

## Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)



Courtesy of Murrelet Halterman, PhD.

### Legal Status

**State:** Endangered

**Federal:** Candidate, Bureau of  
Land Management Sensitive, U.S.

Fish and Wildlife Service Bird of Conservation Concern, U.S. Forest  
Service Sensitive

**Critical Habitat:** N/A

**Recovery Planning:** N/A

**Notes:** In 2001, the U.S. Fish and Wildlife Service (USFWS) completed a 12-month review of a petition for listing the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) under the federal Endangered Species Act, and it determined that a listing was warranted but precluded at the time by higher priority listing actions, at which time the subspecies was added to the candidate list (66 FR 38611–38626). The most annual recent review of candidate species by the USFWS on October 26, 2011 includes the species yellow-billed cuckoo (*Coccyzus americanus*), with a western U.S. Distinct Population Segment (DPS) (76 FR 66370-66439) (i.e., the review does not refer to the western yellow-billed cuckoo subspecies even though California lists the subspecies *C. a. occidentalis* as Endangered). The USFWS continues to find that the western U.S. DPS warrants listing, but that such listing was precluded at the time of 2011 review. The USFWS states that they are working on a proposed listing rule that they expect to publish before making the next annual resubmitted petition 12-month finding (76 FR 66370-66439).

### Taxonomy

Two subspecies of the yellow-billed cuckoo are recognized—western yellow-billed cuckoo (*C. a. occidentalis*) and eastern yellow-billed cuckoo (*C. a. americanus*)—although the validity of the taxonomic grouping has been debated based on morphometric measurements

(e.g., wing length) (Banks 1988, 1990; Franzreb and Laymon 1993). Banks (1988) initially found statistically insignificant differences in wing length, bill length, and upper mandible depth between alleged subspecies. Revised analyses were performed given statistical and methodological errors in the Banks (1988) study. The updated Banks (1990) study found significant differences in wing and bill size between eastern and western cuckoos, but it still concluded that the subspecies should not be recognized. Franzreb and Laymon (1993) used Banks's data and determined that there were significant differences between eastern and western cuckoos in wing, tail, and bill lengths, as well as bill depth, in addition to potential behavioral, vocal, and ecological differences. Franzreb and Laymon (1993) concluded that recognition of the two subspecies should be retained until further examination determined otherwise. The two subspecies are separated by geographic distribution, with the boundary between the two subspecies considered to be the Pecos River in Texas (Hughes 1999). It should be noted that the USFWS refers to the western U.S. DPS in the October 2011 annual review (76 FR 66370-66439) rather than the state-listed western yellow-billed cuckoo subspecies.

Descriptions of the species' physical characteristics can be found in Hughes (1999).

## Distribution

### General

The western yellow-billed cuckoo's historical geographic range is southwestern British Columbia, western Washington, northern Utah, central Colorado, western Texas, south and west to California, and southern Baja California, Sinaloa, and Chihuahua in Mexico (Hughes 1999) (Figure SP-B15). The western yellow-billed cuckoo is rare and local in the southwestern United States. It breeds along the major river valleys in southern and western New Mexico, and central and southern Arizona. In California, the western yellow-billed cuckoo's breeding distribution is now thought to be restricted to isolated sites in the Sacramento, Amargosa, Kern, Santa Ana, and Colorado River valleys (Laymon and Halterman 1987). During surveys in 1999 and 2000 western yellow-billed cuckoos were not found on the Amargosa and Santa Ana rivers (Laymon, pers. comm. 2012).

## **Distribution and Occurrences within the Plan Area**

### ***Historical***

The California Natural Diversity Database (CNDDDB) contains 28 historical (i.e., pre-1990) occurrence records dating from 1917 to 1986. Of the known occurrences, 24 are from 2 years: 1977 (13) and 1986 (11). Single known occurrences are from 1917, 1945, 1978, and 1983. Of the historical known occurrences in the Plan Area, 23 are from the Lower Colorado River, with 14 known occurrences from Imperial County, ranging the Palo Verde area to the U.S.–Mexico border; 6 from eastern Riverside County in the Blythe area; and 2 from San Bernardino County in the Needles area. Five of the historical known occurrences are from the Amargosa River, Tecopa, China Ranch, and Independence areas in Inyo County, and 2 are from the Mojave River in the Upper Narrows and Hodge areas in San Bernardino County. Of 28 historical known occurrences, the majority are on public land.

