# Southwestern Willow Flycatcher
***(Empidonax traillii extimus)***

## 5-Year Status Review:
## Summary and Evaluation

**Photo credit: Scarlett L. Howell, U.S. Geological Survey, San Diego, CA**
**Southwestern willow flycatcher nesting in poison hemlock (*Conium maculatum*), San Diego County, CA**

**U.S. Fish and Wildlife Service**

**Arizona Ecological Services Office**
**Phoenix, Arizona**

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# 5-YEAR REVIEW
# Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

## 1.0 GENERAL INFORMATION

### 1.1 Listing History

**Species:** Southwestern willow flycatcher; subspecies
**Date listed:** February 27, 1995
**FR citation:** Vol. 60 FR 10694-10715
**Classification:** Endangered
**Critical habitat:** Vol. 78 FR 344-534, January 3, 2013

### 1.2 Methodology used to complete the review:

In accordance with section 4(c)(2) of the Endangered Species Act of 1973, as amended (Act), the purpose of a 5-year review is to assess each threatened and endangered species to determine whether its status has changed, and it should be classified differently or removed from the Lists of Threatened and Endangered Wildlife and Plants. The U.S. Fish and Wildlife Service (FWS) evaluated the biology and status of the southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher) to inform this 5-year review.

We most recently evaluated the flycatcher's biology and status as part of a status review conducted in 2017 and combined it with our response to a delisting petition (USFWS 2017). We examined whether new information was available and whether that new information would alter or affect analyses and conclusions made in the previous status review. Data for this current review were solicited from interested parties through a Federal Register notice announcing the review on January 24, 2024. We also contacted federal agencies, state agencies, species experts, universities, and non-governmental organizations to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files and solicited external review from subject experts.

### 1.3 FR Notice citation announcing the species is under active review:

FR Vol. 89 FR 4966-4968, Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 22 Species in the Southwest, January 24, 2024.

## 2.0 REVIEW ANALYSIS

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of "endangered species" or "threatened species." The Act defines an "endangered species" as a species that is "in danger of extinction throughout all or a significant portion of its range," and a "threatened species" as a species that is "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Act requires that we determine whether a species meets the definition of "endangered species" or "threatened species" due to any of the five factors described below.

Section 4(a) of the Act describes five factors that may lead to endangered or threatened status for a species. These include: A) the present or threatened destruction, modification, or curtailment of its habitat or range; B) overutilization for commercial, recreational, scientific, or educational purposes; C) disease or predation; D) the inadequacy of existing regulatory mechanisms; or E) other natural or manmade factors affecting its continued existence.

The identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an "endangered species" or a "threatened species." In assessing whether a species meets either definition, we must evaluate all identified threats by considering the expected response of the species, and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts. The FWS recommends whether the species meets the definition of an "endangered species" or a "threatened species" only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

## 2.1. Distinct Population Segment (DPS) policy (1996):

The southwestern willow flycatcher is not listed as a DPS but is one of four recognized subspecies of the willow flycatcher (Hubbard 1987, Unitt 1987) and is classified as endangered under the Act. Our 2017 petition finding and 5-year review concluded that the best available commercial and scientific information supported the flycatcher's subspecies classification (USFWS 2017).

## 2.2. Updated Information and Current Species Status

We present updated information about the flycatcher, including research and information about its habitat, subspecies classification, and distribution and abundance. We present the raw survey results from 2011 through 2023 (Tables 1-28), primarily based on the established survey protocol (Sogge *et al*. 2010). We summarize recent literature investigating the flycatcher's subspecies status through further genomic, song, and plumage analysis (Mahoney *et al.* 2020, 2021; Ruegg *et al*. 2018, 2021; Forester *et al.* 2023; and Turbek *et al.* 2023). From the genomic research, scientists investigated the flycatcher's vulnerability to climate change (Ruegg *et al*. 2018, 2021; Forester *et al*. 2023; and Turbek *et al.* 2023). Additionally, we report on the spread and effects of the tamarisk leaf beetle (*Diorhabda* spp.) and tamarisk (*Tamarix* spp.) management.

### 2.2.1 Biology and Habitat

#### 2.2.1.1 Flycatcher subspecies classification, litigation, and climate change

Throughout this subsection, we use “willow flycatcher” when referring to the willow flycatcher species as a whole and “southwestern willow flycatcher” when referring to the listed subspecies, *E.t. extimus*.

In 2017, we concluded that the best commercial and scientific information supports southwestern willow flycatcher subspecies classification and endangered status (USFWS 2017). Our finding (USFWS 2017) was in response to a delisting petition (Pacific Legal Foundation 2015) claiming that the southwestern willow flycatcher is not a subspecies or endangered. The Pacific Legal Foundation largely based its petition on Zink’s (2015) criticism of southwestern willow flycatcher morphological and genetic studies. The New Mexico Cattlegrowers Association litigated our finding that the southwestern willow flycatcher is a subspecies, and on February 28, 2023, the United States District Court of Columbia supported our determination (Case No. 21-cv-3263-ACR). The New Mexico Cattlegrowers Association appealed the District Court’s decision, and the United States Court of Appeals for the District of Columbia Circuit affirmed the District Court’s judgement on August 22, 2025 (USCA Case No. 24-5075).

Since our 2017 finding and 5-year review (USFWS 2017), scientists have conducted genomic, song, and plumage analyses further supporting the southwestern willow flycatcher’s subspecies classification (Mahoney *et al.* 2020, 2021; Ruegg *et al*. 2018, 2021; Forester *et al.* 2023; and Turbek *et al.* 2023). Scientists examining the willow flycatcher’s genome also analyzed their results in the context of the bird’s vulnerability to climate change (Ruegg *et al*. 2018, 2021; Forester *et al*. 2023; and Turbek *et al.* 2023). Two studies (Ruegg *et al*. 2018; Mahoney *et al*. 2020) described their results in relation to the southwestern willow flycatcher delisting petition (Pacific Legal Foundation 2015) and Zink’s (2015) critical review.

Mahoney *et al.* (2020, 2021) examined willow flycatcher song structure, plumage, and response to song, reaching the conclusion that song structure and call response support southwestern willow flycatcher subspecies classification. Mahoney *et al*. (2020, p. 6, and 2021, p. 173) found that the southwestern willow flycatcher’s song was most different from the other three willow flycatcher subspecies, with fewer frequency modulations in the song’s terminal portion and generally lower frequency. Based upon willow territory intrusion playback experiments, the southwestern willow flycatcher responded more strongly to its own song, and the other three subspecies responded less strongly to the southwestern willow flycatcher’s song (Mahoney *et al.* 2021, p. 173). Mahoney *et al*. (2020, pp. 2-3) also analyzed willow flycatcher plumages from museum specimens using color models corrected for avian visual systems. In contrast to other plumage studies using different methodologies (Phillips 1948; Aldrich 1951; and Unitt 1987), Mahoney *et al.* (2020, p. 1) concluded that willow flycatcher plumages did not consistently sort in accordance with subspecies designation. In both studies, Mahoney *et al*. (2020, pp. 9-10, and 2021, pp. 180-181) concluded that the differences in southwestern willow flycatcher song structure and response to song were consistent with the need to recognize the southwestern willow flycatcher as a subspecies.

Ruegg *et al*. (2018, 2021) and Turbek *et al*.'s (2023) ecological genomic analysis supported southwestern willow flycatcher subspecies classification and documented a historical shift in southern California to a more genetically diverse population. Ruegg *et al*. (2018, p. 2) used 493 willow flycatcher blood and tissue samples from 41 locations across its entire breeding range, representing the currently accepted subspecies, *E.t. adastus*, *E.t. brewsteri*, *E.t. extimus*, and *E.t. traillii*. Ruegg *et al*. (2018, p. 10) concluded there was clear evidence for management below the species level by demonstrating that willow flycatchers, especially southwestern willow flycatcher, are "not a single homogenous group, but a composite of locally adapted populations with specific genotype-environment relationships related to differences in temperature extremes." Turbek *et al.* (2023, p. 2) further analyzed evolutionary changes to willow flycatchers from San Diego, California, by comparing the genomic patterns of specimens collected between 1888 and 1909 to modern day birds and interpreted the observed patterns in the context of modern willow flycatchers sampled from across the species' range. Southwestern willow flycatchers breeding in San Diego in the late 1800s were more genetically distinct, and modern San Diego specimens consisted of genetic variation from the Pacific Northwest, desert southwest, and historical San Diego (Turbek *et al*. 2023, pp. 2-3). Ruegg *et al.* (2018, pp. 7-10) and Turbek *et al*. (2023, pp. 2-3) described a genomic distribution that reflects the current willow flycatcher subspecies breeding range boundaries described in Sogge *et al*. (2010, pp. 2-3) and the southwestern willow flycatcher recovery plan (USFWS 2002, pp. 7-10, Fig. 3).

Ruegg *et al*. (2018, 2021), Forester *et al*. (2023), and Turbek *et al.* (2023) used willow flycatcher ecological genomic information and modeling to evaluate the southwestern willow flycatcher's vulnerability and extinction risk to climate change. When comparing the average genomic vulnerability for all willow flycatcher subspecies, Ruegg *et al*. (2018, p. 1) concluded the southwestern willow flycatcher was the most vulnerable to future climate conditions due to a mismatch between current and predicted genotypes needed to keep pace with rising temperatures. Forester *et al.* (2023, p. 1) modeled the southwestern willow flycatcher's extinction risk to climate change by including factors such as genetic information at climate-related loci, the spatial distribution of populations, and the subspecies' natural history (abundance, dispersal, demography, etc.). Forester *et al*.'s (2023, pp. 9-11) simulations describe that the dispersal of breeding southwestern willow flycatchers and movement of adaptive alleles across the landscape improved the subspecies' evolutionary potential and mitigated its extinction risk. Consistent with Forester *et al.*'s (2023, pp. 9-11) findings, the primary southwestern willow flycatcher recovery strategy is to increase the abundance of breeding sites and reduce the distance between breeding locations (USFWS 2002, pp. 74-77).

Forester *et al*. (2023, pp. 9-10) discussed that southwestern willow flycatcher populations were at a greater extinction risk from climate change when compounding the effects of drought and high temperatures with increasing nest failure. Higher nest failure rates led larger core southwestern willow flycatcher populations to disappear, eliminating gene flow of adaptive alleles across the breeding range, increasing metapopulation instability, reducing breeding site connectivity, and extirpating more distant and isolated breeding sites. In most modeled simulations under these climate change scenarios, Forester *et al*. (2023, p. 11) found that southwestern willow flycatchers persisted in the Coastal California Recovery Unit (USFWS 2002). As Turbek *et al*. (2023, pp. 5-6) noted, the genetic diversity in the current southwestern willow flycatcher population in San Diego, California, may make it less susceptible to extirpation. In the Rio Grande Recovery Unit, southwestern willow flycatcher populations had reduced occupancy but not complete extirpation (Forester *et al*. 2023, p. 11). Ruegg *et al.* (2018, p. 10) and Forester *et al*. (2023, p. 11) recommend that reducing greenhouse gasses and improving the southwestern willow flycatcher's habitat can help prevent the bird's demographic, spatial, and genetic vulnerability to extinction from climate change.

#### 2.2.1.2 Tamarisk and tamarisk leaf beetles

The flycatcher commonly uses the plant tamarisk (*Tamarix* spp.) for nesting and foraging habitat under appropriate conditions (Sogge *et al*. 2005, p. 1; Durst 2017, p. 16). Durst (2017, p. 16) reported that 62 percent of all flycatcher territories include a substantial proportion of tamarisk. Tamarisk is a tree native to Eurasia that has occurred in the United States since the early 1800s (USFWS 2002, p. H2; Chew 2009, p. 1; and Shafroth *et al*. 2010, p. 11), and in the 1900s likely spread and flourished along southwestern river courses modified by damming, water storage, river regulation, groundwater pumping, and land uses (USFWS 2002, pp. H10-H17; Glenn and Nagler 2005, p. 419; Chew 2009, pp. 17-18; Stromberg *et al*. 2009, pp. 179-180; Shafroth *et al*. 2010, p. 12; Gonzalez *et al*. 2017, p. 1790; and Nagler *et al*. 2021, p. 1). Initially lauded for its beauty, hardiness, and utility, tamarisk was later falsely "monsterized" (Chew 2009, p. 1) for causing declines in native riparian habitat, excessive water consumption, and increased soil salinity (Glenn and Nagler 2005; Chew 2009, pp. 7-9, 17-18; Stromberg *et al*. 2009, pp. 177-180; Shafroth *et al*. 2010, pp. vi-ix; and Nagler *et al*. 2021, p. 1). The misconceptions about why tamarisk flourishes and methods to reduce its abundance and improve native vegetation continue to be a challenge for the public and land management agencies (Gelt 2008, pp. 1, 3; Stromberg *et al*. 2009, pp. 177-182; and McLeod *in* Johnson *et al.* 2018, p. 79). Even though recent literature describes the challenges of decreasing tamarisk and improving native riparian vegetation (USFWS 2002, Appendix H; Gelt 2008, p. 3; Shafroth *et al*. 2010, pp. 69-96; and Gonzalez *et al*. 2017, pp. 1790-1791), land management agencies, private landowners, and other entities continue actions to remove tamarisk where it flourishes without addressing the underlying conditions needed for native vegetation to thrive (Gonzalez *et al*. 2017, p. 1801). Less recently, the U.S. Department of Agriculture's (USDA) desire to control tamarisk led to at least four tamarisk leaf beetle species (*Diorhabda* spp.) being collected from China, Kazakhstan, Uzbekistan, Crete, and Tunisia and released into the western United States as a biocontrol agent (APHIS 2005, 2010). The flycatcher's recovery has become more difficult with the release and spread of tamarisk leaf beetles and the beetle's adverse effect to its habitat (Southwestern Willow Flycatcher Recovery Team 1998; Paxton *et al.* 2011; McLeod *in* Johnson *et al*. 2018, pp. 78-81; USFWS 2014, pp. 41-46; USFWS 2017, p. 27; and Nagler *et al*. 2021, p. 2).

We have described the introduction of the tamarisk beetle into the western United States, the beetle's subsequent spread into flycatcher nesting habitat, and related effects to flycatchers and their habitat in our previous 5-year reviews (USFWS 2014, pp. 30-33; USFWS 2017, pp. 44-48). Our previous descriptions are supplemented by McLeod *in* Johnson *et al*. (2018, pp. 63-69), which provides a detailed chronicle of USDA's search in the 1960s for a biocontrol agent to reduce tamarisk, the leaf beetle program's environmental review in the 1990s and 2000s, and the program's 2001 implementation through its 2010 cessation as well as related effects to flycatchers.

