

# Mojave Lowland Riparian



Mojave Lowland Riparian habitat along Lake Mohave, Clark County. Photo by Elisabeth Ammon.

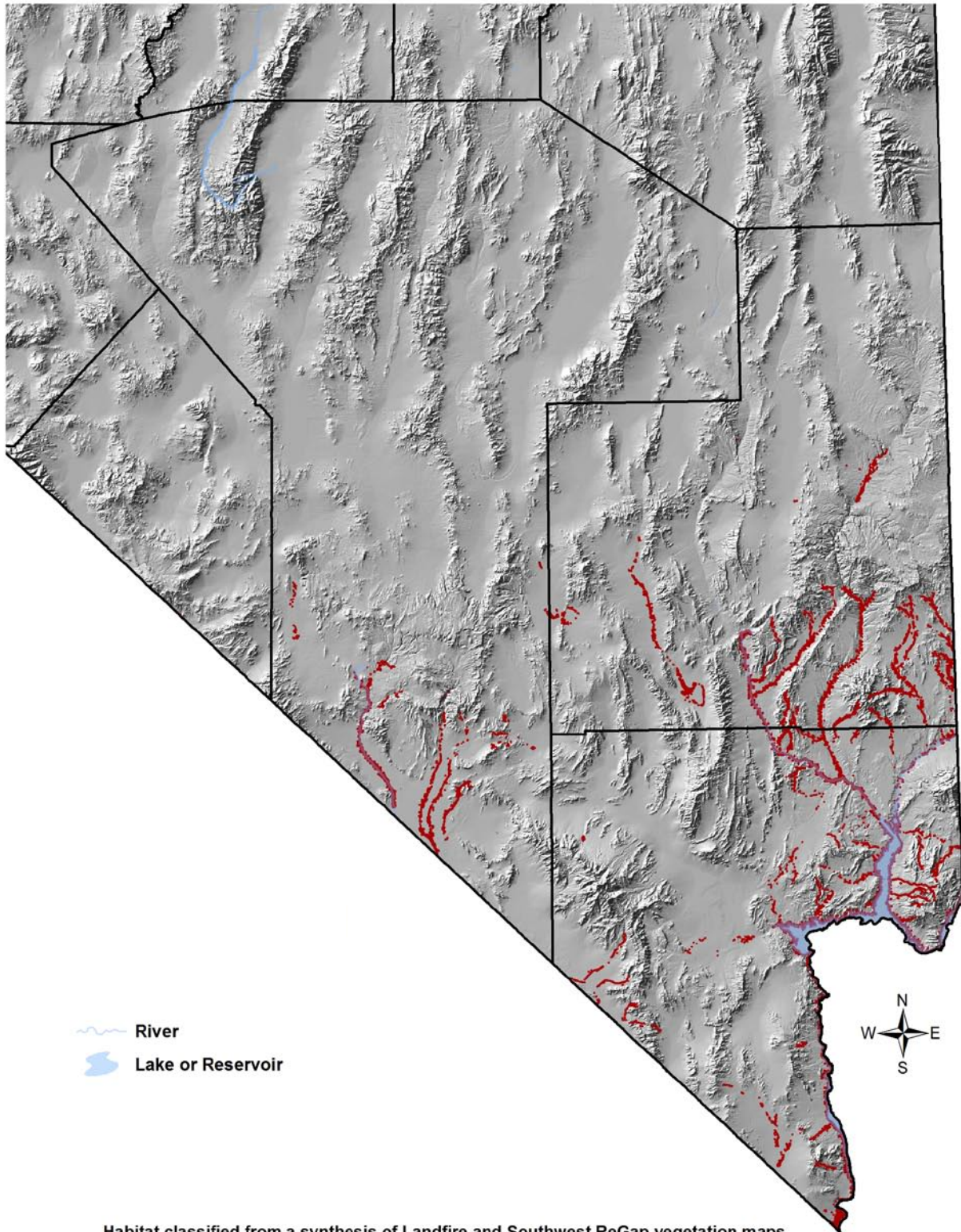
## Key Bird-Habitat Attributes

Stand Structure	Multi-aged tree stands with riparian shrub understory, interspersed with groves of dense riparian shrubs (willows and others) and floodplain wetlands
Ideal Scale for Conservation Action	50 ha [125 ac] or more
Plant Species Composition	Mixed stands of cottonwood and tree willow with multiple species of shrubs as understory, with emphasis on willows; tree willows especially productive for birds; saturated soils or patchy wetlands particularly valuable
Snags	Old-growth riparian trees, including snags and large dead branches add nesting opportunities for several Priority species
Salt Cedar	Removal of saltcedar should be followed by immediate revegetation, to the extent possible; tamarisk beetle invasion should be closely monitored and loss of large stands mitigated to the extent possible with revegetation
Presence of Cliffs > 30 m [100 ft] Tall	Presence of tall cliffs increases value to birds

## Conservation Profile

Estimated Cover in Nevada	16,150 ha [39,900 ac] 0.06% of state
Landownership Breakdown	BLM = 40% NPS = 36% Private = 8% State Lands = 5% Tribal = 4% FWS = 2% Other = 5%
Priority Bird Species	Gambel's Quail Snowy Egret Swainson's Hawk Yellow-billed Cuckoo White-throated Swift Costa's Hummingbird Rufous Hummingbird Willow Flycatcher Bell's Vireo Lucy's Warbler Abert's Towhee (Least Bittern) (Clapper Rail)
Indicator Species	Yellow Warbler (breeding) Wilson's Warbler (migration)
Most Important Conservation Concerns	Surface water diversion, impoundments, and flood control Invasive plants Biocontrol activities Urban, suburban, and industrial development Groundwater pumping Climate change (change in precipitation and temperature) Livestock, wild horse and burro grazing Increase in fire frequency or intensity Motorized recreation
Habitat Recovery Time	25 years
