



las vegas wash coordination committee

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**Marsh Bird Monitoring, including
Yuma Ridgway's Rail, along Las
Vegas Wash, Clark County, Nevada,
2015**



October 2015



SOUTHERN NEVADA
WATER AUTHORITY



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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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October 2015

ABSTRACT

The Las Vegas Wash Coordination Committee (LVWCC), a 29-member stakeholder group, is working to stabilize and enhance the Las Vegas Wash (Wash), the channel that drains flows from the Las Vegas Valley to Lake Mead at Las Vegas Bay. The Wash also flows through the 2,900-acre Clark County Wetlands Park (Wetlands Park). Activities associated with the stabilization program and park development include wetland revegetation and expansion. As a result of informal Section 7 consultation with the U.S. Fish and Wildlife Service regarding the project, the Southern Nevada Water Authority, the lead agency of the LVWCC, began annual surveys to determine the occurrence of Yuma Ridgway's rail (*Rallus obsoletus yumanensis*; formerly known as the Yuma clapper rail [*R. longirostris yumanensis*]) within the Wetlands Park. Surveys were conducted by permitted consultants nearly annually from 2000 through 2007 (McKernan and Braden 2001, 2002; SWCA 2002, 2003, 2005, 2006, 2007, 2008). Conway (2005, 2009) developed a protocol for conducting marsh bird monitoring surveys that includes calling for Ridgway's rail. The U.S. Fish and Wildlife Service accepted this protocol as the new official Yuma Ridgway's rail survey protocol in 2006. The survey protocol enables compliance obligations regarding the Ridgway's rail to be met, while also providing information on the status, abundance and distribution of other sensitive species that may benefit from wetland revegetation efforts. The Las Vegas Wash Project Coordination Team began conducting surveys using the new protocol in 2007 (Van Dooremolen 2010a). Yuma Ridgway's rail could not be surveyed for the first year because the necessary federal permit was not in place. The species was added to the survey in 2008.

Six species were targeted during the 2015 surveys: American bittern, least bittern, black rail, Ridgway's rail, Virginia rail, and sora. Detections of pied-billed grebe, common gallinule, and American coot (referred to as non-target species) were also recorded. Surveys were conducted along three survey routes comprising 25 points. No Ridgway's rail or black rail were detected during the surveys; however, a Yuma Ridgway's rail was seen on Route 4 (the Clark County in-lieu fee mitigation ponds [Mitigation Ponds]) during aquatic bird counts on August 19. This was the first detection of the species within the study area in nine years. American bittern, least bittern, Virginia rail, and sora were detected during the marsh bird surveys, as were the three non-target species. Sora continued to be the most abundant of the target species. Including non-target species, American coot was the most abundant. The abundance of both least bittern and sora decreased from the prior year; Virginia rail abundance increased. While Route 4 once again had the highest abundance of target species, that abundance declined substantially from 2014 and was well below the average of prior years. Even though numbers were down, the Mitigation Ponds continue to offer the highest quality emergent wetland habitat, along with the highest quality potentially suitable nesting habitat for Yuma Ridgway's rail that is currently available in the study area. Although not a breeding season record, the detection of a Yuma Ridgway's rail at the site supports this observation. Annual marsh bird surveys along the Wash should continue in order to comply with informal Section 7 consultation measures regarding Yuma Ridgway's rail.

ACKNOWLEDGEMENTS

I thank the Bureau of Reclamation for providing partial funding to the Southern Nevada Water Authority for this project under assistance agreement number R09AP30017. I also extend my thanks to Nicholas Rice and Timothy Ricks for assisting with surveys. Finally, I thank the Las Vegas Wash Coordination Committee for their continued support for wildlife monitoring and the implementation of the Las Vegas Wash Comprehensive Adaptive Management Plan and the Las Vegas Wash Wildlife Management Plan. These activities have been conducted by Deborah Van Dooremolen under permit no. TE-148556-3 (expires May 24, 2018), Nicholas Rice under permit no. TE-64580A-0 (expires August 31, 2015; renewal in process), and Timothy Ricks under permit no. TE-67397A-0 (expires August 30, 2015; renewal in process) as issued by the U.S. Fish and Wildlife Service, Sacramento, California.

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activities, which include the construction of 21 erosion control structures (weirs) and extensive revegetation, will help deter further erosion and reduce the amount of sediment being deposited into Lake Mead; 18 weirs were in place by spring 2015.

