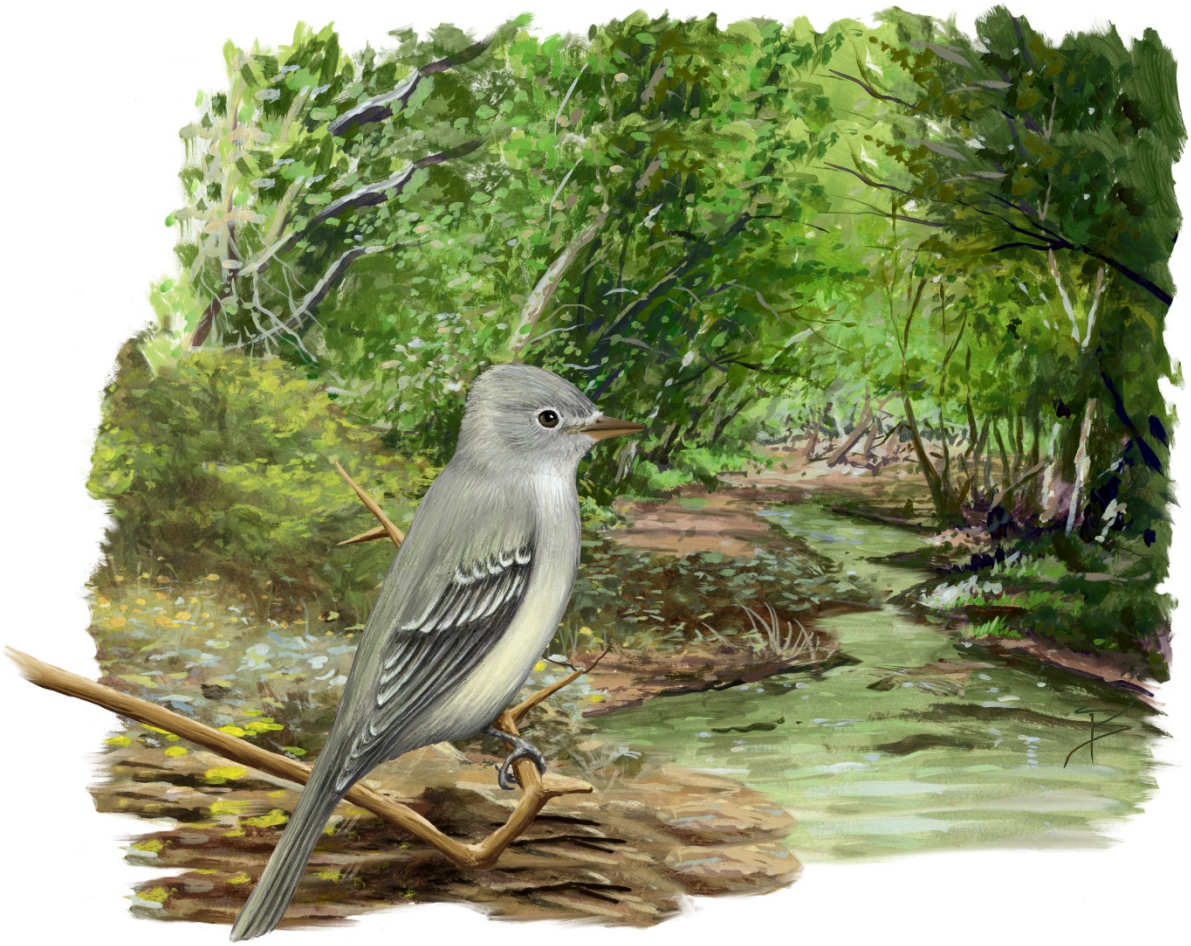
PIMA COUNTY
SUSTAINABILITY & CONSERVATION

Pima County Ecological Monitoring Program

Southwestern Willow Flycatcher Monitoring Protocol

January 2019



Prepared by Pima County Office of Sustainability and Conservation Staff:
Ian W. Murray
Jeff M. Gicklhorn

Recommended Citation:
Murray, I.W. & J.M. Gicklhorn. 2018. Southwestern Willow Flycatcher Monitoring Protocol. Ecological Monitoring Program, Pima County Multi-species Conservation Plan. Report to the U.S. Fish and Wildlife Service, Tucson, AZ.

