Montane Riparian Woodlands

West Fork of the Black River, White Mountains, photo by Al Hikes AZ

Key Habitat Characteristics Profile

Elevational Range[1]

4,000 feet to tree line

Vegetation Structure[4]

Mostly high tree canopy cover, but patches of dense shrub understory cover (25 - 65%) also beneficial; overall woody cover high enough to provide cool, moist forest; riparian areas adjacent to conifer forest with various ages classes particularly beneficial

Plant Species Composition[2]

Sycamores usually dominant; also aspen, evergreen oaks, pines, juniper, Douglas-fir, madrone, or cypress; maples and oaks in understory

Important Microhabitats[4]

Coarse gravel stream substrates; < 7" water depths; availability of cliffs/boulders and large snags

Very high canopy covers of sycamore and other deciduous trees

Patches of dense undergrowth; cool, moist soils

Fire Regime

Unknown, likely increased vulnerability with climate change

NRCS Major Land Resource Areas

35 Colorado Plateau
38 - Mogollon Transition
39 - AZ & NM Basin & Range Mountains
41 - SE AZ Basin & Range

Conservation Profile

Estimated Cover in Arizona[1]

68176.64 ac
0.09% of state

Land Ownership Breakdown[1]

Federal	26.59%
Private	19.16%
Tribal	48.29%
State	5.81%
Other	0.15%

Most Important Conservation Concerns[1]

Logging/wood harvesting
Streamside recreation
Surface water diversions/impoundment/silting
Climate change (drought, habitat shifting)

Habitat Recovery Time

30 – 50 years

Vulnerability to Climate Change[5]

Vulnerability	High
Effects	Loss of snowpack runoff, higher competition with other water uses
Response	Loss of perennial flows and riparian dependent vegetation

Bird Relationships Profile

Representative Bird Species with Accounts

Common Black Hawk, Elegant Trogon, Violet-green Swallow, American Dipper, MacGillivray's Warbler, Red-faced Warbler

Other Associated Breeding Bird Species[3]

Common Merganser, Spotted Sandpiper, Zone-tailed Hawk, Mexican Whip-poor-will, Rivoli's Hummingbird, Black-chinned Hummingbird, Acorn Woodpecker, Red-naped Sapsucker, Arizona Woodpecker, Black Phoebe, Brown-crested Flycatcher, Cordilleran Flycatcher, Dusky Flycatcher, Cassin's Kingbird, Warbling Vireo, Mexican Jay, Bridled Titmouse, Red-breasted Nuthatch, Orange-crowned Warbler, Virginia's Warbler, Yellow Warbler, Painted Redstart, Green-tailed Towhee, Lincoln's Sparrow, Hepatic Tanager, Summer Tanager, Lesser Goldfinch, Black-headed Grosbeak, Indigo Bunting, Lazuli Bunting, Hooded Oriole, Bullock's Oriole

AZ Stewardship Responsibility[1]

Elegant Trogon, Violet-crowned Hummingbird, Blue-throated Mountain-gem, Common Black Hawk, Sulphur-bellied Flycatcher, Dusky-capped Flycatcher, Rose-throated Becard

Last Update: October 2023

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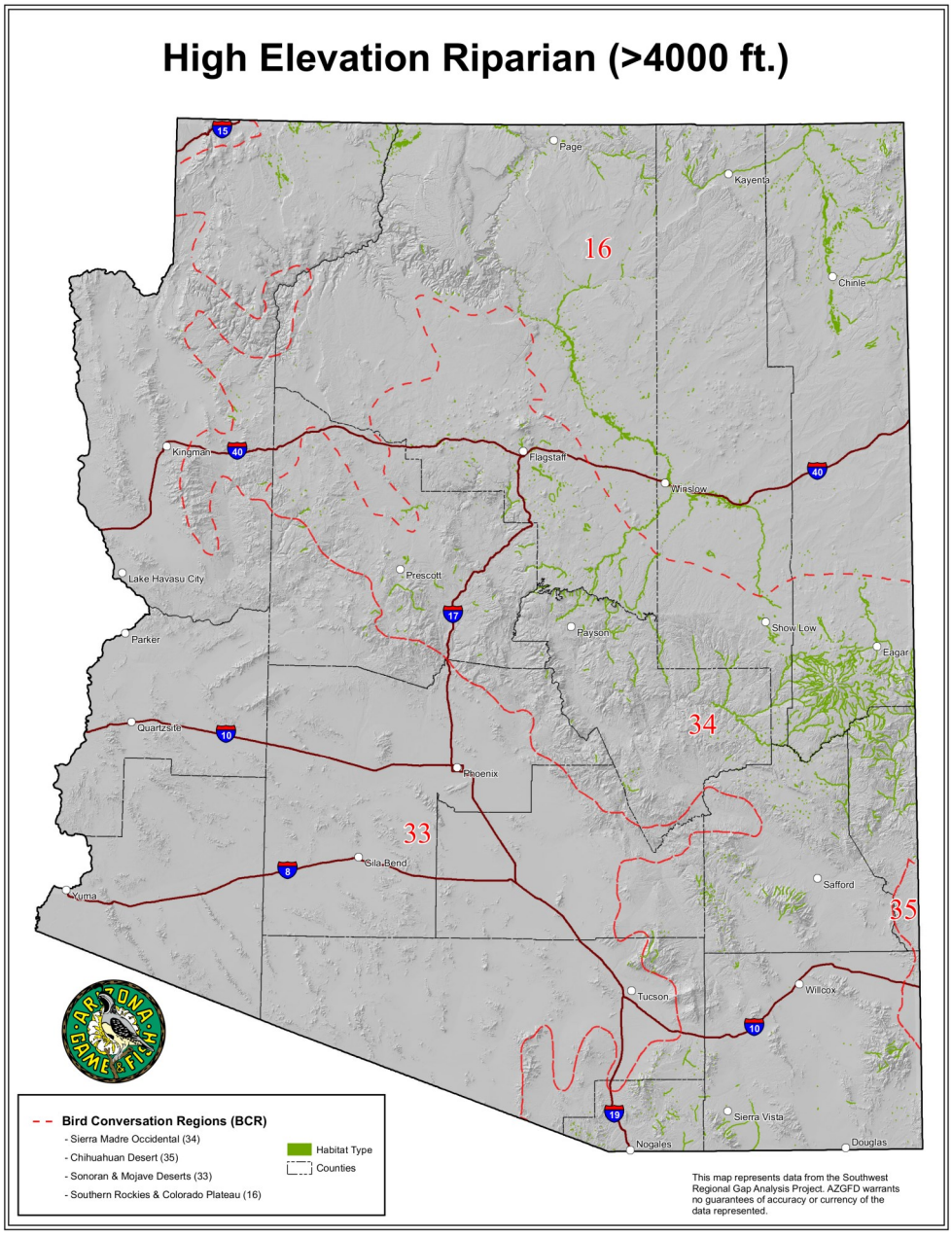

