

Southwestern Willow Flycatcher Protocol Surveys of the Santa Ynez River and San Antonio Creek: 2017 Breeding Season



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Executive Summary

We surveyed for southwestern willow flycatchers (*Empidonax traillii extimus*, SWFL) along three sections of the lower Santa Ynez River flowing through Vandenberg Air Force Base (VAFB), three sections along the middle Santa Ynez River in the Buellton area, and two sections of San Antonio Creek on VAFB, in 2017. At each survey site, three to five rounds of surveys were conducted from May 15 to July 23. No SWFLs were detected on VAFB. Off base, we found three willow flycatchers along the middle Santa Ynez River near Buellton, CA, at and near locations of historic SWFL occupancy. Two birds were observed only once and deemed to be transient willow flycatchers of unknown subspecies (WIFL). The third bird was observed on two separate surveys on the Santa Ynez River in the Buellton vicinity and determined to be a male resident southwestern willow flycatcher. Despite extensive effort, breeding behavior was not observed and no nests were found. The breeding status of the lone resident male was unknown.

While conducting SWFL surveys on the middle Santa Ynez River near Buellton, a single male least Bell's vireo (*Vireo bellii pusillus*, LBVI) was detected singing on three separate surveys. Based on the frequency and spatial distribution of the detections, we believe the LBVI was an unmated resident bird; no breeding behaviors or nests were observed. The LBVI is a federally endangered species previously thought to be extirpated from Santa Barbara County, though rare and local in neighboring Ventura County and additional southern California counties. To our knowledge, the species was last observed in Santa Barbara County in 1999. Since receiving federal protective status in 1986 and concurrent cowbird control initiation, the species population has increased, and is slowly recolonizing its historic range in southern California.

Introduction

The southwestern willow flycatcher (*Empidonax traillii extimus*, SWFL), is a neotropical migrant that appears to primarily winter in Nicaragua (Ruegg et al. unpublished data 2017), and breeds in riparian habitats found in southern California, southern Nevada, southern Utah, southwestern Colorado, Arizona, New Mexico, western Texas, and extreme northwestern Mexico (Sogge et al. 2010). Over the last century, this once common Southwest bird has become exceedingly rare (Sogge et al. 2003, Durst et al. 2008). Southwestern willow flycatchers were a common summer resident found in riparian habitat up to 5000 feet in mountain canyons in southwestern California (Lehman 1994, revised draft 2012, Willett 1933). The species decline is primarily attributed to habitat loss and degradation (Sogge et al. 2010). In 1995, with an estimated 550 breeding territories remaining, the U.S. Fish and Wildlife Service (USFWS) listed the southwestern willow flycatcher as an endangered species (Federal Register 60 [38]: 10694). As of 2007, the species has rebounded to 1,300 estimated breeding territories, but the recovery has been mixed across its range (Sogge et al. 2010) and continues to decline in California. Santa Barbara County marks the current northwestern extent of its breeding range (USFWS 2002).

The SWFL is a riparian obligate species typically nesting in dense riparian vegetation often in close proximity to surface water. This riparian habitat can range from high-elevation willow to lower elevation broadleaf riparian habitat with varying degrees of native and exotic cover (Sogge et al. 2010). SWFLs will also use monotypic stands of exotic saltcedar (*Tamarix spp.*) or Russian olive (*Elaeagnus angustifolia.*). In California riparian, broadleaf willow [*Salix spp.*] dominated habitat is common, though cottonwood (*Populus spp.*), box elder (*Acer negundo*) and exotic *Tamarix* are also found (Sogge et al. 2010). SWFLs in the San Luis Rey River even breed in coast live oak (*Quercus agrifolia*) riparian (U.S. Fish and Wildlife Service 2002). Willow flycatcher preferred habitat is made up of a mosaic of trees varying in size classes, three to 15 m tall, with patches of dense vegetation interspersed with small openings, open water, or shorter vegetation (Sogge et al. 2010).

