

**State of California
Natural Resources Agency
Department of Fish and Wildlife
Wildlife Branch**

**Tricolored Blackbird Life History, Patterns of Movement, and
Nonbreeding Season Distribution and Habitat Use**

Final Report

Agreement Number P1680038

By

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FINAL REPORT

This final report provides a summary of activities and results pursuant to Agreement Number P1680038 between the California Department of Fish and Wildlife and the University of California, Davis to describe research on the life history and non-breeding season distribution and habitat associations of the Tricolored Blackbird (*Agelaius tricolor*). The results of 11 years of banding of breeding tricolored blackbirds were analyzed in a collaboration with scientists at Cornell University to: 1) estimate life history parameters and 2) produce an integrated population model to estimate the trend in the tricolored blackbird population. Banding data were also used to document patterns of movement. Existing records of observations of birds during the non-breeding season were identified, compiled, and standardized to document the distribution and habitat affinities of birds during the non-breeding season. These accumulated records were made available via the Tricolored Blackbird Portal. This report also identifies key conservation areas and resources and integrates results into recommendations for on-the-ground conservation actions.

INTRODUCTION

The tricolored blackbird is a near-endemic California passerine that is strongly gregarious and unique for forming the largest breeding colonies of any North American songbird (Beedy and Hamilton 1999). Due primarily to large-scale habitat losses resulting from the conversion of native habitats to agriculture and urbanization, the chronic destruction of some of the largest breeding colonies during the harvest of their grain-field nesting substrates, the shooting of birds while foraging in fields of ripening rice in mixed-species flocks with other blackbird species, and the use of persistent insecticides, the number of tricolors plummeted during the 20th and early 21st centuries (Neff 1937, Beedy and Hamilton 1999). Although the rapid decline appears to have slowed or even been stopped (Meese 2017), the species was included for protection under the California Endangered Species Act by unanimous vote by the California Fish and Game Commission in May 2018 and is currently under review for inclusion under the federal Endangered Species Act.

METHODS

Two of the seven components of this report involved the analysis of marked tricolored blackbirds but not the trapping and banding of birds *per se*. For descriptions of the methods used to trap and band tricolored blackbirds, see Meese and Simmons (2010) and Wilson, Meese, and Wyckoff (2016).

Estimation of Life History Parameters

The estimation of life history parameters using my bird banding data involved a collaboration with Cornell University. The primary contacts at Cornell were Orin Robinson, a post-doctoral researcher with strong mathematical ecology skills, and Evan Cooch, an Associate Professor in the Department of Natural Resources and one of the world's leading practitioners of estimating life history parameters using marked individuals in populations.

The parameters estimated were: 1) average annual adult survivorship, for both males and females, 2) fecundity, and 3) population growth rate.

For a description of the methods used to estimate the life history parameters from the recapture data, see Robinson et al. (2018, in review).

Patterns of Movement

Patterns of bird movements have been documented in 4 ways, these include the:

1. Analysis of recapture data
2. Analysis of recovery data
3. Documentation by photographs of banded birds provided to me by field workers
4. Observations (“resightings”) of banded birds by me and field workers

Preliminary analyses of my banding data have shown previously undocumented patterns of movement. Several field workers have submitted photographs of banded tricolored blackbird to me which have also documented previously unknown patterns of movement, and I and other field workers who have communicated with me have observed banded birds while conducting field surveys or related work.

Synthesis of Existing Data of Non-breeding Birds

Data Sources

I assessed what is currently known about tricolored blackbird distribution and abundance during the non-breeding season by reviewing the following data sources:

1. eBird

1. Geographically biased, used by most birders who prefer to bird in natural landscapes and this is biased against large parts of the CV where most TRBL are found during the non-breeding season; confirmed by Orin Robinson, Cornell University post-doctoral research associate. See description of methods to control for biases in Robinson et al. 2017.
2. May also be biased toward “birding hotspots” that tend to attract relatively large numbers of birders who report repeatedly from the same locations.
3. Temporally biased due to larger number of recent data sets vs. older data sets.

2. iNaturalist

1. presence/absence only, does not provide estimates of the numbers of birds seen so its use for documenting non-breeding season bird numbers and habitat use is very limited

3. Audubon CBC results

1. Good long-term data set that occurs across a large geographical area
2. Repeated annual surveys with similar methods and levels of effort - standardized
3. Temporally limited but standardized in time
4. Changes in the numbers of CBCs through time, so documenting trends confounded by increases in “sample size”
5. No information outside of count circles

4. Responses to Requests for Assistance (RFAs) to Yahoo Groups

1. central_valley_birds
2. CALBIRDS

3. RFAs sent 10/16, 01/17, 02/17
4. Review of responses received
 1. number
 2. information

5. Individual reports

1. Postings to Yahoo News Groups without responding to RFA
2. Emails from observers
 1. Jules Evens
 2. Steve Simmons
 3. Debi Shearwater

6. My own observations

1. Solano County: Bird's Landing October 27, 2007 with Ted Beedy, we estimated a flock of 50,000 tricolors on Ian Anderson's ranch
2. Birds Landing in winter 2016/2017 and October/November 2017
3. Pt. Reyes National Seashore in winter 2016/2017 and in October/November 2017

7. Hamilton data set, copies of correspondence from Rich Stallcup re: Pt. Reyes National Seashore

1. Thorough review of Bill Hamilton's notebooks in autumn 2016 showed that Bill had no data, no copies of any field notes or records during non-breeding season
2. Copies of two hand-written notes by Rich Stallcup that report autumnal breeding in lake by Drake's Beach and "up to 15,000 birds" at dairies in winter in Outer Peninsula; my own observations in autumn and request for permit to band birds in winter and finding of no birds when I went to select banding location in January 2008

8. Untapped - communicate with state and federal field staff (wildlife biologists, environmental scientists, law enforcement/rangers, etc.) and make specific requests for assistance

RESULTS

A summary of the banding data through 2017 is presented in Appendix I. As of January 2018, 82,133 birds had been banded, and 2,001 banded birds have been recaptured.

Estimation of Life History Parameters

The analyses of my banding data by Cornell University collaborators showed that the average annual adult survivorship ranged from approximately 0.2 to 0.8, with an overall (from 2008-2016) average of about .6 (Robinson et al. 2018, Biological Conservation, in review). The female average annual adult survivorship was slightly higher than was that of the male. The variance among the point estimates was quite high, and additional work should be done to further refine these estimates.

Annual fecundity (defined as the average number of young produced per nest) was estimated to range between 0.46 and 1.27. These estimates might be biased high as the number of nestlings per nest is counted when the nestlings are from 5 to 9 days old, and they do not fledge until they are on average 12 days old.

Mean juvenile survival was estimated as 0.24.

