Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Marsh Bird Surveys Annual Report Fiscal Year 2006

March 2008

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Lower Colorado River Multi-Species Conservation Program

Marsh Bird Surveys Annual Report Fiscal Year 2006

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Abstract

In 2006, surveys for marsh birds were conducted by the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) along portions of the lower Colorado River and adjacent backwaters, lakes, and marshes (Maps 1-3). Surveys were conducted during March, April, and May. In Topock Gorge, Yuma clapper rail (*Rallus longirostris yumanensis*), least bittern (*Ixobrychus exilis*), and Virginia rail (*R. limicola)* were detected. Yuma clapper rail and least bittern were detected at Hart Mine Marsh, while only least bittern were detected at Butler Lake. California black rail (*Laterallus jamaicensis coturniculus*) were not detected during the surveys. There were no detections of the above-listed four species at the Section 10 Backwater.

Introduction

Monitoring and research measures described in the *Habitat Conservation Plan* for the LCR MSCP provide for surveys of Yuma clapper rail, California black rail, and least bittern (LCR MSCP 2004). Surveys are conducted in existing habitat as part of system-wide monitoring, and at sites prior to creation of marshland habitat (LCR MSCP 2004).

The Yuma clapper rail is listed as an endangered species by the Department of the Interior (U.S. Department of Interior 1967). It is presently listed as threatened in California and is a species of special concern in Arizona (Arizona Game and Fish Department 2006, California Department of Fish and Game 2006). The California black rail is listed by the U.S. Fish & Wildlife Service (USFWS) as a migratory nongame bird of management concern (U.S. Fish & Wildlife Service 1995). In California, this species is listed as threatened and in Arizona, it is listed as a species of special concern (Arizona Game and Fish Department 2002, California Department of Fish and Game 2006). The least bittern is a species of special concern in California and Arizona (Remsen 1978, Arizona Game and Fish Department 2001). It is listed by the USFWS as a migratory nongame bird of management concern (U.S. Fish & Wildlife Service 1995).

Background

The Bureau of Reclamation (Reclamation) has conducted surveys in the Topock Gorge portion of the Havasu National Wildlife Refuge (NWR) since 1996 using a protocol specifically for Yuma clapper rail. These surveys are part of a basin-wide, multi-partner effort to monitor the population of the Yuma clapper rail with the ultimate goal of delisting the species (USFWS 1983). In June 2000, Reclamation conducted surveys for the California black rail in Topock Gorge and Topock Marsh as part of a one-time basin-wide survey; no black rails were found in Topock Gorge or Topock Marsh (Conway et al. 2002). In 2005, multi-species marsh bird surveys were performed, in conjunction with the Yuma clapper rail surveys, to compare clapper rail detections between the two survey methods. The marsh bird surveys were specifically directed towards California black rail, least bitten, Virginia rail, and Yuma clapper rail. Starting in 2006, marsh bird survey protocols were used for official Yuma clapper rail surveys (Conway 2005, USFWS 2006). All Reclamation personnel involved with marsh bird surveys have attended and successfully completed the Marsh Bird Training Workshop presented by Dr. Courtney Conway.

Description of Survey Areas

The Section 10 Backwater is located on the Arizona side of the Colorado River at the south end of Bullhead City, Arizona. The backwater consists of two small marshes adjacent to but separate from the Colorado River; the marshes are 3.2 and 1.0 acres (1.3 and 0.4 hectares), respectively, with the larger marsh having an open backwater of 0.5 acres (0.2 hectares). The predominant vegetation is cattail (*Typha* sp.). There are five survey points. The Section 10 backwater is in Reach 3 of the LCR-MSCP planning area.

Topock Gorge is located along the lower Colorado River between Needles, California, and Lake Havasu City, Arizona, in the Havasu NWR. The survey area is 15.3 miles (24.6 kilometers) in length with numerous marshes connected to the river. The predominant vegetation consists of California bulrush (*Schoenoplectus californicus*), southern cattail (*Typha domingensis*), and common reed (*Phragmites communis*), with stands of saltcedar (*Tamarix* sp.) and coyote willow (*Salix exigua*) mixed in. There are 52 survey points in the Topock Gorge. Topock Gorge is also located in Reach 3.

Hart Mine Marsh is a degraded marsh located on Cibola NWR, south of the refuge headquarters, in Arizona. It is the terminus for agricultural drain water from the refuge's farm units. Surveys were conducted prior to potential restoration (LCR MSCP 2005). There are 11.6 acres (4.7 hectares) of open backwater that contain patches of cattail (*Typha* sp.); the entire site covers 623 acres (252 hectares). There are eight survey points. Hart Mine Marsh is in Reach 4.

Butler Lake and MacAllister Lake are located on the Imperial NWR. The lakes are physically separated from the river but depend on seepage from the river (LCR MSCP 2005). They are 59 and 39.5 acres (24 and 16 hectares), respectively. Cattail is the predominant vegetation. There are two survey points at each lake. The two lakes are located in Reach 5.

Methods

Using a standardized protocol from the National Marsh Bird Monitoring Program, surveys for California black rail, least bitten, Virginia rail, and Yuma clapper rail were performed between 15 March and 31 May (USFWS 2003, Conway 2005, USFWS 2006). Three surveys were conducted. A standardized survey form was used to record date, start and end time, location, route, observers, environmental data, and other comments as well as selected marsh birds encountered, their responses, and direction and distance from the survey point (Attachment 1). Though not targeted species, the calls and locations of the pied-billed grebe (*Podilymbus podiceps*) and sora (*Porzana carolina*) were also recorded. Surveys were started 30 minutes before sunrise and continued until marsh birds ceased calling, but never continued later than 10:00 am. Surveys ceased when wind speed was greater than 20 kilometers per hour. This was due to the impaired detection of birds due to noise from rustling vegetation. Surveys were not conducted during periods of sustained rain or heavy fog (Conway 2005).

