Marsh Bird Monitoring, including Yuma Ridgway's Rail, along Las Vegas Wash, Clark County, Nevada, 2024

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LVWCC

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SOUTHERN NEVADA WATER AUTHORITY
Las Vegas Wash Project Coordination Team

Prepared for:

U.S. Fish and Wildlife Service
Southern Nevada Field Office

and

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ABSTRACT

The Las Vegas Wash Coordination Committee has been working to stabilize and enhance the Las Vegas Wash since 1998, with Southern Nevada Water Authority (SNWA) as the lead agency. U.S. Fish and Wildlife Service (USFWS) recommended conducting annual breeding surveys for the federally endangered Yuma Ridgway's rail (*Rallus obsoletus yumanensis*) during Endangered Species Act (ESA) informal section 7 consultation for the project. Permitted contractors performed the surveys through 2007. In 2006, USFWS established a protocol for the Yuma Ridgway's rail surveys that includes monitoring for other marsh bird species. SNWA initiated surveys using this protocol, targeting six species through call broadcast: black rail, Ridgway's rail, Virginia rail, sora, American bittern and least bittern. Detections of pied-billed grebe, common gallinule and American coot (referred to as non-target species) are also reported. In 2022, after staff had regularly detected Yuma Ridgway's rail for a few years, SNWA and the Bureau of Reclamation worked with USFWS on new ESA compliance. USFWS issued a biological opinion in December 2023, and annual surveys for the rail continue. In April–May 2024, field crews conducted three surveys of three routes comprising 16 points and detected five Yuma Ridgway's rails. Field personnel also identified Virginia rail, sora, least bittern and the three non-target species. This was the fourth consecutive year in which field staff detected five or more Yuma Ridgway's rails. Prior to 2021, no more than one Ridgway's rail had been confirmed in the project area in any given year. Additionally, detections were intermittent from 1998 to 2015, often with large gaps (7–9 years) between them; yet since 2015, field staff have reported the species in all but two years. Habitat quality along the routes was fair to good, and marsh bird monitoring should continue in the Wash study area.

ACKNOWLEDGMENTS

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Table of Contents

Page No.

Page No.

List of Tables

List of Figures

List of Appendices

1.0 BACKGROUND

1.1 Las Vegas Wash

The Las Vegas Wash (Wash) is the primary drainage channel for the Las Vegas Valley in Clark County, Nevada, USA. It carries highly treated wastewater, urban runoff, shallow groundwater, and storm runoff through the Clark County Wetlands Park (Wetlands Park) to Lake Mead at Las Vegas Bay (Figure 1). Although once an ephemeral stream, the Wash began supporting perennial flows in the 1950s when the discharge of treated wastewater into the channel was initiated. At first, these perennial flows created a lush wetland along the channel. However, the volume of flows in the Wash continued to increase with the increasing urban population, and erosion began to drain the wetlands and carry thousands of tons of sediment to Lake Mead. By the late 1990s, headcutting had deeply incised the channel and reduced the wetlands by approximately 90% from their peak extent, leaving less than 80 hectares.

Figure 1. General study area map for the Las Vegas Wash.

In 1998, the Las Vegas Wash Coordination Committee (LVWCC), a 28-member stakeholder group, was created to address the degradation of the Wash. The group developed and implemented the Las Vegas Wash Comprehensive Adaptive Management Plan (LVWCC 2000) to stabilize the Wash and restore its ecological functions. Stabilization and enhancement activities included the installation of 21 erosion control structures (weirs) and more than 245

hectares of revegetation to help deter further erosion and reduce the amount of sediment being deposited in Lake Mead. The capital improvements phase of the project was completed in June 2022, and activities continue under the direction of the Las Vegas Wash Long-Term Operating Plan (LTOP; LVWCC 2020).

As a result of Endangered Species Act (ESA) informal section 7 consultation between the U.S. Army Corps of Engineers and U.S. Fish and Wildlife Service (USFWS) on the proposed development of the Wetlands Park and erosion control structures, USFWS recommended annual surveys to determine the occurrence of the federally endangered Yuma Ridgway's rail (*Rallus obsoletus yumanensis*) in the project area. This species was known as the Yuma clapper rail (*R. longirostris yumanensis*) until it was reclassified by Chesser et al. (2014); for simplicity, all references below have been updated with the current species name.

Alcorn (1988) reported nine detections of Ridgway's rail in the Las Vegas Sewage disposal drainage ditch, the present-day City of Las Vegas Water Pollution Control Facility's discharge channel to the Wash at Desert Inn Road, approximately three kilometers upstream of the Wetlands Park, in September 1959. San Bernardino County Museum field personnel reported Yuma Ridgway's rail detections at the Wash in spring 1997 and 1998 (McKernan and Braden 2001); they heard two on May 1, 1997, and one on May 2, 1997, in a small cattail marsh on the Wash just upstream of Desert Inn Road (R. McKernan pers. comm.). SWCA Environmental Consultants (SWCA) field staff detected a Yuma Ridgway's rail along the Wash within the Wetlands Park on May 28 and June 18, 1998, in a wet, salt cedar-dominated area upstream of Pabco Road (Southwest Wetlands Consortium 1998; Figure 2).

Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC, contracted with permitted consultants for surveys in 2000–2004 and 2006–2007 (McKernan and Braden 2001; McKernan and Carter 2002; SWCA 2002, 2003, 2005, 2006, 2007, 2008). In 2006, USFWS established a new survey protocol for the Yuma Ridgway's rail based on Conway (2005) that enables compliance obligations to be met. In addition, the protocol provides information on other sensitive marsh obligates, such as the least bittern (*Botaurus exilis*) and black rail (*Laterallus jamaicensis*), which are covered under the Lower Colorado River Multi-Species Conservation Program. So, in 2007, the Las Vegas Wash Project Coordination Team (Wash Team; the implementation arm of the LVWCC) initiated a marsh bird monitoring study (Van Dooremolen 2010a, 2010b, 2012, 2013, 2014a, 2014b, 2015, 2017a, 2017b, 2018, 2019; Van Dooremolen et al. 2022, 2023, 2024). Yuma Ridgway's rail was added in 2008 when federal permitting was in place.

