

# ***Yellow-billed Cuckoo South Fork Kern River Valley 2014 Annual Report***

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## *Executive Summary*

The Western Yellow-billed Cuckoo (*Coccyzus americanus*) is a neotropical migrant that formally bred in riparian regions throughout the western United States (Hughes 1999). However, over the last 100 years wide-spread loss of their preferred cottonwood/willow habitat has resulted in the extirpation of the cuckoo from most of its historic range (Laymon and Halterman 1987, Hughes 1999). In California, cuckoos are now generally restricted to remnant habitat pockets along the Sacramento Valley, the Kern River, and the lower Colorado River with individuals occasionally reported in other areas (Laymon and Halterman 1987). Concern for the species has resulted in interest by state and federal agencies and private conservation organizations to monitor populations and have led to the Western Yellow-billed Cuckoo being listed as: (1) endangered by the California Department of Fish and Game; (2) a Species of Special Concern by the Arizona Game and Fish Department; (3) a sensitive species by the U.S. Forest Service; and (4) a proposed Threatened species for listing under the Federal Endangered Species Act (ESA) by the U.S. Fish and Wildlife Service.

The South Fork Kern River Valley (SFKRV) has been a consistent cuckoo breeding area for over 30 years (Gaines 1977, Schonholtz 1983, Laymon et al. 1997, Henneman 2009), holds one of the largest remaining contiguous cottonwood/willow forests in the state of California (Gaines 1977), and contains one of the largest populations of cuckoos in the state of CA. As such, the SFKRV provides critically important habitat for the Western Yellow-billed Cuckoo and this important breeding area should be studied, monitored, and

managed to ensure that the local cuckoo population remains stable and to expand our understanding of the relationships between cuckoos and their habitat.

## *Introduction*

### *Yellow-billed Cuckoo History and Biology*

Over the last 100 years, western cuckoo population declined dramatically due to extensive loss of suitable breeding habitat, primarily riparian forests and associated bottomlands dominated by willow (*Salix* spp.), cottonwood (*Populus* spp.), or mesquite (*Prosopis* spp.) (Gaines and Laymon 1984, Laymon and Halterman 1987, Hughes 1999, Halterman et al. 2001). Once considered a common breeder in California, by 1940 the Yellow-billed Cuckoo suffered severe population reduction (Grinnell and Miller 1944) and by 1987 was estimated to occupy only 30 percent of its historical range (Laymon and Halterman 1987). California statewide surveys conducted in 1977 (Gaines and Laymon 1984), 1986/1987 (Laymon and Halterman 1987), and 1999 (Halterman et. al 2001) found Yellow-billed Cuckoo populations were concentrated mostly along the Sacramento River from Red Bluff to Colusa, along the South Fork of the Kern River, and portions of the Lower Colorado River (LCR). Population estimates on the Sacramento and Kern Rivers from the 1999 surveys were similar to those of the 1986/1987 surveys, but lower when compared to the 1977 survey. The Lower Colorado River population appeared to suffer severe declines in the 12 years from the 1986/87 to the 1999 surveys.

In 2001, the United States Fish and Wildlife Service (USFWS) determined that western Yellow-billed Cuckoos represent a Distinct Population Segment (DPS), and as such became a candidate for protective listing under the Endangered Species Act (USFWS 2001). In

2002, the listing was determined to be warranted but precluded by higher priority listing actions (due to limited resources) (USFWS 2002). In 2013 the USFWS formally proposed that the Western DPS be listed as a Threatened Species and protected under the Endangered Species Act (USFWS 2013). The decision to accept the proposed rule to federally protect the species as Threatened under the ESA is pending at this time. Yellow-billed Cuckoos are recognized as state endangered in California (CDFG 1978), a species of special concern in Arizona (AGFD 1988), and a sensitive species on US Forest Service lands within Arizona and New Mexico (USDA 1988).

Yellow-billed Cuckoos are among the latest-arriving Neotropical migrants. They arrive on their breeding grounds in Arizona and California by June (Bent 1940, Hughes 1999). Diet during the breeding season consists primarily of large insects such as grasshoppers, katydids, caterpillars, praying mantids, and cicadas; also tree frogs and small lizards (Bent 1940, Hamilton and Hamilton 1965, Nolan and Thompson 1975, Laymon 1980, Laymon et al. 1997). Nesting usually occurs between late June and late July, but can begin as early as late May and continue until late September (Hughes 1999). Nests consist of a loose platform of twigs, which are built by both sexes and take one to two days to build (Hughes 1999), though occasionally the nest of another species is used (Jay 1911, Bent 1940, Payne 2005). Clutch size is 1-5 (Payne 2005), though up to 8 eggs have been found in one nest due to more than one female laying in the nest (Bent 1940). Eggs are generally laid daily until clutch completion (Jay 1911), and incubation begins once the first egg is laid, lasting 9-11 days (Potter 1980, 1981; Hughes 1999). Young hatch asynchronously and are fed mostly large insects (Laymon and Halterman 1985, Laymon et al. 1997, Halterman et al.

2009) similar to the adult diet. Young fledge after 5 to 9 days (6 days average), but may be dependent on adults for at least three weeks (Laymon and Halterman 1985).

