



las vegas wash coordination committee

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Southwestern Willow Flycatcher Surveys along the Las Vegas Wash, Clark County, Nevada, 2014



December 2014



SOUTHERN NEVADA
WATER AUTHORITY



**Southwestern Willow Flycatcher Surveys along the Las
Vegas Wash, Clark County, Nevada, 2014**

**SOUTHERN NEVADA WATER AUTHORITY
Las Vegas Wash Project Coordination Team**

Prepared for:

**U.S. Fish and Wildlife Service
Southern Nevada Field Office**

and

Las Vegas Wash Coordination Committee

Prepared by:

**Deborah Van Dooremolen
Southern Nevada Water Authority
Las Vegas Wash Project Coordination Team
P.O. Box 99956
Las Vegas, Nevada 89193-9956**

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ABSTRACT

The Las Vegas Wash Coordination Committee (LVWCC), a 29-member stakeholder group, is working to stabilize and enhance the Las Vegas Wash (Wash), the channel that drains flows from the Las Vegas Valley to Lake Mead at Las Vegas Bay. The Wash also flows through the 2,900-acre Clark County Wetlands Park (Wetlands Park). As a result of informal Section 7 consultation with the U.S. Fish and Wildlife Service, the Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC, began annual surveys to determine the occurrence of the southwestern willow flycatcher (*Empidonax traillii extimus*) within the Wetlands Park. These surveys were conducted by permitted consultants from 1998 through 2009 (Southwest Wetlands Consortium 1998; SWCA 1999, 2000, 2001, 2002, 2003, 2005, 2006, 2007, 2008, 2009a, 2009b). Permitted staff from the Las Vegas Wash Project Coordination Team, the implementation arm of the LVWCC, have performed the surveys since (Van Dooremolen 2010, 2011, 2012, 2014). The surveys are conducted using the standard protocol (Sogge et al. 2010), and follow the five-survey protocol recommended for projects.

Surveys for 2014 began May 21 and were completed July 2. A total of 25 migrant willow flycatchers were detected: 21 during the first survey, 3 during the second survey, and 1 during the third survey. No birds were detected during the fourth and fifth surveys.

Approximately 25 fewer acres, the vast majority of which were poor quality, were surveyed in 2014 compared to 2013. Some of the decline was due to weir construction, but most of it was due to defoliation by the tamarisk leaf beetle rendering the habitat unsuitable. The extent of moderate to high quality habitat was similar to 2013. Although habitat quality declined at the Nature Preserve (Route 1) due to a fire, native-dominated revegetation sites along the Wash on Routes 2 and 3 improved somewhat due to changes in hydrology and vegetation maturity, offering moderate to high quality potential nesting habitat.

When surveys first began in 1998, potentially suitable nesting habitat was dominated by tamarisk (*Tamarix ramosissima*) and the hydrology was poor. It is now dominated by native riparian species, due to revegetation and hydrological changes associated with the stabilization project. While southwestern willow flycatchers nest in both tamarisk and native dominated riparian habitats if the conditions are right, tamarisk-dominated habitat in the Colorado River watershed is under threat by the spread of the tamarisk leaf beetle (*Diorhabda* spp.). The defoliation of much of the remaining tamarisk at the Wash in 2014 is evidence of this. With the potential decline in tamarisk-dominated nesting habitat in a portion of its range, native-dominated habitats, such as the Wash, may see increased use by the species.

Annual surveys for southwestern willow flycatchers should continue in order to avoid effects to the species and comply with informal Section 7 consultation measures.

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1.0 BACKGROUND

The Las Vegas Wash (Wash) is the primary drainage channel for the Las Vegas Valley carrying highly treated wastewater, urban runoff, shallow groundwater, and storm runoff into Lake Mead at Las Vegas Bay (Figure 1). Although originally an ephemeral stream, the Wash began supporting perennial flows in the 1950s when the discharge of treated wastewater into the channel was initiated. At first these perennial flows created a lush wetland along the channel. However, the volume of flows in the Wash continued to increase with the increasing urban population, and erosion from the increased flow and from storm events began to drain the wetlands and carry thousands of tons of sediment to Lake Mead. By the late 1990s, headcutting had deeply incised the channel and reduced the wetlands by approximately 90% from their peak extent, leaving less than 200 acres.

