

Yellow-billed Cuckoo

(Coccyzus americanus)

Legal Status

Federal: Candidate

State: Endangered.



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Global and State Conservation Status: G5T3S1: Global Rank, G5 = Secure: Common; widespread and abundant; T-Rank, Same as global rank but related only to the status of the subspecies throughout its range; T3 = Vulnerable: At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors; State Rank, S1 = Critically Imperiled: Critically imperiled in the state because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.

Recovery Plan: None.

Species Description and Life History

Description

The Yellow-billed Cuckoo (*Coccyzus americanus*) is a medium-sized bird about 30 centimeters (11.8 inches) in length and a wingspan of 38-43 cm (15-17 in). The species has a slender, long-tailed profile, with a fairly stout and slightly down-curved bill, which is blue-black with yellow on the base of the lower mandible. Plumage is grayish-brown above and white below, with red primary flight feathers. The tail feathers are boldly patterned with characteristic rows of large white spots on the underside. The legs are short and bluish-gray. Adults have a narrow, yellow eye ring. Juveniles resemble adults, except the tail patterning is less distinct, and the lower bill may have little or no yellow (Hughes 1999).

Seasonal Patterns

In California on the Sacramento River, birds arrive onto breeding territories and pair formation occurs from late June to mid-July following the northward migration from South America and is followed by nest building and raising of young (Haltermann 1991). The species is restricted to the mid-summer period for breeding presumably due to a seasonal peak in large insect abundance (Rosenberg *et al.* 1982). To accommodate this, development of young is very rapid with a breeding cycle of 17 days from egg-laying to

fledging. Following a relatively short period of post-fledging juvenile dependency, cuckoos migrate out of California from approximately mid-August to early September. The species migrates to South America during the non-breeding season and is thus not present in the Central Valley between October and May.

Reproduction

The pair constructs a flimsy twig nest which is typically 5 to 40 feet above the ground in dense canopy cover. Nests in the riparian forest along the south fork of the Kern River consisted of twigs and were lined with roots and dried leaves and were rimmed with pine needles. Clutch size is usually 3 to 4 eggs, rarely 5 (Bent 1940). Both the female and the male incubate the eggs, which lasts for 10 to 11 days (Hamilton and Hamilton 1965). Both parents also share incubating and brooding duties and provision young with food. Young develop very rapidly and fledge from 6 to 8 days post hatching. Parental care continues for an additional 3 to 4 weeks before the southern migration begins (Halterman 1991).

In the well-studied Kern River population, it was found that 70 percent of yellow-billed cuckoo pairs were monogamous, while the remaining 30 percent included a helper at the nest (Laymon 1998). When prey is abundant, cuckoos increase clutch size and may lay eggs in nests of other Yellow-billed Cuckoo pairs and other nests of other species (Fleischer *et al.* 1984, Laymon 1998, Hughes 1999). Further, the Kern River studies determined that cuckoos tend to lay more eggs when they are able to feed nestlings a high percentage diet of katydids, and they tend to fledge more young when prey are easily and quickly captured (Laymon 1998).

Home Range/Territory Size

Limited information is available on home range and territory size. Territory size at the South Fork Kern River ranged from 8 to 40 ha (20 to 100 acres) (Laymon and Halterman 1985), and on the Colorado River as small as 4 ha (10 acres) (Laymon and Halterman 1989). Patch size, type and quality of habitat, and prey abundance largely determine the size of territories (Halterman 1991).

Yellow-billed cuckoos are loosely territorial and do not defend territories, but given uniform habitat they are regularly spaced through the landscape (Laymon 1998). Laymon (1980) found nests placed as close as 60 m (197 feet) apart along the Sacramento River in an area where foraging habitat was abundant but nesting habitat was extremely limited. Breeding densities at the South Fork Kern River from 1985 to 1996 averaged 0.85 pairs/40 ha and ranged from a low of 0.15 pairs/40 ha in 1990 to a high of 1.4 pairs/40 ha in 1993 (Laymon unpublished data *in* Laymon 1998).

Foraging Behavior and Diet

Yellow-billed Cuckoos are primarily foliage gleaners (Laymon 1998). The typical strategy is to slowly hop from limb to limb in the canopy searching for movement of

prey. They also sally from perches to catch flying insects or drop to the ground to catch grasshoppers or tree frogs (Laymon 1998).

