

# Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2005

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## Introduction

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*) is an endangered bird that breeds only in dense riparian habitats in six southwestern states (southern California, extreme southern Nevada, southern Utah, southwestern Colorado, Arizona, and New Mexico). Since 1993, hundreds of Southwestern Willow Flycatcher surveys have been conducted each year, with many new flycatcher breeding sites located. This document synthesizes information on all known Southwestern Willow Flycatcher breeding sites.

This rangewide data synthesis was designed to meet these objectives:

- 1 – identify all known Southwestern Willow Flycatcher breeding sites, and
- 2 – assemble data on the location, habitat, number of flycatchers, and other information for all breeding sites, for as many years as possible, from 1993 through 2005.

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 location where one or more Willow Flycatchers establish 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 habitat; however, there is no standardized definition for site and its use varies 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, we deferred to statewide summary documents or to local managers and researchers when delineating a site for inclusion in the database. 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 may be considered as one territory in some states but two territories in other states.

For each breeding site, we 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.

Gathering and synthesizing the information on numerous breeding sites across a broad geographic area can be challenging because annual survey reporting requirements are not standardized rangewide. Therefore, the nature and degree of readily available information varies widely from state to state. Some states produce detailed annual summary reports based on standardized data sheets submitted by surveyors; these resources were tremendously helpful in producing this report. However, in some areas such as California, surveyors are not required to submit standardized flycatcher survey forms. This makes 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. Fortunately, California has recently instituted a state-wide database that compiles much flycatcher data, even from investigators who are otherwise not reporting. This effort has greatly aided the synthesis of data at the rangewide level. Still, overall compilation efforts would be faster and more precise if flycatcher surveyors throughout the bird's range were required to provide standardized reporting, as is being done in areas such as USFWS Region 2.

This report includes all flycatcher breeding sites reported between 1993 and 2005. The statistics included 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 133 sites that were not surveyed in 2005 are still included in the site and territory tallies if they had resident flycatchers during one or more years since 1993. This report does not include data from sites where only migrant Willow Flycatchers were detected.

We 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 2005-season survey information may not be available until after this report is produced (October 2006). Also, there may be some extant sites that have not yet been reported and are therefore not included herein. New 2005 survey information that comes to light after this report will be incorporated in future rangewide reports.

Additional Considerations in Using and Interpreting the Data in this Report: We 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.

Subspecies status of each site: The Willow Flycatcher 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). Recent studies of flycatcher genetics (e.g., Paxton 2000) and song patterns (e.g., Sedgwick 2001) support a more southern range boundary for *E.t. extimus* than was used for the 1999 summary (Sogge et al. 2000). Future research may provide more insight into subspecies range boundaries; therefore, additional sites may eventually be removed from management as *extimus*, and/or new geographic areas and sites could be added. This should be considered when producing updates in future years, and when making rangewide comparisons among years.

Population estimates: Population estimates are just that – **estimates**. Their accuracy and precision vary with the level of survey effort, the intent of the survey (e.g., determining flycatcher presence/absence vs accurate territory estimate), surveyor experience, the size of the breeding site, habitat density, flycatcher behavior, and even background noise levels. The population estimates often represent the minimum number of flycatchers present; i.e., if surveyors suspected 12 to 14 flycatchers, the lower (more conservative) number was used. Therefore, although estimates may be very accurate for some intensively surveyed sites, the overall statistics presented in this report should be recognized as approximate.

