

## WCFO Field Report

From: Robert Dobbs and Christian Edwards

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Subject: Southwestern Willow Flycatcher Monitoring, May-August 2012

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### INTRODUCTION

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*; hereafter flycatcher) is an obligate riparian bird that occurs patchily along rivers and streams throughout much of the southwestern U.S. from April through September. Females build small open-cup nests, which are typically placed in the fork of small-diameter vertical branches, 2-7 m above the ground. Successful flycatchers typically produce a single clutch per year, but will occasionally produce a second clutch following a successful nest. Unsuccessful flycatchers will re-nest multiple times following nest failure. The flycatcher was federally listed as endangered in 1995 due to declining populations caused primarily by the loss and modification of its breeding habitat (USFWS 1995). The current flycatcher population consists of approximately 1000 known pairs, and an estimated population size of 1200 pairs (USFWS 2002). Three to 11 pairs breed along the Virgin River in St George, Utah (Day 2003).

Breeding habitat is characterized by a mosaic of relatively dense tree and shrub growth, typically in association with surface water or saturated soil, interspersed with more open areas, open water, or shorter, sparser vegetation along rivers, streams, or other wetlands. Plant species composition, vegetation height and density, and patch size vary greatly, but most occupied sites typically consist of dense vegetation in the interior of the patch and within 3-4 m of the ground (Sogge and Marshall 2000, USFWS 2002). Flycatchers historically nested primarily in willows (e.g., *Salix exigua*, *S. gooddingii*), buttonbush (*Cephalanthus occidentalis*), and seepwillow (*Baccharis salicifolia*), but now also nest in thickets dominated by tamarisk (e.g., *Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*). Because habitat loss and degradation are the main factors contributing to the decline of the species, the Southwestern Willow Flycatcher recovery plan emphasizes the increase and improvement of breeding habitat through restoration of native breeding habitat and the management of exotic vegetation (USFWS 2002).

Utah Division of Wildlife Resources (UDWR) continued long-term population monitoring in 2011 by conducting presence-absence surveys at known and potential breeding sites, and at planned future restoration project sites. In coordination with the Virgin River Program, UDWR also continued monitoring breeding productivity for a fourth year in 2011. Associated with nest monitoring, UDWR sampled habitat at successful and unsuccessful nest sites and at randomly selected sites within occupied habitat patches. Toward the goal of recovering the St George flycatcher population, UDWR will use these data to refine ongoing riparian habitat restoration activities to benefit Southwestern Willow Flycatchers specifically. Two observers (Dobbs and Edwards) collected all data.

### METHODS

#### *Population Size and Distribution*

We conducted presence-absence surveys at five previously occupied breeding sites (Seegmiller Marsh, Riverside Marsh, Riverside East, Snipe Pond, and River Road Bridge), at two potential breeding sites (Y-Drain Marsh, Schmutz Drain), and at three restoration project sites (Above Washington Fields Diversion, Below Washington Fields Diversion, Mad Dog Pond) along the Virgin River in Washington Co., Utah. We followed the standardized Southwestern Willow Flycatcher survey protocol (Sogge et al. 2010), conducting one survey during each of three survey periods (15-31 May, 1-24 June, and 24 June-17 July) at sites where restoration work is not

currently planned. At sites where restoration projects are planned, we conducted one survey during the first survey period and two surveys during each of the latter two survey periods. Prior to attempting surveys we used aerial photographs to delineate survey areas and to identify survey routes providing adequate coverage of the area. During surveys we walked survey routes, stopping every 20-30 m. At each stop we first looked and listened for flycatchers for 1-2 min, after which, if a flycatcher was not detected, we broadcast 20 sec of flycatcher song, and then again looked and listened for responding flycatchers.

#### *Reproductive Success*

We attempted to locate and monitor all active flycatcher nests throughout the 2011 breeding season following standard methods (Martin et al. 1997, Rourke et al. 1999). We searched for nests primarily by observing adult behavior and systematically searching vegetation. We generally checked nests every three to four days, but increased nest check frequency to every one to two days in anticipation of nest stage transitions. We monitored nests from a distance when possible, but approached nests closely to observe nest contents and thus determine nest stage transition dates, clutch size, hatching success, and nest fate.