Fall migration is thought to begin in late August, with most birds gone by mid-September (Hughes 1999); however on the Lower Colorado River some individuals appear to begin migrating in early August (McNeil et al. 2011). Their non-breeding range is believed to be the western side of the Andes (Hughes 1999), though little information exists on migration routes and non-breeding range in South America where they can be confused with the endemic pearly-breasted cuckoo (*C. euleri*), their closest relative (Payne 2005).

### *Objectives*

SSRS Yellow-billed Cuckoo research in the Kern River Valley was unfunded in 2014 and as a result minimal research was conducted. The objectives of the 2014 cuckoo research were as follows:

- 1) Conduct four round of surveys to minimally estimate the level of Yellow-billed Cuckoo occupancy within the South Fork of the Kern River Valley.
- 2) Search for and monitor nests to better understand reproductive success in the South Fork Kern River Valley.

This report details (1) surveys conducted in the SFKRV riparian areas from late-June to early-August using the latest cuckoo survey methods, (2) documentation of nesting success of breeding cuckoos, (3) and re-sightings of a previously banded cuckoo.

## *Chapter 1. Detection/Non-Detection Surveys*

### *Introduction*

Long-term monitoring programs focus on the status and trends of species distribution, and can effectively document a species' annual state and changes in their condition through time. Through repeated surveys, the annual status of populations can be assessed by examining within-season distribution, occupancy, and abundance patterns, both spatial and temporal, across the landscape. In 2014, we continued our long-term monitoring of Yellow-billed Cuckoos (cuckoo) within the SFKRV to enable an annual status assessment of the species and to identify trends in cuckoo population parameters.

## *Methods*

### Study Area and Survey Route Selection

We conducted yellow-billed cuckoo surveys along the South Fork Kern River in all suitable habitat from Sierra Way west to the lake shore (Map a). Surveys were not conducted in the Kern River Audubon Preserve habitat upstream (East) of Sierra Way due to low cuckoo activity in previous years (Stanek and Stanek 2012, Whitfield and Stanek 2011, Henneman 2009). In the summer of 2014, Lake Isabella was at its lowest levels since 1977, at 13% of capacity (62,200 acre feet). Despite the 2013 and 2014 droughts, stands of Gooding's Willow (*Salix goodingii*) have emerged along the slowly receding lake edge (Picture 1). Within the young (less than 4 year old) habitat and mixed mature and young habitat within the recent lake drawdown area we added four new transects along the North and South forks of the Kern River (Map a). These four newly established drawdown area transects were surveyed only twice, in survey periods 2 and 3, during the peak of cuckoo detectability (Stanek and Stanek 2012, McNeil et al. 2013). Note, in this report we refer to this new transect area as the drawdown zone, however all of the USFS Wildlife Area is part of the actual Lake Isabella drawdown zone.