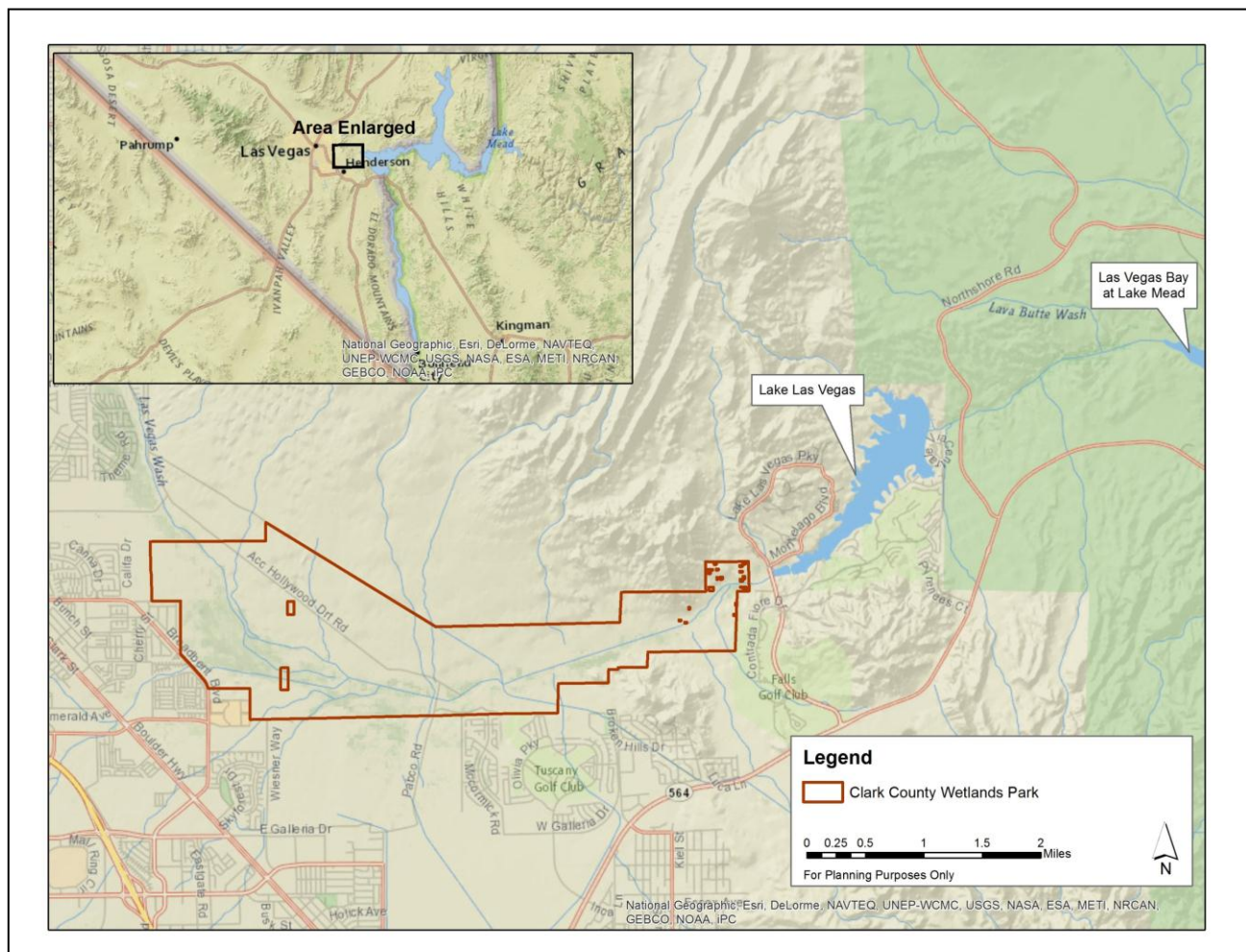


Figure 1. Las Vegas Wash location and general study area map.

In 1998, the Las Vegas Wash Coordination Committee (LVWCC), a now 29-member community stakeholder group, was created to address the degradation of the Wash. The group developed and is implementing the Las Vegas Wash Comprehensive Adaptive Management Plan to stabilize the Wash and restore its ecological functions. Stabilization and enhancement

activities, which include the construction of 21 erosion control structures (weirs) and extensive revegetation, will help deter further erosion and reduce the amount of sediment being deposited in Lake Mead. As of May 2014, 16 permanent weirs were in place.

Weir construction impacts habitat in the Wash. Vegetation must be cleared from each site to allow for vehicle access and for the footprint of the weir itself. Especially in the early years of the project, much of the vegetation present at each site was non-native tamarisk (*Tamarix ramosissima*). Once construction is over, a variety of wetland, riparian, and upland revegetation occurs. The weirs create more favorable conditions for riparian and wetland vegetation along the Wash, so the short-term habitat loss created by construction generally leads to long-term gains. The Wash flows through the 2,900-acre Clark County Wetlands Park (Wetlands Park), and Clark County is also removing tamarisk and planting riparian and wetland vegetation within the study area as it develops park facilities.

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a small songbird that breeds in riparian habitat in the Southwest, and is a federally endangered subspecies of the willow flycatcher. It historically preferred dense willow (*Salix* spp.) habitat throughout its range, but as this habitat declined in the twentieth century, the southwestern willow flycatcher adapted to the non-native tamarisk that had largely replaced its preferred habitat.

As a result of informal Section 7 consultation with the U.S. Fish and Wildlife Service on the proposed development of the park and associated erosion control structures, the Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC, began annual surveys to determine the occurrence of the southwestern willow flycatcher within the Wetlands Park. SNWA contracted with permitted consultants to conduct these surveys from 1998 through 2009 (Southwest Wetlands Consortium 1998; SWCA 1999, 2000, 2001, 2002, 2003, 2005, 2006, 2007, 2008, 2009a, 2009b). Permitted staff from the Las Vegas Wash Project Coordination Team (Wash Team), the implementation arm of the LVWCC, have performed the surveys since (Van Dooremolen 2010, 2011, 2012, 2014). This document reports the results from the 2014 surveys for southwestern willow flycatcher along the Wash.

2.0 METHODS

2.1 Study Area

The general study area consists of the Wetlands Park and an approximately seven-mile reach of the Wash contained within its boundaries. Select areas located immediately adjacent to the park's boundaries are also included if permission to survey is obtained from the landowner. Only potentially suitable nesting habitat is surveyed. For the purposes of this study, potentially suitable nesting habitat is defined as areas with dense to moderately dense riparian vegetation, either bordering or containing surface water or saturated soils. Riparian vegetation in the study area consists of both native and non-native species. Native species primarily include Goodding willow (*S. gooddingii*), sandbar willow (a.k.a. coyote willow; *S. exigua*), cottonwood (*Populus fremontii*), and seep willow (*Baccharis salicifolia*). Tamarisk is the dominant non-native species.