Approximately twenty years ago, the largest southwestern willow flycatcher populations in California occurred along the South Fork of the Kern, San Luis Rey, Santa Margarita (on Marine Corps Base Camp Pendleton), and the Santa Ynez rivers, and were recognized as vital for the stability and longevity of the regional southern California metapopulation (Farmer et al. 2003). In 1996, the Santa Ynez River population in Santa Barbara County was estimated to be between 33 to 39 territories. SWFL breeding records typically occurred along the Santa Ynez River in two primary areas. One area was near Buellton, from the Avenue of the Flags and downstream for approximately seven kilometers where researchers found between five to 33 individual birds from 1986 to 2000, but only five to six territorial birds in 2012 (Farmer et al. 2003, Ball et al. 2012). The second historic occupancy area was on VAFB property in the vicinity of the 13th Street Bridge, including the habitat around the VAFB Waterfowl Management Ponds, where one to six SWFLs were typically found between 1986 to 2000 (Farmer et al. 2003), but zero observed in 2012 and 2014 (Ball et al. 2012, ManTech 2015, R. Evans personal communication 2017). Note in 2014, the VAFB SWFL survey extent was reduced to the riparian habitat around the 13th Street Bridge due to the expansion of 2014 yellow-billed cuckoo surveys (ManTech 2015, R. Evans personal communication 2017). Outside of the lower and middle stretches of the Santa Ynez River, only a few breeding SWFL's have been documented in Santa Barbara County (Ball et al. 2012).

VAFB maintains an extensive ongoing natural resource monitoring and management program to ensure the preservation of federally protected species and its military mission. In order to assess the current status of SWFL on VAFB, the 30th Space Wing Installation Management Flight, Natural Resources Office (30 CES/CEIEA) contracted the Southern Sierra Research Station (SSRS) to perform United States Fish and Wildlife Service (USFWS) protocol level surveys on VAFB and within public right of ways along the Santa Ynez River and San Antonio Creek (USFWS 2010, Figure 1). Both watersheds possess extensive tracts of high quality riparian habitat suitable for SWFL breeding. However, breeding SWFLs have not been documented on VAFB since 2003(Farmer et al. 2003, Ball et al. 2012, R. Evans personal communication 2017). Surveys of the San Antonio Creek sections allow us to compare habitat similarities with the historically occupied Santa Ynez River sections. In

order to determine if the decline in SWFL numbers is limited to the VAFB, 30 CES/CEIEA supported additional protocol level surveys along the historically important stretch of the middle Santa Ynez River in the vicinity of Buellton (Figure 1). Understanding the current population and breeding status of SWFLs at the historic breeding locations within Santa Barbara County will allow us to determine if the apparent SWFL extirpation observed on VAFB is part of an overall population decline within the region, or indication of a more localized trend limited to VAFB. This report documents the results of protocol field surveys performed during the SWFL breeding season between 15 May and 23 July 2017.