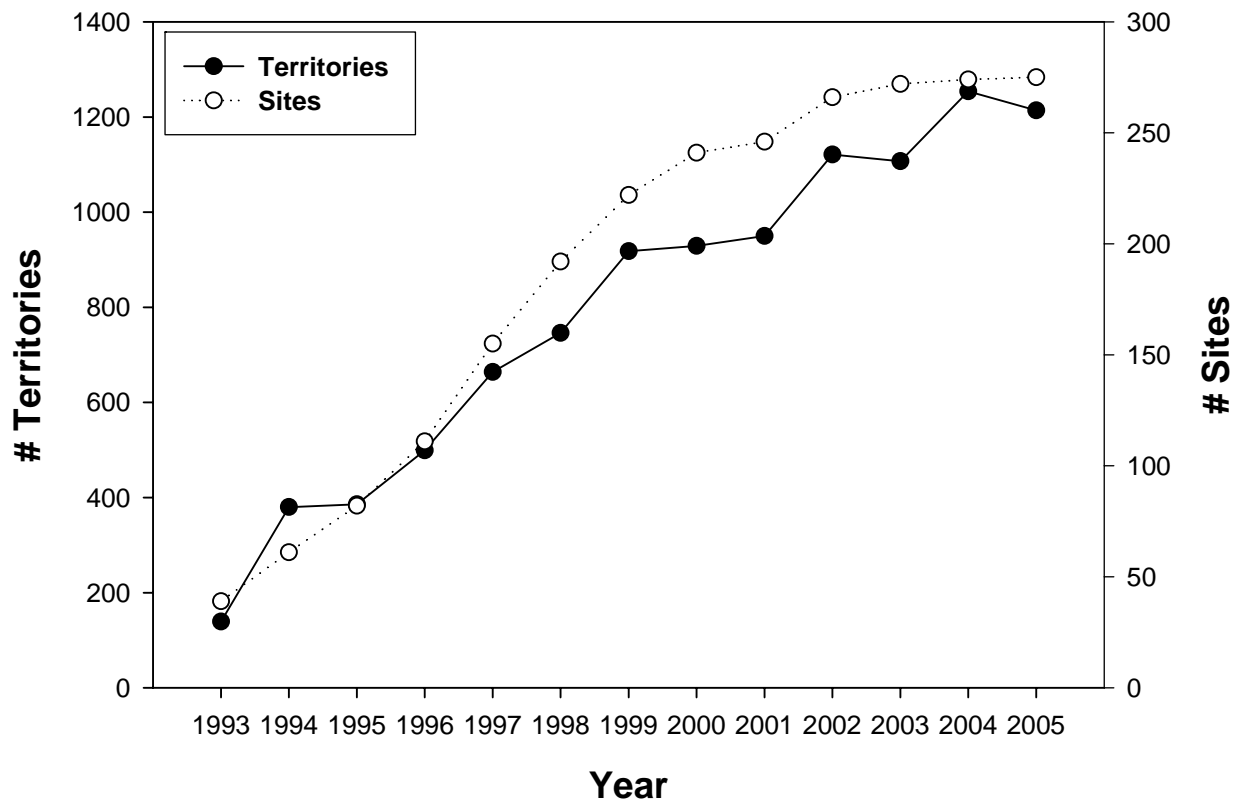
## DATA SUMMARIES

### Changes in the number of known territories over time

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. From a 1993 estimate of roughly 40 sites and 140 territories, we now have data for 275 sites and 1214 territories (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 (e.g., see Paradzick and Woodward 2003). Although population increases and decreases undoubtedly occur at some sites, movements of birds among sites and lack of standardized survey effort/reporting each year 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.

**FIGURE 1.**

**Estimated number of known breeding sites and territories each year, as of 2005. The numbers of sites and territories prior to 2005 have been updated as new information has become available, and so may be different from values shown in past reports.**