In 2001, USDA released northern leaf beetles (*D. carinulata*) collected from China and Kazakhstan into northern Utah, northern Nevada, northern Colorado, Texas, Wyoming, and California (McLeod *in* Johnson *et al*. 2018, pp. 68-69). Between 2003 and 2009, USDA also released three other leaf beetle species adapted to southern climates, collected from Uzbekistan (*D. carinata*), Crete (*D. elongata*), and Tunisia (*D. sublineata*) into Texas (McLeod *in* Johnson *et al*. 2018, pp. 68-69).

Since their release into the western United States, beetles have exceeded USDA's predictions regarding their restricted or slow movements (McLeod *in* Johnson *et al*. 2018, pp. 68-72; Johnson *et al*. 2022; Özsoy *et al.* 2022; Nagler *et al*. 2021, p. 2; and McLeod *et al.* 2023, pp. 2-3), effects to flycatchers and its habitat (Paxton *et al*. 2011; McLeod *et al*. 2023, pp. 183, 203-204), beetles as a flycatcher food source (Puckett and Van Riper 2014, p. 1; Mahoney *et al.* 2017, p. 1), tamarisk's lack of suitability as flycatcher nesting habitat (Sogge *et al*. 2005), and native vegetation recovery (Gonzalez *et al*. 2017, pp. 1790-1791; McLeod *in* Johnson *et al*. 2018, pp. 78-80; and Johnson *et al*. 2022, pp. 53-54).Tamarisk beetles have since spread throughout much of the flycatcher's range.

After *D. carinulata*'s release in northern Utah, it first occurred in the flycatcher's breeding range in 2006 along the Virgin River near the town of St. George in southern Utah (Paxton *et al*. 2011, McLeod *in* Johnson *et al*. 2018, p. 70), and then began spreading south and east into the flycatcher's breeding range in Arizona, Nevada, Colorado, and New Mexico. Although USDA anticipated leaf beetles were unlikely to be successful below 38 degrees North (McLeod *in* Johnson *et al*. 2018, p. 70), leaf beetles defoliated tamarisk in 2009 along the Virgin River near St. George, Utah, at 37 degrees North, followed by widespread flycatcher nest failure (Paxton *et al*. 2011, p. 257). The beetle spread across these southwestern states along the Virgin, Muddy, San Juan, Colorado, Little

Colorado, Rio Grande, San Francisco, Agua Fria, Bill Williams, Verde, and Hassayampa rivers, and other streams (McLeod *in* Johnson *et al.* 2018, pp. 70-72; Johnson *et al*. 2022; McLeod *et al*. 2023, pp. 2-3; and Özsoy *et al*. 2022, p. 4). USDA released *D. sublineata* in Texas and it moved north into the flycatcher's breeding range along the Rio Grande in New Mexico and west into Arizona along the Gila River (McLeod *in* Johnson *et al*. 2018, pp. 70-72; Özsoy *et al.* 2022, p. 3). In 2017, leaf beetles occurred in central Arizona (Johnson *et al*. 2022, pp. 14 and 41), eventually spreading to the Gila, Salt, and San Pedro rivers and Tonto Creek (Johnson *et al.* 2022, p. 24-36; SRP 2024, p. 35-38) where tamarisk is an important component of Arizona's largest nesting flycatcher populations (Ellis *et al*. 2008, pp. i-ii; Durst 2017, pp. 12-13). Overall, leaf beetles were able to move about 25 miles per year (Nagler *et al*. 2021, p. 2), and aside from coastal California where the beetle's status is uncertain, they currently occur across the southwestern willow flycatcher's breeding range (Özsoy *et al.* 2022, p. 4).

Leaf beetles can cause tamarisk plants to defoliate multiple times during each annual growing season, leading to a proportion of plants dying after several years (McLeod *in* Johnson *et al*. 2018, pp. 64-65). Sometimes exceeding thousands of insects per plant and extending over hundreds of acres, leaf beetles feed on tamarisk foliage. In contrast to USDA's predictions that the beetle's effect to tamarisk would be gradual, plant defoliation can be sudden and complete (McLeod *in* Johnson *et al*. 2018, pp. 64-66). After several weeks, tamarisk can grow new leaves, but beetles can defoliate trees numerous times per growing season (McLeod *in* Johnson *et al*. 2018, pp. 64-65). The southern-adapted leaf beetle (*D. sublineata*) can produce 4 to 5 generations per year compared to 2 for the northern beetle (*D. carinulata*), resulting in more frequent defoliations and a longer active season (Johnson *et al*. 2022, p. 54). After re-foliating, tamarisk displays reduced vigor, foliage, flowering, and terminal branch growth (McLeod *in* Johnson *et al*. 2018, pp. 64-65). The plant's age, access to water, defoliation timing, and genetics likely influence how rapidly tamarisk plants die and the proportion of trees that die (McLeod *in* Johnson *et al*. 2018. pp. 64-65). Leaf beetles can cause a 50 to 90 percent (%) reduction in tamarisk canopy (Gonzalez *et al*. 2017, p. 1790).

Nesting flycatchers' response to the leaf beetle-caused habitat alteration from defoliation and plant death likely corresponds to site-specific habitat conditions and defoliation timing (Paxton *et al*. 2011, p. 256; Gonzalez *et al*. 2017, p. 1789; McLeod *in* Johnson *et al*. 2018, pp. 77-80; USFWS 2014, p. 31; USFWS 2017, pp. 41-48; and McLeod *et al*. 2023, pp. 183, 203-204). Paxton *et al*. (2011, p. 256) accurately hypothesized that leaf beetle defoliation should have short-term effects by increasing nest abandonment and predation of bird nests, and long-term effects from reducing breeding bird habitat quality (McLeod *in* Johnson *et al.* 2018, pp. 78-81). Hultine *et al*. (2010. p. 5) identified the potential negative effect of leaf beetles to nesting flycatchers, emphasizing how insect prey within tamarisk is most abundant compared to any other plant assemblages. The timing of tamarisk defoliation in the spring is unpredictable and can occur early in the year leading to reduced habitat quality, increased exposure to nest predation and parasitism, and flycatcher nest failure (Paxton *et al*. 2011, pp. 257-258; McLeod *in* Johnson *et al*. 2018, pp. 78-81). In other years flycatchers may complete nesting more successfully because tamarisk defoliation occurs later in the summer (McLeod *in* Johnson *et al*. 2018, p. 73; SRP 2024, p. 35-38). Mahoney's (2020, p. iv) overall conclusion for nesting riparian birds affected by leaf beetle defoliation along the Virgin River was that "habitats dominated by defoliating tamarisk and dead tamarisk support a depauperate avian community with overall lower bird density, and that these habitats may be physiologically stressful for native birds due to the altered biotic and/or abiotic conditions."

Two studies determined that flycatchers avoid eating leaf beetles (Puckett and Van Riper 2014; Mahoney *et al*. 2017). Puckett and Van Riper (2014) concluded that along the Dolores River in southwestern Colorado, despite leaf beetle's superabundance, birds ate few leaf beetles and beetles did not contribute significantly to bird diets. Mahoney *et al*. (2017, p. 10) similarly found that Lucy's warblers (*Leiothlypis luciae*) and yellow warblers (*Setophaga petechia*) along the Virgin River in Arizona and Nevada did not eat tamarisk leaf beetle adults and larvae, suggesting that leaf beetles are either remarkably poor in nutrients or chemically defended.

Where mixed tamarisk and native habitat occurs along portions of the Virgin River in Utah (McLeod *in* Johnson *et al*. 2018, pp. 73-78) and middle Rio Grande in New Mexico (Moore and Salas 2024, p. 35), biologists recorded nesting flycatchers affected by leaf beetle-altered habitat and moving to nest where native vegetation is more abundant. Paxton *et al*. (2011, p. 257) described widespread flycatcher nest failure in 2009 along the Virgin River near St. George, Utah due to tamarisk defoliation, and McLeod *in* Johnson *et al*. (2018, pp. 73-75) and Edwards *et al*. (2019, p. 19) described leaf beetles affecting flycatcher nesting success the most in the initial two years of tamarisk defoliation. However, beginning in the 2010 breeding season, some nesting flycatchers moved to nearby areas with more native vegetation and reproduction improved (McLeod *in* Johnson *et al*. 2018, p.73; Edwards *et al*. 2019, pp. 16-17). Although nesting flycatchers persisted in the St. George area from leaf beetle defoliation, territory numbers did not return to those which occurred when beetles first arrived (Edwards *et al*. 2019, pp. 19-21, 43). From 2008 to 2017, flycatcher territories in the St. George area were most abundant in 2008 with 16, dropped to 7 in 2011 and 2013, rose to 13 in 2014, and slowly declined to 7 in 2017 (Edwards *et al.* 2019, p. 43). Breeding female flycatchers from 2008 to 2017 were more consistent, ranging between 8 and 12 (Edwards *et al*. 2019, p. 43). Leaf beetles similarly affected nesting flycatcher habitat along the middle Rio Grande, causing previously occupied nesting habitat to have less vegetation density and canopy cover, more dead vegetation, higher temperatures, and lower humidity (Moore and Salas 2024, pp. 41-42). Biologists also described concurrent confounding habitat effects from drought conditions and fire (Cadol *et al*. 2018; Moore and Salas 2024, p. 42). At Elephant Butte Reservoir along the middle Rio Grande in New Mexico, lake level declines increased native riparian habitat within the reservoir's conservation pool as leaf beetle arrived. The serendipitous development of this flycatcher nesting habitat helped maintain and increase the number of flycatcher territories, mitigating the adverse effects of leaf beetles at nearby mixed native-exotic flycatcher habitat (J. Davis, U.S. Fish and Wildlife Service, pers. comm., 2024).

Where monotypic tamarisk and tamarisk-dominated flycatcher habitat occurs along the Virgin River in southern Nevada and lower Colorado River below Hoover Dam along the California/Arizona border, nesting flycatchers failed to reproduce under defoliated conditions and disappeared from breeding sites altered by leaf beetles (McLeod *in* Johnson *et al*. 2018, pp. 70-81; McLeod *et al*. 2023, pp. 203-204). In contrast to the St. George area, leaf beetles had a larger effect to nesting flycatchers farther downstream along the Virgin River at Mormon Mesa in Nevada (McLeod *in* Johnson *et al*. 2018, pp. 75-78). Two years of leaf beetle defoliation at Mormon Mesa caused an 84% dieback of tamarisk, resulting in reduced flycatcher productivity and population size (McLeod *in* Johnson *et al*. 2018, p. 75). Unlike flycatchers in the St. George area, there was no nearby native vegetation for Mormon Mesa nesting flycatchers to use (McLeod *in* Johnson *et al*. 2018, pp. 75-78). Along the lower Colorado River and Virgin River, McLeod *et al*. (2023, p. 203-204) described leaf beetle defoliation causing higher temperatures at flycatcher nests sites and increased flycatcher nest abandonment, addled clutches, and nest failure. Flycatcher territories along the lower Colorado River persisted annually at Topock Marsh for over 20 years in tamarisk-dominated habitat, and periodically along the nearby lower Bill Williams River tributary (McLeod *et al*. 2023, p. 160). This relatively small lower Colorado River flycatcher population reached its peak of about 30 territories in 2004 and has since been declining (McLeod *et al*. 2023, p. 160). Following the arrival of beetles and leaf beetle defoliation in 2017, combined with other stressors such as fire and river regulation (McLeod *et al*. 2023, p. 160), no flycatcher territories were recorded at Topock Marsh or anywhere else along the lower Colorado River below Hoover Dam in 2024 (M. McLeod, SWCA, pers. comm., 2024).

In Arizona, leaf beetles occur along the lower San Pedro, Hassayampa, and upper Verde rivers where flycatchers typically nest in native-dominated habitat with relatively smaller amounts of tamarisk. Biologists have been aware of leaf beetles on the Hassayampa River since 2017 and upper Verde River since 2019 (Johnson *et al*. 2022, pp. 14 and 41). Biologists first detected leaf beetles along the lower San Pedro River in 2022 (SRP 2024, p. 35-36). Likely due to flycatchers nesting in native-dominated habitat, biologists have yet to detect leaf beetles influencing occupied nesting flycatcher habitat along these stream segments (H. English, Salt River Project, pers. comm., 2024; C. Kondrat, Arizona Game and Fish Department, pers. comm., 2024).

Because beetles recently arrived at two of the largest nesting flycatcher populations in central Arizona where tamarisk is a substantial portion of its breeding habitat, we have yet to record the short- and long-term effects of leaf beetles to these populations. Due to the substantial amount of tamarisk occurring at flycatcher breeding sites at Roosevelt Lake at the Salt River and Tonto Creek confluence and the middle and upper Gila River, we can anticipate a decline in flycatcher territory numbers at these areas. Nearby areas where native vegetation is more abundant along the San Pedro River and Tonto, Cherry, Pinal, and Aravaipa creeks (and possibly other tributaries) may see an increase in territory abundance as previous breeding sites deteriorate in quality and flycatchers seek alternate nesting areas. Based upon nesting flycatcher response to leaf beetles along the Virgin River at St. George, Utah (McLeod *in* Johnson *et al*. 2018, pp. 70-81; McLeod *et al*. 2023, pp. 203-204), we think it is reasonable that flycatcher territories will persist in central Arizona in areas where native vegetation dominates, but the number of flycatcher territories will decrease from the effects of leaf beetles at some of the largest established core nesting populations where tamarisk is the dominant woody riparian plant species.

A secondary effect of leaf beetles to flycatcher habitat is increased fire risk (Drus *et al*. 2013, USGS 2013). Some southwestern riparian areas are at higher fire risk due to flood flow suppression, increased ignition sources, reduced groundwater elevation, stream dryness, and abundance of flammable tamarisk (USFWS 2002, L6-L9). Drus *et al*. (2013, p. 453) and U.S. Geological Survey (USGS) (2013, p. 1) describe that leaf beetle herbivory and defoliation cause increased dead leaf and twig material which exacerbates fire risk and behavior (*i.e.* higher temperature, flame length, and rate of spread). Notable recent fires affecting leaf-beetle-altered flycatcher habitat have occurred along the lower Colorado River, Bill Williams River, Gila River, and Rio Grande (McLeod *et a*l. 2023, pp. 10, 35; Clark 2024; and Cadol *et al*. 2018).