Portable compact disc (CD) players with amplified speakers were used to broadcast calls of the four selected species. The CD consisted of 5 minutes of silence followed by 30 seconds of selected calls and 30 seconds of silence for each of the species. Specific calls used were "kicky-doo" and "grr" for black rail, "coo" and "kak" for least bittern, "grunt", "ticket", and "kicker" for Virginia rail, and "clatter", "kek", and "kek-burr" for clapper rail. Calls were played at a volume of 80-90 decibels measured 1 meter from the speakers. Birds encountered before or after the official 9-minute survey period were also

noted on the survey form (Attachment 1). Surveys in Topock Gorge were done by motorized boat and surveys at Hart Mine Marsh were done by kayak or on foot. The surveys at the Section 10 Backwater and at Butler and McAllister lakes were done on foot.

Maps of the survey sites showing the general location of the birds encountered were marked and Universal Transverse Mercator (UTM) coordinates were taken using a global positioning system (GPS) unit of the survey points.

Results

Surveys were conducted on 22 March, 18 April, and 18 May 2006 at the Section 10 backwater (Figure 2). None of the targeted marsh bird species were encountered, but yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) were found to be nesting in the cattails of the backwater.

Surveys in Topock Gorge were conducted on 21-24 March, 25-26 April, and 16-17 May (Figure 1). Yuma clapper rails were detected during all three surveys. In March, 20 clapper rails were detected along with 8 least bitterns, 20 Virginia rails, 2 soras, and 9 pied-billed grebes. During the April surveys, 19 clapper rails were detected as were 15 least bitterns, 7 Virginia rails, 1 sora, and 7 pied-billed grebes. The May surveys yielded 30 clapper rails, 37 least bitterns, 8 Virginia rails, 1 sora, and 54 pied-billed grebes.

At the Hart Mine Marsh, surveys were conducted on 21 March, 19 April, and 23 May (Figure 2). Two clapper rails were detected during the April survey. During the May survey, 2 clapper rails were detected as were 2 least bitterns. These were the only targeted marsh bird species detected.

Two surveys were conducted at both Butler Lake and McAllister Lake on 18 April and 9 May (Figure 2). During the April survey, 2 least bitterns and 1 pied-billed grebe were detected at Butler Lake. During the May survey, 1 least bittern and 1 pied-billed grebe were detected at Butler Lake. Surveys at McAllister Lake failed to detect any of the targeted species. California black rails were not detected during any of the surveys.

Discussion

The primary goal of a continental marsh bird monitoring program would be to estimate population changes in marsh birds (Conway and Nadeau 2005). Using broadcast vocalizations, Gibbs and Melvin (1993) found that three visits to a wetland were adequate to determine the presence or absence of all target species with 90% certainty. Up to 25% change in population abundance of waterbirds can be detected over a 10-year monitoring period by surveying 40-80 mini-routes on 2-3 occasions annually (Gibbs and Melvin 1997). Along the lower Colorado River at Mittry Lake (north of Yuma, Arizona),

Conway et al. (1993) used radiotelemetry in conjunction with playback recordings of Yuma clapper rail to determine detection rates. They determined that marked birds exhibited a year-round response rate of 19.2%. During the early breeding season in March and April, the response rate was 40%. During the late breeding season in May through July, the response rate was 20%. The surveys provide the minimum number of birds present during the survey periods.

This was the first year that the marsh bird survey protocol was used exclusively instead of the Yuma clapper rail survey protocol. Conway and Nadeau (2005) found that broadcasting calls of multiple species of marsh birds instead of just one species does not compromise the vocalization probability of any one species. They concluded that there should be no significant difference in Yuma clapper rail detections between the marsh bird surveys and clapper rail surveys. In 2005, Reclamation conducted both types of surveys to compare results and found no significant difference. The annual count of Yuma clapper rails in Arizona, California, Nevada, and Mexico is determined by recording the highest number of birds encountered for each route regardless of survey period (USFWS 2006). The number of Yuma clapper rails encountered in Topock Gorge from 1996 to 2006 showed an overall progressive increase, despite a decrease from 71 rails encountered in 2004 to 30 rails in 2006 (Figure 3).

Section 10 Backwater

There were no targeted species encountered at the Section 10 Backwater (Figure 2). The area is relatively small, consisting of two small marshes adjacent to but separate from the Colorado River. The marshes are 1.3 and 0.4 hectares (ha), respectively, with the larger marsh having an open backwater of 0.2 ha. The only marsh birds observed were American coots (*Fulica americana*) in April and May, and a cattle egret (*Bulbulcus ibis*) in May.

Topock Gorge

The California black rail was the only targeted species not encountered during surveys in Topock Gorge. The survey route in Topock Gorge runs from River Mile 233 to just past River Mile 218, a distance of 15.3 miles (24.6 kilometers). Marshes are located on both the California and Arizona sides of the river with the largest marsh complexes on the Arizona side just north and south of Blankenship Bend (River Mile 222.5).

Almost all the Yuma clapper rails encountered were in these large marsh complexes for all survey periods; this result is not unusual for this species. The number of Yuma clapper rails encountered, 30, was highest during the last survey period on 16-17 May. A higher number of rails encountered during the last survey period has occurred 7 out of the last 12 survey years (Figure 5).

Least bittern encounters increased with each survey, with the highest occurrence during the last survey period. In 2006, encounters were 8, 15, and 37 in March, April, and May,

respectively (Figure 1). In 2005, although marsh bird surveys were only conducted in April and May, the encounters were 20 and 33, respectively (Figure 1).

In 2006, the highest number of encounters with Virginia rails was during the first survey period (Figure 1). In 2005, 1 Virginia rail was encountered in April, and 6 were encountered in May. Virginia rails vocalize more frequently early in the breeding season according to Johnson and Dinsmore (1986), with the response rate to broadcasted calls higher during the postlaying period. Conway (1995) found that peak vocalizations in Arizona were in mid-April.