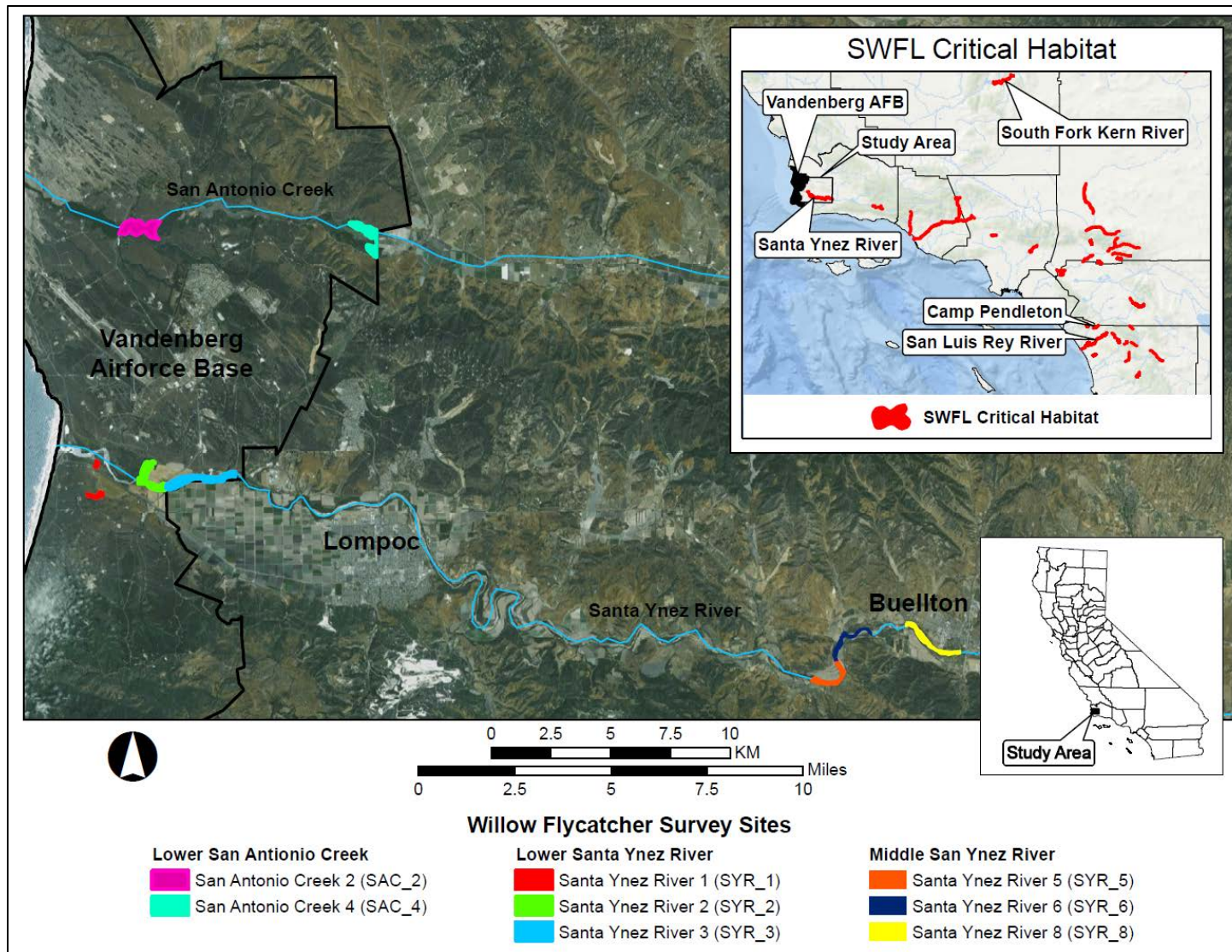


Figure 1. Southwestern willow flycatcher Study Area with Vandenberg Air Force Base and Buellton area survey sites, 2017. Survey Site names are the same as those used by Ball et al. (2012). Inset map shows SWFL southern California critical habitat and four historically large population locations found at Camp Pendleton and the South Fork Kern, Santa Ynez, and San Luis Rey Rivers.

Methods

Study Area

VAFB is a large 40,298 hectare military installation in western Santa Barbara County maintained to conduct missile testing and satellite launches. To satisfy security and safety needs inherent to launch activities, VAFB maintains large portions of the base as undeveloped open space. As a result, approximately 80 percent of VAFB is managed in an undeveloped state (Vandenberg AFB 2008 General Plan). Within these undeveloped areas flows approximately 267 km of perennial and ephemeral streams. During this study SSRS surveyed for southwestern willow flycatchers along the Santa Ynez River and San Antonio Creek, the two largest waterways flowing through VAFB. Santa Ynez River is the largest river in Santa Barbara County reaching from the ocean 109 air km east to its furthest headwaters at Divide Peak in the Santa Ynez Mountains near the Ventura County border. Approximately five-percent of the Santa Ynez River and 8.8 air km of river flow runs through VAFB property (Ball et al. 2003). The smaller of the two watersheds, San Antonio Creek extends 35 air km from its headwaters in the Solomon Hills to the ocean. Approximately nine-percent of the San Antonio Creek and 15.5 air km of creek flow occurs on VAFB (Ball et al. 2003).

