California Black Rail
(*Laterallus jamaicensis coturniculus*)

Legal Status

**State:** Fully Protected; Threatened  
**Federal:** Bureau of Land Management Sensitive  
**Critical Habitat:** N/A  
**Recovery Planning:** N/A  
**Notes:** A molecular genetic analysis published in 2010 (Girard et al. 2010) indicates that birds within the Plan Area may qualify as a separate Distinct Population Segment (DPS) under the Endangered Species Act (ESA) (see the following Taxonomy section). No listing petition has ever been filed for this species (USFWS 2011), but this new information may result in reappraisal of the status of the species in the Lower Colorado River/Salton Trough region.

Taxonomy

The black rail (*Laterallus jamaicensis*) includes several subspecies or races that are largely disjunct in distribution. The two North American subspecies (the type [*L. j. jamaicensis*] and the California black rail [*L. j. coturniculus*]) are widely accepted, while two of the three South American subspecies, Junin rail (*L. tuerosi*) and Galapagos rail (*L. spilonotus*), are often regarded as separate species. Recent molecular analyses have revealed strong genetic divergence between coastal California, Central Valley, and Lower Colorado/Salton Trough populations (Girard et al. 2010). There is evidence for substantial gene flow between the coastal and Central Valley groups, but the Lower Colorado/Salton Trough group "has a unique and highly divergent genetic composition," and may not have originated from the Coastal/Central Valley populations (Girard et al. 2010). Thus, it may constitute a separate subspecies and a distinct population segment for the purposes of assessment and potential protection under the federal ESA.
Distribution

General

The California black rail occurs in California, Arizona, Baja California Norte, and the Colorado River delta in Sonora (Figure SP-B6). The subspecies appears to be composed of three clearly distinct metapopulations. The first and most numerous coastal group inhabits tidal marshes mainly in the northern San Francisco Bay area, with smaller occurrences at sites from Bodega Bay to northwest Baja California. The second, intermediate-sized Central Valley group occurs at interior wetlands of Butte, Nevada, Placer, San Joaquin, and Yuba counties. The third, much smaller Lower Colorado/Salton Trough group occurs primarily at Mittry Lake, Arizona, with additional occurrences along the Lower Colorado River from Bill Williams River to Laguna Dam, and at isolated locations in the Salton Trough (Eddleman et al. 1994; Aigner et al. 1995; Richmond et al. 2008; Girard et al. 2010).

Distribution and Occurrences within the Plan Area

Historical

Grinnell and Miller (1944, pp. 130–131) were not aware of any occurrence of black rails in the Lower Colorado River/Salton Trough area, and the first report of them from the region was for an occurrence at Imperial Dam (Snider 1969, cited in Repking and Ohmart 1977). They were detected widely during extensive surveys in 1973–1974 (Repking and Ohmart 1977). Occurrences along the Lower Colorado River are recorded primarily above the Laguna Diversion Dam and behind the Imperial Dam, and occurrences to the west are primarily associated with the New River, All American Canal, and Coachella Canal (CDFG 2012; Figure SP-B6). It is thus possible that the rail was rare or absent from the Plan Area prior to construction of these structures and initiation of perennial runoff in the New River. Extensive breeding season surveys were conducted in the area by Evens et al. (1991), at 906 stations in the Lower Colorado River and Salton Trough. They had 116 detections, with 65% of detections on the Lower Colorado River, 15% in seeps along the All American Canal, 12% at the Salton Sea, 7% at seeps along the
Coachella Canal, and 1% at Finney Lake in the Imperial Valley. Further extensive surveys in 2000–2001 largely confirmed this distribution, but found far fewer birds despite a greater survey effort (Conway and Sulzman 2007).

Recent

Recent occurrences of California black rail in the Plan Area are primarily along the Lower Colorado River from the Laguna Diversion Dam upstream to about the head of Ferguson Lake (CDFG 2012; Figure SP-B6), although two more isolated occurrences extend the species’ range along the river upstream to near Parker. Other occurrences include an isolated riparian marsh on the north side of the Salton Sea at the Dos Palmas Preserve Area of Critical Environmental Concern on BLM lands, which is supported by seepage from the Coachella Canal; a marsh on the New River near Seeley; marshes at the mouth of the river where it enters the Salton Sea; and marshes supported by seepage from the All American Canal southeast of El Centro (Conway and Sulzman 2007).