The LVWCC is increasing wetland habitat along the channel by planting bulrush (*Schoenoplectus* spp.) in the impoundments of the weirs and along the weir faces; cattail (*Typha domingensis*) and common reed (*Phragmites australis*) volunteer from upstream sources. Emergent vegetation can also be found in the constructed wetland ponds in the Wetlands Park Nature Preserve (Nature Preserve). Clark County has created additional wetland habitat within the Wetlands Park in the form of the in-lieu fee mitigation ponds (Mitigation Ponds; Figure 2). The increase in wetland habitat along the Wash and throughout the Wetlands Park could have a positive impact on secretive marsh birds (e.g., rails and bitterns), including the federally endangered Yuma Ridgway's rail (*Rallus obsoletus yumanensis*). (Note: This species was known as the Yuma clapper rail [*R. longirostris yumanensis*] until it was reclassified as a different species by Chesser et al. [2014]; for simplicity, all references below have been updated with the new species name).

The Yuma Ridgway's rail is largely restricted to the lower Colorado River watershed and the Salton Sea, inhabiting 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 a mean annual home range size of more than 17 acres, while Conway et al. (1993) reported mean annual home range size to be 30 acres. Sites occupied by Yuma Ridgway's rail have a higher percent cover of shallow water (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 and bulrush are preferred, although Yuma Ridgway's rails have also been detected in wetlands dominated by common reed, salt cedar (*Tamarix ramosissima*), 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.

Alcorn (1988) reported that eight Ridgway's rails were observed in the Las Vegas Sewage disposal drainage ditch on September 6, 1959, and that a lone individual was observed in the same location a few weeks later (the site of the detections is believed to be the present-day City of Las Vegas Water Pollution Control Facility discharge channel, located approximately 1.5 miles upstream of the Wetlands Park boundary; Figure 2). A Yuma Ridgway's rail was also detected 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 Weir (Southwest Wetlands Consortium 1998; Figure 2). As a result of informal Section 7 consultation with the U.S. Fish and Wildlife Service on the proposed development of the Wetlands Park and associated erosion control structures, the

