

# **The Status of the Tricolored Blackbird (*Agelaius tricolor*) in Southern California**

## **Results of the Spring 2009 Census**

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## Introduction

Though nearly endemic to the state of California, only a small fraction of the global population of the Tricolored Blackbird (*Agelaius tricolor*) resides in Southern California. These birds are separated from the core population in the Central and Sacramento Valleys by the Tehachapi Mountains in southern Kern County. Though recent studies have determined that the bird in Southern California are not genetically distinct (Pollinger and Berg, in preparation), the relationship between the populations and magnitude of the flow of birds between them over the mountains is not clear.

The Tricolored Blackbirds in Central California have been the focus of survey activity and conservation initiatives for years (see Beedy and Hamilton, 1999 and Kelsey, 2008 for a summary), but relatively little has been done in Southern California where the swollen human population and the breeding ecology of Tricolored Blackbirds conflict in different ways. The breeding colonies of the Tricolored Blackbird in Southern California tend to be small (averaging a few hundred birds) and are typically present in natural marsh vegetation in marginal wetlands (small farm ponds, gravel pits, reservoir edges, sewage ponds, detention basins, etc.). The “mega-colonies” of the Central Valley that can number in the tens of thousands only rarely form in the south, and without diligent searching most Southern California colonies could easily escape notice and could, just as easily, silently wink out of existence. The nomadic nature of Tricolored Blackbirds further means that these breeding colonies are not in the same locations every year.

It is for these reasons that conservation of the species in this area requires the consistent, occasional, and potential locations of breeding colonies to be identified and monitored on an annual basis. Such was emphasized at a meeting of the Tricolored Blackbird Working Group in December of 2008; after which the preparations for the 2009 field season were begun. This report summarizes the results of the census of Tricolored Blackbirds at their breeding colonies in Southern California in the spring of 2009. Comparison is made with results of previous surveys and some conservation issues and recommendations are addressed.

## Methods

The survey methodology for the 2009 breeding season was adapted from that used for the 2008 surveys as conducted under the auspices of Audubon California (see Kelsey, 2008). The momentum following the 2008 surveys in Southern California was harnessed and most of the volunteer surveyors participated again in 2009. Jon Feenstra (coordinator of the 2008 census of Southern California breeding colonies under Rodd Kelsey and Audubon California) acted as primary coordinator in this effort.

Feenstra worked with local birders to form a list of potential colony sites. Sites were then assigned to the volunteer surveyors (active and knowledgeable local birders) who visited the sites within the survey time period (April 21 – April 28). The survey time period was chosen with the design that Tricolored Blackbirds are occupying breeding colonies and a sweep of the region would yield a reasonable estimate of the entire breeding population. As in 2008, birders familiar with Orange and Ventura Counties did not know of any recent Tricolored Blackbird breeding activity and those counties were eliminated from the survey.

Following the late April survey, volunteers were then asked to visit their sites again in mid-June to check on the colony status and determine if additional cycles of breeding were occurring.

Volunteer surveyors included: Tamara Ball, Vernon Benhart, Tom Blackman, Bill Deppe, Tim Dillingham, Peter Famolaro, Nancy Frost, Kimball Garrett, Terry Hunefeld, John Green, Walter Noon, Crispin Rendon, Jennifer Tobin, and Michelle Tobin. Additional related assistance was provided by Howard King, Mike San Miguel, and Doug Willick.

The volunteer surveyors were people already experienced in counting birds or had been active in the 2008 census, and, as such, no training session to describe identification, counting, and survey methodology was held (as had been done before the 2008 surveys). Volunteers were asked to collect information on the number of birds occupying a colony, the geographic size of the colony, and its vegetation properties and surrounding land use, among other fields. Data organization was maintained through field forms adapted from the 2008 survey and distributed to the volunteer surveyors.

Volunteers were asked to submit their survey results to the coordinator and to enter them into the Tricolored Blackbird data portal (<http://tricolor.ice.ucdavis.edu>).

## Results

The survey period ran from April 21 to April 28. 14 volunteers visited 50 potential colony sites in Los Angeles, Riverside, San Bernardino, and San Diego Counties. One site in the Kern County portion of the Antelope Valley (Branch Pond) was visited prior to the survey period and found to be unsuitable for a breeding colony this year. Several sites were surveyed outside of the designated time period in order to accommodate either the volunteers' schedules or a location access issue.