Four survey routes were established to cover all potentially suitable habitat within the Wash (Figure 2). The routes are adjusted each year to accommodate changes in habitat and access due to construction and other factors. In 2014, Route 1 encompassed the Wetlands Park Nature Preserve (Nature Preserve). A portion of Monson Channel bordering the preserve was also included. The route covered 20 acres. The Nature Preserve includes constructed wetland ponds and small streams lined with mostly native riparian vegetation. Vegetation on Monson Channel is dominated by tamarisk. Route 2 is located on the north bank of the Wash, and begins upstream of Pabco Road Weir and continues downstream to the Lake Las Vegas mitigation wetlands. In 2014, it covered 22 acres of habitat. Route 3 is located on the south bank of the Wash, and begins at the eastern boundary of the Wetlands Park and continues upstream to Pabco Road Weir, covering 21 acres of habitat in 2014. Both Routes 2 and 3 are located in the largely stabilized portion of the Wash, where several weirs have been constructed and significant revegetation has occurred. Route 4 is also on the south bank and in 2014, included three revegetation sites just above Pabco Road Weir, covering seven acres of habitat.

2.2 Survey Protocol

Surveys were conducted using the standard protocol developed by Sogge et al. (2010). Surveys began in the hour before sunrise and were completed by 10:30 a.m. (see Appendix A for temperature and weather). Call-playback was used to elicit responses from any nearby willow flycatchers. Surveyors broadcast the species' song (fitz-bew) and calls with MP3 players attached to portable speakers. They walked through potentially suitable nesting habitat broadcasting the vocalizations approximately every 100-130 feet following a period of silent listening. Vocalizations were broadcast for approximately 20 seconds at each stop, followed by 1-2 minutes of listening for a response. Broadcasts were conducted from inside habitat patches where possible, but occasionally had to occur from the habitat edge due to concerns regarding safe access (e.g., adjacency to steep cliffs, etc.).

Each route was surveyed by a team of 2-3 people. Routes 1 and 4 were surveyed contiguously in a single morning (beginning with Route 4 and ending with Route 1), while Routes 2 and 3 each required a full morning. Each team was composed of a minimum of one of the following permitted individuals: Deborah Van Dooremolen (TE-148556-2), Nicholas Rice (TE-64580A-0), or Timothy Ricks (TE-67397A-0). We followed the five-survey protocol for projects (Sogge et al. 2010), which includes one survey in the first survey period, two surveys in the second survey period and two surveys in the third survey period (Table 1). During all periods, Route 2 was surveyed on the first day, and Routes 1, 3 and 4 were surveyed on the second day.

Survey Period	1st Survey	2nd Survey
First (May 15-31)	May 21/22	n/a
Second (June 1-24)	June 4/5	June 11/12
Third (June 25-July 17)	June 25/26	July 1/2

Table 1. Southwestern willow flycatcher survey dates for the study area.

Each route was surveyed by a team of 2-3 people. Routes 1 and 4 were surveyed contiguously in a single morning (beginning with Route 4 and ending with Route 1), while Routes 2 and 3 each required a full morning. Each team was composed of a minimum of one of the following permitted individuals: Deborah Van Dooremolen (TE-148556-2), Nicholas Rice (TE-64580A-0), or Timothy Ricks (TE-67397A-0). We followed the five-survey protocol for projects (Sogge et al. 2010), which includes one survey in the first survey period, two surveys in the second survey period and two surveys in the third survey period (Table 1). During all periods, Route 2 was surveyed on the first day, and Routes 1, 3 and 4 were surveyed on the second day.

The southwestern subspecies is the only willow flycatcher that nests in southern Nevada. However, other non-listed subspecies of the willow flycatcher may pass through the area during migration, and the different subspecies are virtually indistinguishable in the field. Birds discovered during the first and second survey periods may simply be migrating through and cannot be determined to be of the federally endangered subspecies. The third survey period (June 25-July 17) begins after the known migration period, so any willow flycatchers detected then can be considered residents, and thus of the southwestern subspecies (Sogge et al. 2010).

