affects montane riparian areas and consider options for prescribed burns that may recover the riparian zone.
4. Discourage removal of undergrowth in MacGillivray's Warbler habitat when removing undergrowth for fire proofing.

**Climate Change:**

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

Arizona populations of MacGillivray's Warblers are susceptible to climate change because they are at the southern edge of the species' breeding distribution, they occupy high elevation habitats, and they may be sensitive to loss of mesic environments. Species like MacGillivray's Warbler that already select high elevation sites may not be able to retreat in elevation and become locally extirpated.

*Recommended Actions:*

1. Determine vulnerability of deciduous vegetation in currently occupied areas to the effects of prolonged droughts.



2. Develop a monitoring plan for MacGillivray's Warbler that covers the current gap in trend monitoring for Arizona, and also takes into the account possible distributional shifts in response to climate change.

## Research and Monitoring Priorities

1. Conduct population monitoring according to multi-species protocols in breeding areas of MacGillivray's Warbler, or else plan repeat population inventories that obtain population status and current distribution. Determining effects of climate change and population trends are the two main goals.
2. Delineate stronghold areas that feature large percentages of MacGillivray's Warbler populations of Arizona. Make these areas priorities for stewardship action.
3. Determine area requirements and preferred landscape needs of MacGillivray's Warblers in the southwest.
4. Determine the degree to which domestic and wild ungulates affect breeding and migration habitat of MacGillivray's Warbler.

## Literature Cited

<sup>4</sup>Arizona Bureau of Land Management Sensitive Species List – March 2017.

<sup>2</sup>Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan: 2012 – 2022. Arizona Game and Fish Department, Phoenix, AZ.

<sup>3</sup>Department of Defense. 2012. DoD PIF Mission-Sensitive Priority Bird Species. Fact Sheet #11. Department of Defense Partners in Flight Program.

<sup>10</sup>McCarthy, T.D. 2005. MacGillivray's Warbler. *In*: Arizona Breeding Bird Atlas. Corman, T.E., and C. Wise-Gervais (eds.) University of New Mexico Press. Albuquerque, NM.

<sup>5a</sup>Partners in Flight. 2019. Avian Conservation Assessment Database, version 2019. Accessed on March 31, 2020.

<sup>6</sup>Partners in Flight Science Committee. 2019. Population Estimates Database, version 3.0. Accessed on March 31, 2020.

<sup>13</sup>Pitocchelli, J. 2013. MacGillivray's Warbler (*Geothlypis tolmiei*), The Birds of North America Online (A. Poole, ed.) Ithaca: Cornell Lab of Ornithology.

<sup>5b</sup>Rosenberg, K.V., J.A. Kennedy, R. Dettmers, R.P. Ford, D. Reynolds, J.D. Alexander, C.J. Beardmore, P.J. Blancher, R.E. Bogart, G.S. Butcher, A. F. Camfield, A. Couturier, D. W. Demarest, W.E. Easton, J.J. Giocomo, R.H. Keller, A.E. Mini, A.O. Panjabi, D.N. Pashley, T.D. Rich, J.M. Ruth, H. Stabins, J. Stanton, T. Will. 2016. Partners in Flight Landbird Conservation Plan: 2016 Revision for Canada and Continental United States. Partners in Flight Science Committee.

Salafsky, N., Salzer, D., Stattersfield, A.J., Hilton-Taylor, C., Neugarten, R., Butchart, S.H.M., Collen, B., Cox, N., Master, L.L., O'Connor, S. and Wilkie, D. 2008. A standard lexicon for biodiversity conser-



vation: unified classifications of threats and actions. *Conservation Biology* 22(4): 897 – 911.

<sup>7</sup>Sauer, J.R., J.E. Hines, J.E. Fallon, K.L. Pardieck, D.J. Ziolkowski, Jr., and W.A. Link. 2016. The North American Breeding Bird Survey, Results and Analysis 1966 - 2013, Version 2016. USGS Patuxent Wildlife Research Center, Laurel, MD. Accessed on July 1, 2016.

<sup>1</sup>U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, VA. 85 pp.

### Recommended Citation

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