#### *Breeding Habitat and Nest Site Characteristics*

During mid-late August, following flycatcher departure from breeding territories, we sampled vegetation associated with nests active in 2012. We used standard methods (Martin et al. 1997) to quantify ground cover, canopy cover, canopy height, foliage height density and shrub-sapling stem density within a 5-m radius plot, and tree density within an 11.3-m radius plot centered on nest sites (use plots) and randomly selected sites (nonuse plots). We also measured distance to nearest canopy gap, distance to nearest water, and a number of nest site characteristics (e.g., nest height, nest substrate height).

#### *Banding and Re-sighting*

Toward the goal of understanding flycatcher demography, SWCA Environmental Consultants (Flagstaff, Arizona; hereafter SWCA) maintains a long-term banding program throughout much of the Lower Colorado River Recovery Unit, including the St George study area (McLeod and Koronkiewicz 2009). We thus attempted to re-sight color-banded flycatchers returning or dispersing to breeding sites along the Virgin River throughout the 2012 breeding season.

## RESULTS AND DISCUSSION

#### *Population Size and Distribution*

Ten flycatcher territories, distributed among five breeding areas in the St George study area (Riverside Marsh, Riverside East, Seegmiller Marsh, Y-Drain Marsh, and Snipe Pond), were occupied in 2012 (Figure 1). This represented an ongoing decline in the number of active territories since 2008-2009, when effects of tamarisk leaf beetles were first apparent at flycatcher breeding areas. The overall decline has been driven primarily by sharp declines at Riverside Marsh and Seegmiller Marsh, which are dominated by tamarisk (e.g., *Tamarix ramosissima*) (Figure 1). This overall decline has been offset to some degree by increases at Riverside East, Snipe Pond, and Y-Drain Marsh, which are more mixed tamarisk and coyote willow (*Salix exigua*). Although, as in 2011, lower Seegmiller Marsh and River Road Bridge remained vacated in 2012, the overall number of female flycatchers in the St George study area (10) remained similar to 2008-2011 levels (Figure 2). Thus, although the number of territories has decreased since tamarisk leaf beetles began degrading tamarisk-dominated habitat in the St George study area (2008-2009), the number of breeding female flycatchers has not changed.

#### *Reproductive Success*

We monitored a total of 19 active nests (i.e., with confirmed flycatcher eggs or nestlings) in 2012 (Table 1). We located nine additional nests that were constructed and immediately abandoned or relocated by the female prior to confirmation of egg-laying; these nests were not included in nest success calculations or subsequent monitoring activities (e.g., vegetation sampling). Six females had seven successful nests, producing a total of 14 fledglings (Table 1). Two females were successful with their first nest attempts, and four were successful with re-nest attempts following nest failure. Two of these six females attempted a second nest after fledging a successful nest. Four females failed to breed successfully, despite multiple nest attempts.

Of the 12 unsuccessful nest attempts, five nests (42 %) failed due to nest predation, five nests (42 %) failed due to parasitism by Brown-headed Cowbirds (*Molothrus ater*), one nest (8 %) failed to hatch, and one nest (8 %) failed when an American Beaver (*Castor canadensis*) cut down the nest tree. Average daily survival rate of flycatcher nests in 2012 was similar to that observed during the 2009-2011 (i.e., post-beetle) period (Figure 3). Based on these data, there was a 29.4 % probability of a flycatcher nest surviving to fledge at least one young flycatcher (Mayfield survival probability), similar to 2009-2011 (Figure 4). Apparent nest success was 36.8 % (7/19 active nests successfully fledged at least one young flycatcher).

#### *Nest Site Characteristics and Microhabitat*

In 2012 flycatchers built eight active nests in tamarisk and 11 in coyote willow. Use of tamarisk as a nest substrate has not changed among the five years of this study (2008-2012), but use of willow increased dramatically between 2009 and 2010-2012 (Figure 5), likely as a result of flycatchers shifting from tamarisk-dominated breeding areas to more mixed tamarisk-willow breeding areas.

