



## **Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2012**

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# Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2012

## INTRODUCTION

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*; hereafter references to Willow Flycatcher and flycatcher refer to *E. t. extimus* except where specifically noted) is an endangered bird that breeds only in dense riparian habitats in six southwestern states (Arizona, New Mexico and southern portions of California, Colorado, Nevada, and Utah,). Since 1993, thousands of flycatcher surveys have been conducted, and many new flycatcher breeding sites located. This document synthesizes information available through 2012 on all known Southwestern Willow Flycatcher breeding sites. The range-wide database that is the basis for this summary report had not been updated since 2007 (Durst et al. 2008) and information presented herein includes data from surveys conducted at many sites since the 2007 update.

This rangewide data synthesis was designed to meet these objectives:

- 1 – identify all known Southwestern Willow Flycatcher breeding sites, and
- 2 – assemble data to estimate population size, location, habitat, and other information for all breeding sites, for as many years as possible, from 1993 through 2012.

This report provides data summaries in terms of the number of flycatcher sites and the number of territories. When interpreting and using this information, the following must be kept in mind:

**A site** is a geographical location where one or more Willow Flycatchers establishes a territory. Sites with unpaired territorial males are considered breeding sites even if no nesting attempts were documented. A site is often a discrete patch of riparian habitat but may also be a cluster of riparian patches; there is no standardized definition for site and its use varies within and among states. For example, five occupied habitat patches along a 10 km stretch of river might be considered five different sites in one state, but only a single site in another state. This lack of standardization makes comparisons based on “site” problematic. For this report, I generally deferred to statewide summary documents or to local managers and researchers when delineating a site for inclusion in the database. However, there are cases where I considered adjacent and near-by statewide sites as a single site for the purpose of this data summary, primarily for simplicities sake in the range-wide database. Any lumping or splitting of sites at the range-wide level is done on a case-by-case basis. It is also worth noting that the spatial extent and precise location of a “site” is not necessarily consistent through time. As suitable habitat that is surveyed changes through time, the geographical location of a site may shift. However, latitude and longitude data for sites typically reflects its initial survey extent. Site locations in the

range-wide database should be considered approximate. Due to differences in site definitions, one should not evaluate the relative importance of a geographic region (drainage, watershed, state, etc.) based simply on the number of flycatcher sites.

**A territory** is an exclusive defended area within a breeding site. Although detailed monitoring studies have identified unpaired territorial males and/or polygynous males at some flycatcher breeding sites, for the purposes of this report a territory is roughly equivalent to a pair of flycatchers.

In general the concept of “territory” is more similar among states and different investigators than is the term “site”, thus it is a more robust unit to use for summaries and comparisons. However, keep in mind that the definition of a polygynous territory is not consistent among states; a male polygynously paired with two females would be considered one territory in some states and two territories in other states. For each site, I referred to reports or spoke directly with researchers and managers to gather information such as management entity/agency, location (state, drainage, elevation), gross habitat type (native, exotic, or mixed; dominant tree species), and number of flycatcher territories.

Synthesizing the information on more than 300 breeding sites is challenging because annual data collection and survey reporting requirements are not standardized range-wide, and the nature and degree of readily available information varied widely from state to state. The lack of consistent reporting can make it difficult to determine precise survey locations, compare locations between years, standardize site names, and evaluate site-specific characteristics. It also introduces long delays in access to basic site and population information. While consistent survey reporting requirements range-wide would help to alleviate these issues, establishing state-wide databases that cross-reference sites with the range-wide database would greatly aid the compilation of range-wide data. While Arizona, California, and New Mexico have instituted state-wide databases, Arizona’s has not been updated since the 2010 breeding season surveys and Colorado, Nevada, and Utah do not have state-wide databases and their survey data is compiled at the range-wide level.

This report includes the most recent survey data from all known flycatcher breeding sites between 1993 and 2012 (see Appendix 4). Only sites where at least one flycatcher territory has been detected are included in the range-wide database (i.e., sites where territories were never detected are not included). In general, the territory numbers from a particular site presented herein are based on survey data from the most recent year during which surveys were conducted, whether flycatchers were detected or not. Therefore, data from 243 sites that were not surveyed in 2012 are still included in the site and territory summaries if they had territorial flycatchers during one or more years since 1993. This report does not include sites where only migrant Willow Flycatchers were detected or no territorial Southwestern Willow Flycatchers were ever detected.

This report also includes sites that at some time since 1993 had territorial Southwestern

Willow Flycatchers, but as of the most recent survey have zero territories. I considered these sites unoccupied but continue to include them in data summaries based on the most recent surveys conducted at these sites. Sites considered unoccupied in one year may be recolonized by territorial flycatchers in subsequent years and I do not imply any regulatory or permanent designation in calling a site unoccupied.

Additional Considerations in Using and Interpreting the Data in this Report: I used data from a wide variety of sources, and the amount of information and level of detail varied greatly among sites. Because survey methodology and effort varied among sites and/or between years, these summary data should be interpreted and used keeping this variation in mind. Following is a discussion of cautions to consider when using these data.

Recency of survey data: Territory numbers presented in this report are based on most recent survey conducted at a site. For sites not surveyed in 2012, territory totals are from surveys conducted from 1993-2011 (Table 1). Using past survey data for current range-wide population estimates likely introduces error because the assumption that flycatcher territory size is constant through time is not valid. Riparian habitat in the Southwest is dynamic and because Southwestern Willow Flycatcher rely on this habitat for breeding, their response to a changing environment is also dynamic (Paxton et al. 2007).

The number of territories detected in a given year is the best estimate for the range-wide flycatcher population in that year (see *Population estimates* below). However, using territory totals from surveys in past years likely increases the uncertainty in current range-wide population estimates. In order to understand the current range-wide flycatcher population, all known sites should be surveyed in all years. While funding limitations make it impossible to conduct such wide-spread surveys, perhaps annual survey effort could be prioritized to survey those sites that have not been recently surveyed. Additionally, regular surveys at large Southwestern Willow Flycatcher breeding sites (i.e., those with many territories) are important because these sites represent a disproportionately large portion of the range-wide total population (Figure 2). Identifying new or changing flycatcher breeding sites through reconnaissance and modelling efforts (Hatten and Paradzick 2003, Hatten et al. 2010) could also be useful to prioritize future survey efforts. Alternatively, developing rules to guide how results from past surveys are interpreted (e.g., only include survey results less than three years old) or a range-wide occupancy model (MacKenzie et al. 2005) to provide estimates for non-surveyed sites could be useful.

Subspecies status of each site: The sites entered into this database all fall within the geographic range of the southwestern subspecies (*E.t. extimus*), as defined by Unitt (1987), Browning (1993), Sogge et al. (1997), and USFWS (2002). Earlier studies of flycatcher genetics (e.g., Paxton 2000) and song patterns (e.g., Sedgwick 2001) support a more southerly northern range

boundary for *E.t. extimus* than was used for the 1999 range-wide version of this summary (Sogge et al. 2000) and in the Southwestern Willow Flycatcher Recovery Plan (2002) but recent work suggests the current northern boundary is generally appropriate but that delineating a precise boundary is difficult (Paxton et al. 2008). Future research may provide more insight into subspecies range boundaries; therefore, sites may eventually be removed from management as *E.t. extimus*, and/or new geographic areas and sites could be added. This should be considered when producing updates in future years, and when making range-wide comparisons among years.

Population estimates: Population estimates are just that – **estimates**. Their accuracy and precision vary with survey effort, survey intent, surveyor experience, habitat density, flycatcher behavior, and even background noise levels. The population estimates reported for a site are generally the minimum number of flycatchers that are likely present based on the overall survey results; i.e., if surveyors suspected 12 to 14 flycatchers, the lower (more conservative) number was used. Although estimates may be very accurate for some intensively surveyed sites, I have no method to standardize accuracy across surveys; therefore the overall statistics presented in this report should be recognized as approximate.

I sincerely thank the many people who generously provided information from the sites they were surveying and monitoring (see following sections listing data sources and contacts and acknowledgements). Every effort was made to locate and include all survey information for every known Southwestern Willow Flycatcher breeding site; however, due to delays in reporting for some sites, some 2012-season survey information may not have been included in the version of the range-wide database used to generate summaries presented in this report. Updated information from 1993-2012 and new surveys conducted since 2012 will be incorporated in future range-wide reports.

## DATA SUMMARIES

### **Changes in the number of known sites and territories: estimated versus surveyed**

Since 1993, extensive survey effort in Arizona, California, Colorado, Nevada, New Mexico, and Utah has greatly increased the number of known breeding sites and territories. In 1993, there were 41 known sites with 140 territories; in 2012 I estimated 1629 territories at 308 known sites (Figure 1). This increase should NOT be interpreted entirely as a Southwestern Willow Flycatcher population increase. Rather, it is to a great extent a function of increased survey effort over time and using the territory estimate from the most recent survey results for sites not surveyed in the year of interest. Although population increases and decreases have occurred at some sites, movements of birds among sites and lack of standardized survey effort/reporting make it difficult to separate population trends from variances in survey effort. Determination of trends (positive or negative) can be made in only a few cases, and original data sources (e.g., reports, survey data sheets, etc.) must be consulted when trying to elucidate population trends at particular site.

Not all of the 308 sites where Southwestern Willow Flycatcher territories have been discovered over the last 20 years are surveyed every year (Figure 1). However, our compilation includes all sites where flycatcher territories have been detected since 1993, including sites that were not surveyed in 2012. Therefore the total number of sites (n=308) includes 65 that were surveyed in 2012 (only 21% of total number of sites), plus 243 that were last surveyed in 2011 or earlier. The number of sites actually surveyed each year increased from 1993 to 2001, but has been declining since then. This results in an increasing gap between the total number of sites where surveys have ever been conducted and the number of sites that are actually surveyed in a given year. Increasing numbers of sites that are not currently surveyed leads to more uncertainty in the range-wide flycatcher population status because results from past years may not represent current conditions at a given site. See the section on Recency of Survey Data (below) and Appendix 1 for additional details. The total number of sites displayed in Figure 1 is the sum of sites that were actually surveyed in a given year plus the sites that were surveyed in a previous year (i.e., the most recent year when a survey was conducted at the site). The total number of sites reported represents the number of sites included in the range-wide database that have ever had a single flycatcher territory.

