November 29, 2000

TRICOLORED BLACKBIRD 2000 BREEDING SEASON CENSUS AND SURVEY – OBSERVATIONS AND RECOMMENDATIONS

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KEY WORDS: Tricolored blackbird, *Agelaius tricolor*, populations, predation, reproductive success, reproductive effort, rice, silage, agriculture, California

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Executive Summary

Numbers of Tricolored Blackbirds, *Agelaius tricolor* (tricolors), fell precipitously during the 1990s, from 370,000 estimated individuals in 1994 to 240,000 in 1997 and 162,000 in 2000. A count of 105,000 in 1999 is considered in the text and is considered an underestimate. The latest population estimate comes from a United States Fish and Wildlife Service (USFWS) sponsored Census conducted between April 21 and 24, 2000. In addition, a season-long survey was conducted to identify, insofar as possible, all additional tricolor breeding sites present before and after the date of the Census.

In this report reproductive success (RS) measures the proportion of successful nests and the number of fledglings they produce. RS of year 2000 colonies is given for alternative kinds of habitats by nesting substrate and foraging habitat. Reproductive effort (RE) measures use of time by adults during the nesting season. RS/RE is reproductive efficiency. Of all tricolor RE *for the season* 58.9% was at the 10 largest colonies. When nearby (within 5 miles of each other) colonies were merged for the entire 2000 breeding season and the 10 largest colony clusters are aggregated, these concentrations absorb 76.2% of the seasonal RE. Colony clusters are found in largely agricultural regions. Birds associated with colonies comprising colony clusters use exclusive foraging areas. These colony clusters are associated with large and productive foraging areas.

Grain and silage fields in the San Joaquin Valley accounted for 30.0% of the RE. Four colonies lost to harvest operations accounted for 4.1% of the annual RE. A USFWS purchase of the substrate crop at two colonies sheltered 14.2% of the observed RE and produced 12.0% of the season's fledgling crop (RS). Tricolors nested at Merced National Wildlife Refuge in heavy infestations of thistles and mustard in wheat planted for wintering geese. These fields were successfully managed for tricolors and accommodated 11.7% of all tricolor RE.

Collectively, colonies foraging in rice fields in the Sacramento Valley produced 34% of all year 2000 fledglings (RS). Nesting in cattails (*Typha, 2 spp.*), and bulrushes (*Schoenoplectus, 3 spp.*) associated with foraging for insects in rice accounted for 26.3% of the season's RE. Additional rice field foraging from nests in adjacent wild rice added another 4.2% to the overall RE.

Most of the causes of tricolor declines in abundance are known based upon observations during the 1990s of specific habitat changes. Causes of loss of colony sites and foraging habitat are evident and remedies are equally obvious. Management priorities should be to: 1) locate existing colonies and protect them and their associated foraging habitat, 2) manage mitigation associated with development to incorporate colony sites and their associated foraging habitats, 3) establish agreements with the rice, dairy and cattle industries to protect existing colonies and their habitats, 4) acquire easements or title to at-risk nesting and foraging habitats, 5) quantify population trends and their determinants and 6) identify life history characteristics critical to informed evaluation of management strategies.

Recommendations Review

The tricolor problem is spatially immense and differs in its characteristics by area. It is also not a classical management problem because the salient feature of tricolors, breeding and flocking in massive single-species swarms, cannot be preserved by maintaining the species at some minor abundance. Because tricolors completely overlap private property in the Central Valley, listing them as endangered would be disruptive and counterproductive. The alternatives are to encourage landowners and agencies to provide and maintain habitats. In this report and in earlier reports and publications (Hamilton et al. 1995, 1999; Beedy and Hamilton 1997, 1999) we have identified multiple management responses to the tricolor decline problem. These are summarized below.

Management

1. Emphasize further development of habitats favorable to successful reproduction in enduring settings. Take action to support the protection, enhancement and creation of such suitable habitats (Hamilton et al. 1995, #8c, f; Beedy and Hamilton 1997, pg 21; Hamilton et al. 1999, #11). Use HCPs as one imperfect vehicle to accomplish this (Hamilton et al. 1995, #8b; Beedy and Hamilton 1997, pg 24; Hamilton et al. 1999, #4).

2. Manage all public refuges and lands actively where tricolors regularly settle. Improve conditions favoring successful reproduction at existing colonies and colony sites including management of water levels (Hamilton et al. 1995, #8c; Beedy and Hamilton 1997, #6; Hamilton et al. 1999, #8) and management of predators (Hamilton et al. 1995, #8d; Beedy and Hamilton 1997, #6; Hamilton et al. 1999, #7).

3. Canvass the geographic distribution of tricolors for sites lacking one element of tricolor habitat requirements and forward this information to planning agencies. Include dairies, rangeland, highways (CALTRANS cloverleafs) and other sites (Hamilton et al. 1999 #10, DeHaven 2000).

4. Identify tricolor colonies in the path of destruction and protect them, by consent of cooperating parties, seasonal buyouts and in the long term by purchases of land and easements (Hamilton et al. 1999, #11). We have participated in the first two and recommend the latter (Hamilton et al. 1995, #8c; Beedy and Hamilton 1997, pg 20; Hamilton et al. 1999, #6). Tell colony site owners what they are supporting, why tricolors are important, and offer them incentives to encourage tricolors. Investigate the cost to dairies of accommodating tricolor colonies. (Beedy and Hamilton 1997, #5, pg 20, #6, pg 23).

5. Identify all utilized habitats and colonies on an ongoing basis. Identify successful and failed colonies and the causes of colony and reproductive failures. This is my recommendation for the 2001 sequel to the annual Census (Hamilton et al. 1995, #9a; Beedy and Hamilton 1997, #8, page 25; Hamilton et al. 1999, #5, #7).

6. Investigate the cost to dairies of accommodating tricolor colonies. Develop easement programs for dairies and rice growers to support tricolors. This should include funding to secure any resources favoring tricolors wherever they settle (Hamilton et al. 1995, #8b, c; Hamilton et al. 1999, #'s 13, 14).

Science

7. Further investigate life history characteristics of this species, especially demographic population responses such as density dependence, foraging habits and their reproductive outcomes, movements and wintering habits (Beedy and Hamilton 1997, #7; Hamilton et al., 1999 #5).

8. Identify interspecies interactions with this species and its habitats (Hamilton et al. 1995, #9b; Beedy and Hamilton 1997, #8; Hamilton et al. 1999, #7). Tricolors do not at present seem to fit well into the popular multispecies concept of management. The ibis relationship and winter habitat associations are promising places to look (Hamilton et al. 1995, #9b).

9. Determine taxonomic status of Southern California population to determine if it is a genetically discrete population (Beedy and Hamilton 1997, #8; Hamilton et al. 1999, #7).

Oversight

10. Establish a scientific committee to review recommendations and direct study objectives (Hamilton et al. 1999, #1). Submit findings of this research to relevant action-oriented groups. Proposals for action in support of tricolors have been submitted by me to all of the following: USFWS, CDFG, Partners in Flight, the Packard Foundation, the Bureau of Reclamation, the California Farm Bureau, the California Rice Growers, various water districts, individual property owners and The Cattlemen's Association. (Beedy and Hamilton 1997, #6, page 23; Hamilton et al. 1999, #'s10, 14).

Education

11. Emphasize the relative importance of tricolors as the most highly colonial North American land bird species and as one of nine California endemics and as a natural spectacle. There is at present little awareness of this species outside the limited group of birders and their respective organizations. Educate the public regarding the status and grandeur of this species and its colonies and gatherings. (Hamilton et al. 1995, #8a; Beedy and Hamilton 1997, #6).

Introduction

Tricolored Blackbirds are largely (> 95% of all individuals) endemic to California. Breeding tricolors nest in colonies but, unlike their sympatric congener, Red-winged Blackbirds (*Agelaius phoeniceus*), they forage away from their nesting habitat. Dense tricolor settlements form either in spiny vegetation (including wheat, quail brush (*Atriplex*), blackberries (*Rubus*) and mesquite (*Prosopis*)) or in flooded vegetation, especially emergent marsh vegetation (cattails (*Typha* spp.), bulrushes (*Schoenoplectus spp.*), wild rice and in woody plants such as tamarisk (*Tamarisk*), willows (*Salix* spp.) and mulefat (*Baccharis viminea*) (Beedy and Hamilton 1999). Details of tricolor population biology are given in Neff (1937), (DeHaven et al. 1975), Beedy et al. (1991), Cook et al. (1993), Hamilton et al. (1995, 1999) and Beedy and Hamilton (1997, 1999), Hamilton (1998) and Hamilton et al. (1995, 1999). Tricolor life history information is in Orians (1961), Orians and Christman (1968), Collier (1968), Payne (1969), Cook (1996), Hamilton et al. (1995), Hamilton (1998) and Beedy and Hamilton (1999). Relevant life history and population biology comparisons with Red-winged Blackbird are in Orians (1961), Orians and Christman (1968), Collier (1968), Payne (1969), Beletsky (1996), Beletsky and Orians (1989, 1996) and Weatherhead and Dufour (2000). Recent (2000) and past (1931-1999) measures of tricolor distribution and abundance are in Neff (1937), DeHaven et al. (1975), Beedy et al. (1991), Hamilton et al. (1995, 1999), Beedy and Hamilton (1997) and in this report.

Previous summaries identify a continuous precipitous population decline (Cook et al. 1993, Hamilton et al. 1995, 1999, Beedy and Hamilton 1997), correlated with and probably caused by continuing loss of habitat in the Central Valley and in Southern California (Hamilton et al. 1999).

Methods

Pre Census workshop

The workshop was held at Santa Nella (Merced County) to coordinate the Census and to train participants in methods of estimating the number of birds in flocks and colonies. Santa Nella was selected as the site for the workshop because it is central to the population of Census tricolors. The workshop demonstrated that participants could develop skills and confidence in accurately estimating colony size and bird flock size.

The Census

The 2000 Census was supported by USFWS and coordinated by Bill Hamilton, UC Davis and Bob Barnes, California Audubon Society (NAS). Bob Barnes served as a catalyst and drew more attention to the Census than we received in 1999, accounting for the new high in number for participants filing reports. This Census attempted 1) to locate all Tricolored Blackbird colonies throughout their current (April 21-24, 2000) distribution in California, 2) to estimate their numbers and 3) to determine the outcome of their nesting activity. Focus on a particular date avoided

redundant counts of the same individuals as they moved about during the breeding season (Hamilton 1998).

In previous years we used a three-day (Friday-Saturday-Sunday) interval for the censuses, emphasizing Saturday. Friday accommodates agency people. In 2000 including Monday to further attract participants accounted for only 1,754 additional birds. As in previous years after the Census date, further observations by Hamilton, DeHaven (USFWS) and Clendennen (Wind Wolves Reserve) were included if birds were present, based upon stage of breeding evidence, but not observed on the Census date.

The April Census effort was similar to that of 1999 (Table 1, Appendices 1-3). Coordination, forms and methods for reporting colonies were held nearly constant (Appendix 4). Total colony sites, occupied and empty (former colony sites with no birds) provides information about the thoroughness of the Census.

The Census effort in 2000 produced uneven coverage of the tricolor breeding range. Heavily agricultural regions in the Central Valley in particular are at present little known and seldom visited by birders, ornithologists or agency personnel participating in the Census. In 2000 and in other years experienced observers (Mark Chichester, Richard DeHaven, Sam Fitton (BLM) and the author) located large colonies in the San Joaquin Valley not reported by any other observers in the past (e.g., Beedy at al. 1991, DeHaven et al. 1975; but see Collier'1968). The degree of completeness of the Census can be evaluated by determining the fraction of known colonies reported redundantly by other observers. An evaluation of redundant reports suggests that San Joaquin Valley silage colonies and small foothill ponds and springs (Clendennen, Ranlett) are sites most likely to be overlooked by Census observers. Participation in a short-term search is most valuable if an informed observer searches familiar lands.

Some sites were not visited due to access (Phil Unitt, San Diego County) and manpower limitations, especially foothill sites on both sides of the Central Valley. Nevertheless, the method of the Census and the survey, to reinvestigate all known breeding places and to search for new ones, has become an increasingly complete assessment of Tricolored Blackbird distribution and abundance. The 2000 Census probably located a greater proportion of the entire population than did censuses in previous years (Table 2).

Additional reports and personal observations of colonies were compiled throughout the season providing the entire breeding season survey (Appendix 5).

Estimating colony size. There are two ways the number of birds at colonies was estimated. 1) Raw estimates by the participating observers were used if a follow-up by the author could not be made. 2) At all other colonies (n = 20) the author made the original estimate and adjusted it as follows. Several transects were made through the colony, the number and density of active and inactive nests was determined and all nests were marked. Later, after all birds had vacated the colony, the estimated number of empty nests found along more extensive transects was determined. The estimated total number of active nests at the time of the original transect was adjusted based upon linear transects through the colony and mapping of the extent of the colony (see Hamilton et al. 1995). The proportion of active nests at a colony during the nesting season times the number of nests found at the end of the season gives an estimate of the number of females present at that time.

This number is multiplied by 1.5 to include males, a convention of Orians (1961) and Payne (1969) who determined that there was one polygynous male on the average for every two females at breeding colonies. This correction was not possible for the renesting birds at Merced NWR because no transects could be established without disrupting ongoing nesting activity.

Reproductive success (RS)

All accounts of RS in this report were based upon observations S. G. Herman (Evergreen State College) and the author. In a study of Red-winged Blackbirds Weatherhead and Dufour (2000) found a positive relationship of higher RS, as measured in this analysis, to population outcomes in following years. We determined RS by marking or observing nests and their fate immediately prior to fledging (Hamilton et al. 1995). RS was determined as follows:

Method 1. This analysis depends upon the relatively synchronous nesting of tricolor colonies. We either entered colonies or observed known stages of development such as nest building or the end of most male song signaling completion of egg laying and commencement of incubation of the last laid egg. At or near hatching colonies were again revisited and a series of 10 to 30 nests *at the same stage of development* were marked. The percentage of empty nests at this time also was noted. When the oldest nestlings were eight days old the colony was again visited and the number of active nests and number of nestlings per nest noted. At this stage it was also possible to search along an additional unmarked transect crossing the initially marked transect at right angles.

Method 2. If it is impractical to mark nests before eggs hatch, a series of nests can be located when or before the most developed nest is eight days post-hatching, a method comparable to that reported by Beletsky and Orians (1989) for Red-winged Blackbirds. In this way no nests that have fledged young can be mistaken for failed nests. *This procedure is valid only for first nesting attempts at each site.* Observations of subsequent nesting attempts may confuse failed nests with successful but empty nests from an earlier nesting cohort.

After the season when colonies are empty, more extensive transects are made. RS was measured at 20 colonies including the four failed silage colonies (Table 3 plus failed colonies). These data are essential to the estimation of fledgling production. Numbers from these measurements combined with reproductive effort, below, if extensive, can be used to predict the following year's population.

Reproductive effort (RE) and reproductive efficiency (RE/RS)

RE measures are based upon the global estimate of the tricolor population made by the Census, additional survey work and measures of RS at colonies. Reproductive efficiency is RE/RS. It is simply a measure of the effectiveness of time in producing fledglings.

Percentages (RE, Table 4) are the fraction of all time available during the season allocated by all tricolors to each colony. RE, if based upon perfect measurements of RS and of the size of the world population entering the breeding season, would

sum to 100%. But the size of the world population, the size of colonies and the proportion of nests that failed and when they failed all were measured imprecisely. Nevertheless, these are the only data available to estimate the productivity of colonies in alternative habitats. As such they provide data useful in evaluating the effectiveness of management investments to produce fledglings.

The global tricolor population was estimated to be 162,000 adults entering the 2000 breeding season (Table 1, Appendix 1). I assumed half of these birds (81,000) were females. For the 90 available breeding days (Hamilton 1998) minus 10 da for movement and recovery between successive nesting attempts (Payne 1969) there were thus estimated to be two times 81,000 or 162,000 tricolor female breeding days. There were substantially more than 162,000 nesting attempts because of nest failures and subsequent renesting efforts. To determine the percentage of the season's time expended at any particular colony, I determined the number of bird days spent there and divided by 81,000 times 80. These calculations, given in Appendix 6, produced estimates of RE (Table 4) and assume that all females actively nest and renest throughout the breeding season. This assumption is based upon our failure to find any substantial number of adults not actively breeding during the breeding season.

Adult mortality. Conversion of fledgling production to following year breeding adults requires an estimate of annual survivorship. But Tricolored Blackbird post fledging and adult mortality rates are unknown! Thus, no exact prediction of how many birds will enter the 2001 breeding season can be made. Information estimating survivorship in this report comes from studies of Red-winged Blackbirds (Beletsky and Orians 1989), an unsatisfying best-available-data approach. However, the values used here are within the range of values for known populations of songbirds of this size. When these estimates are applied to actual fledging data we (Hamilton et al. 1995) calculated that protection given to colonies in the mid-1990s would have had a substantial impact upon populations in subsequent years (Table 5).

Results

Comparison of 1999 and 2000 censuses

Some departures of numbers of tricolors at particular sites and localities in 2000 from reports in 1994, 1997 and 1999 are summarized in Table 6. These data show irregular annual local occurrence and abundance. While earlier authors commented on the illogical nature of these changes (see Beedy and Hamilton 1999) in most cases probable explanations for most local changes can be provided (Appendix 7).

The number of colonies found on the Census date increased from 53 in 1999 to 71 in 2000 (Table 1). Much of this increase is accounted for by the addition of small colonies in the foothills on both sides of the Central Valley (Figure 1). Ten small colonies in Kern and Placer counties compare with none in the same places in 1999 at the time of the Census (Clendennen, Coast Range foothills, Kern County; Ranlett, Sierra foothill locations Placer County). Five of the six Wind Wolves colonies were active later in the season in 1999, but did not settle until after the Census date and thus were not counted in the summary of the 1999 Census

investigation effort. Addition of these small colonies to Census observations in 2000 were the result of energetic and time-consuming search for colonies by local observers over a period of years, and by observers recruited to participate in the four-day search.

Participation in 2000 by Richard DeHaven, a highly experienced tricolor observer who searched agricultural fields in the San Joaquin Valley in the 1970s resulted in a substantial increase (by about 15,000 birds) in the number of tricolors located in the San Joaquin Valley. If DeHaven had not participated the Census total could have been as low as 147,000. DeHaven's (2000) method was to search extensively based upon several years of experience locating tricolor colonies (DeHaven et al., 1975).

A series of unfavorable local situations negatively impacted 1999 breeding outcomes (Hamilton et al. 1999). Several conditions were more favorable for tricolor breeding in 2000, summarized quantitatively in Table 6. Favorable events in 2000 were the buyout and/or success of the TeVelde and George colonies (Tulare County) the Delevan NWR and Hills Duck Club colonies (Colusa County) and Merced NWR colonies (Merced County). In addition, a greater proportion of all tricolor breeding in 2000 was on government lands (Merced NWR, Delevan NWR) than in previous years. They were highly successful (Appendix 1).

These colonies were in protected settings. Conditions at these sites following fledging may have favored better survival than the one-third estimation used here. Heaviest losses of fledglings are thought to come in the weeks immediately following fledging. Favorable conditions at this stage are produced by situations where the substrate remains habitable, as in marshes and blackberry thickets where water is immediately available. Early dispersal of fledglings and their parents to crèches near water and food, as is necessary for some silage field colonies, may impose higher losses upon fledglings. Circumstances at the Producers Dairy, Fresno County (1994, 1999), Merced NWR (2000) and at the TeVelde Ranch (2000) were particularly favorable because the silage nesting substrate provided persistent cover and access to open water remained available until tricolors and their fledglings voluntarily dispersed. Once tricolor nestlings fledge, marshes provide ideal maturation sites for fledglings.

The central conclusion of the Census and survey is that tricolors are continuing to decline precipitously in numbers, from millions in the 1930s (Neff 1937) to an estimated 750,000 in 1975 (Udvardy 1977), 370,000 as of the 1994 Census and 162,000 in this account for 2000. The conclusion that tricolor numbers are plummeting is based not only upon these data, but also on the collective experience of local experts throughout California who have observed tricolors over long intervals (Liz Cook and Ted Beedy, Sacramento County; Bill Hamilton, Yolo County; Richard DeHaven, Central Valley; Sam Fitton, San Joaquin Valley and Coast Range; Phil Unitt, San Diego County and others). Tricolors are a diminished natural spectacle in the Central Valley and in Southern California, the former strongholds of this species.

Ownership of habitat

About 31% of all tricolor reproductive effort was based upon nests placed on publicly owned property (Appendices 1, 5). This is higher than in most other years. However, these secure nesting sites depend upon the far less secure surrounding private lands. Tricolors select colony sites following spectacular *en masse* reconnaissance flights (Orians 1961) that cannot precisely predict the immediate future of the habitats they depend upon. Conversion of weedy fields and other habitats to cotton, vineyards and other substrates during the breeding season after tricolors have settled, as occurs occasionally, defeats colonies and wastes RE because adults continue to provision small and weak broods. As in previous years (Hamilton et al. 1995) over 90% of all foraging activity was on private property. The largest publicly owned foraging arena in 2000 was associated with the Merced NWR colonies, but these colonies also depended in part upon private lands and dairies (Woolington, pers. comm.).

Regional changes in abundance

There was a dramatic increase in the number of birds present in Merced County (Table 6, Appendices 1, 6) not attributable to increased observer effort. We (USFWS, CDFG, UCD) made a thorough search of Merced County west of Highway 99 in 1994, 1995, 1997, 1999 and 2000, as did others. Both USFWS and CDFG personnel live in this area and regularly travel local highways and roads. Interpretation of this change from 1999 and other years is included in Appendix 7.

Reproductive success and reproductive effort

Determination of the quantitative impact of reproductive losses upon population trends depends upon measures of demographic variables such as fledgling survivorship, annual survivorship of adults and number of breeding attempts. Mean RS for all monitored colonies is about 0.9 fledglings per female per nesting attempt (Table 3). If Census plus Survey counts of breeding birds estimate the global population total nests for the season (219,000) divided by the estimated population of females entering the breeding season (81,000) yields 2.7 nesting attempts per female per season.

The estimated reproductive effort (RE) lost to nests before fledging (RS) in Table 4 depends upon Census data estimating the whole population and identifying the duration of the breeding season. In 2000 the interval from the laying of the first to the last egg was somewhat more than 90 days, but there were relatively few and relatively small colonies at the extremes.

