BROWN-HEADED COWBIRD TRAPPING PROGRAM REPORT FOR NORTH SAN DIEGO COUNTY PRESERVES 2012

LEATHERMAN BIOCONSULTING, INC.

AUGUST 2012

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Prepared for:

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EXECUTIVE SUMMARY

Six modified Australian crow traps were used to trap brown-headed cowbirds (*Molothrus ater*) at the Morro Hills, Rancho del Oro, Buena Vista Creek, and Encinas Creek Preserves in 2012 for the Center for Natural Lands Management. Traps were operational between April 1 and June 5. During this time traps were monitored and maintained and all non-target species and excess cowbirds were removed on a daily basis.

A total of 71 brown-headed cowbirds, including 45 males, 25 females and one juvenile was captured during the trapping period. The overall trapping rate of 0.18 cowbirds per trap day is similar to other programs in southern California. A total of 205 non-target birds from five different species was also captured. No non-target birds died or were preyed upon in the traps during the 2012 trapping season. No threatened or endangered species were captured.

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1.0 INTRODUCTION

1.1 North San Diego County Preserves Brown-headed Cowbird Trapping Program

The Center for Natural Lands Management (CNLM) is a non-profit organization that manages the biological resources on multiple preserves throughout California, including several in San Diego County. As part of its management effort, CNLM operated six brown-headed cowbird (*Molothrus ater*) traps to protect nesting pairs of the federally listed endangered least Bell's vireo (*Vireo bellii pusillus*) on the Morro Hills, Rancho del Oro, Buena Vista Creek, and Encinas Creek Preserves in 2012 [the traps are also expected to protect nearby pairs of California gnatcatcher (*Polioptila californica*)]. These traps are not operated on an annual basis; rather, traps are operated on the respective preserves when the number of incidental observations of brown-headed cowbirds suggests that trapping would benefit existing breeding populations of the least Bell's vireo by reducing the incidence of nest parasitism.

Leatherman BioConsulting, Inc. conducted this cowbird trapping program under authorization from the California Department of Fish and Game (CDFG). All raw trapping data is provided in Appendix 1 in standardized tables developed by the Biological Resources Division of the U.S. Geological Survey; CDFG requires this format so that data for all programs in California are reported consistently.

1.2 Brown-headed Cowbird Background

Brown-headed cowbirds are obligate brood parasites that lay their eggs in the nests of other bird species and rely on the host to incubate the eggs and raise the young. Once ranging through the Great Plains, brown-headed cowbirds have expanded their range throughout North America, and reached southern California by the late 1800's (Unitt 1984). Cowbird populations were well established in the region by the 1930's (Willett 1933, Rothstein 1994), and noticeable declines in native passerine birds as a result of cowbird parasitism were observed by the 1940's (Grinnell and Miller 1944).

Brown-headed cowbirds parasitize nearly every cup-nesting passerine species in North America (Friedman and Kiff 1985, Johnsgard 1997). Host species from the Great Plains have behavioral adaptations to deal with parasitism, such as ejecting the foreign egg, covering over the foreign egg, or abandoning the parasitized nest altogether. While some host species outside the range of cowbirds do not recognize cowbird eggs and readily accept and rear cowbird young, some may retain defenses against parasitism from ancestors that were exposed historically (Peer et al. 2005). However, in a successfully parasitized nest, cowbird young hatch sooner and develop faster than host young, and cowbird nestlings are able to out-compete host nestlings (Rothstein 2004) resulting in substantially reduced reproductive success.

The least Bell's vireo and California gnatcatcher are federally listed species that have suffered population declines primarily because of extensive habitat loss and degradation (Atwood 1993, Smith 1977, Faber et al. 1989). Declining population numbers and their dependence on increasingly reduced, fragmented and degraded habitat lead to a heightened threat from cowbird parasitism (Rothstein 2004), and several researchers have documented the negative effects of cowbird parasitism on these two species (Goldwasser et al. 1980, Jones 1985, Braden 1997, Atwood and Bontrager 2001). Implementation of cowbird trapping during the nesting season has proven to be an effective management strategy (USFWS 1998, Miner et al. 1998, Kus and Whitfield 2005).