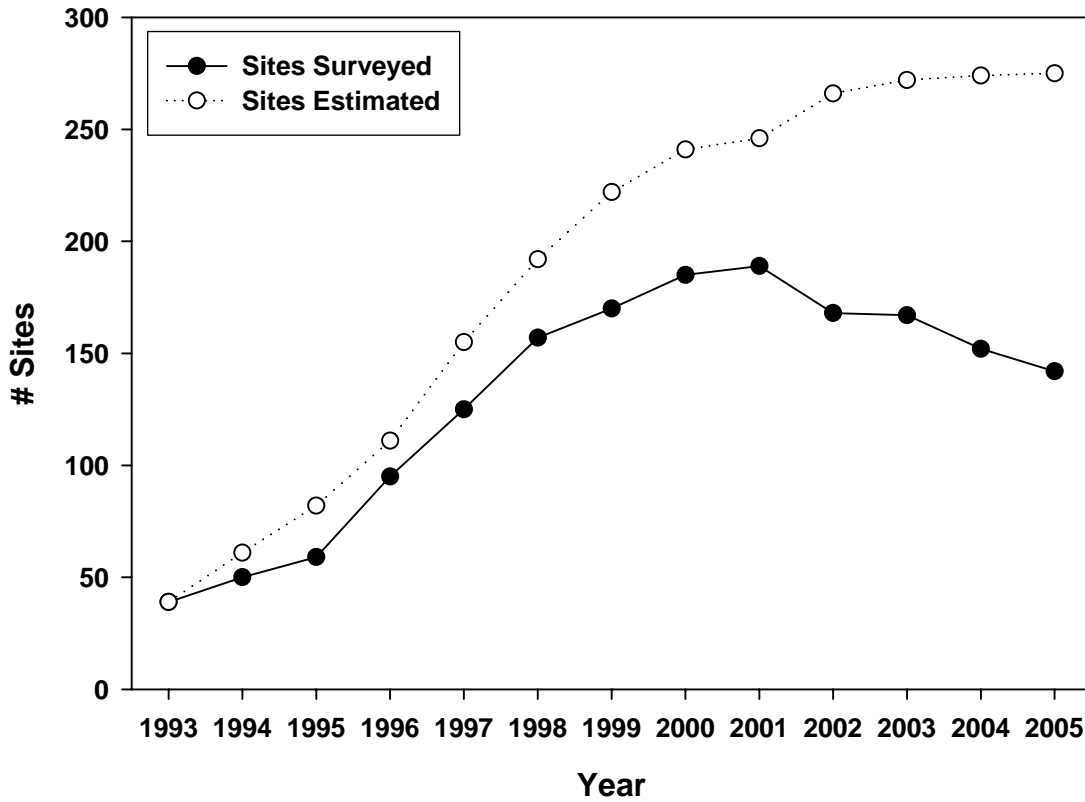


**Numbers of sites over time: surveyed vs estimated**

Not all of the 275 sites where Southwestern Willow Flycatcher territories have been discovered over the last 13 years are surveyed every year. However, our compilation includes all sites where flycatcher territories have been detected, even if only once, since 1993. This includes sites that were not surveyed in 2005. Therefore the total estimated number of sites (n=275) includes 142 that were surveyed in 2005, plus 133 that were last surveyed in 2004 or earlier. The number of sites actually surveyed each year increased from 1993 to 2001, but has been declining since then. See the section on Recency of Survey Data (below) and Appendix 3 for additional details.

**FIGURE 2.**

Number of estimated and surveyed breeding sites each year, as of 2005. The numbers of sites and territories prior to 2005 have been updated as new information has become available, and so may be different from values shown in past reports.

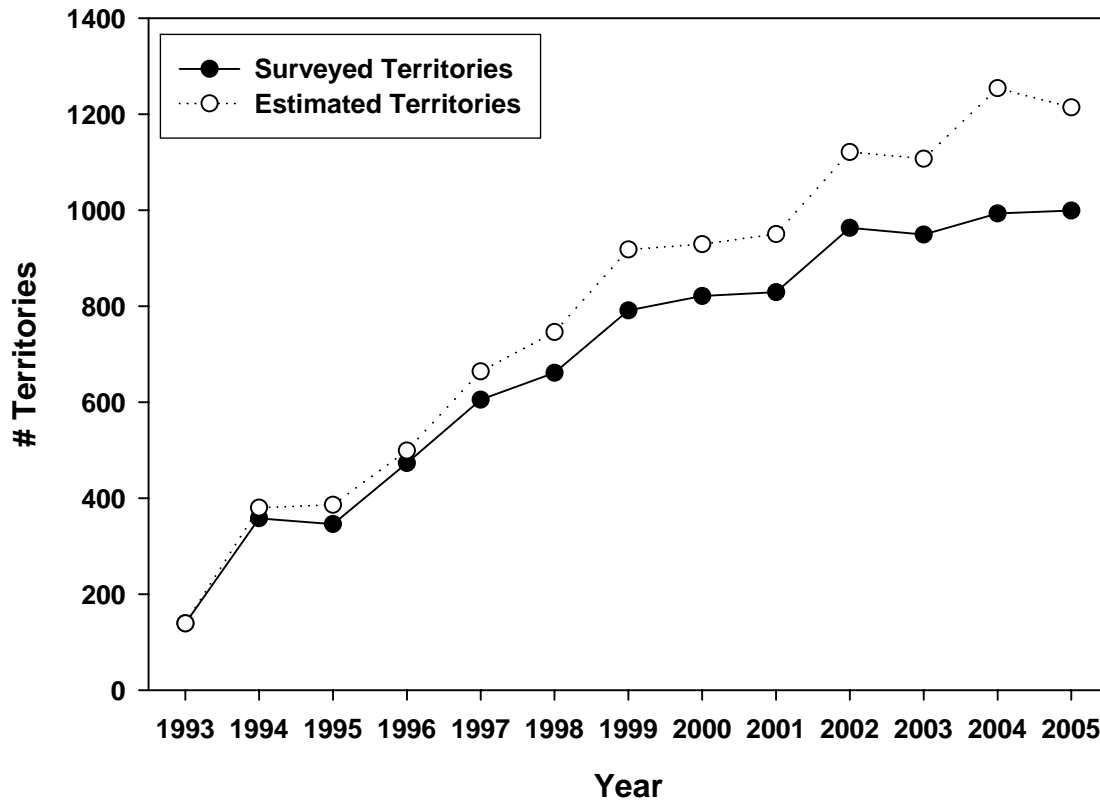


**Numbers of territories over time: surveyed vs estimated**

As previously noted, not all known Southwestern Willow Flycatcher breeding sites are surveyed every year. For sites that were not surveyed in 2005, we used the numbers reported in the most recent pre-2005 survey as an estimate of the number of territories currently at that site. Thus, for sites that were not surveyed in 2005, we continue to report the number of territories from the most recent survey year. In 2005, our estimated total number of territories (1214) includes 999 detected in 2005-season surveys, plus 215 territories from sites that were last surveyed in 2004 or before (Figure 3). See the section on Recency of Survey Data (below) and Appendix 3 for additional details.

