



**Southwestern Willow
Flycatcher and Yellow-billed
Cuckoo Surveys along the
Las Vegas Wash,
Clark County, Nevada, 2019**



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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

Las Vegas Wash Coordination Committee

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ABSTRACT

The Las Vegas Wash Coordination Committee (LVWCC), a 28-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 part of informal Section 7 consultation for the project with the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service (USFWS) recommended conducting annual surveys to determine the occurrence of the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) within the Wetlands Park. These surveys have been conducted since 1998. Following the listing of the yellow-billed cuckoo (*Coccyzus americanus*) as threatened and reinitiation of consultation, USFWS recommended conducting annual surveys for that species, as well. Cuckoo surveys have been conducted annually since 2013. This report describes 2019 survey results for both species.

Flycatcher surveys were conducted from May 20 to June 26; 11 migrant willow flycatchers were detected, all in the first survey period. 2019 surveys for the cuckoo began June 24 and were completed August 6; three cuckoo detections were made, representing one possible breeding territory and one likely migrant. Habitat extent and quality were roughly the same as the prior year for both species. For the flycatcher, this was the highest number of detections since 2014, reversing several years of declines. For the cuckoo, while typically only a few are detected in the entire state each year, 2019 was exceptional, with field crews making more than 35 detections of more than 20 individuals in southern Nevada alone.

Informal Section 7 consultations have been concluded for both species, but annual surveys for southwestern willow flycatchers and yellow-billed cuckoos should continue in order to help project activities avoid take of listed species.

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21 planned permanent weirs and more than 200 hectares (>500 acres) of native vegetation were in place. Revegetation of the final weir sites should be completed by the end of 2020.

Weir construction has impacted habitat at the Wash. Vegetation was 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 was complete, revegetation with native wetland, riparian, and upland plants occurred, with plant selection dictated by site conditions. The Wash flows through the 2,900-acre Clark County Wetlands Park (Wetlands Park), and Clark County is also removing tamarisk and planting mesquite trees and 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.

In 2000, the U.S. Army Corps of Engineers initiated informal Section 7 consultation with the U.S. Fish and Wildlife Service (USFWS) on the proposed development of the park and associated erosion control structures to ensure compliance with the Endangered Species Act (ESA). The USFWS concurred that the project may affect but was unlikely to adversely affect the flycatcher and recommended that annual surveys continue to be conducted to determine its occurrence in the project area. These surveys were conducted by permitted consultants from 1998 through 2009, first contracted by Clark County and then by the Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC (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 2010 (Van Dooremolen 2010, 2011, 2012, 2014a, 2014b, 2015a, 2016a, 2018a, 2018b).

The yellow-billed cuckoo (*Coccyzus americanus*) is a neotropical migrant that breeds extensively throughout eastern North America, from Mexico north to Canada, but has a much more limited breeding distribution in the western portion of the continent. The USFWS listed the western Distinct Population Segment as threatened under the ESA on November 3, 2014. In the Southwest, the cuckoo prefers expansive riparian woodlands with cottonwood, willow, and mesquite for nesting. Thus, the cuckoo may benefit from revegetation efforts associated with the Wash project and Wetlands Park.

A yellow-billed cuckoo was detected during the 1998 southwestern willow flycatcher surveys (Southwest Wetlands Consortium 1998). San Bernardino County Museum examined potential cuckoo habitat in the study area in 2000 and 2001, found it lacking, and did not conduct surveys for the species (McKernan and Braden 2001, McKernan and Carter 2002). From 2002 through 2004, surveys for the cuckoo were conducted; none were found and since habitat was still suboptimal, surveys were discontinued (SWCA 2002, 2003, 2005). In 2013, the Wash Team began conducting annual cuckoo surveys again (Van Dooremolen 2014c, 2014d, 2015b, 2016b, 2017,

2018b). Following the listing of the species, the U.S. Bureau of Reclamation reinitiated informal Section 7 consultation. The USFWS concurred that the project may affect but was unlikely to adversely affect the yellow-billed cuckoo and recommended that annual surveys continue to be conducted to determine its occurrence in the project area.

This document reports the results from the 2019 surveys for southwestern willow flycatchers and yellow-billed cuckoos in potentially suitable nesting habitat along the Wash.

2.0 METHODS

2.1 Potentially Suitable Nesting Habitat

2.1.1 Southwestern Willow Flycatcher

Potentially suitable nesting habitat for the southwestern willow flycatcher is defined as areas with dense to moderately dense riparian vegetation, either bordering or containing surface water or saturated soils. Native riparian species include Goodding willow (*S. gooddingii*), sandbar willow (a.k.a. coyote willow; *S. exigua*), cottonwood (*Populus fremontii*), seep willow (*Baccharis salicifolia*) and willow baccharis (*B. salicina*). Tamarisk is the dominant non-native species, although little remains along the Wash. Small patch sizes, less than a hectare (2.5 acres), are included.

2.1.2 Yellow-billed Cuckoo

Potentially suitable nesting habitat for the yellow-billed cuckoo is defined as patches of native riparian vegetation with at least some large overstory trees, such as cottonwood and Goodding willow, and an understory layer, typically with sandbar willow, seep willow, and/or willow baccharis. Screwbean and honey mesquite (*Prosopis pubescens* and *P. glandulosa*) thickets of suitable stature are also included. No monotypic stands of tamarisk were surveyed as the species typically does not nest in them (Halterman et al. 2016). Patch size is also important. Halterman et al. (2016) recommend a minimum patch size for surveying of five hectares (12 acres) but state that yellow-billed cuckoos rarely nest in patches smaller than 20 hectares (~50 acres).

2.2 Study Area

The general study area consists of the Wetlands Park and an approximately six-mile reach of the Wash contained within its boundaries. Three survey sites were identified in the study area: the Wetlands Park Nature Preserve (Nature Preserve), the Wash and Duck Creek.

2.2.1 Nature Preserve

The Nature Preserve (Figure 2) is the developed heart of the Wetlands Park, with paved and unpaved trails. Native-dominated riparian habitat surrounds constructed wetland ponds—the upper pond, three middle ponds, and Vern’s Pond—and lines the channels that run between them. Emergent vegetation, including cattails (*Typha domingensis*), common reed (*Phragmites australis*), and bulrush (*Schoenoplectus* spp.), occurs in the wetter portions of the understory. The densest and widest riparian patches occur along the channels; the density and width of the habitat ringing the ponds is generally thinner. A grove of cottonwoods just south of the middle ponds transitions to an overstory of Goodding willows with a few cottonwoods interspersed and a dense understory of sandbar willow and willow baccharis. The patches of riparian habitat are connected

