



Las Vegas Wash Coordination Committee

lvwash.org



Southwestern Willow Flycatcher Surveys along the Las Vegas Wash, Clark County, Nevada, 2011



December 2011



Southwestern Willow Flycatcher Surveys along the Las Vegas Wash, Clark County, Nevada, 2011

**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**

December 2011

ABSTRACT

The Las Vegas Wash Coordination Committee, 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 2900-acre Clark County Wetlands Park. During Section 7 consultation on the project, the U.S. Fish and Wildlife Service recommended that annual surveys for southwestern willow flycatcher (*Empidonax traillii extimus*) be conducted during the breeding season to determine the occurrence of the species within the park. Annual 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). 2011 represents the second year these surveys were performed by permitted Southern Nevada Water Authority staff (Van Dooremolen 2010). Surveys were conducted using the standard protocol recently updated by Sogge et al. (2010) in which surveyors broadcast the species' song to elicit a response from any nearby willow flycatchers. We followed the five-survey protocol recommended for projects. Surveys began May 23 and were completed July 14.

A total of 16 willow flycatchers were detected during the survey season: 13 in the first survey, 2 in the second survey, and 1 in the fourth survey (none were detected in the third and fifth surveys). The detection on June 29 (during the fourth survey) in the Calico Islands was categorized as a resident and thus of the federally endangered southwestern subspecies, per Sogge et al. (2010), which states that all migrants should be on their breeding grounds by then. All other detections were classified as migrants. Habitat quality was variable among the survey routes with the highest quality habitat occurring in the Nature Preserve and along the Wash between Pabco Road and Calico Ridge Weirs. Vegetation removal for weir maintenance, fire, and flooding of upstream habitat from the creation of the Lower Narrows Weir reduced the amount of potentially suitable nesting habitat in the study area.

ACKNOWLEDGEMENTS

I would like to thank the Bureau of Reclamation for providing partial funding to the Southern Nevada Water Authority for this project under assistance agreement number R09AP30017. I would also like to extend my thanks to Seth Shanahan, Marissa Foster, and Carol Lane for assisting with surveys. In addition, I would like to thank Lake Las Vegas Resort for allowing access to their mitigation wetlands. Finally, I would like to thank the Las Vegas Wash Coordination Committee for their continued support for wildlife monitoring research and the implementation of the Las Vegas Wash Comprehensive Adaptive Management Plan and Las Vegas Wash Wildlife Management Plan. These activities have been conducted by Deborah Van Dooremolen under permit no. TE-148556-1 (expired October 11, 2011; renewal application received by the U.S Fish and Wildlife Service in September 2011 and in process) and Seth Shanahan under permit no. TE-231424-0 (expires March 18, 2013) as issued by the U.S. Fish and Wildlife Service, Sacramento, California.

Southwestern Willow Flycatcher Surveys along the Las Vegas Wash, Clark County, Nevada, 2011

Table of Contents

	Page No.
Abstract	ii
Acknowledgements	iii
Table of Contents	iv
List of Tables	v
List of Figures	v
List of Appendices	v
1.0 BACKGROUND	1
2.0 METHODS	2
2.1 Study Area	2
2.2 Survey Protocol	3
3.0 RESULTS	5
3.1 Survey Results	5
3.1.1 Route 1	5
3.1.2 Route 2	5
3.1.3 Route 3	6
3.1.4 Route 4	6
3.2 Observations on Habitat Quality	7
3.2.1 Route 1	7
3.2.2 Routes 2 and 3	7
3.2.3 Route 4	8
4.0 DISCUSSION AND RECOMMENDATIONS	9
4.1 Discussion	9
4.2 Recommendations	10
5.0 LITERATURE CITED	10

List of Tables

Table 1. Southwestern willow flycatcher survey dates for the study area.....3

Table 2. 2011 willow flycatcher detection information. GPS coordinates are provided in Appendix B.5

Table 3. Summary of survey results, 1998-2011. 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.9

List of Figures

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

Figure 2. 2011 survey routes and willow flycatcher detection locations. Aerial imagery covering the Wash was taken on February 17, 20114

List of Appendices

Appendix A Survey Temperature and Weather

Appendix B UTM Coordinates (WGS 84) for 2011 Willow Flycatcher Detection Locations

Appendix C List of All Bird Species Detected during 2011 Surveys with Presumed Status and Relative Abundance

1.0 BACKGROUND

The Las Vegas Wash (Wash) is the primary drainage channel for the Las Vegas Valley carrying urban flows, including 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.