For sites that were not surveyed in 2012, I used the territory numbers reported in the most recent pre-2012 survey as an estimate of the number of territories currently at that site. Thus, for sites that were not surveyed in 2012, I continue to report the number of territories from the most recent survey year. In 2012, the total number of territories (1629) includes 580 detected during the 2012 breeding season surveys, plus 1049 territories from sites that were surveyed in 2011 or before (Figure 1). As with site estimates, the trend over the last several years is for an increasing gap between the number of territories known via current surveys and the total number of territories (the

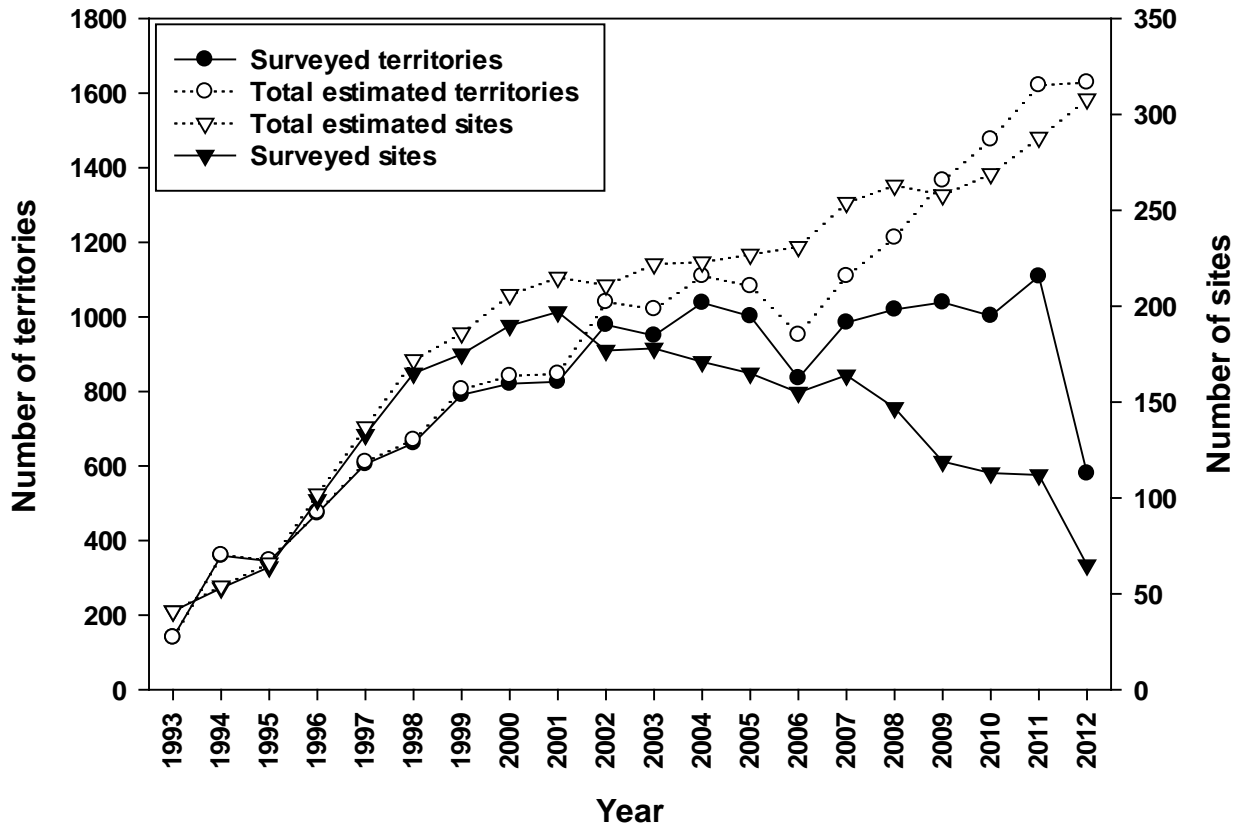
sum of territories from sites actually surveyed in a given year and the territories estimated from previous years' surveys). Using results from past surveys in the current estimate of number of range-wide territories increases uncertainty, particularly for sites that have not been surveyed for several years. The number of territories detected in a given year via actual surveys (e.g., 580 in 2012) represents the robust portion of the estimated number of total territories (e.g., 1629 in 2012) in any given year.

The total number of sites and territories presented throughout this report are based on the results of surveys actually conducted in 2012. However, the most recent survey results available were used from sites that were not surveyed in 2012. Thus, the total estimated numbers of sites and territories in any year represents the survey results in that year and data from the most recent year's results from previously surveyed sites. Limitations to this approach exist. Because surveys are not conducted at all sites in all years, it is not possible to know how many breeding Willow Flycatchers are present in a given year across all sites. Instead, the range-wide numbers of territories is a composite of surveys conducted at sites in different years, which can result in an underestimate or overestimate of the true numbers in a single year. See the section on Recency of Survey Data (below) and Appendix 1 for additional details.



**FIGURE 1.**

Number of total estimated and surveyed Southwestern Willow Flycatcher sites and territories 1993-2012. The actual number of sites surveyed (closed triangles) and the number of territories detected during those surveys (closed circles) each year is included in the total estimated number of sites and territories in that year (open triangles and open circles, respectively). The numbers for the total estimated sites and territories are based on sum of the actual survey results in a given year and the most recent survey results for sites not surveyed in a given year. For example of the 308 known sites in 2012, only 65 were actually surveyed in 2012. There were 580 flycatcher territories detected at those 65 sites in 2012 but the estimated 1629 total flycatcher territories range-wide in 2012 includes 1049 territories detected at the 243 sites not surveyed in 2012 in addition to 580 documented in 2012. Numbers of sites and territories prior to 2012 have been updated as new information has become available and may be different from past reports.



## **Recency of survey data**

As previously indicated, the information used in this report is based on the most recent available survey data for each site. However, not all sites are surveyed every year. Of the 308 sites where Southwestern Willow Flycatchers have established territories since 1993, only 65 sites were surveyed in 2012 (21% of the total sites). Most of the total estimated number of territories in 2012 is based on data from sites surveyed from 1993-2011 (64% of total territory estimate). Because 57% of know sites have not been surveyed since 2011, the territories numbers in the range-wide database for those sites is at least two-years old and the actual number of flycatcher territories at those sites is uncertain. All subsequent data presented in this report are based on the most recent survey available for a given site.

**Table 1.**

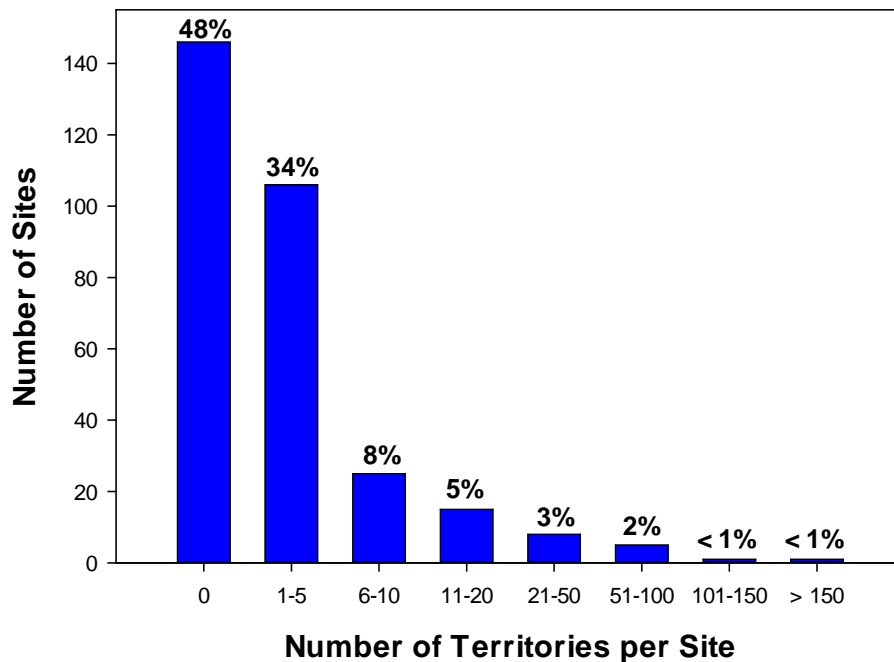
**Most recent year of survey data for Southwestern Willow Flycatcher sites and territories included in this report, as of 2012. Numbers for sites and territories prior to 2012 indicates the most recent year of survey data available for those sites. For example, there is 1 site with 2 territories that has not been surveyed since 1993 that is included in the total number of sites and territories reported herein.**

<b>Year</b>	<b>Number of Sites</b>	<b>Percent of Total Sites</b>	<b>Number of Territories</b>	<b>Percent of Total Territories</b>
1993	1	0.3	2	0.1
1994	1	0.3	0	0.0
1995	1	0.3	1	0.1
1996	1	0.3	3	0.2
1997	3	1.0	3	0.2
1998	4	1.3	6	0.4
1999	5	1.6	6	0.4
2000	2	0.6	1	0.1
2001	16	5.2	39	2.4
2002	10	3.2	10	0.6
2003	8	2.6	1	0.1
2004	10	3.2	9	0.6
2005	14	4.5	35	2.1
2006	14	4.5	9	0.6
2007	26	8.4	68	4.2
2008	23	7.5	134	8.2
2009	17	5.5	146	9.0
2010	20	6.5	40	2.5
2011	67	21.8	536	32.9
2012	65	21.1	580	35.6
Total	308	100	1629	100

**Distribution of breeding sites by number of territories**

Most Southwestern Willow Flycatcher breeding sites are small, both in terms of the number of territories (hosting five or fewer territories: Figure 4) and habitat patch size. One site surveyed in 2012 (San Marcial on the Rio Grande) accounted for 252 territories (43% of the total detected during surveys in 2012). Willow Flycatcher territories have disappeared from 147 of the 308 sites tracked since 1993 and as of the most recent survey do not have any territories (See Appendix 2 for a list of unoccupied sites). However, at some point these unoccupied sites did have at least one territory, sites with only negative Southwestern Willow Flycatcher breeding survey results are not included in the range-wide database. All but four of these sites where flycatcher territories are no longer detected as of the most recent survey were composed of five or fewer territories. The four exceptions – Colorado River inflow to Lake Mead, School House Point North on the Salt River, and Sevilleta National Wildlife Refuge and Isleta Pueblo on the Rio Grande – were larger sites where habitat was impacted by flooding and presumably persistent dry conditions, respectively. However, 91 formerly unoccupied sites have been subsequently recolonized by breeding flycatchers once the riparian habitat recovered.