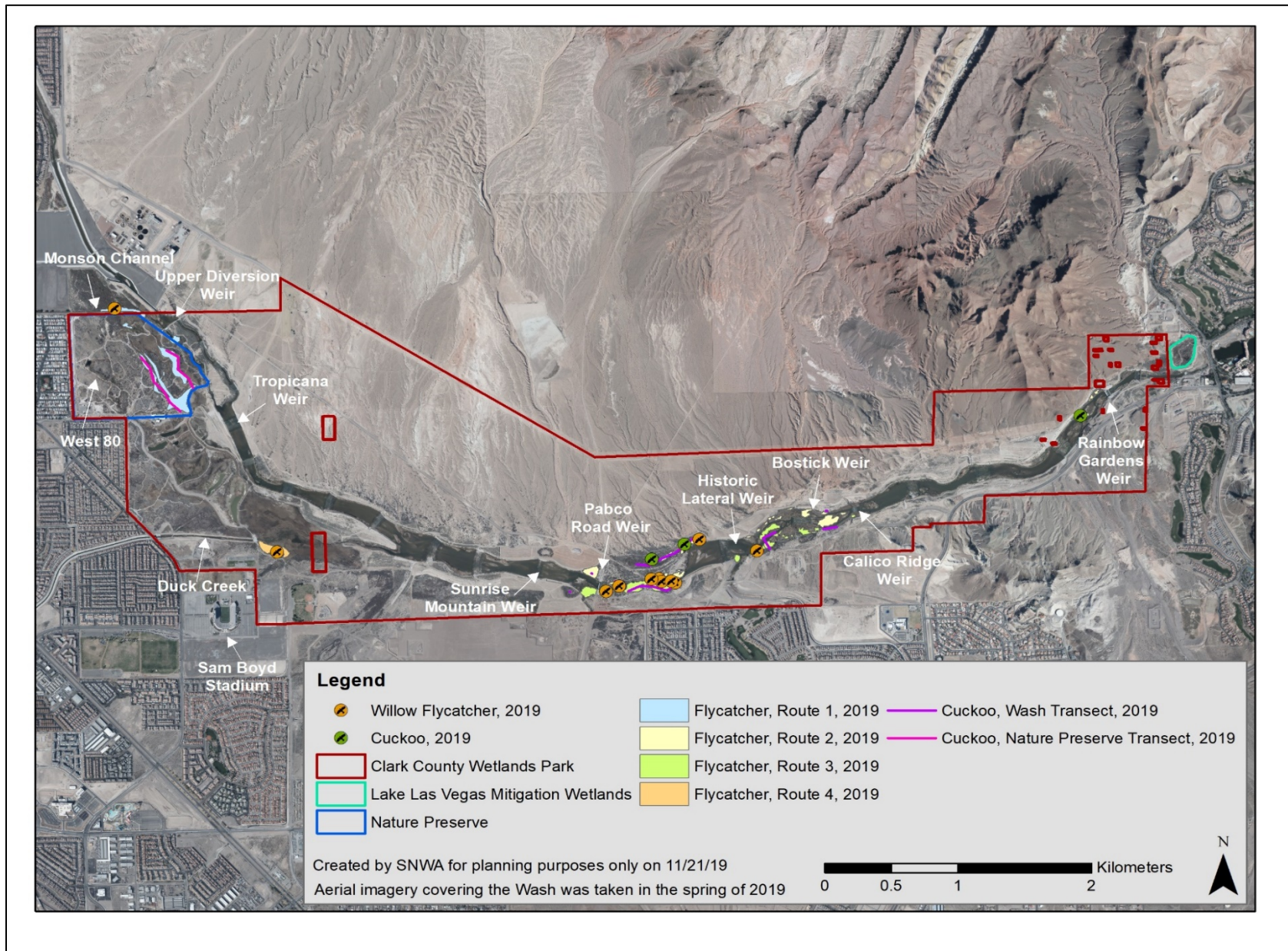


Figure 2. Willow flycatcher survey routes, yellow-billed cuckoo survey transects and 2019 detection locations.

by patches of honey and screwbean mesquite. Both species of mesquite occur either with quailbush (*Atriplex lentiformis*) and willow baccharis in the understory or in thickets. Mesquite trees of various maturity with a saltgrass (*Distichlis spicata*) understory cover the site west of the main survey area to the West 80. In the West 80, which was constructed several years after the area to the east, the riparian zone along the feeder channels and ponds is generally much thinner than in the older portions of the Nature Preserve, limiting its potential suitability to southwestern willow flycatcher. A portion of Monson Channel bordering the preserve is also included in this site, as are small patches upstream and downstream of Upper Diversion Weir. Vegetation on Monson Channel is dominated by tamarisk, and there is one small patch of tamarisk adjacent to Vern's Pond. These areas are only potentially suitable for the flycatcher.

In 2019, seven hectares (~17 acres) of potentially suitable habitat were surveyed for the southwestern willow flycatcher and approximately 16 hectares (~40 acres) were surveyed for the yellow-billed cuckoo, with one route for the flycatcher (Route 1) and two transects for the cuckoo.

2.2.2 Wash

Potentially suitable habitat along the Wash begins just upstream of Pabco Road Weir and continues downstream to Calico Ridge Weir for the cuckoo and to Rainbow Gardens Weir for the flycatcher (Figure 2). The LVWCC has constructed several weirs along the Wash and significant revegetation has occurred and matured. Stringers of native riparian habitat run along either side of the channel, consisting of cottonwood, Goodding and sandbar willows, and some seep willow and willow baccharis. Cattails, common reed, and to a lesser extent bulrush occur in the wetter portions of the understory, and patches of mesquite, both screwbean and honey (often with quailbush or baccharis in the understory) connect the riparian habitat. Little tamarisk remains. The majority of the habitat is concentrated from just upstream of Pabco Road Weir to upstream of Calico Ridge Weir (Figure 2). Habitat further downstream is limited to a few small patches above Rainbow Gardens Weir that only have potential for flycatcher (Figure 2). The Lake Las Vegas mitigation wetlands are no longer surveyed due to poor habitat quality.

In 2019, field crews surveyed just over 10 hectares (~26 acres) of potentially suitable habitat for the southwestern willow flycatcher and approximately 19 hectares (~47 acres) for the yellow-billed cuckoo, with two routes for the flycatcher (Routes 2 and 3) and two transects for the cuckoo, covering both the north and south banks.

2.2.3 Duck Creek

This site includes patches of tamarisk along Duck Creek near Sam Boyd Stadium (Figure 2). In 2019, field crews surveyed less than 1.5 hectares (~3 acres) of potentially suitable habitat for southwestern willow flycatcher with a single route (Route 4).

2.3 Surveys

2.3.1 Southwestern Willow Flycatcher

Surveys for the flycatcher were conducted using the presence/absence protocol developed by Sogge et al. (2010). Each route was surveyed by a team of 2-3 people. Each team was composed of a minimum of one of the following permitted individuals: Deborah Van Dooremolen (TE148556-4), Nicholas Rice (TE64580A-2), or Timothy Ricks (TE67397A-2). The three-survey

general protocol was used, which includes one survey in each of three survey periods (May 15-31, June 1-24, and June 25-July 17). The 2019 surveys were conducted May 20-21, June 3-4, and June 25-26. Prior to 2018, surveys were conducted using the five-survey project-related protocol. USFWS approved the change in survey effort in April of 2018 (08ENVS00-2018-I-0102 and 1-5-01-I-428.AMDI).

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).

Field crews began surveys in the hour before sunrise and were typically finished by 10:30 a.m. (Appendix A). 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 20-30 meters (~65-100 feet) following a period of silent listening. Vocalizations were broadcast for approximately 15 seconds at each stop, followed by 1-2 minutes of listening for a response. If a bird was detected, the surveyors would travel a minimum of 50 meters (~165 feet) to prevent the individual from being double-counted. Broadcasts were conducted from inside habitat patches where possible but occasionally had to occur from the habitat edge due to concerns regarding safe access.

2.3.2 Yellow-billed Cuckoo

Presence/absence surveys for the cuckoo were conducted using the protocol drafted by Halterman et al. (2016). The protocol identifies three survey periods from mid-June through mid-August and requires four surveys across those periods, with one survey in the first period (June 15-30), two surveys in the second (July 1-31), and one survey in the third (August 1-15). The 2019 surveys were conducted June 24, July 8-9, July 22-23, and August 5 -6. Each transect was surveyed by a team of 2-3 people, and the team had a minimum of one of the previously listed permitted individuals.

Surveys began at sunrise and were completed by 11:00 a.m. or when the temperature reached 40° C (104° F), whichever came first. Call-playback was used. Within each transect, broadcasts were conducted every 100 meters (328 feet); points on adjacent transects were likewise separated to prevent double counting. At each broadcast point, the survey team would listen quietly for approximately one minute, and then, if no cuckoos were heard, they would broadcast five of the species' contact calls (the kowlp call), with each call separated by one minute, using an MP3 player attached to a portable speaker. If a bird was detected, the surveyors would move 300 meters along the transect before broadcasting again to prevent the individual from following the broadcast and being counted more than once.

The protocol established a method for determining the breeding implications of survey results. Two detections in an area in two different survey periods separated by at least ten days is a possible breeding territory. Three detections in an area in three different survey periods separated by at

least 10 days is a probable breeding territory. Field staff has to observe copulation, stick carry to nest, carrying food (multiple observations), distraction display(s), the nest, or fledgling(s) to confirm breeding.

3.0 RESULTS

3.1 Surveys

3.1.1 Southwestern Willow Flycatcher

Eleven migrant willow flycatchers were detected during the first survey, May 20-21: one on Monson Channel bordering the Nature Preserve, one at Duck Creek, and nine at the Wash, all but one of which occurred between Pabco Road and Historic Lateral weirs (Figure 2, Appendix A). The birds exhibited various levels of responsiveness, with most singing just a few times in response to the broadcast but a few counter-singing with the playback and other nearby willow flycatchers. The migrants detected along the Wash were identified in native habitat and the birds detected on Monson Channel and Duck Creek were in tamarisk.

