



Lucy's Warbler, photo by ©Robert Shantz

Conservation Profile

Species Concerns	
Climate Change (Droughts)	
Historical Declines	
Habitat Loss	
Groundwater Pumping	
Conservation Status Lists	
USFWS ¹	BCC List (BCRs 33,34)
AZGFD ²	Tier 1C
DoD ³	Yes
BLM ⁴	No
PIF Watch List ^{5b}	No
PIF Regional Concern ^{5a}	Regional Concern and Stewardship Species BCR 33, 34
Migratory Bird Treaty Act	
Covered	
PIF Breeding Population Size Estimates ⁶	
Arizona	2,500,000 ●
Global	3,000,000 ●
Percent in Arizona	83.33%
PIF Population Goal ^{5b}	
Maintain	
Trends in Arizona	
Historical (pre-BBS)	Local extirpations/habitat loss ⁹
BBS ⁷ (1968 – 2013)	-1.94/year ●
PIF Urgency/Half-life (years) ^{5b}	
> 50	
Monitoring Coverage in Arizona	
BBS ⁷	Adequate
AZ CBM	Covered
Associated Breeding Birds	
Ladder-backed Woodpecker, Vermilion Flycatcher, Ash-throated Flycatcher, Bell's Vireo, Verdin, Bewick's Wren, Crissal Thrasher, Phainopepla, Yellow-breasted Chat	

Breeding Habitat Use Profile

Habitats Used in Arizona	
Primary: Lowland Riparian Woodlands	
Secondary: Sonoran Desertscrub (wooded washes)	
Mohave Desertscrub (Joshua tree forests)	
Key Habitat Parameters	
Plant Composition	Mesquite a common component, also cottonwood, willow, tamarisk, paloverde, ironwood, hackberry; Joshua tree; locally oak-sycamore ^{8,9}
Plant Density and Size	Dense mid-story, relatively sparse shrub understory; older stands of mesquite preferred; mature cottonwoods used if tree densities are moderate ¹⁰
Microhabitat Features	Prefers intact, mature mesquite bosques, but also uses denser stands of wooded washes and tamarisk thickets ⁹
Landscape	Higher densities in riparian-filled drainages than in adjacent areas, scattered trees in desert uplands ⁹ ; other landscape requirements unknown
Elevation Range in Arizona	
100 – 4,900 feet ⁸	
Density Estimate	
Territory Size: As small as 0.1 acre ⁹	
Density: 0.5 – 2 pairs/acre (up to 5)	

