

# VIRGIN RIVER RESOURCE MANAGEMENT RECOVERY PROGRAM

## 2009 ANNUAL REPORT

**Project Title: 2009 Southwestern Willow Flycatcher Nest Monitoring Study**

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### **Project Summary:**

In 2005 the Virgin River Resource Management and Recovery Program (Program) incorporated oversight of Utah recovery activities for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*; hereafter flycatcher). This subspecies of the migratory Willow Flycatcher breeds exclusively in dense riparian vegetation along rivers, streams, and other wetlands of the southwestern U.S. Declining flycatcher populations and the loss and degradation of riparian habitats were primary factors leading to the flycatcher's listing as endangered in 1995 (USFWS 1995, 2002). In Utah breeding flycatchers are found along the main-stem Virgin River at a number of locations near St. George in Washington County, as documented by the Utah Division of Wildlife Resources (UDWR; Day 1999, 2005). This area includes designated critical habitat for the flycatcher (USFWS 2005). In 2008 and 2009 the Program funded UDWR to monitor breeding activity and reproductive success, with the primary objectives as follows:

- A. Locate and monitor flycatcher nests to determine reproductive success and factors contributing to failure
  - 1. Locate breeding pairs and specific nest sites
  - 2. Monitor breeding pairs to document breeding phenology
  - 3. Monitor nests to quantify hatching success and fledging success
  - 4. Determine causes of nest failure, if possible
- B. Quantify habitat characteristics of nest sites

The primary goal of the Program is to “implement actions to recover, conserve, enhance, and protect native species,” in part through the “enhancement of riparian and 100-year floodplain habitat” (UDNR 2002). This project addresses Program needs by identifying factors limiting flycatcher reproductive success and by elucidating the relationship between reproductive success and breeding habitat characteristics. Understanding these variables will allow the Program to identify and implement riparian habitat restoration efforts that will specifically benefit Southwestern Willow Flycatchers.

**Project Status/Anticipated Date of Completion:**

Beginning mid-May 2008, Riverside Marsh, River Road Bridge, and Seegmiller Marsh were surveyed following the Arizona Game and Fish Department's (AGFD) presence-absence survey protocol (Sogge et. al. 1997). In 2009, the same areas were again surveyed along with three additional areas: Riverside East, Snipe Pond, and Schmutz Drain. During both years, once active territories were located, nests were located and monitored using AGFD nest survey protocols (Rourke 1999). When territories were no longer active, vegetation data was collected following standardized sampling outlined in the BBIRD Field Protocol (Martin et al. 1997). Additional habitat features were measured, including distance to water and distance to various human disturbances. This study is planned for three years (2008-2010) to obtain more complete data regarding nesting success and habitat requirements of Southwestern Willow Flycatchers along the Virgin River in Washington County, Utah.

**Accomplishments/Recommendations/Results:**

In 2008, sixteen flycatcher territories occupied by territorial males were identified, within three breeding areas (Seegmiller Marsh, Riverside Marsh, and River Road Bridge). Pairs were confirmed in nine of these territories. Eight pairs constructed nests that were located and monitored, and two of these pairs built new nests upon the successful completion of their first nest, resulting in a total of ten nests that were monitored in 2008 (Table 1). If nests were located at nestling stage, clutch size was assumed to be the number of chicks present at time of detection. In 2008 average clutch size ( $\pm$  SD) was  $2.5 \pm 0.5$  eggs ( $n = 25$  eggs from 10 nests), average number of successful fledglings was  $1.7 \pm 1.3$  young ( $n = 17$  young from 10 nests). Two nests failed at the egg stage, and one nest failed at the nestling stage. Causes of nest failures were not determined, but no obvious signs of predation were observed. The nest that failed during the nestling stage had three nestlings that failed to survive; by day 10 after hatching, one chick had disappeared, and the remaining two chicks appeared to be 5 and 6 days old, respectively, when removed from the nest for banding. Those nestlings disappeared between days 10 and 14 after hatching.

Two nests were parasitized by brown-headed cowbirds (*Molothrus ater*) in 2008, one of which included a nest that failed or was abandoned during the egg stage. The other parasitized nest contained two flycatcher eggs, one of which failed to hatch, along with the cowbird egg. One nest failed during the egg stage, possibly because of a storm, but the true cause is unknown. In total, seventeen chicks were presumed to have fledged successfully based on nestling age when last observed in the nest, as well as adult behavior during subsequent visits. Seven fledglings were observed after fledging, confirming success of those nests (Table 2).