Patterns of Movement

Recaptures. Preliminary analyses of the recapture of banded birds show that:

1. breeding birds are not strongly site-faithful and there is much movement between breeding locations within (Wilson, Meese, and Wyckoff 2016) and among years. Curiously, the highest proportion of banded birds (5.3% of captured birds) was recaptured at a colony in Sacramento County in 2013 at which I had never previously banded. The proportion of birds captured that is already banded averages 2.3%.

2. birds move among coastal breeding sites in Monterey County to sites in the Central Valley (Conaway Ranch in Yolo County, Colusa and Delevan National Wildlife Refuges in Colusa County) within the same year

3. birds move from the Central Valley (Colusa and Yolo counties) to the coast (Monterey County) between years.

We do not currently have evidence that movements between the Central Valley and the coast are part of an annual cycle, although this is the suggestion. We do not have evidence of a single individual moving from the coast to the Central Valley and back again, or vice versa. Additional field work is needed to try to determine whether these are one-way or cyclical movements.

4. there is a non-random pattern in the sequence of band numbers such that birds that were originally banded together are disproportionately likely to be recaptured together. This strongly suggests that many birds move together through space and time, and may be attributed to:

- a. genetic relatedness as siblings – both birds fledged from the same nest
- b. genetic relatedness as half-siblings – both birds fledged from different nests in the same territory (have the same father)
- c. the birds are familiar neighbors; perhaps they bred with the same male and then remained together through subsequent breeding seasons.

Additional field work is needed to determine which of these explanations is correct.

Birds Photographed. Patterns of movement documented by photographs show that some birds move from the Central Valley to the Mojave Desert, as a female tricolored blackbird seen and photographed in San Bernardino County in 2015 was banded on the left tarsus. As far as I am aware, I am the only person banding tricolored blackbirds on the left tarsus and I have never banded south of Kern County, so this bird must have come from the Central Valley, although there is a very small probability that it was originally banded in Monterey County.

Resightings. Patterns of movement documented by the observation, or “resighting”, of banded birds shows that birds banded in the Central Valley occur in the lower central Sierra Nevada foothills during subsequent breeding seasons (Sacramento and Madera counties), at Point Reyes National Seashore in the same year following the breeding season, and in the Mojave Desert (San Bernardino County). None of these resightings occurred during the period of this contract and in 12 years of banding, fewer than

20 resightings of banded birds have been recorded, so although the resightings of banded birds provide a very small data set, resightings do document additional movements that enhance our understanding of where birds occur following the breeding season.

Recoveries. Patterns of movement documented by the recovery of the carcasses of dead birds are independent of trapping locations, which are all adjacent to active breeding colonies, so may provide additional insights into bird movements. The recovery data for the 44 carcasses, and one live but impaired bird, are presented in Table 1.

Table 1. Recoveries of carcasses of banded birds.

Band Number	Date Banded	Place Banded	Date Recovered	Place Recovered	Distance (km), direction
1232-76874	6/6/07	Conaway Ranch, Yolo County	01/16/08	Near Gustine, Merced County	165, south
1232-77952	07/01/07	Plumas Arboga, Yuba County	06/03/08	Near Woodland, Yolo County	42, south-southeast
1232-77650	6/27/07	Pioneer Duck Club, Colusa County	04/07/08	Near Ione, Amador County	140, south-southeast
1272-37129	05/09/08	Crane Ranch, Merced County	06/04/08	Near Plumas Lake, Yuba County	190, north-northwest
1292-19442	7/13/08	Plumas Arboga, Yuba County	08/30/08	Near Colusa, Colusa County	55, west-northwest
1292-44318	05/31/09	Delevan NWR, Colusa County	06/09/09	Near Colusa, Colusa County	10, southeast
1292-76640	06/12/09	Delevan NWR, Colusa County	08/26/09	Near Colusa, Colusa County	10, southeast
1292-09285	06/20/08	Plumas Arboga, Yuba County	02/26/10	Safetyville USA, Sacramento County	57, south-southeast
1342-21605	06/07/10	Delevan NWR, Colusa County	09/02/2010	Near Willows, Glenn Co.	15, north
1292-40486	05/19/09	Conaway Ranch, Yolo County	05/27/10	Near Merced, Merced County	184, south
1292-08098	05/30/08	Crane Ranch, Merced County	10/08/10	Near Colusa, Colusa County	240, northwest
1292-92348	06/06/10	Delevan NWR, Colusa County	10/31/10	Near Stonyford, Colusa County	40, west-northwest
1292-45670	06/05/09	Delevan NWR, Colusa County	02/05/11	Near Colusa, Colusa County	10, southeast
1292-40586	05/19/09	Conaway Ranch, Yolo County	03/15/11	Near Yuba City, Yuba County	55, north
1292-77691	06/15/09	Delevan NWR, Colusa County	03/30/11	Near Stonyford, Colusa County	40, west-northwest
1292-79243	06/16/09	Plumas Arboga, Yuba County	05/13/11	Near Maxwell, Colusa County	54, west-northwest
1342-21592	06/07/10	Delevan NWR, Colusa County	05/22/11	Near Stonyford, Colusa County	40, west-northwest

Band Number	Date Banded	Place Banded	Date Recovered	Place Recovered	Distance (km), direction
1342-22433	06/06/10	Delevan NWR, Colusa County	05/25/11	Yolo Bypass, Yolo County	89, south-southeast
1292-20318	05/13/09	Conaway Ranch, Yolo County	06/28/11	Near Maxwell, Colusa County	91, northwest
1292-45115	06/03/09	Delevan NWR, Colusa County	08/27/11	Near Willows, Glenn County	15, north-northeast
1292-42023	05/23/09	Conaway Ranch, Yolo County	09/20/11	Near Willows, Glenn County	91, north-northwest
1292-75688	06/10/09	Delevan NWR, Colusa County	10/29/11	Near Davenport, Santa Cruz County	254, south-southwest
1292-84645*	07/10/09	Yolo Bypass W.A., Yolo County	12/15/11	Near Simi Valley, Ventura County	545, south-southeast
1342-34343	04/29/11	Merced NWR, Merced County	03/09/12	Near Merced, Merced County	31, northeast
1342-31476	07/14/10	Conaway Ranch, Yolo County	06/07/12	Near Colusa, Colusa County	66, north-northwest
1342-24123	06/10/10	Delevan NWR, Colusa County	04/13/12	Near Antioch, Contra Costa County	141, south
1292-43580	05/29/09	Conaway Ranch, Yolo County	06/03/12	Near Gridley, Butte County	80, north
1342-32331	07/20/12	Yolo Bypass W.A., Yolo County	06/30/12	Near Nicolaus, Sutter County	38, north
1342-35004	05/01/11	Merced NWR, Merced County	02/13/13	Near Rio Vista, Solano County	142, northwest
1292-48302	06/06/10	Flying M Ranch, Merced County	05/19/13	Near Angel's Camp, Calaveras County	85, north
1342-27025	06/22/10	Delevan NWR, Colusa County	06/17/13	Near Lincoln, Placer County	71, southeast
1342-26778	06/21/10	Delevan NWR, Colusa County	07/20/13	Near Delevan, Colusa County	0
1342-23900	06/10/10	Delevan NWR, Colusa County	02/13/16	Near Cameron Park, El Dorado County	124, southeast
1352-26856	04/22/15	Merced NWR, Merced County	02/20/16	Near Sutter, Sutter County	235, northwest
1352-80368	06/16/15	Conaway Ranch, Yolo County	05/15/16	Near Hollister, San Benito County	206, south
1292-44588	06/01/09	Delevan NWR, Colusa County	06/02/16	Near Los Molinos, Tehama County	84, north
1342-23280	06/10/10	Delevan NWR, Colusa County	04/06/17	Near Henleyville, Tehama County	77, north
1342-82680	05/12/13	Birch Ranch, Sacramento County	04/21/17	Near Valley Home, Stanislaus County	80, south-southeast
1372-55593	04/20/17	Panoche Valley, San Benito County	05/14/17	Near Bakersfield, Kern County	217, southeast
1342-82531	05/12/13	Birch Ranch, Sacramento County	05/26/17	Near Bakersfield, Kern County	400, south-southeast