Regions of Greatest Conservation Interest	Virgin and Muddy Rivers, Lake Mojave and Big Bend of Colorado River, Meadow Valley Wash, Pahranaagat Valley, Ash Meadows NWR, and many small spring systems
Important Bird Areas	Ash Meadows NWR Lake Mead Lower Muddy River Meadow Valley Wash Moapa Valley Oasis Valley Pahranaagat Valley Complex Virgin River

# Mojave Lowland Riparian



Habitat classified from a synthesis of Landfire and Southwest ReGap vegetation maps combined with manual re-classification. Habitat polygons have been buffered on this map to improve visibility, and thus the extent of the habitat is slightly exaggerated. Small patches of habitat may not be visible on this map, and some areas may be misclassified.

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## Overview

Mojave lowland riparian areas have been historical strongholds of bird species richness in Nevada, even though they only cover less than one percent of the Nevada landscape. Ideally, their complex mix of gallery forest, shrub willows, and floodplain wetlands can provide oases of food-rich, cool environments in the desert landscape, and checklists of over 200 bird species are not unheard of for relatively intact sites. Dominant woody species include Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), and various species of shrub willows (*Salix* spp.), and, in higher elevations, velvet ash (*Fraxinus velutina*). Other riparian shrubs and trees, such as honey mesquite (*Prosopis glandulosa*), and a variety of native herbaceous plants are also found in intact systems, and their presence is important for Priority species such as Lucy's Warbler. Mojave Lowland Riparian habitats are home to some of the birds of greatest conservation concern in Nevada, such as the Southwestern Willow Flycatcher and Yellow-billed Cuckoo. Additionally, the Elf Owl was historically found in old-growth riparian woodlands at the southern tip of Nevada (Rosenberg et al. 1991) and may be poised for a return as it was recently recorded just outside Nevada in Utah's Washington County (Floyd 2000).

