

## CHAPTER 5

# BROWN-HEADED COWBIRD TRAPPING

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### INTRODUCTION

In 2003, we initiated intensive Brown-headed Cowbird trapping at all the life history study areas and continued the same effort in 2004. From 1997 to 2001, willow flycatcher nest success and brood parasitism rates were documented at the life history study areas (McKernan and Braden 2002), with no cowbird trapping conducted in the proximity of the breeding sites. In this study we compare willow flycatcher life history data under the influence of cowbird trapping (2003–2007) with data gathered at the life history study areas from 1997 to 2001 to determine if cowbird trapping and removal affects brood parasitism rates and willow flycatcher nest success and productivity.

### METHODS

We conducted Brown-headed Cowbird trapping at each of the four life history study areas, with the number of traps set in each area determined by landscape characteristics and acreage of the site. Each trap had an effective trapping radius of 0.4 km (John Griffith, GWB, pers. comm., March 2002), and we deployed as many traps as needed at each site such that all the areas of occupied willow flycatcher habitat were under the influence of trapping. USBR biologists approved trap numbers and locations, and trapping methods followed those outlined in Griffith Wildlife Biology (1994a). To minimize the number of parasitism days (the number of days a host population is exposed to each female cowbird), cowbird traps were deployed at least two weeks prior to the initiation of flycatcher nesting (mid-May) and continually operated until all nests were at least past the egg laying and incubation stages (beginning of August).

We used a variation of the Australian crow trap (Figure 5.1) to capture Brown-headed Cowbirds. These portable, wood-framed traps were 4 feet high, 4 feet wide, and 8 feet long, with a door located on one end. The panels consisted of 2-inch by 2-inch wood supports covered with 0.5-inch wire mesh. A piece of plywood, with two 1.25-inch slots down the middle, was attached to the top of each trap for cowbird entry. Signs were posted on each trap door to inform the public of the nature and relevance of the trapping program. The signs were clearly marked and laminated to maintain legibility over the season. Padlocks were used on the doors to discourage vandalism. Each trap was situated in an accessible location and was visible from above with some natural tree cover. To attract cowbirds, a ratio of two male and three female live-decoy cowbirds were maintained in each trap each day. Each trap was leveled, and the wire mesh floor covered with a thin layer of soil to encourage natural foraging and social behavior among the decoy birds.

Six or more horizontal perches were provided in the trap corners, and shadecloth was attached to the outside of each trap to provide adequate shade. An abundant supply of wild birdseed (not containing sunflower seeds, which attract non-target species) and a 1-gallon guzzler of water were kept in each trap and replenished daily.



**Figure 5.1.** Brown-headed Cowbird trap used at life history study areas, 2004.

Each trap was checked every 24 hours, and findings were recorded on an individual daily data sheet (Appendix A). Each day we recorded the number of cowbirds captured and removed, including sex and age, the number of non-target birds captured and released, and any pertinent notes. Upon entering a trap, field personnel carefully flushed out any non-target birds noting species, sex, and, when possible, age. We clipped the wings of all cowbirds at the edge of the secondary and primary feathers, thus lowering the probability of injury in the trap and the likelihood that any escaped bird would be able to survive. Newly trapped cowbirds were removed, placed in a small holding cage, and then euthanized off-site using carbon monoxide.

Because relatively few cowbirds were captured and removed at Mormon Mesa and Mesquite in 2003, all traps at both study areas were moved to different locations, with an additional trap deployed at Mesquite (per verbal agreement with USBR biologists). At Mesquite, two traps were relocated to a riparian forest/agricultural field edge approximately 200 m from the breeding site; the third trap was relocated in riparian vegetation immediately adjacent to the breeding site.

At Mormon Mesa, three traps were relocated from the edge of a large wash to the interior of the riparian habitat less than 50 m from two breeding sites; the fourth trap was relocated immediately adjacent to the Delta West breeding site (see Figures 5.2–5.5 for trap locations).

