

# AVIAN SPECIES SURVEYS OF THE RIPARIAN AREAS OF THE WIND WOLVES PRESERVE, CALIFORNIA



PREPARED FOR THE WILDLANDS CONSERVANCY

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## **EXECUTIVE SUMMARY**

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During spring and summer 2010, bird surveys were conducted in 11 riparian areas on Wind Wolves Preserve in central California. These riparian areas were considered potential habitat for sensitive species such as Southwestern willow flycatcher and Least Bell's vireo. Survey methods included systematically walking through the habitat and recording all avian species seen or heard, recording locations of special status birds, and documenting any breeding evidence. Despite the relatively short-term nature of the surveys, 73 avian species were documented in the riparian areas. Willow flycatchers were detected at 4 of the 11 riparian areas but were determined to be migrant birds using the property as a staging area. However, it was unclear whether these individuals represent the federally endangered subspecies Southwestern willow flycatcher (*E. traillii extimus*) or the state listed Little willow flycatcher (*E. traillii brewsteri*). The federally endangered Least Bell's vireo was documented breeding at the Willows riparian area. This is only the second known population of breeding vireos in the San Joaquin valley and may represent the beginning of the re-colonization of the Central Valley by this species. Wind Wolves Preserve clearly supports a diversity of avian species and because of its size, habitat diversity, and habitat quality, the Wind Wolves Preserve can contribute significantly to the conservation of special status avian species as well as regional biological diversity. Recommendations include (1) conducting an in depth study of Least Bell's vireo on the property, (2) studying and possibly controlling the Brown-headed cowbird population at the Willows riparian area, (3) monitoring natural habitat succession to ensure favorable conditions for vireo breeding, (4) managing and controlling invasive plants in sensitive areas, (5) installing a grade control structure to halt the process of the down-cutting of San Emigdio creek, (6) continuing to limit cattle access in riparian areas, and (7) conducting annual surveys for Willow flycatcher presence and breeding in core riparian areas.

## **INTRODUCTION**

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The Southwestern willow flycatcher (*Empidonax traillii extimus*; hereafter “flycatcher” or “WIFL”) and the Least Bell’s vireo (*Vireo bellii pusillus*; hereafter “vireo” or “LBVI”) were once common riparian breeders in the San Joaquin and Sacramento Valleys of California (Grinnell and Miller 1944). Habitat conversion to agriculture and nest parasitism by Brown-headed cowbird (*Molothrus ater*; here after “cowbird”) is likely responsible for the dramatic population declines observed in these species during the twentieth century. This decline resulted in the total extirpation of flycatcher and vireo populations in all low elevation habitats in the Central Valley by 1980 (USFWS 1998, USFWS 2002, RHJV 2004). Though flycatchers have not been documented breeding in the Central Valley since the 1950’s, vireos have begun a limited re-colonization of the Central Valley. In 2005, after a 50-year absence, vireos successfully bred on the San Joaquin River National Wildlife Refuge (SJRNR) (Howell et al. 2010, Kreitinger and Wood 2005). As more riparian habitat has become available in the Central Valley due to restoration efforts, the vireo has responded by colonizing some of these areas such as on the SJRNR (Howell et al. 2010).

In April 2009, two advertising male vireos were detected on the Wind Wolves Preserve at the Willows riparian area and subsequently observed throughout the breeding season (D. Clendenen pers. comm.). However, aside from incidental records, no intensive surveys of the Wind Wolves Preserve’s riparian areas had been conducted. The objective of this project was to document the presence and/or potential breeding status of vireos and flycatchers on the Wind Wolves Preserve in the southern San Joaquin Valley, California.

## **STUDY AREA**

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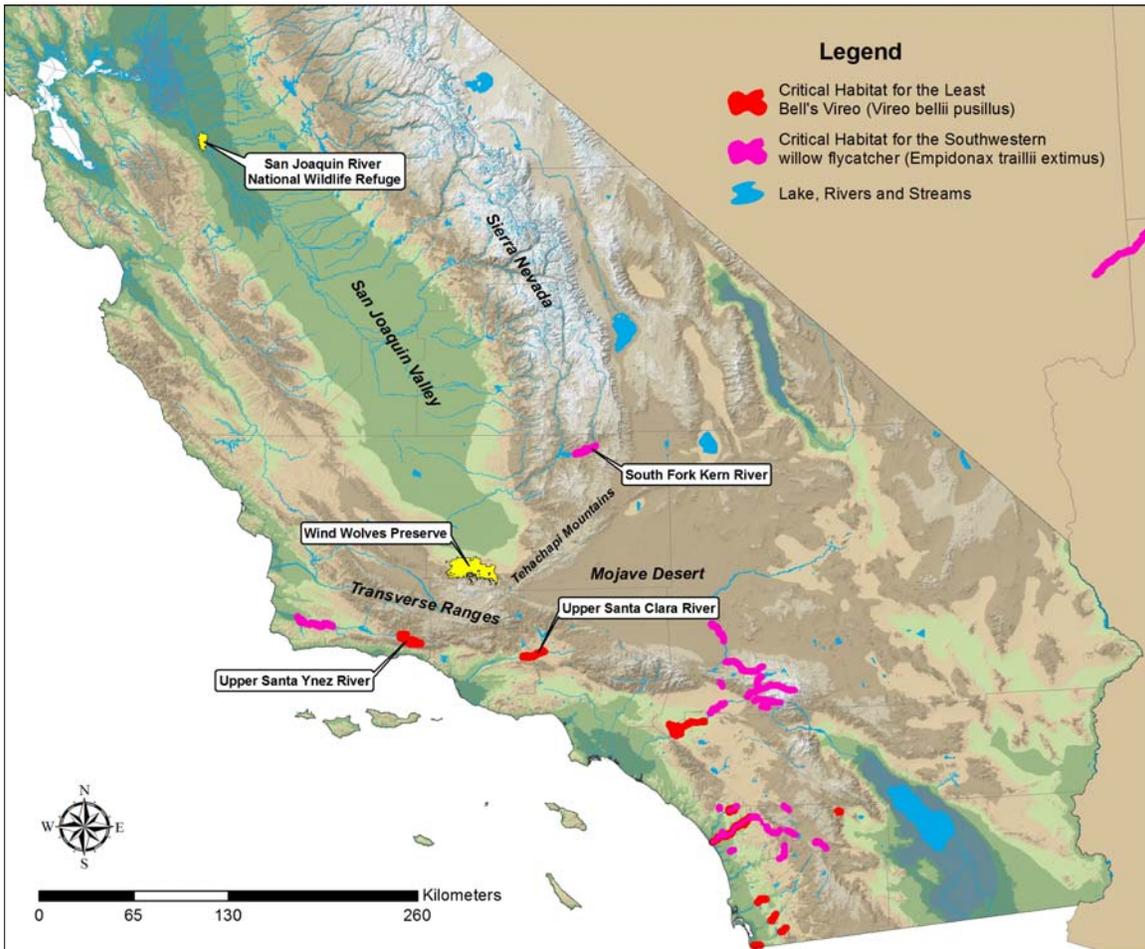
Surveys were conducted on the Wind Wolves Preserve, a privately owned 97,000-acre preserve located in the southern San Joaquin Valley. The preserve, administered by The Wildlands Conservancy, is situated at the general confluence of the San Joaquin Valley, the Transverse Ranges, the Sierra Nevada, and the Mojave Desert (Figure 1). This convergence of biogeographic regions supports a diverse array of habitats, plants and animals.

