

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)

2015 yellow-billed cuckoo surveys on Queen and Arnett Creeks



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Photo Credit: George Andreko, Arizona Game and Fish Department

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Executive Summary:

In October 2013, the United States Fish and Wildlife Service proposed listing the yellow-billed cuckoo in western portions of the United States, Canada, and Mexico (the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)) as a threatened distinct vertebrate population segment under the Endangered Species Act of 1973, as amended in 1998 (Federal Register, October 3, 2013). The final rule designating this population segment was published on October 3, 2014 and went into effect in November (Federal Register, October 3, 2014). Over five-hundred thousand acres of critical habitat have been proposed for this population segment across Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah and Wyoming, with the majority of habitat within Arizona (Federal Register, August 15, 2014).

Probable factors contributing to the birds' population decrease are the loss, alteration and fragmentation of native riparian habitats (Franzreb 1987 and Milhous, 1994). In 2015, Audubon Arizona organized and conducted standardized surveys on three reaches of Queen and Arnett creeks near Superior, Arizona in order to document yellow-billed cuckoo occurrence and abundance and to provide a basis for management recommendations. Results of the 2015 survey efforts are summarized in this report.

Yellow-billed cuckoo detections and habitat:

No cuckoos were detected on any of the three Arnett or Queen Creek transects during the 2015 survey season. The narrowness of these drainages largely excludes mesquite bosque habitat and limited surface water allows for only short stringers of native broad-leaf riparian forest. [REDACTED]

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Forty-four other species were encountered during the 2015 survey season including Abert's towhee which is listed as "Sensitive" by the US Forest Service and as a 'Species of Greatest Conservation Concern' by the Arizona Game and Fish Department.

Management Recommendations:

In the areas identified as having the highest potential for breeding yellow-billed cuckoo, activities that encourage the recruitment of native-broad leaf trees and adjacent mesquite bosque habitat should be supported. Similarly, activities that prevent the recruitment and survivorship of native broad-leaf trees and adjacent mesquite bosque habitat should be avoided. In addition, due to the presence of Abert's towhee along these drainages, activities that would alter the understory vegetation along Queen and Arnett Creeks should be avoided.

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Introduction:

The U. S. Fish and Wildlife Service (USFWS) petitioned to list the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*; hereafter cuckoo) as an endangered species in 1998, but the bird was precluded due to other priority species. In October 2013, the cuckoo population in the western portions of the United States, Canada, and Mexico was proposed to be listed as a threatened distinct vertebrate population segment (Federal Register, October 3, 2013). The final rule designating this population segment was published on October 3, 2014 and went into effect in November (Federal Register, October 3, 2014). Over five-hundred thousand acres of critical habitat have been proposed for this population segment across Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah and Wyoming, including over three thousand acres on the Agua Fria River (Federal Register, August 15, 2014).

In Arizona, the cuckoo was historically widespread and locally common. Although western populations have precipitously declined, Arizona still contains the largest remaining cuckoo population among the States west of the Rocky Mountains (Federal Register, October 3, 2013). The decline of cuckoo populations throughout the western United States has been largely attributed to habitat destruction (Franzreb 1987), inappropriate grazing, and lowered water tables (Milhous 1994). Current information on the distribution and abundance of cuckoos is necessary for the proper management of the species and its preferred habitats.

Audubon has not conducted cuckoo surveys on Queen or Arnett Creek in the past. 2015 surveys were conducted to answer several questions about the cuckoo on these drainages: Are cuckoos using these drainages, when are they present, what is their distribution, and what features support or exclude them?

Natural History:

The American Ornithological Union (AOU) recognizes two subspecies of cuckoos in North America (AOU 1998). The subspecies found in Arizona is the western yellow-billed cuckoo, and this bird's current breeding range includes portions of Arizona, California, western New Mexico, western Texas, southern Utah, and the Mexican states of Sonora and Zacatecas (Russell and Monson 1998). This aligns with the range proposed by the USFWS for the western distinct population of yellow-billed cuckoo (Federal Register, October 3, 2013).

Cuckoos are riparian obligates found primarily in cottonwood-willow associations. In southern Arizona however, the birds have been found breeding in mesquite bosques and in areas dominated by non-native tamarisk (Corman and Magill 2000). Cuckoos arrive on their Arizona breeding grounds in mid-June, after most other neotropical migrants. As a result, cuckoos nest later than most other birds, typically from July 6 through early August (Hamilton and Hamilton 1965, Corman and Magill 2000, Corman 2005). Nesting activities continue through August and into September, especially in southeastern Arizona.

Cuckoos have an accelerated breeding cycle, with young able to climb from the nest at one week of age, and fledging within 12 days post hatch (Hamilton and Hamilton 1965). This trait makes nest-finding difficult, as the birds spend relatively little time in the natal area and tend to be secretive at the nest. Cuckoo surveyors must typically revisit study areas several times to verify the birds' presence.

Methods:

Audubon Arizona conducted surveys along three reaches – one on Arnett Creek, one on Queen Creek upstream of Superior and one on Queen Creek between Superior and Boyce Thompson Arboretum (Table 2 & Appendix A). Surveys were conducted starting on June 24, 2015 and ending on August 4, 2015. Surveyors followed the protocol described by Halterman et al. and released by the USFWS in June of 2015 (Halterman et al., 2015). The protocol instructs surveyors to use taped playback calls to elicit responses. The protocol requires that playback calls are played at 100 meter intervals unless a detection is made. If a cuckoo is detected, surveyors travel 300 meters to avoid double-counting. The protocol also requires surveyors to make four visits to predetermined sites in three prescribed survey windows. The first window is from June 15 to June 30, the second, during which two surveys are conducted, is from July 1 to July 31, and the third is from August 1 to August 15. (Table 1). Surveys must be conducted at least 10 days apart. For a site to be designated “occupied”, surveyors must detect cuckoos two or more times during two or more survey periods. Areas can be further designated as containing possible, probably, and confirmed breeding cuckoos (Table 3) (Halterman et al., 2015).