**FIGURE 3.**

**Number of estimated and surveyed territories each year, as of 2005. The numbers of sites and territories prior to 2005 have been updated as new information has become available, and so may be different from values shown in 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 275 sites where Southwestern Willow Flycatchers have occurred since 1993, only 142 sites were surveyed in 2005. Although our estimates for some sites are based on older survey data, over 78% of known sites have been surveyed since 2002, and sites surveyed since 2004 account for over 88% of the rangewide estimated number of flycatcher territories. Thus, the information used for most of the statistics reported herein is quite recent.

**Table 1. Most recent year of survey data for sites and territories included in this report, as of 2005.**

<b>Year</b>	<b># Sites</b>	<b>% Total Sites (n = 275)</b>	<b># Territories</b>	<b>% Total Territories (n = 1214)</b>
1993	1	0.4	2	0.2
1994	1	0.4	0	0.0
1995	1	0.4	1	0.1
1996	2	0.7	5	0.4
1997	4	1.5	5	0.4
1998	7	2.5	8	0.7
1999	6	2.2	6	0.5
2000	6	2.2	10	0.8
2001	31	11.3	63	5.2
2002	24	8.7	29	2.4
2003	20	7.3	13	1.1
2004	30	10.9	73	6.0
2005	142	51.6	999	82.3

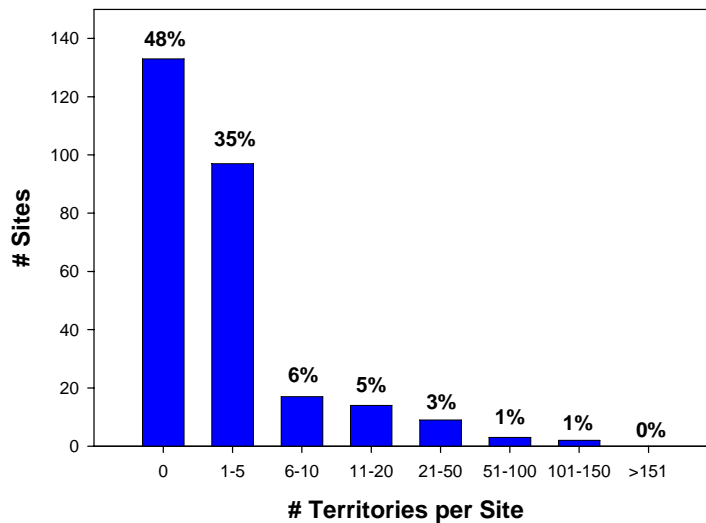
**Distribution of breeding sites by number of territories**

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. Willow Flycatcher territories have disappeared from 133 of the 275 sites tracked since 1993. All but two of these sites where flycatcher territories are no longer detected were composed of five or fewer territories. The two exceptions – Colorado River inflow to Lake Mead, and PZ Ranch on the San Pedro River – were larger sites where habitat was destroyed by flooding and fire, respectively.

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. We know 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). Flycatchers may eventually recolonize some sites from which they have been lost, due to a change in habitat quality, an increase in number of nearby territories, or other unknown factors. Such recolonization has occurred at 36 sites where flycatchers were detected again after at least one year of absence. Some of these sites have repeatedly cycled between occupied and unoccupied status, and some currently have territories while others do not.

If we look again at the size distribution of breeding sites and exclude the sites where territories are no longer detected, the picture remains much the same - the vast majority of sites (97 of 142; 68%) have five or fewer territories. Because most of the 133 sites where birds are no longer detected had very small populations (usually only one or two territories), their loss does not greatly affect the overall rangewide territory estimates, nor many of the territory statistics that we report herein.

**Figure 4.**  
**Number of territories at Willow Flycatcher Breeding Sites, as of 2005.**



**Distribution of territories by state**

Arizona, New Mexico, and California account for the greatest number of known Southwestern Willow Flycatcher sites and territories (Table 2). Nevada, Colorado, and Utah account for about 11% of territories, primarily because the range of *E.t. extimus* includes only the southern extremes of these states, and there are few known breeding sites within this relatively limited geographic area. Texas is absent from this table because there were no recent survey data or other records to shed light on current status and distribution within the state.

**Table 2. Number of Southwestern Willow Flycatcher breeding sites and territories by state, as of 2005.**

<b>State</b>	<b># Sites</b>	<b>% of Total Sites</b>	<b># Territories</b>	<b>% of Total Territories</b>
AZ	117	42.5	495	40.8
CA	94	34.2	191	15.7
CO	10	3.6	63	5.2
NM	38	13.8	393	32.4
NV	13	4.7	68	5.6
UT	3	1.1	4	0.3
<b>TOTAL</b>	275		1214	

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

In general we use the term “drainage” in a generic sense to describe one or more portions of a river system or watershed. Though the different drainages can vary widely in scale, this provides a convenient and useful framework within which to summarize site and territory information (per USFWS 2002).

