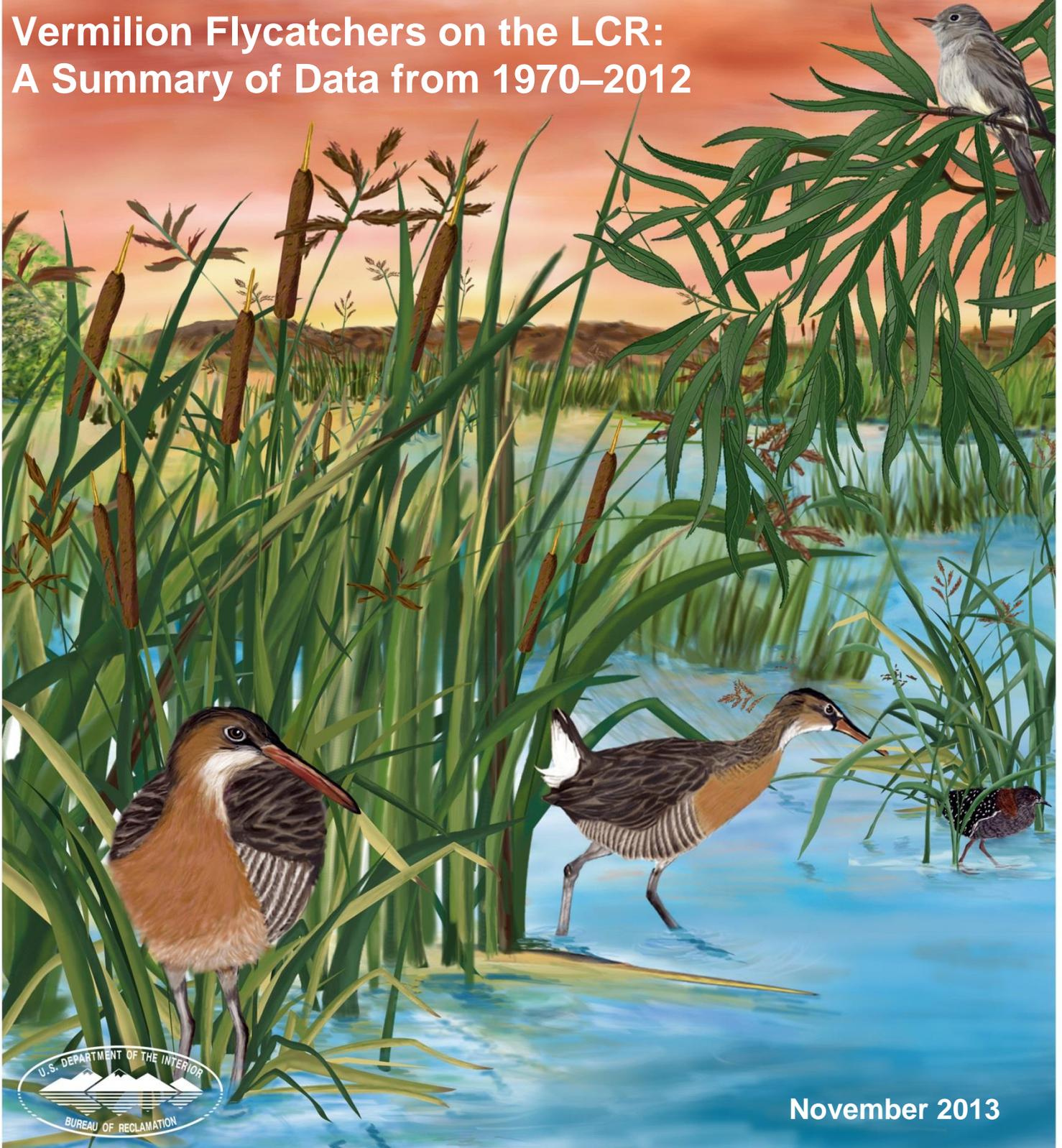


Lower Colorado River Multi-Species Conservation Program



Balancing Resource Use and Conservation

Vermilion Flycatchers on the LCR: A Summary of Data from 1970–2012



November 2013

Lower Colorado River Multi-Species Conservation Program Steering Committee Members

Federal Participant Group

Bureau of Reclamation
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
Bureau of Indian Affairs
Western Area Power Administration

Arizona Participant Group

Arizona Department of Water Resources
Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
Central Arizona Water Conservation District
Cibola Valley Irrigation and Drainage District
City of Bullhead City
City of Lake Havasu City
City of Mesa
City of Somerton
City of Yuma
Electrical District No. 3, Pinal County, Arizona
Golden Shores Water Conservation District
Mohave County Water Authority
Mohave Valley Irrigation and Drainage District
Mohave Water Conservation District
North Gila Valley Irrigation and Drainage District
Town of Fredonia
Town of Thatcher
Town of Wickenburg
Salt River Project Agricultural Improvement and Power District
Unit "B" Irrigation and Drainage District
Wellton-Mohawk Irrigation and Drainage District
Yuma County Water Users' Association
Yuma Irrigation District
Yuma Mesa Irrigation and Drainage District

Other Interested Parties Participant Group

QuadState Local Governments Authority
Desert Wildlife Unlimited

California Participant Group

California Department of Fish and Wildlife
City of Needles
Coachella Valley Water District
Colorado River Board of California
Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
San Diego County Water Authority
Southern California Edison Company
Southern California Public Power Authority
The Metropolitan Water District of Southern California

Nevada Participant Group

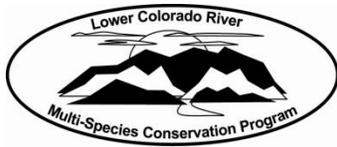
Colorado River Commission of Nevada
Nevada Department of Wildlife
Southern Nevada Water Authority
Colorado River Commission Power Users
Basic Water Company

Native American Participant Group

Hualapai Tribe
Colorado River Indian Tribes
Chemehuevi Indian Tribe

Conservation Participant Group

Ducks Unlimited
Lower Colorado River RC&D Area, Inc.
The Nature Conservancy



Lower Colorado River Multi-Species Conservation Program

Vermilion Flycatchers on the LCR: A Summary of Data from 1970–2012

Prepared by:

Barbara Raulston, Wildlife Group

Lower Colorado River
Multi-Species Conservation Program
Bureau of Reclamation
Lower Colorado Region
Boulder City, Nevada
<http://www.lcrmscp.gov>

November 2013

ACRONYMS AND ABBREVIATIONS

BWRNWR	Bill Williams River National Wildlife Refuge
CBC	Christmas Bird Count
CRIT Preserve	Colorado River Indian Tribe Preserve
CVCA	Cibola Valley Conservation Area
ft	foot/feet
GBBO	Great Basin Bird Observatory
LCR	lower Colorado River
LCR MSCP	Lower Colorado River Multi-Species Conservation Program
m	meter(s)
PVER	Palo Verde Ecological Reserve
Reclamation	Bureau of Reclamation
SSRS	Southern Sierra Research Station
USFWS	U.S. Fish and Wildlife Service
VEFL	vermillion flycatcher

Symbols

%	percent
---	---------

CONTENTS

	Page
Introduction.....	1
Methods.....	3
Results.....	5
Discussion.....	10
Habitat Characteristics of the Vermilion Flycatcher on the Lower Colorado River.....	10
Survey Methods to Detect VEFL.....	12
Literature Cited.....	15

