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Southwestern Willow Flycatcher Surveys along the Las Vegas Wash, Clark County, Nevada, 2012



December 2012



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

Prepared for:

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

and

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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, 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. 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 Southern Nevada Water Authority staff have performed the surveys since (Van Dooremolen 2010, 2011). The surveys are conducted using the standard protocol (Sogge et al. 2010), and follow the five-survey protocol recommended for projects.

2012 surveys began May 23 and were completed July 12. A total of 13 willow flycatchers were detected: 1 in the first survey, 1 between surveys, and 11 in the second survey (none were detected in the third through fifth surveys). Clearance of woody vegetation for various project activities reduced the amount of habitat on the Wash. 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. Poor quality habitat continued to dominate two of the four survey routes, and surveys of these areas may be discontinued in 2013.

When monitoring first began in 1998, potentially suitable nesting habitat was dominated by salt cedar. It is now dominated by native riparian species. The tamarisk leaf beetle (*Diorhabda* sp.) has spread into nesting colonies in southern Nevada and may soon reach the lower Colorado River below Davis Dam. The beetles can defoliate hundreds of acres of salt cedar in a season. The loss of this non-native nesting habitat may increase the importance of native-dominated riparian sites, such as the Wash.

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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.

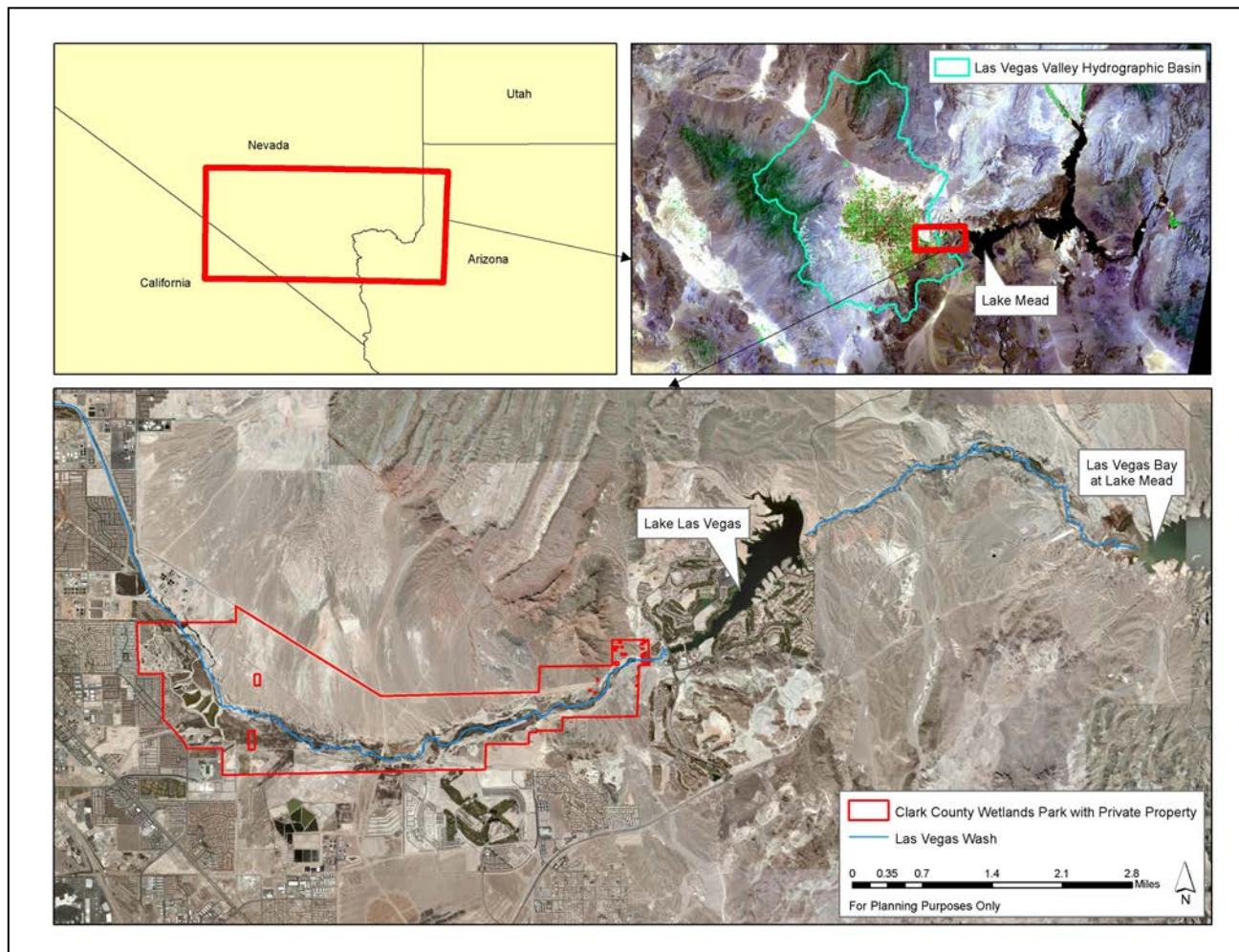


Figure 1: Las Vegas Wash location and general study area map.