Contents

List of Figures 4

List of Tables 4

Abstract 5

Acknowledgements 6

Background 7

Objectives 7

Methods 8

Results 12

Cienega Creek Natural Preserve 13

Bingham Cienega Natural Preserve 14

Proposed changes to Pima County's monitoring obligations 17

Literature Cited 17

Appendix I. Incidental bird species observed or heard at Cienega Creek Natural Preserve during Southwestern willow flycatcher surveys. 18

Appendix II. Incidental bird species observed or heard at Bingham Cienega Natural Preserve during Southwestern willow flycatcher surveys. 20

List of Figures

Figure 1. Survey transects for Southwestern willow flycatcher in the west section of Cienega Creek Natural Preserve. 9

Figure 2. Survey transects for Southwestern willow flycatcher in the east section of Cienega Creek Natural Preserve. 10

Figure 3. Survey transects for Southwestern willow flycatcher at Bingham Cienega Natural Preserve. ... 11

Figure 4. Survey stretch with a well-developed canopy of cottonwood, velvet ash, and Goodding's willow, but a relatively sparse understory of shrubby vegetation, at Cienega Creek Natural Preserve. ... 13

Figure 5. Survey stretch with a well-developed canopy of cottonwood, velvet ash, and Goodding's willow, as well as a dense understory of herbaceous and shrubby native vegetation, at Cienega Creek Natural Preserve. 14

Figure 6. Well-fed pond with narrow stringer of velvet ash, Goodding's willow, and other riparian broad-leaf tree species adjacent to survey area in the southeastern part of Bingham Cienega Natural Preserve. The adjacent area that was surveyed was a mesquite bosque. 15

Figure 7. Survey area made up of a thicket of tamarisk adjacent to a dried pond in the northwestern part of Bingham Cienega Natural Preserve. 15

Figure 8. Survey area made up of a mesquite bosque with scattered velvet ash and netleaf hackberry trees, and an understory of graythorn in the northeastern part of Bingham Cienega Natural Preserve. . 16

Figure 9. Survey area near the site of the main cienega (now dry) with a canopy of velvet ash and cottonwood, and an understory of buttonbush and downed woody debris at Bingham Cienega Natural Preserve. The area in the foreground has been thinned to mitigate for fire. 16

List of Tables

Table 1. Location of Pima County southwestern willow flycatcher survey transects (2017). UTMs are given in the datum NAD83. 12

Table 2. Summary survey results for Pima County southwestern willow flycatcher monitoring (2017). .. 12

Abstract

The southwestern willow flycatcher is one of the species covered under Pima County's Endangered Species Act Section 10 permit and associated Multi-species Conservation Plan. Within the MSCP Pima County has agreed to monitor for the presence of southwestern willow flycatchers, using the U.S. Fish and Wildlife Service (USFWS) call playback survey protocol, in potential riparian habitat at Bingham Cienega Natural Preserve and Cienega Creek Natural Preserve. Pima County followed the 'general survey' iteration of the monitoring protocol that prescribes one survey during each of three survey periods. We did not detect any flycatchers at Cienega Creek, although there may be suitable habitat at that site. We also did not detect any flycatchers at Bingham Cienega, and there is no suitable habitat for this species at this time at this site. Consequently, in consultation with the USFWS, Pima County has been given approval to drop Bingham Cienega as a flycatcher monitoring site, pending any return of suitable habitat for flycatchers at this site. At least every three years, riparian habitat will be evaluated at Bingham Cienega to inform whether flycatcher monitoring should be resumed here.

Acknowledgements

We thank Jennie MacFarland, Jonathan Horst, and volunteers from the Tucson Audubon Society for their efforts in completing surveys. We also thank Iris Rodden for assistance in completing this fieldwork. Brian Powell also provided key insights, discussion, support, and assistance with fieldwork. Jennifer Becker and Jess Barry provided important logistical support and access to the Bingham Cienega site. We also thank Susan Sferra, Greg Beatty, and Scott Richardson for key discussions on survey placement and other logistics.

Background

Pima County's Multi-species Conservation Plan (MSCP) is tasked with ensuring that the County remains in compliance with its federal Endangered Species Act Section 10 Incidental Take Permit. Implementation of an ecological monitoring program is a key requirement of the MSCP, and Pima County has agreed to conduct species-level monitoring for 15 of the 44 plant and animal species covered under the MSCP. The endangered Southwestern willow flycatcher (SWFL) is one such species that the County has agreed to monitor on select riparian habitat across County preserve lands.