Tables

Table		Page
1	Total acres of cottonwood-willow and mesquite habitat created under the LCR MSCP through 2012.....	1
2	Description of woody riparian land cover structural types.....	4

Figures

Figure		Page
1	The LCR MSCP area with boundaries of the seven river reaches.....	2
2	Vermilion flycatcher detections from LCR Christmas Bird Counts, 1980–2010.....	5
3	Breeding locations of vermilion flycatchers (Serena, 1981).	6
4	Locations of transects surveyed on the BWRNWR between 1998 and 2012 (K. Blair, USFWS, BWRNWR).	8
5	Numbers of vermilion flycatchers detected on BWRNWR transects, 1998–2012.....	8
6	Heavily irrigated alfalfa fields at Planet Ranch extending to the border of the BWRNWR are shown clearly in bright green on this 1992 LandSat image.....	11
7	LandSat photo of Planet Ranch in 1999 shows formerly irrigated fields, with only the riparian vegetation at the east and west end of the ranch, along the Bill Williams River, shown in bright green.	11
8	VEFL nest trees by species, BWRNWR, 1993 and 1994.....	12

Attachments

Attachment

- 1 Results from Sites Visited to Determine Presence of Vermilion Flycatcher along the Lower Colorado River

INTRODUCTION

The Bureau of Reclamation (Reclamation) has created over 1,600 acres of cottonwood-willow and over 400 acres of honey mesquite (table 1, figure 1) as part of the requirements of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP). Several monitoring efforts are ongoing at these restoration sites and system-wide, including area searches for breeding birds and surveys designed to detect yellow-billed cuckoos and southwestern willow flycatchers. As part of these efforts, biologists also report sightings of other covered species, including vermilion flycatcher (VEFL), another species covered under the LCR MSCP.

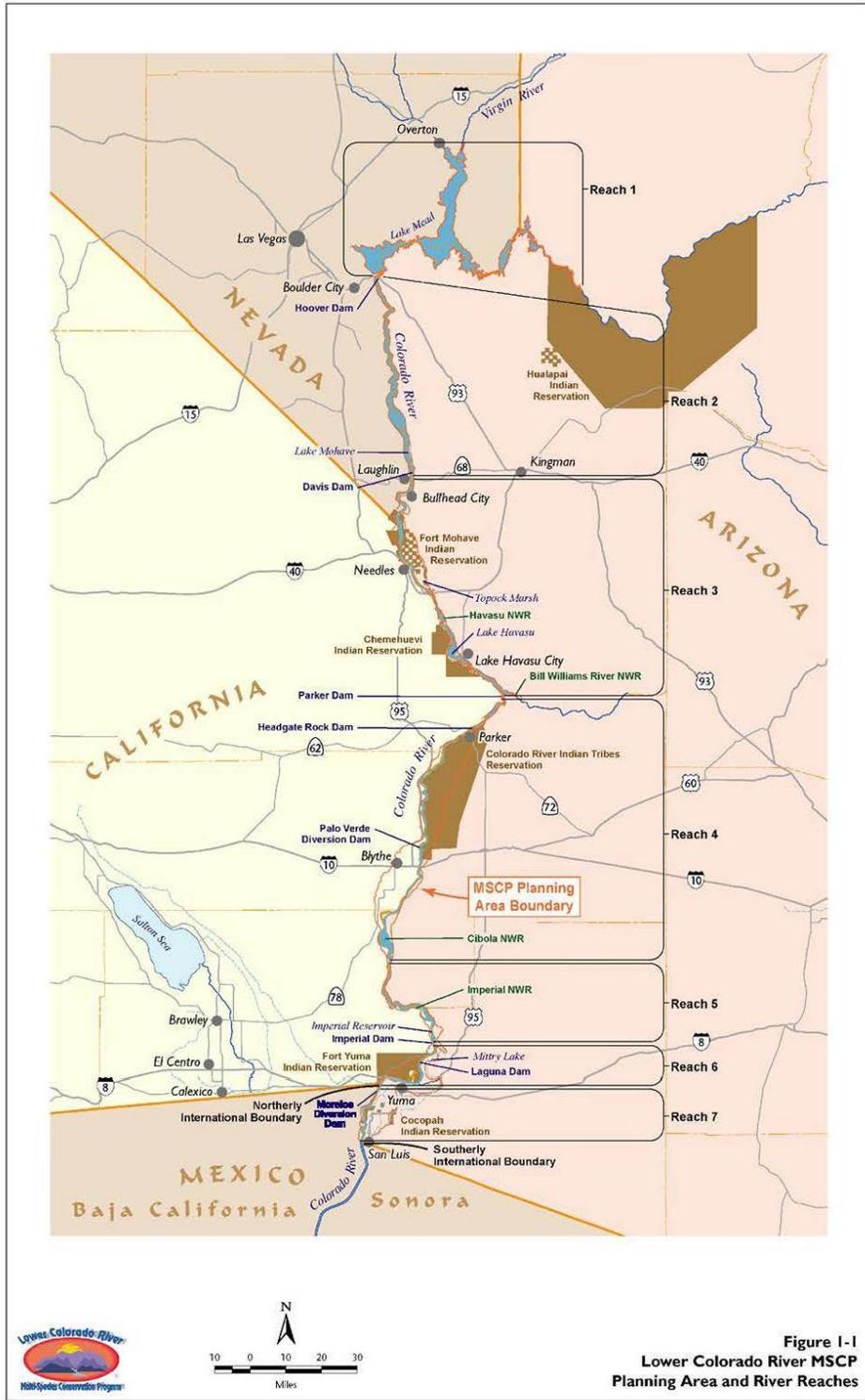
Table 1.—Total acres of cottonwood-willow and mesquite habitat created under the LCR MSCP through 2012

LCR MSCP reach	Cottonwood-willow (acres)	Honey mesquite (acres)
Reach 1	0	0
Reach 2	0	0
Reach 3	107	0
Reach 4	1,480	445
Reach 5	0	0
Reach 6	0	0
Reach 7	44	0
Total	1,631	445

In February 2012, Reclamation began investigating the status of VEFL along the lower Colorado River (LCR) where other surveys were not being conducted. The purpose of this preliminary effort was to (1) determine where VEFL populations are currently located, (2) appropriate survey methods for future investigations, (3) rule out the possibility that surveys for other species, which occur later than when VEFL begin breeding, were simply missing the peak activity period of breeding VEFL, and (4) determine the ideal timing for VEFL surveys in the future. A lack of incidental sightings for such a highly visible species was one reason preliminary surveys were initiated.

VEFL are short-distance migrants, if they migrate at all on the LCR (Rosenberg et al. 1991; Clark), and begin breeding activities in February (Phillips et al. 1964; Rosenberg et al. 1991) before Reclamation's other survey efforts start. Carothers (1974) did not begin observing VEFL in his study until April and notes

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**



**Figure 1-1
Lower Colorado River MSCP
Planning Area and River Reaches**

Figure 1.—The LCR MSCP area with boundaries of the seven river reaches.

that he did not observe active male-female courtship behaviors. Some species, such as the southwestern willow flycatcher and summer tanager, decrease their activity and adjust their singing frequency depending on breeding stage (Phillips et al. 1964; Yard and Brown 2003; Sogge et al. 2010).