Ideal Mojave lowland riparian landscapes consist of a mosaic of dense shrub willow thickets, groves of riparian trees, backwaters and oxbow wetlands, a dynamic floodplain that maintains different successional stages, and a buffer of intact transitional habitat types, such as quailbush, mesquite, and flowering shrubs (Fig. Hab-12-1). These conditions are most often achieved along streams or rivers that have natural flow regimes, or flows that mimic natural regimes. If flows are significantly altered, the probability of native riparian plant loss and weed invasion, particularly by saltcedar, increases (Merritt and Poff 2010). All rivers in the Mojave Desert of Nevada have been altered to various degrees through surface water diversions, channelization, impoundments, and resulting invasive plants. However, careful weed control efforts, water management, and habitat restoration programs can re-create close-to-historic conditions even in these altered riparian systems, as has occurred (or is occurring) in Ash Meadows NWR, Pahranaagat NWR, Key Pittman WMA, and along parts of the Lower Colorado River (LCR MSCP 2004). In addition to pursuing active intensive restoration, we also encourage planners and resource managers to seek out opportunities for natural recovery of riparian habitat patches in smaller, free-flowing systems, such as spring outflows and small tributaries, wherever feasible. Generally this will require that stream flows remain in a semi-natural state, or that these flows can be re-established.

## Main Concerns and Challenges

The following top conservation concerns were identified in our planning sessions for Mojave Lowland Riparian habitat in Nevada:

- Surface water diversion, impoundments, and flood control
- Invasive weeds
- Biocontrol activities
- Urban, suburban, and industrial development
- Groundwater pumping
- Change in precipitation and snowmelt related to climate change

## Mojave Lowland Riparian

- Change in temperature related to climate change
- Overgrazing by livestock, wild horses and burros
- Flood control
- Increase in fire frequency or intensity
- Motorized recreation