Of the 50 potential sites surveyed, 17 active breeding colonies were found with a total of 5453 Tricolored Blackbirds (see Table I). Colonies were found in all counties surveyed, most in valleys and foothills of the coastal mountain ranges (see Fig. 1). The average colony size was 321 birds, but spread between 6 and 2000. Nine of the colonies were found to hold less than 100 birds (see Fig. 2). The largest colony (2000 birds) was at the Hemet Water Treatment Plant where birds occupied a treated water wetland for nesting and foraged at a nearby cattle ranch. One colony, along the Santa Ana River near Colton, San Bernardino County, was a newly discovered location. It was found on private property by a biologist conducting surveys for an unrelated project. Nearly all colonies were reported to be in cattails and/or tules over water. Only a few colonies were in close proximity to farms with stored grains. Most colonies were near areas of natural grasslands for forage. See Table II for specific colony details.

In June, the colonies visited were either vacant or hosted a mix of adults and fledged juveniles foraging nearby and using the colony site for periodic shelter (and possibly an evening roost). The colony site near Lake Hemet in the Garner Valley in the San Jacinto Mountains was not occupied in the April survey, but was active on June 21 with about 300 Tricolored Blackbirds counted. Adult birds were seen carrying food into the colony.

All results are available for viewing in the Tricolored Blackbird data portal.

## **Discussion**

Southern California has been covered to some degree by each of the organized state-wide Tricolored Blackbird censuses that began in 1994. The numbers counted in those surveys vary widely from 42553 in 1997 (Beedy and Hamilton, 1997) to 5487 in 2008 (the previous low count before this year, not considering the incomplete data of 2000 and 2001, see Table III). Coverage during the state-wide surveys was largely focused on the core population in the San Joaquin Valley, and efforts in Southern California were rather cursory surveying a few known colonies in each county. A greater focus was given to Southern California during the state-wide survey of April 2008. Volunteers scoured the region checking known and many potential colony sites. Several new colony sites were located in the process. In addition, greater confidence can be taken in the total number for the region: 5487 birds were counted in 24 breeding colonies in 2008. Since a similar effort was again put forth in the spring of 2009 by many of the same people, the 5453 birds found at 17 colony sites may also be taken with similar confidence (assuming a similar observer error associated with counting moving flocks of birds). The nearly identical number recorded between the two consecutive years of surveying may indicate a short-term stability in the population.

Since the survey effort put forth in 2008 and 2009 differed from that in previous years, care must be taken when commenting on the Southern California population trend since 1994. Though population totals of 2008 and 2009 are lower-bounds (since some colonies were surely missed?), it should be noted that numbers reported before 2008 are likely farther below the actual total number of Tricolored Blackbirds present in Southern California during those years, as more colonies are assumed to have been missed. Bearing this in mind, a significant decline in the population can be inferred. The earliest

accounts indeed noted the Tricolored Blackbird as “the most abundant species near San Diego and Los Angeles” (Baird, 1870; Baird, 1874). Though significant habitat loss has occurred in Southern California in the past century causing widespread population decline or outright extirpation of many species, the causes of the more recent population decline of Tricolored Blackbirds are more a matter of educated speculation. Loss of habitat continues as a major contributor, both the destruction of wetland breeding sites and natural grasslands used for foraging are frequent events coincident with an increasing human population. Furthermore, the conversion to residential uses of agricultural land, which occasionally contains both breeding and feeding areas, eliminates the Tricolored Blackbird colonies that otherwise have not been pushed to the undeveloped periphery.

Weather patterns also influence the annual status of Tricolored Blackbirds in the region. In Southern California the rainy season is largely confined to the winter months. These annual rains supply runoff to the many small streams and cause the growth of lush vegetation throughout the region. They also raise the water levels of the ponds, reservoirs, and marshes that support Tricolored Blackbird breeding colonies. In rainy years more ephemeral wetlands become suitable breeding locations. Permanent wetlands and adjacent forage areas also maintain integrity later into the spring and summer allowing additional cycles of breeding. It follows that the overall effect is an increase in the population of Tricolored Blackbirds. Conversely, dry years should cause a decrease in the number of suitable wetlands, a shorter breeding season, and a decrease in their breeding productivity. In particular, El Nino events contributing to some of the wettest seasons on record and have had major positive effects on the Tricolored Blackbird population. The count of 17695 Tricolored Blackbirds in spring 2005 follows the wettest rainy season on record (see Fig. 3), while annual rainfall was below average leading up to the 2008 and 2009 breeding seasons, and may have contributed to the similar populations counted. It should be noted that all Tricolored Blackbird surveys conducted in Southern California since 1994 (except in 2005) occurred following seasons of below average rainfall. It will be interesting to continue this correlation study with future surveys.