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 2012, 14 weirs were in place (13 permanent and one temporary) and three 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 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 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). Permitted SNWA staff have performed the surveys since (Van Dooremolen 2010, 2011). This document reports the results from the 2012 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). The routes are adjusted each year to accommodate changes in habitat and access due to construction and other factors. In 2012, Route 1 began on the north bank with the remaining habitat between the DU Wetlands No. 1 and Duck Creek Confluence and Upper Narrows weirs construction sites. As in prior years, the route also included the Nature Preserve, the portion of Monson Channel bordering the preserve, and upstream along the Wash to approximately one mile north of the Wetlands Park boundary, covering 49 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 upstream of Pabco Road Weir and continues downstream to the Lake Las Vegas mitigation wetlands. It covers 33 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 22 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 28 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 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 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. Deborah Van Dooremolen (TE-148556-1) led one team and Seth Shanahan (TE-231424-0) led the other. 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 the first and second periods, Routes 1 and 2 were surveyed on the first day, and Routes 3 and 4 were surveyed on the second day. In the third period, the survey teams went out on different dates.

The southwestern subspecies is the only willow flycatcher that nests in southern Nevada. However, other non-listed subspecies of the willow flycatcher may pass

| Survey Period | 1st Survey | 2nd Survey |
|-------------------------|------------|------------|
| First (May 15-31) | May 23/24 | n/a |
| Second (June 1-24) | June 6/7 | June 13/14 |
| Third (June 25-July 17) | | |
| ~ Route 1 | June 25 | July 12 |
| ~ Route 2 | June 26 | July 10 |
| ~ Route 3 | July 2 | July 11 |
| ~ Route 4 | July 3 | July 11 |