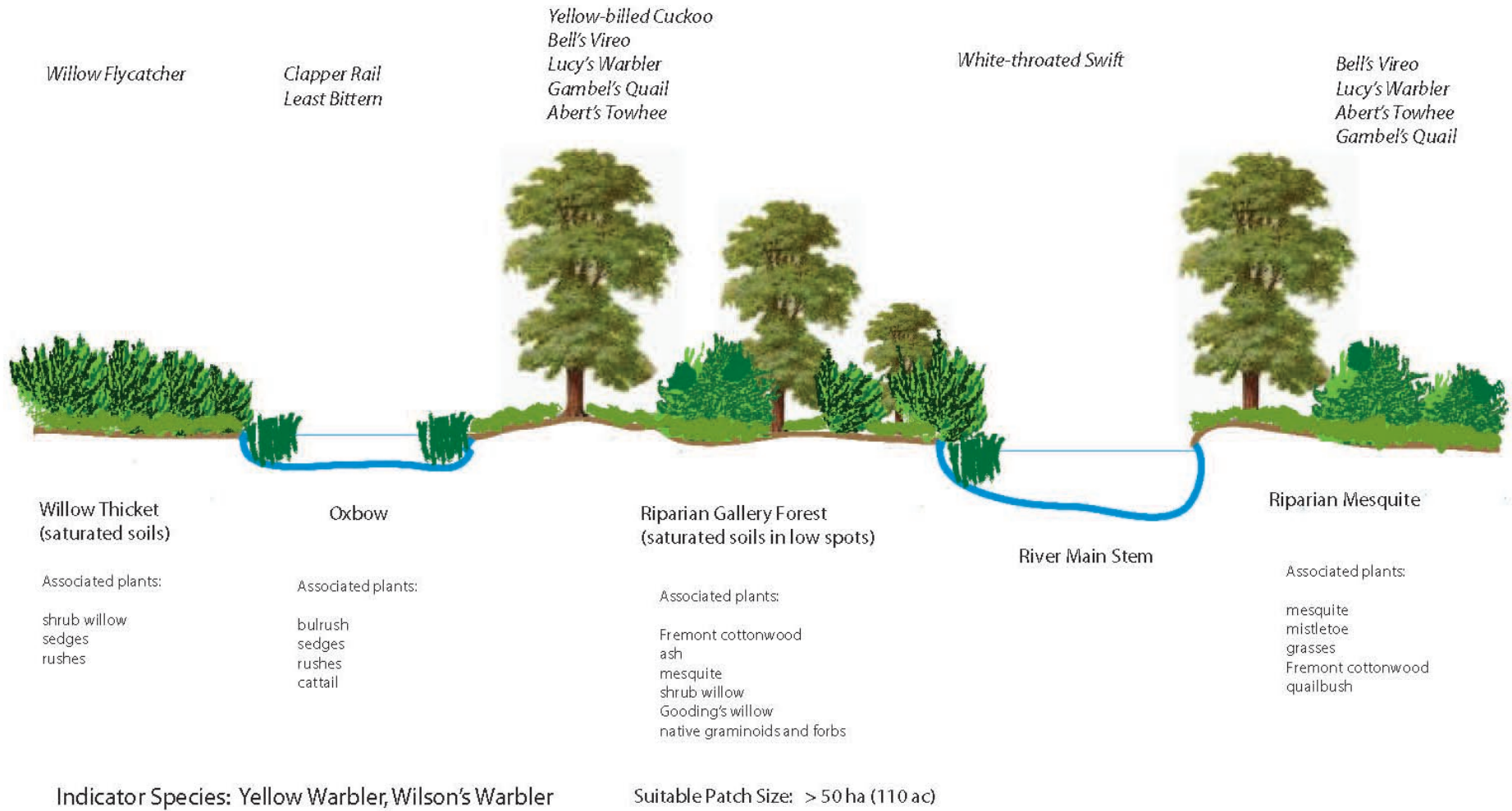
The list of conservation concerns associated with Mojave Lowland Riparian habitat is long and challenging. Given that riparian areas support a disproportionate share of bird diversity, and that they provide crucial migration stopover habitat for landbirds, we are very concerned about any further losses of this habitat, which has already been greatly diminished from historic water development projects and agricultural uses. Several of the top conservation concerns are related in one way or another to maintaining or re-establishing sufficient water flows. Accomplishing this will require concerted effort given the multiple demands on water, along with increasing temperatures and the possibility of reduced precipitation and more frequent droughts.

Starting in the 1970s, lowland riparian areas of the southwest were invaded by saltcedar (tamarisk), following major habitat perturbations such as channelization, impoundments, and surface water diversion (Stromberg et al. 2009). Much has been reported on the relatively low habitat value of saltcedar compared to native vegetation it replaced (e.g., Brand et al. 2008), and as a result, conservation literature for the southwest from the 1980-90s often focused on saltcedar eradication. However, several Priority species, including Southwestern Willow Flycatcher, Bell's Vireo, and Lucy's Warbler, have since colonized saltcedar as nesting habitat, and today, often rely on mixed or pure saltcedar stands over large reaches of river (Walker 2006). In the mid-2000s, the tamarisk beetle *Diorhabda* was released in the Lower Colorado River system as a biocontrol agent for eradicating saltcedar (Hultine et al. 2010). The beetle defoliates saltcedar, but does not necessarily kill it right away, leaving large stands without a canopy and, thus, unsuitable for birds. More details on this threat are described in the Willow Flycatcher species account (p. Spp-59-1). Recent research suggests that saltcedar eradication alone is often ineffective in restoring native riparian vegetation (Harms and Hiebert 2006), and active revegetation is generally required to achieve optimal restoration benefits for wildlife. Therefore, revegetation using native riparian plants is a key strategy for restoration areas that can sustain native plants.