Tricolored Blackbirds evolved their breeding strategy in order to capitalize on the annual changes in the locations of suitable breeding sites; sites with the combination of safe breeding habitat and adequate forage during nesting season (Beedy and Hamilton, 1999). The annual changes that determine the suitability of a breeding site are reflected in the spatial distribution of colonies found in the spring surveys (see Fig. 4). Though colony locations often vary from year to year, most colonies are present in four sub-regions: the Antelope Valley, the San Jacinto Valley and adjacent lowlands, the Lake Henshaw watershed, and the Otay Highlands (see Table IV). The population spread among these sub-regions makes up the majority of Southern California’s total population – nearly identical between 2008 and 2009. Interestingly, the unchanging total in the sub-regions is the sum of widely varying totals between the Antelope Valley, San Jacinto Valley, and Lake Henshaw. It may follow that these changes are the result of birds moving between the sub-regions to areas of optimum conditions. The negative trend in the Antelope Valley may be part of a natural cycle or a cause for concern. The lack of change in total counted in the Otay Highlands may signify a population that remains local to the area during years of similar climate. Unfortunately, it seems that the Otay Highlands were not covered in 2005. Other features notable in Figure 4 are loss of the final known colony on the coastal slope after a survey in June

2005 located a breeding colony near Irvine in Orange County. Though the colony located in Colton in 2009 is evidence that hope still remains for small pocket wetlands in the coastal lowlands. The appearance of the colonies east of Barstow in 2008 was a surprise, but it is possible that Tricolored Blackbirds were occasional wanderers into the Mojave River drainage and simply moved into the agricultural areas as the natural wetland and riparian habitat was destroyed. See Table V for colony activity changes.

The surveys of 2005 showed a remarkable shift of breeding activity between April and June. As noted above, the 2005 breeding season followed the wettest season on record in Southern California and wetlands suitable for Tricolored Blackbird breeding are expected to have been more numerous and maintained their suitability into later in the season. Conversely, both the 2008 and 2009 breeding seasons follow periods of below average rainfall. The only site found to host an active breeding colony in June (adults were feeding nestlings) in both years was in the Garner Valley, near 1500m elevation, and unoccupied when checked in April.

Several major gaps still remain in our understanding of the forces affecting the Tricolored Blackbird in Southern California. Though the recent studies found that Southern California's Tricolored Blackbirds are not a genetically distinct population, the only data on the flow of individuals over the Tehachapi Mountains comes from a second-hand observation of a bird seen in the Leona Valley of Los Angeles County possessing a colored band it acquired in the Central Valley (R. Meese, pers. comm.). Earlier studies recovered banded birds from Santa Barbara south to Baja California and found those birds to be solely from within that region (Neff, 1941; Dehaven and Neff, 1973; Dehaven et al, 1975). A repeat banding study in Southern California, coupled with emphasis on birders and surveyors to watch for banded birds, may shed more light on this distribution mystery.

With the many data being accumulated of the breeding ecology of Tricolored Blackbirds in Southern California, we still have relatively little information on the winter distribution of the species. The overall winter range is known, and large concentrations are occasionally reported by birders or recorded on Christmas Bird Counts, but the locations of all such large flocks and the total number of Tricolored Blackbirds present in the region in winter is unknown. As such, the specific sites most important to their winter well-being are unrecognized and unprotected. A survey commencing in January 2010 is expected to provide the first round of data on this subject.