### ***Recent***

In the Sacramento Valley, the south coast (including Ventura and Los Angeles counties), and Kern County, yellow-billed cuckoos were considered common to numerous in late the 1800s, but only fairly common by 1920s (Hughes 1999). By the 1950s, the subspecies had been extirpated north of Sacramento Valley (Hughes 1999). The species may also no longer breed in the Amargosa and Santa Ana rivers (Laymon, pers. comm. 2012).

The CNDDDB contains nine recent (i.e., since 1990) occurrences for the Plan Area: a 1991 known occurrence in the Alabama Hills near Lone Pine, a 1998 known occurrence from the Laguna Dam area of the Colorado River in Imperial County, a 2009 occurrence north of the Cibola National Wildlife Refuge (NWR), a 2009 occurrence in the Imperial NWR area, and three 2009 occurrences along the Colorado River in the Palo Verde Ecological Reserve in Riverside County (Figure SP-B15) (CDFW 2013).

## Natural History

### Habitat Requirements

This discussion is limited to breeding habitat requirements for western yellow-billed cuckoo in California. Breeding habitat primarily consists of large blocks, or contiguous areas, of riparian habitat, particularly cottonwood–willow riparian woodlands (66 FR 38611–38626) (see Table 1). From a survey conducted from northern Kern and Inyo counties south in 1986 and from southern Kern and Mono counties north in 1987, Laymon and Halterman (1989) proposed that optimum habitat patches for the western yellow-billed cuckoo are greater than 200 acres in size and wider than 1,950 feet; sites 101 to 200 acres in size and wider than 650 feet were suitable; sites 50 to 100 acres in size and 325 to 650 feet were marginal; and sites smaller than these dimensions were unsuitable. Western yellow-billed cuckoo prefers dense riparian thickets with dense low-level foliage near slow-moving water sources. Nests are constructed in willows on horizontal branches in trees, shrubs, and vines, but cottonwoods (*Populus* spp.) are used extensively for foraging, and humid lowland forests are used during migration (Hughes 1999). Of 95 detected nests at the South Fork Kern River, all were in willows, with one exception in a cottonwood (Laymon 1998). Along the Santa Ana River, 92% of nests were in willows, with one nest in a mistletoe clump in a cottonwood and one in an alder (*Alnus* spp.) (Laymon 1998). Nests along the Sacramento River have been found in willow, cottonwood, and alder, and also, although rarely, in orchards (Laymon 1998).

Laymon (1998) presents some detailed habitat information for the Bill Williams River in the Lake Havasu area in Arizona. This area is the most relevant to the Plan Area populations in the lower Colorado River area. Of 14 nests detected in the Bill Williams River, 11 were in willows, 1 in a cottonwood, and 2 in tamarisk (*Tamarix* spp.). Canopy closure averaged 77% and range from 51% to 92%; shrub averaged 33% with a range of 5% to 85%. The average distance of nests to water was 135 feet with a range of 0 to 575 feet.

**Table 1.** Habitat Associations for Western Yellow-Billed Cuckoo

| Land Cover Type              | Land Cover Use       | Habitat Designation | Habitat Parameters   | Supporting Information    |
|------------------------------|----------------------|---------------------|--|---------------------------|
| Riparian woodland and forest | Nesting and foraging | Primary             | Patch size > 198 acres; width > 1,270 feet; dense vegetation | Laymon and Halterman 1989 |

### Foraging Requirements

Yellow-billed cuckoos generally forage for lepidopteran larvae (caterpillars) and other large insects such as katydids by gleaning (Hughes 1999; Laymon 1998). They will also occasionally prey on small lizards, frogs, eggs, and young birds (Gaines 1999; Laymon 1998). Foraging occurs extensively in cottonwood riparian habitat (Hughes 1999).