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

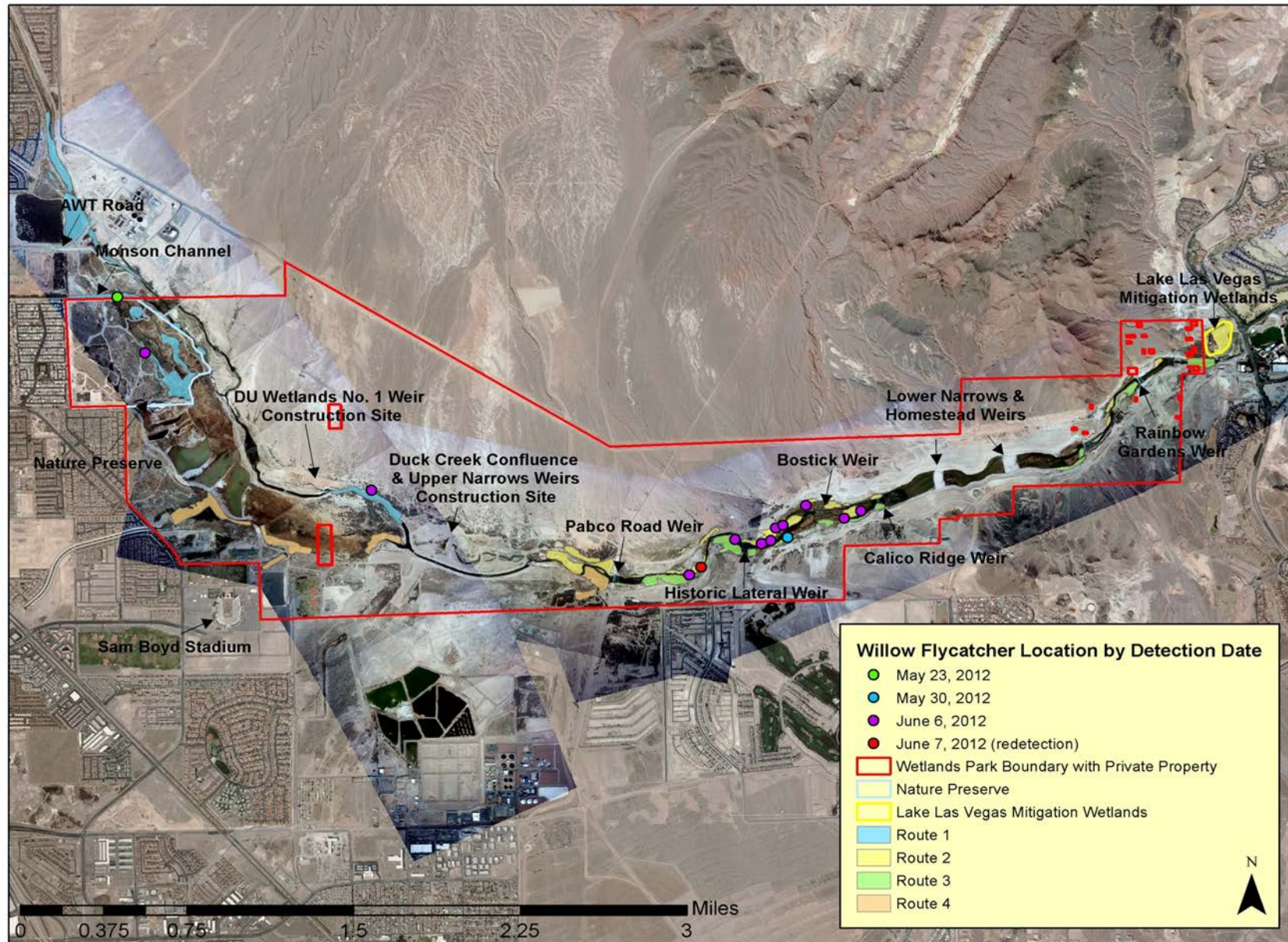


Figure 2: 2012 survey routes and willow flycatcher detection locations. Aerial imagery covering the Wash was taken on March 12, 2012.

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 begins after the known migration period, so any willow flycatchers detected during that time can be considered residents, and thus of the southwestern subspecies (Sogge et al. 2010).

3.0 RESULTS

3.1 Survey Results

We detected 13 willow flycatchers during the 2012 season (Figure 2, Table 2): 1 in the first survey, 1 between the first and second surveys and 11 in the second survey (a 12th detection was made but was considered a redetection of a prior bird). None were detected in the third through fifth surveys. All detections were classified as migrants. A breakdown of the detections by route follows. The banding status of the bird is provided in parentheses where known.

| Route | Date | Location (refer to Figure 2) | Easting | Northing |
|-------|--------------|--|---------|----------|
| 1 | May 23, 2012 | Monson Channel | 677769 | 3997728 |
| 3 | May 30, 2012 | Upstream Bostick South revegetation site | 682622 | 3995881 |
| 1 | June 6, 2012 | 0.2 miles downstream of DU Wetlands No. 1 Weir site | 679613 | 3996215 |
| 1 | June 6, 2012 | Nature Preserve | 677965 | 3997282 |
| 2 | June 6, 2012 | Upstream Historic Lateral North revegetation site | 681910 | 3995596 |
| 2 | June 6, 2012 | Upstream Historic Lateral South passive revegetation site | 682244 | 3995865 |
| 2 | June 6, 2012 | Downstream Historic Lateral North passive revegetation site | 682434 | 3995834 |
| 2 | June 6, 2012 | Downstream Historic Lateral North passive revegetation site | 682502 | 3995857 |
| 2 | June 6, 2012 | Downstream Historic Lateral North passive revegetation site | 682538 | 3995952 |
| 2 | June 6, 2012 | Upstream Bostick North Emergent revegetation site | 682590 | 3995972 |
| 2 | June 6, 2012 | Bostick Island revegetation site | 682756 | 3996122 |
| 2 | June 6, 2012 | Calico Islands (Upstream Calico Emergent) revegetation site | 683036 | 3996025 |
| 2 | June 6, 2012 | Calico Islands (Upstream Calico Emergent) revegetation site | 683157 | 3996081 |
| 3 | June 7, 2012 | Upstream Historic Lateral North revegetation site; redetection | 681996 | 3995654 |