**Figure 2.**  
**Number of territories at Southwestern Willow Flycatcher breeding sites, as of 2012.**



Additionally there have been instances of fire and flooding that did not result in the total loss of flycatcher breeding habitats. There were fires during the 2004 and 2005 breeding seasons in Arizona at the Gila River Kearny Sewage Ponds and San Pedro River Dudleyville Crossing sites, respectively, that may have reduced the amount of suitable breeding habitat for flycatchers at these sites but subsequent surveys indicated that these sites continue to be occupied by small yet persistent breeding populations. The inundation of Roosevelt Lake and Horseshoe Reservoir in Arizona prior to the 2005 breeding season dramatically reduced the available riparian habitat at some sites, resulting in fewer flycatcher territories being detected during 2005 breeding season surveys. Some sites inundated in 2005 have been subsequently surveyed but typically few territories have been detected compared to pre-inundation survey results. The long-term impact of fire and flooding to the riparian habitat at these breeding sites is unknown and should be examined through continued survey efforts into the future.

Not all birds at the sites where flycatcher territories are no longer detected necessarily died – some of these birds moved to other sites where they attempted to establish breeding territories. This is the case for banded flycatchers that moved from the Verde River Tuzigoot Bridge and PZ Ranch to other sites (Paxton and Sogge 1996, Paxton et al. 1997, Netter et al. 1998), plus numerous movements prior to and following the inundation of Roosevelt Lake (Causey et al. 2005). Some of these sites may eventually cycle back into occupancy by breeding flycatchers as a result of changes in habitat quality, an increase in number of nearby territories, or other unknown or undetected factors. There have been 91 sites that have been recolonized after at least one year of when no territorial flycatchers were detected indicating that unoccupied sites may be recolonized by breeding flycatchers in the future as conditions such as habitat quality become more suitable in the future. Some sites have repeatedly cycled between occupied and unoccupied status and some currently have territories while others do not.

Looking again at the size distribution of breeding sites and exclude unoccupied sites, the picture remains much the same – the majority of sites (106 of 161; 66%) have five or fewer territories. Because most of the 147 currently unoccupied sites had few territories (usually only one or two), their loss does not greatly affect the overall range-wide population or many of the statistics reported herein.

**Distribution of territories by state**

Arizona, California, and New Mexico account for the greatest number of known Southwestern Willow Flycatcher sites and territories (Table 2). Nevada, Colorado, and Utah account for less than 9% of territories, primarily because these states have few known Willow Flycatcher breeding sites occurring far enough south to fall within the range of *E.t. extimus*. Texas is absent from this table because there were no survey data or other records to shed light on current status and distribution within the state. For a version of Table 2 that includes updated estimated and surveyed numbers of sites and territories by year and state see Appendix 1.

**Table 2.**  
Number of Southwestern Willow Flycatcher breeding sites and territories by state, as of 2012.

State	Number of Sites	Percent of Total Sites	Number of Territories	Percent of Total Territories
AZ	133	43.1	679	41.7
CA	97	31.5	115	7.1
CO	11	3.6	48	2.9
NM	49	15.9	702	43.1
NV	15	4.9	75	4.6
UT	3	1.0	10	0.6
<b>TOTAL</b>	<b>308</b>		<b>1629</b>	

### **Distribution of territories by drainage**

In general I have designated a drainage name to serve as a functional unit, rather than a defined hydrological unit, as a means to summarize site and territory information. More flycatcher territories are found along the Gila River than any other major drainage (Table 3); one of the largest known populations (in the Cliff-Gila Valley, NM) contributes many of the territories within this drainage. Elsewhere in New Mexico, and in southwest Colorado, most territories are along the Rio Grande. The primary flycatcher drainages in California are the Kern, Owen's, San Luis Rey, Santa Ana, and Santa Margarita Rivers. In Arizona, most flycatchers are found along the Gila, San Pedro, and Salt River drainages. The Virgin River drainage supports the majority of flycatchers in Utah. The Virgin River and the Pahranaagat River support most of the flycatchers in Nevada. Sites along the Colorado River are in Arizona, California, and Utah. The scale of all drainages in the range-wide summary is not equivalent and the drainage naming convention is specific to a particular watershed.

**Table 3.**

**The number of Southwestern Willow Flycatcher breeding sites and territories by major river drainage, as of the 2012.**

<b>Drainage</b>	<b>Number of Sites</b>	<b>Percent of Total Sites</b>	<b>Number of Territories</b>	<b>Percent of Total Territories</b>
Big Sandy River	3	1.0	29	1.8
Bill Williams River	6	1.9	14	0.9
Colorado River	42	13.6	13	0.8
Gila River	55	17.9	591	36.3
Kern River	2	0.6	9	0.6
Owen's River	5	1.6	28	1.7
Pahranaagat River	4	1.3	37	2.3
Rio Grande	29	9.4	425	26.1
Salt River	8	2.6	42	2.6
San Luis Rey River	9	2.9	24	1.5
San Pedro River	20	6.5	187	11.5
Santa Ana River	30	9.7	18	1.1
Santa Margarita River	3	1.0	8	0.5
Tonto Creek	4	1.3	57	3.5
Verde River	7	2.3	24	1.5
Virgin River	8	2.6	50	3.1
All others*	73	23.7	73	4.5
<b>Total</b>	<b>308</b>		<b>1629</b>	

\*All others includes: Agua Fria River, Agua Hedionda, Amargosa River, Canadian River, Chama River, Hassayampa River, Las Flores Creek, Little Colorado River, Meadow Valley Wash, Mimbres River, Mojave River, Pecos River, San Diego Creek, San Diego River, San Dieguito River, San Felipe Creek, San Francisco River, San Gabriel River, San Juan Creek, San Juan River, San Mateo Creek, Santa Clara River, Santa Cruz River, Santa Maria River, Santa Ynez River, Sulphur Creek, Sweetwater River, Temecula Creek

### **Distribution of territories by Recovery and Management Unit**

I tallied the number of breeding sites and territories by Recovery Unit and Management Unit (Table 4), as defined in the Southwestern Willow Flycatcher Recovery Plan (USFWS 2002). Note that in some Management Units, the number of territories is **less than** the number of sites; this occurs where Management Units include primarily small sites, one or more of which no longer contains territorial flycatchers as of the most recent survey (i.e., unoccupied sites; see Appendix 2).

**Table 4.**

**The number of Southwestern Willow Flycatcher breeding sites and territories (as of 2012) and number of territories necessary for recovery criteria, by Recovery Unit and Management Unit.**

Recovery Unit	Management Unit	Number of Sites	Number of Territories	Recovery Criteria
<b>Basin and Mojave</b>	Owens	5	28	50
	Kern	2	9	75
	Amargosa	5	0	25
	Mojave	7	6	25
	Salton	1	0	25
	<b>TOTAL</b>	<b>20</b>	<b>43</b>	<b>200</b>
<b>Coastal California</b>	Santa Ynez	4	5	75
	Santa Clara	12	9	25
	Santa Ana	33	18	50
	San Diego	24	38	125
	<b>TOTAL</b>	<b>73</b>	<b>70</b>	<b>275</b>
<b>Gila</b>	Verde	7	24	50
	Hassayampa - Agua Fria	2	0	25
	Roosevelt	12	99	50
	San Francisco	4	8	25
	Upper Gila	26	402	325
	Gila – San Pedro	48	376	150
	Santa Cruz	1	0	25
<b>TOTAL</b>	<b>100</b>	<b>909</b>	<b>650</b>	
<b>Lower Colorado</b>	Pahrangat	6	47	50
	Virgin	7	40	100
	Little Colorado	5	9	50
	Middle Colorado	21	1	25
	Hoover - Parker	6	11	50
	Bill Williams	10	47	100
	Parker – Southern. Intl Boundary	16	1	150
<b>TOTAL</b>	<b>70</b>	<b>156</b>	<b>525</b>	
<b>Rio Grande</b>	San Luis Valley	7	40	50
	Upper Rio Grande	17	40	75
	Middle Rio Grande	9	347	100
	Lower Rio Grande	5	9	25
	Pecos	1	7	0
<b>TOTAL</b>	<b>39</b>	<b>443</b>	<b>250</b>	
<b>Upper Colorado River</b>	San Juan	5	8	25
	Powell	0	0	25
	<b>TOTAL</b>	<b>5</b>	<b>8</b>	<b>50</b>
<b>GRAND TOTAL</b>		<b>308</b>	<b>1629</b>	<b>1950</b>



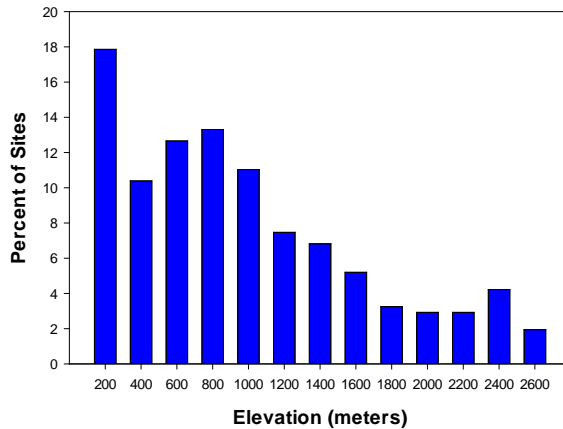


**Elevation range of breeding territories**

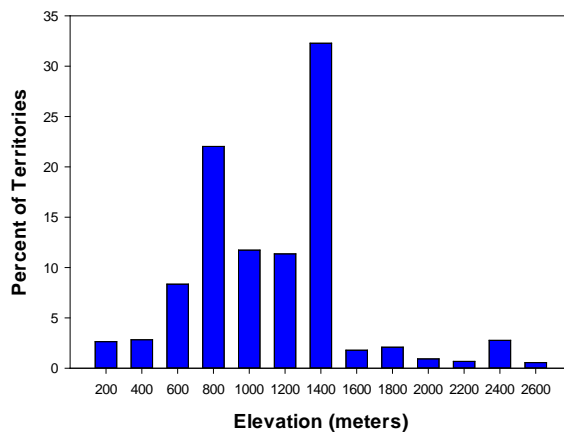
The Southwestern Willow Flycatcher is distributed over a wide elevation range. The majority of sites occur between 0 and 1000 m elevation (Figure 5a). Most territories are found between 401 and 1400 m (Figure 5b), with “spikes” at 601-800 m (the Gila/San Pedro River confluence and Roosevelt Lake in AZ) and 1201-1400 m (the Cliff-Gila Valley and San Marcial in NM). Although relatively few territories are known to occur above 2000 m elevation, Willow Flycatchers breed at three sites that are above 2500 m that had a total of 6 territories during the most recent surveys.

