



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Riparian Bird Surveys at Conservation Areas in the Lower Colorado Region 2019 Annual Report



June 2020

Work conducted under LCR MSCP Work Task F2

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

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Arizona Electric Power Cooperative, Inc.
Arizona Game and Fish Department
Arizona Power Authority
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City of Lake Havasu City
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Yuma County Water Users' Association
Yuma Irrigation District
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Desert Wildlife Unlimited

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Bard Water District
Imperial Irrigation District
Los Angeles Department of Water and Power
Palo Verde Irrigation District
San Diego County Water Authority
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The Metropolitan Water District of Southern California

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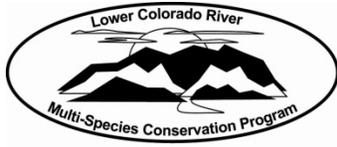
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RECLAMATION

Lower Colorado River Multi-Species Conservation Program

Riparian Bird Surveys at Conservation Areas in the Lower Colorado Region

2019 Annual Report

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ACRONYMS AND ABBREVIATIONS

| | |
|--------------------------------|---|
| AGOL | ArcGIS Online |
| BLCA | Beal Lake Conservation Area |
| Cibola NWR Unit #1 | Cibola National Wildlife Refuge Unit #1 Conservation Area |
| Collector | Collector for ArcGIS |
| cottonwood-willow | Fremont cottonwood-willow species (<i>Populus fremontii-Salix</i> spp.) |
| CVCA | Cibola Valley Conservation Area |
| GBBO | Great Basin Bird Observatory |
| ha | hectare(s) |
| LCR | lower Colorado River |
| LCR MSCP | Lower Colorado River Multi-Species Conservation Program |
| LDCA | Laguna Division Conservation Area |
| m | meter(s) |
| Middle Bill Williams River NWR | Middle Bill Williams River National Wildlife Refuge |
| n | number of species |
| PVER | Palo Verde Ecological Reserve |
| PWCA | Pretty Water Conservation Area |
| Reclamation | Bureau of Reclamation |
| spp. | multiple species in a genus |
| YEW | Yuma East Wetlands |

Symbols

| | |
|----|--------------------|
| °F | degrees Fahrenheit |
| = | equal to |
| > | greater than |
| < | less than |
| % | percent |

CONTENTS

| | Page |
|---|------|
| Executive Summary | ES-1 |
| Introduction | 1 |
| Methods | 3 |
| Project Area | 3 |
| Data Collection..... | 3 |
| Field Methods | 3 |
| Rapid Area Search Surveys..... | 8 |
| Intensive Area Search Surveys..... | 8 |
| Data Processing..... | 8 |
| Quality Assurance and Quality Control..... | 12 |
| Results | 15 |
| Overall | 17 |
| Rapid Area Search Surveys | 20 |
| Intensive Area Search Surveys | 27 |
| Results by Habitat Type..... | 28 |
| Conservation Areas..... | 49 |
| Beal Lake Conservation Area | 49 |
| Cibola National Wildlife Refuge Unit #1 Conservation Area | 51 |
| Cibola Valley Conservation Area | 53 |
| Hunters Hole..... | 55 |
| Laguna Division Conservation Area..... | 55 |
| Middle Bill Williams River National Wildlife Refuge..... | 58 |
| Palo Verde Ecological Reserve..... | 67 |
| Parker Dam Camp..... | 69 |
| Pretty Water Conservation Area | 71 |
| Yuma East Wetlands..... | 71 |
| Literature Cited..... | 73 |
| Acknowledgments..... | 75 |

Tables

| Table | Page |
|-------|---|
| 1 | Number of plots and area by habitat type in conservation areas, 2019..... 4 |
| 2 | Plots selected for intensive area search surveys, 2019 4 |
| 3 | Behavioral information collected during area search surveys and associated breeding evidence categories..... 5 |
| 4 | Description of justification categories for breeding territories on rapid and intensive area search surveys..... 10 |
| 5 | Number of territories for territorial species and estimated number of pairs for non-territorial species per ha by conservation area, 2019..... 18 |
| 6 | Number of territories for five focal species ¹ detected by conservation area in 2019..... 19 |
| 7 | Number of territories for 23 non-focal territorial species by conservation area in 2019 21 |
| 8 | Number of territories for five focal species ¹ detected on rapid area search surveys by conservation area, phase, and plot in 2019 23 |
| 9 | Number of territories for 23 non-focal territorial species ¹ on rapid area search surveys by conservation area, phase, and plot in 2019 29 |
| 10 | Estimated number of pairs of 45 non-territorial species ¹ on rapid area search surveys by habitat type and conservation area in 2019 35 |
| 11 | Number of territories for 24 territorial species ¹ on intensive area search surveys by conservation area, site, and plot in 2019 39 |
| 12 | Estimated number of pairs of 39 non-territorial species on intensive area search surveys by conservation area, site, and plot in 2019 41 |
| 13 | Number of territories for five focal species ¹ detected by habitat type and conservation area in 2019 43 |
| 14 | Number of breeding territories for 23 non-focal territorial species by habitat type and conservation area in 2019 45 |
| 15 | Estimated number of pairs of 45 non-territorial species on rapid area search surveys by habitat type and conservation area in 2019 47 |

Figures

| Figure | | Page |
|--------|---|------|
| 1 | Locations of focal species territories in the Beal Lake Conservation Area, 2019. | 50 |
| 2 | Locations of focal species territories in the Cibola National Wildlife Refuge Unit #1 Conservation Area, 2019. | 52 |
| 3 | Locations of focal species territories in the Cibola Valley Conservation Area northern plots, 2019. | 54 |
| 4 | Locations of focal species territories in the Laguna Division Conservation Area, Reach 01, 2019. | 56 |
| 5 | Locations of focal species territories in the Laguna Division Conservation Area, Reach 02, 2019. | 57 |
| 6 | Locations of focal species territories in Middle Bill Williams River NWR East plot C1901, 2019. | 59 |
| 7 | Locations of focal species territories in Middle Bill Williams River NWR East plots C1905, C1906, and C1908, 2019. | 60 |
| 8 | Locations of focal species territories in Middle Bill Williams River NWR West plots C1912, C1914, C1915 and C1917, 2019. | 62 |
| 9 | Locations of focal species territories in Middle Bill Williams River NWR West plots C1922, C1924, and C1929, 2019. | 63 |
| 10 | Locations of focal species territories in Middle Bill Williams River NWR West plot C1931, 2019. | 64 |
| 11 | Locations of focal species territories in Middle Bill Williams River NWR West plot C1932, 2019. | 65 |
| 12 | Locations of focal species territories in Middle Bill Williams River NWR West plot C1933, 2019. | 66 |
| 13 | Locations of focal species territories in the Palo Verde Ecological Reserve, 2019. | 68 |
| 14 | Locations of focal species territories in the Parker Dam Camp, 2019. | 70 |
| 15 | Locations of focal species territory in the Yuma East Wetlands, 2019. | 72 |

Attachments

Attachment

- 1 Orthophotos Showing Boundaries of Representative Plots in Conservation Areas, 2019
- 2 Reference and Attribute Tables Used During the Survey Season, 2019
- 3 Species Breeding in Conservation Areas, 2019

EXECUTIVE SUMMARY

In 2019, monitoring of riparian birds continued within 10 of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) conservation areas as part of the lower Colorado River bird project. This report summarizes the results of the 2019 field surveys. The primary goal of these field surveys was to use a double sampling area search survey design to document breeding territories for six of the LCR MSCP covered riparian bird species: Arizona Bell's vireo (*Vireo bellii arizonae*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), Sonoran yellow warbler (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*), summer tanager (*Piranga rubra*), and vermilion flycatcher (*Pyrocephalus rubinus*). The secondary goal of these field surveys was to collect information on other breeding riparian bird species.

The double sampling protocol developed by Bart et al. (2010) for the LCR MSCP uses counts of riparian bird territories from two levels of effort: rapid (requires two visits) and intensive (requires eight visits). The intensive area search survey method involves a subset of sampling plots used to estimate a detection ratio to correct the rapid counts for the survey area. In 2019, surveyors completed rapid area search surveys on 81 plots in 10 conservation areas and intensive area search surveys on a random subset of 8 of those plots.

Overall, surveyors visited the conservation areas 226 times and recorded 77 species breeding on all area search survey plots in 2019. Over all area search surveys, the most common focal species recorded was the Sonoran yellow warbler (147 territories), followed by the Arizona Bell's vireo (83 territories), Gila woodpecker (32 territories), summer tanager (23 territories), and vermilion flycatcher (2 territories). Surveyors did not detect any gilded flickers in 2019.

The breakdown of these territory counts by conservation area is as follows:

Beal Lake Conservation Area:

- 11 Sonoran yellow warbler, 9 Arizona Bell's vireo, and 1 summer tanager territory

Middle Bill Williams River National Wildlife Refuge:

- 130 Sonoran yellow warbler, 60 Arizona Bell's vireo, 23 Gila woodpecker, and 12 summer tanager territories

Cibola National Wildlife Refuge Unit #1 Conservation Area:

- 3 Sonoran yellow warbler, 2 vermilion flycatcher, 1 summer tanager, and 1 Gila woodpecker territory

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Cibola Valley Conservation Area:

- 2 Sonoran yellow warbler, 1 Gila woodpecker, and 1 summer tanager territory

Laguna Division Conservation Area:

- 12 Arizona Bell's vireo, 2 Gila woodpecker, and 1 Sonoran yellow warbler territory

Palo Verde Ecological Reserve:

- 8 summer tanager and 2 Arizona Bell's vireo territories

Parker Dam Camp:

- 1 Gila woodpecker territory

Yuma East Wetlands:

- 4 Gila woodpecker territories

No focal species were recorded at Pretty Water Conservation Area or Hunters Hole.

Intensive area search surveys were conducted at the Cibola Valley Conservation Area, the Middle Bill Williams River National Wildlife Refuge, the Laguna Division Conservation Area, the Palo Verde Ecological Reserve, and Parker Dam Camp. During these surveys, surveyors recorded 63 breeding species, including the Arizona Bell's vireo, Gila woodpecker, Sonoran yellow warbler, and summer tanager.

INTRODUCTION

The Lower Colorado River Multi-Species Conservation Program (LCR MSCP) is tasked with balancing the needs of water users with native species and their habitats on the lower Colorado River (LCR). The program was finalized in 2005, with funding for 50 years to recover threatened and endangered species, and to prevent population declines of other species, which would lead to future listings. There are currently 27 species covered under the program, including 12 bird species. The Bureau of Reclamation (Reclamation) began ongoing bird monitoring along the LCR in 2002. A double sampling design was first implemented in 2007 to document distribution, estimate density, and monitor trends of breeding birds (Bart et al. 2010).

Long-term monitoring of riparian birds breeding in conservation areas in the LCR MSCP project area continued in 2019 in accordance with the LCR MSCP's Habitat Conservation Plan (LCR MSCP 2004b), its associated biological opinion (U.S. Fish and Wildlife Service 2005), and the program's Final Environmental Impact Statement (LCR MSCP 2004a). The Great Basin Bird Observatory (GBBO) surveyed 81 plots using a double sampling area search design. This design utilizes rapid area search surveys (two visits) on each selected plot and intensive area search surveys (eight visits) on a subset of eight selected plots. The goal of rapid area search surveys is to obtain estimates of the number of breeding territories over a large sample of area search plots. The goal of intensive area search surveys is to obtain a complete and unbiased measure of all species breeding on the plot. Intensive area search surveys for this project employ the same field methods as rapid area search surveys, but the additional visits should result in more accurate estimated breeding densities than in rapid area search surveys, as the cumulative knowledge from all visits allows surveyors to more accurately count breeding birds on the plot. Analysts can then compare results from both the rapid and intensive area search surveys to calculate a detection ratio, which is an estimate of error for the rapid area search surveys. Analysts will calculate detection ratios as part of the future data analysis for this project; detection ratios were not calculated in 2019.

The primary goal of this sampling effort was to document breeding territories of 6 of the 12 bird species covered under the LCR MSCP within the program's conservation areas. These focal species are: Arizona Bell's vireo (*Vireo bellii arizonae*), Gila woodpecker (*Melanerpes uropygialis*), gilded flicker (*Colaptes chrysoides*), Sonoran yellow warbler (*Dendroica petechia sonorana* = *Setophaga petechia sonorana*), summer tanager (*Piranga rubra*), and vermilion flycatcher (*Pyrocephalus rubinus*). The other six LCR MSCP covered species are covered by other survey efforts and were recorded but not targeted in these surveys. For the yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and southwestern willow flycatcher (*Empidonax traillii extimus*) in particular, targeted surveys are necessary, and this protocol is not adequate to classify these species as breeding. The secondary goal of these field surveys was to collect information on other breeding riparian bird species.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

The 10 conservation areas surveyed in 2019 were: Beal Lake Conservation Area (BLCA), Cibola National Wildlife Refuge Unit #1 Conservation Area (Cibola NWR Unit #1), Cibola Valley Conservation Area (CVCA), Hunters Hole, Laguna Division Conservation Area (LDCA), Middle Bill Williams River National Wildlife Refuge (Middle Bill Williams River NWR), Palo Verde Ecological Reserve (PVER), Parker Dam Camp, Pretty Water Conservation Area (PWCA), and Yuma East Wetlands (YEW).

The objective of the 2019 area search surveys was to document the number and locations of territories of all territorial bird species and estimated number of pairs of non-territorial bird species in a sample of plots within LCR MSCP conservation areas using the double sampling area search protocol. Species that do not breed in the region were not recorded, and those individuals judged to be migrating or without sufficient information to classify as breeding are not reported here.

Results in this report include counts of observed territories of covered and non-covered territorial bird species, locations of focal species territories, and estimated pairs of non-territorial species.

For the purposes of this report, the following definitions will be used:

- **Territory** always refers to a breeding territory.
- **Territorial species** are those that defend a single small to medium size territory, including feeding and nesting areas, to the exclusion of other members of the same species.
- **Non-territorial species** are those species not adequately sampled with this area search protocol. Some have territories that are too large to map on this effort (such as raptors), others breed colonially and defend only a nest site (such as swallows), and others feed and nest in different areas (such as doves).
- **Focal species** are the six LCR MSCP covered species that are the primary focus of this survey effort (see above).
- **Non-focal covered species** are the six LCR MSCP covered species that are surveyed on different projects.
- **Non-focal territorial species** include the six LCR MSCP covered species that are surveyed on different projects and all territorial species not listed as covered species by the LCR MSCP.
- **Local breeders** are species not known to migrate.

METHODS

Project Area

The LCR MSCP project area spans the main stem of the LCR from Separation Canyon (just upstream of Lake Mead) to the Southerly International Boundary with Mexico, just south of Yuma, Arizona. In 2019, the project area for monitoring included 10 LCR MSCP conservation areas located throughout the LCR MSCP project area. In this report, the results from the Middle Bill Williams River NWR is divided into two sections, Middle Bill Williams River NWR East and Middle Bill Williams River NWR West.

Reclamation selected 81 plots for rapid area search surveys using a stratified random sampling plan. Plots were allocated proportional to area, first by conservation area and then by habitat within conservation area (table 1; see attachment 1). Additionally, Reclamation randomly selected eight of these plots for intensive area search surveys (table 2). The 81 plots surveyed ranged in size from 4 to 18 hectares (ha). All available plots are classified into one of three habitat types: cottonwood-willow (Fremont cottonwood-willow species; *Populus fremontii-Salix* spp.), mesquite (*Prosopis* spp.), and mixed (mixture of cottonwood-willow and mesquite) (table 1).

All plots were assessed prior to surveying to determine site accessibility and identify any potential hazards. Trails were created on plots if the surveyor was unable to access within 50 meters (m) of every point on the plot. Care was taken when establishing trails, causing a minimal amount of disturbance to the habitat. The trails were marked using biodegradable orange flagging. All plots selected in 2019 were determined to be safe and accessible, and alternate plots were not used.

Data Collection

Field Methods

All area search surveys occurred between April 19 and June 15, 2019. All visits began at sunrise and ended no later than 11:00 AM in order to minimize survey activities during high temperatures (> 100 °F) and periods of low bird activity. If the surveyor encountered extreme weather such as sustained strong winds or heavy precipitation, visits to the plots were postponed and conducted at a later date when weather conditions were more ideal for bird monitoring.

The goal of a survey, whether it was a rapid or an intensive area search survey, was to identify and record data on all breeding birds present within a plot on each visit.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 1.—Number of plots and area by habitat type in conservation areas, 2019
(The number of plots surveyed by conservation area and habitat is listed in parenthesis.)

| Conservation area | Number of plots | Total area surveyed (ha) | Total area by habitat | | |
|-------------------------------------|-----------------|--------------------------|-----------------------|-----------------|-----------------|
| | | | Cottonwood-willow | Mesquite | Mixed |
| BLCA | 2 | 23 | 17 (1) | 0 | 6(1) |
| Cibola NWR Unit #1 | 10 | 94 | 55 (6) | 0 | 39 (4) |
| CVCA | 14 | 144 | 40 (4) | 64 (6) | 40 (4) |
| Hunters Hole | 1 | 18 | 18 (1) | 0 | 0 |
| Laguna Division Conservation Area | 10 | 99 | 32 (3) | 0 | 67 (7) |
| Middle Bill Williams River NWR East | 4 | 44 | 44 (4) | 0 | 0 |
| Middle Bill Williams River NWR West | 10 | 105 | 105 (10) | 0 | 0 |
| Parker Dam Camp | 2 | 21 | 0 | 10 (1) | 11 (1) |
| PVER | 15 | 166 | 106 (9) | 4 (1) | 56 (5) |
| PWCA | 9 | 97 | 0 | 52 (5) | 45 (4) |
| YEW | 4 | 47 | 9 (1) | 13 (1) | 25 (2) |
| Total | 81 | 858 | 426 (39) | 143 (14) | 289 (28) |

Table 2.—Plots selected for intensive area search surveys, 2019

| Conservation area | Plot | Habitat type | Total area surveyed (ha) |
|-------------------------------------|-------|-------------------|--------------------------|
| CVCA | C2508 | Cottonwood-willow | 11 |
| LDCA | C4951 | Cottonwood-willow | 11 |
| Middle Bill Williams River NWR East | C1905 | Cottonwood-willow | 11 |
| Middle Bill Williams River NWR West | C1914 | Cottonwood-willow | 11 |
| Parker Dam Camp | C2001 | Mesquite | 10 |
| | C2003 | Mixed | 11 |
| PVER | C2302 | Cottonwood-willow | 9 |
| | C2331 | Mixed | 9 |
| Total | | | 83 |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

During each visit, bird locations were mapped and behaviors recorded (table 3) as accurately as possible in order to estimate the number of territories for territorial species and estimated pairs for non-territorial species at the end of the season using cumulative observations from all visits.

Table 3.—Behavioral information collected during area search surveys and associated breeding evidence categories

| Breeding evidence category | Behavior |
|-----------------------------------|------------------------|
| Observed | Calling |
| | Flying |
| | Foraging/perching |
| Possible | Singing |
| | Vocalizing other |
| Probable | Agitation |
| | Copulation |
| | Courtship |
| | Display |
| | Guarding |
| | Pair |
| | Probable nest site |
| | Territory dispute |
| Confirmed | Active nest |
| | Brooding/incubating |
| | Building nest |
| | Caring for fledge |
| | Carrying fecal sac |
| | Carrying food |
| | Carrying nest material |
| | Distraction display |
| | Eggs found in nest |
| | Nest colony |
| | Young found in nest |

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Plots were systematically searched, walking at a slow enough pace to stop and record all bird sightings, locations, and behavior (table 3) on and around a plot. In order to assure that all sections of a plot were adequately covered on each visit, a 50- x 50-m grid was established on the plot map, and surveyors were required to pass within 50 m of every point within the plot. The period of time spent on a visit depended on the difficulty of the terrain, vegetation density, and the amount of bird activity. However, regardless of these factors, visits lasted a minimum of 2 hours. If the surveyor felt that they had recorded at least 90% of all territorial birds present on a plot on a given visit before reaching the cutoff time or temperature, they were required to continue surveying for an additional 10 minutes past this “stop” time. If no birds from new territories were found in this 10-minute period, the surveyor could end the survey. If a bird from a new territory was found, the surveyor would start the 10 minute period over and this process would be repeated as long as birds from new territories were detected. The surveyor used their best judgment to decide if a bird was from a previously recorded territory or a new territory, using behavioral cues such as countersinging or territory size.

The primary goal of each rapid area search visit was to collect location and behavioral data (table 3) for the six focal species to eventually create an accurate territory boundary and correctly evaluate each individual bird as a breeder or non-breeder. Secondly, surveyors were instructed to collect enough location data on non-focal territorial species on or near the plot boundary to create an accurate territory boundary to allow them to decide what percentage of the territory was within a plot. This included walking the plot boundary if feasible. Collecting location data for territory mapping for non-focal territorial species was otherwise a lower priority; however, surveyors were instructed to collect enough behavioral data (see table 3) on all non-focal territorial species to evaluate each individual as a breeder or non-breeder as accurately as possible. The primary goal of each intensive area search visit was to collect location and behavioral (see table 3) data for all territorial species sufficient to create an accurate territory boundary and correctly evaluate each individual bird as a breeder or non-breeder. Finally, on both rapid and intensive area search visits, surveyors collected counts of birds and behavioral (see table 3) data to confirm breeding for all species for which territories cannot be adequately mapped using this protocol (hereafter “non-territorial species”). The taxa classified as non-territorial for the purposes of this project are waterfowl (family Anatidae), gallinaceous birds (order Galliformes), grebes (family Podicipedidae), doves (family Columbidae), cuckoos (family Cuculidae), nightjars (family Caprimulgidae), swifts (family Apodidae), rails (family Rallidae), shorebirds (order Charadriiformes), cormorants (family Phalacrocoracidae), wading birds (order Pelecaniformes), vultures (order Cathartiformes), hawks (order Accipitriformes), owls (order Strigiformes), falcons (family Falconidae), crows and ravens (family Corvidae), swallows (family Hirundinidae), European starlings (*Sturnus vulgaris*), house sparrows (*Passer domesticus*), finches (family Fringillidae), and blackbirds (family Icteridae, excluding orioles [genus *Icterus*]; see appendix 2 for a full list of

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

non-territorial species). Surveyors did not record hummingbirds (family Trochilidae), bird species that do not breed in the project area, or birds seen flying over the plot without using the habitat for nesting, foraging, or shelter.

To conduct the area search surveys, field data were recorded in the application Collector for ArcGIS (Collector) (<https://doc.arcgis.com/en/collector-classic>) on a Samsung Galaxy Tab Active2 using an Android 7.1 (Nougat) operating system. The internal Glonass-capable Global Positioning System was used, which was generally capable of 3-m accuracy. Each surveyor used their own ArcGIS Online (AGOL) (<https://www.arcgis.com/index.html>) account to access Collector, so that only their own data would be visible to them and to ensure that the correct surveyor was always associated with any data collected. To help the surveyor navigate in the field, and to help obtain an accurate location for the birds within the surveyor plot, high-resolution aerial imagery was uploaded to each tablet, as well as a survey layer depicting the boundaries of each plot, and a 50- x 50-m grid.

All trails created were recorded as a feature in Collector for the surveyor to use for plot navigation. Other features published to AGOL for use in Collector included: visit, point, line, and incidental (see attachment 2 for examples and symbology). At the beginning and end of each visit, a visit feature was created to record beginning and end times, weather conditions, and relevant notes. The point feature was used to record bird observations, including species; detection type (visual/audio/both); counts of male, female, unknown, and dependent young; and behaviors. All observed behavior was recorded in Collector from a dropdown list of attributes (see table 3). Each behavioral attribute is associated with a degree of certainty of breeding: observed, possible, probable, or confirmed breeding (see table 3). The line feature was used to indicate where a bird flew or that two points involved the same bird, two different birds, two countersinging birds, a suspected pair, or possibly the same or different individuals. The incidental feature was used to record observations of focal species outside a visit time period. The visit, point, and line features included a 16-hour filter in Collector. On each visit to a plot, the surveyor would only see the visit, point, and line features from that visit. In order to easily distinguish between bird species, four-letter alpha codes depicted species points, and the color of each circle varied by species. Additionally, to help surveyors recognize which species are considered non-territorial, icons of all non-territorial species in Collector are one color (gray).

The project managers designed a backup data collection system in the event the surveyor could not collect data directly in Collector during a visit. In this case, the surveyor used a combination of a hand-held Global Positioning System unit (Garmin Etrex 20 using North American Datum 83 in Zone 11S) and a printed aerial photo of the plot overlaid with a 50-m Universal Transverse Mercator grid. Bird points and lines were recorded onto the printed plot map in place of Collector, and the survey was otherwise conducted as usual. The data from the printed map was entered in Collector as soon as possible.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Rapid Area Search Surveys

Rapid area search surveys consisted of two visits to a plot with at least 20 days between the first visit and the second. The first round of rapid area search surveys was conducted between April 22 and May 22, 2019, and the second round of rapid area search surveys conducted between May 27 and June 15, 2019. The same surveyor conducted both visits to a plot.

Intensive Area Search Surveys

Intensive area search surveys consisted of eight visits to a plot; the same surveyor conducted all eight visits. The rapid area search surveyor and the intensive area search surveyor were always different for an individual plot, and the two surveyors did not discuss any observations of birds on the plot. The intensive area search surveys occurred between April 22 and June 13, 2019, with at least 5, but no more than 9, days between each visit.

Data Processing

Reclamation created a web app on AGOL as part of the collection, processing, and vetting of data for this project. Data collected in the field were synced to AGOL as soon as the surveyor returned to the field house. The surveyor processed these data the same day in the web app. First, the surveyor made a backup file of their unedited points, lines, and incidental features. The surveyors then batch edited the visit, point, line, and incidental features to add the survey key, visit key, surveyor name, and date collected. Surveyors then assigned all point features to a territory for each territorial species. To determine which points should be designated as separate territories, surveyors used typical territory sizes of each species, as well as information gathered in the field, such as multiple observations of an individual, flight paths, and countersinging. On subsequent visits, previously designated territories could be adjusted as needed based on new information.

Finally, the data collected on non-territorial species each day were summarized on paper data sheets. Surveyors used the count and behavioral data (see table 3) collected for each non-territorial species to estimate the number of males, females, unknown, and dependent young present on the visit and to estimate the number of pairs recorded.

Upon completion of the final visit to each area search plot, surveyors created territory polygons for all focal species found breeding (whether on or off plot) and for non-focal territorial species with territories at least partially on plot. To create territory polygons, surveyors drew a territory feature that completely encompassed the line and point features associated with each territory in a convex polygon. This was done by using a “snap-to” feature to place polygon vertices on the points and lines that were judged to define the edge of the observed territory. When territories

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

were defined by one or two points, surveyors created polygons by drawing a box around the point(s). Surveyors excluded outlying points or lines if they fell outside of 90% of the observed locations. Surveyors did not create a territory polygon if they found insufficient evidence to call a bird a breeder.

Each territory polygon was linked to its associated points with a polygon key. Other attributes that surveyors filled out for each territory polygon included counts of male, female, unknown, and dependent young; territory boundary confidence; territory in; and breeding justification.

Surveyors derived counts of male, female, unknown, and dependent young using the minimum count for each category based on the combined point data for the territory.

Territory boundary confidence could be < 50%, 50–75%, or > 75%. Surveyors selected < 50% confidence if they recorded two or fewer points for a territory or if they otherwise thought that the points do not accurately reflect the territory. Surveyors selected 50–75% if they recorded two to five points for a territory or if they otherwise thought that the territory might extend significantly in one direction or a small amount in multiple directions. Surveyors selected >75% if they recorded at least six points for a territory, and they felt confident about all territory boundaries.

Territory in represents the percentage of the territory that falls within a plot polygon, to the nearest 25%. Surveyors recorded a territory as 0% if < 10% of the territory was within the plot boundary. Surveyors recorded a territory as 100% if > 90% of the territory was within the plot boundary. Surveyors used only recorded detections to make these determinations; they did not assume larger territories outside the plot if they did not record those data, with few exceptions, when they were otherwise certain that the territory did extend outside the plot boundary.

The breeding justification was based on a set of rules to help surveyors distinguish between breeding and non-breeding individuals on an area search survey. Because they have a different number of visits, rapid and intensive area search surveys use different but overlapping sets of possible breeding justifications (table 4).

Breeding justifications that could be used for both rapid and intensive area search surveys were: No Justification Required, Observed Confirmed, and No Standard Scenarios (table 4). No Justification Required was used when the surveyor drew a territory, but decided not to count it as breeding, and marked “territory in” as 0%. This scenario is rare because surveyors should not draw territories for birds that could not be considered breeders, and in 2019, this justification was only used by project managers when the breeding justification recorded by the surveyor was insufficient, or incorrect, and the territory could not be counted. Observed Confirmed was used when confirmed breeding behavior was recorded (see table 3)

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 4.—Description of justification categories for breeding territories on rapid and intensive area search surveys

| Category | Survey type | Description |
|--|---------------------|--|
| No Justification Required | Rapid and intensive | No justification required (not counted as a breeding territory). |
| Observed Confirmed | Rapid and intensive | Observed confirmed breeding evidence (see table 3) on at least one visit. |
| Observed Probable Evidence Consecutive | Intensive | Observed bird/pair probable or possible breeding evidence (see table 3) on three consecutive visits. |
| Observed Probable Evidence Season | Intensive | Observed bird/pair probable or possible breeding evidence (see table 3) on at least five non-consecutive visits. |
| Observed Probable Evidence Local | Rapid | Observed probable or possible breeding evidence (see table 3) on at least one visit for known local breeders (i.e., species that do not occur as migrants; see appendix 2). |
| Observed Probable Evidence Both | Rapid | Observed probable or possible breeding evidence (see table 3) on both visits. |
| No Standard Scenarios | Rapid and intensive | Called breeding but does not fit any of the standard scenarios. A detailed explanation was provided in the notes for this territory. This category might be selected for a species that breeds along the LCR but migrates partway through the survey season. |

and took priority over all other breeding justifications. No Standard Scenarios was used when a territory did not meet any of the other breeding justifications but the surveyor felt strongly that it was breeding. In this case, the surveyor was required to provide an explanation to justify the use of this breeding justification. For example, a surveyor may count a territory of a common migratory breeding species that was only detected on one rapid area search survey visit if it demonstrated probable breeding evidence (see table 3) and that section of a plot was covered late in the day on the other visit.

Additional breeding justifications that could be used for rapid area search surveys were Observed Probable Evidence Both and Observed Probable Evidence Local (see table 4). Observed Probable Evidence Both was used when any potential

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

breeding species was observed on both visits and no confirmed breeding behavior was recorded. Observed Probable Evidence Local was used only for non-migratory species when the territory was observed on only one visit and no confirmed breeding behavior was recorded.

Additional breeding justifications that could be used for intensive area search surveys were Observed Probable Evidence Consecutive and Observed Probable Evidence Season (see table 4). Observed Probable Evidence Season was used when the same territory was observed on at least five visits and no confirmed breeding behavior was recorded. Observed Probable Evidence Consecutive was used when a territory was observed on fewer than five visits, but on three to four consecutive visits, and no confirmed breeding behavior was recorded.

Finally, surveyors referred to their non-territorial paper data sheets to record in the web app an estimated number of pairs of each non-territorial species using a plot for nesting, foraging, or resting while breeding. For example, if a surveyor felt that a non-territorial species was nesting nearby and using a plot to feed, they would count that species as using the plot. Because surveyors did not record exact numbers of many non-territorial species, and breeding status can be difficult to determine, the number of pairs of these species should be considered estimates only.

Once all territories were finalized, project managers used the cumulative knowledge of all surveys, including both rapid and intensive area search surveys, to map cumulative territories for all territorial species. This was accomplished using the combined territory status field in the web app. By default, every territory is labeled as “Not combined” when the surveyor enters it. If the project managers decided that two mapped territories likely represented the same territory, they would mark the original territories as “Combined with duplicate territory” and create a new territory encompassing all points and lines of the original territories labeled “New combined territory.” Sources of overlap included territories on or near plot boundaries that were mapped during multiple area search surveys and territories that were mapped on both the rapid and intensive area search surveys on the same plot.

In order to analyze the data collected for a specific area search survey, Combined Territory Status “Not combined” and “Combined with duplicate territory” are used, and territories labeled “New combined territory” are excluded. In order to analyze the cumulative data across the project, “Not combined” and “New combined territory” are used, and territories labeled “Combined with duplicate territory” are excluded. In this report, territories labeled “New combined territory” are excluded to report results specific to all rapid or intensive area search survey efforts. Territories labeled “Combined with duplicate territory” are excluded for cumulative results and for maps of focal species territories.