Table 2: 2012 willow flycatcher detections.

3.1.1 Route 1

Three migrant willow flycatchers were detected on this route (Figure 2, Table 2). The first was found in sparse salt cedar along the Monson Channel on May 23. The remaining two were detected on June 6; one in a stand of salt cedar along the Wash and the other in a small stand of sandbar willow within the Nature Preserve. Two other birds were heard whitting, but since they never fitz-bewed, we could not confirm them as willow flycatchers.

3.1.2 Route 2

Nine migrant willow flycatchers were detected on Route 2. All detections occurred on June 6 (Figure 2; Table 2). One migrant (not banded) was detected in the Upstream Historic Lateral North revegetation site. Further downstream, another sang in response from across the channel in the Upstream Historic Lateral South passive revegetation site. Five were detected from the toe of Historic Lateral Weir to the head of Bostick Weir, all in native revegetation areas, both actively and passively established, four on the north bank and the fifth on an island in the Bostick

Weir impoundment. The final two sang in the Calico Islands. Two other birds whitted but never fitz-bewed so could not be confirmed as willow flycatchers.

3.1.3 Route 3

A willow flycatcher sang spontaneously on May 30 (between official surveys) in the Upstream Bostick South revegetation site (Figure 2, Table 2). We heard the bird fitz-bewing from approximately 8:45 until 9:30 a.m. It was in an area with dense mesquite (*Prosopis* sp.) interspersed with willow and cottonwood in the overstory and an understory of broom baccharis (*B. sarothroides*, see cover photo). It sang loudly, moving from perch to perch in a fairly tight area, as if defending a territory. We heard a wide variety of other vocalizations, too, including whits, weeos, warbling trills, and various squeaks and squeals, commonly categorized as interaction calls. We thought we heard a second bird weeo from an adjacent Goodding willow, but could not confirm it. We returned to the area the next morning, but heard no singing, even after broadcasting per the protocol. We heard a few squeaks and squeals that sounded like interaction calls, but no fitz-bews. The initial observation had seemed significant. It was the first time since the territorial male in 2008 (SWCA 2009a) that a bird sang spontaneously, and its behavior suggested territoriality and the possible presence of another bird (Sogge et al. 2010). However, no further detections were made at this site for the remainder of the survey season, despite taking extra time to survey them thoroughly. Several June 6 detections from Route 2 were within 300-400 feet, so it is possible that one was a redetection, but they are currently considered different birds, and none were detected again.

During the survey on June 7, the field crew heard a willow flycatcher singing from the Upstream Historic Lateral North revegetation site, but concluded that it was a redetection of a bird found there on June 6 during the Route 2 survey.

3.1.4 Route 4

No willow flycatchers were detected along this route.

3.2 Observations on Habitat Quality

3.2.1 Route 1

As in prior years, 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 continues to be of marginal quality. The area between the weir construction sites, along Monson Channel and between the Wetlands Park boundary and AWT road (Figure 2) consists of thin stringers of salt cedar. The Wash channel is incised in these locations, 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 sparsely scattered with native and non-native trees and shrubs.

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 along these routes was reduced due to removal of woody riparian species from a few sites for weir construction and flood control maintenance. Additionally, an area of poor quality salt cedar (dry, upland) was cleared to create a native planting site.

The potentially suitable habitat along these routes is dominated by natives since most of the reach has undergone stabilization and revegetation; little salt cedar remains. The majority of the current habitat is found in the approximately 1.5-mile reach from Pabco Road Weir to Calico Ridge Weir (Figure 2), and this is the stretch where all detections on these routes occurred. The habitat is of moderate quality, although patch sizes are small (typically between 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*) are in the understory.