The sora is a common winter resident and transient between late July and early May. There are records for summer months but there is no evidence of breeding (Rosenberg et al.1991). The numbers of soras encountered were low. Two were encountered in March and 1 each in April and May (Figure 1). In 2005, 3 soras were encountered in April and none in May (Figure 1).

The pied-billed grebe is a locally common resident of the lower Colorado River Valley (Rosenberg et al. 1991). In 2006 and 2005, the highest numbers of encounters with the pied-billed grebe were recorded during the May survey period. There were 54 encounters in 2006 and 63 in 2005 (Figure 1). During the May survey periods, pied-billed grebes were distributed throughout the Topock Gorge survey area.

Hart Mine Marsh

The Yuma clapper rails encountered at Hart Mine Marsh consisted of 2 pairs. The pair encountered in April was at the southernmost survey point and the pair in May was at the most central survey point. These points are approximately 620 m apart. This indicates that there were at least 1 pair and possibly 2 pairs of clapper rails during 2006. During the May survey, 2 least bitterns were encountered at points approximately 500 m apart, indicating at least 2 least bitterns at Hart Mine Marsh.

Butler and McAllister Lakes

Least bitterns and pied-billed grebes were the only marsh birds encountered at Butler Lake (Figure 2). They were encountered during the surveys in April and May, and at the same survey points. The 2 least bitterns encountered in the May survey called from two different locations. They both responded to the broadcast calls with the “coo” call, which is used by males to advertise their presence (Gibbs et al. 1992).

Recommendations

Existing habitat should be continued as part of system-wide monitoring and at individual sites prior to creation of marshland habitat (LCR MSCP 2004).

The relationship between water levels in Topock Gorge and the amount of marsh area that is inundated or exposed should be investigated to determine whether there is a relationship between numbers of marsh birds and available habitat.

Analyze habitat characteristics where target marsh bird species are encountered on a consistent basis, including plant species composition and percentages, distance from detection points to shore and open waters, and depth of water. This information can be used in creation of marsh habitat.

Reclamation should coordinate with the USFWS in cataloging areas along the lower Colorado River that are being surveyed. Areas that are not currently being surveyed should be indentified and potentially surveyed in the future.