3.1.2 Yellow-billed Cuckoo

Field crews made three cuckoo detections (Figure 2, Appendix B): one on the north bank of the Wash on June 24 in cottonwoods just upstream of Historic Lateral Weir, one during other surveys on July 2 in native riparian habitat upstream of Rainbow Gardens Weir, and one in the mesquites of Site 111 on August 6, only a few hundred meters from the location of the June 24 bird. Surveyors concluded the two detections represented a possible breeding territory per the protocol (Haltermann et al. 2016). Although Rainbow Gardens is not typically surveyed for cuckoo given the small patch size, follow up efforts were conducted and failed to detect the bird, and it was concluded that the July 2 bird was a likely migrant.

3.2 Habitat Observations

3.2.1 Nature Preserve

Habitat extent declined by a few acres for the flycatcher as the West 80 appeared suboptimal and thus was not surveyed; it was unchanged for the cuckoo. Habitat quality remained fair for both species, although native riparian trees continued to show signs of stress and die-off, particularly around Vern's Pond and the middle ponds. Tamarisk in the site has experienced varying levels of defoliation by the northern tamarisk beetle (*Diorhabda carinulata*) over the years, but the stringer along Monson Channel was green throughout the season and was surveyed for flycatcher. Although the native habitat appeared to be of higher quality, the sole detection for the site occurred in this straggly tamarisk, a location that hosts a migrant most years. The fungal pathogen, *Phleospora prosopidis*, that has caused stress and leaf curl in screwbean mesquites in the past several years (Jason Eckberg, pers. comm.) seemed to have less impact, as in 2018.

Potential prey items for the cuckoo, such as the Apache cicada (*Diceroprocta apache*), were only occasionally heard or seen, but this may be related, at least in part, to survey timing. Surveys conclude earlier at the Nature Preserve site as less habitat is covered. At the Wash, cicada activity increases as the morning progresses.

3.2.2 Wash

Habitat extent was similar to 2018, with a slight increase for the flycatcher, and quality generally remained fair across the site for both species. Flooding scoured sites between Pabco Road and Historic Lateral weirs. This was the area with the most detections of migrant willow flycatchers, as well as the possible cuckoo breeding territory, although it is also where the majority of the potentially suitable nesting habitat is. Riparian trees in some locations continued to show signs of die-off. Mesquite-dominated revegetation sites continued to mature, improving their potential suitability for cuckoo. Potentially suitable nesting habitat downstream of Calico Ridge Weir (Figure 2) has been limited for the flycatcher for several years now and had been considered non-existent for the cuckoo. However, with the detection of the individual above Rainbow Gardens Weir, cuckoo surveys may be conducted there in 2020, despite the small size of the habitat patch.

Potential prey items for cuckoo were typically present in good numbers and included Apache cicadas, green bird grasshoppers (*Schistocerca shoshone*), field crickets (*Gryllus* spp.) and others.

3.2.3 Duck Creek

Habitat extent remained the same as in 2018, and quality continued to be poor for the flycatcher. Fires in recent years have reduced potentially suitable habitat significantly. While the remaining stand has suffered various levels of defoliation by the northern tamarisk beetle in the past several years, no tamarisk beetle activity was noted this year. Flooding from storms caused a portion of Duck Creek to flow along the border of the stand although it did not generally enter the stand itself; the flows carried refuse that ponded in depressions adjacent to the stand. Despite this, a migrant willow flycatcher was detected here, and so surveys should continue at the site in the future. The site does not offer potentially suitable habitat for the cuckoo.

4.0 DISCUSSION AND RECOMMENDATIONS

4.1 Southwestern Willow Flycatcher Discussion

Migrant willow flycatchers increased to 11 in 2019, reversing several years of declines (Figure 3). The increase lends support to the theory that at least some of the declines in recent years may have been related to survey timing (Van Dooremolen 2018b). All 11 migrant detections in 2019 occurred over a two-day period, indicating a migrant wave. While survey timing may impact the number of willow flycatchers detected, the decline noted from 2015 through 2018 may also have been attributable, at least in part, to habitat losses that occurred both within and adjacent to the study area (Van Dooremolen 2015, 2016). In 2018, habitat extent was just over 18 hectares (~45 acres), the lowest since surveys began. Habitat extent was basically the same in 2019, the first time in more than five years that it did not decrease. The completion of the final weir projects had offered hope that the Wash Team could begin increasing habitat. However, a recently completed engineering assessment indicates that additional patches of riparian vegetation need to be cleared so that the weirs and bank protection can function as designed. The Wash Team is working to identify opportunities for vegetation enhancement outside the footprint of these activities, as well as coordinating vegetation management inside the footprint, to help meet overall habitat goals.

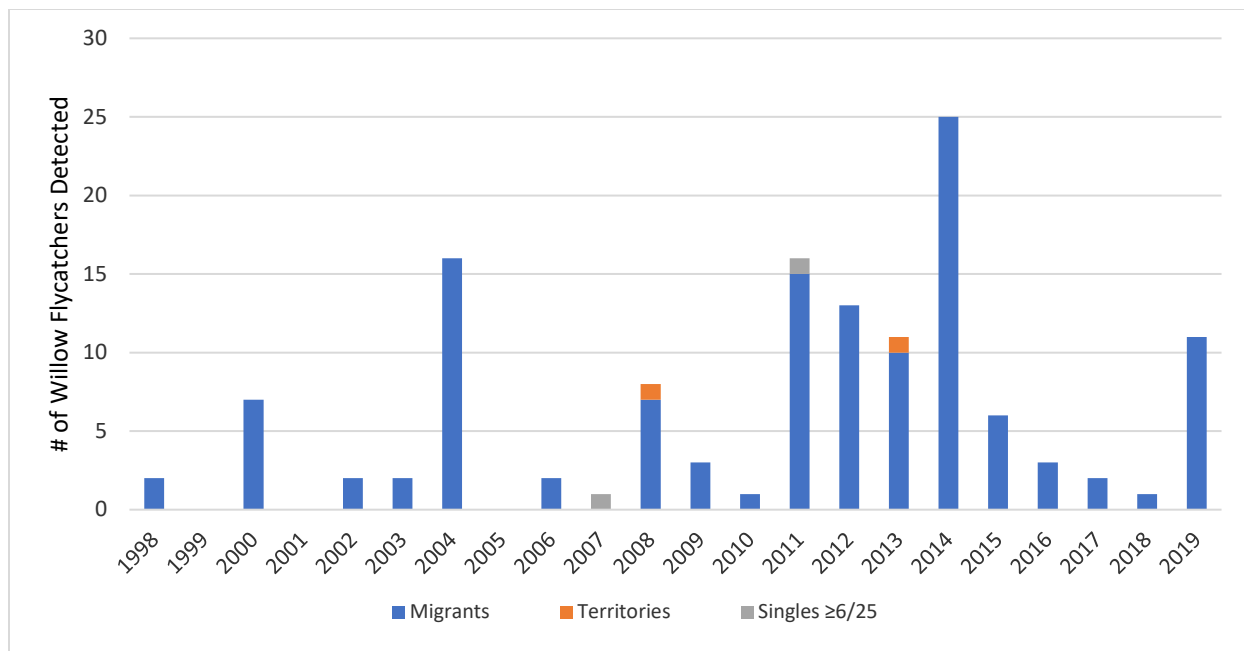


Figure 3. The number of willow flycatchers detected annually, 1998-2019. Birds on territory and single detections in the third survey period (\geq June 25) were assumed to be resident and thus of the endangered southwestern subspecies.

More than 20 years of surveys have shown that the Wash is mostly used by migrating willow flycatchers. Of the 132 individuals detected from 1998 through 2019, 128 (97.0%) were migrants. Just four were considered residents, only two of which established territories, and neither male was confirmed to pair or nest. Reproductive success has a large influence on site fidelity with flycatchers. Individuals that successfully fledge young at a location are more likely to return there and unsuccessful birds that move to a new site the next year typically improve their success (Paxton et al. 2007). Since the males were unsuccessful in their attempts to reproduce at the Wash, it is not surprising that they have not been observed in the study area again. Also, the Wash is approximately 40 miles from the nearest nesting colony, at Overton, Nevada. This may be a larger barrier to colonization than previously thought, even though the Wash's 2008 resident southwestern willow flycatcher was re-sighted there in 2009 (McCleod and Koronkiewicz 2010). The colony there is small, with just a few territories identified in recent years. This makes it more difficult for colonization of the Wash to occur than if it was closer to a colony and that colony was large (M. McCleod pers. comm.). Interestingly, the 2008 male was re-sighted in 2019 for the first time since appearing at Overton 10 years ago. He was photographed by SWCA at Alamo Lake, Arizona, some 260 km (~160 miles) from his last known location (M. McCleod pers. comm.). The bird had been banded at the Wash by SWCA in 2008 and was identified by his color bands. The confirmation of his identity ties him for the willow flycatcher longevity record; he is in at least his 13th year. Such detections confirm the value of bird banding and re-sighting.