In 2019, USFWS determined the Wash project would have no effect on the Ridgway's rail, but annual surveys continued under the Las Vegas Wash Wildlife Management Plan (WMP; Shanahan et al. 2008). In 2022, after staff had regularly detected Yuma Ridgway's rail for a few years, SNWA and the Bureau of Reclamation (BOR) worked with USFWS on new ESA compliance for the LTOP. In December 2023, USFWS issued a biological opinion (BO) authorizing incidental take for the rail in the form of a habitat surrogate for stabilization facilities operations and maintenance. Annual surveys for the species are now conducted under the BO and the WMP. This report presents results from the 2024 monitoring season.

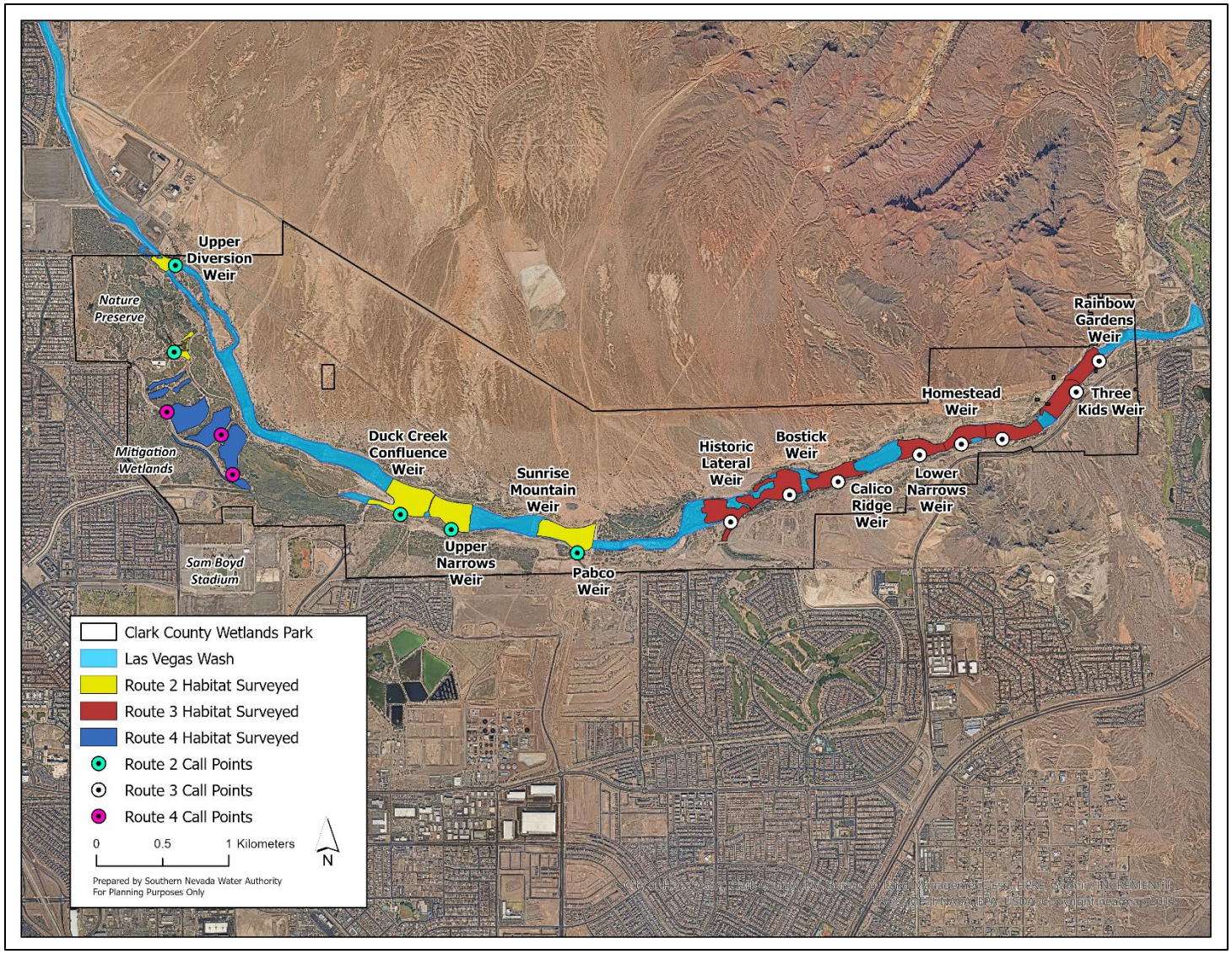

Figure 2. Marsh bird monitoring points and surveyed habitat by route. Locations of interest also shown.

1.2 Yuma Ridgway's Rail

The Yuma Ridgway's rail is a large brownish rail with long orange legs and a long, slightly decurved bill. The endangered Yuma subspecies is found primarily in the lower Colorado River watershed and the Salton Sea (Anderson and Ohmart 1985). While many are year-round residents, more than 35% of the individuals of several populations migrate (Harrity and Conway 2020).

The Yuma Ridgway's rail inhabits freshwater and brackish water wetlands (Anderson and Ohmart 1985). Home range size varies seasonally and is greatest during winter and post-breeding (Eddleman 1989; Conway et al. 1993). Eddleman (1989) reported an average annual home range size of more than 7 hectares, while Conway et al. (1993) estimated it at 12 hectares. Sites occupied by Yuma Ridgway's rail have greater shallow water coverage (Eddleman 1989). Density of emergent vegetation has also been reported as an important habitat variable, although findings differ. Anderson and Ohmart (1985) found that Yuma Ridgway's rail typically reached their highest numbers year-round in the densest stands of emergent vegetation, while Conway et al. (1993) found low stem densities to be an important component.