Also missing from Southern California's database are the results of extensive monitoring of breeding colonies to determine reproductive success. Information on the impacts of predators, changes in food supply as dry summer conditions set in, changes in water levels in human-controlled water resources, and other such influences are unknown. In the Central Valley the effect of crop harvesting and such predators as Cattle Egrets on the success of colonies have been subjects of attention for several years (R. Meese, pers. comm.). Colony monitoring also goes hand in hand with landowner outreach, perhaps the most important step in colony conservation in the region. The small size of Tricolored Blackbird colonies often allows them to escape the notice of the managers and owners of the properties that they occupy. As such, colonies are at risk of destruction by those who do not knowingly intend harm. This is exemplified by several occurrences in the past year. In January 2009 a resident of Holiday Lake in the

Antelope Valley (the largest Tricolored Blackbird breeding colony in Los Angeles County) brought to the attention of the Tricolored Blackbird Working Group that the water supply to the lake was to be shut off by the West Valley Water District as part of an initiative to cut water delivered to decorative ponds. It was a simple matter of email exchange between interested parties and the officials at the water district to inform them that Holiday Lake is not a decorative body of water and that it is important to breeding Tricolored Blackbirds and other wildlife species. The water district agreed and simply removed Holiday Lake from its list – saving the breeding colony for one more year with the stroke of a pen. Later in the spring, a birder in Lancaster, also in the Antelope Valley, observed bulldozers beginning to clear vegetation from the Quartz Hill Detention Basin where Tricolored Blackbirds were actively feeding fledglings. A phone call was made to an agent at the California Department of Fish and Game who then called an official of the City of Lancaster, and the bulldozing was ceased until the breeding season was over. It is clear from these two stories that awareness of property managers and the vigilance of locals is a powerful combination for conservation and similar relationships should be realized and fostered for as many known and potential colony sites as possible. Moreover, though efforts to save Tricolored Blackbird breeding colonies in the area have largely been such successful ad hoc solutions, preemptive action to maintain the most vulnerable and critical areas for their benefit and/or restore sites of potential or historic occurrence will be ideal in increasing the population of Tricolored Blackbirds in Southern California and holding on to the region's biodiversity.

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Table I. The results of the April 2009 Tricolored Blackbird survey for all potential breeding colony sites.

<b>County</b>	<b>Location</b>	<b>Number</b>	
Kern	Branch Park Pond	0	
Los Angeles	Fairmont Reservoir	0	
	Gorman Post Road	45	
	Holiday Lake	400	
	Lake Palmdale	100	
	Mad Dog Ranch	0	
	Munz Ranch Aqueduct	6	
	Quartz Hill Detention Basin	50	
	Reitano Ranch	0	
	Tonner Canyon	0	
	Tweedy Lake	0	
	Riverside	Bridge Street Pond	0
		Diamond Valley Reservation	0
Fisherman's Retreat		0	
Garner Valley - Lake Hemet		0	
Hemet Water Treatment Plant		2000	
Lake Riverside Estates		730	
Lake Skinner		0	
Perris Airport		0	
Ramona Farms		0	
San Jacinto WA: Davis Unit		0	
San Jacinto WA: Potrero Unit		150	
Winchester Slough		0	
San Bernardino		Newberry Springs - Gravel Pit	75
		Newberry Springs - Minneola Pond	450
	Santa Ana River Pond - Colton	100	
San Diego	Barrett Junction	0	
	Boden Canyon Ecological Reserve Pond	0	
	Boulder Creek	0	
	Butterfield Stage Stop	0	
	Campo	0	
	Eagle Peak Rd. - Richie Ranch	50	
	Fashion Valley	0	
	Jacumba	0	
	Japatul Lane	0	
	La Posta	350	
	Lake Domingo	0	
	Lindo Lake	0	
	Marron Valley	0	
	Mesa Grande Road	150	
	Portero	0	
	Puerta La Cruz	25	
	Rancho Jamul Ecological Reserve Pond	0	
	Santa Ynez Valley, Hwy 79 call box 79-231	0	
	Santa Ysabel Ranch	22	
	Taylor Ranch	0	
	Upper Otay Lake	750	
	Upper Sweetwater Reservoir	0	
	Viejas Casino	0	
	Warner Springs Hwy 79 and Hwy S2	0	

Table II. Details of the active breeding colonies from the Spring 2009 surveys.