Our surveys focused on all the major creek drainages supporting willow riparian habitat on the preserve. Many of these creeks historically fed the once extensive Buena Vista and Kern Lakes on the San Joaquin Valley floor. Though these bodies of water no longer exist, the riparian areas associated with these tributaries are preserved intact on the preserve. After consulting with preserve ecologist David Clendenen and reviewing relevant orthophotography, we selected 11 areas containing the highest quality willow-riparian habitat for survey.

On the western portion of the preserve we selected the following drainages for surveys: Little Lobo Drainage, Muddy Creek, San Emigdio Canyon (Twin Fawns and the Willows), and San Emigdio Canyon tributaries (Doc Williams Canyon and Western Side Canyon) (Figure 2).

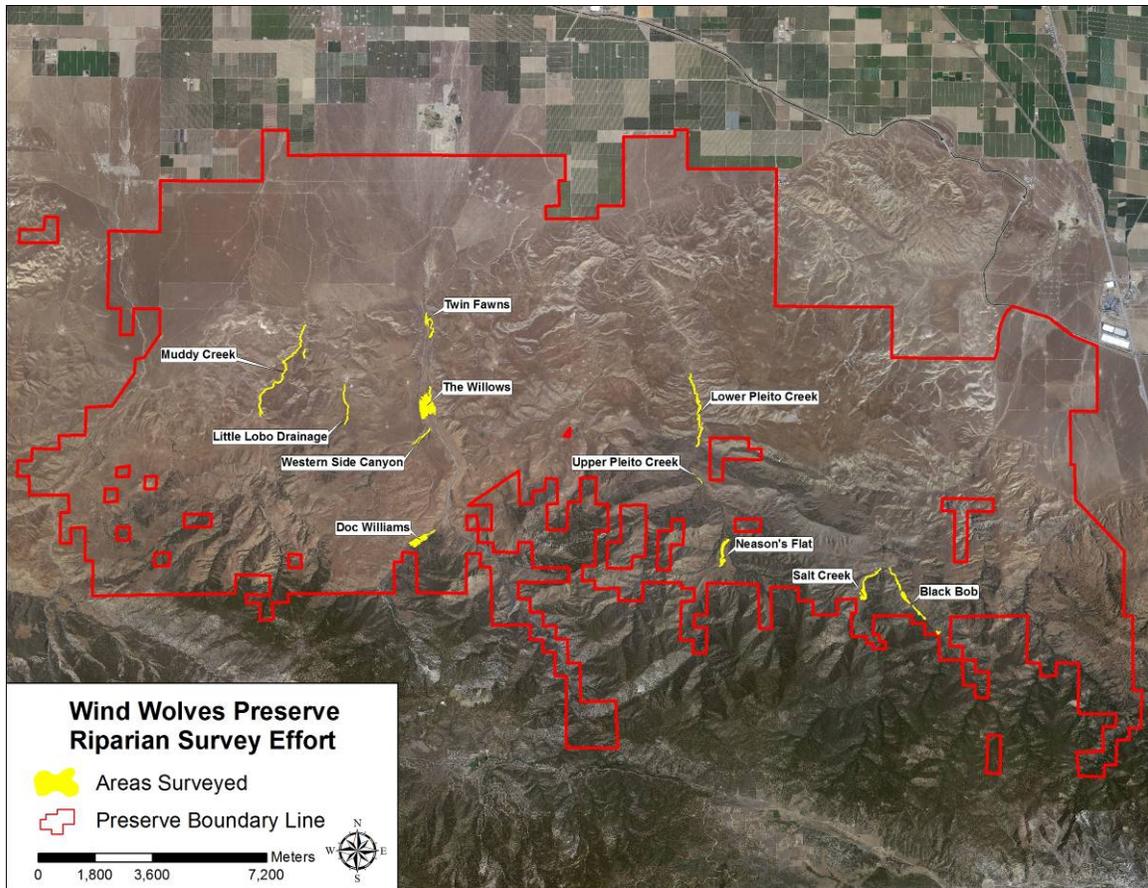
On the eastern portion of the preserve we selected the following drainages for surveys: Black Bob Canyon, Neason’s Flat, Pleito Creek (upper and lower sections), and Salt Creek (Figure 2).