Species preferences also vary. Conway et al. (1993) found that cattail (*Typha domingensis*) and bulrush (*Schoenoplectus* spp.) are preferred; although, Yuma Ridgway's rails have also been detected in wetlands dominated by common reed (*Phragmites australis*), salt cedar (*Tamarix* spp.) and willow (*Salix* spp.; Eddleman 1989; Hinojosa-Huerta et al. 2001). Differences in preferred density and species of emergent vegetation among different geographic locations may relate to densities of crayfish, the most abundantly consumed prey item of the Yuma Ridgway's rail (Anderson and Ohmart 1985). Habitat use also changes throughout the year; thus, Conway et al. (1993) suggest that maintaining shallow, open water areas with stands of emergent vegetation at different successional stages would best support Ridgway's rails year-round.

Yuma Ridgway's rail nesting begins in March and peaks in mid-May on the lower Colorado River (Eddleman 1989). The rail has been documented nesting in stands of living bulrush and cattail over shallow water and in dense dead cattail (Eddleman 1989).

2.0 METHODS

2.1 Description of Survey Routes

The LVWCC has increased wetland habitat by planting bulrush in the impoundments and along the Wash's banks, and cattails and common reed volunteer from upstream sources. Clark County has also created emergent wetlands, in the constructed wetland ponds in the Wetlands Park Nature Preserve (Nature Preserve) and in the in-lieu fee mitigation wetlands (Mitigation Wetlands).

The Wash Team established three routes to survey this habitat (Routes 2–4; Route 1 was surveyed 2007–2010) and has surveyed the Wash and Nature Preserve since 2007 and the Mitigation Wetlands since 2010. To reduce effort and more closely approach the recommended point spacing of 400 meters, in 2021, staff decreased the total number of points surveyed to 16 (Figure 2). GPS coordinates for the points are included in Appendix A.

Route 2 covers 22.0 hectares of habitat with five points: four along the Wash and one in Vern's Pond at the Nature Preserve (Figure 2).

- Above Pabco Weir, one point monitors 6.6 hectares, including emergent habitat dominated by cattails and common reed in a small backwater created by the City of Henderson Water Reclamation Facility outfall channel. It also monitors an extensive area of open water and marsh between Sunrise Mountain and Pabco weirs.
- A point in the impoundment of the Upper Narrows Weir covers 5.8 hectares of habitat; California and Olney bulrush (*S. californicus* and *S. americanus*), cattails and common reed line the banks, and there is extensive open water.
- One point samples 7.0 hectares of habitat at the Duck Creek Confluence Weir and its impoundment. Common reed, cattails and some bulrush blanket the banks, and there are islands of cattails and common reed in the impoundment.
- From the bridge, the Upper Diversion Weir point covers the 1.5-hectare impoundment; the amount of open water versus cattails and common reed varies due to periodic vegetation clearing for weir maintenance.
- A point on Vern's Pond at the Nature Preserve surveys 1.1 hectares of habitat. The pond has areas of open water and dense vegetation composed of cattails, California and hardstem bulrush (*S. acutus*), common reed and a mix of native riparian species along the banks.

Route 3 has eight points covering approximately 34 hectares of banks and islands with varying amounts of cattails, common reed and bulrush, as well as riparian vegetation, along the Wash. The route (Figure 2) includes:

- The backwater wetland at the confluence of the C-1 Channel with the Wash and adjacent wetlands at the toe of Historic Lateral Weir (4.8 hectares).
- The impoundment of Bostick Weir (6.3 hectares).
- The impoundment of Calico Ridge Weir (4.3 hectares).
- The toe of Lower Narrows Weir (3.7 hectares).
- The impoundment of Homestead Weir (3.3 hectares).
- Habitat between Homestead and Three Kids weirs (4.2 hectares).
- Habitat at the toe of Three Kids Weir (4.1 hectares).
- The impoundment of Rainbow Gardens Weir (3.2 hectares).

Route 4 covers 14 hectares of habitat at the Mitigation Wetlands and has three points: one point on each of the three large cells (Cells D–F [formerly Cells 5–7]; Figure 2).

- Cell D (5.1 hectares) is densely vegetated with little to no open water.
- Cell E (4.2 hectares) is also densely vegetated, with a small area of deep open water.
- Cell F (4.7 hectares) has a large area of shallow open water with islands of emergents in addition to dense vegetation along its banks. Emergent vegetation in the three cells is dominated by cattails and phragmites with some bulrush.

- While no longer directly surveyed, the three small cells (2.2 hectares) to the northwest and the 7.2-hectare area flooded by Duck Creek to the southeast can still contribute to results given their proximity to the large cells and the distance calls travel at the site.

Most survey points are separated by at least 400 meters, but there are some that are closer together. Conway (2005, 2009) does allow for tighter spacing but warns of the risk of double-counting individuals.

2.2 Survey Protocol

Field staff performed surveys using a modified version of the North American marsh bird monitoring protocol developed by Conway (2005, 2009). One to two trained observers, including at least one of the following permitted individuals—Deborah Van Dooremolen, Nicholas Rice, Timothy Ricks—conducted one survey per route in each of the following three survey windows: April 1–14, April 15–30 and May 1–15. A field crew surveyed Routes 2 and 4 on one morning and then Route 3 on a second morning. Surveys began one half hour before sunrise and concluded by 9 a.m. Although Conway (2005, 2009) specifies that the survey route be run in the same direction every time, observers ran each route in reverse on the second survey to ensure that most points were surveyed during the earliest morning hours (the time of peak marsh bird vocalization). Staff stopped the survey if wind reached or exceeded 20 kilometers per hour, as measured by the Beaufort wind scale, for more than two points and redid the survey at a later date.

At each point, surveys began with a five-minute period of passive listening followed by broadcasting the vocalizations of each target species in succession to elicit a response. Target species for the Wash survey include black rail, Ridgway's rail, Virginia rail (*R. limicola*), sora (*Porzana carolina*), American bittern (*B. lentiginosus*) and least bittern. Using an iPhone with portable speakers, the field crew broadcast each species' vocalizations for 30 seconds, followed by 30 seconds of silence to listen for responses, for a total of one minute per species. Species' vocalizations were broadcast in succession from most sensitive (i.e., likely to be deterred from responding by hearing the call of another species) to least sensitive: black rail, least bittern, sora, Virginia rail, Ridgway's rail and American bittern.