Two areas of particular note in the reach include an approximately five-acre patch on the north bank, just downstream of Historic Lateral Weir, and a smaller three-acre patch in the Calico Islands revegetation site. The first patch had been largely bare until a few years ago. Following stabilization work, the hydrology became wetter. Willows and cottonwoods sprouted up across the site, although they are still of fairly low stature. Three migrants were detected here in 2012 (Figure 2). In the Calico Islands revegetation site, located between the Bostick and Calico Ridge Weir, areas of saturated soils and standing water are sparsely scattered in the interior. The islands are dominated by stands of Goodding willow with little live material in the understory. The site was considered one of three Present/Future Hotspots (for detections) identified in the 2009 survey report (SWCA 2009b) and yielded two detections this year.

Downstream of Calico Ridge Weir, habitat is limited and the quality is largely marginal, although the Rainbow Gardens Weir revegetation site is improving again due to the resprouting of willows. 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 more than 20% of all detections from 1998 through 2009.

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). They hosted willow flycatcher detections in 2008, 2009, and 2011. Habitat quality began to decline here in 2010 with substantial die-off of Goodding willow, resulting in stands of dead trees. Habitat quality improved in 2012, but has still not returned completely.

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 known 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). 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 in 2012. 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.

The remainder of the habitat along Route 4, occurs in the Duck Creek drainage and is dominated by salt cedar 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. The area northeast of Sam Boyd Stadium (Figure 2) that has hosted several detections over the years (SWCA 2008) was wet this year, but no birds were detected.

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. 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 (McCleod and Koronkiewicz 2010) showing the potential for birds to move to different sites from season to season.

The large number of detections during the June 6 survey indicates a migrant wave, similar to those detected in 2004, 2008, and 2011. A small difference over the latter is that this wave came during the second survey period. Previous waves were detected in the first survey period, in mid to late May. The detection of these waves suggests that the Wash offers valuable habitat to migrating 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 |

Table 3: Summary of survey results, 1998-2012. 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.

Clearance of woody vegetation for various project activities reduced the amount of habitat on the Wash, while habitat quality was similar to 2011. Poor quality habitat continued to dominate Routes 1 and 4. Surveys of these areas may be discontinued in 2013. The moderate to good quality habitats in the Nature Preserve and immediately upstream of Pabco Road Weir would still be surveyed. Native-dominated revegetation sites along Routes 2 and 3 continued to offer moderate quality potential nesting habitat.

When this monitoring first began in 1998, potentially suitable nesting habitat was dominated by salt cedar 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. We have gone seven 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.

This shift to native habitat may increase the likelihood of the species nesting in the project area in coming years. The tamarisk leaf beetle (*Diorhabda* sp.) has spread into nesting colonies in southern Nevada and may soon reach the lower Colorado River below Davis Dam. It was first detected along the Wash on June 20, 2012. The beetles eat salt cedar foliage, leaving trees barren at the height of nesting season, but it takes years to actually kill the trees. The beetles can defoliate hundreds of acres of salt cedar in a season. The loss of this non-native nesting habitat may increase the importance of native-dominated riparian sites, such as the Wash.

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 B). 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.

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Appendix A

Survey Temperature and Weather

| Date | Route # | Temperature (Start/Finish) - Fahrenheit | Weather (Start/Finish) |
|-----------|---------|--|---|
| 5/23/2012 | 1 & 2 | 75/90 | hazy, breezy/hazy, breezy |
| 5/24/2012 | 3 & 4 | 75/80 | clear skies, light wind/clear skies, light wind |
| 6/6/2012 | 1 & 2 | 58/91 | clear skies, light wind/clear skies, light wind |
| 6/7/2012 | 3 & 4 | 59/84 | clear skies, no wind/clear skies, no wind |
| 6/13/2012 | 1 & 2 | 64/98 | clear skies, no wind/clear skies, no wind |
| 6/14/2012 | 3 & 4 | 67/84 | clear skies, no wind/clear skies, no wind |
| 6/25/2012 | 1 | 70/82 | clear skies, light wind/clear skies, light wind |
| 6/26/2012 | 2 | 72/84 | clear skies, no wind/clear skies, no wind |
| 7/2/2012 | 3 | 77/93 | clear skies, no wind/clear skies, no wind |
| 7/3/2012 | 4 | 81/94 | clear skies, no wind/clear skies, light wind |
| 7/10/2012 | 2 | 85/98 | clear skies, no wind/clear skies, no wind |
| 7/11/2012 | 3 & 4 | 74/82 | clear skies, no wind/partly cloudy, no wind |
| 7/12/2012 | 1 | 81/89 | partly cloudy, no wind/overcast, breezy |

