Light-footed Ridgway's Rail

(Rallus Obsoletus Levipes)

5-Year Review:

Summary And Evaluation

Photo: San Diego National Wildlife Refuge marsh habitat (*Lisa Cox/U.S. Fish and Wildlife Service*)
Inset Photo: Light-footed Ridgway's rail (*Joanna Gilkeson/U.S. Fish and Wildlife Service*)

U.S. Fish and Wildlife Service

Carlsbad Fish and Wildlife Office

Carlsbad, California

August 2025

ACKNOWLEDGEMENT

This 5-year status review is informed by the 5-year status report prepared by Ari Espinosa during her 2023 Directorate Fellows Program fellowship at the Carlsbad Fish and Wildlife Office. To complete this assessment, Ari conducted a literature review, updated occurrence data, and coordinated with the U.S. Fish and Wildlife Service staff and external partners. Ari assessed current threats to the species and identified priority research and conservation tasks.

5-YEAR REPORT

Light-footed Ridgway's Rail (*Rallus Obsoletus Levipes*)

GENERAL INFORMATION

Species: Light-footed Ridgway's rail (*Rallus obsoletus levipes*), a bird subspecies
Date Listed: March 8, 1969
Federal Register Citation: Service 1969 (34 FR 5034)
Classification: Endangered
Recovery Plan Information:
Recovery Plan: Light-Footed Clapper Rail Recovery Plan
Date Issued: June 24, 1985 (revised)
Originally Approved: July 1979
Recovery Plan Addendum: Recovery Plan Amendment for the Light-footed Ridgway's Rail
Date Issued: October 4, 2019
Recovery Priority Number: 6 (high degree of threat, low recovery potential, subspecies)
Critical Habitat Designation: No critical habitat has been designated for this species.

BACKGROUND

Under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq*.), the U.S. Fish and Wildlife Service (Service), referred to as "we" in this document, maintain lists of endangered and threatened wildlife and plant species (referred to as the List) in the Code of Federal Regulations (CFR) at 50 CFR 17.11 (for wildlife) and 17.12 (for plants). Section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years.

Most Recent Status Review: Service 2020. *Rallus obsoletus* (=*longirostris*) *levipes* [Light-footed Ridgway's (=Clapper) Rail] 5-year Review: Summary and Evaluation. Prepared by the Carlsbad Fish and Wildlife Office, Carlsbad, California. 51 pp. + appendices.

We initiated the previous status review for the light-footed Ridgway's rail in 2019 (Service 2019, pp. 36116–36118). The review was finalized on July 9, 2020, and recommended no change in status.

Federal Register Notice Announcing this Status Review: On October 16, 2024, we published a Federal Register notice announcing initiation of the 5-year review of this species, and the opening of a 60-day comment period to receive information (Service 2024a, pp. 83510–83514). We received two comments containing occurrence information pertaining to the Light-footed Ridgway's rail.

Species Overview and Habitat:

The light-footed Ridgway's rail [formerly the light-footed clapper rail (*Rallus longirostris levipes*)] is a medium-sized, tawny, and gray-brown marsh bird that generally inhabits coastal salt marshes, lagoons, and some freshwater habitats in southern California, United States, and

northern Baja California, Mexico. Rails nest along tidal creeks of marshes, utilizing upper marsh vegetation such as cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* spp.) to protect nests from high tides (Wilbur and Tomlinson 1976, p. 12). Low tides expose channels and mudflats within the marsh, where rails forage for crustaceans (mainly *Pachygrapsus crassipes* and *Hemigrapsus oregonesis*, possibly *Ucacrenulata* spp.), beetles (Coleoptera), gastropods (*Helix* spp., *Cerithidea californica*, *Malampus olivaceus*), and decapods (Service 1985, p. 9).

ASSESSMENT

Information Acquired Since the Last Status Review

This 5-year review was conducted by the Carlsbad Fish and Wildlife Office. Information for this review was solicited from the public and interested parties through a Federal Register notice announcing this review on October 16, 2024 (Service 2024a, pp. 83510–83514). We received information from the Marine Corps Base Camp Pendleton and the Naval Weapons Station, Seal Beach, during this period with updated contact information for species data and annual reports. We also contacted the Ventura Fish and Wildlife Office, State and Federal partners, and species experts to request any data or information we should consider in our review. Additionally, we conducted a literature search and a review of information in our files.

SUMMARY OF NEW INFORMATION SINCE 2020

Biology and Distribution

Since 2020, new information on habitat preferences for nesting and occupancy have been observed. Newly identified relationships were found between environmental factors and light-footed Ridgway's rail occupancy and breeding pair abundance. These relationships may be useful to inform future management plans for light-footed Ridgway's rail habitat conservation. In addition to habitat analysis, there have been updates to occurrences and the distribution of breeding populations throughout southern California. These updates on breeding pair populations in comparison to the last 5-year review identify marshes of biological significance and describe the current condition of light-footed Ridgway's rail populations as of 2024.

Habitat

In a recent study, salt marsh nest habitat for rails was categorized into three types using percent cover, elevation, and vegetation. The first type, seen in 62 percent of the 34 sites observed, was dominated by *Spartina foliosa* (California cordgrass) cover (Taylor 2019, p. 130). The second type, at slightly higher elevations and with more species richness compared to other groups, was generally dominated by *Salicornia pacifica* (pickleweed) and *Jaumea carnosa* (marsh jaumea) (Taylor 2019, p. 130). The final type was around the marsh exterior and dominated by *Schoenoplectus* spp. (bulrush); it was the least commonly used site observed and had both the highest percent cover and tallest stems of the three groups (Taylor 2019, pp. 130–131).

When comparing light-footed Ridgway's rail occupancy to marsh characteristics, mean percent *Spartina foliosa* coverage had a positive relationship with plot occupancy and nest site selection.

Percent cover of *Salicornia pacifica* had a negative relationship compared to occupancy but was positively associated with nest site selection. Light-footed Ridgway's rails are mostly associated with low marsh habitats and nesting was most likely at a mean elevation of 1.25 meters (m) [4.11 feet (ft)], though utilize higher elevation marsh habitat for foraging and occasional nesting (Zembal and Massey 1981, pp. 4–5; Taylor 2019, p. 134;).

Streamflow and precipitation were other environmental factors analyzed in the study. A positive relationship was observed between summer rain and breeding pair abundance, while a negative relationship was observed between winter rain and breeding pair abundance (Taylor 2019, p. 161). High streamflow, duration, and frequency also seemed to negatively impact breeding pair abundance within a year's timeframe, suggesting there may be immediate impacts to light-footed Ridgway's rail habitat during flooding events. However, frequency of decadal floods had a positive correlation with breeding pair abundance, suggesting that the sediment deposition from flood events encourages growth of suitable habitat (Taylor 2019, p. 142).