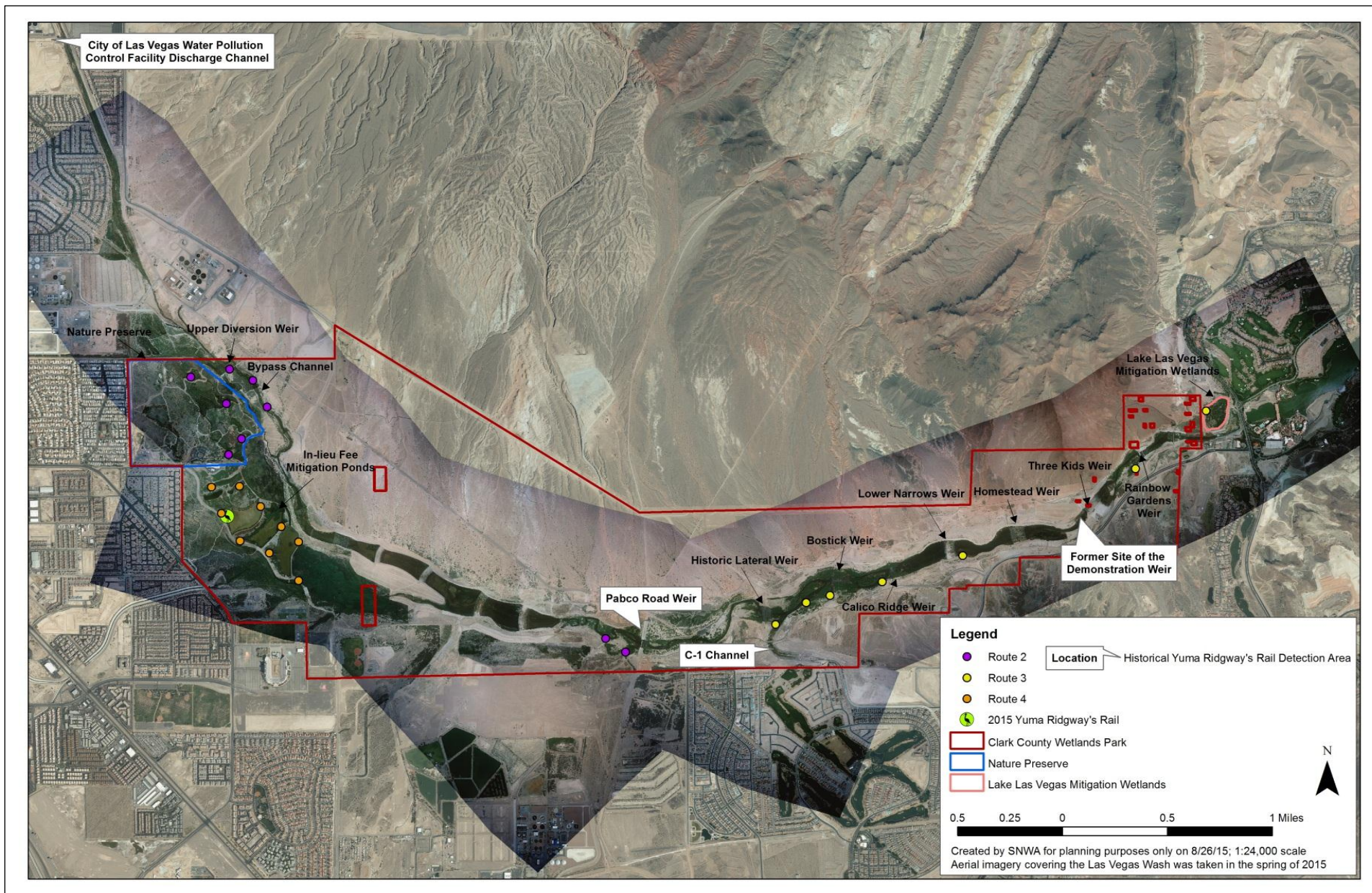


Figure 2. Historical Yuma Ridgway's rail detection areas, survey route locations of interest, and 2015 marsh bird monitoring points and Yuma Ridgway's rail detection location.

Southern Nevada Water Authority (SNWA), the lead agency of the LVWCC, began annual surveys to determine the occurrence of Yuma Ridgway's rail within the Wetlands Park.

SNWA contracted with permitted consultants to perform these surveys from 2000 to 2004 and 2006 to 2007. No Yuma Ridgway's rails were detected from 2000 to 2004, nor in 2007 (Mckernan and Braden 2001, 2002; SWCA 2002, 2003, 2005, 2008). A Yuma Ridgway's rail was detected on May 23, 2005, during surveys for other species. It was calling from emergent habitat in the impoundment of the Demonstration Weir, which has since been demolished and replaced by the Three Kids Weir (SWCA 2006; Figure 2). On June 4 and June 7, 2006, also during surveys for other species, another Ridgway's rail was detected in the marsh along the C-1 Channel near where it discharges to the Wash (SWCA 2007; Figure 2). While the location where the bird was detected was lined with rock and concrete in subsequent years, emergents and other wetland vegetation have returned.

Conway (2005, 2009) developed a protocol for conducting marsh bird monitoring surveys that includes calling for Ridgway's rail. The U.S. Fish and Wildlife Service accepted this protocol as the new official Yuma Ridgway's rail survey protocol in 2006. The survey protocol enables compliance obligations regarding the Ridgway's rail to be met, while also providing information on the status, abundance, and distribution of other sensitive species such as the least bittern (*Ixobrychus exilis*) and black rail (*Laterallus jamaicensis*), which are covered on the Lower Colorado River Multi-Species Conservation Program and may benefit from wetland revegetation efforts. Consequently in 2007, the Las Vegas Wash Project Coordination Team (the implementation team of the LVWCC) initiated a marsh bird monitoring study along the Wash and within the Wetlands Park (Van Dooremolen 2010a, 2010b, 2012, 2013, 2014a, 2014b). Yuma Ridgway's rail could not be surveyed for the first year because the necessary federal permit was not in place; therefore, the species was not added to the survey until 2008. The results described below are from the 2015 monitoring season.

2.0 METHODS

2.1 Description of Survey Routes

Three routes totaling 25 points were surveyed in 2015 (Figure 2). GPS coordinates of the points are included in Appendix A.

Route 2 included nine points in 2015: four within the constructed wetlands ponds at the Nature Preserve, one in the Upper Diversion Weir impoundment, two along the bypass channel, and two along the Wash upstream of Pabco Road Weir (Figure 2). The Nature Preserve ponds (3-acre lower pond [Vern's Pond], 1.5-acre middle pond complex, and 1.5-acre upper pond) have varying amounts of open water and the vegetation is composed of cattails, California and hardstem bulrush (*S. californicus* and *S. acutus*), common reed, sandbar willow (*S. exigua*), Goodding willow (*S. gooddingii*) and cottonwood (*Populus fremontii*). The Upper Diversion Weir point covers the 3.5-acre cattail complex in the impoundment. The bypass channel points include three acres of emergent marsh dominated by bulrush and cattails, with some sandbar and Goodding willow, and other woody riparian species. The points at Pabco Road Weir cover approximately six acres of wetland habitat, with two points upstream of the weir. The emergent habitat is dominated by cattail and common reed. The riparian component of the habitat was reduced; a small stand of sandbar willow and salt cedar still exists but much of the willow and

cottonwood was cleared from the area in preparation for the construction of Sunrise Mountain Weir (now on hold). The common reed that formed the understory of these trees was also cleared but had already grown two feet by the onset of surveys. The water upstream of the weir is slow-moving and includes a small backwater pond and wetlands created by the City of Henderson Water Reclamation Facility outfall channel.