### Reproduction

In the western United States, nests are typically constructed in willows (*Salix* spp.), Fremont cottonwood (*Populus fremontii*), mesquite (*Prosopis* spp.), hackberry (*Celtis* spp.), soapberry (*Sapindus saponaria*), alder (*Alnus* spp.), or cultivated fruit trees on horizontal branches or vertical forks of the large tree or shrub (Hughes 1999). Nests are generally placed between 1 and 6 meters (3 and 20 feet) above the ground and concealed by foliage, especially from above (Hughes 1999). Nest sites in arid regions are restricted to relatively humid river bottoms, ponds, swampy areas, and damp thickets (Hughes 1999). Both the male and female build the nest from twigs (approximately 15 centimeters [6 inches] long) likely collected within 10 meters (33 feet) of the nest site (Hughes 1999).

The western yellow-billed cuckoo has a short breeding season, lasting only about 4 months from time of arrival on breeding grounds in the spring to fall migration (see Table 2). Western yellow-billed cuckoos typically lay a single clutch per season of two or three eggs (average is just over two eggs, and up to four eggs per clutch is known) in mid-June to mid-July, and incubation occurs over 9 to 11 days (Hughes 1999; Johnson et al. 2008). However, Laymon (1998) reports

that in years of abundant resources, double- and even triple-clutching in a season can occur along the South Fork Kern River; over a 12-year period, double-clutching occurred less than half of the study years, and triple-clutching only occurred one year. Double-clutching has not been observed at the Bill Williams River site near the Colorado River (Laymon 1998). Development of the young is very rapid, with fledging occurring in 6 to 9 days; the entire breeding cycle may be only 17 days from egg laying to fledging of the young (Hughes 1999). Fledglings are dependent upon parents for up to 3 weeks following fledging (Johnson et al. 2008). Females often switch mates between broods within years and usually select a new mate in subsequent years. They can also be communal nesters with 2 females laying eggs in a nest and tending the young. Nests often have a helper male that tends the young (Laymon, pers. comm. 2012). The yellow-billed cuckoo has been noted to be both an intraspecific and interspecific brood parasite (Hughes 1999); however, this appears to only occur in the eastern yellow-billed cuckoo. The western yellow-billed cuckoo apparently is rarely parasitized by the brown-headed cowbird (*Molothrus ater*), possibly because its short breeding period reduces the chance of successful nest parasitism (Hughes 1999).

**Table 2.** Key Seasonal Periods for Western Yellow-Billed Cuckoo

|           | Jan | Feb | March | April | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-----------|-----|-----|-------|-------|-----|------|------|-----|-----|-----|-----|-----|
| Breeding  |     |     |       |       | X   | X    | X    | X   | X   |     |     |     |
| Migration |     |     |       |       |     |      |      |     | X   | X   |     |     |

**Notes:** Breeding in late May is rare.

**Sources:** Laymon 1998; Hughes 1999; Gaines 1999.

### Spatial Behavior

Spatial behavior patterns in the western yellow-billed cuckoo include migration, territory use, and dispersal from natal sites, as summarized in Table 3.

The western yellow-billed cuckoo is a long-distance migrant, although details of its migration patterns are not well known (Hughes 1999). It

is a relatively late spring migrant, arriving on the breeding grounds starting mid- to late May, but more commonly in June, and leaving from late August to early September (Franzreb and Laymon 1993; Gaines 1999) (Table 2). The migratory route of the western yellow-billed cuckoo is not well known because few specimens collected on wintering grounds have been ascribed to the western or eastern subspecies. The western yellow-billed cuckoo likely moves down the Pacific Slope of Mexico and Central America to northwestern South America (Hughes 1999).

Western yellow-billed cuckoos may have variable breeding territory sizes, with territories reported to be as small as 10 acres on the Colorado River (Laymon and Halterman 1989), but with a range of 20 to 100 acres on the South Fork Kern River (Laymon 1998). Recent data from radio telemetry studies on the Colorado, San Pedro, and Rio Grande rivers have shown larger home ranges. Cuckoos on the Rio Grande in New Mexico used an average of 204 acres (Sechrist et al. 2009), while cuckoos on the San Pedro River in Arizona, averaged about 125 acres (Halterman 2009). On the Colorado River in Arizona and California, cuckoos home ranges averaged about 95 acres (McNeil et al. 2010; McNeil et al. 2011a, 2011b). Whether western yellow-billed cuckoos are “territorial” in the sense of defending a spatially defined area is uncertain, although individuals have been observed to aggressively supplant each other (Hughes 1999).