**Figure 5.**

**Figure 5a. The percentage of Southwestern Willow Flycatcher breeding sites located at different elevations, as of 2012 (200 = 0 - 200 m, 400 = 201 - 400 m, etc.).**



**Figure 5b. The percentage of Southwestern Willow Flycatcher territories occurring at differing elevations, as of 2012 (200 = 0 - 200 m, 400 = 201 - 400 m, etc.).**



**Use of native and exotic habitats**

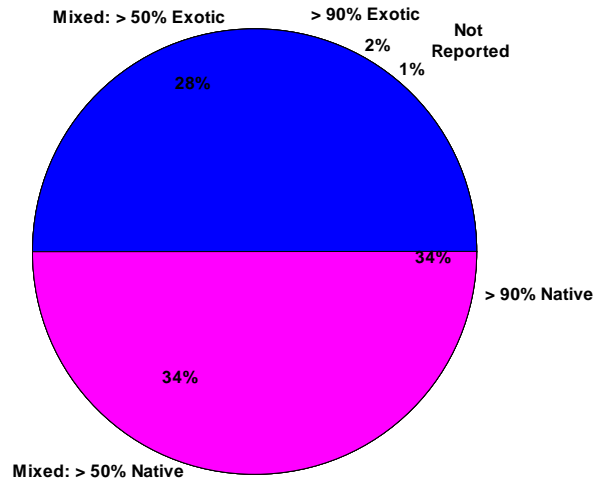
Most flycatcher breeding sites are comprised of spatially complex habitat mosaics, often including multiple patches of habitat with mixtures of both exotic and native vegetation. Within a site, territories are frequently clumped and/or distributed near the patch edge. Thus, the vegetative composition of individual territories may differ from the overall composition of the breeding site. However, depending on the time in the breeding season and the breeding status of an individual, flycatchers may travel between patches, move extensively within a site, or exploit resources outside of a breeding site (Cardinal et al. 2005, 2006). Therefore an area much larger than a territory and possibly much larger than a site may be important to flycatcher breeding success and persistence at a particular site. This concept is supported by recent habitat modeling (Hatten and Paradzick 2003, Paxton et al. 2007).

Detailed territory-based habitat measurements are lacking for the majority of Southwestern Willow Flycatcher breeding sites, yet I attempted to broadly characterize the use of native and exotic habitats. To do so, I classified the habitat at each site into one of four broad categories, based on the overall species composition of the tree/shrub layer(s) of the site. The categories were:

<b>Native</b>	(>90% native vegetation)
<b>Mixed – &gt;50% Native</b>	(50-90% native vegetation)
<b>Mixed – &gt;50% Exotic</b>	(50-90% exotic vegetation)
<b>Exotic</b>	(>90% exotic vegetation)

Sites comprised of primarily native vegetation account for about a third (34%) of the known flycatcher territories (Figure 6). Although only 2% of territories occur at sites dominated by exotic vegetation, another 62% are located within sites where the habitat includes native/exotic mixtures (with saltcedar as the primary exotic tree species). In many of these cases, exotic plants are important contributors to the habitat structure by providing the dense lower-strata vegetation that nesting flycatchers often use.

**Figure 6.**  
Percentage of Southwestern Willow Flycatcher territories occurring within breeding sites of differing compositions of native and exotic vegetation, as of 2012.



### Dominant tree species at breeding sites

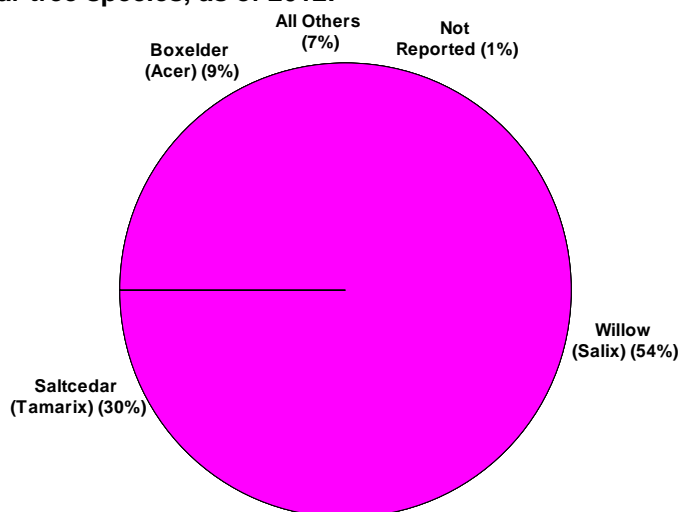
Similar to classifying breeding territory habitat based on site characteristics, the dominant tree species may differ between a site and an individual territory within that site. Generally, detailed territory-based habitat measurements are lacking for the majority of Southwestern Willow Flycatcher breeding sites. Despite this limitation, it is useful to characterize the dominant tree species within known flycatcher breeding sites.

To characterize the degree to which flycatchers breed in habitats dominated by particular tree species, I tallied the number of territories occurring in sites dominated by particular tree species. Over half (54%) of territories are found at sites where willow (*Salix* spp.) is the dominant tree species (Figure 7). Saltcedar (*Tamarix* spp.) predominates at sites that account for 30% of territories and 9% are in patches where boxelder (*Acer negundo*) is the dominant tree. Taken together, sites dominated by all other tree species account for only about 7% of territories.

The large percentage of territories located in boxelder-dominated habitats might suggest that boxelder sites are widely used across the Southwestern Willow Flycatcher's range. However, boxelder-dominated breeding habitats occur only at the U Bar Ranch site on the Gila River and the Highway 152 to San Juan site on the Mimbres River.

#### **Figure 7.**

**Percentage of Southwestern Willow Flycatcher territories occurring within breeding sites dominated by particular tree species, as of 2012.**



**Management of sites and territories**

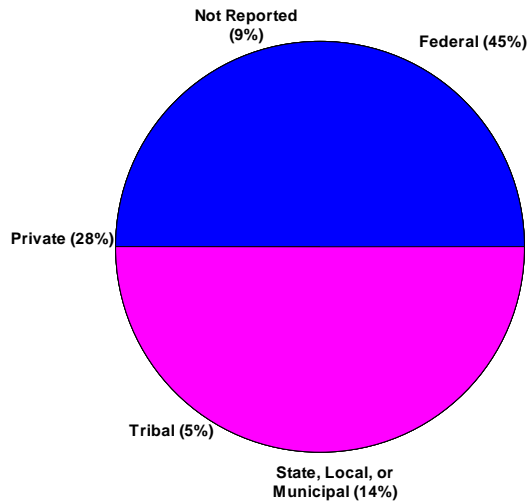
One factor important in conservation and recovery planning is the nature of ownership or management of a site – e.g., whether management of the site is the responsibility of private landowners, the government, or some other entity. I examined this in two ways – first by site, then by territory.

By Site (Figure 8a): Forty-five percent of known breeding sites are under federal government management, 28% are on privately owned lands, 14% are on lands managed by state/local/municipal governments, and 5% are managed by Native American tribes.

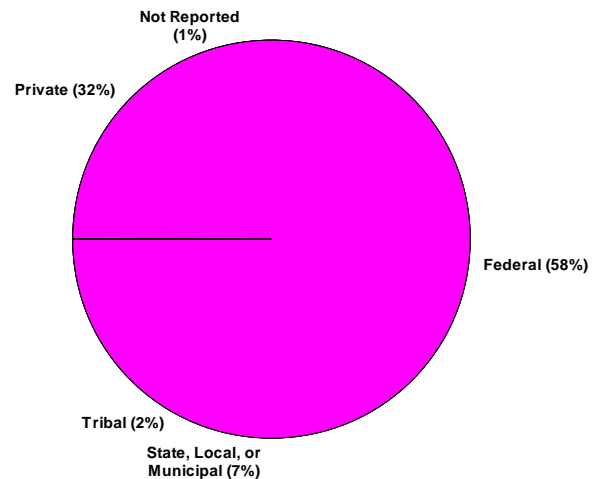
By Territory (Figure 8b): Federal lands account for 58% of flycatcher territories, and private for 32%. This underscores the importance of working with private landowners as flycatcher conservation and recovery efforts proceed. Over a quarter (28%) of the flycatcher territories found on privately owned lands are in the Cliff-Gila Valley, New Mexico.