Observers recorded all target species heard and/or seen during the survey, making a separate record for each bird and noting each minute of the survey period in which it was heard calling and/or seen. Individuals were also recorded if they were heard or seen at the point immediately before or after the survey. Field staff also recorded detections of three other marsh bird species that were not targeted through the broadcast: pied-billed grebe (*Podilymbus podiceps*), common gallinule (*Gallinula galeata*) and American coot (*Fulica americana*). Given the sheer number of coots present at some points, observers often counted them either before or after the survey. Other data collected include the call type heard, the distance and direction to each detected bird, and whether the bird was detected at a previous point. Observers also recorded the background noise level at each point. Noise designated as loud or intense meant that at least some species could not be heard beyond 50 or 25 meters, respectively.

When two trained observers conducted a survey together, they compared data after the survey was completed at each point to rectify any differences in detections.

2.3 Data Analysis

Detections of target and non-target species were summarized by route and date to provide an overall picture of when and where birds were detected. However, since multiple detections could be made of the same bird over the course of a survey season, the number of unique individuals (i.e., abundance) per species was also estimated. This number was calculated as the sum of the maximum number of birds of the species that were detected at each point during the season.

Whether or not a bird was counted as a unique individual was determined by the following criteria:

- If one or more individuals of a species were detected at the same point on more than one survey, then they were considered to be the same individual(s).
- If an individual had been detected at a previous point during a survey, then the second survey detection was not counted.
- If an individual was detected at a point within 200 meters of a location where an individual had been detected on a prior survey, and the individual was calling from the same direction, then it was considered to be the previously detected bird and was not counted as a new individual.

For each route, the total number of individuals detected of each species and the total number of individuals detected regardless of species were divided by the number of points the route contained, yielding a per point abundance for each. Then, for the study area as a whole, the total number of individuals detected of each species and the total number of individuals detected regardless of species were divided by the total number of points surveyed to yield the total abundance per point for each. Per point abundance provides for a more accurate comparison between routes and between years than the total abundance because the number of points surveyed has varied over time. However, with the exception of American coot, the number of individuals detected on each route is typically small enough that the loss or addition of just one or two individuals can have a noticeable impact on this metric.

Total and per point abundance data were compared with results from the last year in which data was collected and with an average of all 17 years of surveys (14 for the Mitigation Wetlands) to look for changes.

3.0 RESULTS AND DISCUSSION

3.1 Species

In 2024, field crews detected four of the six target species (Yuma Ridgway's rail, Virginia rail, sora and least bittern), as well as the three non-target species (Table 1). Sora was the most abundant of the target species with 18 individuals (1.1 per point; Table 2). American coot was the most abundant of all species with 381 birds (23.8 per point; Table 2). Detections were uneven across routes and surveys (Table 1).

It was another high-detection year for Yuma Ridgway's rail (Figure 3). Field crews identified five individuals during surveys. Until 2017, all detections were made during other work, typically on southwestern willow flycatcher surveys in May and June. The record for total

detections of seven individuals (five during surveys and two during other work) was set in 2022. Before 2021, no more than one Ridgway's rail had been confirmed in the Wetlands Park in any given year. Detections were intermittent from 1998 to 2015, with large gaps (7–9 years) between the first and second and the third and fourth (Figure 3). Since 2015, however, field staff have reported the species in all but two years.

Route	Date	YRRA	VIRA	SORA	LEBI	PBGR	COGA	AMCO	Total
2	4/2/2024	1	0	5	1	4	6	66	83
2	4/15/2024	1	0	1	0	0	3	35	40
2	5/6/2024	3	0	0	1	1	13	3	21
2 Total		**5**	**0**	**6**	**2**	**5**	**22**	**104**	**144**
3	4/3/2024	0	1	6	0	0	5	234	246
3	4/16/2024	1	1	6	2	1	8	137	156
3	5/7/2024	0	0	0	0	0	6	3	9
3 Total		**1**	**2**	**12**	**2**	**1**	**19**	**374**	**411**
4	4/2/2024	0	4	3	0	0	4	35	46
4	4/15/2024	1	1	4	0	0	0	2	8
4	5/6/2024	0	0	0	0	1	4	4	9
4 Total		**1**	**5**	**7**	**0**	**1**	**8**	**41**	**63**
Total		**7**	**7**	**25**	**4**	**7**	**49**	**519**	**618**

Table 1. Total 2024 Las Vegas Wash detections for each species by route and date. YRRA=Yuma Ridgway's rail, VIRA=Virginia rail, SORA=sora, LEBI=least bittern, PBGR=pied-billed grebe, COGA=common gallinule, AMCO=American coot.

Route	Year	Pts	YRRA	VIRA	SORA	LEBI	PBGR	COGA	AMCO	Total
2	2023	5	3 (0.6)	0 (0.0)	4 (0.8)	1 (0.2)	2 (0.4)	11 (2.2)	103 (20.6)	124 (24.8)
2	2024	5	3 (0.6)	0 (0.0)	6 (1.2)	1 (0.2)	4 (0.8)	13 (2.6)	68 (13.6)	95 (19.0)
2	**17Y AVG**	**7.9**	**0.5 (0.1)**	**1.0 (0.1)**	**5.9 (0.8)**	**2.8 (0.3)**	**3.6 (0.5)**	**13.5 (1.8)**	**88.6 (12.6)**	**115.9 (16.2)**
3	2023	8	1 (0.1)	2 (0.3)	8 (1.0)	0 (0.0)	3 (0.4)	8 (1.0)	457 (57.1)	479 (59.9)
3	2024	8	1 (0.1)	2 (0.3)	8 (1.0)	2 (0.3)	1 (0.1)	11 (1.4)	278 (34.8)	303 (37.9)
3	**17Y AVG**	**7.9**	**0.2 (0.0)**	**2.1 (0.3)**	**5.5 (0.7)**	**2.1 (0.3)**	**2.5 (0.3)**	**10.7 (1.4)**	**177.4 (22.1)**	**200.5 (25.0)**
4	2023	3	2 (0.7)	2 (0.7)	4 (1.3)	0 (0.0)	0 (0.0)	1 (0.3)	7 (2.3)	16 (5.3)
4	2024	3	1 (0.3)	4 (1.3)	4 (1.3)	0 (0.0)	1 (0.3)	6 (2.0)	35 (11.7)	51 (17.0)
4	**14Y AVG**	**6.9**	**0.6 (0.2)**	**4.6 (0.8)**	**9.0 (1.5)**	**1.7 (0.2)**	**2.3 (0.3)**	**6.1 (0.9)**	**30.9 (4.5)**	**55.5 (8.3)**
Total	2023	16	6 (0.4)	4 (0.3)	16 (1.0)	1 (0.1)	5 (0.3)	20 (1.3)	567 (35.4)	619 (38.7)
Total	2024	16	5 (0.3)	6 (0.4)	18 (1.1)	3 (0.2)	6 (0.4)	30 (1.9)	381 (23.8)	449 (28.1)
Total	**17Y AVG**	**23.2**	**1.2 (0.1)**	**7.6 (0.3)**	**20.0 (0.9)**	**6.5 (0.3)**	**8.1 (0.4)**	**29.4 (1.3)**	**293.7 (14.2)**	**366.7 (17.4)**