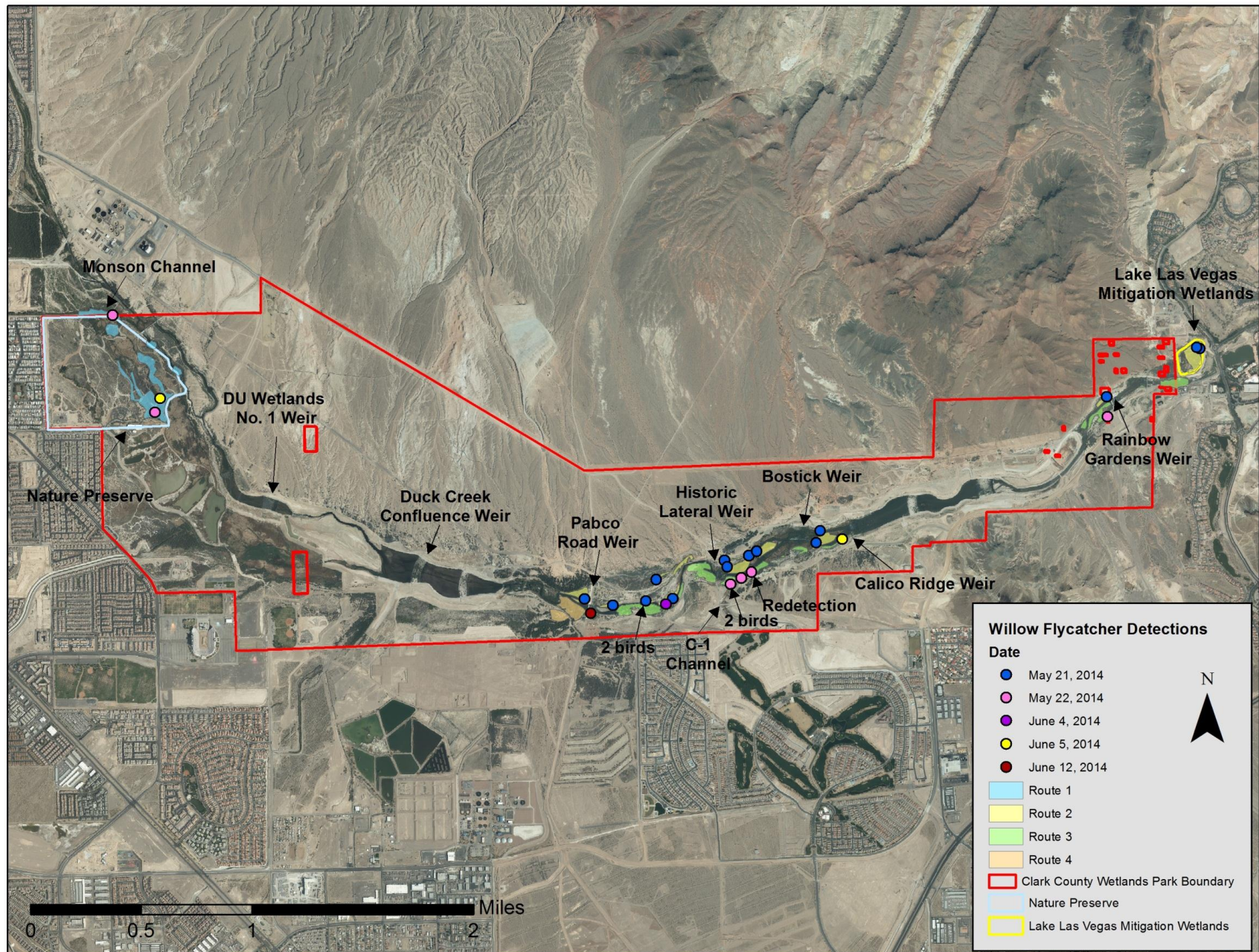


Figure 2. Survey routes and willow flycatcher detection locations; aerial imagery was taken in spring of 2014.

3.0 RESULTS

3.1 Survey Results

A total of 25 migrant willow flycatchers were detected in 2014: 21 during the first survey (a 22nd detection was made but was considered a redetection of a prior bird), 3 during the second survey, and 1 during the third survey (Table 2). Banding status is provided for the few birds for which it could be determined. GPS coordinates for detections are provided in Appendix B.

Route	Survey Date	Status	Location (refer to Figure 2)	Comments
2	May 21, 2014	Migrant	Upstream Pabco North revegetation site	
2	May 21, 2014	Migrant	Downstream Pabco North revegetation site	
2	May 21, 2014	Migrant	Upstream Historic Lateral North revegetation site	Countersang with below; not banded
2	May 21, 2014	Migrant	Upstream Historic Lateral North revegetation site	Countersang with above
2	May 21, 2014	Migrant	Upstream Historic Lateral North revegetation site	
2	May 21, 2014	Migrant	S111 revegetation site	~250ft west of point
2	May 21, 2014	Migrant	Downstream Historic Lateral North passive revegetation site	Not banded
2	May 21, 2014	Migrant	Upstream of Historic Lateral Weir	≥250ft west of point
2	May 21, 2014	Migrant	Downstream Historic Lateral North passive revegetation site	~130ft northeast of point; moved to Bostick Islands and countersang with below
2	May 21, 2014	Migrant	Bostick Islands revegetation site	Countersang with above
2	May 21, 2014	Migrant	Upstream Calico North revegetation site	
2	May 21, 2014	Migrant	Upstream Calico Emergent revegetation site	
2	May 21, 2014	Migrant	Upstream Rainbow Gardens North passive revegetation site	
2	May 21, 2014	Migrant	Lake Las Vegas mitigation wetlands	
2	May 21, 2014	Migrant	Lake Las Vegas mitigation wetlands	
1	May 22, 2014	Migrant	Monson Channel	
1	May 22, 2014	Migrant	Vern's Pond at Nature Preserve	Not banded
3	May 22, 2014	Migrant	Rainbow Islands revegetation site	~65-100ft northwest of point
3	May 22, 2014	Migrant	Upstream Bostick South revegetation site (bird on north bank in Downstream Historic Lateral North passive revegetation site)	~230ft northwest of point; redetection
3	May 22, 2014	Migrant	C-1 Channel/Downstream Historic Lateral South passive revegetation site	~50ft northeast of point, adjacent to Wash; not banded
3	May 22, 2014	Migrant	C-1 Channel/Downstream Historic Lateral South passive revegetation site	Countersang briefly with below
3	May 22, 2014	Migrant	C-1 Channel/Downstream Historic Lateral South passive revegetation site	Countersang briefly with above
2	June 4, 2014	Migrant	Upstream Historic Lateral North revegetation site (bird on south bank in Upstream Historic Lateral South Bank revegetation site)	
3	June 5, 2015	Migrant	Upstream Calico South revegetation site	
1	June 5, 2015	Migrant	Vern's Pond at Nature Preserve	Not banded
3	June 12, 2014	Migrant	Pabco South revegetation site	

Table 2. Willow flycatcher detections in 2014.

