



Lower Colorado River Multi-Species Conservation Program

Balancing Resource Use and Conservation

Marsh Bird Surveys 2009



January 2010

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National Park Service
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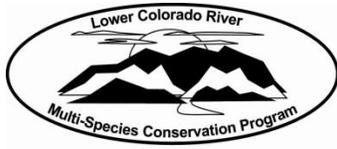
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Lower Colorado River Multi-Species Conservation Program

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ACRONYMS AND ABBREVIATIONS

CD compact disc

km kilometer(s)

LCR MSCP Lower Colorado River Multi-Species Conservation Program

NWR National Wildlife Refuge

Reclamation Bureau of Reclamation

USFWS U.S. Fish and Wildlife Service

Symbols

% percent

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ABSTRACT

In 2009, surveys for marsh birds were conducted by the Lower Colorado River Multi-Species Conservation Program along portions of the lower Colorado River and adjacent backwaters, lakes, and marshes (see maps 1-3). Surveys were conducted during March, April, and May. Least bittern (*Ixobrychus exilis*) and Virginia rails (*Rallus limicola*) were detected at the Big Bend Conservation Area. In Topock Gorge, Yuma clapper rails (*R. longirostris yumanensis*), California black rail (*Lateralus jamaicensis coturniculus*), least bitterns, and Virginia rails were detected. Least bitterns were also detected at the Laguna Burn Site.

INTRODUCTION

Conservation measures for the Habitat Conservation Plan of the Lower Colorado River Multi-Species Conservation Program (LCR MSCP) provide for surveys of the Yuma clapper rail (*Rallus longirostris yumanensis*), California black rail (*Laterallus jamaicensis coturniculus*), and least bittern (*Ixobrychus exilis*) (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 U.S. Department of the Interior (U.S. Department of the Interior 1967). The species 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 special concern (USFWS 1995). In California, this species is listed as threatened and is listed as a species of special concern in Arizona (Arizona Game and Fish Department 2002; California Department of Fish and Game 2006).

The least bittern is a species of special concern in Arizona and California (Arizona Game and Fish Department 2001; Sterling 2008). It is listed by the USFWS as a migratory nongame bird of management concern (USFWS 1995).

BACKGROUND

The Bureau of Reclamation (Reclamation) began conducting surveys in the Topock Gorge portion of the Havasu National Wildlife Refuge (NWR) in 1996 using a protocol specifically for Yuma clapper rail. These surveys were part of a basin-wide multi-partner effort to monitor the population of Yuma clapper rails 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 onetime basin-wide survey; no black rails were found in Topock Gorge or Topock Marsh (Conway et al. 2002). Since 2006, Reclamation has participated in the National Marsh Bird Monitoring Program (<http://ag.arizona.edu/research/azfwru/NationalMarshBird/index.htm>), which involves surveying several species simultaneously using taped recordings of the species calls (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.

SURVEY AREAS

The Big Bend Conservation Area is located south of Laughlin, Nevada, along the Colorado River. It is a small marsh/backwater that contains approximately 15 acres of backwater and 15 acres of upland. The predominant vegetation of the backwater is southern cattail (*Typha domingensis*). It is at the northern limit of Reach 3, and there are four survey points.

Topock Gorge is located along the lower Colorado River between Needles, California, and Lake Havasu City, Arizona, in the Havasu NWR, and is also located in Reach 3. The survey route is 15.3 miles (24.6 kilometers [km]) long. The predominant vegetation consists of California bulrush (*Schoenoplectus californicus*), southern cattail, and common reed (*Phragmites communis*) interspersed with stands of saltcedar (*Tamarix* sp.) and coyote willow (*Salix exigua*). There are 52 survey points in the Topock Gorge.

The Laguna Burn Site is in Reach 6. It is located just below Imperial Dam. It consists of 1.5 acres of open water, 5 acres of marsh, and 77 acres of upland vegetation, which recently burned. The predominant vegetation in the marsh is cattail (sp.). The survey area is in Arizona and has five survey points.

METHODS

Using a standardized protocol from the National Marsh Bird Monitoring Program, surveys for the California black rail, least bittern, Virginia rail, and Yuma clapper rail were performed between March 15 and May 31, 2009 (USFWS 2003; Conway 2005; USFWS 2006). Three surveys were conducted, and a standardized survey form was used to record the 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). Locations and numbers of pied-billed grebes (*Podilymbus podiceps*), soras (*Porzana Carolina*), and common moorhens (*Gallinula chloropus*) were also recorded, although they were not targeted species.

Surveys began 30 minutes before sunrise and continued until marsh birds ceased calling, but never continued later than 10:00 a.m. Surveys ceased when wind speed was greater than 20 km per hour due to the impaired detection of birds caused by noise from rustling vegetation. Surveys are 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). Maps of the survey sites showing the general location of the birds encountered were marked, and Universal Transverse Mercator coordinates were taken using a Global Positioning System for the survey sites. Surveys in Topock Gorge were conducted using a motorized boat; surveys at Big Bend Conservation Area and at the Laguna Burn Site were conducted on foot.

RESULTS

Surveys at Big Bend Conservation Area were conducted on March 27, April 23, and May 15, 2009 (figure 1). Two pied-billed grebes were detected in March. In April, one least bittern and two Virginia rails, one sora, and two pied-billed grebes were detected. One Virginia rail was detected in May.

Surveys in Topock Gorge were conducted March 17–20, April 14–17, and May 19–22, 2009 (figure 2). Yuma clapper rails were detected during all three surveys. In March, 54 clapper rails, 1 black rail, 11 least bitterns, 42 Virginia rails, 5 soras, 42 pied-billed grebes, and 2 common moorhens were detected during the survey period. During the April surveys, 35 clapper rails, 3 black rails, 16 least bitterns, 14 Virginia rails, 6 soras, 79 pied-billed grebes, and 10 common moorhens were detected. The May surveys resulted in detections of 57 clapper rails, 1 black rail, 33 least bitterns, 20 Virginia rails, 86 pied-billed grebes, and 10 common moorhens.