Location	Number	Substrate	Grains Present	Owner	Surrounding Land Use	Primary Observer
Gorman Post Road	45	Nettles	No	private	Grassland, agriculture	Vernon Benhart
Holiday Lake	400	Bulrushes/tules	No	WVWD	Residential, grassland	Vernon Benhart
Lake Palmdale	100	Cattails	No	Palmdale WD	Scrubland, residential	Jon Feenstra
Munz Ranch Aqueduct	6	Nettles	No	private	Grassland	Kimball Garrett
Quartz Hill Detention Basin	50	Cattails	No	City of Lancaster	Residential, grassland	Kimball Garrett
Hemet Water Treatment Plant	2000	Bulrushes/tules	Yes	Eastern Municipal WD	Dairy, agriculture	Crispin Rendon
Garner Valley/Lake Hemet	300	Bulrushes/tules	No		Grassland	Crispin Rendon
Lake Riverside Estates	730	Cattails	No	private	Residential, grassland	Crispin Rendon
San Jacinto WA: Potrero Unit	150	Cattails	No	public	Wildlife refuge, wetland	Crispin Rendon
Newberry Springs - Gravel Pit	75	Cattails	Yes	private	Desert scrub	Bill Deppe
Newberry Springs - Minneola Pond	450	Cattails	No	private	Desert scrub, agriculture	Bill Deppe
Santa Ana River Pond - Colton	100	Cattails	Yes	private	Ruderal lands, residential	John Green
Eagle Peak Rd. - Richie Ranch	50	Cattails	Yes	private	ranches, ruderal lands	Tom Blackman
La Posta	350		Yes	private	cattle ranches	Tom Blackman
Mesa Grande Road	150			private		Tom Blackman
Puerta La Cruz	25	Cattails	Yes	private	Cattle pasture	Terry Hunefeld
Santa Ysabel Ranch	22	Cattails	Yes	private	Cattle ranch	Terry Hunefeld
Upper Otay Lake	750	Bulrushes/tules		public	Residential, grassland	Tom Blackman

Table III. Southern California Tricolored Blackbird totals from all recent statewide surveys. Note that surveys in 2001 and 2004 had incomplete coverage of the region. (Tricolored Blackbird count data for 1994-2008 taken from the data portal, see Methods.)

<b>County</b>	<b>1994</b>	<b>1997</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2004</b>	<b>2005</b>	<b>2008</b>	<b>2009</b>
Los Angeles	815	430	1125	610			5100	1270	601
Orange	1034	231	106	495			0		
Riverside	2175	38356	4000	10000	430		12200	2150	2880
San Bernardino	0	300	1000	0			0	700	625
San Diego	2000	3236	195	2021	150	400	395	1367	1347
Ventura	90	0	0	0			0		
<b>Total</b>	<b>6114</b>	<b>42553</b>	<b>6426</b>	<b>13126</b>	<b>580</b>	<b>400</b>	<b>17695</b>	<b>5487</b>	<b>5453</b>

Table IV. Numbers of Tricolored Blackbirds counted in the major geographic sub-regions of Southern California in April surveys. (Tricolored Blackbird count data for 2005 and 2008 taken from the data portal, see Methods.)

<b>Geographic region</b>	<b>Number of TRBLs by year</b>		
	<b>2005</b>	<b>2008</b>	<b>2009</b>
Antelope Valley	4600	1320	601
San Jacinto Valley	12000	1250	2150
Lake Henshaw vicinity	295	394	197
Otay Mesa	0	711	750
Sub-region total	16895	3675	3698
Total Southern CA pop.	17695	5487	5453
% of Total Southern CA pop.	95.5%	67.0%	67.8%

Table V. Number results for all active Southern California colonies from April surveys. (Tricolored Blackbird count data for 2005 and 2008 taken from the data portal, see Methods.)

County	Colony Name/Location	Number of TRBLs by year		
		2005	2008	2009
Kern	Branch Park Pond	800	50	0
Los Angeles	Fairmont Reservoir	200	30	0
	Gorman Post Road	100	40	45
	Holiday Lake	1000	550	400
	Lake Palmdale	2000	350	100
	Munz Ranch Aqueduct	500	100	6
	Quartz Hill Detention Basin		200	50
Orange	Sand Cyn Rd. & 405	14		
Riverside	Diamond Valley Reservation	500	0	0
	Fisherman's Retreat		400	0
	Hemet Water Treatment Plant		0	2000
	Lake Riverside Estates	200	500	730
	Lake Skinner		200	0
	Perris Airport	1000	0	0
	San Jacinto WA: Davis Unit	10000	0	0
	San Jacinto WA: Potrero Unit	500	250	150
	Winchester Slough		800	0
San Bernardino	Gravel Pit Newberry Springs		200	75
	Newberry Springs Minneola Pond		500	450
	Santa Ana River Pond -Colton			100
San Diego	Barrett Junction		175	0
	Borrego Springs Country Club	100		
	Chihuahua Creek Confluence		250	
	Eagle Peak Rd. - Richie Ranch			50
	La Posta		0	350
	Mesa Grande Road	295	7	150
	Puerta La Cruz		50	25
	Rancho Jamul Ecological Reserve Pond		161	0
	Santa Ysabel Ranch		20	22
	Tule Lake		250	
	Upper Otay Lake		375	750
	Upper Sweetwater Reservoir		250	0
	Warner Springs Hwy 79 and Hwy S2		67	0