Large-scale wildfires have the potential to substantially impact flycatcher populations. In early May 2025, the Bryce Fire burned 3,294 acres of tamarisk-dominated vegetation along a 10-mile-stretch of the Gila River near Fort Thomas, Arizona (InciWeb 2025). The affected area has been subject to periodic defoliation by tamarisk beetles (SRP 2024, p. 35-38), and supported a large population of flycatchers in previous years; 331 territories were reported from the Salt River Project's Fort Thomas preserves in 2024 and unsurveyed suitable breeding habitat was present in other portions of the burn (Hatten 2016, 2023). The fire removed nearly all the live foliage and woody debris within its perimeter, resulting in the effective near total loss of flycatcher habitat in the area (L. Stewart, U.S. Fish and Wildlife Service, pers. obs. 2025). By June 5, 2025, basal resprouts were present on many of the scorched tamarisk trees (L. Stewart, U.S. Fish and Wildlife Service, pers. obs. 2025); however, the long-term potential for flycatcher habitat in the fire's footprint to regenerate is currently unknown and will likely be influenced by factors such as hydrology and future defoliation by tamarisk beetles (Cadol 2018). The Bryce Fire is part of a broader pattern of riparian wildfires along the Gila River within the Upper Gila Management Unit. Between 2018 and 2025, the Gila River corridor from Thatcher to the San Carlos Reservoir has been subject to a series of wildfires, with some areas having burned more than once since 2011 (National Interagency Fire Center 2023, 2025).

There is uncertainty about how leaf beetle movement, beetle species hybridization, and habitat conditions will influence the long-term occurrence and use of tamarisk by nesting flycatchers (Johnson *et al*. 2022, p. 53; Özsoy *et al.* 2022, p. 12). We expect tamarisk can re-establish following the leaf beetle's initial effects because of the plant's occurrence on the landscape and the persistence of altered stream conditions favoring tamarisk. The quality of tamarisk re-growth for nesting flycatchers will likely rely on the hydrological conditions at a given location and other factors. Along the lower Colorado River, McLeod *et al*. (2023, pp. ES5 and 10) described tamarisk defoliation, catastrophic fire, river regulation, and seasonal declines in managed soil moisture influencing flycatcher habitat quality; the combination of these stressors can influence the speed, abundance, and quality of tamarisk re-growth and whether it can return as flycatcher nesting habitat. Following tamarisk defoliation and death, secondary invasion of exotic weeds may limit the quality of re-establishing habitat (Gonzalez *et al.* 2017, p. 1789; Gonzalez *et al.* 2020, p. 1872) and its use by nesting flycatchers (Paxton *et al.* 2011, p. 256). Johnson *et al*. (2022, p. 53) described how leaf beetles move to target green tamarisk, but over time they are uncertain about beetle persistence, duration, departure, and the frequency of beetles returning/cycling through these habitats. Additionally, Özsoy *et al.* (2022, p. 12) discussed how the distribution and hybridization of *D. carinulata* and *D. sublineata* along the lower Rio Grande may influence the effectiveness of leaf beetles. Tamarisk leaf beetles (*D. carinulata* and *D. sublineata*) occurred throughout the lower Rio Grande and then largely disappeared after contacting each other in 2019 (Johnson *et al.* 2022, p. 52; Özsoy *et al*. 2022, pp. 3, 12). It is unclear whether adaptability, competition, or hybridization crashed these lower Rio Grande beetle populations, and whether these dynamics could occur in Arizona where these two beetle species might meet along the Gila River or other streams (Özsoy *et al*. 2022, p. 12).

Gonzalez *et al*. (2017) used 416 sites to evaluate vegetation response to four tamarisk control methods (leaf beetle biocontrol, mechanical removal, heavy machinery, and burning). Only small increases in native plant cover occurred at active removal sites, with no consistent improvement by active revegetation (Gonzalez *et al*. 2017, p. 1789). Gonzalez *et al*. (2017, p. 1789) correlated improved native vegetated cover to permanent stream flow, higher precipitation, and lower grazing pressure, soil salinity, and temperatures. Tamarisk treatments, especially using the highest disturbance methods of burning and heavy machinery, promoted secondary exotic weed growth (Gonzalez *et al*. 2017, p. 1789). Heavy machinery used to remove tamarisk on the upper Gila River near the town of Safford resulted in abundant secondary weed growth of the exotic weed kochia (*Bassia scoparia*) (G. Beatty, U.S. Fish and Wildlife Service, pers. obs. 2019).

Overall, Gonzalez *et al*. (2017, p. 1789) concluded that southwestern river managers have focused too much on weed (tamarisk) control, overlooking the need to improve fluvial processes that generate conditions for native riparian habitat. They cited Stromberg (1997) and others who explained that when appropriate fluvial conditions occur, native riparian plants are competitive with tamarisk without any direct intervention. In Arizona, native trees flourish along numerous tributaries where fluvial processes are unaltered or mildly altered, and along portions of larger streams, such as the upper Verde River and sections of the San Pedro River, where alterations have yet to overwhelm the capacity for native plants to dominate. Gonzalez *et al*.'s (2017, p. 1789) overall results are consistent with our previous flycatcher 5-year reviews (USFWS 2014, p. 31; USFWS 2017, pp. 44-48) and the Flycatcher Recovery Plan's (USFWS 2002, p. K3) conclusion that "hydrologic regimes and fluvial geomorphic processes are prime determinants of riparian community structure."

Paxton *et al*. (2011, p. 256), Gonzalez *et al*. (2017, p. 1789), and our flycatcher 5-year reviews (USFWS 2014, pp 41-46, 2017, pp. 44-48) all similarly concluded that we should expect leaf beetles to have a varied effect to riparian habitat based upon local conditions, which will subsequently influence flycatcher populations. The flycatcher's varied response to leaf-beetle-altered habitat from the Virgin River, lower Colorado River, and Rio Grande have supported those predictions. What has also been evident from monitoring leaf-beetle-altered tamarisk is that in contrast to USDA's predictions that there would be a "consequent and concurrent increase in the native plant community" (McLeod *in* Johnson *et al*. 2018, p. 65), native riparian habitat has yet to flourish following the effects from leaf beetles (Gonzalez *et al*. 2017, p. 1789) and no new flycatcher nesting habitat developed where flycatchers nested in tamarisk along the lower Colorado, Virgin, and Rio Grande rivers. While we have seen some of the short- and long-term leaf beetle effects to local flycatcher populations, biologists have yet to evaluate the overall influence on regional flycatcher populations. As McLeod *in* Johnson *et al.* (2018, pp. 77-78) described the lack of reproduction for a short-lived bird like the flycatcher can lead to precipitous declines in populations. In the future, we should monitor how beetles may affect some of the largest flycatcher nesting populations across its breeding range in central Arizona along the Gila and Salt rivers where tamarisk is the dominant plant species. If there is no or little replacement nesting habitat in these areas as we anticipate, the loss of flycatcher reproduction at these core populations would be the opposite of the bird's recovery strategy; it can increase the distance between flycatcher nesting populations and reduce meta-population stability, overall regional population persistence and resilience, and recovery (USFWS 2002, pp. 74-76).

#### 2.2.1.3 Flycatcher distribution, abundance, survey effort, recovery goals

Prior to this document, Durst (2017, p. 5) generated the most recent rangewide estimate of southwestern willow flycatcher breeding territories (n=1,629 territories). Because not all known occupied flycatcher breeding areas were surveyed annually, nor was all available suitable habitat examined, Durst (2017, p. 5) estimated the known population based upon 2012 surveys and 243 sites surveyed in previous seasons. Durst (2017, p. 5) emphasized that the increase from 1993's flycatcher population estimate (n=140 territories) should not be entirely attributed to an actual population increase, but rather to an increased survey effort. Still, surveyors examined some sites regularly enough to not only track an increase in breeding territories, but also decreases in territory abundance at other locations. Not surprisingly, without standardized flycatcher surveys across its southwestern breeding range, Durst (2017, p. 5) described the difficulty in determining rangewide population trends.

The raw annual rangewide flycatcher survey results from 2011 to 2023, ranged from a low of 940 territories in 2013 to a high of 1,458 territories in 2018 (Tables 1-14). Flycatcher territory abundance and distribution likely fluctuates over relatively short periods of time due to a variety of demographic factors and dynamic habitat conditions. If biologists surveyed all previously known sites where flycatcher territories occurred, the annual rangewide totals over the last decade could be similar to Durst's (2017, p. 5) estimate of 1,629 flycatcher territories, and depending on the year, might exceed that estimated total by a few hundred territories.

While the raw flycatcher survey data does not reflect survey effort (Tables 1-28), biologists surveyed substantial portions of the flycatcher's range annually or with regularity. For example, the Bureau of Reclamation (Reclamation), in support of the Lower Colorado River Multi-Species Habitat Conservation Plan, annually surveyed the lower Colorado River below Hoover Dam to the Southern International Boundary, and tributaries of the lower Colorado River in Arizona and Nevada (McLeod *et al*. 2023). Similarly, Reclamation annually surveyed large sections of the Middle and lower Rio Grande (Moore and Root 2023). Salt River Project (2023a, 2023b), in support of Habitat Conservation Plans for central Arizona dam operations, regularly surveyed portions of the San Pedro, Verde, Gila, and Salt rivers and Tonto Creek. Other entities such as Arizona Game and Fish Department, Colorado Parks and Wildlife, Utah Division of Wildlife, USGS, National Park Service, National Wildlife Refuges, Bureau of Land Management, Department of Defense, Army Corps of Engineers, Southern Sierra Research Station, The Nature Conservancy, Freeport-McMoRan, Los Angeles Department of Water and Power, San Diego Association of Governments, Santa Ana River Watershed Association, Orange County Water District, and others conducted dedicated flycatcher surveys in Arizona, California, Colorado, Nevada, New Mexico, and Colorado.

New Mexico (range = 472 to 707 territories) and Arizona (range = 251 to 636 territories) held the largest amount of flycatcher territories annually from 2011 to 2023 (Table 14). Combined, these two states ranged from having 80.9 to 92.1% of the annual rangewide total over these 13 seasons. Overall, these percentages are higher than previous rangewide estimates where these two states represented 72.9% to 75.3% of the rangewide total from 2004 through 2007 (Durst *et al*. 2005, p. 9; 2006, p. 9; 2007, p. 10; 2008, p. 10) and 84.8% in 2012 (Durst 2017, p. 11) (Table 15). The substantial increase in flycatcher territories within the Middle and Lower Rio Grande and Upper Gila Management Units, and survey consistency within these Management Units and the Roosevelt, Gila-San Pedro, and Bill Williams Management Units in Arizona contributed the higher proportion of flycatcher territories in these two states (USFWS 2002, Figures 8, 10 & 11).

At the northern edge of the flycatcher's breeding range, Nevada, Utah, and Colorado had the smallest statewide proportion of flycatcher territories over the last 13 seasons (Table 14). These three states have the smallest area within the flycatcher's breeding range, comprised primarily by tributaries of the lower Colorado River and the Rio Grande (Tables 16-28). From 2011 to 2023, Colorado annually recorded 0 to 83 flycatcher territories, Nevada 34 to 60 territories, and Utah 7 to 13 territories (Table 14). These raw totals are not remarkably different from the previous flycatcher annual territory estimates where Colorado ranged from 48 to 68 territories, Nevada 68 to 82 territories, and Utah 4 to 10 territories (Table 15). Survey consistency in Nevada and Utah from 2011 to 2023 is likely one reason why the raw flycatcher survey results do not range as dramatically as Colorado. Also, because there are fewer survey sites across these three states, the raw results more closely resemble the previous annual rangewide estimates. Colorado's 83 flycatcher territories in 2020 (Table 13) were notably higher than any of the previous annual estimates from 2004 to 2012 (Table 14), or any of the previous statewide totals recorded from 2011 to 2023 (Table 13). Colorado's next highest annual totals over the last 13 seasons were 45 territories in 2023 and 39 in 2017 and typically were 21 territories or less (Table 13). The leaf beetle's effects to flycatcher nesting habitat along the Virgin River (McLeod *in* Johnson *et al*. 2018, pp. 75-78) likely contributed to a modest decline in Nevada's annual statewide flycatcher territories.

California represents a portion of the flycatcher's breeding range where a decline in territories has occurred since the early 2000s. California's annual flycatcher territory estimate declined from 200 in 2004 (Durst *et al*. 2005, p. 11) to 115 territories in 2012 (Durst 2017, p. 13) (Table 15). This trend persisted from 2012 to 2020 where California's raw annual totals ranged from 28 to 81 territories (Table 13). In particular, the San Diego and Santa Ana Management Units and Kern Management Unit declined in flycatcher territories (Tables 1-13, 16-28). In 2004, Durst *et al.* (2005, p. 11) estimated these three Management Unit having 140 flycatcher territories (70% of California's total) and dropping to 65 territories in 2012 (56% of California's total) (Durst 2017, p. 13). From 2018 to 2020, there were just 38 to 42 flycatcher territories recorded in these three Management Units, with nearly all occurring along the San Luis Rey River in the San Diego Management Unit (Tables 8-10). Over this time period, ongoing regular annual flycatcher surveys occurred in multiple locations in San Diego County (Howell *et al*. 2022, p. 1; Howell and Kus 2025, p. 1-2) and the Kern River (M. Whitfield, Southern Sierra Research Station, pers. com. 2024). If surveyors hadn't recorded 105, 70, and 56 flycatcher territories within the Owens Management Unit from 2021 to 2023, respectively, an increase from the approximately 30 to 40 territories typically recorded, the raw number of annual California flycatcher territories would not have exceeded 100 over the last 13 seasons (Tables 10-14).

In California, along the Kern River's South Fork in the Kern River Management Unit, despite ongoing habitat management, protection, and surveys, flycatcher territories declined from an estimated 20 territories in 2004 (Durst *et al*. 2005, p. 11) to just a single territory recorded from 2020 to 2023 (Tables 10-13). Flycatcher populations are the most stable when breeding sites are within about 10 miles of each other (USFWS 2002, p.72). Flycatcher nesting sites on the Kern River are substantially farther than 10 miles from other nesting flycatchers in California, which may limit immigration to replenish or support the local population. M. Whitfield and J. Manning (Southern Sierra Research Station, pers. com. 2024) also describe that despite flycatcher breeding and survival parameters on the Kern River being comparable to other stable or increasing flycatcher populations, non-breeding season factors may have contributed to the population's decline. From 2000 to 2014, the Kern River flycatcher population declined during the onset of the mega-drought in the southwestern U.S. and portions of western Latin America. Their analysis revealed that Kern River flycatcher survival decreased in response to increased drought conditions prior to flycatchers arriving on the wintering grounds. Their research underscored an increased need for nonbreeding season research to understand the relative importance of intrinsic and extrinsic factors that may be driving annual flycatcher population dynamics.