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 Pahrana gat River support most of the flycatchers in Nevada. Sites along the Colorado River are in Arizona, California, and Utah.

**Table 3. The number of Southwestern Willow Flycatcher breeding sites and territories by major river drainage (drainages with >1% of total flycatcher territories), as of the 2005 breeding season.**

<b>Drainage</b>	<b># Sites</b>	<b>% of Total Sites</b>	<b># Territories</b>	<b>% of Total Territories</b>
Big Sandy River	2	0.7	38	3.1
Bill Williams River	6	2.2	11	0.9
Canadian River	6	2.2	17	1.4
Colorado River	40	14.5	26	2.1
Gila River	45	16.4	284	23.4
Kern River	2	0.7	20	1.6
Owen's River	5	1.8	28	2.3
Pahrana gat River	4	1.5	32	2.6
Rio Grande	24	8.7	212	17.5
Salt River	6	2.2	74	6.1
San Luis Rey River	8	2.9	58	4.8
San Pedro River	19	6.9	165	13.6
Santa Ana River	30	10.9	34	2.8
Santa Margarita River	3	1.1	21	1.7
Tonto Creek	1	0.4	84	6.9
Verde River	6	2.2	23	1.9
Virgin River	8	2.9	38	3.1
All others*	60	21.8	49	4.0
<b>Total</b>	<b>275</b>		<b>1214</b>	

\*All others includes drainages that had <1% of total territories: Agua Fria River, Agua Hedionda, Amargosa River, Chama River, Hassayampa River, Las Flores Creek, Little Colorado River, Meadow Valley Wash, Mimbres River, Mojave 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, and Temecula Creek

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

We 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.

**Table 4. The currently known number of flycatcher breeding sites and territories (as of 2005 data), and the number of territories necessary for recovery (per USFWS 2002), in each Recovery Unit and Management Unit.**

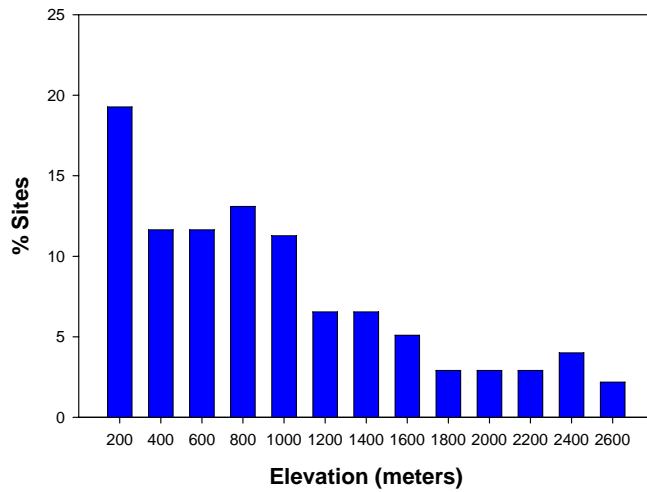
Recovery Unit	Management Unit	# of Sites	# of Territories	Territories Needed for Recovery
<b>Basin and Mojave</b>	Owens	5	28	50
	Kern	2	20	75
	Amargosa	2	1	25
	Mojave	6	3	25
	Salton	1	4	25
	<b>TOTAL</b>	<b>16</b>	<b>56</b>	<b>200</b>
<b>Coastal California</b>	Santa Ynez	4	7	75
	Santa Clara	12	8	25
	Santa Ana	33	34	50
	San Diego	23	86	125
	<b>TOTAL</b>	<b>72</b>	<b>135</b>	<b>275</b>
<b>Gila</b>	Verde	6	23	50
	Hassayampa - Agua Fria	2	0	25
	Roosevelt	7	158	50
	San Francisco	2	3	25
	Upper Gila	21	255	325
	Gila – San Pedro	42	194	150
	Santa Cruz	1	0	25
	<b>TOTAL</b>	<b>81</b>	<b>633</b>	<b>625</b>
<b>Lower Colorado</b>	Pahrnagat	6	39	50
	Virgin	7	31	100
	Little Colorado	4	5	50
	Middle Colorado	20	1	25
	Hoover - Parker	6	24	50
	Bill Williams	9	49	100
	Parker – Southern. Intl Boundary	15	1	150
	<b>TOTAL</b>	<b>68</b>	<b>151</b>	<b>525</b>
<b>Rio Grande</b>	San Luis Valley	6	55	50
	Upper Rio Grande	16	34	75
	Middle Rio Grande	8	135	100
	Lower Rio Grande	3	7	25
	<b>TOTAL</b>	<b>33</b>	<b>231</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>275</b>	<b>1214</b>	<b>1950</b>