Quality Assurance and Quality Control

The multiple data processing steps that were performed by surveyors and project managers using the web app, as outlined above, provided repeated opportunities for data review, correction, and modifications that were a critical element in data quality assurance and quality control. This web app contained multiple filters to ensure that data were entered completely and correctly to the extent possible.

Additional processes and measures that were implemented for data quality assurance and quality control were as follows:

- 1) *Surveyor Skills and Training.* To collect accurate data, surveyors must identify birds correctly, and inter-surveyor biases and differentials in identification and detection abilities must be minimized. The most fundamental and critical step to achieve these goals was to hire field crew with proven field survey and identification experience in relevant projects. The GBBO was able to assemble and deploy a highly capable and highly experienced field team in the 2019 field season. In addition, a training and orientation session for the field crew was conducted prior to initiation of data collection, from April 8 to April 20, 2019. Collectively, training exercises ensured that inter-surveyor biases were minimized, that project-approved protocols were adhered to in data collection, and that surveyors were fully trained in the device-based data collection system used for this project. These exercises included the following:
 - Identification of all bird species likely to be encountered, including a mandatory test, which each surveyor was required to pass before collecting data
 - Classification of all bird species as possibly breeding or migrant only
 - Classification of all possibly breeding bird species as territorial or non-territorial
 - Breeding significance and context of different vocalizations of possibly breeding species
 - Breeding biology of focal species and all common breeding species
 - Double sampling area search survey method
 - Survey techniques, survey protocol, and use of Collector
 - Use of the web app

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

- 2) *Project Manager Skills*: Similarly, data quality was significantly enhanced by the presence of two project managers (Fletcher and Harter) that are highly experienced in the avian biology of the region, in bird surveying and identification, and in the protocols and standards associated with the LCR MSCP project in general, and the project's riparian bird monitoring functions specifically. These project managers were able to provide the field survey team with timely training, advice, and oversight that maximized data quality, standardization, and reliability.
- 3) *Daily Coordination and Supervision*: To ensure that all data called for in the study design were collected by appropriate surveyors at appropriate times, a detailed field schedule was created by the project managers and shared with surveyors on Google Calendar. The project managers ensured that each survey was scheduled for the appropriate number of visits, that visits were the correct number of days apart, and that two people never surveyed the same plot on the same day. The project managers monitored the schedule daily and required crew members to inform them of any changes, which were then accommodated with appropriate calendar revisions. The project managers also provided surveyors with a daily checklist of important logistical preparations and procedures to minimize any preventable downtime or preventable errors in data recording.

To supplement the calendar, Reclamation created an administrative dashboard in AGOL that allowed project managers to review progress with regard to plots surveyed, number of visits, and timing of visits.

When reviewing surveyor data (as outlined in the previous section), the project managers were able to identify any suspect data records and to resolve them in discussion with the appropriate surveyor. This process was a structured exercise that required managers to check each day's data for the following:

- Missing field
- Correct visit number
- Too many territories for a given species
- Reasonable behavior codes for a given species count
- Migrants entered incorrectly, or as "other"
- Ensure the survey tracks confirm adequate coverage of the surveyed plot

The administrative console described above also provided various data summaries that could be used to suggest possible data recording errors to investigate further.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

- 4) *Data Protection*: Once uploaded to AGOL, data collected on field devices are thought to be fairly secure. However, as an extra measure of data protection, a project manager performed a nightly backup of unedited CSV files to Dropbox. Additionally, the feature layers in AGOL that held accumulating data were periodically exported to external, versioned geodatabases that were stored on a local machine and then backed up to a secure cloud storage location (via Carbonite service).
- 5) *Survey Independence and Data Protection*: To eliminate any cross-observer influences on data collection, a given field surveyor could only visualize and edit their own data within the AGOL data system that was created by Reclamation and the GBBO for this project. Only the project managers and Reclamation could then visualize data collected by all surveyors: This not only prevented undue cross-observer influences, but it also protected data from unintentional alteration or deletion. Additionally, surveyors were instructed to avoid discussing their survey findings with any other surveyors collecting data for this project.
- 6) *Post-Season Data Review*: Upon finalization of all surveyor data, the project managers checked all data using available filters in the web app and reran all daily data checks from the survey season. They then downloaded all data in Microsoft Excel and performed additional checks using formulas and filters. Finally, Reclamation created and ran a set of queries to locate additional errors. The project managers corrected all errors that could be fixed post-season in the AGOL web app. In addition to the data checks listed above under point 3, errors looked for included, but were not limited to:
 - Typos
 - Incorrect plot ID
 - Incorrect species
 - Incorrect use of breeding codes
 - Incorrect use of breeding justifications
 - Insufficient justification for territories given the breeding justification of No Standard Scenarios
 - Species outside their known breeding ranges or habitat types

There were a few errors that could not be fixed by project managers post-season without extensive input from the surveyor that recorded the data. Most of these remaining errors (accounting for less than 0.02% of the data)

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

that could not be fixed were associated with behavior fields not matching the detection type or behavior fields not matching the count fields. Examples of these errors are described below.

- Point observations that had behavior fields recorded where the surveyor would have had to actually see the bird, (e.g., flying, foraging, or perching), but under detection type the surveyor didn't record that the bird was detected visually.
- There were point observations where the surveyor recorded a male individual in a species that isn't sexually dimorphic, and the surveyor did not indicate a behavior, such as singing, pair, territory dispute, or guarding mate, as a way in which they determined the sex of the bird.
- There were a few entries in which the surveyor identified the bird as male through their song, but in that particular species, both the male and female sing.

RESULTS

Surveyors successfully completed rapid area search surveys on all 81 selected plots within the targeted timeframe. Surveyors completed all eight visits to each of eight plots selected for intensive area search surveys within the targeted timeframe. A single individual completed each area search survey, with the exception of plot C5901, due to a scheduling issue. Each visit lasted at least 2 hours, with the exception of the second visit to plot C5901.

With a few exceptions, surveyors were able to pass within 50 m of every point on each plot. Those exceptions are listed here; in each case, over 2/3 of the plot was accessible and the surveyor felt that they were still able to adequately detect and map birds throughout the plot.

- On plot C2003, the westernmost section was not safely accessible due to steep, loose, rocky cliffs over riparian vegetation too dense for trails.
- On plot C4954, some areas within the north-central portion of the plot were marsh rather than riparian vegetation, so the surveyor did not survey those areas.
- On visit 2 to plot C1901, access to the north-central section was limited by new beaver dams too deep to cross and by an active common black hawk (*Buteogallus anthracinus*) nest.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

- On some plots within the Middle Bill Williams River NWR, surveyors encountered extremely dense vegetation, in some cases not safely accessed due to high incidence of recent treefall. Biologists had insufficient time at the beginning of the season to complete all trail work, so some trails were completed after surveys had begun. Because of this, biologists did not complete some trails if the surveyors felt the area could be adequately surveyed without them. The following areas were not surveyed within 50 m of every point: the northern section of plot C1908, the northern corner of plot C1915, the northern section of plot C1917, the southern section of plot C1922, the northern corners of plot C1924, and the northeastern section of plot C1932.

In most cases, surveyors were able to meet the daily timing guidelines of starting the visit no later than sunrise and ending no later than 11:00 a.m. Generally, late start times were due to unforeseen trail conditions such as flooding, and late end times were necessary to adequately cover very busy (> 100 territories) or large plots.

Survey visits started after sunrise were:

- Intensive – plot C1905 (visit 4)
- Intensive – plot C1914 (visit 7)
- Intensive – plot C4951 (visit 2)
- Rapid – plot C4944 (visit 1)
- Rapid – plot C5901 (visit 2)

Survey visits ended after 11:00 a.m. were:

- FY19 – Intensive – plot C1914 (visit 7)
- FY19 – Intensive – plot C2003 (visit 1)
- FY19 – Rapid – plot C1931 (visit 1)
- FY19 – Rapid – plot C1931 (visit 2)
- FY19 – Rapid – plot C1932 (visit 1)
- FY19 – Rapid – plot C1933 (visit 1)
- FY19 – Rapid – plot C1933 (visit 2)
- FY19 – Rapid – plot C4702 (visit 1)
- FY19 – Rapid – plot C4702 (visit 2)

In the following tables, the totals for each territorial species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot; some of these territories were entirely off plot and counted as zero in the sum. These tables include either individual results from each area search survey without combined territories (indicated by “excludes new combined territories”) or results from combining territories from the entire survey

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

effort, including rapid and intensive area search surveys as well as territories recorded on multiple plots (indicated by “excludes duplicate territories”). The numbers reported for non-territorial species represent estimated pairs on each area search survey. Overall results for non-territorial species include results from rapid area search surveys only because data collection for these species is not detailed enough to allow for the combination of intensive and rapid area search survey data as with territorial species.

Overall

Results are presented below using the categories territorial, non-territorial, focal species, non-focal covered species, and non-focal territorial species as defined in the Introduction and attachment 2.

Surveyors detected 77 total breeding species on 226 visits to 81 plots in 2019 (see attachment 3), including 28 species classified as territorial and 49 species classified as non-territorial.

Of the six focal species, all but the gilded flicker were recorded on at least one plot. No gilded flickers were detected in 2019.

Of the six non-focal covered species, the Yuma clapper rail (*Rallus longirostris yumanensis* also known as Yuma Ridgway’s rail = *R. obsoletus yumanensis*), western least bittern (*Ixobrychus exilis hesperis*), and elf owl (*Micrathene whitneyi*) were recorded on at least one plot. The yellow-billed cuckoo was also detected, although breeding for this species cannot be determined on this project. No California black rails (*Laterallus jamaicensis coturniculus*) or southwestern willow flycatchers were detected.

Across all conservation areas, Middle Bill Williams River NWR West had a much higher density of territories than other sites (9.1 territories/ha; table 5). Middle Bill Williams River NWR East also had relatively high density of territories (5.0 territories/ha; table 5). Parker Dam Camp and the BLCA were in the moderate range of density of territories with 3.5 and 2.6 territories/ha, respectively (table 5). The lowest densities of territories were at Hunters Hole (0.5 territory/ha) and the PWCA (0.7 territory/ha; table 5).

The highest density of non-territorial species was at the PVER (5.1 estimated pairs/ha; table 5), a large portion of which was a colony of approximately 350 pairs of red-winged blackbirds (*Agelaius phoeniceus*) on plot C2301 (see table 10). Cibola NWR Unit #1 also had a relatively high density of non-territorial species (4.6 estimated pairs/ha), as did Parker Dam Camp and YEW (4.3 and 4.0 estimated pairs/ha, respectively; table 5). The lowest density of non-territorial species was at Hunters

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 5.—Number of territories for territorial species and estimated number of pairs for non-territorial species per ha by conservation area, 2019
(Territories use sum of territories on plot, not count; excludes duplicate territories. Non-territorial estimated pairs uses rapid data only.)

| Conservation area | Breeding territories/ha | Non-territorial estimated pairs/ha |
|-------------------------------------|--------------------------------|---|
| BLCA | 2.6 | 2.1 |
| Cibola NWR Unit #1 | 1.3 | 4.6 |
| CVCA | 1.4 | 3.0 |
| Hunters Hole | 0.5 | 0.7 |
| LDCA | 2.0 | 2.2 |
| Middle Bill Williams River NWR East | 5.0 | 3.0 |
| Middle Bill Williams River NWR West | 9.1 | 1.5 |
| Parker Dam Camp | 3.5 | 4.3 |
| PVER | 1.2 | 5.1 |
| PWCA | 0.7 | 1.3 |
| YEW | 1.3 | 4.0 |

Hole (0.7 estimated pairs/ha), and densities were also low in Middle Bill Williams River NWR West (1.5 estimated pairs/ha) and the PWCA (1.3 estimated pairs/ha; see table 5).

Over both rapid and intensive survey area search surveys, with duplicated territories combined, surveyors detected 287 focal species territories across all conservation areas in 2019 (table 6). A majority of these were in Middle Bill Williams River NWR West (174 territories), followed by Middle Bill Williams River NWR East (51 territories; table 6). Several notable patterns were evident among focal species. Surveyors detected most territories of the Arizona Bell's vireo at the Middle Bill Williams River NWR, including 33 territories at Middle Bill Williams River NWR East and 27 territories at Middle Bill Williams River NWR West (table 6). The LDCA also supported a concentration of this species (12 territories), as did the BLCA (9 territories; table 6). Territories of the Sonoran yellow warbler were concentrated at Middle Bill Williams River NWR West (125 territories; table 6). The Gila woodpecker was widespread, as it was detected at all surveyed conservation areas except the BLCA, Hunters Hole, the PWCA, and the PVER. The PVER supported over a third of the summer tanager territories recorded (8 territories; table 6).

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 6.—Number of territories for five focal species¹ detected by conservation area in 2019 (Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on all area search surveys, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes duplicate territories.)

| Conservation area | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher | All |
|--|----------------------|-----------------------|-------------------------|--------------------|----------------------|-------------------------|
| BLCA (n ² = 3) | 8 (9) | | 8.25 (11) | 0.75 (1) | | 17 (21) |
| Cibola NWR Unit #1 (n = 4) | | 0.25 (1) | 2.75 (3) | 1 (1) | 0.75 (2) | 4.75 (7) |
| CVCA (n = 3) | | 0.25 (1) | 1 (2) | 1 (1) | | 2.25 (4) |
| LDCA (n = 3) | 10 (12) | 0 (2) | 1 (1) | | | 11 (15) |
| Middle Bill Williams River NWR East (n = 4) | 17 (33) | 4 (11) | 3 (5) | 2 (2) | | 26 (51) |
| Middle Bill Williams River NWR West (n = 4) | 22.5 (27) | 9.25 (12) | 121.75 (125) | 9.25 (10) | | 162.75 (174) |
| Parker Dam Camp (n = 1) | | 0.75 (1) | | | | 0.75 (1) |
| PVER (n = 2) | 1.5 (2) | | | 7 (8) | | 8.5 (10) |
| YEW (n = 1) | | 1.75 (4) | | | | 1.75 (4) |
| All | 59 (83) | 16.25 (32) | 137.75 (147) | 21 (23) | 0.75 (2) | 234.75 (287) |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

Over both rapid and intensive area search surveys, with duplicated territories combined, surveyors detected 2,246 non-focal territorial species territories across all conservation areas in 2019 (table 7). A majority of these were in Middle Bill Williams River NWR West (831 territories; table 7). The most numerous species overall were the Abert's towhee (*Melospiza aberti*) (325 total territories), song sparrow (*Melospiza melodia*) (313 total territories), and common yellowthroat (*Geothlypis trichas*) (251 total territories; table 7).

Rapid Area Search Surveys

On 162 visits to 81 plots during rapid area search surveys, surveyors detected 74 total breeding species, including 28 species classified as territorial and 46 species classified as non-territorial.

Of the six focal species, all but the gilded flicker was recorded on at least one rapid area search survey.

Of the six non-focal covered species, the western least bittern was recorded on several rapid area search surveys. One yellow-billed cuckoo was detected at the LDCA, although the breeding status of this species could not be determined through this project. One elf owl was detected at Middle Bill Williams NWR East, calling well off plot. No California black rails, Yuma clapper rails, or southwestern willow flycatchers were detected on rapid area search surveys in 2019.

Surveyors recorded focal species at 8 of the 10 conservation areas that were subject to rapid area search surveys in 2019.

Arizona Bell's vireos were found at three conservation areas: BLCA, Middle Bill Williams River NWR, and LDCA (table 8). Most of these plots held fewer than 5 territories, with the exceptions of Middle Bill Williams River NWR West, Fox Wash plot C1922 (5.5 territories on plot); Middle Bill Williams River NWR West, Mosquito Flats plot C1931 (7.5 territories on plot); and Middle Bill Williams River NWR East, Mineral Wash plot C1901 (14 territories on plot, 20 total territories in the vicinity; table 8). The Middle Bill Williams River NWR East, Esquerra Ranch plot C1905 was also notable for having 10 total territories of Arizona Bell's vireos in the vicinity (table 8).

Surveyors found territories of Gila woodpeckers at or near six conservation areas: Middle Bill Williams River NWR, Cibola NWR Unit #1, CVCA, LDCA, Parker Dam Camp, and YEW (table 8). At the LDCA, surveyors noted Gila woodpeckers during surveys outside the conservation area. The number of territories on a single plot was as high as 2.25 (in dense forest at Middle Bill Williams River NWR West, Mosquito Flats plot C1933), and the total number of territories recorded on a survey was as high as 4 (at Middle Bill Williams River NWR East, Kohen Ranch plot C1908 and Mineral Wash plot C1901; table 8).

Summer tanager territories were present at five conservation areas: BLCA, Middle Bill Williams River NWR, Cibola NWR Unit #1, CVCA, and PVER (table 8). The highest density of summer tanager territories was at Middle Bill Williams River NWR West, Mosquito Flats, with up to three territories on plot C1932 (table 8).

Table 7.—Number of territories for 23 non-focal territorial species¹ by conservation area in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on all area search surveys, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes duplicate territories.)

| Conservation area | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | Total |
|--|-------------------------|-------------------------|----------------------|--------------------------|----------------------|--------------------------|-----------------------|----------------------|-------------------------|-----------------------|------------------|------------------|--------------------------|-------------------------|------------------|---------------------|----------------------|-------------------|---------------------|----------------------|----------------------|-----------------------|------------------------|----------------------------|
| BLCA (n ² = 11) | 9.5 (11) | | | 4.5 (5) | | 1 (1) | 2.25 (3) | | 2.75 (4) | 2.25 (3) | | | 3.75 (4) | 4.5 (5) | | | | | | 2.5 (4) | 5 (7) | | 4.5 (5) | 42.5 (52) |
| Cibola NWR Unit #1 (n = 12) | 30.5 (36) | 7.5 (9) | | 7 (9) | 8 (10) | | 8.5 (11) | | 1 (1) | 4 (4) | | | 13.25 (14) | 13.75 (14) | | | | | | 5 (5) | 17 (20) | 5.5 (9) | | 121 (142) |
| CVCA (n = 12) | 60.25 (74) | 4.25 (7) | | 32.25 (35) | 14.25 (19) | | 7.5 (10) | | | 11.25 (14) | | | 12 (16) | 6.75 (7) | | | | | | 1.5 (3) | 38.5 (47) | 8.75 (10) | 1 (1) | 198.25 (243) |
| Hunters Hole (n = 5) | 3 (3) | 3 (3) | | | | | | | | 1 (1) | | | 1 (1) | | | | | | | | 1 (1) | | | 9 (9) |
| LDCA (n = 12) | 27 (31) | 1.75 (2) | | 17.75 (21) | 4 (4) | | | | 36.75 (46) | 4 (6) | | | 8.5 (11) | 1 (1) | 8 (9) | | | | | 34.75 (42) | 21.25 (25) | | 24 (25) | 188.75 (223) |
| Middle Bill Williams River NWR East (n = 16) | 12.5 (18) | 8.75 (13) | 18.25 (21) | 10.5 (13) | 5 (7) | 4.75 (9) | | 0.25 (1) | 31.25 (32) | 4.5 (6) | | | 6.5 (8) | 26.25 (35) | | 1.5 (3) | | 1.5 (2) | | 33.75 (37) | 8.25 (13) | | 21.25 (24) | 194.75 (242) |
| Middle Bill Williams River NWR West (n = 18) | 50.5 (54) | 9 (11) | 51.25 (56) | 10.25 (12) | 5.75 (7) | 9.5 (11) | 3 (3) | 8.5 (9) | 156.25 (158) | 13 (15) | | 1 (1) | 19.75 (22) | 57.75 (60) | | 0.75 (1) | | 2 (2) | | 213 (216) | 23 (27) | | 160.75 (166) | 795 (831) |
| Parker Dam Camp (n = 15) | 11 (14) | 3 (5) | | 5.75 (7) | 1 (1) | | 1 (1) | 1 (2) | 1.75 (2) | 2.75 (3) | 1 (1) | | 3.75 (5) | 17.75 (20) | | | | 3.5 (5) | | 5.5 (6) | 13 (19) | 0.75 (1) | | 72.5 (92) |
| PVER (n = 14) | 34.75 (48) | 4.5 (6) | | 15.75 (18) | 22.25 (31) | 1.5 (2) | 21.5 (26) | | 1.25 (3) | 1 (3) | | | 24.25 (30) | 20 (23) | | | 1 (1) | | | | 14.75 (19) | 24.25 (30) | 10.75 (12) | 197.5 (252) |
| PWCA (n = 12) | 15.5 (20) | 5 (6) | | 20 (23) | 5.75 (8) | | | | 1.75 (5) | 5 (5) | | | 1 (2) | 1.5 (2) | | | 1 (1) | 1 (1) | 1.25 (2) | | 12 (12) | | | 70.75 (87) |
| YEW (n = 9) | 14.25 (16) | 3.75 (4) | | 9.25 (10) | 3.5 (5) | | | | | 2.5 (3) | | | 3.75 (5) | | | | | | | | 23.25 (28) | 1 (1) | 0.25 (1) | 61.5 (73) |
| Total | 268.75 (325) | 50.5 (66) | 69.5 (77) | 133 (153) | 69.5 (92) | 16.75 (23) | 43.75 (54) | 9.75 (12) | 232.75 (251) | 51.25 (63) | 1 (1) | 1 (1) | 97.5 (118) | 149.25 (167) | 8 (9) | 2.25 (4) | 2 (2) | 8 (10) | 1.25 (2) | 296 (313) | 177 (218) | 40.25 (51) | 222.5 (234) | 1,951.5 (2,246) |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 8.—Number of territories for five focal species¹ detected on rapid area search surveys by conservation area, phase, and plot in 2019 (Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes new combined territories.)

| Conservation area | Site | Plot | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher |
|-------------------------------|---------------------|-------------|---------------------------------|----------------------------|-----------------------------------|---------------------------|---------------------------------|
| BLCA (n ² = 3) | CPhase 01 | C1501 | 2.75 (5) | | | | |
| | CPhase 03 | C1503 | 3.75 (6) | | 8 (11) | 0.75 (1) | |
| Cibola NWR Unit #1 (n = 4) | CW-North | C2707 | | 0.25 (1) | | | 0.75 (2) |
| | Cottonwood Genetics | C2703 | | | | 1 (1) | |
| | Crane Roost | C2721 | | | 1 (1) | | |
| | | C2722 | | | 1 (1) | | |
| | Middle Hippy Fire | C2736 | | | 0 (1) | | |
| | | C2739 | | | 0.75 (1) | | |
| CVCA (n = 3) | Phase 01 | C2505 | | 0.25 (1) | 1 (1) | | |
| | Phase 03 | C2512 | | | 0 (1) | | |
| | Phase 04 | C2516 | | | | 1 (1) | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher |
|--|----------------|-------|----------------------|-----------------|------------------------|----------------|----------------------|
| LDCA (n = 3) | Reach 01 | C4933 | 1 (2) | | | | |
| | | C4937 | 2.75 (3) | | 1 (1) | | |
| | | C4939 | 1.75 (2) | 0 (1) | | | |
| | | C4944 | 3 (3) | | | | |
| | Reach 02 | C4946 | 1 (1) | | | | |
| | | C4953 | | 0 (1) | | | |
| Middle Bill Williams River NWR East (n = 4) | Cougar Point | C1906 | 0 (4) | 0.75 (2) | | | |
| | Esquerra Ranch | C1905 | 2.25 (10) | 0.5 (1) | | | |
| | Kohen Ranch | C1908 | 0.5 (2) | 0.75 (4) | | | |
| | Mineral Wash | C1901 | 14 (20) | 1.75 (4) | 3 (5) | 2 (2) | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher |
|---|-----------------|-------------|---------------------------------|----------------------------|-----------------------------------|---------------------------|---------------------------------|
| Middle Bill Williams River NWR West (n = 4) | Borrow Pit | C1917 | | 1 (2) | | 1 (1) | |
| | Cross River | C1929 | 3 (4) | 0.25 (1) | 4 (4) | 0.5 (1) | |
| | Fox Wash | C1922 | 5.5 (6) | 1 (1) | | | |
| | | C1924 | 1 (1) | 1 (1) | | 0.75 (1) | |
| | Mosquito Flats | C1931 | 7.5 (9) | 2 (3) | 64 (66) | 1.75 (2) | |
| | | C1932 | 0.75 (2) | 1.5 (2) | 39.75 (43) | 3 (3) | |
| | | C1933 | | 2.25 (3) | 5 (6) | 1 (1) | |
| | Sandy Wash | C1912 | 2 (2) | 1 (1) | | | |
| | | C1914 | 4 (4) | 1 (1) | | | |
| | | C1915 | 0.75 (1) | 0.75 (1) | | | |
| Parker Dam Camp (n = 1) | Parker Dam Camp | C2001 | | 0.25 (1) | | | |
| | | C2003 | | 1.25 (2) | | | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher |
|-------------------|----------|-------|----------------------|-----------------|------------------------|----------------|----------------------|
| PVER (n = 1) | Phase 01 | C2301 | | | | 1 (1) | |
| | Phase 04 | C2309 | | | | 2 (2) | |
| | Phase 05 | C2317 | | | | 1 (1) | |
| | Phase 07 | C2327 | | | | 0.75 (1) | |
| | | C2330 | | | | 0.25 (1) | |
| | | C2333 | | | | 1 (1) | |
| YEW (n = 1) | D | C4704 | | 0.5 (1) | | | |
| | F | C4705 | | 0.5 (1) | | | |
| | South AC | C4711 | | 1.25 (3) | | | |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

The only vermilion flycatchers recorded in 2019 were at Cibola NWR Unit #1, CW-North plot C2707 (see table 8). Two partial territories amounted to 0.75 territory on plot (see table 8).

Surveyors recorded Sonoran yellow warbler territories at five conservation areas: BLCA, Middle Bill Williams River NWR, Cibola NWR Unit #1, CVCA, and LDCA (see table 8). Densities were no higher than one territory per plot at the latter three. Densities were moderate at most the BLCA and Middle Bill Williams River NWR plots, where surveyors recorded territories, ranging from 3 to 8, with the exceptions of two Middle Bill Williams River NWR West, Mosquito Flats plots, C1931 (64 territories on plot) and C1932 (39.75 territories on plot; see table 8).

Surveyors recorded 23 territories of non-focal territorial bird species during rapid area search surveys (table 9). Overall, the most common non-focal territorial species were the Abert's towhee, song sparrow, and common yellowthroat. The most widespread (i.e., found on the most individual rapid area search surveys) were the Abert's towhee, ladder-backed woodpecker (*Dryobates scalaris*), and verdin (*Auriparus flaviceps*). Notable rare species included a Hutton's vireo (*Vireo huttoni*) at Middle Bill Williams River NWR West, Mosquito Flats.

Surveyors detected 45 non-territorial species during rapid area search surveys in 2019 (table 10). This includes an elf owl, which the surveyor thought was likely breeding off plot. Four non-territorial species were far more numerous than all others overall: red-winged blackbird and white-winged dove (*Zenaida asiatica*), both with 536 estimated pairs; mourning dove (*Zenaida macroura*) with 425 estimated pairs; and brown-headed cowbird (*Molothrus ater*) with 311 estimated pairs (table 10).

Intensive Area Search Surveys

On 64 visits to 8 intensive area search survey plots, surveyors detected 64 species, including 24 species classified as territorial and 40 species classified as non-territorial.

Of the six focal species, the Arizona Bell's vireo, Gila woodpecker, Sonoran yellow warbler, and summer tanager were recorded on at least one intensive area search survey (table 11). No gilded flickers or vermilion flycatchers were detected on intensive area search surveys in 2019.

Surveyors recorded territories of 20 non-focal territorial bird species during intensive area search surveys. Overall, the most common non-focal species were the Abert's towhee, song sparrow, and Lucy's warbler (*Leiothlypis luciae*). The most widespread (i.e., found on the most individual intensive area search surveys) were the Abert's towhee and ladder-backed woodpecker, both of which were found on every intensive area search survey.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Surveyors detected 40 non-territorial species during intensive area search surveys in 2019, of which surveyors categorized 39 species as breeding on plot (table 12). A western screech-owl (*Megascops kennicottii*) was detected primarily off plot. The most numerous non-territorial species were the brown-headed cowbird, mourning dove, and white-winged dove, all with 65 estimated pairs (table 12). Of the six non-focal covered species, the Yuma clapper rail, western least bittern, and elf owl were recorded on at least one intensive area search survey (table 12). No yellow-billed cuckoos, California black rails, or southwestern willow flycatchers were detected on intensive area search surveys in 2019.

Results by Habitat Type

Of the three conservation area habitat types (cottonwood-willow, mesquite, and mixed), surveyors recorded the highest numbers of all five detected focal species in cottonwood-willow habitat (table 13).

The highest numbers of Arizona Bell's vireo territories in cottonwood-willow habitat were at Middle Bill Williams River NWR East (33 total territories, 17 territories on plot) and Middle Bill Williams River NWR West (27 total territories, 22.5 territories on plot), and in mixed habitat, the highest number was at the LDCA (10 total territories, 8.5 territories on plot; table 13). Surveyors recorded no Arizona Bell's vireo territories in mesquite habitat.

The highest numbers of Gila woodpecker territories in cottonwood-willow habitat were at Middle Bill Williams River NWR East (11 total territories, 4 territories on plot) and Middle Bill Williams River NWR West (12 total territories, 9.25 territories on plot; table 13). In mesquite habitat, surveyors found single partial Gila woodpecker territories at Parker Dam Camp and YEW (table 13). The highest number of territories in mixed habitat was at YEW (one territory) (table 13); the two territories at the LDCA were located outside the conservation area.

The highest number of summer tanager territories in cottonwood-willow habitat was at Middle Bill Williams River NWR West (10 total territories, 9.25 territories on plot), the only territory in mesquite habitat was at the CVCA, and both territories in mixed habitat were at the PVER (table 13).

Both vermilion flycatcher territories recorded in 2019 were in cottonwood-willow habitat at Cibola NWR Unit #1 (table 13).

Sonoran yellow warbler territories were concentrated in cottonwood-willow habitat, particularly at Middle Bill Williams River NWR West (125 total territories, 121.75 territories on plot; table 13). The only Sonoran yellow warbler territory outside of cottonwood-willow was in mixed habitat at the LDCA (table 13).