#### *Banding and Re-sighting*

Five adult flycatchers that were banded in previous years maintained breeding territories in the St George study area during 2012 (Table 2). The female XX:GWG(M) re-sighted (breeding) at Riverside Marsh in 2012, and previously in 2011, was originally banded as a breeding adult at Riverside Marsh in 2010. The male TQ:OD(M) re-sighted (breeding) at Riverside East in 2012, and previously in 2011, was originally banded as a breeding adult at Seegmiller Marsh in 2009, and was subsequently re-sighted (breeding) at Snipe Pond in 2010. The male DD(M):TQ re-sighted at Snipe Pond in 2012 was originally banded as a nestling at Riverside Marsh in 2010; this bird's status and location in 2011 is not known. The male OO(M):TQ re-sighted (breeding) at Snipe Pond in 2012 was originally banded as a breeding adult at Snipe Pond in 2011. The female RO(M):XX re-sighted (breeding) at Snipe Pond in 2012, and previously in 2010 and 2011, was originally banded as a nestling at Mesquite West in 2009; this bird disappeared after two failed nest attempts in 2012. SWCA did not band any flycatchers in the St George area in 2012.

#### LITERATURE CITED

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Table 1. Numbers of active nests, nests parasitized by Brown-headed Cowbirds, nests failed, nests successful, and total fledglings produced by Southwestern Willow Flycatchers at occupied breeding sites along the Virgin River in St George, Washington Co., Utah in 2012.

| Site               | Active nests <sup>1</sup> | Parasitized nests | Failed nests | Successful nests <sup>2</sup> | Total fledglings |
|--------------------|---------------------------|-------------------|--------------|-------------------------------|------------------|
| Seegmiller Marsh   | 1                         | 0                 | 0            | 1                             | 2                |
| Y-Drain Marsh      | 4                         | 0                 | 2            | 2                             | 4                |
| Riverside Marsh    | 5                         | 3                 | 4            | 1                             | 1                |
| River Road Bridge  | 0                         | 0                 | 0            | 0                             | 0                |
| Riverside East     | 2                         | 2                 | 1            | 1                             | 3                |
| Snipe Pond         | 7                         | 4                 | 5            | 2                             | 4                |
| All sites combined | 19                        | 9                 | 12           | 7                             | 14               |

<sup>1</sup> Nests with confirmed Southwestern Willow Flycatcher eggs or nestlings.

<sup>2</sup> Nests producing  $\geq 1$  fledgling.

Table 2. Previously-banded Southwestern Willow Flycatchers re-sighted at breeding sites along the Virgin River in St George, Washington Co., Utah in 2012.

| Site            | Territory # | Sex <sup>1</sup> | Color-band combination <sup>2</sup> |
|-----------------|-------------|------------------|-------------------------------------|
| Riverside Marsh | 2           | F                | XX:GWG(M)                           |
| Riverside East  | 1           | M                | TQ:OD(M)                            |
| Snipe Pond      | 3           | M                | DD(M):TQ                            |
| Snipe Pond      | 2           | M                | OO(M):TQ                            |
| Snipe Pond      | 2           | F                | RO(M):XX                            |

<sup>1</sup> Sex: M = male, F = female, U = unknown.

<sup>2</sup> Color-band codes: EE = electric yellow federal band, PU = pumpkin federal band, TQ = turquoise federal band, XX = standard silver federal band, (M) = metal pin striped band, R = red, O = orange, Y = yellow, G = green, D = dark blue, B = light blue, V = violet, W = white, K = black, Z = gold. Color combinations are read as the bird's left leg and right leg, top to bottom.

† Right leg un-banded. Bird appeared uninjured, suggesting that band fell off.