At the Laguna Burn Site, surveys were conducted on March 25, April 21, and May 13, 2009 (figure 1). The March survey produced three least bitterns, six soras, and one pied-billed grebe. One least bittern, six soras, and two pied-billed grebes were detected during the April survey. The survey in May produced one common moorhen (figure 1).

DISCUSSION

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 percent (%) certainty. Up to a 25% change in population abundance of water birds 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.

Marsh Bird Surveys 2009

(1993) used radio telemetry 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 and through July, the response rate was 20%. The surveys provide the minimum number of birds present during the survey periods.

Conway and Nadeau (2006) found that broadcasting calls of multiple species of marsh birds does not compromise the vocalization probability of any one species. Beginning in 2006, Reclamation adopted the multi-species survey method for all marsh bird surveys on the lower Colorado River. This information is provided to the National Marsh Bird Monitoring Program database. The goal of this program is to estimate population changes in marsh birds using standardized, repeatable survey methods (Conway and Nadeau 2006).

Big Bend Conservation Area

The April survey was the most productive of the three surveys. This was the only survey that detected one of the target species, a least bittern. A species list of all birds observed while doing marsh bird surveys was maintained during each survey period (attachment 2). The most numerous of the bird species inhabiting the marsh were the yellow-headed blackbird (*Xanthocephalus xanthocephalus*). This is the first year that Reclamation has conducted surveys at this site since one survey was done in April 1999 in cooperation with Nevada Division of Wildlife (NDOW). None of the targeted species were detected during that particular survey.

Topock Gorge

All four of the targeted species were 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 km). 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). The survey in May was the only one in which all survey points were visited. Survey points not visited in March (3) and April (6) were due to low water levels or lack of time.

Surveys conducted in May had the highest detections for Yuma clapper rails, 57, and least bitterns, 33 (figure 2). The highest detections of Virginia rails, 42, were during the March survey period (figure 2). Black rail detections were the highest in April, with three. This is the first year that black rail were detected during all three survey periods—one in March, three in April, and one in May. The first detections of black rail in Topock Gorge were in March and April 2007,

one each. There were no detections during 2008. The number of clapper rails detected in May, 57, is almost identical to March 2008's high of 58 and close to the 61 detected in 2007. The highest number of clapper rails detected in Topock Gorge by Reclamation was 71 during the May 2004 survey period (figures 3 and 4).

During the 2009 survey season, clapper rails were detected at 38 sites, black rails at 4 sites, least bitterns at 28 sites, and Virginia rails at 34 sites.

Clapper rails, Virginia rails, and pied-billed grebes were found throughout Topock Gorge. Least bitterns and common moorhens were found primarily south of Devil's Elbow. Soras were encountered above Blankenship Bend and below Castle Rock. One black rail was encountered above Blankenship Bend, while the others were between Blankenship Bend and Castle Rock. One survey point yielded a black rail in both March and April.

Figure 3 lists results by survey point, and map 3 shows the main survey areas. Survey points 1–7 are above Devil's Elbow, and survey point 8 is at Devil's Elbow. The survey points for the Blankenship Bend area are 21–28. Castle Rock is adjacent to survey points 40, 41, and 52. Points 42–51 are below Castle Rock.

A species list of birds observed while doing marsh bird surveys was maintained during each survey period (attachment 3).

Laguna Burn Site

Least bitterns, soras, and pied-billed grebes were encountered during marsh bird surveys in March and April. The May survey had the least amount of birds, with only one common moorhen encountered. A species list of birds observed and their numbers were maintained while doing marsh bird surveys during each survey period (attachment 4).

RECOMMENDATIONS

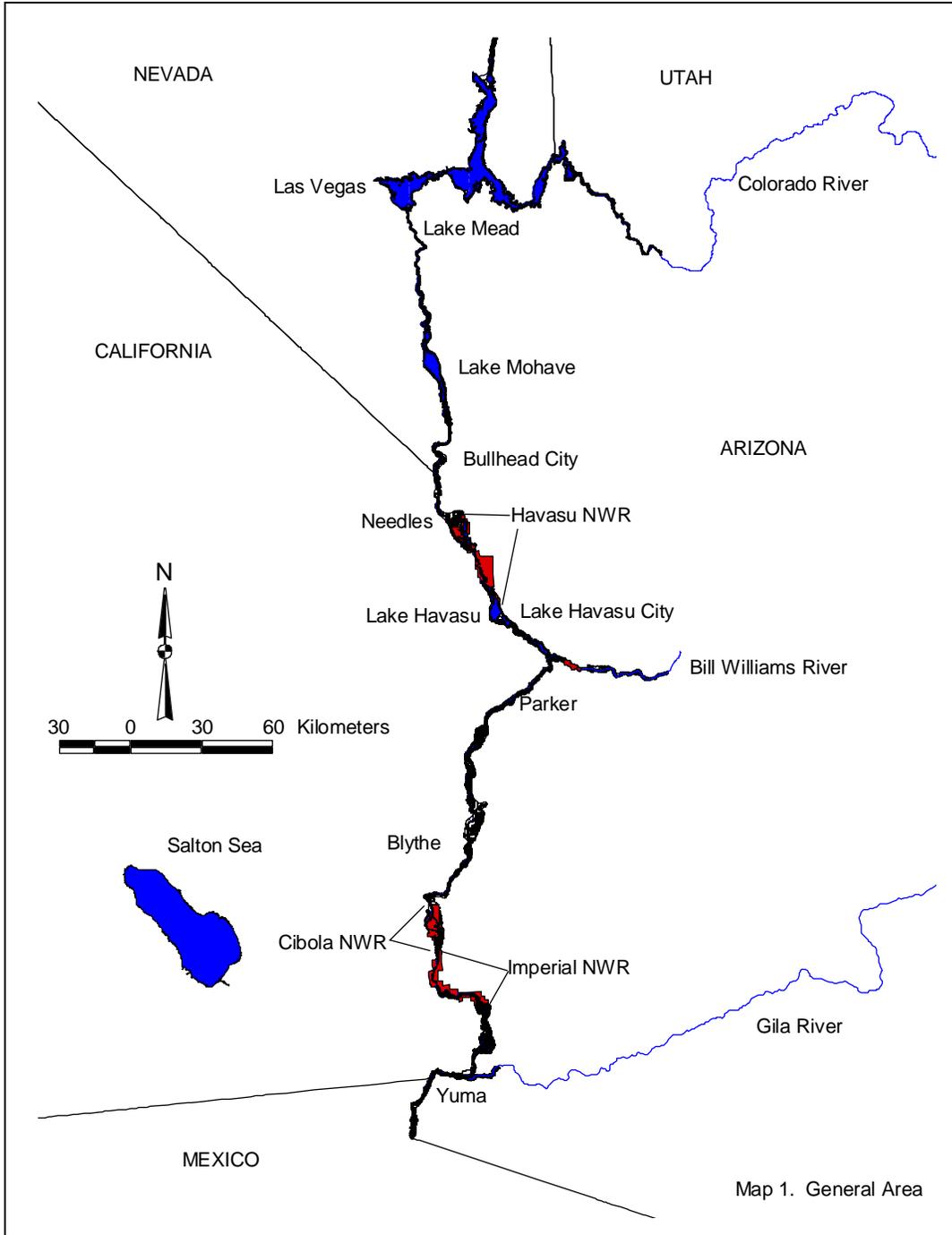
Surveys of existing habitat should be continued as part of system-wide monitoring and at individual sites prior to creation of marshland habitat (LCR MSCP 2004). These surveys are implemented each year as part of the LCR MSCP.