## RESULTS

### *BROWN-HEADED COWBIRDS*

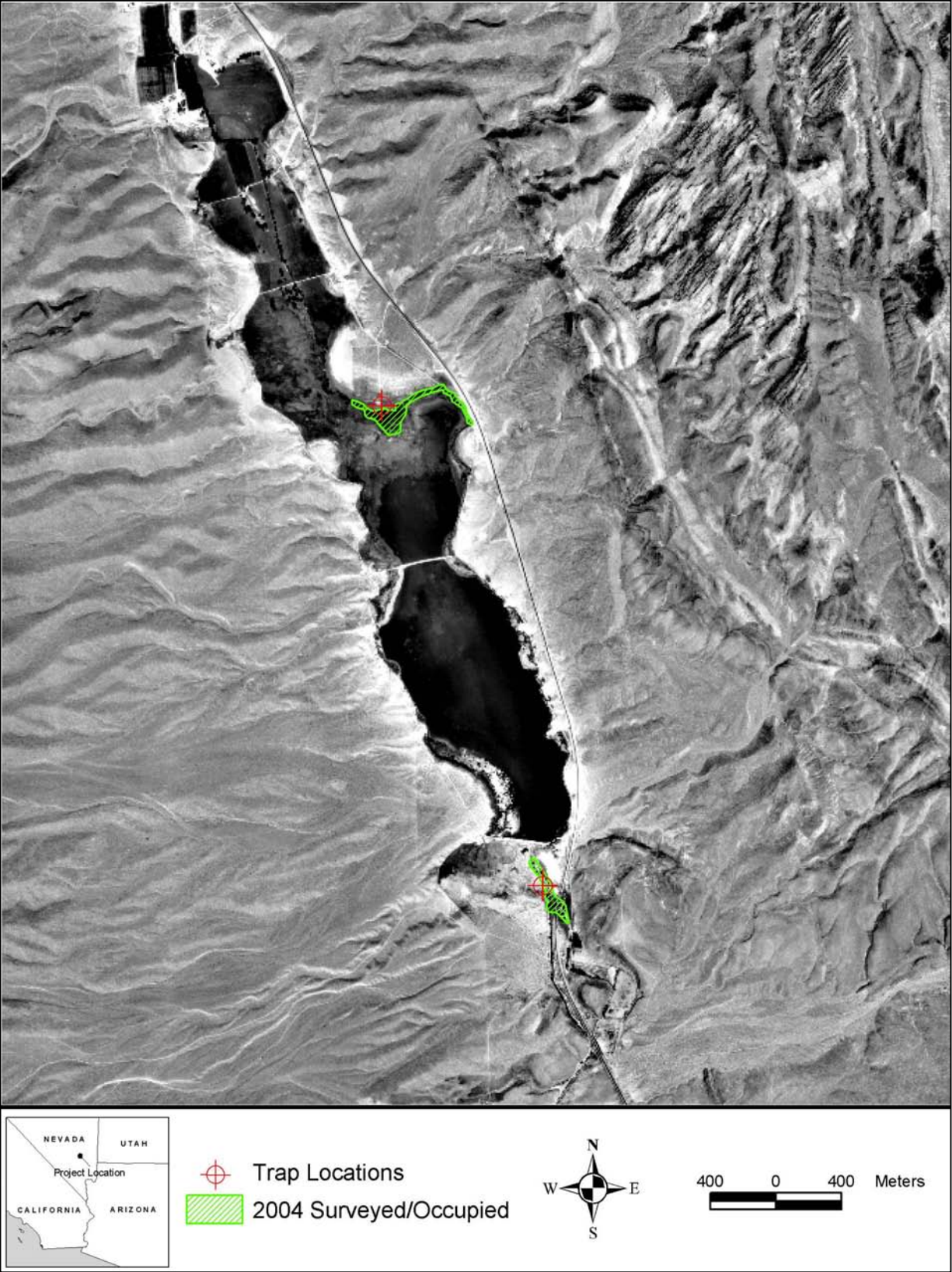
From 15 May to 6 August 2004, we deployed and continuously operated two cowbird traps at Pahranaagat, three at Mesquite, four at Mormon Mesa, and six at Topock. We captured and removed 77, 21, 25, and 45 Brown-headed Cowbirds, respectively, at each study area (Table 5.1).