Occurrences

Annual monitoring for light-footed Ridgway's rail has occurred at 25 southern California coastal wetlands since the last 5-year review, and we updated occurrence status by marsh to reflect breeding pair population counts (Table 1, Table 2; Appendix A). Breeding pair abundance declined between 2022 and 2023, reaching the lowest recorded abundance since 2008 with 266 breeding pairs (Zembal and Hoffman 2022, p.10; Zembel and Hoffman 2023, p.11). However, the most recent 2024 counts have resulted in an increase in breeding pairs by 55 percent from 2023 with 413 pairs (Table 1) (Zembal *et al*. 2024, p.11). This was largely due to high counts in 13 of the 25 marshes, particularly in the Tijuana Slough National Wildlife Refuge, San Elijo Lagoon, and San Dieguito Lagoon. To compare to when the rail was listed, the U.S. population has since maintained levels above the 200 breeding pairs estimated in 1970.

Occurrence status of marshes occupied by the light-footed Ridgway's rail is defined by frequency and reliability of bird detection. Extant occurrences are those with multiple reliable and consistent detections. Sites presumed to be extant also have detections, but detections are unreliable. Sites that are possibly extirpated have not had consistent sightings over the past 15 years or habitat is no longer suitable for light-footed Ridgway's rails. Since the past 5-year review, there have been three changes in occurrence status. The Dairymart ponds are now considered possibly extirpated rather than presumed extant because rails have not been detected at this location since 2007 (Figure 2; Table 2; Appendix A). The marsh at San Joaquin Reserve and San Luis Rey River have had a status change from presumed extant to extant (Table 2), as there have been more reliable detections observed within the past 5 years of surveying (Appendix A). Nine fewer marshes were surveyed within the past 5 years but are still possibly extirpated based on their 2020 occurrence status (Appendix A). Occurrences described as "Unknown" in Table 2 are marshes that have not been surveyed within the past 10 years and the status remains unknown.

During the 2025 breeding season, habitat within the San Elijo Lagoon experienced excessive flooding resulting in a significant decrease of available rail habitat. The impact on the breeding

pairs in this area are currently unknown, though rails may have been subjected to lower food availability and could have experienced higher rates of predation (Zembal 2023, pers. comm.). More detailed results on the species response from this loss of habitat are likely to emerge as habitat recovers and surveys continue over the next 5 years.

Table 1. Counts of light-footed Ridgway's rail pairs detected by annual censuses from 2019 to 2024 that exhibited breeding behavior in California.[1]

County	2019	2020	2021	2022	2023	2024
Santa Barbara	0	0	0	0	0	0
Ventura	9	10	5	4	4	8
Los Angeles	0	0	0	0	0	0
Orange	105	78	84	55	50	53
San Diego	194	274	304	261	212	352
Total Number of Pairs Detected	**308**	**362**	**393**	**320**	**266**	**413**

[1] Zembal and Hoffman 2022, p. 10; Zembal and Hoffman 2023, p. 11; Zembal *et al*. 2024, p. 11.

Since 1988, the Service, the California Department of Fish and Wildlife, the Living Coast Discovery Center, the San Diego Zoo Wildlife Alliance, and SeaWorld San Diego have partnered to run a captive breeding program for light-footed Ridgway's rails. As of 2024, a total of 157 light-footed Ridgway's rails have been released across southern California marshes since the 2020 5-year review (Hamilton 2025, pers. comm). The number of released individuals are recorded by year and location but are not included in the final yearly totals. However, captive-reared and released light-footed Ridgway's rails may have been counted during surveys following their releases.

Table 2. Totals of each occurrence status of light-footed Ridgway's rail marsh habitat and total number of breeding pairs detected during 2019 and 2024.[1]

Occurrence Status	2019	2024
Extant	15	17
Presumed Extant	5	3
Possibly Extirpated	16	17
Unknown	7	6
Total Number of Pairs	**308**	**413**

[1] See Appendix A and Figure 2 For Locations.