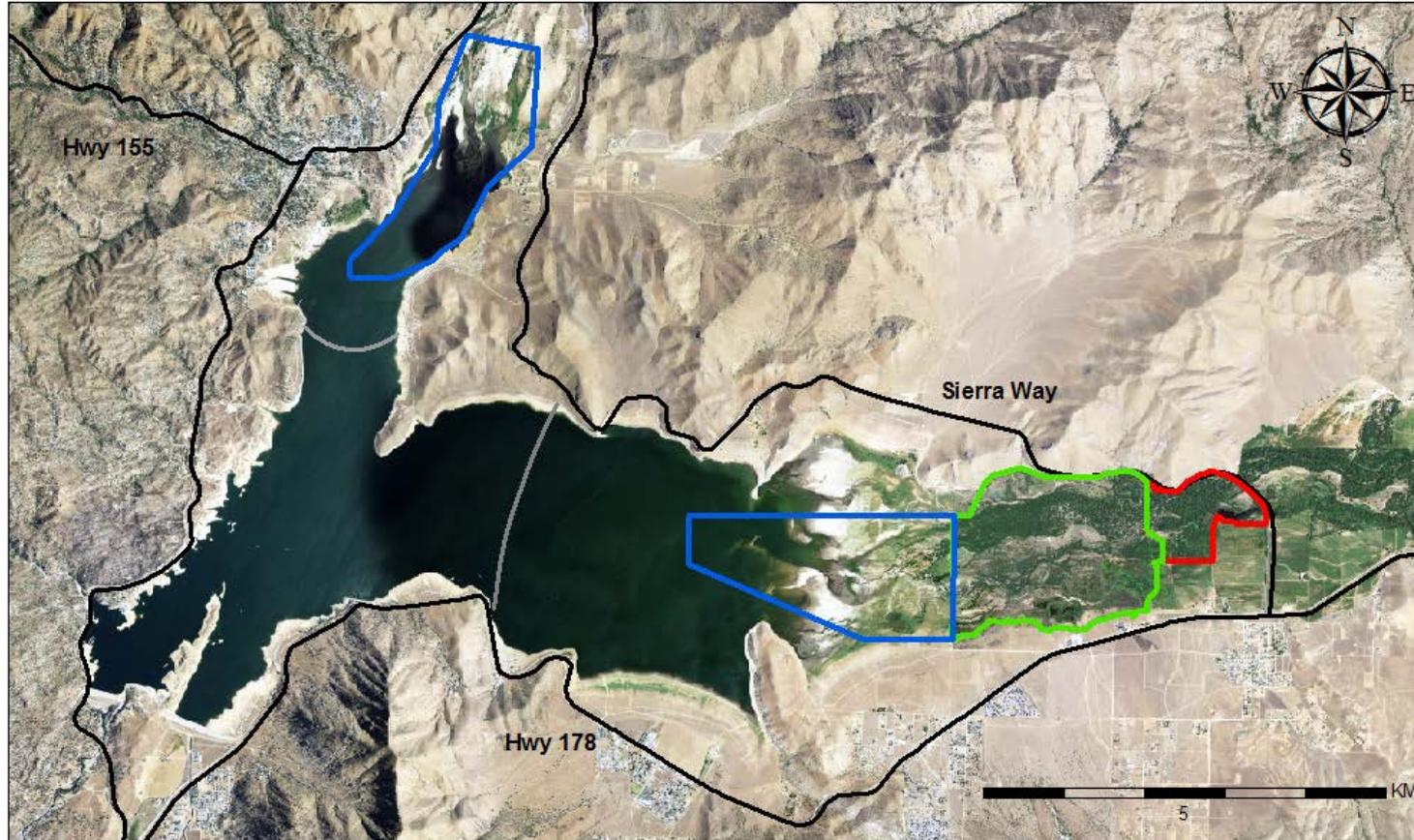
### Detection/Non-detection Surveys

The primary survey objective was to assess the detection and non-detection of Yellow-billed Cuckoos in the suitable habitat found within the SFKRV. Cuckoos are inherently secretive, avoid detection and call infrequently (Hamilton and Hamilton, 1965). Their furtive nature coupled with their somewhat transitory behavior lead to imperfect detection of the species (McNeil et al. 2010, 2011). Also, the use of call-broadcasts can attract cuckoos from neighboring habitat into the surveyed habitat. Given these behaviors, the

surveys are not designed to determine the absolute number of cuckoos within an area, to solely identify breeding status, or be used to assess small-scale habitat preferences.



Picture 1. New willow (*Salix goodingii*) habitat along the South Fork River channel in the receding Lake Isabella drawdown area, 2014. The habitat is approximately two to four meters in height. In 2012 the photographed area was under water.



- Kern River Preserve
- South Fork Wildlife Area
- Lake Drawdown Area
- Lake edge

Map a. Yellow-billed Cuckoo survey areas in the South Fork Kern River Valley, Kern Co., California in 2014.

Table 1-1. Survey period dates.

| Survey Period | Dates                 |
|---------------|-----------------------|
| 1             | June 15th to June 31  |
| 2             | July 1 to July 15     |
| 3             | July 16 to July 31    |
| 4             | August 1 to August 15 |

We conducted four rounds of surveys, along 12 survey routes, between June 28<sup>th</sup> and August 3<sup>rd</sup> following the standard cuckoo survey protocol

(Haltermann et al. 2011). On each survey route, one survey was conducted per survey period and surveys were conducted every 10-12 days (Table 1-1)Table 1-1 Survey period dates.. Cuckoo detection/non-detection surveys were conducted on survey routes along point transects on foot, between sunrise and 10:30 am. Because of the close proximity of some survey routes, adjacent survey routes were surveyed on the same day by different observers to minimize the possibility of double-counting the same cuckoo. On these occasions, surveyors used radios to communicate with each other to avoid double-counting cuckoos. Each site contained one or more survey transects with parallel transects spaced approximately 250 to 300m apart. Survey points were spaced every 100 m along transects. Most transects traversed through the habitat patches. However, some transects ran along riparian habitat edges to maintain a 250m buffer from adjacent transects and to take advantage of greater visual detectability from these edges. Survey points were located using Garmin GPS units and at each point we recorded the UTM location, date, and time. Upon arriving at a survey point, surveyors listened and watched for cuckoos for one minute. If no cuckoos were detected, surveyors used an MP3 player and handheld speaker to broadcast a five-second yellow-billed cuckoo contact call (the 'kowlp' call) (Hughes 1999) at approximately 70 decibels once per minute for five minutes. A five-second contact call was followed by 55 seconds of active observation and listening. If a cuckoo was detected, call-playbacks were discontinued immediately and all pertinent data was recorded (see below). Following a detection, surveyors progressed along the point

transect 300 m from the cuckoo's estimated location. This was done to avoid additional disturbance and duplicate detection of the same bird.

For each cuckoo detection, the surveyor recorded the true bearing and estimated distance from the surveyor to the cuckoo, time of detection, response type, behavior, vocalizations, presence of other cuckoos, interactions, and the presence and/or color combination of leg bands. Any observed breeding evidence was also recorded, including carrying food or nesting material, copulation, the presence of a juvenile, or a nest. An individual cuckoo visually observed or heard during a survey was recorded as a survey detection. If the same individual cuckoo was detected more than once during a single survey, we record only the initial detection as a new survey detection. The repeat detections are also recorded and mapped, but are not used in the final cuckoo survey detection summation. Cuckoos located >300 m apart during a single survey were counted as separate individuals and therefore separate survey detections. Cuckoos encountered any time other than during a survey were classified as non-survey or incidental detections. Information collected for an incidental detection was the same as that collected for a survey detection.