**Table 5.1.** Summary of Brown-headed Cowbirds Trapped and Removed at Pahranaagat NWR, Mesquite, and Mormon Mesa, NV, and Topock Marsh, AZ, 2004

Study area	Trap #	# Males	# Females	# Juveniles	Total # Brown-headed Cowbirds
Pahranaagat	1	13	10	1	24
	2	32	19	2	53
	<b>Total</b>	<b>45</b>	<b>29</b>	<b>3</b>	<b>77</b>
Mesquite	1	0	0	0	0
	2	4	2	0	6
	3	7	7	1	15
<b>Total</b>	<b>11</b>	<b>9</b>	<b>1</b>	<b>21</b>	
Mormon Mesa	1	0	1	0	1
	2	0	4	1	5
	3	6	7	1	14
	4	2	3	0	5
<b>Total</b>	<b>8</b>	<b>15</b>	<b>2</b>	<b>25</b>	
Topock	1	6	2	0	8
	2	1	0	0	1
	3	4	2	1	7
	4	4	2	0	6
	5	1	3	0	4
	6	10	7	2	19
<b>Total</b>	<b>26</b>	<b>16</b>	<b>3</b>	<b>45</b>	

### *BROOD PARASITISM RATES*

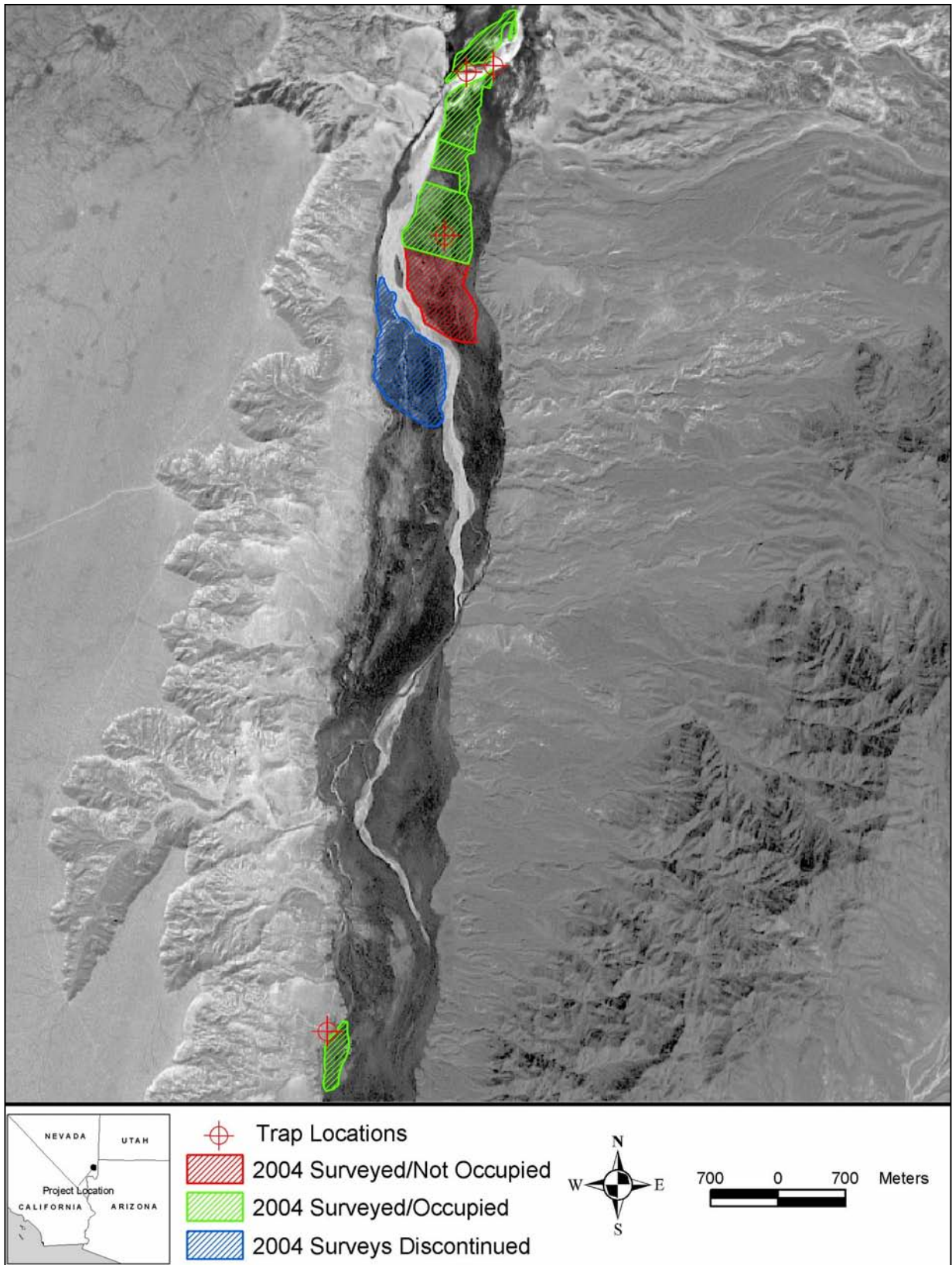
A comparison of the proportion of flycatcher nests parasitized at each of the life history study areas in the pretrapping (1997–2002) and trapping (2003–2004) periods shows a significantly (Chi-square = 4.9,  $P = 0.03$ ) lower parasitism rate in the trapping period at Pahranaagat. There was no change in parasitism rates at Mesquite, Mormon Mesa, or Topock (Table 5.2).