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.

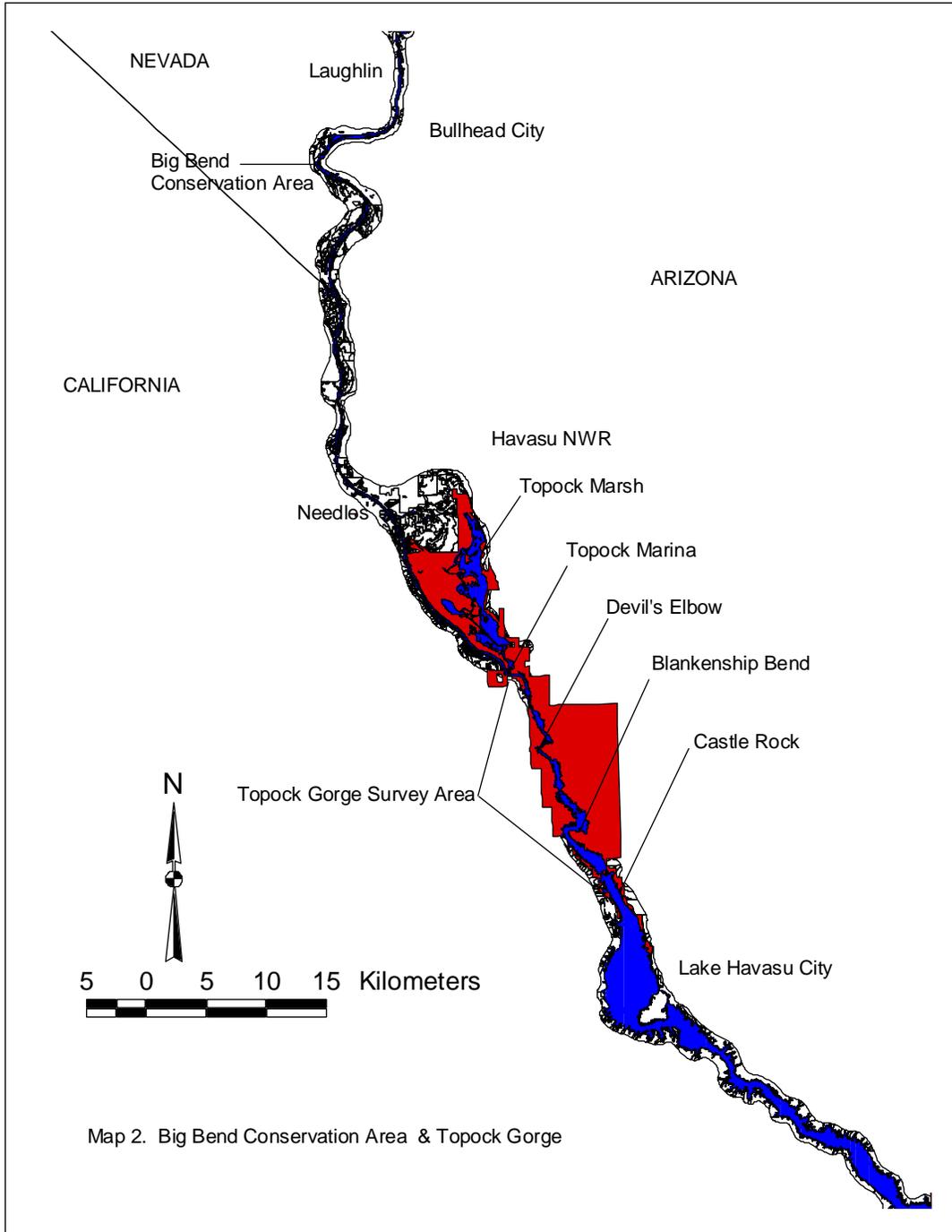
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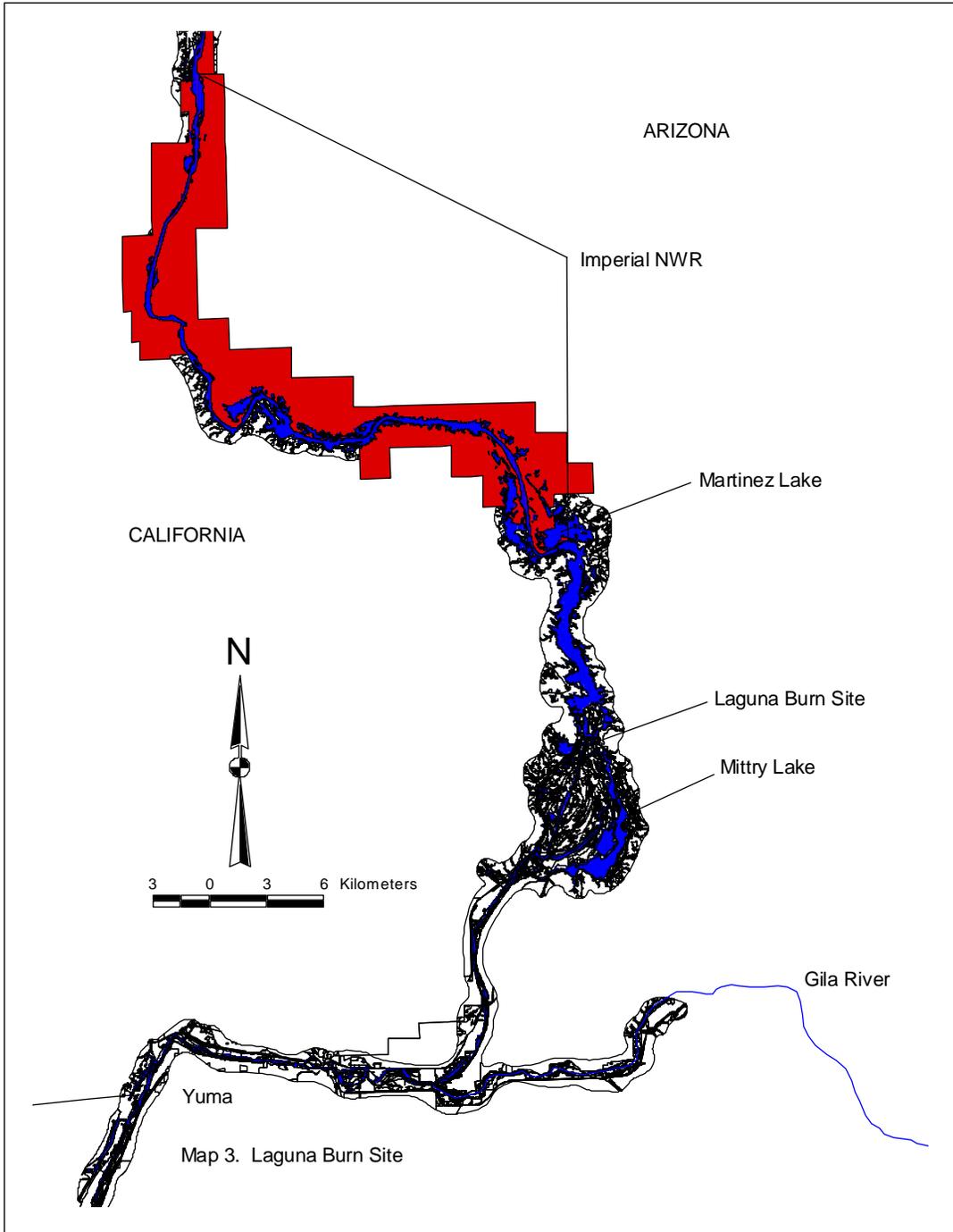
In June 2008, Reclamation entered into a Cooperative Agreement with the University of Arizona and the U.S. Geological Survey under the direction of Dr. Courtney Conway. Under this agreement, a study was initiated in a newly created marsh at Imperial National Wildlife Refuge. The study will document the growth of vegetation and its use by marsh birds over a 2-year period. The study will correlate the range of hydrologic conditions and plant associations preferred by black rails, clapper rails, and least bitterns as well as other marsh bird species encountered. Once the results of this study are final, the information will be used in the development of marsh habitat under the LCR MSCP. If additional information is needed, habitat characteristics where target marsh bird species are encountered on a consistent basis could be analyzed, including plant species composition and percentages, distance from detection point to shore and open waters, and depth of water.