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 9.—Number of territories for 23 non-focal territorial species¹ on rapid area search surveys by conservation area, phase, and plot in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes new combined territories.)

| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | |
|--------------------------------|---------------------|-------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|------------|-------------------|----------------------|-------------|--------------|--------------|-------------|------------------|----------------------|------------|
| BLCA (n ² = 11) | CPhase 01 | C1501 | 3.75 (4) | | | 2.75 (3) | | | | | 1.75 (3) | 2 (2) | | | 1.5 (2) | 3.5 (4) | | | | | | 2.5 (4) | 3.25 (4) | | 2.75 (3) | |
| | CPhase 03 | C1503 | 7 (9) | | | 1.5 (2) | | 0.75 (1) | 2.25 (3) | | 1.5 (2) | 0.25 (1) | | | 2 (3) | 1 (1) | | | | | | | 2 (4) | | 2.25 (3) | |
| Cibola NWR Unit #1 (n = 12) | CW-North | C2707 | 4.5 (7) | 1.25 (2) | | 0.5 (1) | 1.5 (2) | | 1 (2) | | | | | | 0.75 (1) | 0.75 (1) | | | | | | | 2 (3) | 2.75 (5) | | |
| | Cottonwood Genetics | C2703 | 3 (3) | 0.75 (1) | | | 1 (1) | | 1 (1) | | 1 (1) | 1 (1) | | | 0.75 (1) | 4 (4) | | | | | | | 2 (2) | 0.75 (1) | | |
| | Crane Roost | C2721 | 3.5 (5) | 0.75 (1) | | | 1.5 (2) | | | 0.75 (1) | | | | | 0.75 (1) | | | | | | | | | 0 (1) | | |
| | | C2722 | 5 (6) | 1 (1) | | 1 (1) | 0.5 (1) | | | 1 (1) | | | | | | 2 (2) | 3 (3) | | | | | | | 4 (4) | 5 (5) | |
| | | C2724 | 2.25 (4) | | | 1.5 (3) | 1 (1) | | | | | | | | | 2.75 (3) | | | | | | | | 1 (1) | | |
| | Middle Hippy Fire | C2736 | 0.5 (1) | | | | 2 (3) | | | | | | | | | 0.75 (1) | | | | | | | | | | |
| | | C2739 | 2 (2) | | | | 1.75 (2) | | | 1 (1) | | | | | | | | | | | | | | 0.5 (1) | | |
| | Nature Trail | C2705 | 3.5 (4) | 1 (1) | | 2 (2) | | | | 1 (1) | | | | | | 0.75 (1) | 3 (3) | | | | | | | 3 (3) | 1 (2) | |
| | | C2706 | 3.25 (4) | 1.75 (2) | | 2 (2) | | | | 0.75 (1) | | | | | | 2.5 (3) | 3 (3) | | | | | | | 3 (3) | | |
| | Upper Hippy Burn | C2727 | 1.75 (2) | 1 (1) | | | | | | 2 (3) | | | | | | 2 (2) | | | | | | | | 1 (1) | 0.5 (1) | 0.5 (1) |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | | |
|-------------------------|-----------|-------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|------------|-------------------|----------------------|-------------|--------------|--------------|-------------|------------------|----------------------|----------|--|
| CVCA (n = 12) | Phase 01 | C2503 | 0.25 (4) | 1.25 (2) | | | | | | | | | | | 1.25 (5) | | | | | | | | | | | | |
| | | C2505 | 7.5 (8) | 0.75 (1) | | 1 (1) | 1 (1) | | | | | | | | | 2.25 (3) | | | | | | | 1 (1) | 1 (1) | | | |
| | Phase 02 | C2506 | 2 (3) | | | 1.25 (2) | | | 2.25 (3) | | | 0 (1) | | | | 0 (1) | | | | | | | | 0 (1) | 2 (2) | | |
| | | C2508 | 2 (3) | 0 (1) | | | 0.75 (2) | | 2.25 (3) | | | | | | | 1 (2) | | | | | | | | | 0.25 (1) | | |
| | Phase 03 | C2512 | 4.75 (5) | | | 0.75 (1) | 1 (1) | | 1.5 (2) | | | 1.25 (2) | | | 0.75 (1) | 1 (1) | | | | | | | 4.5 (6) | 2.25 (3) | | | |
| | Phase 04 | C2513 | 8.25 (11) | | | 8.75 (9) | | | | | | 1 (2) | | | 1 (2) | | | | | | | | | 9 (11) | | | |
| | | C2514 | 4.75 (6) | | | 3 (3) | 0.5 (1) | | 0.75 (1) | | | 1.75 (2) | | | 1.25 (2) | | | | | | | | | 6 (7) | 1.25 (2) | | |
| | | C2516 | 4 (5) | 1.75 (2) | | 3 (3) | 0.5 (1) | | 1 (2) | | | 1.5 (2) | | | 0.75 (1) | | | | | | | | | 5.25 (6) | | | |
| | Phase 05 | C2520 | 8 (8) | | | 9 (9) | 2 (2) | | | | | 2 (2) | | | 1 (1) | 2 (2) | | | | | | | | 6.5 (8) | | | |
| | Phase 06 | C2523 | 3.75 (5) | | | 2.5 (4) | 1 (2) | | 0.75 (1) | | | 1.75 (2) | | | 0.25 (1) | 1 (1) | | | | | | | | 5 (6) | | | |
| | Phase 07 | C2541 | 3.5 (4) | | | 1 (1) | | | | | | 1 (1) | | | | | | | | | | | | | | | |
| | Phase 08 | C2544 | 4.5 (5) | | | 2 (2) | 1.75 (2) | | 0.75 (1) | | | 1 (1) | | | 1 (1) | 2 (2) | | | | | | | | 2 (2) | | 1 (1) | |
| | Phase 09 | C2546 | 2 (3) | | | | 2.5 (3) | | | | | | | | | | | | | | | | 0.25 (1) | | 1.5 (2) | | |
| | | C2547 | 4.75 (5) | | | 1 (1) | 2.75 (3) | | | | | | | | | 1 (1) | | | | | | | 1.25 (2) | 1 (1) | | | |
| Hunters Hole (n = 5) | CPhase 01 | C5901 | 3 (3) | 3 (3) | | | | | | | | 1 (1) | | | 1 (1) | | | | | | | | 1 (1) | | | | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | | |
|--|----------------|-------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|------------|-------------------|----------------------|-------------|--------------|--------------|-------------|------------------|----------------------|---------------|-------------|
| LDCA (n = 12) | Reach 01 | C4933 | 3 (3) | | | 1 (2) | | | | | 1.75 (2) | 0.5 (1) | | | 1 (1) | | | | | | | 1.75 (2) | 2.75 (4) | | 0.5 (1) | | |
| | | C4937 | 6 (6) | | | 5 (5) | 2 (2) | | | | 1 (1) | 1 (1) | | | 2 (2) | | | | | | | | 2 (2) | 4 (4) | | 6 (6) | |
| | | C4939 | 1.75 (2) | 0.75 (1) | | 1.75 (2) | | | | | | 3 (4) | | | | 0.75 (1) | | | | | | | | 3.25 (4) | 0.75 (1) | | 4.75 (5) |
| | | C4942 | 2.75 (3) | | | 1 (1) | 1 (1) | | | | | 5 (7) | | | | 1 (1) | 1 (1) | | | | | | | 3.75 (4) | 1.75 (2) | | 6 (6) |
| | | C4944 | 5.75 (6) | | | 4.75 (5) | 1 (1) | | | | | 4 (4) | 0.5 (1) | | | 1.5 (2) | | 1 (1) | | | | | | 7 (8) | 2.75 (3) | | 7.25 (8) |
| | Reach 02 | C4945 | 1.5 (2) | 1 (1) | | 2.75 (3) | | | | | | | 0.75 (1) | | | 1 (1) | | | | | | | | 3.75 (4) | | | |
| | | C4946 | 2.5 (5) | | | 2.5 (3) | | | | | | 6.75 (9) | 0.75 (1) | | | 0.75 (1) | | | | | | | | 6.5 (8) | 1.25 (2) | | |
| | | C4951 | 0.75 (1) | | | 1 (1) | | | | | | 7 (8) | | | | 0.75 (1) | | 2.75 (3) | | | | | | 6 (6) | 1 (1) | | |
| | | C4953 | 1.75 (2) | | | 0 (1) | | | | | | 0.25 (1) | | | | 0.75 (1) | | | | | | | | 0.25 (1) | 1.25 (2) | | |
| | | C4954 | 2 (2) | | | | | | | | | 4 (5) | 0.5 (1) | | | 0.5 (1) | | 2.5 (3) | | | | | | 2 (3) | 2 (2) | | |
| Middle Bill Williams River NWR East (n = 16) | Cougar Point | C1906 | 2 (4) | 2 (4) | 5.75 (6) | 2.75 (4) | 1 (1) | 2.25 (4) | | | 5 (5) | 1 (2) | | | 2 (3) | 6.75 (9) | | | | 0.5 (1) | | | 6 (7) | 2 (4) | | 1 (1) | |
| | Esquerra Ranch | C1905 | 3.25 (5) | 1.25 (2) | 2.75 (3) | 2.75 (3) | 0.5 (1) | 0.5 (1) | | 0.25 (1) | 7 (8) | 1 (2) | | | 1.25 (2) | 2.75 (5) | | | | 1 (1) | | | 9.5 (10) | 1.5 (3) | | 2.75 (3) | |
| | Kohen Ranch | C1908 | 2.25 (3) | 2 (3) | 3.75 (5) | 1.75 (2) | 1 (2) | 0.5 (2) | | | 1 (1) | 1 (1) | | | 1 (1) | 3 (5) | | 1.5 (3) | | | | | 1 (2) | | | | |
| | Mineral Wash | C1901 | 4.25 (5) | 2.5 (3) | 6.75 (8) | 3.75 (4) | 2 (2) | 1.5 (2) | | | 18 (18) | 2 (2) | | | 2.5 (3) | 9.75 (11) | | | | 1 (1) | | | 12 (12) | 3.25 (4) | | 16.75 (18) | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

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| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | | |
|--|--------------------------|-----------------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|-------------|-------------------|----------------------|-------------|--------------|--------------|---------------|------------------|----------------------|------------|---------------|
| Middle Bill Williams River NWR West (n = 18) | Borrow Pit | C1917 | 5 (5) | 1 (1) | 4.5 (5) | | | 1 (1) | | | | 1 (1) | | | 1.5 (2) | 5 (5) | | | | | | 9 (9) | | | 4.75 (5) | | |
| | Cross River | C1929 | 2.5 (3) | 0.75 (1) | 5.75 (7) | 1.75 (2) | 1.5 (2) | | | 1 (1) | 2 (2) | 1 (1) | | | 0.75 (1) | 5.5 (6) | | | | | | | 13.25 (14) | 1.75 (2) | | 10 (11) | |
| | Fox Wash | C1922 | 8.25 (9) | | 1 (1) | 1.25 (2) | | | 1 (1) | | | 1 (1) | 4.25 (5) | | | 1 (1) | 4.75 (5) | | | | 1 (1) | | | 5.75 (6) | 3.25 (4) | | 3.5 (4) |
| | | C1924 | 6.75 (7) | 1.25 (2) | 0.5 (1) | 1 (1) | | | | | | | 3 (3) | | | 1 (1) | 4 (4) | | | | | | | 1 (1) | 5 (5) | | 1 (1) |
| | Mosquito Flats | C1931 | 2.75 (3) | | 9.75 (10) | 0.75 (1) | 1.25 (2) | | 1 (1) | | 1 (1) | 81.75 (83) | 0.5 (1) | | | 3.5 (4) | 3.75 (4) | | | | | | | 111.25 (112) | 1.75 (3) | | 60.5 (61) |
| | | C1932 | 5.5 (6) | 0.75 (1) | 7.25 (9) | | | | 2 (2) | 2 (2) | 3.75 (4) | 49.5 (51) | | | 1 (1) | 2.75 (3) | 6.75 (7) | | | | | | | 41 (41) | | | 44.25 (45) |
| | | C1933 | 6 (6) | | 8 (9) | | | | 0.75 (1) | | 2 (2) | 10 (10) | | | | 2 (2) | 6 (6) | | | | | | | 13.25 (14) | | | 28 (30) |
| | Sandy Wash | C1912 | 5 (5) | 2 (2) | 1 (1) | 2 (2) | 1 (1) | 1 (1) | | | | | 1 (1) | | | 2 (2) | 7.75 (8) | | 0.75 (1) | | | | | 8 (8) | 3 (3) | | |
| | | C1914 | 7 (7) | 1.75 (2) | 6.75 (7) | 2 (2) | 1 (1) | 2 (2) | | | 1.75 (2) | 5 (5) | 2 (2) | | | 1 (1) | 4 (4) | | | | 1 (1) | | | 3 (3) | 4 (4) | | 4 (4) |
| | | C1915 | 6 (7) | 1.5 (2) | 5 (5) | 2.5 (3) | 1 (1) | | | | | 2.75 (3) | 1.25 (2) | | | 2 (2) | 8.75 (9) | | | | | | | 4 (4) | 4.75 (6) | | 1 (1) |
| | Parker Dam Camp (n = 14) | Parker Dam Camp | C2001 | 3.25 (4) | 0.75 (1) | | 1.25 (2) | | | 0.5 (1) | 0.5 (1) | | 1 (1) | 1 (1) | | 1.5 (2) | 11 (12) | | | | 1(1) | | | 4.75 (5) | 0.5 (1) | | |
| | | | C2003 | 6.25 (8) | 2 (4) | | 3.25 (5) | 0.75 (1) | | | | 0.75 (2) | | 0.25 (1) | | | 1.75 (3) | 1.75 (2) | | | | | | | 5 (5) | 8 (13) | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 9.—Number of territories for 23 non-focal territorial species¹ on rapid area search surveys by conservation area, phase, and plot in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes new combined territories.)

| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | |
|-------------------|----------|-------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|-------------|-------------------|----------------------|-------------|--------------|--------------|-------------|------------------|----------------------|-------------|
| PVER (n = 14) | Phase 01 | C2301 | 3 (7) | | | 0.5 (1) | 1.25 (2) | | 0.75 (1) | | 1 (1) | 0 (1) | | | 2 (2) | | | | | | | | 2 (3) | 2.5 (3) | | |
| | Phase 02 | C2302 | 5.5 (7) | 0.75 (1) | | 1 (1) | 2.25 (3) | | 3.75 (4) | | | 0.25 (1) | | | 2.5 (3) | | | | | | | | 1.75 (3) | 3 (4) | 0 (1) | |
| | Phase 03 | C2306 | 3.75 (6) | | | | 1.25 (2) | | 1 (1) | | 0 (1) | | | | 1.75 (2) | | | | | | | | 1 (1) | 2.5 (3) | 0 (1) | |
| | Phase 04 | C2308 | 1.25 (2) | | | 0.75 (1) | 2 (3) | | 0.5 (1) | | | | | | | 1.5 (2) | 1.75 (2) | | | | | | | | 1.5 (2) | |
| | | C2309 | 1 (1) | | | 1 (1) | 0.5 (1) | | 2 (2) | | | | | | | 2 (2) | 1 (1) | | | | | | | | 1 (1) | |
| | | C2311 | 4.25 (5) | | | 3.5 (4) | 1.5 (2) | | 0.75 (1) | | | | 0.75 (1) | | | 1.25 (2) | 2 (2) | | | | | | | 4.75 (5) | 0.75 (1) | 3.25 (4) |
| | Phase 05 | C2315 | 3.5 (4) | | | | 1 (2) | 0.75 (1) | | | | | | | | 2 (2) | | | | | | | | | | |
| | | C2317 | 3 (4) | | | 0.75 (1) | 0.75 (2) | | 1.5 (2) | | | | | | | 1.25 (2) | | | | | | | | 0.5 (1) | 1 (1) | 1.5 (2) |
| | | C2318 | 1 (2) | | | 1 (1) | | | 0.75 (1) | | | | | | | 2 (2) | | | | | | | | | | 4 (4) |
| | Phase 06 | C2323 | 1 (2) | 0.5 (1) | | 2 (2) | 1.25 (2) | | 2.25 (4) | | | | | | | 1 (2) | 4.25 (5) | | | | | | | | 0.75 (1) | |
| | | C2326 | 1.5 (2) | 1 (1) | | 1.75 (2) | 1.75 (2) | | 1.5 (2) | | | | | | | 2 (3) | 3.5 (4) | | | | | | | 0.5 (1) | 0.75 (1) | |
| | Phase 07 | C2327 | 3 (3) | | | | 2 (3) | 0.75 (1) | 1 (1) | | | | | | | 1.75 (2) | | | | | | | | 1 (2) | 1.5 (2) | |
| | | C2330 | 0.75 (1) | 0.75 (1) | | 1 (1) | 1.75 (4) | | 0.75 (2) | | | | | | | 1.5 (2) | 3.75 (5) | | | | | | | 1 (1) | 0.5 (1) | |
| | | C2331 | 1.75 (3) | 1 (1) | | 2 (2) | 2.75 (3) | | 1.5 (2) | | | | | | | 1.5 (2) | 2 (2) | | | | | | | 1 (1) | 3.75 (4) | |
| | | C2333 | 1.5 (3) | 0.25 (1) | | | 1.25 (2) | | 1 (1) | | | | | | | 1.5 (2) | | | | | | | | | | |

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Table 9.—Number of territories for 23 non-focal territorial species¹ on rapid area search surveys by conservation area, phase, and plot in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes new combined territories.)

| Conservation area | Site | Plot | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | | |
|-------------------|----------|-------|----------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|---------------|----------------|--------------------------|----------------|------------|-------------------|----------------------|-------------|--------------|--------------|------------|------------------|----------------------|--|--|
| PWCA (n = 12) | PWCA | C2902 | 0.5 (2) | | | 5 (5) | 1.5 (2) | | | | 0 (1) | | | | | | | | | | | | | | | | |
| | | C2903 | 0.5 (1) | | | 0.25 (1) | 0.75 (1) | | | | 1.75 (3) | | | | | | | | | | | 0.25 (1) | | 1 (1) | | | |
| | | C2906 | 3.75 (4) | 1 (1) | | | 0.75 (1) | | | | | | | | | | 1 (1) | | | | | | | 2 (2) | | | |
| | | C2911 | | 0.5 (1) | | 1 (1) | 0.25 (1) | | | | | | | | | | | | | | | | | 1.5 (2) | | | |
| | | C2913 | 0.5 (1) | 0.5 (1) | | 2.25 (4) | 0.75 (1) | | | | | | 0 (1) | | | | | | | | | | | 0.5 (1) | | | |
| | | C2915 | 4.25 (5) | 0.75 (1) | | 3.75 (4) | 0.75 (1) | | | | | | 0.75 (1) | | | 0.75 (1) | | | | | | | | 4 (4) | | | |
| | | C2917 | 3.75 (4) | 1 (2) | | 2 (2) | 0.75 (1) | | | | | | 1 (1) | | | 0 (1) | | | | | | 0 (1) | | | 1.75 (2) | | |
| | | C2918 | 3.25 (4) | | | 4.75 (6) | | | | | | 0 (1) | 1.75 (2) | | | | | | | | | | | | | | |
| | | C2921 | 0.5 (1) | 1 (1) | | 2.5 (3) | | | | | | | 1.25 (2) | | | 0.75 (1) | 0.5 (1) | | | | | | | | 2 (2) | | |
| YEW (n = 9) | D | C4704 | 3 (3) | 1.75 (2) | | 3.5 (4) | 0.75 (2) | | | | | 1 (1) | | | 0.75 (2) | | | | | | | | 4 (5) | | | | |
| | F | C4705 | 4.75 (6) | | | 3 (3) | 0.75 (2) | | | | | 0.5 (1) | | | 2 (3) | | | | | | | | 7 (9) | | | | |
| | I | C4702 | 4 (5) | 0.75 (1) | | 2.75 (3) | 1 (1) | | | | | 1 (1) | | | 1.5 (2) | | | | | | | | 7 (10) | | 0.25 (1) | | |
| | South AC | C4711 | 2.25 (3) | 1.5 (2) | | | | | | | | | | | 0.25 (1) | | | | | | | | 5.5 (6) | 1 (1) | | | |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

Table 10.—Estimated number of pairs of 45 non-territorial species¹ on rapid area search surveys by habitat type and conservation area in 2019

| Conservation area | Site | Plot | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Cooper's hawk | Common raven | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great horned owl | Great egret | Green heron | Greater roadrunner | Great-tailed grackle | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total | | |
|-----------------------------------|---------------------|-------|---------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|---------------|--------------|------------------------|-------------------|----------------|------------------|------------------|-------------|-------------|--------------------|----------------------|-------------|---------------|-----------|----------|----------------------|------------------|------------------|----------------|---------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|-------|----|----|
| BLCA (n ² = 13) | CPhase 01 | C1501 | | | | | | 4 | | | 1 | | | | | 1 | | 1 | | | | 1 | 1 | 1 | | | | | | 1 | | | 3 | | | | | | | | | | | | 8 | 22 | | | | |
| | CPhase 03 | C1503 | | | | | | 3 | | | | | | | | | | 3 | | 1 | | | | | 1 | | | | | | | | | 9 | 1 | | | | | | | | | | | | 6 | 26 | | |
| Cibola NWR Unit #1 (n = 21) | CW-North | C2707 | 1 | | | | | 7 | | | | | | | | 1 | 3 | 2 | | 1 | | | | 1 | 1 | | | | | | 1 | | 22 | | | | 20 | | | | | | | | | | 8 | 68 | | |
| | Cottonwood Genetics | C2703 | | | | | | 6 | | | | | | | | | | 1 | 1 | 1 | | | | | 2 | 16 | | 1 | | | | | 4 | | | | 2 | | | | | | | | | | 6 | 1 | 41 | |
| | Crane Roost | C2721 | | | | | | | 5 | | | | | | | | | | | | | | | | | 1 | | | | | | | 10 | | | | | 35 | | | | | | | | | 32 | 83 | | |
| | | C2722 | | | | | | | 23 | | | | | | | | | | | | | | | | | | 5 | | | | | | | 8 | | | | | 10 | | | | | | | | | 17 | 63 | |
| | | C2724 | | | | | | | 2 | | | | | | | | | 2 | 1 | | | | | | 1 | 2 | | | 1 | | | | 1 | | | | 14 | | | | | | | | | | 3 | 27 | | |
| | Middle Hippy Fire | C2736 | | | | | | | 6 | | | | | | | | | | 4 | | | | | | | 2 | | 1 | | | | 1 | | 3 | 1 | | | 7 | | | | | | | | | 5 | 1 | 31 | |
| | | C2739 | | | | | | | 5 | | | | | | | | | | | | | | | | | 1 | 1 | | | | | | 2 | | | | | | | | | | | | | | | 14 | 23 | |
| | Nature Trail | C2705 | | | | | | 2 | 5 | | | | | | | | | | 3 | | | | | | | 4 | | | | | | | 10 | | | | | 1 | | | | | | | | | | | 13 | 38 |
| | | C2706 | | | | | | | 3 | | | | | | | 1 | 2 | 1 | | | | | | | 1 | 5 | | | 1 | | | | 2 | | | | | | | | | | | | | | | 8 | 24 | |
| | Upper Hippy Burn | C2727 | | | 1 | | | | 6 | | | | | | 1 | | | | | | 1 | | | | | 9 | | 1 | | | | 4 | | | | 1 | 1 | | | | | | | | | | | 8 | 33 | |
| CVCA (n = 16) | Phase 01 | C2503 | | | | | | 4 | | | | | | 1 | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | 2 | 9 | | |
| | | C2505 | | | | | | 19 | | | | | 1 | | | | 2 | 7 | | | | | | | | | | 2 | | | | | 10 | | | | | | | | | | | | | | | 9 | 50 | |
| | Phase 02 | C2506 | | | | | | | 3 | | | | | | | | 1 | 2 | | | | | | 1 | | | | | | | | 3 | | | | | 1 | | | | | | | | | | | 1 | 12 | |
| | | C2508 | | | | | | | 4 | | | | | | 1 | 2 | | | | | | | | | | 1 | 3 | | | | | 2 | | | | | | | | | | | | | | | | 4 | 17 | |
| | Phase 03 | C2512 | | | | | | 4 | | | | | | 1 | | | 4 | | | | | | | | | | | | | | 10 | | | | | | | | | | | | | | | | | 15 | 34 | |
| | Phase 04 | C2513 | | | | | | | 2 | | | | | | | | 1 | 4 | | | | | | 1 | | | | | | | | 4 | | | | | 3 | | | | | | | | | | | 4 | 20 | |
| | | C2514 | | | | | | | 5 | 3 | | | | | | | | | 5 | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | 6 | 22 | |
| | | C2516 | | | | | | | 5 | 1 | | | | | | | | | 4 | | | | | 1 | | | | | | | | 8 | | | | | | | | | | | | | | | 3 | 22 | | |
| | Phase 05 | C2520 | | | | | | 2 | | | | | | | | | 3 | 5 | | | | | | 1 | | | | | | | 1 | | | | | | | | | | | | | | | | | 5 | 17 | |
| | Phase 06 | C2523 | | | | | | 8 | 5 | | | | | | | | | | 10 | | | | | 1 | | | | | | | 4 | | | | | | | | | | | | | | | | | 20 | 48 | |
| | Phase 07 | C2541 | | | | | | 4 | | | | | 1 | | | | | 4 | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | 3 | 14 | |
| | Phase 08 | C2544 | | | | | | 10 | 25 | | | | | | | | | 8 | | | | | | 1 | 1 | 4 | | | | | 15 | | | | | | 3 | | | | | | | | | | 8 | 75 | | |
| | Phase 09 | C2546 | | | | | | | 5 | | | | | | | | | | 4 | | | | 1 | 1 | 8 | | | | | | 2 | 1 | | | | | 1 | | | | | | | | | | | 3 | 26 | |
| C2547 | | | | | | | | 6 | 30 | | | | | | | | | 3 | | | | | | | 1 | | | | | | 3 | | | | | | | | | | | | | | | | 10 | 53 | | |
| Hunters Hole (n = 5) | CPhase 01 | C5901 | | | | | | 3 | | | | | | | | | | 3 | | | | | 1 | | | | | | | | | | | 3 | | | | | | | | | | | | | 1 | 11 | | |

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Table 10.—Estimated number of pairs of 45 non-territorial species¹ on rapid area search surveys by habitat type and conservation area in 2019

| Conservation area | Site | Plot | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Cooper's hawk | Common raven | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great horned owl | Great egret | Green heron | Greater roadrunner | Great-tailed grackle | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total | |
|---|----------------|-------|---------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|---------------|--------------|------------------------|-------------------|----------------|------------------|------------------|-------------|-------------|--------------------|----------------------|-------------|---------------|-----------|----------|----------------------|------------------|------------------|----------------|---------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|-------|----|
| LDCA (n = 21) | Reach 01 | C4933 | 1 | | | | | 3 | | | 1 | | | | | | | 6 | | | | 1 | 2 | | | | | | | 1 | | | 2 | | | | | 1 | | | | | | | 1 | | 20 | | |
| | | C4937 | | | | | | 2 | | | | | | | | | | | 9 | | | | 1 | 1 | | | | | 1 | | | | 3 | | | | | | | | | 1 | | | | 7 | | 25 | |
| | | C4939 | 1 | | | | | 3 | | | | | | | | | | | 2 | | | | 1 | 1 | | | | | | | 2 | | 2 | 1 | | | | | | | | | | | | 2 | | 15 | |
| | | C4942 | 1 | | | 1 | | 2 | | | | | | | | | | | 2 | | | | | | 7 | | | | | | | 4 | | | | 1 | | | | | | 1 | | | | 9 | | 28 | |
| | | C4944 | 1 | | | | | 5 | | | | | | | | | | | 2 | | | | | | 2 | | | | 1 | | 1 | | 2 | | | | | | | 1 | 2 | | | 2 | | 20 | | | |
| | Reach 02 | C4945 | | | | | | | | | | | | | | | | | 6 | | | | | 1 | | | | | | 1 | | 2 | | 2 | | | | | | | | | | | | | 6 | | 18 |
| | | C4946 | 2 | | | | | | | | | | 1 | | | | | | | | | | 1 | | 3 | | | | 2 | | 5 | | 7 | | | | | | | | 2 | | | | | 8 | | 31 | |
| | | C4951 | 5 | | | | | | 2 | | | | | | | | | | 1 | | | | | | 2 | | | 1 | | 1 | | 1 | 2 | | | | | | | | | 1 | | | | 2 | | 22 | |
| | | C4953 | | | | | | | 2 | | | | | | | | | | 2 | | | | | | 4 | | | 1 | | | | 3 | | | | | | | | | | 1 | | | | 3 | | 16 | |
| | | C4954 | 1 | | | | | | 6 | | | | | | | | | | 6 | | | | | | 3 | | | | | | | 3 | | | | | | | | | | | | | 2 | | 21 | | |
| Middle Bill Williams River NWR East (n = 19) | Cougar Point | C1906 | | | | | | 3 | | | | | | 1 | | | | 3 | | | | 1 | | 3 | | | | 1 | 4 | | | 10 | | | | | | | 1 | | | | | 5 | 7 | | 39 | | |
| | Esquerra Ranch | C1905 | | | | | | 2 | 15 | | | | | 1 | | | | | | | 1 | | 1 | 3 | | | | 1 | 3 | | | 3 | | | | | | | | 1 | | | | 2 | 1 | | 34 | | |
| | Kohen Ranch | C1908 | | | | | | 2 | | | | | | | | | | 1 | | | | | 2 | 1 | | | | | | 1 | 6 | 1 | | | | | 1 | | | | | | | | 4 | | 19 | | |
| | Mineral Wash | C1901 | | | | | | 4 | | 1 | | | 1 | 1 | | | | 6 | | | | | | 3 | | | | | 4 | | | 13 | | | 1 | | | | | | | | | | 8 | | 42 | | |
| Middle Bill Williams River NWR West (n = 16) | Borrow Pit | C1917 | | | | | | 2 | | | | | | | | | | | | | | | | 1 | | | | | | | 5 | | | | | | | | | | | | | 1 | 6 | | 16 | | |
| | Cross River | C1929 | | | | | | 1 | 4 | | | | 1 | | | | | | | | | | | 1 | | | | | 2 | | 4 | | | | | | | | | | | 1 | | | 5 | | 19 | | |
| | Fox Wash | C1922 | | | | | | 4 | | | | | | | | | | 1 | | | | | | | | | | | | | 2 | 1 | | | | | | | | | | | 1 | 2 | | 11 | | | |
| | | C1924 | | | | | | | | | | | | | | | | | 3 | | | | | 1 | 3 | | | | | | 3 | | | | | | | | | | | | | 5 | | 18 | | | |
| | Mosquito Flats | C1931 | | | | | | 4 | | | | | | | | | | | | | | | 1 | | | | | | | 3 | | | 1 | | | | | | | | | | | | | 4 | | 13 | |
| | | C1932 | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | 5 | 1 | | 6 | | | | | | | | | | | 10 | 4 | | 30 | | | |
| | | C1933 | | | | | | 2 | | | | | | | | | | | | | | | | | 1 | | | | | | 4 | | | | | | | | | | | | | 3 | | 10 | | | |
| | Sandy Wash | C1912 | | | | | | | | | | | | | 1 | | | | 1 | | | | | 1 | 1 | | | | | | 3 | | | | | | | | | | | | | | | 7 | | 14 | |
| | | C1914 | | | | | | | 1 | | | | | 1 | | | | | | | | | | 1 | | | | | | 1 | | 1 | | | | | | | | | | | | | 5 | | 10 | | |
| C1915 | | | | | | | | 2 | | | | | | | | | | 1 | | | | | 1 | | | | | | | 5 | | | | | | | | | | | | | 4 | | 13 | | | | |