Route 3 included seven points (approximately 40 acres of habitat; Figure 2) in 2015. The route begins in the small backwater wetland at the discharge of the C-1 Channel into the Wash (at the toe of Historic Lateral Weir) and continues downstream to end in the Lake Las Vegas mitigation wetlands, an off-channel wetland located on City of Henderson property just east of the Wetlands Park boundary. It includes points sampling the impoundments of Bostick Weir, Calico Ridge Weir, and Rainbow Gardens Weir, as well as the toe of Lower Narrows Weir (Figure 2). These locations have banks and islands covered in cattail, hardstem bulrush, common reed, and Goodding willow with lesser amounts of sandbar willow and cottonwood. The area around the C-1 Channel point was still flooded as a result of repairs to the Historic Lateral Weir in the winter of 2014, requiring the movement of the monitoring station further up the channel. Emergent habitat in and around the Bostick Weir impoundment was marginally impacted by maintenance of the weir and clearing in preparation for the expansion of the Historic Lateral Weir (put on hold for the foreseeable future).

Route 4 included nine points (approximately 60 acres of habitat; Figure 2) in 2015. The route is located in the Mitigation Ponds created by Clark County. Two points were established on the smaller ponds, six on the larger ponds, and one immediately to the southeast, covering habitat flooded by Duck Creek and the west channel, which carries overflows from Duck Creek and the Mitigation Ponds. The smaller ponds are dominated by dense stands of cattail and common reed, with the closest open water approximately 150 feet or more from the points. The larger ponds are dominated by open water (both shallow and deep); cattails, bulrush, and common reed of varying width grow along the banks and in a few stands in the interior. The habitat at the point immediately adjacent to the Mitigation Ponds consists primarily of cattails, flooded tamarisk, and common reed.

Along each route, survey points were established a minimum of 656 feet apart. Although Conway (2005, 2009) recommends a separation of 1,312 feet, the Wash does not contain enough emergent marsh to allow for such wide spacing while still maintaining a sufficient number of points per route. Conway (2005, 2009) does allow for tighter spacing in such circumstances but warns of the risk of double-counting individuals.

2.2 Survey Protocol

Surveys were performed using the North American marsh bird monitoring protocol developed by Conway (2005, 2009). Trained observers conducted the surveys during the breeding season from late March through mid-May. Four surveys of each route were conducted and each route was surveyed on a separate day. Two observers conducted each survey, including at least one of the following permitted individuals: Deborah Van Dooremolen-TE-148556-3, Nicholas Rice-TE-64580A-0, and Timothy Ricks-TE-67397A-0. 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, each route was run in reverse every other survey to ensure that

most points were surveyed during the earliest morning hours (the time of peak marsh bird vocalization). Surveys were not conducted if wind reached or exceeded 12 miles per hour, as measured by the Beaufort wind scale, for more than two points (see Appendix B for weather conditions on survey days).

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 included American bittern (*Botaurus lentiginosus*), least bittern, black rail, Ridgway's rail, Virginia rail (*R. limicola*), and sora (*Porzana carolina*). Each species' vocalizations were broadcast 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. Vocalizations were broadcast using MP3 players with portable speakers. The 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. Detections of three other marsh bird species that were not targeted through the broadcast were also recorded, including pied-billed grebe (*Podilymbus podiceps*), common gallinule (*Gallinula galeata*), and American coot (*Fulica americana*). Given the sheer numbers 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. The background noise level was also recorded at each point. Noise designated as loud or intense meant that at least some species could not be heard beyond approximately 165 or 80 feet, respectively.

The observers compared data after the survey was completed at each point in order to rectify any differences in detections.

2.3 Data Analysis

Points had to be surveyed a minimum of three times under appropriate conditions (wind below 12 miles per hour, no loud or intense noise, etc.) to be used in the 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 (the abundance) per species along each route 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, they were considered to be the same individual(s). If an individual had been detected at a previous point during a survey, the second survey detection was not counted. If an individual was detected at a point within 656 feet of a location where an individual had been detected on a prior survey, and the individual was calling from approximately the same direction where the other bird had been detected, it was considered to be the previously detected bird and was not counted as a new individual. This yielded an estimate of the number of individuals detected, i.e., the abundance, of each species. (Note: The above assumes that individuals inhabit a relatively

small, defined area, a home range, throughout the survey season. Thus the Virginia rail detected at Point 4 during the second and third surveys on Route 4 was considered a unique individual, and the Virginia rail detected at Point 6 on the same route in the fourth survey was considered a unique individual. This assumption works well for species such as the Virginia rail and sora that inhabit smaller home ranges but could not be applied to the Yuma Ridgway's rail, which has not yet been detected during these marsh bird surveys.)

