SOUTHWESTERN WILLOW FLYCATCHER 2000 SURVEY AND NEST MONITORING REPORT

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EXECUTIVE SUMMARY

Purpose. The southwestern willow flycatcher was federally listed as endangered in 1995. Probable factors contributing to population declines are loss, alteration, and fragmentation of native riparian breeding habitat; loss of wintering habitat; nest predation; and brood parasitism by brown-headed cowbirds. Prompted by the concern of population declines, statewide surveys for the southwestern willow flycatcher were initiated in 1993. Information was gathered in a standardized, systematic, interagency approach to provide a basis for management recommendations. Results of the 2000 survey and nest monitoring effort are summarized in this report.

Surveys, Detections, and Distribution. The Arizona Game and Fish Department (AGFD) and other cooperators spent 4259 hours surveying 197 sites covering approximately 300 linear km of riparian habitat. Surveyors detected 586 resident willow flycatchers at 47 sites. They located 328 flycatcher territories, of which 278 paired flycatchers were documented at 42 sites. Willow flycatchers were documented along 11 drainages. The major concentrations in lower elevations (<1115 m) occurred near the confluence of the Gila and San Pedro rivers, Roosevelt Lake, Alamo Lake, the Gila River (near Pima), Topock Marsh, Big Sandy River, the lower Grand Canyon (river miles 246 to 268), and Camp Verde. Three high elevation (>2400 m) sites with flycatchers were documented, 2 on the Little Colorado River (Greer sites) and 1 on the San Francisco River (Alpine site).

Nesting Attempts and Nest Success. Statewide surveyors documented 352 willow flycatcher nesting attempts at 38 sites throughout Arizona. Nest outcomes (success or failure) were determined for 227 nests located within AGFD and other cooperators' nest monitoring study sites. Of the 227, 103 were successful (45 percent). Mayfield nest success (Mayfield 1961, 1975) was 55 percent. We estimate that 227 willow flycatcher young fledged from the 102 successful nests.

Sixty-two nests were depredated. Forty nests were either deserted or abandoned (including 3 that were abandoned due to cowbird parasitism). Seven infertile clutches were documented. Two nests failed due to weather and 8 nests failed due to other causes. Cowbird brood parasitism was documented in 8 of 227 nesting attempts. Cowbird trapping was conducted at 10 willow flycatcher breeding sites. Brown-headed cowbirds were documented at all but 1 site where willow flycatcher nests or fledglings were observed.

Video Nest Monitoring. Time-lapse video cameras were placed at 11 willow flycatcher nests to record nest predators and parasitism effects. Nest outcomes were recorded for 9 flycatcher nests. Seven flycatcher nests fledged young. Cooper's hawks depredated two flycatcher nests. One nest was depredated but the event was not recorded due to battery failure. One camera was removed after set-up because the female did not return to the nest. However, once the camera was removed, the female returned and attended the nest.

Nesting Habitat Characterization. Of the nesting attempts documented statewide and where adequate information was provided (n = 303), tamarisk was the predominant nesting substrate (270 nests). Nests were also found in willow (31 nests), cottonwood (1 nest), and mesquite (1 nest). Nest site vegetation measurements were taken at the AGFD nest monitoring sites. Mean nest height at the Winkelman Study Area was 5.60 m (s = ±1.47; n = 87). At the Roosevelt Lake sites, mean nest height was 4.37 m (s = ±1.48; n= 105).

Management / Recommendations. The highest priority for willow flycatcher conservation is the protection of occupied willow flycatcher habitat through partnerships with land management agencies as well as private landowners. Extensive surveys have been performed since 1993 to identify flycatcher populations, yet little or no survey data exist for some riparian areas of the state where suitable habitat exists. These areas must be identified and surveys implemented and coordinated through state, federal, Native American, and private partnerships.

Knowledge of habitat relationships and their influence on reproductive success must be a primary component of recovery, conservation, and management strategies. Only through detailed demographic research, surveys, nest monitoring, vegetation sampling, and habitat measurements can these parameters be described. Sharing of data will be needed to identify similarities and differences between local population parameters. The USFWS Southwestern Willow Flycatcher Recovery Team is compiling these parameters, collected by numerous independent researchers. Conservation and recovery of the willow flycatcher is not only dependent on federal and state agency direction, but also must include cooperation and support of private landowners, Native American nations and nongovernmental organizations. Recovery goals should include protection, restoration, and maintenance of riparian ecosystem integrity.

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Southwestern Willow Flycatcher
2000 Survey and Nest Monitoring Report

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INTRODUCTION

The willow flycatcher (*Empidonax traillii)* is a widely distributed summer resident of much of the United States and southern Canada (Brown 1988). The four (or five) subspecies of willow flycatchers recognized in North America (Fig. 1) are distinguished from each other by subtle differences in color and morphology, which can only be observed by careful study of birds in the hand (Phillips 1948, Aldrich 1953, Hubbard 1987, Unitt 1987, Browning 1993). The current breeding range of the southwestern willow flycatcher (*E.t. extimus*) includes Arizona, southern California, New Mexico, southern Nevada, southern Utah, and southwestern Colorado. Recent breeding records from western Texas are lacking (Sogge and others 1997), and there are only a few probable breeding records for extreme northwestern Mexico (Unitt 1987, Wilbur 1987).

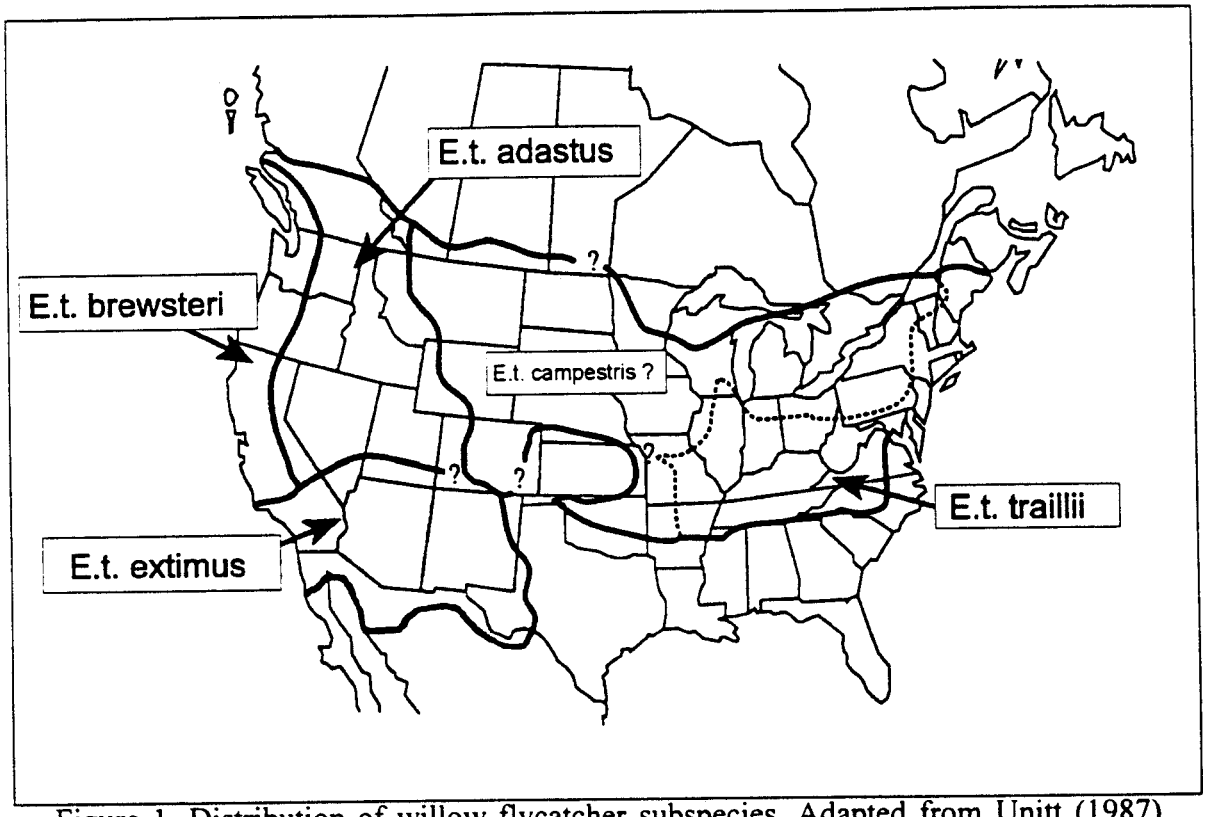

Figure 1. Distribution of willow flycatcher subspecies. Adapted from Unitt (1987) and Browning (1993).

The southwestern willow flycatcher is a riparian obligate, restricted to dense mesic vegetation. Concern over declining willow flycatcher populations and degradation of native riparian habitat prompted Arizona Partners in Flight, an interagency program dedicated to conserving land birds, and the Arizona Game and Fish Department (AGFD), as the coordinating agency, to initiate statewide willow flycatcher surveys in 1993 (Muiznieks and others 1994). At that time, the primary objective was to survey suitable and/or historical riparian and wetland habitat, using standardized methods, to determine the status of the flycatcher in Arizona. As a result of that survey effort, collection of habitat and nest productivity information was identified as an important management recommendation. In 1994, statewide surveys continued, but few breeding sites were documented and most of these were composed of five or fewer territories.

In 1995, the southwestern willow flycatcher was federally listed as endangered (the events leading to listing and designation of critical habitat are described in U.S. Fish and Wildlife Service 1991, 1992, 1993, 1995, 1996, and 1997). The flycatcher was also included on the list of *Wildlife of Special Concern in Arizona* (AGFD in prep.).

After listing in 1995, AGFD began an intensive nest monitoring effort to locate and monitor nests at 3 of the larger breeding areas to collect detailed local population estimates and nest productivity data. This effort has continued through 2000.

This document serves as the AGFD summary report on 2000 activities. It also contains summaries of related work by cooperators. Related work falls into 2 categories: 1) the intensive effort to systematically search riparian habitat to record the presence of willow flycatchers in Arizona (surveys) and 2) the intensive effort at a few select sites to estimate breeding success and productivity and to record vegetation characteristics (monitoring). Because AGFD and some cooperators may be involved in both types of projects, results from both efforts are reported here. The terms "survey" and "monitoring" are used to identify these specific activities.

Specifically, the 2000 AGFD objectives were as follows:

1. Coordinate survey and monitoring efforts with agency and private cooperators.
2. Survey suitable and potentially suitable habitat (where land owner permission was obtained) on the San Pedro River from Redington to its confluence with the Gila River and from Christmas to the Ashurst-Hayden Dam along the Gila River (Winkelman Study Area).
3. Survey suitable or potentially suitable habitat within 40 km of occupied habitat at Roosevelt Lake.
4. Survey habitat at Alamo Lake.
5. Monitor nests to determine nest success and productivity in 3 breeding areas: the Winkelman Study Area, Roosevelt Lake, and Greer/Alpine.
6. Record and report color band information at all survey and monitoring sites to the USGS Colorado Plateau Field Station (CPFS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Bureau of Reclamation (USBR).
7. Document the presence or absence of brown-headed cowbirds (*Molothrus ater*) at survey sites and determine the impacts of brown-headed cowbird parasitism on nest success.

8. Characterize vegetation at nest sites.
9. Document predation and parasitism events using remote video cameras at Roosevelt Lake.
10. Develop management recommendations for the willow flycatcher.
11. Compile statewide data into an annual report.
12. Incorporate survey, monitoring, and geographical data into a comprehensive statewide database.

As noted above, this report includes only the 2000 survey and monitoring data. More in-depth discussions on willow flycatcher natural history, demography, and associated threats can be found in Aldrich (1953), Barlow and McGillivray (1983), Flett and Sanders (1987), Brown (1988), Whitfield (1990), Sedgwick (1992), Sferra and others (1995), Sogge and others (1995), USFWS (1995), Whitfield and Strong (1995), Paxton and Sogge (1996), Paxton and others (1996), Petterson and Sogge (1996), Skaggs (1996), Spencer and others (1996), Whitfield and Enos (1996), Braden and others (1997), Paxton and others (1997), Sferra and others (1997), Sogge and others (1997), SWCA, Inc., Environmental Consultants (1997), McCarthey and others (1998), McKernan and Braden (1998), McKernan and Braden (1999), Paradzick and others (1999), and Paradzick and others (2000). Our work complements that of the CPFS (see Paxton and Sogge 1996, Langridge and Sogge 1997, Netter and others 1998, English and others 1999; Luff and others 2000), and other ongoing research projects.

METHODS

STATEWIDE SURVEYS

Prior to the breeding season, AGFD contacted cooperators and identified statewide survey sites (reaches of riparian habitat). We compiled this information and worked to coordinate surveys among agencies and organizations to limit overlap of areas. All new surveyors attended willow flycatcher training workshops in May prior to receiving their federal and/or state permits.

Surveys were performed according to the established protocol (Sogge and others 1997). During surveys, the sites were designated by the numerous agency and private cooperators in the field on 7.5 minute topographical maps. At a minimum, 1 survey was to be performed at each site in each of the following 3 periods: 15 May to 31 May, 1 June to 21 June, 22 June to 10 July. Surveys were performed at least 6 days apart, from dawn to late morning, while birds were most active. A tape of southwestern willow flycatcher songs and calls was used to elicit responses from possible territorial flycatchers.

Willow flycatchers were considered territorial (or resident within a site) if they were detected between 15 June and 25 July, regardless of whether a possible or known mate was observed. Additionally, birds were considered territorial if observations of nesting activity or nests were found outside these dates. If a bird was detected prior to 15 June, a follow-up survey was conducted to evaluate its status as a territorial bird. Willow flycatchers documented prior to 15

June, but not detected after subsequent visits or in the last survey period, were considered migrants. An "unknown" designation was given to birds if follow-up surveys were not completed according to protocol or if not enough information was available to determine resident or migrant status. The AGFD and other cooperators with nest monitoring permits performed intensive nest searches when willow flycatcher pairs were documented.

Willow flycatcher survey data were recorded on a standardized form (Appendix A) and returned to AGFD and USFWS. In an effort to keep site designations and reporting consistent in future years, all sites were designated using a set of start and stop Universal Transverse Mercator (UTM) coordinates in the AGFD database. This information was then compiled and entered into the Nongame and Endangered Wildlife Program Willow Flycatcher Database and electronically transferred to the Willow Flycatcher Information Management System. Willow flycatcher detection information was also entered into the AGFD Heritage Data Management System.

AGFD Survey Techniques

All AGFD surveys were conducted according to the established survey protocol (Sogge and others 1997). Additionally, when flycatchers were detected, repeat visits were conducted until pair status and color band information was confirmed. To record this information, surveyors visited sites with flycatchers an average of twice per week during the breeding season. When time permitted, AGFD surveyors conducted nest searches and nest checks to document breeding activity at these sites. However, only nest outcomes at monitoring sites were included in the estimates of breeding success and productivity (see nest monitoring section below).

AGFD Survey Areas

Study sites surveyed by AGFD were dense riparian habitats within broad flood plains located in Arizona at: 1) Alamo Lake, 2) Greer/Alpine, 3) Roosevelt Lake, and 4) Winkelman Study Area. A detailed site description is as follows:

Alamo Lake

Alamo Lake survey sites were located near the confluence of the Big Sandy, Santa Maria, and Bill Williams rivers in west-central Arizona at an elevation of approximately 350 m. Surveys were conducted on the Santa Maria River downstream from the Palmerita Ranch to the confluence with the Big Sandy River. On the Big Sandy River surveys were conducted from the confluence with the Santa Maria River to approximately 1 mile upstream of Whiterock. The Santa Maria and Big Sandy rivers form the headwaters of the Bill Williams River; from their confluence all riparian habitat was surveyed downstream to Alamo Lake. The vegetation included associations of coyote willow (*Salix exigua*), Goodding willow (*S. gooddingii*), tamarisk (*Tamarisk spp.*), Fremont cottonwood (*Populus fremontii*), and seep-willow (*Baccharis glutinosa*).

Greer/Alpine

Most sites were located either on the Little Colorado River or on tributaries where suitable or potentially suitable Geyer willow (*Salix geyeriana*) or Bebb willow (*S. bebbiana*) habitat existed. The high elevation survey sites (>2400 m) located in the White Mountains included those areas where nest monitoring was being conducted, and at additional U.S. Forest Service (USFS) managed areas in the Apache Sitgreaves National Forest. Vegetation at these sites was composed mainly of willow patches, interspersed with mountain alder (*Alnus tenuifolia*).

Roosevelt Lake

Surveys were conducted within 40 km upstream of the Tonto Creek and the Salt River inflows to Roosevelt Lake at an elevation of approximately 640 m. Only suitable or potentially suitable habitat was surveyed. Riparian habitat on Tonto Creek was distributed among several distinct patches. Tree species included tamarisk, Goodding willow, Fremont cottonwood, and seep-willow. Riparian vegetation varied along the Salt River from monotypic stands of tamarisk to patches dominated by willow. Stands of riparian habitat have become established at lower lake elevations as the lake has receded for the past 5 years. Survey effort by AGFD has expanded in the last 3 years to include this habitat.

Winkelman Study Area

All suitable habitat (where landowner access was granted) from Redington on the San Pedro River downstream to the confluence with the Gila River was surveyed (68 km). Additionally, approximately 58 linear km of habitat was surveyed from the town of Christmas to the Ashurst-Hayden Dam on the Gila River. Elevation ranged from 695 m at Redington to 481 m at the Ashurst-Hayden Dam. Potentially suitable riparian vegetation in these areas varied along a continuum from monotypic tamarisk to stands of native coyote or Goodding willow and Freemont cottonwood. Riparian habitat was surrounded by upland Sonoran desert as described by Brown (1994).

AGFD Nest Monitoring Techniques

Nest monitoring methods applied by AGFD followed the Southwestern Willow Flycatcher Nest Monitoring Protocol (Rourke and others 1999), a modification of the Breeding Biology Research and Monitoring Database (BBIRD) field protocol (Martin and others 1997). Nest searches were conducted from mid-May through August. Nests were primarily located by watching adults return to a nest or by systematically searching suspected nest sites. Nests were monitored every 2 to 4 days. During incubation, nest contents were observed directly using a mirror pole or miniature video camera. After hatching, the nestling number was also confirmed using these direct techniques. Once confirmed, nests were observed from a distance to reduce the risk of nest predation and the possibility of premature fledging of nestlings. If activity was not observed at a previously active nest, the nest was checked directly to identify nest contents, and a search of the general area was conducted to locate possible fledglings. Nest checks were recorded daily on Nest Record Forms unique to each nest (Appendix B) and on a Nest Monitoring Calendar unique to each site.

We considered a nest successful if any of 4 conditions are documented: 1) 1 or more young were confirmed visually fledging from the nest or located near the nest; 2) adults were seen feeding fledglings; 3) parents behaved as if dependent young were nearby when the nest was empty (that is defensive behavior and/or adults agitated near the nest); or 4) nestlings were observed in the nest within 2 days of the estimated fledge date (this assumption is based on observations by AGFD personnel of southwestern willow flycatchers fledging at 10 days of age). The reader should be aware that this assumption might cause the nest success calculation to be overestimated. Conversely, excluding these nests might cause the nest success calculation to be underestimated.

We considered a nest to have failed if any of 5 outcomes are documented: 1) the nest was found empty or destroyed more than 2 days prior to the estimated fledge date (depredated); 2) the nest fledged no willow flycatcher young but contained cowbird eggs or young (parasitized); 3) the nest was deserted with eggs remaining (deserted); 4) the nest was abandoned prior to egg laying (abandoned); or 5) the entire clutch of eggs was determined to be infertile if the female incubated for an excess of 20 days or if the female deserted the eggs after 12 days and the eggs were candled to verify infertility.

Nest success percentages were computed by dividing the number of successful nests by the total number of nests with known outcome (simple nest success). The Mayfield method (Mayfield 1961, Mayfield 1975) was also used to calculate nest success. Nests failing early in the breeding cycle are less likely to be located because they are in existence for a shorter period of time. Absence of these nests from simple success calculations tends to inflate traditional estimates. The Mayfield method accounts for this by calculating a daily nest mortality rate, determined by the number of failed nests divided by the total number of exposure days. Exposure days are the total number of days the nest was observed to be active. Success rate was calculated for the egg laying, incubation, and nestling stages and then multiplied together to give total Mayfield nest success. For interpretation of Mayfield nest success equations and calculations, refer to Mayfield (1961, 1975) and Rourke and others (1999).