1.3 Trap Placement

One trap each was placed on the Rancho del Oro and Encinas Creek Preserves. Two traps each were placed on the Morro Hills and Buena Vista Creek Preserves. Trap locations were determined in the field by Markus Spiegelberg and Brian Leatherman. All traps were placed along the margin of willow riparian habitat where, to the extent possible, they were in accessible locations, out of public view or access, within a cowbird foraging area or flight corridor, and under potential cowbird perching sites where a cowbird could inspect the trap before approaching. The locations of the traps are shown in Figure 1. UTM coordinates for the traps are provided in Appendix 1.

2.0 METHODS

The traps recommended by the USFWS to trap brown-headed cowbirds are modified Australian crow traps. These large rectangular traps consist of wood frames covered with wire mesh. A narrow wood panel on top of the trap with a 1 ½ inch wide slot allows cowbirds to drop down into the trap but not fly up and out. Shade cloth is attached to the west side of each trap to protect birds from exposure to the afternoon sun, and six perches are installed at varying heights in the corners of the traps for the live decoy birds.

The target trapping season for this program is April 1 to May 30, a period that includes at least the first nesting cycle for the least Bell's vireo. On the first day of trapping, a birdseed tray and a 1-gallon water guzzler were placed in each of the traps. Seed and water were replenished on a daily basis as necessary. The rim and inside of the guzzler were cleaned regularly to remove dirt and algal growth. The traps were inspected to determine their structural integrity, and the doors were pad-locked to reduce the risk of vandalism. A decoy ratio of two males to three females was established in each trap to attract cowbirds within visual or audible range. Cowbirds were wing-clipped to reduce their chances of survival in case of accidental release or escape due to vandalism, and to allow identification of recaptured birds. Decoys were obtained from other trapping programs operated by Leatherman BioConsulting, Inc. Ten male cowbirds were added to the six traps on April 5. Cowbirds subsequently captured in the traps were moved around until all five traps had two males and three females.

The traps were visited on a daily basis to remove captured cowbirds and release non-target species in compliance with permit conditions. Brian Leatherman provided management and oversight of the program and Elia Baldwin and Michael Stevens were responsible for daily trap monitoring. The following maintenance procedures were performed and data recorded on standardized daily monitoring sheets:

- Recorded all newly captured cowbirds [number, gender, age (adult or juvenile)],
- Replaced decoys with newly captured cowbirds as necessary,
- Removed excess cowbirds to maintain decoy ratio through the season,
- Recorded and released all non-target birds,
- Scrubbed rim and inside of the water guzzler to remove dirt and algae,
- Replenished seed and water,
- Cropped tall grass and weeds in the traps to ensure rattlesnakes or other possible hazards within the trap were visible,
- Inspected structural integrity of the trap,
- Documented and repaired trap vandalism.

3.0 RESULTS AND DISCUSSION

3.1 Trap Operation

The traps were operated from April 1 to June 5, for a total of 66 days, or 396 potential trap days (66 days times 6 traps). None of the traps were vandalized during the trapping period and none had to be closed due to excessive non-target bird captures, so the traps were operational 100% of the potential time.

3.2 Cowbird Capture Totals

A total of 71 brown-headed cowbirds was captured during the trapping program in 2012 (Table 1), representing an overall capture rate of 0.18 cowbirds per trap day. Trapping totals included 45 males, 25 females, and one juvenile. The first cowbirds were caught on April 6 when one male and one female were captured in trap RDO1. The last cowbird capture was a female in trap MH1 on the penultimate day of trapping (June 4). Most of the cowbird captures (40) occurred in the month of April for the second year in a row, representing 56.3% of the total captures. No banded cowbirds were captured.

Trap RDO1 was the most successful trap, capturing 17 (23.9%) of the 71 cowbirds in 2012. However, the most cowbirds (25) were captured on the Buena Vista Creek Preserve (for the second year in a row) where there were two traps. The second most productive traps were Traps MH1 and BVC2 where 16 cowbirds were captured in each trap. Calculation of the number of captures per trap day allows evaluation of trapping success relative to other programs regardless of the number of traps or the length of the program by providing a standardized capture rate. Although the trapping rate of 0.18 is nearly half of what it was in 2011 for this program (0.33), it is still good compared with the results of other programs conducted in southern California in 2012 (Leatherman

BioConsulting, Inc. unpubl. data). Furthermore, the addition of one trap at Morro Hills added 66 trap days but only three captures; the trapping rate without that trap would have been higher (0.21 captures per day).