Reclamation should continue to 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 identified and potentially surveyed in the future.



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ATTACHMENTS

- 1 National Marsh Bird Monitoring Program Survey Data Sheet
- 2 Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Big Bend Conservation Area
- 3 Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Top Gorge, Havasu National Wildlife Refuge
- 4 Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Laguna Burn Site

ATTACHMENT 1

ATTACHMENT 2

Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Big Bend Conservation Area

		March	April	May
mallard	<i>Anas platyrhynchos</i>			X
Gambel's quail	<i>Callipepla gambelii</i>		X	X
pieb-billed grebe	<i>Podilymbus podiceps</i>	X	X	
least bittern	<i>Ixobrychus exilis</i>		X	
turkey vulture	<i>Cathartes aura</i>	X	X	X
northern harrier	<i>Circus cyaneus</i>	X		
American kestrel	<i>Falco sparverius</i>			X
Virginia rail	<i>Rallus limicola</i>	X		
sora	<i>Porzana carolina</i>		X	
American coot	<i>Fulica americana</i>	X	X	X
Eurasian collared-dove	<i>Streptopelia decaocto</i>		X	
white-winged dove	<i>Zenaida asiatica</i>		X	X
mourning dove	<i>Zenaida macroura</i>	X	X	X
Anna's hummingbird	<i>Calypte anna</i>	X	X	X
black phoebe	<i>Sayornis nigricans</i>	X		X
Say's phoebe	<i>Sayornis saya</i>		X	
ash-throated flycatcher	<i>Myiarchus cinerascens</i>	X		
Bell's vireo	<i>Vireo bellii</i>			X
common raven	<i>Corvus corax</i>			X
tree swallow	<i>Tachycineta bicolor</i>	X		
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	X	X	X
cliff swallow	<i>Petrochelidon pyrrhonota</i>	X		
verdin	<i>Auriparus flaviceps</i>	X		
marsh wren	<i>Cistothorus palustris</i>	X	X	
black-tailed gnatcatcher	<i>Poliophtila melanura</i>	X	X	X
phainopepla	<i>Phainopepla nitens</i>	X	X	
Lucy's warbler	<i>Oreothlypis luciae</i>	X	X	X
yellow-rumped warbler	<i>Dendroica coronata</i>	X		
common yellowthroat	<i>Geothlypis trichas</i>	X	X	X
Wilson's warbler	<i>Wilsonia pusilla</i>			X
Abert's towhee	<i>Melospiza aberti</i>	X	X	X
song sparrow	<i>Melospiza melodia</i>	X	X	X
blue grosbeak	<i>Passerina caerulea</i>			X
red-winged blackbird	<i>Agelaius phoeniceus</i>	X	X	
yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	X	X	X
great-tailed grackle	<i>Quiscalus mexicanus</i>	X	X	X
brown-headed cowbird	<i>Molothrus ater</i>	X		
Bullock's oriole	<i>Icterus bullockii</i>			X
house finch	<i>Carpodacus mexicanus</i>	X	X	