Food resources vary greatly from year to year and significantly affect reproductive success (Laymon *et al.* 1997). Cuckoos forage within the riparian canopy primarily on slow-moving insects. The principal food item is green caterpillar (primarily sphinx moth larvae) (44.9%), with lesser amounts of katydids (21.8%), tree frogs (23.8%), and grasshoppers (8.7%). The diet also includes cicadas, dragonflies, butterflies, moths, beetles, and spiders (Laymon *et al.* 1997). Primary food items, particularly sphinx moth larvae, are associated with cottonwood trees and likely explain high reported use of cottonwood trees as foraging habitat for cuckoos (Laymon and Halterman 1985).

Habitat Requirements and Ecology

The yellow-billed cuckoo is a riparian obligate species. Its primary habitat association is willow-cottonwood riparian forest, but other species such as alder (*Alnus glutinosa*) and box elder (*Acer negundo*) may be an important habitat element in some areas, including occupied sites along the Sacramento River (Laymon 1998). Nests are primarily in willow trees; however, other species are occasionally used, including cottonwood and alder. Along the Sacramento River, English walnut trees and more rarely prune, plum, and almond trees in adjacent orchards have also been reportedly used for nesting (Laymon 1980). Several nests on the Sacramento River were draped with wild grape (Gaines and Laymon 1984, Laymon 1998). Nest site height in willow trees average 4.3 m (14.1 feet), but those in cottonwood trees have been reported at 30 m (98.4 feet). Canopy cover is typically dense (averaging 96.8% at the nest) and large patch sizes (generally greater than 20 ha [49.4 acres) are typically required (Laymon 1998).

While yellow-billed cuckoos nest primarily in willow (*Salix* spp.) trees, cottonwood (*Populus fremontii*) trees are important as foraging habitat, particularly as a source of insect prey. All studies indicate a highly significant association with relatively expansive stands of mature cottonwood-willow forests, especially dynamic riverine habitats where the river is allowed to meander and willows and cottonwoods can regenerate on point bars and stream banks (Greco 2008); however, yellow-billed cuckoos will occasionally occupy a variety of marginal habitats, particularly at the edges of their range (Laymon 1998). Continuing habitat succession has also been identified as important in sustaining breeding populations (Laymon 1988). Meandering streams that allow for constant erosion and deposition create habitat for new rapidly-growing young stands of willow, which create preferred nesting habitat conditions. Channelized streams or levied systems that do not allow for these natural processes become over-mature and presumably less optimal (Greco 2008).

Along the Sacramento and Feather Rivers, primary factors influencing nest site selection include the presence of cottonwood/willow riparian forest; patch size; and density of understory vegetation. Laymon and Halterman (1989) found a significant trend toward increased occupancy with increased patch size. In California, away from the Colorado River, cuckoos occupied 9.5% of 21 sites 20 to 40 ha in extent, 58.8% of 17 sites 41 to 80 ha in extent, and 100% of 7 sites greater than 80 ha in extent (Laymon and Halterman

1989). On the Sacramento River, Halterman (1991) found that the extent of patch size was the most important variable in determining occupancy.

Species Distribution and Population Trends

Distribution

There are two currently recognized subspecies, *C.a. occidentalis*, found west of the Rocky Mountains and *C.a. americanus*, found in deciduous forests east of the Rocky Mountains. There is a continuing debate over the taxonomic separation of the two subspecies, which is based primarily on morphological and plumage differences (Banks 1988, Franzreb and Laymon 1993), and more recently on genetics studies initiated by the USFWS during the status review for federal listing.

The range of Western Yellow-billed Cuckoo historically extended from southern British Columbia to the Rio Grande River in northern Mexico, and east to the Rocky Mountains (Bent 1940). Currently the only known populations of breeding western yellow-billed cuckoo are several disjunct locations in California, Arizona, and western New Mexico (Halterman 1991). Yellow-billed cuckoos winter in South America from Venezuela to Argentina after a southern migration that extends from August to October (Laymon and Halterman 1985). They migrate north in late June and early July (DeSchauensee 1970).