3.1.1 Route 1

Three migrant willow flycatchers were detected on this route: two on May 22 and one on June 5 (Figure 2; Table 2). On May 22, the first migrant was found on Vern's Pond within the Nature Preserve. The bird responded with a few fitz-bews. It was seen in a Goodding willow near the water's edge and was unbanded. The second bird was identified in a thin stringer of tamarisk on Monson Channel. It whitted a few times and fitz-bewed once in response to the broadcast. On June 5, another migrant was found in native habitat on Vern's Pond; it sang briefly in response to the broadcast and was unbanded. A possible willow flycatcher was also visually identified, but did not respond to the broadcast, so the identification could not be confirmed.

3.1.2 Route 2

Sixteen migrant willow flycatchers were detected on Route 2: 15 on May 21 and 1 on June 4 (Figure 2; Table 2). On May 21, the first migrant was found in willows in the Upstream Pabco North revegetation site. The bird was very responsive, singing and giving other vocalizations (whits, twitters, weeos) for several minutes following the broadcast. The next migrant was found whitting in cottonwoods in the Downstream Pabco North revegetation site, and then fitz-bewed in response to the broadcast. Three migrants were detected in the Upstream Historic Lateral North revegetation site. The first responded with a few whits and fitz-bews from a small stand of willows, then a second bird began to sing, moving around a thin band of cottonwoods on the water's edge. The two countersang for a few minutes. The first of these birds was seen and was unbanded. The third bird was found ~0.1 miles further east and responded with a few whits and fitz-bews from a patch of Goodding willows on the Wash's edge. Another willow flycatcher was detected in honey mesquite (*Prosopis glandulosa*) and defoliated tamarisk in the S111 revegetation site. The next three willow flycatchers were heard in or from the passive revegetation site located on the north bank just downstream of Historic Lateral Weir. The first responded with a few fitz-bews and whits from young native riparian habitat near the base of some bank protection; the bird was seen and had no bands. The second migrant sang once from further upstream. The third whitted and sang once from a mature stand of cottonwoods and willows. This bird became more responsive when a new willow flycatcher began to sing from the willows on the largest of the Bostick Islands, and the two countersang briefly. The next migrant was found in the Upstream Calico North revegetation site. It sang and vocalized (whits, breets, twitters) for a few minutes from a small stand of willows. A second bird may have been heard, but could not be confirmed. The next bird was detected in the Upstream Calico Emergent revegetation site, the island above Calico Ridge Weir. It was in a large Goodding willow with several migrant warblers and sang only a few times, with some whits and twitters. Another migrant was found in a willow just upstream of Rainbow Gardens Weir. It responded with weeos and twitters, fitz-bewing just once after several minutes. The final two migrants of the day were found in willows at the Lake Las Vegas mitigation wetlands. One responded to the broadcast and then a second responded, and the two countersang for a few minutes. On June 4, a migrant was detected from the Upstream Historic Lateral North revegetation site. The bird was in willows on the opposite bank and responded with a few fitz-bews and twitters.

3.1.3 Route 3

Six migrants were detected on Route 3: four on May 22, one on June 5, and one on June 12 (Figure 2; Table 2). On May 22, a migrant willow flycatcher was found in the Rainbow Islands revegetation site. The bird fitz-bewed twice and gave a weeo. From the Upstream Bostick South

revegetation site, a willow flycatcher was heard responding in the passive site on the north bank and presumed to be a repeat of one of the birds detected on Route 2 the prior day. Near the outflow of the C-1 Channel, an unbanded migrant was seen in a cottonwood snag. It whitted and sang a few times in response to the broadcast. Further upstream, on the C-1 Channel, two birds responded from mixed habitat, countersinging briefly. On June 5, a migrant was identified in a thin stringer of sandbar willow in the Upstream Calico South revegetation site, just a few hundred feet upstream of Calico Ridge Weir. Finally, on June 12, a willow flycatcher was found in a large Goodding willow at the base of Pabco Road Weir. It fitz-bewed several times in response to the broadcast.

3.1.4 Route 4

No willow flycatchers were detected along this route.

3.2 Observations on Habitat Quality

3.2.1 Route 1

Habitat quality in the Nature Preserve declined from 2013, due to a fire that burned a few acres in March of 2014. Areas burned included the northwestern end of the patch inhabited by the resident southwestern willow flycatcher in 2013 (Van Dooremolen 2014) and a stretch of riparian and mesquite habitat just east of that patch. In spite of this, the site continued to offer at least moderate quality potentially suitable nesting habitat. The site has dense sandbar willow, other shrubs and emergents in the understory and Goodding willow and cottonwood above. The densest and widest patches occur along the small channels that feed water to a series of constructed wetland ponds. The density and width of the habitat ringing the ponds themselves was generally thinner. The area along Monson Channel (Figure 2) continues to provide suboptimal habitat for nesting, consisting of a thin stringer of tamarisk. However, surveys continued along the channel because they continually yield migrant willow flycatcher detections, including one this year. Although most of the tamarisk in the study area experienced significant defoliation by the tamarisk leaf beetle (*Diorhabda* spp.), the tamarisk along Route 1 was largely unaffected during the survey season.