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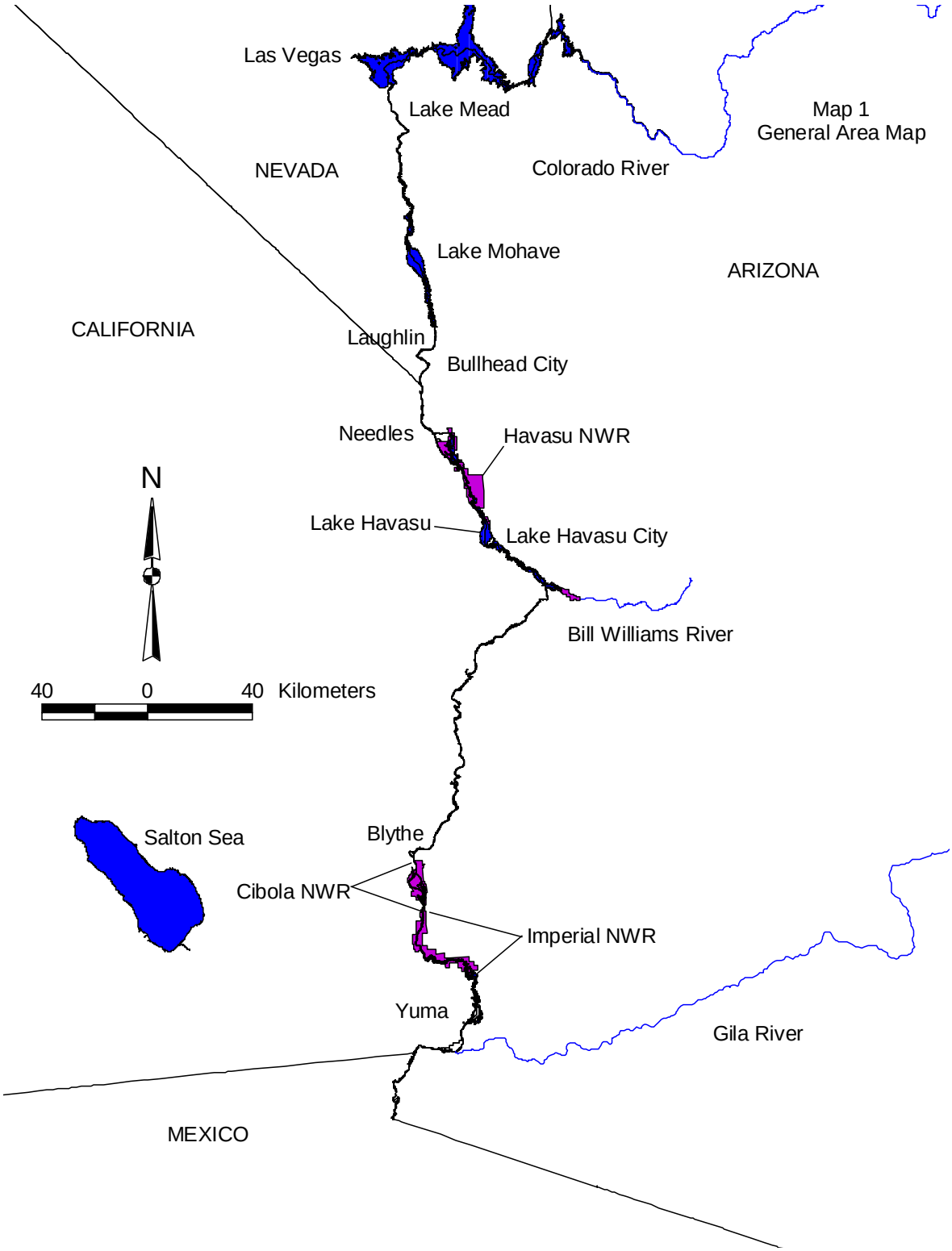
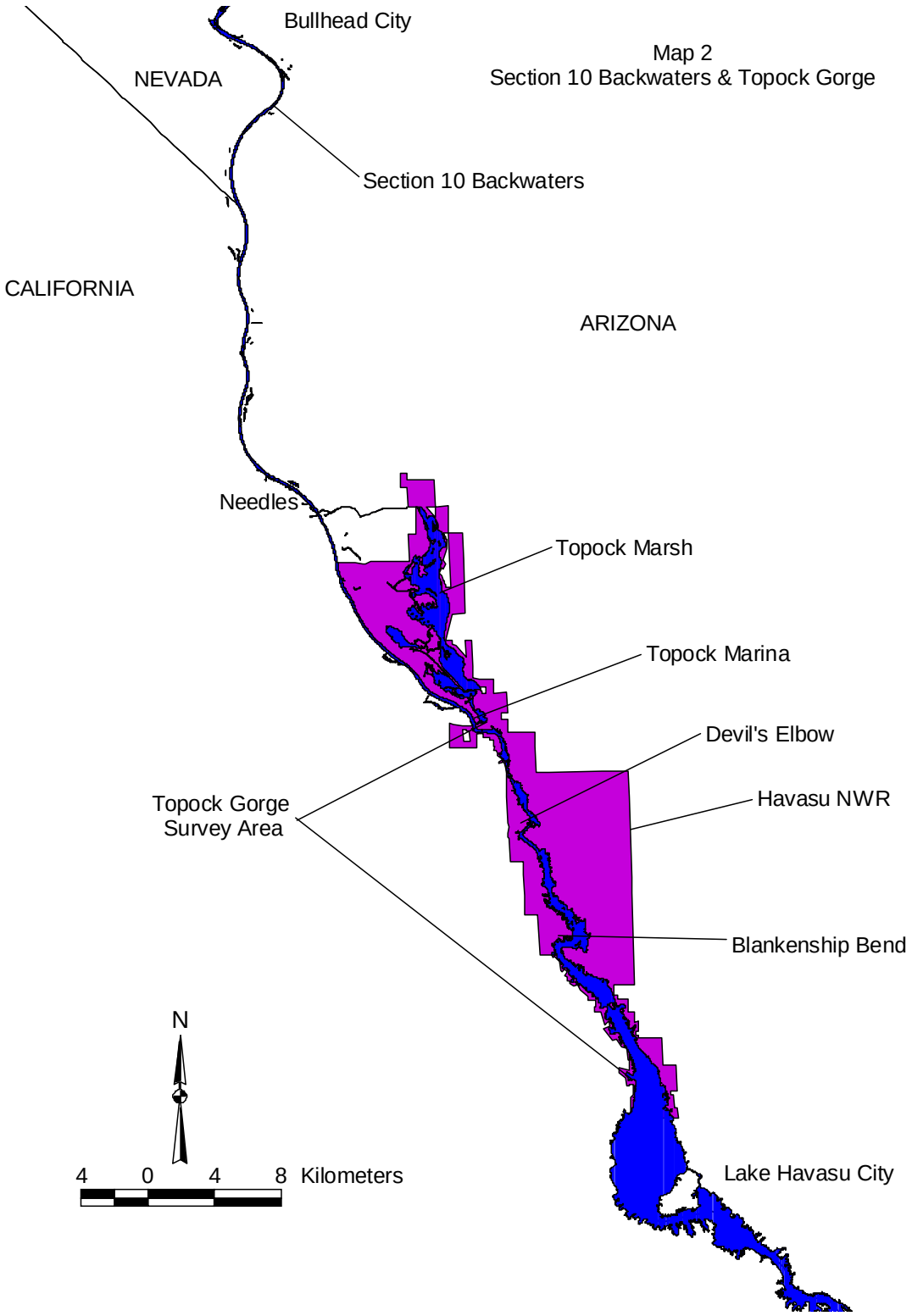
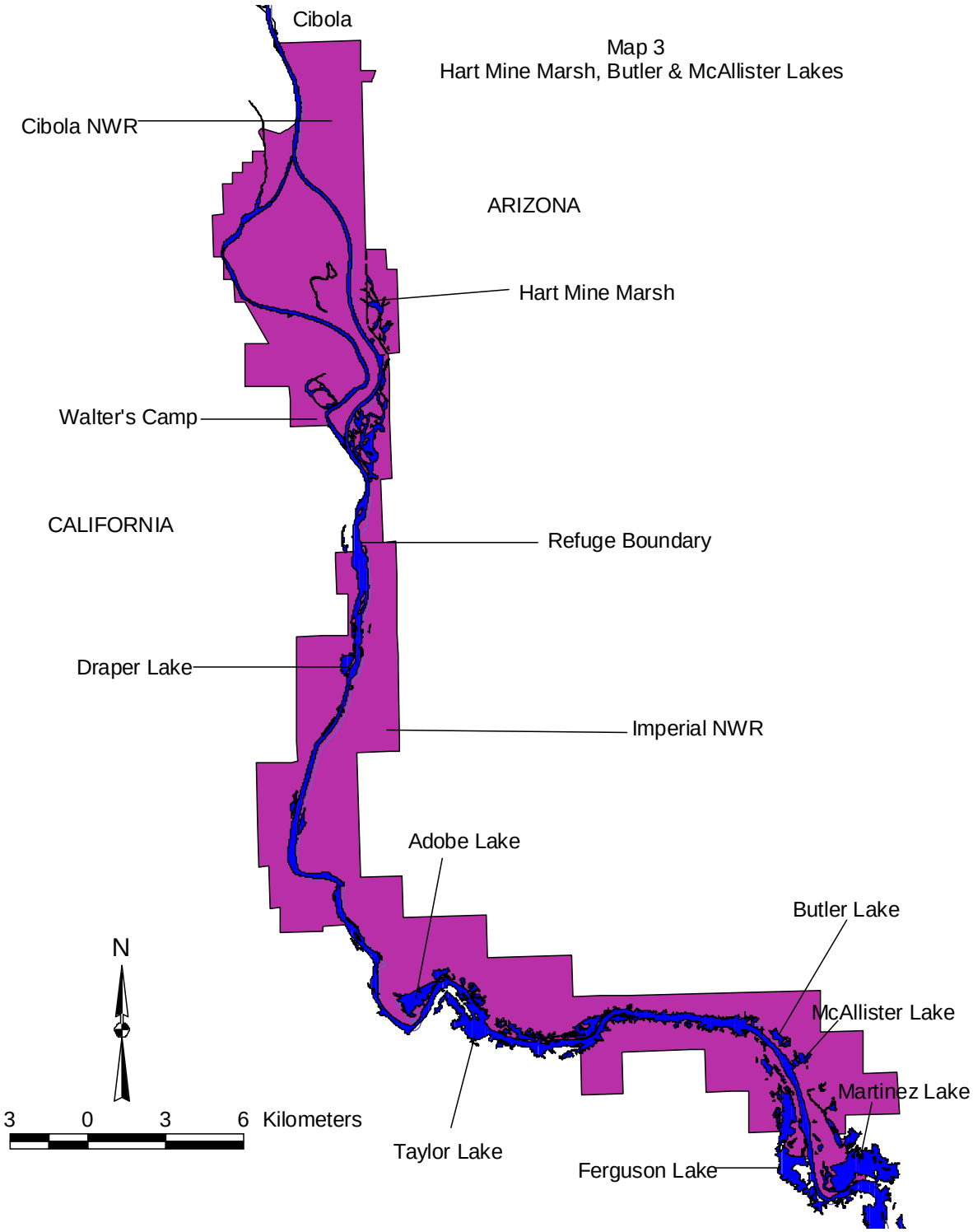


