

**Ecosystems Mission Area—Species Management Research Program**

**Prepared in cooperation with the U.S. Army Corps of Engineers**

**Least Bell's Vireo (*Vireo bellii pusillus*) and Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Surveys in the Sepulveda Dam Basin, Los Angeles County, California—2022 Data Summary**

Data Report 1177

**Cover.** Front: Riparian habitat at the Los Angeles River. Photograph by Scarlett Howell, U.S. Geological Survey, June 2022. Back: Riparian habitat along Haskell Creek recovering from a fire. Photograph by Suellen Lynn, U.S. Geological Survey, April 2022.

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By Ryan E. Pottinger and Barbara E. Kus

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**U.S. Department of the Interior  
U.S. Geological Survey**

## U.S. Geological Survey, Reston, Virginia: 2023

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## Conversion Factors

International System of Units to U.S. customary units

<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
Length		
meter (m)	3.281	foot (ft)
kilometer (km)	0.6214	mile (mi)
hectare (ha)	2.471	acre

## Datums

Horizontal coordinate information is referenced to the World Geodetic System of 1984 (WGS 84).

## Abbreviations

USFWS    U.S. Fish and Wildlife Service



# Least Bell's Vireo (*Vireo bellii pusillus*) and Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Surveys in the Sepulveda Dam Basin, Los Angeles County, California—2022 Data Summary

By Ryan E. Pottinger and Barbara E. Kus

## Executive Summary

We surveyed for Least Bell's Vireos (*Vireo bellii pusillus*; vireo) and Southwestern Willow Flycatchers (*Empidonax traillii extimus*; flycatcher) along Bull Creek, Haskell Creek, and the Los Angeles River (Sepulveda Dam project area) in Los Angeles County, California, in 2022. Four vireo surveys were completed from April 26 to July 14, and three flycatcher surveys were completed from May 19 to July 14. We detected 10 territorial male vireos, 5 of which were confirmed as paired, and 2 transient vireos. Of the 10 territorial vireos, 70 percent were detected along the Los Angeles River, 20 percent along Bull Creek, and 10 percent along Haskell Creek. Of the vireos detected, 80 percent were in habitats characterized as mixed willow, and most vireos were detected in habitats with greater than 50-percent native plant cover. One transient flycatcher was observed in the survey area in 2022.

## Introduction

The Least Bell's Vireo (*Vireo bellii pusillus*; vireo) is a small, migratory songbird that breeds in southern California and northwestern Baja California, Mexico, from April through July (Kus and others, 2022). Historically abundant within lowland riparian ecosystems, vireo populations began declining in the late 1900s as a result of habitat loss and alteration associated with urbanization and conversion of land adjacent to rivers to agriculture (Franzreb, 1989; U.S. Fish and Wildlife Service, 1998; Riparian Habitat Joint Venture, 2004). Additional factors contributing to the vireo's decline have been the expansion in range of the brood-parasitic Brown-headed Cowbird (*Molothrus ater*; cowbird) to include the Pacific Coast (U.S. Fish and Wildlife Service, 1986, 1998; Kus, 1998, 1999), and the introduction of invasive exotic plant species such as giant reed (*Arundo donax*) into

riparian systems. By 1986, the vireo population in California numbered just 300 territorial males (U.S. Fish and Wildlife Service, 1986).

In response to the precipitous decline in the number of vireos in California, the California Fish and Game Commission listed the species as endangered in 1980, and the U.S. Fish and Wildlife Service (USFWS) followed suit in 1986. Since listing, the vireo population in southern California has rebounded, largely in response to cowbird control and habitat restoration and preservation (Kus and Whitfield, 2005). As of 2006, the statewide vireo population was estimated to be approximately 2,500–3,000 territories (U.S. Fish and Wildlife Service, 2006).

Male vireos arrive on breeding grounds in southern California in mid-March with females arriving approximately 1–2 weeks after the males. Male vireos are vocally conspicuous and frequently sing their diagnostic primary song from exposed perches throughout the breeding season. Vireos depart from their breeding territories in late September through early October for their wintering grounds in southern Baja California, Mexico.