While all sites were characterized by willow-riparian habitat dominated by willows (*Salix* spp.) and Fremont cottonwood (*Populus fremontii*), San Emigdio Canyon (Twin Fawns and the Willows), Doc Williams Canyon, Black Bob Canyon, and Salt Creek exhibited a relatively wider riparian corridor with a well-developed understory. Dominant understory species included mulefat (*Baccharis salicifolia*), mugwort (*Artemisia douglasiana*), marsh baccharis (*Baccharis douglasii*), creek nettle (*Urtica dioica*), virgin’s bower (*Clematis ligusticifolia*), wild rose (*Rosa californica*), and elderberry (*Sambucus mexicana*). The remaining drainages were characterized by a poorly developed understory and a sparsely treed, narrow riparian strip.



**Figure 1. Map of Central and Southern California with locations of critical habitat for Least Bell’s vireo and southwestern willow flycatcher relative to the Wind Wolves Preserve.**

The Black Bob Canyon riparian area also contained a significant desert olive (*Forestiera pubescens*) component in the lower portions of the drainage. San Emigdio Canyon (Twin Fawns and the Willows), Doc Williams Canyon, and Los Lobos Canyon contained large sections of emergent wetland dominated by American three-square sedge (*Scirpus americanus*).



**Figure 2. Areas surveyed on Wind Wolves Preserve for flycatcher and vireo during the 2010 breeding season.**

## METHODS

All major drainages supporting riparian habitat on Wind Wolves Preserve were surveyed for vireos and flycatchers between 22 April and 18 July 2010. Field work was conducted by Morgan Ball (USFWS recovery permit# TE031913-2) and Craig Fiehler. Surveying biologists followed standard techniques described by the United States Fish and Wildlife Service (USFWS) and United States Geologic Survey (USGS) in the official vireo and flycatcher survey protocols (USFWS 2001, Sogge et al. 2010). However, the objective of this study was to perform reconnaissance-level surveys to establish the presence and/or potential breeding of these species, not to establish negative declaration. For this reason, the visitation schedules prescribed in the USFWS protocols were not strictly adhered to.

Each creek drainage was surveyed one to five times during the 2010 breeding season. Surveys performed at higher elevation sites were initiated later in the field season. Observers walked slowly (1-2 km/hour) through the riparian areas while searching and listening for vireos and flycatchers. Playback surveys were performed for flycatcher in accordance with USFWS protocol methodologies (Sogge et al. 2010). All vocalizing vireos and flycatchers were identified acoustically by diagnostic song and confirmed

visually when possible. Vireo and flycatcher locations were recorded with a GPS device and territories were estimated and mapped on aerial photos of the survey area. In addition, a comprehensive bird species list was recorded during all field surveys and tallies were performed of all cowbirds detected. Appendix A provides a list of all bird species detected at each riparian survey area on the Wind Wolves Preserve.

All surveys were performed during fair weather conditions between one half hour after sunrise and 10:00am. However, additional observations were made during midday hours at locations where territorial male vireos and flycatchers were detected in an attempt to ascertain breeding status as well as territory size and extent (Figures 3 - 5). To minimize disturbance, surveyors did not attempt to locate nests within occupied territories opting instead to determine breeding status through passive observation of bird movement and interaction.

All drainages in which vireos or flycatchers were detected were surveyed subsequently to determine if the individuals were breeding residents or migrants that were moving through the area. Table 1 provides the dates that each survey location was visited throughout the study period.

**Table 1. Dates of flycatcher and vireo survey effort on Wind Wolves Preserve during the 2010 breeding season.**

Survey Area	Dates Surveyed				
	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5
Black Bob Canyon	9-May-2010	30-May-2010	18-Jul_2010	-	-
Doc Williams Canyon	23-Apr-2010	27-Jun-2010	-	-	-
Little Lobo Drainage	2-May-2010	-	-	-	-
Muddy Creek	2-May-2010	-	-	-	-
Neason's Flat	29-May-2010	-	-	-	-
Pleito Creek (Lower)	15-May-2010	2-Jul-2010	-	-	-
Pleito Creek (Upper)	29-May-2010	-	-	-	-
Salt Creek	9-May-2010	30-May-2010	18-Jul-2010	-	-
San Emigdio Canyon (The Willows)	22-Apr-2010 <i>-partial survey-</i>	23-Apr-2010 <i>-partial survey-</i>	16-May-2010	27-Jun-2010	11-Jul-2010
San Emigdio Canyon (Twin Fawns)	22-Apr-2010	16-Jul-2010	-	-	-
Western Side Canyon	23-Apr-2010	27-Jun-2010	-	-	-