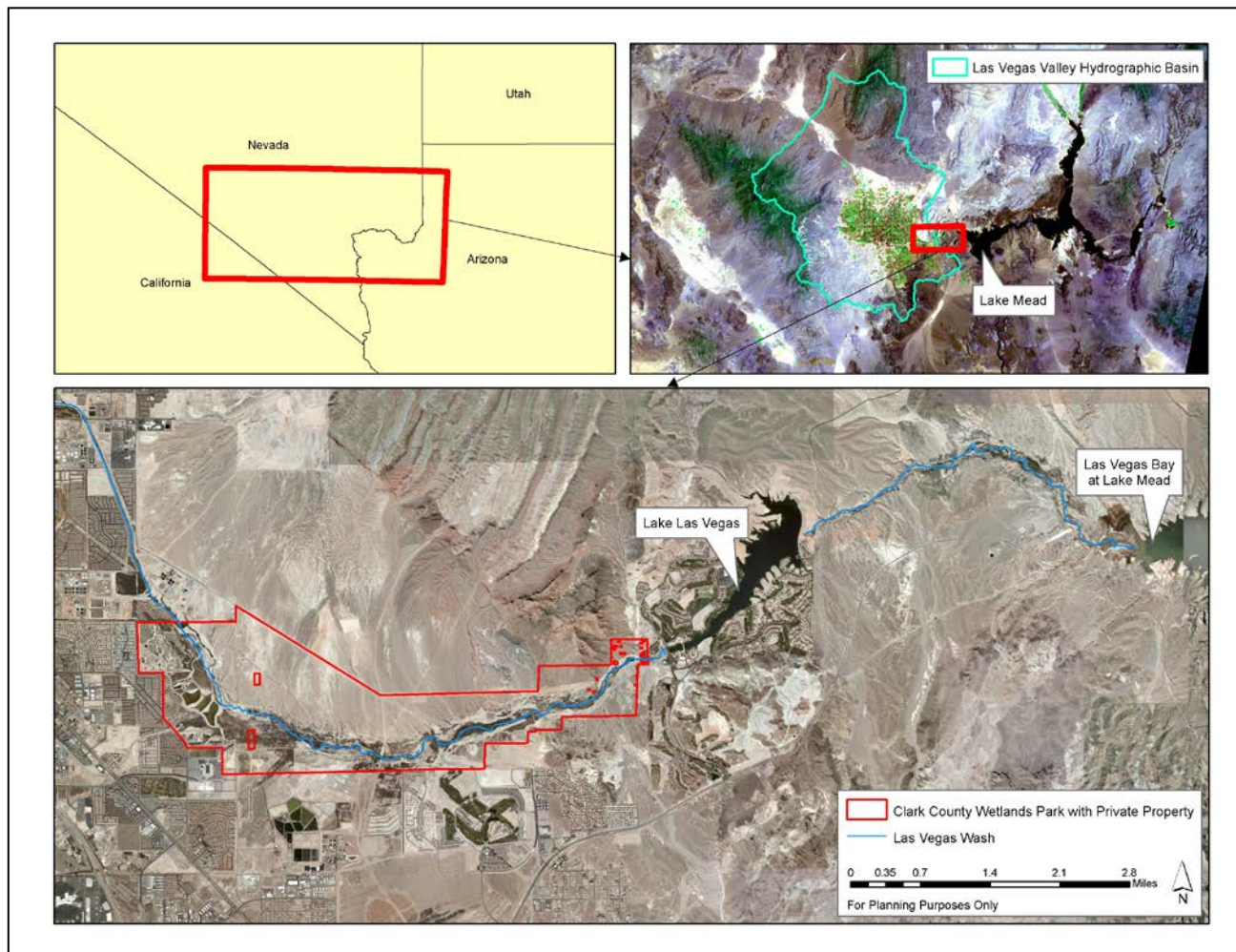


Figure 1: Las Vegas Wash location and general study area map.

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 22 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 2011, 12 weirs were in place and two more were under construction.

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 salt cedar (*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 2900-acre Clark County Wetlands Park (Wetlands Park), and so Clark County is also removing salt cedar and planting riparian and wetland vegetation within the study area as it develops park facilities.

The southwestern willow flycatcher (*Empidonax trailli 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 20th century, the southwestern willow flycatcher adapted to the non-native salt cedar that had largely replaced its preferred habitat.

Since salt cedar dominated the Wash and breeding colonies of the subspecies were established elsewhere in southern Nevada, the U.S. Fish and Wildlife Service required that the Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC, conduct annual surveys to determine the breeding status of the subspecies within the Wetlands Park during informal Section 7 consultation on the proposed development of the park and associated erosion control structures. 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). In 2010, permitted SNWA staff began conducting the surveys (Van Dooremolen 2010). This document reports the results from the 2011 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*). Salt cedar is the dominant non-native species.