The Santa Ynez River and San Antonio Creek contain stretches of highly valuable willow flycatcher habitat (Ball et al. 2012). Barka Slough (SAC_4), lower portions of San Antonio Creek (SAC_2), and lower portions of Santa Ynez River (SYR_2) are characterized by an extensive floodplain that exceeds a width of 300 m in some places (Figure 1). Additionally, the wide band of riparian vegetation in lower San Antonio Creek (SAC_2) and sections of the Santa Ynez River south of Buellton (herein referred to as the middle Santa Ynez River [SYR_5, 6 and 8], Figure 1) are highly dynamic habitat with multiple braided stream channels interspersed with dense emergent wetlands. The lower Santa Ynez River stands as one of the most species rich and productive areas of riparian bird habitat in the nation (Riparian Habitat Joint Venture 2004 as cited in Ball et al. 2012).

Riparian vegetation within the lower watershed of both the Santa Ynez River and San Antonio Creek are primarily composed of native broadleaf woodland habitat dominated by

arroyo willow (*Salix lasiolepis*). However, other common tree species include shining, red, and narrow-leaved willows (*Salix lucida*, *S. leavigata*, and *S. exigua* respectively), boxelder (*Acer negundo*), and blue elderberry (*Sambucus nigra*). Though sparse within coastal riparian habitat, black cottonwood (*Populus trichocarpa*) increases as a proportion of total tree cover approximately 15 air km upstream of the ocean in both watersheds. Riparian understory vegetation is primarily dominated by native species such as stinging nettle (*Urtica dioica*), California blackberry (*Rubus ursinus*), and coyote brush (*Baccharis pilularis*). The cover of non-native species such as poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), giant reed (*Arundo donax*), and cape ivy (*Delairea odorata*) is significant in some areas, especially adjacent to land cleared for agriculture or grazing.

Surveys were performed along three segments of the lower Santa Ynez River flowing through VAFB (SYR_1, SYR_2, SYR_3, Figure 1), three sections along the middle Santa Ynez River downstream of the Avenue of the Flags Bridge (SYR_5, SYR_6 and SYR_8, Figure 1), and two sections of San Antonio Creek on VAFB, including Barka Slough (SAC_2, SAC_4, Figure 1). Survey site names (site codes) are the same as that used by Ball et al. (2012). In all cases, except survey segment SYR_1, riparian habitat was surveyed from areas classified as Waters of the United States (Federal Register 38: 34165).

Survey Protocol

SSRS conducted presence/absence playback surveys for southwestern willow flycatchers along eight established survey routes during 2017. These survey routes were last surveyed for southwestern willow flycatchers in 2012 and 2014 (Ball et al. 2012, ManTech 2015). All surveys were performed in accordance with the established USFWS protocol (Sogge et al. 2010) which are designed to maximize the likelihood of detecting willow flycatchers present during the survey. Surveys were performed between dawn and 10:30 a.m. in fair weather conditions while riparian birds were most active. Each of the eight survey routes were surveyed once per survey period (Table 1). This study followed the standard three visit survey protocol along all survey routes. Suspected resident southwestern willow flycatcher territories, those observed during the non-migration period from approximately June 15 to July 20 (Sogge et al. 2010), were visited a total of five times in order to try to

locate a nest, determine the fate of the nest, and optimally determine the fledging success of the nestlings.

During each survey, the surveyor walked slowly through potentially suitable habitat, pausing at surveillance points every 20-30 meters to listen and look for willow flycatchers. The spacing of surveillance points was set wider in areas of limited habitat. Additional time was spent in areas of quality habitat and sites where willow flycatchers have been documented in the past (i.e. 13th Street Bridge area on VAFB, and areas of SYR_5, SYR_6 and SYR_8 off base). If no willow flycatchers were detected within two minutes of arriving at a given surveillance point, the surveyor performed playbacks to illicit responses from flycatchers. The surveyor performed playbacks of southwestern willow flycatcher song (fitz-bew), call notes (whitts and brits), and burry interaction calls for 5-15 seconds using a hand-held speaker. Playback calls were repeated at the discretion of the surveyor followed by a period of silent listening to detect willow flycatcher vocalizations or activity.

If a willow flycatcher was detected, playback was suspended and the bird was carefully observed to determine the breeding status of the individual. Vocalizing males were tracked to determine if they were interacting with a nesting partner or could be heard “counter-singing” with other males with neighboring territories. Non-vocal individuals were followed in order to confirm the diagnostic fitz-bew vocalization made by males of the species or observe the bird interacting with another confirmed willow flycatcher.

