Trapping, banding, and color-banding of tricolored blackbirds (*Agelaius tricolor*) in the Central Valley in 2007

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California Department of Fish & Game
Habitat Conservation Branch
1416 9th Street, 12th Floor
Sacramento, CA 95814

Robert J. Meese, Ph.D.
Department of Environmental Science & Policy
University of California
Davis, CA 95616

Introduction

The tricolored blackbird (*Agelaius tricolor*), hereafter "tricolor", is a highly colonial North American songbird that is nearly endemic to California (Beedy and Hamilton, 1999). Due to large-scale losses of its breeding and foraging habitats, the numbers of tricolors dropped dramatically during the 20th Century (Neff, 1937; Beedy and Hamilton, 1999; Cook and Toft, 2005) and concern for the future of the tricolor led to a petition by the Center for Biological Diversity to list the tricolor under the State of California and U.S. Endangered Species Acts (CBD, 2004).

Individualized marking (banding and color-banding) can provide numerous insights into the ecology and aspects of the behavioral biology of birds that is otherwise unobtainable (reviewed by Calvo and Furness 1992). The tricolored blackbird has been intensively studied by several researchers for several decades, and previous researchers have banded large numbers of birds. However, previous large-scale banding efforts were limited to placing aluminum bands on nestlings in the 1930's (Neff 1942) and again in the 1970's (DeHaven et al. 1975). The use of bands on nestlings has among its potential shortcomings the high mortality rate of nestlings as well as the requirement to have the bird in the hand to obtain useful information about the banded bird; in most cases, this will require the examination of a carcass of a dead bird or a re-trapping of a previously-banded bird (Lakhani and Newton 1983). We attempted to overcome some of these limitations by trapping and banding only adult and juvenile birds, and placed both aluminum USGS bands as well as plastic color bands on all birds banded. Much useful information may then be provided by an observation of a color-banded bird, and if the large number of birders in California is informed of and their assistance requested to report observations of color-banded birds, much essential information related to the movements of birds in space and time may be accumulated. This enhanced understanding of the birds' movements and habitat requirements may lead to better management, including the conservation of essential resources.

This report is submitted pursuant to permit number SC-009330 and additional written permit obtained from the California Department of Fish & Game, Habitat Conservation Branch in support of tricolored blackbird research and summarizes the methods and results of the 2007 color-banding program.

Methods

Trapping and Banding. Very little information exists on the best trapping strategy for tricolors, as the tricolor has been a protected species for decades, and previous researchers have focused their banding efforts on nestlings. A review of relevant trapping information on crows suggested that tricolors may effectively be caught in a "modified Australian crow trap" (e.g., http://www.oznet.ksu.edu/library/wldlf2/c700.pdf) and I knew from my own observations that tricolors are strongly attracted to provisioned grains. Thus, a modified Australian crow trap baited with cracked corn was selected as the trapping device to be evaluated.

Figure 1. Baited, open tricolored blackbird trap.

In late May I began to bait birds with cracked corn at the Conaway Ranch (Yolo County) colony. Cracked corn was placed in three sections of the dirt road that formed the southern edge of this colony. Three "dove traps", borrowed from the San Luis National Wildlife Refuge, were evaluated for capturing tricolors but in two days of observation were found to be ineffective. These traps were returned to San Luis NWR and a modified "Australian crow trap" was borrowed from Stan Wright, Sacramento-Yolo Vector Control District. The "Australian crow trap", baited with cracked corn purchased from a local hardware store, proved to be quite effective at capturing adult tricolors. The trap was placed on-site, with the door and roof panel left open, baited inside and around the perimeter on May 25th and birds were found inside and outside the trap early the next morning. I used the design of this trap as a template to construct two similar traps as I needed my own traps for subsequent banding efforts (Figures 1 and 2).

