

## ***Riparian Vegetation: Structural Diversity Benefits Birds***

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Since the construction of Glen Canyon Dam in 1963, riparian vegetation has increased the distribution and structural diversity of riparian habitats along the Colorado River. Stable riparian vegetation was absent prior to the dam but now dominates the sandbars (Stevens et al. 1995). Increasing vegetation has resulted in improved soil quality, litter retention and complex vegetation structure (Ranswell 1963). Without scouring flows, marshes have formed at the river's edge. Shrub woodlands border marshes and vary in species composition. The dominant species in these riparian communities is invasive tamarisk (*Tamarix ramosissima*). Native species which add to habitat structure are present in varying densities, including willow (*Salix* spp.), cottonwood (*Populus fremontii*), mesquite (*Prosopis*), catclaw (*Acacia*) and seepwillow (*Baccharis* spp.).

Communities with varying species compositions form diverse structural habitats favored by birds. Most shrub woodland riparian communities are tamarisk-dominated. Tamarisk is a woody shrub or tree with a high density of thin branches. Its leaves are small and cylindrical, providing less cover and heat protection compared to broad-leaf native species like willow and cottonwood (Rossenberg et al. 1991). Also, Tamarisk leaves contain high amounts of salt which, when dropped on the ground, increase soil salinity (Nagler et al. 2003) and can prevent germination of native species. Communities that are monopolized by tamarisk form less structural diversity and may therefore be avoided by foraging and/or nesting birds.

In the Grand Canyon, the mosaic necessary for bird habitat appeared to be present. We observed no monotypes of tamarisk anywhere along the Canyon. It appeared that stands of tamarisk were interspersed with seepwillow, arrowweed and various willow species forming fairly structurally-diverse habitat that can be utilized by bird species.

There are fairly few large, continuous stands of riparian vegetation along the Colorado River in the Grand Canyon. The constriction of riparian vegetation caused by steep slopes of rock limit the riparian corridor to a very narrow band adjacent to the river. Even within suitable riparian habitats, vegetative distribution is patchy at best. Large open

areas consisting of only sand exist, and while this makes for good rafter habitat, it's unclear why vegetation is not colonizing these open areas.

The one species of woody riparian vegetation that was conspicuously absent along the river corridor that would contribute greatly to riparian communities were cottonwoods. We observed only three occurrences of cottonwoods along the river corridor. Two of the three trees were still very young, and the third had been lost to beavers within the last year. The tributaries still retained the native species habitat structure. The image below shows native cottonwood-willow habitat along Deer Creek.



This image shows native cottonwood-willow habitat along Deer Creek. Many of the tributaries retain native riparian habitat and have resisted tamarisk invasion.

However, in the absence of large cottonwood trees, tamarisk is one of, if not the only, species of large woody riparian tree along the corridor. Without tamarisk in this system, birds would be stretched to find suitable nesting substrate.

Riparian communities with diverse vegetation are best for promoting bird diversity. Combinations of species with varying heights, invertebrate use, leaf structure, branch structure and microclimates allow for use by more bird species. While there is

relatively high habitat diversity in the Grand Canyon, it lacks the cottonwood over story characteristic of many healthy riparian habitats.

### References

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