AGFD Nest Monitoring Study Areas

Ten low elevation (<640 m) and 3 high elevation (>2400 m) sites were monitored. These sites were located within 3 of the AGFD survey areas as previously described: 1) Greer/Alpine, 2) Roosevelt Lake, and 3) Winkelman Study Area.

Patch area (ha) for each site was estimated using 1 of 3 methods. Patch areas for the Winkelman Study Area nest monitoring sites were estimated by outlining the perimeter of each site on aerial photographs and using a planimeter to calculate area. Patch areas for the Roosevelt Lake sites were calculated from Arcview (1997) polygons generated from taking UTM coordinates along site perimeters in the field. High elevation site areas were taken from Langridge and Sogge (1997). Estimation of patch area is inclusive of all riparian habitat within each site that contains both occupied and unoccupied portions of habitat.

Greer/Alpine

The high elevation sites (>2400 m) included Alpine Horse Pasture, Greer Town, and River Reservoir. All sites occurred on the Apache-Sitgreaves National Forest. Open meadow and ponderosa pine (*Pinus ponderosa*) forest characterized the surrounding area for all 3 high elevation sites.

Alpine Horse Pasture (0.5 ha). A patch of Geyer willow, approximately 4 m high, was located approximately 100 m from the San Francisco River.

Greer Town (11.5 ha). Most of the habitat was composed of Geyer willow interspersed with mountain alder, Bebb willow and Arizona rose (*Rosa arizonica*). Vegetation, approximately 5 m high, occurred in a linear patch adjacent to the Little Colorado River. Beaver dams created pools within the habitat and 2 small shallow ponds existed adjacent to the patch.

River Reservoir (14 ha). Dense Geyer willow patches, approximately 4 m high, were interspersed among braided channels of the Little Colorado River. Beaver ponds created pools of standing water among the willows.

Roosevelt Lake

Roosevelt Lake sites included the Salt River Inflow and the Tonto Creek Inflow. Both sites occurred on USFS Tonto National Forest. Riparian habitat was surrounded by upland Sonoran desert as described by Brown (1994).

Salt River Inflow (177 ha). The Salt River Inflow monitoring site expanded from 33.8 ha in 1995 – 1998 to 177 ha in 1999 as willow flycatchers were found in new areas. The site consisted of 2 patches: 1) a monotypic tamarisk patch (approximately 9 m high) forming a contiguous patch that flycatchers have occupied for the past 7 years; and 2) a patch of mixed tamarisk and Goodding willow (approximately 5.5 m high) occupied for 2 years. Mesquite was more prevalent away from the river and eventually grades into upland Sonoran desert vegetation. The Salt River was perennial along the northern border of both areas.

Tonto Creek Inflow (71.4 ha). Numerous patches of riparian habitat occurred in the Tonto Creek inflow to Roosevelt Lake. Vegetation varied among patches. Vegetation composition included a tamarisk dominated understory and a patchy Fremont cottonwood and/or Goodding willow overstory. However, stands of monotypic tamarisk occurred in a few areas of the site. Average canopy height was approximately 8 m for the entire site. Tonto Creek flowed only during monsoon storms during the breeding season. A number of small pools were interspersed throughout the habitat, 3 of which were permanent water sources during the 2000 breeding season.

Orange Peel (1 ha). This site, new in 2000, was located downstream of the Tonto Creek monitoring site. Tamarisk dominated most patches with a small number of cottonwood and willow trees interspersed (approximately 5 m high). Tonto Creek, adjacent to the monitoring site, had surface flow during the breeding season.

Winkelman Study Area

Four sites in this area were located along the lower San Pedro River: Aravaipa/San Pedro Confluence, CB Crossing SE, Dudleyville Crossing, and Indian Hills. One site, Kearny, was located on the Gila River. In the following site descriptions Kearny is listed first, followed by downstream to upstream sites along the San Pedro River. Cook's Lake Seep, monitored in prior years, was not monitored in 2000 because no resident flycatchers were documented at the site.

Kearny (11.3 ha). A contiguous patch of vegetation (approximately 8 m high) was predominantly composed of tamarisk interspersed with Goodding willow, Fremont cottonwood, and/or seep-willow. Sewage effluent inundated areas of the site during the breeding season. The perennial Gila River formed the southern boundary of the site.

CB Crossing SE (4.4 ha). Habitat consisted of a tamarisk dominated understory with a patchy Fremont cottonwood and/or Goodding willow overstory (approximately 13.5 m high). Surface water was often present within the patch during periods of irrigation runoff from an adjacent agricultural field.

Indian Hills (33.8 ha). Patch vegetation (approximately 8 m high) was a mixed understory of Goodding willow, seep-willow, and tamarisk with a Fremont cottonwood and/or Goodding willow overstory. Surface water within the site was often present during periods of irrigation runoff from an adjacent agricultural field.

Dudleyville Crossing (109.5 ha). Numerous patches of riparian habitat are located adjacent to the San Pedro River. The segment of river, located approximately 400 m from the nests, had surface flow throughout the breeding season. Vegetation was a mixed understory of Goodding or coyote willow, seep-willow, and tamarisk interspersed with a Fremont cottonwood and/or Goodding willow overstory (approximately 9 m high).

San Pedro / Aravaipa Confluence (9.0 ha). Vegetation (approximately 12 m high) was composed of Goodding willow, seep-willow, and tamarisk understory with a Goodding willow and/or Fremont cottonwood overstory. The San Pedro River was perennial adjacent to the vegetation and divided the site into 2 main patches.

COOPERATOR NEST MONITORING

SWCA Environmental Consultants performed nest monitoring at Camp Verde on the Verde River (for monitoring methods see SWCA Environmental Consultants 1997). The San Bernardino County Museum monitored nests located at Topock Marsh along the lower Colorado River and Monkey's Head along the Bill Williams River (for monitoring methods see McKernan and Braden 1999). Methods for nest monitoring by cooperators sometimes differed from AGFD protocol (Rourke and others 1999), making comparisons difficult, therefore, only descriptive statistics (means and standard deviations) are included for the monitoring data.

COLOR BANDING

Banding of willow flycatchers at AGFD study sites was conducted by CPFS. AGFD coordinated closely with CPFS to resight previously banded birds and determine unbanded adults and nestlings that could be uniquely color banded. For more information regarding the banding methods used and results of their project, see Luff and others (2000).

VIDEO NEST MONITORING SYSTEM

Five time-lapse video monitoring systems were used at willow flycatcher nests to identify nest predators at AGFD study sites. Equipment included a weatherproof camera (6 X 3 X 3 cm) and a VHS variable time lapse video recorder (also housed in a weatherproof case). The camera was attached to an adjacent tree at nest height and approximately 0.5 m from the nest. Modifications were made to the camera system to better camouflage and reduce possible nest abandonment (for example shortening the camera arm, replacing the original camera arm with camouflaged copper tubing, and attaching plant material directly to the camera arm). The video recorder was placed at least 10 m away to limit disturbance at the nest site while changing videotapes. Power was supplied by a 12-volt deep-cycle marine battery, which required replacement every 24 - 36 hours or was continually charged by solar panels in the field. Infrared light emitting diodes in the camera housing allowed activity to be recorded at night. A small video monitor, attached to the video recorder, allowed field workers to ensure proper camera placement and to monitor progress of the nest while replacing the videotape and battery. Video footage was recorded at 20 frames per second, which allowed documentation of predation events and cataloging of behavior, but decreased the frequency of tape replacement.

Cameras were placed at nests within the Roosevelt Lake nest monitoring study sites only. Nests that were at least 6 days into the incubation stage or contained nestlings younger than 7 days old were considered for possible camera set-up. The former limited the chance for abandonment, whereas the latter maximized video footage and reduced the possibility of force fledging young. We further selected nests that met 3 requirements: 1) nest height was less than 5 m high; 2) the density of vegetation around the nest allowed for minimal disturbance during camera set-up; and 3) the vegetation at nest height would not be disturbed by the camera and would allow an unobstructed image. Although these restrictions biases results by precluding random assignment of the cameras to nests, they reduce disturbance to nesting flycatchers. If the female did not return to the nest within 1.5 hours of set-up, the camera was removed and the nest was subsequently monitored to determine the outcome.

COWBIRD TRAPPING

Cowbird trapping was coordinated and conducted by cooperators. Traps were placed at 10 sites with resident willow flycatchers: Alamo Lake-Brown's Crossing, Alpine Horse Pasture, CB Crossing SE, Cooks Lake, Dudleyville, Greer Town, Kearny, Salt River Inflow, Tonto Creek Inflow, and River Reservoir. These traps may have an effect on other breeding sites within close proximity to the trap site. Information can be obtained by contacting the respective agency:

Apache-Sitgreaves National Forest (Alpine Horse Pasture, Greer Town, and River Reservoir), Tonto National Forest (Salt River Inflow and Tonto Creek Inflow to Roosevelt Lake), USBR Phoenix Office (CB Crossing SE, Cooks Lake, Dudleyville Crossing, Indian Hills, and Kearny), and USBR Boulder City Office Nevada (Alamo Lake-Brown's Crossing).

HABITAT CHARACTERISTICS

Vegetation at occupied willow flycatcher sites can be classified into 4 general types (Sogge and others 1997): 1) high elevation Geyer willow, 2) low elevation native broadleaf dominated (that is commonly *Salix spp.* and *Populus fremontii*), 3) low elevation mixed native broadleaf and exotic tamarisk, and 4) low elevation monotypic tamarisk.

General habitat characteristics (such as vegetation type, canopy height, and presence of water) were visually estimated and recorded on survey forms for each survey site (Appendix C). AGFD and SWCA personnel measured habitat variables at the nest sites (Appendix C). Descriptive statistics were calculated where applicable.

RESULTS

SURVEYS, DETECTIONS, AND DISTRIBUTION

One hundred ninety-seven sites were surveyed covering approximately 300 linear km of riparian habitat (Table 1, Appendixes D, E, F). Sites ranged from 30 m to 2798 m in elevation and 0.05 km to 11.3 km in length. The mean site length was 1.6 km. Nineteen of the 197 sites were not surveyed according to protocol. This was due to time or funding limitations or because unsuitable flycatcher habitat was found during the first survey. Of the 197 sites, 16 had not been surveyed previously. Most new survey sites were located along the Colorado River (8 sites) and Gila River (3 sites).

Five hundred eighty-six resident willow flycatchers were documented within 328 territories at 47 sites (Table 1, Appendixes G, H). AGFD personnel and statewide cooperators recorded 278 pairs. Pairing was not observed for 50 territorial birds at 25 sites. The male to female ratio is not 1:1 at all sites where polygynous or lone unpaired birds exist. In some instances, insufficient survey effort and quiet nesting behavior later in the breeding season may have precluded the documentation of pairs.

Flycatchers were documented along 11 drainages. The greatest concentrations of willow flycatchers were found in the Winkelman Study Area (from the confluence of Aravaipa Creek and the San Pedro River to the Florence-Kelvin Highway bridge on the Gila River) and at Roosevelt Lake. (Fig. 2; Table 2). Resident willow flycatchers were detected at 9 new sites. Five sites had not been surveyed in prior years: Big Sandy River Upstream US 93, GRN015, Lake Shore, Mile 259.5L, and Orange Peel. Four sites had been surveyed at least once between 1993-

1999 and had birds detected for the first time in 2000: A-Cross Road South, Aravaipa Inflow South, Miles 257.5 - 257.0R GC, and Waterwheel Cove. Cowbirds were documented at 156 sites including all but 1 (Greer Town) of the flycatcher breeding sites (Appendix F).

Table 1. Willow flycatcher survey effort, detection, and nesting attempt totals in Arizona, 2000.

Number of survey hours	4259
Number of sites surveyed	197
Number of resident willow flycatchers	586
Number of territories	328
Number of sites with resident willow flycatchers	47
Number of pairs	278
Number of sites with documented pairs	42
Number of territories with unverified pair status	50
Number of nesting attempts	352
Number of sites with documented breeding	38
Number of sites with cowbirds detected	156
Number of willow flycatcher breeding sites with cowbirds detected	37

Migrant flycatchers were detected at 53 sites (Appendix F), 11 of which also had resident birds throughout the breeding season. The majority of sites with migrant birds occurred on the Lower Colorado River (27 sites). In some cases, the estimate of migrant birds may be influenced by the density of birds within a site (underestimate), or if resident status cannot be verified based on insufficient survey effort (overestimate). Five flycatchers of unknown status were documented at 3 sites: Hassayampa River Preserve, Mingus Ave-Rocking Chair (Verde River), and Standard Wash (Colorado River).

The lowest elevation where territorial pairs and nesting were documented was 140 m at Topock Marsh on the lower Colorado River. The highest elevation where nesting was documented was at 2530 m (Greer Town). However, resident flycatchers were not detected between 1115 m and 2400 m. Resident willow flycatchers were detected at only 3 high elevation sites: Alpine Horse Pasture (3 flycatchers, 2 territories), River Reservoir (1 flycatcher, 1 territory), and Greer Town (3 flycatchers, 2 territories).

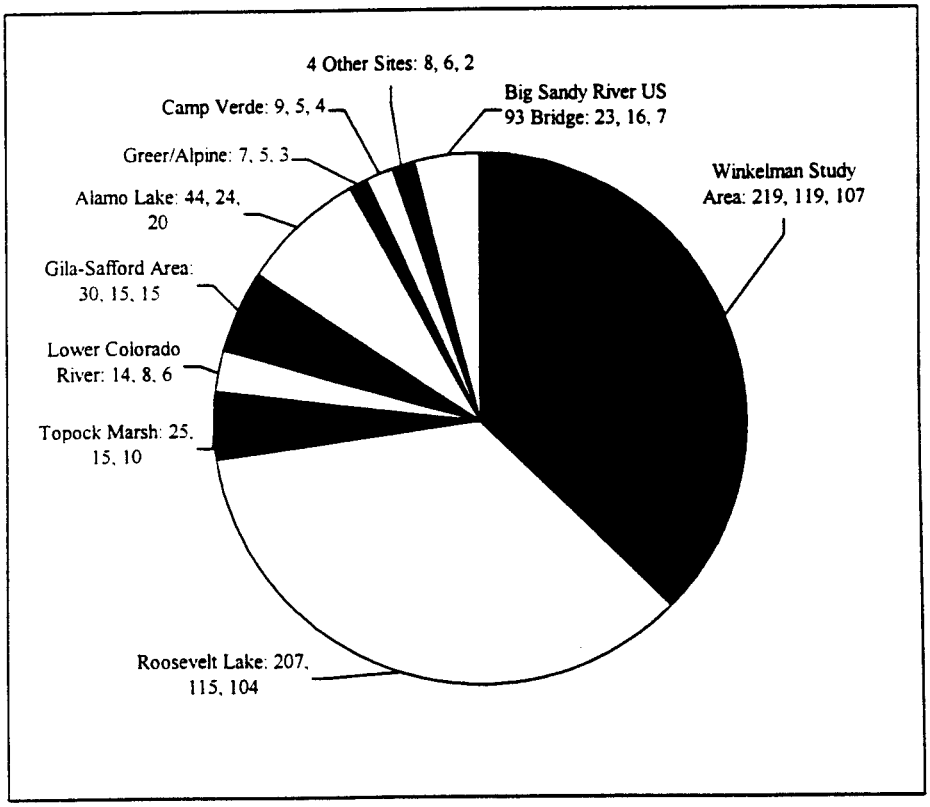

Figure 2. Southwestern willow flycatcher distribution (survey locations: number of resident willow flycatchers, number of territories, number of pairs) in Arizona, 2000. Proportions are based on total number of resident willow flycatchers (see Table 2 for sites within each location).

Table 2. Sites with willow flycatchers grouped by survey locations (see Fig. 2).

Winkelman Study Area	Roosevelt Lake	Lower Colorado River	Gila-Safford Area	Alamo Lake	Greer / Alpine	4 Other Sites
▸ GRN018 ▸ GRS018 ▸ GRS015 ▸ GRN015 ▸ Kearny ▸ GRS012 ▸ GRS011 ▸ GRN010 ▸ GRS007 ▸ GRN004 ▸ CB Crossing Southeast ▸ Indian Hills ▸ Dudleyville Crossing ▸ Malpais Hill ▸ Cook's Lake ▸ Aravaipa Inflow North ▸ San Pedro/Aravaipa Confluence ▸ Aravaipa Inflow South ▸ Wheatfields	▸ A-Cross Road South ▸ Tonto Creek Inflow ▸ Orange Peel ▸ Lake Shore ▸ School House Point South ▸ School House Point North ▸ Salt River Inflow ▸ Cottonwood Acres I	Miles: ▸ 268–265 L GC ▸ 266–262.5 L GC ▸ 259.5 R GC ▸ 257.5-257 R GC ▸ 246.0 GC	▸ Pima East	▸ Lower Big Sandy River ▸ Alamo Lake-Brown's Crossing ▸ Lower Santa Maria River	▸ River Reservoir ▸ Greer Town ▸ Alpine Horse Pasture	▸ Monkey's Head ▸ Waterwheel Cove ▸ Miles 51.5-50.5 L GC ▸ Duncan

NEST MONITORING

Three hundred fifty-two nesting attempts were documented statewide at 38 sites (Appendixes I, J). Of these, 228 nests were located at 12 nest monitoring sites and observed closely throughout the breeding season (one nest had an unknown outcome). Of these, 103 (45 percent) fledged young and 124 (55 percent) failed (Table 3). Predation, recorded at 62 nests (27 percent), was the major cause of nest failure (Table 4). Females deserted or abandoned 40 nests (18 percent).

The earliest willow flycatcher egg laying event was documented on 20 May at Kearny. The first hatching date was 2 June at Kearny. The first flycatcher fledged on 22 June at Kearny. The last documented fledging event occurred on 25 August at Topock Marsh.

Table 3. Willow flycatcher nest monitoring results in Arizona, 2000.

Site			Number of				
			Pairs[a]	Nests	Successful nests	Failed nests	Parasitized nests[b]
High Elevation[c]	Alpine Horse Pasture[d,e]		2	2	0	1	0
	Greer Town[d]		1	1	0	1	0
	Total		3	3	0	2	0
Low Elevation[f]	Roosevelt Lake	Tonto Creek Inflow[d,g]	21	35	19	16	0
		Salt River Inflow[d]	49	76	42	34	1
		Total	70	111	61	50	1
	Winkelman Study Area	San Pedro / Aravaipa Confluence	6	16	3	13	2
		CB Crossing SE[d]	6	8	0	8	0
		Dudleyville Crossing[d]	10	19	10	9	0
		Indian Hills[d]	8	13	4	9	0
		Kearny[d]	20	32	18	14	0
		Total	50	88	35	53	2
	Camp Verde		4	6	2	4	1
	Topock Marsh		13	19	4	15	4
	Monkey's Head		1	1	1	0	0
	Total (all low elevation sites)		138	225	103	122	8
All sites			141	228	103	124	8

[a] Number of pairs contributing to the number of monitored nests.
[b] Includes all parasitized nests. those that both fledged willow flycatcher young and failed.
[c] Nests above 2400 m.
[d] Cowbird trapping at the site during the breeding season.
[e] 1 nest unknown outcome.
[f] Nests below 1115 m.
[g] Includes nests monitored at the Orange Peel site

Table 4. Causes of failure for willow flycatcher nests at nest monitoring sites in Arizona, 2000.

Site			Number of nests					
			Depredated[a]	Abandoned / deserted[b]	Parasitized[c]	Infertile clutches	Weather	Other
High Elevation[d]	Alpine Horse Pasture[e]		0	1	0	0	0	0
	Greer Town[e]		1	0	0	0	0	0
	Total		1	1	0	0	0	0
Low Elevation[f]	Roosevelt Lake	Tonto Creek Inflow[e,g]	10	5	0	1	0	0
		Salt River Inflow[e]	20	7	1	2	1	2
		Total	30	12	1	3	1	2
	Winkelman Study Area	San Pedro / Aravaipa Confluence	6	5	2	0	0	0
		CB Crossing SE[e]	3	2	0	3	0	0
		Dudleyville Crossing[e]	2	5	0	0	1	1
		Indian Hills[e]	5	3	0	0	0	1
		Kearny[e]	6	5	0	1	0	2
		Total	22	20	2	4	1	4
	Camp Verde		2	1	1	0	0	1
	Topock Marsh		7	6	4	0	0	1
	Monkey's Head		0	0	0	0	0	0
	Total (all low elevation sites)		61	39	8	7	2	8
All sites			62	40	8	7	2	8

[a] Includes 3 parasitized nests that were later depredated; includes a nest that was depredated by a cowbird at Indian Hills.
[b] Includes 3 nests abandoned due to cowbird parasitism.
[c] Includes only those nests that failed directly due to cowbird parasitism (nests subsequently abandoned or fledged only cowbird young).
[d] Nests above 2400 m.
[e] Cowbird trapping at the site during the breeding season.
[f] Nests below 1115 m.
[g] Includes nests monitored at the Orange Peel site.