The invasion by saltcedar and alteration of floodplains has also contributed to increased fire frequency in Mojave Lowland Riparian habitat. Because saltcedar and drought-stressed native vegetation are highly flammable, the fires that occur due to human ignitions or lightning strikes can be catastrophic for sites that are occupied by Priority species. While the recovery time of this habitat type is relatively short, it usually requires active restoration measures to prevent the site from being converted to weeds or upland vegetation. Therefore, we recommend that areas occupied by the highest-priority bird species receive full efforts for protection from fire, in the form of prevention efforts, response planning, and dedication of adequate firefighting resources.

# Mojave Lowland Riparian

Not To Scale



**Figure Hab-11-1:** Idealized Mojave lowland riparian landscape to maximize the number of riparian associated Priority bird species.

# Mojave Lowland Riparian

## Conservation Strategies

### Habitat Strategies

- **Manage at landscape scale (> 50 ha [110 ac]**, but smaller patches are also valuable if intact) with the goal of maintaining mosaic of open, mixed-age tree canopy, riparian shrub thickets, flowering shrubs and forbs, and interspersed floodplain wetlands. High species richness in plants and presence of willows are particularly suitable for birds. Patch sizes within the mosaic may be small (< 0.4 ha [1 ac]), but the overall riparian woodland corridor should be contiguous
- **Old-growth trees** are important to several Priority species, but in sites that already have trees, the value of a patch is likely most improved by adding a **native riparian shrub and wetland** component
- **Opportunities to restore channels with natural flow regimes**, or flows that mimic natural regimes, should be aggressively pursued
- **Active revegetation** should be done in all areas where saltcedar is eradicated and native vegetation can be supported
- Maintain **grazing and OHV use** at levels that do not permanently impact the shrub and forb understory or cause soils to be unnaturally exposed
- The majority of priority bird species nest between **April 1 and July 1**, and some of them are particularly sensitive to nest disturbance. This is the time period when intensive treatments or heavy land uses should be largely avoided
- Riparian areas near urban or rural settlements may attract **feral cats and other subsidized predators**. Strategic plantings of impenetrable shrubs (e.g., wild rose) are useful for discouraging opportunistic predators and cowbirds. Feral cat colonies should be moved away from riparian areas

### Research, Planning, and Monitoring Strategies

- Planning that allows for **opportunistic habitat restoration** in places that become available may be key to maintaining riparian resources. Even small patches of intact riparian habitat are highly beneficial to nesting and migrating landbirds
- **Fire** prevention, immediate response planning, and management of fire-prone recreational activities are critical for areas that support high-priority conservation species
- **Monitoring of riparian resources** throughout the region and **effectiveness monitoring of restoration activities** are high priorities
- Continue **long-term monitoring of landbirds** statewide through the Nevada Bird Count, and continue species specific monitoring programs for species of special concern, such as Southwestern Willow Flycatcher and Yellow-billed Cuckoo
- Monitor status of **invasive weeds, including saltcedar, and the tamarisk beetle** to assess threat level and to implement adaptive management
- Encourage **low-impact recreation** in riparian areas, move trails away from sensitive areas, and provide observation decks, boardwalks, and educational materials along trails

# Mojave Lowland Riparian

## Conservation Strategies - continued

### Public Outreach Strategies

- **Promote public appreciation** of intact lowland riparian areas with carefully planned recreational opportunities that raise public profile without impacting vegetation (bird-watching, photography, fishing, nature walks, etc.)
- **Promote public stewardship** of riparian areas through educational materials that explain the threats from feral and domestic cats, fire dangers, and value of native riparian vegetation to migrating songbirds
- **Promote low-impact recreation activities** to aid in public appreciation and stewardship of high-priority sites, particularly in river reaches that are accessible from urban areas



Saltcedar in bloom. Photo by Jen Ballard.

## Mojave Lowland Riparian



Small patch of Mojave Lowland Riparian habitat with nearby cliff.  
Photo by Jen Ballard.