



**Release:**

1 June 2011

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## Maximizing benefits from riparian revegetation efforts: local- and landscape-level determinants of avian response

With limited financial resources available for habitat restoration, information that ensures and/or accelerates success is needed to economize effort and maximize benefit.

In the Central Valley of California USA, riparian habitat has been lost or degraded, contributing to the decline of riparian-associated birds and other wildlife. Active restoration of riparian plant communities in this region has been demonstrated to increase local population sizes and species diversity of landbirds.

In a paper published in *Environmental Management*, we evaluated restoration design elements related to the rate at which bird abundance increased after restoration. In particular we investigated the importance of local (planting palettes and densities) and landscape (proportion of riparian vegetation in the landscape and riparian patch density) factors at 17 restoration projects along the Sacramento River.

For six of seven bird species investigated, the amount of riparian forest in the surrounding landscape was an important variable. Three of seven bird species were positively correlated with the number of tree species planted and three of seven were positively correlated with the planting densities of particular tree species.

The Sacramento River restoration strategy intentionally located revegetation plots near existing remnant riparian forests. Locating revegetation plots near extant forest is a strategy presumably based on habitat fragmentation theory that posits that larger more connected patches are

preferable to smaller highly disconnected patches. Our results confirm the utility of this practice.

### Management Implications

- The value of restoration can be maximized by locating future restoration projects in landscapes with high proportions of existing riparian vegetations.
- Restoration success can be enhanced by planting multiple tree species.
- Planting Valley oaks in particular could benefit multiple bird species.

**Publication Citation:**

Gardali, T., and A.L. Holmes. 2011. Maximizing benefits from riparian revegetation efforts: local- and landscape-level determinants of avian response. *Environmental Management* 48:28-37.