Parasitism

Eight nests were parasitized at nest monitoring study sites (Table 3, 5). Three nests were abandoned due to cowbirds and are included in the parasitism totals in Tables 3 and 4. Cowbirds may have caused or contributed to abandonment at other nests, but direct evidence was not found. Nest parasitism was greatest at Topock Marsh (21 percent: 4 of 19 nests). The remaining parasitized nests were at the Camp Verde (17 percent: 1 of 6 nests), San Pedro/Aravaipa Confluence (13 percent: 2 of 16 nests), and Salt River Inflow sites (1 percent: 1 of 76 nests). Camp Verde, San Pedro/Aravaipa Confluence, and Topock Marsh did not have cowbird trapping programs in place in 2000 (Table 3).

Table 5. Outcomes for parasitized willow flycatcher nests in Arizona, 2000.

	Total nests parasitized	Abandoned	Depredated	Fledged both WIFL[a] and BHCO young	Fledged only BCHO[b] young	Failed cause unknown
Number of nests	8	3	3	0	1	1

[a] WIFL = Willow flycatcher

[b] BHCO = Brown-headed cowbird

Nest Success

Mayfield (1961, 1975) success for all monitored sites combined was 55 percent (Table 6). A total of 83 renests were documented this breeding season, including 7 renests within the same nest cup. Twelve renests were initiated after a successful first nest. There were 9 successful double broods (4 at Roosevelt Lake, 4 at the Winkelman Study Area, and 1 at Topock Marsh). There were also 10 third nesting attempts, of which 2 were successful. There were 3 fourth nesting attempts, 2 were successful.

Nest Productivity

Two hundred twenty-seven young fledged from 102 nests (Table 7). Not included in this total are 9 fledglings detected in 4 territories where no nest was found. Sixty-seven percent of the young fledged were visually confirmed after leaving the nest. Mean clutch size (includes only complete clutches) was 2.55 ($s = \pm 0.59$; $n = 161$). The number of young fledged per female during the breeding season was 1.70 ($s = \pm 1.38$; $n = 127$); the number of young fledged per successful female was 2.51 ($s = \pm 0.88$; $n = 86$). Fifty-one females, of the 127 monitored, failed to successfully fledge young over the entire breeding season.

Table 6. Willow flycatcher nest success at nest monitoring sites in Arizona, 2000.

Site			Percent simple nest success (No. of nests)	Mayfield nest success			
				Nest success (No. of observation days)	No. of nests in stage		
					Lay[a]	Inc[b]	Nest[c]
High Elevation[d]	Alpine Horse Pasture[e]		0 (1)	N/A[f]	N/A	N/A	N/A
	Greer Town[e]		0 (1)	N/A	N/A	N/A	N/A
	Total		0 (2)	N/A	N/A	N/A	N/A
Low Elevation[g]	Roosevelt Lake	Tonto Creek Inflow[e,h]	51 (35)	53 (605)	23	27	22
		Salt River Inflow[e]	55 (76)	60 (1340)	48	59	49
		Total	54 (111)	58 (1945)	71	86	71
	Winkelman Study Area	San Pedro / Aravaipa Confluence	19 (16)	35 (145)	6	9	4
		CB Crossing SE[e]	0 (8)	6 (136)	8	7	2
		Dudleyville Crossing[e]	53 (19)	59 (312)	13	14	12
		Indian Hills[e]	31 (13)	35 (170)	5	9	5
		Kearny[e]	56 (32)	69 (626)	22	24	23
		Total	40 (88)	51 (1389)	54	63	46
	Camp Verde		33 (6)	N/A	N/A	N/A	N/A
	Topock Marsh		21 (19)	N/A	N/A	N/A	N/A
	Monkey's Head		100 (1)	N/A	N/A	N/A	N/A
	Total (all low elevation sites)		45 (225)	55 (3334)	125	149	117
All sites			45 (227)	55 (3334)	125	149	117

[a] Lay - number of nests in the egg laying stage.
[b] Inc - number of nests in the incubation stage.
[c] Nest - number of nests in the nestling stage.
[d] Nests above 2400 m.
[e] Cowbird trapping at the site during the breeding season.
[f] N/A = Mayfield nest success estimate not calculated.
[g] Nests below 1115 m.
[h] Includes nests monitored at the Orange Peel site.

Table 7. Willow flycatcher nest productivity at nest monitoring sites in Arizona, 2000.

Site			Number of young fledged	Mean number young fledged per nest (± s) (n)[a]	Mean number young fledged per successful nests (± s) (n)[a]
High Elevation[b]	Alpine Horse Pasture[c]		0	0 (1)	na
	Greer Town[c]		0	0 (1)	na
	Total		0	0 (2)	na
Low Elevation[d]	Roosevelt Lake	Tonto Creek Inflow[c,e]	39	1.15 ± 1.23(34)	2.17 ± 0.79 (18)
		Salt River Inflow[c]	90	1.23 ± 1.25 (73)	2.31 ± 0.66 (39)
		Total	129	1.21 ± 1.24 (107)	2.26 ± 0.70 (57)
	Winkelman Study Area	San Pedro / Aravaipa Confluence	9	0.56 ± 1.26 (16)	3.00 ± 1.00 (3)
		CB Crossing SE[c]	0	0 (8)	na
		Dudleyville Crossing[c]	24	1.26 ± 1.28 (19)	2.40 ± 0.52 (10)
		Indian Hills[c]	6	0.46 ± 0.78 (13)	1.50 ± 0.58 (4)
		Kearny[c]	42	1.31 ± 1.31 (32)	2.33 ± 0.77 (18)
		Total	81	0.92 ± 1.23 (88)	2.31 ± 0.76 (35)
	Camp Verde		6	1.00 ± 1.67 (6)	3.00 ± 1.41 (2)
	Topock Marsh		9	0.47 ± 0.96 (19)	2.25 ± 0.50 (4)
	Monkey's Head		2	2 (1)	2 (1)
	Total (all low elevation sites)		227	1.03 ± 1.24 (221)	2.29 ± 0.72 (99)
All sites			227	1.02 ± 1.24 (223)	2.29 ± 0.72 (99)

[a] Nests that were parasitized but fledged an unknown number of young were excluded from the analysis.

[b] Nests above 2400 m.

[c] Cowbird trapping at the site during the breeding season.

[d] Nests below 1115 m.

[e] Includes nests monitored at the Orange Peel site

VIDEO NEST MONITORING

Time-lapse video cameras were placed at 11 willow flycatcher nests to record nesting behavior, predation, and parasitism. Approximately 1980 hours of video footage were recorded. Nest outcomes were recorded for 9 of the flycatcher nests (Table 8). One female flycatcher did not return to the nest after camera placement. However, the female resumed attending the nest after the camera was removed. One nest was lost to predation but the camera did not record the event due to battery failure. Seven flycatcher nests were recorded fledging young. We documented 3 predation events (at 2 nests), all by Cooper's hawks (*Accipiter cooperii*).

Table 8. Willow flycatcher nest video camera results, 2000.

Site and Nest no.	Primary Nesting Habitat	Nest Outcome (Video Date)	Set-up date Video ending date	Comments
Lake Shore 2A	Native Willow	Fledged 07/02/00	06/28/00 07/03/00	Fledged 3 young
Lake Shore 4A	Native Willow	Fledged 07/16/00	07/02/00 07/20/00	Fledged 1 young
Lake Shore 8A	Native Willow	Depredated 06/24/00	06/19/00 06/27/00	Nest depredated at night, eggs found on ground with holes in them. Battery failure did not record predator
Lake Shore 14B	Native Willow	Depredated 07/19/00	07/13/00 07/21/00	Cooper's hawk took 3 nestlings
Lake Shore 16A	Native Willow	Fledged 07/20/00	06/30/00 07/23/00	Fledged 2 young
Lake Shore 50A	Native Willow	Fledged 07/03/00	06/16/00 07/11/00	Fledged 3 young
Orange Peel 66B	Mixed Riparian	Depredated Not recorded	07/28/00 07/28/00	Female did not return to nest, camera removed. Nest later depredated
Salt River Inflow 1A	Tamarisk	Depredated 06/17/00; 06/23/00; 06/25/00	06/17/00 06/26/00	Cooper's hawk took one nestling on 6/17 and 6/25, 6/23 predator unknown.
Salt River Inflow 3B	Mixed Riparian	Fledged 08/04/00	07/29/00 08/07/00	Fledged 2 young
Salt River Inflow 88B	Mixed Riparian	Fledged 08/06/00	08/02/00 08/08/00	Fledged 3 young
Salt River Inflow 91B	Tamarisk	Fledged 07/29/00	07/24/00 08/02/00	Fledged 2 young

HABITAT CHARACTERISTICS

Although vegetation composition varied, most sites where willow flycatchers were documented shared common landscape characteristics. Occupied sites were located in broad floodplains, where dense riparian habitat existed and often where water (or saturated soil) was present at least early in the breeding season. In Arizona, these broad riparian areas occur frequently in the elevation range below 1100 m and above 2133 m.

Numerous sites within this mid-elevation band (1100 m – 2133 m) were surveyed, but resident flycatchers were not detected. Vegetation, at these elevations, was often located in narrow

drainages with higher gradient streams that are prone to scouring by flooding. These landscape features restrict the vegetation into forming only narrow linear bands, often dominated by sycamore (*Platanus wrightii*) plant communities.

Most nesting sites (32 of the 38) were characterized as mixed native/exotic associations. However, the amount of tamarisk varied within and between sites. Three sites with nesting flycatchers were composed of dense monotypic stands of tamarisk, forming a nearly continuous closed canopy. One site (Lake Shore at Roosevelt Lake) was classified as native broadleaf dominated. Two sites were classified as high elevation Geyer willow habitat.

For all nests AGFD monitored, and where we received adequate cooperator information, tamarisk was the primary nesting substrate at low elevation nesting sites (Table 9). One nest was documented in a mesquite at Topock Marsh; this is the first report of this species being used as a nesting substrate in Arizona. Mean nest height at Roosevelt Lake and the Winkelman study area was 4.37 m (s= ±1.48; n = 105) and 5.60 m (s= ±1.47; n = 87) respectively (Appendix K).

Table 9. Tree species used for willow flycatcher nesting in Arizona, 2000.

	Prosopis spp.	*Populus Fremontii*	*Salix geyeriana*	*Salix gooddingii*	*Tamarisk* spp.
No. nests	1	1	3	28	270

DISCUSSION

In 2000, AGFD and its cooperators contributed to the knowledge of southwestern willow flycatcher natural history, demography, and habitat requirements. The synthesis of this information will allow managers to develop data driven recovery strategies.

SURVEYS

Protocol surveys in areas of suitable and potentially suitable habitat allow for the determination of the presence or absence of flycatchers at a site (Appendix L, M). Through these surveys statewide patterns of distribution may be estimated. From 1993 - 2000, 547 sites have been surveyed; willow flycatchers have been documented at 97 sites which can be grouped into approximately 12 locations within the state (Table 10). Although the number of territories within the state has increased over the period, survey effort has also increased from a minimum of 700 hours in 1993 to a maximum of 5600 hours in 1999 (Fig. 3). Annual fluctuations in survey effort both in the number of hours and the sites surveyed make it difficult to compare yearly distribution patterns across the entire state. Additionally, within reaches with numerous patches, the dynamic nature of riparian systems affect spatial and temporal distribution of birds across the landscape and correspondingly, the number of flycatchers documented.

Table 10. Willow flycatcher territories documented in Arizona, 1993 – 2000.								
Location	Year							
	1993	1994	1995	1996	1997	1998	1999	2000
Lower Colorado River (Yuma area)	0	0	0	9	1	0	2	0
Lower Bill Williams River/ Lake Havasu	0	1	1	2	1	2	1	1
Topock	0	0	2	3	12	14	15	15
Lake Mead/Lower Grand Canyon	1	0	1	10	8	15	11	8
Miles 50 - 75 Grand Canyon	2	5	4	3	2	1	1	1
Alamo Lake	0	5	4	9	10	12	23	24
Big Sandy Highway 93 Bridge	0	1	0	0	1	0	0	16
Winkelman Study Area	11	45	32	39	76	92	134	119
Gila River (Ft Thomas to San Jose)	1	0	2	8	17	12	6	15
Roosevelt Lake	10	38	30	45	43	51	77	116
Alpine/Greer	5	6	4	7	5	7	7	4
Camp Verde	2	7	2	8	10	7	6	5
8 additional locations	1	0	1	2	4	7	6	4
Annual total	33	108	83	145	190	220	289	328

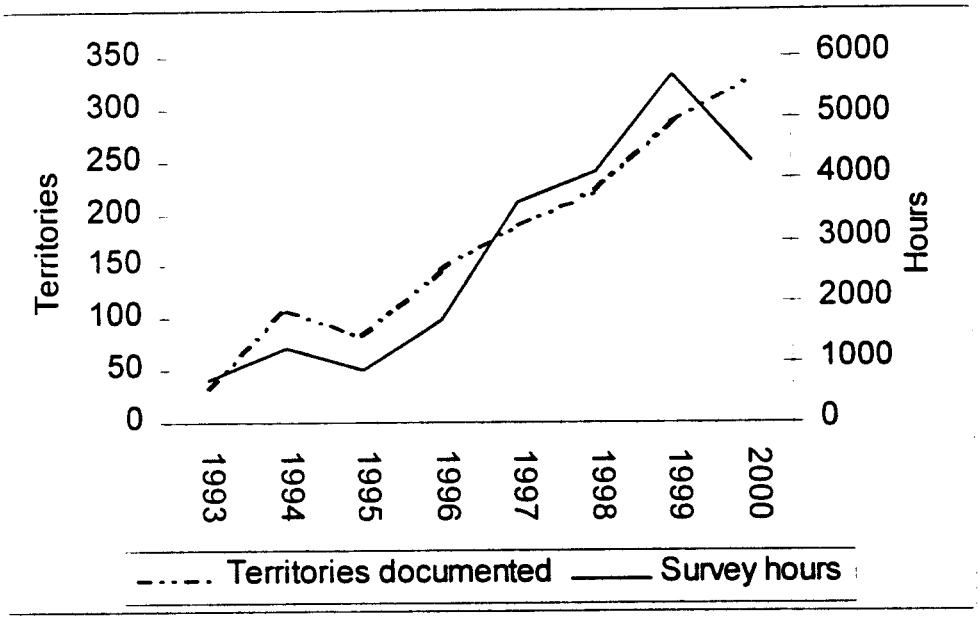

Figure 3. Number of survey hours and willow flycatcher territories documented in Arizona, 1993 – 2000.

To better evaluate flycatcher demographics AGFD, CPFS, and USBR expanded their effort at 2 areas in the state (Roosevelt Lake and the Winkelman Study Area). The AGFD objective for the

past 4 years has been to census the population to determine not only the presence or absence of flycatchers at sites but also the total number of territories and pairs within the entire study area. We have also expanded our effort in habitat patches that have recently become available for nesting. As water levels have receded over the past 5 years at Roosevelt Lake, riparian vegetation has become established in areas that were once inundated and flycatchers have colonized these areas. Similarly, along the main channel of the San Pedro River, which was scoured during a flooding event in 1993, suitable habitat has become reestablished and is being colonized. This expanded survey effort allowed for thorough surveys in habitats that have been occupied for a number of years as well as newly colonized patches. The results have shown the distinct and dynamic nature of each breeding group.

At Roosevelt Lake, the breeding group located in the Salt River delta area has grown from 18 to 87 territories between 1997 and 2000. However, in the Tonto Creek delta, flycatcher territories have only increased from 21 to 28 during the same time period. Movement data from color banded individuals indicate that each breeding group is relatively isolated with greater movement within the groups than between the 2 ends of the lake (Luff and others 2000). However, in the Winkelman Study Area, flycatcher movements are commonly observed between all sites (Luff and others 2000). The number of territories detected from 1998 – 2000 has fluctuated from 92, to 134, to 119 over this period of increased survey effort. The extensive survey effort required to census these specific populations and the dynamic nature of the breeding groups cautions against the extrapolation of population trends for other areas included in the statewide survey effort. Most areas have not had consistent or thorough enough surveys to accurately determine the number of territories or whether the population is increasing or decreasing.

NEST MONITORING

In 1995, AGFD began monitoring nests to record and evaluate factors affecting nest success and document demographic and habitat attributes influencing productivity. Through the use of remote time-lapse video cameras between 1997 and 2000, we have been able to identify specific predators of flycatcher eggs and nestlings. CPFS has been working to determine annual survival rates of both juveniles and adults, rates of immigration and emigration, within and between year movements, and population sex ratios. The annual and site variation in some or all of the demographic parameters identifies the need for long-term monitoring data. This information can be integrated to assess the health and status of populations and to develop management strategies.

HABITAT

The southwestern willow flycatcher occupies a wide variety of riparian habitat across its range (McCarthey and others 1998, Skaggs 1996, Whitfield and Enos 1996), and a large proportion of seemingly suitable habitat remains unoccupied. Habitat variables at numerous scales may be affecting flycatcher selection and reproduction. Landscape level factors such as patch area, arrangement of patches, general habitat type, and varying local and regional water regimes may also be predictors of site occupancy. We are examining remote sensing techniques (that is GIS,

satellite imagery, and aerial photography) as tools to discern landscape scale habitat characteristics influencing flycatcher use. While basic nest measurements have been collected across the state since 1995, in 1998 – 2000, we increased our effort and collected more extensive vegetation measurements. These measurements were centered on the nest tree and within patch non-use plots to assess site selection criteria and habitat effects on productivity.

MANAGEMENT

The highest priority for willow flycatcher conservation is the protection of occupied willow flycatcher habitat and the corresponding environmental conditions and ecosystem processes that allow the habitat to persist. This can only be accomplished through partnerships with land management agencies as well as private landowners to protect, restore, and maintain riparian ecosystem integrity. However, identification of occupied habitat is limited by gaps in survey area. Riparian areas with little or no survey data need to be identified and surveys must be coordinated through state, federal, Native American and private partnerships. Recovery will require protection of extant populations as well as allowing future population expansion through identification, protection, and restoration of potential riparian habitat.

Suitable habitat has not been defined quantitatively. Knowledge of habitat relationships and their influence on reproductive success must be a primary component of recovery, conservation and management strategies for the flycatcher. Only through detailed demographic research, nest monitoring, surveys, vegetation sampling, and habitat measurements can these parameters be described. Nesting ecology studies will also identify life history parameters and the limiting factors for recovery (for example predation and parasitism effects on reproduction). Sharing of data will be needed to identify similarities and differences between local populations. These parameters will affect management decisions on the local and range-wide level. Currently, the USFWS Recovery Team is compiling data from researchers throughout the southwestern willow flycatcher's range and developing recovery strategies. Conservation and recovery success of the willow flycatcher is not only dependent on federal and state agency direction, but also must include cooperation and support of nongovernmental organizations, private landowners, and Native American nations.

RECOMMENDATIONS

SURVEYS

1. Conduct statewide surveys in areas which:
    a. have not been surveyed but appear to have suitable habitat.
    b. contain previously occupied habitat.
    c. are adjacent to occupied habitat.
    d. were previously determined to be unsuitable habitat but have had recent vegetation growth.
2. Multiple years of surveys are needed to adequately describe between-year fluctuations of occupied habitat, especially when survey effort may have varied.
3. Priority areas for more intensive or continued survey effort include:
    a. Alamo Lake/lower Santa Maria River /lower Big Sandy River area
    b. Gila River from Duncan to the Kelvin Bridge
    c. Gila River from the Salt River inflow to Gillespie Dam
    d. Havasu Creek drainage
    e. Little Colorado River and tributaries where suitable habitat exists
    f. Lower Colorado River between river mile 260 and Yuma
    g. Salt River and Tonto Creek upstream from Roosevelt Lake
    h. San Pedro River from Redington to its confluence with the Gila River
    i. Santa Cruz River from Tubac to Rio Rico
    j. Verde River from Cottonwood to the confluence with the Salt River
    k. White River drainage
4. Encourage federal, state, tribal, and private partners to maintain or increase funding for continue statewide surveys and develop partnerships with private landowners to survey suitable habitat.
5. Continue training workshops to improve surveyor knowledge of survey techniques, and also to standardize data reporting, protocol adherence, and interagency communication. Only trained observers with songbird census experience should conduct surveys. Inexperienced surveyors are more likely to falsely identify other species as willow flycatchers or fail to detect birds when they are present.