The Southwestern willow flycatcher (*Empidonax traillii extimus*) is one of four subspecies of the willow flycatcher. It was listed as an endangered species in 1995, primarily due to widespread loss and degradation of riparian habitats in the American Southwest. It is a neotropical migrant songbird that breeds in the southwestern United States and parts of Mexico, and winters primarily in parts of Mexico and Central America. This species is considered to be a riparian obligate, because it requires dense riparian vegetation within which to nest and the presence of surface water, or soil that is moist enough to support this dense vegetation. This riparian vegetation can be either native broadleaf plant species (i.e., willows, buttonbush, cottonwood, ash) or nonnative species such as tamarisk. Breeding habitat generally consists of a brushy and dense understory (≥ 3m tall) with significant amounts of live foliage. SWFL will breed in dense understory that includes a taller canopy of larger trees (such as larger cottonwood and willows), but this is not a requirement as long as a dense and shrubby understory is present (Sogge et al. 2010).

Objectives

Pima County has committed itself to monitoring for the presence of this species using the USFWS-approved call playback survey protocol outlined in Sogge et al. (2010; https://pubs.usgs.gov/tm/tm2a10/). Pima County originally agreed to monitor for this species in three areas of the County's preserve lands that at one point were thought to contain suitable riparian habitat for the species (Pima County 2016). These areas include portions of the A7 Ranch adjacent to the San Pedro River, Bingham Cienega Natural Preserve, and Cienega Creek Natural Preserve. However, in the lead up to the County's first round of SWFL monitoring, inspection of aerial imagery and on-the-ground field assessments with USFWS staff concluded that at this time there is no potential SWFL breeding habitat on those parts of A7 Ranch near the San Pedro River and that it was appropriate to drop this site from those sites that Pima County has committed to monitor for SWFL. **Consequently, Pima County's SWFL monitoring commitments include assessing the occupancy of this species at Bingham Cienega Natural Preserve (one transect) and Cienega Creek Natural Preserve (two transects) following the Sogge et al. (2010) protocol.**

Methods

In 2017, Pima County used the Sogge et al. (2010) playback survey protocol to assess for the presence of the Southwestern willow flycatcher on two Pima County preserve properties, Bingham Cienega Natural Preserve and Cienega Creek Natural Preserve. We followed the 'general survey' iteration of the monitoring protocol that prescribes one survey visit completed during each of the three survey periods (May 15-31, June 1-24, and June 25 – July 17).

We used a FoxPro NX4 electronic caller (or similar device) loaded with a recording provided by the USFWS that contained a series of *fitz-bew* calls to survey for SWFL beginning at or near sunrise and occurring no later than about 1030 h. We followed a 10-30 second quiet listening period with ~15 seconds of broadcast, followed by a one minute listening period. We repeated this every 20-30 meters as we moved through the habitat to be surveyed. All lead field surveyors had completed the SWFL survey protocol training offered by the USFWS and the Arizona Game and Fish Department. See Sogge et al. (2010) for a complete description of the methodology that we followed.

Surveys on Cienega Creek Natural Preserve were done on four different stretches of creek, all of which had some permanent water during the surveys, with mostly native broad-leafed riparian woodland (e.g., Fremont cottonwood, velvet ash, Goodding's willow, and velvet mesquite) and a diverse shrub understory ranging from sparse to dense along the survey lengths (See Figures 1 & 2). Survey transects at Cienega Creek were linear and followed the course of the stream channel with the start and end points given in Table 1.

Riparian habitat quality at Bingham Cienega has declined precipitously over the recent past such that the cienega and downstream marshy habitat no longer have surface water, or even moist soil, during early summer. We surveyed sinuous transects in each of four discrete habitat patches which we concluded had the best potential habitat left on the property, as concluded by pre-survey field assessments (See Figure 3). Bingham Cienega is a historical flycatcher survey site but we do not have available the exact survey locations of previous surveys. Presumably, surveys were focused on the main cienega north of the Bingham ranch house (Figure 3; Cienega patch; ash/cottonwood/buttonbush woodland) as well as the brushy and wet outflow of this cienega. We report the locations of the points bounding the survey polygons (taken from the greatest dimension) in Table 2. During surveys of these polygons, surveyors walked irregularly shaped routes in order to best cover all of the habitat, thus reported distances are minimum estimates of distance covered.