Under the LCR MSCP, Reclamation has been tasked with implementing conservation measures designed to avoid, minimize, and mitigate impacts to covered species. The general measures that apply, but are not specific, to the VEFL include:

- MRM1: Conduct surveys and research to better identify covered and evaluation species habitat requirements
- MRM2: Monitor and adaptively manage created covered and evaluation species habitats
- MRM4: Conduct research to determine and address the effects of brown-headed cowbird nest parasitism on reproduction of covered species

Specific to the vermilion flycatcher, conservation measure VEFL1 states:

“Of the 7,260 acres of created cottonwood-willow and honey mesquite, at least 5,208 acres will be designed and created to provide habitat for this species. Patches of created habitat will be designed and managed to support cottonwood-willow types I–IV and honey mesquite type III that provide habitat for this species. The created habitat will be established in patches as large as possible. At a minimum, however, isolated patches of honey mesquite will be created in patches of at least 50 acres, and, of the 5,940 acres of LCR MSCP–created cottonwood-willow, 1,702 acres will be created in patches of at least 50 acres, 2,348 acres will be created in patches of at least 25 acres, and 1,890 acres will be created in patches of at least 10 acres.”

Also relevant to this species, the Habitat Conservation Plan (HCP) states:

“System monitoring will be conducted to collect data on existing populations and habitats of covered species to determine their status, distribution, density, migration, productivity, and other ecologically important parameters.”

METHODS

To establish a recent history of VEFL on the LCR, this report summarizes information from published and unpublished literature since the 1970s. Information is from Christmas Bird Counts (CBC), U.S. Fish and Wildlife Service

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

(USFWS) files, sightings reported on the eBird database (<http://ebird.org/>), various LCR MSCP reports, and personal communications with local bird watchers and professional biologists.

Investigations to determine current locations of the VEFL population still present on the LCR began in February 2012. The LCR MSCP Habitat Conservation Plan (Reclamation 2004) describes VEFL habitat as cottonwood and willow types I–V and honey mesquite, type III (table 2). However, this effort concentrated on locations that were not being visited as part of other avian projects and covered somewhat different habitat types. Sites with previously reported or commonly known populations of VEFL were not included, such as the Colorado River Indian Tribe ‘Ahakhav Tribal Preserve (CRIT Preserve) and Yuma Quartermaster Depot State Park, while similar habitats located in golf courses, parks, mobile home parks, cemeteries, recreational areas, etc., were included. This effort was not intended to be a structured survey and did not follow a rigorous protocol. If possible, grounds workers, employees, or the general public were questioned about the bird and shown a picture of a male VEFL. At many locations, the species was already known to be present, and information was readily available upon request. Followup searches were then conducted to confirm these sightings. A general description of the site was recorded, Global Positioning System data were taken, and if birds were located, additional information such as evidence of breeding, behavior, age, and sex of individuals were noted.

Table 2.—Description of woody riparian land cover structural types

Structural type	Description
I	Mature stand with distinctive overstory greater than 15 feet (ft) (4.6 meters [m]) high, intermediate class from 2–15 ft (0.6–4.6 m) tall, and understory from 0–2 ft (0–0.6 m) tall. The majority of the foliage is in the upper layers.
II	Stand where the overstory [>15 ft (4.6 m) tall] constitutes greater than 50 percent (%) of trees with little or no intermediate class present. The majority of the foliage is in the upper layers.
III	Stand where largest proportion of trees are 10–20 ft (3.0–6.1 m) high with few trees greater than 20 ft (6.1 m) tall or less than 5 ft (1.5 m) tall. The majority of the foliage is in the middle layer.
IV	Few trees >15 ft (4.6 m) are present; 50% of vegetation is 5–15 ft (1.5–4.6 m) tall with the other 50% between 0–2 ft (0–0.6 m) tall. The majority of the foliage is in the middle layer.
V	60–70% of vegetation present between 0–2 ft (0–0.6 m) tall with the remainder 5–15 ft (1.5–4.6 m) tall. The majority of the foliage is in the lower layer; mostly all new growth with some shrubs or small trees.
VI	75–100% of vegetation from 0–2 ft (0–0.6 m) tall. The majority of the foliage is in the lower layer; almost all new growth with little to no shrubs or trees mixed in.

Adapted from Anderson and Ohmart (1984).

RESULTS

Data on the VEFL population on the LCR prior to 1992 comes mainly from Rosenberg et al. (1991), collected from 1974–1984 as part of the “Lower Colorado River Bird Study” (which was funded by Reclamation). These data, and CBC data beginning in 1980 (figure 2), show VEFL are present on the LCR during the nonbreeding season. Gaps in the data on figure 2 indicate years when a CBC was not conducted, with the exception of Havasu National Wildlife Refuge in 2005, which reported 75 VEFL. This is highly unlikely, but because the true number (more likely 7 or 5) is unknown, that year’s data were excluded. In addition, the CBC named BW Delta2 was conducted in 1980, 1982, 1984, and 1986; when it resumed in 1994, it was renamed BW Delta, but covered the same geographic area.

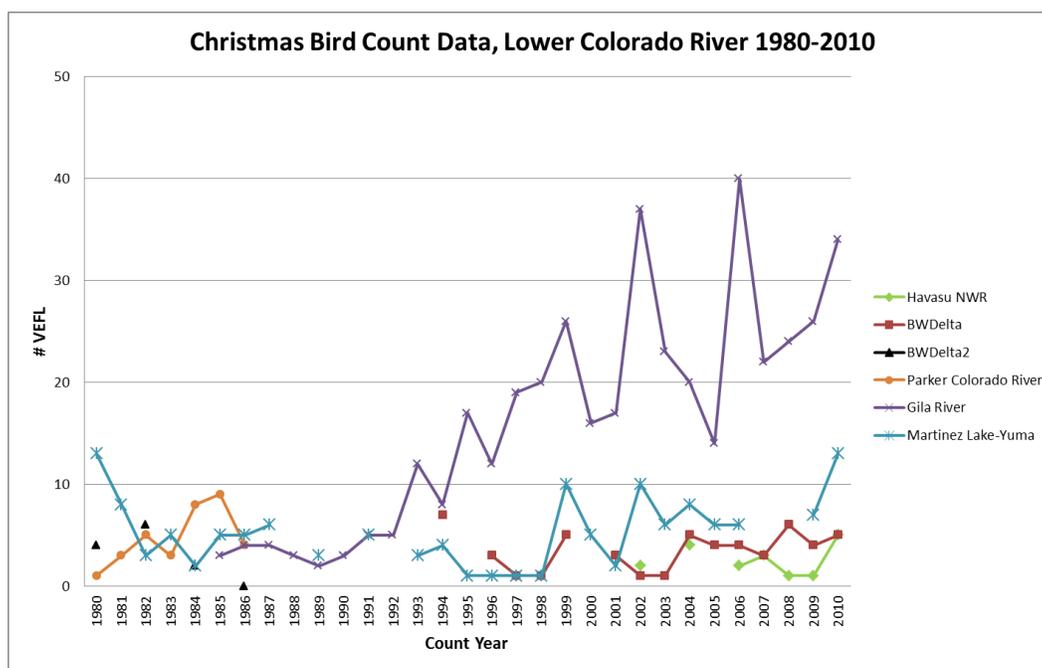


Figure 2.—Vermilion flycatcher detections from LCR Christmas Bird Counts, 1980–2010.