Dispersal and the degree to which the western yellow-billed cuckoo shows site fidelity is largely unknown. The absence of pairs on known breeding sites in some years and presence of breeding birds on previously vacant sites demonstrates that breeding may not occur in the same location every year (Gaines and Laymon 1984). However, some breeding pairs along the South Fork Kern River have returned to the same nest territories for up to 3 years (unpublished data reported by Laymon 1998). Limited banding data indicate birds returning to breeding sites within 1.2 miles of natal sites (Hughes 1999), but too few birds have been banded and monitored to document typical dispersal patterns with any confidence. Along the South Fork Kern River, all banded individuals that have been resighted in the same area have been males (Laymon 1998).

**Table 3.** Spatial Behavior by Western Yellow-Billed Cuckoo

| Type                    | Distance/Area        | Location of Study | Supporting Information    |
|-------------------------|----------------------|-------------------|---------------------------|
| Home Range (Territory?) | As small as 10 acres | Colorado River    | Laymon and Halterman 1989 |
| Home Range              | 20–100 acres         | South Kern River  | Laymon 1998               |

### Ecological Relationships

Intraspecific and interspecific and community relationships are not well understood for the western yellow-billed cuckoo. The eastern yellow-billed cuckoo is an intraspecific and interspecific brood parasite, but this behavior has not been documented in the western yellow-billed cuckoo (Hughes 1999). Where brood parasitism does occur, yellow-billed cuckoos may be mobbed and harassed by other native birds such as American robin (*Turdus migratorius*) (Hughes 1999). Otherwise, there is no information regarding intraspecific and interspecific relationships or competition (Hughes 1999).

Western yellow-billed cuckoos are vulnerable to predation by other birds, particularly by raptors during migration, snakes, and mammals (Hughes 1999). Laymon (1998) reports that red-shouldered hawk (*Buteo lineatus*) and northern harrier (*Circus cyaneus*) have preyed on nestlings and that cuckoos chase western scrub-jay (*Aphelocoma californica*) and loggerhead shrike (*Lanius ludovicianus*) away from nests.

Presence and successful breeding by yellow-billed cuckoos may be limited by available resources. At occupied breeding sites, nesting success may be limited by available food sources. Cuckoo chicks hatch asynchronously, so the nest may contain unhatched eggs and young of various ages (Hughes 1999). The youngest chick in a brood may not be fed when food sources are in short supply, and birds may not reproduce at all when insufficient food is available (Hughes 1999). It also appears that increased food availability has a positive effect on clutch size (Martin 1987; Laymon 1998). A study of the effects of climate on yellow-billed cuckoo found that nesting by eastern yellow-billed cuckoos in the 2003 and 2004 breeding seasons only occurred at

sites where caterpillars were more abundant (Anders and Post 2006) (also see discussion below on climate effects). Laymon (1998) reports that western yellow-billed cuckoos may produce multiple clutches along the South Fork Kern River when food sources are abundant.

## Population Status and Trends

**Global:** Declining (NatureServe 2010)

**State:** Declining (Laymon 1998)

**Within Plan Area:** Same as above

Western yellow-billed cuckoo was once considered common to numerous in the Sacramento Valley, along the southern coast of California from Ventura to Los Angeles counties, and in Kern County in the late 1800s, but it was considered only fairly common by the 1920s (Gaines 1974; Gaines and Laymon 1984). The numbers of yellow-billed cuckoos in California and other western areas had declined markedly into the 1980s with loss of riparian habitats (Laymon and Halterman 1987). Surveys in 1986 and 1987 showed a decline from 123 to 163 pairs in 1977 to 30 to 33 pairs in 1987, or a 73% to 82% decline over this 10-year period (Laymon 1998). The most recent statewide surveys in 1999 and 2000, including the Sacramento, Kern, and Lower Colorado rivers (1999 only), as well as other areas with smaller amounts of habitat, documented 41 to 45 pairs and 49 unmated birds in 1999, and 61 to 67 pairs and 61 to 68 unmated birds in 2000 on the Sacramento and Kern rivers (Halterman et al. 2003). Although the number of detected pairs was higher in 1999-2000 compared to 1986-1987, there were still substantially fewer pairs than detected in 1977.