Band Number	Date Banded	Place Banded	Date Recovered	Place Recovered	Distance (km), direction
1292-93827	05/20/10	Kern NWR, Kern County	06/15/17	Near Bakersfield, Kern County	68, southeast
1372-51396	04/17/17	Panoche Valley, San Benito County	06/12/17	Near Colusa Rancheria, Colusa County	311, north-northwest
1372-49901	07/04/16	Colusa NWR, Colusa County	06/16/17	Near Bakersfield, Kern County	517, south-southeast
1372-49730	07/04/16	Colusa NWR, Colusa County	08/04/17	Near Williams, Colusa County	10, west
1372-71402	06/23/17	Colusa NWR, Colusa County	09/16/17	Near Arbuckle, Colusa County	14, south-southwest

* Encountered alive, released unharmed.

These data show that most recoveries occur in the Sacramento Valley, but some occur in places far from where the birds were originally banded. Two recoveries, one in Santa Cruz County and the other (of the live bird) in Ventura County, document long-distance movements to over-wintering sites in coastal counties. The relative number of birds that make such long-distance movements following the breeding season cannot be estimated from these two observations, but they suggest the need for additional work to better document the movements of post-breeding birds.

Distribution of Non-breeding Birds

A summary of the observations reviewed is presented in Appendix II.

eBird. The use of eBird data to characterize the distribution of over-wintering birds has been critically reviewed by Robinson et al. (2017) and their results confirm that some birds move to coastal regions during winter. The eBird data fail to document the large number of birds known to occur in the Sacramento-San Joaquin River Delta, however, nor do they document the recent steep declines in abundance of birds on the Outer Peninsula at Point Reyes National Seashore.

Christmas Bird Count. Christmas Bird Count (CBC) data are geographically widespread but confined to 15-mile diameter CBC “circles” so cover only very small portions of the state. Still, there are some interesting patterns in the CBC data. I reviewed 2,650 historical records of California CBC data, covering the period from approximately 1912 to 2016, and found that the CBC data may be more helpful in identifying trends in specific areas than in identifying where non-breeding birds occur. In Table 2, below, I provide a summary of the Christmas Bird Counts with the 10 largest numbers of tricolored blackbirds reported. From this table it is clear that the largest number of tricolored blackbirds to be reported from the CBC in California in the past 40 years has jumped around a lot, from Riverside County in the south to Sutter County in the north, and that bird numbers are way down, a result consistent with the numbers reported from recent Statewide Surveys. The sole exception is Merced County, where relatively large numbers of birds continue to be reported from the Los Banos CBC (8,006 in December 2016) and in most months of the year. The Peace Valley CBC, Sutter County, was suspended in 2000, when only 200 birds were reported.

Table 2. Summary of the CBC results with the largest numbers of birds reported.

Count Name	Count County	Count Year	Number of Tricolors Reported
Peace Valley	Sutter	1978	44,560
Los Banos	Merced	1982	28,126
Los Banos	Merced	1997	22,405
Lincoln	Placer	2013	20,273
Lancaster	Los Angeles	1984	15,941
Lancaster	Los Angeles	1985	15,513
Peace Valley	Sutter	1979	15,457
San Jose	Santa Clara	1981	12,704
Santa Maria – Guadalupe	Santa Barbara	1997	10,440
San Jacinto Lake	Riverside	1998	9,920

Yahoo Groups. My 3 requests for assistance, posted to Yahoo central_valley_birds and CALBIRDS groups, two on-line discussion groups that are regularly read by hundreds of birders in California, generated only 16 responses, and these contained, in aggregate, information on fewer than 1,000 birds and consisted of incidental observations of birds around livestock pens. Thus, the Yahoo groups provided minimal additional information on where over-wintering birds occur. However, a posting to CALBIRDS that was apparently not in response to my request for assistance in January 2017 reported a flock of 20-30,000 blackbirds in eastern Contra Costa County, a few miles east of Brentwood. I followed up on this report the following day and found a flock of blackbirds that I estimated to consist of 20,000 birds. However, the lack of roads in this area limited access and thus the effectiveness of road surveys and the birds could not be identified to species, although the flock was observed to be foraging in recently-cultivated fields.

Local Experts. The information provided by local experts, persons with extensive experience in counties or large portions of counties, played a large role in helping to document the occurrence of overwintering birds. Three examples will illustrate the contributions of local experts:

1. Jules Evens, who has studied the birds of the Point Reyes Peninsula for over 3 decades and has authored a guide to the natural history of Point Reyes, emailed me in October 2016 to confirm the near-absence of birds from the Outer Peninsula beginning in 2013. He had for over 2 decades led tours to the Outer Peninsula in November of each year and had until 2013 estimated that 15-20,000 birds were present around the dairies, but in 2013 this number dropped to several hundred and has remained at this level since.

2. Steve Simmons, a retired teacher in Merced, called me in February 2017 to report that he had observed ca. 3,000 birds, mostly females, on the San Felipe Ranch in Merced County, and that these were the first birds that he'd observed in the county all winter, whereas in previous winters, he'd regularly observed from 1-5,000 birds around dairies in the county – a report that closely approximates the number of birds reported from the Los Banos CBC in most years.

3. Debi Shearwater, the owner and operator of Shearwater Journeys, a pelagic birding tour company, emailed me in February 2017 to inform me that she had regularly observed ca. 2,000

tricolored blackbirds in Panoche Valley, San Benito County, hanging around a small dairy and on a large pile of oat hay.