Eight acres of marginal quality habitat were removed from the route in 2014, as the last of the tamarisk between the DU Wetlands No. 1 and Duck Creek Confluence weirs was cleared for the construction of Silver Bowl and Archery weirs,

3.2.2 Routes 2 and 3

Routes 2 and 3 have similar habitat, as the two routes are on opposite sides of the Wash channel. Habitat quality improved in 2014; the overall extent was similar to 2013. The potentially suitable habitat along these routes is dominated by natives since most of the reach has undergone stabilization and revegetation and little tamarisk remains. The fact that there is little tamarisk remaining became important this year, as tamarisk along the Wash experienced wide-scale defoliation by the tamarisk leaf beetle for the first time. As a result of the lack of tamarisk-dominated habitat, the defoliation had little to no impact on habitat quality along the two routes. The majority of the current potentially suitable nesting habitat is found in the approximately 1.5-mile reach from Pabco Road Weir to Calico Ridge Weir (Figure 2). The habitat is of moderate to high quality, although patch sizes are small (typically 1-5 acres). The patches consist of

sandbar and Goodding willow, cottonwood, and some seep willow. In wetter areas, common reed (*Phragmites australis*) and cattails (*Typha domingensis*) form the understory. An area that saw particular improvement was the passive site on the north bank downstream of Historic Lateral Weir. Enhancements to the weir caused the Wash to flow over more of the site, improving hydrology for the southwestern willow flycatcher. Beavers (*Castor canadensis*), which are common in the Wash, then created a series of dams across the site, ponding water in and around the stands. The cottonwoods and willows that sprouted on the site several years ago are now maturing and becoming dense, while new recruits continue to appear.

Downstream of Calico Ridge Weir, habitat is largely limited to the revegetation sites just above Rainbow Gardens Weir and the Lake Las Vegas mitigation wetlands (Figure 2). Habitat quality at both of these sites had suffered several years ago, but is improving, offering fair to moderate quality now.

3.2.3 Route 4

Habitat along Route 4 was of fair quality, but the overall extent of the habitat was greatly reduced in 2014. The route now consists solely of three revegetation sites upstream of Pabco Road Weir: Upstream Pabco South, Upstream Pabco South Lower Plateau, and Upstream Pabco South Upper Plateau. In 2008, the Upstream Pabco South Lower Plateau revegetation site (Figure 2), hosted the first known southwestern willow flycatcher breeding territory on the Wash. (The bird was unsuccessful in attracting a mate and departed after 34 days, but was banded beforehand.) At that time, the site consisted of a stand of large cottonwoods mixed with Goodding willows. Patches of sandbar willow occurred on the periphery as did dense common reed. The site flooded periodically, leaving saturated soils and depressions filled with water in the understory. In the intervening years, the site has changed. To improve floodwater conveyance in early 2009, the cottonwoods and willows were thinned. Cover still has not returned to its pre-thinning state, although it has improved. Upstream Pabco South Upper Plateau exists just to the south but is dominated by mesquites and offers little to no understory.

Eighteen acres of habitat were removed from this route in 2014. The marginal quality tamarisk-dominated habitat that occurred throughout the Duck Creek drainage and that bordered the Upstream Pabco South Upper Plateau revegetation site was defoliated by the tamarisk leaf beetle to the extent that it provided no potentially suitable habitat.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Discussion

With 25 willow flycatchers detected, 2014 was a record year for migrants on the Wash (Table 3). Wash Team staff have documented substantial numbers of migrants in the past several years, showing that the Wash is being used as stopover habitat by the species on the way to its breeding grounds. Although no territorial males were observed this year, a few residents have been recorded since 2007, showing the potential for the study area to host breeding pairs. Established nesting colonies occur within just 40 miles, at Overton, Nevada (McCleod and Pellegrini 2013), and the Wash's 2008 resident southwestern willow flycatcher was re-sighted at Overton in 2009 (McCleod and Koronkiewicz 2010), showing the potential for birds to move to different sites from season to season.

Approximately 25 fewer acres, the vast majority of which were poor quality, were surveyed in 2014 compared to 2013. Some of the decline was due to weir construction, but most of it was due to defoliation by the tamarisk leaf beetle rendering the habitat unsuitable. The extent of moderate to high quality habitat was similar to 2013. Although habitat quality declined at the Nature Preserve (Route 1) due to a fire, native-dominated revegetation sites along the Wash on Routes 2 and 3 improved somewhat, offering moderate to high quality potential nesting habitat.

When southwestern willow flycatcher surveys first began in 1998, potentially suitable nesting habitat was dominated by tamarisk and the hydrology was poor. It is now dominated by native riparian species, due to revegetation and hydrological changes associated with the stabilization project. This shift appears to have positively impacted willow flycatcher occurrence in the project area. Nine years have passed without a zero-detection survey (Table 3), and in that same period two southwestern willow flycatchers established breeding territories in the study area in native-dominated sites, and two other detections occurred that were concluded to be residents of the endangered subspecies.

While southwestern willow flycatchers nest in both tamarisk and native dominated riparian habitats if the conditions are right, tamarisk-dominated habitat in the Colorado River watershed is under threat by the spread of the tamarisk leaf beetle. The defoliation of much of the remaining tamarisk at the Wash is evidence of this. With the potential decline in tamarisk-dominated nesting habitat in a portion of its range, native-dominated habitats, such as the Wash, may see increased use by the species.

As in previous years, it should be noted that although the Wash has the potential to host breeding pairs, it could become a population sink as brown-headed cowbirds are among the most common birds in the study area during the breeding season (Appendix C). The species is a known brood parasite of the southwestern willow flycatcher. While brown-headed cowbirds are no longer considered to be a significant threat, they can still impact flycatcher nest success, “especially at small and isolated breeding sites” (Sogge et al. 2010), such as the Wash would likely be.

4.2 Recommendations

Given the continued detections of migrants, recent detections of residents and the close proximity of established breeding colonies, annual surveys for southwestern willow flycatchers

Year	Migrants	Residents
1998	2	0
1999	0	0
2000	7	0
2001	0	0
2002	2	0
2003	2	0
2004	16	0
2005	0	0
2006	2	0
2007	0	1
2008	7	1*
2009	3	0
2010	1	0
2011	15	1
2012	13	0
2013	10	1*
2014	25	0
*bird on breeding territory for >30 days		

Table 3. Summary of survey results, 1998-2014. Migrants (subspecies undetermined) were detected during the first and/or second survey period. Residents were detected during the third survey period and are considered to be of the endangered southwestern subspecies.

should continue in order to avoid effects to the species and comply with informal Section 7 consultation measures.