The western yellow-billed cuckoo suffered substantial range reductions in the twentieth century due to loss of riparian habitat (Laymon and Halterman 1987). The species was extirpated north of Sacramento Valley by the 1950s (Gaines and Laymon 1984). Surveys throughout California in 1986–1987 found that only three areas in the state supported more than approximately five breeding pairs on a regular basis, including the Sacramento River between Colusa and Red Bluff, the South Fork of the Kern River, and the lower Colorado River (Johnson et al. 2008). In the 1999-2000 surveys, the Sacramento and Kern rivers were the only remaining areas with

more than 1,000 hectares (2,470 acres) each of prime suitable habitat (i.e., high canopy cover, extensive understory, and structural diversity) (Halterman et al. 2003).

Within the Plan Area, the majority of CNDDDB records are from the Colorado River (CDFW 2013). Once considered abundant throughout the lower Colorado River, a dramatic decline of the species was noted during surveys in the 1970s and 1980s. The lower Colorado River and its tributaries supported an estimated 180–240 pairs in 1976–77. This population declined by an estimated 80% to 90% by 1986. In 1998, no pairs could be identified west of the Colorado River in the parts of California that had been occupied in 1976–77. Along the lower Colorado River and its major tributaries, losses have been greatest at lower elevations below 900 meters (3,000 feet) (Johnson et al. 2008).

### **Threats and Environmental Stressors**

The western yellow-billed cuckoo is sensitive to habitat fragmentation and degradation of riparian woodlands due to agricultural and residential development (Hughes 1999), and major declines among western populations reflect local extinctions and low colonization rates (Laymon and Halterman 1989). Groundwater pumping and the replacement of native riparian habitats by invasive non-native plants, especially tamarisk, have substantially reduced the area and quality of available breeding habitats for yellow-billed cuckoo (75 FR 69222–69294). Even where habitat is not degraded, the species has been extirpated from breeding areas occupied by four or fewer pairs (Laymon and Halterman 1987), possibly due to the inherent instability of small populations (Laymon and Halterman 1989). The extensive surveys in 1999 and 2000 found that large breeding populations in California only remain on the Sacramento and Kern rivers where there is still substantial prime habitat (Halterman et al. 2003). Non-native invasive species such as tamarisk (*Tamarix* spp.) may preclude use by western yellow-billed cuckoos; previously occupied willow–cottonwood habitats that converted to monotypic stands of tamarisk generally were no longer inhabited (Laymon and Halterman 1987), although Laymon (1998) reports two nest sites in tamarisk at the Bill Williams River site in Arizona. However, even at these sites, the habitat within the cuckoos' territories was still primarily willow-cottonwood (Laymon, pers. comm. 2012). Of the 33

known occurrences in the CNDDDB database for the Plan Area, three of the sites were reported to have tamarisk invasion (CDFW 2013).

Pesticides may affect behavior of western yellow-billed cuckoo by loss of balance or may cause death by direct contact (Hughes 1999). Pesticides may contaminate preferred prey items, particularly lepidopteran larvae. In addition, some prey species, such as frogs, occur in pesticide-laden runoff adjoining agricultural land (Laymon and Halterman 1987). The western yellow-billed cuckoo also has shown pesticide effects on reproduction due to eggshell thinning (Gaines and Laymon 1984; Laymon and Halterman 1987). Of the 33 known occurrences in the Plan Area, agriculture (and associated access roads) adjacent to occupied habitat was reported to be a threat to five of the sites (CDFW 2013).

Yellow-billed cuckoos are also known to collide with windows, resulting in injuries and fatalities (Klem 1989, 1990). Whether this a substantial threat in the Plan Area is unknown, but it seems unlikely given the limited amount of development in occupied areas.

Climate change may be a stressor on yellow-billed cuckoos. Anders and Post (2006) examined BBS data for the eastern yellow-billed cuckoo for the period of 1966 to 2002 in relation to the North American Oscillation and El Niño Southern Oscillation climate systems. (The western yellow-billed cuckoo was excluded from the analysis due to few data.) Anders and Post (2006) found that populations were sensitive to warm temperatures, with population declines in the year following the preceding breeding season with warm temperatures. They postulate that the decline in productivity is related to reduced available prey because they found that breeding only occurred in 2003 and 2004 on sites with more abundant prey. Lepidopteran larvae outbreaks appear to be more common during cooler weather (Anders and Post 2006). Further, it is possible that warmer temperatures cause earlier peaks of lepidopteran larvae that could be asynchronous with breeding by yellow-billed cuckoos at a time when prey is needed most (Anders and Post 2006).