Discussion

An intensive assessment of the multiple data sources reviewed here shows that the largest number of non-breeding tricolored blackbirds currently (or very recently) occurs in the Sacramento/San Joaquin River Delta in association with livestock (sheep in southern Solano County) or on recently-cultivated fields, apparently eating insect larvae and seeds exposed by the plows (2 observations of 20-30,000 “blackbirds” in eastern Contra Costa County a few miles east of Brentwood in January, 2017). Far smaller numbers of birds now occur on the Outer Peninsula at Point Reyes National Seashore, Marin County. The numbers of birds reported from the dairies on the Outer Peninsula at Point Reyes dropped sharply beginning in 2013 are far below (< 10% of) what they were previously (< 1,000 in the winters of 2016/2017 and 2017/2018 [pers. obs.] vs. 15-20,000 a decade ago). The reasons for this rapid, steep decline are unknown.

A variable number of birds, visually estimated to consist of 4,000 in November 2017, occurs during winter in southern Solano County, primarily consuming grains put out for sheep, in the region around Birds Landing and Montezuma Hills roads. Several thousand birds are typically reported from the Los Banos CBC, Merced County. And an average of about 2,000 birds occurs in winter in the Panoche Valley of San Benito County. There are very small numbers (tens to hundreds) of birds scattered throughout many locations from San Diego County up to Mendocino County during winter, and virtually all of these birds are associated with concentrated food sources, primarily livestock or recently cultivated fields. There is no evidence that large numbers of birds over-winter in the lower Sierra Nevada foothills, with the possible exception of western Placer County, where a large winter roost was discovered in the winter of 2016/2017 in Yankee Slough and found to be used by about 35,000 blackbirds, including tricolors (Deren Ross and pers. obs.).

Current sources of information, primarily eBird and Christmas Bird Counts, which rely upon ground-based surveys in preferred locations (“hot spots” in the case of eBird, count circles in the case of CBCs) appear to be insufficient in answering basic questions about where, when, how many, and what the birds are doing as large numbers of birds remain unaccounted-for during winter. It is likely, given the constraints on access and the paucity of roads, that many more birds occur in the Sacramento/San Joaquin River Delta (Figure 1) than have been documented here. It is unlikely that observations of tricolored blackbirds that are made incidentally to other survey activities will suffice to more completely inform us about where over-wintering birds occur and what resources and habitats they utilize. Rather, what is needed is a non-breeding season survey effort that may be coordinated similarly to and conducted by many of the same persons who participate in the triennial Statewide Surveys supplemented by aerial surveys that may more efficiently find groups of foraging blackbirds. As the California Department of Fish and Wildlife Waterfowl Program annually conducts aerial surveys of large portions of lower elevation regions of the state (Skalos and Weaver 2017), it is recommended that persons conducting these surveys be asked to report any flocks of blackbirds they observe.

Habitats and Resources Used by Non-breeding Birds

From all available information, the vast majority of non-breeding birds are concentrated into three regions during winter (November to February):

1. the Sacramento/San Joaquin River Delta,
2. the Central Coast, and
3. Merced County.

Far smaller numbers of birds (groups of fewer than 10 individuals to groups of several hundred individuals) are scattered around the state from as far north as Mendocino County to the extreme south of the state, near the Mexico border in San Diego County. In almost all cases, these smaller groups of birds are associated with livestock, primarily sheep, cows, and horses, and appear to rely heavily upon the grains provided to the livestock to support them through the winter months. In addition, there are two reliable reports of birds in southern California relying upon scraps scavenged from dumps outside urban areas in Riverside County (R. Cook, pers. comm.) during the winter months.

Thus, the accumulated data all serve to support an overall impression of heavy dependence upon human activities during the non-breeding season, first with many birds concentrating in multi-species flocks (with red-winged [*Agelaius phoeniceus*], Brewer's [*Euphagus cyanocephalus*], and yellow-headed blackbirds [*Xanthocephalus xanthocephalus*] and European starlings [*Sturnus vulgaris*] and brown-headed cowbirds [*Molothrus ater*]) and consuming ripening rice in the central and upper Sacramento Valley from August to November, followed by birds becoming less concentrated but remaining in multi-species foraging and roosting flocks with the largest numbers of birds reported from the Sacramento/San Joaquin River Delta following plows as they cultivate fields and expose seeds and insect larvae, around dairies in Merced County, and smaller numbers of birds concentrating along the Central Coast at dairies (e.g., Moonglow Dairy, Monterey County, at several dairies on the outer peninsula at Point Reyes National Seashore, Marin County).

Conservation Recommendations

The observations of non-breeding birds documented in this report show that the vast majority of birds are dependent upon human activities to provide foods required to sustain them through the winter. Groups of birds ranging in size from fewer than 10 to as many as 30,000 individuals have been reported during winter from regions from Mendocino County in the north to San Diego County in the south, with the largest groups of birds, sometimes numbering in the tens of thousands, being reported from the Sacramento/San Joaquin River Delta, where they have been observed following plows or foraging in recently cultivated fields. Two locations where large numbers of birds were known to occur in winter, the outer Point Reyes Peninsula (where 15-20,000 birds had occurred annually until less than 10 years ago) and near Birds Landing, Solano County, where 50,000 birds were documented in October, 2007, now support far fewer birds – less than 1,000 in the case of Pt. Reyes, and no more than 4,000 during the winter of 2017/2018 near Birds Landing (pers. obs.). The causes for these dramatic declines are unknown but not attributable to changes in local conditions as no changes have taken place in either location for decades (pers. obs. and by report by landowner where birds were documented in Solano County).

Thus, the conservation of non-breeding birds will likely continue to depend upon the activities of humans to sustain them through the non-breeding season. Any major changes to these existing activities may represent threats to the species as few birds have been reported from regions where human activities (livestock feeding operations, land cultivation, rice harvest) are few or absent. Land

conversions, from wetlands or uplands to vineyards, nut orchards, or other perennial crops are known, existing threats to the species as they reduce both breeding and foraging habitats for breeding birds, and similar land conversions in the Delta would be expected to have similar deleterious effects on overwintering birds.

There is a great need for enhanced survey effort in the Delta in the region bounded by I-80 on the north, I-5 on the east, I-205 on the south, and S.R. 113 on the west (Figure 1). Given the relatively few roads and the prevalence of private property in this region, aerial surveys to supplement ground surveys are strongly recommended during the November to February interval. This area is annually surveyed in winter by the California Department of Fish and Wildlife to estimate the number of waterfowl (Skalos and Weaver 2017) and it is recommended that CDFW staff attempt, when feasible, to document the occurrence of flocks of wintering blackbirds while conducting its wintering waterfowl surveys.