The match of the Census total to the observed RE (94.6 % in Table 4) was unexpectedly close and it is tempting to normalize these data to achieve a perfect match but this was not done. Comparison of these two data sets, collected in entirely different ways, suggest that an approximately equal effort was expended to obtain them. Both were more or less equally limited by property access and manpower constraints. The same people were responsible for about half the

estimates of the number of birds in colonies and about half of the same data entered into both summaries.

Dairy and grain associated colonies. Over 40% of all Tricolored Blackbird RE in 2000 was associated directly with dairies in the San Joaquin Valley and Southern California. Four colonies, one in Fresno County, two in Kings County and one in Tulare County were lost to harvest, accounting for 4.1% of all RE (Table 4).

Reproductive success in silage was 0.6 when failed and successful colonies were lumped (79,000 birds). When the 20,000 birds breeding in failed colonies are excluded RS was 1.0 per nest.

Silage and grain colonies near dairies accounted for 28.8% of all RE (Table 4). At and near dairies birds may nest in silage, cattails, Himalaya Blackberries, or in other nesting substrates (>41.5 % of seasonal RE, Table 4). Of this amount 11.7% was on the secure Merced NWR. Of the silage habitat, 14.2% of all RE was protected from destruction by USFWS purchase. But 14.2% is not the reproductive efficiency. When part of or all nests at colonies are lost, birds losing nests are freed to nest elsewhere. Assuming harvest losses occur midway through the breeding cycle, RE saved is half 14.2% or 7.1% and the number of fledglings saved by buyout intervention is proportionately less.

In recent years at Merced NWR when cattails but not thistles were available as a nesting substrate (except 1991, 'Glory Hole' cattail pond) there were no or small (<2000) colonies in this area. This year colonies nested in wheat fields overgrown to thistles and mustard (Tables 3, 4). Two of the three colonies nested a second time immediately following the first nesting effort. Nests were selectively placed in the densest patches of thistles and mustard. None were built in the patches of pure wheat between the thistle patches.

Rice associated colonies. Rice is an important foraging habitat for late nesting tricolors in the Sacramento Valley. Breeding in cattails or bulrushes adjacent to rice fields accounted for over 26.3% of all 2000 RE and over 34% of all RS. Most rice dependent colonies (86% of the individuals in 2000) range outward to forage for insects in rice fields. Cook (*pers. comm.*) noted the preference of tricolors for foraging in flooded and especially dry vernal pools. Figure 2 shows the foraging distance limits of one such colony on Tract 17, Delevan NWR. Tricolors at that colony also foraged on the refuge in dried vernal pools where insects, especially grasshoppers, were particularly conspicuous, but this part of the nestling provisioning effort accounted for less than 10% of all foraging time by that colony.

Bulrush nesting. At Maxwell II, nests in bulrushes were initially more successful than those in broadleaf cattails (*Typha latifolia*) in those in narrow leaf cattails (*T. angustifolia*) were the least successful. These differences were not analyzed further because their effect was eliminated by subsequent night heron predation. Bulrushes also accommodate heron, egret and ibis nesting. At two sites in Stanislaus and Merced counties, bulrush-nesting tricolor colonies not associated with night herons or ibises were highly successful. A large tricolor colony in bulrushes where no cattails were available in Riverside County was unsuccessful (<10% of nests fledged chicks) due to predation by Black-crowned Night-herons (*Nycticorax nycticorax*) and Great-tailed Grackles (*Quiscalus mexicanus*).

Observer effect. Comparison of RS of these nests with the marked and visited transect is a control estimating the effect of the observer upon the marked transect (summarized for previous years in Cook and Hamilton, ms.). No measurable effect was found, either in 2000 or in previous years (Cook and Hamilton, ms.). However, following entry into the George Dairy colony, Tulare County by the author and Richard DeHaven to evaluate the advisability of purchasing the colony and the crop, out trails through the exotic annual nettle (*Urtica urens*) and silage subsequently provided access for coyotes or dogs to prey upon nestlings. This result shows that coyote predation may be reduced by the presence of nettles.

Predation

Black-crowned Night-herons. Predation by Black-crowned Night-herons and raccoons (*Procyon lotor)* upon nests in cattail marshes and by Common Ravens (*Corvus corax*) and coyotes (*Canis latrans*) in upland and silage settings has in the past had catastrophic consequences for some colonies (Hamilton et al. 1995). However, some large cattail colonies were not heavily preyed upon by night herons in 2000. A high success rate was observed at two on Delevan NWR colonies (66% and 80% of all nest starts) and high RS in some cattail colonies was observed elsewhere (Table 3). This contrasts with recent (1993-1999) observations of wholesale tricolor nesting losses to night herons at most Central Valley cattail nesting sites including Delevan NWR in 1996 and 1997 and at several other sites in all previous years.

Ibis association. In 2000 I discovered that tricolors directly associated with ibises (*Plegadis chihi*) are protected from night heron predation. In some situations, as at Sutter NWR, Sutter County and the I-5 II colonies, tricolors stacked nests in bulrushes immediately below ibis nest platforms. In the same marshes, where both bulrushes and cattails were available, ibises sometimes used bulrushes exclusively (I-5 colony, 2000). Ibis also often use cattails for nesting platforms elsewhere.

Ten largest colonies

The record of the largest colonies since 1992 is summarized in Beedy and Hamilton (1997) for 1992, 1993, 1994 and 1997. The proportion of birds at the 10 largest colonies for the 2000 Census date (Table 7a, Figure 3) could be indicative of the thoroughness of our search. As the number of colonies located increases, the proportion of birds comprising the largest colonies might be expected to decrease, especially if the largest colonies are more likely to be detected. This proportion was 61.3% of all nesting birds at the time of the Census, lower than in previous years, suggesting that the 2000 search may have been particularly thorough.

Inclusion of a second list of the 10 largest colonies for the entire breeding season showed that over 58.9% of the *entire breeding season RE* was at the 10 largest colonies (Table 7b, Figure 4). When adjacent independent colonies within five miles of one another were combined into 10 *colony clusters* (Table 7c, Figure 5) they included an even greater proportion (76.2%) of all measured RE by tricolors for the season. One of several reasons colony clusters are so quantitatively important is that some of them produce two successive broods at the same location. Individuals losing nests can start again without losing time to travel and reconnaissance.

Discussion

Census analysis

Differences between years. Not all initial size estimates of colonies located during the Census can be adjusted by a post-season transect search to determine the number of active nests present during the breeding season. Refinement of initial estimates has been our convention in all years and, while it is a source for error in annual population estimates, it has been consistent. Part of the difference between 1999 and 2000 in number of birds found on the Census date could reflect a population increase resulting from protection by USFWS in 1999 of a large nesting colony (Producer's Dairy) in silage. But assuming that one-third of the fledglings produced there survived to breed the following year (Cook et al. 1993), fledglings from that colony would have added only about 9,000 individuals to the year 2000 breeding cohort (Table 5). The difference between 1999 and 2000 can more probably be explained by participation of DeHaven in the 2000 Census and by our failure to fully account for the fate of the large flock (75,000) observed (Hamilton et al. 1999) just prior to the 1999 Census in Tulare County.

Nonbreeding birds. There have been in all years of this study (1992-2000) relatively few nonbreeding birds (Appendix 2 for the Census date in 2000); most of them are flocks associated with colonies.

Habitat selection and habitat losses

Habitat selection. Tricolor colonies vary in size from 100 or even less (e.g., Clendennen, Kern County foothills) to as many as 105,000 individuals (1994, San Luis NWR) and in the past to as many as 300,000 individuals (Neff, 1937, Glenn County). Initial settlement at colony sites is into the most favorable situations. As settlement continues less favorable habitats are occupied. For example, dense thistles in wheat and silage fields attract first nesting individuals. Later starters may nest in thinner thistle patches or even in the wheat. Mapping hatching dates of nests throughout a colony identifies this relationship. First hatching nests are first settled. Males settling less favorable peripheral habitats may not attract females and subsequently may abandon their territories (Hamilton et al. 1995). This agrees with Collier's (1968) observation that far more individuals initiate than complete the nesting cycle at most or all colony sites, as observed again this year.

At some colonies all suitable nesting habitat is occupied (Hamilton et al. 1995). Elsewhere there is additional nesting habitat closely similar to that occupied which is unutilized (e.g., most, but not all, years at Laguna Seca, Monterey County). There are different densities of settlements in different years, especially at sites where all suitable habitat is utilized, such as at the Toledo Pit, Tulare County. So a local settlement exceeding the capacity of nesting habitat to accommodate it may accept low quality nesting substrate. Or some individuals may move on and settle elsewhere.

Habitat selection and water utilization. Tricolors select colony sites based upon their proximity to foraging areas. Nesting success depends, in part, upon the mean distance they must travel to provision chicks (Cook, Hamilton pers. obsn.). Tricolor colonies also depend upon open water within a short (< 500 m) distance from colony sites. Their need for water is low and can be satisfied by a small pond

and less than an acre-foot of water, by irrigation canals and even pools remaining late in the spring in seasonal streams. However, sites dependent upon flooding to protect nests or to support emergent aquatic vegetation, such as bulrushes and cattails, require open water for about four months and may require as much as three acre feet of water per acre per year. In California cattail marsh studies underway and completed suggest that cattails use less water than the reference comparison crop, healthy lawn or alfalfa. One cattail marsh in Ontario, Canada used 4.8 mm water/da, about 2 acre-feet/ 4 mo. season, not significantly different from shallow open pond water (4.9 mm/day). Thus, removal of cattails may not appreciably improve the water retention capacity of shallow water-filled reservoirs. This counterintuitive conclusion is due to a reduction of evaporative water losses by the cattail stand (Price 1994). Removal of cattail stands to enhance water capacity, as observed in Fresno, Yolo and Glenn counties and elsewhere may be unwarranted.

Reserve characteristics. Nesting sites must be associated with a nearby foraging space. In this year's rice study the foraging area supporting colonies on Delevan NWR included rice fields only up to 3.5 miles away. This area amounted to 10,000 ha or 25,000 acres per colony site (Figure 2). The amount of foraging habitat used within this space depends upon the resource and usually includes only a small part of the total area.

Other crops suitable for foraging tricolors near colonies include alfalfa and irrigated pasture, safflower, sunflowers and grains. Tricolors do occasionally forage in orchards, but not vineyards, and in most row crops (tomatoes, cotton, sugar beets, etc.), but they spend no substantial time doing so. Rangeland and oak-woodland are also important foraging habitats (East Park, Colusa County, Laguna Seca, Monterey County, Camanche Reservoir, San Joaquin County). All colonies require nearby water sources.

There is a vast additional potential to produce tricolor fledglings associated with rice if safe (free from night heron predation) nesting substrates can be provided. Mike Wolder, biologist at Sacramento NWR, Glenn County, advises development of parcels not smaller than 25-30 acres. A further modest buffer zone outside impoundments is desirable.

The colony on Tract 17 at Delevan NWR (Figure 2) was ideally situated to take advantage of nearby rice fields without being a major problem to rice growers. There are several reasons for the low impact of the Delevan colonies upon rice growers: 1) these colonies were not immediately adjacent to the utilized fields and thus their impact upon sprouting rice was spread over several growers, 2) the area was in production in all directions and there was a large amount of rice within reach of foraging tricolors and 3) the refuge provided some foraging habitat, supplementing tricolor resources and reducing the impact upon nearby rice. Elsewhere 40-acre parcels work well as nesting habitats. But parcels as small as two acres or even less can be significant producers of fledglings (Sunsweet, Yolo County 1998, 2000; San Luis Obispo County colony, 2000, 2/3 acre).

The most important foraging areas near dairies were alfalfa fields, irrigated pastures and grain associated with dairying operations. Adult tricolors in this setting also make extensive use of wheat and barley in the milk stage and dairy cow rations, especially cracked corn (Skorupa et al. 1980, Hamilton et al. 1995), imposing moderate losses upon dairymen.

Colony clusters. Once having identified the concept of colony clusters (above) I searched for them not only on the ground but also in the recent historical record. They were not difficult to find. The colony cluster in the vicinity of the Capitol Outing Club, Colusa County, followed by Orians (1961) in the late 50s, remains active (Table 7). Himalaya blackberries supporting a vast rice-foraging tricolor settlement east of Willows, California, were deliberately destroyed in 1998. In Sacramento County the colony cluster at Ranch Seco was lost to deliberate destruction of nesting habitat and to a huge vineyard. In Kings County during the 1990s the tricolor megalopolis near I-5 was lost to almonds, barley and cotton. The historical (1959) marsh colony at Madison, Yolo County (>100,000, Orians 1961) was lost to drainage. Neff (1937 reported several colony clusters, mostly in marshes in the midst of the rice growing districts of the Sacramento Valley that no longer exist.

Deliberate habitat destruction. Deliberate habitat loss, sometimes associated with tricolor observer actions, both by Census observers and the author, is a major problem. Since there has been a trend towards nesting in introduced plants (DeHaven 1975, Cook 1996, Hamilton and Beedy 1997, 1999) it will be difficult to rationalize their protection. As agriculture continues to intensify, patches of Himalaya blackberries are steadily being lost to potent herbicides and burning. A biodiversity-based justification for long-term maintenance of Himalaya blackberries (Hamilton et al. 1999) and giant cane (*Arundo*, DeHaven 2000) is not a viable long-term solution to the tricolor decline problem.

Urbanization. Protection of spectacular small colonies in the midst of cities, especially in Southern California but also at Laguna Seca (Monterey County) and elsewhere by easements or outright purchase is an urgent priority.

Predation changes. The distribution and abundance of ibis in California is expanding, from 800 in 1990 to 5,134 in 1999 (Ivey et al. 2000). Resurgence of ibis may change the long-term value of cattail marshes for tricolors and offers one answer to the question of how tricolors dealt with night herons in the past.

Management Actions and Their Outcome

Population increases depend upon habitat enhancement and protection. Since suitable nesting and foraging habitats have entirely different characteristics, improvement of conditions for either may produce a successful colony where there was none, as observed in 2000 and in other years at several locations.

Wind Wolves Conservancy. At Wind Wolves (western Kern County), following fence building to exclude cattle from foothill springs, the number of birds using nettles and cattails there increased from 740 in 1999 to 3,660 in 2000. Tricolors, unlike redwings, are well suited to exploitation of open, unirrigated rangeland. End of season observation showed high RS (as measured only by attendance of large flocks provisioning flighted fledglings) is a harbinger of further population increases. The limits to production in such safe foothill colonies has not been determined but has the potential to increase overall tricolor abundance while generating positive benefits in rangelands by controlling herbivorous insects, especially grasshoppers. The privately funded initiative at Wind Wolves identifies

a major opportunity to enhance tricolor numbers in rangeland habitats. Foothill and valley margins colonies also have escaped night heron predation (e.g., Sunsweet, Table 3).

Refuge nesting in goose habitat. At Merced NWR three colonies settled in weedy wheat. There thistles flourished in wheat fields planted to attract geese. A large proportion (>80%) of tricolor nests in these thistles succeeded. Both of the colonies monitored also successfully renested (Table 3, 4). This is at a site where there has been little successful tricolor nesting during the 1990s. A secure nesting substrate was the missing ingredient.

Other management actions on NWRs. At Sacramento, Delevan, Merced and Kern NWRs pools with cattails continue to be managed for tricolors. In comparison with 1994 observations an increasing proportion of the entire RE in 2000 was on wildlife refuges. Colusa NWR (Colusa County), once a tricolor nesting site, at present maintains no suitable tricolor nesting habitat.

Populations

Connectivity (Merriam 1991), i.e. movement between colony sites in California north of the Tehachapis may be nearly complete (DeHaven et al. 1975, Hamilton 1998). A success or loss anywhere may be a contribution to, or subtraction from the whole Central Valley population and, if tricolors move freely between Northern and Southern California, the global tricolor population. Local between year changes in presence of tricolors (Table 6) can be related to changes in local conditions. Earlier authors, incompletely informed about the causes of year-to-year changes in conditions, felt these changes were illogical and without apparent cause (a conclusion summarized in Beedy and Hamilton 1999). Payne (1969) evaluated proximate causes of year-to-year changes in settlement patterns. He and Collier (1968) evaluated the role of burning of cattail marshes and the delay or elimination of initiation of breeding caused by it. Collier (1968) showed that the drying of ponds caused local colonies to shift their location and noted that specific marsh conditions influenced changes in settlement and numbers. Most of the year-to-year changes (Table 6) have logical explanations, derived from my diachronic observations. Some of them are given in Appendix 7. Site by site, the causes of loss of colony sites and their associated foraging habitats are known. Causes of tricolor declines in abundance are also known and remedies are equally apparent.

The main utility of Table 4 is to show the relative importance of alternative habitats and the management strategies they suggest. Substitution of alternative estimates will change the results (Table 5). For example, if survivorship of adults is 70% rather than 50% there will be 33,000 more adults in 2001. But these adjustments will not change the relative importance of particular colonies; relative importance of colonies will change only if the global population was underestimated. Available data suggest that a viable management strategy is to work with known colony sites and already identified habitats. Search for and evaluation of habitat without these leads (DeHaven 2000), a potentially useful long-term strategy, will be neither cost effective nor timely.

Hamilton (1998) evaluated patterns of irregular within-breeding-season movements by tricolors. His study, based upon the annual censuses and surveys, showed that

tricolors are breeding at more than one place during the breeding season, i.e., that they are itinerant breeders. When tricolors have not yet arrived at a site an observer finding no colonies may erroneously conclude that there are no birds using a particular locality or region that year (Hosea 1984, Beedy et al. 1991, DeHaven 2000 for Colusa County).

Colonies also can be overlooked if visits to colony sites are infrequent. At one site (Capitol Outing Club) in 1994, 60,000 tricolors arrived and initiated breeding between June 1 and June 4. Their nests were entirely emptied by night heron predation by June 17. Observations there on all dates before June 1 and after June 17 would have produced no observations of tricolors. To avoid missing birds during the breeding season local searches must persistently observe colony sites throughout the season, an activity best pursued by local residents.

Further Work and Recommendations

There is a wide range of possible ways that tricolor distribution and abundance are affected (see especially Hamilton 1998). These have been largely unevaluated. The extensive and complex literature dealing with population fluctuations has as yet not been brought to bear on the tricolor population evaluation and management problem. One achievement of ongoing tricolor studies is identification of a set of actions (Beedy and Hamilton 1997, Hamilton et al., 1999, this report) that, when implemented in specific places, will promptly reverse the striking decline in tricolor numbers noted here and reported elsewhere.

Future Censuses and surveys. In 1994, 1997, 1999 and 2000 we searched for colonies with as many people as possible, as thoroughly as possible on a specific date. This Census depends upon participants to locate and estimate the size of colonies. Serious amateur and professional birders (Appendix 8) located most of all birds recorded. Future censuses and surveys should emphasize participation by these highly motivated and knowledgeable individuals. An expanded list of people contacted and who contacted us but filed no written or verbal report is also available. Censuses in the past two years were done on short notice. There is competition for the time of those individuals most qualified to make field evaluations of tricolor distribution and abundance in late April when the censuses are conducted. A season long search for colonies would not depend upon recruiting of these individuals on a particular weekend. I recommend that a season-long survey be conducted in 2001 to more effectively identify all colonies and to avoid overemphasis upon the San Joaquin Valley colonies active on the traditional dates of the Census. What is the best method for attaining maximum coverage?

Any census should be planned well in advance and an intensive search for colonies initiated by mid-March. Early season observers need to be in the field by 20 March when the silage-nesting season begins. Much of the work developing estimates of colony size and almost all of the RS estimates were made after the Census was completed. Some colonies forming before or after the Census were not located or were reported and not quantified. These essential activities are personnel and cost limited. Resources throughout the 1990s, with the exception of 1994, were inadequate to exploit the opportunity to evaluate the fate of colonies which in all years has depended heavily upon volunteer labor. To quantitatively track this

species we need one or two full-time experienced field workers and a full-time communications and records keeper working at least six months.

Contacting landowners and convincing them to accept observers is a time consuming process and requires a skillful person willing to work with diverse people and organizations. Censuses and surveys are sensitive and have resulted in the loss of colonies to deliberate destruction by landowners. Further work needs to consider ways to minimize this effect.

Night heron predation. Unlike all recent years (since 1991) Black-crowned Night-heron predation was low or absent at some cattail colonies. Hence I withdraw my support for our (Hamilton et al. 1999) recommendation that additional large cattail expanses to accommodate tricolor breeding be avoided. This conclusion notwithstanding, most tricolor nesting in cattails failed at Kern NWR, Kern County, probably due to night heron predation. Night herons were observed destroying the Maxwell I and Maxwell II colonies (Colusa County). A quantitative measure of night heron and ibis distribution and abundance is needed. It should be compared with earlier heron censuses conducted by CDFG. These old records need to be recovered and extended.

Rice. Tricolors are at present heavily dependent upon rice (Table 4), the successor to the great Sacramento Valley wetlands. In 2000 RS at most nests in rice habitats was lower (by about 20%) than in other (1991-1999) seasons (Table 3). A recent analysis of riparian birds in California (RHJV, 2000) states that pesticides are a factor in tricolor decline. I know of no evidence that toxic contaminants have adversely affected this species since Beedy and Hayworth's (1992) report of selenium poisoning associated with the Kesterson affair. The possible impact of recent changes in pest insect control upon tricolor reproduction in rice needs evaluation. A study of the environmental relationships of tricolors depending upon rice is a high priority. For an evaluation of use and management of rice for waterbirds in Europe see Fasola and Ruiz (1997).

Silage. The scale of operations necessary to implement a policy of protecting colonies in silage by USFWS should not be underestimated. It may not be evident from this and previous reports that censuses in late April were conducted during the breeding season well after several silage colonies already were lost. Some silage colony losses scatter large colonies, reducing the potential to accurately estimate numbers of colonies and breeding birds. If USFWS plans to implement a policy of protecting all tricolor colonies in silage habitats, regardless of planned actions, the plan needs to be established before the 2001 tricolor breeding season.

Access. Another issue to be considered relative to tricolor management if silage colonies are going to be managed is access to private property. One 1994 Tulare County silage colony (50,000 birds) nesting on private property could only be accessed by travelling about three miles on private roads. That year USFWS personnel were unable to do so. The colony was wiped out during harvest. Elsewhere we have relied on the goodwill of landowners for access to colonies. How is this problem going to be resolved?

Are buyouts meaningful to tricolor populations? There are several reasons to buy out or otherwise protect at-risk colonies on private property. These include; (1)

silage fields produce tricolors, a declining and possibly jeopardized species, supplementing their numbers relatively inexpensively, (2) there are ethical objections to destroying colonies of birds and (3) we should a be observing the Migratory Bird Treaty Act.