From 2015 to 2023, USGS (Howell *et al*. 2022; Houston *et al*. 2024; Howell and Kus 2024, 2025) surveyed for breeding flycatchers across the San Diego Management Unit in southern California, documenting a decline and shift in flycatcher territory distribution. USGS surveyed for flycatchers at 39 San Diego County locations along portions of Agua Hedionda, Cottonwood, Escondido, Fallbrook, Los Penasquitos, Pilgrim, and San Mateo creeks, and the Otay, San Diego, San Dieguito, San Luis Rey, Santa Margarita, Sweetwater, and Tijuana rivers (Howell *et al*. 2022, p. 1; Houston *et al*. 2024, p. 2; Howell and Kus 2025, p. 1). Out of the 17 locations historically occupied by breeding flycatchers, surveyors found flycatcher territories at just six locations (Howell *et al*. 2022, p. 1; Howell and Kus 2025, p. 1). Nearly all flycatcher territories occurred along the San Luis Rey River (Howell *et al*. 2022; Howell and Kus 2025). At Marine Corps Base Camp Pendleton, a previously considered stable flycatcher breeding population along the Santa Margarita River was reduced to a single territory by 2023 (Howell and Kus 2025, p. 1). Along the upper San Luis Rey River, Howell *et al.* (2022, p. 37) observed the decline of historically occupied oak tree nesting habitat, possibly driving flycatcher emigration upstream toward a new breeding site detected at Lake Henshaw. Howell *et al*. (2022, p. 34) describe that declining water levels at Lake Henshaw from 2012 to 2016, likely led to an increase in flycatcher habitat. They speculate, based upon modeled satellite imagery (Hatten 2016), anecdotal information, and movement of banded territorial flycatchers (Howell *et al*. 2022, p. 34) that by 2017 (and possibly earlier), flycatchers discovered and started nesting at Lake Henshaw. At the end of 2023, nearly all known nesting flycatchers in the San Diego Management Unit occurred along the upper San Luis Rey River surrounding Lake Henshaw (Howell and Kus 2024, p. 1, Howell and Kus 2025, p. 1).

Over the 13 seasons from 2011 through 2023, annual raw flycatcher survey results from 8 of the 29 Management Units exceeded the Recovery Plan's numerical goals for the number of territories during at least one season (Tables 1-13) (USFWS 2002, pp. 84-85). The Flycatcher Recovery Plan established numerical territory goals per Management Unit ranging from 25 to 325 territories; in addition to the 29 units with numerical goals, three Management Units do not have a set goal, *i.e.,* have a goal of 0 (Tables 1-13) (USFWS 2002, pp. 84-85). Based on consistent annual surveys, the Middle Rio Grande Management is the only Management Unit where the raw results surpassed its 100-territory numerical recovery goal in each of these 13 seasons (range = 277 to 515 territories). Recorded flycatcher territories in lower Rio Grande, Upper Gila, Gila-San Pedro, Roosevelt, Owens, Pahranagat, and San Luis Valley Management Units exceeded annual numerical goals at least once from 2011 to 2023 (Tables 1-13). Three Management Units were near or surpassed goals briefly (Tables 1-13). At single seasons, flycatcher raw survey results exceeded territory numerical recovery goals for the Pahranagat (2014) (Table 4) and San Luis Valley (2020) (Table 10) Management Units. Over these 13 years, annual flycatcher survey results from the Owens Management Unit surpassed territory numerical goals for three seasons (2021-2023). In 2020, these 8 Management Units represented 89% (1,061 of 1,189) of all recorded annual flycatcher territories; in 2021, 89% (1,044 of 1,174); 92% in 2022 (1,196 of 1,302); and 92% (1,258 of 1,360) again in 2023 (Tables 10-13). The Rio Grande, and the Gila, San Pedro, Salt, Owens, Pahranagat, and Muddy rivers, along with some Arizona tributaries (Pinal, Cherry, Aravaipa, Rye, and Tonto creeks) are the streams where nearly all flycatcher territories occurred in these eight Management Units (Tables 15-27).

Based upon annual flycatcher surveys from 2011 to 2023, 21 of the 29 Management Units with numerical flycatcher territory goals never reached their target (Tables 1-13). Combined, the numerical territory recovery goal for these 21 Management Units represents 1,200 flycatcher territories (USFWS 2002, pp. 84-85). In 2023, raw survey results counted 102 flycatcher territories in these 21 Management Units. Flycatcher surveyors typically search some of these 21 Management Units thoroughly, like those along the lower Colorado River or across San Diego County and the Kern River, providing a clear record for the flycatcher's rare occurrence or absence. Yet, since listing, surveyors have rarely or not thoroughly examined the Santa Cruz, San Francisco, Powell, San Juan, Salton, Mohave, and other Management Units for flycatcher territories. The Basin and Mohave and Upper Colorado Recovery/Management Units often have the fewest number of flycatcher territories recorded, well below the 200 and 50-territory numerical recovery goals, respectively (Tables 1-13).

As highlighted above, flycatcher territory abundance declined across the Coastal California Recovery/Management Units, and the lower Colorado River Recovery/Management Units. Durst *et al*. (2005, 2006, 2007, and 2008) estimated the Coastal California Recovery/Management Units had 120 to 144 flycatcher territories from 2004 to 2007, and 70 in 2012 (Durst 2017). Most recently, between 2020 and 2023, surveyors in the Coastal California

Recovery/Management Units annually tallied 39 to 53 flycatcher territories (Tables 10-13). Durst *et al*. (2005, 2006, 2007, and 2008) also estimated the Lower Colorado Recovery/Management Units had 150 to 183 flycatcher territories from 2004 to 2007, and 156 in 2012 (Durst 2017). Surveyors along the lower Colorado River and its immediate tributaries annually recorded between 59 and 99 territories from 2020 to 2023 (Tables 10-13). The annual raw flycatcher survey results from the Coastal California and Lower Colorado Recovery/Management Units are well below the 275 and 525 territories identified as numerical recovery goals, respectively (USFWS 2002, pp. 84-85).

The largest flycatcher nesting populations (Middle Rio Grande, Lower Rio Grande, Upper Gila River, San Pedro/Gila confluence, and Roosevelt Lake) in the Gila and Rio Grande Recovery Units, which accounted for 82% of all rangewide territories (1,122 of 1,360) in 2023, may not persist with the same abundance into the future. Tamarisk is the dominant nesting habitat along Roosevelt Lake, the Gila River at the San Pedro River confluence, and the upper Gila River in Arizona and is subject to effects from tamarisk beetles and wildfire. Ongoing long-term stream/groundwater alteration, flow regulation, and water storage make it unlikely native vegetation will replace beetle- or wildfire-killed tamarisk at these locations. We have yet to fully observe the short and long-term effects of the tamarisk leaf beetle at the largest flycatcher locations and over the broader region because the beetle has only recently arrived at these areas. Nesting flycatchers along the Rio Grande have already moved some nesting locations farther into Elephant Butte Reservoir's conservation pool due to the leaf beetle's effect and from lowering lake levels. At some point in the future, it is reasonable to expect Elephant Butte Reservoir's lake levels will rise and remove or alter recently established nesting habitat within its conservation pool. It is unclear to what degree any remaining flycatcher nesting habitat along Elephant Butte's margins or upstream/downstream can sustain the current number of territories. The effects of wildfire are expected to further compound those of the beetle and have already done so on the upper Gila River. In 2024, the 325-territory goal for the Upper Gila Management Unit was exceeded by the territories present on Salt River Project's Fort Thomas preserves alone (331 territories); territories on the Fort Thomas preserves accounted for 72% of all territories (213 of 294 territories) reported from this management unit in 2023. Severe degradation to the point of effective loss of habitat that supported these territories resulting from the 2025 Bryce Fire (see Section 2.2.1.2) is expected to substantially reduce the number of territories reported from the Upper Gila Management Unit into the future. In summary, we do not anticipate that the large populations of nesting flycatchers will completely disappear as a result of the combined effect of leaf beetles and wildfire, yet it seems unlikely the habitat and supporting stream conditions will be able to sustain the current high number of territories (Tables 1-13).

Across it breeding range, the flycatcher's distribution has not remarkably changed since the Recovery Plan was completed (USFWS 2002, Figure 3). While numbers of flycatcher territories increased and decreased in previously known areas along streams, there were few streams or stream segments where surveyors found new substantial flycatcher nesting populations (Tables 16-28). In Arizona, surveyors found new flycatcher populations nesting on Aravaipa Creek (tributary to the San Pedro River) and Granite and Willow Creeks (tributaries to Verde River); we did not previously know of flycatcher territories occurring on either creek. Breeding flycatchers have continued to demonstrate the ability to respond and persist due to dynamic habitat changes when alternate habitat occurs nearby, whether from the leaf beetle effects on the Virgin River in St. George, Utah; habitat availability changes along the San Luis Rey River in San Diego County; or habitat increase at Elephant Butte Reservoir along the Rio Grande. Additionally, the flycatcher continues to demonstrate, when habitat is available, an ability to grow its breeding populations relatively quickly and expand into nearby available habitat. Growing flycatcher populations in the Middle Rio Grande Management Unit likely helped lead to a noticeable population increase in the Lower Rio Grande Management Unit. Conversely, when habitat declines and there is no nearby habitat, flycatcher nesting populations have decreased or disappeared on the lower Colorado River, Virgin River, Kern River, and coastal California streams. These examples continue to support the Recovery Plan's strategy to establish connected meta-populations across Management and Recovery Units (USFWS 2002, pp. 74-77). Flycatcher population persistence (stability) is more likely to increase by adding more sites, than adding more territories to existing sites (USFWS 2002, p. 72). These encouraging factors about flycatchers demonstrate that if we can improve the distribution and abundance of flycatcher nesting habitat, breeding populations are capable of responding quickly.

### 2.2.2 Threats Analysis (threats, conservation measures, and regulatory mechanisms)

The reasons for the flycatcher's decline and current and future threats are numerous, complex, and interrelated. These factors vary in severity over the landscape, and at any given location, several are likely to be at work, with cumulative and synergistic effects. We summarize the major factors below by categories corresponding to the Act's five listing factors (section 4(a)(1)). Much of the source material for the basic description of items and issues below is adapted from the Recovery Plan (USFWS 2002, pp. 33-42) and previous 5-year reviews (USFWS 2014, 2017) when applicable. Since completion of the Recovery Plan (USFWS 2002) and following our most recent 5-year review (USFWS 2017), new issues are primarily the spread and ongoing effects to the flycatcher's habitat from the tamarisk leaf beetle and research evaluating the anticipated effects of climate change (see section 2.2.1.2). For additional discussions see the flycatcher's listing rule (USFWS 1995), Recovery Plan (USFWS 2002) and our previous 5-year reviews (USFWS 2014, 2017).

#### 2.2.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

The primary cause of the flycatcher's decline is habitat alteration and modification by water and land management, which has been additionally affected by the introduction, spread, and effect of the tamarisk leaf beetle. The flycatcher's riparian nesting habitat tends to be uncommon, isolated, dispersed, and dynamic due to natural disturbance and regeneration events from floods, drought, and to a lesser extent, fire. River function supporting riparian nesting habitat has been modified and altered from water and land management actions such as damming, diversion, groundwater pumping, channelization, urbanization, agricultural development, livestock grazing, fire, recreation, phreatophyte control/vegetation management, and other factors. In some instances, there have also been site-specific and temporal increases in riparian habitat. Overall, southwestern riparian ecosystems have declined from changes to water flow, groundwater reductions, interruptions in natural hydrological events and cycles, physical modifications to streams, direct removal of riparian vegetation, and an increase in fire events due to water management and land use practices. These issues are ongoing and are addressed in greater detail in the Recovery Plan (USFWS 2002) and previous 5-year reviews (USFWS 2014, 2017). Notable new and anticipated issues associated with tamarisk management and the tamarisk leaf beetle's effects to flycatcher habitat, productivity, and populations are described above (see section 2.2.1.2).

**2.2.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:**

No known new effects from overutilization or collection have been documented for the flycatcher. Overuse was not identified as a threat in the flycatcher's final listing rule (USFWS 1995) nor in the Recovery Plan (USFWS 2002). Survey training occurs annually sponsored by FWS Field Offices and other partners (State Wildlife Agencies, USGS, consultants, etc.) and provides technical and field experience to the flycatcher survey protocol and identification. We are not familiar with the trading or collecting of the flycatcher, therefore this threat likely does not exist, and there is no expectation for change in the future.

**2.2.2.3 Disease or predation:**

In 2017, we addressed the known effects to the flycatcher from nest predation and disease, including the anticipated increased predation effects caused by increased exposure of nesting flycatchers from tamarisk leaf beetle defoliation (USFWS 2017). There is no new information about increased or different risks from disease. We noted increased flycatcher nest failure caused by tamarisk leaf beetle defoliation, which likely included a component of predation (see section 2.2.1.2).

**2.2.2.4 Inadequacy of existing regulatory mechanisms:**

We described in 2017 (USFWS 2017) that if the flycatcher was not listed under the Act, existing Federal and State mechanisms, such as the Migratory Bird Treaty Act, Federal Land Policy and Management Act, National Forest Management Act, Clean Water Act, State Wildlife Plans and other protections can be helpful, but overall none are specific enough or comprehensively address the flycatcher's breeding range to adequately protect the bird and provide for its recovery.

Since 2017, Federal, State, Tribal, and private entities have continued to implement actions under the Act which have conserved the flycatcher, reduced and minimized effects to the flycatcher, and used their authorities in the furtherance of the Act's purpose. Across the flycatcher's breeding range, hundreds of surveys and thousands of hours document its distribution and abundance (Tables 1-28). Federal agencies continue to evaluate projects and reduce and minimize effects through formal and informal consultation with the FWS under Section 7 of the Act. Numerous long-term Habitat Conservation Plans and Safe Harbor Agreements under Section 10 are implemented annually. Private entities, such as Freeport McMoRan, and Native American Tribes implement voluntary flycatcher-specific management plans. Under Section 2 of the Act, Federal agencies use their authorities to conserve listed species. For example, Animal Plant and Health Inspection Services has funded an online flycatcher-specific habitat suitability model, cowbird trapping, and tamarisk leaf beetle monitoring/reporting. Additionally, the FWS contributed to the Southern Sierra Research Station's ongoing investigation into the flycatcher's wintering grounds in central America developing awareness, partnerships, and conservation. The National Resource Conservation Services Working Lands for Wildlife Program dedicated effort toward collaborating with landowners to protect and develop flycatcher habitat.

#### 2.2.2.5 Other natural or manmade factors affecting its continued existence:

In 2017, we addressed climate change, the vulnerability of small populations, and genetic effects (USFWS 2017). Earlier in this document we summarized new research focusing on the flycatcher, genetics, and its vulnerability to climate change (see section 2.2.1.2).