4.2 Yellow-billed Cuckoo Discussion

Three yellow-billed cuckoo detections were made in 2019 (Figure 4). These were determined to equal two birds, one a likely migrant and the other a possible breeding territory. While typically only a few cuckoos are detected in the entire state each year, 2019 was exceptional. Field crews made more than 35 detections of more than 20 individuals in southern Nevada alone, including several possible and probable breeding territories, as well as confirmed nesting and fledging at Mesquite West (J. Streit, S. Nichols, and C. Klinger pers. comm.).

Given the limited extent and quality of potentially suitable nesting habitat, the Nature Preserve and Wash can likely, at best, support just a few pairs of nesting cuckoos. However, the Wash appears to be an important site for the species in Nevada, lacking detections in only a few years since annual surveys commenced, with breeding indicated by probable territories at the Nature Preserve in 2013 and at the Wash in 2017 and the possible territory at the Wash in 2019 (Figure 4).

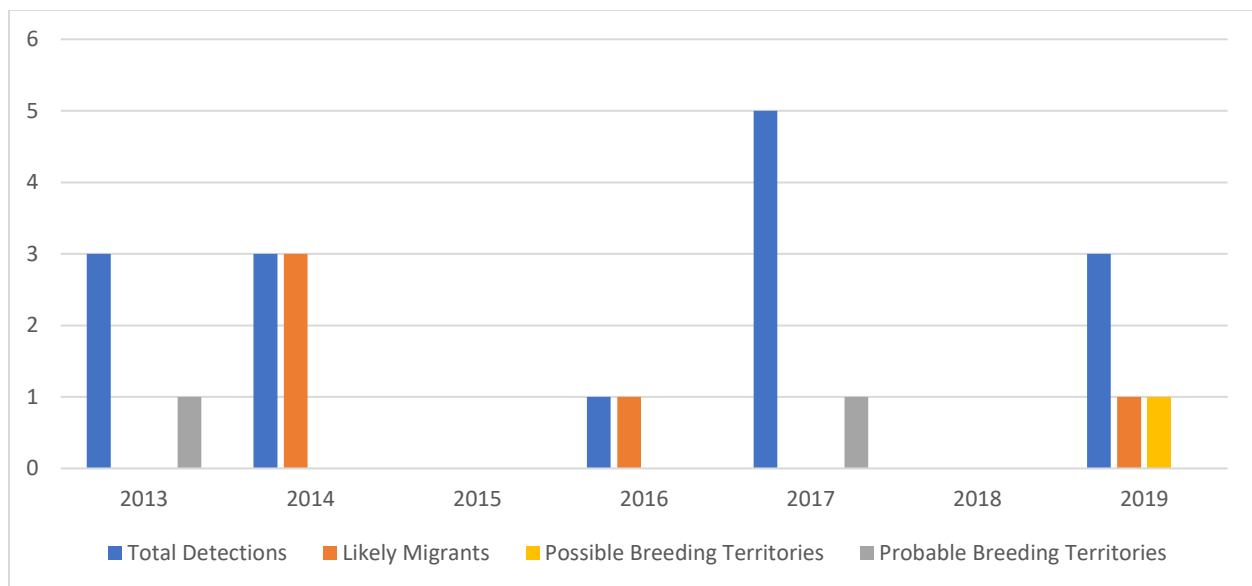


Figure 4. Yellow-billed cuckoo survey detections, 2013-2019.

4.3 Recommendations

Annual monitoring for the southwestern willow flycatcher and yellow-billed cuckoo were originally necessary to comply with informal Section 7 consultation measures. That consultation has been concluded, but continued monitoring is recommended. Wash Team staff are trained and permitted, and effort has been reduced. Field crews have identified two resident southwestern willow flycatchers since 2008 (Figure 3) and three potential breeding territories for the yellow-billed cuckoo since 2013 (Figure 4). While no consultation is in effect for these species any longer, that does not remove the requirement under the Endangered Species Act to avoid take of federally listed species. Continued monitoring will enhance the Wash Team's ability to detect these species and respond proactively, if needed.

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- 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.
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http://www.lvwash.org/assets/pdf/resources_wildlife_flycatcher_2013.pdf
- Van Dooremolen, D. 2014b. Southwestern willow flycatcher surveys along Las Vegas Wash, Clark County, Nevada, 2014. 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_wildlife_flycatcher_2014.pdf
- Van Dooremolen, D. 2014c. Yellow-billed cuckoo surveys along the Las Vegas Wash, Clark County, Nevada, 2013. 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_cuckoo2013.pdf
- Van Dooremolen, D. 2014d. Yellow-billed cuckoo surveys along the Las Vegas Wash, Clark County, Nevada, 2014. 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_cuckoo2014.pdf
- Van Dooremolen, D. 2015a. Southwestern willow flycatcher surveys along Las Vegas Wash, Clark County, Nevada, 2015. 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_wildlife_flycatcher_2015.pdf
- Van Dooremolen, D. 2015b. Yellow-billed cuckoo surveys along the Las Vegas Wash, Clark County, Nevada, 2015. 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_cuckoo2015.pdf
- Van Dooremolen, D. 2016a. Southwestern willow flycatcher surveys along Las Vegas Wash, Clark County, Nevada, 2016. 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_wildlife_flycatcher_2016.pdf

- Van Dooremolen, D. 2016b. Yellow-billed cuckoo surveys along the Las Vegas Wash, Clark County, Nevada, 2016. 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_cuckoo2016.pdf
- Van Dooremolen, D. 2017. Yellow-billed cuckoo surveys along the Las Vegas Wash, Clark County, Nevada, 2017. 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_cuckoo2017.pdf
- Van Dooremolen, D. 2018a. Southwestern willow flycatcher surveys along Las Vegas Wash, Clark County, Nevada, 1998-2017. 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_wildlife_flycatcher_2018.pdf
- Van Dooremolen, D. 2018b. Southwestern willow flycatcher and yellow-billed cuckoo surveys along Las Vegas Wash, Clark County, Nevada, 2018. 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_wildlife_flycatcher_2018.pdf

Appendix A

Southwestern Willow Flycatcher Survey Datasheets

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Las Vegas Wash, Route 1 (Nature Preserve) State: NV County: Clark
 USGS Quad Name: _____ Elevation: 496 (meters)
 Creek, River, or Lake Name: Las Vegas Wash

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)?

Yes X No _____

Survey Coordinates: Start: E 678148 N 3997000 UTM Datum: NAD83 (See instructions)
 Stop: E 677734 N 3997012 UTM Zone: 11N

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

****Fill in additional site information on back of this page****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, <i>Diorhabda</i> spp.]). If <i>Diorhabda</i> found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Timothy Ricks & Victoria Wuest	Date:	1	0	0	N					
	Start:						1	U	677741	3997769
	Stop:									
	Total hrs:									
Survey # 2 Observer(s): Timothy Ricks & Jason Eckberg	Date:	0	0	0	N					
	Start:									
	Stop:									
	Total hrs:									
Survey # 3 Observer(s): Timothy Ricks & Victoria Wuest	Date:	0	0	0	N					
	Start:									
	Stop:									
	Total hrs:									
Survey # 4 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Survey # 5 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Overall Site Summary <small>Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.</small>		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any WIFLs color-banded? Yes _____ No _____ Unknown If yes, report color combination(s) in the comments section on back of form and report to USFWS.				
Total survey hrs: <u>7.9</u>		0	0	0	0					

Reporting Individual: Deborah Van Dooremolen Date Report Completed: 10/16/2019
 US Fish & Wildlife Service Permit #: TE148556-4 State Wildlife Agency Permit #: n/a

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Deborah Van Dooremolen Phone # 702-822-3370
 Affiliation Southern Nevada Water Authority E-mail debbie.vandooremolen@snwa.com
 Site Name Las Vegas Wash, Route 1 Date report Completed _____
 Was this site surveyed in a previous year? Yes X No _____ Unknown _____
 Did you verify that this site name is consistent with that used in previous yrs? Yes X No _____ Not Applicable _____
 If name is different, what name(s) was used in the past? _____
 If site was surveyed last year, did you survey the same general area this year? Yes X No _____ If no, summarize below.
 Did you survey the same general area during each visit to this site this year? Yes X No _____ If no, summarize below.
 Management Authority for Survey Area: Federal _____ Municipal/County X State _____ Tribal _____ Private _____
 Name of Management Entity or Owner (e.g., Tonto National Forest) Clark County

Length of area surveyed: 2.0 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

_____ Native broadleaf plants (entirely or almost entirely, > 90% native)
X Mixed native and exotic plants (mostly native, 50 - 90% native)
 _____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)
 _____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix spp. (gooddingii & exigua), Populus fremontii

Average height of canopy (Do not include a range): 5 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features).
Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Las Vegas Wash, Route 2 (North Bank) State: NV County: Clark
 USGS Quad Name: _____ Elevation: 467 (meters)
 Creek, River, or Lake Name: Las Vegas Wash

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)?