Without year-round banding of the LCR VEFL population, the relationship between the wintering and breeding populations remains unknown. Rosenberg et al. (1991) suggests they may represent separate populations. Rosenberg et al. (1991) also notes that, in the winter, VEFL are more likely to be found near agricultural and vegetated urban areas rather than riparian woodlands. This is also indicated by the specific locations VEFL are found during the BWDelta

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

CBC, which is centered at the Bill Williams Bridge over Arizona Hwy. 95: golf courses, parks, campgrounds, and other open, urban areas with irrigated grass and scattered mesquites.

It is clear that VEFL were not at all common on the LCR during the period that Rosenberg et al. (1991) were collecting data: vermilion flycatchers were “rare and local. . . few pairs along the Bill Williams delta” . . . and, “no more than 10 pairs widely scattered along the entire main stem of the LCR” (Rosenberg et al. 1991). Numerous publications and unpublished reports resulted from this work, including an excerpt concerning VEFL from an unpublished report by M. Serena dated November 30, 1981, entitled “The Status of Selected Birds along the Lower Colorado River” (figure 3).

- Known breeding localities in the summer of 1981 include the following (Ken Rosenberg, pers. comm.):
- 1) Blythe golf course (one pair)
 - 2) Clark Ranch, 14 miles north of Blythe (one pair). This pair nested in one of a line of tall riparian cottonwoods, successfully fledging two offspring. These were the first Vermilion Flycatchers to nest in this immediate area in seven or eight years (Sue Clark, pers. comm.)
 - 3) Agricultural-riparian vegetation interface between Poston and Parker, AZ (two pairs)
 - 4) Willow Valley Estates, AZ (one pair)
 - 5) Vicinity of Yuma, AZ (two pairs)
 - 6) Bill Williams delta (four-six pairs)

Figure 3.—Breeding locations of vermilion flycatchers (Serena, 1981).

The VEFL population on the Bill Williams River National Wildlife Refuge (BWRNWR) seems to have increased after the LCR bird study was officially completed in 1984, and VEFL remained more common there throughout the 1990s, particularly at the eastern portion of the refuge (B. Raulston, personal observation; K. Blair, personal communication). It is possible the species was taking advantage of insects attracted to Planet Ranch’s 2,205 acres of alfalfa during that period. Alfalfa was also being irrigated during the LCR bird study (B. Anderson, personal communication, August 2011), but the extent of this practice at that time is unknown, whereas during the 1990s, Planet Ranch was under full cultivation and irrigating with over 12,000 acre-feet of water (B. Raulston, personal observation, September 2013).

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

Between March 1992 – October 1992, Anthony R. Nelson, under the direction of R. William Mannan, University of Arizona, documented VEFL at select locations on the BWRNWR while conducting Emlen transects (Emlen 1971) and point counts (Reynolds et al. 1980; Nelson et al. 1993). The following year, Neale and Sacks (1994a and 1994b), working with Michael Morrison, University of Arizona, documented 10 nests in April and May 1993 from Mineral Wash to Planet Ranch (Neale and Sacks 1994a; B. Sacks, personal communication, August 2011). In addition to the 10 males associated with these nests, they also noted 8 single males and 3 paired (not yet nesting) males during that period of time.

In 1994, Annalaura Averill and Suellen Lynn, also under the direction of Michael Morrison, determined the relative abundances of riparian birds, including VEFL, using a variable circular-plot method to conduct point counts surveys on the four lower Colorado River national wildlife refuges (Lynn et al. 1996). During this time, Averill and others noted more detailed information on VEFL nests on the BWRNWR in field notes recorded for Averill's thesis on parasitism by brown-headed cowbirds (Averill 1996). Although her thesis did not include VEFL nest analysis, this information was later summarized in an unpublished manuscript (Averill et al. 1994). Between April 9 and July 1, 1994, Averill et al. (1994) documented at least 30 pairs of VEFL breeding on the BWRNWR. Averill's (and others) field notes for that same period documented at least 62 nesting attempts (A. Averill and P. Hurley, unpublished report and field notes, 1994). Although no birds were banded during these studies, VEFL are very territorial, and with minimal observation, individual pairs are easier to distinguish than many other species (Rosenberg et al. 1991; Smith 1970).

Since 1998, data from strip transects surveyed by K. Blair and various volunteers document a steady decline in observations of VEFL on the BWRNWR. Each strip transect is 400 x 20 m and comprised of 20 contiguous 20 x 20 m plots (survey stations). For avian species, 3 minutes are spent in each plot. Transects are surveyed for 3 consecutive days, four times per year (one time per season). All birds within the plot are recorded, including flyovers. Birds noted outside of the fixed area or time are recorded separately (K. Blair, personal communication, September 2011). Transects where VEFL were documented since 1998 are shown on figure 4, and numbers detected are on figure 5. These transects overlap with the general areas surveyed by Neale and Sacks (1994a, 1994b) and Averill et al. (1994). Overall, two or fewer individuals were recorded between 2007–2012 (figure 5), with none detected at the easternmost transect, Planet-Mohave Wash, after 2006.

The Great Basin Bird Observatory (GBBO), using a double-sampling area search method (2006–2012) (Bart et al. 2010) along the Colorado River from Lake Mead to the Northern International Boundary with Mexico, has also concluded that VEFL are extremely rare both on the BWRNWR in formerly occupied riparian habitats and along the LCR. In 2012, 80 randomly selected plots were surveyed

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

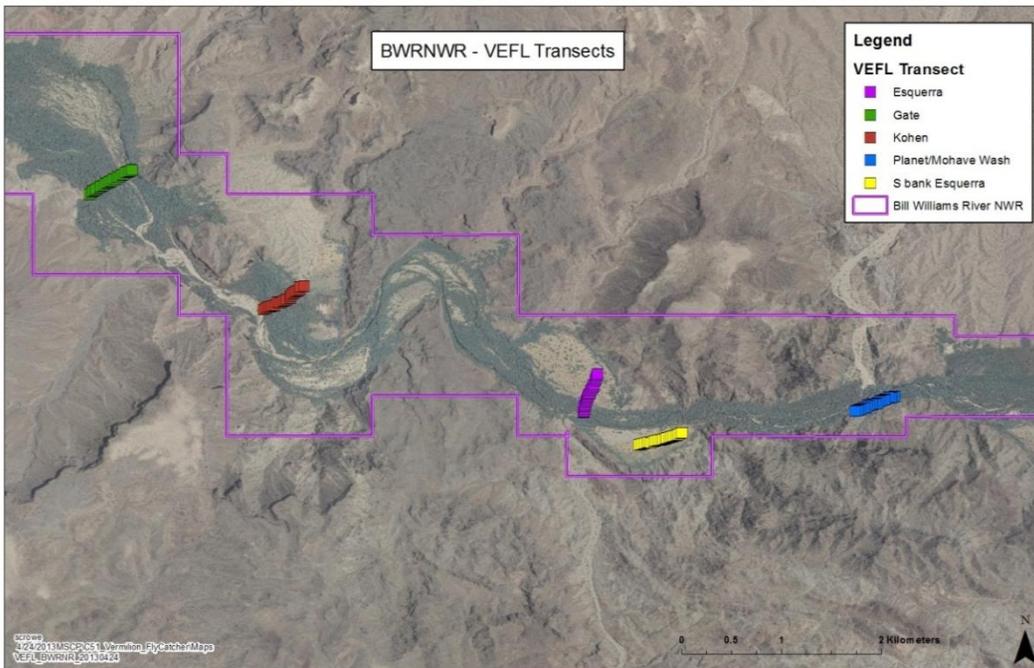


Figure 4.—Locations of transects surveyed on the BWRNWR between 1998 and 2012 (K. Blair, USFWS, BWRNWR).