If pair bonding behavior was identified, the surveyor would quietly linger in an attempt to observe nest building, food carrying, fecal sac carrying, or repetitive movement patterns indicative of breeding. If any breeding behavior was identified, breeding birds were tracked to the location of their nest. If located, nests would have been photographed within a habitat context; notes regarding the nest height, placement, and surrounding habitat would be taken, and the number of eggs and/or nestlings counted. In a situation where brown-headed cowbird (*Molothrus ater*), a brood parasite, had laid egg(s) in the nest of a SWFL, the egg(s) or hatched chick(s) would be removed and destroyed.

At the conclusion of each survey, USFWS Willow Flycatcher Survey and Detection Forms (Sogge et al. 2010) were completed for each survey route.

Table 1. Southwestern willow flycatcher survey schedule and detections, 2017.

Area	Site Name	Site Code	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
			15-31 May	1-24 June	25 June -25 July		
<i>San Antonio Creek</i>	San Antonio Creek 2	SAC_2	0 (5/18)	0 (6/13)	0 (7/11)	-	-
	Barka Slough	SAC_4	0 (5/17)	0 (6/13)	0 (7/11)	-	-
	San Antonio Creek Total		0	0	0	-	-
<i>Lower Santa Ynez River</i>	Surf Pasture	SYR_1	0 (5/17)	0 (6/14)	0 (7/12)	-	-
	13 th Street Bridge West	SYR_2	0 (5/16)	0 (6/13)	0 (7/11)	-	-
	13 th Street Bridge East	SYR_3	0 (5/16)	0 (6/13)	0 (7/11)	-	-
	Lower Santa Ynez Total		0	0	0		
<i>Middle Santa Ynez River</i>	Santa Ynez River 5	SYR_5	0 (5/16)	0 (6/14)	0 (7/12)	-	-
	Santa Ynez River 6	SYR_6	2 (5/16)	0 (6/14)	0 (7/12)	-	-
	Santa Ynez River 8	SYR_8	0 (5/15)	0 (6/14)	1 (7/12)	0 (7/13)	1(7/23)
	Middle Santa Ynez Total		2	0	1	0	1

Results

SSRS surveyed approximately 7.6 km of riparian habitat along the lower San Ynez River (on VAFB property), 10.9 km along the middle Santa Ynez River (near Buellton, CA), and an additional 4.1 km along San Antonio Creek and Barka Slough (on VAFB property). During these surveys, no SWFLs were detected on Vandenberg Air Force Base (Table 1).

Off base, three willow flycatchers were detected along the middle Santa Ynez River near Buellton, CA, at the SYR_6 and SYR_8 survey sites (Table 1, Table 2, and Figure 2). At the SYR_6 survey site, we detected two lone willow flycatchers during the first survey period only, near an area historically known as the “Yvonne site”, a stretch of river with persistent historic SWFL occupancy (Farmer 2003, Ball 2012). The SYR_8 southwestern willow flycatcher was observed on the third and fifth visit at the “Buellton Site”, a historic SWFL area along the survey route with a consistent history of occupancy (Farmer et al. 2003, Ball et al. 2012). We did not observe SWFL breeding behavior or locate any nests.

At the SYR_8 site, during three willow flycatcher surveys, we detected a least Bell’s vireo, a Federally Endangered species last observed in Santa Barbara County twenty years ago, but rare and local in neighboring Ventura County and additional southern California counties

(Table 3, Figure 2). We suspect that the three observations were of a single male LBVI. The distances between successive observations (~800m) suggest that this bird was not breeding and likely moving through the habitat assessing the area for suitability and mates.

Table 2. Willow Flycatcher observations on the Santa Ynez River, 2017.

Survey Site	Survey Date	SWFL Observations
SYR_6	16 – May - 2017	Two lone male willow flycatchers singing near the historically occupied “Yvonne” site.
SYR_8	13 – July - 2017	One lone SWFL singing.
	23 – July - 2017	One lone calling SWFL.

Table 3. Least Bell's vireo observations on the Santa Ynez River, 2017.