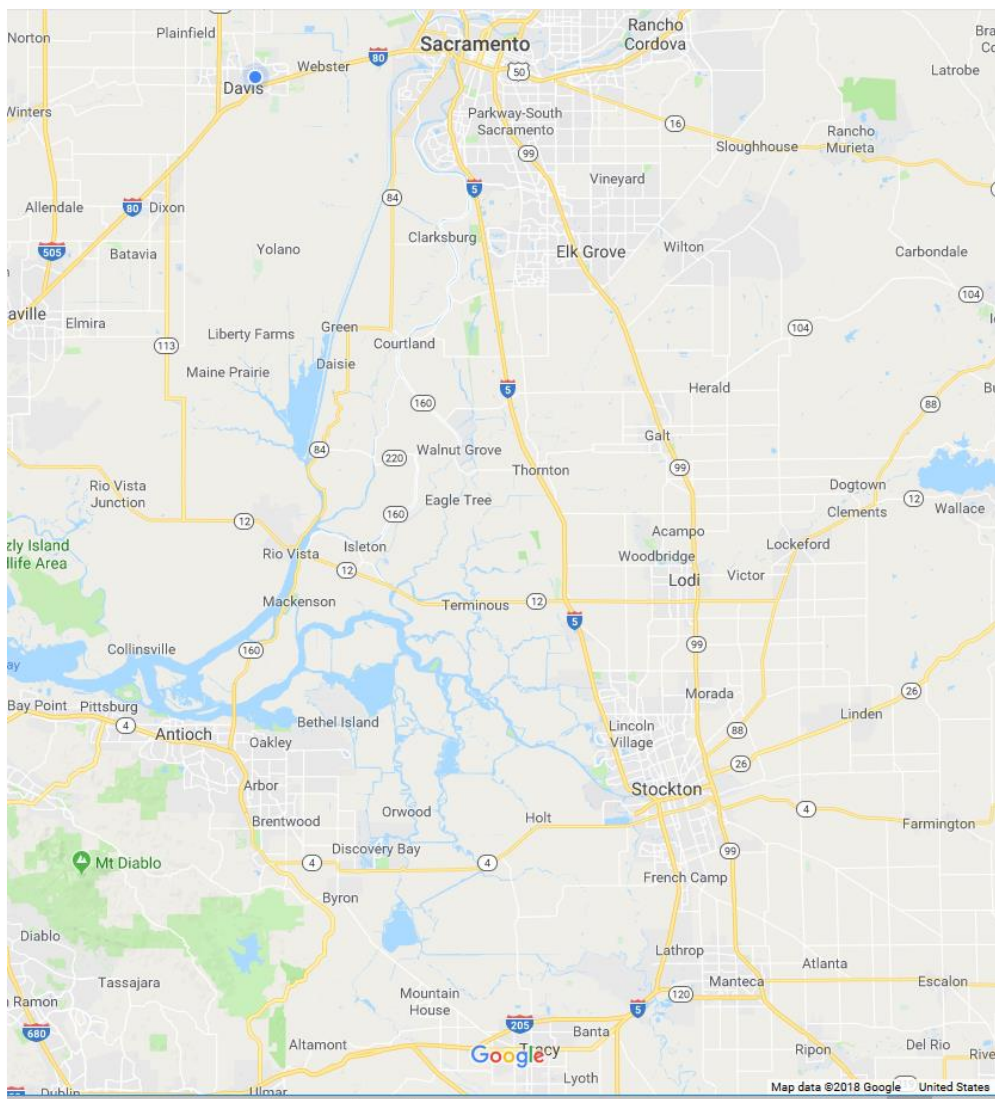


Figure 1. Sacramento-San Joaquin Delta area to be more thoroughly surveyed.

Another major gap in our knowledge of the over-wintering ecology of the tricolored blackbird is where these birds roost at night and during severe weather. There has recently (winter of 2016/2017) been documented a large (35,000 birds) winter roost in Placer County in Yankee Slough, and this is the only roost known to me in the Central Sierra foothills. The ca. 2,000 birds in the Panoche Valley, San Benito County are known to roost in tules and cattails along Panoche Creek. And there is a very large (visually estimated by the local caretaker to consist of 2-3 million blackbirds in 2013/2014) winter roost on or near Sherman Island in the Delta, just north of Antioch. Winter roosts may be especially important to over-winter survival as they consist of substrates that provide protection from many predators and may provide some protection from winter storms. Blackbirds are known to seek cover underneath lodged stems of tules and cattails at night (pers. obs.) and thus may avoid severe winds and drenching rains that may occur during winter storms, enhancing survivorship during storm events. Thus, the conservation status of all larger roosts identified should be assessed and, where necessary, steps should be taken to attempt to ensure the conservation of at-risk roost locations.

Conclusions

1. Despite the production of a robust data set (90,000 birds banded, 2,365 unique recaptured birds as of 7/2018), more banding is needed, and more banded birds must be recaptured, to estimate life history parameters and more thoroughly answer intriguing questions about patterns of movement, especially spatial movements and movements among pairs and/or groups of birds among sites.
2. Much work remains to quantify bird numbers and habitat use, characteristics, and dependencies during the non-breeding season. It is known that there is a general trend, that involves most of the Central Valley, for birds to move about within the upper Sacramento Valley during late summer and autumn in search of fields of ripening rice, but after that, beginning in November, the largest numbers of birds are generally reported in the Sacramento/San Joaquin River Delta. However, bird numbers reported from the Delta are far lower than are those reported 3 months prior in the Sacramento Valley, so there remain gaps in our knowledge of where wintering birds occur.
3. We need much more specific information on where the “missing” birds are in winter, and on what habitats they utilize for feeding and, especially, for roosting. We have established the association between over-wintering birds and their food sources associated with the cultivation of fields and livestock feeding areas in the Delta, but we have only a very few observations of large numbers (thousands to tens of thousands) of birds. We have more thoroughly documented the decline in the numbers of birds that formerly occurred in winter in the region around Birds Landing in Solano County and Point Reyes National Seashore and have relatively better documentation of the occurrences of birds at locations along the Central Coast. Given the number of birds not accounted for, and the number of highly qualified individuals who are out on the landscape who could report them, it seems most likely that relatively large numbers of birds are in rural areas where the numbers of roads and limits on access prevent many from making observations and reporting birds.
4. A large-scale, well-integrated effort is needed to fill in the knowledge gaps, and given the limits of road surveys, a winter survey supplemented by aerial surveys is most likely required to document bird aggregations and habitat associations. It is not likely that one individual can

conduct a winter survey, as the geographic area is too large, and the existing information derived exclusively from ground surveys suggests that the birds are often in remote locations that cannot be adequately surveyed from the ground. Thus, an integrated effort that enlists the support of local experts and field workers across state and federal agencies, NGOs, environmental consultants and others who are in the field during the tricolor's non-breeding season and especially those who have access to private property where birds may occur should contribute records of observations to the Tricolored Blackbird Portal so as to piece together a more complete picture of where the birds are, what resources they're using, what threats they might face, and what steps might be necessary to conserve and/or enhance populations of non-breeding birds. And these efforts should be supplemented by one or more aerial surveys from November until mid-February. This winter survey would be most appropriately coordinated through the Tricolored Blackbird Working Group as nearly all of these groups are represented and many if not most Working Group members have participated in Statewide and/or Sampling surveys. Data entry for this effort would most appropriately be via the Portal but eBird may be used by participants who do not have Portal accounts.