### **Conservation and Management Activities**

A rangewide conservation and assessment strategy for the western yellow-billed cuckoo is currently in preparation by a group of federal, state, and nongovernmental agencies organized by the Sacramento office of the USFWS (75 FR 69222–29294). Work on the conservation strategy is expected to be initiated in 2011.

Known occurrences of western yellow-billed cuckoo in the Plan Area are on BLM land. BLM Manual 6840 establishes Special-Status Species policy for plant and animal species and the habitat on which they depend (BLM 2001). The objectives of the BLM policy are:

- A. To conserve listed species and the ecosystems on which they depend.
- B. To ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special-status species and do not contribute to the need to list any special-status species, either under provisions of the ESA or other provisions of this policy (BLM 2001).

The BLM has identified the western yellow-billed cuckoo as a sensitive species and requires surveys in suitable habitat areas prior to authorizing activities that could disturb the species or its habitat.

Although the western yellow-billed cuckoo is not federally listed, several habitat conservation plans that would provide regulatory coverage for species, were it to be listed, have been implemented, including the Clark County Nevada Habitat Conservation Plan; the Lower Colorado River Multi-Species Conservation Plan; and the California Department of Corrections Electrified Fence Project (for 26 sites throughout California, including nine sites in the Plan Area). Each of these conservation plans provides for conservation/protection and management of habitats that benefit the western yellow-billed cuckoo.

Wetland permits under Section 1600 of the California Department of Fish and Wildlife Code and federal Clean Water Act 404 issued by CDFW and the U.S. Army Corps of Engineers, respectively, also typically require avoidance, minimization, and mitigation measures for impacts to riparian habitats that may be used by western

yellow-billed cuckoo and which may benefit the species. Further, any impacts to the species resulting in “take” are regulated by Section 2081 of the California Endangered Species Act, and full mitigation of impacts is required.

## **Data Characterization**

Statewide systematic surveys for the western yellow-billed cuckoo have not been conducted since 1999 and 2000 (Halterman et al. 2003), and there are only three recent (since 1990) known occurrences in the CNDDDB for the Plan Area (CDFW 2013). The current status of the species along the lower Colorado River and other areas where it has historically occurred, such as the Amargosa and Mojave rivers, is unknown. However, 26 of the 33 historic and recent known occurrences of the species are on public lands and are not subject to intense development pressure. The main concern for these areas is current habitat quality given that the western yellow-billed cuckoo requires large, dense tracts of riparian habitat. Water development (e.g., in the Victorville area) and invasive species such as tamarisk may have caused habitat degradation at some of the known occurrence sites since the cuckoo has been seen in the areas.

## **Management and Monitoring Considerations**

Western yellow-billed cuckoo usually occur in large, dense tracts of riparian habitat, as summarized previously under Habitat Requirements. Therefore, management and monitoring will need to focus on maintaining, restoring, and enhancing large tracts of suitable habitat for the species, including controlling invasive species, such as tamarisk (Laymon and Halterman 1985; Laymon 1998; Sogge et al. 2008) and ensuring water sources to maintain large riparian areas. The native, deep-rooted species that compose suitable cuckoo habitat, generally associated with perennial watercourses, require floods for maintenance and are tolerant of submersion when young (66 FR 38611–38626; Hughes 1999). Fire is also a consideration along the Colorado River, especially where people camp and may leave unattended camp fires (Comrack, pers. comm. 2011). The species is also highly dependent on adequate food sources (primarily caterpillars) for successful breeding (Martin 1987; Hughes 1999;

Anders and Post 2006), so potential impacts on the prey base by pesticides applied to agricultural areas near suitable habitat are also a management concern. Pesticides may also cause lethal and sublethal poisoning to adults and young, adversely affecting the health and reproductive fitness of individuals and the viability of populations (Hughes 1999).

## **Species Modeled Habitat Distribution**

This section provides the results of habitat modeling for western yellow-billed cuckoo, using available spatial information and occurrence information, as appropriate. For this reason, the term “modeled suitable habitat” is used in this section to distinguish modeled habitat from the habitat information provided in Habitat Requirements, which may include additional habitat and/or microhabitat factors that are important for species occupation, but for which information is not available for habitat modeling.