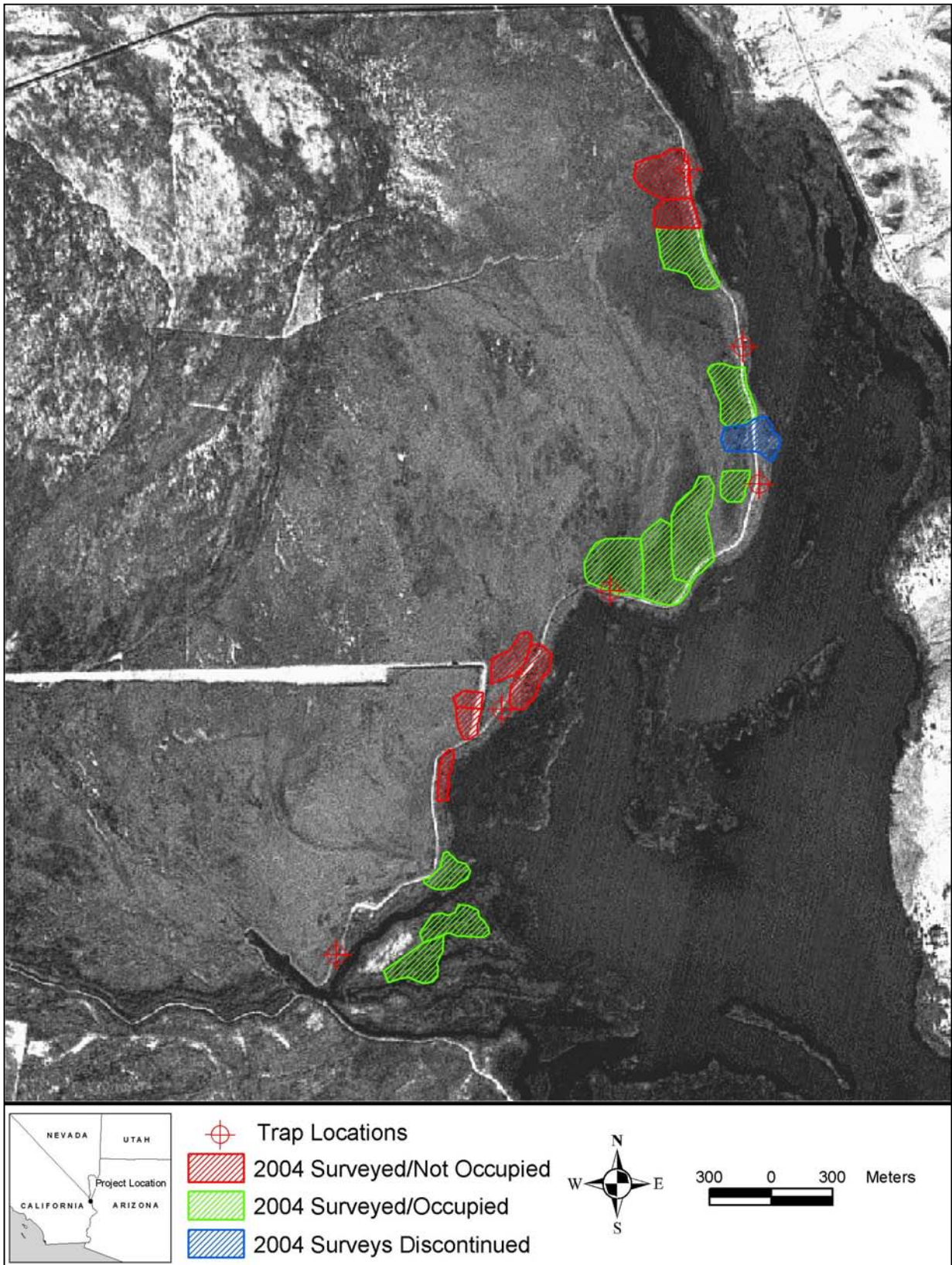
**Figure 5.2.** Cowbird trap locations at Pahrnagat NWR, NV, 2004.