## *Results*

### Survey Detections

Surveys conducted from June 29 to August 4, across 12 survey routes, (Map b), yielded 43 Yellow-billed Cuckoo detections (Map c). All detections were made in the habitat along the South Fork of the Kern River. No detections were made along the North Fork of the Kern River habitat or in the newly emergent willow habitat along the South Fork of the Kern River. Cuckoo detections in the drawdown area along the south fork of the Kern River (on the "Far West" survey transect) were made in habitat comprised of young (less than four years old) and more mature (greater than six years old) willow (*Salix goodingii*) stands

(Table 1-2). Total cuckoo survey detections in 2014 were half those detected on surveys in 2012 (Table 1-2).

Table 1-2. YBCU survey detections, 2014

| Area                                     | Cuckoos Detected Per Survey Period |    |    |   | Total Survey Detections |
|--|------------------------------------|----|----|---|-------------------------|
|  | 1                                  | 2  | 3  | 4 |                         |
| Kern River Preserve (West of Sierra Way) | 3                                  | 0  | 0  | 2 | 5                       |
| South Fork Wildlife Area                 | 13                                 | 7  | 9  | 2 | 31                      |
| Lake Drawdown Area                       | 0                                  | 3  | 3  | 1 | 7                       |
| Total                                    | 16                                 | 10 | 12 | 5 | 43                      |

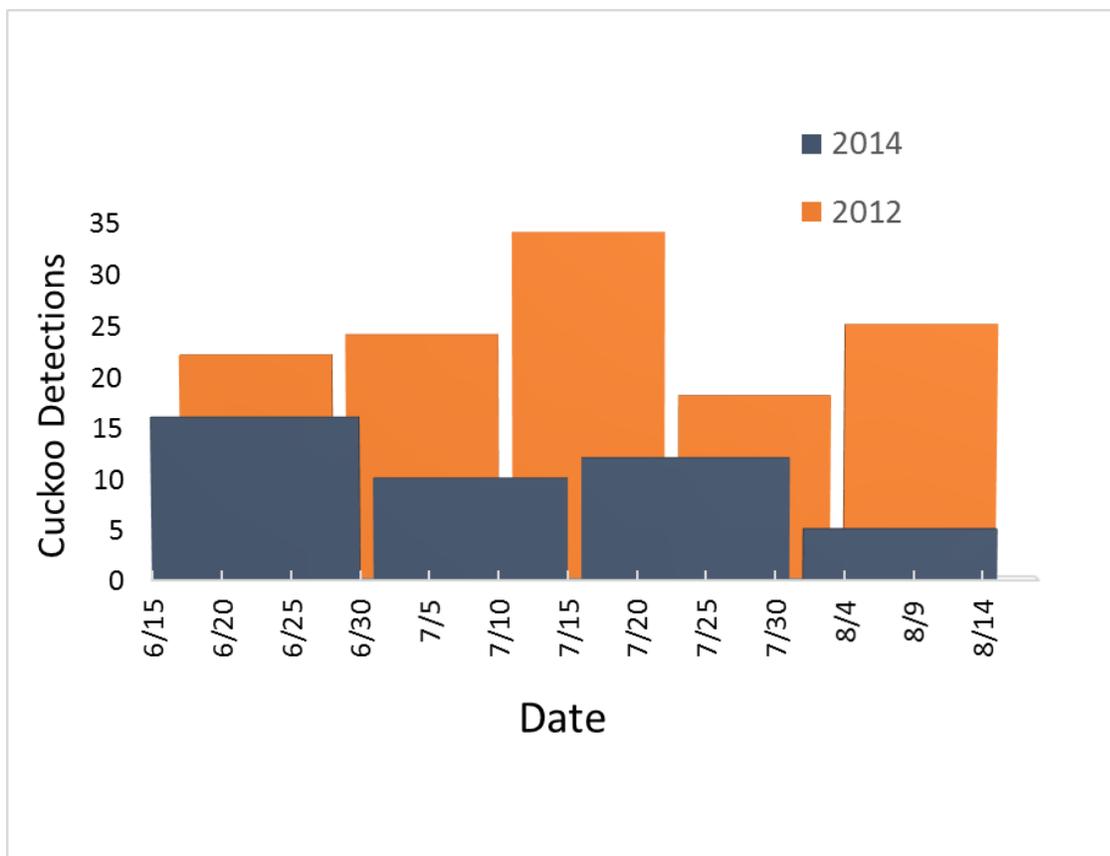
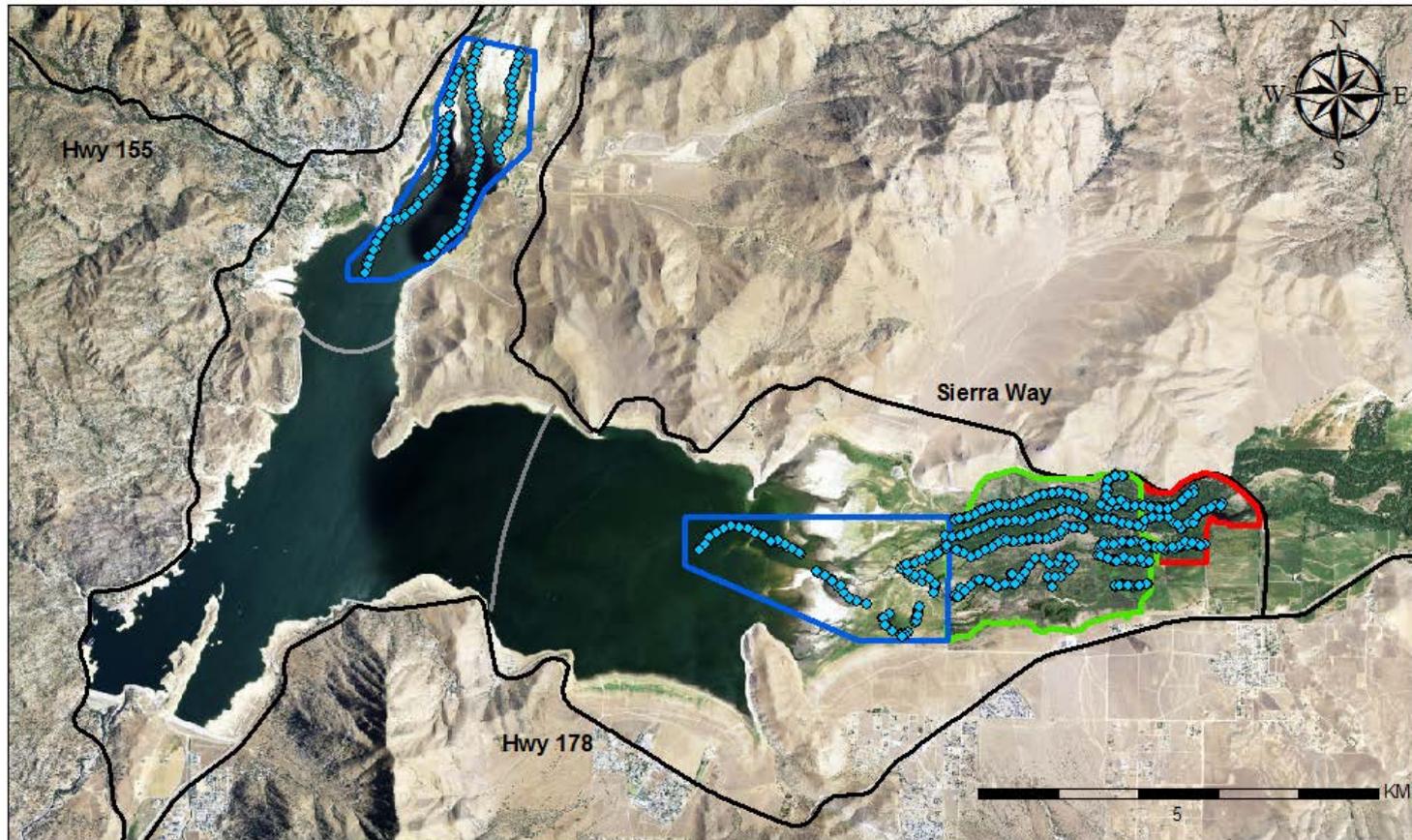