Most trapping programs capture more males than females. The male to female ratio for 2012 was very high at 1.8:1 (45 males to 25 females). It is desirable (from a management standpoint) to capture as many females as possible, because they can lay as many as 40 eggs in the nests of other birds in a single season (Scott and Ankney 1980, Jackson and Roby 1992). The capture of 25 female cowbirds on the preserves therefore removed the potential threat of parasitism to as many as 1,000 nests.

Table 1. Brown-headed Cowbirds Captured by Trap, 2012

Trap	COWBIRDS CAPTURED				
	Male	Female	Juvenile	Total	Per Trap Day
MH1	10	6	0	16	0.24
MH2	2	1	0	3	0.05
RDO1	11	6	0	17	0.26
BVC1	6	3	0	9	0.14
BVC2	10	5	1	16	0.24
EC1	6	4	0	10	0.15
Total	45	25	1	71	
Average	7.50	4.17	0.17	11.83	0.18

A total of 173 cowbirds have been captured over the two years this program has been conducted (Table 2). The total number of cowbirds captured in 2012 was approximately 70% of the number captured in 2011, which was the first year of trapping. The number of cowbirds captured increased at Rio Del Oro (15 in 2011 vs. 17 in 2012) but decreased at each of the other three preserves. The number of cowbirds captured in most programs fluctuate widely from year to year, likely reflecting that a number of outside factors (reproductive success, immigration, survivorship, weather patterns, land use, etc.) affect the population at multiple scales.

Table 2. Summary of Total Brown-headed Cowbirds Captured, 2011-2012

Year	COWBIRDS CAPTURED						
	Male	Female	Juvenile	Total	Per Trap	Per Trap Day	M:F Ratio
2011	56	46	0	102	20.40	0.33	1.22
2012	45	25	1	71	11.83	0.18	1.80
Total	101	71	1	173			
Average	50.50	35.50	0.50	86.50	16.12	0.26	1.80

3.3 Non-Target Captures

A total of 205 individuals from five non-target bird species was captured during the 2012 trapping season (Table 3). The same non-target birds were often re-captured and released each day, so the actual number of individuals captured was likely much less than the raw data suggest (see Appendix 1). The most frequently captured native species were the California towhee (*Pipilo crissalis*), making up 46.3% of the captures, and the song sparrow (*Melospiza melodia*), making up 27.3% of the captures. Forty-seven captures of the Calilfornia thrasher (*Toxostoma redivivum*) were recorded making up 22.9% of the captures. The red-winged blackbird (*Agelaius phoeniceus*) and house finch (*Carpodacus mexicanus*) rounded out the remaining captures. No non-native species were captured.

No non-target birds died or were preyed upon during the 2012 trapping season. Only four non-target birds died or were preyed upon last season. This cumulative number of non-target deaths represents 1.34% of the total non-target captures, which is below the 2.0% level considered acceptable by the wildlife agencies. Some trapping programs record thousands of non-target captures (Leatherman BioConsulting, Inc. unpub. data). The 205 captures on this program is extremely low by comparison, and suggests that the trapping effort had little effect on the resident native avifauna. No threatened or endangered species were captured.

Table 3. Summary of Total Non-target Birds Captured, 2011-2012

Year	Species Captured	Birds Captured	Died or Preyed Upon	% of Non-Target Deaths	No. Captured per Trap	Non-Targets Captured/ Trap Day
2011	5	149	4	2.68%	29.80	0.49
2012	5	205	0	0.00%	34.17	0.52
Total		354	4	1.13%		
Average	5.00	177.00	2.00	1.34%	31.98	0.50

4.0 RECOMMENDATIONS

The six brown-headed cowbird traps placed at four northern San Diego County preserves captured 71 cowbirds in 2012. The following recommendations are made to continue the successful operation of the program.