Map 1. General Area Map



Map 2. Section 10 Backwaters and Topock Gorge



Map 3. Hart Mine Marsh, Butler Lake and McAllister Lake

National Marsh Bird Monitoring Program Survey Data Sheet

Pg___of____

Date *(eg 10-May-04)* **:**

Name of marsh or route :

Observer(s) *(list all)** **:**

Survey replicate # :

	Before	After
Temperature *(°F)* **:**		
Wind speed *(mph)* **:**		
Cloud cover *(%)* **:**		
Precipitation *(see below)* **:**		

**list all observers in order of their contribution to the data collected*

put an "S" in the appropriate column if the bird was seen, a "1" if the bird was heard, and "1S" if both heard and seen

Station#	Start Time (military)	Background noise	Species	Responded During:											Call Type(s)	Direction	Distance (meters)	Detected at a Previous Point	Comments
				Before	Pass 0-1	Pass 1-2	Pass 2-3	Pass 3-4	Pass 4-5	BLRA 5-6	LEBI 6-7	VIRA 7-8	CLRA 8-9	After					
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Call Types: BLRA: *kicky-doo, grr, churt* CLRA: cltr, kburr, kek, khurrah LEBI: *coo, kak, ert* VIRA: *grunt, ticket, kicker*

If the call type is not one of the above listed types, describe the call in the comments column

Precipitation: light rain, rain, heavy rain, light snow, snow, heavy snow, fog, none

Background noise: 0 *no noise* 1 *faint noise* 2 *moderate noise (probably can't hear some birds beyond 100m)*
3 *loud noise (probably can't hear some birds beyond 50m)* 4 *intense noise (probably can't hear some birds beyond 25m)*

Attachment 1

Survey Data Sheet

Results of Marsh Bird Surveys
Topock Gorge, Havasu NWR
2005-2006

	April 20-22, 2005						May 19-20, 2005						March 21-24, 2006						April 25-26, 2006						May 16-17						
Point #	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	Point #
1							0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3
4	0	0	0	0	0	1	0	2		1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	4
5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	5
6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
7	0	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
8	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8
9	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	9
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	10
11	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	11
12	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	12
13	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	13
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	14
15	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	15
16	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	0	0	0	0	0	1	0	1	16
17	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	0	1	0	1	0	1	17
18	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2	18
19	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	1	0	0	3	0	0	2	0	0	1	0	0	0	0	2	19
20	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	20
21	0	0	0	0	0	1	4	2	0	1	0	3	1	0	0	0	0	1	0	0	0	0	0	0	2	2	0	0	0	4	21
22	0	1	0	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	1	0	2	22
23	2	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	4	23
24	0	0	0	0	0	1	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	24
25	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
26	2	0	0	0	0	2	0	0	0	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	26
27	0	0	0	0	0	2	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	27
28	1	0	0	0	0	0	0	0	0	0	0	1	4	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	28
29	0	0	0	0	0	2	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	29
30	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	30
31	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	31
32							0	3	0	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	1	0	32
33							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	33
34	0	0	0	0	0	0	1	0	0	0	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	34
35	0	2	0	0	1	2	0	1	0	0	0	3	0	2	0	0	0	0	2	1	0	0	0	2	3	0	0	1	0	0	35
36	2	0	0	0	0	0	1	0	0	1	0	1	1	1	0	3	0	1	1	0	0	0	0	0	0	0	0	2	0	0	36
37	0	0	0	0	0	0	5	0	0	0	0	0	1	0	0	0	1	1	1	0	0	0	0	2	0	0	0	1	0	0	37
38	0	1	0	0	0	0	5	0	0	0	0	3	0	1	0	3	0	0	1	0	0	0	0	0	7	0	0	0	0	0	38
39							0	4	0	0	0	2	1	1	0	0	0	1	1	2	0	1	1	1	0	1	0	0	0	0	39
40	0	1	0	0	0	2	0	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	40
41	0	0	0	0	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	3	41
42	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	2	42
43	6	1	0	0	0	0	2	2	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	2	43
44	2	0	0	0	0	1	0	0	0	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	1	4	0	0	0	2	44
45	0	0	0	1	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	45
46	4	4	0	0	1	2	0	2	0	0	0	6	3	0	0	0	0	0	0	1	0	0	0	1	0	5	0	0	0	2	46
47	2	1	0	0	0	0	0	1	0	0	0	2	0	0	0	1	0	0							0	0	0	0	0	2	47
48	0	1	0	0	1	0	2	0	0	0	0	0	0	0	0	1	0	0	3	0	0	0	0	0	2	0	0	0	0	0	48
49	2	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	49
50	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5	50
51	0	0	0	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	51
52	1	2	0	0	0	2	2	0	0	1	0	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	52
Totals	24	20	0	1	3	37	32	33	0	6	0	63	20	8	0	20	2	9	19	15	0	7	1	7	30	37	0	8	1	54	Totals