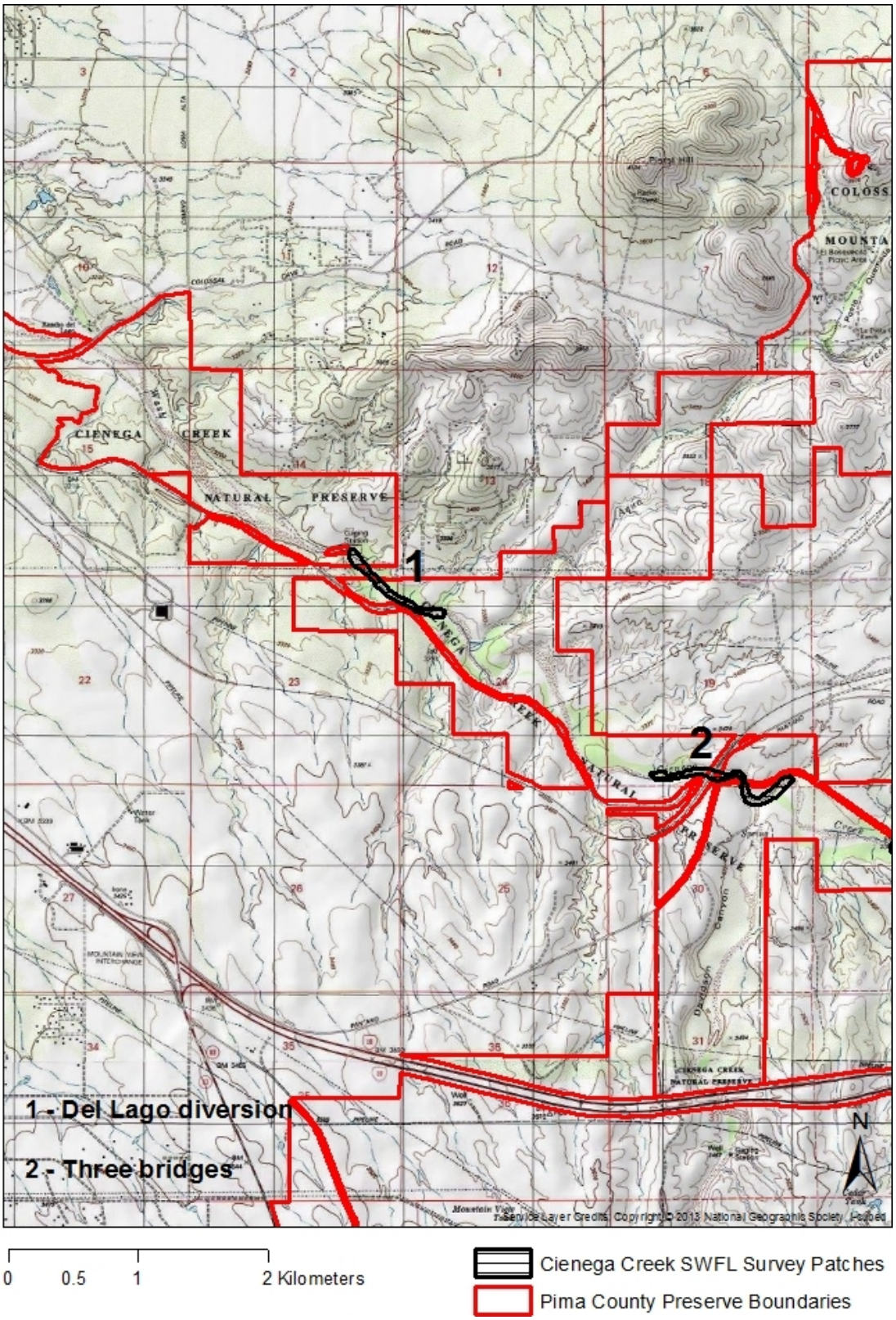


Figure 1. Survey transects for Southwestern willow flycatcher in the west section of Cienega Creek Natural Preserve.