**Figure 8.**

**Figure 8a. Percentage of Southwestern Willow Flycatcher breeding sites by land management, as of 2012.**



**Figure 8b. Percentage of Southwestern Willow Flycatcher territories by land management, as of 2012.**



## **SUMMARY:**

- Many new breeding sites and territories have been identified since the early 1990s as a result of extensive survey efforts throughout the Southwest. In 1993, there were only 140 territories distributed among 41 known breeding sites. As of 2012, based on the most recent surveys at 308 sites, there are an estimated total of 1629 Southwestern Willow Flycatcher territories (but remember the earlier caution about lack of standard definition for “site”).
- Not all 308 known sites are surveyed every year. The total estimated number of range-wide territories (1629) is based on sites where surveys were actually conducted in 2012 and the results from most recent survey at sites not surveyed in 2012. In 2012, only 65 sites were surveyed and 580 territories were detected. The 1629 total range-wide territory estimate in 2012 includes results from 243 sites that detected 1049 territories during surveys from 1993-2011. In order to understand the current range-wide flycatcher population, all known sites should be surveyed in all years. While it may be impossible to conduct such wide-spread surveys, perhaps annual survey effort could be prioritized to survey those sites that have not been recently surveyed. Additionally, regular surveys at large Southwestern Willow Flycatcher breeding sites (i.e., those with many territories) are particularly important because these sites represent a disproportionately large portion of the range-wide total population. Identifying new or changing flycatcher breeding sites through reconnaissance and modelling efforts (Hatten and Paradzick 2003, Hatten et al. 2010) could also be useful to prioritize future survey efforts. Alternatively, rules could be developed to guide how results from past surveys are interpreted (e.g., only include survey results less than three years old) or a range-wide occupancy model (MacKenzie et al. 2005) to provide estimates for non-surveyed sites could be useful.
- Most territories are found within small breeding sites (those sites with five or fewer territories). There are only seven known sites with 50 or more territories, though this comparison is confounded by lack of a standard definition of site. One site surveyed in 2012 accounted for 252 territories (San Marcial on the Rio Grande).
- There were 147 known sites that at one time had flycatchers since 1993, but were unoccupied as of 2012 - almost all were small sites (five or fewer territories). Because these sites had small populations, these territory losses account for only a small percentage of known territories; however, they underscore the vulnerability of small sites.
- The states of Arizona, California, and New Mexico account for 92% of known flycatcher territories. Colorado, Nevada, and Utah collectively have about 8% of the known territories. This report includes no standardized Southwestern Willow Flycatcher surveys from Texas, and hence nothing of the current status of the flycatcher there.

- Southwestern Willow Flycatchers are distributed over a wide elevation range, with most from 401 to 1400 m, but a few small sites (n=3) are located above 2500 m in elevation.
- Flycatcher territories are found in sites dominated by both native and exotic habitat. Over a third (34%) of territories are in sites dominated by native habitat and 62% of territories are in sites with a mixture of native and habitat habitats. Only 2% of known territories occur in sites dominated by exotic habitat. Sites dominated by willow or saltcedar account for 84% of territories. Boxelder is the dominant tree at only two sites but these sites account for 9% of territories.
- Almost half (45%) of sites are on federally-managed lands and 28% are on private lands; these privately owned sites account for 32% of known territories. Approximately one-quarter (28%) of territories on privately owned sites are found in the Cliff-Gila Valley, New Mexico.

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## LITERATURE CITED

- Browning, M.R. 1993. Comments on the taxonomy of *Empidonax traillii* (Willow Flycatcher). *Western Birds* 19:25-33.
- Cardinal, S.N. and E.H. Paxton. 2005. Home range, movement, and habitat use of the Southwestern Willow Flycatcher, Roosevelt Lake, AZ – 2004. U.S. Geological Survey report to the U.S. Bureau of Reclamation, Phoenix.
- Cardinal, S.N., E.H. Paxton, and S.L. Durst. 2006. Home range, movement, and habitat use of the Southwestern Willow Flycatcher, Roosevelt Lake, AZ – 2005. U.S. Geological Survey report to the U.S. Bureau of Reclamation, Phoenix.
- Causey, C.F., S.L. Durst, P.J. Newell, M.G. Pollock, E.H. Paxton, and M.K. Sogge. 2005. Survivorship and movements of Southwestern Willow Flycatchers at Roosevelt Lake, Arizona – 2005. U.S. Geological Survey report to the U.S. Bureau of Reclamation, Phoenix.
- Durst, S.L., M.K. Sogge, S.D. Stump, H.A. Walker, B.E. Kus, and S.J. Sferra. 2008. Southwestern willow flycatcher breeding site and territory summary – 2007. U.S. Geological Survey Open-File Report 2008-1303, 31p.
- Hatten, J.R., and C.E. Paradzick. 2003. A multiscaled model of southwestern willow flycatcher breeding habitat. *Journal of Wildlife Management* 67: 774-788.
- Hatten, J.R., E.H. Paxton, and M.K. Sogge. 2010. Modeling the dynamic habitat and breeding population of Southwestern Willow Flycatcher. *Ecological Modelling* 221:1674-1686.
- MacKenzie, D.I., J.D. Nichols, J.A. Royle, K.H. Pollock, L.L. Bailey, and J.E. Hines. 2005. Occupancy estimation and modeling: inferring patterns and dynamics of species occurrence. Academic Press, Waltham, MA. 344p.
- Netter, M.R., E.H. Paxton and M.K. Sogge. 1998. Banding and movements of the Southwestern Willow Flycatcher at Roosevelt Lake and San Pedro River/Gila River confluence, Arizona – 1998. USGS Colorado Plateau Field Station Report.
- Paxton, E.H. 2000. Molecular genetic structuring and demographic history of the Willow Flycatcher. Masters Thesis. Northern Arizona University, Flagstaff, AZ.
- Paxton, E. and M.K. Sogge. 1996. Banding and population genetics of Southwestern Willow Flycatchers in Arizona – 1996 Summary Report. USGS Colorado Plateau Field Station Report.
- Paxton, E.H., S. Langridge, and M.K. Sogge. 1997. Banding and population genetics of Southwestern Willow Flycatchers in Arizona – 1997 Summary Report. USGS

Colorado Plateau Field Station Report.

- Paxton, E.H., M.K. Sogge, S.L. Durst, T.C. Theimer, and J. Hatten. 2007. The Ecology of the Southwestern Willow Flycatcher in Central Arizona: A 10-year Synthesis Report. USGS Open File Report 2007-1381. <http://pubs.usgs.gov/of/2007/1381>.
- Paxton, E.H., M.K. Sogge, T.C. Theimer, J. Girard, and P. Keim. 2008. Using molecular genetic markers to resolve a subspecies boundary: the northern boundary of the Southwestern Willow Flycatcher in the four-corner states. U.S. Geological Survey Open-file Report 2007-1117, 20p.
- Sedgwick, J.A. 2001. Geographic variation in the song of Willow Flycatchers: differentiation between *Empidonax traillii adastus* and *E.t. extimus*. *Auk* 118:366-379.
- Sogge, M.K., R.M. Marshall, S.J. Sferra and T.J. Tibbitts. 1997. A Southwestern Willow Flycatcher natural history summary and survey protocol. National Park Service Technical Report NPS/NAUCPRS/NRTR-97/12.
- Sogge, M. K., S. J. Sferra, T. D. McCarthey, S. O. Williams, and B. E. Kus. 2000. Southwestern Willow Flycatcher breeding site and territory summary - 1999. U.S. Geological Survey, Flagstaff, AZ.
- Unitt, P. 1987. *Empidonax traillii extimus*: an endangered subspecies. *Western Birds* 18:137-162.
- U.S. Fish and Wildlife Service. 2002. Final Southwestern Willow Flycatcher Recovery Plan. U.S. Fish and Wildlife Service, Albuquerque, NM.

**Appendix 1.** Distribution of sites and territories by year and state based on both total estimated and surveyed site and territory values. Data for years prior to 2012 reflect the actual surveys conducted in the year and total estimates based on the most recent surveys prior to that year. These updated numbers may differ from past reports. The estimated total number of sites and territories is the sum of the actual surveys conducted in a given year plus the results of the most recent surveys conducted in previous years.

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
2012	AZ	133	58.6	679	62.7	20	12.1	125	12.5
	CA	97	42.7	115	10.6	27	16.4	29	2.9
	CO	11	4.8	48	4.4	1	0.6	0	0.0
	NM	49	21.6	702	64.8	7	4.2	347	34.6
	NV	15	6.6	75	6.9	8	4.8	69	6.9
	UT	3	1.3	10	0.9	2	1.2	10	1.0
	<b>TOTAL</b>	<b>308</b>		<b>1629</b>		<b>65</b>		<b>580</b>	
2011	AZ	123	54.2	630	58.2	51	30.9	375	37.4
	CA	87	38.3	108	10.0	24	14.5	23	2.3
	CO	11	4.8	48	4.4	2	1.2	19	1.9
	NM	49	21.6	755	69.7	25	15.2	617	61.6
	NV	15	6.6	71	6.6	8	4.8	65	6.5
	UT	3	1.3	10	0.9	2	1.2	10	1.0
	<b>TOTAL</b>	<b>288</b>		<b>1622</b>		<b>112</b>		<b>1109</b>	
2010	AZ	119	52.4	496	45.8	62	37.6	255	25.4
	CA	79	34.8	100	9.2	19	11.5	35	3.5
	CO	10	4.4	29	2.7	1	0.6	0	0.0
	NM	44	19.4	763	70.5	22	13.3	631	63.0
	NV	14	6.2	76	7.0	7	4.2	70	7.0
	UT	3	1.3	12	1.1	2	1.2	12	1.2
	<b>TOTAL</b>	<b>269</b>		<b>1476</b>		<b>113</b>		<b>1003</b>	