Yes X No _____

Survey Coordinates: Start: E 681269 N 3995676 UTM Datum: NAD83 (See instructions)
 Stop: E 685051 N 3997084 UTM Zone: 11N

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

****Fill in additional site information on back of this page****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, <i>Diorhabda</i> spp.]). If <i>Diorhabda</i> found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Debbie Van Dooremolen, Nicholas Rice & Timothy Ricks	Date: _____	6	0	0	N		# Birds	Sex	UTM E	UTM N
	Start: _____						1	U	681523	3995558
	Stop: _____						2	U	681822	3995615
	Total hrs: _____						1	U	681912	3995610
							1	U	682124	3995924
	1	U	682526	3995965						
Survey # 2 Observer(s): Deborah Van Dooremolen & Timothy Ricks	Date: _____	0	0	0	N		# Birds	Sex	UTM E	UTM N
	Start: _____									
	Stop: _____									
	Total hrs: _____									
Survey # 3 Observer(s): Debbie Van Dooremolen & Timothy Ricks	Date: _____	0	0	0	N		# Birds	Sex	UTM E	UTM N
	Start: _____									
	Stop: _____									
	Total hrs: _____									
Survey # 4 Observer(s): N/A	Date: _____						# Birds	Sex	UTM E	UTM N
	Start: _____									
	Stop: _____									
	Total hrs: _____									
Survey # 5 Observer(s): N/A	Date: _____						# Birds	Sex	UTM E	UTM N
	Start: _____									
	Stop: _____									
	Total hrs: _____									
Overall Site Summary <small>Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.</small>		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any WIFLs color-banded? Yes _____ No _____ Unknown				
Total survey hrs: <u>9.1</u>		0	0	0	0	If yes, report color combination(s) in the comments section on back of form and report to USFWS.				

Reporting Individual: Deborah Van Dooremolen Date Report Completed: 10/16/2019
 US Fish & Wildlife Service Permit #: TE148556-4 State Wildlife Agency Permit #: n/a

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Deborah Van Dooremolen Phone # 702-822-3370
 Affiliation Southern Nevada Water Authority E-mail debbie.vandooremolen@snwa.com
 Site Name Las Vegas Wash, Route 2 Date report Completed _____
 Was this site surveyed in a previous year? Yes X No _____ Unknown _____
 Did you verify that this site name is consistent with that used in previous yrs? Yes x No _____ Not Applicable _____
 If name is different, what name(s) was used in the past? _____
 If site was surveyed last year, did you survey the same general area this year? Yes x No _____ If no, summarize below.
 Did you survey the same general area during each visit to this site this year? Yes x No _____ If no, summarize below.
 Management Authority for Survey Area: Federal x Municipal/County x State _____ Tribal _____ Private _____
 Name of Management Entity or Owner (e.g., Tonto National Forest) Bureau of Reclamation and Clark County

Length of area surveyed: 4.1 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

x Native broadleaf plants (entirely or almost entirely, > 90% native)
 _____ Mixed native and exotic plants (mostly native, 50 - 90% native)
 _____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)
 _____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix spp. (gooddingii & exigua), Populus fremontii

Average height of canopy (Do not include a range): 6 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features, Attach additional sheets if necessary).

The Lake Las Vegas mitigation wetlands were not surveyed this year and have been dropped from the route due to lack of suitable habitat.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Las Vegas Wash, Route 3 (South Bank) State: NV County: Clark
 USGS Quad Name: _____ Elevation: 440 (meters)
 Creek, River, or Lake Name: Las Vegas Wash

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)?

Yes X No _____

Survey Coordinates: Start: E 683246 N 3996084 UTM Datum: NAD83 (See instructions)
 Stop: E 681232 N 3995502 UTM Zone: 11N

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

****Fill in additional site information on back of this page****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, <i>Diorhabda</i> spp.]). If <i>Diorhabda</i> found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Nicholas Rice & Julia Mueller	Date:	3	0	0	N					
	Start:						1	U	681912	3995594
	Stop:						1	U	681764	3995610
	Total hrs:						1	U	681423	3995515
Survey # 2 Observer(s): Deborah Van Dooremolen & Julia Mueller	Date:	0	0	0	N					
	Start:									
	Stop:									
	Total hrs:									
Survey # 3 Observer(s): Deborah Van Dooremolen & David Syzdek	Date:	0	0	0	N					
	Start:									
	Stop:									
	Total hrs:									
Survey # 4 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Survey # 5 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Overall Site Summary Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any WIFLs color-banded? Yes _____ No <u>Unknown</u> If yes, report color combination(s) in the comments section on back of form and report to USFWS.				
Total survey hrs: 8.0		0	0	0	0					

Reporting Individual: Deborah Van Dooremolen Date Report Completed: 10/16/2019
 US Fish & Wildlife Service Permit #: TE148556-4 State Wildlife Agency Permit #: n/a

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Deborah Van Dooremolen Phone # 702-822-3370
 Affiliation Southern Nevada Water Authority E-mail debbie.vandoremolen@snwa.com
 Site Name Las Vegas Wash, Route 3 Date report Completed _____
 Was this site surveyed in a previous year? Yes X No _____ Unknown _____
 Did you verify that this site name is consistent with that used in previous yrs? Yes x No _____ Not Applicable _____
 If name is different, what name(s) was used in the past? _____
 If site was surveyed last year, did you survey the same general area this year? Yes x No _____ If no, summarize below.
 Did you survey the same general area during each visit to this site this year? Yes x No _____ If no, summarize below.
 Management Authority for Survey Area: Federal x Municipal/County x State _____ Tribal _____ Private _____
 Name of Management Entity or Owner (e.g., Tonto National Forest) Bureau of Reclamation and Clark County

Length of area surveyed: 2.1 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

x Native broadleaf plants (entirely or almost entirely, > 90% native)
 _____ Mixed native and exotic plants (mostly native, 50 - 90% native)
 _____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)
 _____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Salix spp. (gooddingii & exigua), Populus fremontii

Average height of canopy (Do not include a range): 6 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features, Attach additional sheets if necessary).

The Upstream Pabco South revegetation site is now included in this route, rather than Route 4. The Upstream Pabco South Upper Plateau revegetation site, which had also been on Route 4, was not surveyed and has been dropped due to lack of suitable habitat.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: Las Vegas Wash, Route 4 (Duck Creek) State: NV County: Clark
 USGS Quad Name: _____ Elevation: 472 (meters)
 Creek, River, or Lake Name: Las Vegas Wash

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? Yes X No _____
 Survey Coordinates: Start: E 679006 N 3995831 UTM Datum: NAD83 (See instructions)
 Stop: E 678823 N 3995887 UTM Zone: 11N

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

****Fill in additional site information on back of this page****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding-potential threats [livestock, cowbirds, <i>Diorhabda</i> spp.]). If <i>Diorhabda</i> found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s): Nicholas Rice & Julia Mueller	Date:	1	0	0	N		1	U	678957	3995823
	Start:									
	8:15									
	Stop:									
	8:45									
Total hrs:	0.5									
Survey # 2 Observer(s): Deborah Van Dooremolen & Julia Mueller	Date:	0	0	0	N					
	Start:									
	8:26									
	Stop:									
	8:51									
Total hrs:	0.4									
Survey # 3 Observer(s): Deborah Van Dooremolen & David Syzdek	Date:	0	0	0	N					
	Start:									
	8:02									
	Stop:									
	8:19									
Total hrs:	0.3									
Survey # 4 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Survey # 5 Observer(s): N/A	Date:									
	Start:									
	Stop:									
	Total hrs:									
Overall Site Summary Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.		Total Adult Residents	Total Pairs	Total Territories	Total Nests	Were any WIFLs color-banded? Yes _____ No _____ Unknown				
Total survey hrs: 1.2		0	0	0	0	If yes, report color combination(s) in the comments section on back of form and report to USFWS.				