Table 10.—Estimated number of pairs of 45 non-territorial species¹ on rapid area search surveys by habitat type and conservation area in 2019

| Conservation area | Site | Plot | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Cooper's hawk | Common raven | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great horned owl | Great egret | Green heron | Greater roadrunner | Great-tailed grackle | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total | |
|--------------------------|-----------------|-------|---------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|---------------|--------------|------------------------|-------------------|----------------|------------------|------------------|-------------|-------------|--------------------|----------------------|-------------|---------------|-----------|----------|----------------------|------------------|------------------|----------------|---------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|-------|----|
| Parker Dam Camp (n = 11) | Parker Dam Camp | C2001 | 1 | | | | | 4 | 2 | | | | | | | 13 | | 8 | | | | | | | 19 | | | | | | | | 9 | 2 | | | | | | | | | | | 7 | 65 | | | |
| | | C2003 | | | | | | 3 | | | | | | | | | 3 | | 1 | | 1 | | | | | 4 | | | | | 2 | | | 5 | 3 | | | | | | | | | | | 4 | 26 | | |
| PVER (n = 22) | Phase 01 | C2301 | | | | | | 3 | | | | | | 1 | | 1 | 5 | | 1 | | | | | 1 | 2 | | 1 | | | 3 | | | 11 | | | | 350 | | | | | | | | | 33 | 412 | | |
| | Phase 02 | C2302 | | | | | | 7 | | | | | | 1 | | | 2 | 5 | | 1 | | | | | 6 | | | 1 | | 1 | | 27 | | | 1 | 39 | | | | | | | | | 30 | 121 | | | |
| | Phase 03 | C2306 | | | | | | 3 | | | | | | | 2 | | | | | 1 | | | | | 5 | | | | | 1 | | 16 | | | | | | | | | | | | 8 | 40 | | | | |
| | Phase 04 | C2308 | | | | | | | 6 | | | | | | | 1 | | | | | | | | 1 | 1 | 2 | | 3 | | | 1 | | 6 | | | | | | | | | | | | | 17 | 41 | | |
| | | C2309 | | | | | | | 5 | | | | | 2 | | 1 | | | | | | | | | 1 | 1 | | | | | | 5 | | | | | | | | | | | | | | 9 | 25 | | |
| | | C2311 | | | | | | | 4 | | | | | | | | | | | | | | | | | 1 | | 4 | | | | 3 | | | | | | | | | | | | | | 8 | 20 | | |
| | Phase 05 | C2315 | | | | | | | 1 | | | | | | | | | | | | | | | | | 1 | | | | | | 1 | | | | | | | | | | | | | | | 4 | 9 | |
| | | C2317 | | | | | | | 3 | | | | | 1 | | | | | | | | | | | | 5 | | 1 | | | | 1 | | | | | | 1 | 4 | | | | | | | | 4 | 20 | |
| | | C2318 | | | | | | | 1 | | | | | | | | | 2 | | | | | | | | 3 | | | | | | 2 | | | | | | | | | | | | | | 4 | 28 | | |
| | Phase 06 | C2323 | | | | | | | 6 | | | | | | | 1 | | | | | | | | | | 2 | | | | | | 4 | | | | | | | | | | | | | | | | 5 | 21 |
| | | C2326 | | | | | | | 3 | | | | | | | | | | 2 | | 1 | | | 1 | | 3 | | | | | 1 | | | 3 | | | | | | | | | | | | | 4 | 23 | |
| | Phase 07 | C2327 | | | 1 | | | | 3 | | | | | | 1 | | | | | | | 1 | | | | 4 | | 1 | | | | 1 | | | | | | | | | | | | | | | | 15 | 30 |
| | | C2330 | | | | | | | 6 | | | | | | | | | | 1 | | | | | 1 | | 4 | | | | | 1 | | | | | | | | | | | | | | | | | 3 | 20 |
| | | C2331 | | | | | | | 5 | | | | | | | | 1 | | | | | | | | | 6 | | | | | 1 | | | 3 | | | | | | | | | | | | | | 4 | 23 |
| C2333 | | | | | | | | 4 | | | | | 2 | 2 | | | | | | 1 | | | | | 3 | | 1 | | | | 1 | | | | | | | | | | | | | | | 6 | 21 | | |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 10.—Estimated number of pairs of 45 non-territorial species¹ on rapid area search surveys by habitat type and conservation area in 2019

| Conservation area | Site | Plot | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Cooper's hawk | Common raven | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great horned owl | Great egret | Green heron | Greater roadrunner | Great-tailed grackle | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total | | | |
|-------------------|----------|-------|---------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|---------------|--------------|------------------------|-------------------|----------------|------------------|------------------|-------------|-------------|--------------------|----------------------|-------------|---------------|-----------|-----------|----------------------|------------------|------------------|----------------|----------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|--------------|----|----|----|
| PWCA (n = 14) | PWCA | C2902 | | | | | | 1 | | | | | | | | | | | | | | | | 2 | | | | | | 3 | | | 3 | | | | | | | | | | | | 1 | | 10 | | | | |
| | | C2903 | | | | | | 1 | | | | | | | | | | | | | | | | | 4 | | | | | | 5 | | | 1 | | | | | | | | | | | | | 1 | | 12 | | |
| | | C2906 | | | | | | 1 | | | | | | | | | | | | 1 | | | | | 1 | | | | | | 11 | | | 1 | | | | 1 | | | | | | | | | 6 | | 22 | | |
| | | C2911 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | 2 | | | | | | | | | | | | | | | 5 | | |
| | | C2913 | | | | | | 2 | | | | | | | | | | | 1 | 1 | | | | | 1 | 4 | 2 | | | | 3 | | | 3 | | | | 1 | | | | | | | | | 1 | | 19 | | |
| | | C2915 | | | | | | | | | | | | | | | | 3 | | 1 | | | | | 1 | | | | | | 4 | | | 5 | | | | | | | | | | | | | | 3 | | 17 | |
| | | C2917 | | | | | | | | | | | | | | | | 2 | 2 | | | | | | | 2 | 1 | | | | 3 | | | 1 | | | | | | | | | | | | | | 2 | | 13 | |
| | | C2918 | | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | 2 | | | 2 | | | | | | | | | | | | | | | 3 | | 11 |
| | | C2921 | | | | | | | 2 | | | | | | | 1 | 1 | | 9 | | | | | | | | | | | | 1 | | | 4 | | | | | | | | | | | | | | | 3 | | 21 |
| YEW (n = 20) | D | C4704 | | | | | | 4 | | | | | | | | 6 | | | | | | | 1 | 1 | | | | | | | | | 12 | | | | | | | | | | | | | | | 2 | | 26 | |
| | F | C4705 | | | | | | 5 | | | | | 1 | | 1 | | 5 | | | | | | 1 | | | | | 1 | | | | | 26 | | | | | | | | | | | | | | | 3 | | 43 | |
| | I | C4702 | | | | | | 5 | | | | | 1 | | 3 | | 3 | | 1 | 1 | | | 1 | | 1 | | | | 4 | | | | 16 | | | | | | | | | | | | | | 13 | | 50 | | |
| | South AC | C4711 | 1 | | | 1 | 1 | 4 | 6 | | | | | | | 6 | | 1 | | | | | 1 | 8 | 2 | 1 | | | | 1 | | | 5 | | | | 2 | 25 | | | | | | | | | 4 | | 69 | | |
| All | | | 12 | 3 | 2 | 2 | 1 | 2 | 311 | 91 | 1 | 3 | 7 | 6 | 19 | 53 | 6 | 177 | 3 | 12 | 2 | 5 | 33 | 55 | 158 | 1 | 13 | 15 | 2 | 39 | 57 | 1 | 1 | 425 | 11 | 3 | 10 | 536 | 25 | 4 | 2 | 3 | 6 | 1 | 19 | 536 | 2 | 2,677 | | | |

¹ Scientific names of all species are listed in attachment 3.
² n = Number of species at each conservation area included in this table.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 11.—Number of territories for 24 territorial species¹ on intensive area search surveys by conservation area, site, and plot in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on an area search survey, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes new combined territories.)

| Conservation area | Site | Plot | Abert's towhee | Arizona Bell's vireo | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Gila woodpecker | Hooded oriole | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern mockingbird | Phainopepla | Song sparrow | Sonoran yellow warbler | Summer tanager | Verdin | Western kingbird | Yellow-breasted chat |
|---|-----------------|-------|----------------|----------------------|-------------------------|---------------|--------------------------|---------------|--------------------------|------------------|-------------|---------------------|------------------|-----------------|---------------|--------------------------|----------------|------------|----------------------|-------------|--------------|------------------------|----------------|--------------|------------------|----------------------|
| CVCA (n = 5) | Phase 02 | C2508 | 3.75 (5) | | 1 (3) | | | 1.75 (3) | | 2 (2) | | | | | | 2 (3) | | | | | | | | | 0.25 (1) | |
| LDCA (n = 6) | Reach 02 | C4951 | 0.5 (1) | | | | | | | | | 8.5 (12) | | | | 1.25 (2) | | 1.5 (2) | | | 7.25 (9) | | | 1 (1) | | |
| Middle Bill Williams River NWR East (n ² = 13) | Esquerra Ranch | C1905 | 5 (6) | 1 (5) | 2.25 (3) | | 1.5 (2) | 0.75 (1) | 0.5 (1) | | | 4.5 (5) | | 0.75 (1) | | 1 (1) | 6.25 (8) | | | | 13 (14) | | | 2.5 (3) | | 2.5 (4) |
| Middle Bill Williams River NWR West (n = 18) | Sandy Wash | C1914 | 2.75 (3) | 1 (1) | 1.5 (2) | 6.5 (8) | | 0.75 (1) | 2.5 (4) | 1 (1) | 0.5 (1) | 10.25 (11) | 1 (1) | 0.75 (2) | | 3.25 (4) | 5.5 (7) | | | | 7 (8) | 9 (9) | 1 (1) | 3 (4) | | 9 (10) |
| Parker Dam Camp (n = 15) | Parker Dam Camp | C2001 | 4.5 (5) | | 1.75 (2) | | 2.75 (3) | | | 1 (1) | 0.5 (1) | | 2.5 (3) | 0.75 (1) | 1 (1) | 0.75 (1) | 10 (10) | | | 2.5 (3) | | | | 5.75 (6) | 0.75 (1) | |
| | | C2003 | 5.5 (9) | | 1.5 (3) | | 1.75 (3) | | | | 0.75 (1) | 1.75 (2) | | 0.25 (1) | 0.75 (1) | 1.25 (3) | 4 (6) | | | 1 (2) | 5.5 (6) | | | 6.25 (11) | | |
| PVER (n = 14) | Phase 02 | C2302 | 4.5 (6) | 1.5 (2) | 0.25 (1) | | 1 (2) | 2 (3) | | 1.75 (3) | | | 0.25 (1) | | | 1.5 (2) | 1.75 (2) | | | | | | | 2.75 (3) | 7.5 (10) | 0 (2) |
| | Phase 07 | C2331 | 1 (1) | | | | | 2 (2) | | 5.75 (6) | | 0.25 (1) | | | | 1 (1) | 1 (1) | | 1 (1) | | | | | | 1.75 (2) | |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

Table 12.—Estimated number of pairs of 39 non-territorial species¹ on intensive area search surveys by conservation area, site, and plot in 2019

| Conservation area | Site | Plot | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Brown-headed cowbird | Cliff swallow | Common gallinule | Common ground dove | Common raven | Cooper's hawk | Elf owl | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great horned owl | Great egret | Greater roadrunner | Great-tailed grackle | House finch | Inca dove | Killdeer | Lesser goldfinch | Lesser nighthawk | Mallard | Mourning dove | Northern harrier | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Snowy egret | Turkey vulture | Virginia rail | Western least bittern | White-throated swift | White-winged dove | Yuma clapper rail | All | |
|---|-----------------|-------|---------------|------------------|----------|---------------------------|--------------------|----------------------|---------------|------------------|--------------------|--------------|---------------|----------|------------------------|-------------------|----------------|------------------|------------------|-------------|--------------------|----------------------|-------------|-----------|----------|------------------|------------------|----------|---------------|------------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|---------------|-----------------------|----------------------|-------------------|-------------------|------------|-----|
| CVCA (n = 13) | Phase 02 | C2508 | | | | | 7 | | | 1 | 1 | | | | | 6 | 1 | | 1 | | | 5 | 9 | 1 | | 2 | | | 16 | | | | | | | | | | | 29 | | 82 | |
| LDCA (n = 24) | Reach 02 | C4951 | 5 | | | 1 | 2 | 5 | | 3 | | | | | | | 3 | 1 | | 5 | | 1 | 1 | | 1 | | 9 | 3 | 5 | 1 | | 3 | | 4 | 2 | 1 | 2 | 2 | | 4 | 2 | 66 | |
| Middle Bill Williams River NWR East (n ² = 14) | Esquerra Ranch | C1905 | | | | | | 3 | | | | | | | | | 2 | | | | | | 5 | | | 3 | | | 6 | | 5 | | | | | | | | 4 | 3 | | 31 | |
| Middle Bill Williams River NWR West (n = 12) | Sandy Wash | C1914 | | | | | | 2 | | | | | 1 | 1 | | | | | | 1 | | | | | | 2 | | | 3 | | | | | | | | | | | 4 | | 14 | |
| Parker Dam Camp (n = 16) | Parker Dam Camp | C2001 | | 1 | | | | 3 | | | | | | | 5 | | 3 | | | | 2 | | 10 | | | 1 | | | 6 | | 10 | | | | | | | | | 5 | | 46 | |
| | | C2003 | | | | | | 4 | 3 | | | | | | | | | 3 | | 1 | | | | 10 | | | 3 | | | 6 | | 1 | | | | | | | | 7 | | 38 | |
| PVER (n = 21) | Phase 02 | C2302 | | 1 | 1 | | | 38 | 4 | | | | 1 | | | 3 | 4 | | | | 1 | | 12 | | | 3 | 1 | | 19 | | 5 | | 1 | 15 | | 1 | | | | | 10 | | 120 |
| | Phase 07 | C2331 | | | | | | 3 | | | 1 | | | | 2 | | | | 1 | | | 1 | 6 | | | 1 | | | 4 | | | | 2 | | 1 | | | | | 3 | | 25 | |
| Total | | | 5 | 2 | 1 | 1 | 2 | 65 | 7 | 3 | 1 | 2 | 2 | 1 | 7 | 9 | 16 | 1 | 3 | 5 | 4 | 7 | 53 | 1 | 1 | 15 | 10 | 3 | 65 | 1 | 21 | 3 | 1 | 24 | 2 | 3 | 2 | 2 | 4 | 65 | 2 | 422 | |

¹ Scientific names of all species are listed in attachment 3.
² n = number of species at each conservation area included in this table.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 13.—Number of territories for five focal species¹ detected by habitat type and conservation area in 2019
(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on all area search surveys, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes duplicate territories.)

| Habitat type | Conservation area | Arizona Bell's vireo | Gila woodpecker | Sonoran yellow warbler | Summer tanager | Vermilion flycatcher | Area total |
|-------------------|--|-----------------------|-------------------------|-------------------------|-----------------------|-------------------------|-------------------------|
| Cottonwood-willow | BLCA (n ² = 3) | 6 (7) | | 8.25 (11) | 0.75 (1) | | 15 (19) |
| | Cibola NWR Unit #1 (n = 4) | | 0.25 (1) | 2.75 (3) | 1 (1) | 0.75 (2) | 4.75 (7) |
| | CVCA (n = 2) | | 0.25 (1) | 1 (2) | | | 1.25 (3) |
| | LDCA (n = 1) | 1.5 (2) | | | | | 1.5 (2) |
| | Middle Bill Williams River NWR East (n = 4) | 17 (33) | 4 (11) | 3 (5) | 2 (2) | | 26 (51) |
| | Middle Bill Williams River NWR West (n = 4) | 22.5 (27) | 9.25 (12) | 121.75 (125) | 9.25 (10) | | 162.75 (174) |
| | PVER (n = 2) | 1.5 (2) | | | 5.75 (6) | | 7.25 (8) |
| | YEW (n = 1) | | 0.25 (2) | | | | 0.25 (2) |
| | Habitat total | 48.5 (71) | 14 (27) | 136.75 (146) | 18.75 (20) | 0.75 (2) | 218.75 (266) |
| Mesquite | CVCA (n = 1) | | | | 1 (1) | | 1 (1) |
| | Parker Dam Camp (n = 1) | | 0.75 (1) | | | | 0.75 (1) |
| | YEW (n = 1) | | 0.5 (1) | | | | 0.5 (1) |
| | Habitat total | | 1.25 (2) | | 1 (1) | | 2.25 (3) |
| Mixed | BLCA (n = 1) | 2 (2) | | | | | 2 (2) |
| | LDCA (n = 3) | 8.5 (10) | 0 (2) | 1 (1) | | | 9.5 (13) |
| | PVER (n = 1) | | | | 1.25 (2) | | 1.25 (2) |
| | YEW (n = 1) | | 1 (1) | | | | 1 (1) |
| | Habitat total | 10.5 (12) | 1 (3) | 1 (1) | 1.25 (2) | | 13.75 (18) |
| Total | 59 (83) | 16.25 (32) | 137.75 (147) | 21 (23) | 0.75 (2) | 234.75 (287) | |

¹ Scientific names of all species are listed in attachment 3.

² n = number of species at each conservation area included in this table.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

As with focal species, surveyors found the highest number of territories of non-focal territorial species in cottonwood-willow habitat (table 14). The most numerous species in cottonwood-willow habitat was the song sparrow (280 total territories), while in mesquite habitat it was the verdin (67 total territories), and in mixed habitat it was the Abert's towhee (88 total territories; table 14). Overall, surveyors found 20 non-focal territorial species in cottonwood-willow habitat, 16 in mesquite habitat, and 18 in mixed habitat.

As with non-focal territorial species, surveyors recorded the highest numbers of non-territorial species in cottonwood-willow habitat (table 15). The most numerous of the non-territorial species in cottonwood-willow habitat was the red-winged blackbird (491 estimated pairs), whereas the most common in mesquite habitat was the mourning dove (72 estimated pairs), and the most common in mixed habitat was the white-winged dove (132 estimated pairs; table 15).

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 14.—Number of breeding territories for 23 non-focal territorial species¹ by habitat type and conservation area in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on all area search surveys, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes duplicate territories.)

| Habitat type | Conservation area | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | Total | |
|-------------------|--|----------------------|-------------------------|-------------------|--------------------------|------------------|--------------------------|-------------------|----------------|---------------------|---------------------|----------------|----------------|--------------------------|-------------------|---------------------|-------------------|----------------------|-------------|----------------|-----------------|---------------------|-------------------|----------------------|---------------------|------------------------|
| Cottonwood-willow | BLCA (n ² = 10) | 8.5 (10) | | | 2.75 (3) | | 1 (1) | 2.25 (3) | | 1 (1) | 0.25 (1) | | | 2.75 (3) | 2 (2) | | | | | | | 2.5 (4) | | 3.75 (4) | 26.75 (32) | |
| | Cibola NWR Unit #1 (n = 12) | 20.75 (24) | 4.75 (6) | | 1.5 (2) | 6.25 (8) | | 6.75 (9) | | 1 (1) | 3 (3) | | | 6.5 (7) | 7.75 (8) | | | | | | 5 (5) | 10 (13) | 4.5 (7) | | 77.75 (93) | |
| | CVCA (n = 10) | 15.5 (20) | 2.5 (5) | | 1.75 (2) | 4.25 (6) | | 2.75 (3) | | | 1.25 (2) | | | 5.75 (7) | 1 (1) | | | | | | | 4.5 (6) | 3.5 (4) | | 42.75 (56) | |
| | Hunters Hole (n = 5) | 3 (3) | 3 (3) | | | | | | | | 1 (1) | | | 1 (1) | | | | | | | | 1 (1) | | | 9 (9) | |
| | LDCA (n = 11) | 6.25 (9) | | | 3.5 (4) | 1 (1) | | | | 21.75 (29) | 0.75 (1) | | | 2 (3) | 1 (1) | 3.5 (4) | | | | | | 18.5 (22) | 4 (5) | 6 (6) | 68.25 (85) | |
| | Middle Bill Williams River NWR East (n = 16) | 12.5 (18) | 8.75 (13) | 18.25 (21) | 10.5 (13) | 5 (7) | 4.75 (9) | | 0.25 (1) | 31.25 (32) | 4.5 (6) | | | 6.5 (8) | 26.25 (35) | | 1.5 (3) | | 1.5 (2) | | | 33.75 (37) | 8.25 (13) | | 21.25 (24) | 194.75 (242) |
| | Middle Bill Williams River NWR West (n = 18) | 50.5 (54) | 9 (11) | 51.25 (56) | 10.25 (12) | 5.75 (7) | 9.5 (11) | 3 (3) | 8.5 (9) | 156.25 (158) | 13 (15) | | 1 (1) | 19.75 (22) | 57.75 (60) | | 0.75 (1) | | 2 (2) | | | 213 (216) | 23 (27) | | 160.75 (166) | 795 (831) |
| | PVER (n = 13) | 22.25 (32) | 1.25 (2) | | 4.75 (6) | 11 (16) | 1.5 (2) | 9.25 (11) | | 1 (2) | 0.25 (2) | | | 16 (18) | 4.5 (5) | | | | | | | | 7 (10) | 16.75 (21) | 6 (6) | 101.5 (133) |
| | YEW (n = 4) | 2.25 (3) | 1 (1) | | | | | | | | | | | | | | | | | | | 5.5 (6) | 1 (1) | | 9.75 (11) | |
| | | Habitat total | 141.5 (173) | 30.25 (41) | 69.5 (77) | 35 (42) | 33.25 (45) | 16.75 (23) | 24 (29) | 8.75 (10) | 212.25 (223) | 24 (31) | | 1 (1) | 60.25 (69) | 100.25 (112) | 3.5 (4) | 2.25 (4) | | 3.5 (4) | | 270.25 (280) | 65.75 (85) | 25.75 (33) | 197.75 (206) | 1,325.5 (1,492) |
| Mesquite | CVCA (n = 10) | 31.5 (38) | 1.75 (2) | | 26.25 (28) | 4 (6) | | 1.75 (3) | | | 9 (10) | | | 4.5 (7) | 3.75 (4) | | | | | | | 31 (37) | 1.75 (2) | | 115.25 (137) | |
| | Parker Dam Camp (n = 13) | 5.5 (6) | 1.5 (2) | | 2.75 (3) | 1 (1) | | 1 (1) | 0.5 (1) | | 2.75 (3) | 1 (1) | | 1.75 (2) | 12 (12) | | | | 2.5 (3) | | | 5.75 (6) | 0.75 (1) | | 38.75 (42) | |
| | PVER (n = 10) | 4.25 (5) | | | 3.5 (4) | 1.5 (2) | | 0.75 (1) | | | 0.75 (1) | | | 1.25 (2) | 2 (2) | | | | | | | 4.75 (5) | 0.75 (1) | 3.25 (4) | 22.75 (27) | |
| | PWCA (n = 10) | 9.5 (11) | 3.5 (4) | | 8 (9) | 1.75 (3) | | | | 1.75 (3) | 3 (3) | | | 1 (2) | 0.5 (1) | | | | | 0.25 (1) | | 10 (10) | | | 39.25 (47) | |
| | YEW (n = 6) | 3.5 (4) | | | 3 (3) | 1.25 (2) | | | | | 0.5 (1) | | | 1 (1) | | | | | | | | 7.5 (9) | | | 16.75 (20) | |
| | | Habitat total | 54.25 (64) | 6.75 (8) | | 43.5 (47) | 9.5 (14) | | 3.5 (5) | 0.5 (1) | 1.75 (3) | 16 (18) | 1 (1) | | 9.5 (14) | 18.25 (19) | | | | 2.5 (3) | 0.25 (1) | | 59 (67) | 3.25 (4) | 3.25 (4) | 232.75 (273) |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 14.—Number of breeding territories for 23 non-focal territorial species¹ by habitat type and conservation area in 2019

(Totals for each species include the sum of territories on plot, including partial territories to the nearest 0.25 territory, and, in parenthesis, the count of territories recorded on all area search surveys, including whole territories regardless of how much is on plot. A zero indicates the species was detected off plot only. Excludes duplicate territories.)

| Habitat type | Conservation area | Abert's towhee | Ash-throated flycatcher | Bewick's wren | Black-tailed gnatcatcher | Blue grosbeak | Brown-crested flycatcher | Bullock's oriole | Canyon wren | Common yellowthroat | Crissal thrasher | Hooded oriole | Hutton's vireo | Ladder-backed woodpecker | Lucy's warbler | Marsh wren | Northern cardinal | Northern mockingbird | Phainopepla | Say's phoebe | Song sparrow | Verdin | Western kingbird | Yellow-breasted chat | Total | |
|--------------|--------------------------------|-------------------------|-------------------------|----------------------|--------------------------|----------------------|--------------------------|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|------------------|--------------------------|-------------------------|-----------------------|---------------------|----------------------|-------------------|---------------------|----------------------|-----------------------|-----------------------|------------------------|----------------------------|-------------------------|
| Mixed | BLCA (n = 9) | 1 (1) | | | 1.75 (2) | | | | | 1.75 (3) | 2 (2) | | | 1 (1) | 2.5 (3) | | | | | | 2.5 (4) | 2.5 (3) | | 0.75 (1) | 15.75 (20) | |
| | Cibola NWR Unit #1 (n = 10) | 9.75 (12) | 2.75 (3) | | 5.5 (7) | 1.75 (2) | | 1.75 (2) | | | 1 (1) | | | 6.75 (7) | 6 (6) | | | | | | | 7 (7) | 1 (2) | | 43.25 (49) | |
| | CVCA (n = 11) | 13.25 (16) | | | 4.25 (5) | 6 (7) | | 3 (4) | | | 1 (2) | | | 1.75 (2) | 2 (2) | | | | | | | 1.5 (3) | 3 (4) | 3.5 (4) | 1 (1) | 40.25 (50) |
| | LDCA (n = 11) | 20.75 (22) | 1.75 (2) | | 14.25 (17) | 3 (3) | | | | 15 (17) | 3.25 (5) | | | 6.5 (8) | | 4.5 (5) | | | | | | 16.25 (20) | 17.25 (20) | | 18 (19) | 120.5 (138) |
| | Parker Dam Camp (n = 10) | 5.5 (8) | 1.5 (3) | | 3 (4) | | | | 0.5 (1) | 1.75 (2) | | | | 2 (3) | 5.75 (8) | | | | 1 (2) | | | 5.5 (6) | 7.25 (13) | | | 33.75 (50) |
| | PVER (n = 12) | 8.25 (11) | 3.25 (4) | | 7.5 (8) | 9.75 (13) | | 11.5 (14) | | 0.25 (1) | | | | 7 (10) | 13.5 (16) | | | 1 (1) | | | | | 3 (4) | 6.75 (8) | 1.5 (2) | 73.25 (92) |
| | PWCA (n = 11) | 6 (9) | 1.5 (2) | | 12 (14) | 4 (5) | | | | 0 (2) | 2 (2) | | | | 1 (1) | | | 1 (1) | 1 (1) | 1 (1) | | | 2 (2) | | | 31.50 (40) |
| | YEW (n = 8) | 8.5 (9) | 2.75 (3) | | 6.25 (7) | 2.25 (3) | | | | | 2 (2) | | | 2.75 (4) | | | | | | | | | 10.25 (13) | | 0.25 (1) | 35 (42) |
| | | Habitat total | 73 (88) | 13.5 (17) | | 54.5 (64) | 26.75 (33) | | 16.25 (20) | 0.5 (1) | 18.75 (25) | 11.25 (14) | | | 27.75 (35) | 30.75 (36) | 4.5 (5) | | 2 (2) | 2 (3) | 1 (1) | 25.75 (33) | 52.25 (66) | 11.25 (14) | 21.5 (24) | 393.25 (481) |
| | Total | 268.75 (325) | 50.5 (66) | 69.5 (77) | 133 (153) | 69.5 (92) | 16.75 (23) | 43.75 (54) | 9.75 (12) | 232.75 (251) | 51.25 (63) | 1 (1) | 1 (1) | 97.5 (118) | 149.25 (167) | 8 (9) | 2.25 (4) | 2 (2) | 8 (10) | 1.25 (2) | 296 (313) | 177 (218) | 40.25 (51) | 222.5 (234) | 1,951.5 (2,246) | |

¹ Scientific names of all species are listed in attachment 3.

² n = Number of species at each conservation area included in this table.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

Table 15.—Estimated number of pairs of 45 non-territorial species on rapid area search surveys by habitat type and conservation area in 2019

| Habitat type | Conservation area | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Common raven | Cooper's hawk | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great egret | Great horned owl | Great-tailed grackle | Greater roadrunner | Green heron | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total |
|-------------------|--|----------------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|--------------|---------------|------------------------|-------------------|----------------|------------------|-------------|------------------|----------------------|--------------------|-------------|-------------|---------------|-----------|----------|----------------------|------------------|------------------|----------------|----------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|--------------|
| Cottonwood-willow | BLCA (n ² = 8) | | | | | | 3 | | | | | | | | | 3 | | | 1 | 1 | | | | | | | | | 2 | | | 9 | 1 | | | | | | | | | | | 6 | | 26 | |
| | Cibola NWR Unit #1 (n = 18) | | 1 | 1 | | | 52 | | | | | 1 | | 1 | 3 | 3 | 1 | | 3 | 4 | | | 33 | | | 2 | | | 1 | | | 50 | | 1 | 68 | | | | | | | | | 85 | 1 | 311 | |
| | CVCA (n = 10) | | | | | | 31 | | | | 1 | 3 | | | 4 | 11 | | | | | 1 | | | 3 | | 2 | | | | | | 24 | | | | | | | | | | | | 30 | | 110 | |
| | Hunters Hole (n = 5) | | | | | | 3 | | | | | | | | | | 3 | | | | | | 1 | | | | | | | | | 3 | | | | | | | | | | | | 1 | | 11 | |
| | LDCA (n = 16) | 8 | | | 1 | | 4 | | | 1 | | | | | | | 3 | | | | 12 | | 1 | | | | 3 | | 6 | | 1 | 13 | | 1 | 4 | | | | 2 | 2 | | | | 19 | | 81 | |
| | Middle Bill Williams River NWR East (n = 19) | | | | | | 11 | 15 | 1 | | | | 3 | 1 | | | 10 | | | | | 4 | 1 | 10 | | | | 2 | 11 | | 1 | 32 | 1 | 1 | | | | 1 | 2 | | | | 7 | 20 | | 134 | |
| | Middle Bill Williams River NWR West (n = 16) | | | | | | 20 | 4 | | | | 1 | 2 | | | 6 | | | | | | 4 | 1 | 7 | | | | | 12 | 3 | | 34 | 1 | | 1 | | | | | | 1 | 12 | 45 | | 154 | | |
| | PVER (n = 21) | | | 1 | | | 33 | | | | 4 | 8 | 1 | 2 | 3 | 10 | | | 1 | 4 | 2 | 2 | | 27 | | 6 | 1 | | 5 | 1 | | 70 | | | 3 | 417 | | | | | | | | | 126 | | 727 |
| | YEW (n = 16) | 1 | | | 1 | 1 | 4 | 6 | | | | | | | | 6 | 1 | | | | 8 | 1 | | 2 | 1 | | | | 1 | | | 5 | | | 2 | 25 | | | | | | | 4 | | 69 | | |
| | | Habitat total | 9 | 1 | 2 | 2 | 1 | 161 | 25 | 1 | 1 | 5 | 16 | 4 | 13 | 6 | 50 | 1 | 1 | 8 | 28 | 12 | 3 | 82 | 1 | 8 | 6 | 2 | 29 | 13 | 1 | 1 | 240 | 3 | 2 | 5 | 491 | 25 | 1 | 2 | 2 | 2 | 1 | 19 | 336 | 1 | 1,623 |

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

Table 15.—Estimated number of pairs of 45 non-territorial species on rapid area search surveys by habitat type and conservation area in 2019

| Habitat type | Conservation area | American coot | American kestrel | Barn owl | Black-crowned night-heron | Black-necked stilt | Bronzed cowbird | Brown-headed cowbird | Cliff swallow | Common black hawk | Common gallinule | Common ground dove | Common raven | Cooper's hawk | Eurasian collared-dove | European starling | Gambel's quail | Great blue heron | Great egret | Great horned owl | Great-tailed grackle | Greater roadrunner | Green heron | House finch | House sparrow | Inca dove | Killdeer | Lawrence's goldfinch | Lesser goldfinch | Lesser nighthawk | Long-eared owl | Mallard | Mourning dove | Northern rough-winged swallow | Pied-billed grebe | Red-tailed hawk | Red-winged blackbird | Rock pigeon | Turkey vulture | Violet-green swallow | Virginia rail | Western least bittern | Western screech-owl | White-throated swift | White-winged dove | Yellow-headed blackbird | Total | |
|--------------|-----------------------------|---------------|------------------|----------|---------------------------|--------------------|-----------------|----------------------|---------------|-------------------|------------------|--------------------|--------------|---------------|------------------------|-------------------|----------------|------------------|-------------|------------------|----------------------|--------------------|-------------|-------------|---------------|------------|----------|----------------------|------------------|------------------|----------------|-----------|---------------|-------------------------------|-------------------|-----------------|----------------------|-------------|----------------|----------------------|---------------|-----------------------|---------------------|----------------------|-------------------|-------------------------|------------|----------|
| Mesquite | CVCA (n = 10) | | | | | | 26 | 9 | | | 1 | | | | 4 | | 32 | | | | | 4 | | | | | | | | | | 21 | | | | | | | | | | | | | 41 | 143 | | |
| | Parker Dam Camp (n = 9) | | 1 | | | | 4 | 2 | | | | | | | 13 | | 8 | | | | | | | 19 | | | | | | | | 9 | 2 | | | | | | | | | | | | 7 | 65 | | |
| | PVER (n = 5) | | | | | | 4 | | | | | | | | | | | | | | | | | 1 | | 4 | | | | | | 3 | | | | | | | | | | | | | 8 | 20 | | |
| | PWCA (n = 11) | | | | | | 3 | | | | | 1 | | | 3 | | 14 | | | 1 | 6 | 1 | | 1 | | | | | | | | 13 | | | | | | | | | | | | | 9 | 68 | | |
| | YEW (n = 8) | | | | | | 5 | | | | | | | 1 | 1 | | 5 | | | | | | 1 | | | | 1 | | | | | 26 | | | | | | | | | | | | 3 | 43 | | | |
| | Habitat total | | 1 | | | | | 42 | 11 | | | 1 | 1 | 1 | 1 | 21 | | 59 | | | 1 | 6 | 6 | | 21 | | 4 | 1 | | | 72 | 2 | | | | | | | | | | | | 68 | 339 | | | |
| Mixed | BLCA (n = 10) | | | | | | 4 | | | 1 | | | | | 1 | 1 | 1 | | | | 1 | 1 | 1 | | | | | 1 | | | 3 | | | | | | | | | | | | | | 8 | 22 | | |
| | Cibola NWR Unit #1 (n = 14) | | | | | 2 | 16 | | | | | 1 | | 4 | 9 | | | | | | | 2 | | 13 | | | 3 | | | 1 | | 16 | 1 | | | | | | | | | | | | 29 | 1 | 120 | |
| | CVCA (n = 12) | | | | | | 24 | 55 | | | | | | | 1 | 17 | | | | | 1 | 3 | 1 | 13 | | | | | | | 23 | 1 | | | | | | | | | | | | 22 | 166 | | | |
| | LDCA (n = 17) | 3 | 1 | | | | 21 | | | | 1 | | | | | | 33 | | | | | 12 | 4 | | 1 | | 5 | | | 6 | | 17 | 1 | 1 | | | | 1 | 1 | 4 | | | | 23 | 135 | | | |
| | Parker Dam Camp (n = 9) | | | | | | 3 | | | | | | | | 3 | 1 | | | | 1 | | | | 4 | | | | | | 2 | | 5 | 3 | | | | | | | | | | 4 | 26 | | | | |
| | PVER (n = 15) | | | | | | 23 | | | | 1 | 1 | | 1 | 3 | | | | | 1 | | 2 | | 20 | | 1 | | | | 3 | | 12 | | | | 4 | 13 | | 2 | | | | | 20 | 107 | | | |
| | PWCA (n = 11) | | | | | | 8 | | | | | | | | | 1 | 2 | | | | | 7 | 1 | 2 | | | | | | 19 | | 9 | | | | 1 | 1 | | | | | | | 11 | 62 | | | |
| | YEW (n = 12) | | | | | | 9 | | | | | | | 1 | 9 | 3 | | | 1 | 1 | | 2 | | 2 | | | | | 4 | | | 28 | | | | | | | | | | | | 15 | 76 | | | |
| | Habitat total | 3 | 1 | | | | 2 | 108 | 55 | | 2 | 1 | 2 | 1 | 19 | 68 | 2 | 1 | 3 | 21 | 15 | 2 | 55 | 33 | 5 | 158 | 1 | 13 | 15 | 2 | 39 | 57 | 1 | 1 | 425 | 11 | 3 | 10 | 536 | 25 | 4 | 2 | 3 | 6 | 1 | 19 | 536 | 2 |

¹ Scientific names of all species are listed in attachment 3.