For each route, the total number of individuals detected of each species, the total number of individuals detected of target 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, the total number of individuals detected of target 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 can provide a more accurate comparison between routes and between years because the number of points surveyed has varied over time). These data were then compared with results from the previous year's survey and with an average of all prior years of surveys to look for changes over time.

As stated in Section 2.1, the recommended spacing of points is 1,312 feet. Broadcasting from points with tighter spacing may impact bird behavior, calling them in from more distant points (Conway 2009). Since spacing for this study is half of the recommended distance, it is possible that some individuals were double-counted.

3.0 RESULTS AND DISCUSSION

Of the target species, American bittern, least bittern, Virginia rail, and sora were detected (Table 1). At least one individual of each species was detected on all routes with the exception of American bittern, which was only detected on Route 4. At least one individual of each non-target species was also detected on all routes. Common gallinule and American coot were identified during all survey replicates on each route (Table 1).

Sora was the most abundant of the target species with 0.72 individuals per point (Table 2). American coot was the most abundant of all species with 6.48 birds per point, while common gallinule was a distant second at 1.56 birds per point (Table 2).

Route 4 had the highest total and per point abundances of the target species collectively; however, individually, least bittern and sora were most abundant on Route 2 (Table 2). Total (all species) per point abundance was highest on Route 3 at 17.43 birds per point (Table 2).

As in prior years of this study, no Yuma Ridgway's rail or black rail were detected during the surveys (Table 2). However, a Yuma Ridgway's rail was seen on Route 4, less than 200 feet from one of the monitoring points, during aquatic bird counts on August 19 (UTMs: E-678176, N-3996491; Datum-WGS84, Zone 11N). The bird was visually observed foraging along the edge of the marsh ringing the most northern of the large ponds (Figure 2). In the following weeks, the rail was seen in the same location on several different mornings. It was last observed on September 3. An aquatic bird count on September 19 failed to detect it. Further visits are needed to determine whether the rail has actually left the site or simply went undetected that day.

Route	No. of Points	Date	AMBI	LEBI	VIRA	SORA	PBGR	COGA	AMCO	Grand Total
2	9	3/30/2015		1		6	2	12	19	40
		4/13/2015		4		1	6	12	17	40
		4/27/2015		1		2	2	7	6	18
		5/11/2015		2	1			3	6	12
2 Total				8	1	9	10	34	48	110
3	7	3/31/2015			1			5	92	98
		4/14/2015			1	4	1	6	49	61
		4/29/2015		2	1	3		8	16	30
		5/12/2015		1	1	1	2	3	6	14
3 Total				3	4	8	3	22	163	203
4	9	4/1/2015	1	2	2	1	3	6	7	22
		4/15/2015			2	4	2	6	29	43
		4/30/2015		1	2	4	2	8	21	38
		5/13/2015			2			4	20	26
4 Total			1	3	8	9	7	24	77	129
Grand Total	25		1	14	13	26	20	80	288	442

Table 1. Total 2015 detections for each species by route and date for the 25 points surveyed. AMBI=American Bittern, LEBI=Least Bittern, VIRA=Virginia Rail, SORA=Sora, PBGR=Pied-billed Grebe, COGA=Common Gallinule, AMCO=American Coot.

While the timing of the first observation fits with that of a dispersing juvenile (breeding colonies exist within approximately 40 miles, on the Muddy River and in the Overton Wildlife Management Area), the bird appeared to be in adult plumage (see cover photo, taken by SNWA biologist Aaron Ambos). It is the first Ridgway's rail detected in the study area since June 2006.

Of the target species that were detected during the marsh bird surveys, American bittern was detected for just the second time since the surveys began in 2007, both detections having occurred at the Mitigation Ponds (Route 4). Least bittern, Virginia rail, and sora have been identified in all survey years (Table 2).

Although it declined from the prior year, least bittern abundance remained in line with the average from the prior eight years of the study at 9 individuals (0.36 per point; Table 2). Sora abundance declined more dramatically year over year, decreasing by more than 40% and falling below its eight-year average of 20.75 individuals (0.83 per point). However, at 18 individuals, abundance was similar to that observed prior to 2012, when sora abundance was consistently at or below 16 birds. Most of the decline in sora abundance can be attributed to Route 4, which yielded far fewer detections than it has in the past few years (Table 2), despite the highest single survey abundance for sora (10 birds) being reported during aquatic bird counts at the site on April 23. Sora breeding still has not been confirmed during the study, with most, if not all, birds disappearing or at least falling silent by the fourth survey. (See Van Dooremolen 2010a and 2010b for further discussion on the breeding status of sora and the other species in the Wash.)

While least bittern and sora abundances decreased year over year, Virginia rail abundance increased (Table 2), due largely to an increase in the number of birds detected on Route 3.