Figure 1. The locations of all active Tricolored Blackbird breeding colonies in Southern California as found during the spring 2009 surveys. Red dots mark colonies active in April, yellow dots mark the colonies active in June.



Figure 2. The distribution of Tricolored Blackbird breeding colonies in Southern California based on the estimated number of birds present during the April 2009 survey data.

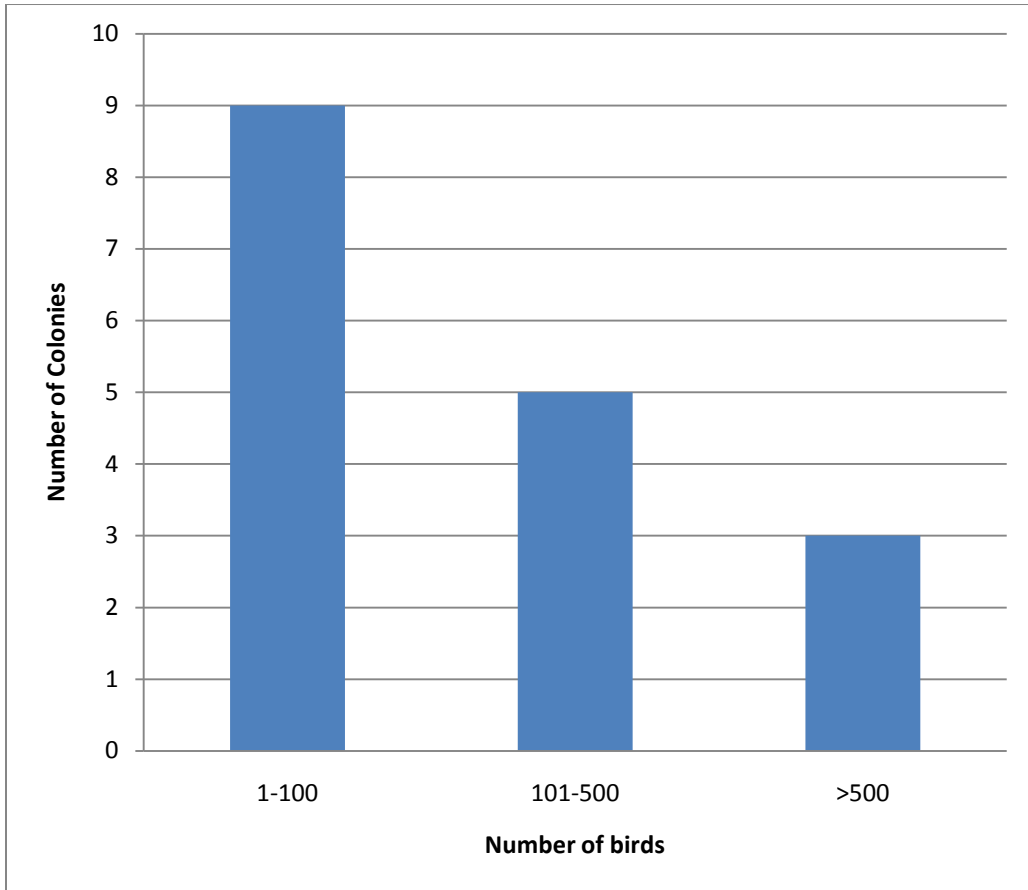




Figure 3. Plot depicting the number of Tricolored Blackbirds counted during April surveys of Southern California (green bars) with the annual rainfall recorded in downtown Los Angeles (red line) and the average rainfall from 1877 – 2007. (Rainfall data from the National Weather Service and the Los Angeles Almanac; Tricolored Blackbird count data 1994-2008 taken from the data portal, see Methods.)