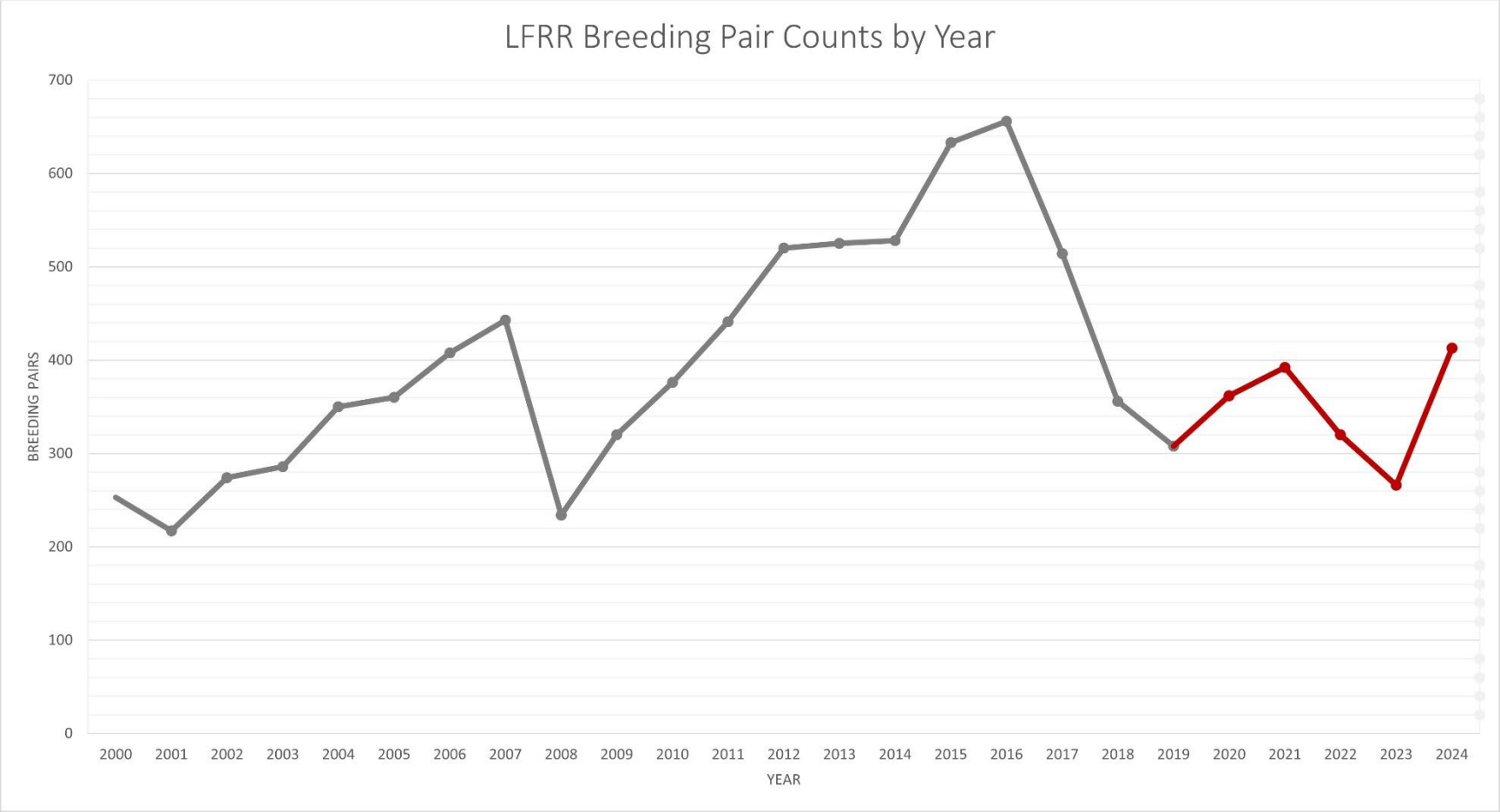

Figure 1. Number of light-footed Ridgway's rail pairs exhibiting breeding behavior in California as detected by annual censuses conducted from 1980–2024.[1,2]

[1] Zembal and Hoffman 2022, p. 10; Zembal and Hoffman 2023, p.11; Zembal *et al*. 2024, p. 11.
[2] New data since 2019, which was used for the 2020 5-Year Review, are in red.

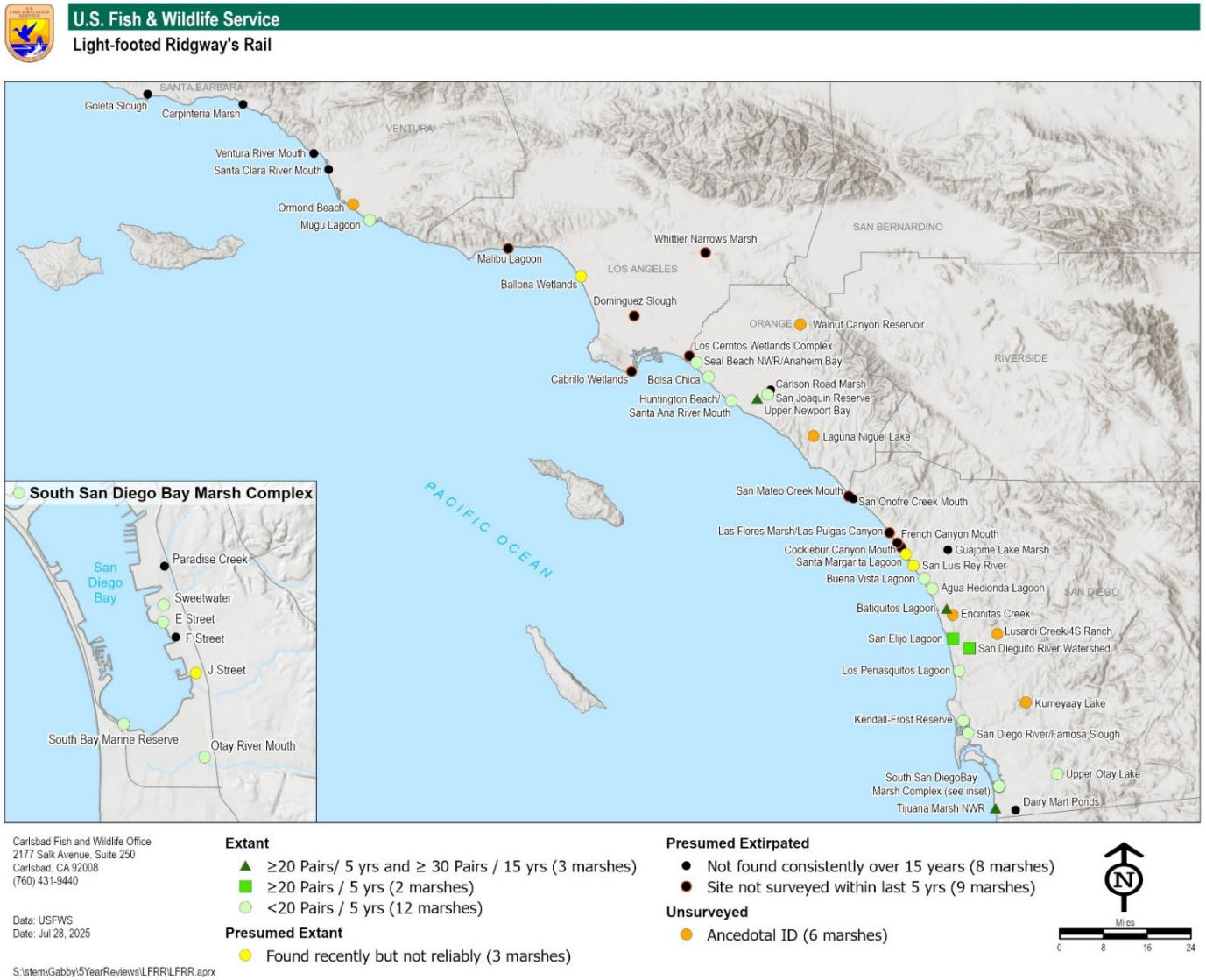

Figure 2. Locations and number of breeding pairs of light-footed Ridgway's rails reported from California surveys, 1980–2024.

Populations in Mexico

Historically, a large population of light-footed Ridgway's rails resided in marshes in Mexico. The survival of these populations contributes greatly to the survival of the species as a whole. Until recently, the Mexico subpopulation has been poorly documented, with the largest survey counts conducted from 1986-1988 (Service 2024b, p.12). Efforts were focused on two general areas, Estero Punta Banda and Bahía de San Quintín in Baja California, Mexico (Figure 3). In 1981, four observers surveyed roughly 25 percent of the suitable habitat at Estero Punta Banda and documented 68 breeding pairs. At Bahía de San Quintín, about 33 percent of the habitat was surveyed, resulting in the detection of 107 pairs. Because the same areas were not surveyed during each of the four visits, the counts are not directly comparable. However, the highest counts for both wetland complexes were recorded in 1987 (González Bernal 2009, pp. 12–37).