### 2.3 Synthesis

The substantial new information about the flycatcher is associated with its breeding distribution and abundance (Tables 1-28); tamarisk management, the tamarisk leaf beetle's effects to flycatcher nesting habitat and populations including interrelated effects of wildfire (Gonzalez *et al*. 2017; McLeod *in* Johnson *et al*. 2018; Johnson *et al*. 2022; and Özsoy *et al.* 2022); and research into the flycatcher's genome, song, and plumage (Ruegg *et al*. 2018, 2021; Mahoney *et al.* 2020, 2021; Forester *et al.* 2023; and Turbek *et al.* 2023). The flycatcher remains an endangered species due to its limited distribution and abundance, population decline across Recovery/Management Units, and ongoing and future threats to its largest nesting populations from the tamarisk leaf beetle and water management.

Following our 2017 petition finding and flycatcher 5-year review (USFWS 2017), scientists conducted additional research analyzing the flycatcher's genome, song, and plumage. Ruegg *et al*. (2018, 2021) and Turbek *et al*.'s (2023) willow flycatcher ecological genomic analysis and Mahoney *et al*.'s (2020) song analysis supported southwestern willow flycatcher subspecies classification (*E.t. extimus*). Ruegg *et al.* (2018, pp. 7-10) and Turbek *et al*.'s (2023, pp. 2-3) genomic results reflected the current southwestern willow flycatcher subspecies breeding range (USFWS 2002, pp. 7-10, Fig. 3; Sogge *et al*. 2010, pp. 2-3).

Despite the flycatcher's improved territory numbers in both the Gila and Rio Grande Recovery/Management Units; the Basin and Mohave, Coastal California, Lower Colorado, and Upper Colorado Recovery/Management Units fell substantially short of numerical territory recovery goals (Tables 1-13) (USFWS 2002, pp. 77-81). As described earlier (see section 2.2.1.3), flycatcher territories in both the Coastal California and Lower Colorado Recovery/Management Units have declined over the past decade. The overall raw number of flycatcher territories recorded annually since 2017, ranging from 1,089 to 1,458, approached but did not meet or exceed rangewide numerical recovery goals to consider for downlisting or delisting (1,950 for Criteria A and 1,500 for Criteria B) (USFWS 2002, pp. 77-79). A more refined estimate of rangewide territories, could indicate that the flycatcher did reach those overall rangewide numbers for downlisting consideration. Regardless, we did not reach the recovery goal for establishing flycatcher territories geographically across its range to reach 80% or 50% of each Management Unit's numerical territory goals, nor did we reach the numerical territory goals identified for every Recovery Unit (Tables 1-13) (USFWS 2002, pp. 77-79). For example, in 2018, when the most flycatcher territories were recorded rangewide (n=1,458), surveyors recorded a total of 206 flycatcher territories in 21 Management Units (Table 8) where the combined numerical recovery goal is 1,200 flycatcher territories (USFWS 2002, pp. 84-85). Additionally, surveyors recorded over 50% fewer flycatcher territories (n=102) in these 21 Management Units in 2020 (Table 13).

The tamarisk leaf beetle has adversely affected flycatcher population persistence in the Lower Colorado Recovery/Management Unit, and we anticipate the leaf beetle, along with wildfire and ongoing water management, will adversely affect the largest flycatcher nesting populations in the Gila Recovery/Management Unit and possibly the Rio Grande Management/Recovery Unit. The leaf beetle has helped degrade flycatcher habitat to nearly eliminate nesting populations along the lower Colorado River near Topock Marsh along the California/Arizona border and reduce territories along the Virgin River in Nevada (McLeod *et al.* 2023). The leaf beetle has recently arrived in central Arizona, where tamarisk is the primary nesting habitat for the state's largest flycatcher nesting populations in the Roosevelt, Gila-San Pedro, and Upper Gila Management Units. Recent wildfire has contributed to stressors along the upper Gila River through the severe degradation of habitat that supported at least 331 territories in 2024. Due to ongoing river damming and storage, water diversion, and groundwater withdrawals, it is unlikely that native plants can establish in these Arizona Management Units following leaf beetle degradation to tamarisk nesting habitat. The leaf beetle currently occurs in the Middle Rio Grande Recovery/Management Unit, altering previously used nesting habitat, and the flycatcher's population size is at risk due to ongoing water management and leaf beetle effects. Together, the Gila and Rio Grande Management/Recovery Units represented 82% of all flycatcher breeding territories (1,122 of 1,360 territories) recorded in 2023. The anticipated leaf beetle effects to these large flycatcher nesting populations creates broader concern about the stability of regional flycatcher populations (USFWS 2002, pp. 74-77). Also, the leaf beetle's overall adverse effect to rangewide flycatcher habitat negatively influences recovery goals focused on the abundance of flycatcher habitat and population persistence (USFWS 2002, pp. 77-81).

After reviewing the best available scientific information, we conclude that southwestern willow flycatcher remains an endangered species. The evaluation of threats affecting the species under the factors in 4(a)(1) of the Act and analysis of the status of the species in our recent 5-year review (USFWS 2017) remains an accurate reflection of the species' current status.

## 3.0 RESULTS

### 3.1 Recommended Classification:

No change is needed.

### 3.2 New Recovery Priority Number:

No change recommended (see 48 FR 43098, September 21, 1983 & 48 FR 51985, November 15, 1983 - Correction).

### 3.3 Listing and Reclassification Priority Number:

No change recommended (see 48 FR 43098, September 21, 1983).

## 4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

In addition to the issues the Recovery Plan describes in the stepdown outline and narrative (USFWS 2002, pp. 96-136), the following recommendations reinforce existing recovery strategies and introduce new recommendations.

- Track existing and develop new conservation plans, easements, and other documents that provide flycatcher habitat protection to track Recovery Plan goals (USFWS 2002, p. 96).

- Continue to develop and improve statewide and rangewide survey and data management collection, entry, and reporting (USFWS 2002, p. 101, 5.1.3). We recommend exploring the use of an online reporting system and integration into a database to simplify reporting and data analysis.

- Maintain and annually update the existing online satellite-based flycatcher habitat suitability model (Hatten 2016). This model is species-specific and can assist in evaluating projects, assessing project effects, determining incidental take exceedance, establishing Safe Harbor Agreement baseline status, and determining habitat-based recovery goals, and likely additional flycatcher conservation actions.

- Track the presence, absence, distribution, and abundance of flycatcher territories at well-established breeding sites and at other sites that have not been surveyed recently (USFWS 2002, p.101, 5.1.2). Consider implementing a coordinated multi-state rangewide survey and sampling effort, using habitat and occupancy models to better track and estimate the overall rangewide distribution and abundance of territorial flycatchers. Consider surveying a stable annual subset of breeding sites with additional surveys examining all breeding sites over a 3- to 4-year period. This would include a component to seek out territorial flycatchers in previously unsurveyed areas, especially in Management Units where there has been less effort. Use the flycatcher satellite habitat suitability model (Hatten 2016) to help identify new survey sites.

- Develop an occupancy model in conjunction with on-the-ground surveys and the satellite habitat model to estimate rangewide flycatcher populations (incorporating factors such as persistence as functions of patch size, time, and proximity of other flycatcher populations).

- Inform partners and the public about tamarisk and leaf beetle issues. Continue to improve the overall understanding about tamarisk using the latest science.

- Monitor flycatcher population response to effects of leaf beetles and track leaf beetle distribution, abundance, movement, and genetic identity. Explore the occurrence, disappearance, and re-occurrence of beetles at a site, how tamarisk responds, and how these factors impact flycatcher populations.

- Monitor the response of flycatcher populations to wildfire by assessing frequency and severity of wildfires within flycatcher habitat, how habitat changes following wildfire, time to recolonization and spatial recolonization patterns by flycatchers, and effects to flycatcher abundance and reproductive fitness.

- Implement strategies described in Recovery Plan to improve the quality and abundance of native vegetation in areas affected by tamarisk leaf beetle defoliation. These strategies should focus on reducing existing stressors (water and land management actions) to create conditions that will allow native vegetation to grow and flourish, recycle, and overall be self-sustaining (USFWS 2002, p. 98, 1.1.3.2.3).

- Conduct studies to establish how conditions on the flycatcher's breeding and winter grounds, and the stopover migratory habitats in between, influence one another so we may better understand the limitations and challenges for the flycatcher's recovery. Additional studies of migrating and wintering flycatchers, including stopover habitat selection and use, foraging ecology, and physiology, would help identify factors that may be amenable to conservation and management activities aimed at increasing flycatcher survivorship on migration. Also, partnerships with international cooperators toward management of key wintering locations may facilitate implementation of management actions which can aid in flycatcher survivorship.

- To support the Recovery Plan's strategies of maintaining existing populations and reducing the distance between breeding sites, examine the feasibility of establishing nesting flycatcher populations through innovative ways, such as fostering nestlings or eggs into other suitable passerine nests. Focusing efforts where there is suitable habitat and recovery goals, but longer distance to nearby nesting populations makes it less likely pioneering flycatchers will locate habitat. This effort, like hacking peregrine falcons or bald eagles, could speed up recovery, distribute flycatchers across the range to reduce risk of catastrophic loss, and improve metapopulation stability. We recommend the process consider subspecies genetic integrity and source populations from nearby areas. For longer-term benefits, we recommend combining implementation with a habitat assessment or conservation commitments to develop and maintain habitat.