Four survey routes were established to cover all potentially suitable habitat within the Wash (Figure 2). Route 1 begins in the Nature Preserve and continues upstream along the west bank of the Wash to approximately one mile north of the Wetlands Park boundary, covering 43 acres. The Nature Preserve includes constructed wetland ponds and small streams lined with riparian vegetation. The area to the north has undergone little stabilization or revegetation. Route 2 is located on the north bank of the Wash, and begins just upstream of Pabco Road Weir and continues downstream to the Lake Las Vegas mitigation wetlands. It covers 25 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 23 acres of habitat. 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 begins just above Pabco Road Weir. It includes the remaining habitat upstream along the Wash and the Duck Creek drainage and covers 39 acres. Although the route begins in a riparian revegetation site, the majority covers areas that have not undergone stabilization or revegetation.

2.2 Survey Protocol

Surveys were conducted using the recently updated standard protocol developed by Sogge et al. (2010). Surveys began in the hour before sunrise and were completed by 10:30 a.m. 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 ft following a period of silent listening. Vocalizations were broadcast for approximately 20 seconds at each stop, followed by one to two 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, inability to enter without damaging vegetation, vagrant camps).

It took two teams of two people two days to complete one full survey of all four routes. Routes 1 and 2 were surveyed on the first day, and Routes 3 and 4 were surveyed on the second day. Deborah Van Dooremolen (TE-148556-1) led one team and Seth Shanahan (TE-231424-0) led the other. We followed the revised five-survey protocol for projects (Sogge et al. 2010), which now includes two surveys in the second survey period and two surveys in the third survey period. Survey period one remained the same (May 15-31) with one survey required. The dates of survey periods two and three changed to June 1-24, and June 25-July 17, respectively. See Table 1 for actual survey dates and Appendix A for temperature and weather.

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

Survey Period	1st Survey	2nd Survey
First (May 15-30)	May 23/24	n/a
Second (June 1-24)	June 8/9	June 22/23
Third (June 25-July 17)	June 29/30	July 13/14

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

discovered during the first and second survey periods may simply be migrating through the area and cannot be determined to be of the federally endangered subspecies. The third survey period begins after the known migration period, so any willow flycatchers detected during that time can



Figure 2: 2011 survey routes and willow flycatcher detection locations. Aerial imagery covering the Wash was taken on February 17, 2011.

be considered residents, and thus of the southwestern subspecies (Sogge et al. 2010).

3.0 RESULTS

3.1 Survey Results

We detected 16 willow flycatchers during the 2011 season (Figure 2, Table 2, Appendix B): 13 in the first survey, 2 in the second survey, and 1 in the fourth survey (none were detected in the third and fifth surveys). The detection on June 29 (during the fourth survey) was categorized as a resident and thus of the federally endangered southwestern subspecies. All other detections were classified as migrants. A breakdown of the detections by survey route follows. The banding status of the bird is provided in parentheses where known.

Survey Route	Date	Species	Location (refer to Figure 2)
Route 1	May 23, 2011	Willow Flycatcher	Monson Channel
Route 2	May 23, 2011	Willow Flycatcher	Below Historic Lateral Weir, on the north bank
Route 2	May 23, 2011	Willow Flycatcher	Lake Las Vegas mitigation wetlands
Route 2	June 8, 2011	Willow Flycatcher	Across the Wash in the Downstream Pabco South revegetation site
Route 2	June 8, 2011	Willow Flycatcher	~ 0.2 miles upstream of Rainbow Gardens Weir, on the north bank
Route 2	June 29, 2011	Southwestern Willow Flycatcher	Calico Islands revegetation site
Route 3	May 24, 2011	Willow Flycatcher	Bostick Weir revegetation site, south bank
Route 3	May 24, 2011	Willow Flycatcher	Bostick Weir revegetation site, south bank
Route 3	May 24, 2011	Willow Flycatcher	Upstream Bostick South revegetation site
Route 3	May 24, 2011	Willow Flycatcher	Upstream Bostick South revegetation site
Route 3	May 24, 2011	Willow Flycatcher	Upstream Historic Lateral South revegetation site
Route 4	May 24, 2011	Willow Flycatcher	Upstream Pabco South Lower Plateau revegetation site
Route 4	May 24, 2011	Willow Flycatcher	Upstream Pabco South Upper Plateau revegetation site
Route 4	May 24, 2011	Willow Flycatcher	Duck Creek
Route 4	May 24, 2011	Willow Flycatcher	Duck Creek
Route 4	May 24, 2011	Willow Flycatcher	~0.4 miles east of the in-lieu fee mitigation ponds

Table 2: 2011 willow flycatcher detection information. GPS coordinates are provided in Appendix B.