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*; flycatcher) is one of four subspecies of Willow Flycatcher in the United States, with a breeding range including southern California, Arizona, New Mexico, extreme southern parts of Nevada and Utah, and western Texas (Hubbard, 1987; Unitt, 1987). Restricted to riparian habitat for breeding, the flycatcher has declined in recent decades in response to widespread habitat loss throughout its range, and possibly, brood parasitism by cowbirds (Wheelock, 1912; Willett, 1912, 1933; Grinnell and Miller, 1944; Remsen, 1978; Garrett and Dunn, 1981; Unitt, 1984, 1987; Gaines, 1988; Schlorff, 1990; Whitfield and Sogge, 1999). By 1993, the species was believed to number approximately 70 pairs in California (U.S. Fish and Wildlife Service, 1993) in small, disjunct populations. The flycatcher was listed as endangered by the State of California in 1992 and by the USFWS in 1995.

Male flycatchers typically arrive on breeding grounds in southern California in early to mid-May, whereas females arrive approximately 1 week later. While on the breeding grounds, males sing repeatedly from exposed perches. Flycatchers depart from their breeding territories in mid-August through early September for their wintering grounds in Central America and northern South America.

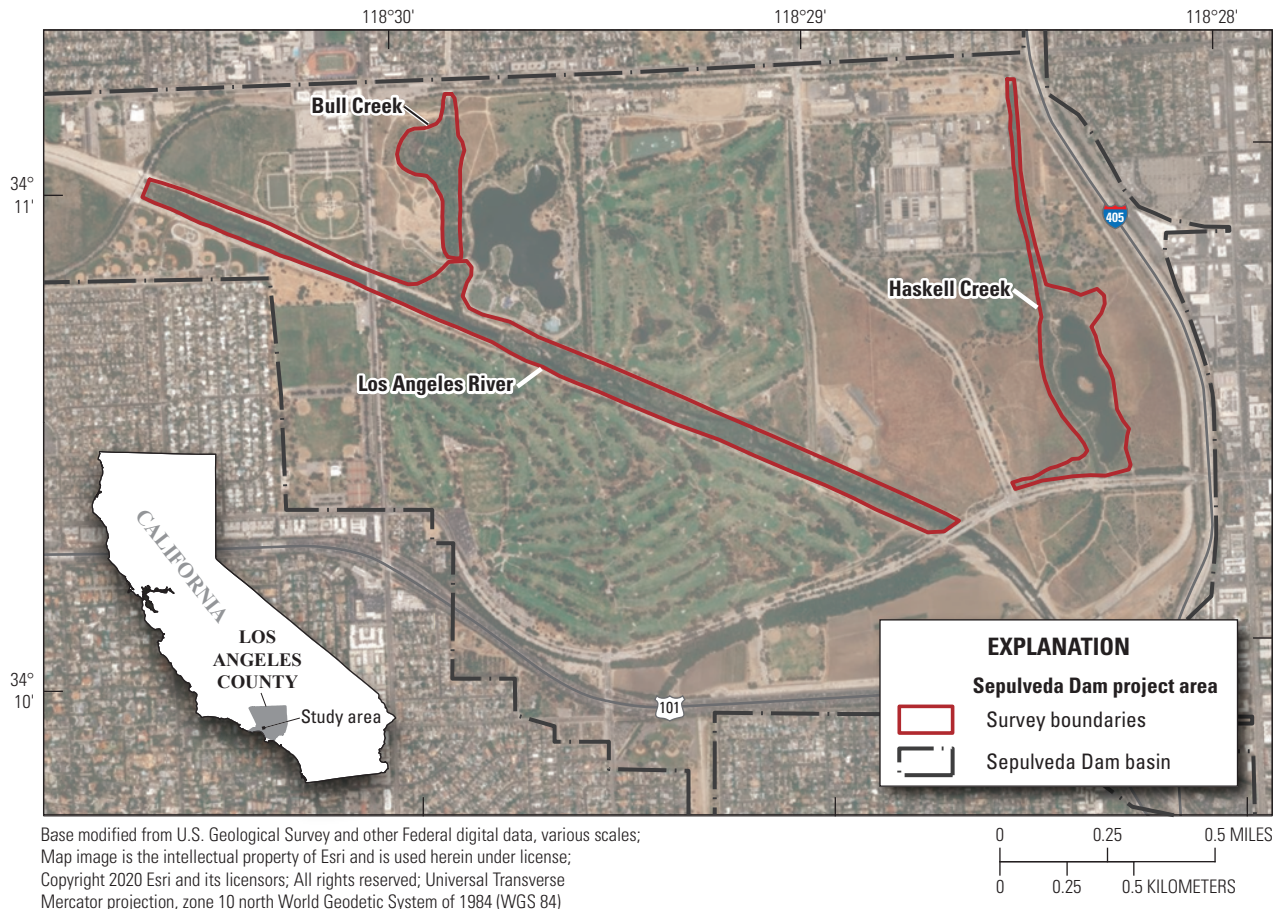
Flycatchers in southern California co-occur with vireos. However, unlike the vireo, which has increased tenfold since the mid-1980s in response to management to alleviate threats (U.S. Fish and Wildlife Service, 2006), the number of flycatchers has remained low. Currently, most flycatchers in California are concentrated at one site: the upper San Luis Rey River at Lake Henshaw in San Diego County (Howell and Kus, 2022). Outside of this site, flycatchers occur as small, isolated populations of one to six pairs.