Natural History

Habitat Requirements

Suitable California black rail habitat generally includes salt marshes, freshwater marshes, and wet meadows. Most California populations, especially in the southern part of the state, are nonmigratory, and these habitat types serve for breeding, foraging, and overwintering. In tidal areas, the rails also require dense cover of upland vegetation to provide protection from predators when rails must leave marsh habitats during high tides (Eddleman et al. 1994). Typical associated vegetation includes pickleweed (Salicornia virginica) in salt marshes and bulrush (Scirpus spp.) in less saline habitats (Evens et al. 1991; Harvey et al. 1999).

During the most recent comprehensive survey of California black rail occurrence in the Lower Colorado River/Salton Trough region Conway and Sulzman (2007), all sites with black rail detections were located in riparian marsh habitat, although at many sites, upland habitat (chiefly Mojave or Sonoran desert lowland) or open water
were also present within 50 meters (164 feet) of the detection site. The dominant wetland plant species were common threesquare (*Schoenoplectus pungens*), arrowweed (*Pluchea sericea*), Fremont cottonwood (*Populus fremontii*), seepwillow (*Baccharis salicifolia*), tamarisk (*Tamarix ramosissima*), common reed (*Phragmites australis*), and salt grass (*Distichlis stricta*). Plant communities usually consisted of a single dominant species, and the highest detection rates were associated with communities dominated by common threesquare, arrowweed, Fremont cottonwood, and mixed shrubs. These plants are strongly associated with shallow water or moist soil near the upland/wetland interface. Similar results were reported from prior surveys in the region, with Evens et al. (1991) reporting strongest occurrence associations with common threesquare, cattails (*Typha angustifolia* and *T. domingensis*), California bulrush (*Scirpus californicus*), and native tree/shrub communities. Tamarisk was also positively associated with black rails but not when the tamarisk formed dense monotypic stands, which it often does in the region (Conway and Sulzman 2007). Conway and Sulzman (2007) concurred with previous authors in further concluding that black rail was positively associated with sites that have very shallow standing water (less than 3 centimeters (1.18 inches) deep) and very low daily water level fluctuations.

**Foraging Requirements**

California black rails forage in the same habitats that they use for breeding. They prey on small (< 1 centimeter [.39 inch]) invertebrates, chiefly insects, gleaned from marsh vegetation and mudflats; they also eat small seeds (Eddleman et al. 1994). Analysis of seven incidentally taken rails from an Arizona site found that the birds’ diet included various beetles, grasshoppers, ants, earwigs, spiders, and other miscellaneous insects, as well as snails, bulrush, and cattail seeds. Bulrush and cattail seeds appear to be an important component of their diet during the winter months when insect prey availability is low (Flores and Eddleman 1991, as cited in Eddleman et al. 1994).
BIRDS

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Reproduction

The black rail reproductive cycle begins with pair formation (Table 1). Associated behavior has not been observed but may involve calls by both sexes, which have been recorded from late February into July on sites along the Lower Colorado River (Eddleman et al. 1994). Multiple broods may be raised; nest records from Arizona indicate that the peak of egg-laying for the first brood of the season is May 1 (Eddleman et al. 1994). One study of black rail nesting along the Lower Colorado River determined that located nests had a mean clutch size of 4.8 eggs (Flores and Eddleman 1993). Nests were in clumps of vegetation elevated an average of 6.4 centimeters (2.52 inches) above the mud substrate. Incubation began at varying dates from March 30 to June 25, lasting from 17 to 20 days. Both sexes incubated the eggs. The birds aggressively defended the nests by scolding, raising their wings, and running toward researchers. Both young and parents abandoned the nest within 24 hours after the last egg in each clutch had hatched. Newborn hatchlings, although fairly precocious, are small and downy; it seems likely that a period of parental care is needed, but there are no data on the subject (Eddleman et al. 1994). One female was recaptured 18 days after nest abandonment with an egg in her oviduct, suggesting that multiple brooding may occur (Flores and Eddleman 1993).