² n = Number of species at each conservation area included in this table.

Conservation Areas

Beal Lake Conservation Area

Surveyors recorded 27 species on 2 rapid area search surveys at the BLCA, including 21 territories of 3 focal species (see table 6), 52 territories of 11 non-focal territorial species (see table 7) and 48 estimated pairs of 13 species classified as non-territorial (see table 10).

The most numerous territorial species were the Abert's towhee and Sonoran yellow warbler (both with 11 total territories; see tables 6 and 7) and Arizona Bell's vireo (9 total territories; see table 6).

The most numerous non-territorial species were the mourning dove, brown-headed cowbird, and white-winged dove.

Of the six focal species, the Arizona Bell's vireo, Sonoran yellow warbler, and summer tanager were recorded on at least one rapid area search survey (figure 1).

Surveyors detected none of the six non-focal covered species at the BLCA in 2019.

Surveyors confirmed one Sonoran yellow warbler nest under construction on April 30 in the north-central portion of plot C1503. Surveyors did not find any nests of obligate cavity nesters in the BLCA in 2019.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

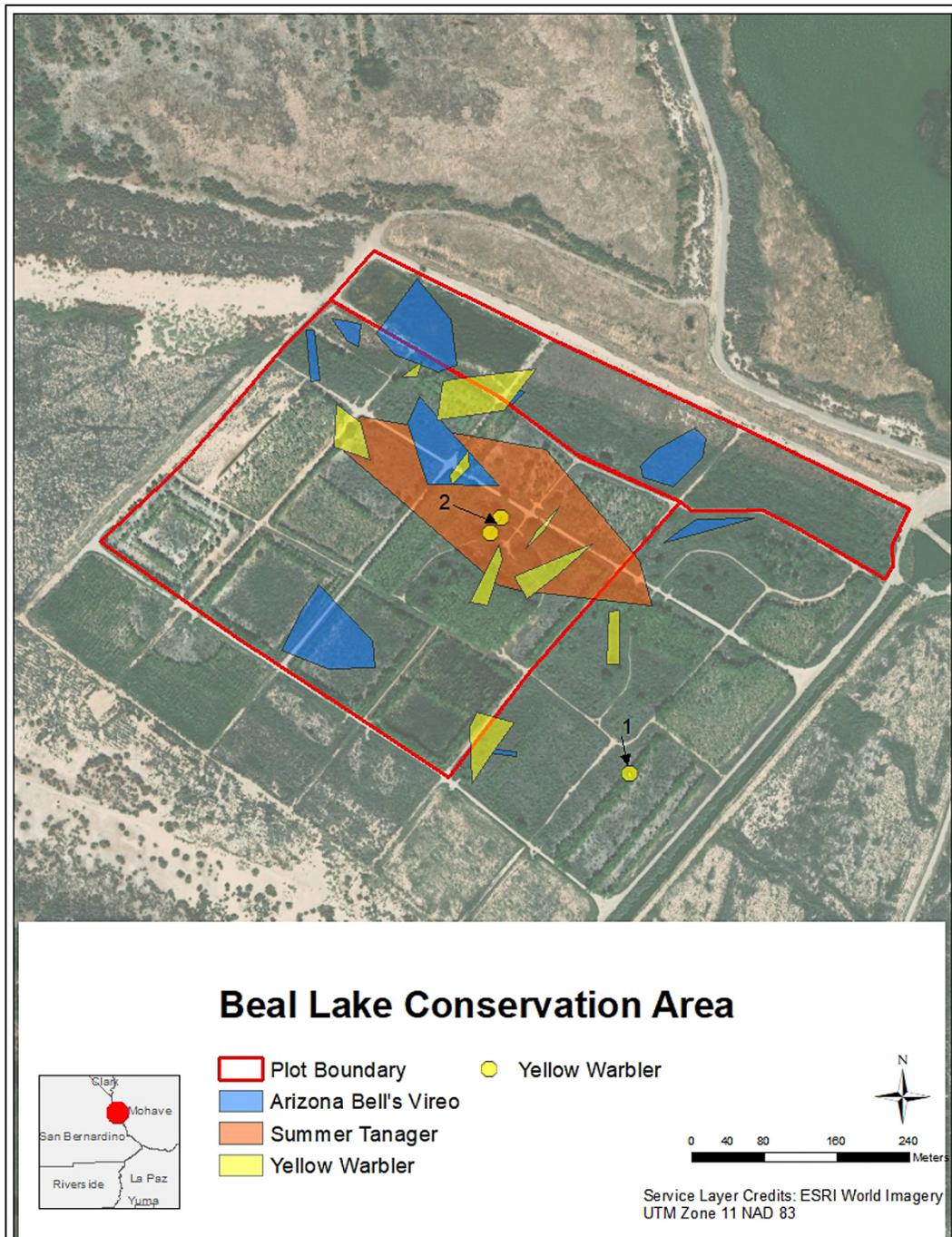


Figure 1.—Locations of focal species territories in the BLCA, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Cibola National Wildlife Refuge Unit #1 Conservation Area

Surveyors recorded 37 species on 10 rapid area search surveys at Cibola NWR Unit #1, including 7 territories of 4 focal species (see table 6), 142 territories of 12 non-focal territorial species (see table 7), and 431 estimated pairs of 21 species classified as non-territorial (see table 10).

The most numerous territorial species were the Abert's towhee (36 total territories), verdin (20 total territories), and ladder-backed woodpecker and Lucy's warbler (each with 14 total territories; see table 7).

The most numerous non-territorial species were the white-winged dove, red-winged blackbird, and brown-headed cowbird.

Of the six focal species, the Gila woodpecker, Sonoran yellow warbler, summer tanager, and vermilion flycatcher were recorded on at least one rapid area search survey (figure 2). A Gila woodpecker held a partial territory on CW-North plot C2707, using the trees on the northern and eastern edges of the plot. Surveyors recorded three territories of the Sonoran yellow warbler: one at Crane Roost plot C2721, one at Crane Roost plot C2722, and one partial territory at Middle Hippy Fire plot C2739. The single summer tanager territory used the eastern portion of Cottonwood Genetics plot C2703. Both vermilion flycatcher territories were located on CW-North plot C2707; both pairs used the edge of the trees in the conservation area and foraged in adjacent agricultural fields, one on the north side of the plot and one on the south side. The surveyor located one vermilion flycatcher nest under construction in a small cottonwood in the northeastern corner of the plot on May 15.

Surveyors detected none of the six non-focal covered species, nor did they find any nests of obligate cavity nesters in Cibola NWR Unit #1 in 2019.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

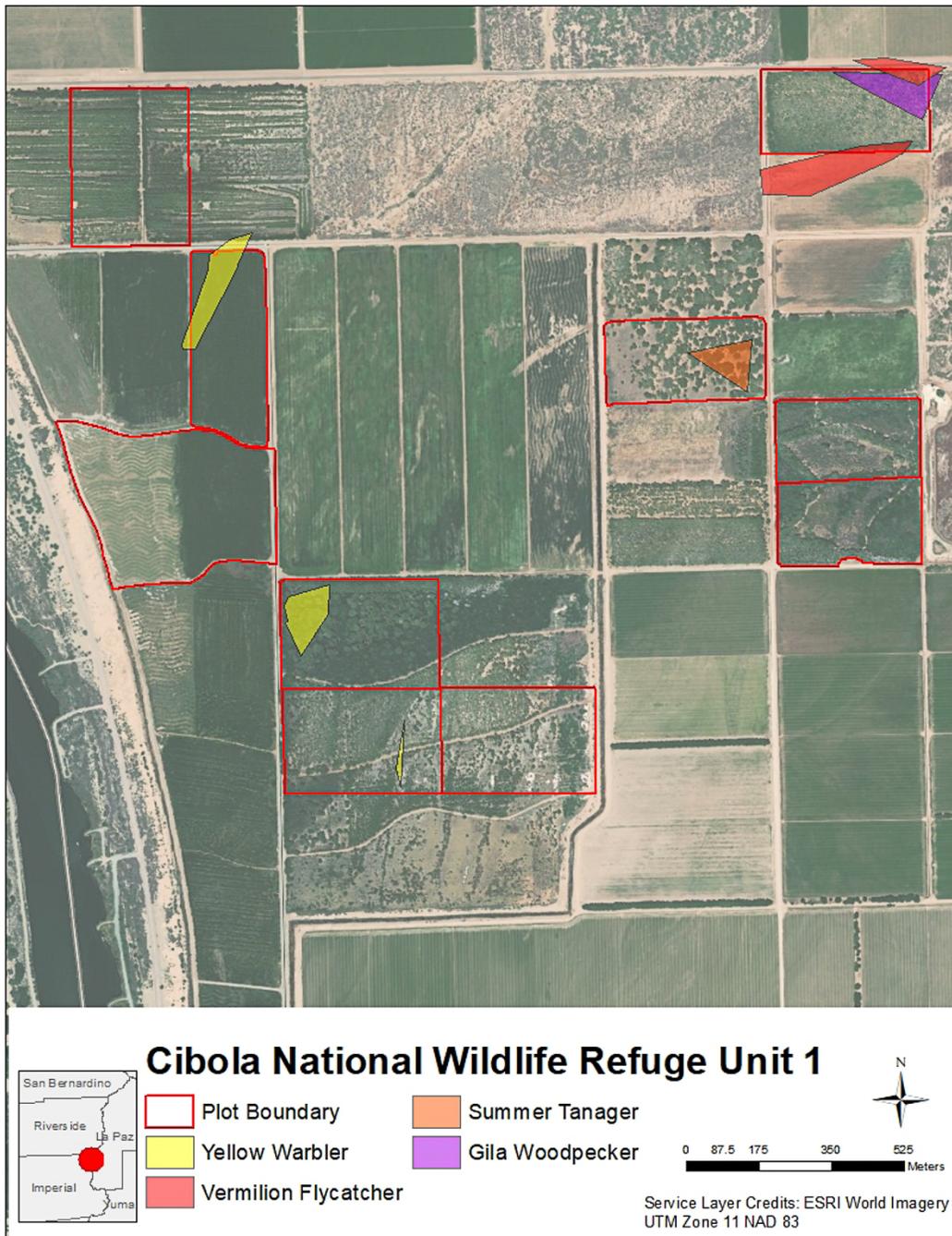


Figure 2.—Locations of focal species territories in Cibola NWR Unit #1, 2019.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Cibola Valley Conservation Area

Surveyors recorded 34 species on 14 rapid area search surveys and 1 intensive area search survey at the CVCA, including 4 territories of 3 focal species (see table 6), 243 territories of 12 non-focal territorial species (see table 7) and, on rapid area search surveys only, 419 estimated pairs of 16 species classified as non-territorial (see table 10). The surveyor of the intensive area search survey recorded an additional three non-territorial species not otherwise detected at the CVCA in 2019 (European starling, great horned owl [*Bubo virginianus*], and lesser goldfinch (*Spinus psaltria*); see table 12).

The most numerous territorial species were the Abert's towhee (74 total territories), verdin (47 total territories), and black-tailed gnatcatcher (*Polioptila melanura*) (35 total territories; see table 7).

The most numerous non-territorial species on rapid area search surveys were the white-winged dove, brown-headed cowbird, and mourning dove.

Of the six focal species, the Gila woodpecker, Sonoran yellow warbler, and summer tanager were recorded on at least one area search survey (figure 3). Surveyors documented one Gila woodpecker perched in the trees on the eastern edge of Phase 01 plot C2505. Surveyors recorded two territories of the Sonoran yellow warbler: one in the interior of Phase 01 plot C2505 and one off plot just south of Phase 03 plot C2512. The single summer tanager territory was located in the central portion of Phase 04 plot C2516.

Surveyors detected none of the six non-focal covered species at the CVCA in 2019, nor did they confirm nests of covered species or obligate cavity nesters.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

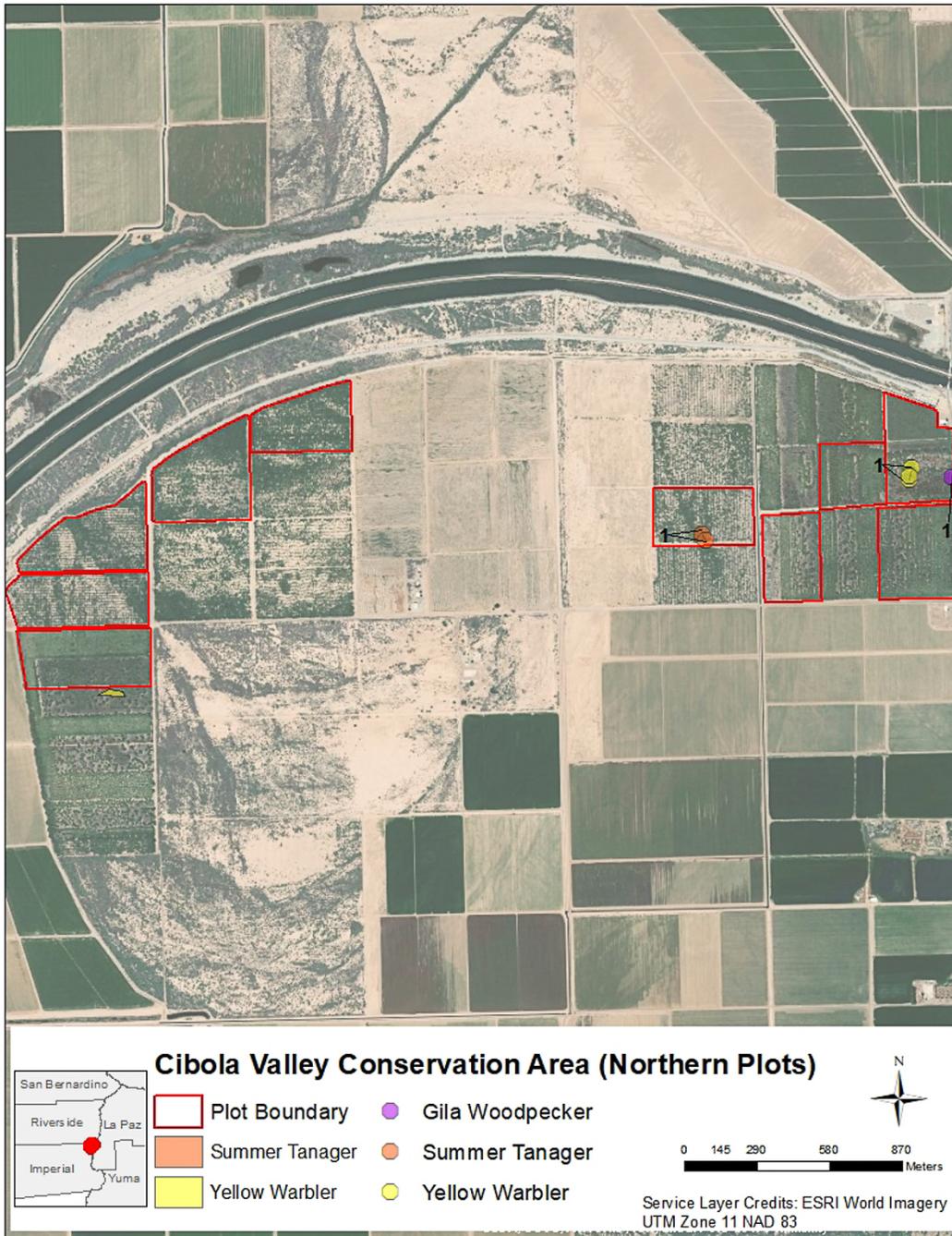


Figure 3.—Locations of focal species territories in the CVCA northern plots, 2019. Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Hunters Hole

Surveyors recorded 10 species on 1 rapid area search survey at Hunters Hole, including 9 territories of 5 non-focal territorial species (see table 7) and 11 estimated pairs of 5 species classified as non-territorial (see table 10).

The most numerous territorial species were the Abert's towhee and ash-throated flycatcher (*Myiarchus cinerascens*), each with three territories (see table 7).

The most numerous non-territorial species were the brown-headed cowbird, Gambel's quail (*Callipepla gambelii*), and mourning dove.

Surveyors recorded no covered species nor nests of obligate cavity nesters in Hunters Hole in 2019.

Laguna Division Conservation Area

Surveyors recorded 42 species on 10 rapid area search surveys and 1 intensive area search survey at the LDCA, including 15 territories of 3 focal species (see table 6), 223 territories of 12 non-focal territorial species (see table 7) and, on rapid area search surveys only, 217 estimated pairs of 21 species classified as non-territorial (see table 10). The surveyor of the intensive area search survey recorded an additional six non-territorial species not otherwise detected at the LDCA in 2019 (black-necked stilt [*Himantopus mexicanus*], Yuma clapper rail, great blue heron [*Ardea herodias*], great egret [*Ardea alba*], northern harrier [*Circus hudsonius*], and snowy egret [*Egretta thula*]).

The most numerous territorial species were the common yellowthroat (46 total territories), song sparrow (42 total territories), and Abert's towhee (31 total territories; see table 7).

The most numerous non-territorial species on rapid area search surveys were the white-winged dove, Gambel's quail, and mourning dove.

Of the six focal species, the Arizona Bell's vireo and Sonoran yellow warbler were recorded on at least one area search survey (figures 4–5). Surveyors detected 12 territories of Arizona Bell's vireos within the LDCA, of which all but 2 were in Reach 01, and they were especially concentrated in plots C4939 and C4944. The single territory of the Sonoran yellow warbler used the western portion of Reach 01 plot C4937. Two Gila woodpecker territories were located to the east of the conservation area and are not shown on figures 4 or 5.

Of the six non-focal covered species, surveyors found western least bitterns in marshy areas of both Reach 01 and Reach 02, with an estimated six pairs on five rapid area search surveys. Additionally, an estimated two pairs of Yuma clapper rails used the marsh around the intensive area search plot, Reach 02 plot C4951.

Surveyors found no nests of covered species nor of obligate cavity nesters in the LDCA in 2019.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

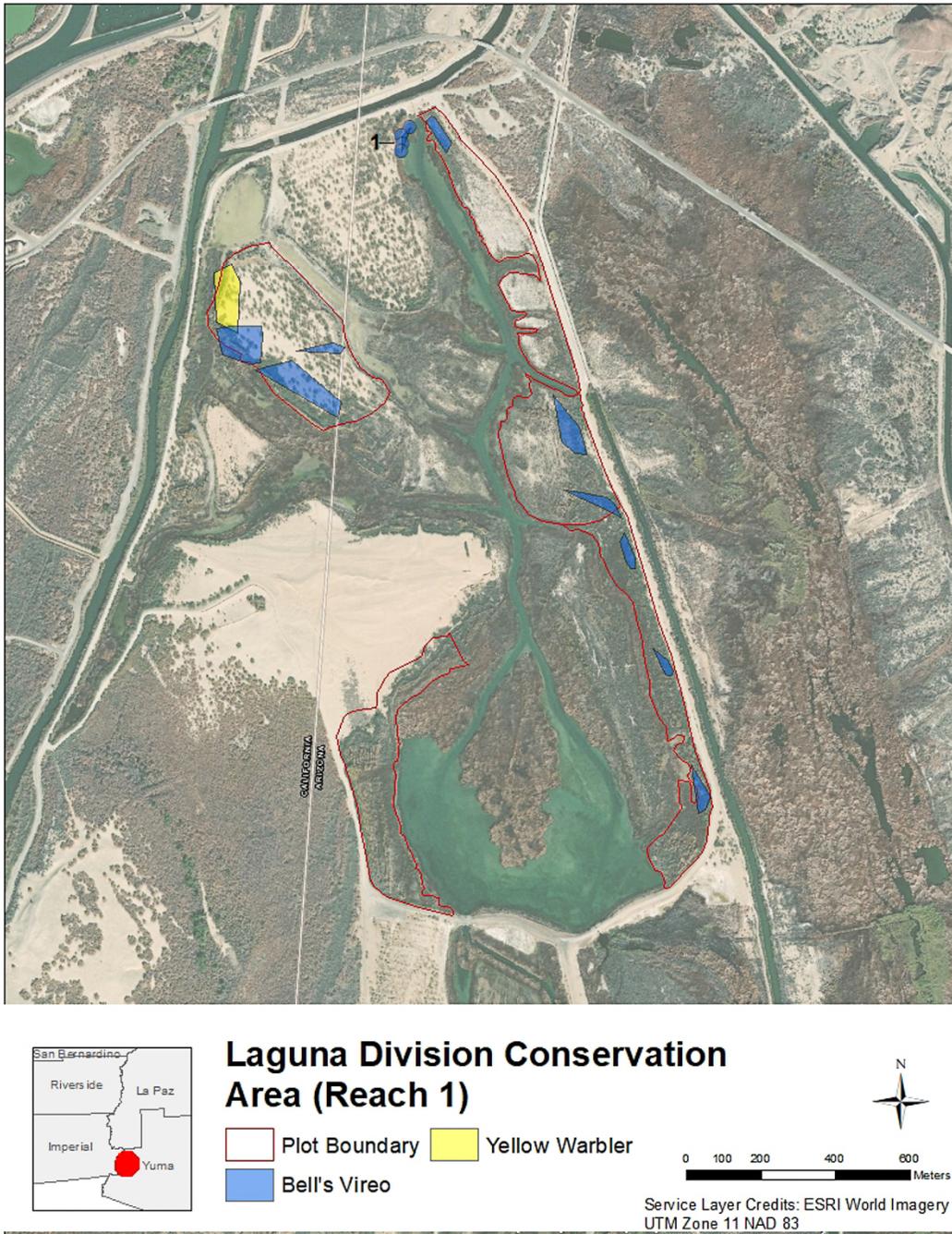


Figure 4.—Locations of focal species territories in the LDCA, Reach 01, 2019. Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

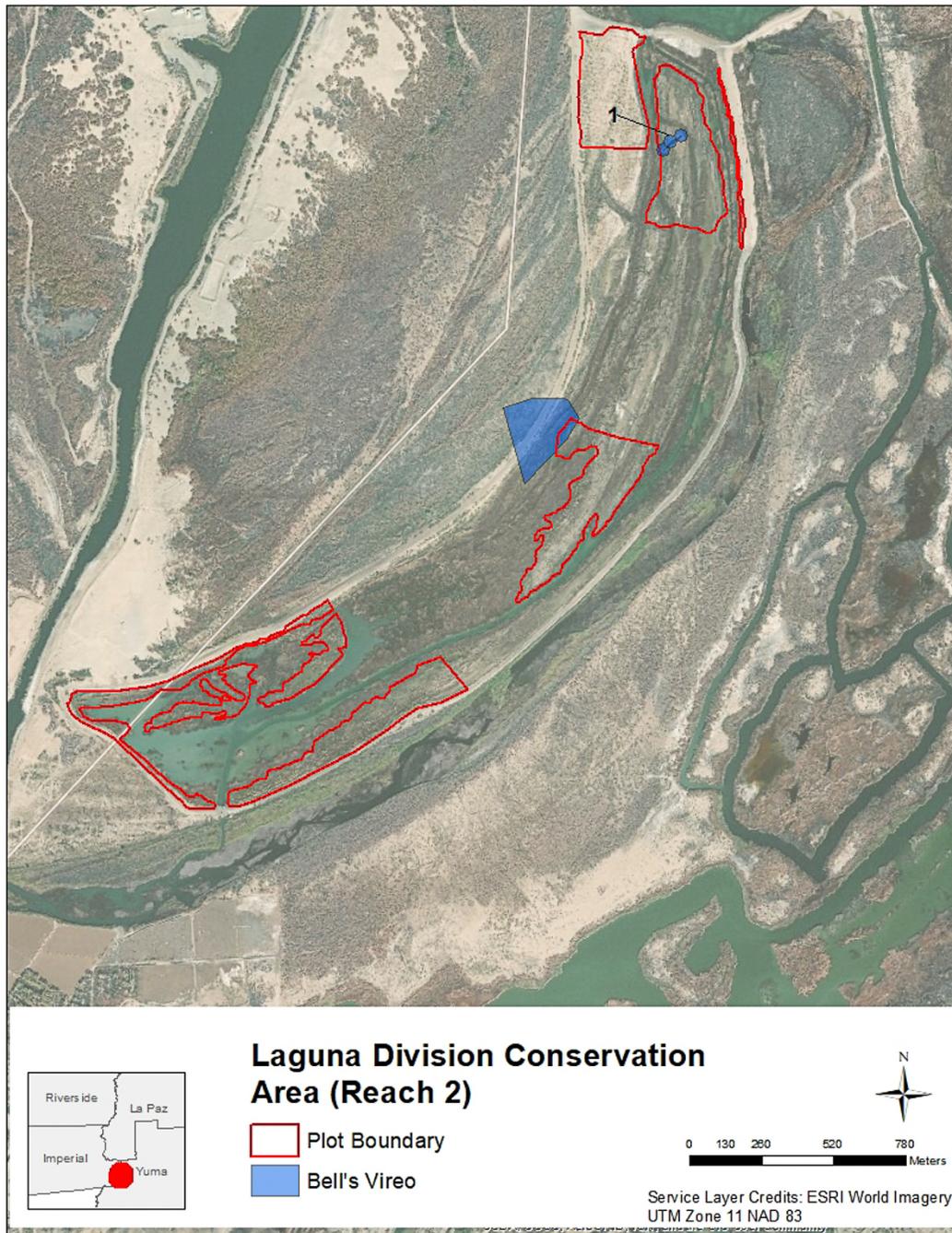


Figure 5.—Locations of focal species territories in the LDCA, Reach 02, 2019. Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Middle Bill Williams River National Wildlife Refuge

Analysts divided the results for the Middle Bill Williams River NWR into two subareas: Middle Bill Williams River NWR East and Middle Bill Williams River NWR West.

Middle Bill Williams River NWR East

Surveyors recorded 39 species on 4 rapid area search surveys and 1 intensive area search survey at Middle Bill Williams River NWR East, including 51 territories of 4 focal species (see table 6), 242 territories of 16 non-focal territorial species (see table 7) and, on rapid area search surveys only, 134 estimated pairs of 19 species classified as non-territorial (see table 10). The surveyor of the intensive area search survey did not record any additional non-territorial species not otherwise detected as on-plot breeders at Middle Bill Williams River NWR East in 2019. However, a surveyor did record one elf owl off plot during a rapid area search survey, which is not included in the above numbers.

The most numerous territorial species were the song sparrow (37 total territories), Lucy's warbler (35 total territories; see table 7), and Arizona Bell's vireo (33 total territories; see table 6).

The most numerous non-territorial species on rapid area search surveys were the mourning dove, white-winged dove, and cliff swallow (*Petrochelidon pyrrhonota*).

Of the six focal species, the Arizona Bell's vireo, Gila woodpecker, Sonoran yellow warbler, and summer tanager were recorded on at least one area search survey (figures 6-7). Surveyors detected a total of 33 territories of Arizona Bell's vireos on all 4 plots. This species was especially concentrated in Mineral Wash plot C1901, with 14 territories on the plot, and 20 total territories in the vicinity. Surveyors recorded a total of 11 Gila woodpecker territories on all 4 plots. Surveyors located two territories of summer tanagers on the eastern portion of Mineral Wash plot C1901. All five territories of Sonoran yellow warblers were along the river channel of Mineral Wash plot C1901.

Of the six non-focal covered species, one elf owl was located at the end of the road into Mineral Wash, west of plot C1901.

