Bird-Habitat Associations

Results from the Trinity River that quantify habitat associations of the focal species help to characterize the riparian habitat needed to support these, and other, wildlife species (Miller et al. 2005, 2010). Song Sparrows, Yellow Warblers, and Yellow-breasted Chats consistently show positive associations with willows (*Salix spp.*). To a lesser extent all focal species show positive associations with alders (*Alnus spp.*). Cottonwoods (some *Populus spp.*) are currently uncommon on the landscape and still Song Sparrows, Yellow Warblers, Yellow-breasted Chats, and Black-headed Grosbeaks show positive associations with these riparian trees. **Willows, alders,** and **cottonwoods** are all important components of the riparian habitat on the Trinity River.

Our findings highlight additional habitat features that should be present in a functional riparian system, based on their positive associations with focal species. These include areas with extensive **herbaceous cover** (Song Sparrow, Yellow Warbler), extensive **canopy cover** (Yellow Warbler), **numerous trees taller than 11m** (Black-headed Grosbeak), and **open areas near water** (Tree Swallow) (Miller et al. 2005, 2010).

Photo © Ian Ausprey

Restoration plantings at the Hocker Flat restoration site, 2011.

Noteworthy Findings from Broader Literature

1. Song Sparrows, Yellow-breasted Chats, and Yellow Warblers are frequent hosts for Brown-headed Cowbirds (Erhlich et al. 1988, RHJV 2004). The number of young they produce each year will likely be **influenced by the size of the local cowbird population.**

2. A study by Gardali and Holmes in the Central Valley of California identified factors that explained how quickly bird abundance increased after restoration for seven species (2011). For six of the seven, the amount of riparian forest in the surrounding landscape was an explanatory factor: **the more riparian habitat on the nearby landscape, the faster bird abundance increased after restoration.** This finding serves as a guide to help prioritize future restoration projects.

3. The Lower Clear Creek Rehabilitation Project in Shasta County, California demonstrates the **value of maintaining large patches of riparian habitat** adjacent to restoration sites (Young and Burnett 2012). At one restoration site in particular, large patches of retained riparian vegetation appeared to aid the recovery of focal bird species. Three years post restoration, all focal bird species territories at this site incorporated portions of the adjacent, remnant vegetation. Yellow-breasted Chats occurred more densely here following restoration than at sites with smaller patches of remnant vegetation. At other restoration sites smaller patches of remnant vegetation also provided benefits, but to a lesser extent.

Population Trends

We detect **stable or increasing populations for our five focal species over the past ten years at two landscape scales.** At the **regional scale** of northwestern California, an analysis of Breeding Bird Survey data from the years 2002-2009 showed neither increasing nor decreasing trends for the five focal species (USGS 2012). In contrast, during the same time period at the **40-mile program area scale** (i.e., mainstem Trinity River from Lewiston Dam to its confluence with the North Fork Trinity River), populations increased for four of the five focal species (Song Sparrow, Black-headed Grosbeak, Yellow-breasted Chat, and Yellow Warbler); no trends were detected for the Tree Swallow (Miller et al. 2010).

At the **restoration site scale,** we had sufficient data for trend analysis at only one site—Hocker Flat—and even here results should be interpreted cautiously due to a small sample size. We analyzed population trends for the five focal species from 2005, the year channel rehabilitation occurred, through 2011. Song Sparrows showed reduced abundance immediately following channel rehabilitation activities, but then showed an increasing abundance trend such that their abundance reached pre-rehabilitation levels five years after restoration (Ausprey et al. 2012, Figure 1).

Over 130 species of birds were detected during surveys in the program area, demonstrating the value of the Trinity River and its riparian habitat to avian diversity. This is consistent with the knowledge that riparian ecosystems support the most diverse bird communities in the arid and semi-arid parts of the western United States.

The five focal species were among the top ten most commonly detected birds during surveys. This abundance is needed for statistical analyses of bird population trends.

In a separate analysis using data from bird banding stations, we detected additional signals of reduced abundance following channel rehabilitation activities. During the first year post-restoration at the Hocker Flat site, abundance of Song Sparrow, Yellow Warbler, and Yellow-breasted Chat declined while abundance of these species increased, on average, across five untreated sites during the same time period (Alexander et al. In Review). Due to small sample sizes, these findings should be considered with caution.

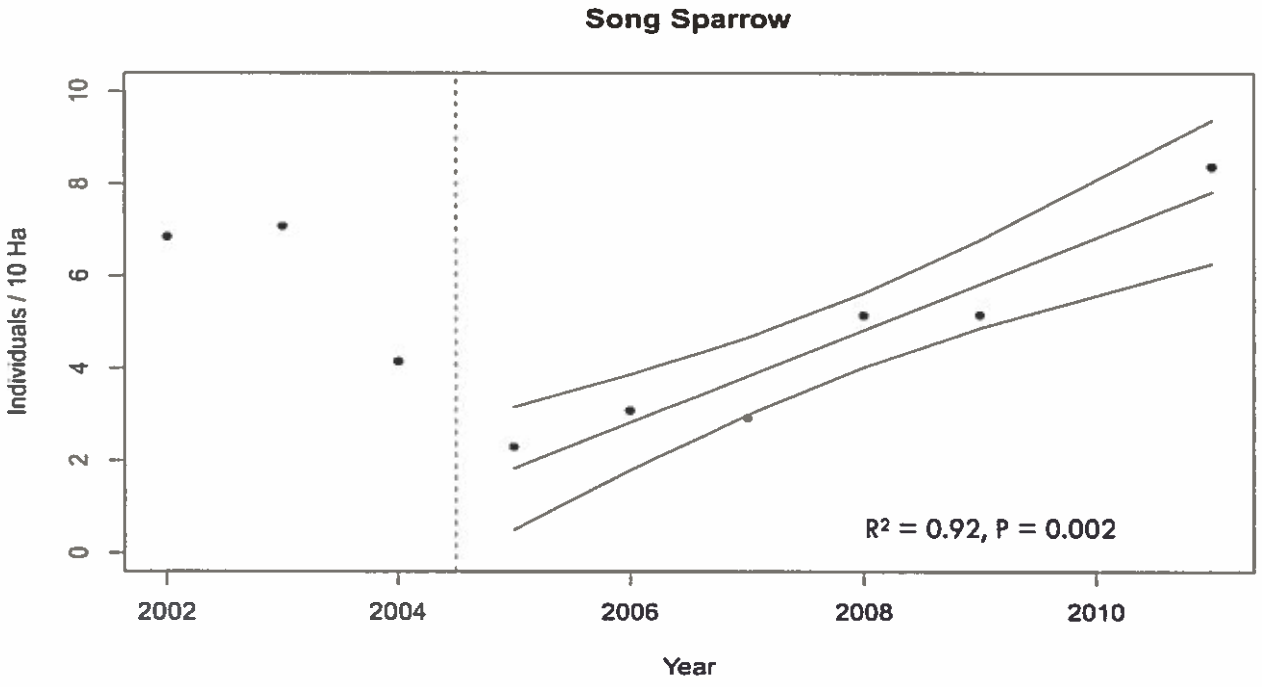

Figure 1. Abundance trend and 95% confidence bands for Song Sparrow at Hocker Flat, 2002 - 2011. The trend is estimated only for the years following site construction to investigate bird response to new vegetative growth. The vertical dashed line marks the year of construction. (Figure from Ausprey et al. 2012.)