2012 Southwestern Willow Flycatcher Range-wide Summary

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
2009	AZ	102	44.9	417	38.5	55	33.3	318	31.7
	CA	85	37.4	108	10.0	26	15.8	43	4.3
	CO	11	4.8	51	4.7	2	1.2	22	2.2
	NM	43	18.9	710	65.6	25	15.2	582	58.1
	NV	14	6.2	70	6.5	9	5.5	64	6.4
	UT	3	1.3	10	0.9	2	1.2	10	1.0
	<b>TOTAL</b>	<b>258</b>		<b>1366</b>		<b>119</b>		<b>1039</b>	
2008	AZ	113	49.8	395	36.5	70	42.4	308	30.7
	CA	81	35.7	89	8.2	31	18.8	29	2.9
	CO	10	4.4	30	2.8	2	1.2	2	0.2
	NM	42	18.5	602	55.6	31	18.8	590	58.9
	NV	14	6.2	81	7.5	11	6.7	75	7.5
	UT	3	1.3	16	1.5	2	1.2	16	1.6
	<b>TOTAL</b>	<b>263</b>		<b>1213</b>		<b>147</b>		<b>1020</b>	
2007	AZ	105	46.3	351	32.4	67	40.6	302	30.1
	CA	83	36.6	109	10.1	47	28.5	58	5.8
	CO	10	4.4	50	4.6	5	3.0	42	4.2
	NM	40	17.6	518	47.8	31	18.8	507	50.6
	NV	13	5.7	75	6.9	11	6.7	69	6.9
	UT	3	1.3	7	0.6	3	1.8	7	0.7
	<b>TOTAL</b>	<b>254</b>		<b>1110</b>		<b>164</b>		<b>985</b>	
2006	AZ	114	49.4	391	41.1	84	54.2	349	41.7
	CA	68	29.4	100	10.5	36	23.2	49	5.9
	CO	6	2.6	8	0.8	1	0.6	0	0.0
	NM	29	12.6	370	38.9	21	13.5	361	43.2
	NV	12	5.2	76	8.0	11	7.1	70	8.4
	UT	2	0.9	7	0.7	2	1.3	7	0.8
	<b>TOTAL</b>	<b>231</b>		<b>952</b>		<b>155</b>		<b>836</b>	

2012 Southwestern Willow Flycatcher Range-wide Summary

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
2005	AZ	111	48.9	490	45.2	92	55.8	481	48.0
	CA	62	27.3	99	9.1	32	19.4	49	4.9
	CO	8	3.5	56	5.2	3	1.8	48	4.8
	NM	32	14.1	373	34.4	25	15.2	365	36.4
	NV	11	4.8	61	5.6	10	6.1	55	5.5
	UT	3	1.3	4	0.4	3	1.8	4	0.4
	<b>TOTAL</b>	<b>227</b>		<b>1083</b>		<b>165</b>		<b>1002</b>	
2004	AZ	101	45.3	514	46.3	88	51.5	508	48.9
	CA	70	31.4	162	14.6	41	24.0	112	10.8
	CO	9	4.0	49	4.4	7	4.1	47	4.5
	NM	29	13.0	316	28.5	22	12.9	308	29.7
	NV	11	4.9	62	5.6	10	5.8	56	5.4
	UT	3	1.3	7	0.6	3	1.8	7	0.7
	<b>TOTAL</b>	<b>223</b>		<b>1110</b>		<b>171</b>		<b>1038</b>	
2003	AZ	103	46.4	418	40.9	95	53.4	412	43.4
	CA	67	30.2	163	16.0	41	23.0	114	12.0
	CO	8	3.6	77	7.5	6	3.4	75	7.9
	NM	29	13.1	297	29.1	22	12.4	289	30.4
	NV	12	5.4	58	5.7	11	6.2	52	5.5
	UT	3	1.4	8	0.8	3	1.7	8	0.8
	<b>TOTAL</b>	<b>222</b>		<b>1021</b>		<b>178</b>		<b>950</b>	
2002	AZ	93	44.1	454	43.7	87	49.2	450	46.0
	CA	62	29.4	173	16.6	40	22.6	128	13.1
	CO	10	4.7	60	5.8	9	5.1	59	6.0
	NM	31	14.7	304	29.2	27	15.3	299	30.5
	NV	12	5.7	44	4.2	11	6.2	38	3.9
	UT	3	1.4	5	0.5	3	1.7	5	0.5
	<b>TOTAL</b>	<b>211</b>		<b>1040</b>		<b>177</b>		<b>979</b>	

2012 Southwestern Willow Flycatcher Range-wide Summary

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
2001	AZ	91	42.3	349	41.2	86	43.7	345	41.8
	CA	83	38.6	215	25.4	74	37.6	203	24.6
	CO	1	0.5	1	0.1	0	0.0	0	0.0
	NM	24	11.2	207	24.4	21	10.7	202	24.5
	NV	13	6.0	73	8.6	13	6.6	73	8.8
	UT	3	1.4	3	0.4	3	1.5	3	0.4
	<b>TOTAL</b>	<b>215</b>		<b>848</b>		<b>197</b>		<b>826</b>	
2000	AZ	86	41.7	335	39.8	81	42.6	331	40.3
	CA	73	35.4	183	21.7	65	34.2	171	20.8
	CO	1	0.5	1	0.1	1	0.5	1	0.1
	NM	31	15.0	257	30.5	28	14.7	252	30.7
	NV	12	5.8	56	6.7	12	6.3	56	6.8
	UT	3	1.5	10	1.2	3	1.6	10	1.2
	<b>TOTAL</b>	<b>206</b>		<b>842</b>		<b>190</b>		<b>821</b>	
1999	AZ	91	48.9	293	36.4	87	49.7	290	36.7
	CA	66	35.5	191	23.7	61	34.9	184	23.3
	CO	0	0.0	0	0.0	0	0.0	0	0.0
	NM	22	11.8	300	37.2	20	11.4	295	37.3
	NV	6	3.2	17	2.1	6	3.4	17	2.1
	UT	1	0.5	5	0.6	1	0.6	5	0.6
	<b>TOTAL</b>	<b>186</b>		<b>806</b>		<b>175</b>		<b>791</b>	
1998	AZ	98	57.0	221	33.0	96	58.2	221	33.4
	CA	41	23.8	135	20.1	38	23.0	131	19.8
	CO	1	0.6	1	0.1	1	0.6	1	0.2
	NM	21	12.2	262	39.1	19	11.5	257	38.9
	NV	9	5.2	30	4.5	9	5.5	30	4.5
	UT	2	1.2	21	3.1	2	1.2	21	3.2
	<b>TOTAL</b>	<b>172</b>		<b>670</b>		<b>165</b>		<b>661</b>	

2012 Southwestern Willow Flycatcher Range-wide Summary

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
1997	AZ	71	51.8	188	30.8	70	52.6	188	31.1
	CA	37	27.0	116	19.0	36	27.1	115	19.0
	CO	3	2.2	35	5.7	3	2.3	35	5.8
	NM	20	14.6	243	39.8	18	13.5	238	39.3
	NV	5	3.6	18	2.9	5	3.8	18	3.0
	UT	1	0.7	11	1.8	1	0.8	11	1.8
	<b>TOTAL</b>	<b>137</b>		<b>611</b>		<b>133</b>		<b>605</b>	
1996	AZ	47	46.1	145	30.5	46	46.5	145	30.7
	CA	27	26.5	118	24.8	26	26.3	117	24.7
	CO	0	0.0	0	0.0	0	0.0	0	0.0
	NM	25	24.5	208	43.7	24	24.2	206	43.6
	NV	2	2.0	3	0.6	2	2.0	3	0.6
	UT	1	1.0	2	0.4	1	1.0	2	0.4
	<b>TOTAL</b>	<b>102</b>		<b>476</b>		<b>99</b>		<b>473</b>	
1995	AZ	28	42.4	84	24.2	27	42.2	84	24.3
	CA	18	27.3	88	25.4	18	28.1	88	25.5
	CO	0	0.0	0	0.0	0	0.0	0	0.0
	NM	18	27.3	172	49.6	17	26.6	170	49.3
	NV	1	1.5	1	0.3	1	1.6	1	0.3
	UT	1	1.5	2	0.6	1	1.6	2	0.6
	<b>TOTAL</b>	<b>66</b>		<b>347</b>		<b>64</b>		<b>345</b>	
1994	AZ	26	48.1	111	30.7	26	49.1	111	30.9
	CA	10	18.5	84	23.3	10	18.9	84	23.4
	CO	0	0.0	0	0.0	0	0.0	0	0.0
	NM	18	33.3	166	46.0	17	32.1	164	45.7
	NV	0	0.0	0	0.0	0	0.0	0	0.0
	UT	0	0.0	0	0.0	0	0.0	0	0.0
	<b>TOTAL</b>	<b>54</b>		<b>361</b>		<b>53</b>		<b>359</b>	

2012 Southwestern Willow Flycatcher Range-wide Summary

Year	Total Estimated Sites and Territories					Surveyed Sites and Territories			
	State	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year	Num. of Sites	Pct. of Total Sites by Year	Num. of Terr.	Pct. of Total Terr. by Year
1993	AZ	18	43.9	33	23.6	18	43.9	33	23.6
	CA	7	17.1	75	53.6	7	17.1	75	53.6
	CO	0	0.0	0	0.0	0	0.0	0	0.0
	NM	16	39.0	32	22.9	16	39.0	32	22.9
	NV	0	0.0	0	0.0	0	0.0	0	0.0
	UT	0	0.0	0	0.0	0	0.0	0	0.0
	<b>TOTAL</b>	<b>41</b>		<b>140</b>		<b>41</b>		<b>140</b>	



**Appendix 2.** List of the 147 sites that at one time had Southwestern Willow Flycatcher territories, but were unoccupied as of the most recent survey (zero territories for one or more years). The most recent survey year is indicated.

We term these “unoccupied” sites, though it is important to recognize that a particular site could become occupied again in the future. If flycatchers are detected at any site in subsequent years, that site will no longer be considered “unoccupied” and would be removed from this list. In past years there have been 91 sites that were unoccupied for one or more years but were subsequently reoccupied by flycatchers.