There are 174,654 acres of modeled suitable habitat for western yellow-billed cuckoo in the Plan Area. Appendix C includes a figure showing the modeled suitable habitat in the Plan Area.

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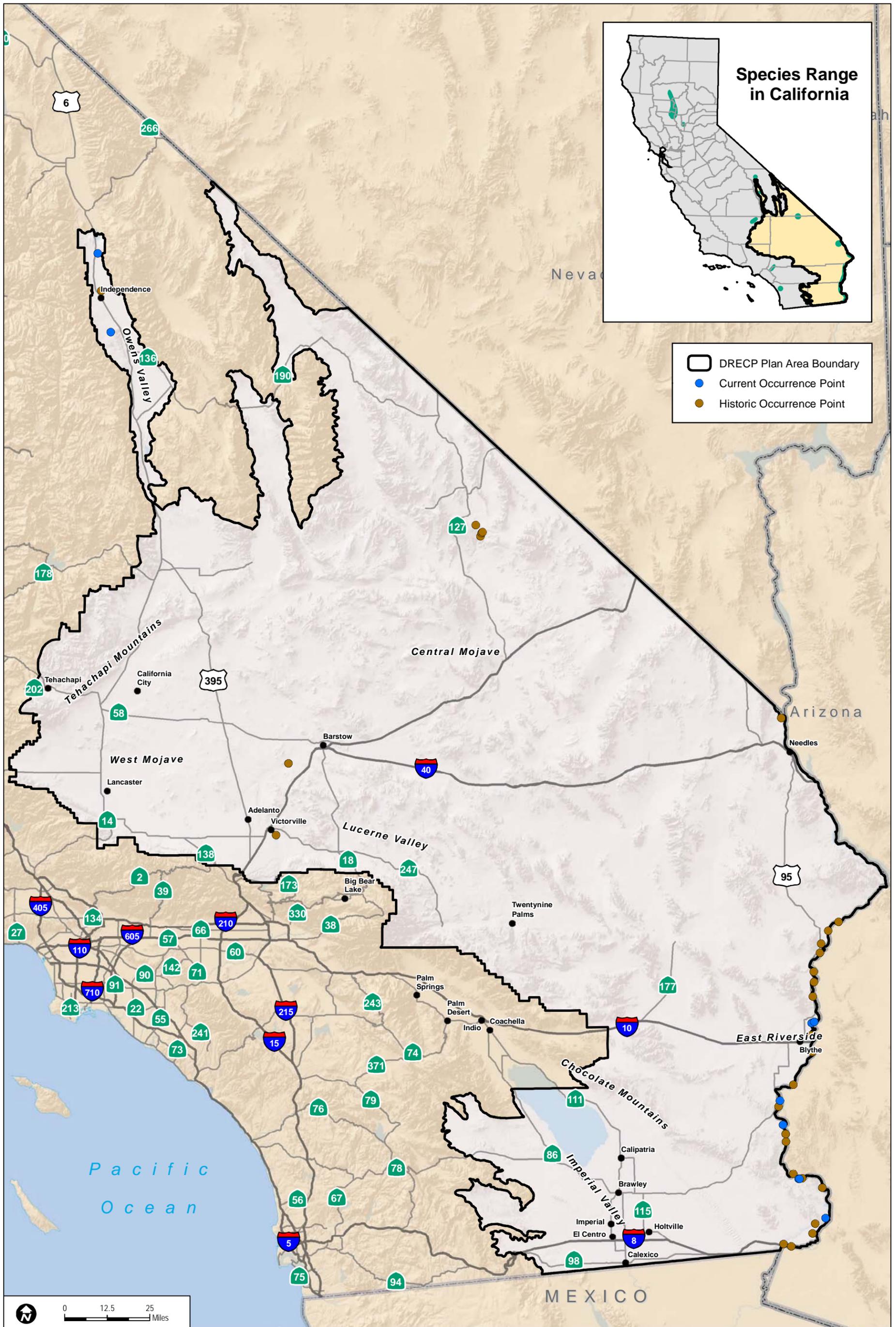
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**BIRDS**      **Western Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*)**

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**FIGURE SP-B13**  
**Western Yellow-billed Cuckoo Occurrences in the Plan Area**