Discussion above suggests that tricolor abundance is a matter of adding to and subtracting from a pool of individuals comprising the population. This kind of calculation is especially meaningful when populations are suppressed by catastrophic events such as DDT poisoning, excessive hunting, collecting and other exotic human forces. Is silage cutting such a factor? Between 1992 and 1994, in 1999 and 2000 we (CDFG, USFWS, Hamilton, Producers Dairy) protected several colonies, substantially reducing silage breeding colony losses. Nevertheless the decline continued (Table 5). Perhaps tricolor population decline is the outcome of habitat loss and largely independent from fledgling losses. Was the Passenger Pigeon (*Ectopistes migratorius*) hunted to extinction or the victim of massive habitat changes (Butcher 1992)?

Population changes and within-season movements. The plausible suggestion by DeHaven (2000) that losses of large colonies in the silage fields may have no population meaning seems to be refuted by his classical studies (DeHaven et al. 1975) which showed that tricolor philopatry is limited. Tricolors fledged at any particular colony are more likely to be found somewhere else the following year than at their natal colony site when they initiate nesting. It seems to follow that successful colonies may contribute to or draw upon breeding stock elsewhere, either as colonists or as additions to active colonies. It should also follow that those persistent failures at particular colony sites use reproductive effort (RE), depleting the entire population. In response to these arguments DeHaven (pers. comm.) notes that while natal philopatry is limited, 2-year-old and older tricolors may be more highly philopatric to their sites of initial breeding settlement, a relationship not tested by any available data and certainly a possibility. Itinerant breeding (Hamilton 1998) demonstrates the interdependence of tricolor colonies throughout the Central Valley and possibly the tricolor world. To what extent are the respective colonies in the Central Valley drawing upon or contributing to one another? Are there major sources (of production of fledglings) and sinks (habitats yielding unsuccessful reproduction, Pulliam 1988, Hamilton et al. 1995)? Many details of tricolor life history are unresolved and knowledge of them is crucial to an informed evaluation of the causes of tricolor population decline.

Conclusion

Tricolored Blackbirds deserve to be given a higher priority in conservation affairs than they have so far been given. In a recent USGS announcement of support for species at risk (SAR), over 40 species of birds were listed as eligible for funding. Tricolored Blackbirds were not included. In a review of avian diversity and conservation priorities, Owens and Bennett (2000) evaluated phenotypic diversity. The phenotypic diversity component of the North American avifauna represented by tricolors is huge. Tricolors are now the most highly colonial land bird in North America, a place they took in 1914 when the Passenger Pigeon became extinct. Massed colonies are a part of tricolor and avian diversity, and that aspect of their diversity continues to erode.

Acknowledgments

I am indebted to Tara Zimmerman and USFWS for support for the 2000 Census, survey and preparation of this report. Anne Forcella worked with all drafts, management of the database, and in other ways, assistance deeply appreciated. Steve Herman, Evergreen State University, helped organize the Santa Nella workshop and contributed invaluable help in determining reproductive success at colonies in the San Joaquin Valley. Karen Miller (USFWS) attended the workshop and made helpful suggestions regarding future workshops.

Bob Barnes, California Audubon, organized the Census, recruiting not only participants but also enthusiasm for the species and its protection.

The participants in the Census are listed in Appendix 8. Their reports included much of importance in addition to the reports of observations of tricolor at and away from colonies. Appendix 8 lists only those who contributed written accounts to the Census. Listing of all those who dutifully searched for and reported colonies is not possible but their support is deeply appreciated.

Sam Fitton and Richard DeHaven made particularly extensive travels in the San Joaquin Valley to make the Census as complete as possible.

Liz Cook contributed data not only from 2000 but also previous years. Without her extensive knowledge of the tricolor issue in Sacramento County a far less complete report would be possible.

Without exception I have had full cooperation from the USFWS NWRs and their respective staffs. This included the use of staff time to participate in counts of colonies and to verify situations in the field that would otherwise have relied only upon the observations of the author. At San Luis NWR Sharon Bakeman and Tim Kelson assisted in the field with post-season nest counts. Mike Carpenter helped in the field at Delevan with active nest counts. Dennis Woolington provided logistic and personal support with information and time afield. At Sacramento NWR Mike Wolder provide real time information about tricolor settlements. At Kern NWR tricolor observations were made and supported by David Hardt and Jack Allen.

Holman King, CDFG biologist, located and supported reconnaissance of a colony in northern Merced and southern Stanislaus counties.

David Clendennen precisely tracked tricolor and other events in nature on the Wind Wolves reserve.

Several readers of draft versions of this report contributed substantially to its revisions. I am indebted to Rhys Bowen, Ted Beedy, Richard DeHaven and Kevin Hunting for this assistance. Liz Cook also provided important comments.

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Investigation effort summary for Tricolored Blackbird Survey years

INVESTIGATION SITES	N SITES ON APRIL 21-24				N COUNTIES			
	1994	1997	1999	2000	1994	1997	1999	2000
SURVEY BREEDING COLONIES	80	71	53	72	26	25	22	24
COLONY SITES NO BIRDS PRESENT	94	43	114	134	18	15	19	26
TOTAL	174	114	167	206	33	29	29	33
TOTAL BREEDING COLONIES ALL DATES	99	79	89	98	28	28	26	25
TOTAL COUNTIES SURVEYED					37	34	32	33
SURVEY PARTICIPANTS REPORTING	68	55	50	81				

SURVEY SUMMARY, NUMBER OF BIRDS:	1994	1997	1999	2000
BREEDING BIRDS *1	300,000	185,000	85,000	105,481
BREEDING BIRDS **2	330,000	230,000	95,000	155,000

*1 Breeding birds as of late April; observers Bill Hamilton, Liz Cook, Bakersfield observers, Sam Fitton, Tim Manolis. Scope is Central Valley plus eastern Riverside County. Latter done by Hamilton, local collaborators. Figures rounded to nearest 5,000.

**2 Breeding birds as above plus all reports by other observers throughout the geographic distribution of the species as of late April. Rounded to

TABLE 2

ANNUAL SURVEY COMPARISON

Region and County	1994 Breeding	1994 Nonbreeding	1994 Total	1997 Breeding	1997 Nonbreeding	1997 Total
SACRAMENTO VALLEY						
BUTTE	0	0	0	0	0	0
COLUSA	25	2	27	2,100	1,975	4,075
EL DORADO	0	0	0	0	0	0
GLENN	2,000	0	2,000	0	0	0
PLACER	1,000	0	1,000	430	228	658
SACRAMENTO	93,225	803	94,028	25,850	5,658	31,508
SUTTER	35	200	235	0	0	0
TEHAMA	0	0	0	35	0	35
YOLO	400	75	475	200	0	200
YUBA	0	597	597	0	950	950
SUBTOTAL	**96,685**	**1,677**	**98,362**	**28,615**	**8,811**	**37,426**
SAN JOAQUIN VALLEY						
CALAVERAS	0	0	0	8,253	60	8,313
FRESNO	21,150	0	21,150	2,500	6,050	8,550
KERN	70,600	1,655	72,255	16,850	50	16,900
KINGS	0	10,000	10,000	33,300	0	33,300
MERCED	60,100	19,000	79,100	13,000	0	13,000
SAN JOAQUIN	13,750	2,228	15,978	11,750	107	11,857
STANISLAUS	2,500	1,428	3,928	150	0	150
TULARE	50,000	0	50,000	53,500	2,000	55,500
SUBTOTAL	**218,100**	**34,311**	**252,411**	**139,303**	**8,267**	**147,570**
SAN FRANCISCO BAY DELTA						
ALAMEDA	20	4	24	1,265	0	1,265
CONTRA COSTA	400	0	400	0	0	0
MARIN	0	400	400	0	0	0
NAPA	11	0	11	350	50	400
SANTA CLARA	3,350	150	3,500	550	0	550
SOLANO	0	5	5	37	1	38
SUBTOTAL	**3,781**	**559**	**4,340**	**2,202**	**51**	**2,253**
NORTH COAST						
HUMBOLDT	100	0	100	0	0	0
LAKE	0	0	0	0	60	60
MENDOCINO	0	0	0	12	0	12
SONOMA	0	30	30	0	0	0
SUBTOTAL	**100**	**30**	**130**	**12**	**60**	**72**
CENTRAL COAST						
MONTEREY	2,200	20	2,220	5,500	400	5,900
SAN BENITO	0	0	0	460	778	1,238
SAN LUIS OBISPO	0	0	0	660	0	660
SANTA BARBARA	2,000	0	2,000	0	0	0
SANTA CRUZ	0	0	0	0	0	0
SUBTOTAL	**4,200**	**20**	**4,220**	**6,620**	**1,178**	**7,798**
SOUTHERN CALIFORNIA						
LOS ANGELES	755	60	815	430	0	430
ORANGE	1,000	34	1,034	231	0	231
RIVERSIDE	2,100	75	2,175	37,956	400	38,356
SAN BERNARDINO	0	0	0	300	0	300
SAN DIEGO	2,000	0	2,000	3,178	58	3,236
TUOLUMNE	0	0	0	0	0	0
VENTURA	90	0	90	0	0	0
SUBTOTAL	**5,945**	**169**	**6,114**	**42,095**	**458**	**42,553**
NORTHEAST INTERIOR						
LASSEN	0	0	0	0	6	6
MODOC	0	250	250	0	0	0
SHASTA	2,500	85	2,585	0	0	0
SISKIYOU	400	547	947	250	0	250
SUBTOTAL	**2,900**	**882**	**3,782**	**250**	**6**	**256**
TOTAL	**331,711**	**37,648**		**219,097**	**18,831**	
GRAND TOTAL			**369,359**			**237,928**
CALIFORNIA CO WITH BIRDS	**32**				**30**	

TABLE 2

ANNUAL SURVEY COMPARISON

Region and County	1999 Breeding	1999 Nonbreeding	1999 Total	2000 Breeding	2000 Nonbreeding	2000 Total
SACRAMENTO VALLEY						
BUTTE	5,000	958	5,958	5,035	399	5,434
COLUSA	1,000	31	1,031	2,500	0	2,500
EL DORADO	0	0	0	0	0	0
GLENN	0	0	0	0	0	0
PLACER	2,000	2,500	4,500	6,200	0	6,200
SACRAMENTO	12,859	0	12,859	12,275	4,108	16,383
SUTTER	200	200	400	200	0	200
TEHAMA	0	0	0	0	0	0
YOLO	0	0	0	80	0	80
YUBA	0	0	0	0	0	0
SUBTOTAL	**21,059**	**3,689**	**24,748**	**26,290**	**4,507**	**30,797**
SAN JOAQUIN VALLEY						
CALAVERAS	0	0	0	260	500	760
FRESNO	39,790	250	40,040	5,046	15	5,061
KERN	3,350	0	3,350	10,600	50	10,650
KINGS	0	0	0	10,000	0	10,000
MERCED	1,500	2,461	3,961	25,980	1,120	27,100
SAN JOAQUIN	0	0	0	7,008	65	7,073
STANISLAUS	3,000	1,126	4,126	0	15	15
TULARE	14,000	0	14,000	53,300	0	53,300
SUBTOTAL	**61,640**	**3,837**	**65,477**	**112,194**	**1,765**	**113,959**
SAN FRANCISCO BAY DELTA						
ALAMEDA	4,000	0	4,000	0	0	0
CONTRA COSTA	0	0	0	0	0	0
MARIN	0	0	0	0	0	0
NAPA	640	40	680	104	0	104
SANTA CLARA	0	0	0	0	0	0
SOLANO		33	33	0	0	0
SUBTOTAL	**4,640**	**73**	**4,713**	**104**	**0**	**104**
NORTH COAST						
HUMBOLDT	0	0	0	0	0	0
LAKE	0	0	0	0	0	0
MENDOCINO	15	0	15	0	0	0
SONOMA	0	0	0	0	0	0
SUBTOTAL	**15**	**0**	**15**	**0**	**0**	**0**
CENTRAL COAST						
MONTEREY	2,430	6	2,436	955	63	1,018
SAN BENITO		160	160	702	718	1,420
SAN LUIS OBISPO	261	250	511	500	500	1,000
SANTA BARBARA	0	0	0	0	0	0
SANTA CRUZ	300	0	300	200	0	200
SUBTOTAL	**2,991**	**416**	**3,407**	**2,357**	**1,281**	**3,638**
SOUTHERN CALIFORNIA						
LOS ANGELES	520	605	1,125	510	100	610
ORANGE	100	6	106	490	5	495
RIVERSIDE	3,000	1,000	4,000	10,000	0	10,000
SAN BERNARDINO	1,000	0	1,000	0	0	0
SAN DIEGO	160	35	195	1,310	711	2,021
TUOLUMNE	0	0	0	400	175	575
VENTURA	0	0	0	0	0	0
SUBTOTAL	**4,780**	**1,646**	**6,426**	**12,710**	**991**	**13,701**
NORTHEAST INTERIOR						
LASSEN	0	0	0	300	9	309
MODOC	0	0	0	0	0	0
SHASTA	0	0	0	0	0	0
SISKIYOU	0	0	0	0	0	0
SUBTOTAL	**0**	**0**	**0**	**300**	**9**	**309**
TOTAL	**95,125**	**9,661**		**153,955**	**8,553**	
GRAND TOTAL			**104,786**			**162,508**
CALIFORNIA CO WITH BIRDS		**23**			**25**	

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TABLE 3
REPRODUCTIVE SUCCESS IN 2000

Colony (Foraging Habitat)	Substrate	Date	N nests	succ nests	% succ	RS Succ	RS All	Colony Size	Fledge	Predation	Ibis
COLUSA											
DELEVAN 17 (RICE)	CATTAIL	6/17/00	35	28	80	1.5	1.20	25,000	20,000	NO	NO
DELEVAN 42 (RICE)	CATTAIL	6/10/00	29	19	66	2.7	1.80	12,000	14,000	NO	NO
HILLS (RICE)	CATTAIL	6/23/00 6/27/00	36	24 18	67	1.6 1.6	1.20	25,000	20,000	NO	
ACRE FARMS (RICE)	CATTAIL	6/13/00	39	6	15	1.6	0.50	10,000	3,333	HERON	NO
I-5 MAXWELL I (RICE)	CATTAIL	7/1/00	22	5	23	1.6	0.40	5,000	1,199	HERON	YES
I-5 MAXWELL II (RICE)	CATTAIL / BULRUSH	7/9/00	71	2	3	2.0	0.03	2,000	38	HERON	YES
HARBISON RD (CATTAIL)		7/1/00		0	0	0.0	0.00	7,500	0	HERON	NO
MERCED											
MERCED NWR # 3 (RANGELAND)	THISTLE	5/25/00	22	18	82	1.4	1.12	18,000	13,440	NO	NO
MERCED NWR # 5 (RANGELAND)	THISTLE	6/3/00	5	4	80	1.0	0.80	11,000	8,800	NO	NO
ARENA PLAINS (RANGELAND)	H.BLKBERRY	5/13/00	36	18	50	1.9	0.95	8,500	5,666	NO	NO
RIVERSIDE											
HEMET	BULRUSH	4/7/00 5/12/00	6 44	2	4	1.8 1.5	0.20 0.10	10,000 10,000	1,333 454	HERON / GRACKLE	YES
SUTTER											
SUTTER NWR (RICE)	CATTAIL / BULRUSH	8/2/00	108	7	6	1.4	0.10	7,500	500	HERON	YES
TULARE											
TE VELDE (ALFALFA)	SILAGE	5/3/00 5/6/00	33 91	24 44	73 48	1.4 1.5	1.00 0.70	30,000 30,000	20,000 14,000	COYOTE	NO
TOLEDO PIT (ALFALFA)	CATTAIL	4/16/00	36	16	44	1.6	0.70	15,000	7,000	NONE	NO
YOLO											
SUNSWEET I (RICE)	CATTAIL	4/17/00	20	0	0	0.0		200	0	UNK	NO
SUNSWEET II (RICE)	CATTAIL	6/1/00		10		2.1		2,000	2,800	NO	NO

X WEIGHTED RS / NEST OF MEASURED COLONIES EXCLUDING LOST SILAGE COLONIES 0.87
X UNWEIGHTED RS / NEST OF MEASURED COLONIES INCLUDING LOST SILAGE COLONIES 0.81

TABLE 4

REPRODUCTIVE EFFORT SUMMARY FOR BREEDING COLONIES

Colony	Ownership nesting	Ownership foraging	Foraging Substrate	Si	D	Nesting Substrate	SU	Reproductive effort	Colony Size (Adults)	Fledglings	Fledglings per
Population use of time for each colony, Time lost to successful nests (S) appears above lost nests (U) Silage (Si) Grain (G) Dairy (D) Privte (PVT) Public (PUB) Government (GOV)											
RICE DEPENDENT FORAGING											
DELEVAN 17:	GOV	PVT/PUB	RICE			CATTAIL	S	8.2%	25,000	20,000	1.20
							U	0.8%			
DELEVAN 42:	GOV	PVT	RICE			CATTAIL	S	3.3%	12,000	14,000	1.75
							U	0.6%			
HILLS RICE:	PVT	PVT	RICE			CATTAIL/ BULLRUSH	S	6.9%	25,000	20,000	1.20
							U	1.3%			
ACRE FARMS:	PVT	PVT	RICE			CATTAIL	S	0.6%	10,000	3,333	0.50
							U	1.3%			
MAXWELL I:	GOV	PVT	RICE			CATTAIL	S	0.5%	5,000	1,200	0.36
							U	0.6%			
MAXWELL II:	GOV	PVT	RICE			WILD RICE	S	TRACE	2,000	38	0.02
							U	0.3%			
SUNSWEET:	PVT	PVT	RICE			CATTAIL	S	0.7%	2,000	1,919	1.44
SUTTER WILD RICE:	PVT	PVT	RICE			CATTAIL	S	3.7%			
							U	0.5%			
SUTTER NWR:	GOV	PVT	RICE			CATTAIL/ BULLRUSH	S	0.2%	7,500	500	0.10
							U	0.7%			
HARBISON	PVT	PVT	RICE			CATTAIL	U	0.3%	7,500	0	0.00
TOTAL ALL RICE								**30.5%**			
ALFALFA FORAGING (=DAIRY DEPENDENT) COLONIES											
FAILED SILAGE			ALFALFA	Si	/D	CUT FEED	U	4.1%	20,000	0	0.00
TE VELDE:	PVT	PVT	ALFALFA	Si	/D	WHEAT (TRITICALE)	S	7.4%	30,000	17,000	0.85
							U	3.9%			
GEORGE DAIRY:	PVT	PVT	ALFALFA	Si	/D	WHEAT/ NETTLES	S	2.3%	7,500	4,500	0.90
							U	0.6%			
TOLEDO PIT:	PUB	PVT	ALFALFA		D	CATTAILS	S	2.4%	21,000	10,266	0.70
							U	3.8%			
HEMET:	PUB	PVT	ALFALFA		D	BULRUSH	S	0.3%	20,000	1,000	0.05
							U	4.0%			
TOTAL ALL								**28.8%**			
MERCED COUNTY COLONIES, RANGELAND FORAGING											
MERCED NWR 3:	GOV	PVT/GOV	RANGE	Si	/D	THISTLE	S	6.1%	18,000	13,440	1.12
							U	0.7%			
MERCED NWR 5:	GOV	PVT/GOV	RANGE	Si	/D	THISTLE	S	3.6%	11,000	8,800	1.20
							U	0.5%			
ARENA PLAINS:	PUB	PVT	RANGE			H. BLACKBERRY	S	1.8%	8,500	5,666	1.00
							U	0.9%			
MERCED NWR NORTH:	PUB	PVT/GOV	RANGE	Si	/D	WHEAT		0.8%	2,000		
TOTAL MEASURED MERCED:								**14.3%**			

TABLE 4

REPRODUCTIVE EFFORT SUMMARY FOR BREEDING COLONIES

Colony	Ownership nesting	Ownership foraging	Foraging Substrate	Si	D	Nesting Substrate	SU	Reproductive effort	Colony Size (Adults)	Fledglings	Fledglings per
The following were not measured and are estimated based upon same year and other year measurements in similar habitats elsewhere.											
KERN NWR RENEST	GOV	PVT	?			CATTAIL		0.7%	2,000		
STANISLAUS SLOUGH:	?	PVT	ALFALFA			BULRUSH		4.6%	15,000		
OTHER BULRUSH	MIX	MIX	MIXED			BULRUSH		2.8%	9,139		
BLACKBERRY	MIX	MIX				H. BLACKBERRY		8.0%	25,192		
CATTAIL	MIX	MIX	MIXED			CATTAIL		3.0%	9,957		
TAMARISK	PVT	PVT	MIXED			TAMARISK		0.6%	2,000		
WIND WOLVES (NETTLE/ CATTAIL)	PVT	PVT	RANGE			NETTLE		1.1%	3,660		
OTHER WILLOW	PVT	PVT	MIXED			MIXED/ WILLOW		0.2%	767		
TOTAL ESTIMATED RS NOT MEASURED								**21.0%**	**67,715**		
UNACCOUNTED FOR NESTING								5.4%			
GRAND TOTAL								**100.0%**			

TABLE 5

DEMOGRAPHIC CONSEQUENCES OF INTERVENTION

COLONY SAVED	N	RS	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1991 SAN ANTONIO (AL)	3,500		777	389	194	97	49	25	13	7	4	2
1992 LETTUCE (KI)	65,000	2.5		36,111	18,056	9,028	4,514	2,257	1,129	565	283	142
1992 LETTUCE (KI)	15,000	2.2			7,333	3,667	1,834	917	459	230	115	58
1993 TULARE (TU)	48,000	1.0			10,666	5,333	2,667	1,334	667	334	167	84
1994 WILDWOOD (KE)	28,000	1.5				9,333	4,667	2,333	1,167	584	292	146
1994 PRODUCERS (FR)	28,000	1.8				8,000	4,000	2,000	1,000	500	250	125
1994 SAN LUIS (ME)	105,000	0.7				15,633	7,817	3,909	1,955	978	489	245
1999 PRODUCERS (FR)	45,000	0.9									9,000	4,500
2000 TE VELDE (TU)	30,000	0.85										5,667
2000 GEORGE DAIRY (TU)	7,500	0.85										1,417
Total difference in breeding adults			**777**	**36,500**	**36,249**	**51,091**	**25,545**	**12,723**	**6,390**	**3,198**	**10,600**	**12,386**

The same estimates with 70% rather than 50% annual adult survivorship are:

COLONY SAVED	N	RS	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1991 SAN ANTONIO (AL)	3,500		777	544	581	267	187	131	92	64	45	9
1992 LETTUCE (KI)	65,000	2.5		36,111	25,278	17,685	12,379	8,666	6,066	4,246	2,972	2,081
1992 LETTUCE (KI)	15,000	2.2			7,333	5,133	3,593	2,515	1,761	1,232	863	604
1993 TULARE (TU)	48,000	1.0			10,666	7,466	3,262	2,283	1,598	1,119	783	548
1994 WILDWOOD (KE)	28,000	1.5				9,333	6,533	4,573	3,201	2,241	1,569	1,098
1994 PRODUCERS (FR)	28,000	1.8				8,000	5,600	3,920	2,744	1,921	1,345	941
1994 SAN LUIS (ME)	105,000	0.7				15,633	10,943	7,660	5,362	3,753	2,627	1,839
1999 PRODUCERS (FR)	45,000	0.9									9,000	6,300
2000 TE VELDE (TU)	30,000	0.85										5,667
2000 GEORGE DAIRY (TU)	7,500	0.85										1,417
Total difference in breeding adults			**777**	**36,655**	**43,858**	**63,527**	**44,469**	**31,128**	**20,824**	**14,576**	**19,204**	**20,504**

Same, but Reproductive Effort saved subtracted to account for breeding elsewhere, 50% annual survivorship:

COLONY SAVED	N	RS	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1991 SAN ANTONIO (AL)	3,500		388	194	97	48	24	12	6	3	2	1
1992 LETTUCE (KI)	65,000	2.5		18,055	9,027	4,513	2,257	1,129	565	283	142	71
1992 LETTUCE (KI)	15,000	2.2			3,666	1,833	915	457	229	114	57	29
1993 TULARE (TU)	48,000	1.0			5,333	2,666	1,333	667	334	167	84	42
1994 WILDWOOD (KE)	28,000	1.5				4,666	2,333	1,167	584	292	146	73
1994 PRODUCERS (FR)	28,000	1.8				4,000	2,000	1,000	500	250	125	63
1994 SAN LUIS (ME)	105,000	0.7				7,817	3,909	1,955	978	489	245	123
1999 PRODUCERS (FR)	45,000	0.9									4,500	2,250
2000 TE VELDE (TU)	30,000	0.85										2,834
2000 GEORGE DAIRY (TU)	7,500	0.85										709
Total difference in breeding adults			**388**	**18,249**	**18,123**	**25,543**	**12,772**	**6,386**	**3,196**	**1,598**	**5,301**	**6,195**

Same, but Reproductive Effort saved included, 70% annual survivorship:

COLONY SAVED	N	RS	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
1991 SAN ANTONIO (AL)	3,500		388	272	190	133	93	65	46	32	22	31
1992 LETTUCE (KI)	65,000	2.5		18,055	12,638	8,847	6,193	4,335	3,034	2,124	1,187	1,041
1992 LETTUCE (KI)	15,000	2.2			3,666	2,566	1,796	1,257	880	616	431	302
1993 TULARE (TU)	48,000	1.0			5,333	3,733	2,331	1,632	1,142	800	560	392
1994 WILDWOOD (KE)	28,000	1.5				4,666	3,266	2,286	1,600	1,120	784	549
1994 PRODUCERS (FR)	28,000	1.8				4,000	2,800	1,960	1,372	960	762	471
1994 SAN LUIS (ME)	105,000	0.7				7,816	5,471	3,830	2,681	1,877	1,314	920
1999 PRODUCERS (FR)	45,000	0.9									4,500	3,150
2000 TE VELDE (TU)	30,000	0.85										2,834
2000 GEORGE DAIRY (TU)	7,500	0.85										709
Total difference in breeding adults			**388**	**18,327**	**21,827**	**31,761**	**23,633**	**16,542**	**10,755**	**7,529**	**9,560**	**10,399**

Riverside County created wetland. The Hemet colony was occupied as soon as habitat planted to bulrushes in 1993 developed to partial maturity late in the 1994 season. By 1997 the planting was mature and hosted most of the tricolors known to inhabit southern California (Bowen and Hamilton, pers. obsns.). Between 1997 and 1999 management actions changed the basic characteristic of the Hemet habitat by burning the bulrushes and removing most of the bulrushes, temporarily deleting its current value as tricolor habitat. In 1999 this colony was located in a smaller research marsh unaffected by management actions. It recovered by the 2000 breeding season a substantially smaller area was available for nesting.

Toledo Pit (Kern County). This water district holding pond has consistently accommodated large tricolor colonies since first observed in 1995. In 1999 a large (35,000) flock of tricolors found the pond empty in late April. By the time the pond was flooded on May 1 they had moved (Hamilton et al. 1999).

Sacramento County. Collapse of the huge Sacramento County breeding population was occasioned by deliberate habitat destruction, planting of vineyards and other forms of development (Beedy pers comm., Cook, pers, comm., DeHaven pers. comm.).

Oneill Forebay (Merced County). The decline of highly productive settlements in the Himalaya blackberries at O'Neill Forebay (Merced County) from 1994 conditions followed watercourse changes there and loss of vigor by the blackberry plant nesting substrate.

Producers Dairy (Fresno County). The Producers Dairy colony has variously suffered attempts to incidentally and deliberately (scaring devices, elimination of a cattail marsh) eliminate tricolor habitat or conditions. Given its situation near a large alfalfa foraging area it probably will remain an initial settlement site.

Sunsweet drying yard (Yolo County). This colony is typical of industrial colony sites at gravel pits, prisons and smaller sewage facilities throughout California. Its small size (< 3 acres) limits colony size. Created in 1994, it was first colonized after volunteer cattails matured in 1997. A nearby rice grower who lost some sprouting rice to the adjacent colony prevailed upon the parent company, Sunsweet to disk the cattails in the winter of 1997-1998. Regrowth occurred and it was again colonized in 1999 and 2000, an outcome the grower reluctantly agreed to. The fate of this highly productive colony depends upon the outcome of continuing negotiations.

Silage. In 1994 all silage colony birds were protected by buyout, private agreement and protection of a colony in silage planted by private parties on federal land. In intervening years until 1999 no protection was afforded and large colonies were wiped out before the census. The apparent decline in the number of silage nesting birds at the time of the Census may reflect colony destruction rather than a failure to settle silage. The fate of all silage colonies depends upon the fate of buyout policy. No unprotected silage colony produced any fledglings in the 1990s. Management of planting dates and crop varieties (DeHaven 2000) is not likely to change the negative outcome for tricolors for this winter planted crop.

Merced County. The surge of tricolor numbers in Merced County between 1999 and 2000 (Table 2) is one of several year to year changes, the nature of which seem to preclude effective sampling of overall abundance by local sampling schemes. Even sampling of colonies and their size as widely as in one of the major valleys of Central California (San Joaquin Valley or Sacramento Valley) will not produce an estimate accurately predicting the results of a global census. To verify this conclusion, compare Sacramento Valley and San Joaquin Valley contributions to the sum of the censuses for all years.

Merced NWR. Changes were largely (55%) the result of agricultural practices incidentally benefiting tricolors. Thistles were encouraged to mature after tricolors settled in them. Prompt initiation of active management by Dennis Woolington when tricolors settled enhanced the productivity of these colonies. These actions included timely irrigation of the thistle crop, making possible a secure second nesting attempt.

Rice. Extending from the data showing that a tricolor colony utilizes 25,000 acres of rice (Figure 2) and assuming 514,000 acres of California rice (Ag Census of California, 1997), fully utilized rice could accommodate as many as 20.6 tricolor megacolonies. The difference between this number and observations suggests that several additional colonies could be accommodated in rice country if there were appropriately situated nesting sites. However, Delevan Tract 17 has been a reserve summer wetland for several years and has not previously attracted tricolors.

During the brief interval of my association with this species (9 years) it has been reduced from a prominent feature of the valley and foothills landscape to an irregularly encountered species. Causes of loss of colony sites and foraging habitat are evident and overall causes of tricolor declines in abundance are known. Remedies are equally apparent. Maintenance of populations without habitat will be a policy with negative consequences. This report of waxing and waning of successful reproduction is an account of colony surveillance and does not necessarily address the causes of tricolor decline.

TABLE 6

ANNUAL COMPARISON OF SELECTED HABITATS

Change in 2000 from previous surveys in number of tricolors found in specific habitats, places or regions. Totals include renesting. Some birds are thus counted more than once. Totals may exceed the world population. Numbers are rounded to nearest 5,000.

SITES	2000	1999	1998	1997	1996	1995	1994	1993	1992
APRIL SURVEY TOTAL	**162,000**	**110,000**		**240,000**			**350,000**	**inc.**	**inc.**
SACRAMENTO VALLEY									
DELEVAN NWR #42	**12,000	2,000		12,000			12,000	9,000	0
SACRAMENTO CO.	12,000	13,000		32,000			110,000	**inc.**	84,000
SUNSWEET, YOLO CO.	2,040	•		0			**X**	**X**	**X**
CHAMBERLAIN, YOLO CO.	**X**	**X**		0			0	1,000	800
CAPITOL OUTING, COLUSA CO.	31,000	6,000		80,000			60,000	5,000	60,000
SAN JOAQUIN VALLEY									
MERCED CO.	26,000	1,500		13,000			112,000	20,000	79,000
PRODUCERS DAIRY, FRESNO CO.	0	37,500		5,500			20,000	?	?
SILAGE, GRAIN, SAN JAOQUIN VALLI	60,500	14,000		2,500			118,000	*48,000	*50,000
TOLEDO PIT, TULARE CO.	21,000	•		51,000			50,000	unk.	?
KERN NWR	7,500	2,000		9,000			1,500	5,000	15,000
KINGS CO. (I-5)	•	•		•			•	20,000	65,000
SOUTHERN CALIFORNIA									
HEMET, RIVERSIDE CO.	10,000	4,000		35,000			2,000	**X**	**X**

* = Survey less extensive than in other years, but sites counted were done as in other years

** = New pond, 2 sites

• = Essential feature of habitat missing, no settlement possible

X = Habitat did not exist

? = Site not examined sufficiently to provide reliable information

Inc. = Search incomplete compared with more recent years

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
TABLE 7
10 LARGEST COLONIES

County	Date/Nesting	Number	Observer	Location	Substrate	Latitude	Longitude	RE
TABLE 7A. 10 LARGEST COLONIES OBSERVED ON 2000 SURVEY DATES								
TULARE	4/20/00	18,000		HAMILTON - DEHAVEN - GREG TE VELDE	WHEAT SILAGE	36 5.47	119 27.1	##
TULARE	4/20/00	15,000		HAMILTON - TOLEDO PIT NW POND [HIST 1995-	CATTAIL	36 05.581	119 41.101	6.2
MERCED	4/21/00	12,000		HAMILTON/ DEHAVEN - MERCED NWR S UNIT E FIELD #3 (REVISED EST 5/3 BASED ON	WHEAT THISTLE/ MUSTARD	37 10.315	120 36.047	6.8
RIVERSIDE	4/21/00	10,000		HAMILTON & PAULEK - HEMET SEWAGE	BULRUSH	33 47.986	117 01.255	4.3
MERCED	4/21/00	8,500		HARVEY - MERCED NWR ARENA PLAINS UNIT HWY 140 TO SNOWBIRD LN BEAR CREEK	H. BLACKBERRY/ WILLOW	37 10.2	120 25.2	2.7
TULARE	4/26/00	7,500		HAMILTON - GEORGE DAIRY [HIST]	SILAGE/ NETTLES	36 0.33	119 28.55	2.9
SAN JOAQUIN	4/22/00	7,000		HOLT - S SIDE HWY 12 POND [HIST 1997-1999]	CATTAIL/	38 12.135	120 59.644	2.1
KINGS	4/21/00	6,000		DEHAVEN - D&T DAIRY/ KANSAS AVE/ 5TH AVE 10 MI N CORCORAN.	SILAGE	36 7.922	119 33.439	1.2
TULARE	4/20/00	6,000		HAMILTON - TOLEDO PIT SW POND	CATTAIL/ BULLRUSH	36 05.298	119 40.992	*
TULARE	4/20/00	5,000		HAMILTON - TULE RIVER AG FIELD	SILAGE	36 03.958	119 51.306	* 1.0
TOTAL	**95,000**							

* Reproductive Effore (RE) of two Toledo Pit colonies was not determined separately

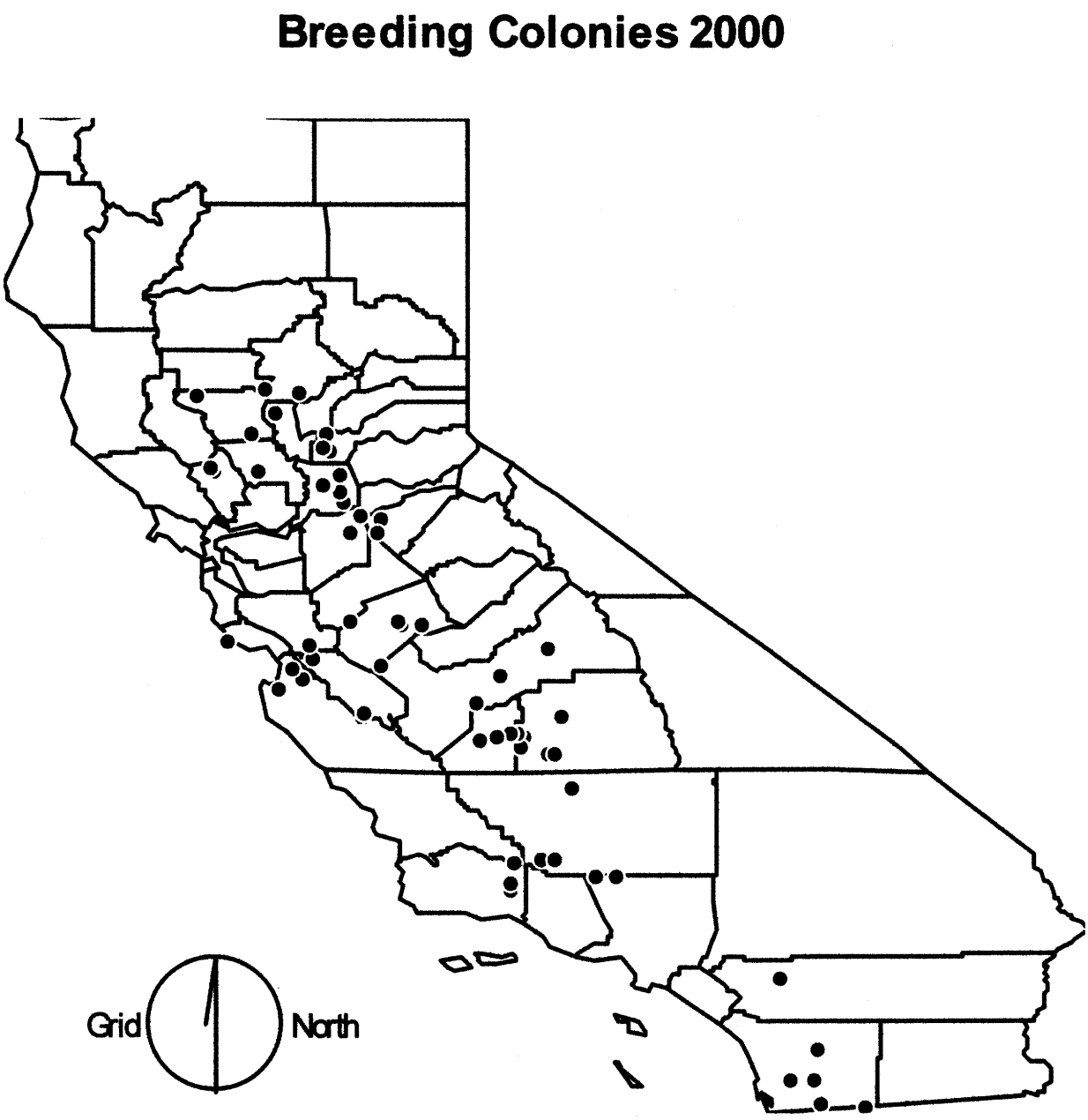
TABLE 7B. 10 LARGEST COLONIES OBSERVED THROUGHOUT THE 2000 BREEDING SEASON								
TULARE	4/30/00	30,000		HAMILTON - DEHAVEN - GREG TE VELDE	WHEAT SILAGE	36 5.47	119 27.1	11.3
COLUSA	6/17/00	25,000		HAMILTON - DELEVAN NWR BLOCK 17	CATTAIL	39 17.0	122 5.7	9.0
COLUSA	6/23/00	25,000		HAMILTON - GRAY HILL'S DUCK CLUB SE	CATTAIL	39 13.557	122 05.599	8.2
TULARE	4/30/00	21,000		HAMILTON - TOLEDO PIT	CATTAIL	36 05.581	119 41.101	6.2
MERCED	6/20/00	15,000		KING - AG SLOUGH MERCED/STANISLAUS CO LINE W OF HILMAR E SIDE SAN JOAQUIN	BULRUSH	37 24.492	120 58.160	4.6
COLUSA	6/10/00	12,000		HAMILTON - DELEVAN BLOCK 42	CATTAIL	39 16.680	122 06.256	3.9
MERCED	5/15/00	18,000		HAMILTON/ DEHAVEN - MERCED NWR S UNIT E FIELD #3 (REVISED EST 5/3 BASED ON WITHIN COLONY OBS) LATE SEASON INCREASE	WHEAT/ THISTLE/ MUSTARD	37 12	120 37	6.8
RIVERSIDE	4/21/00	20,000		HAMILTON & PAULEK - HEMET SEWAGE	BULRUSH	33 47.986	117 01.255	4.3
COLUSA	6/13/00	10,000		HAMILTON - ACRE FARMS, INCUBATING	CATTAIL	39 19.149	122	1.9
MERCED	4/21/00	8,500		HARVEY - MERCED NWR ARENA PLAINS UNIT HWY 140 TO SNOWBIRD LN BEAR CREEK	H. BLACKBERRY/ WILLOW	37 17	120 42	2.7
TOTAL	**184,500**							

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
TABLE 7
10 LARGEST COLONIES

County		Date/Nesting	Number	Observer	Location	Substrate	Latitude	Longitude	RE
TABLE 7C. COLONY CLUSTERS OBSERVED THROUGHOUT THE 2000 BREEDING SEASON									
TULARE		4/20/00	30,000	HAMILTON - DEHAVEN - GREG TE VELDE		WHEAT SILAGE	36 5.47	119 27.1	11.3
TULARE		4/20/00	6,000	HAMILTON - TOLEDO PIT SW POND		CATTAIL/ BULLRUSH	36 05.298	119 40.992	1.2
TULARE		4/30/00	15,000	HAMILTON - TOLEDO PIT NW POND		CATTAIL	36 05.581	119 41.101	6.2
	51,000								
COLUSA		6/17/00	25,000	HAMILTON - DELEVAN NWR BLOCK 17		CATTAIL	39 17.0	122 5.7	9.0
COLUSA		6/10/00	12,000	HAMILTON - DELEVAN BLOCK 42		CATTAIL	39 16.680	122 06.256	##
COLUSA		7/1/00 Y	7,500	HAMILTON - HARBISON RD		CATTAIL			0.3
	44,500								
COLUSA		6/13/00	10,000	HAMILTON - ACRE FARMS, INCUBATING		CATTAIL	39 19.149	122	1.9
COLUSA		6/23/00	25,000	HAMILTON - GRAY HILL DUCK CLUB - SE		CATTAIL	39 13.557	122 05.599	8.2
	35,000								
MERCED		4/21/00	12,000	HAMILTON/ DEHAVEN - MERCED NWR S UNIT E FIELD #3 (REVISED EST 5/3 BASED ON		WHEAT/ THISTLE/ MUSTARD	37 10.315	120 36.047	6.8
MERCED		5/15/00	6,000	HAMILTON/ DEHAVEN - MERCED NWR S UNIT E FIELD #3 (REVISED EST 5/3 BASED ON WITHIN COLONY OBS) LATE SEASON INCREASE		WHEAT/THISTLE	37 10.315	120 36.047	
MERCED		4/21/00	3,000	CHOUINARD - MERCED NWR E FIELD #5		THISTLE/	37 12	120 37	4.1
MERCED		5/15/00	8,000	HAMILTON - MERCED NWR FIELD #5 SECOND BREEDING			37 12	120 37	
MERCED		4/21/00	2,000	HARVEY - MERCED NWR DUCK SLOUGH		WHEAT	37 12	120 37	0.8
	31,000								
RIVERSIDE		4/21/00	10,000	HAMILTON & PAULEK - HEMET SEWAGE		BULRUSH	33 47.986	117 01.255	
RIVERSIDE		5/12/00	10,000	HAMILTON - HEMET SECOND BREEDING		BULRUSH	33 47.986	117 01.255	4.3
	20,000								
MERCED*		6/20/00	15,000	KING - AG SLOUGH MERCED/STANISLAUS CO LINE W OF HILMAR E SIDE SAN JOAQUIN		BULRUSH	37 24.492	120 58.160	4.6
STANISLAUS*		6/20/00	2,000	HAMILTON - AG SLOUGH ON MERCED/STANISLAUS CO LINE NEAR DENAIR		BULRUSH	37 28.92	120 58.282	0.6
	17,000								
TULARE		4/20/00	5,000	HAMILTON - TULE RIVER AG FIELD		SILAGE	36 03.958	119 51.306	1.0
TULARE		4/26/00	7,500	HAMILTON - GEORGE DAIRY		SILAGE/ NETTLES	36 0.33	119 28.55	2.9
	12,500								
MERCED		4/21/00	8,500	HARVEY - MERCED NWR ARENA PLAINS UNIT HWY 140 TO SNOWBIRD LN BEAR CREEK		H. BLACKBERRY/ WILLOW	37 17	120 42	2.7
	8,500								
SAN JOAQUIN		4/22/00	7,000	HOLT - S SIDE HWY 12 POND [HIST 1997-1999]		CATTAIL/	38 12.135	120 59.644	2.1
	7,000								
KINGS		4/21/00	6,000	DEHAVEN - D&T DAIRY/ KANSAS AVE/ 5TH AVE 10 MI N CORCORAN.		SILAGE	36 7.922	119 33.439	1.2
	6,000								
TOTAL*	**232,500**								

* Exceeds world population. This is a summery of repeated nesting throughout the breeding season.