For cross-referencing purposes, K. Blair identifies these transects as A1-Kohen (red), A2-Esquerra (purple), sjv-south bank Esquerra (yellow), R1-Gate (green), and R2-Planet/Mohave (blue).

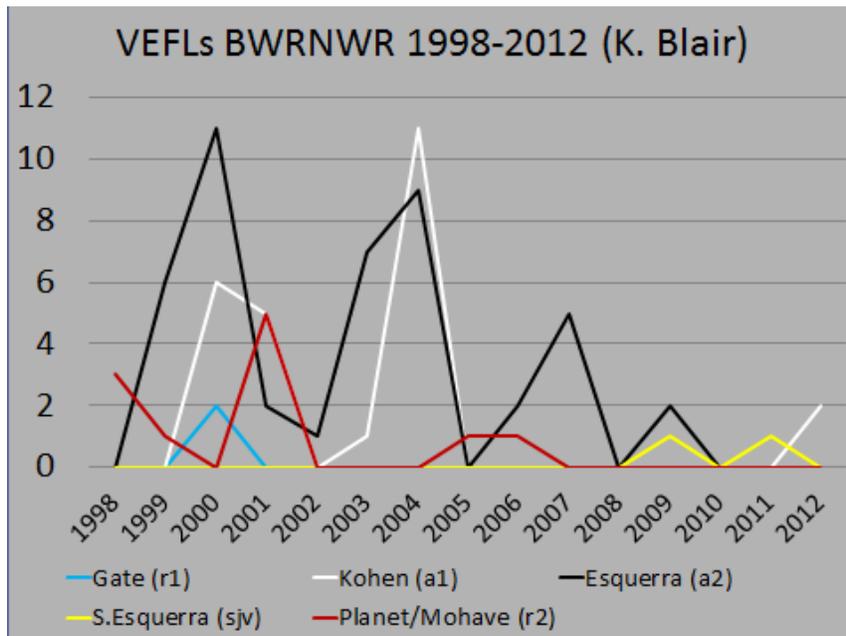


Figure 5.—Numbers of vermilion flycatchers detected on BWRNWR transects, 1998–2012.

(K. Blair, BWRNWR personal communication).

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

with no breeding VEFL detected (GBBO 2013). At nonrandomly selected plots (i.e., restoration sites [both existing and LCR MSCP restoration sites]), breeding VEFL have been detected only at the CRIT Preserve within the cottonwood-willow restoration area, which began development in 2002. Directly across from this habitat is an irrigated, grassy park with many old-growth honey mesquites where breeding VEFL have been documented since approximately 2001 (eBird records, personal observation). What is presumably an extension of this population began nesting in the cottonwood-willow restored area beginning in 2008. VEFL continue to nest in both the park and cottonwood-willow areas: four breeding territories were confirmed in the restored cottonwood-willow habitat in 2012 (GBBO 2013).

Southern Sierra Research Station (SSRS 2008-2012) has been surveying and monitoring yellow-billed cuckoos on the LCR and Bill Williams River and rarely observes VEFL incidentally. VEFL have been detected at eight sites from Pahrangat National Wildlife Refuge in southern Nevada to Quigley Pond, east of Yuma, Arizona, since 2008, with no more than five and as few as one at any of them.

During 2012, a total of 40 locations along the LCR from Yuma to Needles were visited between February 2 and April, 19, 2012 (attachment 1). Information used for followup searches, gained from grounds workers, employees, residents, or the general public, was most often associated with the presence of a male VEFL; if only female VEFL were present, they were rarely noticed by these casual observers. This was not usually the case, however, as males and female VEFL were together more often than not. Minimal taped calls were played in the vicinity of breeding vermilion flycatchers and indicate VEFL are highly responsive to this survey technique, although it is not necessary to detect them.

Vermilion flycatchers were present at eight locations between Yuma, Arizona, and Lake Havasu City, Arizona, and nesting was documented at four of these locations (attachment 1). Other locations where VEFL were present included the Blythe Cemetery, River Lodge Golf Course (near Parker, Arizona), Big River Community Park (on the California side of the LCR near Parker, Arizona), Emerald Canyon Golf Course (Parker, Arizona), La Paz County Park (Parker, Arizona), and Hidden Shores Resort (north of Yuma, Arizona). In addition, VEFL were reliably reported by others in 2012 from Rotary Park (Lake Havasu City, Arizona), Quartermaster Depot State Park (Yuma, Arizona), CRIT Preserve (Parker, Arizona), and McIntyre Park, Blythe, California. Breeding was confirmed at River Lodge Golf Course, Big River Community Park, La Paz County Park, and Hidden Shores Resort.

DISCUSSION

Habitat Characteristics of the Vermilion Flycatcher on the Lower Colorado River

In the 1980s, VEFL were uncommon during winter and fall and rare during spring and summer, with the most abundant breeding habitat occurring from lower Bill Williams River to Lake Havasu within the LCR flood plain. During the nonbreeding season, VEFL largely vacated this habitat in favor of open, park-like areas on the LCR (Rosenberg et al. 1991). During breeding, VEFL were reported nesting in groves of cottonwood-willow bordered by honey mesquite, open water, and pastures.

In Arizona, VEFL are found breeding in broad-leaf riparian woodlands and mesquite bosques, often in the vicinity of water (Averill-Murray and Corman 2005). They are also found in riparian woodlands, residential areas, and along the margins of agricultural fields near accessible water (Rosenberg et al. 1991). Vermilion flycatchers have an affinity for active agricultural areas, and other open grassy areas that are irrigated as evidenced by their continued presence on golf courses, in cemeteries, and in park-like habitats in urban areas (Rosenberg et al. 1991; Wolf and Jones 2000; B. Raulston, personal observation, August 2011). Rosenberg et al. (1991) noted the Blythe Golf Course and the Parker Dam Residences, just below Parker Dam, as areas of “consistent occurrence,” and VEFL are still present at these two areas (B. Raulston, personal observation).

Most of the VEFL found on the BWRNWR during the early 1990s were located on the eastern end of the refuge: the riparian areas bordering Planet Ranch. Given the species’ affinity for irrigated agricultural areas with riparian habitat and water nearby, the changes that occurred at Planet Ranch during that time period may explain the disappearance of VEFL there. In 1992, the entire ranch was planted mainly in alfalfa and was being irrigated heavily (figure 6.). Sometime in the mid-1990s, Planet Ranch ceased farming activities, and by 1999, the difference in the irrigated area could be clearly seen (figure 7). Coinciding with this change in agricultural practices was the decline of VEFL as well.

Rosenberg et al. (1991) also noted that the VEFL “has never been known to use the extensive but dry honey mesquite woodlands found from Parker to Ehrenberg.” Neale and Sacks (1994b) described 10 nests on the BWRNWR during April and May 1993, and Averill et al. (1994) described 56; none in either study were in mesquites (figure 8). In contrast, all four breeding confirmations in 2012 were based on nests found in mesquites.