YCRA - Yuma clapper rail
LEBI - least bittern
BLRA - black rail
VIRA - Virginia rail
SORA - sora rail
PBGR - pied-billed grebe

Figure 1

Note: Blank spaces indicate no visit made during survey

Marshbird Survey Results - 2006
Butler and McAllister Lakes, Hart Mine Marsh, Section 10 Backwater

		Butler & McAllister Lakes - Imperial NWR					
Date	Point	YCRA	LEBI	BLRA	VIRA	SORA	PBGR
4.18.06	BU 1	0	0	0	0	0	0
	BU 2	0	2	0	0	0	1
	MC 1	0	0	0	0	0	0
	MC 2	0	0	0	0	0	0
Totals		0	2	0	0	0	1
05.06.06	BU 1	0	0	0	0	0	0
	BU 2	0	1	0	0	0	1
	MC 1	0	0	0	0	0	0
	MC 2	0	0	0	0	0	0
Totals		0	1	0	0	0	1

		Hart Mine Marsh - Cibola NWR					
Date	Point	YCRA	LEBI	BLRA	VIRA	SORA	PBGR
03.21.06	H1	0	0	0	0	0	0
	H2	0	0	0	0	0	0
	H3	0	0	0	0	0	0
	H4	0	0	0	0	0	0
	H5	0	0	0	0	0	0
	H6	0	0	0	0	0	0
	H7	0	0	0	0	0	0
	H8	0	0	0	0	0	0
Totals		0	0	0	0	0	0
04.19.06	H1	0	0	0	0	0	0
	H2	0	0	0	0	0	0
	H3	0	0	0	0	0	0
	H4	0	0	0	0	0	0
	H5	0	0	0	0	0	0
	H6	0	0	0	0	0	0
	H7	0	0	0	0	0	0
	H8	2	0	0	0	0	0
Totals		2	0	0	0	0	0
05.23.06	H1	2	0	0	0	0	0
	H2	0	1	0	0	0	0
	H3	0	0	0	0	0	0
	H4	0	0	0	0	0	0
	H5	0	0	0	0	0	0
	H6	0	1	0	0	0	0
	H7	0	0	0	0	0	0
	H8	0	0	0	0	0	0
Totals		2	2	0	0	0	0

		Section 10 Backwater					
Date	Point	YCRA	LEBI	BLRA	VIRA	SORA	PBGR
03.22.06	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	4	0	0	0	0	0	0
	5	0	0	0	0	0	0
Totals		0	0	0	0	0	0
04.18.06	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	4	0	0	0	0	0	0
	5	0	0	0	0	0	0
Totals		0	0	0	0	0	0
05.18.06	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	4	0	0	0	0	0	0
	5	0	0	0	0	0	0
Totals		0	0	0	0	0	0

YCRA - Yuma clapper rail
LEBI - least Bittern
BLRA - black rail
VIRA - Virginia rail
SORA - sora rail
PBGR - pied-billed grebe