Since the 2020 5-year review, surveys were repeated in Estero Punta Banda and San Quintín Bay (Moreno Higareda 2025, per comm.). Routes in each marsh were selected from previous studies: González-Guzmán (2007) at the Estero Punta Banda and González Bernal (2009) at San Quintín Bay. They reported 14 occupied marshes with documented pairs in the Bahia San Quintín and 9 occupied marshes in Estero Punta Banda (Appendix B). In 2022, counts were determined using the draft light-footed Ridgway's rail monitoring protocol (Conway 2021, pp. 2–11) and in 2023 and 2024 using an adapted methodology from Richard Zembal (Moreno Higareda 2025, pers. comm.) (Appendix B). Due to varying techniques and low amount of annual data, it is difficult to ascertain trends in populations for these marshes, though a continuation in this effort is important to understand the status of the subspecies throughout its entire range.

Movement

In the 2020 5-year review, we acknowledged the potential of long-term movement in light-footed Ridgway's rails, which were previously thought to stay within a small territorial home range (Zembal *et al*. 1989, p. 41). The longest recorded distance of movement was recorded in 2009, when a captive-raised female travelled 258 kilometers (km) [160 miles (mi)] from the release site back to the facility where the bird was hatched and reared (Zembal *et al*. 2017, p. 36).

A more recent study assessed the movement, dispersal, and survival of wild and captive-reared light-footed Ridgway's rails using satellite transmitters (Sawyer *et al*. 2022, entire). Between 2020 and 2022, repeated releases of captive-reared and wild-caught juvenile light-footed Ridgway's rails were conducted at Tijuana Slough National Wildlife Refuge, San Elijo Lagoon Ecological Reserve and Nature Center, and Batiquitos Lagoon Ecological Reserve. Dispersal distances ranged from less than 0.5 km (0.3 mi) to a maximum of 1.5 km (0.9 m), with most individuals, regardless of origin, remaining close to their release sites. While a few captive-reared rails exhibited short-distance exploratory movement, the overall pattern supports limited dispersal following release. Overall, rails in this study moved only short distances in comparison to the 258-km (160 mi) record in 2009, or the more recent 161-km (100 mi) distance moved by one captive-raised male released in 2015 (Zembal *et al*. 2017, p. 37; Sawyer 2020, pp. 2–5).

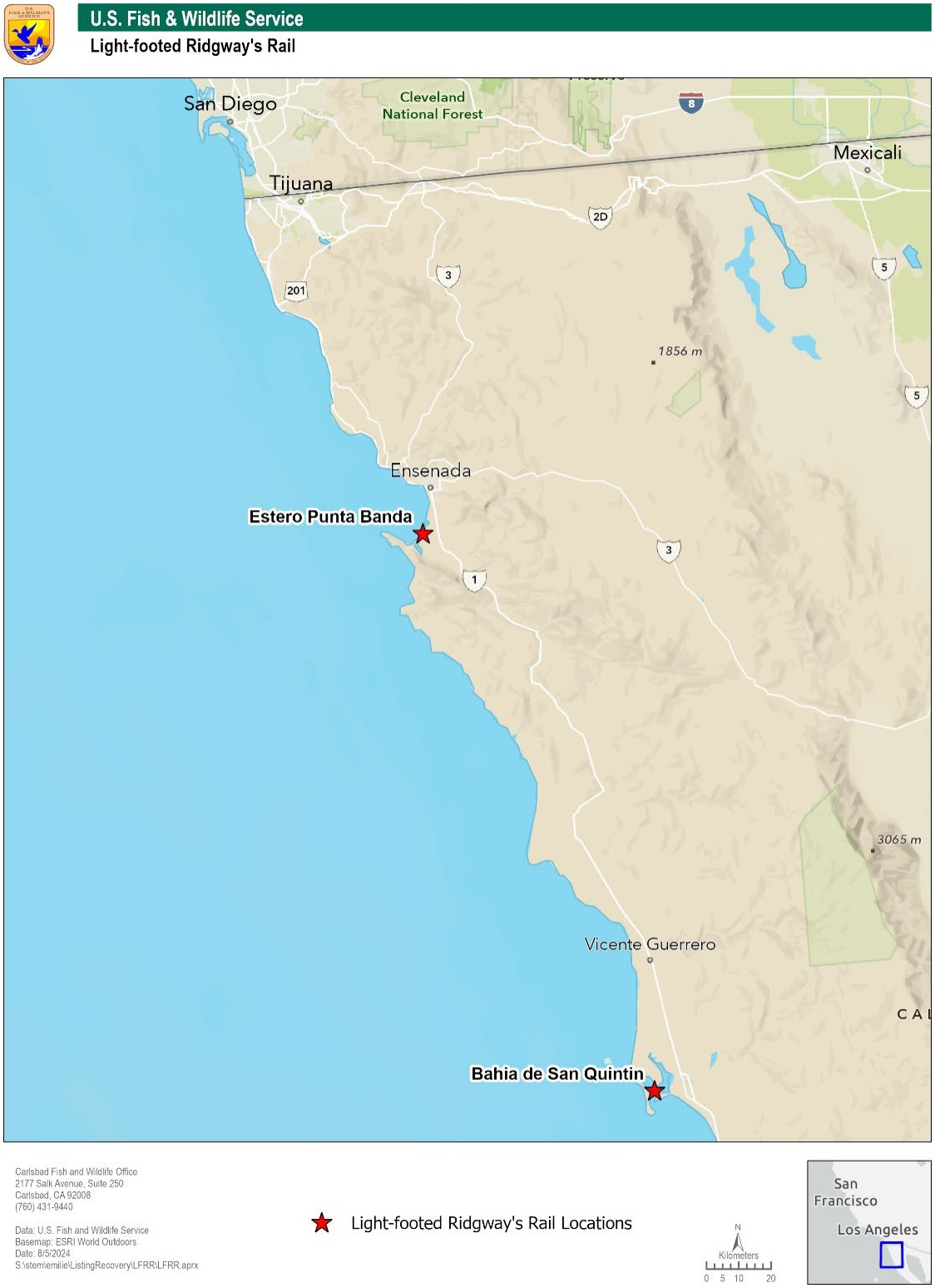

Figure 3. Light-footed Ridgway's Rail survey locations in Baja California, Mexico.