3.1.1 Route 1

One migrant willow flycatcher was detected on this route on May 23 (Figure 2, Table 2). The bird was found in sparse salt cedar along the Monson Channel.

3.1.2 Route 2

Four migrant willow flycatchers and one resident southwestern willow flycatcher were detected while conducting surveys on Route 2 (Figure 2, Table 2). This was the only route to have detections beyond the first survey. On May 23, one migrant (not banded) was detected just downstream of Historic Lateral Weir in a small patch of sandbar willow growing along the Wash and one was found in the large Goodding willows in the Lake Las Vegas mitigation wetlands. On June 8, a bird was heard fitz-bewing in response to the broadcast from across the Wash in the

Downstream Pabco South riparian-dominated revegetation site. Another bird responded on the north bank, approximately 0.2 miles upstream of Rainbow Gardens Weir. The bird was moving about in mixed native riparian/salt cedar habitat and at first responded only with twitters and other interaction vocalizations. The bird finally fitz-bewed when we moved to a second call station further back from the Wash channel. On June 29, a bird fitz-bewed twice in response to the broadcast in the Calico Islands, with the first response coming several seconds after the broadcast was finished. The detection occurred approximately 0.15 miles downstream from the location where we detected two birds on Route 3 on May 24 (see below). Due to the late (in the season) timing of the detection, we concluded the bird was a resident and thus of the endangered subspecies, but no breeding activity was observed on-site.

3.1.3 Route 3

Five migrants were detected during surveys on Route 3 (Figure 2, Table 2) on May 24. The detections occurred from Bostick Weir to just above Historic Lateral Weir. Two of the detections were of two birds each. The first of these occurred on the Bostick Weir, on the south bank in a native-dominated wetland/riparian patch. At first, just one bird sang, flying from perch to perch (not banded), responding to the broadcast with fitz-bews and whitts. Then a second bird fitz-bewed from inside a small patch of sandbar willows while the other bird was still visible. This occurred twice. The visible bird showed no aggression to the other willow flycatcher, possibly indicating a pair (Sogge et al. 2011). Further upstream, in the Upstream Bostick South revegetation site, a willow flycatcher responded to the broadcast instantly, fitz-bewing aggressively. Almost immediately, a second bird responded and the two countersang for more than a minute, at which time one bird flew at and appeared to hit the other bird. The birds were in an area of the site with desert willow (*Chilopsis linearis*), mesquite (*Prosopis* sp.), willow, and cottonwood with an understory of broom baccharis (*B. sarothroides*), less than a tenth of a mile from where a bird was detected along Route 2 the previous day. These observations seemed significant, the former indicating a possible pair and the latter suggesting territorial defense, both of which are listed as signs of breeding activity in the federal protocol (Sogge et al. 2010). However, no further detections were made at these sites for the remainder of the survey season, despite taking extra time to survey them thoroughly. The fifth detection on May 24 occurred in a thin band of sandbar willow bordering the Wash along the southwestern edge of the Historic Lateral South revegetation site.

3.1.4 Route 4

Five migrant willow flycatchers were detected along this route on May 24 (Figure 2). Two were found in revegetation sites just upstream of Pabco Road Weir, one in the riparian-dominated Upstream Pabco South Lower Plateau site and the other (not banded) in the Upper Plateau site in honey mesquite (*P. glandulosa*). Two were detected (one confirmed as not banded) in the sparse stringers of salt cedar along Duck Creek, approximately 0.5-0.6 miles northeast of Sam Boyd Stadium. The remaining bird was identified on a ledge on the Wash channel dominated with salt cedar, approximately 0.4 miles east of the in-lieu fee mitigation ponds.

3.2 Observations on Habitat Quality

3.2.1 Route 1

As in 2010, the highest quality potentially suitable nesting habitat along this route was found in the Nature Preserve, with dense sandbar willows, other shrubs and emergents in the understory and Goodding willow and cottonwood above. The densest and widest patches occurred along the small channels that feed water to a series of constructed wetland ponds. Habitat quality continued to improve as dozens of small sandbar willows and emory baccharis (*B. emoryi*) had sprouted up in these areas. The density and width of the habitat ringing the ponds themselves was generally thinner. The remainder of the habitat along the route was of marginal quality. The area between the Wetlands Park boundary and AWT road (Figure 2) consists of thin stringers of salt cedar lining the Wash and Monson Channel. The Wash channel is somewhat incised here, separating the Wash from the trees by approximately ten feet, so that the ground in the stands is dry. North of the AWT road, a large but similarly dry stand of salt cedar borders the Wash until the channel opens up and is scattered with native and non-native trees and shrubs that are relatively sparse and of low stature.