Figure 2

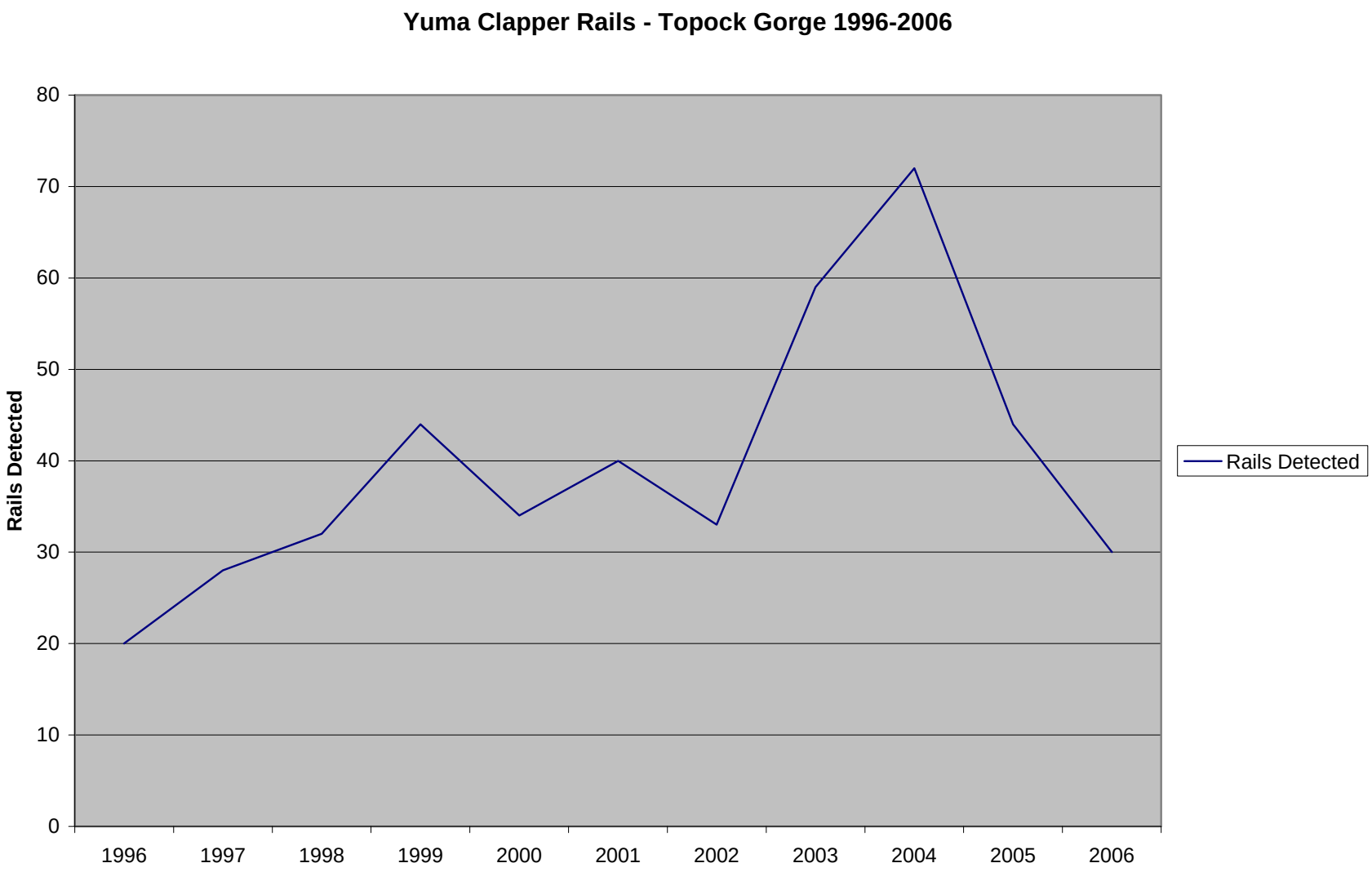
Yuma Clapper Rails - Topock Gorge 1996-2006
Rails Detected
80
70
60
50
40
30
20
10
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
Rails Detected

Figure 3

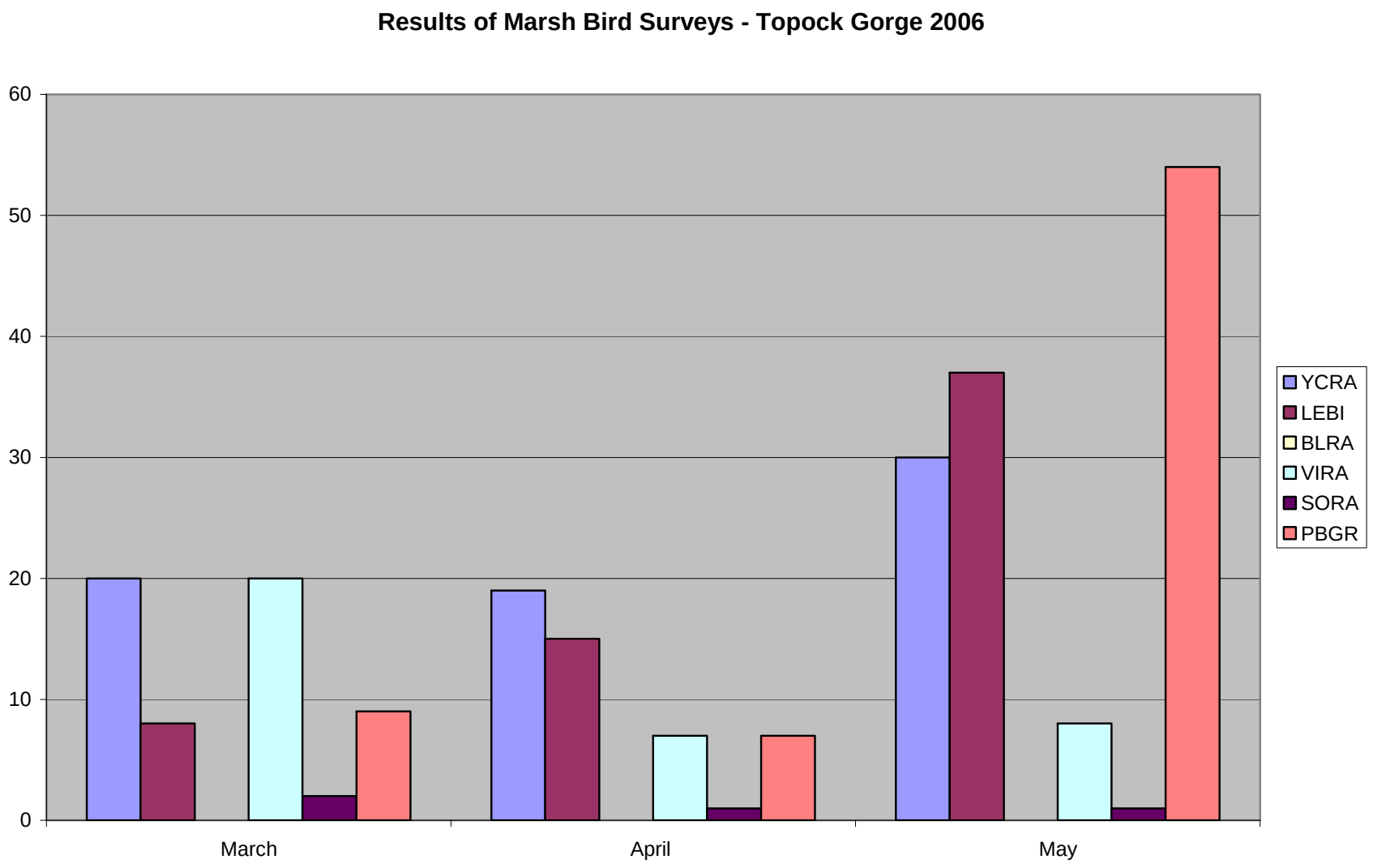
Results of Marsh Bird Surveys - Topock Gorge 2006
60
50
40
30
20
10
0
March
April
May
YCRA
LEBI
BLRA
VIRA
SORA
PBGR