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## 6.0 APPENDIX 1 – TABLES

Table 1. 2011 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 1 | 11 | 75 |
| | Amargosa | 1 | 1 | 25 |
| | Mojave | - | - | 25 |
| | Salton | 1 | 4 | 25 |
| | **TOTAL** | **3** | **16** | **200** |
| **Coastal California** | Santa Ynez | 2 | 2 | 75 |
| | Santa Clara | 4 | 10 | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | - | - | 125 |
| | **TOTAL** | **6** | **12** | **275** |
| **Gila** | Verde | 3 | 17 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 10 | 92 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 6 | 171 | 325 |
| | Gila – San Pedro | 37 | 305 | 150 |
| | Santa Cruz | 1 | 1 | 25 |
| | **TOTAL** | **57** | **586** | **650** |
| **Lower Colorado** | Pahranagat | 5 | 42 | 50 |
| | Virgin | 5 | 30 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | 1 | 1 | 25 |
| | Hoover to Parker | 5 | 5 | 50 |
| | Bill Williams | 5 | 11 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **21** | **89** | **525** |
| **Rio Grande** | San Luis Valley | 1 | 21 | 50 |
| | Upper Rio Grande | 1 | 3 | 75 |
| | Middle Rio Grande | 43 | 400 | 100 |
| | Lower Rio Grande | 2 | 8 | 25 |
| | Pecos | 1 | 2 | 0 |
| | **TOTAL** | **48** | **434** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **135** | **1137** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 2. 2012 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 1 | 9 | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | 1 | 1 | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **2** | **10** | **200** |
| **Coastal California** | Santa Ynez | 2 | 5 | 75 |
| | Santa Clara | 2 | 6 | 25 |
| | Santa Ana | 1 | 2 | 50 |
| | San Diego | 4 | 11 | 125 |
| | **TOTAL** | **9** | **24** | **275** |
| **Gila** | Verde | 2 | 6 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 13 | 74 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 10 | 286 | 325 |
| | Gila – San Pedro | 8 | 122 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **33** | **488** | **650** |
| **Lower Colorado** | Pahranagat | 4 | 48 | 50 |
| | Virgin | 5 | 31 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 2 | 2 | 50 |
| | Bill Williams | 2 | 3 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **13** | **84** | **525** |
| **Rio Grande** | San Luis Valley | - | - | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 45 | 348 | 100 |
| | Lower Rio Grande | 5 | 27 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **50** | **375** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **107** | **981** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 3. 2013 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 1 | 5 | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **1** | **5** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | 1 | 5 | 25 |
| | Santa Ana | 1 | 1 | 50 |
| | San Diego | 4 | 41 | 125 |
| | **TOTAL** | **6** | **47** | **275** |
| **Gila** | Verde | - | - | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 3 | 37 | 50 |
| | San Francisco | 2 | 16 | 25 |
| | Upper Gila | 14 | 163 | 325 |
| | Gila – San Pedro | 12 | 193 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **31** | **409** | **650** |
| **Lower Colorado** | Pahranagat | 5 | 44 | 50 |
| | Virgin | 5 | 21 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | 1 | 1 | 25 |
| | Hoover to Parker | 5 | 6 | 50 |
| | Bill Williams | 2 | 14 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **18** | **86** | **525** |
| **Rio Grande** | San Luis Valley | 6 | 21 | 50 |
| | Upper Rio Grande | 1 | 1 | 75 |
| | Middle Rio Grande | 54 | 333 | 100 |
| | Lower Rio Grande | 8 | 38 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **69** | **393** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **125** | **940** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 4. 2014 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 6 | 41 | 50 |
| | Kern | 1 | 3 | 75 |
| | Amargosa | 1 | 1 | 25 |
| | Mojave | -[1] | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **8** | **45** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | 2 | 5 | 25 |
| | Santa Ana | 1 | 2 | 50 |
| | San Diego | 4 | 11 | 125 |
| | **TOTAL** | **7** | **18** | **275** |
| **Gila** | Verde | 1 | 7 | 50 |
| | Hassayampa-Agua Fria | 1 | 1 | 25 |
| | Roosevelt | 7 | 73 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 28 | 268 | 325 |
| | Gila – San Pedro | 6 | 121 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **43** | **470** | **650** |
| **Lower Colorado** | Pahranagat | 5 | 51 | 50 |
| | Virgin | 3 | 13 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 1 | 1 | 50 |
| | Bill Williams | 7 | 30 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **16** | **95** | **525** |
| **Rio Grande** | San Luis Valley | 2 | 8 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 34 | 277 | 100 |
| | Lower Rio Grande | 8 | 44 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **44** | **329** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **118** | **957** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 5. 2015 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 4 | 38 | 50 |
| | Kern | 1 | 3 | 75 |
| | Amargosa | -[1] | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **5** | **41** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | 2 | 3 | 25 |
| | Santa Ana | 3 | 4 | 50 |
| | San Diego | 3 | 33 | 125 |
| | **TOTAL** | **8** | **40** | **275** |
| **Gila** | Verde | 2 | 13 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 3 | 40 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 25 | 160 | 325 |
| | Gila – San Pedro | 24 | 239 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **54** | **452** | **650** |
| **Lower Colorado** | Pahranagat | 6 | 35 | 50 |
| | Virgin | 5 | 16 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 7 | 10 | 50 |
| | Bill Williams | 13 | 39 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **31** | **100** | **525** |
| **Rio Grande** | San Luis Valley | 3 | 16 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 40 | 278 | 100 |
| | Lower Rio Grande | 11 | 46 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **54** | **340** | **250** |
| **Upper Colorado** | San Juan | 1 | 1 | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **1** | **1** | **50** |
| **Grand Total** | | **153** | **974** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 6. 2016 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 3 | 27 | 50 |
| | Kern | 2 | 4 | 75 |
| | Amargosa | -[1] | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **5** | **31** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | 1 | 1 | 25 |
| | Santa Ana | 1 | 1 | 50 |
| | San Diego | 4 | 33 | 125 |
| | **TOTAL** | **6** | **35** | **275** |
| **Gila** | Verde | 4 | 11 | 50 |
| | Hassayampa-Agua Fria | 1 | 1 | 25 |
| | Roosevelt | 6 | 46 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 33 | 420 | 325 |
| | Gila – San Pedro | 6 | 106 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **50** | **584** | **650** |
| **Lower Colorado** | Pahranagat | 6 | 39 | 50 |
| | Virgin | 4 | 19 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 2 | 5 | 50 |
| | Bill Williams | 21 | 56 | 100 |
| | Parker to S. Int. Border | 1 | 1 | 150 |
| | **TOTAL** | **34** | **120** | **525** |
| **Rio Grande** | San Luis Valley | 3 | 10 | 50 |
| | Upper Rio Grande | 1 | 2 | 75 |
| | Middle Rio Grande | 41 | 279 | 100 |
| | Lower Rio Grande | 7 | 52 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **52** | **343** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **147** | **1113** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 7. 2017 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 2 | 2 | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **2** | **2** | **200** |
| **Coastal California** | Santa Ynez | 1 | 1 | 75 |
| | Santa Clara | 1 | 2 | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 3 | 25 | 125 |
| | **TOTAL** | **5** | **28** | **275** |
| **Gila** | Verde | 3 | 26 | 50 |
| | Hassayampa-Agua Fria | 2 | 4 | 25 |
| | Roosevelt | 10 | 77 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 41 | 322 | 325 |
| | Gila – San Pedro | 8 | 82 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **64** | **511** | **650** |
| **Lower Colorado** | Pahranagat | 6 | 37 | 50 |
| | Virgin | 5 | 19 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 2 | 2 | 50 |
| | Bill Williams | 9 | 65 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **22** | **123** | **525** |
| **Rio Grande** | San Luis Valley | 4 | 39 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 35 | 316 | 100 |
| | Lower Rio Grande | 9 | 70 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **48** | **425** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **141** | **1089** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 8. 2018 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 1 | 1 | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **1** | **1** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | 2 | 3 | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 5 | 39 | 125 |
| | **TOTAL** | **7** | **42** | **275** |
| **Gila** | Verde | 6 | 15 | 50 |
| | Hassayampa-Agua Fria | 2 | 2 | 25 |
| | Roosevelt | 4 | 133 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 28 | 547 | 325 |
| | Gila – San Pedro | 3 | 66 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **43** | **763** | **650** |
| **Lower Colorado** | Pahranagat | 6 | 39 | 50 |
| | Virgin | 5 | 22 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 1 | 2 | 50 |
| | Bill Williams | 10 | 70 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **22** | **133** | **525** |
| **Rio Grande** | San Luis Valley | 1 | 11 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 41 | 421 | 100 |
| | Lower Rio Grande | 12 | 85 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **54** | **517** | **250** |
| **Upper Colorado** | San Juan | 1 | 2 | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **1** | **2** | **50** |
| **Grand Total** | | **128** | **1458** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 9. 2019 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | 1 | 1 | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **1** | **1** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | - | - | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 4 | 41 | 125 |
| | **TOTAL** | **4** | **41** | **275** |
| **Gila** | Verde | 6 | 21 | 50 |
| | Hassayampa-Agua Fria | 1 | 1 | 25 |
| | Roosevelt | 3 | 30 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 28 | 277 | 325 |
| | Gila – San Pedro | 22 | 223 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **60** | **552** | **650** |
| **Lower Colorado** | Pahranagat | 5 | 34 | 50 |
| | Virgin | 5 | 21 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 4 | 8 | 50 |
| | Bill Williams | 9 | 87 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **23** | **150** | **525** |
| **Rio Grande** | San Luis Valley | 1 | 6 | 50 |
| | Upper Rio Grande | 1 | 5 | 75 |
| | Middle Rio Grande | 36 | 345 | 100 |
| | Lower Rio Grande | 12 | 100 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **50** | **456** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **138** | **1200** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 10. 2020 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | -[1] | - | 50 |
| | Kern | - | - | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **0** | **0** | **200** |
| **Coastal California** | Santa Ynez | 1 | 1 | 75 |
| | Santa Clara | - | - | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 5 | 38 | 125 |
| | **TOTAL** | **6** | **39** | **275** |
| **Gila** | Verde | 8 | 39 | 50 |
| | Hassayampa-Agua Fria | 1 | 4 | 25 |
| | Roosevelt | 3 | 243 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 18 | 293 | 325 |
| | Gila – San Pedro | - | - | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **30** | **579** | **650** |
| **Lower Colorado** | Pahranagat | 6 | 41 | 50 |
| | Virgin | 6 | 15 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | - | - | 25 |
| | Hoover to Parker | 4 | 6 | 50 |
| | Bill Williams | 7 | 20 | 100 |
| | Parker to S. Int. Border | 1 | 1 | 150 |
| | **TOTAL** | **24** | **83** | **525** |
| **Rio Grande** | San Luis Valley | 6 | 83 | 50 |
| | Upper Rio Grande | 1 | 4 | 75 |
| | Middle Rio Grande | 18 | 286 | 100 |
| | Lower Rio Grande | 15 | 115 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **40** | **488** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **100** | **1189** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 11. 2021 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 4 | 105 | 50 |
| | Kern | -[1] | - | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **4** | **105** | **200** |
| **Coastal California** | Santa Ynez | 1 | 1 | 75 |
| | Santa Clara | - | - | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 4 | 48 | 125 |
| | **TOTAL** | **5** | **49** | **275** |
| **Gila** | Verde | 5 | 22 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 20 | 194 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 14 | 82 | 325 |
| | Gila – San Pedro | 2 | 48 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **41** | **346** | **650** |
| **Lower Colorado** | Pahranagat | 5 | 42 | 50 |
| | Virgin | 5 | 16 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | 2 | 2 | 25 |
| | Hoover to Parker | 2 | 2 | 50 |
| | Bill Williams | 8 | 37 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **22** | **99** | **525** |
| **Rio Grande** | San Luis Valley | 1 | 10 | 50 |
| | Upper Rio Grande | 1 | 2 | 75 |
| | Middle Rio Grande | 34 | 433 | 100 |
| | Lower Rio Grande | 14 | 130 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **50** | **575** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **122** | **1174** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 12. 2022 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 4 | 70 | 50 |
| | Kern | -[1] | - | 75 |
| | Amargosa | - | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **4** | **70** | **200** |
| **Coastal California** | Santa Ynez | - | - | 75 |
| | Santa Clara | - | - | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 2 | 42 | 125 |
| | **TOTAL** | **2** | **42** | **275** |
| **Gila** | Verde | 8 | 25 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 11 | 81 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 11 | 265 | 325 |
| | Gila – San Pedro | 9 | 124 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **39** | **495** | **650** |
| **Lower Colorado** | Pahranagat | 2 | 20 | 50 |
| | Virgin | 5 | 19 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | 2 | 2 | 25 |
| | Hoover to Parker | 1 | 2 | 50 |
| | Bill Williams | 7 | 16 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **17** | **59** | **525** |
| **Rio Grande** | San Luis Valley | 2 | 11 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 44 | 515 | 100 |
| | Lower Rio Grande | 16 | 110 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **62** | **636** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **124** | **1302** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 13. 2023 Southwestern willow flycatcher territories recorded by Management Unit.

| Southwestern Willow Flycatcher Recovery Unit | Southwestern Willow Flycatcher Management Unit | Number of Sites with Southwestern Willow Flycatcher Territories | Number of Southwestern Willow Flycatcher Territories | Recovery Criteria |
|---|---|---|---|---|
| **Basin and Mojave** | Owens | 4 | 56 | 50 |
| | Kern | 1 | 1 | 75 |
| | Amargosa | -[1] | - | 25 |
| | Mojave | - | - | 25 |
| | Salton | - | - | 25 |
| | **TOTAL** | **5** | **57** | **200** |
| **Coastal California** | Santa Ynez | 1 | 1 | 75 |
| | Santa Clara | - | - | 25 |
| | Santa Ana | - | - | 50 |
| | San Diego | 2 | 52 | 125 |
| | **TOTAL** | **3** | **53** | **275** |
| **Gila** | Verde | 1 | 2 | 50 |
| | Hassayampa-Agua Fria | - | - | 25 |
| | Roosevelt | 8 | 58 | 50 |
| | San Francisco | - | - | 25 |
| | Upper Gila | 22 | 361 | 325 |
| | Gila – San Pedro | 13 | 220 | 150 |
| | Santa Cruz | - | - | 25 |
| | **TOTAL** | **44** | **641** | **650** |
| **Lower Colorado** | Pahranagat | 3 | 35 | 50 |
| | Virgin | 4 | 21 | 100 |
| | Little Colorado | - | - | 50 |
| | Middle Colorado | 4 | 7 | 25 |
| | Hoover to Parker | - | - | 50 |
| | Bill Williams | 6 | 18 | 100 |
| | Parker to S. Int. Border | - | - | 150 |
| | **TOTAL** | **17** | **81** | **525** |
| **Rio Grande** | San Luis Valley | 5 | 45 | 50 |
| | Upper Rio Grande | - | - | 75 |
| | Middle Rio Grande | 39 | 379 | 100 |
| | Lower Rio Grande | 14 | 104 | 25 |
| | Pecos | - | - | 0 |
| | **TOTAL** | **58** | **528** | **250** |
| **Upper Colorado** | San Juan | - | - | 25 |
| | Powell | - | - | 25 |
| | **TOTAL** | **0** | **0** | **50** |
| **Grand Total** | | **126** | **1360** | **1950** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 14. Southwestern willow flycatcher territories recorded annually by state, 2011-2023.

| State | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arizona | 431 | 308 | 251 | 350 | 341 | 455 | 325 | 636 | 432 | 499 | 303 | 496 | 594 |
| California | 28 | 34 | 52 | 62 | 81 | 66 | 30 | 43 | 42 | 39 | 154 | 112 | 110 |
| Colorado | 21 | 0 | 21 | 8 | 16 | 10 | 39 | 11 | 6 | 83 | 10 | 11 | 45 |
| Nevada | 65 | 69 | 59 | 52 | 40 | 48 | 48 | 45 | 46 | 49 | 51 | 34 | 54 |
| New Mexico | 584 | 560 | 550 | 472 | 485 | 524 | 639 | 707 | 665 | 512 | 647 | 642 | 550 |
| Utah | 8 | 10 | 7 | 13 | 11 | 10 | 8 | 16 | 9 | 7 | 9 | 7 | 7 |
| **Total** | **1137** | **981** | **940** | **957** | **974** | **1113** | **1089** | **1458** | **1200** | **1189** | **1174** | **1302** | **1360** |

Table 15. Southwestern willow flycatcher statewide and rangewide territory estimates 2004-2007, and 2012.

| State | 2004[1] | 2005[2] | 2006[3] | 2007[4] | 2012[5] |
|---|---|---|---|---|---|
| Arizona | 544 | 495 | 482 | 459 | 679 |
| California | 200 | 191 | 190 | 172 | 115 |
| Colorado | 65 | 63 | 58 | 66 | 48 |
| Nevada | 68 | 68 | 82 | 76 | 75 |
| New Mexico | 372 | 393 | 443 | 519 | 702 |
| Utah | 7 | 4 | 7 | 7 | 10 |
| **Total** | **1256** | **1214** | **1262** | **1299** | **1629** |

[1]Durst *et al*. 2005; [2]Durst *et al.* 2006; [3]Durst *et al*. 2007; [4]Durst *et al*. 2008; [5]Durst 2017