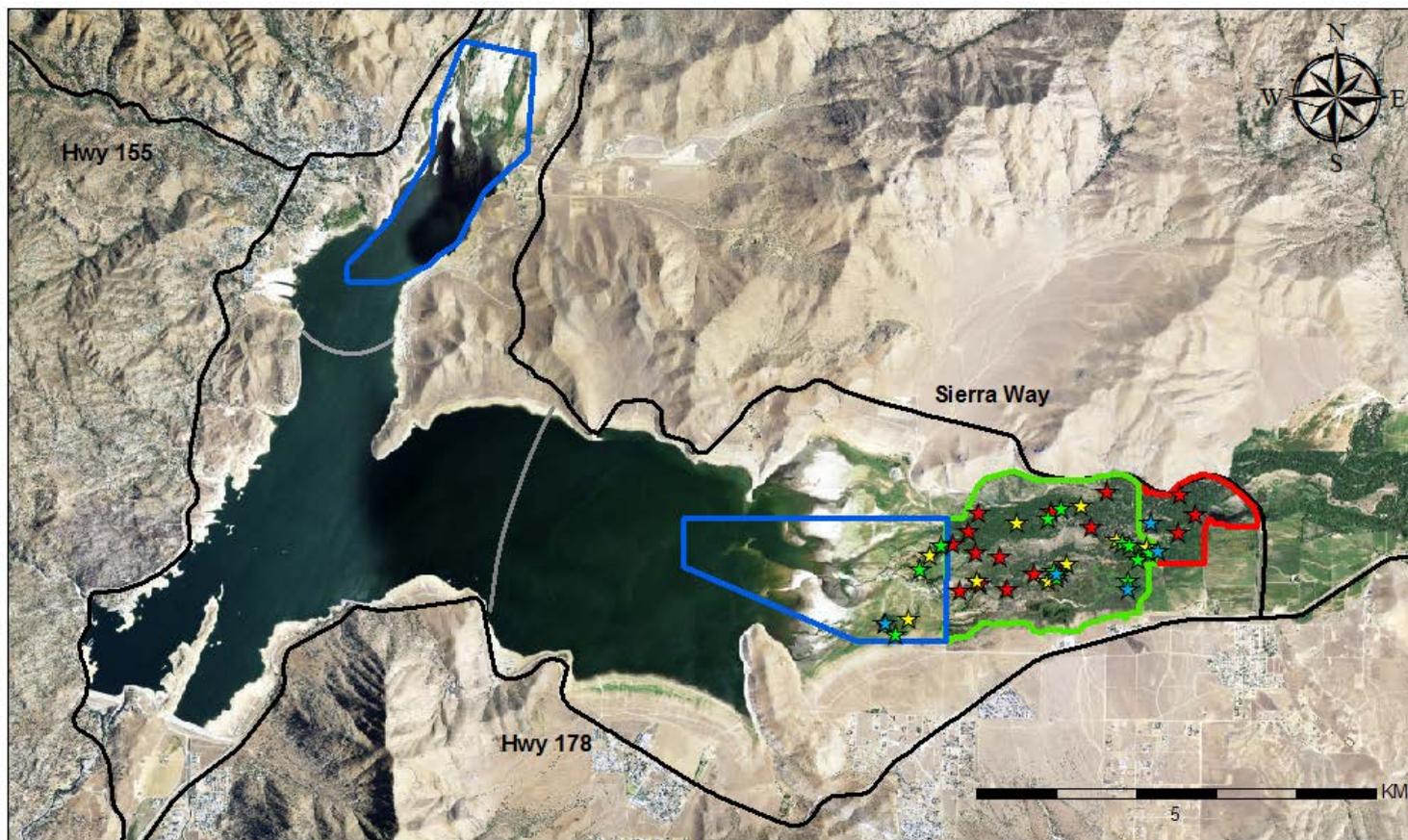
Figure 1-1. 2012 (orange) and 2014 (blue) cuckoo detections per survey period displayed. Bar widths indicate the dates of each survey period. In 2012 transects were surveyed five times across five survey periods between June 17<sup>th</sup> and August 15<sup>th</sup>. In 2014 transects were surveyed four times across four survey periods between June 15<sup>th</sup> and August 15<sup>th</sup>. For comparison, 2012 detections made in survey periods 1, 2, 4, & 5, (n = 89) were twice those made in the four 2014 survey periods (n=43)