**Figure 5.3.** Cowbird trap locations at Mesquite, NV, 2004.



**Figure 5.4.** Cowbird trap locations at Mormon Mesa, NV, 2004.



**Figure 5.5.** Cowbird trap locations at Topock Marsh, AZ, 2004.

**Table 5.2.** Brown-Headed Cowbird Brood Parasitism Rates at the Four Life History Study Areas, 1997–2004\*

	Year	Pahrnagat	Mesquite <sup>1</sup>	Mormon Mesa <sup>2</sup>	Topock
<b>Pre-trapping periods</b>	1997	nm <sup>3</sup>	60.0% (5)	18.8% (16)	11.1% (9)
	1998	0.0% (19)	57.1% (7)	15.4% (13)	28.6% (21)
	1999	12.5% (16)	nd <sup>4</sup>	0.0% (12)	30.0% (20)
	2000	14.3% (21)	22.2% (9)	25.0% (16)	16.7% (18)
	2001	14.8% (27)	15.8% (19)	20.0% (20)	25.0% (20)
	2002	33.3% (21)	31.6% (19)	0.0% (10)	16.7% (12)
<b>Trapping periods</b>	2003	0.0% (11)	22.2% (18)	10.0% (10)	22.2% (9)
	2004	0.0% (17)	47.1% (17)	16.7% (6)	31.6% (38)
<b>% parasitism pretrapping periods (SE)</b>		14.9% (5.3)	37.3% (9.0)	13.2% (4.4)	21.4% (3.1)
<b>% parasitism trapping periods (SE)</b>		0.0% (0.0)	34.7% (12.5)	13.4% (3.4)	26.9% (4.7)

\* Total number of nests is indicated in parentheses for each year. Data for pre-trapping periods (1997–2002) are from McKernan and Braden (2002) and Braden and McKernan (unpubl. data); data for trapping periods (2003–2004) are from Koronkiewicz et al. (2004) and this document.

<sup>1</sup> Study area includes Mesquite East in 1997–1999 and Mesquite West in 2000–2004.

<sup>2</sup> Study area included Virgin River Delta sites.

<sup>3</sup> Study area not monitored.

<sup>4</sup> Study area monitored, no breeding documented.