Site name	Site code	State	Year	Reference
Agua Fria River - Waddell Dam	AFWADA	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Agua Hedionda - Macario Canyon	AHMACA	CA	2012	CA SWFL dbase, USGS San Diego
Amargosa River - Amargosa Canyon	AMAMCA	CA	2012	CA SWFL dbase, USGS San Diego
Amargosa River - Oasis Valley - Springdale	AMOVSP	NV	2008	Klinger and Furtek 2009
Ash Meadows NWR - Carson Slough	AMAMCS	NV	2007	Klinger and Furtek 2008
Ash Meadows NWR - Horseshoe North and South	AMAMHO	NV	2009	Klinger and Conrad 2010
Ash Meadows NWR - Point of Rocks	AMAMPR	NV	2009	Klinger and Conrad 2010
Bill Williams - Cave Wash	BWCAVE	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Bill Williams Delta Marsh Edge	BWDEMA	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Bill Williams Gemini	BWGEMI	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Bluewater Creek	RIBLUE	NM	2011	Ryan & Carstensen email 11/12
Canebrake Preserve	KECANE	CA	2003	CA SWFL dbase, USGS San Diego
Colorado River - Adobe Lake	COADOB	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Big Hole Slough	COBHSL	CA	2010	CA SWFL dbase, USGS San Diego

## 2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Colorado River - Cibola SW Landing Strip	COCIBO	AZ	2009	AZ SWFL dbase, AZGF Phoenix
Colorado River - Clear Lake	COCLLA	AZ	2011	McLeod and Pellegrini 2013
Colorado River - Draper Lake	CODRAP	CA	2008	McLeod and Pellegrini 2013
Colorado River - Ehrenberg	COEHRE	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Ferguson Lake	COFERG	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Gila Confluence 1	COGILA	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Grand Canyon RM 28-29	COGC29	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Colorado River - Grand Canyon RM 50-51 L	COGC50	AZ	2012	Stroud-Settles and Holm 2012
Colorado River - Grand Canyon RM 65.3 L	COGC65	AZ	2004	Munzer et al. 2005
Colorado River - Grand Canyon RM 71 L	COGC71	AZ	2012	Stroud-Settles and Holm 2012
Colorado River - Grand Cyn RM 246 L	CO246L	AZ	2012	Stroud-Settles and Holm 2012
Colorado River - Grand Cyn RM 259 R	CO259R	AZ	2012	Stroud-Settles and Holm 2012
Colorado River - Grand Cyn RM 259.5 L	CO259L	AZ	2005	English et al. 2006
Colorado River - Grand Cyn RM 263-262 L	CO263L	AZ	2004	Munzer et al. 2005
Colorado River - Grand Cyn RM 265-263 L	CO265L	AZ	2003	Smith et al. 2004
Colorado River - Grand Cyn RM 268-264 R	CO268R	AZ	2004	Munzer et al. 2005

2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Colorado River - Grand Cyn RM 268-265 L	CO268L	AZ	2003	Smith et al. 2004
Colorado River - Grand Cyn RM 270-268 L	CO270L	AZ	2003	Smith et al. 2004
Colorado River - Grand Cyn RM 272-268 R	CO272R	AZ	2004	Munzer et al. 2005
Colorado River - Grand Cyn RM 273-270 L	CO273L	AZ	2002	Smith et al. 2003
Colorado River - Grand Cyn RM 277-273 L	CO277L	AZ	2012	Stroud-Settles and Holm 2012
Colorado River - Grand Cyn RM 277-274 R	CO277R	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Colorado River - Hoge	COHOGE	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Lake Mead Delta	COMEAD	AZ	2008	AZ SWFL dbase, AZGF Phoenix
Colorado River - Martinez lake	COMALA	AZ	2011	McLeod and Pellegrini 2013
Colorado River - Miles 257.5 to 257.0 R	CO257R	AZ	2005	English et al. 2006
Colorado River - Mittry Lake	COMITT	AZ	2012	McLeod and Pellegrini 2013
Colorado River - Picacho East	COPICA	CA	2007	McLeod email April 2008
Colorado River - Taylor Lake	COTAYL	CA	2007	CA SWFL dbase, USGS San Diego
Colorado River - Trampas Wash	COTRAM	CA	2007	CA SWFL dbase, USGS San Diego
Colorado River - Walker Lake	COWALK	CA	2012	McLeod and Pellegrini 2013
Colorado River Blankenship	COBLAN	AZ	2010	AZ SWFL dbase, AZGF Phoenix
De Luz Creek - Camp Pendleton	SMDELU	CA	2012	CA SWFL dbase, USGS San Diego

## 2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Gila River - Dysart Road	GIDYSA	AZ	2003	Smith et al. 2004
Gila River - Earven Flat	GIEAFL	AZ	2005	English et al. 2006
Gila River - Fort Thomas Bridge	GIFTBR	AZ	1994	Paradzick et al. 2001
Gila River - Fortuna Wash	GIFOWA	AZ	2011	McLeod and Pellegrini 2013
Gila River - GRGS016	GIGS16	AZ	2011	Graber et al. 2012
Gila River - GRN 033	GIGN33	AZ	2011	Graber et al. 2012
Gila River - GRSN031	GIGI31	AZ	2011	Graber et al. 2012
Gila River - Guthrie	GIGUTH	AZ	2006	Graber et al. 2007
Gila River - San Jose	GISAJO	AZ	2001	Smith et al. 2002
Gila River - Smithville Canal	GISMIT	AZ	1997	McCarthy et al. 1998
Gila River - Solomon NW	GISONW	AZ	2007	Stump email March 2008
Gila River - Whitlow Dam	GIWHDA	AZ	2009	AZ SWFL dbase, AZGF Phoenix
Gila River GRN015	GIGN15	AZ	2011	Graber et al. 2012
Gila River Pima Bridge	GIPIBR	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Hassayampa Preserve	HAHASS	AZ	2011	M. Lawrence datasheet
Kanab Creek - Town of Kanab	COKANB	UT	2007	Day email March 2008
Lake Havasu - Neptune	COHAVA	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Las Flores Creek	LFLAFL	CA	2012	CA SWFL dbase, USGS San Diego
Las Vegas Wash	COLVWA	NV	2012	Van Dooremolen 2012
Los Ojos Highway 95 Bridge	CHOJOS	NM	2008	Ryan & Carstensen email 11/12
Meadow Valley Wash - Site 1	MVMV01	NV	2006	Klinger and Furtek 2007
Mimbres River - Highway 152 to San Juan	MIDISE	NM	2008	Ryan & Carstensen email 11/12
Mojave River - Mojave Forks	MOMOFR	CA	2008	CA SWFL dbase, USGS San Diego

2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Mojave River - Oro Grande	MOORGR	CA	2011	CA SWFL dbase, USGS San Diego
Mojave River, Victorville I-15	MOVICT	CA	2012	CA SWFL dbase, USGS San Diego
Nelson Reservoir	LCNERE	AZ	2006	Graber et al 2007
Pahrnagat River - Crystal Springs	PACRSP	NV	2008	Klinger and Furtek 2009
Pahrnagat River - North River Ranch	PANRRA	NV	2012	McLeod and Pellegrini 2013
Parkview Fish Hatch	CHPARK	NM	2001	Williams 2002
Rio Grande - Frijoles Canyon to Chochiti	RIFRCA	NM	2012	Moore and Ahlers 2012
Rio Grande - Selden Canyon	RISELD	NM	2011	Ryan & Carstensen email 11/12
Rio Grande - Sevilleta NWR	RISEVL	NM	2012	Moore and Ahlers 2012
Rio Grande Isleta	RIISLE	NM	2011	Ryan & Carstensen email 11/12
Rio Grande Orilla Verde	RIORIL	NM	2011	Ryan & Carstensen email 11/12
Rio Grande Taos Junction Bridg	RITAOS	NM	2007	Leonard email March 2008
Rio Grande Velarde-El Guique	RIELGU	NM	2002	Williams email 3/03
Rio Grande Velarde-Garcia Acequia	RIGARC	NM	2009	Ryan & Carstensen email 11/12
Rio Grande Velarde-La Canova	RILACA	NM	2009	Ryan & Carstensen email 11/12
Rio Grande Velarde-La Rinconada	RILARI	NM	2009	Ryan & Carstensen email 11/12
Salt River - School House Point N	SRSCHN	AZ	2006	Graber et al. 2007
Salt River - School House Point S	SRSCHS	AZ	2006	Graber et al. 2007
Salt River Inflow - Roosevelt Lake	SRSALT	AZ	2011	Tonto Basin Rang Dist 8/2011
San Diego Creek - Laguna Lakes	SGLALA	CA	2011	CA SWFL dbase, USGS San Diego
San Diego River - El Capitan	SDELCA	CA	2012	CA SWFL dbase, USGS San Diego

## 2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
San Dieguito River	SDSADI	CA	2012	CA SWFL dbase, USGS San Diego
San Felipe Creek - San Felipe	SESAFE	CA	2007	CA SWFL dbase, USGS San Diego
San Gabriel River	SBSAGA	CA	2012	CA SWFL dbase, USGS San Diego
San Jacinto River - Bautista Canyon	SCBAUT	CA	2006	CA SWFL dbase, USGS San Diego
San Jacinto River and Levee	SCRVLV	CA	2011	CA SWFL dbase, USGS San Diego
San Juan Creek - Canada Gobernadora	SUCAGO	CA	2012	CA SWFL dbase, USGS San Diego
San Juan Creek - La Novia Bridge	SUNOBR	CA	2005	CA SWFL dbase, USGS San Diego
San Juan River - Shiprock	SJSHIP	NM	1999	Fitzgerald unpub data
San Luis Rey River - Agua Caliente Creek	SLACCR	CA	2007	CA SWFL dbase, USGS San Diego
San Luis Rey River - Guajome Lake	SLGUAJ	CA	2012	CA SWFL dbase, USGS San Diego
San Luis Rey River - Pilgrim Creek	SLPILG	CA	2012	CA SWFL dbase, USGS San Diego
San Luis Rey River - Whelan Lake	SLWHEL	CA	2012	CA SWFL dbase, USGS San Diego
San Pedro River - Apache Powder Rd	SPAPPO	AZ	2004	Munzer et al. 2005
San Pedro River - Bingham Cienega	SPBICI	AZ	2005	English et al. 2006
San Pedro River - Cabbage Wash	SPCAWA	AZ	2005	English et al. 2006
San Pedro River - Hereford Bridge	SPHEBR	AZ	2012	S. Blackman datasheet 2012
San Pedro River - Indian Hills	SPINHI	AZ	2005	English et al. 2006
San Pedro River - Malpais Hill	SPMAHI	AZ	2005	English et al. 2006
San Pedro River - Soza Wash	SPSOWA	AZ	2003	Smith et al. 2004
San Pedro River, SR 90	SPSR90	AZ	2009	AZ SWFL dbase, AZGF Phoenix