			Target Species (TS) abundance (per point)					Non-target Species abundance (per point)			
Year	Route	No. of Points	AMBI	LEBI	VIRA	SORA	Total TS	PBGR	COGA	AMCO	Grand Total
2007	1	9	0 (0.00)	1 (0.11)	4 (0.44)	7 (0.78)	12 (1.33)	1 (0.11)	1 (0.11)	15 (1.67)	29 (3.22)
	2	8	0 (0.00)	4 (0.50)	2 (0.25)	5 (0.63)	11 (1.38)	7 (0.88)	14 (1.75)	81 (10.13)	113 (14.13)
	3	7	0 (0.00)	4 (0.57)	1 (0.14)	2 (0.29)	7 (1.00)	4 (0.57)	13 (1.86)	68 (9.71)	92 (13.14)
2007 Total		24	0 (0.00)	9 (0.38)	7 (0.29)	14 (0.58)	30 (1.25)	12 (0.50)	28 (1.17)	164 (6.83)	234 (9.75)
2008	1	9	0 (0.00)	0 (0.00)	4 (0.44)	6 (0.67)	10 (1.11)	1 (0.11)	1 (0.11)	20 (2.22)	32 (3.56)
	2	8	0 (0.00)	2 (0.25)	0 (0.00)	5 (0.63)	7 (0.88)	4 (0.50)	15 (1.88)	41 (5.13)	67 (8.38)
	3	9	0 (0.00)	9 (1.00)	1 (0.11)	5 (0.56)	15 (1.67)	5 (0.56)	12 (1.33)	151 (16.78)	183 (20.33)
2008 Total		26	0 (0.00)	11 (0.42)	5 (0.19)	16 (0.62)	32 (1.23)	10 (0.38)	28 (1.08)	212 (8.15)	282 (10.85)
2009	1	9	0 (0.00)	2 (0.22)	2 (0.22)	5 (0.56)	9 (1.00)	0 (0.00)	0 (0.00)	4 (0.44)	13 (1.44)
	2	8	0 (0.00)	2 (0.25)	0 (0.00)	6 (0.75)	8 (1.00)	4 (0.50)	11 (1.38)	46 (5.75)	69 (8.63)
	3	8	0 (0.00)	2 (0.25)	2 (0.25)	5 (0.63)	9 (1.13)	4 (0.50)	13 (1.63)	97 (12.13)	123 (15.38)
2009 Total		25	0 (0.00)	6 (0.24)	4 (0.16)	16 (0.64)	26 (1.04)	8 (0.32)	24 (0.96)	147 (5.88)	205 (8.20)
2010	1	3	0 (0.00)	0 (0.00)	2 (0.67)	3 (1.00)	5 (1.67)	0 (0.00)	0 (0.00)	0 (0.00)	5 (1.67)
	2	9	0 (0.00)	2 (0.22)	2 (0.22)	7 (0.78)	11 (1.22)	3 (0.33)	11 (1.22)	28 (3.11)	53 (5.89)
	3	6	0 (0.00)	2 (0.25)	0 (0.00)	3 (0.50)	5 (0.83)	1 (0.17)	10 (1.67)	50 (8.33)	66 (11.00)
	4	3	1 (0.33)	0 (0.00)	3 (1.00)	3 (1.00)	7 (2.33)	0 (0.00)	2 (0.67)	3 (1.00)	12 (4.00)
2010 Total		21	1 (0.05)	4 (0.19)	7 (0.33)	16 (0.76)	28 (1.33)	4 (0.19)	23 (1.10)	81 (3.86)	136 (6.48)
2011	2	9	0 (0.00)	4 (0.44)	0 (0.00)	5 (0.56)	9 (1.00)	5 (0.56)	11 (1.22)	54 (6.00)	79 (8.78)
	3	6	0 (0.00)	2 (0.33)	2 (0.33)	2 (0.33)	6 (1.00)	2 (0.33)	8 (1.33)	65 (10.83)	81 (13.50)
	4	9	0 (0.00)	2 (0.22)	11 (1.22)	9 (1.00)	22 (2.44)	7 (0.78)	9 (1.00)	56 (6.22)	94 (10.44)
2011 Total		24	0 (0.00)	8 (0.33)	13 (0.54)	16 (0.67)	37 (1.54)	14 (0.58)	28 (1.17)	175 (7.29)	254 (10.58)
2012	2	9	0 (0.00)	5 (0.56)	1 (0.11)	8 (0.89)	14 (1.56)	5 (0.56)	14 (1.56)	32 (3.55)	65 (7.22)
	3	9	0 (0.00)	4 (0.44)	3 (0.33)	13 (1.44)	20 (2.22)	2 (0.22)	16 (1.78)	184 (20.44)	222 (24.67)
	4	9	0 (0.00)	6 (0.67)	13 (1.44)	14 (1.56)	33 (3.67)	6 (0.67)	10 (1.11)	36 (4.00)	85 (9.44)
2012 Total		27	0 (0.00)	15 (0.56)	17 (0.63)	35 (1.30)	67 (2.48)	13 (0.48)	40 (1.48)	252 (9.33)	372 (13.78)
2013	2	9	0 (0.00)	3 (0.33)	1 (0.11)	5 (0.56)	9 (1.00)	3 (0.33)	15 (1.67)	71 (7.89)	98 (10.89)
	3	9	0 (0.00)	1 (0.11)	2 (0.22)	5 (0.56)	8 (0.89)	0 (0.00)	8 (0.89)	48 (5.33)	64 (7.11)
	4	9	0 (0.00)	3 (0.33)	7 (0.78)	12 (1.33)	22 (2.44)	5 (0.56)	10 (1.11)	59 (6.56)	96 (10.67)
2013 Total		27	0 (0.00)	7 (0.26)	10 (0.37)	22 (0.81)	39 (1.44)	8 (0.30)	33 (1.22)	178 (6.59)	258 (9.56)
2014	2	9	0 (0.00)	5 (0.56)	0 (0.00)	11 (1.22)	16 (1.78)	5 (0.56)	16 (1.78)	45 (5.00)	82 (9.11)
	3	7	0 (0.00)	2 (0.29)	1 (0.14)	4 (0.57)	7 (1.00)	1 (0.14)	3 (0.43)	140 (20.00)	151 (21.57)
	4	9	0 (0.00)	5 (0.56)	5 (0.56)	16 (1.78)	26 (2.89)	3 (0.33)	13 (1.44)	33 (3.67)	75 (8.33)
2014 Total		25	0 (0.00)	12 (0.48)	6 (0.24)	31 (1.24)	49 (1.96)	9 (0.36)	32 (1.28)	218 (8.72)	308 (12.32)
2015	2	9	0 (0.00)	4 (0.44)	1 (0.11)	7 (0.78)	12 (1.33)	6 (0.67)	17 (1.89)	24 (2.67)	59 (6.56)
	3	7	0 (0.00)	2 (0.29)	3 (0.43)	5 (0.71)	10 (1.43)	2 (0.29)	12 (1.71)	98 (14.00)	122 (17.43)
	4	9	1 (0.11)	3 (0.33)	5 (0.56)	6 (0.67)	15 (1.67)	4 (0.44)	10 (1.11)	40 (4.44)	69 (7.67)
2015 Total		25	1 (0.04)	9 (0.36)	9 (0.36)	18 (0.72)	37 (1.48)	12 (0.48)	39 (1.56)	162 (6.48)	250 (10.00)