The traps that I built were of like dimensions (i.e. 6' x 6' x 6') to the trap loaned by Stan Wright, but had three significant differences:

1. traps were constructed of individual panels that could be taken apart and reassembled on-site, making them portable
2. traps had 1x2" rolled welded wire side and roof panels instead of ½" mesh, which made them much easier on the birds (Figures 1 and 2) and coincidentally seemed to make the birds less

Figure 2: Tricolored blackbird trap with transport cage.

reluctant to enter the trap, enhancing capture rate; further, the welded wire in my traps was counter-sunk into dados or grooves cut into the wooden frame so there were no sharp edges exposed to the birds nor to the researcher

3. traps had adjustable slats on top which allowed an evaluation of the optimum gap between the slats, defined as the smallest gap which allowed birds to pass through while simultaneously preventing birds from passing back out

The trap was left open (door open and top panels off; Figure 1) and baited with cracked corn during the intervals between banding bouts, allowing the birds to habituate to the trap. I would typically begin a trapping and banding bout before 8 am, when I would arrive, rebait the trap, replace the roof panels, and close the door. I would then retreat a short distance (10-50 m) and wait. Birds would typically enter the trap within seconds of my retreat, often when I was no more than 10 m from the trap, and I would wait for, in most cases, 10 minutes or so or until thirty or more birds had been captured. I would then return to and enter the trap, close the door behind me, and place 20-30 tricolors within a small cage typically used for parakeets and finches (Figure 2). I would release any remaining trapped birds, replace the roof panels and close the door, and transport the caged birds to a nearby table for banding. I repeated this process until late morning, when the temperature was high enough that I was concerned for the safety of the birds.

Color Band Scheme. I placed the required USGS aluminum band on the left tarsus and two additional color bands (Darvic 4 mm) as follows: if the bird was an adult, a white color band was placed on the left tarsus above the USGS band to denote year (2007) and a second color band was placed on the right tarsus to denote location of banding (green = Conaway Ranch, blue = Plumas-Arboga, orange = Pioneer Duck Club; Figure 3). If the bird to be banded was a fledgling, both color bands were

Figure 3: Color-banded female tricolored blackbird.

placed on the right tarsus. This scheme enables the discrimination of birds banded as fledglings (year and place of birth known) to those banded as adults (year and place of birth unknown).

Color bands were sealed with a small butane-powered soldering iron to prevent their removal by the birds, as tricolored blackbirds are known to be able to remove plastic color bands from their legs (W.J. Hamilton III and Tom Gardali, pers. comm.).

All banding data were entered into Bandit, banding data management software developed by the USGS, and returned to the USGS Bird Banding Laboratory in Laurel, Maryland.

Trapping and Banding Locations. Birds were banded at three locations, as summarized below. All three of these locations were private property, and in all cases permission to access the property, to erect and maintain traps, and to trap and band birds was obtained from the landowners.

Site 1: Conaway Ranch, Yolo County: Grays Bend USGS Quad, NW ¼ Section 11, T9N R2E, 38.6427, -121.7255 (NAD83)

Site 2: Plumas-Arboga, Yuba County: USGS Olivehurst Quad, SW ¼ Section 16, T14N R4E, 39.0297, -121.537 (NAD83)

Site 3: Pioneer Duck Club, Colusa County: USGS Colusa Quad, SW ¼ Section 22, T15N R2W, 39.2199, -122.1130 (NAD83)

Collections of Brood-reduced Young, Eggs, and Carcasses of Adults. I searched for brood-reduced young around the margins of colonies. When fresh carcasses, i.e. those that appeared to be less than 24 hours old and in excellent condition, of brood-reduced young were found, these were collected, placed into a cooler at ca. 2-3^{0}C, and then frozen within 8 hours. In instances where colonies were about to be destroyed through harvest, I collected eggs from nests. Eggs collected were placed into a cooler at ca. 2-3^0 C and maintained at this temperature. In rare instances, and despite an abundance of caution, adults died as a consequence of banding operations. When an adult died, its carcass was collected, chilled at 2-3^0 C and frozen within 8 hours. In all cases, frozen carcasses and chilled eggs were transferred to the Museum in the Department of Wildlife, Fisheries, and Conservation Biology at the University of California, Davis for deposit, curation, and addition to its collections.