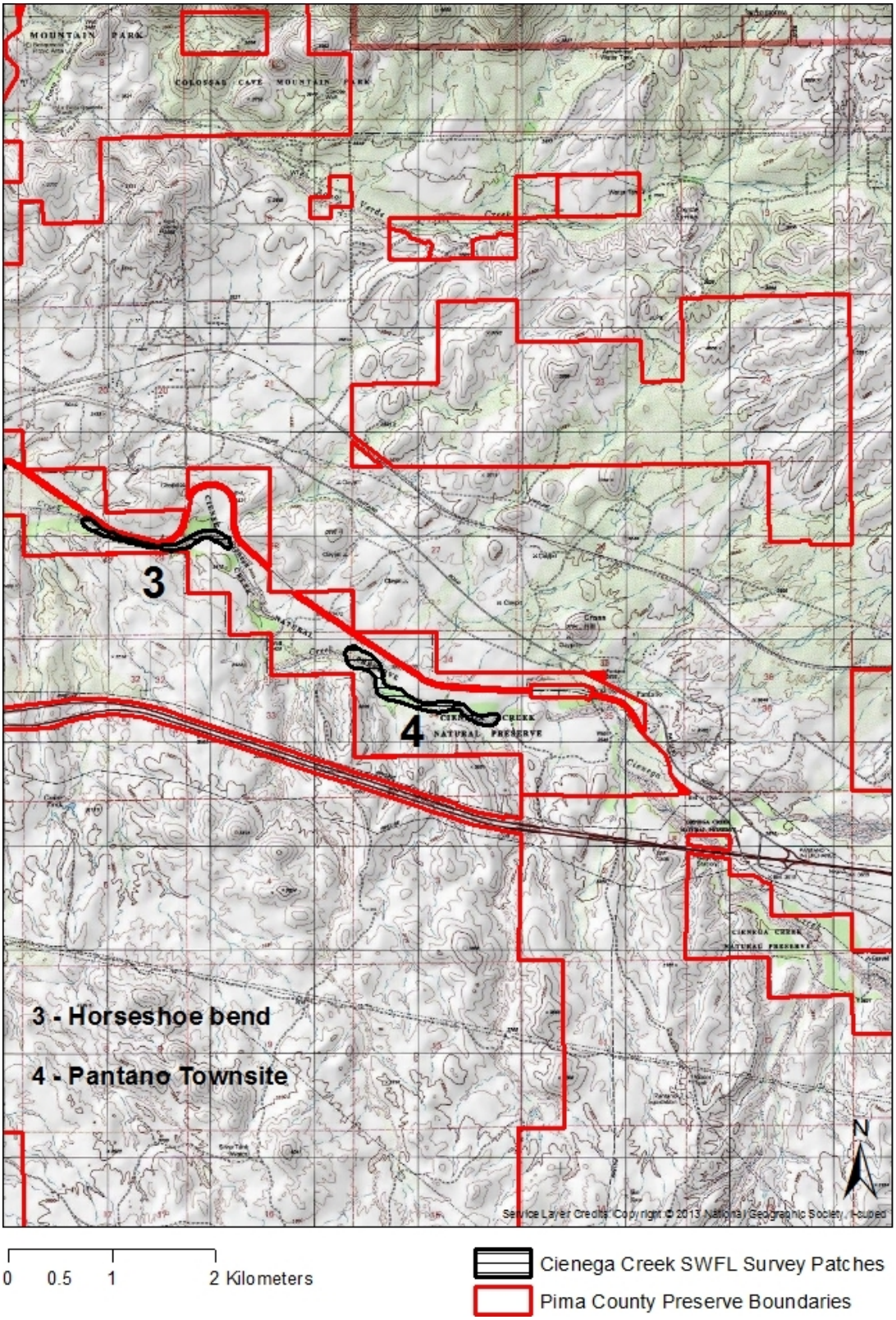


Figure 2. Survey transects for Southwestern willow flycatcher in the east section of Cienega Creek Natural Preserve.