3.2.2 Routes 2 and 3

Routes 2 and 3 have similar habitat, as the two routes present opposite sides of the Wash channel. The potentially suitable habitat is dominated by natives since most of the reach has undergone stabilization and revegetation; little salt cedar remains. Habitat along these routes was reduced in 2011 due to the clearing of a patch of Goodding willow on the north bank just below Pabco Road Weir for weir maintenance. The flooding of the islands below Calico Ridge Weir by the impoundment of the Lower Narrows Weir led to the die-off of most of the willows by the end of the survey season, also reducing habitat. The majority of the current habitat is still concentrated in the approximately 1.5-mile reach from Pabco Road Weir to Calico Ridge Weir (Figure 2), and is of moderate quality, although patch sizes are small (typically between 1-5 acres). The patches consist of sandbar and Goodding willow, as well as some cottonwood and seep willow. In wetter areas, cattails (*Typha domingensis*) and common reed (*Phragmites australis*) are often present in the understory. In the Calico Islands revegetation site, located between the Bostick and Calico Ridge Weir, areas of saturated soils and standing water were found in the island interior, improving the habitat quality from 2010. In prior years, the wet zone and much of the structure (provided by a mixture of wetland and riparian species) were limited to the edges. The majority of the surface area is still dominated by stands of Goodding willow with little live material in the understory. These islands were considered one of three Present/Future Hotspots (for detections) identified in the 2009 survey report (SWCA 2009b) and yielded the June 29, 2011, detection of a southwestern willow flycatcher (Figure 2).

A new area with potential to provide habitat in the future is located on the north bank of the Wash, just downstream of the Historic Lateral Weir. The area, which is just over five acres, had been largely bare. Following stabilization work, the hydrology became wetter and the site now includes a small backwater and other wet areas. Willows and cottonwoods have sprouted up in large number across the site, although they are still of low stature. A migrant was detected here on May 23 in some mature sandbar willows on the bank (Figure 2).

Downstream of Calico Ridge Weir, habitat is limited and the quality is largely marginal, although the Rainbow Gardens Weir revegetation site is improving again. The construction of the Lower Narrows and Homestead Weirs (Figure 2) removed a large amount of habitat from these routes (cleared in 2009), habitat that had yielded ten detections from 1998 through 2009 (more than 20% of all detections that occurred during that time period). Construction of the weirs was completed in the summer of 2011, but revegetation opportunities are largely limited to more xeric areas and are not likely to substantially improve potential nesting habitat.

The furthest downstream point surveyed was the Lake Las Vegas mitigation wetlands (Figure 2), part of Route 2. The mitigation wetlands are located just to the east of the Wetlands Park and were also considered a Present/Future Hotspot in 2009 (SWCA 2009b), hosting willow flycatcher detections in both 2008 and 2009. Habitat quality had declined here in 2010 with substantial die-off of Goodding willow resulting in thickets of standing dead trees. Some patches of live trees remained but they were more isolated and had less understory (some cattails, mesquite, and a patch of sandbar willow). Conditions were similar in 2011, but a migrant was detected here on May 24.

3.2.3 Route 4

Habitat along Route 4 was of mixed quality. The route begins with the remaining 2009 Present/Future Hotspot (SWCA 2009b), which is the only native-dominated habitat on the route. In 2008, this site (Upstream Pabco South Lower Plateau), located just upstream of Pabco Road Weir (Figure 2), played host to the only southwestern willow flycatcher breeding territory to have ever been established on the Wash (the bird was unsuccessful in attracting a mate and departed after 34 days, but was banded beforehand – see cover photo). 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. The site was dry for the 2009 and 2010 survey seasons, but showed some improvement in 2011, frequently having moist soils. A second revegetation site (Upstream Pabco South Upper Plateau) exists just to the south but is dominated by mesquites and offers little to no understory. Both sites yielded migrant detections in 2011.