The purpose of this study was to document the distribution and abundance of vireos and flycatchers in 2022 in the Sepulveda Dam basin in Los Angeles County, California. These data will inform natural resource managers about the status of these endangered species at the Sepulveda Dam basin.

## Methods

### Study Area

The Sepulveda Dam, located in the city of Los Angeles, California, was completed by the U.S. Army Corps of Engineers in 1941 with the primary purpose of flood risk management and the secondary purpose of recreation. The Sepulveda Dam basin is comprised of more than 800 hectares (ha) west of Interstate 405 and north of U.S. Highway 101. The study area is in the Sepulveda Dam basin along a 4-kilometer (km) stretch of the Los Angeles River, a 2-km stretch of Haskell Creek, and a 1-km stretch along Bull Creek (fig. 1). These stretches of river are surrounded by recreational areas and contain narrow strips of riparian habitat comprised of native and non-native species. Disturbances such as homeless camps, fire, and invasive exotic plants are pervasive throughout the study area. Several fires have burned sections of riparian vegetation in the study area, including a fire that burned approximately 24 ha in 2019 (Los Angeles Fire Department, 2019), from which the riparian vegetation is still recovering.



**Figure 1.** Locations of Least Bell's Vireo (*Vireo bellii pusillus*) and Southwestern Willow Flycatcher (*Empidonax traillii extimus*) survey sites at Sepulveda Dam project area, Los Angeles County, California, 2022.

## Surveys

Biologists Scarlett Howell and Suellen Lynn from the U.S. Geological Survey (USGS) surveyed for vireos and flycatchers under USFWS permit ESPER0004080\_0.1 following standard survey techniques (U.S. Fish and Wildlife Service, 2001; Sogge and others, 2010). Four vireo surveys were completed between April 26 and July 14, 2022, and three flycatcher surveys were completed between May 19 and July 14, 2022 (table 1). Observers walked slowly through or adjacent to riparian habitat, listening and searching for vireos and flycatchers and systematically playing a recording of a vireo or flycatcher song to elicit a territorial response. Surveys typically began at sunrise and were completed by early afternoon, avoiding conditions of high winds and extreme heat that can reduce bird activity and detectability. For each vireo or flycatcher encountered, observers recorded age (adult or juvenile), sex, breeding status (paired, undetermined, or transient), and whether the bird was banded. A male was considered paired if a female was visually detected, if we heard vocalizations unique to mated birds, or if we observed evidence of breeding (for example, food carry, a nest, or dependent juveniles in the territory). A vireo or flycatcher was considered transient if detected only once or, if more than once, detections were less than 2 weeks apart.