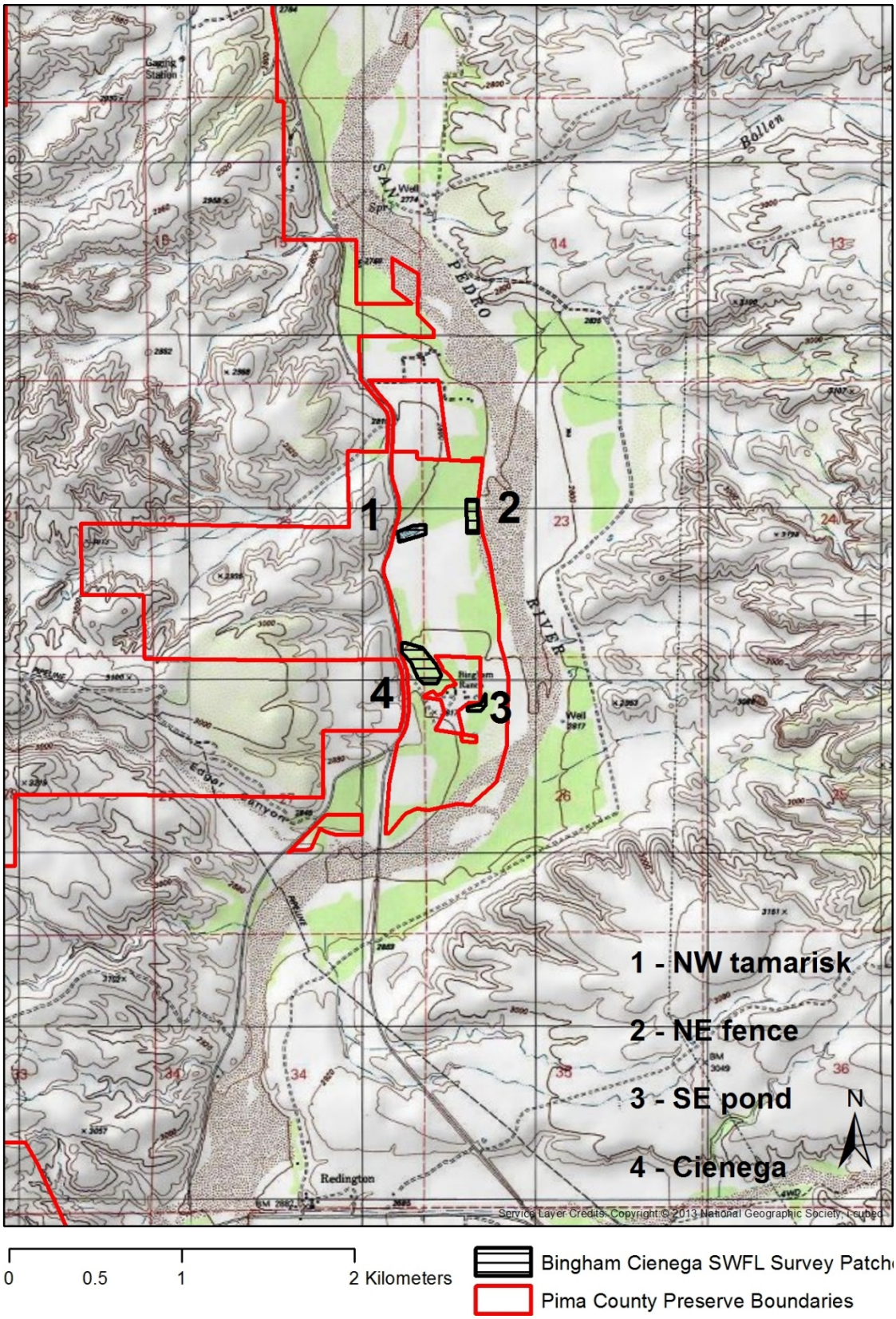


Figure 3. Survey transects for Southwestern willow flycatcher at Bingham Cienega Natural Preserve.

Results

We surveyed approximately 0.8 km (estimated maximum extent of all the survey patches) of area at Bingham Cienega and 5.6 km (linear distance of stream channel) at Cienega Creek, a total of three times each during the three survey periods (Tables 1 & 2). We did not detect any SWFL on any of the survey visits. See Appendices I and II for other incidental bird species detected at these sites during surveys.

Table 1. Location of Pima County southwestern willow flycatcher survey transects (2017). UTMs are given in the datum NAD83.

Site	Survey Start		Survey End	
	UTM Easting	UTM Northing	UTM Easting	UTM Northing
Cienega Creek Natural Preserve*				
Del Lago	531289	3543957	530583	3544429
3 Bridges	534053	3542590	533006	3542669
Horseshoe	536344	3541669	534692	3542190
Pantano	538593	3540219	537325	3540792
Bingham Cienega Natural Preserve**				
NW tamarisk	548367	3591883	548222	3591852
NE fence	548613	3591873	548618	3592070
Cienega	548424	3591006	548279	3591322
SE Pond	548715	3590917	548695	3590808

*Locations provided are the start and end points of linear transects following the stream channel.
**Locations provided are the points marking the greatest dimension of a survey polygon.

Table 2. Summary survey results for Pima County southwestern willow flycatcher monitoring (2017).

Site	Survey Period 1 May 15 - 31		Survey Period 2 June 1 - 24		Survey Period 3 June 25 – July 17	
	Area length (km) Survey time (h)	SWFL	Area length (km) Survey time (h)	SWFL	Area length (km) Survey time (h)	SWFL
Bingham Cienega Natural Preserve						
NW tamarisk	0.2 km; 0.5 h	0	0.2 km; 0.5 h	0	0.2 km; 0.8 h	0
NE fence	0.2 km; 0.4 h	0	0.2 km; 0.5 h	0	0.2 km; 0.3 h	0
Cienega	0.3 km; 0.9 h	0	0.3 km; 1.5 h	0	0.3 km; 0.5 h	0
SE Pond	0.1 km; 0.2 h	0	0.1 km; 0.3 h	0	0.1 km; 0.5 h	0
Cienega Creek Natural Preserve						
Del Lago	1.0 km; 1.2 h	0	1.0 km; 1.0 h	0	1.0 km; 1.4 h	0
3 Bridges	1.3 km; 1.0 h	0	1.3 km; 0.6 h	0	1.3 km; 1.5 h	0
Horseshoe	1.6 km; 2.0 h	0	1.6 km; 2.0 h	0	1.6 km; 1.3 h	0
Pantano	1.7 km; 1.3 h	0	1.7 km; 1.3 h	0	1.7 km; 2.0 h	0