## RESULTS

### *SOUTHWESTERN WILLOW FLYCATCHER*

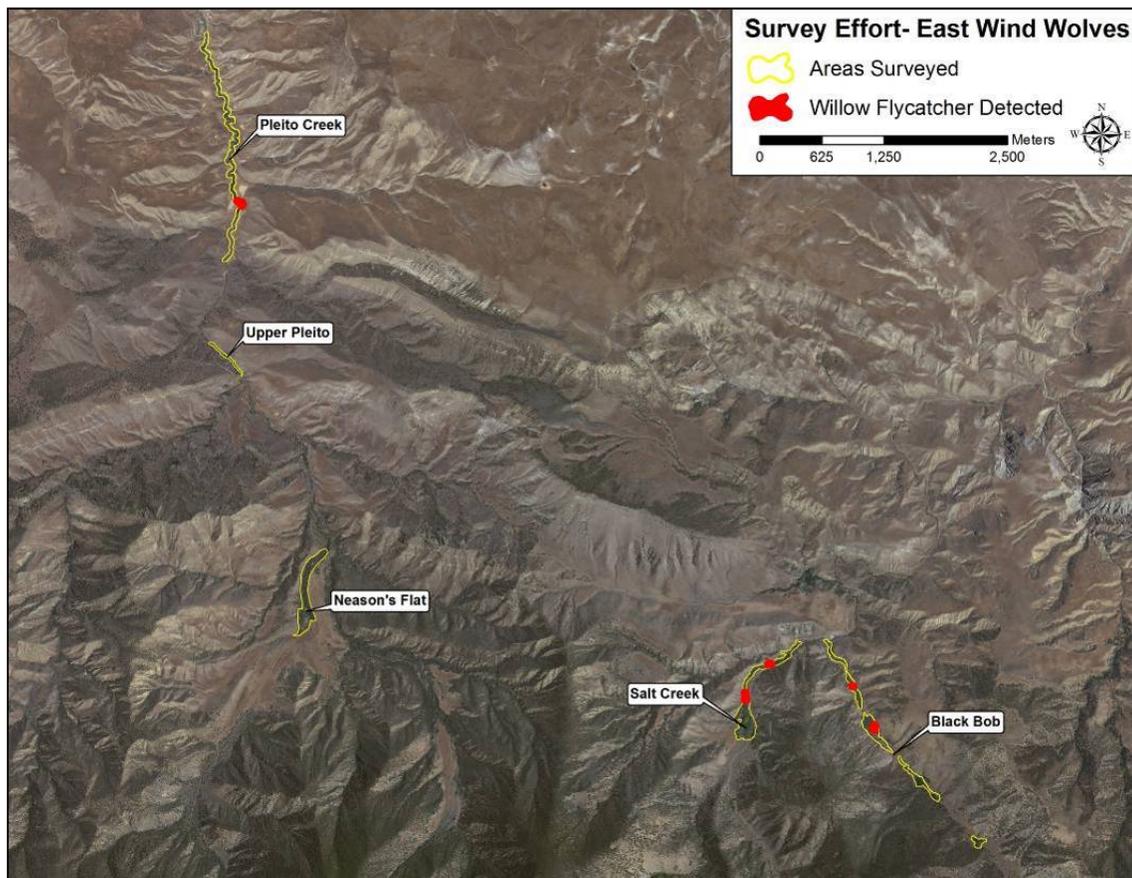
Flycatchers were observed at four drainages during the survey period (Figures 3 and 4; Table 2). However, detections were limited to a period between 9-30 May 2010 and no breeding activity or banded birds were observed. Table 2 provides dates and observation summaries for all flycatchers observed on the preserve throughout the survey period.

The Willows section of San Emigdio Canyon had the largest number of flycatchers counted on any particular day with six confirmed and 2 probable flycatchers (Figure 3).

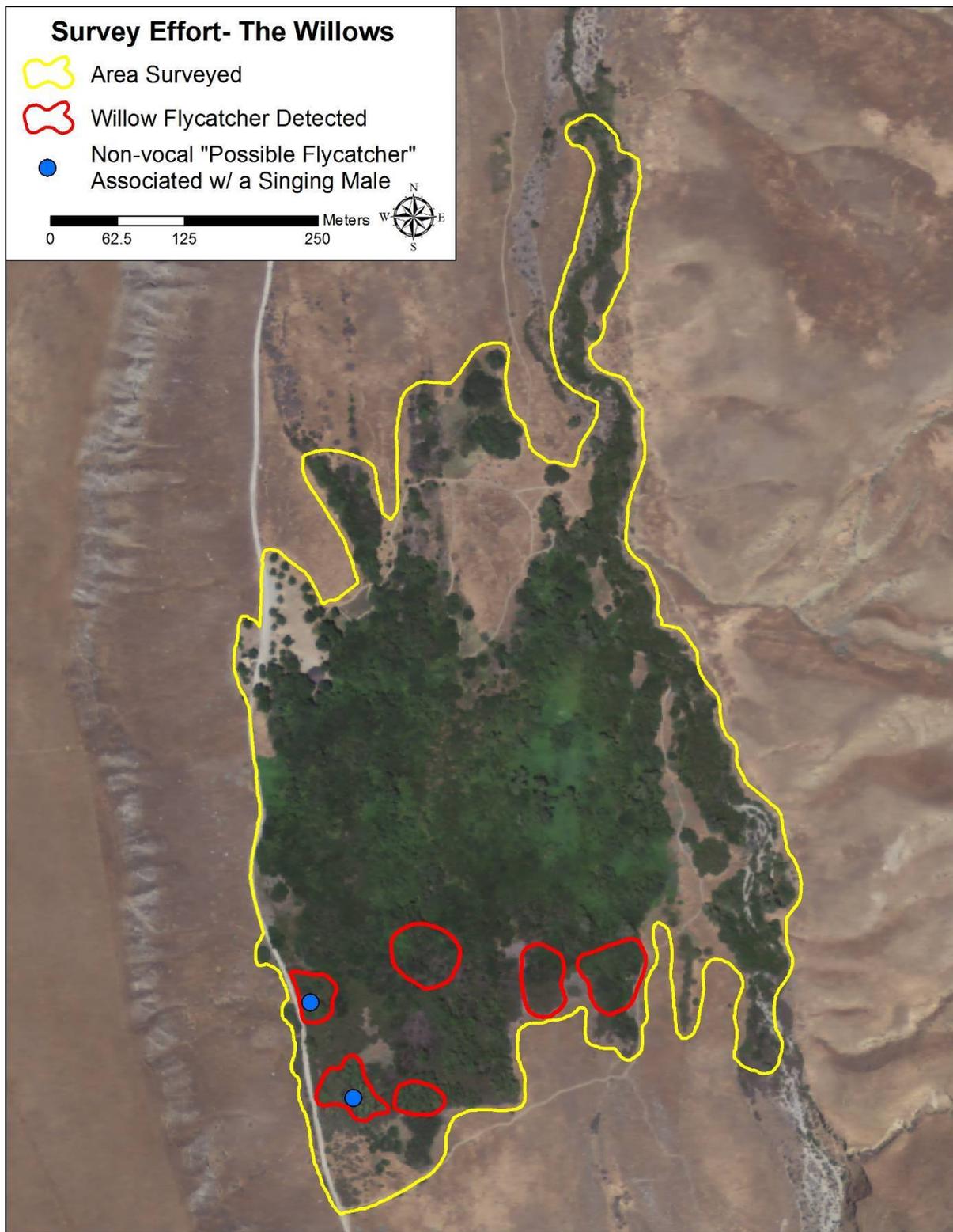
However, as with the upper section of Pleito Creek, the birds only remained onsite long enough for detection during a single survey (Figure 4). Flycatchers were observed during two survey sessions in Black Bob Canyon and Salt Creek although observed territory placement was not consistent from visit to visit (Figure 4).