**Elevation range of breeding territories**

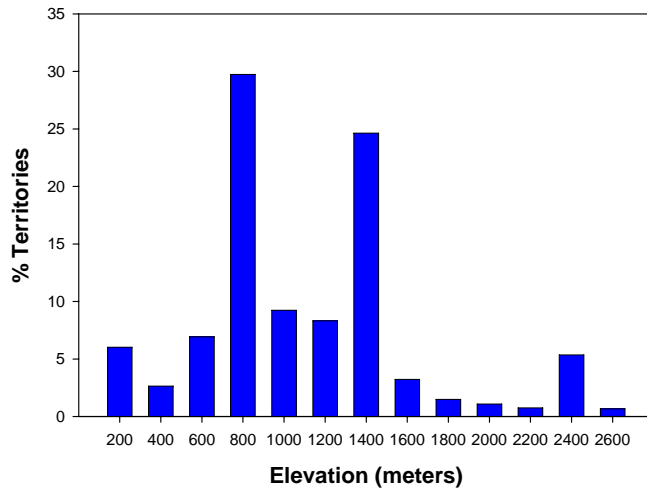
The Southwestern Willow Flycatcher is distributed over a wide elevation range. The majority of sites occur between 0 and 1000 m elevation (Figure 5a). Most territories are found between 0 and 1600 m (Figure 5b), with “spikes” at 601-800 m (the Gila/San Pedro River confluence and Roosevelt Lake in AZ) and 1401-1600 m (the Cliff-Gila Valley and San Marcial sites in NM). Although relatively few territories are known to occur above 2000 m elevation, Willow Flycatchers breed at four sites that are above 2500 m.

**Figure 5.**

**Figure 5a. The percentage of flycatcher breeding sites located at different elevations, as of 2005 (200 = 0 - 200 m, 400 = 201 - 400 m, etc.).**



**Figure 5b. The percentage of flycatcher territories occurring at differing elevations, as of 2005 (200 = 0 - 200 m, 400 = 201 - 400 m, etc.).**



**Use of native and exotic habitats**

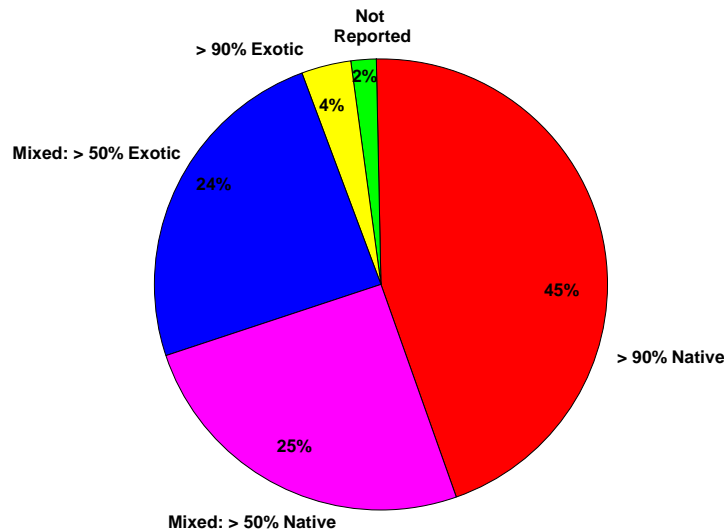
Many (perhaps most) flycatcher breeding sites are comprised of spatially complex habitat mosaics, often including both exotic and native vegetation. Within a site territories are frequently clumped and/or distributed near the patch edge. Thus, the vegetative composition of individual territories may differ from the overall composition of the patch. Furthermore, depending on the time in the breeding season and the breeding status of an individual flycatcher, flycatchers may move extensively within a patch, travel between patches, or even exploit resources outside of a breeding patch. Therefore an area much larger than a territory, and possibly much larger than a patch, may influence flycatcher breeding success and persistence at a particular site.

Detailed territory-based habitat measurements are lacking for most Southwestern Willow Flycatcher breeding sites, yet we attempted to broadly characterize the use of native and exotic habitats. To do so, we 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:

- Native** (>90% native vegetation)
- Mixed – >50% Native** (50-90% native vegetation)
- Mixed – >50% Exotic** (50-90% exotic vegetation)
- Exotic** (>90% exotic vegetation)

Habitat patches comprised of native vegetation account for less than half (45%) of the known flycatcher territories (Figure 6). Although only 4% of territories occur at exotic sites, another 49% are located within sites where the habitat includes native/exotic mixtures. In many of these cases, exotics are contributing significantly to the habitat structure by providing the dense lower-strata vegetation that flycatchers prefer.