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Appendix A

Survey Temperature and Weather

Date	Route #	Temperature (Start/Finish) - Fahrenheit	Weather (Start/Finish)
5/21/2014	2	62/85	Clear, calm/clear, light breeze
5/22/2014	4 & 1	60/80	Clear, calm/clear, calm
	3	61/72	Clear, light breeze/partly cloudy, calm
6/4/2014	2	73/79	Clear, calm/clear, calm
6/5/2014	4 & 1	70/77	Clear, calm/clear, calm
	3	72/82	Clear, light breeze/clear, calm
6/11/2014	2	76/95	Clear, calm/clear, calm
6/12/2014	4 & 1	80/83	Clear, calm/clear, calm
	3	80/84	Clear, calm/clear, calm
6/25/2014	2	69/87	Clear, calm/clear, calm
6/26/2014	4 & 1	77/80	Clear, light breeze/overcast, light breeze
	3	79/87	Clear, calm/ overcast, light breeze
7/1/2014	2	77/83	Clear, calm/clear, calm
7/2/2014	4 & 1	84/90	Clear, calm/clear, calm
	3	84/85	Clear, calm/clear, calm

Appendix B

GPS Coordinates for 2014 Willow Flycatcher Detections

Species	Location	Habitat	Date	Easting*	Northing	Comments
Willow Flycatcher	Upstream Pabco North revegetation site	native	20140521	681335	3995633	
Willow Flycatcher	Downstream Pabco North revegetation site	native	20140521	681543	3995586	
Willow Flycatcher	Upstream Historic Lateral North revegetation site	native	20140521	681782	3995619	Countersang with below; not banded
Willow Flycatcher	Upstream Historic Lateral North revegetation site	native	20140521	681782	3995619	Countersang with above
Willow Flycatcher	Upstream Historic Lateral North revegetation site	native	20140521	681978	3995635	
Willow Flycatcher	S111 revegetation site	native	20140521	681858	3995776	~250ft west of point
Willow Flycatcher	Downstream Historic Lateral North passive revegetation site	native	20140521	682356	3995915	Not banded
Willow Flycatcher	Upstream of Historic Lateral Weir	native	20140521	682376	3995868	≥250ft west of point
Willow Flycatcher	Downstream Historic Lateral North passive revegetation site	native	20140521	682531	3995948	~130ft northeast of point; moved to Bostick Islands and countersang with below
Willow Flycatcher	Bostick Islands revegetation site	native	20140521	682589	3995980	Countersang with above
Willow Flycatcher	Upstream Calico North revegetation site	native	20140521	683050	3996130	
Willow Flycatcher	Upstream Calico Emergent revegetation site	native	20140521	683021	3996041	
Willow Flycatcher	Upstream Rainbow Gardens North passive revegetation site	native	20140521	685135	3997105	
Willow Flycatcher	Lake Las Vegas mitigation wetlands	native	20140521	685810	3997455	
Willow Flycatcher	Lake Las Vegas mitigation wetlands	native	20140521	685789	3997465	
Willow Flycatcher	Monson Channel	tamarisk	20140522	677904	3997700	
Willow Flycatcher	Vern's Pond at Nature Preserve	native	20140522	678212	3996990	Not banded
Willow Flycatcher	Rainbow Islands revegetation site	native	20140522	685141	3996958	~65-100ft northwest of point
Willow Flycatcher	Upstream Bostick South revegetation site (bird on north bank in Downstream Historic Lateral North passive revegetation site)	native	20140522	682553	3995829	~230ft northwest of point; redetection
Willow Flycatcher	C-1 Channel/Downstream Historic Lateral South passive revegetation site	native	20140522	682477	3995787	~50ft northeast of point, adjacent to Wash; not banded
Willow Flycatcher	C-1 Channel/Downstream Historic Lateral South passive revegetation site	mix	20140522	682398	3995739	Countersang briefly with below
Willow Flycatcher	C-1 Channel/Downstream Historic Lateral South passive revegetation site	mix	20140522	682398	3995739	Countersang briefly with above
Willow Flycatcher	Upstream Historic Lateral North revegetation site (bird on south bank in Upstream Historic Lateral South Bank revegetation site)	native	20140604	681928	3995594	
Willow Flycatcher	Upstream Calico South revegetation site	native	20140605	683211	3996068	
Willow Flycatcher	Vern's Pond at Nature Preserve	native	20140605	678250	3997092	Not banded
Willow Flycatcher	Pabco South revegetation site	native	20140612	681382	3995528	

*Datum - NAD83

Appendix C

List of All Bird Species Detected during 2014 Surveys
with Presumed Status and Relative Abundance

The following table includes all bird species identified in the study area during the 2014 southwestern willow flycatcher surveys. Presumed status comes from our field observations. Relative abundance categories are modified after Phillips et al. (1964); abundance of a given species is based on our field observations. Species names and taxonomic order follow the American Ornithologists' Union's *Check-list of North American Birds* (AOU 1998) and subsequent revisions. Adapted from Appendix A in SWCA (2009b).