**Table 2. Record of flycatcher observations on Wind Wolves Preserve during the 2010 breeding season.**

Survey Area	Date	Flycatcher Observations
Black Bob Canyon	9-May-10	possible WIFL- only heard 2 "Wits" & 1 "Breet"
	30-May-10	4 male WIFLs- "Fitz-bew" heard
Pleito Creek (Lower)	15-May-10	3 male WIFLs- "Fitz-bew" heard within a 90m area
Salt Creek	9-May-10	1 male WIFL- "Fitz-bew" heard
	30-May-10	1 male WIFL- "Fitz-bew" heard
San Emigdio Canyon (The Willows)	16-May-10	6 male WIFL- "Fitz-bew" heard, 2 non-vocal "possible WIFLs" seen in association with advertising males



**Figure 3. Areas of flycatcher detection in Eastern Wind Wolves Preserve during the 2010 breeding season.**



**Figure 4. Areas of flycatcher detection at the Willows in San Emigdio Canyon on 16 May 2010.**

## *LEAST BELL'S VIREO*

Throughout the survey period, all vireo detections were limited to the Willows section of San Emigdio Canyon. At one point in the season as many as five territorial males were detected (Figure 5). However, only two advertising males remained onsite throughout the breeding season with one territory remaining highly stable (Figure 5). All but the westernmost advertising male on 16 May were both seen and heard, however bands were

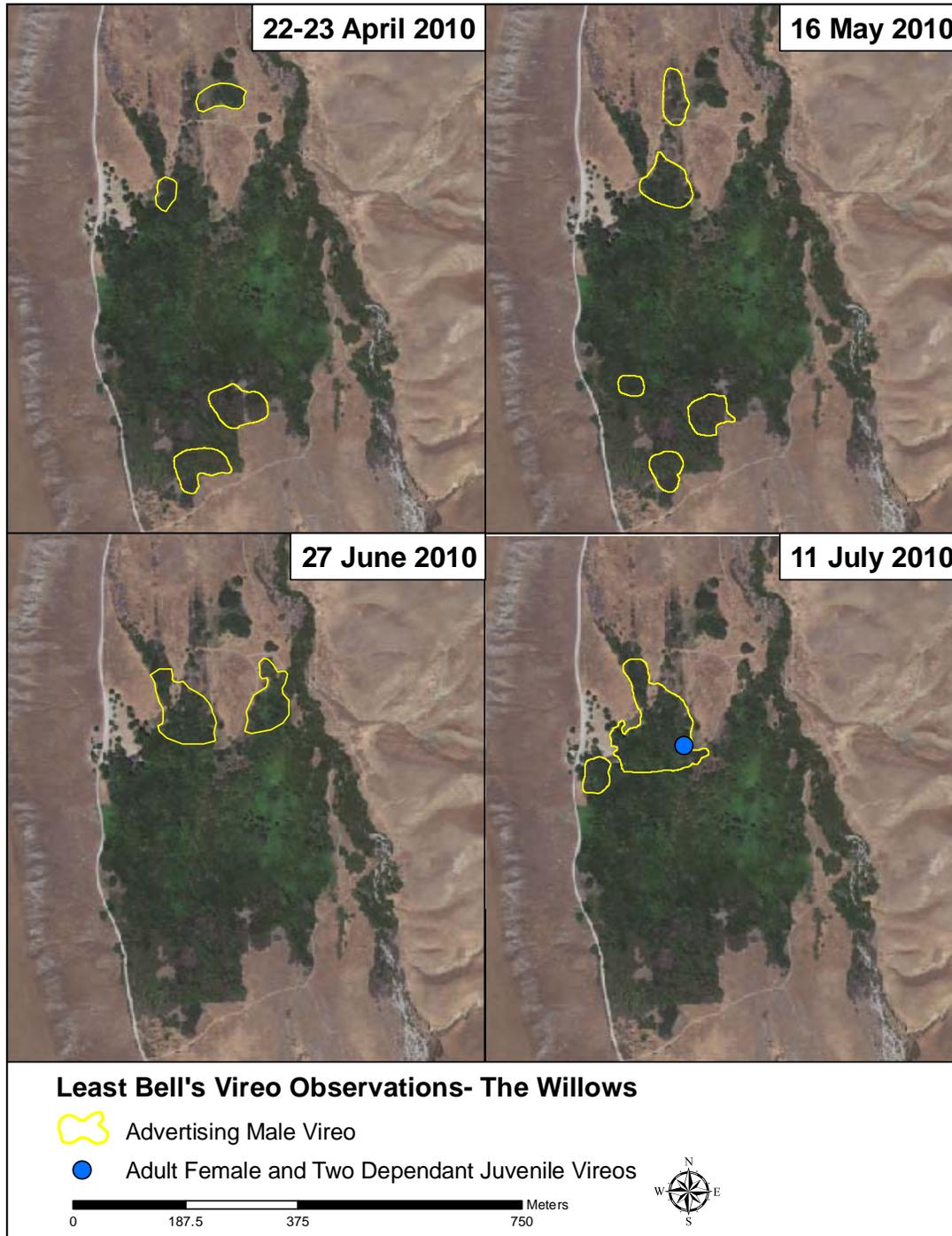


Figure 5. Areas of vireo detection at the Willows in San Emigdio Canyon during the 2010 breeding season.

not observed on any individuals. During all surveys, efforts were made to track the movements of the vocalizing males in an attempt to determine the presence of a female or other breeding activity. These observations were always performed from a trail or the riparian edge to minimize disturbance.

No non-male vireo detections or interaction vocalizations were observed during the three initial visits (22-23 April, 16 May and 27 June) to the Willows. Fortunately, trailside observations during the final site visit on 11 July proved successful. During that survey, the movements of an advertising male were tracked throughout its territory until a short series of interaction calls was detected. These calls lead to the discovery of two dependant juvenile vireos accompanied by an adult female vireo and the highly vocal male. The juvenile birds were observed wing-begging at and being provisioned by the advertising male while the adult female remained nearby performing intermittent interaction calls. Attempts were made to track the movements of the other male vireo observed on that day but no paired birds or breeding activity was detected.