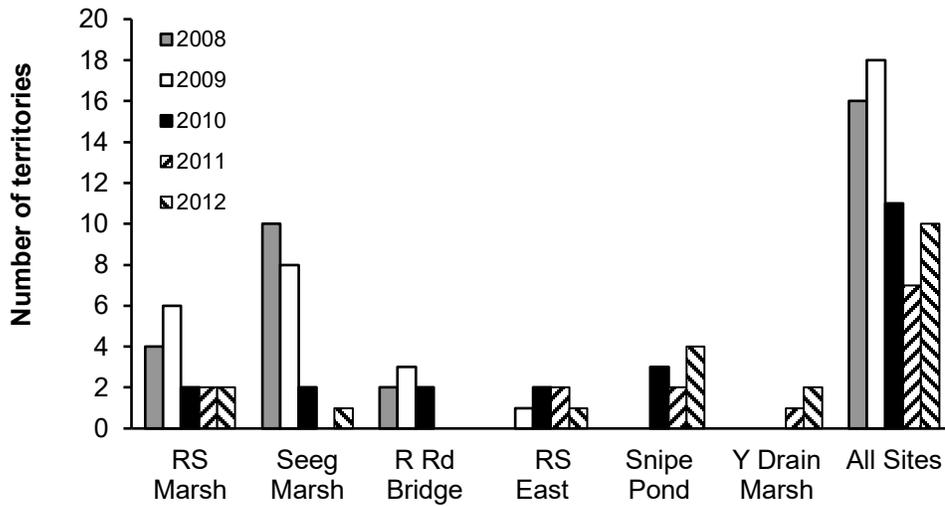


Figure 1. Number of Southwestern Willow Flycatcher territories (males exhibiting territorial behavior beyond 31 May) among years (2008-2012) at six breeding sites, and overall, along the Virgin River in St George, Washington Co., Utah. Breeding site abbreviations refer to Riverside (RS) Marsh, Seegmiller (Seeg) Marsh, River Road (R Rd) Bridge, Riverside (RS) East, Snipe Pond and Y-Drain Marsh.

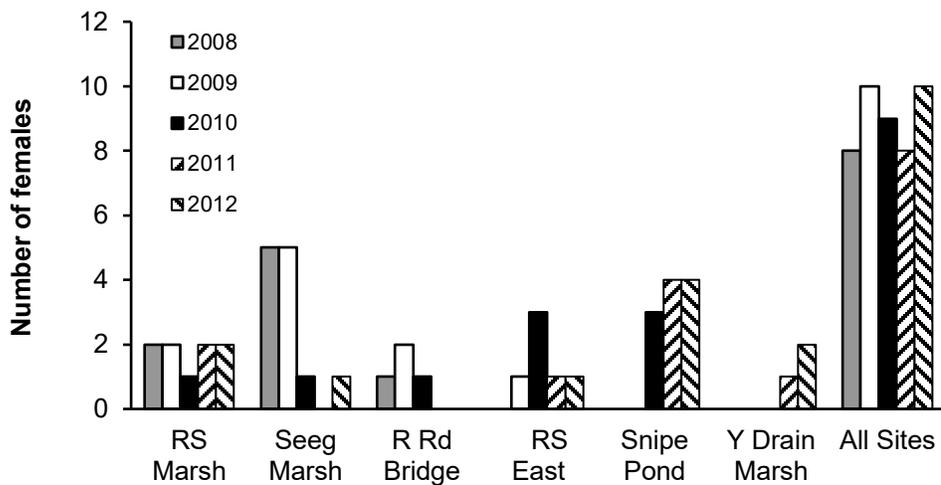


Figure 2. Number of confirmed Southwestern Willow Flycatcher breeding pairs among years (2008-2012) at six breeding sites, and overall, along the Virgin River in St George, Washington Co., Utah. See Figure 1 for breeding site abbreviations.