◆ Survey Points

- Kern River Preserve
- South Fork Wildlife Area
- Lake Drawdown Area
- Lake edge

Map b. Yellow-billed cuckoo survey points in the Kern River Valley, Kern Co. California, 2014.



Survey Detections

Survey Period

- ★ 1
- ★ 2
- ★ 3
- ★ 4

- Kern River Preserve
- South Fork Wildlife Area
- Lake Drawdown Area
- Lake edge

Map c. Yellow-billed cuckoo survey detections in the Kern River Valley, Kern Co. California, 2014.

## *Discussion*

In 2014, cuckoos appeared to have arrived to the Kern River Valley weeks later than usual, similar to that observed in 2013 (Stanek 2013). No cuckoos were detected in the valley in May and very few were detected in June. The first cuckoo detections for the summer were observed during Willow Flycatcher (*Empidonax traillii extimus*) surveys at the KRP Prince Pond area on June 16<sup>th</sup> and then in the South Fork Wildlife Area on June 21<sup>st</sup>. Cuckoo detections increased slowly thereafter into July. Due to the dearth of cuckoo detections from mid to late June (survey period 1) formal surveys were delayed until a suitable number of detections were made within the valley. Survey period 1 surveys were conducted on June 29<sup>th</sup> and June 30<sup>th</sup> to accommodate the cuckoos' late arrival to the valley.

In the drawdown zone along both the North and South forks of the Kern River, surveys were conducted in young, one to three year old, Gooding's Willow stands. In general, the habitat consisted of tree stands between two and four meters tall, and varied between five and 100 meters wide. No cuckoos were detected in this habitat. Along the Lower Colorado River cuckoos readily use two-year old habitat planted at restoration sites, in particular at the Palo Verde Ecological Reserve (PVER) (McNeil et al. 2013). The restoration habitat at PVER is actively irrigated and two year old trees are often between eight and ten meters tall. Prey availability is likely one of the main driving forces to cuckoo habitat selection for breeding (McNeil et al. 2013). Food resources at PVER are largely unknown, but appear to be abundant because clutch sizes are large, the breeding season is long (May to September) and cuckoos have been documented to double and triple clutch (McNeil et al. 2013). The prey composition and availability in the new habitat in the KRV drawdown area remains unknown. While the drawdown habitat along the forks of the Kern river are approximately

the same age as that at PVER, the similarities end here and the two sites are vastly different in area, height, water, and most likely food availability. Future surveys of this young KRV habitat will be important to better understand what constitutes suitable cuckoo habitat grown under natural conditions.

Overall the cuckoos appear to have arrived late and the survey period detection totals suggest that we had a low number of resident cuckoos this year compared to that observed in 2012. With the record breaking drought this year, following the extreme 2013 drought, food resources may have been low and many cuckoos may have stayed in the valley only briefly and departed early from the area.