Surveyors recorded several nests of interest in Middle Bill Williams River NWR East. A Gila woodpecker nest in a Goodding's willow (*Salix gooddingii*) on Mineral Wash plot C1901 contained nestlings on June 10. Surveyors located two ash-throated flycatcher nest plots on Esquerra Ranch plot C1905, one in a snag and active on May 1, and one containing young on June 15. Also of interest was a common black hawk nest on Mineral Wash plot C1901. The nest was active on both visits (May 16 and June 10) and contained chicks on the latter date.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

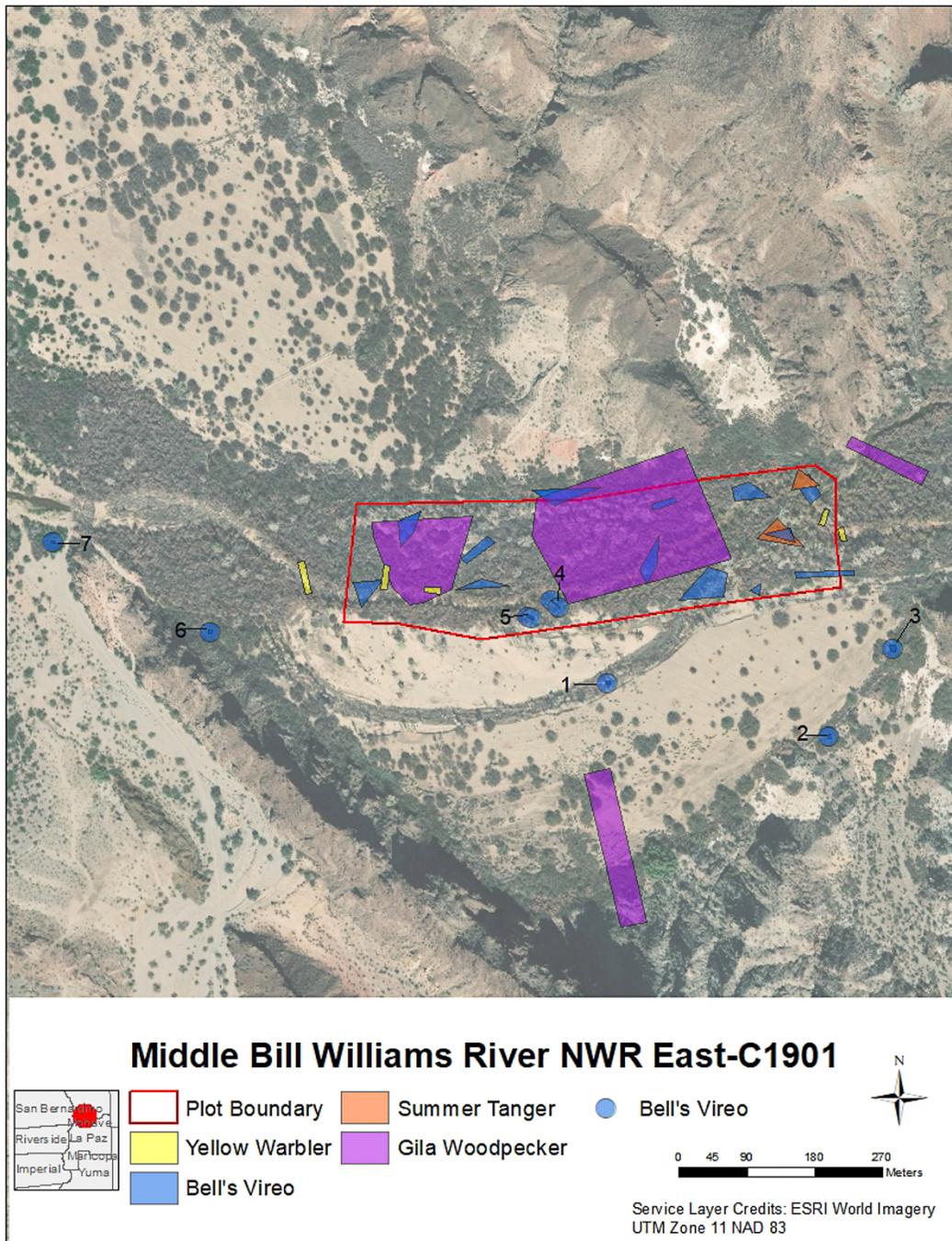


Figure 6.—Locations of focal species territories in Middle Bill Williams River NWR East plot C1901, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

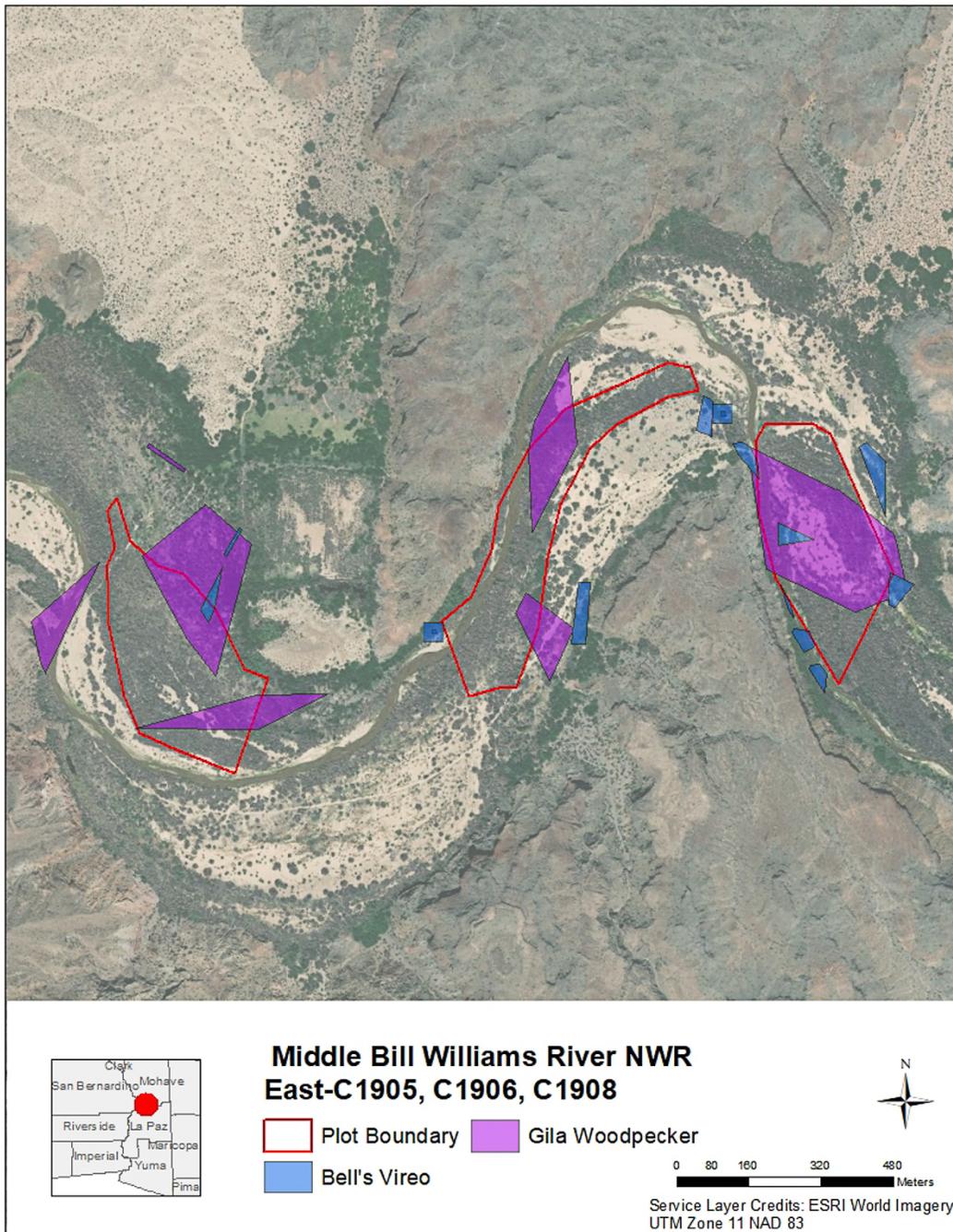


Figure 7.—Locations of focal species territories in Middle Bill Williams River NWR East plots C1905, C1906, and C1908, 2019.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Middle Bill Williams River NWR West

Surveyors recorded 39 species on 10 rapid area search surveys and 1 intensive area search survey at Middle Bill Williams River NWR West, including 174 territories of 4 focal species (see table 6), 831 territories of 18 non-focal territorial species (see table 7) and, on rapid area search surveys only, 154 estimated pairs of 16 species classified as non-territorial (see table 10). The surveyor of the intensive area search survey recorded one additional non-territorial species (elf owl) not otherwise detected at Middle Bill Williams River NWR West in 2019.

The most numerous territorial species were the song sparrow (216 total territories), yellow-breasted chat (*Icteria virens*; 166 total territories), and common yellowthroat (158 total territories; see table 7).

The most numerous non-territorial species on rapid area search surveys were the white-winged dove, mourning dove, and brown-headed cowbird.

Of the six focal species, the Arizona Bell's vireo, Gila woodpecker, Sonoran yellow warbler, and summer tanager were recorded on at least one area search survey (figures 8–12). Surveyors detected a total of 27 territories of Arizona Bell's vireos on 8 plots. This species was concentrated in Mosquito Flats plot C1931 and Fox Wash plot C1922, with nine and six total territories, respectively. Surveyors recorded a total of 12 Gila woodpecker territories on all 10 plots. Surveyors located 10 territories of summer tanagers, including up to 3 on an individual plot. By far the most numerous focal species in Middle Bill Williams River NWR West was the Sonoran yellow warbler, with 125 total territories. The highest density was present in Mosquito Flats, including 64 territories on plot C1931 and 39.75 territories on plot C1932.

Of the six non-focal covered species, the intensive surveyor of Sandy Wash plot C1914 detected an elf owl singing and calling on and off plot. The bird was using a saguaro (*Carnegia gigantea*) just off the northeastern edge of the plot, although the surveyor did not confirm nesting.

Surveyors recorded several nests of interest in Middle Bill Williams River NWR West. Two Gila woodpecker nests with young were active on Mosquito Flats plot C1933 on May 22. A pair of brown-crested flycatchers (*Myiarchus tyrannulus*) nested in a snag on Fox Wash plot C1922. Surveyors located an ash-throated flycatcher nest with young on Sandy Wash plot C1914 on May 15, and a Cooper's hawk (*Accipiter cooperii*) nest on the same plot from April 23 to June 4, after which the young successfully fledged.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

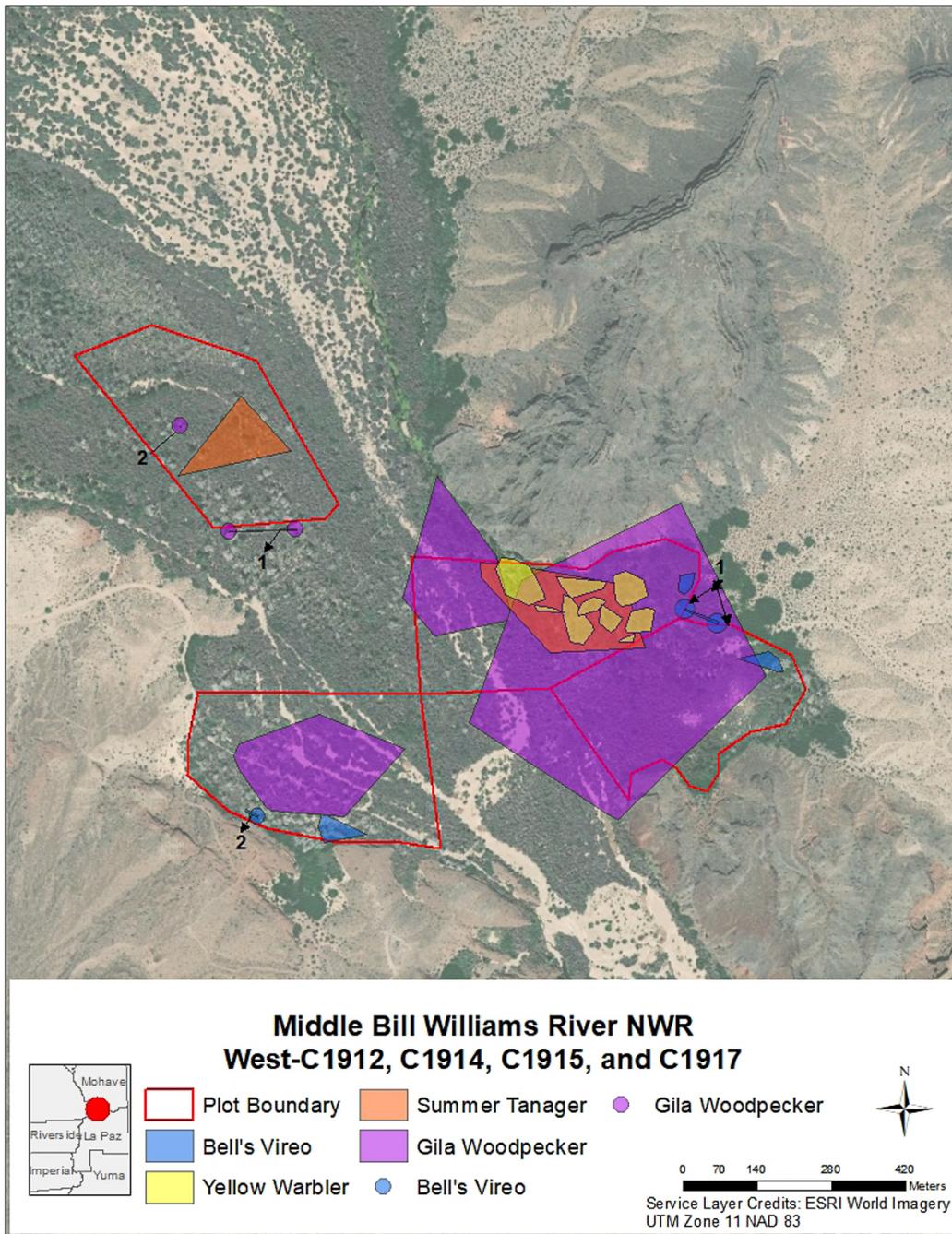


Figure 8.—Locations of focal species territories in the Middle Bill Williams River NWR West plots C1912, C1914, C1915 and C1917, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

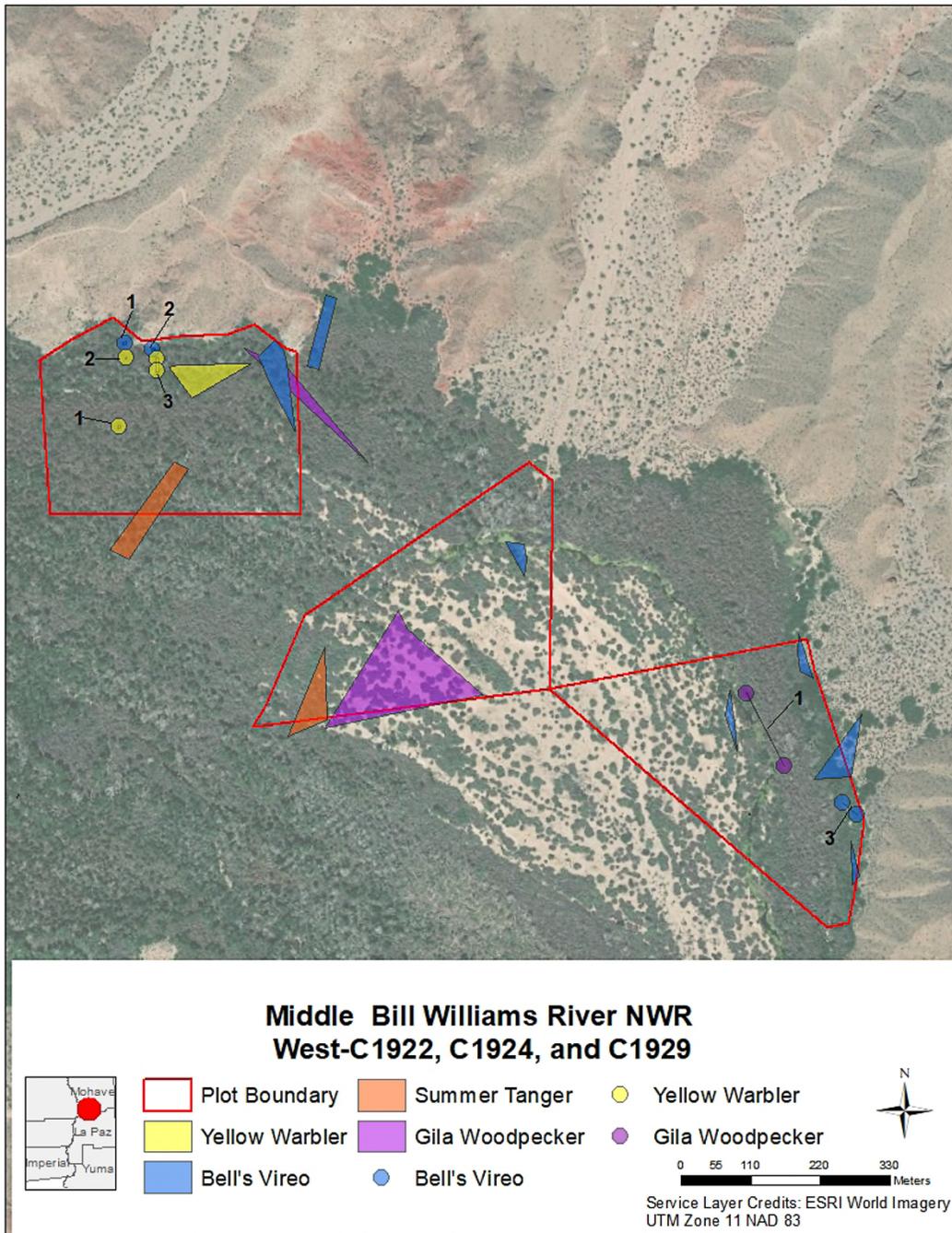


Figure 9.—Locations of focal species territories in Middle Bill Williams River NWR West plots C1922, C1924, and C1929, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

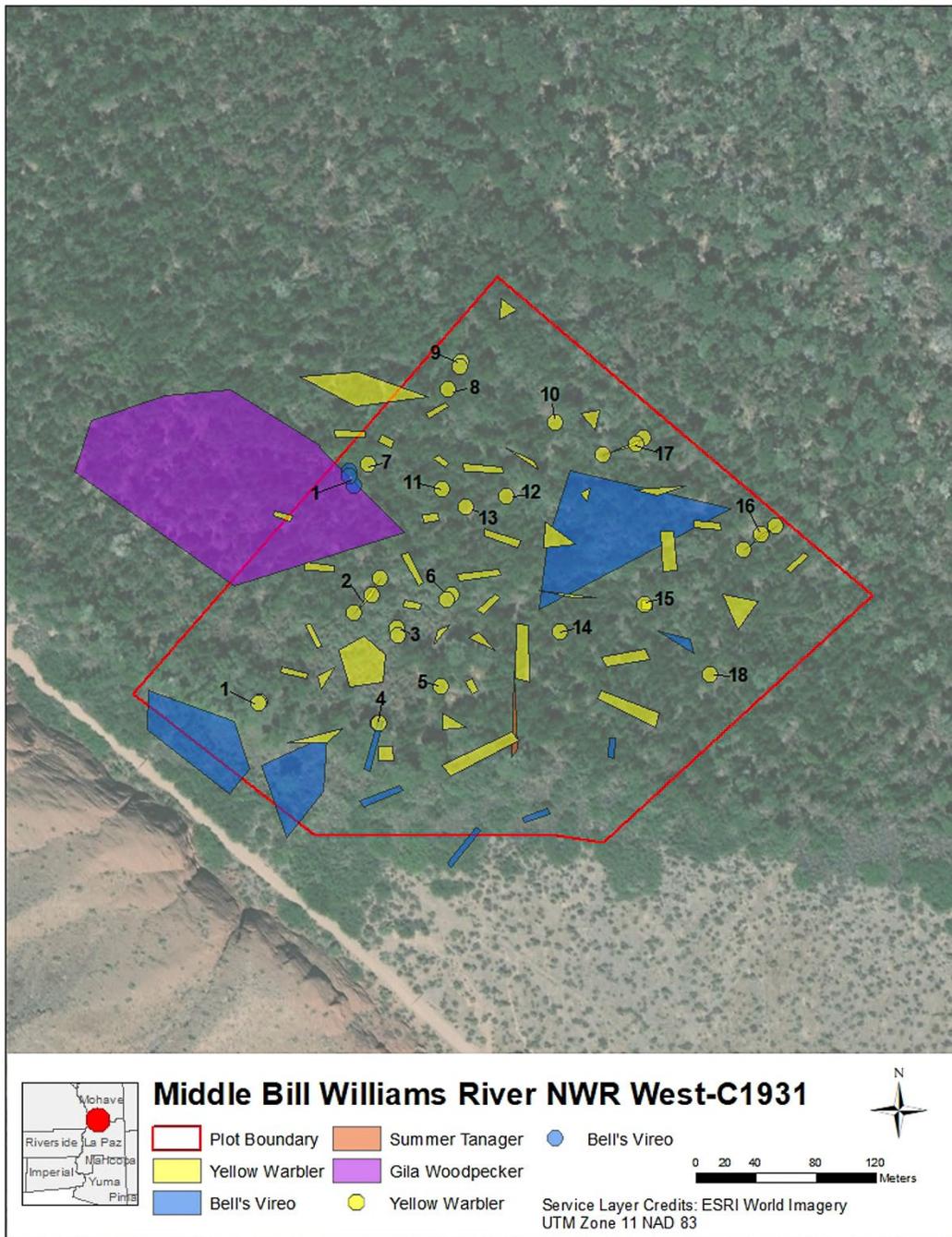


Figure 10.—Locations of focal species territories in Middle Bill Williams River NWR West plot C1931, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report

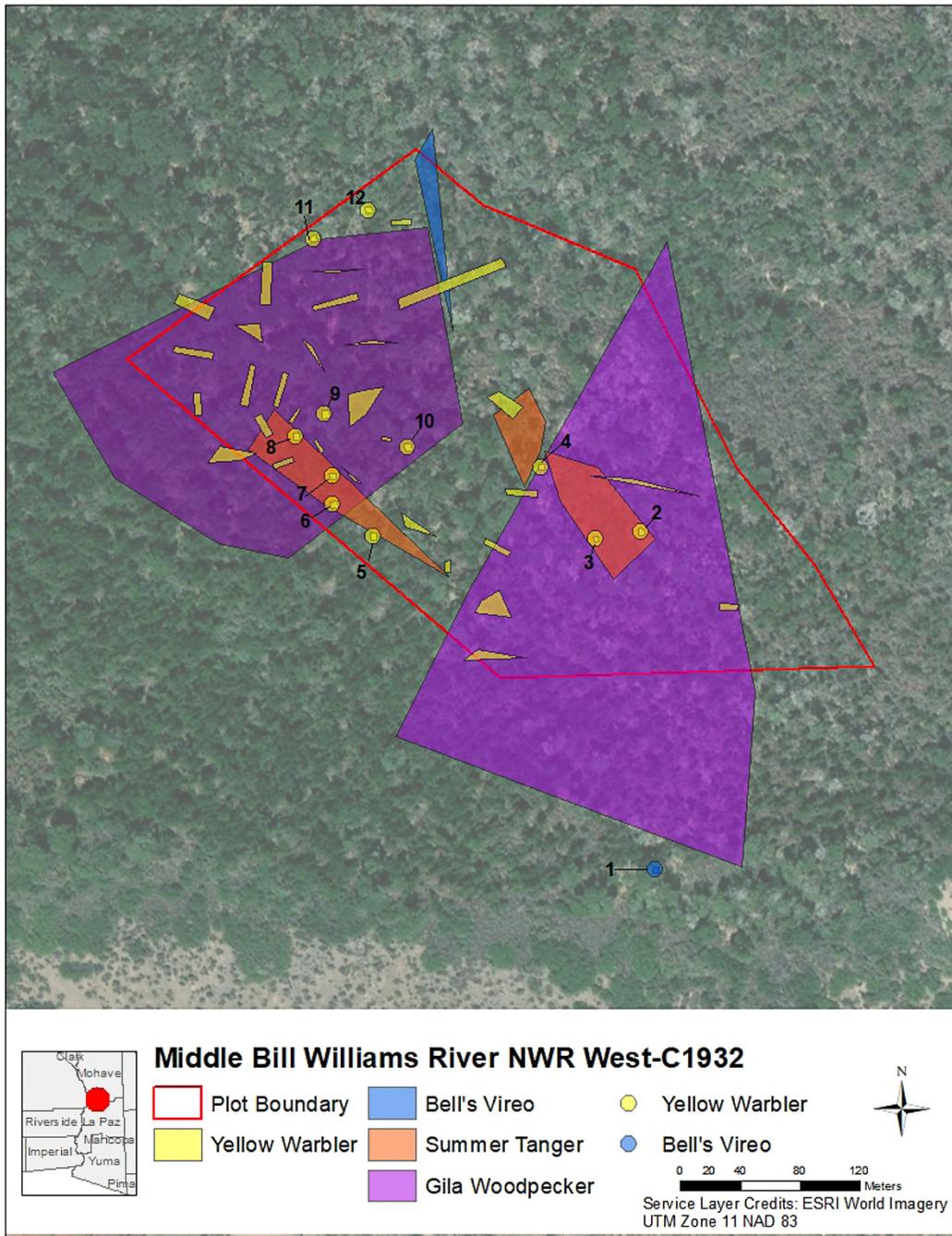


Figure 11.—Locations of focal species territories in Middle Bill Williams River NWR West plot C1932, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

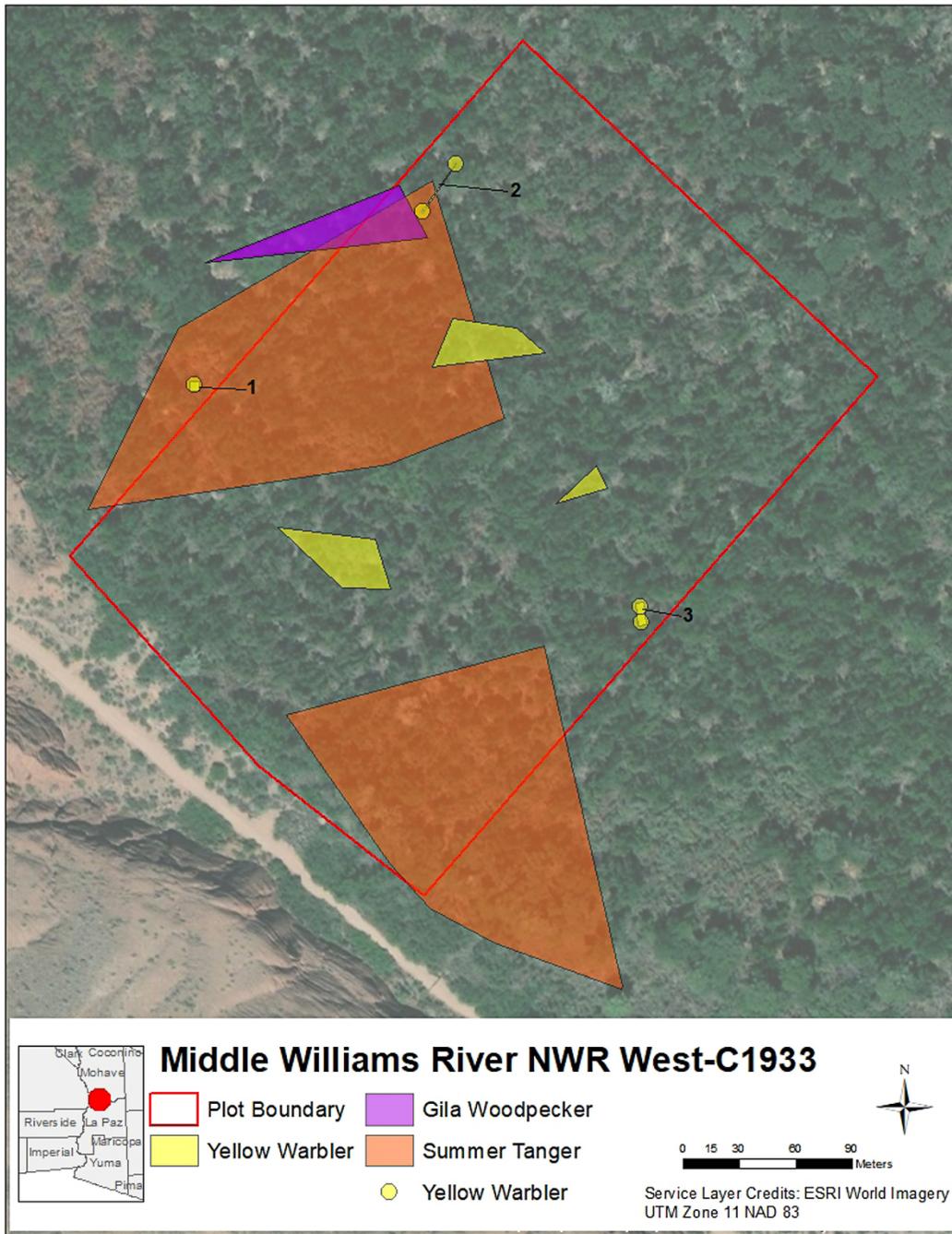


Figure 12.—Locations of focal species territories in Middle Bill Williams River NWR West plot C1933, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Palo Verde Ecological Reserve

Surveyors recorded 41 species on 15 rapid area search surveys and 2 intensive area search surveys at the PVER, including 10 territories of 2 focal species (see table 6), 252 territories of 14 non-focal territorial species (see table 7) and, on rapid area search surveys only, 854 pairs of 22 species classified as non-territorial (see table 10). This includes a colony of an estimated 350 pairs of red-winged blackbirds on Phase 01 plot C2301. The surveyors of the intensive area search surveys recorded an additional three non-territorial species not otherwise found at the PVER in 2019 (American kestrel [*Falco sparverius*], cliff swallow, and northern rough-winged swallow [*Stelgidopteryx serripennis*]).

The most numerous territorial species were the Abert's towhee (48 total territories), blue grosbeak (*Passerina caerulea*) (31 total territories), and the ladder-backed woodpecker and western kingbird (*Tyrannus verticalis*) (each with 30 total territories; see table 7).

The most numerous non-territorial species on rapid area search surveys were the red-winged blackbird, white-winged dove, and mourning dove.

Of the six focal species, the Arizona Bell's vireo and summer tanager were on at least one area search survey (figure 13). Surveyors detected two territories of Arizona Bell's vireos within the PVER, both on the western edge of Phase 02 plot C2302. The eight summer tanager territories at the PVER were widespread, with eight territories distributed throughout the conservation area.

Of the six non-focal covered species, one western least bittern was heard outside the conservation area on the Colorado River near Phase 07 plot C2330.

Surveyors did not confirm nests of covered species or obligate cavity nesters in the PVER in 2019.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

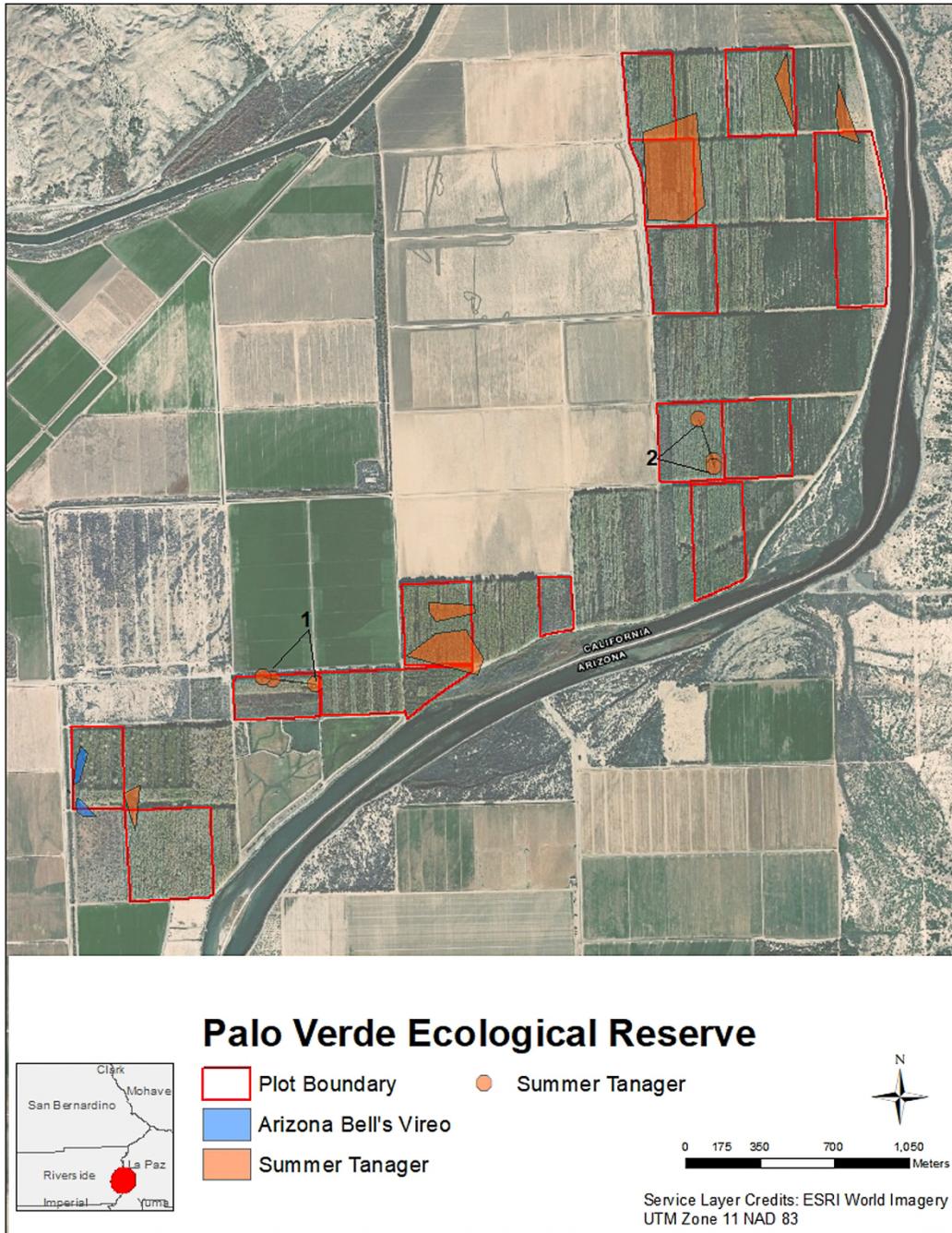


Figure 13.—Locations of focal species territories in the PVER, 2019.

Point locations represent detections that met the criteria for a territory but for which there were insufficient points to delineate the territory with a polygon. The numbers on the map indicate which points belong to the same territory for territories that were too small to delineate with a polygon.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Parker Dam Camp

Surveyors recorded 28 species on 2 rapid area search surveys and 2 intensive area search surveys at Parker Dam Camp, including 1 territory of 1 focal species (see table 6), 92 territories of 15 non-focal territorial species (see table 7) and, on rapid area search surveys only, 91 pairs of 11 species classified as non-territorial (see table 10). The surveyors of the intensive area search surveys recorded one additional non-territorial species greater roadrunner (*Geococcyx californianus*) not otherwise detected at Parker Dam Camp in 2019.