ATTACHMENT 3

Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Topock Gorge, Havasu National Wildlife Refuge

		March	April	May
gadwall	<i>Anas strepera</i>	X	X	
American wigeon	<i>Anas americana</i>			X
mallard	<i>Anas platyrhynchos</i>	X	X	X
cinnamon teal	<i>Anas cyanoptera</i>	X	X	
northern shoveler	<i>Anas clypeata</i>	X		
northern pintal	<i>Anas acuta</i>	X	X	
green-winged teal	<i>Anas crecca</i>	X	X	
redhead	<i>Aythya americana</i>	X	X	X
ring-necked duck	<i>Aythya collaris</i>	X		X
lesser scaup	<i>Aythya affinis</i>			X
bufflehead	<i>Bucephala albeola</i>	X	X	
ruddy duck	<i>Oxyura jamaicensis</i>	X	X	
Gambel's quail	<i>Callipepla gambelii</i>	X	X	X
common loon	<i>Gavia immer</i>		X	
pieb-billed grebe	<i>Podilymbus podiceps</i>	X	X	X
eared grebe	<i>Podiceps nigricollis</i>	X	X	X
western grebe	<i>Aechmophorus occidentalis</i>		X	
American white pelican	<i>Pelecanus erythrorhynchos</i>		X	
brown pelican	<i>Pelecanus occidentalis</i>			X
double-crested cormorant	<i>Phalacrocorax auritus</i>	X	X	X
least bittern	<i>Ixobrychus exilis</i>	X	X	X
great blue heron	<i>Ardea herodias</i>	X	X	X
great egret	<i>Ardea alba</i>	X	X	
snowy egret	<i>Egretta thula</i>		X	
green heron	<i>Butorides virescens</i>		X	X
black-crowned night heron	<i>Nycticorax nycticorax</i>	X	X	X
white-faced ibis	<i>Plegadis chihi</i>	X	X	
turkey vulture	<i>Cathartes aura</i>	X	X	X
osprey	<i>Pandion haliaetus</i>	X	X	
bald eagle	<i>Haliaeetus leucocephalus</i>	X	X	
northern harrier	<i>Circus cyaneus</i>	X	X	
red-tailed hawk	<i>Buteo jamaicensis</i>	X	X	X
American kestrel	<i>Falco sparverius</i>	X	X	
merlin	<i>Falco columbarius</i>		X	
peregrine falcon	<i>Falco peregrinus</i>	X		
California black rail	<i>Latterallus jamaicensis coturnulus</i>	X	X	X
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	X	X	X
Virginia rail	<i>Rallus limicola</i>	X	X	X
sora	<i>Porzana carolina</i>	X	X	
common moorhen	<i>Gallinula chloropus</i>	X	X	X
American coot	<i>Fulica americana</i>	X	X	X
killdeer	<i>Charadrius vociferus</i>	X		
American avocet	<i>Recurvirostra americana</i>		X	X
marbled godwit	<i>Limosa fedoa</i>	X		
least sandpiper	<i>Calidris minutilla</i>		X	
Wilson's snipe	<i>Gallinago delicate</i>	X		
ring-billed gull	<i>Larus delawarensis</i>	X		

Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Topock Gorge, Havasu National Wildlife Refuge (continued)

		March	April	May
Caspian tern	<i>Hydroprogne caspia</i>		X	X
rock pigeon	<i>Columba livia</i>	X	X	X
white-winged dove	<i>Zenaida asiatica</i>		X	X
mourning dove	<i>Zenaida macroura</i>	X	X	X
greater roadrunner	<i>Geococcyx californianus</i>		X	
great-horned owl	<i>Bubo virginianus</i>	X	X	
lesser nighthawk	<i>Chordeiles acutipennis</i>		X	X
white-throated swift	<i>Aeronautes saxatalis</i>		X	
belted kingfisher	<i>Megaceryle alcyon</i>	X	X	
ladder-backed woodpecker	<i>Picoides scalaris</i>	X	X	X
northern flicker	<i>Colaptes auratus</i>	X		
Say's phoebe	<i>Sayornis saya</i>		X	
ash-throated flycatcher	<i>Myiarchus cinerascens</i>	X	X	X
western kingbird	<i>Tyrannus verticalis</i>			X
Bell's vireo	<i>Vireo bellii</i>	X	X	X
common raven	<i>Corvus corax</i>	X	X	X
tree swallow	<i>Tachycineta bicolor</i>	X	X	
violet-green swallow	<i>Tachycineta thalassina</i>		X	X
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	X	X	X
bank swallow	<i>Riparia riparia</i>	X		
cliff swallow	<i>Petrochelidon pyrrhonota</i>	X	X	X
barn swallow	<i>Hirundo rustica</i>		X	
verdin	<i>Auriparus flaviceps</i>	X	X	X
cactus wren	<i>Campylorhynchus brunneicapillus</i>	X		X
canyon wren	<i>Salpinctes obsoletus</i>	X	X	X
Bewick's wren	<i>Thryomanes bewickii</i>	X	X	
house wren	<i>Troglodytes aedon</i>	X	X	
marsh wren	<i>Cistothorus palustris</i>	X	X	X
black-tailed gnatcatcher	<i>Polioptila melanura</i>	X		X
American robin	<i>Turdus migratorius</i>	X		
northern mockingbird	<i>Mimus polyglottos</i>			X
phainopepla	<i>Phainopepla nitens</i>	X	X	
Lucy's warbler	<i>Oreothlypis luciae</i>		X	X
yellow warbler	<i>Dendroica petechia</i>			X
yellow-rumped warbler	<i>Dendroica coronata</i>	X		
common yellowthroat	<i>Geothlypis trichas</i>	X	X	X
yellow-breasted chat	<i>Icteria virens</i>			X
summer tanager	<i>Piranga rubra</i>		X	
western tanager	<i>Piranga ludoviciana</i>			X
spotted towhee	<i>Pipilo maculatus</i>	X		
Abert's towhee	<i>Melospiza aberti</i>	X	X	X
song sparrow	<i>Melospiza melodia</i>	X	X	X
red-winged blackbird	<i>Agelaius phoeniceus</i>	X	X	X
yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	X	X	X
great-tailed grackle	<i>Quiscalus mexicanus</i>	X	X	X