Survey Site	Survey Date	LBVI Observations
SYR_8	16 – May - 2017	1 LBVI heard singing. No visual observation.
	13 – July - 2017	1 LBVI heard singing approximately 800m from where it was detected on 16-May-2017.
	23 – July - 2017	1 LBVI heard singing quietly. No visual observation. Detected near the 13-Jul-2017 detection location.



Figure 2. Habitat used by the SYR_8 southwestern willow flycatcher, 2017.

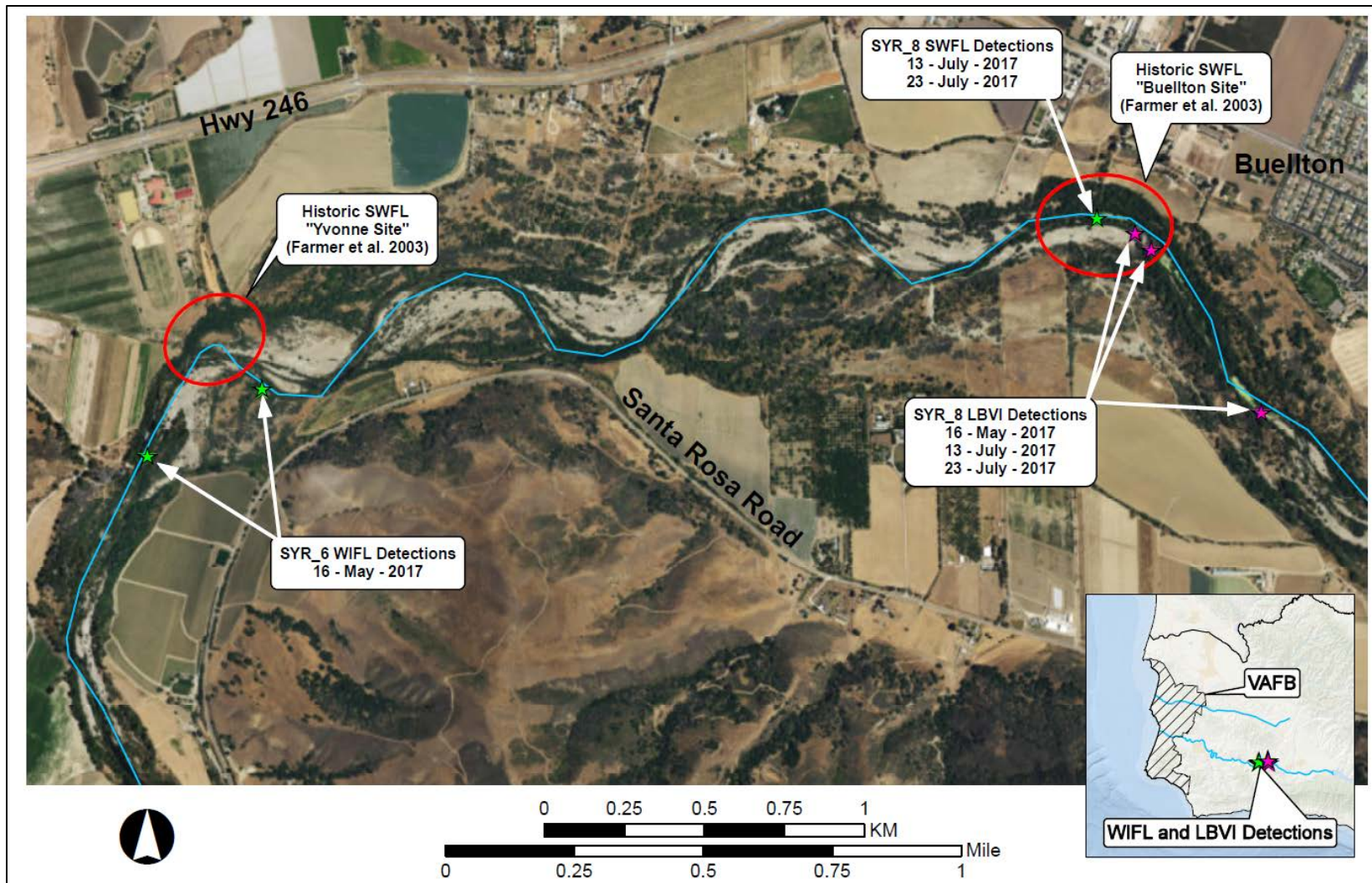


Figure 3. Southwestern willow flycatcher and least Bell's vireo 2017 detections on the middle Santa Ynez River, near and in the historically occupied "Yvonne" and "Buellton" sites (Farmer et al. 2003).