A closely related subspecies of Ridgway's rail, Yuma Ridgway's Rail (*Rallus obsoletus yumanensis*), was recently found to seasonally migrate long distances between the United States and Mexico (Harrity and Conway 2020, entire). From 2017 to 2019, 89 Yuma Ridgway's rails were tracked via satellite transmitters. Excluding rails that disappeared or died, the average distance of fall migration observed during this study was 619 km (Harrity and Conway 2020, p. 304). This new information regarding Yuma Ridgway's rail long-distance migration and use of a variety of habitats ranging from freshwater marshes to desert arroyos to coastal wetlands (Harrity and Conway 2020, p. 310), may indicate a need for further research on the movement patterns of light-footed Ridgway's rails. Although light-footed Ridgway's rail movement recorded during the 2020–2022 movement study (Sawyer *et al*. 2022, entire) was close-ranged, the lack of long-term monitoring due to early mortality or limited sample sizes should be considered when assessing the current available information on light-footed Ridgway's rail movement.

Genetics to Inform Captive Release

A decline in genetic heterozygosity, having two different versions (alleles) of a gene at a specific location, within a population may lead to a decrease in fitness (Reed and Frankham 2003, pp. 233–234). Genetic monitoring for the light-footed Ridgway's rail, among wild and captive populations, has been lacking since the beginning of the captive breeding and release program in 1988. Since the 2020 status review, a study was conducted by USGS to gain a better understanding of genetic structure and diversity in wild populations to reflect augmentation through the captive breeding program. Blood samples were taken from individuals across 17 marshes within Southern California from 2020 to 2022 (Vandergast *et al*. 2025, p. 4).

The study found three major genetic clusters throughout the range of the light-footed Ridgway's rail: (1) Orange County (including Mugu Lagoon), (2) North San Diego County, and (3) South San Diego County. North San Diego County had the highest genetic diversity, with the Orange County cluster having the lowest genetic diversity and in need of genetic rescue. The current pool of captive breeders had lower genetic diversity than all wild genetic clusters, besides Mugu Lagoon which faces issues from consistently low population counts. Low genetic diversity in the captive breeders could reflect the sourcing of breeding birds consistently from one low diversity wetland in Orange County (Newport Bay), and that inter-relatedness among some breeding pairs was higher than the average in most wild populations. Though they were able to rank genetic diversity among these clusters, overall genetic clusters exhibited relatively high gene flow rates, varying between 4 percent and 24 percent, likely influenced by the presence of captive bred and released birds.

Based on these results, integrating individuals from the North San Diego genetic cluster into the breeding program may result in a positive impact to increase genetic diversity within wild populations. This may have an even larger impact on populations with lower genetic diversity, such as those at Mugu Lagoon and all Orange County wetlands.

Survival for Captive Releases

To ensure success of a captive breeding and translocation program, best practices must be understood to ensure highest survival rates after release. Since the 2020 review, a study was conducted to track survival rates of light-footed Ridgway's rails at three San Diego wetlands: Tijuana Slough National Wildlife Refuge, Batiquitos Lagoon Ecological Reserve, and San Elijo Lagoon Ecological Reserve (Sawyer and Conway 2025, entire). These locations were chosen based on their large rail populations and availability of unoccupied habitat to support additional pairs (Sawyer and Conway 2025, p. 2). Satellite transmitters were attached to 46 captive released juveniles and 42 wild caught juveniles between June and December of 2020–2022 to detect mortality and track survival of rails. Within 72 hours of mortality detection, deceased birds were collected, and cause of death was determined (Sawyer and Conway 2025, p. 3).

Over the course of the study, they found that survival probability of captive rails was influenced by (1) time since release and (2) the time of year rails were released. Daily survival probability of captive released rails were consistently lower than that of wild-caught rails, but steadily increased with time since release, matching wild-caught rail survival after approximately 100 days post release (Sawyer and Conway 2025, pp. 5–6). Additionally, survival probability was influenced by the time of year rails were released, with individuals released in early summer (June to July) exhibiting higher survival than those release in later summer (September to December). Individuals released in the later part of the year may face difficulties in adapting to lower cover availability, coupled with higher water levels and an increase in predator populations. Therefore, efforts should be made to conduct releases earlier in the summer (June to July) to maximize initial survival and allow the juveniles time to modify their behaviors to suit their new environment (Sawyer and Conway 2025, pp. 6–8).

Survey Methods

A variety of monitoring techniques may be necessary to gain better insight on the distribution of light-footed Ridgway's rail. A recent study found that environmental DNA (eDNA) can be used to effectively detect the presence of Ridgway's rail (*Rallus obsoletus*) (Guan *et al*. 2022, entire). This method exhibited high sensitivity, resulting in accurate detection even when environmental samples contained low concentrations of Ridgway's rail DNA (Guan *et al*. 2022, p. 9). Using this method, the distribution and presence of Ridgway's rail can be assessed without the need for visual or auditory confirmation. Instead, environmental samples from suspected rail habitat, such as marsh water, can be screened for targeted DNA to determine presence of the species. The authors caution that the genetically similar Clapper (*Rallus crepitans*) and King rail (*Rallus elegans*) could be mistakenly identified as Ridgway's rail, but this is unlikely to impact the utility of eDNA as a survey tool because the species ranges do not overlap (Guan *et al*. 2022, p. 6).

Though census data for the rail has been collected since the 1980s, monitoring methods have not allowed for range-wide abundance estimates. Since 2020, a range-wide sampling framework was developed for monitoring to inform a population assessment using a more rigorous statistical sampling regime with species recovery goals in mind (Stevens *et al*. 2024). This protocol uses standardized methods and sampling units with the goal of large-scale estimations that could be

used for species recovery planning. Future implementation of this new protocol is anticipated to provide a replicable process for building customized and statistically defensible sampling frameworks to assess the recovery of the species.

THREATS

The final listing rule for the light-footed Ridgway's rail, which predated the Endangered Species Act of 1973, did not describe threats to the rail or its habitat (Service 1969, entire). Information in the final revised recovery plan (Service 1985, p. 77), the 2009 5-year review (Service 2009, p. 16), and the 2018 Species Report (Service 2018, p. 15) for light-footed Ridgway's rail was synthesized to inform a five-factor analysis of threats in the 2020 5-year review where reduced habitat quality, effects associated with small population sizes, and unnaturally high levels of predation were described as the predominant factors limiting light-footed Ridgway's rail abundance; additionally, hydrological changes and the effects of climate change and seal level rise threaten the persistence of this subspecies into the future. (Service 2020, p. 34).