The remainder of the habitat along Route 4, both along the Wash channel and throughout the Duck Creek drainage, is dominated by salt cedar and is of marginal quality. Flows are largely channelized or are isolated at the edge of the stands so that all but the trees bordering the water are dry, with no surface water or saturated soil in the stand interior. Also, some stands that were burned as recently as a few years prior to surveys have not yet returned to their full stature, and a fire in the spring burned a few more acres of salt cedar near the mitigation ponds. The area northeast of Sam Boyd Stadium (Figure 2) that has hosted several detections over the years (SWCA 2008) continues to be dry and of marginal habitat value. The stand was once fed by runoff and generally wet during the survey season, but has now been dry for several years.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Discussion

Willow flycatcher use of the Wash continues to be largely limited to migration (Table 3). However, three years (2007, 2008, and 2011) have resulted in detections that could be concluded to be residents and thus of the federally endangered southwestern subspecies. In 2007, the bird was detected only once, but in 2008, a male actually set up a breeding territory for more than 30 days. In 2011, the bird was only detected the one time, on June 29. Per the protocol (Sogge et al. 2010), birds detected during the third survey period (June 25-July 17) can be concluded to be of the southwestern subspecies, regardless of whether breeding is confirmed as all migrants should be on their breeding grounds by then. Thus, we concluded the bird was a resident. There are some interesting points to note with this detection though. Although a bird was detected in that location only once, the location was just 0.15 miles downstream of the May 24 detection of two willow flycatchers (one somewhat territorial and one relatively quiet but uncontested, suggesting a possible pair) on Bostick Weir and 0.35 miles downstream of the May 24 detection of two birds appearing very territorial in the Upstream Bostick South revegetation site. Likewise, southwestern willow flycatchers become very quiet later in the nesting season (Sogge et al. 2010). The June 29 bird responded only twice to the broadcast and the response was fairly anemic. Sogge et al. (2010) state that, "Isolated pairs can be much quieter and harder to detect than pairs with adjacent territorial flycatchers."

The continued detections of migrants and the recent detections of residents indicate that the area has the potential to host breeding pairs. Established nesting colonies occur within just 40 miles of the study area at Overton, Nevada (McCleod and Koronkiewicz 2010), and the Wash's 2008 southwestern willow flycatcher was re-sighted at Overton in 2009 showing the potential for birds to move to different sites from season to season (McCleod and Koronkiewicz 2010).

The large number of detections during the May 23/24 surveys indicates a migrant wave, similar in size to that of the 2004 survey season. A smaller wave was detected in 2008. The detection of these waves suggests that the Wash offers valuable habitat to migrating willow flycatchers.

Weir maintenance, fire, and flooding of upstream habitat from the creation of the Lower Narrows Weir reduced the amount of potentially suitable nesting habitat in the study area in 2011. Clearance of native woody vegetation for weir maintenance will continue to reduce both the

Year	Migrants	Residents
1998	2	0
1999	0	0
2000	7	0
2001	0	0
2002	2	0
2003	2	0
2004	18	0
2005	0	0
2006	2	0
2007	0	1
2008	7	1
2009	3	0
2010	1	0
2011	15	1

Table 3: Summary of survey results, 1998-2011. 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.

extent and quality of potentially suitable nesting habitat on the Wash in 2012. The Calico Islands and several other patches along the Wash are slated for clearing in the winter of 2011/2012. Given this, it is less likely that we will see net gains in habitat extent and quality over the next 5-10 years, as proposed in the 2010 report (Van Dooremolen 2010). While the expected loss of these habitat patches is unfortunate, it is necessary for the protection of the weirs, without which there would be no native revegetation along the Wash and the channel itself would be further incised and unstable.

When this monitoring first began in 1998, potentially suitable nesting habitat was dominated by salt cedar. It is now dominated by native riparian habitat, supplied by the revegetation associated with the stabilization project on the Wash. The quality of the habitat at several of the Wash revegetation sites and at the Nature Preserve has improved in the past several years even as the overall amount of available habitat has declined. It is likely no coincidence that in that time we have gone six years without a zero-detection survey (Table 3), witnessed a southwestern willow flycatcher establish the first (2008) breeding territory in the study area in a riparian revegetation site, and had two other years with detections we could conclude to be residents of the endangered subspecies.

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 abundant 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

With the continued detections of migrants, recent detections of residents and the close proximity of established breeding colonies, annual surveys for southwestern willow flycatchers should continue. The surveys are also needed to comply with informal Section 7 consultation measures, and will enable SNWA to be proactive should nesting pairs be identified.

5.0 LITERATURE CITED

- American Ornithologists' Union (AOU). 1998. Check-list of North American birds. Seventh Edition. American Ornithologists' Union, Washington, D.C. 829 pp.
- McCleod, M.A. and T.J. Koronkiewicz. 2010. Southwestern willow flycatcher surveys, demography, and ecology along the lower Colorado River and tributaries, 2009. Annual report submitted to Bureau of Reclamation, Boulder City, NV, by SWCA Environmental Consultants, Flagstaff, AZ. 165 pp.
- Phillips, A.R., J. Marshall, and G. Monson. 1964. *The Birds of Arizona*. University of Arizona Press, Tucson. 212 pp.
- Sogge, M.K., Ahlers, Darrell, 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 p.