Figure 1. California distribution of breeding TricoloredBlackbirds during the Survey



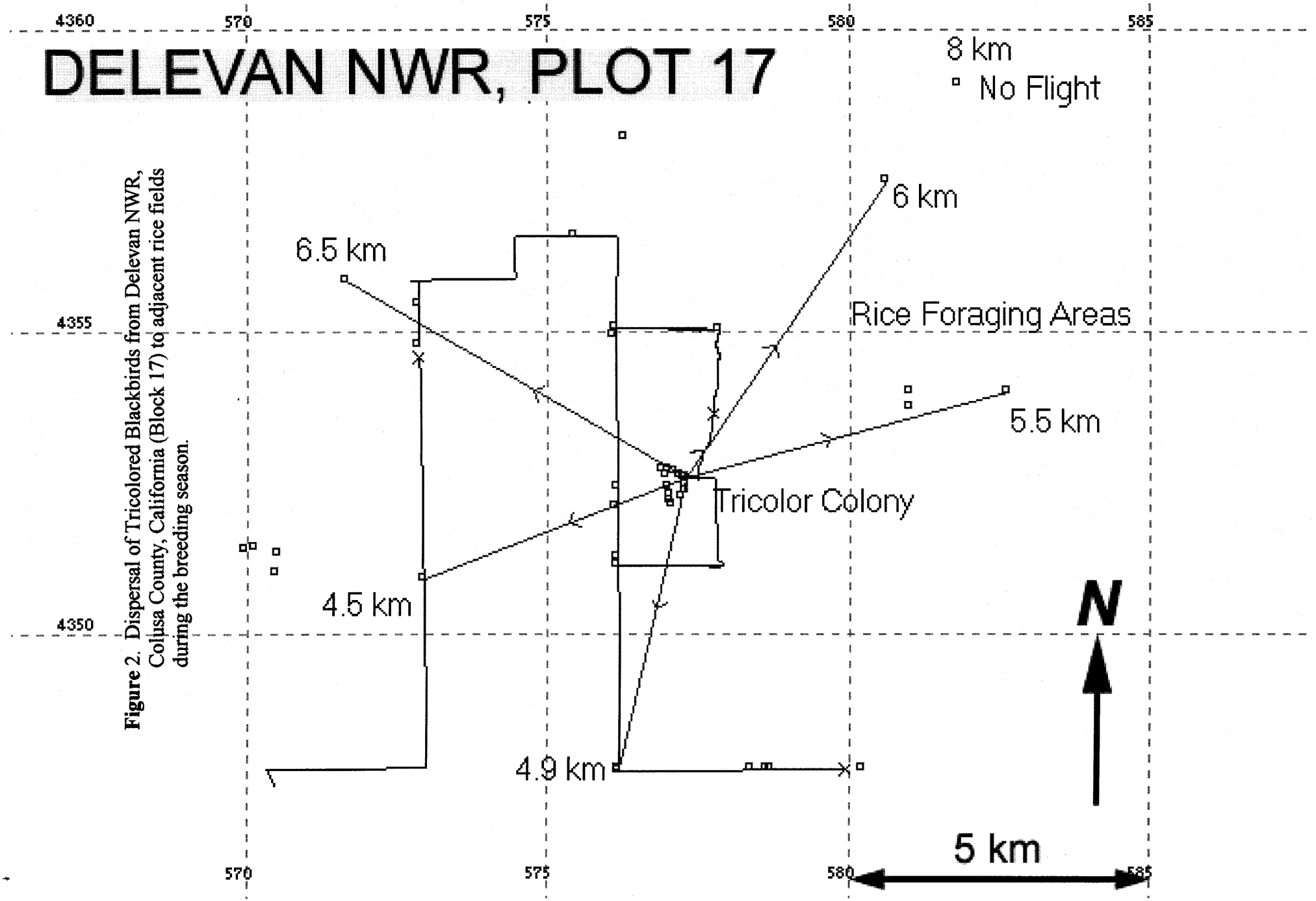


Figure 2. Dispersal of Tricolored Blackbirds from Delevan NWR, Colusa County, California (Block 17) to adjacent rice fields during the breeding season.

Figure 3. Ten largest Tricolored Blackbird colonies observed during the Survey.

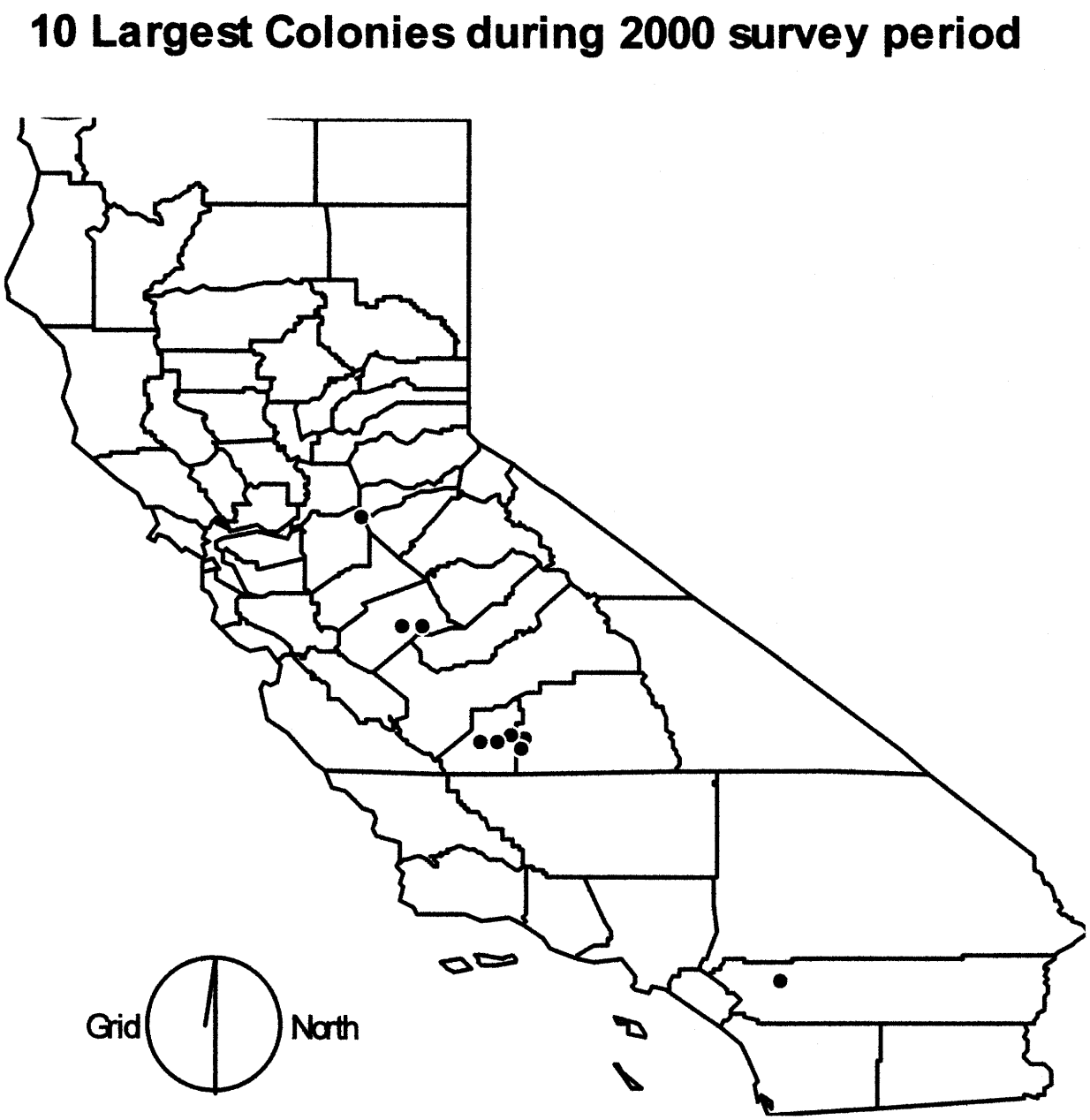


Figure 4. Ten largest colonies observed during the breeding season, 2000. Successive breeding attempts at the same location are included.

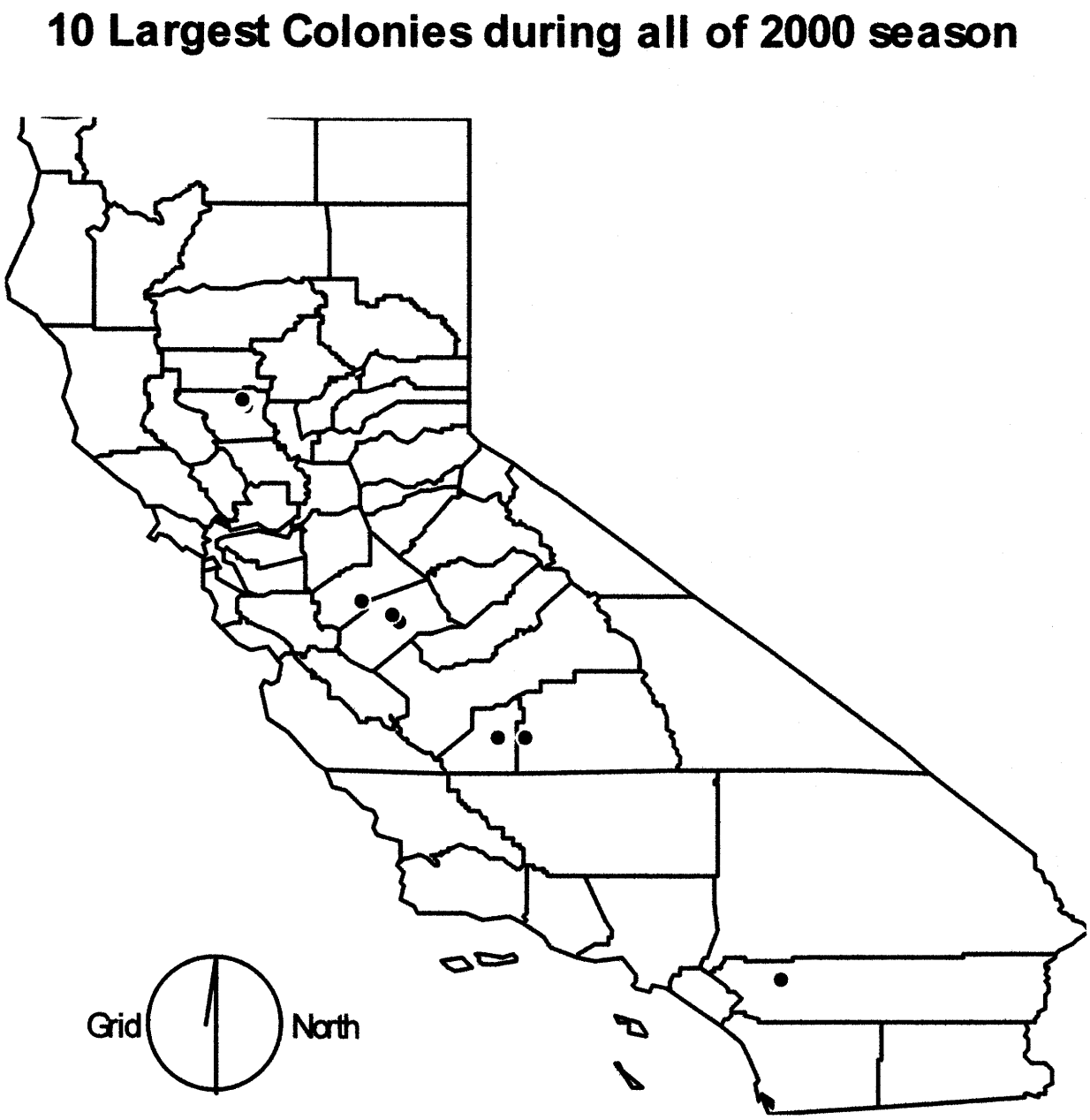


Figure 5. Ten largest megacolonies observed in 2000. These 10 places include ?3% of all breeding attempts during the season (% effort?)

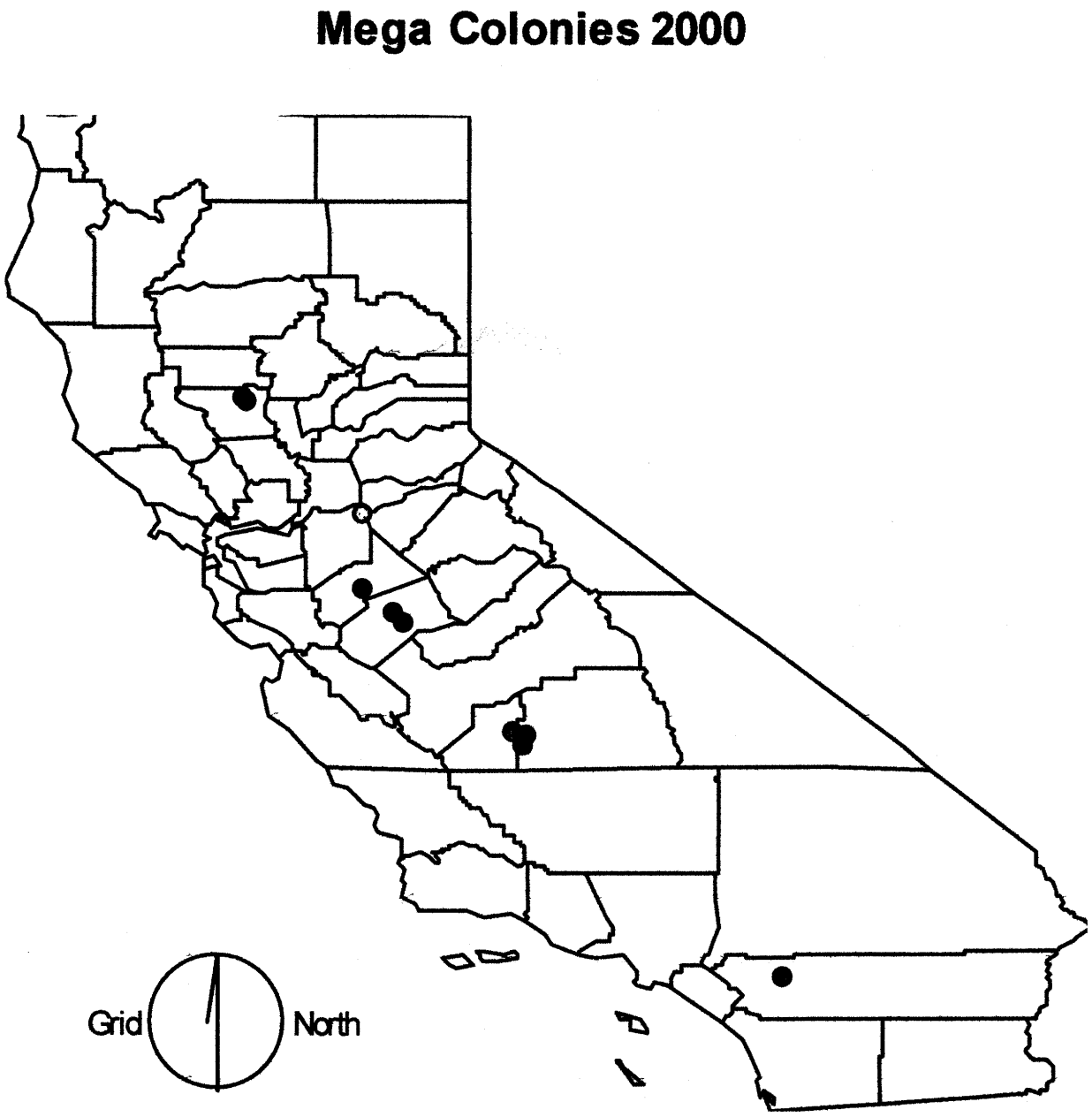
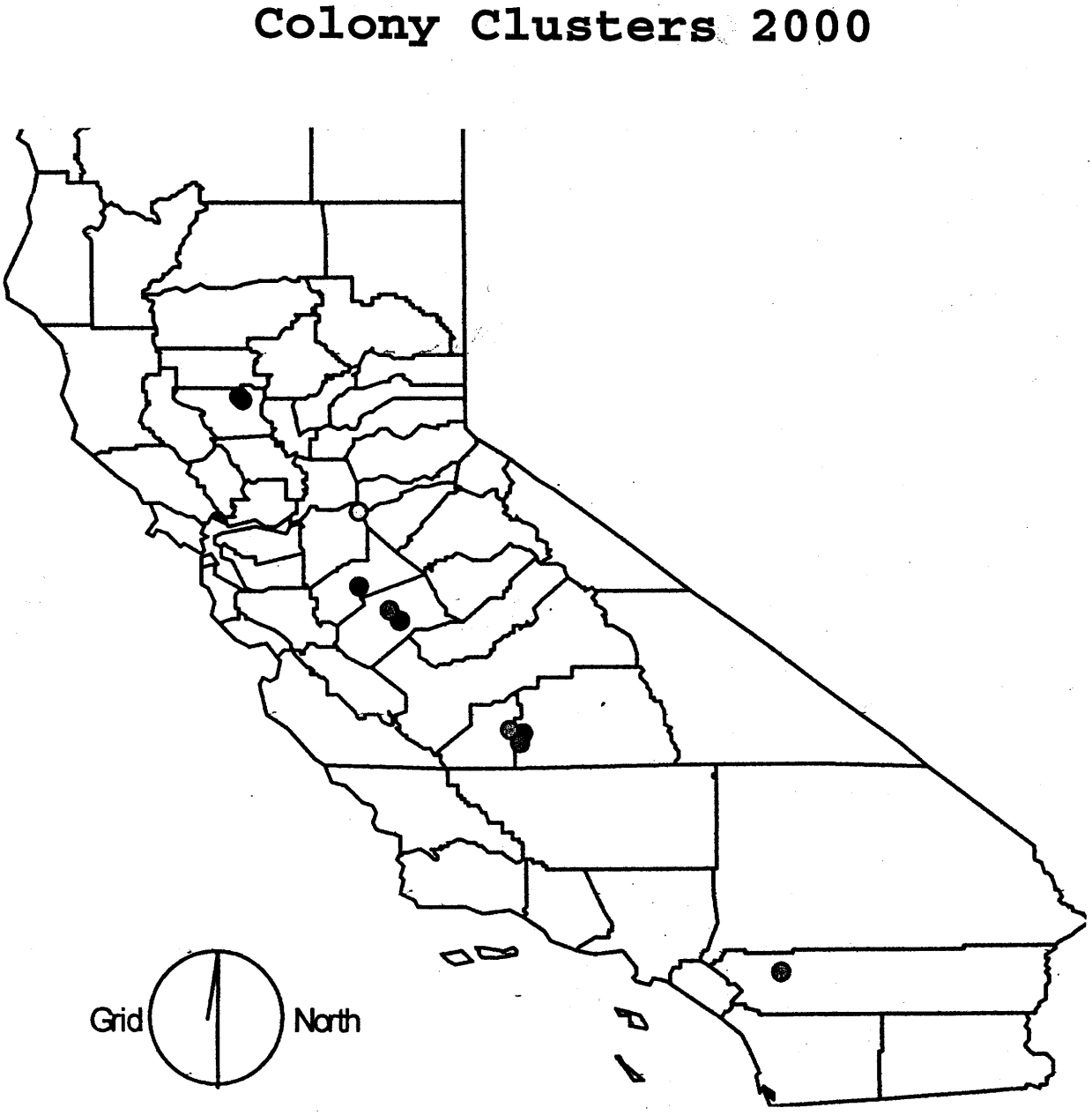


Figure 5. Ten largest colony clusters observed in 2000. These 10 places included 76.2% of the seasonal reproductive effort by Tricolored Blackbirds



TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 1
BREEDING BIRDS

COUNTY:	Total	Date/Nesti		Number	Observer	Location	Substrate	Latitude	Longitude
BUTTE		4/24/00	Y	35	CORDES - UBBWA LITTLE DRY CREEK UNIT. WEST SIDE FIELD II. DFG. OVER WATER.		WILLOW/CATTAIL	39 23.290	121 53.291
BUTTE	5,035	4/23/00	Y	5,000	MANOLIS - LONE TREE RD. [HIST 1999]		H. BLACKBERRY	39 22.359	121 34.531
CALAVERAS		4/22/00	Y	40	BALDWIN - 487 HUNT RD POND 2.1 MI W SALT SPRING VALLEY RD [HIST 1997]		CATTAIL	38 02.50	120 50.17
CALAVERAS	260	4/22/00	Y	220	BALDWIN - 1860 S PETERSBURG RD, VALLEY SPRINGS [HIST 1997]		CATTAIL/ H. BLACKBERRY	38 11.301	120 47.791
COLUSA	2,500	4/22/00	Y	2,500	BEEDY - US BUREC SITES - LODOGA RD, LARGE FLOODED MARSH SE END OF EAST PARK RES. [HIST 1994-1998]		BULRUSH	39 20.390	122 31.244
FRESNO		4/22/00	Y	46	FITTON - LITTLE PANOCHE RES E TIP OF ISLAND [HIST] (STONE- 100)		CATTAIL/WILLOW	36 46.678	120 48.019
FRESNO	5,046	4/21/00	Y	5,000	DEHAVEN - N SIDE MONTEIRO BROS DAIRY 5336 W HARLAN RD AT POLK 3 MI NW OF		NETTLES/WHEAT SILAGE	36 26.7	119 53.68
KERN		4/21/00	Y	925	LA BERTEAUX - KERN RIVER @ 2,800 FT. [HIST		H. BLACKBERRY	34 44.087	124 10.236
KERN		4/24/00	Y	1,500	ALLEN - W SIDE RIVER BOTTOM 1.5 MI W SW CORNER KERN NWR THEN DIRT RD S 1.4 MI		CATTAIL/BULRUSH	36 41.98	119 39.63
KERN		4/21/00	Y	4,000	ALLEN -KERN NWR MARSH UNIT 1 [HIST 1992-1999] MAINTAINED		CATTAIL/BULRUSH	34 43.717	119 34.786
KERN		4/21/00	Y	35	HAMILTON - KERN QUARRY; FEMALES [HIST]		CATTAIL	35 38.687	119 34.700
KERN		4/21/00	Y	480	BLACK - MT POSO OIL FIELDS TULE RD #1 BTW GRANITE & BKS GLENNVILLE RD MILE MARKER 152 F 8.05 [HIST 1999]		CATTAIL/BULRUSH	35 37.43	118 58.73
KERN		4/22/00	Y	1,000	CLENDENNEN - SAG POND WIND WOLVES PRESERVE SAN EMIGDIO RANCH [HIST 1998-1999] CATTLE EXCLUDED		CATTAIL	34 56.73	119 11.144
KERN		4/24/00	Y	300	CLENDENNEN - WESTERN CANYON WIND WOLVES PRESERVE SAN EMIGDIO RANCH [HIST 1998-1999] CATTLE EXCLUDED FOUND ONLY 1		CATTAIL/NETTLES		
KERN		4/22/00	Y	1,000	CLENDENNEN - LITTLE LOBO WETLAND WIND WOLVES PRESERVE SAN EMIGDIO RANCH CATTLE EXCLUDED [HIST 1998-1999]		CATTAIL/NETTLES	35 56.933	119 12.46
KERN		4/22/00	Y	300	CLENDENNEN - MUDDY CREEK WIND WOLVES PRESERVE SAN EMIGDIO RANCH SOME CATTLE [HIST 1998]		NETTLES	34 56.436	119 15.00
KERN		4/22/00	Y	600	CLENDENNEN - SANTIAGO SPRINGS WIND WOLVES PRESERVE SAN EMIGDIO RANCH CATTLE EXCLUDED [HIST 1999]		NETTLES	34 56.270	119 16.637
KERN		4/22/00	Y	60	CLENDENNEN - DOGGY FLAT WIND WOLVES PRESERVE SAN EMIGDIO RANCH [NEW]		NETTLES	35 56.685	119 9.507
KERN	10,600	4/22/00	Y	400	CLENDENNEN - ECHO CANYON WIND WOLVES PRESERVE SAN EMIGDIO RANCH [NEW]		NETTLES	34 57.513	119 8.978