Lack of appropriate marsh habitat continues to be a widespread limiting factor for rail populations (Service 2020, p. 28). Fragmentation and degradation of suitable rail habitat leaves populations especially vulnerable to catastrophic events, resulting in extirpation and a lower likelihood of recolonization (Service 2009, p.16).

Depredation is another threat acknowledged in past literature, with known predators of the light-footed Ridgway's rail including raptors, feral cats (*Felis catus*), nonnative foxes (*Vulpes vulpes*), and raccoons *(Procyon lotor*) (Soulé *et al*. 1988, p. 84). Decreased cover of cordgrass or pickleweed limits sites of refuge for light-footed Ridgway's rails, which leaves both adult birds and their nests exposed to predators. Urbanization exacerbates depredation of rails not only by diminishing habitat cover for rails, but through the creation of productive habitat for human-adapted predators (e.g., feral cats) in areas that interface marshland (Overton and Wood 2015, p. 6).

Since the 2020 5-year review, no new threats have been identified. The threats described in the 2020 5-year review are still applicable, as there have been no major changes to the impacts of habitat quality, small population size, and high levels of predation on the light-footed Ridgway's rail. However, new information has become available about the potential effects of climate change on rail habitat. We summarize this new information below.

Climate Change

In our 2020 5-year review, we noted the potential impacts of climate change, such as hydrological shifts and sea level rise, on light-footed Ridgway's rail habitat. Tidal influence in southern California threatens to drown the already limited cordgrass and pickleweed habitat that rails depend on. In many areas, the existing barrier of urban development leaves little space for marsh habitat to expand inland when facing sea level rise or flooding events, resulting in the phenomenon known as coastal squeeze. New climate change studies have provided updated projections on the future of southern California salt marshes. Other potential influences of

habitat limitation and degradation relating to climate change events (precipitation and sea level rise) are discussed below.

Precipitation

A recent dissertation aimed to identify the broader impacts of climate change on light-footed Ridgway's rail habitat based on the relationship between rail populations and external environmental factors (Taylor 2019, entire). More intense and frequent storms are projected to increase in the future that may affect long term persistence of light-footed Ridgway's rail populations (Taylor 2019, p. 142). The increase in precipitation can lower soil salinity and increase soil moisture, creating conditions that are optimal for *Spartina foliosa* germination (Taylor 2019, p. 142). However, flooding from the watershed has the potential to drown valuable habitat, which can have an immediate negative impact on the light-footed Ridgway's rail. The response of light-footed Ridgway's rail to catastrophic events should be considered when weighing the tradeoffs of high precipitation events. Resiliency to drastic changes in precipitation or sea level heavily depends on the marsh's sediment accretion rate, and the population's access to upland marsh habitat for refuge (Taylor 2019, p. 132). Physical processes modelled in Newport Bay, California, indicated that sediment deposition was mostly caused by episodic storm events. In this model, significant deposition occurred in marsh regions closest to fluvial sediment sources, and erosion in regions further away (Brand *et al*. 2022, p. 16). Although deposition from large-scale storm events may result in immediate increased marsh elevation, the variation in topography from storm events in the model resulted in a final prediction of marsh elevation loss at Newport Bay by 2100 under both low and high rates of sea level rise (Brand *et al*. 2022, p. 15).

Sea level rise

Projections of suitable Ridgway's rail habitat following three sea level rise scenarios were modeled using *MaxEnt* software (Rosencranz *et al*. 2018, p. 1212). Changes in breeding season habitat suitability within southern California was determined by comparing accretion rates to sea level rise scenarios, then applying these projections to known light-footed Ridgway's rail marsh habitat (Rosencranz *et al*. 2018, p. 1214). Sediment supply, accretion, and vegetative colonization were identified as the main drivers for a marsh's ability to withstand sea level rise (Stralberg *et al*. 2011, p. 2; Veloz *et al*. 2013, p. 19). Under high sea level rise scenarios, it was projected that 83 percent of light-footed Ridgway's rail suitable habitat would be lost by 2100. Under moderate sea level rise scenarios, marshes were predicted to initially increase in suitability, then decline due to submergence (Rosencranz *et al*. 2018, p. 1214). The study's findings are consistent with other models projecting sea level rise impacts on marsh habitat, supporting the idea that high sea level rise and low sediment accretion may result in local extirpation of rails due to loss of habitat through habitat drowning (Veloz *et al*. 2013, p. 17).

Since the last 5-year review, an experiment using sediment augmentation as a short-term solution to habitat submersion was successful, indicating that the technique may be useful for mitigating sea level rise in light-footed Ridgway's rail habitat. Risks associated with augmentation include the possibility of sediment dispersal off the targeted site, effects of construction on turbidity, and the unknown impacts storm activity would have on the modified site (Thorne *et al*. 2019, p. 2). To evaluate these concerns, 12,901 cubic meters of dredge material was applied across 4 hectares

(9.9 acres) of marsh at Seal Beach National Wildlife Refuge, a site with known light-footed Ridgway's rail occurrences. The thin-layer augmentation successfully increased marsh elevation and no movement of dredge material into the bay or estuary was observed outside of the applied area (Thorne *et al*. 2019, p. 11). Although long term success has not been evaluated, application of sediment into marsh habitat at localized areas may alleviate the pressure of sea level rise by providing upper marsh refuge and extending habitat for light-footed Ridgway's rails.

Supplementation of artificial habitat may help to mitigate some of the impacts of habitat degradation. Artificial nesting platforms (rafts) within marshes provide safe refugia during high tide events. Raft availability may become increasingly important as sea levels continue to rise and drown habitats circumscribed by urbanization. Therefore, continued use, maintenance, and improvements of rafts are likely to be important for rails as protection from the deleterious effects of tides and predators. However, since the 2020 5-year review further research has been done that shows raccoons, which are common in urban environments, also are able to use rafts (Burton 2025, entire). Strategic placement, in areas where raccoons are less likely to access the rafts such as in dense cordgrass, may be an important factor in their usage (Burton 2025, p. 38-39). Additional predator management to control raccoon populations may be needed where forms of artificial habitat are being utilized.

Summary of Threats

Since the 2020 5-year review, no new threats to the light-footed Ridgway's rail have been identified. However, new information has become available about climate change projections and their potential effects to light-footed Ridgway's rail habitat. Updated projections of precipitation and sea level rise suggest that degradation or loss of valuable marsh habitat is projected to occur within the century. The potential impacts of climate change should continue to be an important consideration in habitat management and protection plans.