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Appendix I. Daily Summary of Banding Results.

County	Location	Date	No_birds_banded
Yolo	Conaway Ranch	5/27/2007	60
Yolo	Conaway Ranch	5/28/2007	43
Yolo	Conaway Ranch	5/29/2007	52
Yolo	Conaway Ranch	5/30/2007	45
Yolo	Conaway Ranch	5/31/2007	21
Yolo	Conaway Ranch	6/1/2007	85
Yolo	Conaway Ranch	6/2/2007	27
Yolo	Conaway Ranch	6/3/2007	49
Yolo	Conaway Ranch	6/4/2007	26
Yolo	Conaway Ranch	6/5/2007	8
Yolo	Conaway Ranch	6/6/2007	84
Yolo	Conaway Ranch	6/8/2007	45
Yolo	Conaway Ranch	6/10/2007	1
Yolo	Conaway Ranch	6/11/2007	63
Yolo	Conaway Ranch	6/14/2007	6
Yolo	Conaway Ranch	6/15/2007	1
Yolo	Conaway Ranch	6/19/2007	26
Yuba	Plumas Arboga	6/19/2007	92
Yuba	Plumas Arboga	6/21/2007	119
Colusa	Pioneer Duck Club	6/22/2007	25
Yuba	Plumas Arboga	6/23/2007	91
Yuba	Plumas Arboga	6/25/2007	60
Colusa	Pioneer Duck Club	6/25/2007	14
Yuba	Plumas Arboga	6/26/2007	127
Colusa	Pioneer Duck Club	6/27/2007	34

Yuba	Plumas Arboga	6/28/2007	138
Yuba	Plumas Arboga	6/29/2007	115
Yuba	Plumas Arboga	7/1/2007	160
Yuba	Plumas Arboga	7/3/2007	97
Yolo	Conaway Ranch	7/6/2007	58
Merced	Bert Crane Ranch	4/30/2008	52
Merced	Bert Crane Ranch	5/1/2008	286
Merced	Bert Crane Ranch	5/7/2008	664
Merced	Bert Crane Ranch	5/9/2008	712
Yolo	Willow Slough	5/23/2008	301
Yolo	Willow Slough	5/28/2008	119
Yolo	Willow Slough	5/29/2008	160
Merced	Bert Crane Ranch	5/30/2008	252
Yolo	Willow Slough	6/1/2008	38
Yolo	Willow Slough	6/3/2008	112
Yolo	Willow Slough	6/5/2008	123
Yuba	Plumas Arboga	6/7/2008	3
Yolo	Willow Slough	6/7/2008	72
Yuba	Plumas Arboga	6/10/2008	60
Yuba	Plumas Arboga	6/12/2008	200
Yuba	Plumas Arboga	6/18/2008	121
Yuba	Plumas Arboga	6/19/2008	180
Yuba	Plumas Arboga	6/20/2008	197
Yuba	Plumas Arboga	6/21/2008	145
Yuba	Plumas Arboga	6/22/2008	87
Yuba	Plumas Arboga	6/24/2008	3
Yuba	Plumas Arboga	6/25/2008	161
Yuba	Plumas Arboga	6/26/2008	182

Yuba	Plumas Arboga	7/9/2008	1
Yuba	Plumas Arboga	7/10/2008	52
Yuba	Plumas Arboga	7/11/2008	90
Yuba	Plumas Arboga	7/12/2008	243
Yuba	Plumas Arboga	7/13/2008	61
Yuba	Plumas Arboga	7/14/2008	238
Yuba	Plumas Arboga	7/15/2008	10
Yuba	Plumas Arboga	7/16/2008	27
Yuba	Plumas Arboga	7/17/2008	15
Yuba	Plumas Arboga	7/18/2008	12
Yolo	Yolo Bypass Wildlife Area T20	7/20/2008	215
Yuba	Plumas Arboga	7/21/2008	5
Yolo	Yolo Bypass Wildlife Area T20	7/21/2008	176
Yuba	Plumas Arboga	7/22/2008	45
Yolo	Yolo Bypass Wildlife Area T20	7/22/2008	141
Yuba	Plumas Arboga	7/23/2008	23
Yolo	Yolo Bypass Wildlife Area T20	7/23/2008	102
Yuba	Plumas Arboga	7/24/2008	19
Yolo	Yolo Bypass Wildlife Area T20	7/24/2008	143
Yuba	Plumas Arboga	7/25/2008	9
Yolo	Yolo Bypass Wildlife Area T20	7/27/2008	13
Kern	El Cinco Duck Club	4/13/2009	93
Kern	El Cinco Duck Club	4/14/2009	54
Kern	El Cinco Duck Club	4/15/2009	10
Kern	El Cinco Duck Club	4/16/2009	6
Kern	ECLA Ponds	4/16/2009	1
Kern	El Cinco Duck Club	4/21/2009	126
Kern	ECLA Ponds	4/21/2009	3

Kern	El Cinco Duck Club	4/22/2009	69
Kern	El Cinco Duck Club	4/23/2009	29
Kern	El Cinco Duck Club	4/27/2009	3
Kern	ECLA Ponds	4/27/2009	35
Kern	ECLA Ponds	4/28/2009	56
Kern	ECLA Ponds	4/29/2009	48
Kern	ECLA Ponds	4/30/2009	33
Yolo	Conaway Ranch	5/12/2009	121
Yolo	Conaway Ranch	5/13/2009	150
Yolo	Conaway Ranch	5/14/2009	206
Yolo	Conaway Ranch	5/15/2009	188
Yolo	Conaway Ranch	5/18/2009	218
Yolo	Conaway Ranch	5/19/2009	323
Yolo	Conaway Ranch	5/20/2009	315
Yolo	Conaway Ranch	5/21/2009	293
Yolo	Conaway Ranch	5/22/2009	579
Yolo	Conaway Ranch	5/23/2009	650
Yolo	Conaway Ranch	5/25/2009	391
Yolo	Conaway Ranch	5/26/2009	329
Yolo	Conaway Ranch	5/28/2009	364
Yolo	Conaway Ranch	5/29/2009	385
Colusa	Delevan NWR T43	5/31/2009	653
Colusa	Delevan NWR T43	6/1/2009	212
Colusa	Delevan NWR T43	6/2/2009	260
Colusa	Delevan NWR T43	6/3/2009	197
Colusa	Delevan NWR T43	6/4/2009	369
Colusa	Delevan NWR T43	6/5/2009	378
Colusa	Delevan NWR T43	6/9/2009	387