- Southwest Wetlands Consortium. 1998. A survey for southwestern willow flycatchers along Las Vegas Wash, Clark County Wetlands Park, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Clark County Department of Parks and Recreation, Las Vegas.
- SWCA. 1999. Survey for southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2000. Survey for southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2001. Survey for southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2002. Survey for Yuma clapper rails, yellow-billed cuckoos and southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2003. Survey for Yuma clapper rails, yellow-billed cuckoos and southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2005. [2004] Survey for Yuma clapper rails, yellow-billed cuckoos and southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2006. Survey for southwestern willow flycatchers in 2005 along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2007. 2006 survey for Yuma clapper rails and southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2008. 2007 survey for Yuma clapper rails and southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.
- SWCA. 2009a. 2008 survey for southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.

SWCA. 2009b. 2009 survey for southwestern willow flycatchers along Las Vegas Wash, Clark County, Nevada. Prepared by SWCA Environmental Consultants, Salt Lake City. Final report prepared for the Southern Nevada Water Authority, Las Vegas.

Van Dooremolen, D. 2010. Southwestern willow flycatcher surveys along Las Vegas Wash, Clark County, Nevada, 2010. Prepared by the Southern Nevada Water Authority, Las Vegas, NV. Prepared for the U.S. Fish and Wildlife Service and the Las Vegas Wash Coordination Committee.

http://www.lvwash.org/assets/pdf/resources_ecoresearch_yuma10.pdf

Appendix A

Survey Temperature and Weather

Date	Route #	Temperature (Start/Finish) - Fahrenheit	Weather (Start/Finish)
5/23/2011	1 & 2	60/75	partly cloudy, breezy/partly cloudy, breezy
5/24/2011	3 & 4	60/75	clear skies, no wind/clear skies, no wind
6/8/2011	1 & 2	65/85	clear skies, no breeze/clear skies, light breeze
6/9/2011	3 & 4	65/85	clear skies, no wind/clear skies, no wind
6/22/2011	1 & 2	80/90	clear skies, no wind/clear skies, no wind
6/23/2011	3 & 4	85/95	clear skies, light breeze/clear skies, no breeze
6/29/2011	1 & 2	85/95	partly cloudy, no wind/partly cloudy, light wind
6/30/2011	3 & 4	75/95	clear skies, windy/clear skies, no wind
7/13/2011	1 & 2	70/90	clear skies, no wind/clear skies, no wind
7/14/2011	3 & 4	70/85	clear skies, no wind/clear skies, no wind

Appendix B

UTM Coordinates (WGS 84) for 2011 Willow Flycatcher Detection Locations

Survey Route	Date	Species	Location (refer to Figure 2)	Easting	Northing
Route 1	May 23, 2011	Willow Flycatcher	Monson Channel	677731	3997705
Route 2	May 23, 2011	Willow Flycatcher	Below Historic Lateral Weir, on the north bank	682432	3995843
Route 2	May 23, 2011	Willow Flycatcher	Lake Las Vegas mitigation wetlands	685805	3997478
Route 2	June 8, 2011	Willow Flycatcher	Across the Wash in the Downstream Pabco South revegetation site	681760	3995629
Route 2	June 8, 2011	Willow Flycatcher	~ 0.2 miles upstream of Rainbow Gardens Weir, on the north bank	684951	3996839
Route 2	June 29, 2011	Southwestern Willow Flycatcher	Calico Islands (in the Calico Ridge Weir impoundment)	683098	3996105
Route 3	May 24, 2011	Willow Flycatcher	Bostick Weir, south bank	682923	3995967
Route 3	May 24, 2011	Willow Flycatcher	Bostick Weir, south bank	682918	3995980
Route 3	May 24, 2011	Willow Flycatcher	Upstream Bostick South revegetation site	682575	3995854
Route 3	May 24, 2011	Willow Flycatcher	Upstream Bostick South revegetation site	682592	3995854
Route 3	May 24, 2011	Willow Flycatcher	Upstream Historic Lateral South revegetation site	682032	3995686
Route 4	May 24, 2011	Willow Flycatcher	Upstream Pabco South Lower Plateau revegetation site	681309	3995523
Route 4	May 24, 2011	Willow Flycatcher	Upstream Pabco South Upper Plateau revegetation site	681116	3995469
Route 4	May 24, 2011	Willow Flycatcher	Duck Creek	679649	3995837
Route 4	May 24, 2011	Willow Flycatcher	Duck Creek	679404	3995894
Route 4	May 24, 2011	Willow Flycatcher	~0.4 miles east of the in-lieu fee mitigation ponds	679419	3996230