NEST MONITORING

1. Continue to monitor nests at small and large populations of flycatchers to evaluate reproductive success, productivity, incidences of cowbird parasitism, predation, and impacts of other disturbances (for example human and weather).
2. Continue to investigate causes of nest failure by establishing additional remote cameras at nest sites.

RESEARCH NEEDS

1. Develop and implement quantitative vegetation analysis at the site, patch, territory, and nest scales.
2. Develop and analyze habitat differences between occupied and unoccupied areas at the patch and/or site scale.
3. Investigate habitat effects (structural and floristic) on nesting success and productivity.
4. Continue banding willow flycatchers to investigate between and within site movement, site-fidelity, survivorship, polygamy, and genetic variation between populations.
5. Continue to provide data to the USFWS Recovery Team.

MANAGEMENT

1. Protect areas with extant flycatcher populations.
2. Minimize impacts of deleterious land uses (for example grazing, water diversion, and inundation) on willow flycatcher breeding habitat.
3. Monitor areas where regeneration of riparian vegetation is occurring and consider these for future surveys.
4. Continue trapping cowbirds at the Salt River and Tonto Creek inflows to Roosevelt Lake, breeding areas in the Winkelman Study Area, and the Greer site on the Little Colorado River. Initiate trapping at high-risk areas or occupied breeding sites unless there is no evidence of parasitism. Investigate trapping options at corrals, feedlots, and roost sites near willow flycatcher breeding sites.
5. Encourage and create private/public partnerships for fencing and habitat restoration through federal, state, and nongovernment programs (for example USFWS Partners for Wildlife, and the AGFD Stewardship Program).
6. Continue and increase communication with federal and state agencies, and private organizations conducting willow flycatcher surveys, monitoring, and research, to develop region-wide conservation strategies.

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Appendix A. Survey and detection form for Arizona willow flycatcher surveys, 2000.

Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name_____ Was site surveyed in previous year? Yes No
If yes, what site name was used? _____

County _____ State_____ USGS Quad Name_____

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? 9 *Yes* 9 *No*

Site Coordinates: Start: N_____ E_____ UTM
Stop: N_____ E_____ UTM Zone _____
Elevation _____ feet / meters (circle one)

***** Fill in additional site information on back of this page *****

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found ? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey
1 _____ _____	Date start stop total hrs ____							
2 _____ _____	Date Start Stop total hrs ____							
3 _____ _____	Date Start Stop total hrs ____							
_____ _____	Date Start Stop total hrs ____							
_____ _____	Date start stop total hrs ____							

Overall Site Summary (Total only resident WIFLs) Total survey hrs_____	Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? Yes No If yes, report color combination(s) in the comments section on back of form

Name of Reporting Individual_____ Date Report completed_____

Submit the original of this form. Retain a copy for your records.

Appendix A (continued). Survey and detection form for Arizona willow flycatcher surveys, 2000.

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of reporting Individual _____ Phone # _____

Affiliation _____ Email _____

Site Name _____
Did you verify that this site name is consistent with that used in previous years? Yes No (circle one)

Management Authority for Survey Area (circle one): Federal Municipal/County State Tribal Private

Name of Management Entity or Owner (for example, Tonto National Forest) _____

Length of area surveyed:_____ (specify units, for example, miles=mi, kilometers=km, meters=m)

Did you survey the same general area during each visit to this site this year? Yes/No If no, summarize in comments.
If site was surveyed last year, did you survey the same general area this year? Yes/No If no, summarize in comments.

Vegetation Characteristics:
Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):
- ☐ Native broadleaf plants (entirely or almost entirely)
- ☐ Mixed native and exotic plants (mostly native)
- ☐ Mixed native and exotic plants (mostly exotic)
- ☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrubs species: _____

Average height of canopy: _____ (specify units)

Was surface water or saturated soil present at or adjacent to the site? Yes No (circle one)
Distance from the site to surface water or saturated soil: _____ (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? Yes No (circle one)
If yes, describe in comments section below.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary):
_____
_____
_____

Appendix B. Willow Flycatcher nest record form. 2000

Willow Flycatcher Nest Record Form

Return form to the AGFD (2221 W. Greenway Rd., Phoenix, AZ 85023) and keep a copy for your files.

AGFD site no.:_____ Site name:_____ Nest no.:_____

1) How was nest located:_ (Location codes: **PB**= parent behavior, **F**= flush, **NBC**= non-behavior cue, **SS**= systematic search, **L**= luck, **PY**= from previous yrs nest, **YB**= young behavior, **O**= other)

2) Elusiveness:_____ (Rank adult behavior 1-4, 1= shy/elusive 4= very conspicuous)

Bird 1: Color band combination:_____ Band Number:_____ Female

Bird 2: Color band combination:_____ Band Number:_____ Male

In the space above provide directions to the nest. Sketch prominent landmarks, water courses, veg. patch borders, etc. Also, indicate North in relation the nest and include a topographic map with nest location marked.

Willow Flycatcher				Cowbird			
Transition dates		Number		Transition dates		Number	
	Found		Eggs		First egg		Eggs
	First egg		Nestlings		Hatching		Nestlings
	Clutch completion		Fledglings (Presumed)		Fledged		Fledglings
	Hatching		Fledglings (Confirmed)				
	Fledged or Failed						

Outcome (Record code & describe):_____:_____

Mayfield Success

(WIFL) Period	# Exposure days	Success code
Egg Laying		
Incubation		
Nestling		

Additional Bbird Codes

(BB) timing of cowbird fate:	(BB) exact nestling period:
(BB) exact laying period:	(BB) number fledged:
(BB) exact incubation period:	(BB) exact number fledged:
(BB) non-final clutch size:	

Outcome codes: **UN**= unknown; **FY**= fledged young, with at least one young seen leaving or in the vicinity of nest; **FP**= fledged young, as determined by parents behaving as if dependent fledgling(s) nearby; **FU**= suspected fledging of at least one young; **FC**= fledged at least one host young with cowbird parasitism; **FD**= Nest depredated, the confirmed fledging of at least one young; **PO**= predation observed; **PE**= probable predation, nest empty and intact. Fledging of young unlikely; **PD**= predation, damage to nest structure; **PC**= probable predation by cowbird; **AB**= nest abandoned prior to egg(s) being laid; **DE**= deserted with egg(s) or young; **AC**= nest abandoned due to cowbird, cowbird egg(s) found in nest that was absent on previous nest check; **CO**= failure due to cowbird, host attempted to raise cowbird young. No host young were fledged from the nest; **WE**= failure due to weather; **HA**= failure due to human activities; **OT**= other.
Mayfield success codes: **S**= successful; **D**= depredated; **N**= status unknown/nest not occupied; **U**= status unknown/nest occupied- fate unknown; **M**= mortality other that predation; **A**= abandoned with host egg(s) or young; **Z**= abandoned, no (zero) eggs laid

Appendix B (continued). Nest record form. 2000.

Willow Flycatcher Nest Record Form (continued)

AGFD site no.:_____ Site name:_____ Nest no.:_____

Date	Time	Obs	Mon Type	Stage	Adult pres.	# WF Egg	# CB Egg	# WF Nstl	# CB Nstl	#WF Fldg	Age Yng	Comments

Return form to the AGFD (2221 W. Greenway Rd., Phoenix, AZ 85023) and keep a copy for your files.

Appendix C. List of habitat variables measured at willow flycatcher sites and nests in Arizona. 2000.

Variables recorded at each survey site:

1. General vegetation characteristics of species in tree/shrub layer by visual estimation: 1) native riparian tree/shrub; 2) mixed native and exotic (tamarisk) tree/shrub associations (predominantly native); 3) mixed native and exotic tree shrub associations (predominantly exotic); and 4) monotypic tamarisk.
2. The three predominant tree/shrub species.
3. Estimated height of canopy.
4. Presence of water or saturated soil.
5. Distance from site to surface water or saturated soil.
6. Any change in hydrological conditions between the three survey visits.
7. Start and stop UTM coordinates.

Variables recorded at each nest were:

1. Nest substrate.
2. Nest location (determined using the Global Positioning System (GPS) to the nearest 1 m).
3. Nest height above ground (measured to nearest 0.1 m).
4. Nest substrate height (measured to the nearest 0.1 m).
5. Diameter of main stem of nest plant (measured at 1.4 m along stem above ground, to nearest 0.1 cm).
6. Local patch height (measured to the nearest 0.1 m).
7. Distance from nest to:
   a. Foliage edge (measured to nearest 0.1 m).
   b. Nearest water or saturated soil when nest was found (measured to the nearest 0.1 m or from GPS data to the nearest 1 m).
8. Type of water (that is seep, cienega, stream, river, etc.).
9. 180 UTM location points averaged and corrected taken with a GPS unit.

Appendix D. Sites in Arizona surveyed for willow flycatchers, 2000. (see map, Appendix E)

Agua Fria River

1. Waddell Dam

Big Sandy River

2. Lower Big Sandy River
3. Big Sandy River Downstream US 93, Big Sandy River Upstream US 93

Bill Williams River

4. Bill Williams River Delta – Marsh Edge, Monkey's Head, Gemini, Cave Wash 1
5. Cave Wash 2, Buckskin
6. Bill Williams Pipeline
7. Alamo Lake – Brown's Crossing

Black River

8. PS Ranch

Colorado River

9. Hunter's Hole, Gadsden Pond, Gadsden Bend, Cocopah
10. County 14th St. to County 13th St., County 13th St. to County 12th St., County 12th St. to County 11th St.
11. Lower Yuma Division #2, Yuma Division
12. Fort Yuma 1 & 2, 2 East to Gila River, Fort Yuma 3, Gila/Colorado Confluence 1, Gila/Colorado Confluence 2
13. Mittry Lake
14. Cottonwood Nursery
15. Clear Lake
16. Picacho East (Island Lake), Picacho West, Adobe Lake
17. Cibola Lake, Cibola #2
18. Ehrenberg
19. Disneyland
20. Standard Wash
21. Beaver Island to Thompson Bay
22. Neptune – North Lake Havasu
23. Topock Marsh
24. Waterwheel Cove
25. Miles 270.0 to 268.0 L GC, Miles 268.0 to 265.0 L GC, Miles 268.0 to 264.0 R GC
26. Miles 265.0 to 263.5 L GC, Miles 266.0 to 262.5 L GC, Miles 262.8 to 261.8 R GC – Wards Cave Rapid, Miles 261.2 to 260.5 R GC, Mile 260.0 R GC, Mile 260.0 L Quarter Master GC, Mile 259.5 L, Mile 259.5 R Waterfall Rapid GC, Miles 257.5 to 257.0 R GC, Miles 257.2 to 256.6 L GC
27. Mile 252.3 R GC – Reference Point Rapid, Mile 252.2 L GC
28. Mile 249.0 L Lost Creek GC, Mile 248.3 Surprise Canyon GC, Mile 246.0 L GC
29. Mile 204.5 R Spring Canyon GC
30. Miles 199.0 to 196.0 R Parashant Camp GC, Miles 198.0 to 196.0 L GC, Miles 196.0 to 195.1 L GC, Miles 196.0 to 191.0 R GC, Miles 194.9 to 191.2 L GC
31. Miles 143.5 to 143.0 R GC
32. Clear Water Spring – Kanab Creek
33. Mile 133.7 R Tapeats Creek GC
34. Miles 72.2 to 72.0 R GC – Unkar, Miles 71.3 to 71.0 L Cardenas GC
35. Miles 67.1 to 66.8 L GC, Mile 65.3 L Lava Chuar GC
36. Miles 56.5 to 56.0 R Kwagunt Marsh GC
37. Mile 50.0 L GC, Miles 51.5 to 50.5 L GC, Miles 46.9 to 46.6 R GC, Miles 43.8 to 38.8 L GC
38. Mile 5.2 R GC
39. Miles 0.5 to 0.2 Lees Ferry GC

Gila River

40. North Gila Valley Site 1, Fortuna Wash
41. West of Airport Road
42. Goodyear KR
43. Gila River 123rd to 107th Ave.
44. North Butte
45. GRN033
46. GRSN030, GRN029, GRN028, GRN027
47. GRSN023
48. Mineral Creek at Lake Flat
49. GRN020, GRS019, GRN019, GRN018, GRS018
50. GRS015, GRN015, Kearny, GRS014, GRN014, GRN013, GRS013, GRN012, GRS012, GRN011, GRS011, GRN010, GRS010, GRN009, GRS008, GRN008, GRS007, GRN007, GRS004, GRN005, GRN004, GRN003, GRN002
51. Dripping Springs Campground
52. Dripping Springs Wash
53. Pima East
54. San Jose
55. Duncan

Hassayampa River

56. Hassayampa River Preserve

Appendix D (continued). Sites in Arizona surveyed for willow flycatchers, 2000. (see map appendix E.)

Little Colorado River

57. Hall Creek, Benny Creek, Wonderland Trap, River Reservoir, Greer Town, Sheep Crossing, Phelps Cabin
58. Nelson Reservoir

Salt River

59. Lake Shore, School House Point South, School House Point North, Salt River Inflow, Cottonwood Acres II, Cottonwood Acres I, Meddler Point, Eads Wash, Roosevelt Diversion Dam, Salt River at State Route 288 Bridge
60. Canyon Creek at O.W. Bridge

San Francisco River

61. Alpine Horse Pasture

San Pedro River

62. CB Crossing Northeast, CB Crossing West, CB Crossing Southeast, Indian Hills, Dudleyville Crossing, Malpais Hill, PZ Ranch, PZ Ranch West, Cook's Lake Cienega/Seep, Aravaipa Inflow North, San Pedro/Arivaipa Confluence, Arivaipa Inflow South, Wheatfields, Wheatfields South, Capgage Wash
63. San Manuel Crossing
64. Catalina Wash
65. Bingham Cienega
66. Soza Wash
67. St. David Cienega
68. SPRNCA – Boquillas, Charleston Bridge North
69. Escapula Wash North, State Route 90 Bridge
70. SPRNCA – Carr to Hunter
71. Hereford Bridge
72. SPRNCA – Palominas

Santa Cruz River

73. Sanford Butte

Santa Maria River

74. Lower Santa Maria River

Tonto Creek

75. Orange Peel, Tonto Creek Inflow, A-Cross Road South, A-Cross Road North, Bar-X Road

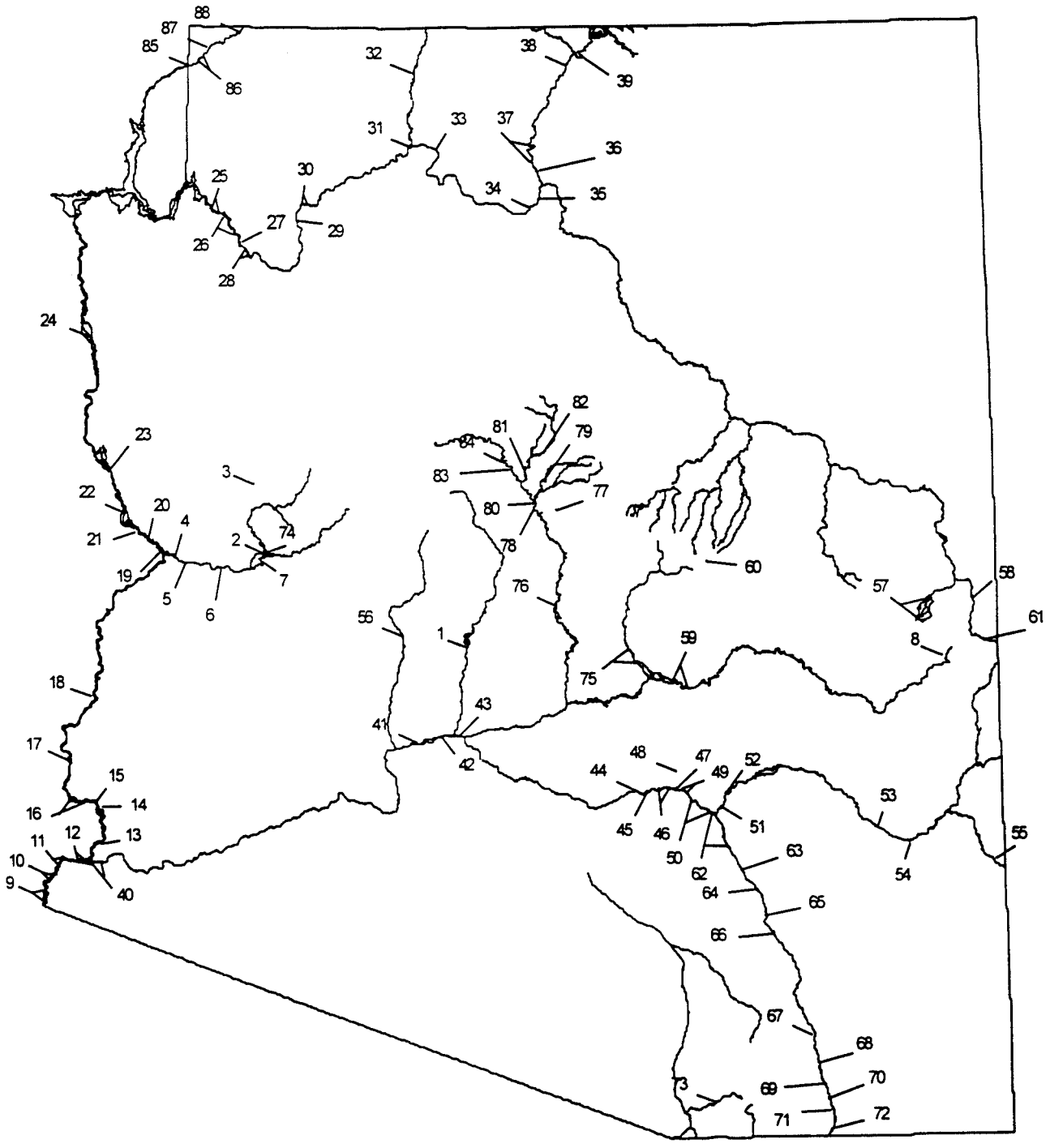
Verde River

76. Ister Flat
77. Bull Pen
78. White Bridge
79. Stage Stop – Dry Beaver Creek
80. Camp Verde
81. Sheepshead Canyon
82. Red Rock Crossing – Oak Creek
83. Mingus Ave. – Rocking Chair Road
84. Tapco

Virgin River

85. Nevada Border
86. Little Bend, Big Bend, Corral Bluff
87. Littlefield
88. Black Rock Gulch

Appendix E. Map of sites in Arizona and sites along adjoining water bodies surveyed for willow flycatchers, 2000. (see Appendix D for site names.)



Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m). Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Agua Fria River									
Waddell Dam Maricopa, 439, 2.0	5/24/00 6/23/00	0 0	0	0	0	0	0	0	Y
Big Sandy River									
Lower Big Sandy River Mohave, 357, 64.4	5/5/00 5/13/00 5/16/00 5/25/00 5/28/00 5/29/00 5/31/00 6/8/00 6/8/00 6/12/00 6/12/00 6/20/00 6/21/00 6/28/00 6/28/00 6/30/00 7/2/00 7/5/00 7/5/00 7/13/00	4 0 8 0 2 7 8 4 1 9 0 1 6 8 0 5 7 3 0 13	13	7	6	7	0	2	Y
Big Sandy River Downstream US 93 Mohave, 555, 20.1	5/30/00 5/31/00 6/15/00 6/15/00 6/26/00 6/26/00 7/5/00 7/5/00 7/13/00 7/13/00	2 6 10 3 1 5 8 5 8 4	18	13	5	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Big Sandy River Upstream US 93[f] Mohave, 549, 17.7	5/30/00 6/14/00 6/14/00 6/27/00 6/27/00 7/6/00 7/6/00 7/14/00 7/14/00	3 0 7 1 10 3 0 1 0	5	3	2	0	0	0	Y
Bill Williams River									
Bill Williams River Delta - Marsh Edge La Paz, 163, 25.0	5/30/00 5/30/00 5/30/00 6/6/00 6/19/00 6/19/00 6/19/00 6/27/00 7/12/00 7/12/00 7/20/00	0 0 1 1 0 0 2 0 0 0 0	0	0	0	0	0	2	Y
Monkey's Head La Paz, 143, 13.0	5/23/00 5/29/00 5/31/00 6/8/00 6/19/00 7/4/00 7/4/00 7/19/00	1 2 0 2 2 0 2 0	2	1	1	1	0	0	Y
Gemini La Paz, 152, 13.0	5/19/00 6/5/00 6/21/00 7/17/00	0 1 0 0	0	0	0	0	0	1	Y

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Cave Wash 1 La Paz, 152, 23.5	5/22/00 5/23/00 6/2/00 6/8/00 6/15/00 6/22/00 7/17/00 7/21/00	0 1 3 1 0 0 0 0	0	0	0	0	0	4	Y
Cave Wash 2 La Paz, 152, 10.0	5/17/00 6/2/00 6/22/00 7/13/00	0 1 0 0	0	0	0	0	0	1	Y
Buckskin La Paz, 174, 16.3	5/17/00 5/22/00 6/2/00 6/7/00 6/22/00 7/2/00 7/13/00 7/19/00	0 0 1 2 0 0 0 0	0	0	0	0	0	2	Y
Bill Williams Pipeline La Paz, 238, 2.6	6/15/00	0	0	0	0	0	0	0	Y
Alamo Lake - Brown's Crossing Mohave, 348, 50.8	5/9/00 5/15/00 5/23/00 5/26/00 5/30/00 6/9/00 6/22/00 6/28/00 7/1/00 7/4/00 7/12/00	10 13 12 10 13 14 17 15 13 7 21	23	12	11	13	0	0	Y
Black River									
PS Ranch Apache, 2317, 7.5	5/27/00 6/6/00 6/23/00 6/30/00	0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Colorado River									
Hunter's Hole Yuma, 30, 17.5	5/23/00 5/23/00 6/5/00 6/5/00 6/14/00 6/14/00 6/23/00 6/23/00 7/2/00 7/2/00 7/16/00 7/16/00 7/21/00 7/21/00	0 2 2 3 2 0 0 0 0 0 0 0 0 0	0	0	0	0	0	5	Y
Gadsden Pond Yuma, 46, 30.9	5/22/00 5/23/00 6/3/00 6/6/00 6/14/00 6/25/00 7/2/00 7/8/00 7/16/00 7/21/00 5/22/00 6/3/00 6/14/00 6/23/00 7/2/00 7/8/00 7/16/00 7/21/00	6 2 3 5 0 0 0 0 0 0 3 3 0 0 0 0 0 0	0	0	0	0	0	6	Y
Cocopah Yuma, 30, 3.2	5/22/00 6/6/00 6/26/00	2 6 0	0	0	0	0	0	6	U
County 14th St. to County 13th St. Yuma, 30, 3.2	6/6/00 6/26/00	0 0	0	0	0	0	0	0	U

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
County 13th St. to County 12th St. Yuma, 35, 4.8	5/30/00 6/16/00 7/5/00	1 0 0	0	0	0	0	0	1	Y
County 12th St. to County 11th St. Yuma, 30, 2.0	5/30/00 6/16/00 7/5/00	2 0 0	0	0	0	0	0	2	Y
Lower Yuma Division #2 Yuma, 37, 4.3	5/24/00 6/9/00 7/3/00	0 5 0	0	0	0	0	0	5	Y
Yuma Division Yuma, 30, 37.7	5/22/00 5/24/00 5/24/00 6/6/00 6/9/00 6/21/00 6/26/00 7/3/00 7/9/00	1 0 0 2 0 0 0 0 0	0	0	0	0	0	2	Y
Fort Yuma 1 & 2 Yuma, 38, 12.5	5/20/00 5/20/00 5/22/00 5/31/00 6/6/00 6/9/00 6/16/00 6/24/00 6/26/00 7/2/00 7/13/00 7/20/00	5 5 0 0 4 2 0 0 0 0 0 0	0	0	0	0	0	2	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
2 East to Gila River Yuma, 38, 17.8	5/20/00 6/1/00 6/13/00 6/20/00 6/27/00 7/4/00 7/13/00 7/19/00	0 5 1 0 0 0 0 0	0	0	0	0	0	5	Y
Fort Yuma 3 Yuma, 40, 14.5	5/22/00 5/31/00 6/9/00 6/16/00 6/24/00 7/2/00 7/13/00 7/20/00	0 0 0 0 0 0 0 0	0	0	0	0	0	0	Y
Gila/Colorado Confluence 1 Yuma, 40, 12.5	5/20/00 6/1/00 6/13/00 6/20/00 6/27/00 7/4/00 7/13/00 7/19/00	1 2 2 0 0 0 0 0	0	0	0	0	0	2	Y
Gila/Colorado Confluence 2 Yuma, 40, 13.5	5/20/00 6/1/00 6/13/00 6/20/00 6/27/00 7/4/00 7/13/00 7/19/00	2 7 1 0 0 0 0 0	0	0	0	0	0	7	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Mittry Lake Yuma, 49, 27.9	5/19/00 5/21/00 5/31/00 5/31/00 6/10/00 6/12/00 6/19/00 6/19/00 6/27/00 6/27/00 7/4/00 7/4/00 7/10/00 7/11/00	0 1 1 1 0 1 1 0 1 0 1 0 0 1	0	0	0	0	0	1	Y
Cottonwood Nursery Yuma, 63, 23.5	5/31/00 6/6/00 6/12/00 6/22/00 7/1/00 7/11/00 7/20/00 8/1/00	0 1 0 0 0 0 0 0	0	0	0	0	0	1	Y
Clear Lake La Paz, 61, 9.0	5/7/00 6/1/00 6/8/00 6/16/00 6/22/00 6/29/00 7/11/00 7/18/00	0 3 3 3 0 0 0 0	0	0	0	0	0	3	Y
Picacho East (Island Lake) La Paz, 76, 8.3	6/2/00 6/9/00 6/21/00 6/29/00 7/8/00 7/9/00 7/18/00 8/2/00	0 3 0 0 0 0 0 0	0	0	0	0	0	3	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Picacho West La Paz, 61, 16.8	5/24/00 6/4/00 6/13/00 6/21/00 7/6/00 7/12/00 7/19/00	0 0 0 0 0 0 0	0	0	0	0	0	0	Y
Adobe Lake La Paz, 61, 19.5	5/25/00 6/4/00 6/13/00 6/21/00 7/6/00 7/12/00 7/19/00	1 1 0 0 0 0 0	0	0	0	0	0	1	Y
Cibola Lake La Paz, 65, 24.0	5/26/00 6/8/00 6/15/00 6/22/00 6/29/00 7/7/00 7/14/00 7/21/00	5 2 0 0 0 0 0 0	0	0	0	0	0	5	Y
Cibola #2 La Paz, 66, 12.1	5/26/00 6/8/00 6/15/00 6/22/00 6/29/00 7/7/00 7/14/00	0 0 0 0 0 0 0	0	0	0	0	0	0	Y
Ehrenberg La Paz, 79, 30.5	5/24/00 6/7/00 6/15/00 6/20/00 6/28/00 7/6/00 7/13/00 7/20/00 7/31/00	0 1 1 1 0 0 0 0 0	0	0	0	0	0	1	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Disneyland Mohave, 137, 1.2	6/13/00 6/29/00	0 0	0	0	0	0	0	0	N
Standard Wash Mohave, 137, 1.4	6/13/00 6/20/00	0 1	0	0	0	0	1	0	Y
Beaver Island to Thompson Bay Mohave, 137, 5.8	6/20/00 6/27/00 7/11/00	0 0 0	0	0	0	0	0	0	Y
Neptune - North Lake Havasu Mohave, 137, 17.0	6/2/00 6/9/00 6/30/00 7/24/00	4 6 0 0	0	0	0	0	0	6	Y
Topock Marsh Mohave, 140, 190.5	Monitored 5/00 to 8/00	N/A	25	15	10	19	0	2	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Waterwheel Cove[f] Mohave, 195, 129.0	5/25/00	0	3	3	0	0	0	1	Y
	5/25/00	2							
	5/25/00	1							
	5/26/00	0							
	5/26/00	0							
	6/6/00	0							
	6/6/00	1							
	6/6/00	1							
	6/6/00	0							
	6/15/00	1							
	6/15/00	2							
	6/15/00	0							
	6/15/00	0							
	6/22/00	1							
	6/22/00	1							
	6/22/00	0							
	6/22/00	1							
	6/29/00	1							
	6/29/00	1							
	6/29/00	0							
	6/29/00	1							
	7/7/00	0							
	7/7/00	0							
	7/7/00	0							
	7/7/00	0							
	7/11/00	0							
	7/11/00	0							
	7/11/00	0							
	7/11/00	0							
	7/12/00	0							
	7/12/00	0							
	7/13/00	0							
	7/13/00	0							
	7/19/00	0							
	7/19/00	0							
	7/19/00	0							
	7/19/00	0							
	7/21/00	0							
	7/21/00	0							
	7/21/00	0							
	7/21/00	0							

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Miles 270.0 to 268.0 L GC Mohave, 372, 11.5	5/10/00 5/25/00 6/8/00 6/21/00 7/6/00 7/19/00 7/19/00	0 0 0 0 0 0 0	0	0	0	0	0	0	Y
Miles 268.0 to 265.0 L GC Mohave, 366, 207.5	Surveyed 5/8/00 to 8/7/00	N/A	5	3	2	1	0	3	Y
Miles 268.0 to 264.0 R GC Mohave, 366, 46.2	5/14/00 5/14/00 5/18/00 5/26/00 5/29/00 5/29/00 6/1/00 6/1/00 6/7/00 6/30/00 7/6/00 7/6/00 7/26/00 8/4/00	0 1 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	Y

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Miles 265.0 to 263.5 L GC Mohave, 366, 33.3	5/9/00 5/23/00 5/25/00 6/6/00 6/7/00 6/20/00 6/23/00 7/6/00 7/7/00 7/18/00 7/26/00 7/26/00 7/31/00 8/3/00 8/3/00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	Y
Miles 266.0 to 262.5 L GC Mohave, 353, 55.4	5/18/00 6/1/00 6/1/00 6/14/00 6/28/00 6/28/00 7/10/00 7/10/00 7/17/00 7/17/00 7/19/00	0 0 0 1 0 0 0 1 0 3 2	2	1	1	1	0	0	Y
Miles 262.8 to 261.8 R GC - Wards Cave Rapid Mohave, 353, 20.0	5/25/00 6/5/00 6/28/00 7/10/00	0 0 0 0	0	0	0	0	0	0	Y
Miles 261.2 to 260.5 R GC Mohave, 353, 29.5	5/19/00 6/5/00 6/13/00 6/20/00 7/6/00 7/19/00	0 1 0 0 0 0	0	0	0	0	0	0	Y

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Mile 260.0 R GC Mohave, 384, 3.0	5/24/00 6/7/00 6/21/00 7/7/00 7/18/00	0 0 0 0 0	0	0	0	0	0	0	N
Mile 260.0 L Quarter Master GC Mohave, 384, 8.0	5/24/00 6/7/00 6/21/00 7/7/00 7/18/00	0 0 0 0 0	0	0	0	0	0	0	Y
Mile 259.5 L[f] Mohave, 353, 28.6	6/28/00 6/28/00 6/30/00 6/30/00 7/5/00 7/7/00 7/11/00 7/18/00 7/25/00 7/27/00	1 1 1 1 1 0 0 1 0 0	1	1	0	0	0	0	Y

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Mile 259.5 R Waterfall Rapid GC Mohave, 353, 136.8	5/12/00	1	0	0	0	0	0	4	Y
	5/19/00	0							
	5/24/00	0							
	5/30/00	1							
	6/7/00	0							
	6/8/00	1							
	6/12/00	0							
	6/14/00	2							
	6/14/00	2							
	6/16/00	2							
	6/16/00	1							
	6/21/00	1							
	6/30/00	0							
	7/7/00	0							
	7/11/00	0							
	7/18/00	0							
	7/18/00	1							
	7/25/00	0							
	7/27/00	1							
	8/3/00	0							
	8/4/00	0							
	8/10/00	1							
Miles 257.5 to 257.0 R GC[f] Mohave, 353, 40.3	5/24/00	0	2	1	1	0	0	0	Y
	5/30/00	1							
	6/6/00	1							
	6/13/00	1							
	6/20/00	0							
	7/6/00	2							
	7/7/00	1							
	7/13/00	0							
	7/13/00	1							
	7/17/00	0							
	7/24/00	0							
	7/24/00	1							
	7/28/00	1							
	7/28/00	1							
	8/3/00	0							

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Miles 257.2 to 256.6 L GC Mohave, 353, 24.0	5/24/00 6/6/00 6/26/00 7/9/00 7/28/00	0 0 0 0 0	0	0	0	0	0	0	Y
Mile 252.3 R GC - Reference Point Rapid Mohave, 353, 20.0	5/23/00 6/4/00 6/12/00 6/27/00 7/19/00	0 0 0 0 0	0	0	0	0	0	0	Y
Mile 252.2 L GC Mohave, 384, 25.0	5/23/00 6/4/00 6/5/00 6/12/00 6/27/00 7/19/00 7/19/00	0 0 1 0 0 0 0	0	0	0	0	0	1	Y
Mile 249.0 L Lost Creek GC Mohave, 366, 3.5	5/23/00 6/6/00 6/20/00 7/5/00 7/18/00	0 0 0 0 0	0	0	0	0	0	0	N
Mile 248.3 R Surprise Canyon GC Mohave, 366, 4.0	5/23/00 6/6/00 6/20/00 7/5/00 7/18/00	0 0 0 0 0	0	0	0	0	0	0	N

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Mile 246.0 L GC Mohave, 372, 161.9	5/22/00 5/23/00 6/2/00 6/2/00 6/3/00 6/6/00 6/9/00 6/9/00 6/9/00 6/15/00 6/20/00 6/22/00 6/29/00 6/29/00 6/29/00 6/29/00 7/6/00 7/8/00 7/12/00 7/12/00 7/12/00 7/12/00 7/18/00 7/20/00 7/26/00 8/8/00	0 0 1 1 0 0 2 1 1 1 0 2 1 1 1 1 0 0 1 1 1 1 0 1 2 0	4	2	2	1	0	0	Y
Mile 204.5 R Spring Canyon GC Mohave, 457, 3.0	5/31/00 6/13/00 7/1/00	0 0 0	0	0	0	0	0	0	N
Miles 199.0 to 196.0 R Parashant Camp GC Mohave, 488, 3.0	5/30/00 6/11/00 6/30/00	0 0 0	0	0	0	0	0	0	N
Miles 198.0 to 196.0 L GC Coconino, 468, 3.0	5/30/00 6/11/00 6/30/00	0 0 0	0	0	0	0	0	0	N
Miles 196.0 to 195.1 L GC Coconino, 471, 2.5	5/30/00 6/10/00 6/30/00	0 0 0	0	0	0	0	0	0	N

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Miles 196.0 to 191.0 R GC Mohave, 488, 2.5	5/30/00 6/10/00 6/30/00	0 1 0	0	0	0	0	0	1	N
Miles 194.9 to 191.2 L GC Coconino, 473, 2.5	5/30/00 6/10/00 6/30/00	0 0 0	0	0	0	0	0	0	N
Miles 143.5 to 143.0 R GC Mohave, 573, 1.5	5/28/00 6/6/00 6/28/00	0 0 0	0	0	0	3	0	0	N
Clear Water Spring - Kanab Creek Mohave, 1277, 6.7	6/2/00 6/21/00 7/6/00	0 0 0	0	0	0	0	0	0	Y
Mile 133.7 R Tapeats Creek GC Coconino, 604, 1.5	5/27/00 6/3/00 6/27/00	0 0 0	0	0	0	0	0	0	N
Miles 72.2 to 72.0 R GC - Unkar Coconino, 854, 4.0	5/15/00 5/24/00 6/3/00 6/23/00	1 0 0 0	0	0	0	0	0	1	N
Miles 71.3 to 71.0 L Cardenas GC Coconino, 854, 5.0	5/23/00 5/29/00 6/2/00 6/23/00	0 0 0 0	0	0	0	0	0	0	Y
Miles 67.1 to 66.8 L GC Coconino, 816, 2.5	5/25/00 6/1/00 6/23/00	0 0 0	0	0	0	0	0	0	N
Mile 65.3 L Lava Chuar GC Coconino, 854, 3.0	5/22/00 5/23/00 6/22/00	0 0 0	0	0	0	0	0	0	N
Miles 56.5 to 56.0 R Kwagunt Marsh GC Coconino, 854, 3.0	5/22/00 6/1/00 6/22/00	0 0 0	0	0	0	0	0	0	N
Mile 50.0 L GC Coconino, 854, 1.0	5/21/00 5/21/00 5/30/00 6/25/00	0 0 0 0	0	0	0	0	0	0	N

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Miles 51.5 to 50.5 L GC Coconino, 854, 24.0	5/21/00 5/21/00 5/22/00 5/22/00 5/22/00 5/31/00 5/31/00 5/31/00 6/21/00 6/21/00 6/23/00 7/4/00 8/8/00	2 1 1 0 0 1 0 0 2 0 0 2 3	2	1	1	1	0	0	T
Miles 46.9 to 46.6 R GC Coconino, 854, 3.9	5/20/00 5/21/00 5/28/00 6/21/00	0 0 0 0	0	0	0	0	0	0	N
Miles 43.8 to 38.8 L GC Coconino, 884, 3.3	5/20/00 5/29/00 6/21/00	0 0 0	0	0	0	0	0	0	N
Mile 5.2 R GC Coconino, 970, 3.0	5/19/00 6/1/00 6/22/00	0 0 0	0	0	0	0	0	0	N
Miles 0.5 to -0.2 R Lees Ferry GC Coconino, 948, 3.5	5/19/00 5/28/00 6/19/00	0 0 0	0	0	0	0	0	0	Y
Gila River									
North Gila Valley Site 1 Yuma, 41, 17.8	5/20/00 6/1/00 6/12/00 6/18/00 6/26/00 7/3/00 7/10/00 7/17/00	1 8 3 1 0 0 0 0	0	0	0	0	0	8	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Fortuna Wash Yuma, 61, 19.0	5/20/00 5/20/00 6/1/00 6/1/00 6/12/00 6/12/00 6/18/00 6/18/00 6/26/00 6/26/00 7/3/00 7/3/00 7/10/00 7/10/00 7/17/00 7/17/00	0 2 1 2 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	3	Y
West of Airport Road Maricopa, 259, 9.6	5/31/00 6/12/00 6/30/00	2 0 0	0	0	0	0	0	2	Y
Goodyear KR Maricopa, 274, 7.5	5/30/00 5/31/00 6/20/00 6/21/00 7/3/00 7/8/00	0 0 0 0 0 0	0	0	0	0	0	0	Y
Gila River 123rd to 107th Ave. Maricopa, 277, 3.0	5/31/00 6/12/00 7/6/00	0 0 0	0	0	0	0	0	0	N
North Butte Pinal, 491, 13.5	5/26/00 6/11/00 7/6/00	0 0 0	0	0	0	0	0	0	Y
GRN033 Pinal, 494, 5.5	5/23/00 6/8/00 6/24/00 6/24/00	0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRSN030 Pinal, 506, 3.0	5/24/00 6/9/00 7/7/00	0 0 0	0	0	0	0	0	0	Y
GRN029 Pinal, 515, 10.5	5/24/00 6/9/00 7/7/00	0 0 0	0	0	0	0	0	0	Y
GRN028 Pinal, 518, 7.3	5/25/00 6/13/00 7/16/00	0 0 0	0	0	0	0	0	0	Y
GRN027 Pinal, 521, 6.0	5/25/00 6/13/00 7/16/00	0 0 0	0	0	0	0	0	0	Y
GRSN023 Pinal, 537, 4.0	5/17/00 6/7/00 7/5/00	0 0 0	0	0	0	0	0	0	N
Mineral Creek at Lake Flat Pinal, 668, 22.5	5/25/00 6/2/00 7/8/00	0 0 0	0	0	0	0	0	0	Y
GRN020 Pinal, 549, 6.5	4/29/00 5/12/00 5/17/00 5/29/00 6/2/00 7/5/00	0 0 0 0 0 0	0	0	0	0	0	0	N
GRS019 Pinal, 555, 9.3	5/15/00 5/28/00 6/7/00 6/23/00 7/9/00	1 0 0 0 0	0	0	0	0	0	1	Y
GRN019 Pinal, 549, 4.5	5/3/00 6/2/00 7/5/00 7/6/00	0 0 1 0	0	0	0	0	0	1	N