Table 16. Southwestern willow flycatcher territories recorded annually by river drainage – 2011.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2011 | -[1] | - |
| Amargosa River | NV | 2011 | - | - |
| Amargosa River | CA | 2011 | 1 | 1 |
| Big Sandy River | AZ | 2011 | 1 | 7 |
| Bill Williams River | AZ | 2011 | 4 | 4 |
| Colorado River | AZ | 2011 | 5 | 5 |
| Gila River | AZ | 2011 | 30 | 188 |
| Gila River | NM | 2011 | 6 | 171 |
| Hassayampa River | AZ | 2011 | - | - |
| Kern River | CA | 2011 | 1 | 11 |
| Mojave River | CA | 2011 | - | - |
| Muddy River | NV | 2011 | 2 | 9 |
| Owens River | CA | 2011 | - | - |
| Pahranagat River | NV | 2011 | 3 | 33 |
| Pecos River | NM | 2011 | 1 | 2 |
| Rio Grande | CO | 2011 | 1 | 21 |
| Rio Grande | NM | 2011 | 46 | 411 |
| Salt River | AZ | 2011 | 2 | 26 |
| San Diego River | CA | 2011 | - | - |
| San Luis Rey River | CA | 2011 | 1 | 1 |
| San Francisco River | AZ | 2011 | - | - |
| San Francisco River | NM | 2011 | - | - |
| San Juan River | CO | 2011 | - | - |
| San Juan River | NM | 2011 | - | - |
| San Pedro River | AZ | 2011 | 7 | 117 |
| Santa Ana River | CA | 2011 | 1 | 1 |
| Santa Clara River | CA | 2011 | 1 | 4 |
| Santa Margarita River | CA | 2011 | 1 | 7 |
| Santa Maria River | AZ | 2011 | - | - |
| Santa Ynez River | CA | 2011 | - | - |
| Tonto Creek | AZ | 2011 | 5 | 53 |
| Verde River | AZ | 2011 | 3 | 17 |
| Virgin River | AZ | 2011 | - | - |
| Virgin River | NV | 2011 | 2 | 22 |
| Virgin River | UT | 2011 | 3 | 8 |
| | | | | |
| Other | AZ | 2011 | 4 | 14 |
| Other | CA | 2011 | 3 | 3 |
| Other | CO | 2011 | - | - |
| Other | NM | 2011 | - | - |
| Other | NV | 2011 | 1 | 1 |
| Other | UT | 2011 | - | - |
| **Totals** | | | **135** | **1137** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 17. Southwestern willow flycatcher territories recorded annually by river drainage – 2012.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2012 | -[1] | - |
| Amargosa River | NV | 2012 | - | - |
| Amargosa River | CA | 2012 | - | - |
| Big Sandy River | AZ | 2012 | - | - |
| Bill Williams River | AZ | 2012 | 2 | 3 |
| Colorado River | AZ | 2012 | 2 | 2 |
| Gila River | AZ | 2012 | 7 | 124 |
| Gila River | NM | 2012 | 7 | 185 |
| Hassayampa River | AZ | 2012 | - | - |
| Kern River | CA | 2012 | 1 | 9 |
| Mojave River | CA | 2012 | 1 | 1 |
| Muddy River | NV | 2012 | 2 | 11 |
| Owens River | CA | 2012 | - | - |
| Pahranagat River | NV | 2012 | 2 | 37 |
| Pecos River | NM | 2012 | - | - |
| Rio Grande | CO | 2012 | - | - |
| Rio Grande | NM | 2012 | 50 | 375 |
| Salt River | AZ | 2012 | 4 | 27 |
| San Diego River | CA | 2012 | - | - |
| San Luis Rey River | CA | 2012 | 1 | 1 |
| San Francisco River | AZ | 2012 | - | - |
| San Francisco River | NM | 2012 | - | - |
| San Juan River | CO | 2012 | - | - |
| San Juan River | NM | 2012 | - | - |
| San Pedro River | AZ | 2012 | 4 | 99 |
| Santa Ana River | CA | 2012 | 1 | 2 |
| Santa Clara River | CA | 2012 | 2 | 6 |
| Santa Margarita River | CA | 2012 | 1 | 8 |
| Santa Maria River | AZ | 2012 | - | - |
| Santa Ynez River | CA | 2012 | 2 | 5 |
| Tonto Creek | AZ | 2012 | 6 | 32 |
| Verde River | AZ | 2012 | 2 | 6 |
| Virgin River | AZ | 2012 | - | - |
| Virgin River | NV | 2012 | 2 | 21 |
| Virgin River | UT | 2012 | 3 | 10 |
| | | | | |
| Other | AZ | 2012 | 3 | 15 |
| Other | CA | 2012 | 2 | 2 |
| Other | CO | 2012 | - | - |
| Other | NM | 2012 | - | - |
| Other | NV | 2012 | - | - |
| Other | UT | 2012 | - | - |
| **Totals** | | | **107** | **981** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 18. Southwestern willow flycatcher territories recorded annually by river drainage – 2013.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2013 | -[1] | - |
| Amargosa River | NV | 2013 | - | - |
| Amargosa River | CA | 2013 | - | - |
| Big Sandy River | AZ | 2013 | - | - |
| Bill Williams River | AZ | 2013 | 2 | 14 |
| Colorado River | AZ | 2013 | 5 | 6 |
| Gila River | AZ | 2013 | 4 | 8 |
| Gila River | NM | 2013 | 13 | 162 |
| Hassayampa River | AZ | 2013 | - | - |
| Kern River | CA | 2013 | 1 | 5 |
| Mojave River | CA | 2013 | - | - |
| Muddy River | NV | 2013 | 1 | 7 |
| Owens River | CA | 2013 | - | - |
| Pahranagat River | NV | 2013 | 3 | 36 |
| Pecos River | NM | 2013 | - | - |
| Rio Grande | CO | 2013 | 6 | 21 |
| Rio Grande | NM | 2013 | 63 | 372 |
| Salt River | AZ | 2013 | 1 | 17 |
| San Diego River | CA | 2013 | - | - |
| San Luis Rey River | CA | 2013 | 2 | 30 |
| San Francisco River | AZ | 2013 | - | - |
| San Francisco River | NM | 2013 | 2 | 16 |
| San Juan River | CO | 2013 | - | - |
| San Juan River | NM | 2013 | - | - |
| San Pedro River | AZ | 2013 | 8 | 185 |
| Santa Ana River | CA | 2013 | 1 | 1 |
| Santa Clara River | CA | 2013 | 1 | 5 |
| Santa Margarita River | CA | 2013 | 1 | 10 |
| Santa Maria River | AZ | 2013 | - | - |
| Santa Ynez River | CA | 2013 | - | - |
| Tonto Creek | AZ | 2013 | 1 | 3 |
| Verde River | AZ | 2013 | - | - |
| Virgin River | AZ | 2013 | - | - |
| Virgin River | NV | 2013 | 2 | 14 |
| Virgin River | UT | 2013 | 3 | 7 |
| | | | | |
| Other | AZ | 2013 | 2 | 18 |
| Other | CA | 2013 | 1 | 1 |
| Other | CO | 2013 | - | - |
| Other | NM | 2013 | - | - |
| Other | NV | 2013 | 2 | 2 |
| Other | UT | 2013 | - | - |
| **Totals** | | | **125** | **940** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 19. Southwestern willow flycatcher territories recorded annually by river drainage – 2014.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2014 | -[1] | - |
| Amargosa River | NV | 2014 | 1 | 1 |
| Amargosa River | CA | 2014 | - | - |
| Big Sandy River | AZ | 2014 | - | - |
| Bill Williams River | AZ | 2014 | 5 | 27 |
| Colorado River | AZ | 2014 | 1 | 1 |
| Gila River | AZ | 2014 | 4 | 125 |
| Gila River | NM | 2014 | 25 | 151 |
| Hassayampa River | AZ | 2014 | 1 | 1 |
| Kern River | CA | 2014 | 1 | 3 |
| Mojave River | CA | 2014 | - | - |
| Muddy River | NV | 2014 | 2 | 7 |
| Owens River | CA | 2014 | 6 | 41 |
| Pahranagat River | NV | 2014 | 2 | 41 |
| Pecos River | NM | 2014 | - | - |
| Rio Grande | CO | 2014 | 2 | 8 |
| Rio Grande | NM | 2014 | 42 | 321 |
| Salt River | AZ | 2014 | 3 | 31 |
| San Diego River | CA | 2014 | - | - |
| San Luis Rey River | CA | 2014 | 1 | 4 |
| San Francisco River | AZ | 2014 | - | - |
| San Francisco River | NM | 2014 | - | - |
| San Juan River | CO | 2014 | - | - |
| San Juan River | NM | 2014 | - | - |
| San Pedro River | AZ | 2014 | 5 | 113 |
| Santa Ana River | CA | 2014 | 1 | 2 |
| Santa Clara River | CA | 2014 | 2 | 5 |
| Santa Margarita River | CA | 2014 | 1 | 5 |
| Santa Maria River | AZ | 2014 | 2 | 3 |
| Santa Ynez River | CA | 2014 | - | - |
| Tonto Creek | AZ | 2014 | 2 | 16 |
| Verde River | AZ | 2014 | 1 | 7 |
| Virgin River | AZ | 2014 | - | - |
| Virgin River | NV | 2014 | - | - |
| Virgin River | UT | 2014 | 3 | 13 |
| | | | | |
| Other | AZ | 2014 | 2 | 26 |
| Other | CA | 2014 | 2 | 2 |
| Other | CO | 2014 | - | - |
| Other | NM | 2014 | - | - |
| Other | NV | 2014 | 1 | 3 |
| Other | UT | 2014 | - | - |
| **Totals** | | | **118** | **957** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 20. Southwestern willow flycatcher territories recorded annually by river drainage – 2015.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2015 | -[1] | - |
| Amargosa River | NV | 2015 | - | - |
| Amargosa River | CA | 2015 | - | - |
| Big Sandy River | AZ | 2015 | - | - |
| Bill Williams River | AZ | 2015 | 12 | 37 |
| Colorado River | AZ | 2015 | 7 | 10 |
| Gila River | AZ | 2015 | 20 | 142 |
| Gila River | NM | 2015 | 25 | 160 |
| Hassayampa River | AZ | 2015 | - | - |
| Kern River | CA | 2015 | 1 | 3 |
| Mojave River | CA | 2015 | - | - |
| Muddy River | NV | 2015 | 2 | 3 |
| Owens River | CA | 2015 | 4 | 38 |
| Pahranagat River | NV | 2015 | 3 | 29 |
| Pecos River | NM | 2015 | - | - |
| Rio Grande | CO | 2015 | 3 | 16 |
| Rio Grande | NM | 2015 | 51 | 324 |
| Salt River | AZ | 2015 | 1 | 25 |
| San Diego River | CA | 2015 | - | - |
| San Luis Rey River | CA | 2015 | 2 | 29 |
| San Francisco River | AZ | 2015 | - | - |
| San Francisco River | NM | 2015 | - | - |
| San Juan River | CO | 2015 | - | - |
| San Juan River | NM | 2015 | 1 | 1 |
| San Pedro River | AZ | 2015 | 4 | 97 |
| Santa Ana River | CA | 2015 | 1 | 2 |
| Santa Clara River | CA | 2015 | 1 | 2 |
| Santa Margarita River | CA | 2015 | 1 | 4 |
| Santa Maria River | AZ | 2015 | 1 | 2 |
| Santa Ynez River | CA | 2015 | - | - |
| Tonto Creek | AZ | 2015 | 1 | 2 |
| Verde River | AZ | 2015 | 2 | 13 |
| Virgin River | AZ | 2015 | - | - |
| Virgin River | NV | 2015 | 2 | 5 |
| Virgin River | UT | 2015 | 3 | 11 |
| | | | | |
| Other | AZ | 2015 | 1 | 13 |
| Other | CA | 2015 | 3 | 3 |
| Other | CO | 2015 | - | - |
| Other | NM | 2015 | - | - |
| Other | NV | 2015 | 1 | 3 |
| Other | UT | 2015 | - | - |
| **Totals** | | | **153** | **974** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 21. Southwestern willow flycatcher territories recorded annually by river drainage – 2016.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2016 | -[1] | - |
| Amargosa River | NV | 2016 | - | - |
| Amargosa River | CA | 2016 | - | - |
| Big Sandy River | AZ | 2016 | 1 | 2 |
| Bill Williams River | AZ | 2016 | 19 | 49 |
| Colorado River | AZ | 2016 | 3 | 6 |
| Gila River | AZ | 2016 | 10 | 236 |
| Gila River | NM | 2016 | 25 | 191 |
| Hassayampa River | AZ | 2016 | 1 | 1 |
| Kern River | CA | 2016 | 2 | 4 |
| Mojave River | CA | 2016 | - | - |
| Muddy River | NV | 2016 | 2 | 3 |
| Owens River | CA | 2016 | 3 | 27 |
| Pahranagat River | NV | 2016 | 3 | 32 |
| Pecos River | NM | 2016 | - | - |
| Rio Grande | CO | 2016 | 3 | 10 |
| Rio Grande | NM | 2016 | 49 | 333 |
| Salt River | AZ | 2016 | 3 | 33 |
| San Diego River | CA | 2016 | - | - |
| San Luis Rey River | CA | 2016 | 2 | 30 |
| San Francisco River | AZ | 2016 | - | - |
| San Francisco River | NM | 2016 | - | - |
| San Juan River | CO | 2016 | - | - |
| San Juan River | NM | 2016 | - | - |
| San Pedro River | AZ | 2016 | 4 | 99 |
| Santa Ana River | CA | 2016 | 1 | 1 |
| Santa Clara River | CA | 2016 | 1 | 1 |
| Santa Margarita River | CA | 2016 | 1 | 2 |
| Santa Maria River | AZ | 2016 | 1 | 5 |
| Santa Ynez River | CA | 2016 | - | - |
| Tonto Creek | AZ | 2016 | 2 | 2 |
| Verde River | AZ | 2016 | 4 | 11 |
| Virgin River | AZ | 2016 | - | - |
| Virgin River | NV | 2016 | 2 | 9 |
| Virgin River | UT | 2016 | 2 | 10 |
| | | | | |
| Other | AZ | 2016 | 1 | 11 |
| Other | CA | 2016 | 1 | 1 |
| Other | CO | 2016 | - | - |
| Other | NM | 2016 | - | - |
| Other | NV | 2016 | 1 | 4 |
| Other | UT | 2016 | - | - |
| **Totals** | | | **147** | **1113** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 22. Southwestern willow flycatcher territories recorded annually by river drainage – 2017.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2017 | 1 | 3 |
| Amargosa River | NV | 2017 | -[1] | - |
| Amargosa River | CA | 2017 | - | - |
| Big Sandy River | AZ | 2017 | - | - |
| Bill Williams River | AZ | 2017 | 8 | 57 |
| Colorado River | AZ | 2017 | 2 | 2 |
| Gila River | AZ | 2017 | 7 | 77 |
| Gila River | NM | 2017 | 37 | 253 |
| Hassayampa River | AZ | 2017 | 1 | 1 |
| Kern River | CA | 2017 | 2 | 2 |
| Mojave River | CA | 2017 | - | - |
| Muddy River | NV | 2017 | 2 | 5 |
| Owens River | CA | 2017 | - | - |
| Pahranagat River | NV | 2017 | 3 | 26 |
| Pecos River | NM | 2017 | - | - |
| Rio Grande | CO | 2017 | 4 | 39 |
| Rio Grande | NM | 2017 | 44 | 386 |
| Salt River | AZ | 2017 | 3 | 33 |
| San Diego River | CA | 2017 | - | - |
| San Luis Rey River | CA | 2017 | 2 | 24 |
| San Francisco River | AZ | 2017 | - | - |
| San Francisco River | NM | 2017 | - | - |
| San Juan River | CO | 2017 | - | - |
| San Juan River | NM | 2017 | - | - |
| San Pedro River | AZ | 2017 | 5 | 74 |
| Santa Ana River | CA | 2017 | - | - |
| Santa Clara River | CA | 2017 | 1 | 2 |
| Santa Margarita River | CA | 2017 | - | - |
| Santa Maria River | AZ | 2017 | 1 | 8 |
| Santa Ynez River | CA | 2017 | 1 | 1 |
| Tonto Creek | AZ | 2017 | 4 | 36 |
| Verde River | AZ | 2017 | 3 | 26 |
| Virgin River | AZ | 2017 | - | - |
| Virgin River | NV | 2017 | 3 | 11 |
| Virgin River | UT | 2017 | 2 | 8 |
| | | | | |
| Other | AZ | 2017 | 3 | 8 |
| Other | CA | 2017 | 1 | 1 |
| Other | CO | 2017 | - | - |
| Other | NM | 2017 | - | - |
| Other | NV | 2017 | 1 | 6 |
| Other | UT | 2017 | - | - |
| **Totals** | | | **141** | **1089** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 23. Southwestern willow flycatcher territories recorded annually by river drainage – 2018.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2018 | -[1] | - |
| Amargosa River | NV | 2018 | - | - |
| Amargosa River | CA | 2018 | - | - |
| Big Sandy River | AZ | 2018 | - | - |
| Bill Williams River | AZ | 2018 | 9 | 68 |
| Colorado River | AZ | 2018 | 1 | 2 |
| Gila River | AZ | 2018 | 9 | 349 |
| Gila River | NM | 2018 | 20 | 199 |
| Hassayampa River | AZ | 2018 | 1 | 1 |
| Kern River | CA | 2018 | 1 | 1 |
| Mojave River | CA | 2018 | - | - |
| Muddy River | NV | 2018 | 2 | 11 |
| Owens River | CA | 2018 | - | - |
| Pahranagat River | NV | 2018 | 3 | 24 |
| Pecos River | NM | 2018 | - | - |
| Rio Grande | CO | 2018 | 1 | 11 |
| Rio Grande | NM | 2018 | 53 | 506 |
| Salt River | AZ | 2018 | 1 | 95 |
| San Diego River | CA | 2018 | - | - |
| San Luis Rey River | CA | 2018 | 3 | 36 |
| San Francisco River | AZ | 2018 | - | - |
| San Francisco River | NM | 2018 | - | - |
| San Juan River | CO | 2018 | - | - |
| San Juan River | NM | 2018 | 1 | 2 |
| San Pedro River | AZ | 2018 | 3 | 66 |
| Santa Ana River | CA | 2018 | - | - |
| Santa Clara River | CA | 2018 | 2 | 3 |
| Santa Margarita River | CA | 2018 | 1 | 2 |
| Santa Maria River | AZ | 2018 | 1 | 2 |
| Santa Ynez River | CA | 2018 | - | - |
| Tonto Creek | AZ | 2018 | 1 | 34 |
| Verde River | AZ | 2018 | 6 | 15 |
| Virgin River | AZ | 2018 | - | - |
| Virgin River | NV | 2018 | 2 | 6 |
| Virgin River | UT | 2018 | 3 | 16 |
| | | | | |
| Other | AZ | 2018 | 2 | 4 |
| Other | CA | 2018 | 1 | 1 |
| Other | CO | 2018 | - | - |
| Other | NM | 2018 | - | - |
| Other | NV | 2018 | 1 | 4 |
| Other | UT | 2018 | - | - |
| **Totals** | | | **128** | **1458** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 24. Southwestern willow flycatcher territories recorded annually by river drainage – 2019.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2019 | -[1] | - |
| Amargosa River | NV | 2019 | - | - |
| Amargosa River | CA | 2019 | - | - |
| Big Sandy River | AZ | 2019 | - | - |
| Bill Williams River | AZ | 2019 | 9 | 87 |
| Colorado River | AZ | 2019 | 4 | 8 |
| Gila River | AZ | 2019 | 20 | 209 |
| Gila River | NM | 2019 | 24 | 215 |
| Hassayampa River | AZ | 2019 | 1 | 1 |
| Kern River | CA | 2019 | 1 | 1 |
| Mojave River | CA | 2019 | - | - |
| Muddy River | NV | 2019 | 2 | 11 |
| Owens River | CA | 2019 | - | - |
| Pahranagat River | NV | 2019 | 2 | 20 |
| Pecos River | NM | 2019 | - | - |
| Rio Grande | CO | 2019 | 1 | 6 |
| Rio Grande | NM | 2019 | 49 | 450 |
| Salt River | AZ | 2019 | 1 | 22 |
| San Diego River | CA | 2019 | - | - |
| San Luis Rey River | CA | 2019 | 3 | 39 |
| San Francisco River | AZ | 2019 | - | - |
| San Francisco River | NM | 2019 | - | - |
| San Juan River | CO | 2019 | - | - |
| San Juan River | NM | 2019 | - | - |
| San Pedro River | AZ | 2019 | 6 | 76 |
| Santa Ana River | CA | 2019 | - | - |
| Santa Clara River | CA | 2019 | - | - |
| Santa Margarita River | CA | 2019 | 1 | 2 |
| Santa Maria River | AZ | 2019 | - | - |
| Santa Ynez River | CA | 2019 | - | - |
| Tonto Creek | AZ | 2019 | - | - |
| Verde River | AZ | 2019 | 6 | 21 |
| Virgin River | AZ | 2019 | - | - |
| Virgin River | NV | 2019 | 3 | 12 |
| Virgin River | UT | 2019 | 2 | 9 |
| | | | | |
| Other | AZ | 2019 | 2 | 8 |
| Other | CA | 2019 | - | - |
| Other | CO | 2019 | - | - |
| Other | NM | 2019 | - | - |
| Other | NV | 2019 | 1 | 3 |
| Other | UT | 2019 | - | - |
| **Totals** | | | **138** | **1200** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 25. Southwestern willow flycatcher territories recorded annually by river drainage – 2020.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2020 | -[1] | - |
| Amargosa River | NV | 2020 | - | - |
| Amargosa River | CA | 2020 | - | - |
| Big Sandy River | AZ | 2020 | - | - |
| Bill Williams River | AZ | 2020 | 7 | 20 |
| Colorado River | AZ | 2020 | 5 | 7 |
| Gila River | AZ | 2020 | 2 | 186 |
| Gila River | NM | 2020 | 16 | 107 |
| Hassayampa River | AZ | 2020 | 1 | 4 |
| Kern River | CA | 2020 | - | - |
| Mojave River | CA | 2020 | - | - |
| Muddy River | NV | 2020 | 2 | 9 |
| Owens River | CA | 2020 | - | - |
| Pahranagat River | NV | 2020 | 3 | 29 |
| Pecos River | NM | 2020 | - | - |
| Rio Grande | CO | 2020 | 6 | 83 |
| Rio Grande | NM | 2020 | 34 | 405 |
| Salt River | AZ | 2020 | 1 | 141 |
| San Diego River | CA | 2020 | - | - |
| San Luis Rey River | CA | 2020 | 3 | 36 |
| San Francisco River | AZ | 2020 | - | - |
| San Francisco River | NM | 2020 | - | - |
| San Juan River | CO | 2020 | - | - |
| San Juan River | NM | 2020 | - | - |
| San Pedro River | AZ | 2020 | - | - |
| Santa Ana River | CA | 2020 | - | - |
| Santa Clara River | CA | 2020 | - | - |
| Santa Margarita River | CA | 2020 | 1 | 1 |
| Santa Maria River | AZ | 2020 | - | - |
| Santa Ynez River | CA | 2020 | 1 | 1 |
| Tonto Creek | AZ | 2020 | 2 | 102 |
| Verde River | AZ | 2020 | 7 | 36 |
| Virgin River | AZ | 2020 | - | - |
| Virgin River | NV | 2020 | 3 | 8 |
| Virgin River | UT | 2020 | 3 | 7 |
| | | | | |
| Other | AZ | 2020 | 1 | 3 |
| Other | CA | 2020 | 1 | 1 |
| Other | CO | 2020 | - | - |
| Other | NM | 2020 | - | - |
| Other | NV | 2020 | 1 | 3 |
| Other | UT | 2020 | - | - |
| **Totals** | | | **100** | **1189** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 26. Southwestern willow flycatcher territories recorded annually by river drainage – 2021.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2021 | -[1] | - |
| Amargosa River | NV | 2021 | - | - |
| Amargosa River | CA | 2021 | - | - |
| Big Sandy River | AZ | 2021 | - | - |
| Bill Williams River | AZ | 2021 | 8 | 37 |
| Colorado River | AZ | 2021 | 2 | 2 |
| Gila River | AZ | 2021 | - | - |
| Gila River | NM | 2021 | 14 | 82 |
| Hassayampa River | AZ | 2021 | - | - |
| Kern River | CA | 2021 | - | - |
| Mojave River | CA | 2021 | - | - |
| Muddy River | NV | 2021 | 2 | 7 |
| Owens River | CA | 2021 | 4 | 105 |
| Pahranagat River | NV | 2021 | 2 | 30 |
| Pecos River | NM | 2021 | - | - |
| Rio Grande | CO | 2021 | 1 | 10 |
| Rio Grande | NM | 2021 | 49 | 565 |
| Salt River | AZ | 2021 | 8 | 101 |
| San Diego River | CA | 2021 | - | - |
| San Luis Rey River | CA | 2021 | 3 | 47 |
| San Francisco River | AZ | 2021 | - | - |
| San Francisco River | NM | 2021 | - | - |
| San Juan River | CO | 2021 | - | - |
| San Juan River | NM | 2021 | - | - |
| San Pedro River | AZ | 2021 | 2 | 48 |
| Santa Ana River | CA | 2021 | - | - |
| Santa Clara River | CA | 2021 | - | - |
| Santa Margarita River | CA | 2021 | 1 | 1 |
| Santa Maria River | AZ | 2021 | - | - |
| Santa Ynez River | CA | 2021 | 1 | 1 |
| Tonto Creek | AZ | 2021 | 8 | 73 |
| Verde River | AZ | 2021 | 4 | 18 |
| Virgin River | AZ | 2021 | - | - |
| Virgin River | NV | 2021 | 2 | 7 |
| Virgin River | UT | 2021 | 3 | 9 |
| | | | | |
| Other | AZ | 2021 | 5 | 24 |
| Other | CA | 2021 | - | - |
| Other | CO | 2021 | - | - |
| Other | NM | 2021 | - | - |
| Other | NV | 2021 | 3 | 7 |
| Other | UT | 2021 | - | - |
| **Totals** | | | **122** | **1174** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 27. Southwestern willow flycatcher territories recorded annually by river drainage – 2022.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2022 | -[1] | - |
| Amargosa River | NV | 2022 | - | - |
| Amargosa River | CA | 2022 | - | - |
| Big Sandy River | AZ | 2022 | - | - |
| Bill Williams River | AZ | 2022 | 6 | 13 |
| Colorado River | AZ | 2022 | 1 | 2 |
| Gila River | AZ | 2022 | 7 | 318 |
| Gila River | NM | 2022 | 9 | 17 |
| Hassayampa River | AZ | 2022 | - | - |
| Kern River | CA | 2022 | - | - |
| Mojave River | CA | 2022 | - | - |
| Muddy River | NV | 2022 | 1 | 5 |
| Owens River | CA | 2022 | 4 | 70 |
| Pahranagat River | NV | 2022 | 1 | 15 |
| Pecos River | NM | 2022 | - | - |
| Rio Grande | CO | 2022 | 2 | 11 |
| Rio Grande | NM | 2022 | 60 | 625 |
| Salt River | AZ | 2022 | 8 | 59 |
| San Diego River | CA | 2022 | - | - |
| San Luis Rey River | CA | 2022 | 2 | 42 |
| San Francisco River | AZ | 2022 | - | - |
| San Francisco River | NM | 2022 | - | - |
| San Juan River | CO | 2022 | - | - |
| San Juan River | NM | 2022 | - | - |
| San Pedro River | AZ | 2022 | 2 | 41 |
| Santa Ana River | CA | 2022 | - | - |
| Santa Clara River | CA | 2022 | - | - |
| Santa Margarita River | CA | 2022 | - | - |
| Santa Maria River | AZ | 2022 | 1 | 3 |
| Santa Ynez River | CA | 2022 | - | - |
| Tonto Creek | AZ | 2022 | 3 | 22 |
| Verde River | AZ | 2022 | 6 | 20 |
| Virgin River | AZ | 2022 | - | - |
| Virgin River | NV | 2022 | 2 | 12 |
| Virgin River | UT | 2022 | 3 | 7 |
| | | | | |
| Other | AZ | 2022 | 4 | 18 |
| Other | CA | 2022 | - | - |
| Other | CO | 2022 | - | - |
| Other | NM | 2022 | - | - |
| Other | NV | 2022 | 2 | 2 |
| Other | UT | 2022 | - | - |
| **Totals** | | | **124** | **1302** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