Natural History Profile

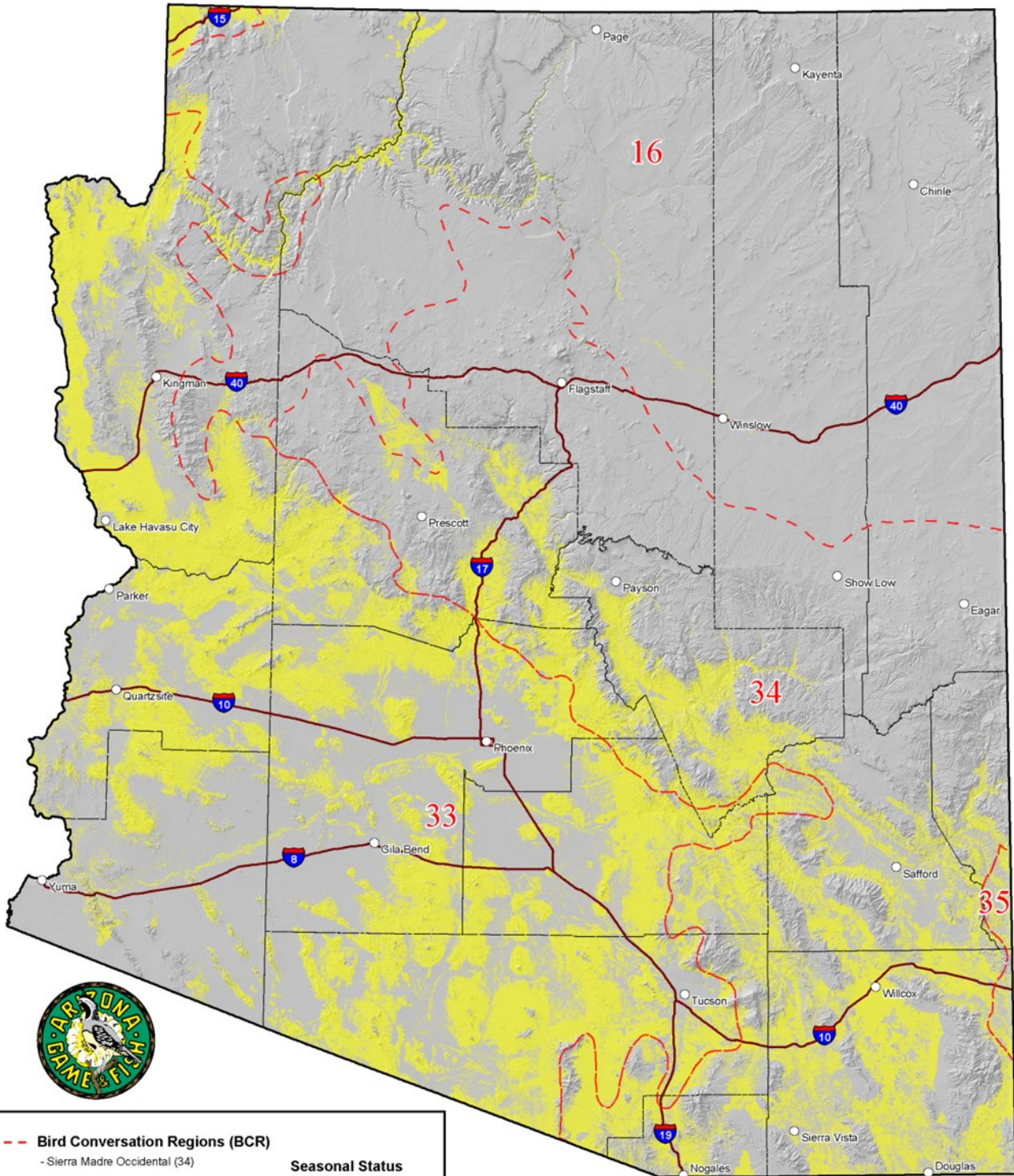
Seasonal Distribution in Arizona	
Breeding	Mid-March – early July ⁸
Migration	Late February – April; late June – September, occasionally into mid-October ⁸
Winter	Typically absent
Nest and Nesting Habits	
Type of Nest	Cup in shallow cavity
Nest Substrate	Primarily shallow tree limb cavities and crevices, including behind loose bark ^{8,9}
Nest Height	2 – 36 feet above ground ^{8,9}
Food Habits	
Diet/Food	Insects ⁹
Foraging Substrate	Trees and shrub foliage ⁹



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

Last Update: April 2023

Distribution of Lucy's Warbler



-- Bird Conservation Regions (BCR)

- Sierra Madre Occidental (34)
- Chihuahuan Desert (35)
- Sonoran & Mojave Deserts (33)
- Southern Rockies & Colorado Plateau (16)

Seasonal Status

- Breeding Only
- Counties

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

SPECIES ACCOUNT ● LUCY'S WARBLER *Oreothlypis luciae*



General Information

Distribution in Arizona

Lucy's Warblers are widespread south of the Mogollon Rim in low to mid-elevation riparian areas and wooded desert washes at elevations below 4,900 feet (Corman 2005). They are also found in riparian areas along the lower Colorado River and Lake Mead, the Virgin River, Grand Canyon, Kanab Creek, the Little Colorado River upstream to beyond Cameron, as well as locally in Mohave desertscrub with tall Joshua trees. In the 1950s they became scarce within the lower Colorado River valley, but have since recovered locally where there has been restoration of native habitats (Rosenberg et al. 1991, Corman 2005). Lucy's Warblers are migratory and winter south of the U.S. border (Johnson et al. 2012). They are also known to undergo a molt migration in southeastern Arizona following the breeding season (Chambers et al. 2011).