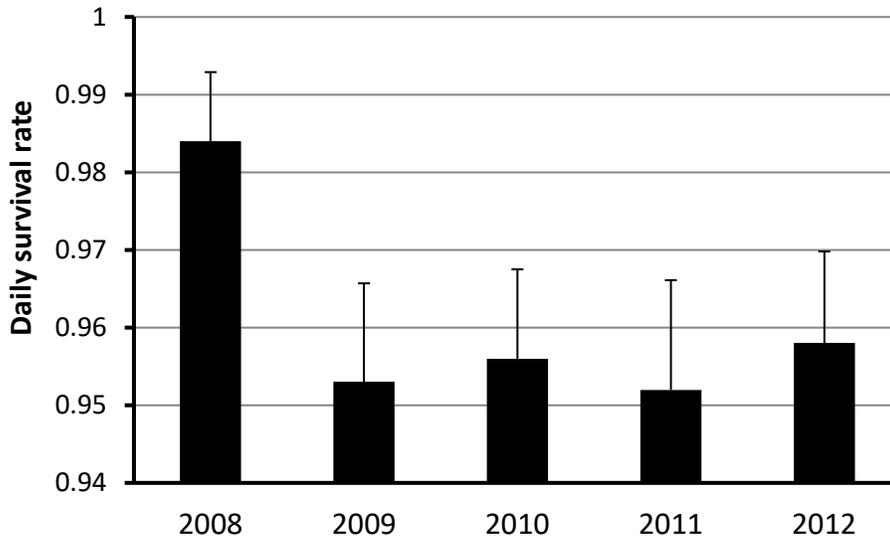


Figure 3. Mean ( $\pm$  SE) daily survival rate of active Southwestern Willow Flycatcher nests along the Virgin River in St George, Utah, 2008-2012.

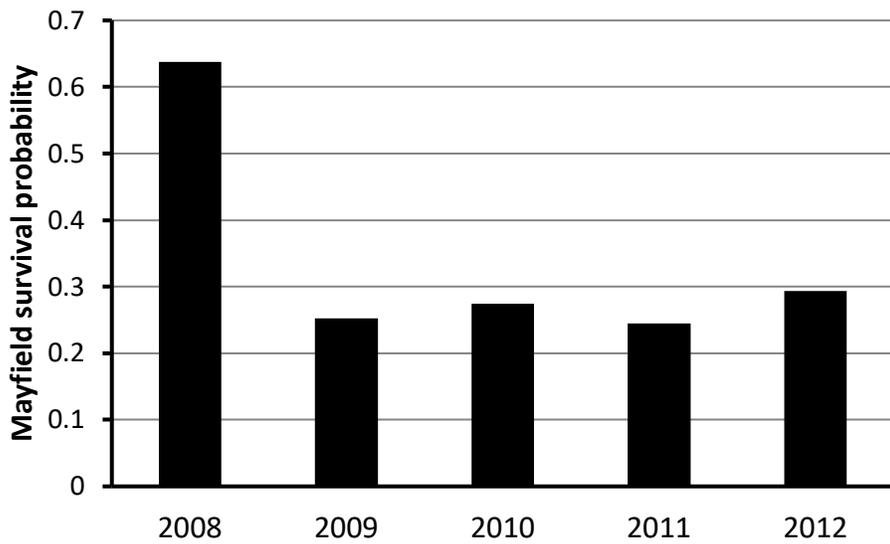


Figure 4. Mayfield survival probability of active Southwestern Willow Flycatcher nests along the Virgin River in St George, Utah, 2008-2012.

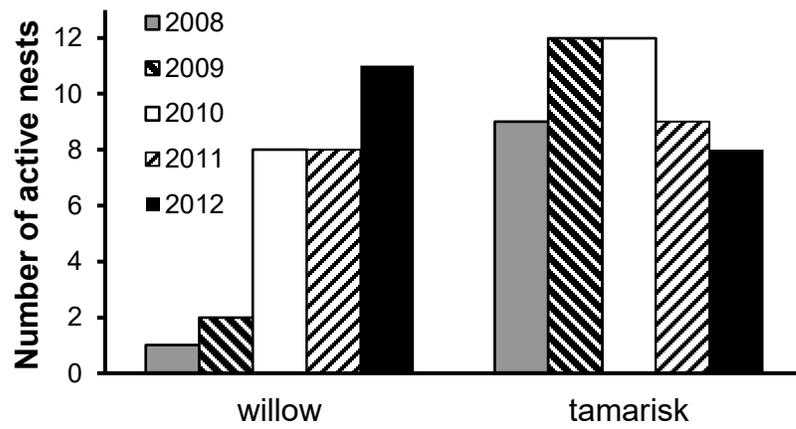


Figure 5. Number of Southwestern Willow Flycatcher nests built in coyote willow and tamarisk among years (2008-2012) along the Virgin River in St George, Utah.