In addition to surveying for cuckoos, surveyors kept an all-species list. Surveyors added species to the list both at call points and while in transit between points. Individual birds were not tallied.

Results/Discussion:

No cuckoos were detected on any of the three Arnett or Queen Creek transects during the 2015 survey season.

These drainages do not contain suitable cuckoo breeding habitat. While stretches of riparian forest dominated by native broad-leaf trees such as Goodding’s willow, Fremont cottonwood, and Arizona ash exist, these stringers are too short to support breeding cuckoos. This is likely due to a very limited amount of surface water. In addition, the majority of the habitat along these drainages is confined within narrow canyons rarely exceeding 200 meters in width. The steep canyon walls result in a rapid transition from riparian habitat to upland Sonoran desert scrub and leaves little room for adjacent mesquite bosque. This arrangement results in habitat patches that are much smaller than the 80 hectare patches in which cuckoos are typically found (Halterman et al., 2015). While cuckoos can be found in patches as small as 20 hectares (Halterman et al., 2015), the patches would have to exhibit extremely robust insect productivity to support them and this level of productivity was not encountered.

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Forty-four other species were encountered during the 2015 survey season. Species detected were great blue heron, turkey vulture, Cooper’s hawk, common black-hawk, Gambel’s quail, white-winged dove, mourning dove, greater roadrunner, great horned owl, black-chinned hummingbird, Anna’s

hummingbird, Gila woodpecker, ladder-backed woodpecker, northern flicker, black phoebe, ash-throated flycatcher, brown-crested flycatcher, Cassin's kingbird, western kingbird, Bell's vireo, common raven, verdin, Bewick's wren, rock wren, canyon wren, cactus wren, black-tailed gnatcatcher, northern mockingbird, Lucy's warbler, yellow warbler, yellow-breasted chat, western tanager, summer tanager, northern cardinal, blue grosbeak, Abert's towhee, canyon towhee, black-throated sparrow, song sparrow, hooded Oriole, Scott's oriole, brown-headed cowbird, house finch, and lesser goldfinch. One of these species, the Abert's towhee, is listed as "sensitive" by the US Forest Service and as a 'Species of Greatest Conservation Concern' by the Arizona Game and Fish Department.

Table 1: Recommended number and timing of visits during each survey period for yellow-billed cuckoo surveys (Halterman et al, 2015)

Pre-season Period	General Surveys			Post-season Period		
	Minimum 1 survey this period	Minimum 2 surveys this period	Minimum 1 survey this period			
	Cuckoos may be vocal and responsive during this period. Birds detected during this period may be migrants or breeders. If detected only in Period 1, birds are likely migrants.	Cuckoos may be vocal and responsive during this period. Birds detected during this period may be migrants or breeders. Most birds detected during this period are likely to be breeders.	Cuckoos are generally less vocal and responsive during this period. Birds detected during this period may be migrants or breeders.			
June 15	Survey Period 1	July 1	Survey Period 2	July 31	Survey Period 3	August 15

Table 2: 2013 Yellow-billed Cuckoo Transects on Queen and Arnett Creeks

Transect	UTM Start	UTM End
Arnett Creek		
Lower Queen Creek		
Upper Queen Creek		

Table 3: Interpretation of results to estimate yellow-billed cuckoo breeding status (Halterman et al. 2015. Originally from Holmes et al. 2008 and McNeil et al. 2013)

Estimation Type	Term	Definition
Breeding Territory Estimation	Possible breeding territory (PO)	Two or more total detections in an area during two survey periods and at least 10 days apart. For example, within a certain area, one detection made during Survey Period 2 coupled with another cuckoo detection made 10 days later, also during Survey Period 2, warrants a PO territory designation.
	Probable breeding territory (PR)	Three or more total detections in an area during at least three survey periods and at least 10 days between each detection. PO territory plus YBCUs observed carrying food (single observation), carrying a stick (single observation), traveling as a pair, or exchanging vocalizations.
	Confirmed breeding territory (CO)	Observation of copulation, stick carry to nest, carrying food (multiple observations), distraction display, nest, or fledgling.
Population estimation	Minimum breeding territory	The observed number of confirmed breeding territories (CO).
Occupancy estimation	Site occupancy	Occupancy is based on two or more total survey detections during two or more survey periods and at least 10 days apart. Multiple detections in an area over an extended period of time suggest that the area may have been used for breeding.

Management Recommendations:

While much of Queen and Arnett Creeks is too canyon bound to support habitat for breeding cuckoos, multiple areas are wide enough. In these areas, specifically the eastern most portion of the Arnett Creek transect at the mouth of the canyon, the eastern portion of the Upper Queen Creek transect through the area referred to by Superior locals as “the Jungle” and the western portion of the Upper Queen Creek transect after exiting the canyon, activities that encourage the recruitment of native-broad leaf trees and adjacent mesquite bosque habitat should be supported. Similarly, activities that prevent the recruitment and survivorship of native broad-leaf trees and adjacent mesquite bosque habitat should be avoided.

Though much of the habitat surveyed does not support cuckoos, forty-four additional species were encountered including Abert’s towhee – a species listed as “sensitive” by the US Forest Service and as a ‘Species of Greatest Conservation Concern’ by the Arizona Game and Fish Department. For this reason, activities that would alter the understory vegetation along Queen and Arnett Creeks should be avoided.

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