The most numerous territorial species were the Lucy's warbler (20 total territories), verdin (19 total territories), and Abert's towhee (14 total territories; see table 7).

The most numerous non-territorial species on rapid area search surveys were the house finch (*Haemorhous mexicanus*), Eurasian collared-dove (*Streptopelia decaocto*), and mourning dove.

Of the six focal species, one Gila woodpecker pair held a territory in the central portion of the conservation area, including both plots surveyed (figure 14).

Surveyors detected none of the six non-focal covered species at Parker Dam Camp in 2019, nor did they confirm nests of covered species.

Surveyors located a ladder-backed woodpecker nest on plot C2001 and observed an altercation between the ladder-backed woodpeckers and a Gila woodpecker that tried to enter the cavity.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

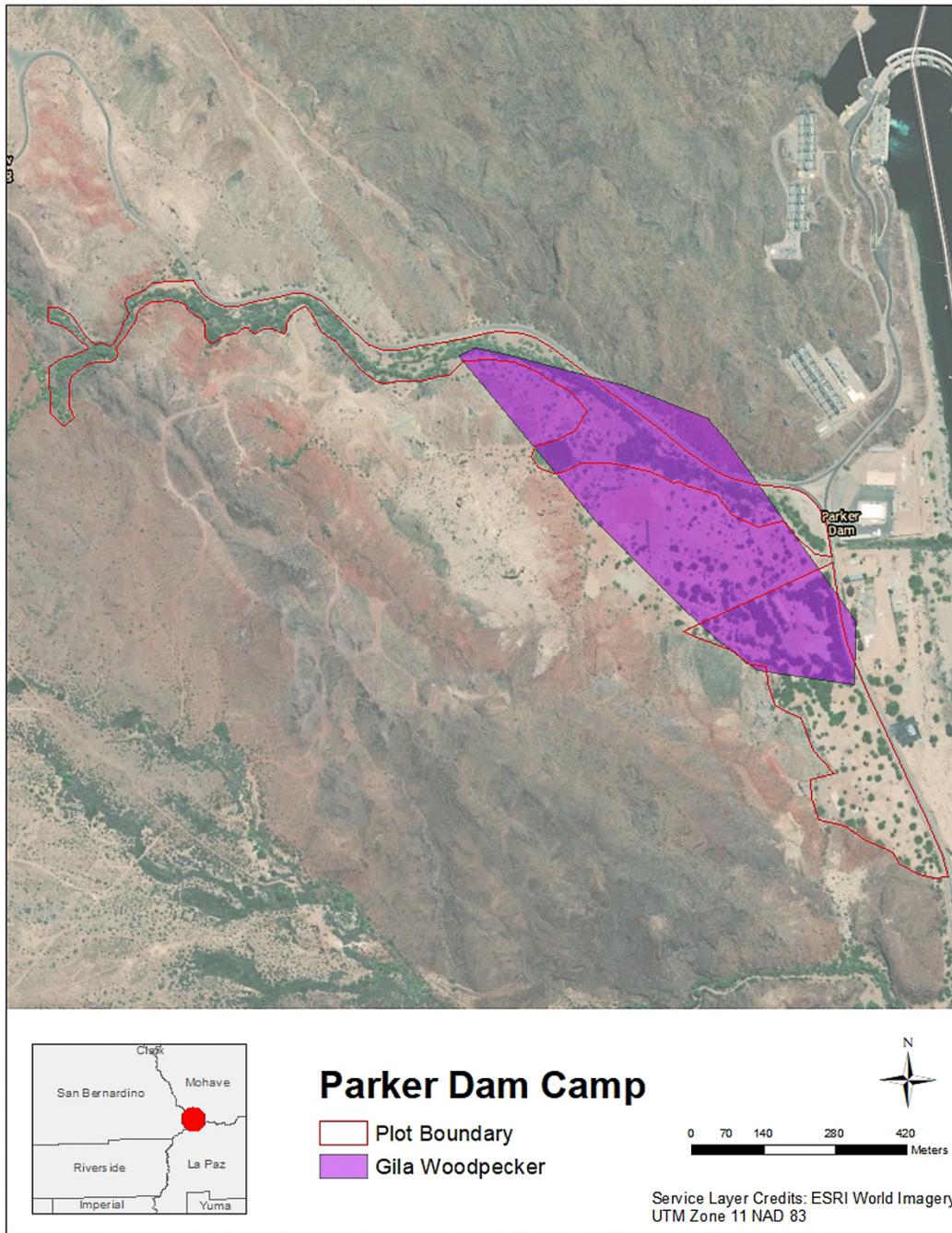


Figure 14.—Locations of focal species territories in Parker Dam Camp, 2019.

Riparian Bird Surveys at Conservation Areas in the Lower Colorado River Region, 2019 Annual Report

Pretty Water Conservation Area

Surveyors recorded 26 species on 9 rapid area search surveys at the PWCA, including 87 territories of 12 non-focal territorial species (see table 7) and 130 pairs of 14 species classified as non-territorial (see table 10).

The most numerous territorial species were the black-tailed gnatcatcher (23 total territories), Abert's towhee (20 total territories), and verdin (12 total territories; see table 7).

The most numerous non-territorial species were the lesser nighthawk (*Chordeiles acutipennis*), mourning dove, and white-winged dove.

Surveyors recorded no focal species or cavity nests in the PWCA in 2019.

Of the six non-focal covered species, one western least bittern was heard in the channel just outside plot C2913; it is not included in the numbers above.

Yuma East Wetlands

Surveyors recorded 30 species on 4 rapid area search surveys at YEW, including 4 territories of 1 focal species (see table 6), 73 territories of 9 non-focal territorial species (see table 7), and 188 pairs of 20 species classified as non-territorial (see table 10).

The most numerous territorial species were the verdin (28 total territories), Abert's towhee (16 total territories), and black-tailed gnatcatcher (10 total territories; see table 7).

The most numerous non-territorial species were the mourning dove, rock pigeon (*Columba livia*), and white-winged dove.

Of the six focal species, surveyors recorded three Gila woodpecker territories at YEW and a fourth just outside the conservation area across the Colorado River (figure 15).

Surveyors detected none of the six non-focal covered species at YEW in 2019.

Surveyors confirmed one Gila woodpecker nest with young on June 11 in a tree next to the parking lot. Surveyors located two cavity nests on phase South AC plot C4711: a ladder-backed woodpecker nest with young in a cottonwood on June 11 and an active ash-throated flycatcher nest in a snag on May 8. Another ash-throated flycatcher nest was active in a cottonwood on June 4 on Phase 01 plot C4702.

**Riparian Bird Surveys at Conservation Areas
in the Lower Colorado River Region, 2019 Annual Report**

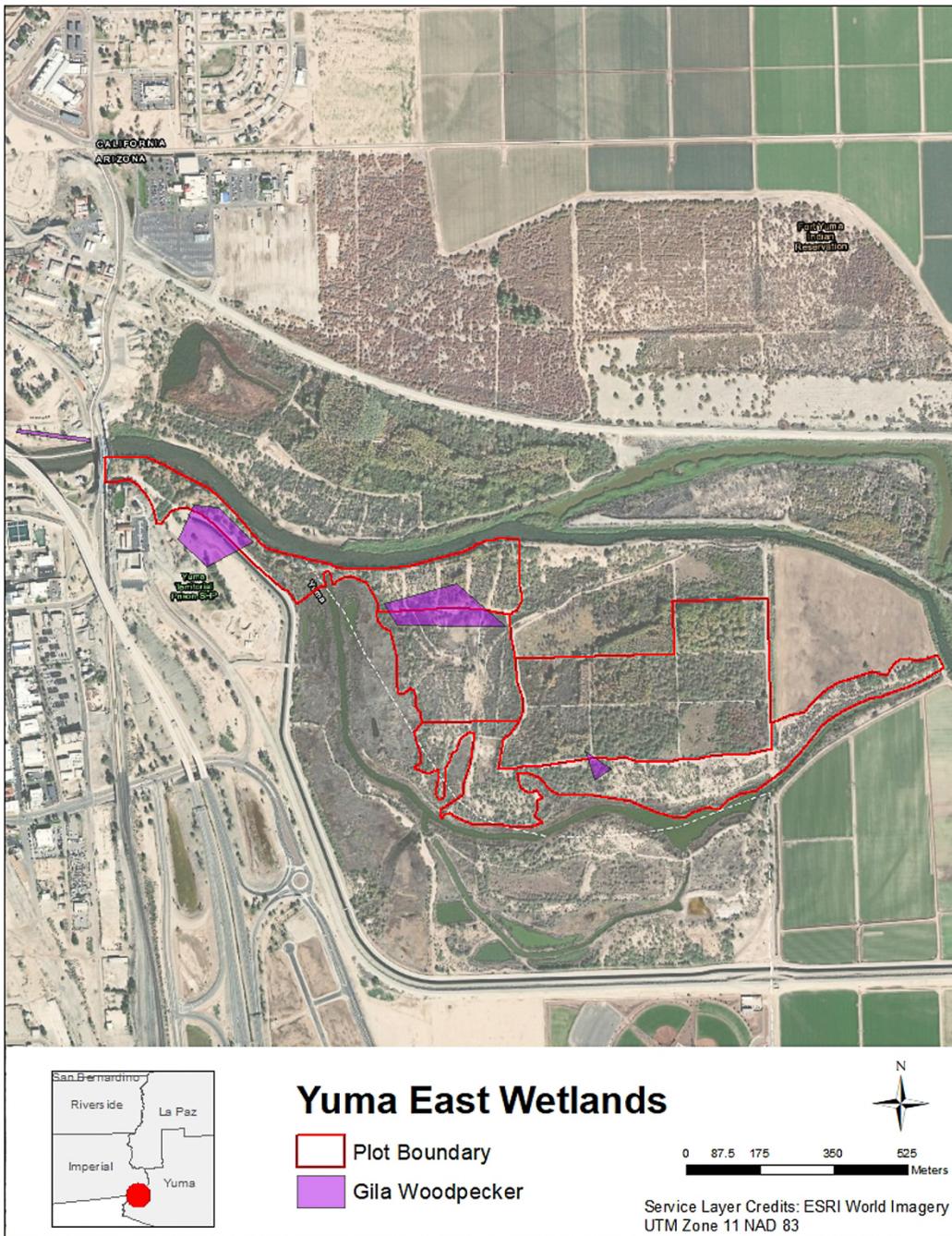


Figure 15.—Locations of focal species territory in YEW, 2019.

LITERATURE CITED

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.

LCR MSCP (see Lower Colorado River Multi-Species Conservation Program).

Lower Colorado River Multi-Species Conservation Program (LCR MSCP). 2004a. Lower Colorado River Multi-Species Conservation Program, Volume I: Final Programmatic Environmental Impact Statement/Environmental Impact Report. Sacramento, California.

_____. 2004b. Lower Colorado River Multi-Species Conservation Program, Volume II: Habitat Conservation Plan, Final. December 17 (J&S 00450.00). Sacramento, California.

U.S. Fish and Wildlife Service. 2005. Biological and Conference Opinion on the Lower Colorado River Multi-Species Conservation Program, Arizona, California, and Nevada. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

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A network of partner organizations and agencies worked with the GBBO on permitting and access to survey sites. The GBBO thanks John Bourne with the Havasu National Wildlife Refuge, Emilie Seavey with the Bill Williams River National Wildlife Refuge, Brenda Zaun with the Southwestern Arizona National Wildlife Refuge Complex, John Steffan and other Reclamation staff and contractors at Parker Dam Camp and the Laguna Division Conservation Area, David Vigil with the California Department of Fish and Wildlife, William Knowles with the Arizona Game and Fish Department, Vianey Avila with the Yuma Crossing National Heritage Area, and Brandi Mattias with the Quechan Indian Tribe for their assistance with plot access.

Finally, these surveys would not be possible without the hard work of the surveyors: Geoff Bland, Sue Bruner, Alex Flores, Carlos González, Emily Ridley, David Vander Pluym, and Diane Wong-Kone.

ATTACHMENT 1

Orthophotos Showing Boundaries of Representative Plots
in Conservation Areas, 2019



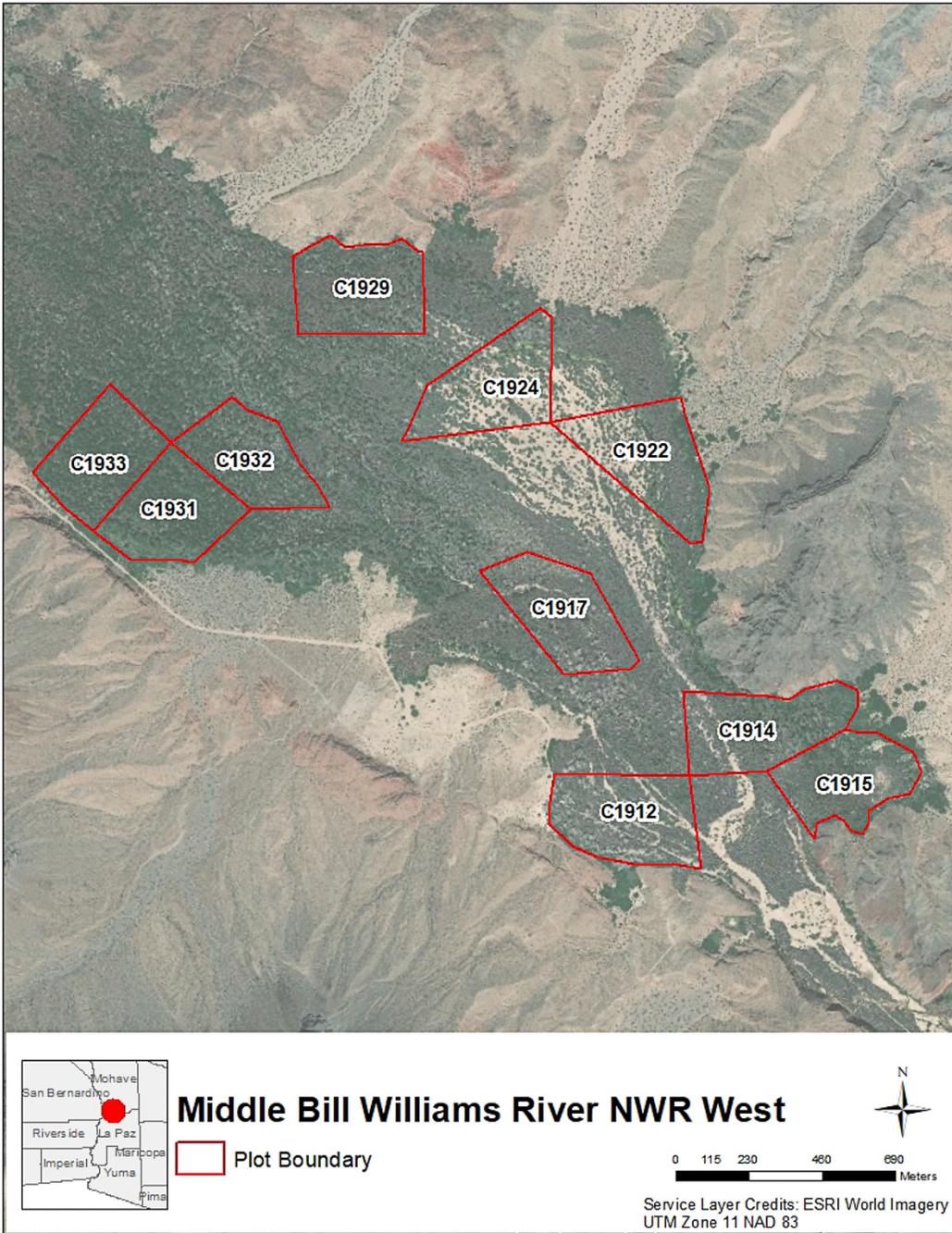
Beal Lake Conservation Area

 Plot Boundary



0 37.5 75 150 225
Meters

Service Layer Credits: ESRI World Imagery
UTM Zone 11 NAD 83





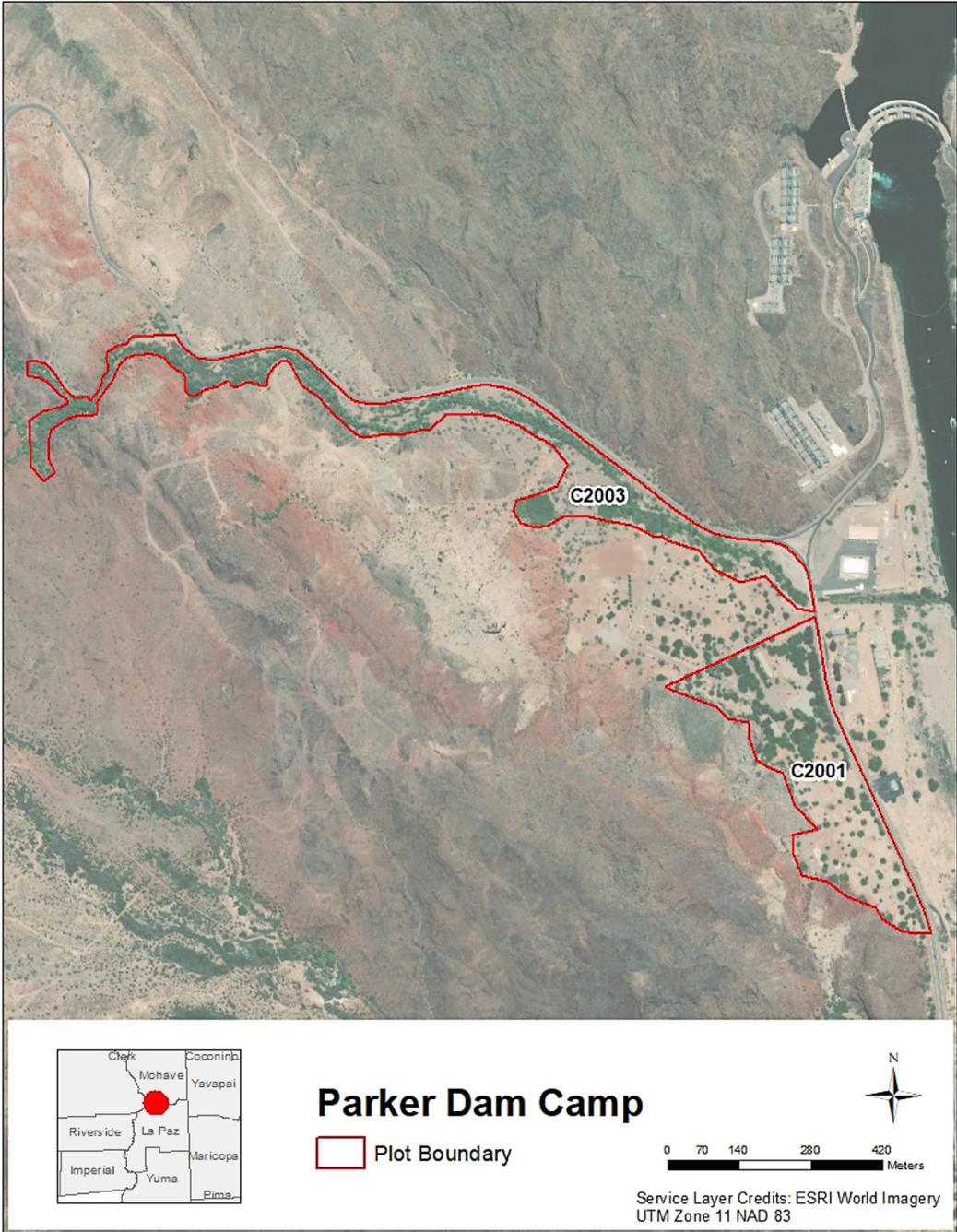
Middle Bill Williams River NWR East

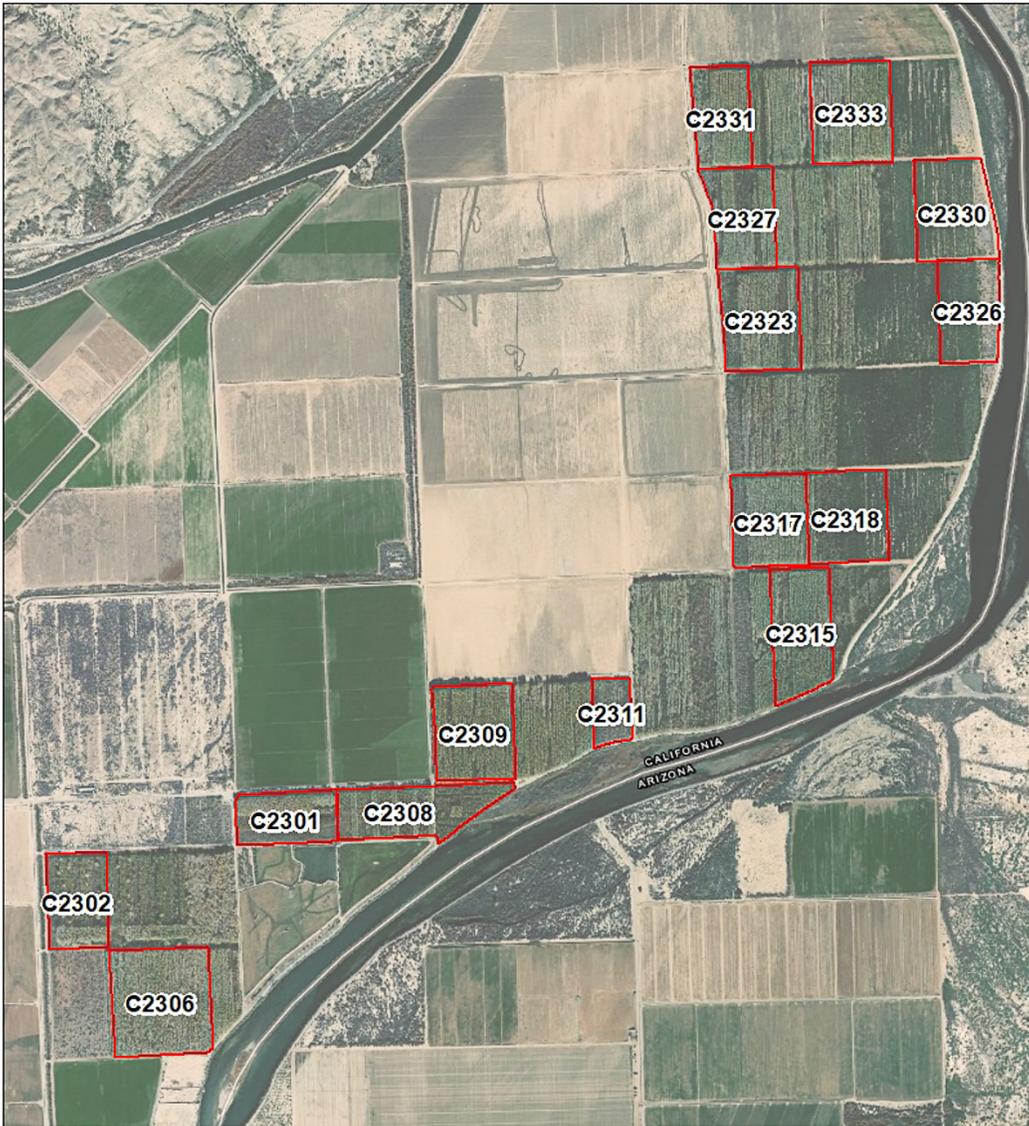
 Plot Boundary



0 145 290 580 870 Meters

Service Layer Credits: ESRI World Imagery
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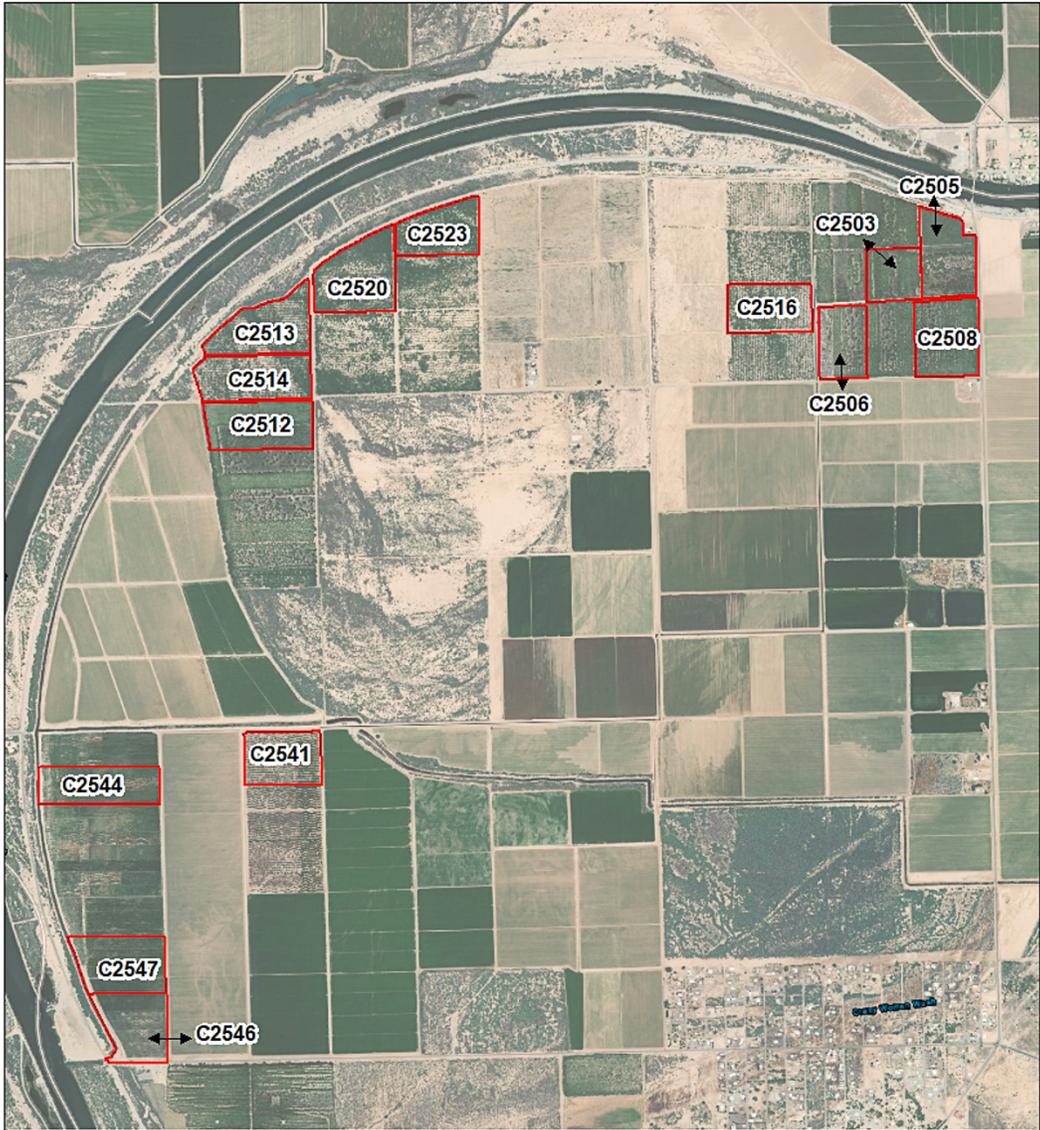


Palo Verde Ecological Reserve

 Plot Boundary



Service Layer Credits: ESRI World Imagery
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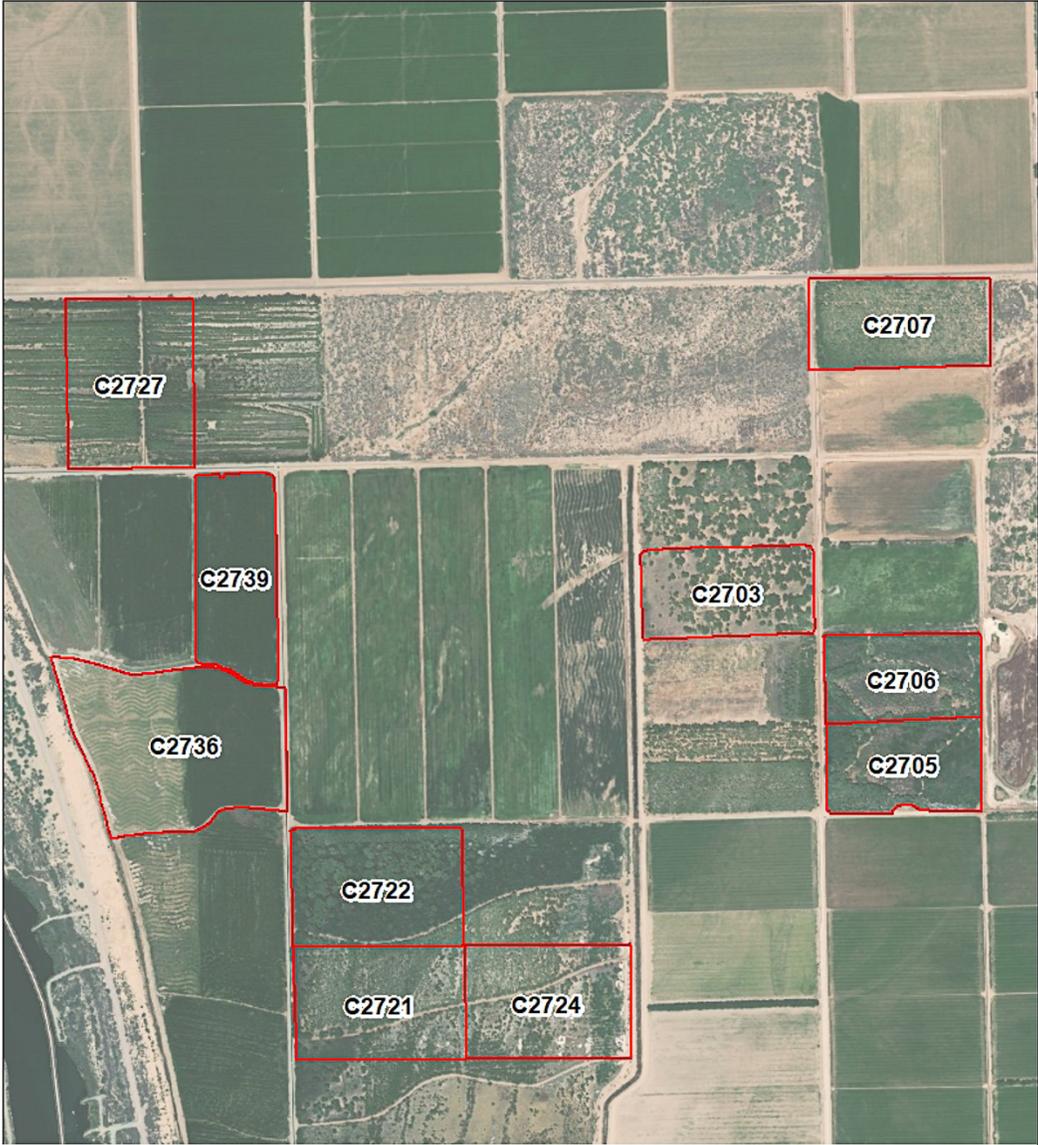