Habitat Codes Included in Montane Riparian

Arizona Breeding Bird Atlas

- WAR, WAB, WGB, WMR, WIR (above 4,000 feet)

USGS Southwestern ReGAP

- North American Warm Desert Lower Montane Riparian Woodland and Shrubland (above 4,000 feet)
- Rocky Mountain Lower Montane Riparian Woodland and Shrubland
- Rocky Mountain Subalpine-Montane Riparian Shrubland
- Rocky Mountain Alpine-Montane Wet Meadow
- Invasive Southwest Riparian Woodland and Shrubland

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General Information

Habitat Importance

Montane riparian areas of Arizona are the stronghold of the U.S. populations of Elegant Trogon and Red-faced Warbler. All montane riparian bird species require relatively unaltered streams and streamside vegetation that provide overall cool, moist, and aquatic invertebrate-rich environments. The condition of adjacent forests is also important, and birds use both the riparian vegetation and intact nearby coniferous and upland desertscrub habitats. In the arid southwest, many birds that use this habitat are riparian obligates.

Distribution in Arizona

Montane riparian habitat occurs throughout the state. Streams and rivers (Verde, Agua Fria, Hassayampa, Fossil Creek, and Aravaipa Creek) above 4,000 feet elevation support a high diversity of birds, particularly neotropical migrants.

Habitat Description

High-elevation montane riparian areas are typically within mixed conifer, ponderosa pine, pinyon-juniper forest, and desert grasslands. Higher elevation streams are dominated by aspen, alder, bigtooth maple, boxelder, locust, Gambel oak and gooseberry. They feature rocky, cool, fast-flowing streams that are often surrounded by rock outcroppings or cliffs. Lower elevation montane streams are characterized by a mostly high canopy cover of sycamores interspersed with other trees, such as firs and pines. Interior riparian deciduous forests above 4,000 feet are a mix of sycamore, willow, walnut, cottonwood, and ash. These rivers and streams have a steep gradient and experience scouring flash flood events. The upper terraces are often a mix of juniper, mesquite, and netleaf hackberry. The understory vegetation often includes patches of shrub thickets, but also areas where tree canopy cover is high enough to prevent thick undergrowth. The forest floor is cool and moist. Where beaver are present, they play an important role in the ecological balance in these riparian systems.

Montane Riparian Woodlands

Conservation Concerns 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
Biological Resource Use: • Logging and wood harvesting	• Logging and logging roads close to or through riparian	High
Human Intrusions and Disturbance: • Recreational activities	• Recreational activities impacting streams and stream banks	Medium
Natural System Modifications: • Dams and water management/use	• Dewatering or altering resulting in loss of invertebrates	Medium
Climate Change: • Ecosystem encroachment • Changes in precipitation and hydrological regimes (drought)	• Predicted drought and resulting habitat changes	High

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

Based on the habitat needs of the six representative bird species reviewed to create this account, montane riparian areas of Arizona have the primary conservation concerns of climate change (prolonged droughts) and surface water diversion. Livestock grazing is not a factor in most montane riparian areas in southeastern Arizona, although herbivory by livestock and wildlife is a consideration in northern Arizona. A higher-ranking concern to four of our representative bird species is small population size in Arizona, which increases the high ecological risk of not addressing habitat conservation concerns. We recommend Bringing Birds Home: A guide to Enhancing Rivers, Streams and Desert Washes for Birds and Other Wildlife.