Habitat Description

Lucy's Warblers prefer riparian habitat with dense mesquite woodlands; in fact, their breeding range largely matches the distribution of this vegetation type (Johnson et al. 2012). They also use tamarisk, cottonwood, and willow woodlands for nesting, but they reach their highest densities in mesquite bosques (Rosenberg et al. 1991, Johnson et al. 2012). They use mature cottonwoods if tree densities are moderate (Lynn 1996). In the Tucson area they are fairly common in areas with mature mesquite, even within city limits. Lucy's Warblers also occur in scattered stands of larger mesquite and Joshua trees in upland scrub, desert grasslands, and desert washes, as well in as foothill and mid-elevation drainages with ash, walnut, sycamore, and oak (Phillips et al. 1964, Johnson et al. 2012). Molt migration habitat is similar to breeding habitat and includes cottonwood, willow, and mesquite (Chambers et al. 2011).

Microhabitat Requirements

Lucy's Warblers typically nest in mature trees. They use woodpecker-created or shallow natural cavities, as well as hollows behind peeling bark; flood debris in trees; cavities in cliffs, stream banks or road cuts; or deserted nest structures from other birds such as Verdins and Cliff Swallows (Corman 2005, Johnson et al. 2012). Lucy's Warblers forage primarily in the crowns of riparian trees, particularly mesquite (Johnson et al. 2012).

Landscape Requirements

Lucy's Warblers appear to be one of the few conservation priority species that can successfully nest within fairly small habitat patches, although this has not been studied in any detail. They occur in intact, mature mesquite and other mid- to lower-elevation riparian woodlands. Conservation of any sized riparian woodland stands, particularly those associated with surface water, is beneficial to this species.



Conservation Issues and Management Actions

Small Population

A high portion of the global population (73%) of Lucy's Warbler resides in Arizona during the breeding season. Its global breeding extends minimally into adjacent states, plus locally to the south into northern Sonora and northwest Chihuahua. This leaves Arizona not only with most of the responsibility for conserving this species, but also provides the opportunity to work toward the species' conservation within a single political boundary.

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	Destruction or alteration of desert washes and mesquite bosque habitats	Medium
Agriculture • Livestock farming and ranching	Unsustainable livestock grazing of riparian areas reduce cottonwood and willow recruitment	Medium
Biological Resource • Logging and wood harvesting	Mesquite fuel wood cutting	Medium
Natural System Modifications • Fire and fire suppression • Dams and water management/use	Wildfires in riparian and mesquite bosques Groundwater pumping and diversion of surface water	High
Invasive and Problematic Species • Invasive non-native plants and animals	Tamarisk beetle	Medium
Climate Change • Ecosystem encroachment • Changes in temperature regimes • Changes in precipitation and hydrological regimes		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

Agriculture:

- Livestock farming and ranching

Biological Resource:

- Logging and Wood harvesting

Natural System Modifications:

- Fire and fire suppression
- Dams and water management/use

Groundwater pumping, dams, and other water diversions are partially responsible for historic losses of low-land mesquite bosques and other riparian woodlands, including areas along the lower Colorado, Gila and Santa Cruz rivers (Johnson et al. 2012). Clear-cutting, fuelwood harvesting, unsustainable livestock grazing, habitat conversion for agriculture, and other land uses have caused significant historical loss of this habitat. Increasing wildfire events in riparian and mesquite bosque as a result of invasion of exotic tamarisk, grasses, and forbs will kill or greatly set-back the mature trees upon which Lucy's Warblers depend for nesting. Unsustainable livestock grazing in riparian areas reduces cottonwood, willow, and other native tree recruitment.

Lucy Warbler populations are subject to increased threats from ongoing urban and rural expansion, including proposed housing developments and the associated infrastructure. This development will result in increased groundwater pumping, which in turn will impact the cottonwood-willow and associated mesquite habitat along the river. Urbanization is expected to increase water demands causing additional habitat losses in the future. Mesquite harvest for firewood and charcoal is currently a local issue, but it may expand with increasing urbanization.