Reporting Individual: Deborah Van Dooremolen Date Report Completed: 10/16/2019
 US Fish & Wildlife Service Permit #: TE148556-4 State Wildlife Agency Permit #: n/a

Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Deborah Van Dooremolen Phone # 702-822-3370
Affiliation Southern Nevada Water Authority E-mail debbie.vandooremolen@snwa.com
Site Name Las Vegas Wash, Route 4 Date report Completed _____
Was this site surveyed in a previous year? Yes X No _____ Unknown _____
Did you verify that this site name is consistent with that used in previous yrs? Yes x No _____ Not Applicable _____
If name is different, what name(s) was used in the past? _____
If site was surveyed last year, did you survey the same general area this year? Yes _____ No x If no, summarize below. _____
Did you survey the same general area during each visit to this site this year? Yes x No _____ If no, summarize below. _____
Management Authority for Survey Area: Federal x Municipal/County x State _____ Tribal _____ Private _____
Name of Management Entity or Owner (e.g., Tonto National Forest) Bureau of Reclamation and Clark County
Length of area surveyed: 0.3 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

_____ Native broadleaf plants (entirely or almost entirely, > 90% native)
_____ Mixed native and exotic plants (mostly native, 50 - 90% native)
_____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)
x Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.

Tamarix ramosissima., Prosopis spp.

Average height of canopy (Do not include a range): 4 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features).

Attach additional sheets if necessary.

This route used to begin upstream of Pabco Road Weir. With a desire for logical order following habitat changes, the route is now confined to the Duck Creek area. This area just had one surveyable patch of tamarisk in 2018 due to a May 2018 fire.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Appendix B

Yellow-billed Cuckoo Survey Datasheets

Yellow Billed Cuckoo Survey Form

Site Name: Nature Preserve, Transect 1		County: Clark		State: NV	
USGS Quad Name: _____		Elevation: 496			
Creek, River, Wetland, or Lake Name: Las Vegas Wash					
Site Coordinates:	Start: E	678226	N	3996929	UTM Zone: 11N
	Stop: E	677941	N	3997350	Datum: NAD83
Ownership: <input type="checkbox"/> BLM <input type="checkbox"/> Reclamation <input type="checkbox"/> NPS <input type="checkbox"/> USFWS <input type="checkbox"/> USFS <input type="checkbox"/> Tribal <input type="checkbox"/> State <input type="checkbox"/> Private <input checked="" type="checkbox"/> Other (Municipal/County) Clark County					
Was site surveyed in previous year? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown If yes, what site name was used? Same					

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
								UTM E	UTM N				UTM E	UTM N
Survey Period #1 Observer(s): Van Dooremolen, D & Wuest, V	Date:	0												
	6/24/2019													
	Start:													
	5:33 AM													
	Stop:													
	6:25 AM													
Total hrs:	Total:													
	0.9													
Survey Period #2 Observer(s): Rice, N; Ricks, T & Wuest, V	Date:	0												
	7/8/2019													
	Start:													
	6:28 AM													
	Stop:													
	7:25 AM													
Total hrs:	Total:													
	1.0													
Survey Period #3 Observer(s): Van Dooremolen, D & Ricks, T	Date:	0												
	7/22/2019													
	Start:													
	5:45 AM													
	Stop:													
	6:39 AM													
Total hrs:	Total:													
	0.9													
Survey Period #4 Observer(s): Van Dooremolen, D & Ricks, T	Date:	0												
	8/5/2019													
	Start:													
	6:14 AM													
	Stop:													
	7:26 AM													
Total hrs:	Total:													
	1.2													
Survey Period #5 Observer(s): N/A	Date:													
	Start:													
	Stop:													
Total hrs:	Total:													
Survey Summary:		# Det	#PO	#PR	#CO	#Nests found	Total Survey Hours:							
Total YBCUs*		0					4.00							
Notes (refer to Cuckoo # associated with individual detections)														

*Include justification for these designations.

Behavior Codes: AN = at nest, BI = brooding or incubating, CF = adult carrying food, CN = carrying nest material, COP = copulation, CP = catches prey, DD = distraction displays/defense of nesting area, EF = eats food, FL = recently fledged young of species incapable of flight, FLY = flying, FO = foraging, FS = adult carrying a fecal sac, FY = adults feeding nestlings, JUV = juvenile, NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, PR = preening, SI = sitting, US = used, inactive nest with blue-green eggshells.

Fill in the following information completely

Name of Reporting Individual Deborah Van Dooremolen Date Report completed 10/17/2019

Affiliation Southern Nevada Water Authority Phone # 702-822-3370 Email debbie.vandooremolen@snwa.com

USFWS Permit # TE148556-4 State Permit # n/a

Site Name Nature Preserve, Transect 1

Length of area surveyed 0.5 (in kilometers = km)

Did you survey the same general area during each visit to this site this year? ☒ Yes ☐ No If no, summarize in comments below

If site was surveyed last year, did you survey the same general area this year? ☒ Yes ☐ No If no, summarize in comments below

Overall Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

Native broadleaf plants (>75% native)	<input checked="" type="checkbox"/>	Mixed native and exotic plants (mostly native 51-75%)	<input type="checkbox"/>
Exotic/introduced plants (>75% exotic)	<input type="checkbox"/>	Mixed native and exotic plants (mostly exotic 51-75%)	<input type="checkbox"/>

Average height of canopy (m) 6 (specify units) meters

Estimated Canopy Cover (percent) 75%

Overstory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u>10%</u> Cottonwood	<u>25%</u> Goodding's Willow	<u>50%</u> Coyote Willow	<u>Other (specify)</u>
<u> </u> Tamarisk	<u> </u> Russian Olive	<u> </u> Other (specify) Mesquite	<u>Other (specify)</u>

Average height of understory canopy (m) 3 (specify units) meters

Estimated Understory Cover (percent) 75%

Understory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u> </u> Cottonwood	<u> </u> Goodding's Willow	<u>50%</u> Coyote Willow	<u>Other (specify)</u>
<u> </u> Tamarisk	<u> </u> Russian Olive	<u>25%</u> Other (specify) Quailbush	<u>Other (specify)</u>
<u>10%</u> Baccharis	<u> </u> New Mexico Oli		

Was surface water or saturated soil present at or adjacent to site within 300 meters? ☒ Yes ☐ No (circle one)

Was surface water or saturated soil present at or adjacent to all patches surveyed? ☒ Yes ☐ No (circle one)

Comments. Please provide comments regarding differences between the survey patches within the site. For example, if the average canopy for this site is 30% cover, but within one patch it is 60% cover - please note. Also, please note significant differences between dominant overstory and understory vegetation among the patches. Document these differences with photographs whenever possible. Make sure to reference comments to photo number whenever available.

Please change percentages for dominant species to allow for more flexibility, or change to ranges of percentages (1-5, 5-25, 25-50, etc.).