**Table 1.** Key Seasonal Periods for California Black Rail

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Source: Eddleman et al. 1994

Repking and Ohmart (1977) reported California black rail densities of 1.1 to 1.6 hectares (2.7 to 4 acres) in spring, and 0.7 hectare (1.7 acres) in winter, on the lower Colorado River. In Arizona, black rail used home ranges averaging 0.4 +/- 0.2 hectare (.98 +/- .49 acre) and rarely overlapped (Flores 1991, as cited in Harvey et al. 1999).
Spatial Behavior

Movement of rails within habitat is primarily by running along the ground, often using trails made by voles (Microtus spp.). Rails can also swim short distances. Flight, which exposes them to aerial predators, is uncommon (Eddleman et al. 1994).

California black rails are nonmigratory, but their occurrence at many locations indicates that dispersal movements occur (Eddleman et al. 1994). However, there is no documentation about the timing or manner of such movements.

Ecological Relationships

Black rail predators have not yet been identified in the Lower Colorado River/Salton Trough region. Elsewhere, avian predators include great blue heron (Ardea herodias), great egret (Casmerodius albus), northern harrier (Circus cyaneus), ring-billed gull (Larus delawarensis), great horned owl (Bubo virginianus), and short-eared owl (Asio flammeus) (Eddleman et al. 1994). Known mammalian predators include rats (Rattus spp.), red fox (Vulpes vulpes), and domestic cats (Felis domesticus); nest predators likely include a variety of other mammals and reptiles as well (Eddleman et al. 1994).

Little is known about competition among black rails or between black rails and other species. Richmond et al. (2010), investigating competition between black and Virginia rails in Northern California freshwater marshes, found a positive association between the two species; in the smallest marshes, Virginia rail presence was a good predictor of black rail presence.

Brood parasitism of black rails is not known to occur (Eddleman et al. 1994). It is likely that black rails, as most birds, are subject to infectious disease and to parasitism by invertebrates such as mites and protozoans, but this has not been documented (Eddleman et al. 1994).

Mutualistic or commensal relationships do not appear to have been identified or studied in black rails. Habitat and prey requirements of black rails are discussed in the previous Habitat Requirements and Foraging Requirements sections, respectively.
Population Status and Trends

**Global:** Declining (Birdlife International 2008)

**State:** Declining (Conway and Sulzman 2007)

**Within Plan Area:** No formal assessment, but results of Evens et al. (1991) and Conway and Sulzman (2007) indicate populations are likely declining.


The 1991 study reported that “subpopulations were small and isolated” and that “[t]he causes of this downward trend—all related to habitat loss or degradation—are pervasive and ongoing” (Evens et al. 1991). Conway and Sulzman (2007, p. 996) delivered a similar conclusion: “Our data suggest that degradation and elimination of suitable emergent marshes over the past 25 to 30 years has caused significant reduction in black rail distribution in Southern California and Arizona.”

**Threats and Environmental Stressors**

Human impacts on black rails include shooting and trapping, contaminants, collisions, effects of research, and habitat impairment. Shooting and trapping effects are likely very minor due to the small size of the bird (Eddleman et al. 1994). Contaminant effects, such as from exposure to pesticides, are virtually unknown, but slightly elevated selenium levels were found in Lower Colorado River birds and eggs analyzed in 1988 (Flores and Eddleman 1991, as cited in Eddleman et al. 1994). Research effects include potential disturbance of nesting birds during surveys, and more severe effects, such as mortality, nest failure, or exposure to predation, may occur in association with mist netting, radio tracking, or other invasive research techniques.
Addressing the Lower Colorado River/Salton Trough populations, specifically, Conway and Sulzman (2007) identify degradation and loss of suitable emergent marsh habitat as the principal threat to the species. They also note declines in habitat suitability due to the spread of tamarisk.

**Conservation and Management Activities**

California black rail is not the subject of a documented recovery plan, and there do not appear to be any active state or local programs focused on its conservation and management. However, it is a covered species in several approved habitat conservation plans (HCPs) and natural community conservation plans. Several of these only affect the coastal and/or Central Valley populations and are not related to the Desert Renewable Energy Conservation Plan (DRECP) Area, but the rail is also a covered species under both the Coachella Valley Multi-Species Conservation Plan (MSCP) and the Lower Colorado River MSCP. Both plans include provisions to create or enhance black rail habitat within the proposed DRECP Plan Area. The Coachella Valley MSCP would conserve and create black rail habitat at several sites in the Plan Area, and would take other conservation actions such as control of tamarisk and measures to ensure proper hydrologic function of conserved habitat (CVAG 2007, pp. 9-132 to 9-137). The Lower Colorado River MSCP includes provisions to maintain existing black rail habitat and to create new habitat along the Lower Colorado River (LCR MSCP 2004, pp. 5-57 to 5-58).