## NON-TARGET SPECIES

Eight non-target species were captured at all life history study areas during cowbird trapping (Table 5.3). Non-target species captures included House Sparrow (*Passer domesticus*), Blue Grosbeak (*Guiraca caerulea*), Red-winged Blackbird (*Agelaius phoeniceus*), Northern Mockingbird (*Mimus polyglottos*), Abert's Towhee (*Pipilo aberti*), Black-headed Grosbeak (*Pheucticus melanocephalus*), House Finch (*Carpodacus mexicanus*), and California Towhee (*Pipilo crissalis*). Because the same individual(s) may be captured and released on consecutive days, the total number of individuals of each species captured cannot be accurately determined. Mortalities included two individuals of two species (Northern Mockingbird, House Finch), with cause of death undetermined.

**Table 5.3.** Summary of Non-Target Species Captured during Brown-Headed Cowbird Trapping at the Life History Study Areas, 2004

Study Area	(Number Captured) Species (Sex - F, M, or?)	Capture Date(s) <sup>1</sup>
Pahrnagat	(1) House Sparrow (F)	7 July
Mesquite	(1) Blue Grosbeak (juvenile)	18 June
	(1) Red-winged Blackbird (M)	19 June
	(1) Blue Grosbeak (?)	2 July
	(1) Northern Mockingbird (?)	9 July
	(1) Abert's Towhee (?)	12 July



**Table 5.3.** Summary of Non-Target Species Captured during Brown-Headed Cowbird Trapping at the Life History Study Areas, 2004, continued

Study Area	(Number Captured) Species (Sex - F, M, or?)	Capture Date(s) <sup>1</sup>
Mormon Mesa	(3) Northern Mockingbird (?)	30 June**
	(1) Black-headed Grosbeak (?)	30 June
	(1) Northern Mockingbird (?)	1–3 July
	(2) Northern Mockingbird (?)	30 July, 1 August
Topock	(1) House Finch (?)	3 June
	(3) House Finch (1M, 2F)	4 June
	(2) House Finch (F)	5 June
	(2) House Finch (1M, 1F)	6-9, 11–17 June
	(3) House Finch (2M, 1F)	18 June
	(1) House Finch (F)	19–21 June
	(2) House Finch (F)	22 June
	(8) House Finch (1M, 7F)	23 June
	(1) House Finch (F)	24–27 June
	(1) House Finch (?)	30 June**
	(1) California Towhee (?)	5,8,13 July
	(2) Northern Mockingbird (juvenile)	29 July
	(1) House Finch (?)	31 July

\*\* = mortality

<sup>1</sup> Dates given indicate a separate capture on each date. Unless preceded by a mortality, it is not known whether a bird captured on a specific date is the same or a different individual from one captured on previous dates.

## DISCUSSION

The frequency of Brown-headed Cowbird brood parasitism of willow flycatchers is known to be highly variable, ranging from less than 10% at some sites to over 60% at others (Sedgwick 2000). Cowbird brood parasitism of the flycatcher is of particular concern because parasitism usually results in reduced reproductive output (Sedgwick and Knopf 1988, Harris 1991, Whitfield and Sogge 1999, Rothstein et al. 2003). However, Brown-headed Cowbirds are native passerines, and willow flycatchers can raise offspring to fledging from a brood parasitized nest. Thus, cowbird management issues are complicated, particularly because it is still unclear how brood parasitism rates affect willow flycatcher population sizes (Rothstein et al. 2003).

Similar to 2003, the total number of Brown-headed Cowbirds captured at each of the four life history study areas in 2004 was variable, ranging from 21 to 77, with large numbers of captures recorded at Pahrnagat (77) and Topock (45), and relatively few captures recorded at Mesquite (21) and Mormon Mesa (25). Reasons for this variability are undetermined; however, the total number of cowbird captures at each site appeared not to be directly related to the total number of traps per site. For example, and similar to 2003, Pahrnagat had two traps and the greatest number of cowbirds captured, while Mormon Mesa had four traps and fewer cowbirds captured. Trends in subsequent years may suggest reasons for this variability.