**Table 1.** Dates and results of Least Bell's Vireo (*Vireo bellii pusillus*) and Willow Flycatcher (*Empidonax traillii*) surveys in the Sepulveda Dam project area, Los Angeles County, California, in 2022.

[M, male; F, female; U, unknown sex; J, juvenile; —, no data]

Survey date	Number							
	Least Bell's Vireo				Willow Flycatcher			
	M	F	U	J	M	F	U	J
04/26/2022	8	3	0	0	—	—	—	—
05/19/2022	8	1	0	0	0	0	1	0
06/16/2022	8	2	0	0	0	0	0	0
07/14/2022	10	1	0	0	0	0	0	0

The four sub-species of Willow Flycatcher are visually similar in plumage and are difficult to distinguish in the field. Several of the subspecies migrate through California on the way to their breeding grounds. Because multiple subspecies of flycatchers may be encountered during surveys, we refer to non-resident flycatchers in tables and figures as Willow Flycatchers (*Empidonax traillii*) and refer to resident breeding flycatchers as Southwestern Willow Flycatchers.

Vireo and flycatcher locations were recorded using Environmental Systems Research Institute (Esri) Field Maps (Environmental Systems Research Institute, 2022) on an Android phone with 1 to 15-meter (m) positioning accuracy to determine geographic coordinates (World Geodetic System of 1984 [WGS 84]). Dominant native and exotic plants were recorded at each territory location, and percent cover of native vegetation was estimated using categories of less than 5 percent, 5–50 percent, 51–95 percent, and greater than 95 percent. The overall habitat type within the territory was specified according to the following categories:

**Mixed willow riparian:** Habitat dominated by one or more willow species, including Gooding's black willow (*Salix gooddingii*), arroyo willow (*S. lasiolepis*), and red willow (*S. laevigata*), with mule fat (*Baccharis salicifolia*) as a frequent co-dominant.

**Willow-cottonwood:** Willow riparian habitat in which Fremont cottonwood (*Populus fremontii*) is co-dominant.

**Willow-sycamore:** Willow riparian habitat in which California sycamore (*Platanus racemosa*) is co-dominant.

**Sycamore-oak:** Woodlands in which California sycamore and coast live oak (*Quercus agrifolia*) occur as co-dominants.

**Riparian scrub:** Dry or sandy habitat dominated by sandbar willow (*S. exigua*) or mule fat, with few other woody species.

**Upland scrub:** Coastal sage scrub adjacent to riparian habitat.

**Non-native:** Sites vegetated exclusively with non-native species, such as giant reed (*Arundo donax*) and salt cedar (*Tamarix ramosissima*).