Please provide USGS 7.5 minute quad (or similar) showing survey area to each survey form

Yellow-billed Cuckoo Survey and Detection Form, continued													
Name of Reporting Individual <u>Deborah Van Dooremolen</u>							Phone # <u>702-822-3370</u>						
Affiliation <u>Southern Nevada Water Authority</u>							Email <u>debbie.vandooremolen@snwa.com</u>						
Site Name <u>Nature Preserve, Transect 1</u>													
Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
							UTM E	UTM N				UTM E	UTM N
No detections													

Notes - Cont. (refer to Cuckoo # associated with individual detections)

Yellow Billed Cuckoo Survey Form

Site Name: Nature Preserve, Transect 2		County: Clark		State: NV	
USGS Quad Name: _____		Elevation: 498			
Creek, River, Wetland, or Lake Name: Las Vegas Wash					
Site Coordinates:	Start: E	678125	N	3997390	UTM Zone: 11N
	Stop: E	678327	N	3997102	Datum: NAD83
Ownership: <input type="checkbox"/> BLM <input type="checkbox"/> Reclamation <input type="checkbox"/> NPS <input type="checkbox"/> USFWS <input type="checkbox"/> USFS <input type="checkbox"/> Tribal <input type="checkbox"/> State <input type="checkbox"/> Private <input checked="" type="checkbox"/> Other (Municipal/County) Clark County					
Was site surveyed in previous year? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown If yes, what site name was used? Same					

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected.	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
								UTM E	UTM N				UTM E	UTM N
Survey Period #1 Observer(s): Van Dooremolen, D & Wuest, V	Date:	0												
	6/24/2019													
	Start:													
	6:33 AM													
	Stop:													
	7:17 AM													
	Total hrs:	Total:												
	0.7													
Survey Period #2 Observer(s): Rice, N; Ricks, T & Wuest, V	Date:	0												
	7/8/2019													
	Start:													
	5:32 AM													
	Stop:													
	6:16 AM													
	Total hrs:	Total:												
	0.7													
Survey Period #3 Observer(s): Van Dooremolen, D & Ricks, T	Date:	0												
	7/22/2019													
	Start:													
	6:49 AM													
	Stop:													
	7:40 AM													
	Total hrs:	Total:												
	0.9													
Survey Period #4 Observer(s): Van Dooremolen, D & Ricks, T	Date:	0												
	8/5/2019													
	Start:													
	7:40 AM													
	Stop:													
	8:28 AM													
	Total hrs:	Total:												
	0.8													
Survey Period #5 Observer(s): N/A	Date:													
	Start:													
	Stop:													
		Total hrs:	Total:											
Survey Summary:		# Det	#PO	#PR	#CO	#Nests found	Total Survey Hours:							
Total YBCUs*		0					3.10							
Notes (refer to Cuckoo # associated with individual detections)														

*Include justification for these designations.

Behavior Codes: AN = at nest, BI = brooding or incubating, CF = adult carrying food, CN = carrying nest material, COP = copulation, CP = catches prey, DD = distraction displays/defense of nesting area, EF = eats food, FL = recently fledged young of species incapable of flight, FLY = flying, FO = foraging, FS = adult carrying a fecal sac, FY = adults feeding nestlings, JUV = juvenile, NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, PR = preening, SI = sitting, US = used, inactive nest with blue-green eggshells.

Fill in the following information completely

Name of Reporting Individual Deborah Van Dooremolen Date Report completed 10/17/2019

Affiliation Southern Nevada Water Authority Phone # 702-822-3370 Email debbie.vandooremolen@snwa.com

USFWS Permit # TE148556-4 State Permit # n/a

Site Name Nature Preserve, Transect 2

Length of area surveyed 0.4 (in kilometers = km)

Did you survey the same general area during each visit to this site this year? ☒ Yes ☐ No If no, summarize in comments below

If site was surveyed last year, did you survey the same general area this year? ☒ Yes ☐ No If no, summarize in comments below

Overall Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

Native broadleaf plants (>75% native)	<input checked="" type="checkbox"/>	Mixed native and exotic plants (mostly native 51-75%)	<input type="checkbox"/>
Exotic/introduced plants (>75% exotic)	<input type="checkbox"/>	Mixed native and exotic plants (mostly exotic 51-75%)	<input type="checkbox"/>

Average height of canopy (m) 9 (specify units) meters

Estimated Canopy Cover (percent) 75%

Overstory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u>50%</u> Cottonwood	<u>50%</u> Goodding's Willow	<u> </u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u> </u> Other (specify)	<u> </u> Other (specify)

Average height of understory canopy (m) 3 (specify units) meters

Estimated Understory Cover (percent) 75%

Understory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u> </u> Cottonwood	<u> </u> Goodding's Willow	<u>75%</u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u> </u> Other (specify)	<u> </u> Other (specify)
<u>10%</u> Baccharis	<u> </u> New Mexico Oli		

Was surface water or saturated soil present at or adjacent to site within 300 meters? ☒ Yes ☐ No (circle one)

Was surface water or saturated soil present at or adjacent to all patches surveyed? ☒ Yes ☐ No (circle one)

Comments. Please provide comments regarding differences between the survey patches within the site. For example, if the average canopy for this site is 30% cover, but within one patch it is 60% cover - please note. Also, please note significant differences between dominant overstory and understory vegetation among the patches. Document these differences with photographs whenever possible. Make sure to reference comments to photo number whenever available.

Please change percentages for dominant species to allow for more flexibility, or change to ranges of percentages (1-5, 5-25, 25-50, etc.).

Please provide USGS 7.5 minute quad (or similar) showing survey area to each survey form

Yellow-billed Cuckoo Survey and Detection Form, continued													
Name of Reporting Individual <u>Deborah Van Dooremolen</u>						Phone # <u>702-822-3370</u>							
Affiliation <u>Southern Nevada Water Authority</u>						Email <u>debbie.vandooremolen@snwa.com</u>							
Site Name <u>Nature Preserve, Transect 2</u>													
Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
							UTM E	UTM N				UTM E	UTM N
No detections													

Notes - Cont. (refer to Cuckoo # associated with individual detections)

Yellow Billed Cuckoo Survey Form

Site Name: LV Wash (UP to UCE), Transect 1 (No. Bank)						Co: Clark		State: NV	
USGS Quad Name: _____						Elevation: 467			
Creek, River, Wetland, or Lake Name: Las Vegas Wash									
Site Coordinates:		Start: E	681311	N	3995667	UTM Zone: 11N			
		Stop: E	683074	N	3996147	Datum: NAD83			
Ownership: BLM Reclamation <input checked="" type="checkbox"/> PS <input type="checkbox"/> USFWS <input type="checkbox"/> USFS <input type="checkbox"/> Tribal <input type="checkbox"/> State <input type="checkbox"/> Private <input type="checkbox"/> Other (Municipal/County) Clark County									
Was site surveyed in previous year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown						If yes, what site name was used? Same			

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected.	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
								UTM E	UTM N				UTM E	UTM N
Survey Period #1 Observer(s): Rice, N; Ricks, T & Syzdek, D	Date:	1	6:19 AM	P, A	CN	4	n/a	682011	3995884			1	682011	3995884
	Start:													
	5:24 AM													
	Stop:													
	6:46 AM													
	Total hrs:	Total:												
	1.4													
Survey Period #2 Observer(s): Rice, N; Ricks, T & Wuest, V	Date:	0												
	Start:													
	6:51 AM													
	Stop:													
	8:47 AM													
	Total hrs:	Total:												
	1.9													
Survey Period #3 Observer(s): Ricks, T & Wuest, V	Date:	0												
	Start:													
	8:01 AM													
	Stop:													
	10:06 AM													
	Total hrs:	Total:												
	2.1													
Survey Period #4 Observer(s): Ricks, T & Wuest, V	Date:	1	7:01 AM	P, A	CN	4	n/a	681842	3995772			1	681767	3995766
	Start:													
	6:02 AM													
	Stop:													
	8:38 AM													
	Total hrs:	Total:												
	2.6													
Survey Period #5 Observer(s): N/A	Date:													
	Start:													
	Stop:													
	Total hrs:	Total:												
Survey Summary:		# Det	# PO	# PR	# CO	# Nests found	Total Survey Hours:							
Total YBCUs*		2	1				8.00							
Notes (refer to Cuckoo # associated with individual detections)														
*Include justification for these designations.														

Behavior Codes: AN = at nest, BI = brooding or incubating, CF = adult carrying food, CN = carrying nest material, COP = copulation, CP = catches prey, DD = distraction displays/defense of nesting area, EF = eats food, FL = recently fledged young of species incapable of flight, FLY = flying, FO = foraging, FS = adult carrying a fecal sac, FY = adults feeding nestlings, JUV = juvenile, NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, PR = preening, SI = sitting, US = used, inactive nest with blue-green eggshells.