Common Name	Scientific Name	Presumed Status	Relative Abundance
Canada goose	<i>Branta canadensis</i>	R	U
Gadwall	<i>Anas strepera</i>	R	R
American wigeon	<i>Anas americana</i>	M	R
Mallard	<i>Anas platyrhynchos</i>	R	C
Cinnamon teal	<i>Anas cyanoptera</i>	R	R
Green-winged teal	<i>Anas crecca</i>	M	R
Gambel's quail	<i>Callipepla gambelii</i>	R	C
Double-crested cormorant	<i>Phalacrocorax auritus</i>	R	U
American white pelican	<i>Pelecanus erythrorhynchos</i>	M	R
Least bittern	<i>Ixobrychus exilis</i>	R	R
Great blue heron	<i>Ardea herodias</i>	R	U
Great egret	<i>Ardea alba</i>	R	U
Snowy egret	<i>Egretta thula</i>	R	U
Green heron	<i>Butorides virescens</i>	R	FC
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	R	U
White-faced ibis	<i>Plegadis chihi</i>	M	FC
Turkey vulture	<i>Cathartes aura</i>	R	R
Northern harrier	<i>Circus cyaneus</i>	R	R
Cooper's hawk	<i>Accipiter cooperii</i>	R	U
Red-tailed hawk	<i>Buteo jamaicensis</i>	R	R
Sora	<i>Porzana carolina</i>	M	R
Common gallinule	<i>Gallinula galeata</i>	R	U
American coot	<i>Fulica americana</i>	R	FC
Killdeer	<i>Charadrius vociferous</i>	R	R
Black-necked stilt	<i>Himantopus mexicanus</i>	R	FC
American avocet	<i>Recurvirostra americana</i>	R	FC
Spotted sandpiper	<i>Actitis macularius</i>	R	U
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>	M	R
White-winged dove	<i>Zenaida asiatica</i>	R	FC
Mourning dove	<i>Zenaida macroura</i>	R	FC

Common Name	Scientific Name	Presumed Status	Relative Abundance
Greater roadrunner	<i>Geococcyx californianus</i>	R	U
Great horned owl	<i>Bubo virginianus</i>	R	R
Lesser nighthawk	<i>Chordeiles acutipennis</i>	R	U
White-throated swift	<i>Aeronautes saxatalis</i>	R	R
Black-chinned hummingbird	<i>Archilochus alexandri</i>	R	U
Anna's hummingbird	<i>Calypte anna</i>	R	U
Costa's hummingbird	<i>Calypte costae</i>	R	U
American kestrel	<i>Falco sparverius</i>	R	U
Western wood-pewee	<i>Contopus sordidulus</i>	M	FC
Willow flycatcher	<i>Empidonax traillii</i>	M	U
Western-type flycatcher	<i>Empidonax difficilis</i>	M	R
Black phoebe	<i>Sayornis nigricans</i>	R	FC
Say's phoebe	<i>Sayornis saya</i>	R	FC
Ash-throated flycatcher	<i>Myiarchus cinerascens</i>	R	R
Western kingbird	<i>Tyrannus verticalis</i>	R	U
Loggerhead shrike	<i>Lanius ludovicianus</i>	M	R
Warbling vireo	<i>Vireo gilvus</i>	M	R
Common raven	<i>Corvus corax</i>	R	R
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	R	C
Bank swallow	<i>Riparia riparia</i>	M	R
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	R	FC
Verdin	<i>Auriparus flaviceps</i>	R	C
Canyon wren	<i>Catherpes mexicanus</i>	R	U
Bewick's wren	<i>Thryomanes bewickii</i>	R	C
Marsh wren	<i>Cistothorus palustris</i>	R	C
Black-tailed gnatcatcher	<i>Poliophtila melanura</i>	R	C
Northern mockingbird	<i>Mimus polyglottos</i>	R	U
Crissal thrasher	<i>Toxostoma crissale</i>	R	FC
Cedar waxwing	<i>Bombycilla cedrorum</i>	M	R
Phainopepla	<i>Phainopepla nitens</i>	R	R
Lucy's warbler	<i>Oreothlypis luciae</i>	R	FC
Common yellowthroat	<i>Geothlypis trichas</i>	R	C
Yellow warbler	<i>Setophaga petechia</i>	R	C
Wilson's warbler	<i>Cardellina pusilla</i>	M	FC
Yellow-breasted chat	<i>Icteria virens</i>	R	C
Abert's towhee	<i>Melospiza aberti</i>	R	C

Common Name	Scientific Name	Presumed Status	Relative Abundance
Song sparrow	<i>Melospiza melodia</i>	R	C
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	M	R
Summer tanager	<i>Piranga rubra</i>	R	R
Western tanager	<i>Piranga ludoviciana</i>	M	R
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	M	U
Blue grosbeak	<i>Passerina caerulea</i>	R	C
Indigo bunting	<i>Passerina cyanea</i>	R	U
Red-winged blackbird	<i>Agelaius phoeniceus</i>	R	C
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	R	U
Great-tailed grackle	<i>Quiscalus mexicanus</i>	R	C
Brown-headed cowbird	<i>Molothrus ater</i>	R	C
Hooded oriole	<i>Icterus cucullatus</i>	R	R
Bullock's oriole	<i>Icterus bullockii</i>	R	R
House finch	<i>Haemorhous mexicanus</i>	R	FC

Presumed Status

Resident (R)	Species is present in the area throughout the summer nesting season.
Migrant (M)	Species passes through the area during migration.

Relative Abundance

Abundant (A)	Species is easily detected in large numbers (>50) on a daily basis.
Common (C)	Species is easily detected on a daily basis, but not in large numbers (5–50).
Fairly Common (FC)	Species regularly detected in small numbers (2–4) on a daily basis.
Uncommon (U)	Species regularly detected in very small numbers, although not necessarily every day.
Rare (R)	Species detected irregularly in very small numbers.