### ***BROWN-HEADED COWBIRD***

Brown-headed cowbirds were observed in low numbers at 7 of the 11 survey areas on Wind Wolves Preserve (Table 3).

**Table 3. The number of Brown-headed cowbirds observed during riparian bird surveys on Wind Wolves Preserve from 22 April 2010 to 11 July 2010. Survey areas in bold indicate locations where vireos and/or flycatchers were detected.**

Survey Area	Number of Cowbirds					Average
	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	
Doc Williams Canyon	1	3	n/a	n/a	n/a	2
Los Lobos	1	n/a	n/a	n/a	n/a	1
<b>Pleito Creek (Lower)</b>	5	4	n/a	n/a	n/a	4.5
<b>Salt Creek</b>	1	1	0	n/a	n/a	0.67
<b>San Emigdio Canyon (The Willows)</b>	0	0	1	0	2	0.6
San Emigdio Canyon (Twin Fawns)	4	1	n/a	n/a	n/a	2.5
Western Side Canyon	2	0	n/a	n/a	n/a	1

## **DISCUSSION**

### ***SOUTHWESTERN WILLOW FLYCATCHER***

While no breeding activity was observed, flycatcher occurrence during the breeding season indicates that Wind Wolves Preserve is a potentially important stopover location during the spring migration route. However, it is not clear whether these individuals represent the federally endangered subspecies, Southwestern willow flycatcher (*E. traillii extimus*) or Little willow flycatcher (*E. traillii brewsteri*) which is listed as state threatened in California. This distinction cannot be made without observation of a clearly banded individual or morphometric and colorimeter data of an individual in the hand (Phillips et al. 1966, Paxton et al. 2010).

Given Wind Wolves Preserve's geographic position at the junction of the Transverse Ranges and the southern extent of the Sierra Nevada, it is more than likely that both subspecies utilize the preserve as a stopover location on their northward migration (Figure 1). While most of the *E. traillii extimus* breeding population along the South Fork Kern River is banded, the lack of banded bird sightings on Wind Wolves Preserve does not rule out the possibility that some of the observed flycatchers were making their way to the South Fork Kern River to breed (M. Whitfield pers. comm.)

The best indicators of habitat quality for flycatchers in California include riparian width, density, structural complexity, the presence of long-lasting moisture or flow (Sedgewick 2000; Hatten et al. 2010, Sogge et al. 2010). Based on these habitat indicators, four sites on Wind Wolves Preserve (the Willows, Twin Fawns, Black Bob Canyon, and Salt Creek Canyon) have the potential to support breeding flycatcher. Therefore, annual surveys to determine the late breeding season presence of flycatcher should be considered.

Although flycatchers do not currently breed on Wind Wolves Preserve, the property possesses quality habitat and is geographically situated to serve as a potentially significant migratory stopover locality for the species.

### ***LEAST BELL'S VIREO***

During the breeding season, multiple male vireos were observed in the Willows section of San Emigdio Canyon, but only one bird appeared to form a pair bond and successfully breed. Of the five observed vireo territories, three ultimately disappeared, the fourth territory shifted during the latter portion (presumably the same male) of the breeding season, and the territory where breeding was eventually confirmed remained relatively static while growing in size through the course of the season. Given that aggressive nest searches were not performed it cannot be assumed that the observed breeding success of the male vireo on the static territory was the only vireo breeding that occurred. It is common for territorial boundaries of vireos to become relaxed after the fledging of young as the family group ranges over larger areas (RHJV 2004). The observed territorial plasticity of the second male vireo at the latter end of the breeding season could potentially be explained by the fledging of a brood, though there was no observed evidence that this had occurred.

This breeding observation is the first in this portion of the southern San Joaquin Valley since prior to 1980 and follows discovery of breeding vireos at the San Joaquin River National Wildlife Refuge in 2005 (RHJV 2004, Howell et al. 2010). Though the discovery of the SJRNWR population is encouraging in terms of vireos returning to the central portion of their historic range, these breeding records must be taken cautiously. Between 2005 and 2006, only 4 vireos in total were banded on SJRNWR. Subsequently, vireos were not detected in 2008 or 2009 at SJRNWR (Howell et al. 2010). None of birds observed on Wind Wolves Preserve was banded, leaving the connectivity of this population and the SJRNWR population in question. However, since 1980, the population of vireos in southern California has experienced an eightfold increase (Kus and Whitfield 2005). As breeding habitat in southern California becomes saturated, vireos may begin pushing northward into areas of suitable habitat such as Wind Wolves preserve and other areas of restored riparian habitat in the Central Valley (Howell et al. 2010).

Given the observations of migratory flycatchers, it is highly likely that Wind Wolves Preserve serves as an important area for migratory birds moving northward into the Central Valley from southern California. It is also an intermediate location between the upper Santa Clara River population and SJRNWR population (Figure 1).

### ***BROWN-HEADED COWBIRD***

Though not observed in large numbers, Brown-headed cowbirds were routinely observed during riparian surveys. Brown-headed cowbirds are obligate brood parasites that rely on a wide array of host species to unsuspectingly incubate their eggs and raise their young. This nest parasitism will often cause nest abandonment or deceive the host parents into raising a young cowbird at the expense of their own young. Nestling cowbirds hatch from the egg and grow at a relatively rapid speed allowing them to quickly monopolize the resources of their host parents and often eject their host bird siblings or eggs from the nest to reduce competition (Lowther 1993). Both Least Bell's vireos and Southwestern willow flycatcher are frequent cowbird hosts in Southern California and experience high reproductive failure of their own offspring in the presence of Cowbird young (Kus 1999, Whitfield et al. 1997). However, under a rigorous cowbird population control regime, vireo and flycatcher nesting productivity can increase (Kus and Whitfield 2005). Further study at Wind Wolves Preserve is needed to determine whether cowbird nest parasitism is a concern requiring cowbird management actions.