Table 2. Total and per point abundances for each species by route and overall for 2023 and 2024 with study averages. Overall averages include data from Route 1, which was surveyed 2007–2010. YRRA=Yuma Ridgway's rail, VIRA=Virginia rail, SORA=sora, LEBI=least bittern, PBGR=pied-billed grebe, COGA=common gallinule, AMCO=American coot.

Although least bittern abundance increased year over year, it was still low, with the most recent three-year period recording the lowest abundance for the species in the 17-year study (Table 2, Appendix B). Virginia rail and sora have been identified in all survey years, as have the three non-target species (Appendix B), although abundances have fluctuated. Still, sora has always been the most abundant of the target species, and American coot has always been the most abundant of all species identified (Appendix B). Field crews have never detected black rail and only rarely detected American bittern.

The abundances of most species increased from 2023 to 2024; Yuma Ridgway's rail decreased by one individual and American coot abundance decreased substantially (Table 2). Per point abundances were generally in line with or higher than long-term averages (Table 2, Appendix B).

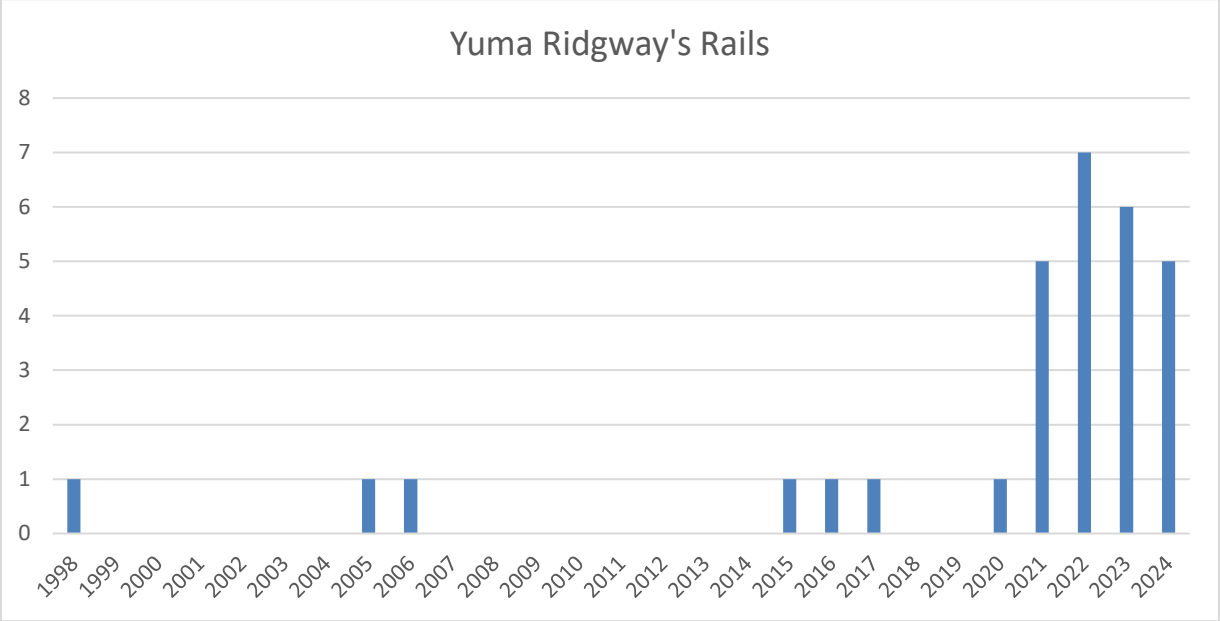

Figure 3. Number of Yuma Ridgway's rail individuals detected at the Las Vegas Wash since 1998.

3.2 Routes

3.2.1 Route 2

In 2024, field staff identified six species on this route (Tables 1 and 2). The route had the highest abundance of Yuma Ridgway's rail, with repeated detections of a kekking male upstream of Pabco Weir and the detection of a pair above Upper Narrows Weir. This was the third year with a territorial male in the Pabco impoundment and the fourth year with a territory in the Upper Narrows impoundment. Comparing 2024 species' abundances to 2023 and to the long-term averages, results were mixed (Table 2, Appendix B).

Habitat quality was fair to good. The habitat from just above Duck Creek Confluence Weir downstream to Upper Narrows Weir (Figure 2) is among the highest quality potentially suitable nesting habitat currently available for Yuma Ridgway's rail on the Wash channel.

3.2.2 Route 3

Field personnel identified seven species on this route (Tables 1 and 2). Least bittern was detected for the first time in several years, and the route had the highest abundance of the species (Table 2, Appendix B). Yuma Ridgway's rail abundance was the same year over year and above the study average. The results for other species varied (Table 2, Appendix B).