Table 28. Southwestern willow flycatcher territories recorded annually by river drainage – 2023.

| Drainage | State | Year | Sites with Territories | Number of Territories |
|---|---|---|---|---|
| Agua Fria River | AZ | 2023 | -[1] | - |
| Amargosa River | NV | 2023 | - | - |
| Amargosa River | CA | 2023 | - | - |
| Big Sandy River | AZ | 2023 | - | - |
| Bill Williams River | AZ | 2023 | 5 | 17 |
| Colorado River | AZ | 2023 | 2 | 2 |
| Gila River | AZ | 2023 | 16 | 440 |
| Gila River | NM | 2023 | 15 | 67 |
| Hassayampa River | AZ | 2023 | - | - |
| Kern River | CA | 2023 | 1 | 1 |
| Mojave River | CA | 2023 | - | - |
| Muddy River | NV | 2023 | 1 | 3 |
| Owens River | CA | 2023 | 4 | 56 |
| Pahranagat River | NV | 2023 | 2 | 32 |
| Pecos River | NM | 2023 | - | - |
| Rio Grande | CO | 2023 | 5 | 45 |
| Rio Grande | NM | 2023 | 53 | 483 |
| Salt River | AZ | 2023 | 8 | 58 |
| San Diego River | CA | 2023 | - | - |
| San Luis Rey River | CA | 2023 | 1 | 51 |
| San Francisco River | AZ | 2023 | - | - |
| San Francisco River | NM | 2023 | - | - |
| San Juan River | CO | 2023 | - | - |
| San Juan River | NM | 2023 | - | - |
| San Pedro River | AZ | 2023 | 4 | 74 |
| Santa Ana River | CA | 2023 | - | - |
| Santa Clara River | CA | 2023 | - | - |
| Santa Margarita River | CA | 2023 | 1 | 1 |
| Santa Maria River | AZ | 2023 | 1 | 1 |
| Santa Ynez River | CA | 2023 | 1 | 1 |
| Tonto Creek | AZ | 2023 | - | - |
| Verde River | AZ | 2023 | 1 | 2 |
| Virgin River | AZ | 2023 | - | - |
| Virgin River | NV | 2023 | 2 | 14 |
| Virgin River | UT | 2023 | 2 | 7 |
| | | | | |
| Other | AZ | 2023 | - | - |
| Other | CA | 2023 | - | - |
| Other | CO | 2023 | - | - |
| Other | NM | 2023 | - | - |
| Other | NV | 2023 | 2 | 5 |
| Other | UT | 2023 | - | - |
| **Totals** | | | **127** | **1360** |

1 – a dash "-" represents either no surveys occurred or surveys occurred and no territories were recorded.

**U.S. FISH AND WILDLIFE SERVICE**

**5-YEAR REVIEW of Southwestern Willow Flycatcher *(Empidonax traillii extimus)***

**Current classification**:

Endangered

**Recommendation resulting from the 5-Year Review**:

No change needed

**FIELD OFFICE APPROVAL**:

**Lead Field Supervisor, Fish and Wildlife Service, Arizona Ecological Services Office**

Approve HEATHER WHITLAW Digitally signed by HEATHER WHITLAW Date: 2025.08.28 12:35:58 -07'00' ________________________________________