## Results

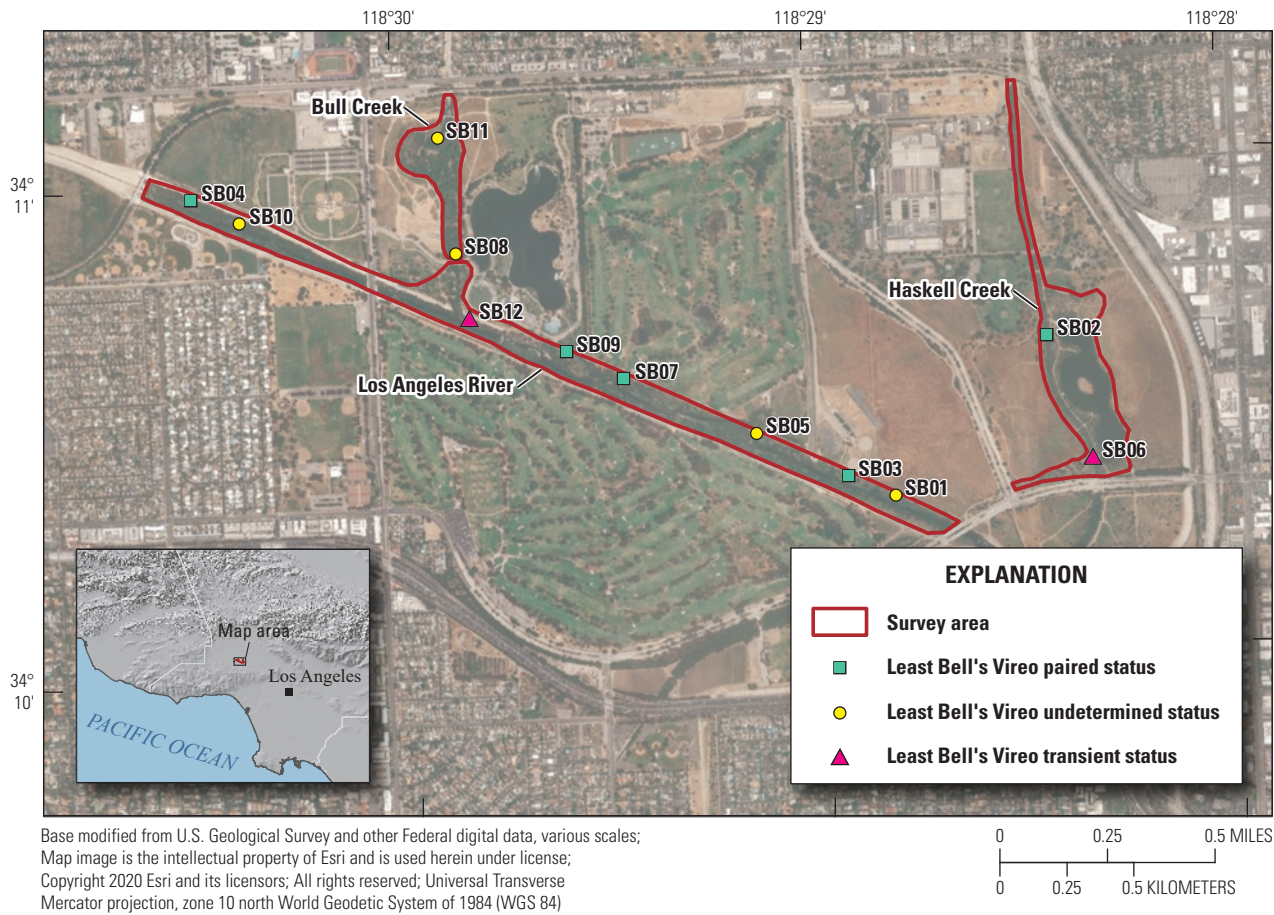
A total of 10 territorial male vireos and 2 transient vireos were detected in 2022 (table 2; fig. 2). Of the 10 territorial vireos, 5 were confirmed as paired, and 5 were of undetermined status. Three banded vireos were observed, each with a single silver metal federal band on the right leg, indicating they were part of a genetics study completed in 2020 (B. Kus, U.S. Geological Survey, unpub. data, 2020). Juvenile vireos were not detected during surveys.

Least Bell's Vireos were detected in three habitat types, with 80 percent of vireo territories occurring in mixed willow riparian habitat and the remaining 20 percent occurring in willow habitat co-dominated by cottonwoods or sycamores (table 3). Of the vireo territories, 80 percent occurred in habitat comprised of greater than 50-percent native plant cover (table 4). Both territories occurring in habitat with less than 50-percent native vegetation were in areas co-dominated by willows and the exotic tree Shamel ash (*Fraxinus uhdei*).

One Willow Flycatcher of unknown subspecies was detected on May 19, 2022 (table 1; fig. 3). The transient Willow Flycatcher occupied riparian habitat comprised of greater than 95-percent native habitat dominated by willow and cottonwood.

**Table 2.** Number and breeding status of territorial Least Bell's Vireo (*Vireo bellii pusillus*) in the Sepulveda Dam project area, Los Angeles County, California, in 2022.