Colusa	Delevan NWR T43	6/10/2009	579
Colusa	Delevan NWR T43	6/11/2009	629
Colusa	Delevan NWR T43	6/12/2009	531
Colusa	Delevan NWR T43	6/15/2009	880
Yuba	Plumas Arboga	6/16/2009	994
Colusa	Delevan NWR T43	6/17/2009	365
Yuba	Plumas Arboga	6/20/2009	557
Yuba	Plumas Arboga	6/22/2009	557
Yuba	Plumas Arboga	6/25/2009	493
Yolo	Conaway Ranch	6/26/2009	986
Yolo	Conaway Ranch	7/4/2009	75
Yolo	Yolo Bypass Wildlife Area T20	7/8/2009	643
Yolo	Yolo Bypass Wildlife Area T20	7/9/2009	807
Yolo	Yolo Bypass Wildlife Area T20	7/10/2009	554
Yolo	Yolo Bypass Wildlife Area T20	7/13/2009	444
Yolo	Yolo Bypass Wildlife Area T20	7/14/2009	344
Yolo	Yolo Bypass Wildlife Area T20	7/15/2009	298
Yolo	Yolo Bypass Wildlife Area T20	7/16/2009	137
Yolo	Yolo Bypass Wildlife Area T20	7/17/2009	248
Kern	Kern NWR	5/18/2010	201
Kern	Kern NWR	5/19/2010	243
Kern	Kern NWR	5/20/2010	311
Kern	Kern NWR	5/24/2010	130
Kern	Kern NWR	5/25/2010	115
Kern	Kern NWR	5/26/2010	148
Merced	Bear Creek	6/2/2010	229
Colusa	Delevan NWR T43	6/5/2010	643
Colusa	Delevan NWR T43	6/6/2010	698

Colusa	Delevan NWR T43	6/7/2010	603
Colusa	Delevan NWR T43	6/8/2010	646
Colusa	Delevan NWR T43	6/9/2010	464
Colusa	Delevan NWR T43	6/10/2010	1614
Colusa	Delevan NWR T43	6/11/2010	353
Colusa	Delevan NWR T43	6/16/2010	306
Colusa	Delevan NWR T43	6/17/2010	580
Colusa	Delevan NWR T43	6/19/2010	668
Colusa	Delevan NWR T43	6/21/2010	576
Colusa	Delevan NWR T43	6/22/2010	481
Colusa	Delevan NWR T43	6/23/2010	717
Yolo	Conaway Ranch	7/3/2010	627
Yolo	Conaway Ranch	7/4/2010	874
Yolo	Conaway Ranch	7/5/2010	675
Yolo	Conaway Ranch	7/6/2010	530
Yolo	Conaway Ranch	7/8/2010	336
Yolo	Conaway Ranch	7/9/2010	227
Yolo	Conaway Ranch	7/13/2010	69
Yolo	Conaway Ranch	7/14/2010	373
Yolo	Conaway Ranch	7/15/2010	226
Yolo	Conaway Ranch	7/16/2010	173
Yolo	Yolo Bypass Wildlife Area T20	7/19/2010	195
Yolo	Yolo Bypass Wildlife Area T20	7/20/2010	267
Yolo	Yolo Bypass Wildlife Area T20	7/21/2010	74
Yolo	Yolo Bypass Wildlife Area T20	7/22/2010	99
Yolo	Conaway Ranch	7/28/2010	33
Yolo	Conaway Ranch	7/30/2010	24
Kern	Bitter Creek NWR	4/20/2011	65

Kern	Bitter Creek NWR	4/21/2011	81
Kern	Bitter Creek NWR	4/22/2011	29
Merced	Merced NWR Maintenance Shop	4/28/2011	689
Merced	Merced NWR Maintenance Shop	4/29/2011	886
Merced	Merced NWR Maintenance Shop	5/1/2011	862
Merced	Merced NWR Maintenance Shop	5/2/2011	317
Merced	Merced NWR Maintenance Shop	5/3/2011	404
Merced	Merced NWR Maintenance Shop	5/4/2011	274
Merced	Merced NWR Maintenance Shop	5/5/2011	216
Colusa	Delevan NWR T45.1	6/1/2011	260
Colusa	Delevan NWR T45.1	6/2/2011	1017
Colusa	Delevan NWR T45.1	6/9/2011	250
Colusa	Delevan NWR T45.1	6/13/2011	89
Colusa	Delevan NWR T45.1	6/14/2011	91
Colusa	Delevan NWR T45.1	7/6/2011	744
Colusa	Delevan NWR T17.1	7/12/2011	216
Colusa	Delevan NWR T17.1	7/13/2011	23
Colusa	Delevan NWR T45.1	8/6/2011	489
Monterey	Ohlone Trace Pond	5/3/2012	28
Monterey	Ohlone Trace Pond	5/4/2012	9
Colusa	Delevan NWR T45.1	5/24/2012	1
Colusa	Delevan NWR T45.1	5/25/2012	543
Colusa	Delevan NWR T45.1	5/26/2012	494
Colusa	Delevan NWR T45.1	5/27/2012	394

Colusa	Delevan NWR T45.1	5/28/2012	659
Colusa	Delevan NWR T45.1	6/2/2012	228
Colusa	Delevan NWR T45.1	6/3/2012	142
Colusa	Delevan NWR T43	6/8/2012	270
Colusa	Delevan NWR T43	6/9/2012	70
Colusa	Delevan NWR T43	6/15/2012	27
Sacramento	Birch Ranch 1	5/3/2013	1
Monterey	Ohlone Trace Pond	5/6/2013	163
Monterey	Ohlone Trace Pond	5/7/2013	400
Monterey	Ohlone Trace Pond	5/8/2013	88
Sacramento	Birch Ranch 2	5/12/2013	451
Sacramento	Birch Ranch 2	5/13/2013	360
Sacramento	Birch Ranch 2	5/14/2013	270
Sacramento	Birch Ranch 2	5/15/2013	294
Sacramento	Birch Ranch 2	5/16/2013	212
Yolo	Conaway Ranch	6/11/2013	320
Yolo	Conaway Ranch	6/12/2013	71
Yolo	Conaway Ranch	6/14/2013	138
Yolo	Conaway Ranch	6/27/2013	68
Yolo	Conaway Ranch	6/28/2013	135
Yolo	Conaway Ranch	6/29/2013	155
Monterey	Ohlone Trace Pond	5/7/2014	61
Monterey	Ohlone Trace Pond	5/8/2014	42
Monterey	Ohlone Trace Pond	5/9/2014	38
Monterey	Ohlone Trace Pond	5/10/2014	23
Yolo	Conaway Ranch	6/13/2014	445
Yolo	Conaway Ranch	6/14/2014	955
Yolo	Conaway Ranch	6/16/2014	770