The collection of carcasses and eggs is summarized in Table 1, below.

Table 1: Summary of carcasses and eggs collected.

Colony	Date	What Collected	Number	Comments
Poso 1	4/18/07	Eggs	7	2 clutches of 4 and 3 eggs
ECLA Pond	4/18/07	Dead nestling	1	
Poso 1	4/23/07	Brood-reduced young	24	Several other carcasses not collected due to poor conditions
Poso 1	4/24/07	Brood-reduced young	14	
Cornerstone 1	5/02/07	Dead nestling	1	
Conaway Ranch	5/28/07	Dead adult females	2	Two died after banding
Conaway Ranch	6/06/07	1 dead adult male	1	Found as carcass ca. 10 m from banding site
Pioneer Duck Club West Pond	6/15/07	Brood-reduced young	15	
Plumas-Arboga	6/17/07	Brood-reduced young	4	
Plumas-Arboga	6/19/07	Adult females	2	Died after banding

Results

The modified Australian crow traps were very effective at capturing tricolored blackbirds when baited with cracked corn, were easily transported, and rapidly set up. They effectively trapped the birds while permitting a minimum of escapees (I observed two females escape through the wire mesh), and no birds escaped through the top of the trap once the slats were configured to allow a gap of 2" between them. Also, the traps were especially gentle on the birds, and were not known to have caused abrasions or other injuries nor to have directly caused any mortality. Four of the five adults that died were females that may been especially sensitive to stress, and the lone male was found as a fresh carcass beneath a ladder used by wood duck researchers some 10 m from the banding location.

A total of 1772 birds was banded at three sites, as summarized below. The specific days banded, and the number of birds banded on each date, are provided in Appendix I.

Number of days of banding: 30
First day: 5/27/07 at Conaway Ranch, Yolo County
Last day: 7/03/07 at Plumas-Arboga, Yuba County

No. birds banded: 1772
No. adults banded: 1766
No. juveniles banded: 6
No. females banded: 1274 (72%; 1272 adults, 2 juveniles)
No. males banded: 494 (28%; 491 adults, 3 juveniles)

No. unknown/unrecorded sex banded: 4

No. birds banded at Conaway Ranch: 700 in 18 banding days; green and white
No. birds banded at Pioneer Duck Club: 73 in 3 banding days; orange and white
No. birds banded at Plumas-Arboga: 999 in 9 banding days; blue and white

Mist nets were not used to attempt to capture birds this year because no large crèches formed in any of the sites where banding was attempted, and mist nets were deemed to likely be relatively inefficient capture devices when compared to the traps.

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Appendix I. Daily Banding results.

Site	Date	No. Birds Banded
Conaway Ranch	05/27/2007	60
Conaway Ranch	05/28/2007	43
Conaway Ranch	05/29/2007	52
Conaway Ranch	05/30/2007	45
Conaway Ranch	05/31/2007	21
Conaway Ranch	06/01/2007	85
Conaway Ranch	06/02/2007	27
Conaway Ranch	06/03/2007	49
Conaway Ranch	06/04/2007	26
Conaway Ranch	06/05/2007	8
Conaway Ranch	06/06/2007	84
Conaway Ranch	06/07/2007	58
Conaway Ranch	06/08/2007	45
Conaway Ranch	06/10/2007	1
Conaway Ranch	06/11/2007	63
Conaway Ranch	06/14/2007	6
Conaway Ranch	06/15/2007	1
Conaway Ranch	06/19/2007	26
Plumas Arboga	06/19/2007	92
Plumas Arboga	06/21/2007	119
Plumas Arboga	06/23/2007	91
Plumas Arboga	06/25/2007	60
Plumas Arboga	06/26/2007	127
Plumas Arboga	06/28/2007	138
Plumas Arboga	06/29/2007	115
Plumas Arboga	07/01/2007	160
Plumas Arboga	07/03/2007	97
Pioneer Duck Club	06/22/2007	25
Pioneer Duck Club	06/25/2007	14
Pioneer Duck Club	06/27/2007	34