**Birds Observed or Encountered during Marsh Bird Surveys in 2009 – Topock Gorge,
Havasu National Wildlife Refuge (continued)**

		March	April	May
brown-headed cowbird	<i>Molothrus ater</i>	X	X	
Bullock's oriole	<i>Icterus bullockii</i>			X
brown-headed cowbird	<i>Molothrus ater</i>	X	X	
house finch	<i>Carpodacus mexicanus</i>	X	X	X

ATTACHMENT 4

**Birds Observed or Encountered during Marsh Bird Surveys in 2009
Laguna Burn Site**

		March	April	May
Gambel's quail	<i>Callipepla gambelii</i>			X
pied-billed grebe	<i>Podilymbus podiceps</i>	X	X	
double-crested cormorant	<i>Phalacrocorax auritus</i>	X		
least bittern	<i>Ixobrychus exilis</i>	X	X	
great blue heron	<i>Ardea herodias</i>	X	X	X
great egret	<i>Ardea alba</i>	X	X	
snowy egret	<i>Egretta thula</i>			X
green heron	<i>Butorides virescens</i>			X
osprey	<i>Pandion haliaetus</i>	X		X
American kestrel	<i>Falco sparverius</i>			X
sora	<i>Porzana Carolina</i>	X	X	
common moorhen	<i>Gallinula chloropus</i>			X
American coot	<i>Fulica americana</i>	X	X	X
killdeer	<i>Charadrius vociferous</i>	X	X	
rock pigeon	<i>Columba livia</i>	X	X	
white-winged dove	<i>Zenaida asiatica</i>		X	X
mourning dove	<i>Zenaida macroura</i>	X	X	X
lesser nighthawk	<i>Chordeiles acutipennis</i>		X	X
black-chinned hummingbird	<i>Archilochus alexandri</i>	X		
Anna's hummingbird	<i>Calypte anna</i>	X		
ladder-backed woodpecker	<i>Picoides scalaris</i>	X	X	X
black phoebe	<i>Sayornis nigricans</i>		X	X
Say's phoebe	<i>Sayornis saya</i>	X	X	X
ash-throated flycatcher	<i>Myiarchus cinerascens</i>	X	X	X
western kingbird	<i>Tyrannus verticalis</i>		X	X
tree swallow	<i>Tachycineta bicolor</i>	X	X	
northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>		X	X
cliff swallow	<i>Petrochelidon pyrrhonota</i>			X
barn swallow	<i>Hirundo rustica</i>	X		X
marsh wren	<i>Cistothorus palustris</i>	X	X	X
European starling	<i>Sturnis vulgaris</i>		X	X
yellow warbler	<i>Dendroica petechia</i>			X
yellow-rumped warbler	<i>Dendroica coronata</i>	X		
common yellowthroat	<i>Geothlypis trichas</i>	X	X	X
Wilson's warbler	<i>Wilsonia pusilla</i>			X
yellow-breasted chat	<i>Icteria virens</i>			X
song sparrow	<i>Melospiza melodia</i>	X	X	X
red-winged blackbird	<i>Agelaius phoeniceus</i>	X		X
great-tailed grackle	<i>Quiscalus mexicanus</i>	X	X	X
brown-headed cowbird	<i>Molothrus ater</i>	X	X	
house finch	<i>Carpodacus mexicanus</i>		X	

Big Bend Conservation Area Marsh Bird Survey Results, 2009

March 27

April 23

May 15

Point #	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	
1	0	0	0	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
4															0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	2	0	0	1	0	2	1	2	0	0	0	0	1	0	0	0	0

YCRA – Yuma clapper rail
 BLRA – California black rail
 SORA – sora
 COMO – common moorhen

LEBI – least bittern
 VIRA – Virginia rail
 PBGR – pied-billed grebe



Aerial photo of marsh bird survey points at Big Bend Conservation Area.
 (Bureau of Reclamation photo)

Figure 1

Laguna Burn Site Marsh Bird Survey Results, 2009

March 25

April 21

May 13

Point #	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	
1	0	1	0	0	2	1	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	1
2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	2	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Totals	0	3	0	0	6	1	0	0	1	0	0	6	2	0	0	0	0	0	0	0	0	1



Aerial photo of marsh bird survey points at Laguna Burn Site, below Imperial Dam. (Taken several years before fire)