Yolo	Conaway Ranch	6/17/2014	702
Yolo	Conaway Ranch	6/18/2014	565
Yolo	Conaway Ranch	6/26/2014	105
Yolo	Conaway Ranch	7/3/2014	232
Yolo	Conaway Ranch	7/4/2014	143
Merced	Merced NWR East Farmfield 3	4/22/2015	164
Merced	Merced NWR East Farmfield 3	4/23/2015	504
Merced	Merced NWR East Farmfield 3	4/24/2015	338
Yuba	Plumas Arboga	5/25/2015	29
Yuba	Plumas Arboga	5/26/2015	154
Yuba	Plumas Arboga	5/28/2015	94
Yuba	Plumas Arboga	5/29/2015	102
Yuba	Plumas Arboga	5/30/2015	362
Yuba	Plumas Arboga	6/1/2015	297
Yuba	Plumas Arboga	6/4/2015	198
Yuba	Plumas Arboga	6/6/2015	220
Yolo	Conaway Ranch	6/16/2015	810
Yolo	Conaway Ranch	6/18/2015	861
Yolo	Conaway Ranch	6/19/2015	740
Yolo	Conaway Ranch	6/20/2015	306
Colusa	Delevan NWR T43	6/27/2015	579
Colusa	Delevan NWR T43	6/28/2015	350
Colusa	Delevan NWR T43	6/29/2015	139
Merced	Merced NWR Chamberlain Road	4/13/2016	105
Yuba	Plumas Arboga	5/27/2016	510
Yuba	Plumas Arboga	5/28/2016	57
Yuba	Plumas Arboga	6/2/2016	208
Yuba	Plumas Arboga	6/3/2016	523

Yuba	Plumas Arboga	6/4/2016	355
Yuba	Plumas Arboga	6/5/2016	422
Yuba	Plumas Arboga	6/6/2016	351
Yuba	Plumas Arboga	6/9/2016	435
Yuba	Plumas Arboga	6/10/2016	626
Yuba	Plumas Arboga	6/11/2016	198
Yuba	Plumas Arboga	6/13/2016	615
Yuba	Plumas Arboga	6/14/2016	493
Yuba	Plumas Arboga	6/19/2016	448
Yuba	Plumas Arboga	6/20/2016	631
Colusa	Colusa NWR T27	6/22/2016	554
Colusa	Colusa NWR T27	6/23/2016	662
Colusa	Colusa NWR T27	6/24/2016	710
Colusa	Colusa NWR T27	6/25/2016	551
Colusa	Colusa NWR T27	6/26/2016	392
Colusa	Colusa NWR T27	7/2/2016	685
Colusa	Colusa NWR T27	7/3/2016	641
Colusa	Colusa NWR T27	7/4/2016	362
Colusa	Colusa NWR T27	7/6/2016	149
Yuba	Plumas Arboga	7/6/2016	132
Colusa	Colusa NWR T27	7/7/2016	322
Yuba	Plumas Arboga	7/14/2016	20
Colusa	Colusa NWR T27	8/7/2016	205
San Benito	Panoche Valley	4/17/2017	920
San Benito	Panoche Valley	4/20/2017	706
San Benito	Panoche Valley	4/21/2017	276
Kern	Wind Wolves: Pleitito Creek	4/25/2017	21
Kern	Wind Wolves: Pleitito Creek	4/26/2017	88

Yuba	Plumas Arboga	6/11/2017	325
Yuba	Plumas Arboga	6/12/2017	626
Yuba	Plumas Arboga	6/13/2017	420
Yuba	Plumas Arboga	6/14/2017	259
Yuba	Plumas Arboga	6/15/2017	176
Colusa	Colusa NWR T27	6/16/2017	88
Colusa	Colusa NWR T27	6/17/2017	163
Colusa	Colusa NWR T27	6/19/2017	146
Colusa	Colusa NWR T27	6/23/2017	235
Colusa	Colusa NWR T27	6/24/2017	123
Colusa	Colusa NWR T27	6/26/2017	369
Colusa	Colusa NWR T27	6/27/2017	205
Colusa	Colusa NWR T27	6/28/2017	139
Yuba	Plumas Arboga	6/28/2017	62
Colusa	Colusa NWR T27	6/29/2017	81
Yuba	Plumas Arboga	6/30/2017	138
Yuba	Plumas Arboga	7/2/2017	231
Yuba	Plumas Arboga	7/2/2017	200
Yuba	Plumas Arboga	7/6/2017	47
Yuba	Plumas Arboga	7/7/2017	59
Colusa	Delevan NWR T43	7/19/2017	150
Colusa	Delevan NWR T43	7/20/2017	147
Colusa	Delevan NWR T43	7/21/2017	300
Colusa	Delevan NWR T43	7/22/2017	304
Colusa	Delevan NWR T43	7/23/2017	110
Solano	Anderson Ranch	11/5/2017	95
Solano	Anderson Ranch	11/7/2017	275
Solano	Anderson Ranch	11/9/2017	5

Solano	Anderson Ranch	11/11/2017	57
Solano	Anderson Ranch	11/12/2017	79

Total: 82,133 birds banded

Appendix II. Reports of observations of tricolored blackbirds during the non-breeding season.

Source	Observer	Date(s)	Location	Number of Birds	Comments
Personal Observation	Rich Stallcup	10/17/1995	Pt. Reyes Nat'l. Seashore	12-14,000	Documented on postcard sent to Ted Beedy; found in Bill Hamilton archive
Personal Observation	Rich Stallcup	4/2/2000	Pt. Reyes Nat'l. Seashore	6-12,000	Documented in letter sent to Bill Hamilton
Personal Observation	Robert J. Meese	10/27/2007	Birds Landing, Solano Co.	50,000	Previously unknown location
Personal Observation	Lisa Hug	2010-2016	Various	0-200	37 records from multiple N. Calif. locations
Personal Observation	Robin Wolcott	2002-2011	Various	0-80	11 records from multiple N. Calif. locations
Personal Observation	Rick Williams	2015-2017	Conaway Ranch, Yolo Co.	2-570	11 records from all seasons
Christmas Bird Count	Various	1912-2016	Various	0-44,560	Counts of tricolored blackbirds from 2,650 CBCs
Personal Observation	Robert J. Meese	11/2017	Birds Landing, Solano Co.	800	High number of birds seen during 5 days of banding.
Personal Observation	Robert J. Meese	11/2016-1/2017	Pt. Reyes Nat'l. Seashore	400	Maximum number of birds seen in 3 surveys of Outer Peninsula dairies.
Personal Observation	Robert J. Meese	11/2015-1/2016	Pt. Reyes Nat'l. Seashore	600	Maximum number of birds seen in 3 surveys of Outer Peninsula dairies.
Personal Observation	Steve Simmons	2/2017	San Felipe Ranch, Merced Co.	3,000	Mostly females.
Personal Observation	Debi Shearwater	1/2017	Panoche Valley, San Benito Co.	2,000	Present all winter, feed at local dairy and on stored oat hay bales.
Personal Observation	Jules Evens	9/16/2016	Mendoza Dairy, Pt. Reyes Nat'l. Seashore	< 100	Formerly abundant, with wintering flocks estimated to consist of 5-20,000 birds
Personal Observation	Robert J. Meese	1/2017	5 miles east of Brentwood, Contra Costa Co.	20-30,000 "blackbirds"	Unable to identify to species due to distance/lack of access.