## **CONCLUSIONS AND RECOMMENDATIONS**

The riparian bird surveys conducted by ESRP on Wind Wolves Preserve helped document the presence and distribution of two special status bird species: the Willow flycatcher and Least Bells' vireo. Both species, once widespread in the San Joaquin Valley, are now relegated to small pockets of breeding birds in widely spaced locations. Currently, this is only the second known population of breeding vireos in the San Joaquin Valley. As riparian habitat restoration efforts continue, these small pockets of breeding birds may represent a nexus for the eventual re-colonization of the San Joaquin Valley. The Preserve clearly supports a diversity of avian species and because of its size, habitat diversity, and habitat quality, Wind Wolves Preserve can contribute significantly to the conservation of special status avian species and regional biological diversity.

### ***RECOMMENDATIONS***

Based on the results of this project, the following recommendations are offered:

#### **1. Perform in-depth study of Least Bell's vireos on the property**

The vireo reproduction on Wind Wolves Preserve reported herein, represents only the second known breeding population in the San Joaquin Valley. Gathering data on this population through long-term monitoring would provide vital information for future conservation and species recovery efforts. Performing careful nest searches and monitoring their status will determine breeding success and rates of Brown-headed

cowbird parasitism, while color banding the population will provide data on demographic trends and allow for analysis of dispersal and site fidelity.

Annual visits to all suitable but currently unoccupied vireo breeding habitats (Twin Fawns, Black Bob Canyon, and Salt Creek Canyon) should also be conducted to determine if vireos attempt colonization of other regions of the preserve.

## **2. Study and possibly control the Brown-headed cowbird population at the Willows**

Brown-headed cowbirds were not observed in large numbers on Wind Wolves Preserve during the 2010 surveys. However, a single female Brown-headed cowbird can parasitize as many as 40 nests in a single breeding season (Scott and Ankney 1980), and Least Bell's vireos are extremely susceptible to cowbird brood parasitism (Goldwasser et al. 1980). Given the relatively small size of the Willows riparian area and the limited population of vireos utilizing the site, the presence of only a few cowbirds could certainly jeopardize vireo breeding efforts on Wind Wolves Preserve. We therefore recommend that future monitoring include an assessment of the cowbird threat to nesting success. Localized cowbird eradication programs performed during the breeding season have been known to increase nesting success and productivity of Least Bell's vireo (Kus and Whitfield 2005).

## **3. Monitor natural habitat succession to ensure favorable conditions for vireo breeding**

Least Bell's vireos typically prefer early seral to mid-seral riparian woodland with vegetation characteristics of stands between five to ten years of age (Goldwasser 1981, Kus 1998, RECON 1989, USFSW 1998). On Wind Wolves Preserve, the portion of San Emigdio creek at the Willows courses through a moderately incised channel divorced from the majority of adjacent riparian woodland (Figure 7). Therefore, most of the Willows section of San Emigdio creek does not receive a regular flood scouring. This lack of periodic disturbance may result in a slow habitat transition to a more decadent stand, less suitable for breeding vireos. Artificial disturbance may be required to maintain suitable nesting habitat if vireos respond unfavorably to natural habitat succession. Habitat modification of this sort has not been performed with the intent to manage or maintain vireo habitat suitability. Hypothetically, artificial disturbance could involve selective tree and understory thinning (performed in the fall and winter) intended to maintain balance between new understory growth and mature canopy vegetation. This type of resource management should be limited in scale and performed under consultation with regulatory authorities.

## **4. Manage and control invasive plants in sensitive areas**

Though most of the riparian habitat in the Willows portion of San Emigdio creek at the Willows is dominated by native cover, there are a few areas where invasive plant species have become established. There are small patches of tamarisk (*Tamarix* sp.) and horehound (*Marrubium vulgare*) present along the site's southern margin and a dense stand of common teasel (*Dipsacus fullonum*) growing in the central meadow south of the Bobcat Loop Trail (Figure 6). However, a dense stand of perennial pepperweed (*Lepidium latifolium*) growing on the southwest corner of the Willows may pose the greatest threat to the riparian habitat supporting vireos at the site (Figure 6). This

relatively herbicide tolerant weed spreads by creeping roots and rhizomes, and prolific seed production allowing it to rapidly displace native wetland and riparian understory species (Young et al. 1998), thereby establishing a monoculture that degrades habitat quality for riparian birds (Bossard et al. 2000). In order to maintain and improve habitat quality for vireos and flycatchers, we suggest an aggressive invasive plant control program in all high quality riparian areas.



Figure 6. An aerial view of the San Emigdio Creek drainage.



**Figure 7. Photographs of invasive plant species growing at the Willows section of San Emigdio Canyon. (A) common teasel growing in the central meadow south of the Bobcat Loop Trail, (B) horehound filling the gaps between patches of mulefat used by vireo on the south end of the Willows, (C) a dense stand of perennial pepperweed infiltrating the riparian understory of the southwest side of the Willows and (D) a single tamarisk tree growing amidst native riparian vegetation of south side of the Willows.**

**5. Install a grade control structure to halt the process of the down-cutting of San Emigdio creek**

The extensive riparian woodland habitat found at the Willows portion of San Emigdio creek appears to be the result of an impermeable geologic layer forcing groundwater in the otherwise dry creek bed to surface, much like a spring. While most of the Willows has moist soils allowing for the development of riparian habitat, only the eastern edge of the site has perennial surface flow within a relatively narrow waterway (Figure 7). Downstream of the Willows, the creek bed consolidates into an incised channel. ESRP is not currently aware of any data pertaining to the age of this incised channel or the degree

of down-cutting erosion which has occurred in recent decades, but this situation deserves additional scrutiny. The confinement of channel flow accelerates stream bank erosion and down-cutting which can result in a lowering of the water table and drying of the wetland habitats (Rosgen 1997). We suggest that a geomorphological assessment of this section of San Emigdio creek be performed to determine the rate of erosion and to assist in the development of strategies to mitigate future habitat loss.