Cienega Creek Natural Preserve

The four reaches of Cienega Creek that we surveyed all contained surface water or moist soil. We frequently observed other riparian bird species such as common yellowthroat, yellow-breasted chat, and yellow warbler, and riparian obligate species such as longfin dace and lowland leopard frogs were also present. The surveyed stretches were primarily native broadleaf plants (> 90%) and generally had a 12 – 15 m high canopy (where present) of Goodding's willow, Fremont cottonwood, and velvet ash. Tamarisk, though present, was widely scattered and relatively rare. The native shrub understory in the areas that we surveyed ranged from sparse (Figure 4) to dense (Figure 5).

Figure 4. Survey stretch with a well-developed canopy of cottonwood, velvet ash, and Goodding's willow, but a relatively sparse understory of shrubby vegetation, at Cienega Creek Natural Preserve.

Figure 5. Survey stretch with a well-developed canopy of cottonwood, velvet ash, and Goodding's willow, as well as a dense understory of herbaceous and shrubby native vegetation, at Cienega Creek Natural Preserve.

Bingham Cienega Natural Preserve

We surveyed four areas that contained the best potential SWFL habitat on the property. None of the survey areas contained moist soil, and the only surface water on the site is a small well-fed pond that is adjacent to the Bingham Cienega ranch house. This pond is on an inholding that is not part of the available surface area and while some willow and ash trees ring it (Figure 6), the adjacent habitat surveyed on County land is dry and primarily mesquite bosque with little understory development (SE Pond; Figure 3). There is a narrow, but dense area of tamarisk ringing a long-dried pond in the northwestern-most survey area (NW tamarisk; Figure 3). These salt cedars show visible signs of moisture stress with substantial die-off of large limbs (Figure 7). Much of the northeastern area that we surveyed (NE fence; Figure 3) is a mesquite bosque with an understory of graythorn and scattered netleaf hackberry trees (Figure 8). What used to be the main cienega and its outflow is completely dry, but still contains a canopy of velvet ash and cottonwood, with substantial levels of tree dieback. The understory lacks herbaceous vegetation, and is made up of scattered large buttonbush plants, as well as large amounts of downed woody debris (Figure 9).

In its current state of continuing riparian decline, Bingham Cienega is not likely to contain suitable SWFL breeding habitat.

Figure 6. Well-fed pond with narrow stringer of velvet ash, Goodding's willow, and other riparian broad-leaf tree species adjacent to survey area in the southeastern part of Bingham Cienega Natural Preserve. The adjacent area that was surveyed was a mesquite bosque.

Figure 7. Survey area made up of a thicket of tamarisk adjacent to a dried pond in the northwestern part of Bingham Cienega Natural Preserve.

Figure 8. Survey area made up of a mesquite bosque with scattered velvet ash and netleaf hackberry trees, and an understory of graythorn in the northeastern part of Bingham Cienega Natural Preserve.

Figure 9. Survey area near the site of the main cienega (now dry) with a canopy of velvet ash and cottonwood, and an understory of buttonbush and downed woody debris at Bingham Cienega Natural Preserve. The area in the foreground has been thinned to mitigate for fire.

Proposed changes to Pima County's monitoring obligations

The riparian habitat at Bingham Cienega Natural Preserve has been undergoing a long-term drying trend since 2002 that has resulted in substantial decline of woody riparian vegetation and a near elimination of herbaceous riparian vegetation and surface water. This site no longer contains habitat suitable for breeding southwestern willow flycatchers, a fact echoed by the U.S. Geological Survey's consideration of this site as one where this species has been extirpated. In light of this observation, we have proposed to the U.S. Fish and Wildlife Service to no longer perform complete surveys of this site every three years, until and if suitable riparian habitat again becomes available on the site. After review, USFWS staff have agreed to this proposal, with the caveat that Pima County evaluates available riparian vegetation at least every three years (S. Richardson, personal communication, 13 December 2018). If rising shallow groundwater again allows for suitable riparian habitat at this site, Pima County will resume monitoring for flycatchers at this site every three years.

Literature Cited

Durst, S.L., Sogge, M.K., Stump, Shay D., Williams, Sartor O., Kus, Barbara E., and Sferra, Susan J. 2007. Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2006. USGS Open File Report 2007-1391. [http://pubs.usgs.gov/of/2007/1391/].

Pima County. 2016. Multi-species Conservation Plan for Pima County, Arizona: Final. Submitted to the Arizona Ecological Services office of the U.S. Fish and Wildlife Service, Tucson, Arizona.