Today, there may be only 1–2 pairs on the BWRNWR detected in the mesquite grasslands upstream of Mineral Wash on the old Esquerra Ranch and downstream on the old Kohen Ranch (K. Blair, personal communication). Both of these areas

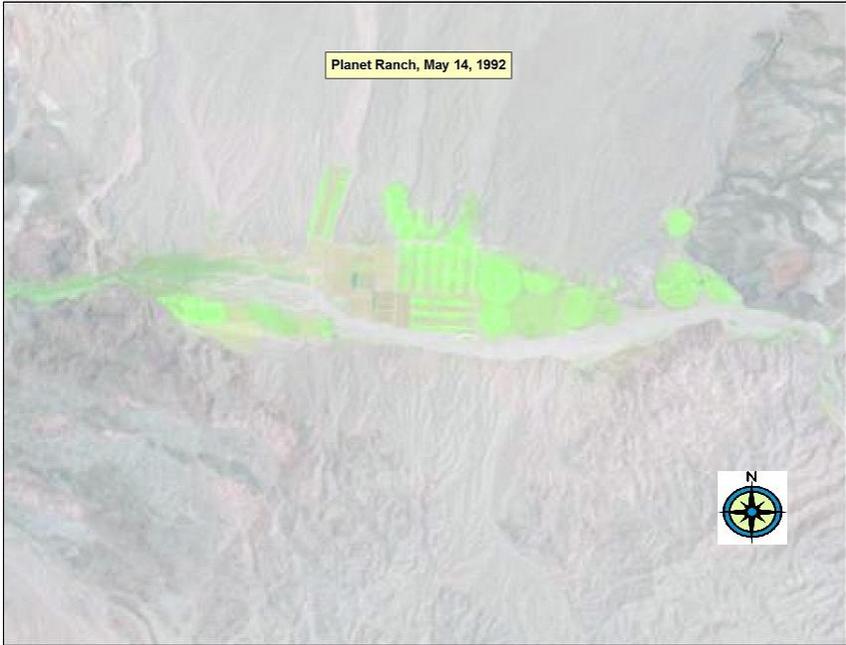


Figure 6.—Heavily irrigated alfalfa fields at Planet Ranch extending to the border of the BWRNWR are shown clearly in bright green on this 1992 LandSat image.



Figure 7.—LandSat photo of Planet Ranch in 1999 shows formerly irrigated fields, with only the riparian vegetation at the east and west end of the ranch, along the Bill Williams River, shown in bright green.

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

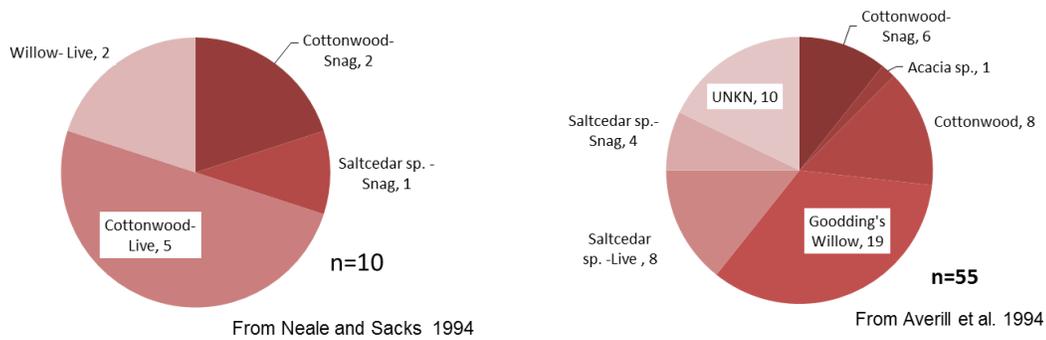


Figure 8.—VEFL nest trees by species, BWRNWR, 1993 and 1994.

consist of unirrigated grass and scattered honey mesquites with cottonwood and willow adjacent along the river. Along the LCR, they can now be reliably found year round on most golf courses, in parks, and in residential areas along the LCR where older, mature mesquite trees and irrigated grass are present.

Current and future habitat being created and managed at Palo Verde Ecological Reserve (PVER), Cibola Valley Conservation Area (CVCA), Cibola Unit 1, Beal Lake Conservation Area, and Laguna Division Conservation Area is based on the description of VEFL habitat from the HCP (Reclamation 2004) and fits the descriptions in the literature of the native habitat used by VEFL in the recent past. Cottonwood-willow types I–V and honey mesquite type III (see table 2) are expected to provide native habitat for VEFL.

Survey Methods to Detect VEFL

In order to detect many nocturnal and/or secretive avian species, standardized, quantitative survey methods using taped calls and songs to elicit a response are required. Individual species' behaviors as well as habitat features can also make detection difficult or impossible without this technique. Under the LCR MSCP, tape-playbacks are used for surveying elf owls, yellow-billed cuckoos, marsh birds, including the Yuma clapper rail, and southwestern willow flycatchers.

In contrast, vermilion flycatchers are not secretive in the least, even when nesting. They frequent more open areas, and they are highly visible when present due to the bright coloration of the males. They are very territorial, their vocalizations are distinct, and when courting females, males often perform a vocal and aerial display (Tinkham 1949; Phillips et al. 1964; Smith 1970; Taylor and Hanson 1970; Carothers 1974). All of these factors make it difficult to miss this species if it is present. The lack of incidental sightings during other avian surveys does not appear to be due to missing VEFL that are actually present, nor is timing likely a factor, as VEFL remain active through June and July. VEFL are also highly

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

responsive to playing taped calls, which cause the agitated male to immediately fly to the source of the song. Taped calls caused much more of a disturbance than is necessary to locate individuals, especially males, but females as well, as they are normally not far from their mates. For these reasons, taped-playback methods are not recommended for this species.

VEFL are still very localized on the LCR; they are not present in all, or even most, of the cottonwood-willow types I–V and mesquite type III available. The species has declined even on the BWRNWR where this habitat is still present in abundance. VEFL remaining on the LCR are easily found and often reported to the eBird database from irrigated, grassy parks and golf courses rather than native habitats. Surveys conducted on randomly selected plots by GBBO (2010) concluded that the number of VEFL found was too small to conduct an analysis of habitat. For these reasons, a random point-count type survey is not recommended. A nonrandom, area search technique based on the range of habitats used by VEFL on the LCR now and in the recent past may be more effective and less costly than random surveys.

In January 2012, a male VEFL was seen at the Palo Verde Ecological Reserve (B. Anderson, personal communication), and another individual was observed at CVCA in a large, remnant cottonwood tree on the edge of the created cottonwood-willow habitat adjacent to the agricultural fields. As the LCR MSCP restoration sites mature and openings develop within stands, the habitat should become more suitable to VEFL. If presence and breeding is confirmed, further surveys and studies may be implemented at LCR MSCP restoration sites.