In California, where much of its historical range has been greatly reduced, yellow-billed cuckoos still occur in isolated sites in the Sacramento Valley from Tehama to Sutter Counties, along the South Fork of the Kern River, in the Owen's Valley, Prado Basin, and in the Lower Colorado River Valley (Gaines and Laymon 1984, Laymon 1998).

Population Trends

Studies conducted since the 1970s indicate that there may be fewer than 50 breeding pairs in California (Gaines 1977, Laymon and Halterman 1987, Halterman 1991, Laymon et al. 1997). While a few occurrences have been detected elsewhere recently, including the Eel River, the only locations in California that currently sustain breeding populations include the Colorado River system in southern California, the South Fork Kern River east of Bakersfield, and isolated sites along the Sacramento River in northern California (Laymon and Halterman 1989, Laymon 1998).

Declines in numbers of the yellow-billed cuckoo in California are a result of "removal widely of essential habitat conditions," as described by Grinnell and Miller (1944). These declines have continued primarily in the San Joaquin Valley, north coast, and central coast (where the populations had been extirpated by 1977) (Gaines and Laymon 1984), and the species was nearly extirpated in the Lower Colorado River Valley by 1999. In the Sacramento Valley, only 1 percent of the species' historical habitat remains to support a small population estimated at only 50 pairs in 1987 and 19 pairs in 1989 (Laymon and Halterman 1989). Population estimates based on surveys conducted in 1999 are similar to those from the 1980s (USFWS 2001). Because no surveys have been

conducted since 1999, the current status of the Sacramento Valley population is not known.

Distribution and Population Trends in the Plan Area

The historic distribution of yellow-billed cuckoo extended throughout the Central Valley, where the species was considered common (Belding 1890). In the mid-1940s, Grinnell and Miller (1944) still considered the Central Valley distribution to extend from Bakersfield to Redding. While there are few historical records from Yolo County, presumably the species nested within the county along the west side of the Sacramento River and possibly along smaller tributary drainages, including Putah Creek, Willow Slough, and Cache Creek.

Since 1965, there have been nine records of yellow-billed cuckoo in Yolo County, including:

- Willow Slough in 1965
- Sacramento River in 1977
- Elkhorn Regional Park in 1982
- Gray's Bend in 1997
- City of Davis in 2001
- Putah Creek Sinks in June 2005
- Cache Creek Settling Basin in July 2005
- Fremont Weir in June 2006
- Fremont Weir in July 2006

These records were reported in Gaines (1974), Yolo Audubon Society Checklist Committee 2004, Yolo Audubon Society (2005), and by Steve Hampton at (<http://www.geocities.com/rainforest/canopy/6181/yolo.html>). All of these records are presumed to be migrants or non-breeding individuals. While there are no confirmed breeding records for Yolo County, they are fairly common nesters just across the Sacramento River in Sutter County, especially in riparian forests along the western toe drain of the Sutter Bypass. Up to 15 birds responded to taped vocalizations while canoeing this area in a single day in mid-June 1995 (Beedy pers. obs.).

Very little potential breeding habitat remains in Yolo County, and the mostly channelized and rip-rapped banks of the Sacramento River provide few opportunities for river meandering or riparian restoration that would provide suitable yellow-billed cuckoo breeding habitat (Greco 2008). While migrants could potentially use riparian habitats along the Sacramento River and other watercourses, there are few areas that support sufficient contiguous patches of suitable habitat to support breeding cuckoos.

Threats to the Species and Other Conservation Issues

Historic declines have been due primarily to the removal of riparian forests in California for agricultural expansion and urban expansion (USFWS 2001). Habitat loss and degradation continues to be the most significant threat to remaining populations. Habitat

loss continues as a result of bank stabilization and flood control projects, urbanization along edges of watercourses, agricultural activities, and river management that alter flow and sediment regimes. Overuse by livestock has been a major factor in the degradation and modification of riparian habitats in the western United States. The effects include changes in plant community structure and species composition, and relative abundance of species and plant density. (http://www.fws.gov/sacramento/es/animal_spp_acct/yellow-billed_cuckoo.pdf). Harris et al. (1986) believed that termination of grazing along portions of the South Fork of the Kern River in California was responsible for increases in riparian vegetation.