Figure 4

Encounters of Yuma Clapper Rail
Yuma Clapper Rail Surveys 1996-2005
Topock Gorge, Havasu NWR

SITE #	Apr-96	May-96	Apr-97	May-97	Apr-98	May-98	Apr-99	May-99	Mar-00	Apr-00	May-00	Mar-01	Apr-01	May-01	Mar-02	Apr-02	May-02	Mar-03	Apr-03	May-03	Mar-04	Apr-04	May-04	Mar-05	Apr-05	May-05	Mar-06	Apr-06	May-06	SITE #
1	0	0	0	0	0	0	1	2	0	0	0	2	1	2	0	0	0	1	0	2	0	0	1	0	0	0	0	1	0	1
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	1	2	2	0	2	0	0	0	0	3
4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	7
8	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	2	3	0	1	2	0	0	0	9
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	10
11	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	2	0	0	1	0	0	0	0	11
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1	2	3	1	0	0	12
13	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	13
14	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	15
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	16
17	0	0	0	0	3	1	4	3	0	0	0	0	1	1	1	0	2	1	4	1	2	1	1	1	0	0	1	1	0	17
18	0	2	0	0	0	1	1	0	0	2	1	1	1	1	0	0	1	1	1	0	5		0	7	0	2	0	1	0	18
19	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	1	2	0	2	2	3	0	3	1	19
20	0	0	0	1	1	1	0	2	0	2	1	0	1	2	1	0	1	1	2	4	2	0	0	0	0	0	0	0	0	20
21	3	4	1	2	1	1	1	0	0	1	2	5	4	3	4	0	3	3	4	4	6	4	3	3		6	1	0	2	21
22	0	2	2	1	2	0	1	3	3	4	0	4	1	4	0	2	3	4	4	5	3	3	2	1	2	2	0	3	0	22
23	3	0	0	1	1	0	1	1	0	1	0	0	0	0	0	0	1	0	1	2	0	5	2	1	2	3	0	0	1	23
24	3	1	0	1	1	0	0	0	0	1	5	2	2	0	0	0	1	0	1	0	0	0	1	2	1	1	0	0	1	24
25	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	25
26	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	1	2	0	0	0	0	0	0	2	26
27	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	27
28	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	2	2	0	0	1	0	0	0	4	0	0	28
29	0	0	0	1	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1	0	0	29
30	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	30
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	31
32	1	0	0	0	2	1	0	2	0	0	1	0	3	0	0	0		0	0	0	0	0	2		0	0	2	0	0	32
33	3	2	2	2	0	1	5	3	0	0	1	0	0	0	0	2	1	1	0	0	0	0	3		0	0	0	0	0	33
34	0	2	1	0	1	1	1	1	0	0	0	0	3	3	0	2	0	0	1	0	1	0	0	0	0	1	2	0	0	34
35	2	0	0	1	3	1	5	1	8	0	0	1	2	1	0	0	2	5	3	2	6	2	5	0	1	0	0	2	3	35
36	1	1	1	1	0	2	2	6	3	1	1	2	0	0	0	2	0	1	3	0	6	1	4	2	0	4	1	1	0	36
37	2	2	0	0	2	1	1	4	0	0	0	3	2	2	0	1	0	2	3	3	0	0	0	2	2	1	1	1	0	37
38	0	0	1	3	2	3	2	3	1	1	0	1	3	3	0	7	4	4	5	5	6	2	1	4	5	2	0	1	7	38
39	1	0	0	2	1	0	0	4	0	1	0	1	1	0	0	2	0	1	2	2	2	1	4	0	2	0	1	1	0	39
40	0	0	1	0	0	1	2	1	2	2	2	0	0	1	1	1	3	4	2	2	1	0	6	1	1	0	0	0	0	40
41	0	2	1	1	0	3	1	0	5	1	1	1	1	4	0	0	5	1	1	0	0	1	8	0	0	0	0	0	3	41
42	0	0	2	2	3	3	2	0	0	1	2	2	1	3	4	3		2	2	0	2	0	3	2	1	0	0	0	3	42
43	1	1	1	2	2	3	0	1	0	3		0	0	3	0	0	0	1	1	3	0	5	0	4	1	7	0	0	1	43
44	0	0	2	2	0	2	1	3	0	0	0	0	0	0	0	0	0	2	2	3	1	2	2	1	1	2	0	0	1	44
45	0	0		0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	1	0	1	0	3		1	2	0	0	0	45
46	0	0	0	1	0	1	0	0		2	2	0	0	0	0	2	0	3	1	0		3	0		1	0	3	0	0	46
47		0	1	1	1	1	0	0	1	0	0	0	2	0	0	0	1	2	2	0	1	1	0	2	0	0	0		0	47
48		0	0	1	1	0	0	1	3	1	2	0	4	2	0	1	0	1	0	3	1	1	0	1	0	2	0	3	2	48
49		0	1	0	1	0	1	1	2	2	0	0	0	1	0	1	0	4	0	2	1	1	0	1	2	0	0	0	2	49
50			0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0		0	0	0	0	0	1	0	0	0	50
51			3	1	1	0	3	1	2	2	2	2	1	3	2	0	1	3	4	2	0	0	4	2	1	0	0	0	0	51
52				0	0	0	0	0	1	3	2	0	0	0	0	0	0	2	2	2	3	0	5	1	2	0	0	1	0	52
TOTAL	20	19	20	28	32	29	41	44	31	34	27	30	36	40	17	27	33	55	59	54	57	47	71	43	38	44	20	19	30	TOTAL

Note: Blank spaces indicate no visit during survey period.

Figure 5