Biological Resource Use:

- Logging and wood harvesting

Red-faced Warblers are negatively affected by clear-cutting and other timber harvesting practices in their breeding habitat (Martin and Barber 1995). In a study of clear-cuts and selectively-logged forest plots, Red-faced Warblers were present only in untouched areas (Franzreb and Ohmart 1978, Szaro and Balda 1979). Treatments that remove foliage from ground level to 60 feet in height and over > 30% basal area may render previous warbler habitat unsuitable (Szaro and Balda 1979, Franzreb 1983).

Recommended Actions:

1. Maintain a no-timber harvesting buffer of 150 feet (or to the slope break of canyons) in areas occupied by breeding Red-faced Warblers and areas adjacent to montane riparian zones.
2. Local, unregulated firewood harvesting (oaks and larger snags) could reduce the quality of Elegant Trogon

nesting and foraging areas by reducing canopy and removal of potential nesting tree snags.

Human Intrusions and Disturbance:

- Recreational activities

Development of roads and recreation sites (e.g., campgrounds, picnic areas, parking lots) in montane riparian areas results in direct loss of breeding habitat loss for Red-faced Warblers. This species requires high-elevation, moist, deciduous/coniferous mixed forest to breed, a habitat type not particularly prevalent in Arizona. Human disturbance at the nest (e.g., picnicking, hiking, dog walking, group gatherings) may change or impede nesting behavior that can result in nest abandonment, nestlings leaving the nest prematurely, or alerting predators to the nest location (including predation by dogs) (Martin and Barber 1995). These activities can also result in habitat changes such as severe erosion, social trails, and vegetation trampling, further negatively impacting nesting success.

Recommended Actions:

1. Discourage developing new recreation areas (such as picnic areas and campgrounds) in montane riparian zones.
2. Where these recreation areas already exist, create outreach materials and provide public education about breeding birds, their habitat, and how to minimize disturbance (e.g., posters, pamphlets, docents at recreation sites).
3. Clearly mark trails and closed/restoration areas; use fences and natural barriers to minimize human disturbance.
4. Post signs requiring day hikers to stay on trails in riparian areas.
5. Create and/or enforce leash laws for dogs.
6. Regulate group size and number of concurrent users in riparian recreation sites (e.g., enforcing parking restrictions in established lots as well as on roadsides).

Natural System Modifications:

- Dams and water management/use

Several of the representative bird species need year-round access to perennial streams, as they almost exclusively forage on stream invertebrates. Any loss of stream reaches that fit these criteria results in habitat loss for these species. Further, flooding, dewatering, or impoundments of reaches results in loss of nest and foraging sites. Any stream alteration or other water project that affects the water table in drainages risks dewatering the riparian zone and losing sycamores that are important for Elegant Trogon nesting, as well as deciduous shrubs that are important nesting and foraging substrates for other species.

Recommended Actions:

1. Examine the extent to which water projects affect the sycamore-pine-oak landscape in areas occupied by Elegant Trogon; consider adjustments to minimize negative impacts.
2. Determine amount of water diversions that are currently in place in American Dipper occupied areas and consider adjustments to minimize negative impacts.
3. Encourage and support land management actions that reduce soil erosion and promote water recharge and stream flows (e.g., rock structures in upland tributaries).
4. Discourage further water developments in the breeding range of Elegant Trogons and Red-faced Warblers.

5. Examine options for replacing diversions with modern infrastructure that allows them to be placed lower in the drainage, be more efficient, and retain minimum instream flows in critical reaches.
6. Examine and implement options for stream restoration in dewatered reaches through watershed restoration (rock gabion check dams in upper tributaries).

Climate Change:

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

Most of the representative bird species of montane riparian areas have either the northern-most or southern-most edge of their range in Arizona and may show the gradual effects from climate change. They occupy high-elevation, moist forests for which most climate models predict prolonged droughts and gradual losses. Southern species are expected to retreat to high-elevations and lower latitudes, if available. Northern species are anticipated to retreat to higher elevations and higher latitudes. Reduced snow packs and prolonged droughts are a direct threat to the integrity of these ecosystems. All species are dependent on the availability of adequate instream flows. For instance, increased drought cycles threaten water quality and availability that has maintained critical prey species for Common Black Hawks and in the long-term, risk further loss of mature riparian forests (Duffy 2012).

Recommended Actions:

1. Identify areas occupied by Elegant Trogons and Red-faced Warblers and potentially suitable areas that could be restored.
2. Evaluate land uses that may compound the effects of prolonged drought on the sycamore-pine-oak interface.
3. Determine effects of land uses, such as recreation, livestock and silvicultural practices on Elegant Trogons and their nesting habitats.
4. Use Red-faced Warblers as an indicator species for monitoring effects of climate change. Implement a standardized monitoring or inventory program that shows change in abundance and current breeding range.

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Recommended Citation

Arizona Bird Conservation Initiative and Sonoran Joint Venture. 2023. Montane Riparian Habitat Account. Available at https://sonoranjv.org/accounts/montane-riparian.pdf