Habitat quality was fair to good. Habitat in the reach between Lower Narrows and Homestead weirs still appears to be the highest quality potentially suitable nesting habitat for Ridgway's rail on the route; the individual, however, was detected in the C-1 Channel near its confluence with the Wash.

3.2.3 Route 4

Field personnel detected six species on this route. Detections included one Yuma Ridgway's rail, a decrease from 2023 (Table 2). The route had the highest abundance of Virginia rail. Abundances of all species but Ridgway's rail were flat or up year over year, and only sora and least bittern per point abundances were below their long-term averages (Table 2, Appendix B).

The habitat quality at the Mitigation Wetlands continues to be good for the Yuma Ridgway's rail. Field staff noted that water levels appeared high in the three large cells and open water continued to be limited to non-existent in all but Cell F (formerly Cell 7).

4.0 RECOMMENDATIONS

Annual monitoring for Yuma Ridgway's rail should continue in support of the BO and WMP.

Additionally, in preparation for the move to long-term operations of facilities, SNWA engineers worked with a consulting firm to review the function of all stabilization structures. They found that vegetation on the weirs and in key areas around them negatively impacts the ability to carry 100-year flood flows. As a result, crews cleared more than 25 hectares of marsh and riparian vegetation from weir sites that will now need to be maintained (i.e., re-cleared) every 2–4 years. This process has and will impact habitat for marsh birds, including the Yuma Ridgway's rail. While biologists had been concerned that the clearing would be detrimental, the results have shown that it has the potential to benefit habitat values and site occupation. The site at Pabco Weir that yielded detections of an individual in 2022–2024 was cleared of degraded riparian habitat in 2020 and had converted to a passively established cattail-dominated wetland by 2022. Continued marsh bird monitoring at Wash sites will provide additional information on how clearing for weir maintenance impacts targeted species, particularly the Yuma Ridgway's rail.

5.0 CONCLUSION

The LVWCC completed the installation of 21 weirs and more than 245 hectares of native vegetation to stabilize and enhance the Wash, with SNWA as the lead agency. USFWS recommended annual breeding surveys for the federally endangered Yuma Ridgway's rail during informal section 7 consultation for the project. USFWS established a survey protocol that includes monitoring for other marsh bird species. This report presents 2024 monitoring results for six target species and three non-target species. Three surveys were conducted along three survey routes comprising 16 points in the study area. Field crews detected a high number of Yuma Ridgway's rail (n=5) and also identified Virginia rail, sora, least bittern and the three non-target species. Habitat quality on the routes was fair to good. Marsh bird monitoring should continue at the Wash in support of the BO and WMP.

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Appendix A

GPS Coordinates for 2024
Marsh Bird Monitoring Points

Route	Point	Easting	Northing	Location (Primary)
2	6	681245	3995496	Wash, Pabco Road Weir impoundment and City of Henderson outfall
2	4.8	680290	3995659	Wash, Upper Narrows Weir impoundment, south bank
2	4.75	679905	3995767	Wash, Duck Creek Confluence Weir impoundment, south bank
2	4.5	678178	3997623	Wash, Upper Diversion Weir bridge
2	1	678178	3996968	Nature Preserve, Vern's Pond
4	5	678130	3996515	Mitigation Wetlands, Cell 5
4	3.5A	678526	3996342	Mitigation Wetlands, Cell 6; replaces 3.5 and 4 to reduce effort and improve spacing between points
4	0.5A	678628	3996058	Mitigation Wetlands, Cell 7; replaces 0.5 and 2.5 to reduce effort and improve spacing between points
3	1.5	682400	3995747	Wash, C-1 Channel
3	3A	682781	3995901	Wash, Bostick Weir impoundment, south bank; moved to bank protection due to flooding from weir maintenance
3	4.5	683207	3996062	Wash, Calico Ridge Weir impoundment, south bank
3	4.55	683820	3996274	Wash, toe of Lower Narrows Weir, south bank
3	4.56	684134	3996360	Wash, Homestead Weir impoundment, south bank
3	4.6A	684535	3996397	Wash, between Homestead and Three Kids weirs, south bank; moved ~100 meters downstream for greater spacing between points
3	6.5A	684978	3996723	Wash, toe of Three Kids Weir, south bank; moved upstream for greater spacing between points
3	7	685136	3996960	Wash, Rainbow Gardens Weir impoundment, south bank

Appendix B

Total and Per Point Abundances by Year and Route for the Las Vegas Wash. YRRA=Yuma Ridgway's Rail, VIRA=Virginia Rail, SORA=Sora, AMBI=American Bittern, LEBI=Least Bittern, PBGR=Pied-billed Grebe, COGA=Common Gallinule, AMCO=American Coot