Figure 2

Topock Gorge Marsh Bird Survey Results, 2009

March 17–20

April 14–17

May 19–22

Point #	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	YCRA	LEBI	BLRA	VIRA	SORA	PBGR	COMO	Point #
1	1	0	0	0	1	1	0	1	0	0	0	0	2	0	1	1	0	0	0	1	0	1
2	0	0	0	0	0	2	0	1	0	0	0	0	4	0	1	0	0	0	0	4	0	2
3	2	1	0	1	1	2	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	3
4	2	0	0	1	0	2	0	1	1	0	1	0	2	0	1	1	0	0	0	6	0	4
5	0	0	0	1	0	4	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	5
6	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	6
7	1	1	0	0	1	6	1	1	0	0	0	0	4	1	0	0	0	3	0	2	0	7
8	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	8
9	0	0	0	0	0	0	0	2	1	0	0	0	2	0	0	2	0	0	0	0	0	9
10	0	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	1	0	10
11	2	1	0	0	0	0	0	1	1	0	0	0	2	0	3	2	0	1	0	2	0	11
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	12
13	2	1	0	1	0	2	0	1	0	0	0	0	3	0	0	1	0	0	0	0	0	13
14	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	14
15	0	2	0	1	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	15
16	0	0	0	3	0	1	0	0	0	0	2	0	3	0	0	0	0	0	0	2	1	16
17	1	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0	3	0	17
18	1	0	0	1	0	0	0	4	0	0	0	1	2	0	2	0	0	0	0	0	0	18
19	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0	19
20	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	3	0	20
21	0	0	0	3	0	1	0	0	0	0	2	0	1	0	7	2	0	3	0	0	0	21
22	1	0	0	2	0	1	0	1	0	1	1	0	3	0	4	1	0	0	0	3	0	22
23	1	0	0	2	0	0	0	0	0	0	1	0	4	0	2	2	0	0	0	1	0	23
24	0	0	0	2	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	3	0	24
25	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	25
26	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	2	0	26
27	0	0	0	2	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	2	0	27
28	1	0	0	2	0	0	0	1	0	0	0	0	2	0	0	0	0	2	0	2	0	28
29	1	0	0	1	0	0	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0	29
30	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	30
31	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	31
32	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	3	0	32
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	33
34	3	0	1	0	0	1	0	1	0	1	0	0	1	0	1	0	0	3	0	1	0	34
35	2	0	0	1	0	0	0	2	1	0	0	0	4	0	5	1	0	3	0	2	0	35
36	4	0	0	1	0	0	0	1	0	1	0	0	0	0	0	3	0	2	0	2	1	36
37	3	0	0	1	0	0	0	1	1	0	0	0	3	0	4	0	0	0	0	0	0	37
38	4	0	0	3	0	0	0	1	1	0	3	0	4	1	5	1	0	0	0	2	0	38
39	1	1	0	1	0	0	0	6	1	0	1	0	7	0	6	2	0	0	0	13	0	39
40	2	2	0	2	0	0	0								1	0	0	0	0	1	0	40
41	0	0	0	0	0	2	0								2	0	0	0	0	1	0	41
42	1	0	0	2	0	3	0								0	0	0	0	0	1	0	42
43	4	0	0	0	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	43
44	1	0	0	1	0	2	0	1	1	0	0	0	0	0	0	0	0	0	0	3	1	44
45	3	0	0	0	0	0	0	0	1	0	1	1	1	2	0	0	0	1	0	0	1	45
46								0	4	0	0	2	9	1	0	3	0	0	0	1	0	46
47	4	0	0	0	0	0	1	0	0	0	0	0	0	2	0	2	0	0	0	2	3	47
48	4	0	0	1	0	1	0	3	0	0	0	1	3	1	0	2	0	0	0	1	1	48
49	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	49
50															0	0	0	0	0	0	0	50
51	0	0	0	0	0	0	0								0	0	0	0	0	3	0	51
52															1	0	0	0	0	1	1	52
Totals	54	11	1	42	5	42	2	35	16	3	14	6	79	9	57	33	1	20	0	86	10	Totals

Figure 3

Yuma Clapper Rail, Topock Gorge, 1996–2009

SITE #	Apr-96	May-97	Apr-98	May-99	Apr-00	May-01	May-02	Apr-03	May-04	May-05	May-06	Apr-07	May-08	May-09	SITE #
1	0	0	0	2	0	2	0	0	1	0	0	2		1	1
2	0	0	0	0	0	0	0	0	1	0	0	0		1	2
3	0	0	0	0	0	0	0	1	2	0	0	2		0	3
4	0	0	0	0	0	0	0	0	0	0	0	0		1	4
5	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	6
7	0	0	0	0	0		0	0	0	0	0	0		0	7
8	0	0	0	0	0		0	0	0	0	0	0		0	8
9	0	0	0	0	0	0	0	0	3	2	0	2		0	9
10	0	0	0	0	0	0	0	0	0	0	0	1		0	10
11	0	0	0	0	1	0	1	0	0	0	0	0		3	11
12	0	0	0	0	0	0	0	0	1	3	0	1		0	12
13	0	1	0	0	0	0	0	0	0	0	0	1		0	13
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
15	0	0	0	0	0	0	0	1	0	0	0	0	0	0	15
16	0	0	0	0	0	0	0	0	1	0	0	0	0	0	16
17	0	0	3	3	0	1	2	4	1	0	0	7	2	0	17
18	0	0	0	0	2	1	1	1	0	2	0	1	2	2	18
19	0	0	2	0	0	0	1	2	0	3	1	3	2	1	19
20	0	1	1	2	2	2	1	2	0	0	0	2	0	2	20
21	3	2	1	0	1	3	3	4	3	6	2	0	2	7	21
22	0	1	2	3	4	4	3	4	2	2	0	2	1	4	22
23	3	1	1	1	1	0	1	1	2	3	1	1	4	2	23
24	3	1	1	0	1	0	1	1	1	1	1	0	0	1	24
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
26	0	0	1	0	1	0	2	0	0	0	2	0	0	0	26
27	0	0	0	0	0	0	0	1	0	0	0	0	0	2	27
28	0	0	0	0	0	1	0	2	1	0	0	1	0	0	28
29	0	1	0	0	1	0	0	0	1	0	0	0	0	1	29
30	0	0	0	1	0	0	0	0	1	0	0	0	0	1	30
31	0	0	0	0	0	0	0	0	0	0	1	1	0	1	31
32	1	0	2	2	0	0		0	2	0	0	0	0	0	32
33	3	2	0	3	0	0	1	0	3	0	0	0	0	2	33
34	0	0	1	1	0	3	0	1	0	1	0	0	2	1	34
35	2	1	3	1	0	1	2	3	5	0	3	5	0	5	35
36	1	1	0	6	1	0	0	3	4	4	0	4	2	0	36
37	2	0	2	4	0	2	0	3	0	1	0	0	0	4	37
38	0	3	2	3	1	3	4	5	1	2	7	4	8	5	38
39	1	2	1	4	1	0	0	2	4	0	0	5	1	6	39
40	0	0	0	1	2	1	3	2	6	0	0	1	3	1	40
41	0	1	0	0	1	4	5	1	8	0	3	1	2	2	41
42	0	2	3	0	1	3		2	3	0	3	1	2	0	42
43	1	2	2	1	3	3	0	1	0	7	1	1	9	0	43
44	0	2	0	3	0	0	0	2	2	2	1	4	4	0	44
45	0	0	0	0	0	0	0	1	3	2	0	0	6	0	45
46	0	1	0	0	2	0	0	1	0	0	0	3	3	0	46
47		1	1	0	0	0	1	2	0	0	0	2	0	0	47
48		1	1	1	1	2	0	0	0	2	2	2	0	0	48
49		0	1	1	2	1	0	0	0	0	2	0	0	0	49
50		0	0	0	0	0	0	0	0	1	0	1	0	0	50
51		1	1	1	2	3	1	4	4	0	0	0	1	0	51
52		0	0	0	3	0	0	2	5	0	0	0	2	1	52
TOTAL	20	28	32	44	34	40	33	59	71	44	30	61	58	57	TOTAL