Table 2. Total and per point abundances by year and route for 2007-2015. AMBI=American Bittern, LEBI=Least Bittern, VIRA= Virginia Rail, SORA=Sora, PBGR=Pied-billed Grebe, COGA=Common Gallinule, AMCO=American Coot. Note that Route 1 was greatly reduced in 2010 and then dropped from surveys in 2011, while surveys began on a partial Route 4 in 2010 that expanded into a full route in 2011.

Abundance was just above the eight-year average of 8.63 individuals (0.34 per point). Of continued interest is the abundance of the species on Route 4. The route, which had averaged 1.00 or more birds per point, declined to 0.78 in 2013 and then to just 0.56 birds per point in both 2014 and 2015 (Table 2). Virginia rail abundance on Route 4 was still higher than on the other routes. However, this is the first time since 2011 that the route has accounted for less than 70% of all Virginia rail detections. Despite this, the Mitigation Ponds and the adjacent area flooded by Duck Creek and the west channel still appear to offer the best habitat for the species in the study area.

The abundance of target species on Route 2 was down from the previous year, when it peaked at 16, but was still above average. The route is a blend of off-channel constructed wetlands created and maintained by Clark County and sites the LVWCC has stabilized and revegetated along the Wash. Six birds from target species were identified in each area, but richness was not evenly distributed, with three least bittern, a Virginia rail and two sora in the constructed wetlands of the Nature Preserve and one least bittern and five sora detected at Wash sites. Although clearing in preparation for weir construction impacted some habitat on the Wash, it was largely riparian and not emergent habitat that was affected and habitat quality remained good.

Route 3 continued to have the highest total (all species) abundance, but the lowest abundance of target species (Table 2). However, abundance of target species increased substantially from 2014, to just above average. The marsh at the toe of the Lower Narrows Weir continued to expand and the area accounted for a Virginia rail and two sora detections. Marsh habitat also expanded in the Homestead Weir impoundment just downstream (not surveyed) and will likely merit a monitoring point in the future. Common gallinule abundance increased to a more normal level following its 2014 low for the route. The high total abundance on the route continues to be attributable to coots, although their numbers declined from the previous year, despite the opening of visibility into the impoundment of the Historic Lateral Weir resulting in the counting of individuals in that area for the first time. As with Route 2, clearing in preparation for weir construction impacted some habitat, but overall habitat quality was fair to good.