Subarea	Number of territorial males	Number of pairs	Number of birds with undetermined status	Number of transients
Bull Creek	2	0	2	0
Haskell Creek	1	1	0	1
Los Angeles River	7	4	3	1
<b>Total</b>	<b>10</b>	<b>5</b>	<b>5</b>	<b>2</b>



**Figure 2.** Least Bell's Vireo (*Vireo bellii pusillus*) detections and breeding status on Bull Creek, Haskell Creek, and the Los Angeles River, Sepulveda Dam project area, Los Angeles County, California, in 2022.

**Table 3.** Habitat types used by Least Bell's Vireo (*Vireo bellii pusillus*) in the Sepulveda Dam project area, Los Angeles County, California, in 2022.

[**Mixed willow riparian:** Habitat dominated by one or more willow species, including Gooding's black willow, arroyo willow, and red willow, with mule fat as frequent co-dominant. **Willow-cottonwood:** Willow riparian habitat in which Fremont cottonwood is co-dominant. **Willow-sycamore:** Willow riparian habitat in which California sycamore is co-dominant. **Abbreviations:** <, less than; >, greater than]

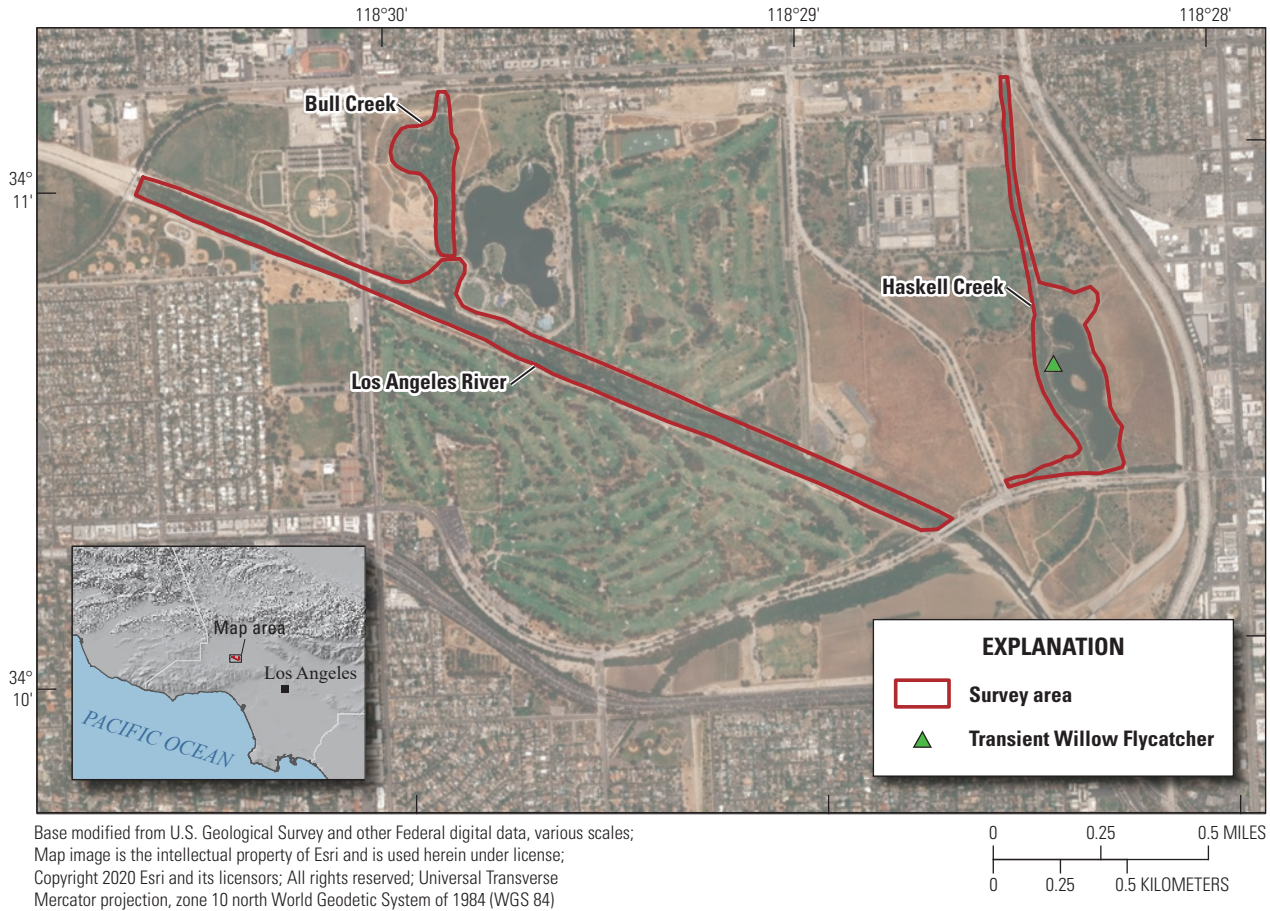
Habitat type	Number of territories				Total
	<5-percent native	5- to 50-percent native	51- to 95-percent native	>95-percent native	
Mixed willow riparian	0	2	6	0	8
Willow-cottonwood	0	0	0	1	1
Willow-sycamore	0	0	0	1	1
<b>Total</b>	0	2	6	2	10