2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Santa Ana River - Banning Canyon	SABANN	CA	2012	CA SWFL dbase, USGS San Diego
Santa Ana River - Bear Creek	SABEAR	CA	2008	CA SWFL dbase, USGS San Diego
Santa Ana River - Cienega Seca	SACIEN	CA	2007	CA SWFL dbase, USGS San Diego
Santa Ana River - City Creek	SACICR	CA	2008	CA SWFL dbase, USGS San Diego
Santa Ana River - Deer Creek	SADEER	CA	2007	CA SWFL dbase, USGS San Diego
Santa Ana River - East Etiwanda Creek	SAEECR	CA	2001	CA SWFL dbase, USGS San Diego
Santa Ana River - Featherly Regional Park	SAFEAT	CA	2008	CA SWFL dbase, USGS San Diego
Santa Ana River - Forest Falls	SAFOFA	CA	2008	CA SWFL dbase, USGS San Diego
Santa Ana River - La Cadena to Waterman	SALACA	CA	2011	CA SWFL dbase, USGS San Diego
Santa Ana River - Metcalf Creek	SAMECR	CA	2006	CA SWFL dbase, USGS San Diego
Santa Ana River - Mtn Home Village	SAMTNH	CA	2007	CA SWFL dbase, USGS San Diego
Santa Ana River - Oak Glen	SAOAGL	CA	2006	CA SWFL dbase, USGS San Diego
Santa Ana River - Rattlesnake Creek	SARTSN	CA	2004	CA SWFL dbase, USGS San Diego
Santa Ana River - San Timoteo Creek	SASNTI	CA	2012	CA SWFL dbase, USGS San Diego
Santa Ana River - SR 38 Bridge Crossing	SA38BC	CA	2008	CA SWFL dbase, USGS San Diego
Santa Ana River - Strawberry Creek	SASTCR	CA	2000	CA SWFL dbase, USGS San Diego
Santa Ana River - Van Dusen Canyon	SAVDCA	CA	2007	CA SWFL dbase, USGS San Diego
Santa Ana River - Waterman Creek	SAWACR	CA	2001	CA SWFL dbase, USGS San Diego
Santa Clara River - Arco/Four Corners	STARCO	CA	2011	CA SWFL dbase, USGS San Diego

2012 Southwestern Willow Flycatcher Range-wide Summary

Site name	Site code	State	Year	Reference
Santa Clara River - Elizabeth Lake Canyon	STELCA	CA	2007	CA SWFL dbase, USGS San Diego
Santa Clara River - San Francisquito Creek	STSFQR	CA	2001	CA SWFL dbase, USGS San Diego
Santa Clara River - Saticoy	STSATI	CA	2010	CA SWFL dbase, USGS San Diego
Santa Clara River - Soledad Canyon	STSOCA	CA	2009	CA SWFL dbase, USGS San Diego
Santa Clara River - Upper Piru Creek	STUPPI	CA	2006	CA SWFL dbase, USGS San Diego
Santa Cruz River - Cienega Creek	SZCICR	AZ	2010	AZ SWFL dbase, AZGF Phoenix
Santa Margarita River - Fallbrook Creek	SMFALL	CA	2012	CA SWFL dbase, USGS San Diego
Santa Ynez River - Gibraltar	SYGIBR	CA	2002	CA SWFL dbase, USGS San Diego
Santa Ynez River - Lompoc	SYLOMP	CA	2012	CA SWFL dbase, USGS San Diego
Santa Ynez River - Vandenberg AFB	SYVAND	CA	2012	CA SWFL dbase, USGS San Diego
Santa Ysabel Creek - Tim's Canyon	SDTICA	CA	2011	CA SWFL dbase, USGS San Diego
Sulphur Creek	PHSUCR	CA	2003	CA SWFL dbase, USGS San Diego
Sweetwater Reservoir	SWSWRE	CA	2008	CA SWFL dbase, USGS San Diego
Temecula Creek - Aguanga	TEAGUA	CA	2001	CA SWFL dbase, USGS San Diego
Verde River - Stage Stop - Dry Beaver Creek	VESSDB	AZ	2009	AZ SWFL dbase, AZGF Phoenix
Verde River - Tuzigoot Bridge	VETUZI	AZ	2006	Graber et al. 2007
Williams Creek Reservoir	SJWICR	CO	2012	Khung letter 2012



## Appendix Literature Cited:

- Arizona Game and Fish Department. Arizona Southwestern Willow Flycatcher Database. Phoenix, Arizona.
- Blackman, S. 2012. Completed willow flycatcher survey and detection form, August 7, 2012.
- Day, K.S. 2008. Email summary of Southwestern Willow Flycatchers in Utah.
- English, H.E., A.E. Graber, S.D. Stump, H.E. Telle, and L.A. Ellis. 2006. Southwestern Willow Flycatcher 2005 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 248. Arizona Game and Fish Department, Phoenix, Arizona.
- Graber, A.E., D.M. Weddle, H.C. English, S.D. Stump, H.E. Telle, and L.A. Ellis. 2007. Southwestern willow flycatcher 2006 survey and nest monitoring report. Nongame and Endangered Wildlife Program. Technical Report 249. Arizona Game and Fish Department, Phoenix, AZ.
- Graber, A.E., T.J. Koronkiewicz, and J.L. Granger. 2012. Southwestern willow flycatcher surveys and nest monitoring along the Gila River between Coolidge Dam and South Butte, 2011. Annual summary report submitted to U.S. Bureau of Reclamation, Glendale, Arizona. SWCA Environmental Consultants.
- Khung, K.C. 2012. Letter to U.S. Fish and Wildlife Service, Western Colorado Field Supervisor. U.S. Forest Service, San Juan National Forest, Pagosa Ranger District.
- Klinger, C.M. and B. Furtek. 2007. Breeding status and surveys for the Southwestern Willow Flycatcher and Yellow-billed Cuckoo at sites in southern Nevada. Nevada Department of Wildlife, Southern Region Diversity Program, Program Activities Report.
- Klinger, C.M. and B. Furtek. 2008. Breeding status and surveys for the Southwestern Willow Flycatcher and Yellow-billed Cuckoo at select sites in southern Nevada, 2007 Annual Report. Nevada Department of Wildlife, Southern Region Diversity Program, Program Activities Report.
- Klinger, C. and B. Furtek. 2009. Southwestern willow flycatcher and yellow-billed cuckoo survey and monitoring at selected sites in southern Nevada, 2008 annual report. Nevada Department of Wildlife, Southern Region Diversity Program, Program Activities Report.
- Klinger, C. and B. Conrad. 2010. Southwestern willow flycatcher and yellow-billed cuckoo survey and monitoring at selected sites in southern Nevada, 2009 annual report. Nevada Department of Wildlife, Southern Region Diversity Program, Program Activities Report.
- Lawrence, M. 2011. Completed willow flycatcher survey and detection form, August 31, 2011.
- Leonard, F. 2008. Email summary of Southwestern Willow Flycatcher sites in New Mexico. March, 2008.
- McCarthy, T.D., C.E. Paradzick, J.W. Rourke, M.W. Sumner, and R.F. Davidson. 1998. Arizona Patners in Flight Southwestern Willow Flycatcher 1997 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 130. Arizona Game and Fish Department, Phoenix, AZ.
- McLeod, M.A. 2008. Email summary of SWCA Southwestern Willow Flycatcher survey sites in Arizona, California, and Nevada.
- McLeod, M.A., and A.R. Pellegrini. 2013. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries, 2008-2012. Summary report submitted to the U.S. Bureau of Reclamation Boulder City, NV. SWCA Environmental Consultants, Flagstaff, AZ.

- Moore, D., and D. Ahlers. 2012. 2012 Southwestern willow flycatcher study results – selected sites along the Rio Grande from Bandelier National Monument to Elephant Butte Reservoir, New Mexico. Bureau of Reclamation, Technical Services Center, Fisheries and Wildlife Resources, Denver, CO
- Munzer, O.M., H.C. English, A.B. Smith, and A.A. Tudor. 2005. Southwestern Willow Flycatcher 2004 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 244. Arizona Game and Fish Department, Phoenix, Arizona.
- Paradzick, C.E., T.D. McCarthy, R.F. Davidson, J.W. Rourke, M.W. Sumner, and A.B. Smith. 2001. Southwestern Willow Flycatcher 200 survey and nest monitoring report. Nongame and Endangered Wildlife Program 175. Arizona Game and Fish Department, Phoenix, AZ.
- Ryan, V., and D. Carstensen. 2012. Email summary of southwestern willow flycatcher territories in New Mexico. November, 2012.
- Smith, A.B., C.E. Paradzick, A.A. Woodward, P.E.T. Dockens, and T.D. McCarthy. 2002. Southwestern Willow Flycatcher 2001 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 191. Arizona Game and Fish Department, Phoenix, AZ.
- Smith, A.B., A.A. Woodward, P.E.T. Dockens, J.S. Martin, and T.D. McCarthy. 2003. Southwestern Willow Flycatcher 2002 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 210. Arizona Game and Fish Department, Phoenix, AZ.
- Smith, A.B., P.E.T. Dockens, A.A. Tudor, H.C. English, and B.L. Allen. 2004. Southwestern Willow Flycatcher 2003 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 233. Arizona Game and Fish Department, Phoenix, AZ.
- Stroud-Settles, J., and G. Holm. 2012. Surveying for southwestern willow flycatchers in Grand Canyon National Park. U.S. Department of the Interior, National Park Service, Grand Canyon National Park, Grand Canyon, Arizona.
- Tonto Basin Ranger District. 2011. Completed willow flycatcher survey and detection form, August 15, 2011.
- U.S. Geological Survey – San Diego Field Station. California Southwestern Willow Flycatcher Database. San Diego, California.
- Van Dooremolen, D. 2012. Southwestern willow flycatcher surveys along the Las Vegas Wash, Clark County, Nevada, 2012. Report prepared for U.S. Fish and Wildlife Service, Southern Nevada Field Office and Las Vegas Wash Coordination Committee. Southern Nevada Water Authority, Las Vegas, Nevada.
- Williams, S. 2002. Email summaries of Willow Flycatchers in New Mexico.
- Williams, S. 2003. Email summaries of Willow Flycatchers in New Mexico. March, 2003.