While Route 4 once again had the highest abundance of target species (Table 2), that abundance declined substantially from 2014 and was well below the average of 22.00 individuals (2.75 per point) of prior years. Even though numbers were down, the Mitigation Ponds continue to offer the highest quality emergent wetland habitat in the study area. The ponds also represent the highest quality potentially suitable nesting habitat for Yuma Ridgway's rail currently available. Although not a breeding season record, the detection of a Yuma Ridgway's rail at the site, the first within the entire study area in nine years, supports this observation.

4.0 RECOMMENDATIONS

As stated in previous reports, annual variations in the abundances of individual bird species are common. Additional years of monitoring will provide more information on these species in the study area. Also, annual monitoring for Yuma Ridgway's rail is necessary to comply with informal Section 7 consultation measures. Thus, it is recommended that marsh bird monitoring continue in 2016. In addition, follow-up visits should continue at the Mitigation Ponds to determine the status of the Ridgway's rail first found in August.

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Appendix A

GPS Coordinates for 2015
Marsh Bird Monitoring Points

Route	Point	Eastings	Northings	Location (Primary)	Comments
2	1	678178	3996968	Nature Preserve, Vern's Pond	
2	1.5	678276	3997090	Nature Preserve, Vern's Pond	
2	2	678155	3997357	Nature Preserve, Middle Ponds	
2	3	677879	3997558	Nature Preserve, Upper Pond	
2	4.5	678178	3997623	Wash, Upper Diversion Weir	
2	4.6	678357	3997540	Wash, Bypass Channel	
2	4.7	678468	3997338	Wash, Bypass Channel	
2	5	681090	3995598	Wash, Upstream of Pabco Road Weir	
2	6	681245	3995496	Wash, Upstream of Pabco Road Weir	
3	1.5A	682393	3995724	Wash, C-1 Channel	~80 feet SSE up the C-1 Channel due to changed hydrology
3	2	682626	3995895	Wash, Bostick Impoundment	
3	3	682808	3995954	Wash, Bostick Impoundment	
3	4.5	683207	3996062	Wash, Calico Ridge Weir Impoundment	
3	4.55	683820	3996274	Wash, Toe of Lower Narrows Weir	Added in 2014 to cover marsh below Lower Narrows Weir
3	7	685136	3996960	Wash, Rainbow Gardens Weir Impoundment	
3	8	685673	3997411	Lake Las Vegas Mitigation Wetlands	
4	0.5	678726	3996304	Mitigation Ponds, Pond 6	
4	1	678730	3996008	Duck Creek and West Channel	
4	2.5	678502	3996216	Mitigation Ponds, Pond 6	
4	3.5	678591	3996420	Mitigation Ponds, Pond 5	
4	4	678276	3996306	Mitigation Ponds, Pond 5	
4	5	678130	3996515	Mitigation Ponds, Pond 4	
4	6	678051	3996715	Mitigation Ponds, Pond 1	
4	7	678266	3996725	Mitigation Ponds, Pond 3	
4	8	678431	3996573	Mitigation Ponds, Pond 4	

Appendix B

2015 Survey Weather Conditions

Date	Route #	Temperature (Start/ Finish) - Fahrenheit	Sky (Start/Finish)	Beaufort (Start/Finish)
3/30/2015	2	56/79	partly cloudy/clear skies	0 (<1 mph)/0 (<1 mph)
3/31/2015	3	66/72	clear skies/partly cloudy	0 (<1 mph)/1 (1-3 mph)
4/1/2015	4	66/75	clear skies/clear skies	0 (<1 mph)/2 (4-7 mph)
4/13/2015	2	58/74	clear skies/clear skies	0 (<1 mph)/0 (<1 mph)
4/14/2015	3	67/78	partly cloudy/partly cloudy	1 (1-3 mph)/3 (8-12 mph)
4/15/2015	4	51/59	clear skies/clear skies	3 (8-12 mph)/2 (4-7 mph)
4/27/2015	2	60/70	clear skies/clear skies	0 (<1 mph)/1 (1-3 mph)
4/29/2015	3	58/74	clear skies/clear skies	0 (<1 mph)/0 (<1 mph)
4/30/2015	4	62/78	partly cloudy/partly cloudy	0 (<1 mph)/0 (<1 mph)
5/11/2015	2	51/78	clear skies/partly cloudy	0 (<1 mph)/0 (<1 mph)
5/12/2015	3	74/78	partly cloudy/partly cloudy	3 (8-12 mph)/1 (1-3 mph)
5/13/2015	4	64/70	cloudy/cloudy	0 (<1 mph)/3 (8-12 mph)