Current threats to the light-footed Ridgway's rail, including reduced habitat quality, effects associated with small, fragmented population sizes, and unnaturally high levels of predation have not changed from the previous 5-year review. The new information described above for climate change (precipitation and sea level rise) does not alter the conclusions of our 5-factor analysis of threats in the 2020 5-year review.

RECOVERY

Recovery plans provide guidance to the Service, States, and other partners and interested parties on ways to minimize threats to listed species, and on criteria that may be used to determine when recovery goals are achieved. Recovery criteria in these plans serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened or delisted when protection under the Act is no longer necessary.

As described in the 2020 Status review, the light-footed Ridgway's rail has not met the criteria for downlisting or delisting indicating that the threats facing the subspecies have not been sufficiently reduced. Current estimates of suitable habitat, number of pairs, and occupied marshes are insufficient to ensure appropriate resiliency of the subspecies. The rail continues to remain absent from parts of its historical range (Santa Barbara and Los Angeles Counties) and

occupies fewer marshes than is needed to provide sufficient protection from catastrophic events and the adaptive capacity to ensure viability of the subspecies long term. Lastly, the status and distribution of the rail in Baja California, Mexico remains largely unknown, though progress is being made to increase our knowledge.

CONCLUSION

Prior to the Endangered Species Act, what is now the light-footed Ridgway's rail was classified as endangered under the 1969 Federal Register notice (Service 1969, p. 5034). On June 27, 1971, the light-footed Ridgway's rail was also listed as endangered by the State of California under the California Endangered Species Act (CDFW 2019, p. 16).

Since the previous 5-year review, we have received new information describing the movement of light-footed Ridgway's rail, analysis of preferred habitat, and projections of climate change impacts on southern California marshes. We also received updates on monitoring and reintroduction efforts and have described changes in population abundance and occurrences from the 2020 5-year review. In 2024, 413 light-footed Ridgway's rail breeding pairs were observed across 19 southern California marshes. This count is likely to contain translocated birds as a total of 157 light-footed Ridgway's rails from ongoing captive breeding programs have been released since 2020.

The previously listed threats of depredation, urbanization, and marsh fragmentation continue to affect the populations of light-footed Ridgway's rail and their habitat. Based on updated projections of sea level rise and precipitation, the potential of habitat degradation or loss resulting from climate change over the next century should be considered when assessing urgency of conservation efforts.

New studies since the 2020 5-year review reinforce previously known characteristics of light-footed Ridgway's rail, such as their limited movement beyond selected marsh territories. However, the discovery of migration patterns in the closely related Yuma Ridgway's rail may call for further exploration and long-term monitoring of light-footed Ridgway's rail movement. Light-footed Ridgway's rail habitat preferences, specifically elevation and vegetation type, have also been studied in recent years. The study's identification of environmental factors associated with preferred nesting or territorial habitat may be useful for conservation planning and habitat restoration efforts.

The new information summarized in this review does not substantially alter the species' status or the results of our five-factor analysis in the 2020 5-year review. Therefore, we conclude that the light-footed Ridgway's rail remains a federally endangered species and recommend no change in listing status.

RECOMMENDATIONS FOR FUTURE ACTIONS

The recommended actions listed below are to be continued or initiated over the next 5–10 years. We recognize that conservation of the light-footed Ridgway's rail will require continued cooperation and coordination with partners to minimize impacts from current threats and aid future conservation efforts:

1. Continue annual surveys of light-footed Ridgway's rail across southern California. Implement the standard survey protocol for monitoring light-footed Ridgway's rail.

2. Continue to implement the captive rearing program for the light-footed Ridgway's rail to expand the current distribution. Implement best practices for captive rearing and continue to monitor and improve captive-release survivorship.

3. Enhance the genetic diversity of light-footed Ridgway's rail populations, particularly in Orange and Ventura County marshes, by sourcing captive breeding pairs from populations with higher genetic diversity in the North San Diego genetic cluster.

4. Continue monitoring potential impacts of climate change scenarios on light-footed Ridgway's rail habitat.

5. Work with partners to monitor and conserve light-footed Ridgway's rail in Baja California, Mexico. Conduct genetic studies of these populations to determine the possibility to integrate their genetics in the current captive breeding program.

6. Work with partners to continue conservation and management of known habitat in southern California.

7. Initiate long-term research on movement and dispersal capabilities of the light-footed Ridgway's rail.

8. Identify possible environmental factors contributing to population fluctuations of light-footed Ridgway's rail.

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FIELD OFFICE APPROVAL

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Appendices

APPENDIX A

Annual monitoring for light-footed Ridgway's rail has occurred at 25 southern California coastal wetlands since the last 5-year review. This appendix details counts of light-footed Ridgeway rails in recent years in the United States. Occurrence status of marshes occupied is defined by frequency and reliability of bird detection. Extant occurrences are those with multiple reliable and consistent detections. The following table summarizes recent occurrences and is organized by the county; status at the time of the last 5-year review in 2019 (extant, presumed extant, possibly extirpated); its current status; and summary of the status between 2019 and 2024 in each marsh by name.

Table A-1. Light-footed Ridgway's rail occurrence table from 2019 to 2024.[1]

County	Marsh Name	2019	2020	2021	2022	2023	2024	2019 status	2024 status	2019–2024 Summary
Santa Barbara	**Goleta Slough**	0	-	-	0	-	-	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
Santa Barbara	**Carpinteria Marsh**	0	0	0	0	0	0	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
Ventura	**Ventura River Mouth**	0	0	0	0	-	-	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
Ventura	**Santa Clara River Mouth**	0	0	0	0	-	-	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
Ventura	**Ormond Beach**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
Ventura	**Mugu Lagoon**	9	10	5	4	4	8	Extant	Extant	<20/5 yrs
Los Angeles	**Malibu Lagoon**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
Los Angeles	**Whittier Narrows Marsh**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
Los Angeles	**Ballona Wetlands**	0	0	0	0	0	-	Presumed Extant	Presumed Extant	No Pairs Detected
Los Angeles	**Dominguez Slough**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed

County	Marsh Name	2019	2020	2021	2022	2023	2024	2019 status	2024 status	2019–2024 Summary
Los Angeles	**Cabrillo Wetlands**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
LA & Orange	**Los Cerritos Wetlands**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
Orange	**Seal Beach NWR**	26	13	9*	3	2	7	Extant	Extant	<20/5 yrs
Orange	**Bolsa Chica**	8	5	9	2	1	4	Extant	Extant	<20/5 yrs
Orange	**Walnut Creek Reservoir**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
Orange	**Carlson Road Marsh**	0	0	0	0	0	0	Possibly Extirpated	Possibly Extirpated	No detected pairs
Orange	**San Joaquin Reserve**	0	1	0	3	8	8	Presumed Extant	Extant	<20/5 yrs
Orange	**Upper Newport Bay**	63	53	59	44	36	32	Extant	Extant	≥20/5 yrs
Orange	**Huntington Beach Wetlands**	8	6	7*	3	3	2	Extant	Extant	<20/5 yrs
Orange	**Laguna Niguel**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
San Diego	**San Mateo Creek Mouth**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
San Diego	**San Onofre Creek Mouth**	0	0	0	-	-	-	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
San Diego	**Las Flores Marsh**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
San Diego	**French Canyon Mouth**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed
San Diego	**Cocklebur Canyon Mouth**	-	-	-	-	-	-	Possibly Extirpated	Possibly Extirpated	Site Not Surveyed

County	Marsh Name	2019	2020	2021	2022	2023	2024	2019 status	2024 status	2019–2024 Summary
San Diego	**Guajome Lake Marsh**	0	0	0	0	0	0	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
San Diego	**Santa Margarita Lagoon**	2	-	1	2	-	-	Presumed Extant	Presumed Extant	<20/5 yrs
San Diego	**San Luis Rey River**	0	-	0*	0	0	1	Presumed Extant	Extant	<20/5 yrs
San Diego	**Buena Vista Lagoon**	10	10	13*	12*	11	14	Extant	Extant	<20/5 yrs
San Diego	**Agua Hedionda Lagoon**	7	5	7	5	6	5	Extant	Extant	<20/5 yrs
San Diego	**Batiquitos Lagoon**	32	35	40*	34	32	41	Extant	Extant	>20/5 yrs
San Diego	**Encinitas Creek**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
San Diego	**Lusardi Creek/4S Ranch**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
San Diego	**San Elijo Lagoon**	46	42	78*	49*	41	75	Extant	Extant	>20/5 yrs
San Diego	**San Dieguito River Watershed**	26	27	37*	45	20	52	Extant	Extant	>20/5 yrs
San Diego	**Los Peñasquitos Lagoon**	12	16	16*	16	10	23	Extant	Extant	<20/5 yrs
San Diego	**Kumeyaay Lake**	-	-	-	-	-	-	Unsurveyed	Unsurveyed	Site Not Surveyed
San Diego	**Kendall-Frost Reserve**	2	7	11*	6	10	10	Extant	Extant	<20/5 yrs
San Diego	**San Diego River**	19	25	13*	14	6	13	Extant	Extant	<20/5 yrs
San Diego	**Upper Otay Lake**	-	-	-	6	-	-	Unsurveyed	Presumed Extant	<20/5 yrs
San Diego	**South San Diego Bay Marsh Complex (survey point)**	11	13	10	7	6	10	Extant	Extant	<20/5 yrs

County	Marsh Name	2019	2020	2021	2022	2023	2024	2019 status	2024 status	2019–2024 Summary
San Diego	(Paradise Creek)	0	0	0	0	0	0	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
San Diego	(Sweetwater)	7	6	5	0	1	3	Extant	Extant	<20/5 yrs
San Diego	(E Street)	2	1	1	0	0	0	Extant	Extant	<20/5 yrs
San Diego	(F Street)	0	0	0	0	0	0	Possibly Extirpated	Possibly Extirpated	No Pairs Detected
San Diego	(J Street)	0	0	0	1	1	3	Presumed Extant	Presumed Extant	<20/5 yrs
San Diego	(Otay River Mouth)	1	5	4	6	2	2	Extant	Extant	<20/5 yrs
San Diego	(South Bay Marine Reserve)	1	1	0	0	2	2	Extant	Extant	<20/5 yrs
San Diego	**Tijuana Marsh NWR**	29	94	79*	73	70	108	Extant	Extant	≥30/15 yrs & ≥20/5 yrs
San Diego	**Dairymart Ponds**	-	0	-	0	0	0	Presumed Extant	Possibly Extirpated	No Pairs Detected
	Totals	**308**	**362**	**393**	**320**	**266**	**413**	**20 marshes occupied**	**20 marshes occupied**	

- Indicates that no census was taken.
* Indicates the detection of unpaired rails.
[1] Status of each marsh location.

APPENDIX B

There have been recent efforts to document light-footed Ridgway's rail occurrences in Mexico. Occupancy has been primarily reported in two general areas, Estero Punta Banda and Bahía de San Quintín in Baja California, Mexico. The following table summarizes recent occurrences and is organized by the complex, marsh name, and the pair counts for 2022, 2023, and 2024.

Table B-1. Light-footed Ridgway's rail occurrences between 2022–2024 in Bahia San Quintin and Estero de Punta Banda in Baja California, Mexico.[1]

Complex	Marsh Name	2022	2023	2024
Bahia San Quintin	Humedal de Punta Mazo	1	4	6
Bahia San Quintin	La Chorera	16	13	24
Bahia San Quintin	La Herradura	11	9	24
Bahia San Quintin	Chapala Sur	21	11	16
Bahia San Quintin	Chapala	6	2	3
Bahia San Quintin	Athene	10	15	34
Bahia San Quintin	San Lorenzo	2	-	-
Bahia San Quintin	Molino viejo	2	20	11
Bahia San Quintin	Panteon Ingles Norte	10	12	15
Bahia San Quintin	Panteon Ingles Sur	7	8	10
Bahia San Quintin	San Simon Norte	4	5	3
Bahia San Quintin	San Simon Sur	4	6	26
Bahia San Quintin	Cielito lindo soba	5	9	30
Bahia San Quintin	Punta Azufre	0	18	0
Estero de Punta Banda	Estero beach Hotel-Ostricola	12	15	50
Estero de Punta Banda	Greenhouse-Tony's Camp	28	34	80
Estero de Punta Banda	Arroyo San Carlos	43	48	86
Estero de Punta Banda	ICU Medical	14	18	29
Estero de Punta Banda	Arroyo Las Animas	30	50	85
Estero de Punta Banda	Ruta Jonathan	7	11	14
Estero de Punta Banda	La Grulla	17	26	48
Estero de Punta Banda	Dique	23	12	27
Estero de Punta Banda	Baja Cove Beah	5	5	24
Totals		**287**	**369**	**469**

"-" indicates that no census was taken.

[1] showing the complex name, marsh name.