1. Traps should continue to be operated during the peak nesting season of the target host species (the least Bell's vireo) to maximize program effectiveness and reduce program costs.
2. Because annual trapping at the same preserves may not be necessary, CNLM should consider developing a coordinated regional cowbird trapping program plan

that rotates available traps among the preserves from one year to the next and factors in the locations of traps from other programs.

3. In 2011, one trap at Morro Hills captured 27 cowbirds. This year, two traps at Morro Hills captured 19 cowbirds, suggesting that two traps may not be necessary at this location.
4. CNLM should consider initiating studies to collect baseline data at each of the preserves to provide a valid measure of program need and effectiveness. Data on parasitism rates on the target host species are probably the best measure but is often cost prohibitive because it requires intensive nest monitoring. Point counts provide data on the size and distribution of cowbird and host species populations, and the ratio of cowbirds to hosts can be used as a rough indicator of parasitism intensity.

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North San Diego County Preserves

Regional Cowbird Trap Locations
Figure 1

Leatherman BioConsulting, Inc.
Source: Google Earth

APPENDIX 1

USGS Data Forms

Brown-headed Cowbird Trapping Data Report

Site or Project name **North San Diego County Preserve** Trapped previous year? Yes X No
County Orange State CA USGS Quad Name Morro Hill, San Luis Rey, Encinitas
General Coordinates 4 71 680 mE 36 37 880 mN (UTM NAD 83 Datum Zone 11S)

Attach map with trap locations

Number of Traps # 6 Trapping Period 4/1/2012 – 6/5/2012
Number of trap days (1 trap day = 1 trap operated for a 24 hour period) 396 (of 396 possible)
Is trapping performed as a project permit requirement? Yes ____ No X
If yes, explain (e.g. Biological Opinion, State MOU, NCCP) _____
Length of trapping requirement (e.g. 5 years) N/A
Program year (e.g. year 2 of 5) Year 2
Focal protected species (e.g. L. Bell's vireo, Willow flycatcher, Ca. gnatcatcher) Least Bell's Vireo
Were nest monitoring studies performed in conjunction with trapping? Yes___ No X
Investigator_____
If yes, what percentage of nests were parasitized?_____% of _____ nests monitored,
Annual trapping costs (optional) $_____

Trap Metrics

Table 1. Attached with trap coordinates, trapping period, trap days, and dates of non-operation.

Brown-headed Cowbird Captures

Overall Number of Cowbirds Caught (do not include banded cowbirds)
Males (M) 45
Females (F) 25
Juveniles (J) 01
Cowbird Captures per trap day 0.18

Table 2. Attached with cowbird captures by trap, date, sex and age.

Non-target Captures

Table 3. Attached with non-target captures by date, trap, and disposition.

Brown-headed Cowbird Trapping Data Report (continued)

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Notes/Comments

In addition to State and Federal submittals mail or e-mail to:

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Table 1. Trap-by-Trap Metrics

Trap #	Trap Coordinates (UTM - NAD 83)		Elevation (feet)	Trapping Period	# Trap Days	Dates of Non-operation/Comments
MH1	473155mE	3680494mN	60	4/1/2012 - 6/5/2012	66	None
MH2	472623mE	3682199mN	215	4/1/2012 - 6/5/2012	66	None
RDO1	471680mE	3673880mN	128	4/1/2012 - 6/5/2012	66	None
BVC1	470513mE	3671287	47	4/1/2012 - 6/5/2012	66	None
BVC2	471281mE	3671112mN	71	4/1/2012 - 6/5/2012	66	None
EC1	470986mE	3664791mN	52	4/1/2012 - 6/5/2012	66	None
				Total	396	