In 2004, Mesquite and Mormon Mesa showed increases in the total number of captures compared to 2003 (21 vs. 6 at Mesquite, and 25 vs. 3 at Mormon Mesa). It is likely the relocation of all traps at both study areas and the addition of a third trap at Mesquite contributed to the increased numbers of cowbirds captured at both areas. Conversely, fewer cowbirds were captured at Pahrnagat and Topock than in 2003 (77 vs. 115 at Pahrnagat, and 45 vs. 113 at Topock). Reasons for this variability are undetermined; however, many more cowbirds are removed annually at Pahrnagat than is reported for the traps alone. At the Pahrnagat NWR headquarters, located less than 2 km from the nearest breeding site, up to 70 cowbirds are captured and removed annually for decoys at other trapping areas. Therefore, from 2003 to 2004 approximately 330 cowbirds were removed from the Pahrnagat study area. Given that a relatively large number of cowbirds have been removed from an area that contains only approximately 7.5 ha of riparian flycatcher habitat surrounded by upland desert, we might expect cowbird numbers to decrease in the area in subsequent years. The reason for less than half the number of cowbirds captured and removed from Topock in 2004 compared to 2003 is undetermined. Overall, the total number captured at the Topock study area does not reflect total cowbird detections in the area, with cowbirds detected at the breeding sites daily. Trapping results in subsequent years may help to explain this variability.

Two years of trapping are insufficient to make an unequivocal determination on the effectiveness of cowbird trapping. Preliminary data, however, indicate a decline in the parasitism rate at Pahrnagat since the implementation of trapping, with no brood parasitism documented at this study area in 2003 or 2004. As discussed above, large numbers of cowbirds have been removed from the study area, and cowbird numbers would be expected to decrease in the area as trapping continues in subsequent years. In addition, very few cowbirds were detected at the Pahrnagat breeding sites during daily flycatcher monitoring in 2004. Trapping results and brood parasitism rates recorded in subsequent years will provide the information necessary to determine if cowbird trapping affects brood parasitism rate and willow flycatcher nest success and productivity at Pahrnagat.

At Mesquite, cowbird brood parasitism rates have been high since flycatcher monitoring began in 1997 (Table 5.2). Moreover, a relatively large number of nest failures at Mesquite can be directly attributed to brood parasitism, with a number of abandonment and depredation events also possibly attributable to cowbirds (see Tables 4.3–4.4 and Discussion in Chapter 4). The flycatcher breeding site at Mesquite is bordered entirely by golf courses, human-made ponds and canals, fountains, and agricultural fields, and very large numbers of cowbirds are detected daily at the breeding sites during flycatcher monitoring. Overall, extensive human development immediately adjacent to the riparian forest at Mesquite has greatly enhanced cowbird habitat. Although cowbird trapping and removal has been conducted for only two years, which is likely an insufficient amount of time to influence flycatcher parasitism rates or reproductive success (Rothstein et al. 2003), further study is needed to investigate whether a more aggressive cowbird removal program is warranted at Mesquite.

At Mormon Mesa and Topock, cowbird brood parasitism rates have not changed since trapping was initiated. However, as noted previously, two years of trapping is likely an insufficient amount of time to influence flycatcher parasitism rates or reproductive success at sites. Trapping results and brood parasitism rates recorded in subsequent years will provide the information necessary to determine if cowbird trapping affects brood parasitism rate and willow flycatcher nest success and productivity at the study areas.

Eight non-target species were captured at Pahranaagat, Mesquite, Mormon Mesa and Topock during cowbird trapping in 2004. Mortalities consisted of two individuals: one Northern Mockingbird and one House Finch. Capturing non-target species is of concern but is unavoidable. Griffith Wildlife Biology (1994b) reported over 8,400 captures of non-target species during a single season of cowbird trapping at Camp Pendleton, California. Species other than cowbirds have higher mortality rates in traps and may incur reduced breeding success because of time spent away from the nest (Rothstein et al. 2003). This emphasizes the need to check traps every 24 hours as specified in the above methods.

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