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRN018 Pinal, 561, 87.5	4/29/00 5/11/00 5/13/00 5/14/00 5/15/00 5/25/00 5/31/00 6/6/00 6/14/00 6/21/00 6/22/00 6/26/00 6/28/00 7/4/00 7/10/00 7/18/00 7/22/00	0 3 4 5 5 7 7 7 8 8 8 8 8 8 8 8 8	8	4	4	5	0	0	Y
GRS018 Pinal, 543, 24.3	5/11/00 5/16/00 5/28/00 6/6/00 6/22/00 7/9/00 7/23/00	2 4 1 5 7 0 1	6	4	2	2	0	0	Y
GRS015 Pinal, 555, 12.8	4/29/00 5/9/00 5/15/00 5/26/00 6/5/00 6/15/00 6/28/00 7/8/00	0 0 0 0 3 3 2 2	2	1	1	1	0	1	Y
GRN015[f] Pinal, 551, 6.0	5/15/00 6/15/00 6/23/00 6/28/00 7/4/00	0 1 2 2 2	2	1	1	1	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Kearny Pinal, 555, 38.5	4/27/00 4/30/00 5/2/00 5/3/00 5/4/00 5/8/00 5/11/00 5/15/00 6/2/00 7/5/00	0 1 2 2 4 9 12 15 34 37	38	19	19	32	0	0	Y
GRS014 Pinal, 555, 22.5	5/2/00 5/26/00 6/20/00 7/5/00	0 0 0 0	0	0	0	0	0	0	Y
GRN014 Pinal, 558, 2.4	5/23/00 6/10/00 6/25/00	0 0 0	0	0	0	0	0	0	N
GRN013 Pinal, 558, 15.5	5/23/00 5/24/00 6/10/00 6/25/00	1 0 0 0	0	0	0	0	0	1	N
GRS013 Pinal, 558, 65.3	4/29/00 5/2/00 5/10/00 5/12/00 5/27/00 5/29/00 6/11/00 6/12/00 6/22/00 6/23/00	0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	Y
GRN012 Pinal, 579, 3.0	5/23/00 5/24/00 6/5/00 6/24/00	1 0 0 0	0	0	0	0	0	1	F

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRS012 Pinal, 555, 116.3	4/28/00 4/29/00 5/2/00 5/3/00 5/9/00 5/11/00 5/13/00 5/16/00 5/22/00 5/24/00 5/31/00 6/10/00 6/13/00 6/19/00 6/24/00 7/4/00 7/6/00 7/17/00 7/19/00 7/24/00 8/1/00	1 1 1 1 4 2 6 6 7 7 7 8 12 12 12 8 12 13 12 5 3	13	7	7	10	0	0	Y
GRN011 Pinal, 579, 6.3	5/1/00 6/13/00 6/27/00	0 0 0	0	0	0	0	0	0	F
GRS011 Pinal, 561, 24.7	4/30/00 5/13/00 5/28/00 6/8/00 6/15/00 6/25/00 7/8/00	1 1 3 4 2 4 3	4	2	2	3	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRN010 Pinal, 573, 64.0	5/1/00 5/11/00 5/12/00 5/14/00 5/16/00 5/27/00 5/28/00 5/29/00 5/31/00 6/9/00 6/13/00 6/24/00 6/27/00 6/27/00 7/10/00 7/18/00 7/22/00	0 1 1 1 2 4 4 4 5 4 4 4 4 4 4 3 1	4	2	2	2	0	0	Y
GRS010 Pinal, 561, 24.3	4/30/00 5/9/00 5/13/00 5/17/00 6/6/00 6/13/00 6/25/00	0 0 0 1 4 1 0	0	0	0	0	0	4	Y
GRN009 Pinal, 579, 4.8	5/29/00 6/12/00 7/6/00	0 0 0	0	0	0	0	0	0	Y
GRS008 Pinal, 567, 35.0	5/1/00 5/15/00 5/25/00 6/7/00 6/9/00 6/26/00 6/27/00	0 0 0 0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRN008 Pinal, 579, 7.8	4/30/00 6/12/00 6/13/00 6/19/00 7/6/00	0 1 1 0 0	0	0	0	0	0	1	Y
GRS007 Pinal, 573, 146.0	4/28/00 5/1/00 5/9/00 5/10/00 5/11/00 5/12/00 5/14/00 5/23/00 5/25/00 5/30/00 6/7/00 6/9/00 6/10/00 6/14/00 6/21/00 6/24/00 6/26/00 6/27/00 6/28/00 7/5/00 7/7/00 7/11/00 7/18/00 7/20/00 7/23/00 7/25/00 7/31/00	0 0 3 6 7 8 10 7 7 15 14 0 13 21 19 8 19 0 14 14 15 15 18 17 14 3 2	18	10	10	13	0	0	Y
GRN007 Pinal, 579, 24.5	4/30/00 5/26/00 6/19/00 6/26/00	0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
GRS004 Pinal, 601, 7.8	5/1/00 5/2/00 5/3/00 5/13/00 5/24/00	1 0 0 0 0	0	0	0	0	0	1	Y
GRN005 Pinal, 579, 4.5	5/1/00 5/27/00 6/13/00 6/24/00	0 0 0 0	0	0	0	0	0	0	N
GRN004 Pinal, 585, 28.5	5/1/00 5/12/00 5/22/00 6/11/00 6/12/00 6/23/00 6/26/00 7/10/00	0 0 0 2 2 2 2 1	2	2	0	0	0	0	Y
GRN003 Pinal, 585, 2.8	5/2/00 5/24/00 6/5/00 6/24/00	0 0 0 0	0	0	0	0	0	0	Y
GRN002 Pinal, 585, 4.1	5/2/00 5/24/00 6/5/00 6/24/00	0 0 0 0	0	0	0	0	0	0	Y
Dripping Springs Campground Pinal, 610, 3.7	5/16/00 6/9/00 7/5/00	0 0 0	0	0	0	0	0	0	N
Dripping Springs Wash Gila, 622, 4.0	6/9/00 7/5/00	0 0	0	0	0	0	0	0	Y
Pima East Graham, 857, 33.0	5/16/00 5/16/00 5/17/00 6/7/00 7/6/00 7/7/00	5 0 1 20 26 4	30	15	15	15	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
San Jose Graham, 918, 7.0	5/17/00 6/2/00 6/23/00	0 0 0	0	0	0	0	0	0	Y
Duncan Greenlee, 1113, 17.3	5/16/00 5/19/00 6/20/00 7/11/00	4 1 1 1	1	1	0	0	0	1	Y
Hassayampa River									
Hassayampa River Preserve Maricopa, 573, 11.5	6/8/00 6/11/00 6/11/00 6/15/00 6/17/00	3 0 0 0 1	0	0	0	0	3	0	Y
Little Colorado River									
Hall Creek Apache, 2799, 2.3	6/20/00 6/26/00 6/29/00 7/2/00 7/12/00 7/14/00	0 0 0 0 0 0	0	0	0	0	0	0	Y
Benny Creek Apache, 2500, 13.8	5/26/00 5/30/00 6/10/00 6/25/00 7/1/00	0 0 0 0 0	0	0	0	0	0	0	Y
Wonderland Trap Apache, 2530, 0.6	5/24/00 6/8/00 6/29/00	0 0 0	0	0	0	0	0	0	N

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
River Reservoir Apache, 2500, 28.2	5/24/00 5/29/00 6/8/00 6/12/00 6/21/00 6/29/00 7/13/00	0 1 1 1 1 1 0	1	1	0	0	0	0	Y
Greer Town Apache, 2539, 36.0	5/23/00 5/28/00 6/7/00 6/14/00 6/19/00 6/22/00 7/3/00 7/12/00	3 2 3 3 3 3 3 1	3	2	1	1	0	0	N
Sheep Crossing Apache, 2683, 4.5	5/19/00 6/10/00 6/28/00 7/2/00	0 0 0 0	0	0	0	0	0	0	N
Phelps Cabin Apache, 2744, 2.3	5/27/00 6/6/00 6/23/00 7/2/00	0 0 0 0	0	0	0	0	0	0	N
Nelson Reservoir Apache, 2256, 2.5	5/25/00 5/30/00 6/9/00 6/27/00 7/11/00	0 0 0 0 0	0	0	0	0	0	0	Y
Salt River									
Lake Shore[f] Gila, 640, 21.3	5/3/00 5/16/00 5/17/00 6/13/00 7/5/00	0 1 3 21 30	31	18	14	13	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
School House Point South Gila, 640, 12.3	5/16/00 5/16/00 5/16/00 6/13/00 6/13/00 6/13/00 6/19/00 6/19/00 7/5/00 7/5/00 7/5/00	0 5 0 2 2 0 7 6 3 4 0	13	7	6	3	0	0	Y
School House Point North Gila, 640, 82.3	5/16/00 5/17/00 6/6/00 6/28/00	1 5 10 9	9	5	4	2	0	0	Y
Salt River Inflow Gila, 640, 0.0	Monitored 5/00 to 8/00	N/A	108	59	54	76	0	0	Y
Cottonwood Acres II Gila, 652, 21.0	5/23/00 6/7/00 7/11/00	0 0 0	0	0	0	0	0	0	Y
Cottonwood Acres I Gila, 652, 23.0	5/17/00 5/31/00 6/14/00 6/27/00	0 0 3 2	2	1	1	1	0	1	Y
Meddler Point Gila, 640, 4.0	5/15/00 6/13/00 7/5/00	0 0 0	0	0	0	0	0	0	Y
Eads Wash Gila, 661, 4.0	5/17/00 6/13/00 7/5/00	0 0 0	0	0	0	0	0	0	Y
Roosevelt Diversion Dam Gila, 665, 3.5	5/17/00 6/14/00 6/27/00	0 0 0	0	0	0	0	0	0	N
Salt River at State Route 288 Bridge Gila, 668, 8.5	5/15/00 6/13/00 7/5/00	0 0 0	0	0	0	0	0	0	N

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Canyon Creek at O.W. Bridge Gila, 1982, 3.0	5/30/00 6/7/00 6/28/00	0 0 0	0	0	0	0	0	0	N
San Francisco River									
Alpine Horse Pasture Apache, 2415, 28.3	5/25/00 5/30/00 6/9/00 6/11/00 6/13/00 6/20/00 6/27/00 7/4/00 7/11/00	2 3 4 3 3 3 2 2 2	3	2	2	2	0	1	Y
San Pedro River									
CB Crossing Northeast Pinal, 598, 21.8	5/15/00 6/1/00 6/27/00	0 0 0	0	0	0	0	0	0	Y
CB Crossing West Pinal, 595, 23.0	5/16/00 6/13/00 6/26/00	0 0 0	0	0	0	0	0	0	Y
CB Crossing Southeast Pinal, 595, 0.0	4/27/00 5/1/00 5/5/00 6/4/00 6/8/00	0 0 0 8 7	11	6	6	8	0	0	Y
Indian Hills Pinal, 604, 67.0	4/27/00 4/29/00 5/3/00 5/5/00 5/13/00 5/15/00 6/20/00 6/27/00	0 2 6 0 7 8 17 16	15	8	8	13	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Dudleyville Crossing Pinal, 604, 102.8	4/27/00 4/30/00 5/4/00 5/5/00 5/9/00 5/12/00 5/17/00 5/22/00 5/22/00 5/23/00 5/23/00 5/31/00 6/12/00 6/13/00 6/13/00 6/14/00 6/14/00 6/19/00 6/28/00 7/4/00 7/4/00 7/8/00 7/15/00	0 2 3 4 4 9 0 0 0 1 0 0 0 0 2 7 0 1 3 0 0 0 4	23	14	10	19	0	5	Y
Malpais Hill Pinal, 634, 30.8	5/10/00 5/11/00 5/17/00 5/28/00 5/31/00 6/6/00 6/10/00 6/12/00 6/14/00 6/19/00 6/27/00	3 2 2 3 3 4 4 4 4 3 5	5	3	2	3	0	0	Y
PZ Ranch Pinal, 634, 25.5	4/29/00 5/16/00 6/3/00 6/3/00 6/26/00	0 0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
PZ Ranch West Pinal, 634, 20.3	5/23/00 6/14/00 7/8/00	0 0 0	0	0	0	0	0	0	Y
Cook's Lake Cienega/Seep Pinal, 643, 58.7	4/27/00 4/27/00 4/28/00 4/30/00 5/1/00 5/1/00 5/3/00 5/3/00 5/5/00 5/5/00 5/9/00 5/13/00 5/17/00 5/22/00 5/24/00 5/28/00 6/5/00 6/5/00 6/10/00 6/17/00 6/21/00 6/29/00 7/8/00 7/17/00 7/21/00	0 0 0 0 2 0 2 0 2 0 1 2 1 3 0 1 5 5 8 0 8 1 5 5 0	12	7	5	0	0	1	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Aravaipa Inflow North Pinal, 662, 101.3	5/3/00 5/9/00 5/11/00 5/14/00 5/15/00 5/24/00 5/27/00 5/30/00 6/3/00 6/12/00 6/13/00 6/20/00 6/25/00 6/26/00 6/27/00 7/4/00 7/7/00	3 4 4 9 8 15 4 16 20 10 10 21 11 8 10 19 20	20	11	10	12	0	0	Y
San Pedro/Arivaipa Confluence Pinal, 659, 53.3	4/27/00 4/27/00 4/28/00 4/30/00 5/3/00 5/8/00 5/11/00 5/12/00 5/15/00 5/26/00 5/28/00 6/11/00 6/14/00 6/24/00 6/27/00 7/5/00	0 0 0 0 0 3 2 2 1 2 2 5 6 4 4 4	16	8	8	16	0	2	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Aravaipa Inflow South[f] Pinal, 659, 17.5	5/13/00 5/23/00 6/8/00 6/28/00 7/5/00 7/6/00	0 0 3 5 6 4	6	3	3	2	0	0	Y
Wheatfields Pinal, 671, 32.5	4/27/00 5/13/00 5/23/00 5/26/00 5/29/00 6/8/00 6/9/00 6/19/00 7/5/00	0 5 10 10 11 15 14 12 14	14	7	7	7	0	0	Y
Wheatfields South Pinal, 671, 8.8	5/29/00 6/21/00 7/4/00	0 0 0	0	0	0	0	0	0	Y
Capgage Wash Pinal, 681, 6.8	5/10/00 5/29/00 6/21/00 7/4/00	0 0 0 0	0	0	0	0	0	0	Y
San Manuel Crossing Pinal, 780, 5.8	5/16/00 6/7/00 6/23/00	0 0 0	0	0	0	0	0	0	Y
Catalina Wash Pinal, 774, 11.3	5/16/00 5/25/00 6/7/00 6/23/00 7/6/00	0 1 0 0 0	0	0	0	0	0	1	N
Bingham Cienega Pima, 689, 5.8	5/25/00 6/7/00 6/19/00 6/23/00 7/6/00	0 0 2 1 0	0	0	0	0	0	2	Y

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Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Soza Wash Cochise, 915, 14.5	5/27/00 6/12/00 6/28/00	0 1 0	0	0	0	0	0	1	Y
St. David Cienega Cochise, 1128, 14.5	5/27/00 6/9/00 6/30/00	0 0 0	0	0	0	0	0	0	Y
SPRNCA - Boquillas Cochise, 1189, 14.3	5/31/00	0	0	0	0	0	0	0	Y
Charleston Bridge North Cochise, 1189, 30.0	5/28/00 6/19/00 7/13/00	0 0 0	0	0	0	0	0	0	Y
Escapula Wash North Cochise, 1220, 18.5	5/29/00 6/20/00 7/12/00	0 0 0	0	0	0	0	0	0	Y
State Route 90 Bridge Cochise, 1238, 9.5	5/26/00 6/10/00 7/1/00	0 0 0	0	0	0	0	0	0	Y
SPRNCA - Carr to Hunter Cochise, 1250, 23.5	5/24/00 5/25/00 6/8/00 6/28/00	0 0 0 0	0	0	0	0	0	0	Y
Hereford Bridge Cochise, 1265, 18.0	5/25/00 6/7/00 6/27/00	0 0 0	0	0	0	0	0	0	Y
SPRNCA - Palominas Cochise, 1280, 24.0	5/21/00 6/6/00 6/29/00	0 0 0	0	0	0	0	0	0	Y
Santa Cruz River									
Sanford Butte Santa Cruz, 1186, 11.3	5/31/00 6/16/00 7/8/00	0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Santa Maria River									
Lower Santa Maria River Mohave, 354, 60.5	5/17/00 5/17/00 5/24/00 5/27/00 5/27/00 6/6/00 6/6/00 6/7/00 6/7/00 6/10/00 6/11/00 6/13/00 6/13/00 6/22/00 6/27/00 6/28/00 6/30/00 6/30/00 7/3/00 7/3/00 7/11/00 5/14/40	3 1 0 5 1 5 1 6 2 0 0 6 2 6 1 0 3 2 4 0 2 3	8	5	3	2	0	0	Y
Tonto Creek									
Orange Peel[f] Gila, 610, 27.0	5/24/00 5/24/00 6/21/00 6/21/00 7/19/00 7/19/00	1 0 6 2 3 5	11	7	5	6	0	0	Y
Tonto Creek Inflow Gila, 640, 0.0	Monitored 5/00 to 8/00	N/A	34	20	19	31	0	0	Y
A-Cross Road South[f] Gila, 677, 8.0	5/24/00 6/21/00 7/11/00	1 2 2	2	1	1	1	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
A-Cross Road North Gila, 677, 8.0	5/24/00 6/21/00 7/11/00	0 0 0	0	0	0	0	0	0	Y
Bar-X Road Gila, 694, 18.8	5/24/00 6/21/00 7/19/00	0 0 0	0	0	0	0	0	0	Y
Verde River									
Ister Flat Yavapai , 610, 27.0	5/16/00 6/7/00 6/27/00	0 1 0	0	0	0	0	0	0	Y
Bull Pen Yavapai, 1122, 2.0	5/18/00 6/15/00	0 0	0	0	0	0	0	0	Y
White Bridge Yavapai, 930, 3.0	5/19/00 6/6/00 6/27/00	0 0 0	0	0	0	0	0	0	Y
Stage Stop - Dry Beaver Creek Yavapai, 1104, 3.3	5/17/00 6/8/00	0 0	0	0	0	0	0	0	Y
Camp Verde Yavapai, 942, 4.5	5/24/00 6/14/00 7/24/00	2 9 6	9	5	4	6	0	0	Y
Sheepshead Canyon Yavapai, 1052, 4.3	5/20/00 6/10/00	0 0	0	0	0	0	0	0	Y
Red Rock Crossing - Oak Creek Coconino, 1207, 1.5	5/15/00 6/5/00	0 0	0	0	0	0	0	0	Y
Mingus Ave - Rocking Chair Road Yavapai, 994, 20.3	5/19/00 6/12/00 6/13/00 6/28/00 6/29/00	0 0 0 1 0	0	0	0	0	1	0	Y
Tapco Yavapai, 1037, 3.5	5/22/00 6/8/00 6/29/00	0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Virgin River									
Nevada Border Mohave, 488, 8.7	5/27/00 5/30/00 6/24/00 7/4/00 7/17/00	0 0 0 0 0	0	0	0	0	0	0	Y
Little Bend Mohave, 518, 7.5	5/26/00 6/6/00 6/29/00 7/14/00 8/1/00	0 0 0 0 0	0	0	0	0	0	0	Y
Big Bend Mohave, 515, 14.4	5/20/00 6/6/00 6/29/00 7/13/00 7/26/00	0 0 0 0 0	0	0	0	0	0	0	Y
Corral Bluff Mohave, 524, 10.6	5/19/00 6/5/00 7/3/00 7/12/00 7/25/00	0 0 0 0 0	0	0	0	0	0	0	Y
Littlefield Mohave, 579, 25.2	5/18/00 5/18/00 5/25/00 6/3/00 6/9/00 6/20/00 6/20/00 6/28/00 7/6/00 7/10/00 7/13/00 7/24/00 7/31/00	1 0 0 0 0 0 0 0 0 0 0 0 0	0	0	0	0	0	0	Y

Appendix F. Arizona willow flycatcher survey results by site, 2000.