**Data Characterization**

Although the black rail is extremely difficult to survey or observe in the wild, its habitat requirements are well understood, and it remains within a small home range in suitable habitat. Accordingly, it is feasible to identify, conserve, or even create habitat that will be used by black rails. Probably the greatest obstacle to black rail management is a complete absence of knowledge regarding dispersal movements. Past surveys (Evens et al. 1991; Conway and Sulzman 2007) have documented disappearance of black rail from apparently suitable habitat without recolonization. Population models applied to the Central Valley populations indicate that the existing small, dispersed populations are not large enough to be self-sustaining.
(Girard et al. 2010); yet they persist, a circumstance that suggests birds are moving to and/or between these populations in a manner that is not yet understood. Resolving this uncertainty is prerequisite to any successful black rail recovery effort in California.

Management and Monitoring Considerations

Black rail management at existing preserves along the Lower Colorado River, such as the Bill Williams River National Wildlife Refuge and the Mittry Lake Wildlife Area (Arizona), as well as under approved HCPs such as the Coachella Valley MSCP and the Lower Colorado River MSCP, focuses on conserving and maintaining suitable habitat conditions by maintaining suitable hydrology and plant communities.

Any management actions potentially affecting California black rail habitat would likely require surveys to assess the potential for habitat occupancy. Survey protocols appropriate for habitat in the Lower Colorado River/Salton Trough area have been developed and are described by Conway (2005) with additional information available at the North American Marsh Bird Monitoring Program website (http://www.cals.arizona.edu/research/azfwru/NationalMarshBird); this protocol is currently used for the Lower Colorado River MSCP.

Predicted Species Distribution in Plan Area

There are 40,424 acres of modeled suitable habitat for California black rail in the Plan Area. Modeled suitable habitat occurs in the southern portion of the Plan Area in the following ecoregion subsections: Borrego Valley-West Mesa, Cadiz-Vidal Valley, Chocolate Mountains and Valleys, East Mesa-Sand Hills, Imperial Valley, and Palo Verde Valley and Mesa. Modeled suitable habitat occurs below 500 feet in elevation and includes arid west freshwater emergent marsh, Southwestern North American riparian, flooded and swamp forest/scrubland, and Southwestern North American introduced riparian scrub vegetation types. Appendix C includes specific model parameters and a figure showing the modeled suitable habitat in the Plan Area.

Appendix C provides a summary of the methodology used to model DRECP Covered Species with Maxent. For the California black rail, 36
occurrence points were used to train the Maxent model and 11 occurrence points were used to test the model’s performance. Overall, the Maxent model has excellent statistical support. The occurrence points occur in limited environmental conditions, increasing the predictive power of the model. The small number and fairly concentrated distribution of occurrence samples result in good predictive ability throughout most of the Plan Area. Based upon a natural break in the distribution of the probability of occurrence that Maxent estimates, all 100-meter grid cells with greater than 0.147 probability of occurrence were defined as California black rail habitat.

The Maxent model predicts 551,912 acres of California black rail habitat, compared with 40,424 acres predicted by the expert model. Compared to the expert model, the Maxent model defines habitat more broadly, including much more habitat east of the Colorado River to the Salton Sea, and small patches in the northern part of the Plan Area, where occurrence data are scarce. The habitat threshold could be adjusted to remove these areas, were they determined to be non-habitat areas. The expert model limits its prediction of California black rail habitat to areas bordering the Salton Sea, and the Colorado, New, and Amargosa Rivers.

**Literature Cited**


BIRDS California Black Rail (*Laterallus jamaicensis coturniculus*)


Figure SP-B6

California Black Rail Occurrences in the Plan Area (N=47)


Note: Occurrence point size graphically represents the precision level code for the data point but is not scaled geographically.