LITERATURE CITED

- Anderson, B.A. and R. Ohmart. 1984. Lower Colorado River riparian methods of quantifying vegetation communities to prepare type maps. Final report to Bureau of Reclamation, Lower Colorado Region, Boulder City, NV.
- Averill, Annalaura. 1996. Brown-headed cowbird parasitism of neotropical migratory songbirds in riparian areas along the lower Colorado River. Master's Thesis, University of Arizona, Tucson.
- Averill, Annalaura, S. Lynn, and M. Morrison. 1994. Unpublished manuscript. Nesting habits of vermilion flycatchers along the Bill Williams River, Mohave, and La Paz Counties, Arizona. Wildlife and Fisheries Science, School of Natural Resources, University of Arizona, Tucson, Arizona, under Cooperative Agreement with USFWS, Region 2, Albuquerque, NM.
- Averill-Murray, Annalaura and T.E. Corman. 2005. Vermilion flycatcher. pp. 316–117 *in* T.E. Corman and C. Wise-Gervais, eds. Arizona Breeding Bird Atlas, University of New Mexico Press, Albuquerque, NM.
- Bart, J., L. Dunn, and A. Leist. 2010. A sampling plan for riparian birds of the Lower Colorado River—Final Report: U.S. Geological Survey Open-File Report 2010–1158. 20 p.
- Bureau of Reclamation (Reclamation). 2004. Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan. Final December 17 (Jones & Stokes 00450.00.). Sacramento, CA. [http://www.lcrmscp.gov/publications/hcp_volii_dec04.pdf]
- Cardinal, S.N., E.H. Paxton, and S.L. Durst. 2006. Home range, movement, and habitat use of the Southwestern Willow Flycatcher, Roosevelt Lake, AZ—2005: U.S. Geological Survey report to the Bureau of Reclamation, Phoenix, AZ. 21 p.
- Carothers, S.W. 1974. Breeding ecology and the time-energy budget of male vermilion flycatchers and comments on the social organization of southwestern riparian birds. Thesis submitted to the University of Illinois at Urbana-Champaign, Urbana, IL.
- Clark, G. A. Jr., 2001. Tyrant flycatchers. Pp. 384-398 *in* The Sibley Guide to Bird Life and Behavior (C. Elphick, J. B. Dunning, Jr., and D. A. Sibley eds.). Alfred A. Knopf, New York.

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

- Emlen, J.T. 1971. Population densities of birds derived from transect counts. *Auk* 88:323–342.
- Great Basin Bird Observatory (GBBO). 2010. Intensive area searches and spot-mapping: Great Basin Bird Observatory's protocol for conducting bird surveys using intensive area search and spot-mapping methods, March 2010. Great Basin Bird Observatory, 1755 E. Plumb Lane #256A, Reno, NV.
- _____. 2011. Summary report on the Lower Colorado River riparian bird surveys, 2008–2010, September 2011. Submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Lower Colorado Region, Boulder City, NV, by the Great Basin Bird Observatory, 1755 E. Plumb Lane #256A, Reno, NV. 107 p.
- _____. 2013. Lower Colorado River Riparian Bird Surveys, 2012 Annual Report, March 2013. Submitted to the Lower Colorado River Multi-Species Conservation Program, Bureau of Reclamation, Lower Colorado Region, Boulder City, NV, by the Great Basin Bird Observatory, 1755 E. Plumb Lane #256A, Reno, NV. 145 p.
- Halterman, M.D., E.T. Rose, S.E. McNeil, and D. Tracy. 2009. Yellow-billed Cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2008 annual report to the Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Boulder City, NV, by Southern Sierra Research Station.
[http://www.lcrmscp.gov/reports/2008/d7_rep_08.pdf]
- Lynn, S. and A. Averill. 1996. Neotropical migratory bird monitoring project in the lower Colorado River Valley, final report submitted to the U.S. Fish and Wildlife Service.
- McNeil, S.E., M.D. Halterman, E.T. Rose, and D. Tracy. 2010. Yellow-billed cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2009 annual report to the Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Boulder City, NV, by Southern Sierra Research Station.
[http://www.lcrmscp.gov/reports/2009/d7_rep_09.pdf]
- McNeil, S.E., D. Tracy, J.R. Stanek, J.E. Stanek, and M.D. Halterman. 2011. Yellow-billed cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2010 annual report to the Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Boulder City, NV, by Southern Sierra Research Station.
[http://www.lcrmscp.gov/reports/2010/d7_rep_10.pdf]

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

- McNeil, S.E., D. Tracy, J.R. Stanek, and J.E. Stanek. 2012. Yellow-billed cuckoo distribution, abundance, and habitat use on the lower Colorado River and tributaries, 2011 annual report to the Bureau of Reclamation, Lower Colorado River Multi-Species Conservation Program, Boulder City, NV, by Southern Sierra Research Station.
[http://www.lcrmscp.gov/reports/2010/d7_rep_11.pdf]
- Neale, J.C.C. and Benjamin N. Sacks. 1994a. Distribution and abundance of breeding and migratory birds on the Bill Williams River National Wildlife Refuge, Parker, AZ, Spring 1993. Unpublished report submitted to U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM.
- _____. 1994b. Distribution, abundance, and breeding biology of the vermilion flycatcher (*Pyrocephalus rubinus*), Bill Williams River National Wildlife Refuge, Parker, AZ, Spring 1993. Unpublished report submitted to U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM.
- Nelson, A.R. and R.W. Mannan. 1993. Use of riparian vegetation by non-game migratory birds on Bill Williams National Wildlife Refuge: A baseline survey. Unpublished report submitted to U.S. Fish and Wildlife Service, Region 2, Albuquerque, NM.
- Phillips, A., J. Marshall, and G. Monson. 1964. The Birds of Arizona. University of Arizona Press, Tucson, AZ.
- Reynolds, R.T., J.M. Scott, and R.A. Nussbaum. 1980. A variable circular-plot method for estimating bird numbers. *Condor* 82:309–313.
- Rosenberg, K. V. , R. D. Ohmart, W. C. Hunter and B. W. Anderson. 1991. Birds of the Lower Colorado River Valley. University of Arizona Press, Tucson, AZ. 416 pp.
- Serena, M. 1981. The status of selected riparian birds along the lower Colorado River. Unpublished report to Nongame Wildlife Investigations, California Department of Fish and Game. 29 p.
- Smith, W.J. 1967. Displays of the vermilion flycatcher (*Pyrocephalus rubinus*). *Condor* 69(6):601–605.
- _____. 1970. Courtship and territorial displaying in the Vermilion Flycatcher, *Pyrocephalus rubinus*. *Condor* 72:488–491.
- Sogge, M.K., D. Ahlers, and S.J. Sferra. 2010. A natural history summary and survey protocol for the southwestern willow flycatcher: U.S. Geological Survey Techniques and Methods 2A-10. 38 p.

**Vermilion Flycatchers on the LCR:
A Summary of Data from 1970–2012**

Taylor, W.K. and H. Hanson. 1970. Observations on the breeding biology of the vermilion flycatcher in Arizona. *Wilson Bull.* 82 (3):315–319.

Tinkham, E.R. 1949. Notes on nest-building of the vermilion flycatcher. *Condor* 51:230–231.

Wolf, B.O. and S.L. Jones. 2000. Vermilion Flycatcher (*Pyrocephalus rubinus*), *in* The Birds of North America, No. 484 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Yard, H.K. and B.T. Brown. 2003. Singing behavior of the Southwestern Willow Flycatchers in Arizona: *Studies in Avian Biology*, Vol. 26, pp. 125–130.