#### **6. Continue to limit cattle access to riparian areas**

Wind Wolves Preserve should continue to avoid cattle grazing in the vicinity of high quality riparian areas to support healthy riparian ecosystems and maintain low Brown-headed cowbird numbers. (Taylor 1986, Schulz and Leininger 1990, Goguen and Mathews 2000)

#### **7. Conduct annual surveys for Willow flycatcher presence and breeding in core riparian areas**

As mentioned in the discussion section, Wind Wolves Preserve is utilized as a migratory stopover location for Willow flycatcher during spring migration and a number of sites on the preserve have the potential to support flycatcher breeding. For this reason, we suggest annual surveys be conducted at the Willows, Twin Fawns, Black Bob canyon, and Salt Creek canyon during the late breeding season after migrants have vacated the area to monitor for the presence of flycatcher breeding on the preserve.

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## APPENDIX A

The table below includes a list of bird species detected at the focal riparian areas on the Wind Wolves Preserve, California, during surveys in the spring and summer of 2010. Table Codes are as follows: × indicates the presence of a species and **B** indicates that breeding activity was observed.

Species	Black Bob	Doc Williams	Little Lobo	Los Lobos	Lower Pleito	Neason's Flat	Salt Creek	Twin Fawns	Upper Pleito	Western Side Cyn	The Willows
Acorn Woodpecker							×				
Allen's Hummingbird										×	
American Goldfinch											×
American Kestrel	<b>B</b>			×	×	×					×
American Robin		×									
Anna's Hummingbird	×			×		×	×				×
Ash-throated Flycatcher	×	×			×	×	×	×	×		×
Band-tailed Pigeon							×				
Barn Owl					×						
Barn Swallow			×								
Bewick's Wren	×	×		×	×		×	×	×		×
Black Phoebe		×			×			×	×		×
Black-chinned Hummingbird											×
Black-headed Grosbeak	×	×				×	×			×	×
Black-throated Gray Warbler								×			×
Blue Grosbeak		×	×	×	×	×	×	×		×	×
Brewer's Blackbird										×	×
Brown-headed Cowbird		×		×	×		×	×		×	×
Bullock's Oriole	×	×	×	×	×	×	×	×	×	×	×
Bushtit	×				×	×	×	×		×	×
California Quail	<b>B</b>	×		×	×	×	×	×	×	<b>B</b>	×
California Thrasher	×	×			×		×				×
California Towhee	×	×		×	×	×	×	×	<b>B</b>	×	×

Species	Black Bob	Doc Williams	Little Lobo	Los Lobos	Lower Pleito	Neason's Flat	Salt Creek	Twin Fawns	Upper Pleito	Western Side Cyn	The Willows
Cedar Waxwing								×			
Cliff Swallow					<b>B</b>					×	
Common Raven	×	×	×	×	×	×		×		×	×
Common Yellowthroat								×			×
Cooper's Hawk		×									
Costa's Hummingbird	×				×				×	×	×
Eurasian Collared Dove						×					
European Starling		×		×		×		×		×	×
Golden Eagle					×						
Golden-crowned Sparrow	×						×				×
Great Horned Owl										<b>B</b>	
Greater Roadrunner											
Hairy Woodpecker	×										
Hammond's Flycatcher							×				
Hermit Warbler		×									
Horned Lark			×								
House Finch	×	×			×		×	×		×	×
House Wren	×	×			×	×	×	×	×	×	×
Hutton's Vireo											×
Lark Sparrow				×	×	×		×			
Lawrence's Goldfinch	×			×	×	×	×	×		×	×
Lazuli Bunting	×	×			×	×	×		×		
Least Bell's Vireo											<b>B</b>
Lesser Goldfinch	×	×		×	×	×	×	×	×	×	×
Loggerhead Shrike					×			×			×
Merlin								×			
Mountain Quail	×					×	×				
Mourning Dove	×	×	×	×	×	×	×	×	×	×	<b>B</b>
Nashville Warbler							×				
Northern Flicker	×						×				
Northern Harrier		<b>B</b>	×								

Species	Black Bob	Doc Williams	Little Lobo	Los Lobos	Lower Pleito	Neason's Flat	Salt Creek	Twin Fawns	Upper Pleito	Western Side Cyn	The Willows
Northern Mockingbird											×
Northern Pygmy Owl	×										
Northern Rough-winged Swallow										×	
Nuttall's Woodpecker	×	×			×	×	×	×		×	×
Oak Titmouse	×					×	×		×		×
Orange-crowned Warbler		×			×		×	×		×	×
Pacific-slope Flycatcher	×	×			×			×	×	×	
Phainopepla	×	×			×	×	×				
Purple Finch							×				
Red-tailed Hawk								×		×	×
Red-winged Blackbird			×							×	
Rock Wren				×	×						
Rufous-crowned Sparrow					×		×		×	×	
Say's Phoebe					×					×	×
Song Sparrow	×	×	×	×	×	×	×	×	×	<b>B</b>	<b>B</b>
Spotted Towhee	×	×			×	×	×	×		×	×
Steller's Jay	×	×									
Swainson's Thrush					×						×
Tricolored Blackbird			<b>B</b>		×						
Violet-green Swallow										×	×
Warbling Vireo	×	×		×			×			×	×
Western Bluebird							×				×
Western Kingbird		×		×	×			×		×	×
Western Meadowlark			×		×	×	×	×			
Western Scrub-Jay	×	×				×	×				
Western Tanager	×			×	×		×	×			
Western Wood-Pewee	×					×	×	×	×		×
White-breasted Nuthatch		×									
White-crowned Sparrow			×	×				×		×	×
White-throated Swift					×		×				
Willow Flycatcher	×				×		×				×

Species	Black Bob	Doc Williams	Little Lobo	Los Lobos	Lower Pleito	Neason's Flat	Salt Creek	Twin Fawns	Upper Pleito	Western Side Cyn	The Willows
Wilson's Warbler	×	×			×	×	×	×	×	×	×
Wrentit	×	×				×	×				×
Yellow Warbler	×						×				
Yellow-rumped Warbler					×					×	×