Year	Route	Points	YRRA	VIRA	SORA	AMBI	LEBI	PBGR	COGA	AMCO	Grand Total
2007	1	9	0 (0.0)	4 (0.4)	7 (0.8)	0 (0.0)	1 (0.1)	1 (0.1)	1 (0.1)	15 (1.7)	29 (3.2)
2007	2	8	0 (0.0)	2 (0.3)	5 (0.6)	0 (0.0)	4 (0.5)	7 (0.9)	14 (1.8)	81 (10.1)	113 (14.1)
2007	3	7	0 (0.0)	1 (0.1)	2 (0.3)	0 (0.0)	4 (0.6)	4 (0.6)	13 (1.9)	68 (9.7)	92 (13.1)
2007	Total	24	0 (0.0)	7 (0.3)	14 (0.6)	0 (0.0)	9 (0.4)	12 (0.5)	28 (1.2)	164 (6.8)	234 (9.8)
2008	1	9	0 (0.0)	4 (0.4)	6 (0.7)	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.1)	20 (2.2)	32 (3.6)
2008	2	8	0 (0.0)	0 (0.0)	5 (0.6)	0 (0.0)	2 (0.3)	4 (0.5)	15 (1.9)	41 (5.1)	67 (8.4)
2008	3	9	0 (0.0)	1 (0.1)	5 (0.6)	0 (0.0)	9 (1.0)	5 (0.6)	12 (1.3)	151 (16.8)	183 (20.3)
2008	Total	26	0 (0.0)	5 (0.2)	16 (0.6)	0 (0.0)	11 (0.4)	10 (0.4)	28 (1.1)	212 (8.2)	282 (10.9)
2009	1	9	0 (0.0)	2 (0.2)	5 (0.6)	0 (0.0)	2 (0.2)	0 (0.0)	0 (0.0)	4 (0.4)	13 (1.4)
2009	2	8	0 (0.0)	0 (0.0)	6 (0.8)	0 (0.0)	2 (0.3)	4 (0.5)	11 (1.4)	46 (5.8)	69 (8.6)
2009	3	8	0 (0.0)	2 (0.3)	5 (0.6)	0 (0.0)	2 (0.3)	4 (0.5)	13 (1.6)	97 (12.1)	123 (15.4)
2009	Total	25	0 (0.0)	4 (0.2)	16 (0.6)	0 (0.0)	6 (0.2)	8 (0.3)	24 (1.0)	147 (5.9)	205 (8.2)
2010	1	3	0 (0.0)	2 (0.7)	3 (1.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (1.7)
2010	2	9	0 (0.0)	2 (0.2)	7 (0.8)	0 (0.0)	2 (0.2)	3 (0.3)	11 (1.2)	28 (3.1)	53 (5.9)
2010	3	6	0 (0.0)	0 (0.0)	3 (0.5)	0 (0.0)	2 (0.3)	1 (0.2)	10 (1.7)	50 (8.3)	66 (11.0)
2010	4	3	0 (0.0)	3 (1.0)	3 (1.0)	1 (0.3)	0 (0.0)	0 (0.0)	2 (0.7)	3 (1.0)	12 (4.0)
2010	Total	21	0 (0.0)	7 (0.3)	16 (0.8)	1 (0.1)	4 (0.2)	4 (0.2)	23 (1.1)	81 (3.9)	136 (6.5)
2011	2	9	0 (0.0)	0 (0.0)	5 (0.6)	0 (0.0)	4 (0.4)	5 (0.6)	11 (1.2)	54 (6.0)	79 (8.8)
2011	3	6	0 (0.0)	2 (0.3)	2 (0.3)	0 (0.0)	2 (0.3)	2 (0.3)	8 (1.3)	65 (10.8)	81 (13.5)
2011	4	9	0 (0.0)	11 (1.2)	9 (1.0)	0 (0.0)	2 (0.2)	7 (0.8)	9 (1.0)	56 (6.2)	94 (10.4)
2011	Total	24	0 (0.0)	13 (0.5)	16 (0.7)	0 (0.0)	8 (0.3)	14 (0.6)	28 (1.7)	175 (7.3)	254 (10.6)
2012	2	9	0 (0.0)	1 (0.1)	8 (0.9)	0 (0.0)	5 (0.6)	5 (0.6)	14 (1.6)	32 (3.6)	65 (7.2)
2012	3	9	0 (0.0)	3 (0.3)	13 (1.4)	0 (0.0)	4 (0.4)	2 (0.2)	16 (1.8)	184 (20.4)	222 (24.7)
2012	4	9	0 (0.0)	13 (1.4)	14 (1.6)	0 (0.0)	6 (0.7)	6 (0.7)	10 (1.1)	36 (4.0)	85 (9.4)
2012	Total	27	0 (0.0)	17 (0.6)	35 (1.3)	0 (0.0)	15 (0.6)	13 (0.5)	40 (1.5)	252 (9.3)	372 (13.8)
2013	2	9	0 (0.0)	1 (0.1)	5 (0.6)	0 (0.0)	3 (0.3)	3 (0.3)	15 (1.7)	71 (7.9)	98 (10.9)
2013	3	9	0 (0.0)	2 (0.2)	5 (0.6)	0 (0.0)	1 (0.1)	0 (0.0)	8 (0.9)	48 (5.3)	64 (7.1)
2013	4	9	0 (0.0)	7 (0.8)	12 (1.3)	0 (0.0)	3 (0.3)	5 (0.6)	10 (1.1)	59 (6.6)	96 (10.7)
2013	Total	27	0 (0.0)	10 (0.4)	22 (0.8)	0 (0.0)	7 (0.3)	8 (0.3)	33 (1.2)	178 (6.6)	258 (9.6)
2014	2	9	0 (0.0)	0 (0.0)	11 (1.2)	0 (0.0)	5 (0.6)	5 (0.6)	16 (1.8)	45 (5.0)	82 (9.1)
2014	3	7	0 (0.0)	1 (0.1)	4 (0.6)	0 (0.0)	2 (0.3)	1 (0.1)	3 (0.4)	140 (20.0)	151 (21.6)
2014	4	9	0 (0.0)	5 (0.6)	16 (1.8)	0 (0.0)	5 (0.6)	3 (0.3)	13 (1.4)	33 (3.7)	75 (8.3)
2014	Total	25	0 (0.0)	6 (0.2)	31 (1.2)	0 (0.0)	12 (0.5)	9 (0.4)	32 (1.3)	218 (8.7)	308 (12.3)
2015	2	9	0 (0.0)	1 (0.1)	7 (0.8)	0 (0.0)	4 (0.4)	6 (0.7)	17 (1.9)	24 (2.7)	59 (6.6)
2015	3	7	0 (0.0)	3 (0.4)	5 (0.7)	0 (0.0)	2 (0.3)	2 (0.3)	12 (1.7)	98 (14.0)	122 (17.4)
2015	4	9	0 (0.0)	5 (0.6)	6 (0.7)	1 (0.1)	3 (0.3)	4 (0.4)	10 (1.1)	40 (4.4)	69 (7.7)
2015	Total	25	0 (0.0)	9 (0.4)	18 (0.7)	1 (0.0)	9 (0.4)	12 (0.5)	39 (1.6)	162 (6.5)	250 (10.0)
2016	2	9	0 (0.0)	0 (0.0)	7 (0.8)	0 (0.0)	2 (0.2)	4 (0.4)	7 (0.8)	23 (2.6)	43 (4.8)
2016	3	8	0 (0.0)	2 (0.3)	3 (0.4)	0 (0.0)	1 (0.1)	1 (0.1)	12 (1.5)	155 (19.4)	174 (21.8)
2016	4	9	0 (0.0)	3 (0.3)	7 (0.8)	0 (0.0)	2 (0.2)	4 (0.4)	7 (0.8)	76 (8.3)	99 (11.0)
2016	Total	26	0 (0.0)	5 (0.2)	17 (0.6)	0 (0.0)	5 (0.2)	9 (0.4)	26 (1.0)	254 (9.8)	316 (12.2)
2017	2	10	0 (0.0)	4 (0.4)	0 (0.0)	1 (0.1)	3 (0.3)	1 (0.1)	10 (1.0)	103 (10.3)	122 (12.2)
2017	3	9	0 (0.0)	4 (0.4)	6 (0.7)	0 (0.0)	1 (0.1)	1 (0.1)	10 (1.1)	192 (21.3)	214 (23.8)
2017	4	9	1 (0.1)	0 (0.0)	5 (0.6)	1 (0.1)	1 (0.1)	0 (0.0)	7 (0.8)	22 (2.4)	37 (4.1)
2017	Total	28	1 (0.0)	8 (0.3)	11 (0.4)	2 (0.1)	5 (0.2)	2 (0.1)	27 (1.0)	317 (11.3)	373 (13.3)
2018	2	8	0 (0.0)	1 (0.1)	4 (0.5)	0 (0.0)	4 (0.5)	3 (0.4)	19 (2.4)	185 (23.1)	216 (27.0)
2018	3	9	0 (0.0)	1 (0.1)	7 (0.8)	0 (0.0)	2 (0.2)	3 (0.3)	14 (1.6)	123 (13.7)	150 (16.7)
2018	4	9	0 (0.0)	0 (0.0)	8 (0.9)	1 (0.1)	0 (0.0)	1 (0.1)	6 (0.7)	17 (1.9)	33 (3.7)
2018	Total	26	0 (0.0)	2 (0.1)	19 (0.7)	1 (0.0)	6 (0.2)	7 (0.3)	39 (1.5)	325 (12.5)	399 (15.4)
2019	2	9	0 (0.0)	2 (0.2)	7 (0.8)	0 (0.0)	4 (0.4)	0 (0.0)	19 (2.1)	297 (33.0)	329 (36.6)
2019	3	9	0 (0.0)	7 (0.8)	9 (1.0)	0 (0.0)	1 (0.1)	6 (0.7)	13 (1.4)	170 (18.9)	206 (22.9)
2019	4	9	0 (0.0)	5 (0.6)	20 (2.2)	0 (0.0)	1 (0.1)	1 (0.1)	2 (0.2)	23 (2.6)	52 (5.8)
2019	Total	27	0 (0.0)	14 (0.5)	36 (1.3)	0 (0.0)	6 (0.2)	7 (0.3)	34 (1.3)	490 (18.2)	587 (21.7)