**Table 4.** Vegetation composition of Least Bell's Vireo (*Vireo bellii pusillus*) territories in the Sepulveda Dam project area, Los Angeles County, California, in 2022.

[**Mixed willow riparian:** Habitat dominated by one or more willow species, including Gooding's black willow, arroyo willow, and red willow, with mule fat as frequent co-dominant. **Willow-cottonwood:** Willow riparian habitat in which Fremont cottonwood is a co-dominant. **Willow-sycamore:** Willow riparian habitat in which California sycamore is a co-dominant. **Abbreviation:** >, greater than]

Territory	Habitat type	Dominant species	Percentage native cover	Dominant exotic species
SB01	Mixed willow riparian	Red or arroyo willow	51 to 95	Black mustard
SB02	Willow-cottonwood	Fremont cottonwood	>95	
SB03	Mixed willow riparian	Red or arroyo willow	51 to 95	Black mustard
SB04	Willow-sycamore	California sycamore	>95	
SB05	Mixed willow riparian	Red or arroyo willow	51 to 95	Black mustard
SB07	Mixed willow riparian	Shamel ash, red or arroyo willow	5 to 50	Black mustard, Shamel ash
SB08	Mixed willow riparian	Gooding's black willow	51 to 95	Black mustard
SB09	Mixed willow riparian	Red or arroyo willow	51 to 95	Black mustard
SB10	Mixed willow riparian	Shamel ash, Gooding's black willow	5 to 50	Gum tree ( <i>Eucalyptus sp.</i> ), Shamel ash
SB11	Mixed willow riparian	Gooding's black willow	51 to 95	Black mustard

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**Figure 3.** Willow Flycatcher (*Empidonax traillii*) detection and breeding status at Haskell Creek, Sepulveda Dam project area, Los Angeles County, California, in 2022.



## Summary

In 2022, we documented 10 vireo territories at the Sepulveda Dam project area. The population of vireos at the Sepulveda Dam decreased by 29 percent since 2018, when 14 vireo territories were documented (Pottinger and Kus, 2019). Most of the decrease occurred at Haskell Creek, which declined from three territories in 2018 (Pottinger and Kus, 2019) to one in 2022. The decline in vireo territories at Haskell Creek is most likely attributable to a fire that occurred in 2019 (Los Angeles Fire Department, 2019). We observed many homeless encampments in the project area, which are likely contributing to increased fire frequency. Although riparian vegetation usually recovers to levels usable by vireos within 2–3 years post-fire (B. Kus, U.S. Geological Survey, unpub. data), fires occurring on an annual basis are likely detrimental to riparian vegetation, and therefore, negatively affect Least Bell's Vireo population levels.

No breeding flycatchers were detected in 2022 at the Sepulveda Dam project area. The detection of one transient Willow Flycatcher suggests the vegetation at the Sepulveda Dam project area may provide stopover habitat for migrating flycatchers.

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