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 1
BREEDING BIRDS

COUNTY:	Total	Date/Nesti		Number	Observer Location	Substrate	Latitude	Longitude
KINGS		4/21/00	Y	4,000	DEHAVEN - 0.25 MI NW RD 36/ AVE 192 6 MI NE CORCORAN. SILAGE BEING MOWED COLONY LOST BIRDS DISPERSING - HATCHLINGS 2D	BARLEY/MUSTARD SILAGE	36 8.45	119 29.6
KINGS		4/21/00	Y	6,000	DEHAVEN - D&T DAIRY/ KANSAS AVE/ 5TH AVE 10 MI N CORCORAN.	SILAGE	36 7.922	119 33.439
	10,000							
LASSEN		4/19/00	Y	300	MANOLIS- HWY 395 CREEK DRAINAGE [HIIST]	CATTAILS	36 56.73	119 12.464
	300							
LOS ANGELES		4/22/00	Y	210	GARRETT - N OF AVE B - 8 W OF 250TH ST W NEENACH [HIST]	CATTAIL/BULRUSH	34 47.25	118 34.250
LOS ANGELES		4/24/00	Y	300	CLENDENNEN - QUAIL LAKE HWY 138 4-5 MI E HWY I-5 ON CALIFORNIA AQUADUCT	CATTAIL/BULRUSH	34 46.16	118 44.7
	510							
MERCED		4/21/00	Y	480	FITTON - 1 MI N OF END COTTONWOOD RD E ACROSS FROM COMM. TOWER E OF I-5 W OF CANAL [HIST CLOSE TO SITE]	CATTAIL	37 11.839	121 04.462
MERCED		4/21/00	Y	2,000	HARVEY - MERCED NWR TURNER ISLAND RD NW DUCK SLOUGH PERIMETER RD	WHEAT	37 12	120 37
MERCED		4/21/00	Y	8,500	HARVEY - MERCED NWR ARENA PLAINS UNIT HWY 140 TO SNOWBIRD LN BEAR CREEK	H. BLACKBERRY/ WILLOW	37 10.2	120 25.2
MERCED		4/21/00	Y	12,000	HAMILTON/ DEHAVEN - MERCED NWR S UNIT E FIELD #3 (REVISED EST 5/3 BASED ON WITHIN	WHEAT THISTLE/ MUSTARD	37 10.315	120 36.047
MERCED		4/21/00	Y	3,000	CHOUINARD - MERCED NWR E FIELD #5	THISTLE/	37 12	120 37
	25,980							
MONTEREY		4/21/00	Y	35	TENNEY - HEBERT POND N SIDE SAN JUAN GD 0.1 MI E HEBERT RD [HIST 1994-1995]	CATTAIL	36 45	121 37.2
MONTEREY		4/21/00	Y	20	TENNEY - EAST ZABOLA POND E SIDE OLD STAGE RD 8.8 MI S OF SAN JUAN GD RD [HIST	CATTAIL	36 39.25	121 32.554
MONTEREY		4/22/00	Y	900	DAVIS - LAGUNA SECA [HIST]	CATTAIL	36 34.156	121 45.970
	955							
NAPA		4/21/00	Y	24	KAY - JULIANA VINYARD POND #2 END BARNETT RD POPE VALLEY [HIST 1997-1999]	CATTAIL	38 39.210	122 23.798
NAPA		4/21/00	Y	80	KAY - ST SUPERY VINYARD DOLLAR HIDE RD POPE VALLEY [HIST 1993-1999]	H. BLACKBERRY	38 38.389	122 21.943
	104							
ORANGE		4/22/00	Y	300	ERICKSON - SAND CYN RES NEAR SAND CYN OVERPASS S OF HWY 405 NW OF UC IRVINE	THISTLE		
ORANGE		4/21/00	Y	40	AIRD - HWY 405 @ SAND CANYON EXIT IN AG			
ORANGE		4/21/00	Y	150	AIRD - LAGUNA NIGUEL REGIONAL PARK, CENTRAL ISLAND	REEDS		
	490							
PLACER		4/22/00	Y	5,000	RANLETT - PLACER #1 STOCKPOND OFF INDUSTRIAL BLVD. [HIST 1990'S]	BULRUSH	38 51.49	121 19.46
PLACER		4/22/00	Y	1,000	RANLETT - PLACER #2 RIOSA RD 5 MI E OF SHERIDAN 0.5 MI W GLADDING RD TEICHERT	H. BLACKBERRY	38 58.8	121 17.53

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
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BREEDING BIRDS

COUNTY:	Total	Date/Nesti		Number	Observer	Location	Substrate	Latitude	Longitude
PLACER		4/22/00	Y	200	RANLETT - PLACER #3 PLACER HOLDINGS/	TWELVE BRIDGES NEAR STOCKPOND ON HILLSIDE SEEP [HIST 1997-1999]	H. BLACKBERRY	38 50.01	121 15.65
	6,200								
RIVERSIDE		4/21/00	Y	10,000	HAMILTON & PAULEK -	HEMET SEWAGE	BULRUSH	33 47.986	117 01.255
	10,000								
SACRAMENTO		4/22/00	Y	220	COOK -	ELDER CREEK RD W OF EXCELSIOR	H. BLACKBERRY	38 30.658	121 18.566
SACRAMENTO		4/22/00	Y	560	COOK -	KNOX/FLORIN RDS NESTING. FORAGING IN NW GRASSY FIELDS (BURKE - 200) [HIST	H. BLACKBERRY	38 29.56	121 18.53
SACRAMENTO		4/22/00	Y	500	COOK -	HWY 16 D OF BRADSHAW RD BEHIND BETHANY SLAVIC MISSIONARY CHURCH. NESTING (BURKE - 30 FORAGING)	H. BLACKBERRY		
SACRAMENTO		4/22/00	Y	4,200	COOK -	S/E CORNER MORRISON CREEK/BRADSHAW RD ; NESTING [HIST]	H. BLACKBERRY	38 31.53	121 19.83
SACRAMENTO		4/22/00	Y	2,500	COOK -	E INTERSECTION APRICOT/TAVERNOR RDS [HIST]	H. BLACKBERRY	38 26.21	121 11.2
SACRAMENTO		4/27/00	Y	20	BURKE -	JACKSON HWY / BRADSHAW OPPOSITE 10270 ELDER CREEK RD	H. BLACKBERRY	38 30.449	121 20.085
SACRAMENTO		4/26/00	Y	3,900	DEHAVEN -	ENTRANCE TO PRARIE CITY ORV PARK 0.5 MI JUNCT WHITE ROCK RD. 2 GROUPS	H. BLACKBERRY	38 35.970	121 10.330
								38 36.057	121 10.265
SACRAMENTO		4/26/00	Y	375	DEHAVEN -	2 MI NW RANCHO SECO COOLING TOWERS OFF TWIN CITIES RD BENEATH POWER LINES INCUBATING (EPANCHIN - 130	H. BLACKBERRY/ ROSE	38 20.884	121 08.887
	12,275								
SAN BENITO		4/22/00	Y	580	SHEARWATER -	HWY 25 S BITTERWATER RD IRRIGATION DITCH	CATTAIL/ MUSTARD	36 20.813	120 57.438
SAN BENITO		4/24/00	Y	54	SHEARWATER -	SAN FELIPE LAKE. HWY 152 / PACHECO PASS RD	BULRUSH	36 59.099	121 27.843
SAN BENITO		4/19/00	Y	68	SHEARWATER -	TELEDYNE POND UNION RD/ HWY 156 [HIST 1996-1997; 1999]	CATTAIL	36 50.1	121 26.98
	702								
SAN DIEGO		4/22/00	Y	300	UNMACK -	JACUMBA POND OLD HWY 80 [HIST 1997-1999]	CATTAIL	32 34.201	116 11.548
SAN DIEGO		4/21/00	Y	340	SMITH -	HWY 79 / MESA GRANDE RD JUNCT, SANTA YSABELL	H. BLACKBERRY	33 8.76	116 39.96
SAN DIEGO		4/21/00	Y	600	WINTER -	I-8 TO WEST WILLOWS EXIT @ VIEJAS INDIAN CASINO [HIST 1999]	CATTAIL	32 50.5	116 41.68
SAN DIEGO		4/22/00	Y	50	BREISCH -	POTRERO S LAKE OF TWIN LAKES RESORT [HIST 1999 ALTERED]	CATTAIL	32 37.417	116 36.734
SAN DIEGO		4/22/00	Y	20	STOWE - UNITT -	LINDO LAKE RT 67 FROM EL CAJON [HIST 1994-1999]	CATTAIL	32 51.30	116 55.00
	1,310								
SAN JOAQUIN		4/22/00	Y	8	HOLT -	E. HWYS 12/88 INTERSECTION S. SIDE	CATTAIL	38 03.327	121 04.612
SAN JOAQUIN		4/22/00	Y	7,000	HOLT -	S SIDE HWY 12 POND [HIST 1997-1999]	CATTAIL/BULRUSH	38 12.135	120 59.644
	7,008								

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BREEDING BIRDS

COUNTY:	Total	Date/Nesti		Number	Observer	Location	Substrate	Latitude	Longitude
SAN LUIS OBISPO		4/22/00	Y	300	HAMILTON - CUYAMA POND HWY 33. 0.5 MI S OF HWY 166 [HIST] [SCHRAM - 500 4/18/00]		BULRUSH/CATTAIL	34 55.119	119 31.147
SAN LUIS OBISPO		4/21/00	Y	200	EDELL - POND, HWY 58 E JUNCT BITTERWATER RD [HIST 1999]		CATTAIL/WILLOW	35 21.931	120 04.669
	500								
SANTA CRUZ		4/22/00	Y	200	BULGER - POND 1 KM NE OF GREYHOUND ROCK ON PACIFIC COAST [HIST 1995-1999]		CATTAIL/ BULRUSH	37 1.467	122 14.683
	200								
SUTTER		4/22/00	Y	200	MANOLIS - PASS RD 3.8 MI E WEST BUTTE RD		H. BLACKBERRY	39 11.105	121 48.097
	200								
TULARE		4/22/00	Y	1,800	STEARNS - YOKOHL VALLEY ROCKY HILL RD		BULRUSH	36 17.9	119 4.03
TULARE		4/20/00	Y	15,000	HAMILTON - TOLEDO PIT NW POND		CATTAIL	36 05.581	119 41.101
TULARE		4/26/00	Y	7,500	HAMILTON - GEORGE DAIRY [HIST]		SILAGE/ NETTLES	36 0.33	119 28.55
TULARE		4/20/00	Y	5,000	HAMILTON - TULE RIVER AG FIELD		SILAGE	36 03.958	119 51.306
TULARE		4/20/00	Y	6,000	HAMILTON - TOLEDO PIT SW POND		CATTAIL/BULLRUS	36 05.298	119 40.992
TULARE		4/20/00	Y	18,000	HAMILTON - (DEHAVEN - HWY 168 GREG TE VELDE JUNCT RD 56 / AVE 168		WHEAT SILAGE	36 5.47	119 27.1
	53,300								
TUOLUMNE		4/23/00	Y	400	SCHEIFERSTEIN - S OF ROCK RIVER RD @				
	400								
YOLO		4/22/00	Y	30	ROMINGER - RANCH POND [HIST NEW POND		CATTAIL	38 59.748	122 01.811
YOLO		4/22/00	Y	50	HAMILTON - SUNSWEET		CATTAIL	38 37.162	121 57.756
	80								
TOTAL	**153,955**				**BREEDING BIRDS**				

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 2
NONBREEDING BIRDS

COUNTY:	Total	Date/Nestin		Number	Observer Location	Substrate	Latitude	Longitude
BUTTE		4/24/00	N	23	CORDES - OROVILLE WA. WILBER RD. 1.6MI S HWY 162. BIRDS ACTIVELY FORAGING.		39 26.543	121 39.195
BUTTE		4/24/00	N	11	CORDES - Z RD/ SEVEN MILE LN.@ COUNTY SIGN MARKER.	RICE HULL PILE/ SUDAN GRASS	39 32.188	121 55.146
BUTTE		4/22/00	N	80	LOLLER - TABLE MOUNTAIN. N OROVILLE OFF LARGE PARKING LOT W. SIDE CHEROKEE RD.			
BUTTE		4/21/00	N	25	LOMELI - NELSON RD 1.9 MI E OF HWY 99			
BUTTE		4/21/00	N	30	LOMELI - PALERMO/HONCUT HWY NEAR COX		39 23.386	121 32.316
BUTTE		4/21/00	N	60	LOMELI - NELSON RD 1.3 MI E HWY 99 FORAGING FLOCK	DRY VERNAL POOL	39 31.415	121 39.856
BUTTE		4/21/00	N	100	LOMELI - COTTONWOOD RD 1.9 MI E HWY 99 PONDING BASIN	DEAD WILLOWS	39 33.158	121 39.922
BUTTE		4/21/00	N	70	LOMELI - 0.2 MI W WILBUR RD / TRES VIAS RD NEAR BARN. MIXED FLOCK FORAGING		39 30.582	121 39.160
	399							
CALAVERAS		4/22/00	N	500	BALDWIN - ROCK CREEK RD 1.5 MI S MILTON FORAGING FLOCK [HIST 1995, 1996, 1997]		38 1.2	120 50
	500							
FRESNO		4/22/00	N	12	FITTON - LITTLE PANOCHE RES W OF RES BACKWATER ON FENCE		36 44.636	120 51.639
FRESNO		4/22/00	N	3	FITTON -FEEDLOT SHELL RD W OF HWY 33 [HIST] MALES	FEEDLOT	36 13.512	120 20.588
	15							
KERN		4/21/00	N	45	BLACK - 1 MI E OF SITE #1 BTW GRANITE & BKS GLENNVILLE RD MILE MARKER 152 F 9.18	BULRUSH/CATTAIL	35 37.6	118 58.02
KERN		4/22/00	N	5	CLENDENNEN - NEW WATER WIND WOLVES PRESERVE SAN EMIGDIO RANCH [HIST 1998-1999] HEAVILY GRAZED	CATTAIL		
	50							
LASSEN		4/19/00	N	9	TATMAN - HONEY LAKE WA 2 MI FROM DAKIN UNIT FORAGING MIXED FLOCK			
	9							
LOS ANGELES		4/24/00	N	100	CLENDENNEN - CLEVELAND'S POND GORMAN POST RD E SIDE 3 MI S OF GORMAN		34 43.82	118 48.15
	100							
MERCED		4/26/00	N	30	HAMILTON - BOSE RD [HIST 1990'S]	H. BLACKBERRY	37 29.146	120 82.313
MERCED		4/21/00	N	500	SANDE - NUNES & SONS DAIRY HWY 140/ EDMINSTER RD FORAGING FLOCKS CARRING FOOD. COLONY POSSIBLY 1 MI IN BBERRY	H. BLACKBERRY	37 19	120 52
MERCED		4/21/00	N	250	FITTON - REGO DAIRIES BETWEEN ORCHARD & WHITWORTH RDS FORAGING FLOCK		37 12.208	121 03.844
MERCED		4/21/00	N	210	FITTON - BUTTS RD W OF I-5 FORAGING FLOCK		37 09.465	121 04.049
MERCED		4/24/00	N	130	STONE - O'NEILL FOREBAY WA HWY 33 POND #1 ROOSTING ON COTTONWOODS [HIST]		37 4.9	121 1.4
	1,120							

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 2
NONBREEDING BIRDS

COUNTY:	Total	Date/Nestin		Number	Observer	Location	Substrate	Latitude	Longitude
MONTEREY		4/22/00	N	8	DAVIS - LOCH PADDEN				
MONTEREY		4/22/00	N	10	DAVIS -E SIDE OLD STAGE RD POND FORAGING MIXED FLOCK		PASTURE	36 39.088	121 31.467
MONTEREY		4/22/00	N	45	FITTON - PEACH TREE VALLEY POND RT 25 S			36 10.881	120 48.161
	63								
ORANGE		4/22/00	N	5	KENYON - VILLAGE POND PARK BETWEEN MUIRLANDS AND ROCKFIELD IN LAKE FOREST				
	5								
SACRAMENTO		4/22/00	N	39	COOK - SCOTT RD S OF WHITE ROCK RD FORAGING IN FIELDS (FREGIEN - 50)		RANGELAND	38 35.215	121 07.642
SACRAMENTO		4/22/00	N	430	COOK - S OF ELDER CREEK, FORAGING AND ROOSTING [HIST]		WILLOWS		
SACRAMENTO		4/22/00	N	290	COOK - CLAY STATION RD 1.1 MI S OF DILLARD RD; MOSTLY MALES FORAGING FLOCK		PASTURE	38 20.25	121 09.76
SACRAMENTO		4/22/00	N	2,600	COOK - NW CORNER OF KATENA / CLAY STATION RDS FORAGING FLOCK				
SACRAMENTO		4/22/00	N	500	FREGIEN - SCOTT RD 2.5 MI S WHITE ROCK RD POND [HIST 1997-1999]		CATTAIL/BULRUSH	38 3.85	121 07.89
SACRAMENTO		4/22/00	N	60	BURKE - NATOMAS RD S OF RIEGO RD DEWITT FARMS & AJOINING FIELDS		H. BLACKBERRY		
SACRAMENTO		4/24/00	N	29	TREASTER - DILLARD/ COLONY RDS NEAR END WOODS RD FORAGING GRASSLAND VERNAL		SEDGE		
SACRAMENTO		4/23/00	N	160	TREASTER - HOWARD RANCH MIXED FLOCK FORAGING GRASSLAND VERNAL POOL.				
	4,108								
SAN BENITO		4/22/00	N	1	FITTON - BITTERWATER CK		ELDERBERRY	36 19.789	120 56.466
SAN BENITO		4/22/00	N	280	FITTON - HWY 25 JUNCT COALINGA-LOS GATOS CK RD FLYING FLOCK			36 24.055	120 52.942
SAN BENITO		4/22/00	N	34	SHEARWATER - LONOAK RD 1.9 HWY 25 FLYING				
SAN BENITO		4/22/00	N	40	SHEARWATER - HWY 25 ALONG DITCH FLYING				
SAN BENITO		4/22/00	N	38	SHEARWATER - HWY 25 @ LEWIS CK BRIDGE FLOCK BATHING IN CREEK			36 18.033	120 55.803
SAN BENITO		4/22/00	N	261	SHEARWATER - IDRIA RD @ 7.0 MILE MARKER. MALES FORAGING NEAR CREEK			36 31.005	120 49.959
SAN BENITO		4/24/00	N	64	SHEARWATER - CIENGA & AIRLINE (HWY 25) FORAGING FLOCK PASTURE MUSTARD NEAR DRAINAGE DITCH [HIST PAICINES RES CLOSE]			36 42.862	121 16.655
	718								
SAN DIEGO		4/21/00	N	50	MCINTOSH - AMIGO RD / HWY 78 POND [HIST		CATTAIL/BULRUSH		
SAN DIEGO		4/20/00	N	400	UNMACK - TULE LAKES, WIEST RANCH MC CAIN VALLEY RD				
SAN DIEGO		4/24/00	N	1	MAHRDT - RESERVOIR [HIST 1997 - 1999				

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 2
NONBREEDING BIRDS

COUNTY:	Total	Date/Nestin		Number	Observer	Location	Substrate	Latitude	Longitude
SAN DIEGO		4/22/00	N	30	PRYDE - SANTEE LAKES FLOCK FORAGING GRASSLAND [HIST]			32 51.42	117 00.36
SAN DIEGO		4/24/00	N	200	WEAVER - CHIHUAHUS CREEK BRIDGE HWY 79 W OF OAK GROVE HAYING FORAGING AREA				
SAN DIEGO		4/22/00	N	30	BREISCH - 25026 POTRERO VALLEY RD FLOCK IN OPEN FIELD			32 36.837	116 36.817
	711								
SAN JOAQUIN		4/22/00	N	52	YEE - S AIRPORT WY & AVENUE D FLOCK				
SAN JOAQUIN		4/22/00	N	13	HOLT - CLEMENTS RD NEAR COMSTOCK RD HERON ROOST REMOVED [HIST 1995]			38 05.887	121 07.426
	65								
SAN LUIS OBISPO		4/21/00	N	500	EDELL - 5650 BITTERWATER RD FLOCK FORAGING IN GRASSLAND			35 21.931	120 04.669
	500								
STANISLAUS		4/21/00	N	15	FITTON - ORESTIMBRE CK NEWMAN RANCH			37 18.028	121 09.314
	15								
TUOLUMNE		4/25/00	N	175	SCHIEFERSTEIN - ROCK RIVER RD HETCH HETCHY LIMING PLANT; MALES. POSSIBLE COLONY IN BBERRY ON BROOKS RANCH		PASTURE		
	175								
TOTAL	**8,553**				**NONBREEDING BIRDS**				