**Table 1: Number of southwestern willow flycatcher occupied territories, confirmed breeding pairs, and active nests monitored by breeding area along the Virgin River, Washington County, UT in 2008 and 2009.**

Breeding Area	2008			2009		
	Territories	Confirmed Pairs	Active Nests	Territories	Confirmed Pairs	Active Nests
Riverside Marsh	4	2	3	6	2 <sup>2</sup>	3
Seegmiller Marsh	10	5	6	8	5	8
River Road Bridge	2	1	1	3	2	6
Riverside East	Not monitored	Not monitored	Not monitored	1	1	1
Schmutz Drain	Not monitored	Not monitored	Not monitored	1 <sup>1</sup>	0	0
Snipe Pond	Not monitored	Not monitored	Not monitored	0	0	0
<b>Total</b>	<b>16</b>	<b>8</b>	<b>10</b>	<b>19</b>	<b>10</b>	<b>18</b>

<sup>1</sup> – Likely migrant

<sup>2</sup> – One male paired with two nesting females

In 2009, 15 territories that were active in 2008 were active again. Three nests were built in the same tree as a 2008 nest, and at least one female returned to the same territory that she used in the previous year. The average clutch size was  $2.4 \pm 1.1$  ( $n = 36$  eggs from 18 nests). The average number of successful fledglings was down to  $0.1 \pm 0.4$  young per nest with eggs ( $n = 2$  young from 15 nests with eggs). Three nests built by the same female were abandoned before eggs were laid, apparently due to cowbird harassment, and on her fourth nest attempt the nest was parasitized. Four additional nests were parasitized by cowbirds, one of which failed to hatch either cowbird or flycatcher eggs. Five additional nests that did not contain cowbird eggs failed to hatch, and three nests with eggs and four with nestlings were depredated by an unknown predator. Two nests fledged successfully, one of which was from a parasitized nest where the cowbird egg failed to hatch.

**Table 2: Summary of 2008 and 2009 southwestern willow flycatcher nesting results by breeding area, Virgin River, Washington County, UT.**

Breeding Area	2008				2009			
	Total Nests with Eggs	Number of Nests Parasitized	Number of Nest Failures	Total Fledged	Total Nests with Eggs	Number of Nests Parasitized	Number of Nest Failures	Total Fledged
Riverside Marsh	3	1	1	3	3	0	3	0
Seegmiller Marsh	6	0	1	13	8	2	7	1
River Road Bridge	1	1	0	1	3	2	3	0
Riverside East	-	-	-	-	1	1	0	1
<b>Total</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>17</b>	<b>15</b>	<b>5</b>	<b>13</b>	<b>2</b>

In 2008 nine nests were built in tamarisk (*Tamarix ramosissima*) and one nest was built in coyote (narrowleaf) willow (*S. exigua*), and in 2009 12 nests were built in tamarisk, two in coyote willow, and one in Russian olive (*Elaeagnus angustifolia*). In 2008 80% ( $n = 8$ ) of nests were built within 20 m of water or saturated soil, and in 2009 67% ( $n = 10$ ) and 93% ( $n = 14$ ) of nests

were built within 20 m and 30 m, respectively, of water or saturated soil. For all but one nest, the closest water was an inflow to the Virgin River, backed up into marshy areas and small ponds created by beaver activity. Tamarisk was the most abundant woody species at breeding sites based on stem counts within an 11.3-m radius of each nest, except for one nest in 2008 and three nests in 2009 where the most abundant species within the 11.3-m plot was coyote willow.



**Figure 1 Adult female banded as nestling in 2001, at Pahranaagat National Wildlife Refuge**

Two previously banded adults were re-sighted in 2008. One female was uniquely color banded in 2004 along the Virgin River, just upstream of Lake Mead, by SWCA Environmental Consultant workers in cooperation with the U.S. Bureau of Reclamation. An adult male was also previously banded as a nestling, with an orange anodized federal band during the same study. These two individuals returned to the same territories in 2009 and an adult female was re-sighted that had been banded as a nestling in 2001, at Pahranaagat National Wildlife Refuge.

Five nestlings were banded opportunistically in 2008 with the assistance of SWCA Environmental Consultant personnel. Two of these nestlings, however, were under-developed and did not survive to fledging. In 2009, two of the nestlings banded in 2008 were re-sighted, one in the Washington County study area (a female that nested successfully at Riverside East) and the other in Nevada (reported by SWCA crews). Five chicks were banded in 2009, all of which vanished from the nest before old enough to fledge. Four adult males and one adult female were mist-netted and banded, and the eight-year old female was recaptured and her worn bands replaced.

Tamarisk beetles (*Diorhabda elongata*) defoliated tamarisk during the breeding seasons of 2008 and 2009. Monitoring defoliation and refoiliation events were beyond the scope of this study and not quantified. Canopy density was not measured prior to or during defoliation events, and baseline nesting success or vegetative conditions were not measured in years prior to significant beetle activity. Effects of tamarisk beetle defoliation on flycatcher nesting success are thus unknown.

**UDWR recommends:**

- 1) *Continue monitoring nest success of Southwestern Willow Flycatchers.*
- 2) *Continue quantifying habitat characteristics associated with flycatcher nests (occupied suitable habitat).*
- 3) *Quantify habitat characteristics at randomly-located sites within unoccupied suitable habitat.*

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