Discussion

Southwestern willow flycatchers were not detected on Vandenberg Air Force Base in 2017. Off base, three willow flycatchers were detected on the middle Santa Ynez River, near Buellton, in and near historically occupied willow flycatcher habitat (Ball et al. 2012). Of these three detected birds, two were deemed transient migrants, and one a resident territorial male. The two transient willow flycatchers were located near the “Yvonne” site during the first survey only. Because the willow flycatchers’ migration can still occur during the first survey period, we cannot state with certainty whether these two birds were residents, or identify their subspecies classification (*Empidonax traillii extimus*, *E.t. brewsterii*, or possibly *E.t. adastus*) as it is impossible to differentiate willow flycatcher subspecies from field observations. The third detected willow flycatcher was observed on two separate surveys at the historic “Buellton” site. Based on the behavior and dates of detection, we suspect that this bird was a resident southwestern willow flycatcher, and either an unmated male that had previously set up a territory outside of the survey area, or a male whose nest had already fledged or failed and was doing post-breeding movements prior to migration. Despite extensive effort, we did not observe breeding behavior or locate SWFL nests within the study area.

Over the last twenty-one years the local SWFL population, primarily found on the middle Santa Ynez River near Buellton, has dramatically declined from a peak of 33-39 territories observed in 1996 (Farmer et al. 2003), down to 5-6 territories in 2012 (Ball et al. 2012), and now 1 observed territory in 2017. Unfortunately, over this same timeframe, this trend of extreme population decline and subsequent near extirpation has been documented throughout the region. All of the former SWFL stronghold populations within the southern California metapopulation, the South Fork of the Kern, Middle San Luis Rey, Santa Margarita, and San Ynez River populations, are down to single digit territories and facing local extinction (Allen et al. 2017, Kus et al. 2016, Whitfield 2017). The causes of the local and regional population declines are unknown (Kus et al. 2016).

In contrast to the steep SWFL population declines observed in southern California, the federally endangered least Bell’s vireo has experienced steady population gains since its

protective listing in 1986, and cowbird control initiation. LBVI population increases have recently lead to expansions of its occupied range, and recolonizations of habitat where they have been absent for over 50 years (Whitfield 2017, Howell et al. 2010). To our knowledge, the species was last observed in Santa Barbara County in 1999 (UCSB 2017). With the ongoing range expansion and the detection of a singing territorial male on the Santa Ynez River in 2017, recolonization of breeding LBVI in Santa Barbara County is likely to occur.

San Antonio Creek on Vandenberg Air Force Base

Areas surveyed within San Antonio Creek possess the potential to attract and support SWFLs. The lower San Antonio Creek possesses a low gradient stream channel braided with numerous low flow side channels and patchy emergent wetlands. This assortment of wetland types with persistent soil moisture is conducive to the prey base that supports SWFL (Sogge et al. 1997). However, a lack of dynamic stream processes leading to habitat disturbances and succession has lead much of the habitat to develop into a thick tangle of poison oak understory with a dense canopy overstory, creating a compact monotypic structure less suitable for SWFLs. The surveyed areas have been deemed suitable for SWFLs in the past, though the species has yet to be documented in the area (Ball et al. 2012). In its current condition, coupled with the availability of more suitable habitat on the Santa Ynez River (on VAFB and in the Buellton area), and the dramatic decline in the local SWFL population, the habitat appears unlikely to attract breeding willow flycatchers in the near future.