Fill in the following information completely

Name of Reporting Individual Deborah Van Dooremolen Date Report completed 11/6/2019

Affiliation Southern Nevada Water Authority Phone # 702-822-3370 Email debbie.vandooremolen@snwa.com

USFWS Permit # TE148556-4 State Permit # n/a

Site Name Las Vegas Wash (Upstream Pabco to Upstream Calico Emergent), Transect 1 (North Bank)

Length of area surveyed 2.1 (in kilometers = km)

Did you survey the same general area during each visit to this site this year? ☒ Yes ☐ No If no, summarize in comments below

If site was surveyed last year, did you survey the same general area this year? ☒ Yes ☐ No If no, summarize in comments below

Overall Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

Native broadleaf plants (>75% native)	<input checked="" type="checkbox"/>	Mixed native and exotic plants (mostly native 51-75%)	<input type="checkbox"/>
Exotic/introduced plants (>75% exotic)	<input type="checkbox"/>	Mixed native and exotic plants (mostly exotic 51-75%)	<input type="checkbox"/>

Average height of canopy (m) 8 (specify units) meters

Estimated Canopy Cover (percent) 75%

Overstory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u>25%</u> Cottonwood	<u>25%</u> Goodding's Willow	<u> </u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u>25%</u> Other (specify) <u>Mesquite</u>	<u> </u> Other (specify)

Average height of understory canopy (m) 3 (specify units) meters

Estimated Understory Cover (percent) 25%

Understory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u> </u> Cottonwood	<u> </u> Goodding's Willow	<u>10%</u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u>10%</u> Other (specify) <u>Quailbush</u>	<u> </u> Other (specify)
<u>10%</u> Baccharis	<u> </u> New Mexico Oli		

Was surface water or saturated soil present at or adjacent to site within 300 meters? ☒ Yes ☐ No (circle one)

Was surface water or saturated soil present at or adjacent to all patches surveyed? ☒ Yes ☐ No (circle one)

Comments. Please provide comments regarding differences between the survey patches within the site. For example, if the average canopy for this site is 30% cover, but within one patch it is 60% cover - please note. Also, please note significant differences between dominant overstory and understory vegetation among the patches. Document these differences with photographs whenever possible. Make sure to reference comments to photo number whenever available.

Please change percentages for dominant species to allow for more flexibility, or change to ranges of percentages (1-5, 5-25, 25-50, etc.).

Please provide USGS 7.5 minute quad (or similar) showing survey area to each survey form

Site Name Las Vegas Wash (Upstream Pabco to Upstream Calico Emergent), Transect 1 (North Bank).

Notes - Cont. (refer to Cuckoo # associated with individual detections)

Notes - Cont. (refer to Cuckoo # associated with individual detections)

Yellow Billed Cuckoo Survey Form

Site Name: LV Wash (UP to UCE), Transect 2 (So. Bank)				Co: Clark		State: NV	
USGS Quad Name:				Elevation: 472			
Creek, River, Wetland, or Lake Name: Las Vegas Wash							
Site Coordinates:		Start: E	681135	N	3995508	UTM Zone: 11N	
		Stop: E	683150	N	3996020	Datum: NAD83	
Ownership: BLM Reclamation <input checked="" type="checkbox"/> PS USFWS USFS Tribal State Private <input checked="" type="checkbox"/> Other (Municipal/County) Clark County							
Was site surveyed in previous year? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If yes, what site name was used? Same							

Survey # Observer(s) (Last Name, First Initial)	Date (m/d/y) Survey, Time, Total Hours	Total Number of YBCUs detected.	Time Detected (AM):	Detect Type: I=Incidental P=Playback A=aural V=visual B=both	Voc. Type: CN=Contact CO=coo AL=alarm OT=other (describe)	Playback #: Number of times 'Kowlp' call played before YBCU responded	Behavior code	Surveyor Detection Coordinates		Distance (m)	Bearing	C u c k o o #	Corrected Coordinates	
								UTM E	UTM N				UTM E	UTM N
Survey Period #1 Observer(s): Rice, N; Ricks, T & Syzdek, D	Date:	0												
	6/24/2019													
	Start:													
	7:06 AM													
	Stop:													
	8:58 AM													
Total hrs:	Total:													
1.9														
Survey Period #2 Observer(s): Rice, N; Ricks, T & Wuest, V	Date:	0												
	7/9/2019													
	Start:													
	5:06 AM													
	Stop:													
	6:41 AM													
Total hrs:	Total:													
1.6														
Survey Period #3 Observer(s): Ricks, T & Wuest, V	Date:	0												
	7/23/2019													
	Start:													
	5:52 AM													
	Stop:													
	7:44 AM													
Total hrs:	Total:													
1.9														
Survey Period #4 Observer(s): Ricks, T & Wuest, V	Date:	0												
	8/6/2019													
	Start:													
	9:02 AM													
	Stop:													
	10:40 AM													
Total hrs:	Total:													
1.6														
Survey Period #5 Observer(s): N/A	Date:													
	Start:													
	Stop:													
Total hrs:	Total:													
Survey Summary:		# Det	# PO	# PR	# CO	# Nests found	Total Survey Hours:							
Total YBCUs*		0					7.00							
Notes (refer to Cuckoo # associated with individual detections)														
*Include justification for these designations.														

Behavior Codes: AN = at nest, BI = brooding or incubating, CF = adult carrying food, CN = carrying nest material, COP = copulation, CP = catches prey, DD = distraction displays/defense of nesting area, EF = eats food, FL = recently fledged young of species incapable of flight, FLY = flying, FO = foraging, FS = adult carrying a fecal sac, FY = adults feeding nestlings, JUV = juvenile, NB = nest building, NE = active nest with unbroken eggs in it, NY = nest with young seen or heard in it, ON = occupied nest, PR = preening, SI = sitting, US = used, inactive nest with blue-green eggshells.

Fill in the following information completely

Name of Reporting Individual Deborah Van Dooremolen Date Report completed 10/17/2019

Affiliation Southern Nevada Water Authority Phone # 702-822-3370 Email debbie.vandooremolen@snwa.com

USFWS Permit # TE148556-4 State Permit # n/a

Site Name Las Vegas Wash (Upstream Pabco to Upstream Calico Emergent), Transect 2 (South Bank)

Length of area surveyed 1.8 (in kilometers = km)

Did you survey the same general area during each visit to this site this year? ☒ Yes ☐ No If no, summarize in comments below

If site was surveyed last year, did you survey the same general area this year? ☒ Yes ☐ No If no, summarize in comments below

Overall Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

Native broadleaf plants (>75% native)	<input checked="" type="checkbox"/>	Mixed native and exotic plants (mostly native 51-75%)	<input type="checkbox"/>
Exotic/introduced plants (>75% exotic)	<input type="checkbox"/>	Mixed native and exotic plants (mostly exotic 51-75%)	<input type="checkbox"/>

Average height of canopy (m) 8 (specify units) meters

Estimated Canopy Cover (percent) 75%

Overstory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u>25%</u> Cottonwood	<u>25%</u> Goodding's Willow	<u> </u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u>25%</u> Other (specify) <u>Mesquite</u>	<u> </u> Other (specify)

Average height of understory canopy (m) 3 (specify units) meters

Estimated Understory Cover (percent) 25%

Understory Vegetation: (provide percent estimate of the following dominant species). Use <1%, 10%, 25%, 50%, 75%, 90%, 100%.

<u> </u> Cottonwood	<u> </u> Goodding's Willow	<u>10%</u> Coyote Willow	<u> </u> Other (specify)
<u> </u> Tamarisk	<u> </u> Russian Olive	<u>10%</u> Other (specify) <u>Quailbush</u>	<u> </u> Other (specify)
<u>10%</u> Baccharis	<u> </u> New Mexico Oli		

Was surface water or saturated soil present at or adjacent to site within 300 meters? ☒ Yes ☐ No (circle one)

Was surface water or saturated soil present at or adjacent to all patches surveyed? ☒ Yes ☐ No (circle one)

Comments. Please provide comments regarding differences between the survey patches within the site. For example, if the average canopy for this site is 30% cover, but within one patch it is 60% cover - please note. Also, please note significant differences between dominant overstory and understory vegetation among the patches. Document these differences with photographs whenever possible. Make sure to reference comments to photo number whenever available.

Please change percentages for dominant species to allow for more flexibility, or change to ranges of percentages (1-5, 5-25, 25-50, etc.).

Please provide USGS 7.5 minute quad (or similar) showing survey area to each survey form

Yellow-billed Cuckoo Survey and Detection Form, continued

Affiliation	Southern Nevada Water Authority	Email	debbie.vandoremlen@snwa.com
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Site Name Las Vegas Wash (Upstream Pabco to Upstream Calico Emergent), Transect 2 (South Bank)

[illegible]