Recommended Actions:

1. Work with land management agencies and local governments to regulate groundwater pumping from municipal agencies and local private operations to achieve sustainability for riparian areas.
2. Promote groundwater recharge projects to offset pumping.
3. Work with land management agencies, developers, and private landowners to avoid or minimize surface water diversions and manipulations.
4. Promote the flood control benefits of healthy riparian areas.
5. Support efforts within the State to recognize the connection between surface water and groundwater.
6. Promote the economic benefits of tourism (birding and hiking, etc.) to the local communities; highlight the many birding festivals in the state;
7. Incorporate the value of wildlife into watershed management efforts. Promote these as a public service to the people of Arizona (birding, tourism, outdoor recreation, land values, etc.)
8. Work with land management agencies to ensure that impacts to public lands from proposed developments are thoroughly evaluated.
9. Support the beneficial use of water for wildlife.



Natural System Modifications:

- Other ecosystem modifications

Invasive and Problematic Species:

- Invasive non-native/alien plants and animals

Few bird species are as closely associated with a single vegetation type as Lucy's Warbler is with mesquite woodlands (Johnson et al. 2012). The use of tamarisk by Lucy's Warblers in certain locations (e.g., Colorado River within the Grand Canyon) should be taken into consideration prior to any eradication of tamarisk. The use of native species, particularly mesquite, for revegetation should be a priority on tamarisk sites where Lucy's Warblers are found. The tamarisk beetle invasion into the lower Colorado River and Gila River valleys may lead to habitat loss for Lucy's Warblers, as it results in widespread defoliation and possible loss of tamarisk stands.

Recommended Actions:

1. Protect mesquite bosques and densely wooded washes and work with agency partners and private landowners on strategies to retain and protect mesquite, especially in drainages.
2. Encourage sustainable harvest instead of large-scale clearing of mesquite where harvest of fuelwood is legal. Discourage mesquite harvest otherwise.
3. Develop public outreach materials that emphasize the ecological value of mesquite for Lucy's Warbler and other wildlife and its vulnerability to excessive fuelwood harvest.
4. Promote efforts such as the Tucson Audubon Desert Nestbox Program, which has a special design for Lucy's Warbler (<http://tucsonaudubon.org/lucys-warblers-and-nestboxes/>).

Climate Change:

- Ecosystem encroachment
- Changes in temperature regimes
- Changes in precipitation and hydrological regimes

Historically, riparian vegetation loss to channelization, water diversions, and conversion to agriculture caused major population losses of Lucy's Warbler throughout the southwest (Johnson et al. 2012). While native riparian areas loss continue in some areas, Lucy's Warbler populations along the lower Colorado River have somewhat recovered recently due to use of exotic tamarisk as breeding habitat (Rosenberg et al. 1991). However, working towards recovery of mesquite and other native riparian woodlands is still important, as these habitat types are likely more suitable for long-term recovery of the species. The expected increase frequency of drought conditions and higher temperatures will likely reduce insect prey abundance, thus negatively influencing nesting success rates. Lucy's Warblers are near their thermal threshold at current temperatures. Increasing temperatures resulting from climate change may result in lower productivity or mortality put them at further risk (Blair and Walsberg 1996).

Recommended Actions:

1. Make Lucy's Warbler an "umbrella species" for the importance of mesquite bosque woodlands and desert wash riparian habitat integrity, the risks from climate change on native wildlife, and a benchmark of habitat restoration success since recovery is more easily achieved with this species than many other



conservation priority species.

2. Use Lucy's Warbler as an example for public outreach to explain the importance of riparian areas and water conservation and the impacts of climate change and droughts. Show the Lucy's Warbler story of survival from historic losses and subsequent recovery.

Research and Monitoring Priorities

1. Clarify area and landscape requirements, sensitivity to disturbances, and response to riparian restoration efforts for breeding Lucy's Warblers.
2. Monitor Lucy's Warblers via multi-species protocols, ensuring that these can accommodate the early nesting season.
3. Determine strategies for habitat enhancement for Lucy's Warbler, such as slow removal of exotic plants, plantings of native trees such as mesquite, and use of nestboxes.
4. Investigate effects of climate change on riparian habitat within Lucy's Warbler habitat.

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