Appendix C

List of All Bird Species Detected during 2011 Surveys
with Presumed Status and Relative Abundance

The following table includes all bird species identified in the study area during the 2011 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	R
Mallard	<i>Anas platyrhynchos</i>	R	C
Ruddy duck	<i>Oxyura jamaicensis</i>	R	R
Gambel's quail	<i>Callipepla gambelii</i>	R	C
Pied-billed grebe	<i>Podilymbus podiceps</i>	R	U
Eared grebe	<i>Podiceps nigricollis</i>	R	R
Double-crested cormorant	<i>Phalacrocorax auritus</i>	R	U
Least bittern	<i>Ixobrychus exilis</i>	R	U
Great blue heron	<i>Ardea herodias</i>	R	FC
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	U
Turkey vulture	<i>Cathartes aura</i>	R	R
Osprey	<i>Pandion haliaetus</i>	R	U
Northern harrier	<i>Circus cyaneus</i>	R	U
Cooper's hawk	<i>Accipiter cooperii</i>	R	U
Red-tailed hawk	<i>Buteo jamaicensis</i>	R	U
Virginia rail	<i>Rallus limicola</i>	R	R
Common gallinule	<i>Gallinula galeata</i>	R	FC
American coot	<i>Fulica americana</i>	R	U
Killdeer	<i>Charadrius vociferous</i>	R	FC
Black-necked stilt	<i>Himantopus mexicanus</i>	R	R
American avocet	<i>Recurvirostra americana</i>	R	R
Spotted sandpiper	<i>Actitis macularius</i>	R	FC
Caspian tern	<i>Hydroprogne caspia</i>	M	U
White-winged dove	<i>Zenaida asiatica</i>	R	FC
Mourning dove	<i>Zenaida macroura</i>	R	C
Greater roadrunner	<i>Geococcyx californianus</i>	R	U

Common Name	Scientific Name	Presumed Status	Relative Abundance
Lesser nighthawk	<i>Chordeiles acutipennis</i>	R	U
White-throated swift	<i>Aeronautes saxatalis</i>	R	U
Black-chinned hummingbird	<i>Archilochus alexandri</i>	R	FC
Anna's hummingbird	<i>Calypte anna</i>	R	U
Costa's hummingbird	<i>Calypte costae</i>	R	U
Olive-sided flycatcher	<i>Contopus cooperi</i>	M	R
Western wood-pewee	<i>Contopus sordidulus</i>	M	U
Willow flycatcher	<i>Empidonax traillii</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>	R	R
Bell's vireo	<i>Vireo bellii</i>	R	U
Plumbeus vireo	<i>Vireo plumbeus</i>	M	R
Warbling vireo	<i>Vireo gilvus</i>	M	U
Common raven	<i>Corvus corax</i>	R	U
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	R	C
Cliff swallow	<i>Petrochelidon pyrrhonota</i>	R	FC
Barn swallow	<i>Hirundo rustica</i>	M	R
Verdin	<i>Auriparus flaviceps</i>	R	C
Bewick's wren	<i>Thryomanes bewickii</i>	R	C
Marsh wren	<i>Cistothorus palustris</i>	R	C
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	R	R
Black-tailed gnatcatcher	<i>Polioptila melanura</i>	R	C
Northern mockingbird	<i>Mimus polyglottos</i>	R	U
Crissal thrasher	<i>Toxostoma crissale</i>	R	FC
Phainopepla	<i>Phainopepla nitens</i>	R	R
Lucy's warbler	<i>Oreothlypis luciae</i>	R	C
Common yellowthroat	<i>Geothlypis trichas</i>	R	C
Yellow warbler	<i>Setophaga petechia</i>	R	C
Townsend's warbler	<i>Setophaga townsendi</i>	M	R
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
Song sparrow	<i>Melospiza melodia</i>	R	C

Common Name	Scientific Name	Presumed Status	Relative Abundance
Summer tanager	<i>Piranga rubra</i>	R	R
Western tanager	<i>Piranga ludoviciana</i>	M	U
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>	M	R
Blue grosbeak	<i>Passerina caerulea</i>	R	FC
Indigo bunting	<i>Passerina cyanea</i>	R	R
Red-winged blackbird	<i>Agelaius phoeniceus</i>	R	A
Western meadowlark	<i>Sturnella negeta</i>	R	R
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	A
Hooded oriole	<i>Icterus cucullatus</i>	R	R
Bullock's oriole	<i>Icterus bullockii</i>	R	FC
House finch	<i>Carpodacus mexicanus</i>	R	FC
Lesser goldfinch	<i>Spinus psaltria</i>	R	U

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.