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 3
NO BIRDS

COUNTY	Date/Nestin	Number	Observer	Location	Substrate	Latitude	Longitude
ALAMEDA	4/22/00	N		PEETERS - SUNOL AREA (3 SITES) [HIST]	CATTAIL	37 34.16	121 52.30
BUTTE	4/24/00	N	0	SILVEIRA - LLANO SECO SACRAMENTO RIVER NWR @ 7 MILE / NELSON RDS (ENTIRE REFUGE)		39 32.83	121 54.64
CALAVERAS	4/22/00	N	0	BALDWIN - COPPEROPOLIS RES [HIST 1996-	CATTAIL	37 89.09	120 38.22
COLUSA	4/24/00	N	0	CARPENTER - DELEVAN NWR (ENTIRE REFUGE) [HIST 1994, 1998]	H. BLACKBERRY	39 17	122 5.7
COLUSA	4/24/00	N	0	WOLDER - COLUSA NWR @ ABLE / DAM RDS INTERSECTION (ENTIRE REFUGE)	CATTAIL	39 8.92	121 62.07
COLUSA	4/22/00	N	0	BEEDY - PIONEER DUCK CLUB, LURLINE RD FLOODED, GOOD GROWTH	CATTAIL/TULE	39 13.874	122 05.859
COLUSA	4/22/00	N	0	BEEDY - ACRE FARMS LURLINE RD DEEP FLOODED [HIST]	CATTAIL/TULE	39 19.149	122 06.218
COLUSA	4/22/00	N	0	BEEDY - CAPITOL OUTING CLUB, SANTA FE RD HISTORICAL FLOODED BURNED THIS YEAR	CATTAIL	39 13.903	122 06.985
EL DORADO	4/23/00	N	0	MALL - S HWY 50 CRAZY HORSE CAMPGROUND [1987 HIST SITE CONVERTED RESIDENTIAL]		38 39.250	121 00.25
EL DORADO	4/23/00	N	0	MALL - GOLD HILL RD .25 MI W HWY 49	H. BLACKBERRY/ CATTAIL	38 45.75	120 51.717
EL DORADO	4/23/00	N	0	MALL - SALMON FALLS RD POND 3.9 MI S OF PIOLOT HILL [HIST 1971]	H. BLACKBERRY/ CATTAIL	38 47.45	121 01.116
FRESNO	4/27/00	N	0	HAMILTON - PRODUCER'S DAIRY SE CORNER	SILAGE	36 44.087	120 13.403
FRESNO	4/27/00	N	0	HAMILTON - PRODUCER'S POND [HIST]	CATTAIL	36 44.562	120 13.936
FRESNO	4/21/00	N	0	FITTON - LITTLE PANOCHE CK GRAVEL PIT [HIST] WATER WITHHELD SITE DISTURBANCE	CATTAIL	36 47.865	120 44.959
FRESNO	4/22/00	N	0	FITTON - AT LITTLE PANOCHE /MINE CREEKS	WILLOWS	36 44.381	120 51.639
FRESNO	4/22/00	N	0	FITTON - LAKE LOS NIETOS [HIST]	CATTAIL	36 44.636	120 51.639
FRESNO	4/22/00	N	0	FITTON - NW COLINGA GRAVEL PIT [HIST]	CATTAIL	36 09.925	120 22.243
FRESNO	4/22/00	N	0	FITTON - FRESNO W OF SUTTER AVE [HIST]		36 05.492	120 12.730
GLENN	4/25/00	N	0	WOLDER - HWY I5 RD 7 W RD HH [HIST 1994]	H. BLACKBERRY		
GLENN	4/24/00	N	0	CARPENTER - SACRAMENTO NWR @ DUCK PONDS (ENTIRE REFUGE) [HIST 1996]		39 25.40	121 70.40
GLENN	4/25/00	N	0	CARPENTER/WOLDER - NE JUNCT RD 99W & RD 39 (BAYLISS) POOR HABITAT	TULE/ WILLOW		
GLENN	4/25/00	N	0	CARPENTER/WOLDER - RD 45 & RD VV SITE DESTRUCTION FIRE & SPRAY [HIST 1995]	H. BLACKBERRY	39 32.98	122 3.54

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 3
NO BIRDS

COUNTY	Date/Nestin		Number	Observer	Location	Substrate	Latitude	Longitude
GLENN	4/25/00	N	0	CARPENTER/WOLDER - RD VV & RD 34; (DAIRY N OF RD 34)		H. BLACKBERRY	39 37.02	122 3.21
GLENN	4/25/00	N	0	CARPENTER - RD PP & RD 45			39 32.82	122 67.93
GLENN	4/25/00	N	0	CARPENTER /WOLDER- GRAVEL PIT RD 45 &		CATTAIL		
GLENN	4/25/00	N	0	CARPENTER/WOLDER - GRAVEL PIT S OF RD 48 PRIVATE PROPERTY PETE KNIGHT		CATTAIL	39 32.1	122 10.18
HUMBOLDT	4/22/00	N	0	JULIANO - DRAKE HILL RD, HWY 101 S. OF FORTUNA AND VICINITY [HIST]				
KERN	4/21/00	N	0	HAMILTON - WILDWOOD RD		WHEAT/BARLEY	35 43.891	119 26.225
KERN	4/20/00	N	0	HAMILTON - BAKERSFIELD RECHARGE (3 SITES) [HIST]			35 19.529	119 12.173
KERN	4/22/00	N	0	CLENDENNEN - THREE SPRINGS WIND WOLVES PRESERVE SAN EMIGDIO RANCH		NETTLES		
KERN	4/22/00	N	0	CLENDENNEN - SOMETIMES LAKE WIND WOLVES PRESERVE SAN EMIGDIO RANCH [HIST 1999] EPHEMERAL DRY		CATTAIL		
KINGS	4/22/00	N	0	HAMILTON - KINGS CANAL - 24TH & ELGIN [HIST CATTAILS CLEARED]			36 22.459	119 53.235
LOS ANGELES	4/16/00	N	0	GARRETT - PIUTE PONDS EDWARDS AIRFORCE BASE S OF AVE C 1.5 MI E OF SIERRA HWY		BULRUSH	34 47.44	118 7.46
MENDOCINO	4/22/00	N	0	MORLEY - POND STATE HWY 20. LOGGING CAMP 19 MCGUIRE RANCH			39 21.164	123 36.669
MERCED	4/21/00	N	0	HARVEY - MERCED NWR ARENA PLAINS UNIT SUNRISE & PELICAN LAKE [HIST]		TULE	37 17	120 42
MERCED	4/21/00	N	0	CHOUINARD - ARENA PLAINS UNIT, MERCED NWR HWY 165 N/ E HWY 140, S SNOWBIRD LN [HIST] WETLANDS			37 17	120 42
MERCED	4/26/00	N	0	HAMILTON - STAIR STEP [HIST]			37 02.389	120 58.103
MERCED	4/26/00	N	0	HAMILTON - WILLOWS IN VICINITY		H. BLACKBERRY	37 18.474	120 50.564
MERCED	4/26/00	N	0	HAMILTON - EDMINSTER RD AREA		H. BLACKBERRY		
MERCED	4/26/00	N	0	HAMILTON - HENRY MILLER [HIST 1999]			37 06.005	120 56.488
MERCED	4/25/00	N	0	HAMILTON - H. BLACKBERRY [HIST] DEGRADED, POISONED OUT		H. BLACKBERRY	37 18.107	120 51.068
MERCED	4/25/00	N	0	HAMILTON - H. BLACKBERRY [HIST 1994]		H. BLACKBERRY	37 18.019	120 51.098
MERCED	4/25/00	N	0	HAMILTON - BARN [HIST 1993]		BULRUSH	37 08.144	120 49.997

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 3
NO BIRDS

COUNTY	Date/Nestin	Number	Observer	Location	Substrate	Latitude	Longitude
MERCED	4/21/00 N	0	SANDE - BIG BOTTOM DAIRY N SAN JOAQUIN R LEVEE HWYS 165 & 140			37 18	120 53
MERCED	4/21/00 N	0	SANDE - KESTERSON FREITAS UNITS HWYS 165 &140 [HIST MAINTAINED]			37 15	120 52
MERCED	4/21/00 N	0	HARVEY - MERCED NWR DUCK SLOUGH [HIST SITE DISTURBANCE FLOODING & FENCELINE			31 12	120 37
MERCED	4/21/00 N	0	CHOUINARD - MERCED NWR DEAD MAN SLOUGH [HIST]			37 12	120 37
MERCED	4/21/00 N	0	WOOLINGTON- WEST BEAR CK - EAST BEAR CK SITES [HIST]			37 15	120 47
MERCED	4/21/00 N	0	WOOLINGTON - LOS BANOS DETENTION DAM			36 58.43	120 59.50
MONTEREY	4/21/00 N	0	TENNEY - SMALL ZABALA POND / OLD STAGE RD 8.3 MI S OF SAN JUAN GD RD [HIST 1994-1996			36 39.626	121 32.839
MONTEREY	4/23/00 N	0	TENNEY - WARNER POND GARRIN RD 0.25 MI E OF ELKHORN RD			36 40.58	121 43.9
MONTEREY	4/21/00 N	0	TENNEY - CRAZY HORSE POND SAN JUAN GD / CRAZY HORSE CYN RD S			36 46.378	121 36.094
MONTEREY	4/22/00 N	0	DAVIS - HEBERT RD POND			36 45.687	121 37.115
NAPA	4/24/00 N	0	WYKOFF - NAPA VALLEY CORP DR/ ANSELMO CT MARSH [HIST 1998]			38 14.786	122 16.702
NAPA	4/24/00 N	0	WYKOFF - NAPA-SONOMA WA POND HUICHICA CK UNIT. [HIST OVER GROWN WILL BE		CATTAIL	38 12.716	122 70.628
NAPA	4/21/00 N	0	KAY - JULIANA VINYARD POND #1 END BARNETT RD POPE VALLEY [HIST 1997-1999]		CATTAIL	38 39.210	122 23.798
RIVERSIDE	4/23/00 N	0	PAULEK - SAN JACINTO WA (ENTIRE REFUGE)			33 52.75	117 06.71
RIVERSIDE	4/21/00 N	0	HAMILTON - BRIDGE ST RIVERSIDE		NETTLE		
SACRAMENTO	4/22/00 N	0	BURKE - MATHER INTERNATIONAL RD / ZINFINDEL DR. DECIMATED BY GRAVEL CO				
SACRAMENTO	4/22/00 N	0	LATROBE RD 2 MI N OF JACKSON HWY		H. BLACKBERRY	38 31.038	121 07.196
SACRAMENTO	4/22/00 N	0	CLARKSBURG RD E OF BIDWELL RD				
SACRAMENTO	4/22/00 N	0	SLOUGHOUSE RD E OF GRANTLINE RD		H. BLACKBERRY	38 28.00-13	121 13.36-14.32
SACRAMENTO	4/22/00 N	0	HAUSCHILT RD N OF HWY 104				
SACRAMENTO	4/22/00 N	0	CHEROKEE RD 1/3 MI S OF HWY 104		H. BLACKBERRY	38 17.066	121 15.914
SACRAMENTO	4/22/00 N	0	INTERSECTION SHELDON RD / WATERMAN RD		H. BLACKBERRY	38 26.290	121 20.893
SACRAMENTO	4/22/00 N	0	BRADSHAW RD S OF SHELDON RD		H. BLACKBERRY	38 27.433	121 20.087
SACRAMENTO	4/22/00 N	0	INTERSECTION GRANTLINE RD / MOSHER RD		H. BLACKBERRY	38 23.40	121 20.10
SACRAMENTO	4/22/00 N	0	ALTA MESA RD 1 MI S OF BORDON RD		H. BLACKBERRY	38 16.53	121 13.49
SACRAMENTO	4/22/00 N	0	FLORIN RD 1 MI E OF ELK GROVE RD				
SACRAMENTO	4/22/00 N	0	DAVIS RD S OF DILLARD RD		H. BLACKBERRY	38 24.084	121 15.355
SACRAMENTO	4/22/00 N	0	IVIE RD AT HWY 104		H. BLACKBERRY		
SACRAMENTO	4/22/00 N	0	WALNUT RD @ HWY 99				
SACRAMENTO	4/22/00 N	0	EAGLES NEST RD 1/2 MI S OF JACKSON HWY		H. BLACKBERRY	38 29.03	121 15.50
SACRAMENTO	4/22/00 N	0	INTERSECTION GRANTLINE RD / BRADSHAW		H. BLACKBERRY		
SACRAMENTO	4/22/00 N	0	COSUMNES RIVER N OF DILLARD RD 2 MI E OF			38 21.54	121 19.48

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 3
NO BIRDS

COUNTY	Date/Nestin	Number	Observer	Location	Substrate	Latitude	Longitude
SACRAMENTO	4/22/00 N	0	MARENGO RD 1/2 MI N OF SIMMERHORN RD		H. BLACKBERRY		
SACRAMENTO	4/22/00 N	0	INTERSECTION BORDEN RD / WEST RD		H. BLACKBERRY		
SAN BENITO	4/24/00 N	0	SHEARWATER - HWY 152 BETTENCOURT DAIRY. [HIST YES]			36 58.998	121 28.106
SAN BENITO	4/24/00 N	0	SHEARWATER - HWY 25 & CIENEGA RD PAICINES RESERVOIR [HIST]			36 43.070	121 16.839
SAN BENITO	4/24/00 N	0	SHEARWATER - FRYE LANE [HIST 1996-1997]		BULRUSH	36 55. 930	121 25.471
SAN BENITO	4/24/00 N	0	SHEARWATER - POND RIGEMARK GOLF COURSE FAIRVIEW RD & HWY 25 [HIST]			36 48.957	121 21.802
SAN BENITO	4/24/00 N	0	SHEARWATER - POND SANTA ANITA/QUIEN SABE RDS [HIST 1996]			36 47.854	121 15.798
SAN BENITO	4/24/00 N	0	SHEARWATER - GRANITE ROCK POND DEEP WATER SOUTHSIDE RD .9 MI JUNCT UNION RD			36 48.828	121 23.059
SAN JOAQUIN	4/22/00 N	0	HOLT - CLEMENTS / COMSTOCK RDS INTERSECTION [HIST 1994-1997]			38 05.445	121 07.687
SAN JOAQUIN	4/22/00 N	0	HOLT - DEAD END GILMORE RD HIMALAYA BLACKBERRIES REMOVED [HIST 1990-1995]			38 04.279	120 99.442
SAN LUIS	4/22/00 N	0	EDELL - POND HWY 46 5 MI E HWY 1 [HIST				
SAN LUIS	4/21/00 N	0	EDELL - POND CRESTON RD PASO ROBLES			34 55.8	119 30.75
SAN LUIS OBISPO	4/22/00 N	0	EDELL - POND, VILLACK RD/ 3 MI N CAYUCAS, HWY 1 [HIST 1987-1989]		CATTAIL		
SAN LUIS OBISPO	4/24/00 N	0	STILES - SEWAGE EVAP PONDS, HWY 1 N CUESTA COLLEGE [HIST 1988]		BULRUSH		
SANTA CLARA	4/22/00 N	0	MILLER - SARGENT CREEK				
SANTA CLARA	4/22/00 N	0	MILLER - COYOTE RANCH PERCOLATION		TULES		
SANTA CLARA	4/22/00 N	0	MILLER - CALERO RESERVOIR MARSH		TULES		
SANTA CLARA	4/22/00 N	0	MILLER - SILVER CREEK		CATTAIL		
SANTA CLARA	4/22/00 N	0	MILLER - HALLS VALLEY				
SANTA CLARA	4/22/00 N	0	MILLER - ARROYO BAYO				
SANTA CLARA	4/22/00 N	0	MILLER - CALAVERAS RESERVOIR				
STANISLAUS	4/20/00 N	0	HAMILTON - HWY I-5			37 19.737	121 06.447
SUTTER	4/24/00 N	0	WOLDER - SUTTER NWR (ENTIRE REFUGE)			39 4.42	121 45.52
SUTTER	4/24/00 N	0	WOLDER - BUTTE SINK (ENTIRE REFUGE)			39 15.83	121 54.31
SUTTER	4/22/00 N	0	MANOLIS - WEST BUTTE RD S OF ENTRANCE SUTTER BUTTE OUTING CLUB [HIST 1994?				
SUTTER	4/22/00 N	0	MANOLIS - GILSIZER SLOUGH AT SUTTER BYPASS /W END THOMPSON RD[HIST				
TEHAMA	4/24/00 N	0	WOLDER - H. BLACKBERRY HWY I5 N OF				

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 3
NO BIRDS

COUNTY	Date/Nestin	Number	Observer	Location	Substrate	Latitude	Longitude
YOLO	4/24/00 N	0	MOORE - ANDERSON POND		CATTAIL	38 36.570	121 59.844
YOLO	4/22/00 N	0	HAMILTON - CHAMBERLAIN H. BLACKBERRY DELETED (2 SITES) [HIST]		H. BLACKBERRY	38 35.569	121 51.746
YOLO	4/22/00 N	0	HAMILTON - WINTERS SEWAGE [HIST]		CATTAIL	38 32.52	121 59.28
YUBA	4/22/00 N	0	BEEDY - TANABE /RAMIREZ RDS [HIST AREA]				
YUBA	4/24/00 N	0	PEACEMAKER - HWY 65 TO 40 MILE RD, TO HOFFMAN RD RANCHO RIO OSO DUCK CLUB		H. BLACKBERRY		
YUBA	4/24/00 N	0	PEACEMAKER - HWY 65 W DAIRY RD N OF WHEATLAND [HIST 1996-1997] AMPHITHEATER UNDER CONSTRUCTION CLOSE]			39 2.67	121 27.58
YUBA	4/24/00 N	0	PEACEMAKER - FORTY MILE RD BILL GRAHAM PRESENTS [HIST 1996]				

1999 Tricolored Blackbird Survey Form

County of Observation:_____ Date of Observation:_____
Observer:_____ Telephone #:_____
Address:_____

Target Date: Saturday, April 24 and Sunday, April 25, 1999
Reports for any *breeding season* date are important. Specify date(s) of your observations.

Complete oneform for *each* individual nesting or non-nesting colony and each exact location where tricolors have been observed nesting in the past but were not present on April 26. **Please return this form immediately to allow researchers time to follow up on your observations.**

Send the completed form to: Kevin Hunting
California Department of Fish and Game
Sacramento, CA 95814
Phone: (916) 657-4436
Fax: (916) 653-1019

NESTING COLONIES (if no nesting behavior is observed, please go to Non-nesting, below):
Estimated number and sex ratio of adults:_____ (Whole number, not a range or +/- please)

☐ Some Singing.....	Yes	No	Please circle choice that applies
☐ Carrying nesting material.....	Yes	No	
☐ Adults carrying food.....	Yes	No	
☐ Fledglings out of nest.....	Yes	No	

☐ Estimated area (acres) of habitat occupied by nests:_____ Ac.
☐ Estimated area (acres) of habitat not occupied by nests:_____ Ac.
☐ Nesting Substrate: Do not use tules as a category. Instead, use cattails, bulrushes, or other specific plant species designations. (If more than one species, use percentages.)
___Cattails ___ Himalaya Blackberries ___ Willows
___Bulrushes ___Other Blackberries ____Nettles
___Ag Fields (circle type): barley wheat silage thistles mustard
___Other (specify species): _____

NON-NESTING COLONIES OR FLOCKS:
☐ Estimated number and sex ratio of adults:_____(Whole number, not a range or +/-please)

LOCATION (Nesting or Non-Nesting):
Please give exact location and include a copy of a map (topo maps are best) if possible.
USGS quad name and UTM coordinates are preferred.
☐ USGS Quad Name _____
☐ UTM Coordinates (GPS)_____N_____E_____Zone
☐ Township, Range, Section: Twn Rng Sec
Directions: How to reach the observation site. Road names, distances travelled, local landmarks
☐ Road designations: _____
☐ Owner or local contact, if known: _____
HISTORY: Have you or has anyone in your party observed tricolors nesting at this exact or nearby (specify which) location in the past? If yes, give years: _____
Condition of historic site: _____

2000 Tricolored Blackbird Survey Form

2000 Tricolor Survey: fax to 530 752 3350 or E-mail wjhamilton@ucdavis.edu
County of Observation: Date of Observation:_____
Observer: _____ Telephone_____
Address: _____
Email: _____
Reports for any breeding season date are important. Specify date(s) of your observations.
Target Dates: Saturday, April 22, Sunday, April 23, 2000. If these not possible go on April 21 or 24.
Complete one form for each individual nesting or non-nesting colony and each location where tricolors were observed nesting in the past but were not present on April 22 or 23 of this year. Please e-mail or fax this form

Mail the completed form to: Bill Hamilton
Division of Environmental Science and Policy (DESP will do),
University of California Davis, Davis, CA 95616.
Fax: (530) 752 3350 . Email wjhamilton@ucdavis.edu
Mobile phone (530) 304 6655. Phone (530) 752 1122

NESTING COLONIES (if no nesting behavior is observed, please go to Non-breeding, below.
Estimated number and sex ratio of adults: (Whole number, not a range or +/- please)
☐ Some Singing..... Yes No circle all choices that apply
☐ Some Carrying nesting material..... Yes No
☐ Some Adults carrying food..... Yes No
☐ Some Fledglings out of nest..... Yes No
☐ Estimated area (acres) of habitat occupied by nests: Ac.
☐ Estimated area (acres) of habitat not occupied by nests: Ac.
☐ Nesting Substrate: Do not use tules as a category. Instead, use cattails, bulrushes, or other. If more than one species supports nests estimate percentages.
☐ Cattails Himalaya Blackberries Willows Bulrushes Other Blackberries _____

Length, width, shape of area occupied by this colony _____
Nearest water source used by this colony: _____
NON-BREEDING COLONIES OR FLOCKS (see information page).
☐ Number and sex ratio of adults:_____(Whole number, not a range or +/-please)

LOCATION (Breeding or non-breeding): Exact location, copy of a map (topo maps are best) if possible.
GPS measurements are great. Please indicate where the GPS reading was taken relative to the colony. Or give USGS designations or copy part of a map.
☐ Latitude_____Longitude_____
☐ Township, Range, Section: Twn Rng Sec
Directions: How to reach the observation site. Road names, distances traveled, local landmarks
☐ Road designations: _____
☐ Owner or local contact, if known: _____
HISTORY: Have you or has anyone in your party observed tricolors nesting at this exact or nearby (specify which) location in the past? If yes, give years: _____
Condition of historic site: _____