## *Chapter 2. Mist Netting, Color Banding, and Re-sights*

### *Introduction*

Yellow-billed Cuckoo breeding populations in the Western United States are restricted to small and isolated riparian habitat fragments comprising less than 1% of the western landscape (Rich 2002). Dispersal of individuals among breeding sites is vital for gene flow and population persistence, but can be significantly impacted by habitat fragmentation and isolation even in birds capable of long-distance flight (Martin et al. 2006; Martín et al. 2008; Ortego et al. 2008). Long-term color banding can provide information on natal and breeding dispersal patterns, as well as other poorly understood key traits such as survivorship, mate and site fidelity, breeding behavior and morphology, and population demography and genetic structure. In 2014, we banded and re-sighted cuckoos, to increase our ability to make behavioral observations, track cuckoo movements, and identify individual's nests. We aimed to recapture three geolocators attached to cuckoos banded in 2012. The reclamation of a geocator would have provided us with an invaluable data set cataloging the cuckoos' movements for a full year, from July 2012 to July 2013 which could be used to address questions on cuckoo dispersal and population connectivity.

### *Methods*

#### Mist Netting

We attempted to capture adult cuckoos during the breeding season from early July to early-August. First we located a responsive cuckoo by broadcasting recorded conspecific vocalizations. Responsive cuckoos were often found while conducting presence absence surveys. We then found a suitable net lane and used a target mist net technique modified from Sogge et al. (2001): we attached three or three stacked mist nets (totaling 7.8 to 10.4

m high) 9m in length between two canopy poles placed in a vegetation gap of similar canopy height. This type of mist-net set-up is typically used to band bats, but we have found it useful in catching cuckoos because they rarely fly close enough to the ground to use a conventional two meter high mist net set-up. With the nets in place, we then broadcast various recorded cuckoo vocalizations from speakers placed on either side of the net to lure in cuckoos. During each mist netting attempt we recorded number of cuckoos in the area and which vocalizations elicited a response. If no cuckoos displayed interest in our playbacks after approximately one hour, we took down the nets and moved the set-up to another location.

### Banding Nestlings

We band nestlings at located nests that are accessible with ladders. Nestlings between three and six days of age are gently removed from the nest, banded, and returned to the nest within fifteen minutes of removal.

### Color Banding

We banded all captured cuckoos with a federal aluminum band on one leg and a pin-stripped color aluminum band on the other leg with a unique color combination. Adult cuckoos and nestlings in nests that we can reach are banded in this manner. Non-target captured birds were immediately released without banding. We used a stopped wing rule to measure wing and tail, calipers to measure bill length, and 100 g Pesola® scales or 400 g Acculab digital scales to weigh all birds. On adult birds we record additional morphological data such as molt, feather wear, orbital ring color, cloacal protuberance (CP) score (0-3), and brood patch (BP) score (0-5) following MAPS protocols. We extracted a small amount of

blood from each bird from the brachial artery, and placed the blood sample on PermaCode™ cards and/or in EDTA-treated buffer.

## *Results and Discussion*

### Mist Netting

We made five mist netting attempts between July 5 and August 5 in 2014, no adult cuckoos were captured.

### Banding Nestlings

We found three nests in 2014. One nest, located along the Far West transect west of Patterson Lane and in the lake drawdown area, was reached by ladder and two nestlings were banded. The nest was located in a group of young short willow trees, approximately 4m tall, with taller mature trees surrounding the young patch of trees. The other two nests were inaccessible.

### Color Banding

We banded just two nestlings in the KRV in 2014 (Table 2-1).

Table 2-1. Yellow-billed Cuckoos banded in the SFKRV, 2014.

| <b>ID</b> | <b>Capture Code</b> | <b>Capture Date</b> | <b>Federal Band #</b> | <b>Color Band Combination<sup>1</sup></b> |
|-----------|---------------------|---------------------|-----------------------|---|
| 1         | New                 | 7/23/2013           | 1202-68086            | G-W-G/AS                                  |
| 2         | New                 | 7/23/2013           | 1202-68087            | R-Y-R/AS                                  |

<sup>1</sup>Band color codes (top to bottom, left/right): AS = Aluminum Silver, G=green, R=red, W=white, and Y=yellow. '-' between colors indicates a split band.

### Re-sights

In 2014 we saw many unbanded cuckoos, but re-sighted only one color-banded cuckoo.

The resight of the banded bird was incomplete. Several researchers verified an aluminum (AS) band on its left leg and dark blue (mB) on its right. This bird was spotted near (< 25m from) nest KOA-N1-14 and was confirmed to be one of the parents of nest WA4-N1-14. The right leg band may have been a split band blue with green (G) or blue with black (Bk), reports are conflicting. A grainy picture shows a blue right band, but does not rule out additional split band colors. The AS/mB and AS/mB-Bk possibilities do not match any previous KRV or LCR banding records. AS/mB-G is close to a known banded bird in the Kern, Wrath (Table 2-2)! It is possible, though not definitive that this bird was Wrath. Wrath was originally banded in 2012 (Stanek and Stanek 2012) and was resighted in 2013 (Stanek 2013). Nest KOA-N1-14, is less than 100m from Wrath's two nests in 2012.

Table 2-2. Yellow-billed Cuckoos re-sighted in the SFKRV, 2014.

| <b>Name</b> | <b>Federal Band #</b> | <b>Color Band Combination<sup>1</sup></b> | <b>Sex</b>          | <b>Dates of Observation</b> |
|-------------|-----------------------|---|---------------------|-----------------------------|
| Wrath       | 1202-68077            | AS/G-mB-G                                 | Female <sup>2</sup> | 7/5, 7/31                   |

<sup>1</sup>Band color codes (top to bottom, left/right): AS = Aluminum Silver, G=green, and mB=medium blue. '-' between colors indicates a split band

<sup>2</sup>Sex determined by DNA analysis.