Lower Santa Ynez River on Vandenberg Air Force Base

Areas surveyed along the Lower Santa Ynez River include Miguelito Wetland at the confluence of Miguelito Creek and the Santa Ynez River, Surf Pasture, and river stretches upstream and downstream of the 13th Street Bridge. Miguelito Wetland and Surf Pasture represent the western most habitat used by SWFLs within their U.S. breeding range, but breeding has not been documented here since 1994 (Farmer et al. 2003, Ball et al. 2012). In general the habitat at these locations appear marginal for attracting breeding SWFL. The habitat at Surf Pasture was void of moist ground, and rewatering the area could revive the local wetland, bring back a healthy understory under the forest canopy, and lead to conditions to increase insect abundance. The Miguelito Wetland was abundant with

brackish water, emergent vegetation, insect prey, and a strong Marsh Wren (*Cistothorus palustris*) population, and appears suitable for willow flycatchers. Similarly, many portions of the Santa Ynez River upstream and downstream of the 13th Street Bridge also appear suitable for willow flycatchers, but have not had breeding SWFL since 2000 (Farmer et al. 2003). However, much of the riparian woodland habitat along his stretch of river is steeply incised, especially downstream of the bridge, and exceeds 10m in places. Incised waterways lead to unhealthy riparian ecosystems as channels downcut, the water table drops, and the perched floodplain and adjacent forest dry out (Rosgen 1997). However, in 2017 the replacement of the 13th Street Bridge was in progress, and the new bridge incorporates design features with the intent to ameliorate future channel downcutting (R. Evans personal communication 2017).

Middle Santa Ynez River near Buellton

Many sections of the middle Santa Ynez River, particularly the areas with strong historic occupancy, the “Yvonne”, “Buellton”, and “Santa Rosa” sites (see Farmer et al. 2003 and Ball et al. 2012), appear to offer exemplary SWFL breeding habitat. Historically, these sites supported the largest SWFL population in county (Farmer et al. 2003), though strong declines first observed in 2012 (Ball et al. 2012) have continued and in 2017 the “Buellton” site had the only territory found in the study area.

Management Recommendations

We concur with many of the management recommendations proposed by Ball et al. 2012.

More specifically, the following recommendations:

- 1) Promote management practices that support and to maintain SWFL habitat: relatively, but not uniformly dense growth of trees and shrubs with interior openings or openings along the edges in riparian areas. These dense patches are often interspersed with small openings, open water, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense.
- 2) Continue to manage exotic species especially giant reed (*Arundo donax*), and cape ivy (*Delairea odorata*) that degrade habitat for SWFLs and for LBVIs.
- 3) Continue surveys for SWFLs along the lower Santa Ynez River as well as the off base sites on the middle Santa Ynez River where historic SWFL breeding areas are located (it is also the area with the most recent LBVI detection). As stated in Ball et al. 2012: “This pairing allows observations on VAFB to be placed within a context of the SWFL population trend within the entire Santa Barbara County metapopulation.” These surveys will also help track the likely increase of the LBVI population on the Santa Ynez River.
- 4) Continue avian point counts along riparian corridors on VAFB at least every other year. This data provides a way to track the health of the riparian community on Base and can identify areas of both high and low riparian bird productivity (Ball et al. 2012).

In southern California, with the onset of the federal protective listing for the least Bell’s vireo and subsequent cowbird control initiation, LBVI populations increased steadily, then plateaued, indicating that the habitat reached a carrying capacity for the species (Kus and Whitfield 2005), and approximately 10 years ago the species began expanding its range north and east, and now west. Local Santa Barbara County communities and VAFB will need to make considerations for the LBVI in future riparian habitat actions. The positive LBVI population trajectory is on its way toward recovery and according to the draft LBVI

Recovery plan will require an approximate minimum of 3,300 pairs to downlist the species, and about 4,200 pairs to meet delisting criteria (USFWS 1998). The successful rebound of the least Bell's vireo population has been largely attributed to cowbird trapping. To promote continued growth, sustainable Santa Barbara County LBVI populations, and delisting of the species we recommend implementation of appropriate cowbird control measures in areas where female cowbird numbers are determined to be high and parasitism rates (of LBVI) are greater than 20-30%. More importantly, we recommend practices emphasizing restoration and maintenance of natural process on which species depend (Kus and Whitfield 2005).

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