Fragmentation reduces the ability of an area to sustain a population, leading to local extirpations and the loss of dispersal corridors (USFWS 2001). Nesting cuckoos are sensitive to habitat fragmentation that reduces patch size to less than 100 x 300 meters (Hughes 1999). Fragmentation of occupied habitats could make nest sites more accessible and more vulnerable to predation. Predation is a significant source of nest failures, which have been recorded at 80% in some areas (Hughes 1999). Nestlings have been taken by hawks, jays, grackles (*Quiscalus quiscula*) (Nolan and Thompson 1975; Launer et al. 1990) while nestlings and eggs are vulnerable to predation by snakes and small mammals (Nolan, 1963). In addition, pesticides use associated with agricultural practices may also pose a long-term threat to Cuckoos. Pesticides may affect behavior and cause death or potentially affect prey populations (Hughes 1999, USFWS 2001).

Another likely factor in the loss and modification of yellow-billed cuckoo habitat is the invasion by the exotic tamarisk (*Tamarisk* sp.). The spread and persistence of tamarisk has resulted in significant changes in riparian plant communities. In monotypic tamarisk stands, the most striking change is the loss of community structure. The multi-layered community of herbaceous understory, small shrubs, middle-layer willows, and overstory deciduous trees is often replaced by one monotonous layer. Plant species diversity has declined in many areas and relative species abundance has shifted in others. Other effects include changes in percent cover, total biomass, fire cycles, thermal regimes, and perhaps insect fauna (Rosenberg et al. 1991; Busch and Smith 1993). Conversion to tamarisk typically coincides with reduction or complete loss of bird species strongly associated with cottonwood-willow habitat including the yellow-billed cuckoo (Hunter et al. 1987; Hunter et al. 1988; Rosenberg et al. 1991).

West Nile virus is spreading throughout portions of the western United States and poses a threat to bird species. The National Wildlife Health Center of the U.S. Geological Survey (USGS) has identified the yellow-billed cuckoo as a species that may be affected by West Nile virus (USGS 2003).

Significant data gaps relating to many aspects of the life history of the yellow-billed cuckoo exist. Data gaps include spacing parameters, the capacity for producing offspring, sources of mortality, mating system dynamics, and population structure. Brood parasitism by the Yellow-billed Cuckoo requires further study to identify the physiological and behavioral controls associated with the production of extra eggs. The current extent and causes of eggshell thinning and the effects of pesticides on cuckoos and the availability of prey need to be understood (Laymon 1998). Furthermore, detailed

censuses of declining western populations must continue to determine locations of remnant populations and viable sizes necessary for future conservation programs (Laymon 1980).

A habitat model developed by Gaines (1974) for the Yellow-billed Cuckoo in the Sacramento Valley includes the following: patch size of at least 25 acres, at least 100.5-m (330-ft) wide and 302-m (990-ft) long, within 100.5 m (330 ft) of surface water, and dominated by cottonwood/willow gallery forest with high-humidity microclimate. Halterman and Laymon (1989) further refined the model by classifying habitat patch sizes for suitability. A willow-cottonwood forest patch greater than 604 m (1,980 ft) wide and greater than 81 ha (200 acres) is classified as optimum habitat; a patch 201- to 603.5-m (660 to 1,980-ft) wide and 41.5 to 81 ha (102.5 to 200 acres) is suitable; a patch 100.5- to 201-m (330- to 660-ft) wide and 20 to 40 ha (50 to 100 acres) is marginal, and smaller patches are unsuitable. Management objectives for the Sacramento Valley include six subpopulations of 25 pairs each to maintain viable populations sizes (Laymon 1998). To achieve this goal, it would be necessary to establish or preserve at least 6,070 ha (15,000 acres) of optimum/suitable habitat. As of 1998, only 2,367 ha (5,850 acres) of habitat were considered suitable (Laymon 1998).

Many large riparian areas along the Sacramento River in Tehama County and along the Feather River in Yuba and Sutter Counties appear to be unoccupied but apparently represent suitable habitat for yellow-billed cuckoo (Gaines and Laymon 1984). In addition, factors determining local population fluctuations need to be fully understood in order to guide effective management actions to increase and stabilize populations at local carrying capacity.

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