**Figure 6.**  
**Percentage of flycatcher territories occurring within breeding sites of differing compositions of native and exotic vegetation, as of the 2005 breeding season.**



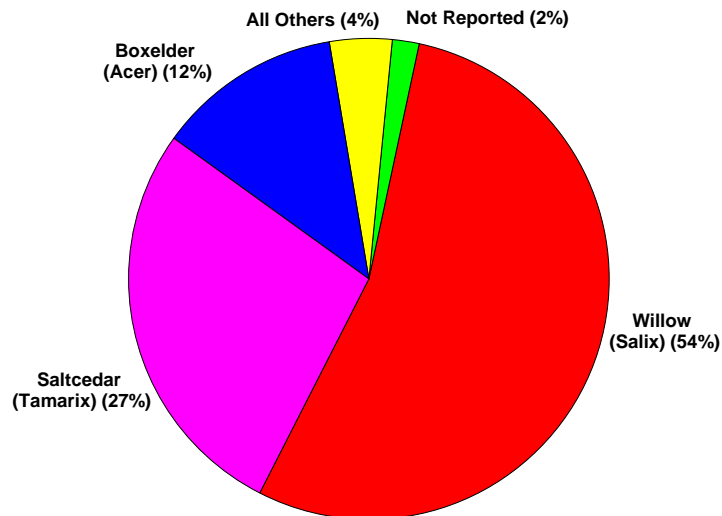
### Dominant tree species at breeding sites

Similar to classifying breeding territory habitat based on patch-level characteristics, the dominant tree species may differ between a patch and an individual territory within that patch. 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, we tallied the number of territories occurring in breeding 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). More than 25% of territories are located at sites where saltcedar (*Tamarix spp*) predominates, and 12% are in patches where boxelder (*Acer negundo*) is the most common habitat component. Taken together, sites dominated by all other tree species account for only about 4% of territories.

The large percentage of territories located in habitats dominated by boxelder might suggest that such sites are widely used across the Southwestern Willow Flycatcher's range. However, flycatchers breed in boxelder dominated habitats only in the Cliff-Gila Valley, New Mexico (Stoleson and Finch 2003).

**Figure 7.**  
Percentage of flycatcher territories occurring within breeding sites dominated by particular tree species, as of the 2005 breeding season.





**Administration/management of sites and territories**

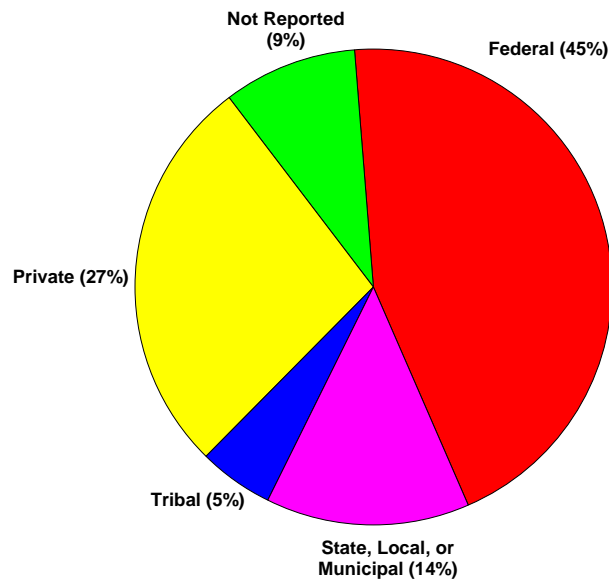
One factor important in conservation and recovery planning is the nature of ownership or “administration” of a site – e.g., whether management of the site is the responsibility of private landowners, the government, or some other entity. We examined this in two ways – first by site, then by territory.

By Site (Figure 8a): Forty-five percent of known breeding sites are under Federal government administration, 27% are on privately owned lands, state/local/municipal governments account for another 14% of sites, and 5% are administered by Native American tribes.