Table 2. Brown-Headed Cowbirds Captured by Trap and Date

	MH1			MH2			RDO1			BVC 1			BVC2			EC1			TOTAL		
Date	M	F	J	M	F	J	M	F	J	M	F	J	M	F	J	M	F	J	M	F	J
4/6/2012							1	1											1	1	0
4/7/2012							1						1	1		1			3	1	0
4/8/2012													1						1	0	0
4/9/2012														1					0	1	0
4/10/2012				1									1						2	0	0
4/11/2012							1												1	0	0
4/14/2012							1						1						2	0	0
4/15/2012																			0	0	0
4/16/2012																1			1	0	0
4/20/2012							1	1											1	1	0
4/21/2012	1	1					1			4	2								6	3	0
4/22/2012							1	1					2				1		3	2	0
4/23/2012																1			1	0	0
4/24/2012	2						1	1											3	1	0
4/25/2012													1	1					1	1	0
4/26/2012		1																	0	1	0
4/28/2012										1				1					1	1	0
April total	3	2	0	1	0	0	8	4	0	5	2	0	7	4	0	3	1	0	27	13	0
5/1/2012					1														0	1	0
5/2/2012																1	1		1	1	0
5/3/2012							1							1					1	1	0
5/4/2012	1															1			2	0	0
5/5/2012				1						1	1								2	1	0
5/6/2012							1												1	0	0
5/7/2012	1																		1	0	0
5/9/2012													1						1	0	0
5/10/2012								1											0	1	0
5/11/2012	1												1						2	0	0
5/12/2012	1																		1	0	0
5/13/2012													1						1	0	0
5/19/2012																1	1		1	1	0
5/22/2012							1												1	0	0
5/23/2012		1						1											0	2	0
5/27/2012																	1		0	1	0
5/29/2012	1	1																	1	1	0
5/31/2012		1																	0	1	0
May total	5	3	0	1	1	0	3	2	0	1	1	0	3	1	0	3	3	0	16	11	0
6/1/2012	1																		1	0	0
6/2/2012																			0	0	0
6/3/2012	1														1				1	0	1
6/4/2012		1																	0	1	0
June total	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	1	1
TOTAL	10	6	0	2	1	0	11	6	0	6	3	0	10	5	1	6	4	0	45	25	1
		16			**3**			**17**			**9**			**16**			**10**			**71**	

Table 3. Non-target Captures by Trap and Date

	MH1								MH2		RDO1				BVC2			
	CATO		SOSP		RWBL		HOFI		CATO		CATO		CATH		CATO		SPTO	
Date	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P
4/6/2012	1																	
4/8/2012			1								1							
4/9/2012			1															
4/10/2012			1															
4/11/2012			1															
4/12/2012			1															
4/13/2012			1															
4/14/2012			1															
4/15/2012			1															
4/16/2012			1															
4/17/2012			1															
4/18/2012	1		1															
4/19/2012	1		1															
4/20/2012	1		1															
4/21/2012			2										1				1	
4/22/2012			1										1					
4/23/2012	1		1						1									
4/24/2012	1		1															
4/25/2012	3		1										1					
4/26/2012	3		1						3				3					
4/27/2012	3		1						3				3					
4/28/2012	3		1						1				1					
4/29/2012	1		1						1				1					
4/30/2012	3		1						3				2					
5/1/2012	3		1						3				1					
5/2/2012	2		1										1					
5/4/2012	1		1						1				1					
5/5/2012			1										1					
5/6/2012			1						1				1					
5/7/2012			1						2				1		2			
5/8/2012			1						2				1		2			
5/9/2012	1		1						2				2					
5/10/2012	1		1						2				2					
5/11/2012			1						1				1					

Table 3. Non-target Captures by Trap and Date

	MH1								MH2		RDO1				BVC2			
	CATO		SOSP		RWBL		HOFI		CATO		CATO		CATH		CATO		SPTO	
Date	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P	C	P
5/12/2012			2						2				1					
5/13/2012			1						1				1					
5/14/2012			1						2				1					
5/15/2012			1						2				1					
5/16/2012			1						2		2		2					
5/17/2012			2								2		2				1	
5/18/2012			1										1					
5/19/2012													1		1			
5/20/2012			1						1				1					
5/21/2012			1						1				1					
5/22/2012			1						1		1		1		2			
5/23/2012			1										1					
5/24/2012			1								2		2					
5/25/2012	1		1		4						3		1					
5/26/2012			2															
5/27/2012			1				1				1		1					
5/28/2012			1								1		1					
5/29/2012			1						1				1					
5/30/2012			1								1		1					
5/31/2012			1								4		1					
C*	31		56		4		1		39		18		47		7		2	
P*		0		0		0		0		0		0		0		0		0

*C = Captured

*P = Predated upon or otherwise mortally injured