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 5
LATE SEASON BIRDS

COUNTY	Total	late/Nesting		Number	Observer	Location	Substrate	Latitude	Longitude
COLUSA		5/9/00	N	20	HAMILTON - CHISOLM COVE EAST PARK RES		CATTAIL	39 20.390	122 31.244
COLUSA		6/22/00	N	0	HAMILTON - COLUSA NWR. NO WATER, MARSH DRYING [HIST]		BULRUSH	39 8.92	121 62.07
COLUSA		6/13/00	Y	10,000	HAMILTON - ACRE FARMS, INCUBATING		CATTAIL	39 19.149	122 06.218
COLUSA		6/13/00	Y	5,000	HAMILTON - HWY I-5 & MAXWELL RD I		CATTAIL	39 18.29	122 11.515
COLUSA		7/9/00	Y	2,000	HAMILTON - HWY I-5 & MAXWELL RD I I		BULRUSH/ CATTAIL	39 18.05	122 12.05
COLUSA		6/10/00	Y	12,000	HAMILTON - DELEVAN BLOCK 42		CATTAIL	39 16.680	122 06.256
COLUSA		6/17/00	Y	25,000	HAMILTON - DELEVAN NWR BLOCK 17		CATTAIL	39 19.154	122 06.219
COLUSA		6/23/00	Y	25,000	HAMILTON - GRAY HILL DUCK CLUB - SE		CATTAIL	39 13.784	122 05.703
COLUSA	86,520	7/1/00	Y	7,500	HAMILTON - HARBISON RD		CATTAIL		
FRESNO	0	5/2/00	N	0	HAMILTON - LITTLE PANOCHE PARKING LOT			36 47.124	120 47.942
GLENN	0	6/21/00	N	0	HAMILTON - BLUE GUM RD CHEESE FACTORY PONDS, CATTAIL DELETED TO CONTROL ENVIRONMENTAL PROBLEMS			39 35.043	122 11.440
KERN		7/21/00	Y	700	BARNES - PRINCE'S POND		BULRUSH	35 40.33	118 20.20
KERN		7/21/00	Y	100	BARNES - 0.5 MI FROM PRINCE'S POND		BULRUSH/ H. BLACKBERRY		
KERN		6/8/00	Y	2,000	HAMILTON - CORNER COCORAN AND HWY 46 NE PITS, PROVISIONING FLEDGLINGS		TAMARISK/ CATTAIL	35 36.281	119 34.318
KERN		6/4/00	N	0	HAMILTON - TWISSELMAN, HWY I-5 [HIST]		COTTON	35 43.922	119 44.538
KERN		6/4/00	Y	600	HAMILTON - KERN NWR NESTING FAILURE, FORAGING [HIST]		CATTAIL	35 44.48	119 35.102
KERN	6,400	5/11/00	Y	3,000	HAMILTON - KERN NWR		CATTAIL	35 44.018	119 35.102
MERCED		6/20/00	Y	15,000	KING - AG SLOUGH MERCED/STANISLAUS CO LINE W OF HILMAR E SIDE SAN JOAQUIN		BULRUSH	37 24.492	120 58.160
MERCED		5/15/00	Y	6,000	HAMILTON - MERCED NWR TOUR RTE FIELD #3 SECOND BREEDING		WHEAT/THISTLE	37 10.315	120 36.047
MERCED	29,000	5/15/00	Y	8,000	HAMILTON - MERCED NWR FIELD #5 SECOND BREEDING			37 12	120 37
MONTEREY		6/27/00	Y	300	SHEARWATER - NE OF SAN JUAN / CRAZYHORSE RD INTERSECTION AT POND (PLUS ABOUT 200 FLEDGLINGS) [HIST		CATTAILS	36 46.378	121 36.044
MONTEREY		5/9/00	Y	300	BANKS - FORT HUNTER-LIGGETT NW POND AT JUNCT MISSION & NACIMIENTO-FERGUSON		CATTAIL/ WILLOW	36 0.49	121 14.3
MONTEREY	600	5/9/00	N	0	BANKS - SAN ARDO [HIST]		DESERT OLIVE		

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 5
LATE SEASON BIRDS

COUNTY	Total	late/Nesting		Number	Observer	Location	Substrate	Latitude	Longitude
PLACER	1,500	5/4/00	Y	1,500	DEHAVEN - 0.5 MI E BREWER RD /0.5 MI S NICOLAUS RD DRY PASTURE W/ LEVEES		H. BLACKBERRY	38.53.345	121.26.464
RIVERSIDE	10,000	5/12/00	Y	10,000	HAMILTON - HEMET SECOND BREEDING		BULRUSH	33 47.986	117 01.255
SACRAMENTO	4,000	5/4/00	Y	4,000	DEHAVEN - NATOMAS BASIN CONSERVANCY PROPERTY. NATOMAS LEVEE RD 1.5 MI S JUNCT RIEGO RD [HIST 1960-1999] TOTAL OF 5		H. BLACKBERRY	38 43.869	121 29.658
SAN BENITO		5/2/00	N	150	FITTON - RT 25 BEARVALLEY 0.5 N LA GLORIA			36 34.194	121 10.902
SAN BENITO		5/2/00	N	500	FITTON - SAN JUAN RD 1.5 MI W SAN JUAN BAUTISTA BI DIRECTIONAL FLYING FLOCK, COLONY PRIVATE LAND			36 51.589	121 33.105
SAN BENITO	1,050	5/28/00	Y	400	FITTON - SAN JUAN RD 2.5 MI NE SAN JUAN BAUTISTA COLONY LN OPFF DUNCAN AVE PO BOX 'FOSTER'S 400' SAN BENITO RIVER		CATTAIL	36 51.6036	121 29.941
SAN DIEGO	700	4/30/00	Y	700	HESTER - CAMERON CORNERS POND HWY 5 BUCKNER SPRINGS TURNOFF TO HWY 94 LEFT INCUBATING [HIST 1997-1999]		CATTAIL	32 37.666	116 28.083
SAN LUIS OBISPO		5/29/00	Y	500	STILES - CAL POLY PONDS W OF CUESTA		BULRUSH	35 19.76	120 44.91
SAN LUIS OBISPO		5/10/00	N	0	FITTON - CRESTON RD 2.2 MI E OF S EL POMAR RD OAK GRASSLAND CONVERTED [HIST]		VINEYARD	35 34.117	120 34.742
SAN LUIS OBISPO	501	5/10/00	N	1	FITTON - RT 58 5.0 MI W SODA LAKE RD MALE		CATTAIL	35 30.772	120 12.617
SANTA CRUZ	100	7/26/00	Y	100	BULGER - WADDELL CREEK MARSH MOUTH HWY 1 [HIST 1999]		CATTAIL	37 5.69	122 19.67
STANISLAUS	2,000	6/20/00	Y	2,000	HAMILTON - AG SLOUGH ON MERCED/STANISLAUS CO LINE NEAR DENAIR		BULRUSH	37 28.92	120 58.282
SUTTER		7/16/00	Y	6,000	MOORE - WILD RICE A; HWY 113 5.32 MI TO ROBBINS ALL RICE FORAGING/HAY FIELDS		WILD RICE	38 56.522	121 40.835
SUTTER		7/16/00	Y	6,000	MOORE - WILD RICE; HWY 113 4.2 MI N OF ROBBINS FLEDGLINGS / FLIGHTLINGS ALL		WILD RICE		
SUTTER	19,500	7/18/00	Y	7,500	HAMILTON - SUTTER NWR TRACT 20.1		CATTAIL	38 59.96	121 39.48
TEHAMA	0	6/21/00	N	0	HAMILTON - GAY CREEK HIST]		H. BLACKBERRY	39 47.886	122 12.269
TULARE	12,000	4/30/00	Y	12,000	HAMILTON - (DEHAVEN - HWY 168 GREG TE VELDE JUNCT RD 56 / AVE 168 (LATE SEASON		WHEAT SILAGE	36 5.47	119 27.1

TRICOLORED BLACKBIRD April 21-24, 2000 SURVEY
APPENDIX 5
LATE SEASON BIRDS

COUNTY	Total	late/Nesting		Number	Observer	Location	Substrate	Latitude	Longitude
YOLO		7/15/00	N	0	HUNTER - DAVIS SEWAGE PONDS		CATTAIL		
YOLO		6/15/00	Y	100	CONNOR - CONAWAY RANCH		H. BLACKBERRY	38 36.238	121 42.670
YOLO		6/13/00	Y	2,000	HAMILTON - SUNSWEET 2ND COLONY AT LOCATION [HIST?]		CATTAIL	38 37.162	121 57.756
	2,100								
TOTAL	**175,971**				**LATE SEASON BIRDS**				

I made the following assumptions:

1) Successful nests plus fledging to independence takes a female 40 days.

2) To quantify time taken when nests are lost to rainfall and windstorm I counted from the beginning of nesting to the event. To determine the initiation of nesting, I determined the day the first egg was laid and added 5 days for nest building.

3) Losses to Black-crowned Night Herons are mostly predation upon eggs. To determine the cost of these losses I took the nest-building interval and added half the incubation period (11 da) or about 10 days.

4) Loss to coyotes and raccoons, which are nestling and egg predators that continue to hunt until fledging, is, on the average, 25 days.

From estimated values (Table 3), there were fledglings produced by 67.95% of the population.	=	127,662
That makes an estimate of 100 % of the whole fledgling Population	=	179,046
We (Cook et al. 1993) estimate fledgling annual survivorship at 1/3 X 179,046 yearlings entering the 2001 season	=	59,692
I estimate annual survivorship of 162,000 adults at 1/2 after Orians and Beletsky's (1989) studies of Washington state redwing adults in 2000	=	81,000
If annual adult survivorship were 70% this figure would be	=	[113,400]
These figures predict the 2001 adult breeding season population will be	=	140,692
Protected by FWS buyouts, 21,500 fledglings	=	7,166
Without buyouts the projected 2001 estimate would be		
At 70% adult survivorship this figure is	=	[173,000]
Without the buyouts and 70% adult survivorship	=	[165,834]

These numbers are simulations, based upon hypothetical survivorship information for another species. Any suggestion that they predict 2001 populations would be unwarranted.

Riverside County created wetland. The Hemet colony was occupied as soon as habitat planted to bulrushes in 1993 developed to partial maturity late in the 1994 season. By 1997 the planting was mature and hosted most of the tricolors known to inhabit southern California (Bowen and Hamilton, pers. obsns.). Between 1997 and 1999 management actions changed the basic characteristic of the Hemet habitat by burning the bulrushes and removing most of the bulrushes, temporarily deleting its current value as tricolor habitat. In 1999 this colony was located in a smaller research marsh unaffected by management actions. It recovered by the 2000 breeding season a substantially smaller area was available for nesting.

Toledo Pit (Kern County). This water district holding pond has consistently accommodated large tricolor colonies since first observed in 1995. In 1999 a large (35,000) flock of tricolors found the pond empty in late April. By the time the pond was flooded on May 1 they had moved (Hamilton et al. 1999).

Sacramento County. Collapse of the huge Sacramento County breeding population was occasioned by deliberate habitat destruction, planting of vineyards and other forms of development (Beedy pers comm., Cook, pers, comm., DeHaven pers. comm.).

Oneill Forebay (Merced County). The decline of highly productive settlements in the Himalaya blackberries at O'Neill Forebay (Merced County) from 1994 conditions followed watercourse changes there and loss of vigor by the blackberry plant nesting substrate.

Producers Dairy (Fresno County). The Producers Dairy colony has variously suffered attempts to incidentally and deliberately (scaring devices, elimination of a cattail marsh) eliminate tricolor habitat or conditions. Given its situation near a large alfalfa foraging area it probably will remain an initial settlement site.

Sunsweet drying yard (Yolo County). This colony is typical of industrial colony sites at gravel pits, prisons and smaller sewage facilities throughout California. Its small size (< 3 acres) limits colony size. Created in 1994, it was first colonized after volunteer cattails matured in 1997. A nearby rice grower who lost some sprouting rice to the adjacent colony prevailed upon the parent company, Sunsweet to disk the cattails in the winter of 1997-1998. Regrowth occurred and it was again colonized in 1999 and 2000, an outcome the grower reluctantly agreed to. The fate of this highly productive colony depends upon the outcome of continuing negotiations.

Silage. In 1994 all silage colony birds were protected by buyout, private agreement and protection of a colony in silage planted by private parties on federal land. In intervening years until 1999 no protection was afforded and large colonies were wiped out before the census. The apparent decline in the number of silage nesting birds at the time of the Census may reflect colony destruction rather than a failure to settle silage. The fate of all silage colonies depends upon the fate of buyout policy. No unprotected silage colony produced any fledglings in the 1990s. Management of planting dates and crop varieties (DeHaven 2000) is not likely to change the negative outcome for tricolors for this winter planted crop.

Merced County. The surge of tricolor numbers in Merced County between 1999 and 2000 (Table 2) is one of several year to year changes, the nature of which seem to preclude effective sampling of overall abundance by local sampling schemes. Even sampling of colonies and their size as widely as in one of the major valleys of Central California (San Joaquin Valley or Sacramento Valley) will not produce an estimate accurately predicting the results of a global census. To verify this conclusion, compare Sacramento Valley and San Joaquin Valley contributions to the sum of the censuses for all years.

Merced NWR. Changes were largely (55%) the result of agricultural practices incidentally benefiting tricolors. Thistles were encouraged to mature after tricolors settled in them. Prompt initiation of active management by Dennis Woolington when tricolors settled enhanced the productivity of these colonies.

Rice. Extending from the data showing that a tricolor colony utilizes 25,000 acres of rice (Figure 2) and assuming 514,000 acres of California rice (Ag Census of California, 1997), fully utilized rice could accommodate as many as 20.6 tricolor megacolonies. The difference between this number and observations suggests that several additional colonies could be accommodated in rice country if there were appropriately situated nesting sites.

During the brief interval of my association with this species (9 years) it has been reduced from a prominent feature of the valley and foothills landscape to an irregularly encountered species. Causes of loss of colony sites and foraging habitat are evident and overall causes of tricolor declines in abundance are known. Remedies are equally apparent. Maintenance of populations without habitat will be a policy with negative consequences. This report of waxing and waning of successful reproduction is an account of colony surveillance and does not necessarily address the causes of tricolor decline.

NAME	ORGANIZATION	ADDRESS	e-MAIL	PHONE	COUNTY
AIRD, BRUCE	SEA & SAGE AUDUBON		baaird@earthlink.net		ORANGE
ALLEN, JACK	KERN NWR	KERN NWR PO BOX 670, DELANO CA 93216	Jack_Allen@FWS. Gov	661-725-2767	KERN
ANDERSON, JOHN		21740 CO RD 88, WINTERS CA 95694		530-662-4570	YOLO
BALDWIN, SY	USFS	PO BOX 162 LONG BARN CA 95335-0162	sbaldwin@fs.fed.us	209-586-3234	CALAVARAS
BANKS, JIM	MOCKINGBIRD RIDGE ASSOC	50880 PINE CANYON, KING CITY CA 93930	jhbanks@inreach.com		MONTEREY
BARBEK, D.					SAN DIEGO
BARNES, BOB	CALIFORNIA AUDUBON	PO BOX 953, WELDON CA 93283	bbarnes@lightspeed.net	760-378-3044	KERN
BEEDY, TED	JONES & STOKES ASSOC, INC	2600 V ST, SUITE 100, SACRAMENTO CA 95818-1914	tedb@jsanet.com	916-737-3000	COLUSA
BIRD, BILL	US BURREC	140W WOOD ST, WILLOWS CA 95988		530-934-1329	COLUSA
BLACK, GORDON		2619 RIO VISTA, BAKERSFIELD CA 93306	gblack1539@aol.com	661-872-1539	KERN
BLITCH, JOHN	USFWS; SAN LUIS NWR				MERCED
BREISCH, RICH		4735 MT ASHMUN DR, SAN DIEGO CA 92111	breisch@cari.net	858-278-6280	SAN DIEGO
BULGER, JOHN		500 SWANTON RD PO 14 , DAVENPORT ANA NUEVO CA 95017		831-405-1944	SANTA CRUZ
BURKE, CARL		2725 11TH AVE, SACRAMENTO CA 95818	hobur@cwo.com	916-457-2740	SACRAMENTO
CARPENTER, MIKE	USFWS; SACRAMENTO NWR	752 CO RD 99W, WILLOWS CA 95988	Mike_Carpenter@fws.gov	530-934-2801	GLENN
CHAINEY, MARK					COLUSA
CHOUINARD, TINA	USFWS; SAN LUIS NWR	947 W PACHECO BLVD, LOS BANOS CA 93635	Tina_Chouinard@fws.gov	209-826-3508	MERCED
CLENDENNEN, DAVID	WINDWOLVES PRESERVE	PO BOX 189 MARICOPA HWY, BAKERSFIELD CA 93252	dclenden@lightspeed.net	661-858-1115	KERN
CONNOR, MIKE	CONAWAY RANCH				YOLO
COOK, LIZ	CDWR	6 SIMMONS WAY, DAVIS CA 95616	lcook@water.ca.gov	530-758-9726	SACRAMENTO
CORDES, STEVE	DFG2	PO BOX 190 BUTTE CITY CA 95920	upper#032#butte@dfg.ca.gov	530-982-2169	BUTTE
DAVIS, JEFF	UCSC ENVIRONMENTAL STUDIES	UCSC SANTA CRUZ CA 95064	jndavis@cats.ucsc.edu	831-459-4763	MONTEREY
DEHAVEN, RICHARD	USFWS	2800 COTTAGE WY, SACRAMENTO CA 95825	Richard_DeHaven@fws.gov	916-414-6738	SACRAMENTO
EDELL, TOM	US	46 EIGHTH ST, CAYUCOS CA 93430	Tom_Edell@dot.ca.gov	805-995-1691	SAN LUIS OBISPO
EPANCHIN, PETER	USFWS	2615 O ST APT B, SACRAMENTO CA 95816	Peter_Epanchin@fws.gov	916-451-4433	SACRAMENTO
ERICKSON, RICHARD	LSA ASSOCIATES	ONE PARK PLAZA, SUITE 500, IRVINE CA 92614	richard.erickson@lsa-assoc.com	949-553-0666	ORANGE
FITTON, SAM	BLM	2091 CALISTOGA DR, HOLLISTER CA 95023	sfitton@ca.blm.gov	831-630-5023	FRES/MERC/MONT /SANLOU/SANBEN
FREGIEN, GARY	CDPR	1416 9TH ST RM 923, SACRAMENTO CA 95814	gfreg@parks.ca.gov	916-653-0578	SACRAMENTO
FULTON, JOHN	USFWS; SAN LUIS NWR				MERCED
GARRETT, KIMBALL	LA CO MUSEUM NAT HIST	900 EXPOSITION BLVD, LOS ANGELES CA 90007	Kgarrett@nhm.org	213-763-3368	LOS ANGELES
GEORGE, KATHY					SACRAMENTO
GIFFORD,					SAN JOAQUIN
GRUMMER, BILL					NAPA
HAMILTON, BILL	UNIVERSITY OF CALIFORNIA	UC DAVIS DESP DAVIS CA 95616	wjhamilton@ucd.edu	530-752-1122	COL/YOLO/KING/MER/FRES/TUL/SANJOA
HARVEY, KAREN	FWS; SAN LUIS NWR	SAN LUIS NWR COMPLEX PO BOX 2176, LOS BANOS CA 93635	Karen_harvey@fws.gov	209-826-3508	MERCED
HESTER, DOROTHY		3726 BELFORD ST, SAN DIEGO CA 92111		898-277-0357	SAN DIEGO
HOLT, WALDO		3900 RIVER DR, STOCKTON CA 95204	waldoh@juno.com	209-462-4438	SAN JOAQUIN
HUNTER, MIKE	CITY OF DAVIS PUBLIC WORKS	1717 5TH ST, DAVIS CA 95616		530-681-7874	YOLO
JULIANO, DAVID	CDFG		djuliano@dfg.ca.gov		HUMBOLDT
KAY, GUY		1660 KEARNEY ST, ST HELENA CA 94574	guyinsth@napanet.net	707-963-9664	NAPA
KENYON, DICK			Kenyon@exo.com		ORANGE
KING, HOLMAN	CDFG; REGION 4			209-667-1219	STANISLAUS
KELDSEN, TIM	USFWS; SAN LUIS NWR				MERCED
LA BERTEAUX, DENISE	EREMICO BIOLOGICAL SERVICES	10375 LOS PINOS RD, ONYX CA 93255-9726	EREMICO@aol.com	760-378-3021	KERN
LOLLER, FRED			fvlollar@aol.com		BUTTE
LOMELI, R. H.	DFG	2071 OROVILLE CHICO HWY, DURHAM CA 95938	hlomeli@dfg.ca.gov	530-892-8470	BUTTE
MACOUBRIE, MARLA	USFWS	2800 COTTAGE WAY SACRAMENTO CA 95825	marla_macoubrie@fws.gov	916-414-6557	SANTA CLARA
MAHRDT, C. R.		9847 WILLOW LN, ESCONDIDO CA 92029	cmahrdt@aol.com	760-741-1895	SAN DIEGO
MALL, ROLF		1004 CHAFFIN CT, ROSEVILLE CA 95661	TheMalls@aol.com	916-784-3182	PLACER
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William J. Hamilton III
DESP, UCD, Davis, CA 95616

Tara Zimmerman
911 NE 11th Ave
Portland, OR 97232

Dear Tara:

The final draft of the 2000 Tricolored Blackbird report is enclosed.

In this report I recommend that a season-long survey be conducted in 2001 to identify as many colonies as possible throughout the breeding season, i.e., March through July. This would be a big job and will cost at least the $42,000 I proposed for the survey and census in 2000. There is a lot of office, telephone and public relations work associated with this.

I do not plan to be the coordinator of this action if it is taken, but can train and consult. There should be at least two people looking closely at each colony. Every possible effort needs to be taken to avoid provoking deliberate habitat destruction. I have some ideas on this, but I'd prefer to not write further recommendations until I know who is going to be in the field.

We nee an early plan for 2001. The California Farm Bureau, Rice Growers Association and Cattlemen's Association should, in my opinion, be told of our intentions as soon as they are clearly in mind.

My current plan is to work intensively with colonies on rangeland at the Wind Wolves Conservancy in western Kern County. I will focus upon foraging habits and habitats, especially comparing grazed and ungrazed grasslands. I will also compare foraging in rangeland with that in agricultural land in the nearby San Joaquin Valley. I have no funding for this activity by the Conservancy is keen on the project and will help logistically. While this project can be scaled to be inexpensive, the best use of time would be to use telemetry to accelerate data collection and to tackle more problems than can be solved with less sophisticated gear. If there is any prospect for funding I will submit a request.

I have greatly appreciated the opportunity to work with you and other USFWS personnel during the course of our activities until now.

A final bill for services is enclosed. If you would like the title page to include USFWS let me know and I'll submit revised copy.

Sincerely Yours,

William J. Hamilton III