Year	Route	Points	YRRA	VIRA	SORA	AMBI	LEBI	PBGR	COGA	AMCO	Grand Total
2021	2	5	1 (0.2)	2 (0.4)	7 (1.4)	0 (0.0)	2 (0.4)	2 (0.4)	15 (3.0)	148 (29.6)	177 (35.4)
2021	3	8	0 (0.0)	2 (0.3)	5 (0.6)	0 (0.0)	0 (0.0)	3 (0.4)	12 (1.5)	292 (36.5)	314 (39.3)
2021	4	3	2 (0.7)	6 (2.0)	12 (4.0)	0 (0.0)	1 (0.3)	0 (0.0)	3 (1.0)	21 (7.0)	45 (15.0)
2021	Total	16	3 (0.2)	10 (0.6)	24 (1.5)	0 (0.0)	3 (0.2)	5 (0.3)	30 (1.9)	461 (28.8)	536 (33.5)
2022	2	5	1 (0.2)	1 (0.2)	6 (1.2)	0 (0.0)	0 (0.0)	3 (0.6)	11 (2.2)	157 (31.4)	179 (35.8)
2022	3	8	2 (0.3)	0 (0.0)	3 (0.4)	0 (0.0)	0 (0.0)	4 (0.5)	7 (0.9)	448 (56.0)	464 (58.0)
2022	4	3	2 (0.7)	1 (0.3)	6 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4 (1.3)	13 (4.3)
2022	Total	16	5 (0.3)	2 (0.1)	15 (0.9)	0 (0.0)	0 (0.0)	7 (0.4)	18 (1.1)	609 (38.1)	656 (41.0)
2023	2	5	3 (0.6)	0 (0.0)	4 (0.8)	0 (0.0)	1 (0.2)	2 (0.4)	11 (2.2)	103 (20.6)	124 (24.8)
2023	3	8	1 (0.1)	2 (0.3)	8 (1.0)	0 (0.0)	0 (0.0)	3 (0.4)	8 (1.0)	457 (57.1)	479 (59.9)
2023	4	3	2 (0.7)	2 (0.7)	4 (1.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	7 (2.3)	16 (5.3)
2023	Total	16	6 (0.4)	4 (0.3)	16 (1.0)	0 (0.0)	1 (0.1)	5 (0.3)	20 (1.3)	567 (35.4)	619 (38.7)
2024	2	5	3 (0.6)	0 (0.0)	6 (1.2)	0 (0.0)	1 (0.2)	4 (0.8)	13 (2.6)	68 (13.6)	95 (19.0)
2024	3	8	1 (0.1)	2 (0.3)	8 (1.0)	0 (0.0)	2 (0.3)	1 (0.1)	11 (1.4)	278 (34.8)	303 (37.9)
2024	4	3	1 (0.3)	4 (1.3)	4 (1.3)	0 (0.0)	0 (0.0)	1 (0.3)	6 (2.0)	35 (11.7)	51 (17.0)
2024	Total	16	5 (0.3)	6 (0.4)	18 (1.1)	0 (0.0)	3 (0.2)	6 (0.4)	30 (1.9)	381 (23.8)	449 (28.1)