Figure 4

Yuma Clapper Rails Topock Gorge 1996 - 2009

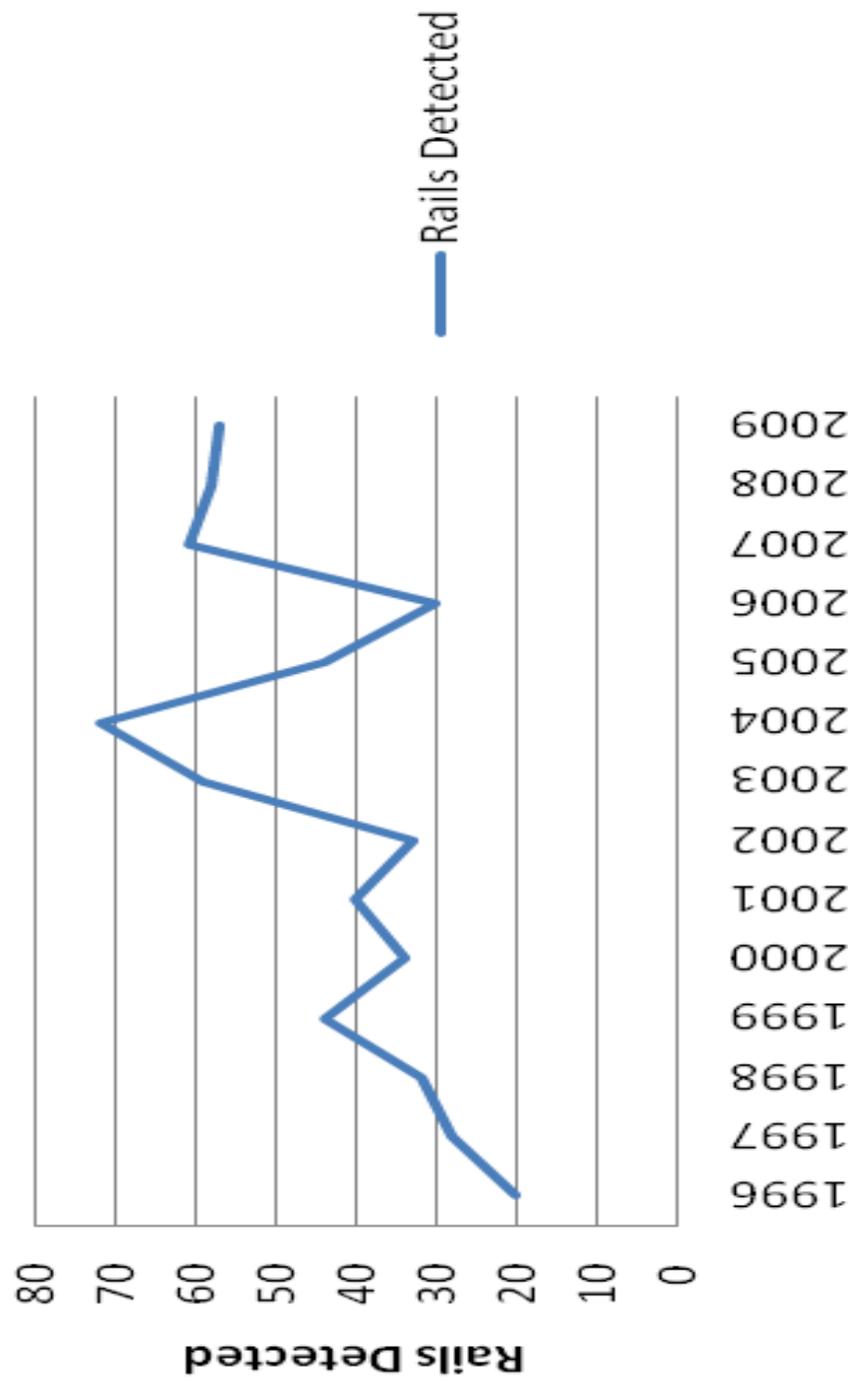


Figure 5