Cibola Valley Conservation Area

Plot Boundary



Service Layer Credits: ESRI World Imagery
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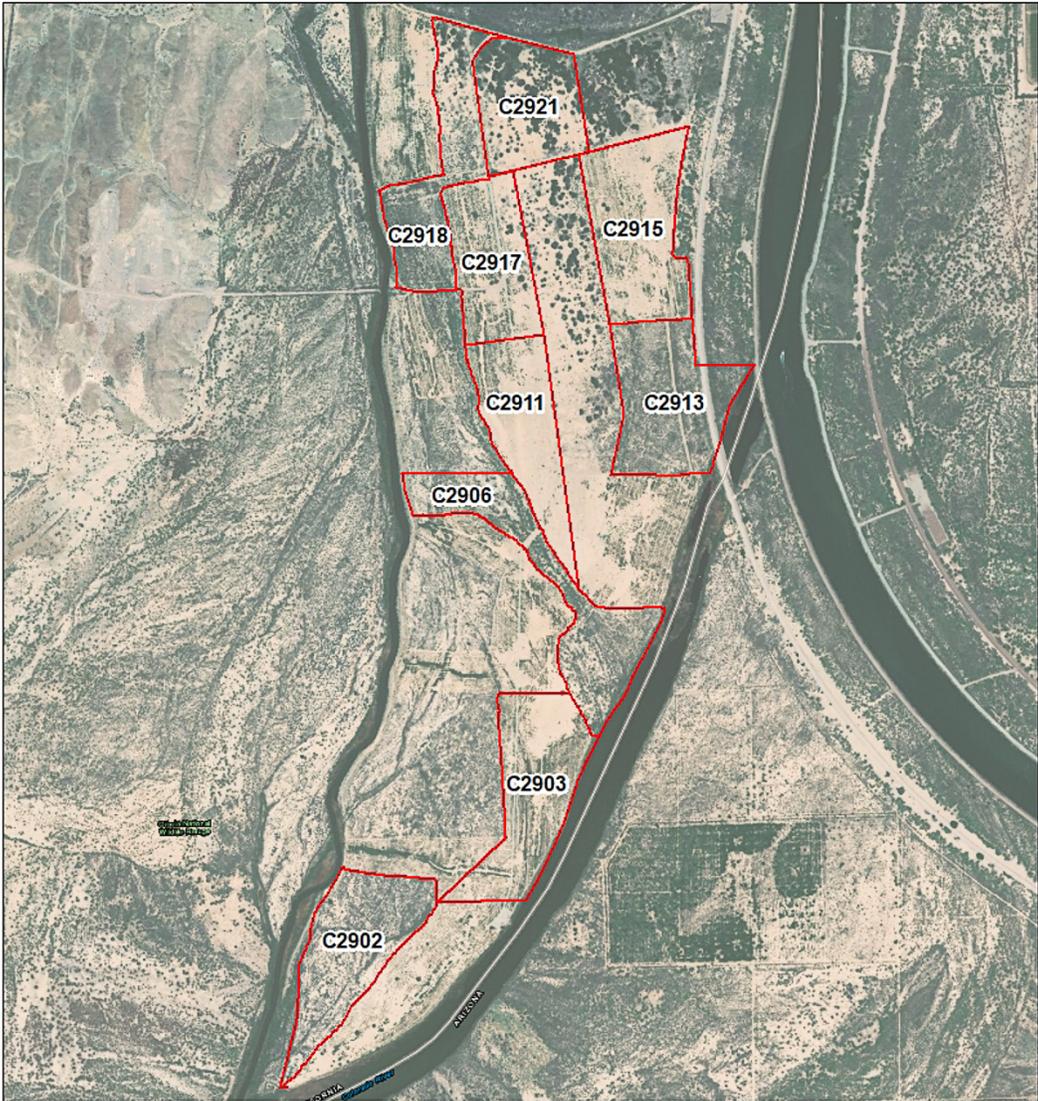
Cibola National Wildlife Refuge Unit #1

 Plot Boundary



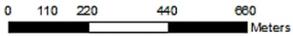
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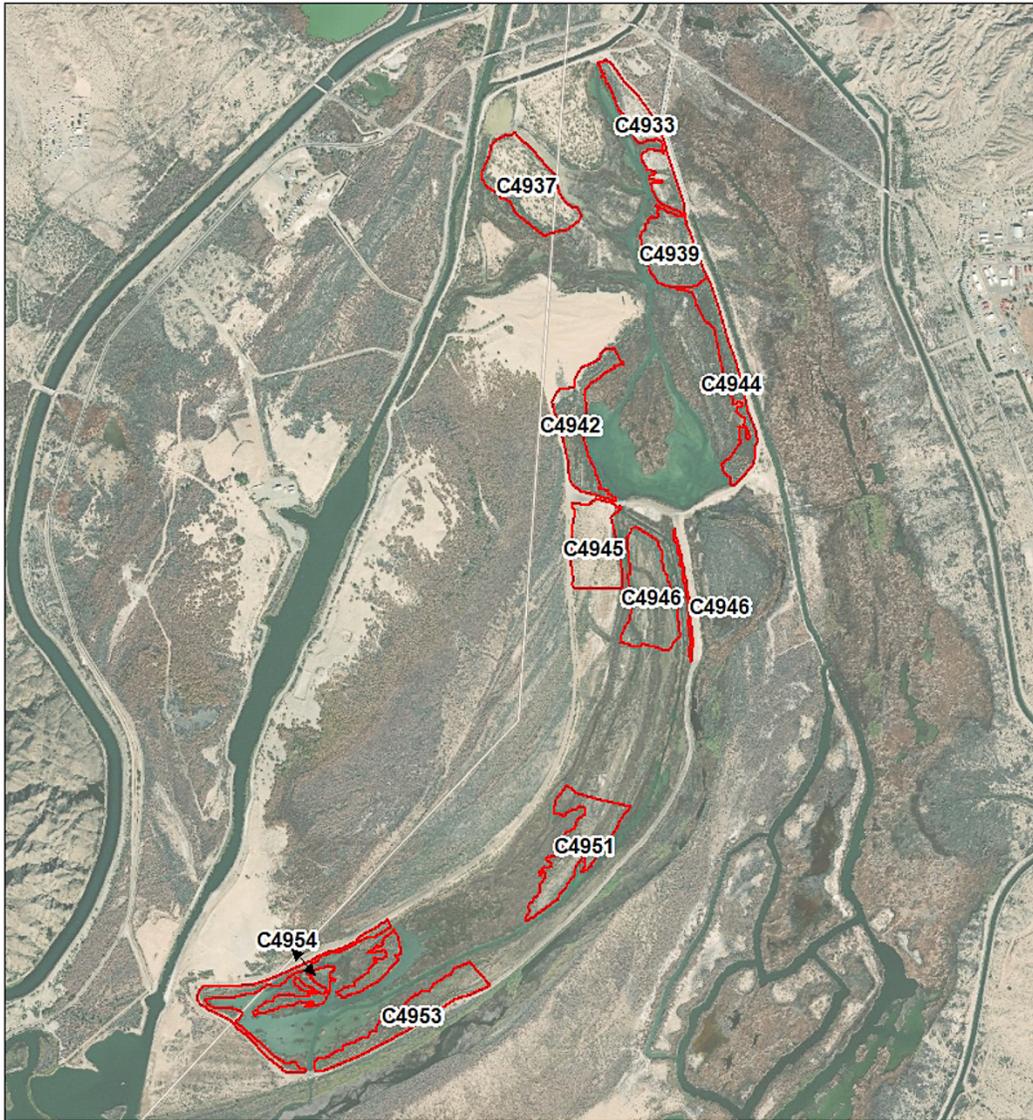


Pretty Water Conservation Area

 Plot Boundary

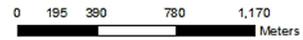


Service Layer Credits: ESRI World Imagery
UTM Zone 11 NAD 83



Laguna Division Conservation Area

 Plot Boundary



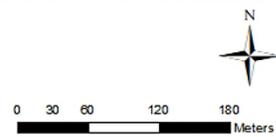
Service Layer Credits: ESRI World Imagery
UTM Zone 11 NAD 83





Hunters Hole

 Plot Boundary



Service Layer Credits: ESRI World Imagery
UTM Zone 11 NAD 83

ATTACHMENT 2

Reference and Attribute Tables Used During the Survey
Season, 2019

Table 2-1.—Beaufort wind scale

| Code | Windspeed (mph) ¹ | Wind description | Conditions on land |
|------|------------------------------|------------------|---|
| 0 | < 1 | Calm | Calm. Smoke rises vertically. |
| 1 | 1–3 | Light air | Smoke drift indicates wind direction. Leaves are stationary. |
| 2 | 4–7 | Light breeze | Wind felt on exposed skin. Leaves rustle. |
| 3 | 8–12 | Gentle breeze | Leaves and small twigs constantly moving. |
| 4 | 13–18 | Moderate breeze | Dust and loose paper raised. Small branches begin to move. |
| 5 | 19–25 | Fresh breeze | Branches of a moderate size move. Small trees with leaves begin to sway. |
| 6 | 26–31 | Strong breeze | Large branches in motion. Whistling heard in overhead wires. Empty plastic bins tip over. |
| 7 | 32–38 | High wind | Whole trees in motion. Effort needed to walk against the wind. |
| 8 | 39–46 | Gale | Some twigs broken from trees. Progress on foot is seriously impeded. |

¹ mph = miles per hour.

Table 2-2.—Sky conditions

| Code | Sky conditions |
|------|------------------------|
| 0 | Clear/few clouds |
| 1 | Partly cloudy variable |
| 2 | Cloudy/overcast |
| 3 | Fog |
| 4 | Drizzle |
| 5 | Showers |

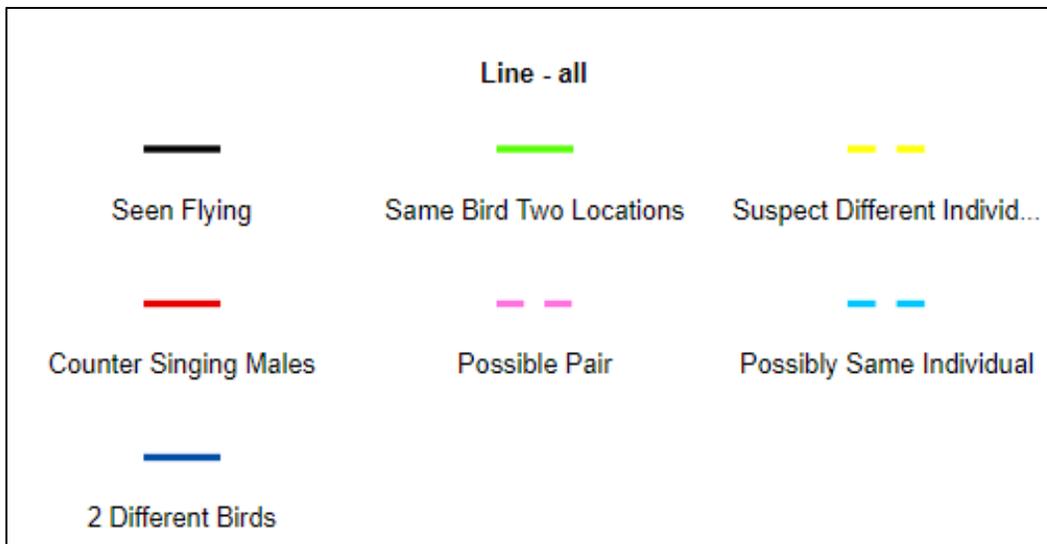


Figure 2-1.—Collector/web app line attribute values and symbology, 2019.

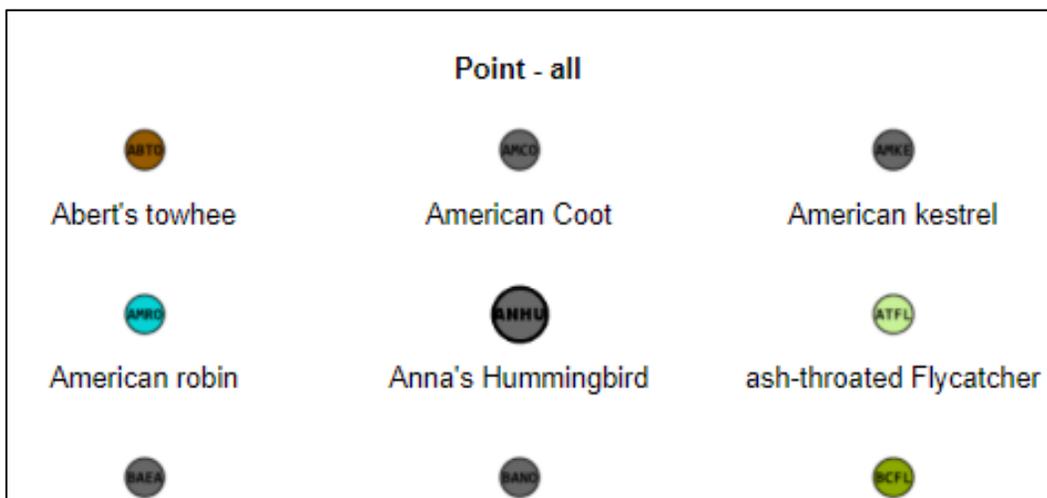


Figure 2-2.—Collector/web app point attribute values and symbology, 2019.

| | | | |
|-----|------------------------|----|---------------------|
| ★-🏠 | Active Nest | 🥚🏠 | Eggs found in Nest |
| !! | Agitation | ✈️ | Flying |
| 🐣 | Brooding/Incubating | 👁️ | Foraging/Perching |
| 🔨🏠 | Building Nest | 📖 | Guarding |
| 💬 | Calling | 🏠🏠 | Nest Colony |
| 🐣 | Caring for Fledge | ♂️ | Pair |
| ➔🍷 | Carrying Food | ?🏠 | Probable Nest Site |
| ➔🔨 | Carrying Nest Material | 🎵 | Singing |
| 💕💕 | Copulation | ☀️ | Territory Dispute |
| 💕 | Courtship | 📢 | Vocalizing Other |
| 📺 | Display | 🐣🏠 | Young found in Nest |
| ⚠️ | Distraction Display | | |

Figure 2-3.—Behavior symbology used in point labels.

Table 2-3.—"Local" species not known to migrate that have bred in the study area

| Common name | Scientific name | LCR MSCP status |
|---------------------------------|--|------------------------|
| Abert's towhee | <i>Melospiza aberti</i> | |
| Black-tailed gnatcatcher | <i>Poliophtila melanura</i> | |
| Cactus wren | <i>Campylorhynchus brunneicapillus</i> | |
| Canyon wren | <i>Catherpes mexicanus</i> | |
| Crissal thrasher | <i>Toxostoma crissale</i> | |
| Gila woodpecker | <i>Melanerpes uropygialis</i> | Focal species |
| Gilded flicker | <i>Colaptes chrysoides</i> | Focal species |
| Hutton's vireo | <i>Vireo huttoni</i> | |
| Ladder-backed woodpecker | <i>Dryobates scalaris</i> | |
| LeConte's thrasher | <i>Toxostoma lecontei</i> | |
| Northern cardinal | <i>Cardinalis cardinalis</i> | |
| Nutting's flycatcher | <i>Myiarchus nuttingi</i> | |
| Unidentified thrasher species | <i>Toxostoma species</i> | |
| Unidentified woodpecker species | Picidae species | |
| Verdin | <i>Auriparus flaviceps</i> | |

Table 2-4.—"Both" species; migratory species that require extra effort to distinguish breeders from migrants that have bred in or near the study area

| Common name | Scientific name | LCR MSCP status |
|--|------------------------------------|---------------------------|
| American robin | <i>Turdus migratorius</i> | |
| Arizona Bell's vireo | <i>Vireo bellii arizonae</i> | Focal species |
| Ash-throated flycatcher | <i>Myiarchus cinerascens</i> | |
| Bendire's thrasher | <i>Toxostoma bendirei</i> | |
| Bewick's wren | <i>Thryomanes bewickii</i> | |
| Black phoebe | <i>Sayornis nigricans</i> | |
| Black-throated sparrow | <i>Amphispiza bilineata</i> | |
| Blue grosbeak | <i>Passerina caerulea</i> | |
| Brown-crested flycatcher | <i>Myiarchus tyrannulus</i> | |
| Bullock's oriole | <i>Icterus bullockii</i> | |
| Common yellowthroat | <i>Geothlypis trichas</i> | |
| Hooded oriole | <i>Icterus cucullatus</i> | |
| Horned lark | <i>Eremophila alpestris</i> | |
| Indigo bunting | <i>Passerina cyanea</i> | |
| Lark sparrow | <i>Chondestes grammacus</i> | |
| Loggerhead shrike | <i>Lanius ludovicianus</i> | |
| Lucy's warbler | <i>Leiothlypis luciae</i> | |
| Marsh wren | <i>Cistothorus palustris</i> | |
| Northern mockingbird | <i>Mimus polyglottos</i> | |
| Phainopepla | <i>Phainopepla nitens</i> | |
| Rock wren | <i>Salpinctes obsoletus</i> | |
| Say's phoebe | <i>Sayornis saya</i> | |
| Song sparrow | <i>Melospiza melodia</i> | |
| Sonoran yellow warbler | <i>Setophaga petechia sonorana</i> | Focal species |
| Southwestern willow flycatcher | <i>Empidonax traillii extimus</i> | Non-focal covered species |
| Summer tanager | <i>Piranga rubra</i> | Focal species |
| Tropical kingbird | <i>Tyrannus melancholicus</i> | |
| Unidentified <i>Empidonax</i> flycatcher | <i>Empidonax</i> species | |
| Unidentified flicker species | <i>Colaptes</i> species | |
| Unidentified flycatcher species | Tyrannidae species | |

Table 2-4.—"Both" species; migratory species that require extra effort to distinguish breeders from migrants that have bred in or near the study area

| Common name | Scientific name | LCR MSCP status |
|----------------------------------|---|---------------------------|
| Unidentified hummingbird species | <i>Trochilidae</i> species | |
| Unidentified oriole species | <i>Icterus</i> species | |
| Unidentified sparrow species | <i>Passerellidae</i> species | |
| Unidentified warbler species | <i>Parulidae</i> species | |
| Unidentified wren species | <i>Troglodytidae</i> species | |
| Vermilion flycatcher | <i>Pyrocephalus rubinus</i> | Focal species |
| Western kingbird | <i>Tyrannus verticalis</i> | |
| Western meadowlark | <i>Sturnella neglecta</i> | |
| Yellow-billed cuckoo | <i>Coccyzus americanus occidentalis</i> | Non-focal covered species |
| Yellow-breasted chat | <i>Icteria virens</i> | |

Table 2-5.—Non-territorial species; species not adequately sampled with this area search protocol that have bred in or near the study area

| Common name | Scientific name | LCR MSCP Status |
|---------------------------|--|---------------------------|
| American coot | <i>Fulica americana</i> | |
| American kestrel | <i>Falco sparverius</i> | |
| Bald eagle | <i>Haliaeetus leucocephalus</i> | |
| Barn owl | <i>Tyto alba</i> | |
| Black-crowned night heron | <i>Nycticorax nycticorax</i> | |
| Black-necked stilt | <i>Himantopus mexicanus</i> | |
| Bronzed cowbird | <i>Molothrus aeneus</i> | |
| Brown-headed cowbird | <i>Molothrus ater</i> | |
| Burrowing owl | <i>Athene cunicularia</i> | |
| California black rail | <i>Laterallus jamaicensis coturniculus</i> | Non-focal covered species |
| Canada goose | <i>Branta canadensis</i> | |
| Cattle egret | <i>Bubulcus ibis</i> | |
| Cinnamon teal | <i>Spatula cyanoptera</i> | |
| Clark's grebe | <i>Aechmophorus clarkii</i> | |
| Cliff swallow | <i>Petrochelidon pyrrhonota</i> | |
| Common black hawk | <i>Buteogallus anthracinus</i> | |
| Common gallinule | <i>Gallinula galeata</i> | |
| Common ground-dove | <i>Columbina passerina</i> | |
| Common poorwill | <i>Phalaenoptilus nuttallii</i> | |
| Common raven | <i>Corvus corax</i> | |
| Cooper's hawk | <i>Accipiter cooperii</i> | |
| Double-crested cormorant | <i>Phalacrocorax auritus</i> | |
| Elf owl | <i>Micrathene whitneyi</i> | Non-focal covered species |
| Eurasian collared-dove | <i>Streptopelia decaocto</i> | |
| European starling | <i>Sturnus vulgaris</i> | |
| Gadwall | <i>Mareca strepera</i> | |
| Gambel's quail | <i>Callipepla gambelii</i> | |
| Gray hawk | <i>Buteo plagiatus</i> | |
| Great blue heron | <i>Ardea herodias</i> | |
| Great egret | <i>Ardea alba</i> | |
| Great horned owl | <i>Bubo virginianus</i> | |
| Greater roadrunner | <i>Geococcyx californianus</i> | |
| Great-tailed grackle | <i>Quiscalus mexicanus</i> | |
| Green heron | <i>Butorides virescens</i> | |
| House finch | <i>Haemorhous mexicanus</i> | |
| House sparrow | <i>Passer domesticus</i> | |
| Inca dove | <i>Columbina inca</i> | |
| Killdeer | <i>Charadrius vociferus</i> | |
| Lawrence's goldfinch | <i>Spinus lawrencei</i> | |

Table 2-5.—Non-territorial species; species not adequately sampled with this area search protocol that have bred in or near the study area

| Common name | Scientific name | LCR MSCP Status |
|-------------------------------------|---------------------------------------|---------------------------|
| Lesser goldfinch | <i>Spinus psaltria</i> | |
| Lesser nighthawk | <i>Chordeiles acutipennis</i> | |
| Long-eared owl | <i>Asio otus</i> | |
| Mallard | <i>Anas platyrhynchos</i> | |
| Mourning dove | <i>Zenaida macroura</i> | |
| Northern harrier | <i>Circus hudsonius</i> | |
| Northern rough-winged swallow | <i>Stelgidopteryx serripennis</i> | |
| Peregrine falcon | <i>Falco peregrinus</i> | |
| Pied-billed grebe | <i>Podilymbus podiceps</i> | |
| Redhead | <i>Aythya americana</i> | |
| Red-shouldered hawk | <i>Buteo lineatus</i> | |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | |
| Red-winged blackbird | <i>Agelaius phoeniceus</i> | |
| Ring-necked pheasant | <i>Phasianus colchicus</i> | |
| Rock pigeon | <i>Columba livia</i> | |
| Ruddy duck | <i>Oxyura jamaicensis</i> | |
| Snowy egret | <i>Egretta thula</i> | |
| Turkey vulture | <i>Cathartes aura</i> | |
| Unidentified accipiter hawk species | <i>Accipiter</i> species | |
| Unidentified blackbird species | Icteridae species | |
| Unidentified dove species | Columbidae species | |
| Unidentified duck | Anatidae species | |
| Unidentified falcon species | <i>Falco</i> species | |
| Unidentified goldfinch species | <i>Spinus</i> species | |
| Unidentified hawk species | Accipitridae species | |
| Unidentified swallow species | Hirundinidae species | |
| Violet-green swallow | <i>Tachycineta thalassina</i> | |
| Virginia rail | <i>Rallus limicola</i> | |
| Western grebe | <i>Aechmophorus occidentalis</i> | |
| Western least bittern | <i>Ixobrychus exilis hesperis</i> | Non-focal covered species |
| Western screech-owl | <i>Megascops kennicottii</i> | |
| White-faced ibis | <i>Plegadis chihi</i> | |
| White-tailed kite | <i>Elanus leucurus</i> | |
| White-throated swift | <i>Aeronautes saxatalis</i> | |
| White-winged dove | <i>Zenaida asiatica</i> | |
| Yellow-headed blackbird | <i>Xanthocephalus xanthocephalus</i> | |
| Yuma clapper rail | <i>Rallus longirostris yumanensis</i> | Non-focal covered species |
| Zone-tailed hawk | <i>Buteo albonotatus</i> | |

ATTACHMENT 3

Species Breeding in Conservation Areas, 2019

Table 3-1.—List of species detected breeding in 2019 by conservation area¹

| Common name | Scientific name | BLCA | Cibola NWR Unit #1 | CVCA | Hunters Hole | LDCA | Middle Bill Williams River NWR East | Middle Bill Williams River NWR West | Parker Dam Camp | PVER | PWCA | YEW |
|---------------------------|---------------------------------|------|--------------------|------|--------------|------|-------------------------------------|-------------------------------------|-----------------|------|------|-----|
| Abert's towhee | <i>Melospiza aberti</i> | X | X | X | X | X | X | X | X | X | X | X |
| American Coot | <i>Fulica americana</i> | | | | | X | | | | | | X |
| American kestrel | <i>Falco sparverius</i> | | X | | | X | | | X | X | | |
| Arizona Bell's vireo | <i>Vireo bellii arizonae</i> | X | | | | X | X | X | | X | | |
| Ash-throated flycatcher | <i>Myiarchus cinerascens</i> | | X | X | X | X | X | X | X | X | X | X |
| Barn owl | <i>Tyto alba</i> | | X | | | | | | | X | | |
| Bewick's wren | <i>Thryomanes bewickii</i> | | | | | | X | X | | | | |
| Black-crowned night-heron | <i>Nycticorax nycticorax</i> | | | | | X | | | | | | X |
| Black-necked stilt | <i>Himantopus mexicanus</i> | | | | | X | | | | | | X |
| Black-tailed gnatcatcher | <i>Poliophtila melanura</i> | X | X | X | | X | X | X | X | X | X | X |
| Blue grosbeak | <i>Passerina caerulea</i> | | X | X | | X | X | X | X | X | X | X |
| Bronzed cowbird | <i>Molothrus aeneus</i> | | X | | | | | | | | | |
| Brown-crested flycatcher | <i>Myiarchus tyrannulus</i> | X | | | | | X | X | | X | | |
| Brown-headed cowbird | <i>Molothrus ater</i> | X | X | X | X | X | X | X | X | X | X | X |
| Bullock's oriole | <i>Icterus bullockii</i> | X | X | X | | | | X | X | X | | |
| Canyon wren | <i>Catherpes mexicanus</i> | | | | | | X | X | X | | | |
| Cliff swallow | <i>Petrochelidon pyrrhonota</i> | | | X | | | X | X | X | X | | X |
| Common black hawk | <i>Buteogallus anthracinus</i> | | | | | | | X | | | | |
| Common gallinule | <i>Gallinula galeata</i> | X | | | | X | | | | | | |
| Common ground dove | <i>Columbina passerina</i> | | | X | | | | | | X | | |
| Common raven | <i>Corvus corax</i> | | X | X | | | X | X | X | X | X | |
| Common yellowthroat | <i>Geothlypis trichas</i> | X | X | | | X | X | X | X | X | X | |
| Cooper's hawk | <i>Accipiter cooperii</i> | | | | | | X | X | | X | | X |
| Crissal thrasher | <i>Toxostoma crissale</i> | X | X | X | X | X | X | X | X | X | X | X |
| Elf owl | <i>Micrathene whitneyi</i> | | | | | | X | X | | | | |
| Eurasian collared-dove | <i>Streptopelia decaocto</i> | X | X | X | | | X | | X | X | X | X |
| European starling | <i>Sturnus vulgaris</i> | | X | X | | | | | X | X | | |
| Gambel's quail | <i>Callipepla gambelii</i> | X | X | X | X | X | X | X | X | X | X | X |
| Gila woodpecker | <i>Melanerpes uropygialis</i> | | X | X | | X | X | X | X | | | X |

Table 3-1.—List of species detected breeding in 2019 by conservation area¹

| Common name | Scientific name | BLCA | Cibola NWR Unit #1 | CVCA | Hunters Hole | LDCA | Middle Bill Williams River NWR East | Middle Bill Williams River NWR West | Parker Dam Camp | PVER | PWCA | YEW |
|-------------------------------|-----------------------------------|------|--------------------|------|--------------|------|-------------------------------------|-------------------------------------|-----------------|------|------|-----|
| Great blue heron | <i>Ardea herodias</i> | | X | | | X | | | | | X | |
| Great egret | <i>Ardea alba</i> | | | | | X | | | | X | | X |
| Great horned owl | <i>Bubo virginianus</i> | X | X | X | | | | | X | X | X | X |
| Greater roadrunner | <i>Geococcyx californianus</i> | X | X | X | X | X | X | X | X | X | X | X |
| Great-tailed grackle | <i>Quiscalus mexicanus</i> | X | X | X | | X | | | | X | X | X |
| Green heron | <i>Butorides virescens</i> | X | | X | | X | X | X | | | | |
| Hooded oriole | <i>Icterus cucullatus</i> | | | | | | | | X | | | |
| House finch | <i>Haemorhous mexicanus</i> | | X | X | | X | X | X | X | X | X | X |
| House sparrow | <i>Passer domesticus</i> | | | | | | | | | | | X |
| Hutton's vireo | <i>Vireo huttoni</i> | | | | | | | X | | | | |
| Inca dove | <i>Columbina inca</i> | | | X | | | | | | X | | |
| Killdeer | <i>Charadrius vociferus</i> | | X | | | X | | | | X | | X |
| Ladder-backed woodpecker | <i>Dryobates scalaris</i> | X | X | X | X | X | X | X | X | X | X | X |
| Lawrence's goldfinch | <i>Spinus lawrencei</i> | | | | | | X | | | | | |
| Western least bittern | <i>Ixobrychus exilis hesperis</i> | | | | | X | | | | | | |
| Lesser goldfinch | <i>Spinus psaltria</i> | X | | X | | | X | X | X | X | | X |
| Lesser nighthawk | <i>Chordeiles acutipennis</i> | X | X | X | | X | | X | | X | X | |
| Long-eared owl | <i>Asio otus</i> | | | | | | X | | | | | |
| Lucy's warbler | <i>Leiothlypis luciae</i> | X | X | X | | X | X | X | X | X | X | |
| Mallard | <i>Anas platyrhynchos</i> | | | | | X | | | | | | |
| Marsh wren | <i>Cistothorus palustris</i> | | | | | X | | | | | | |
| Mourning dove | <i>Zenaida macroura</i> | X | X | X | X | X | X | X | X | X | X | X |
| Northern cardinal | <i>Cardinalis cardinalis</i> | | | | | | X | X | | | | |
| Northern harrier | <i>Circus hudsonius</i> | | | | | X | | | | | | |
| Northern mockingbird | <i>Mimus polyglottos</i> | | | | | | | | | X | X | |
| Northern rough-winged swallow | <i>Stelgidopteryx serripennis</i> | X | X | X | | X | X | X | X | X | | |
| Phainopepla | <i>Phainopepla nitens</i> | | | | | | X | X | X | | X | |
| Pied-billed grebe | <i>Podilymbus podiceps</i> | | | | | X | X | | | | | |
| Red-tailed hawk | <i>Buteo jamaicensis</i> | | X | | | | X | X | X | X | X | |

Table 3-1.—List of species detected breeding in 2019 by conservation area¹

| Common name | Scientific name | BLCA | Cibola NWR Unit #1 | CVCA | Hunters Hole | LDCA | Middle Bill Williams River NWR East | Middle Bill Williams River NWR West | Parker Dam Camp | PVER | PWCA | YEW |
|-------------------------|---------------------------------------|------|--------------------|------|--------------|------|-------------------------------------|-------------------------------------|-----------------|------|------|-----|
| Red-winged blackbird | <i>Agelaius phoeniceus</i> | | X | X | | X | | | | X | X | X |
| Rock pigeon | <i>Columba livia</i> | | | | | | | | | | | X |
| Say's phoebe | <i>Sayornis saya</i> | | | | | | | | | | X | |
| Snowy egret | <i>Egretta thula</i> | | | | | X | | | | | | |
| Song sparrow | <i>Melospiza melodia</i> | X | X | X | | X | X | X | X | | | |
| Sonoran yellow warbler | <i>Setophaga petechia sonorana</i> | X | X | X | | X | X | X | | | | |
| Summer tanager | <i>Piranga rubra</i> | X | X | X | | | X | X | | X | | |
| Turkey vulture | <i>Cathartes aura</i> | | | | | X | X | | | X | | |
| Verdin | <i>Auriparus flaviceps</i> | X | X | X | X | X | X | X | X | X | X | X |
| Vermilion flycatcher | <i>Pyrocephalus rubinus</i> | | X | | | | | | | | | |
| Violet-green swallow | <i>Tachycineta thalassina</i> | | | | | | X | | | | | |
| Virginia rail | <i>Rallus limicola</i> | | | | | X | | | | | | |
| Western kingbird | <i>Tyrannus verticalis</i> | | X | X | | | | | X | X | | X |
| Western screech-owl | <i>Megascops kennicottii</i> | | | | | | | X | | | | |
| White-throated swift | <i>Aeronautes saxatalis</i> | | | | | | X | X | X | | | |
| White-winged dove | <i>Zenaida asiatica</i> | X | X | X | X | X | X | X | X | X | X | X |
| Yellow-breasted chat | <i>Icteria virens</i> | X | | X | | X | X | X | | X | | X |
| Yellow-headed blackbird | <i>Xanthocephalus xanthocephalus</i> | | X | | | | | | | | | |
| Yuma clapper rail | <i>Rallus longirostris yumanensis</i> | | | | | X | | | | | | |

¹ BLCA = Beal Lake Conservation Area; Cibola NWR Unit #1 = Cibola National Wildlife Refuge Unit #1 Conservation Area, CVCA = Cibola Valley Conservation Area; LDCA = Laguna Division Conservation Area; PVER = Palo Verde Ecological Reserve; PWCA = Pretty Water Conservation Area; YEW = Yuma East Wetlands.