ATTACHMENT 1

Results from Sites Visited to Determine Presence of
Vermilion Flycatcher along the Lower Colorado River

Date	Observers	Site name	Nearest town/State	Total # VEFL	# male	# female	Unkn sex	Nest	UTM	Notes
2-Feb-12	B. Raulston, B. Sabin	Blythe Golf Course	Blythe, CA	1	0	1	0	0	0719541 3728595	Only saw one female at golf course.
2-Feb-12	B. Raulston, B. Sabin	Blythe Cemetery	Blythe, CA	2	2	0	0	0	0722573 3724010	One male seen on each side of cemetery (cemetery divided by road).
2-Feb-12	B. Raulston, B. Sabin	River Lodge Golf Course	Parker, AZ	1	1	0	0	0	0763927 3794963	One lone male.
2-Feb-12	B. Raulston, B. Sabin	River Lodge Golf Course	Parker, AZ	1	0	1	0	0	0763869 3795114	One lone female.
20-Mar-12	B. Raulston	Rio Del Sol RV Haven	Parker, AZ	0	0	0	0	0	0738978 3777661	Cottonwoods planted in a row along river and mesquites in rows in trailer park area along roads throughout park, grassy and open areas, but no VEFL.
20-Mar-12	B. Raulston	Big River Community Park	Parker, AZ	1	1	0	0	0	0742494 3778892	One male singing and flycatching near gazebo across from entrance.
20-Mar-12	B. Raulston	Big River Community Park	Parker, AZ	1	1	0	0	0	0742494 3778892	One male singing and flycatching near gazebo across from entrance.
21-Mar-12	B. Raulston	Riverside Mobile Home Park	Parker, AZ	0	0	0	0	0	0753787 3785831	Habitat not present.
21-Mar-12	B. Raulston	Bermuda Dunes	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	River Reflections	Parker, AZ	0	0	0	0	0	0754865 3786638	Habitat not present.

Date	Observers	Site name	Nearest town/State	Total # VEFL	# male	# female	Unkn sex	Nest	UTM	Notes
		Estates								
21-Mar-12	B. Raulston	River Shore Resort Motel	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	River Land Resort	Parker, AZ	0	0	0	0	0	0755546 3787212	Habitat not present.
21-Mar-12	B. Raulston	Emerald Cove Resort	Parker, AZ	0	0	0	0	0	0755443 3788281	Habitat not present.
21-Mar-12	B. Raulston	Desert Riviera	Parker, AZ	0	0	0	0	0	0756128 3789060	Habitat not present.
21-Mar-12	B. Raulston	Cross Roads Campground	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	Rio Del Colorado	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	Rock House	Parker, AZ	0	0	0	0	0	0757174 3790011	Habitat not present.
21-Mar-12	B. Raulston	Empire Landing	Parker, AZ	0	0	0	0	0	0757606 3790455	Habitat not present.
21-Mar-12	B. Raulston	Windmill Resort	Parker, AZ	0	0	0	0	0	0758362 3791100	Habitat not present.
21-Mar-12	B. Raulston	Bullfrog Day Use Area	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	Echo Lodge Resort	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	Bender's	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.

Date	Observers	Site name	Nearest town/State	Total # VEFL	# male	# female	Unkn sex	Nest	UTM	Notes
21-Mar-12	B. Raulston	Quail Hollow	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	Cable Car	Parker, AZ	0	0	0	0	0	n/a	Habitat not present.
21-Mar-12	B. Raulston	River Lodge Golf Course	Parker, AZ	2	1	1	0	1	0763803 3795112	Female just starting to build nest, collecting cobwebs. Irrigated grass, mesquites.
21-Mar-12	B. Raulston	River Lodge Golf Course	Parker, AZ	2	1	1	0	0	0763877 3794748	Pair, but no nest activity yet. Irrigated grass, mesquites.
21-Mar-12	B. Raulston	Black Meadow Landing Golf Course	Parker, AZ	0	0	0	0		0758376 3804198	Habitat is very good for VEFL; golf course with lots of mesquites, burros, irrigation, but no VEFL seen.
21-Mar-12	B. Raulston	River Lodge Golf Course	Parker, AZ	2	1	1	0	1	0763877 3794748	Female just starting to build nest, collecting cobwebs. Irrigated grass, mesquites.
21-Mar-12	B. Raulston	River Lodge Golf Course	Parker, AZ	2	1	1	0	0	0763877 3794748	Pair, but no nest activity yet. Irrigated grass, mesquites.
22-Mar-12	B. Raulston	Emerald Canyon Golf Course	Parker, AZ	1	0	1	0	0	0759195 3790958	One female near 8th and 9th tee.
22-Mar-12	B. Raulston	Cattail Cove State Park	Parker, AZ	0	0	0	0	0	n/a	Lots of trees, but not many areas with grass and mesquite, mostly non-native trees.
22-Mar-12	B. Raulston	River Island State Park	Parker, AZ	0	0	0	0	0	n/a	Good habitat near entrance.

Date	Observers	Site name	Nearest town/State	Total # VEFL	# male	# female	Unkn sex	Nest	UTM	Notes
22-Mar-12	B. Raulston	La Paz County Park	Parker, AZ	3	1	2	0	1	0759041 3791272	Two females, one male. One pair around nest, feeding two nestlings. The other female is just to the south of the nest area. Male may be courting her as well. In small area protected from camping and vehicles; grass and mesquites.
3-Apr-12	B. Raulston	Green Belt, Yuma	Yuma, AZ	0	0	0	0	0	n/a	Walked from Hilton Garden Inn to Yuma West Wetlands.
4-Apr-12	B. Raulston	Cocopah RV Golf Resort	Yuma, AZ	0	0	0	0	0	n/a	Several people have seen VEFL here in past 2 years.
4-Apr-12	B. Raulston	Las Barrancas Golf Course	Yuma, AZ	0	0	0	0	0	n/a	Good wash habitat, ironwoods, palo verde, mesquites. Too far from lower Colorado River.
5-Apr-12	B. Raulston	Hidden Shores Golf Course	Yuma, AZ	2	1	1	0	1	0737645 3640850	Pair feeding young in nest.
5-Apr-12	B. Raulston	Hidden Shores Golf Course	Yuma, AZ	2	1	1	0	0	0737645 3640850	Two-year male and female together, male singing. Male not completely red yet.
10-Apr-12	B. Sabin	Parker Dam Camp	Parker Dam, AZ	2	1	0	1	0	0762804 3797638	One immature male with red head and mostly brownish body, one unknown: likely immature female. No adults seen.

Date	Observers	Site name	Nearest town/State	Total # VEFL	# male	# female	Unkn sex	Nest	UTM	Notes
18-Apr-12	B. Raulston, B. Sabin	Wheeler In Park	Parker, AZ	0	0	0	0	0	0748824 3783065	Just below Parker Bridge. Good habitat, mesquite trees and cottonwood-willow along small backwater, grass, irrigation, right on river.
18-Apr-12	B. Raulston, B. Sabin	Big River Community Park	Parker, AZ	3	1	2	0	1	0742494 3778892	One female on nest, other female and male seen closer to office/kiosk area. Not sure who is with who.
18-Apr-12	B. Raulston, B. Sabin	Near Fairgrounds, Parker, AZ	Parker, AZ	0	0	0	0	0	0747894 3780078	Very sparse habitat.
18-Apr-12	B. Raulston, B. Sabin	CRIT Library, Parker	Parker, AZ	0	0	0	0	0	0747976 3779762	Grass and trees present, but mostly pine species, not mesquites.
18-Apr-12	B. Raulston	Big River Community Park	Parker, AZ	3	1	2	0	1	0742494 3778892	One female on nest, other female and male seen closer to office/kiosk area. Not sure who is with who.
19-Apr-12	B. Raulston, B. Sabin	Kohen Ranch, BWRNWR, K. Blair's Transect A1	Parker, AZ	0	0	0	0	0	n/a	K. Blair had VEFL here on March 29, 2012. Good habitat, grass and mesquite alongside cottonwood-willow.