## *Chapter 3. Nest Searching and Monitoring*

### *Introduction*

Population assessments are best defined in terms of the survival and reproductive success (Van Horne 1983). For any species to maintain a healthy population, reproduction needs to be successful. Though our resources were limited, we monitored cuckoo breeding effort through comprehensive nest searching in an effort monitor cuckoo breeding status in the Kern River.

### *Methods*

We used a number of techniques to search for nests during the breeding season. During surveys, we located all detected cuckoos visually if possible, and searched vegetation in the vicinity for nests (following Martin and Geupel 1993). Cuckoos may respond from the nest to broadcast survey calls, and if they are close enough to the surveyor, the nest can be located. We also relied on the fact that nesting pairs share incubation duties (Potter 1980, Hughes 1999, Halterman et al. 2009) and soon after sunrise, the female replaces the male on the nest, with one or both often vocalizing during the exchange. To observe a nest exchange, before dawn, one or more researchers would wait in the area of a suspected nest; and if a call was given, attempts were made to triangulate the location of the calling bird. Cuckoos may also call prior to arriving at the nest to feed young and a third technique followed localized activity or behavioral clues (e.g. food and stick carries, alarm calls) and directed efforts into these areas until a nest was located. We also performed systematic searches, concentrating on edge and structural transition habitats. Additionally, we used radio telemetry to locate nests (Chapter 4 of this report). We distinguished used cuckoo

nests from similar stick nests of other species (such as doves) by the presence of bluish egg fragments remaining in or directly below the nest.

After locating a nest, we recorded the GPS location approximately 10 m from the nest; a more accurate reading was taken after nesting activity ceased. We recorded nest site characteristics such as nest tree species, tree height and nest height, stage, and the banded status of adults if known. If possible, we used a video camera attached to a telescoping pole to monitor nests every 2-5 days. Nestlings were banded at 3-6 days when accessible (Chapter 24 of this report). Nests were judged successful if at least one young fledged, which we determined by detecting an adult or fledgling in the vicinity of the nest within two days of the estimated fledge date. Young cuckoos leave the nest before they can fly, thus they climb or hop onto nearby branches where they may remain in close proximity to the nest for several days. Nests were considered failed if they were found damaged or destroyed, with large egg shell fragments or remains, or empty before the earliest possible fledge date with no further activity detected nearby. Nests were considered deserted if intact eggs or chicks were present and no further parental activity was observed.

### *Results and Discussion*

Between July 11 and Aug 2, 2014, we found three nests and one territory (Table 3-1). One nest, FW-N1-14, was located west of Patterson Lane, the western boundary of the USFS Wildlife Area, in an area we called the lake drawdown zone, along the survey route we call the Far West. The nest was located in a young dense stand of trees estimated to be four years old, and surrounded by stands of older more mature trees. In 2010 the lake edge meandered through this area, but has not reached this location in subsequent years. The

mature surrounding stands of trees were established prior 2010, but not the young stand of trees where the nest was located. In 2013, cuckoos were found using this same area, but no nests were found. The two other nests and one territory were found in the USFS South Fork Wildlife Area. One of these nests was in an area where nests were found in 2013, and 2012. The territory (a young fledgling was observed, but no nest found) was in a location that held a territory in 2012 and had cuckoo detections in 2013 (Stanek and Stanek 2012, Stanek 2013). Overall, in 2014, we suspect that there were several nests that we did not locate, including several in the USFS South Fork Wildlife area and possibly one or two in the KRP (west of Sierra Way). We found evidence of four nests and based on cuckoo detections, speculate there were at least six to eight nests in the KRV this year.

Table 3-1. Yellow-billed Cuckoo nests found in the SFKRV, 2014.

| <b>Nest</b> | <b>Date Found</b> | <b>Adult 1</b>              | <b>Adult 2</b> | <b>Tree Species</b>            | <b># Eggs</b> | <b>1st Egg<sup>2</sup></b> | <b>Nest Fate<sup>3</sup></b> | <b>Fledge Date</b> |
|-------------|-------------------|-----------------------------|----------------|--------------------------------|---------------|----------------------------|------------------------------|--------------------|
| FW-N1-14    | 7/11              | Unknown                     | Unknown        | Goodding's willow <sup>1</sup> | 2             | 7/06                       | F2                           | 7/22               |
| KOA-N1-14   | 7/21              | Unknown                     | Unknown        | Goodding's willow <sup>1</sup> | ?             | 7/08                       | F1                           | 7/25               |
| WA4-N1-14   | 7/24              | Unknown Banded <sup>4</sup> | Unbanded       | Goodding's willow <sup>1</sup> | ?             | 7/23                       | F1                           | 8/09               |

<sup>1</sup>Tree species: Goodding's willow = *Salix gooddingii*

<sup>2</sup>Estimated date first egg laid (based on 10 day incubation period and 6 day brooding period).

<sup>3</sup>Fate: F=fledged (number of known fledglings).

<sup>4</sup>Suspect banded parent cuckoo was Wrath (1202-68077)

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