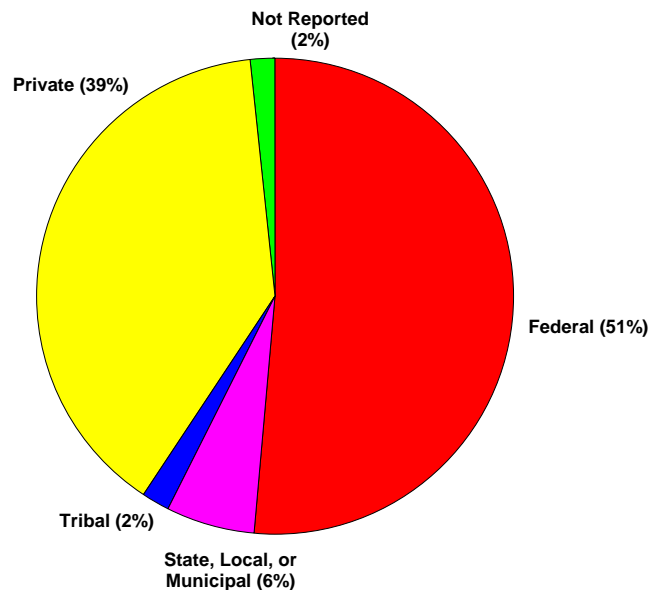
By Territory (Figure 8b): Federal lands account for 51% of flycatcher territories, and private for 39%. This underscores the importance of working with private landowners as flycatcher conservation and recovery efforts proceed. Roughly a third (32%) of the flycatcher territories found on privately owned lands are in the Cliff-Gila Valley, New Mexico.

**Figure 8**

**Figure 8a. Percentage of flycatcher breeding sites found under different land ownership, as of the 2005 breeding season.**



**Figure 8b. Percentage of flycatcher territories found under different land ownership, as of the 2005 breeding season.**



## SUMMARY: 2005

- We have learned of many new breeding sites and territories since the early 1990s as a result of extensive survey efforts throughout the Southwest. In 1993, there were only 140 known territories distributed among 40 breeding sites. The current count (as of 2005) is 1214 territories located among 275 sites (but remember the earlier caution about lack of standard definition for “site”).
- Not all of the 275 known sites are surveyed every year. The total estimated number of known territories (1214) is based on the most recent survey at all sites and does not reflect sites that were actually surveyed in a given year. In 2005 there were 142 sites that were surveyed with 999 territories detected.
- Most territories are found within small breeding sites (those sites with five or fewer territories). There are only five sites with 50 or more territories, though this comparison is confounded by lack of a standard definition of site.
- We know of 133 sites that supported territorial flycatcher in at least one year since 1993, but as of 2005 do not; almost all were small sites (five or fewer territories). Because these were primarily small sites, these territory losses account for only a small percentage of known territories; however, they underscore the possible vulnerability of small sites.
- The states of California, Arizona, and New Mexico account for 89% of known flycatcher territories. Nevada, Colorado, and Utah collectively have 11% of the known territories. We know virtually nothing about the current status of the Southwestern Willow Flycatcher in Texas.
- Southwestern Willow Flycatchers are distributed over a wide elevation range, with most from sea level to 1600 m, but a few sites (n=4) are located as high as 2500 m in elevation.
- Fewer than half (45%) of territories are in native habitat and 29% are in habitats having a 50% or greater exotic component. A large percentage of the native habitat territories occur at one site – the Cliff-Gila Valley in New Mexico. Over 90% of territories are in habitats where willow, saltcedar, or boxelder are the dominant tree species; flycatchers breed in boxelder-dominated habitats only in the Cliff-Gila Valley, New Mexico.
- Fewer than half (45%) of sites are on federally-controlled lands and 27% are on private lands; these privately owned sites account for 39% of known territories. Approximately one-third (32%) of territories on privately owned sites are found in the Cliff-Gila Valley, New Mexico.

## Acknowledgements

This synthesis of data from so many sites over such a broad geographic range was only made possible by the efforts of numerous cooperators. Originally, these data were gathered by hundreds of agency and non-governmental biologists surveying for thousands of hours, often in very difficult field conditions. Their dedication and efforts are greatly appreciated. Further, the ability to report specific information for each site was aided by agencies and people that provided detailed summary information; our sincere thanks go to the individuals listed below.

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## Literature Cited

- Browning, M.R. 1993. Comments on the taxonomy of *Empidonax traillii* (Willow Flycatcher). *Western Birds* 19:25-33.
- 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.
- Paradzick, C.E. and A. A. Woodward. 2003. Distribution, abundance, and habitat characteristics of Southwestern Willow Flycatchers (*Empidonax traillii extimus*) in Arizona, 1993 – 2000. *Studies in Avian Biology* 26:22-29.
- 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. 2000. Molecular genetic structuring and demographic history of the Willow Flycatcher. Masters Thesis. Northern Arizona University, Flagstaff, AZ.
- Sedgwick, J.A. 2001. Geographic variation in the song of Willow Flycatchers: differentiation between *Empidonax traillii adustus* 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. McCarthy, S. O. Williams, and B. E. Kus. 2000. Southwestern Willow Flycatcher breeding site and territory summary - 1999. U.S. Geological Survey, Flagstaff, AZ.
- Stoleson, S.H. and D.M. Finch. 2003. Microhabitat use by breeding Southwestern Willow Flycatchers on the Gila River, New Mexico. *Studies in Avian Biology* 26:91-95.
- 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.