Sogge, M.K., Ahlers, D., and Sferra, S.J. 2010. A natural history summary and survey protocol for the Southwestern Willow Flycatcher. U.S. Geological Survey Techniques and Methods 2A-10. 38 pp.

Appendix I. Incidental bird species observed or heard at Cienega Creek Natural Preserve during Southwestern willow flycatcher surveys.

19 May 2017

Common ground dove
Mourning dove
White-winged dove
Arizona Bell's vireo
Abert's towhee
Summer tanager
Western tanager
Empidonax sp.
Western wood-pewee
Cassin's kingbird
Gray hawk
Zone-tailed hawk
Great-horned owl
Yellow-breasted chat (including carrying nesting material)
Northern rough-winged swallow
Purple martin
Common yellowthroat
Lucy's warbler (multiple instances of adults feeding fledged juveniles)
Yellow warbler
Hooded oriole
White-crowned sparrow
Gila woodpecker
Ladder-backed woodpecker
Bewick's wren (carrying food to cavity in standing cottonwood)
Black phoebe
Vermillion flycatcher
Broad-billed hummingbird
Northern beardless tyrannulet
Verdin
Curve-billed thrasher
Yellow-rumped warbler
Wilson's warbler
Black-headed grosbeak
Northern cardinal
Lazuli bunting
Blue grosbeak
Ash-throated flycatcher
Brown-crested flycatcher
Brown-headed cowbird
Northern mockingbird
House finch
Lesser goldfinch
Common raven (nest in cottonwood tree with young)

Appendix I. Continued

15 June 2017

Common ground dove
Mourning dove
White-winged dove
Arizona Bell's vireo (heard calling along most of the course of Cienega Creek; adult seen feeding x2 full-sized fledglings)
Abert's towhee
Summer tanager
Western wood-pewee
Gray hawk
Zone-tailed hawk (x2 likely nests)
Barn owl
Yellow-breasted chat
Northern rough-winged swallow (nesting in at least one section of steep cut bank)
Purple martin
Common yellowthroat
Lucy's warbler (adult feeding fledged juveniles)
Yellow warbler
Gila woodpecker
Ladder-backed woodpecker
Bewick's wren
Black phoebe
Vermillion flycatcher
Broad-billed hummingbird
Black-chinned hummingbird (including female building nest in young ash tree)
Anna's hummingbird
Northern beardless tyrannulet
Verdin
Black-throated sparrow
Northern cardinal
Blue grosbeak
Ash-throated flycatcher
Brown-crested flycatcher
Brown-headed cowbird
Great-blue heron (at one of the large pools full of dace and lowland leopard frog tadpoles)
Common raven (fledglings seen in area of nest)
House finch
Lesser goldfinch
Canyon wren

Appendix II. Incidental bird species observed or heard at Bingham Cienega Natural Preserve during Southwestern willow flycatcher surveys.

16 May 2017

Summer tanager
Western tanager
Yellow-breasted chat
White-throated swift
Cliff swallow
Northern-rough winged swallow
Black-chinned hummingbird (female feeding nestlings at nest in ash about 25 feet up)
Broad-billed hummingbird
Yellow warbler
Lucy's warbler (fledglings being fed in mesquite canopy)
Wilson's warbler
Verdin
Cooper's hawk
Gray hawk
Gila woodpecker
Ladder-backed woodpecker
Mourning dove
Common ground dove
White-winged dove
Common raven
Empidonax sp.
Arizona Bell's vireo
Abert's towhee
Vermilion flycatcher
Northern cardinal
Bewick's wren
Wild turkey
Brown-crested flycatcher
Brown-headed cowbird
Phainopepla
Northern mockingbird
Turkey vulture
Black-tailed gnatcatcher
Eurasian collared dove

Appendix II. Continued

13 June 2017

Purple martin
Abert's towhee
Wild turkey
Brown-headed cowbird
Northern cardinal
Vermillion flycatcher (sitting on nest)
Summer tanager
Yellow-breasted chat
White-throated swift
Black-chinned hummingbird
Broad-billed hummingbird
Yellow warbler (adult seen foraging at blooming saguaro)
Lucy's warbler (fledglings being fed in mesquite canopy)
Verdin
Cooper's hawk
Gray hawk
Gila woodpecker
Ladder-backed woodpecker
Mourning dove
Common ground dove
White-winged dove
Eurasian collared dove
Common raven
Arizona Bell's vireo
Common yellowthroat (one male seen near irrigated orchard and large patch of yerba mansa near house)
Bewick's wren
Red-tailed hawk
Swainson's hawk