Appendix B

List of All Bird Species Detected during 2012 Surveys
with Presumed Status and Relative Abundance

The following table includes all bird species identified in the study area during the 2012 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 |
|---------------------------|----------------------------------|-----------------|--------------------|
| Gadwall | <i>Anas strepera</i> | R | U |
| Mallard | <i>Anas platyrhynchos</i> | R | C |
| Blue-winged teal | <i>Anas discors</i> | R | R |
| Cinnamon teal | <i>Anas cyanoptera</i> | R | U |
| 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 |
| Western grebe | <i>Aechmophorus occidentalis</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 | R |
| Northern harrier | <i>Circus cyaneus</i> | R | U |
| Sharp-shinned hawk | <i>Accipiter striatus</i> | M | R |
| Cooper's hawk | <i>Accipiter cooperii</i> | R | U |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | R | R |
| American kestrel | <i>Falco sparverius</i> | R | R |
| Peregrine falcon | <i>Falco peregrinus</i> | R | R |
| Virginia rail | <i>Rallus limicola</i> | R | R |
| Common gallinule | <i>Gallinula galeata</i> | R | U |
| 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 |

| Common Name | Scientific Name | Presumed Status | Relative Abundance |
|-------------------------------|-----------------------------------|-----------------|--------------------|
| Spotted sandpiper | <i>Actitis macularius</i> | R | U |
| Wilson's phalarope | <i>Phalaropus tricolor</i> | M | R |
| White-winged dove | <i>Zenaida asiatica</i> | R | U |
| Mourning dove | <i>Zenaida macroura</i> | R | C |
| Owl, unidentified | | | |
| Greater roadrunner | <i>Geococcyx californianus</i> | R | U |
| 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 | U |
| Anna's hummingbird | <i>Calypte anna</i> | R | U |
| Costa's hummingbird | <i>Calypte costae</i> | R | U |
| Western wood-pewee | <i>Contopus sordidulus</i> | M | U |
| Willow flycatcher | <i>Empidonax traillii</i> | M | U |
| Pacific-slope 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> | R | R |
| Bell's vireo | <i>Vireo bellii</i> | R | U |
| Common raven | <i>Corvus corax</i> | R | U |
| Horned lark | <i>Eremophila alpestris</i> | R | R |
| 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 |
| 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>Polioptila melanura</i> | R | C |
| Northern mockingbird | <i>Mimus polyglottos</i> | R | U |
| Crissal thrasher | <i>Toxostoma crissale</i> | R | FC |
| 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 |
| Wilson's warbler | <i>Cardellina pusilla</i> | M | U |

| Common Name | Scientific Name | Presumed Status | Relative Abundance |
|-------------------------|--------------------------------------|-----------------|--------------------|
| 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 |
| Summer tanager | <i>Piranga rubra</i> | R | R |
| Western tanager | <i>Piranga ludoviciana</i> | M | U |
| Blue grosbeak | <i>Passerina caerulea</i> | R | C |
| Indigo bunting | <i>Passerina cyanea</i> | R | R |
| Red-winged blackbird | <i>Agelaius phoeniceus</i> | R | C |
| Yellow-headed blackbird | <i>Xanthocephalus xanthocephalus</i> | R | R |
| Great-tailed grackle | <i>Quiscalus mexicanus</i> | R | C |
| Brown-headed cowbird | <i>Molothrus ater</i> | R | C |
| House finch | <i>Carpodacus mexicanus</i> | R | FC |
| Lesser goldfinch | <i>Spinus psaltria</i> | R | U |
| House sparrow | <i>Passer domesticus</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.