Sitename County, Elevation (m), Survey Hours	Individual Surveys		Site Summary						
	Survey Date[a]	WIFL[b]	Resident Adult WIFL	Territories	Pairs	Nests	Unknown Status WIFL[c]	Migrant WIFL[d]	BHCO Present[e]
Black Rock Gulch Mohave, 720, 16.8	5/15/00 5/31/00 6/26/00 7/7/00 7/21/00	0 0 0 0 0	0	0	0	0	0	0	Y

[a] Duplicate survey dates indicate different areas surveyed within sites and/or multiple surveyors.
[b] WIFL = adult willow flycatchers (*Empidonax traillii extimus*).
[c] Estimated number of willow flycatchers that could not be classified as resident or migrant due to brief appearance at the site during the breeding season or lack of survey data.
[d] Maximum number of migrant willow flycatchers detected during any single survey visit.
[e] BHCO = Brown-headed cowbirds (*Molothrus ater*).
[f] New site with resident flycatchers detected in 2000.

Appendix G. Sites in Arizona with resident willow flycatchers, 2000. (see map, Appendix H)

Big Sandy River
1. Lower Big Sandy River
2. Big Sandy River Downstream US 93, Big Sandy River Upstream US 93

Bill Williams River
3. Monkey's Head
4. Alamo Lake – Brown's Crossing

Colorado River
5. Topock Marsh
6. Waterwheel Cove
7. Miles 268.0 to 265.0 L GC
8. Miles 266.0 to 262.5 L GC, Mile 259.5 L, Miles 257.5 to 257.0 R GC
9. Mile 246.0 L GC
10. Miles 51.5 to 50.5 L GC

Gila River
11. GRN018, GRS018
12. GRS015, GRN015, Kearny, GRS012, GRS011, GRN010, GRS007, GRN004
13. Pima East
14. Duncan

Little Colorado River
15. River Reservoir, Greer Town

Salt River
16. Lake Shore, School House Point South, School House Point North, Salt River Inflow, Cottonwood Acres I

San Francisco River
17. Alpine Horse Pasture

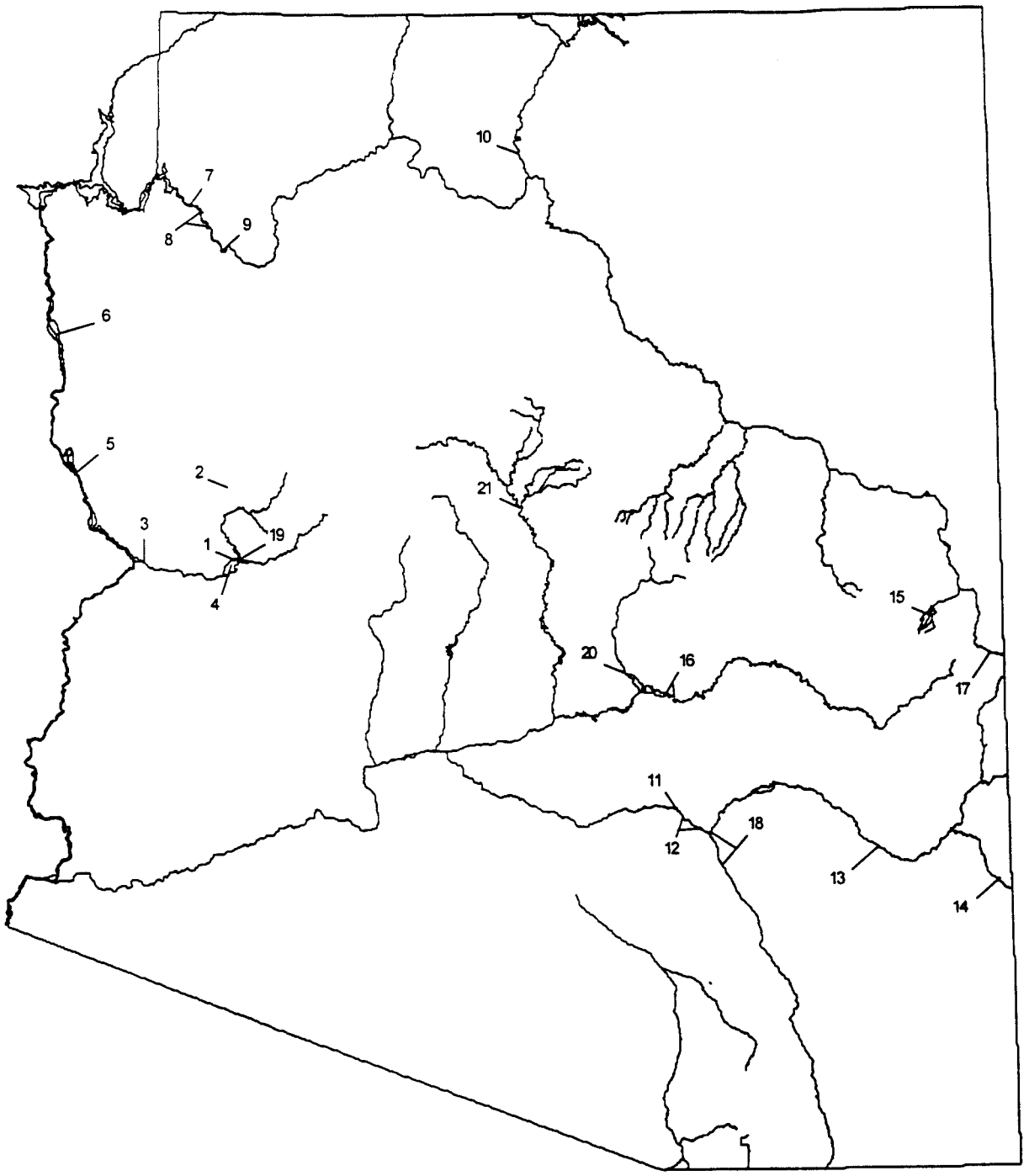
San Pedro River
18. CB Crossing Southeast, Indian Hills, Dudleyville Crossing, Malpais Hill, Cook's Lake Cienega/Seep, Aravaipa Inflow North, San Pedro/Arivaipa Confluence, Arivaipa Inflow South, Wheatfields,

Santa Maria River
19. Lower Santa Maria River

Tonto Creek
20. Orange Peel, Tonto Creek Inflow, A-Cross Road South

Verde River
21. Camp Verde

Appendix H. Map of sites in Arizona with resident willow flycatchers, 2000. (see Appendix G for site names)



Appendix I. Sites in Arizona with documented nesting willow flycatchers, 2000. (see map, Appendix J)

Big Sandy River
1. Lower Big Sandy River

Bill Williams River
2. Monkey's Head
3. Alamo Lake – Brown's Crossing

Colorado River
4. Topock Marsh
5. Miles 268.0 to 265.0 L GC
6. Miles 266.0 to 262.5 L GC
7. Mile 246.0 L GC
8. Miles 51.5 to 50.5 L GC

Gila River
9. GRN018, GRS018
10. GRS015, GRN015, Kearny, GRS012, GRS011, GRN010, GRS007
11. Pima East

Little Colorado River
12. Greer Town

Salt River
13. Lake Shore, School House Point South, School House Point North, Salt River Inflow, Cottonwood Acres I

San Francisco River
14. Alpine Horse Pasture

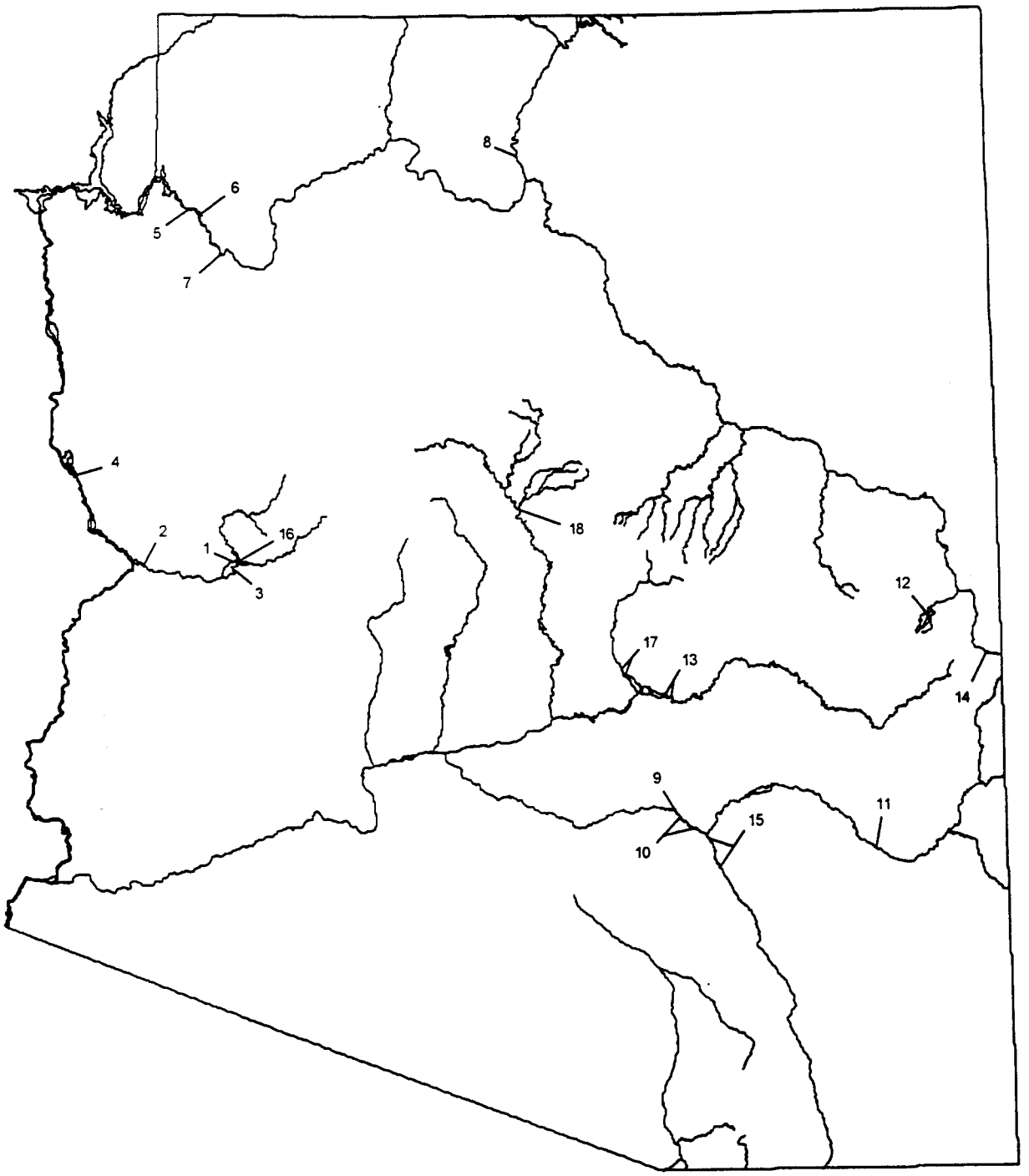
San Pedro River
15. CB Crossing Southeast, Indian Hills, Dudleyville Crossing, Malpais Hill, Aravaipa Inflow North, San Pedro/Arivaipa Confluence, Arivaipa Inflow South, Wheatfields.

Santa Maria River
16. Lower Santa Maria River

Tonto Creek
17. Orange Peel, Tonto Creek Inflow, A-Cross Road South

Verde River
18. Camp Verde

Appendix J. Map of sites in Arizona with documented nesting willow flycatchers, 2000.(see Appendix I for site names)



Appendix K. Habitat measurements recorded at willow flycatcher nests located at low elevation (< 1115 m) nest monitoring sites in Arizona, 2000.

	Nest height (m)	Nest shrub height (m)	Diameter of nest shrub main stem (cm)	Distance from nest to water (m)
Dudleyville Crossing				
Number of nests	19	19	19	19
Mean ± s	6.18 ± 1.25	10.21 ± 2.13	13.29 ± 5.03	393.05 ± 139.70
Median	6.5	10.2	13.0	421.0
Min.	3.9	6.4	6.5	15.0
Max.	8.4	13.7	24.2	516.0
San Pedro / Aravaipa Confluence				
Number of nests	16	16	16	16
Mean ± s	5.51 ± 1.00	9.13 ± 2.79	10.27 ± 5.48	12.59 ± 23.43
Median	5.4	8.7	8.3	6.6
Min.	3.7	4.5	3.5	0
Max.	7.0	15.8	22.5	98.0
Indian Hills				
Number of nests	13	13	13	13
Mean ± s	5.66 ± 1.80	9.04 ± 2.86	15.45 ± 9.06	30.55±45.69
Median	5.5	8.5	11.8	12.2
Min.	2.5	5.9	4.8	0
Max.	8.9	16.5	32.2	138.0
CB Crossing SE				
Number of nests	8	8	8	8
Mean ±s	4.15±1.08	6.48±1.24	4.94±1.00	52.75 ± 14.25
Median	4.3	6.6	5.3	53.5
Min.	2.6	4.2	3.1	35.0
Max.	5.2	8.0	6.2	75.0
Kearny				
Number of nests	31	32	32	32
Mean ± s	5.63 ± 1.54	9.19 ± 2.18	11.23 ± 4.98	7.23 ± 8.93
Median	5.7	9.1	10.3	4.0
Min.	2.7	5.1	4.0	0
Max.	8.8	14.5	21.7	34.3
Winkelman Study Area Total				
Number of nests	87	88	88	88
Mean ± s	5.60 ± 1.47	9.13 ± 2.48	11.55 ± 6.16	99.09 ± 169.46
Median	5.6	8.8	9.5	11.8
Min.	2.5	4.2	3.1	0
Max.	8.9	16.5	32.2	516.0

Appendix K (continued). Habitat measurements recorded at willow flycatcher nests located at low elevation (<1115 m) nest monitoring sites in Arizona, 2000.

	Nest height (m)	Nest shrub height (m)	Diameter of nest shrub main stem (cm)	Distance from nest to water (m)
Tonto Creek Inflow[a]				
Number of nests[b]	33	34	34	34
Mean ± s	5.66 ± 1.32	8.18 ± 1.65	9.11 ± 4.18	110.00 ± 64.05
Median	5.5	8.1	8.2	87.0
Min.	3.2	5.04	3.7	7.9
Max.	8.5	11.84	19.0	239.0
Salt River Inflow				
Number of nests[b]	72	72	72	73
Mean ± s	3.78 ± 1.14	6.67 ± 1.63	6.55 ± 3.43	240.85 ± 110.83
Median	3.67	6.56	5.7	226.0
Min.	1.45	3.69	1.9	40.0
Max.	8.6	10.6	19.2	535.0
Roosevelt Lake Total:				
Number of nests[b]	105	106	106	107
Mean ± s	4.37 ± 1.48	7.16 ± 1.78	7.37 ± 3.86	199.27 ± 115.62
Median	4.0	6.95	6.65	200.0
Min.	1.45	3.69	1.9	7.9
Max.	8.6	11.84	19.2	535.0

[a] Includes nests at the Orange Peel site.
[b] Number of nests used in calculations.

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Agua Fria River									
Agua Fria MC 85 Bridge	1							0	
Luke Riparian Corridor	2		0						
Waddell Dam	3							0	0
Confluence of Humbug Creek & Cow Creek	4	0							
Gillette Ruins	4			0					
Agua Fria Near Black Mesa	5	0							
Lousy Canyon	5	0							
Black Canyon Creek	5	0							
Agua Fria Below Bloody Basin	5	0							
Silver Creek	5	0							
Indian Creek	5	0							
Cordes Jct.	5	0							
Ash/Little Ash/Dry Creeks	5	0							
Little Ash Creek	5				0				
Horner Gulch	5				0				
Yellow Jacket Creek	5				0				
Grapevine Canyon - Agua Fria River	6		0						
Big Sandy River									
Lower Big Sandy River	7		4	4	0	4	6	8	7
Signal Canyon	8						0		
Madril Wash	8						0		
Six Mile Crossing - Burro Creek	9	0	0	0			0		
Francis Creek	10	0	0	0				0	
Big Sandy River Downstream US 93	11		1			1			13
Big Sandy River Upstream US 93	11								3
Trout Creek	12							0	
Cottonwood Creek	13				0				
Bill Williams River									
Bill Williams River Delta - Marsh Edge	14	0		1	0	0	0	0	0
Monkey's Head	14		0	0	0	0	0	1	1
Gemini	14	0	1	0	1	0	1	0	0
Cave Wash 1	14		0	0	0	0	0	0	0
Cave Wash 2	14	0	0					0	0
Buckskin	14	0	0		0		1	0	0
Bill Williams Pipeline	15		0		0		0	0	0
Alamo Dam	16	0			0	0			
Alamo Lake - Brown's Crossing	17				5	5	5	10	12
Black River									
Wildcat Point	18					0			
PS Ranch	18		0			0	0		0
Buffalo Crossing - Black River	18		0						
Diamond Rock Campground	18					0			
Burro Mountain	19		0						
Thompson Ranch	19			0		0	0		
Blue River									
Blue River Crossing	20		0						
Blue School	20		0						
Upper Blue River Campground	20		0						
Bobcat Flat- Blue River	20		0						
Central Arizona Project Canal									
56th St. along CAP Canal	21					0			
Colorado River									
Hunter's Hole	22	0	0	0	0	0	0	0	0
Gadsden Pond	22	0	0	0	0	0	0	0	0
Gadsden Bend	22	0	0	0	0	0	0	0	0

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Cocopah	22						0		0
County 14th St. to County 13th St.	23					0			0
County 13th St. to County 12th St.	23	0		0		0		0	0
County 12th St. to County 11th St.	23					0	0	0	0
County 11th St. to County 10th St.	23					0	0	0	
County 10th St. to County 9th St.	23					0	0	0	
County 9th St. to Morelos Dam	23	0				0	0	0	
Lower Yuma Division #2	23					0	0	0	0
Yuma Division	23		0		0	0	0	0	0
Fort Yuma 1 & 2	24			0		0	0	0	0
Yuma Territorial Prison	24							0	
2 East to Gila River	24				0		0	0	0
Fort Yuma 3	24					0	0		0
Gila/Colorado Confluence 3	24					0			
Gila/Colorado Confluence 1	24					0		2	0
Gila/Colorado Confluence 2	24					0	0	0	0
Mittry Lake	25	0	0		2	0	0	0	0
Martinez Lake	26		0	0	0				
Imperial HQ	26					0	0		
IB	26		0	0	0				
IS	26		0	0	0				
Farmfield #20	26							0	
Killdeer	26			0					
Dredge Channel	26			0	0				
Farm Field	26			0					
Cottonwood Nursery	26			0	0				
Flycatcher	26			0	0				
Triangle	26							0	
Firebreak	26			0					
Cattail	26			0					
Imperial HQ	26					0	0		
Ironwood	26				0				
Smoke Tree	26				0				
Clear Lake	26				1		0	0	0
Picacho East (Island Lake)	27		0		1				0
Picacho West	27		0		0	0	0	0	0
Picacho Island	27							0	
Adobe Lake	27				2	1	0	0	0
Paradise Valley South	27							0	
Paradise Valley North	28							0	
Clip Wash Mine	28						0		
Cibola Lake Overlook	28							0	
Cibola Lake	28			0	0	0	0	0	0
SW of Landing Strip - Cibola	28		0	0	1	0	0	0	
Cibola #2	28							0	0
Arnet Ditch/Tieback Levee	28	0			0		0		
Cibola Reveg Flat	28							0	
Cibola Island Unit	28						0		
High Levee East	29		0		0				
Farm Unit 1 Reveg.	29		0	0					
Palo Verde	29				0				
A-10 Backwash	30						0		
Ehrenberg	30	0	0		1	0	0	0	0
Anjohns	31							0	
Horse Island	32							0	
Noname Lake	33						0	0	
Hidden Valley Island	33						0		

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Calzona	33							0	
Twelvemile Slough	34							0	
Ahakhav Preserve	35					0	0	0	
Cienega Springs	36					0			
Parker Strip	36				0				
Disneyland	37							0	0
Standard Wash	37					0	0	0	0
Beaver Island to Thompson Bay	37					0	0	0	0
Neptune - North Lake Havasu	38				1	0	0	0	0
Blankenship	38				0	1	0		
Topock Marsh	39	0	0	2	3	12	14	15	15
Waterwheel Cove	40				0		0	0	3
Lake Mead Delta	41			1	10	6	0		
Miles 277.0 to 274.0 R GC	41	1			0	0	0		
Miles 277.0 to 273.0 L GC	41					0	1	0	
Miles 273.5 to 273.0 R GC	41						0		
Miles 273.5 to 270.0 L GC	41					0	2	0	
Miles 272.0 to 268.0 R GC	41					0	2	1	
Miles 270.0 to 268.0 L GC	41					2	1	0	0
Miles 268.0 to 265.0 L GC	41					0	5	5	3
Miles 268.0 to 264.0 R GC	41					0	1	0	0
Miles 265.0 to 263.5 L GC	42					0	1	0	0
Miles 266.0 to 262.5 L GC	42						0	1	1
Miles 262.8 to 261.8 R GC - Wards Cave Rapid	42								0
Mile 262 L GC	42					0			
Mile 261.8 L GC	42					0			
Mile 261.2 L GC	42					0			
Miles 261.2 to 260.5 R GC	42						0	0	0
Mile 261.0 L GC	42					0			
Mile 260.6 L GC	42					0			
Mile 260.0 R GC	42					0			0
Mile 260.0 L Quarter Master GC	42	0				0			0
Mile 259.5 L	42								1
Mile 259.5 R Waterfall Rapid GC	42						0	1	0
Miles 257.5 to 257.0 R GC	42						0	0	1
Miles 257.2 to 256.6 L GC	42							0	0
Mile 255.5 R Devils Slide Rapid GC	42						0		
Mile 252.9 L GC	43					0			
Mile 252.3 R GC - Reference Point Rapid	43								0
Mile 252.2 L GC	43					0			0
Mile 251.8 L GC	43					0			
Mile 251.3 L GC	43					0			
Mile 251.0 L GC	43					0			
Mile 249.0 L Lost Creek GC	43								0
Mile 248.3 R Surprise Canyon GC	43								0
Mile 246.0 L GC	43					0	2	3	2
Mile 243.0 L GC	43					0			
Miles 204.8 to 204.7 L GC	44			0					
Mile 204.5 R Spring Canyon GC	44						0	0	0
Miles 199.0 to 196.0 R Parashant Camp GC	44			0	0		0	0	0
Miles 198.0 to 196.0 L GC	44							0	0
Miles 196.0 to 195.1 L GC	44							0	0
Miles 196.0 to 191.0 R GC	44			0	0		0	0	0
Mile 195.0 L GC	44						0	0	
Miles 194.9 to 191.2 L GC	44							0	0
Mile 168.0 R Fern Glen GC	45						0		

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Miles 143.5 to 143.0 R GC	46			0			0	0	0
Jensen Canyon - Kanab Creek	47				0				
Little Spring - Kanab Wilderness	47			0					
Clear Water Spring - Kanab Creek	48						0	0	0
Mile 136.0 R GC	49			0					
Mile 133.7 R Tapeats Creek GC	49						0		0
Miles 72.2 to 72.0 R GC - Unkar	50								0
Miles 71.3 to 71.0 L Cardenas GC	50	1		0	0	0	0	0	0
Miles 67.1 to 66.8 L GC	50								0
Mile 65.3 L Lava Chuar GC	50		1	1	0	0	0	0	0
Miles 56.5 to 56.0 R Kwagunt Marsh GC	51				0		0	0	0
Mile 52.7 R Lower Nankoweap Camp GC	51				0				
Mile 52.0 L GC	51			0					
Mile 50.0 L GC	51						0		0
Miles 51.5 to 50.5 L GC	51	1	4	3	3	2	1	1	1
Miles 46.9 to 46.6 R GC	51	0		0	0		0	0	0
Miles 43.8 to 38.8 L GC	51								0
Mile 5.2 R GC	52								0
Miles 0.5 to -0.2 R Lees Ferry GC	53						0	0	0
Miles -2.9 to - 3.4 R GC	53			0					
Mile -6.1 R GC	53			0					
Mile -8.3 to -8.5 R GC	53			0					
Mile -8.8 R GC	53	0							
Mile -9 Marsh GC	53	0							
Chaol Canyon - Lake Powell	54					0			
Gila River									
North Gila Valley Site 1	55				0	0	0	0	0
North Gila Valley Site 2	55				0	0			
Fortuna Wash	55				1	0	0	0	0
Gila River at US Route 95	55						0	0	
Dome Slough	55					0	0	0	
Ligurta	55					0	0	0	
West Pond - Quigley Wildlife Area	56							0	
Tacna Marsh - Quigley Wildlife Area	56		0			0			
Pole Site	57					0	0	0	
Painted Rock Dam	58				0				
Gillespie Dam	59		0		0			0	
Arlington Valley - Pond & Slough	59		0		0				
Arlington South	59							0	
Arlington North	59							0	
Robbins Butte	60	0	0		0			0	
Buckeye East of Powerline	60				0	0	0	0	
West of Airport Road	60				0	0	0	0	0
Jackrabbit Trail East - Gila River	61	0	0						
Goodyear KR	61								0
Estrella	61							0	
N.E. Goodyear Butte	61				0			0	
Dysart Road	61							0	
Gila River 123rd to 107th Ave.	61		0	0	0	0	0	0	0
Picacho Lake	62		0	0					
Whitlow Dam	63		0		0		0		
South Butte	64	0	0	0			0		
North Butte	64			0		0	0	0	0
GRN033	65			0	1	0	0	0	0
Donnelly Wash	65			0	0	0	0		
GRS032	65			0	0	0	0		
GRSN031	65			0	1	0	0		

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
GRSN030	66			0	0	0	0		0
GRN029	66	0		0	0	0	0	0	0
GRN028	66	0		0	0	0	0	0	0
GRN027	66	0		0	0	0	0	0	0
GRSN026	66	0		0	0	0	0		
GRS025	66			0	0	0	0		
GRSN023	66			0	0	0	0	0	0
GRSN022	66				0	0	0		
Mineral Creek - Gila River	66						0		
Mineral Creek at Twin Domes	67						0		
Mineral Creek at Lake Flat	68						0	0	0
GRS020	69				0	0	0		
GRN020	69				2	2	2	5	0
GRS019	69					0	0	0	0
GRN019	69					0	0	0	0
GRN018	69					2	2	5	4
GRS018	69					1	1	4	4
GRS016	69					0			
GRS015	69					1	1	1	1
GRN015	69								1
Kearny	69		1		6	8	25	23	19
GRS014	69					0	0	0	0
GRN014	69					0	0	0	0
GRN013	69					0	0	0	0
GRS013	69					1	0	0	0
GRN012	69					0	0		0
GRS012	69					4	6	8	7
GRN011	69					2	0	0	0
GRS011	69					0	0	1	2
GRN010	69					5	4	4	2
GRS010	69					3	0	4	0
GRS009	69					0	0		
GRN009	69					0	0	0	0
GRS008	69					0	0	0	0
GRN008	69					0	0	0	0
GRS007	69					3	6	11	10
GRN007	69					0	0	0	0
GRS006	69					0	0		
GRS005	69					0	0		
GRS004	69					0	0	0	0
GRS003	69					0	0	0	0
GRN005	69					0	0	0	0
GRN004	69					1	1	2	2
GRN003	69					0	0	0	0
GRN002	69					0	0	0	0
GRS002	69					0			
GRS001	69					0			
Dripping Springs Campground	70				0	0	0	0	0
Dripping Springs Wash	71						0	1	0
Mescal Creek	75	0							
Coolidge Dam	73	0		0	0				
Carland Wash	74	0	0			0	0	0	
Fort Thomas - Geronimo	74		0			2	2	2	
Porter Wash Ponds	74	0				0			
Fort Thomas MS	74						2		
Fort Thomas Bridge	74	1	0						
Charley Thompson Springs - Clay Mine	74					0			

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Teague	74					0	0	0	
Simon Spring	75	0	0						
Pima Bridge	75	0	0			2			
Cottonwood Wash	75	0	0						
Cluff Reservoir 1- Ash Creek	76	0	0			0			
Cluff Reservoir 3 - Ash Creek	76	0	0						
Pima East	77					12	5	4	15
Watson Wash	77				0	0			
Watson Spring	77				0				
Thatcher	77				0				
Smithville Canal	77				1	0			
Safford	77				0	0	0		
Solomon Northwest	78				3	0	2		
San Simon River Barrier	79					0			
Sanchez Road	80			2	4	1	0		
San Jose	80			0	0	0	1	0	0
Southwest Sanchez	81	0		0					
Earven Flat	82					0	0	0	
Northwest of Rail End Canyon	82					0			
Bonita Creek	82					0			
Upper Bonita Creek	83	0				0			
Half Mile	84						0	0	
Gutherie	84					0	0	0	
Duncan	85						2	4	1
Hassayampa River									
Hassayampa at Arlington Canal	86	0						0	
Hassayampa River Preserve	87	0	0		0	1	3	2	0
Box Canyon Area	88			0					
King Solomon Gulch	88			0					
O'Brien	88			0					
Seal Mountain	88			0					
Crook's Canyon	89		0						
Hassayampa River - Climax Mine	90	0							
Wolf Creek Campground	90	0							
Little Colorado River									
Pasture Canyon	91			1	0		0	0	
Begashibito Canyon	92						0	0	
Blue Canyon	92						0	0	
Dinnebito	93							0	
Grand Falls - North of 70 Bridge	94					0			
Yung-pi	95							0	
Kykotsmovi	96							0	
Coyote Spring	97						0	0	
Polacca Wash	98						0		
Polacca Sewer Pond	98						0		
Lower Keams Canyon	99						0		
Keams Canyon - Beaver Dam	100						0	0	
Kalbito Springs	101							0	
Sawmill	102			0					
Enchinique	103			0					
Leonard Point - Clear Creek	104		0						
East Clear Creek	104	0	0				0		
Rock Tank - Willow Creek	105		0						
Wiggins Crossing - Willow Creek	105		0				0	0	
Chevelon Wildlife Area	106								
Gauging Station	107			0					
Chevelon Crossing North	107	0	0	0					

Appendix L. Number of willow flycatcher territories documented in Arizona. 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Fools Hollow Lake - Show Low	108	0	0						
Billy Creek	109	0	0						
Mineral Springs	110					0			
Springer/Round Valley Crossing	111						0		
Wenima Ranch	111		0	0	0	0	0	0	0
South Fork Campground	112	0	0						
Hall Creek Near Greer	112		0						
Hall Creek	112		0		0	0	0	0	0
Benny Creek	112	0	0	0	0	0	0	0	0
River Reservoir Spillway	112				0				
Wonderland Trap	112						0	0	0
Tunnel Reservoir	112			0	0	0	0		
River Reservoir	112	5	5	9	7	4	3	1	1
Greer Trout Ponds	112	0	0	0	0	0			
Greer Town	112	0	0	0	4	3	4	4	2
Upper West Fork	112			0					
Government Spring	112					0	0		
Sheep Crossing	112		0		0	0	0	0	0
Amberon Flat	112							0	
Church Camp	112					0	0		
Phelps Cabin	112	0	0		0	0	0	0	0
Sipe Wildlife Area	113					0			
Rudd Creek	113	0	0						
Nelson Reservoir	113	0	1	0	0		0	0	0
Nutrioso	114	0	0						
Colter Creek	114					0	0		
Salt River									
Salt River 91st to 107th Ave.	115		0		0			0	
Salt River 83rd Ave	115				0				
Salt River 67th Ave.	115				0				
Salt River 59th Ave.	115				0				
Cave Creek	116					0			
Granite Reef	117		0					0	
Coon Creek	117		0						
Coon's Bluff	117		0						
Stewart Mountain Dam	118							0	
Alder Creek - Apache Lake	119		0						
Lower Parker Creek	120		0						
Upper Parker Creek	120		0						
Pinto Creek	121	0	0						
Lake Shore	122								17
School House Point South	122							5	7
School House Point North	122					0	0	2	5
Salt River Inflow	122	2	25	12	22	18	20	44	57
Cottonwood Acres II	122		0		0	0	0	0	0
Cottonwood Acres I	122	0	0			0	0	1	1
Meddler Point	122		0	0			0		0
Eads Wash	122						0		0
Roosevelt Diversion Dam	122						0		0
Salt River at State Route 288 Bridge	122		0			0	0	0	0
Horseshoe Bend to State Route 288	122					0	0		
Pinal Creek	123					0	0		
Lost Gulch	124						0		
Upper Salt River - Cherry Crk to Horseshoe	125					0			
Canyon Creek at O.W. Bridge	126	0	0		0	0	0	0	0
San Francisco River									
South of Clifton	127					0			

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Sycamore Gulch	128					0			
Lower San Francisco River	128				0				
Upper San Francisco River	129		0						
Alpine Horse Pasture	130	5	5	4	3	2	3	3	2
Pheasant Farm	130	0		0					
San Francisco River South of Alpine	130	0							
San Pedro River									
CB Crossing Northeast	131					0	0	0	0
CB Crossing West	131					0	0	0	0
CB Crossing Southeast	131					5	4	6	6
Indian Hills	131		5	3	3	15	12	12	8
Dudleyville Crossing	131	4	0	0	1	3	6	10	14
Malpais Hill	131				0	0	1	2	3
PZ Ranch	131		21	14	8	5	1	1	0
PZ Ranch West	131						0	0	0
Cook's Lake Cienega/Seep	131	7	18	15	17	13	13	11	7
Aravaipa Inflow North	131						0	7	11
San Pedro/Arivaipa Confluence	131	0					6	14	8
Araviapa Canyon	132					0			
Aravaipa Inflow South	133						0	0	3
Wheatfields	133					2	1	2	7
Wheatfields South	133						0	0	0
Capgage Wash	133						0	0	0
Cronley Wash	133						0		
Mammoth North	133						0		
Mammoth Sewage Ponds	133						0		
Mammoth South	133						0		
San Manuel Crossing	133	0	0		0		0	0	0
Catalina Wash	134	0					0	0	0
South Catalina Wash	134		0	0	0		0		
Peck Canyon South	135						0		
Bingham Cienega	135						2	0	0
Swamp Springs Canyon	136	0							
Soza Wash	137	0		0	0	0	0	0	0
Cascabel	137	0		0		0	0		
Bass Canyon	138	0		0					
Hookers Hot Springs	138		0						
Paige Creek	139		0	0					
Ash Creek I	140			0					
Ash Creek II	140			0					
Apache Powder Rd.	141				2				
Miller Water Gap	142						0		
St. David Cienega	142								0
Summers	142		0	0	0				
SPRNCA - Contention	143			0		0			
Fairbank to Contention	143				0	0			
SPRNCA - Boquillas	143			0		0			0
Charleston Bridge North	143					0			0
Escapula Wash North	144					0			0
Escapula Wash South	144					0	0		
State Route 90 Bridge	144					1	0	0	0
SPRNCA - Carr to Hunter	145		0	0				0	0
Hereford Bridge	146						0	0	0
SPRNCA - Palominas	147			0					0
Santa Cruz River									
Arivaca Creek	148	0							
Avra Valley Bridge S.	149	0	0		0				

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Lower Sabino Canyon	150		0						
Upper Tanque Verde	151		0						
Empire/Cienega - Cienega Creek	152		0						
Cienega Creek Near Cross Hill	152	0							
Cienega Creek	153		0	0		0	0	0	
Chavez Siding Rd. - Santa Cruz River	154	0							
Anza Trail	154	0		0				0	
Santa Gertrudis South	154							0	
Peck Canyon Bridge	154							0	
Rio Rico	154		0					0	
Patagonia Lake-Sonoita Creek	155				0	0			
Sanford Butte	155								0
Patagonia - Sonoita Creek Preserve	155		0						
Cottonwood Spring	156			0					
Ruby Rd. Bridge - Santa Cruz River	157	0							
Bog Hole Wildlife Area	158	0							
Santa Maria River									
Lower Santa Maria River	159	0	1	0	4	1	1	5	5
Tres Alamos Falls	160		0						
Date Creek - Cottonwood Canyon	161	0							
Billingsley Spring	162			0		0			
Yerba Mansa Spring	163			0					
Big Stick Mine and downstream	164			0					
Santa Maria River at US Route 93 Bridge	164				0	0	0	0	
Date Creek Beaver Ponds	165			0					
Cottonwood Canyon	166	0							
Tonto Creek									
Orange Peel	167								7
Tonto Creek Inflow	167	3	8	9	16	21	28	24	20
A-Cross Road South	167						0		1
A-Cross Road North	167						0		0
Bar-X Road	167					0	0		0
Rye Creek	168			0	0				
Tonto Creek - Gisela	169			0					
Gibson Creek - Round Valley	170			0					
Spring Creek - Buzzard Roost Mesa	171	0							
Bear Hide Spring	172			0					
Christopher Creek	172	0	0						
Indian Gardens	172	0	0						
Verde River									
Horseshoe Dam	173		0						
Ister Flat	174	1	0			2	0	0	0
Ister Flat West	174							0	
Sycamore Creek At Sheep Bridge	175		0				0		
Tangle Peak R	176						0		
Mile 16.5 L	176		0				0	0	
Mile 18.0 R	176						0		
Mile 18.5 L	176						0		
Mile 18.5 R	176						0		
Wet Bottom Creek L	176		0		0	0	0		
Palo Verde Spring	176					0			
Red Creek	176		0						
Cow Flop Spring R	176						0		
Pete's Cabin Mesa R	177	0					0		
Mile 29.5 R (ROG)	177		0				0		
Mile 31.75 R	177						0		

Appendix L. Number of willow flycatcher territories documented in Arizona, 1993 – 2000. (see map, Appendix M). (Blank fields indicate no surveys conducted).

Site Name	Map Number	1993	1994	1995	1996	1997	1998	1999	2000
Mile 32.75 L	177		0				0		
Mile 33.25 R	177						0		
Squaw Butte R	177	0	0				0		
Houston Creek	177	0							
Mile 34.5 R	177						0		
East Verde - Verde Confluence L	177		0				0		
East Verde - Doll Baby Ranch	178		0		0	0		0	
Lost Shirt Bend	179	0							
Stehr Lake	180		0						
Fossil Creek	180		0						
Aqueduct Spring	180		0				0		
Bridge to Irving Powerplant	180						0		
Fossil Springs	180		0						
West Clear Creek Near Shill's Crossing	181				0				
East Wingfield Mesa - West Clear Creek	181		0						
West Clear Creek Campground	181	0	0	0	0	0			
Hance Springs	182		0						
Bull Pen	182		0	0	0	0	0	0	0
Rancho Rio Verde	181				0				
Copper Canyon	183		0						
White Bridge	184		0	0	0	0	0	0	0
Wet Beaver Creek	185		0		0				
Red Tank Draw	185		0						
Stoneman Lake	186		0						
Winter Cabin Tank - Dry Beaver Creek	187		0			0			
Stage Stop - Dry Beaver Creek	187	0	0	0	0	0	0	0	0
Camp Verde	183		7		6	10	7	6	5
Comville Bridge - Oak Creek	188		0						
Sheepshead Canyon	188	0	0	0	0	0	0	0	0
Mormon Cossing - Oak Creek	188		0		0	0			
Red Rock Crossing - Oak Creek	189		0	0	0	0	0	0	0
West Fork - Oak Creek	190	0	0						
Spring Creek	188	0			0	0			
Bignotti Beach	188		0						
Mingus Ave - Rocking Chair Road	191		0		0	0	0	0	0
Dead Horse State Park	191		0						
Mescal Gulch	191	1		0					
Tavasci Marsh	191	0		0	2	0		0	
Verde Outflow	191				0				
Tuzigoot Gallery Forest	191				0				
Tuzigoot Bridge	191	1		2	0	0	0	0	
Tapco	191	0	0	0	0	0	0	0	0
Sycamore Canyon	192	0	0	0					
Granite Creek	193			0					
Confluence of Apache Creek & Walnut Creek	194	0							
Virgin River									
Nevada Border	195						0	0	0
Little Bend	196						0	0	0
Big Bend	196						0		0
Corral Bluff	196						0	0	0
Littlefield	197		0	0	0	0	0		0
Spring Arroyo	197				0				
Big Spring	197				0				
AF 628	197				0				
Black Rock Gulch	198						0	0	0

Appendix M. Map of sites in Arizona surveyed for willow flycatchers, 1993 – 2000. (see Appendix L for site names).