

Western Riverside County MSHCP Biological Monitoring Program 2018 Tricolored Blackbird Survey Protocol

INTRODUCTION

The Tricolored Blackbird (*Agelaius tricolor*) is a medium-sized member of the songbird family Icteridae and a near-California endemic, with 95% of its historic breeding range within the state (Beedy et al. 2017). This species is one of 45 bird species covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (Dudek & Associates 2003). Species-specific Core Areas designated by the Plan for the Tricolored Blackbird include Mystic Lake/San Jacinto Wildlife Area, San Jacinto River Floodplain, Collier Marsh/Lake Elsinore Grasslands, Northwest Alberhill, and Vail Lake/Wilson Valley/Eastern Temecula Creek (Fig. 1). The Plan also stipulates specific conservation objectives, among which are the continued use of, and successful reproduction in, at least one of these five Core Areas at least once every five years (Objective 4), and the protection of all known nesting locations on conserved lands (Objective 6). Core Areas include most historic breeding sites known at the time the MSHCP was developed.

Conservation Objective 4 was met in 2017 (Biological Monitoring Program 2018). However, due to the dramatic decline of this species over the last two decades (Biological Monitoring Program 2011) and the critical need to obtain continuous data on population distribution and trend, we strive to conduct surveys for this species annually, permitting the availability of trained staff. In most years, our surveys target historic breeding sites as well as other suitable habitat within the species' Core Areas.

Breeding Biology

Tricolored Blackbirds are colonial breeding birds (Beedy et al. 2017). A single territory will include 1 male and 1–3 females. The average sex ratio is 1:2 males to females. Breeding occurs from March–June and can be itinerant, whereby birds may nest multiple times during a season but in different parts of their range. Nests are built within small territories that usually occupy a few square meters within tight proximity to each other. Timing of nesting is highly synchronous and young fledge within a few days of each other, with juveniles often gathering together in flocks called creshes. Only females build nests and incubate eggs but both sexes provision young.

The MSHCP describes primary (nesting) habitat to include marshlands and freshwater bodies within the Riverside Lowlands and Foothills Bioregions of the MSHCP Plan Area. Secondary habitat includes playa and vernal pools, grasslands, agricultural land, and riparian scrub. Approximately 60% of all Tricolored Blackbird colonies observed within the Plan Area over the last 3 decades nested in freshwater marsh, and 40% in undeveloped upland and agricultural areas (Biological Monitoring Program 2011). In marshes, nests are built over water in mature stands of cattail (*Typha* spp.) or bulrush (*Schoenoplectus* spp.). In upland areas, nesting substrates consist primarily of spiny, protective vegetation such as milk thistle (*Silybum marianum*), bull thistle (*Cirsium vulgare*), stinging nettle (*Urtica dioica*), or grain crops grown as silage for

cattle. Tricolored Blackbirds also require a source of fresh, open water and suitable foraging areas (e.g., upland pasture, grassland, alfalfa). Foraging birds will fly up to 8 km (5 miles) to sources of abundant food (like farms with stored grains), but most foraging occurs within 3.2 km (2 miles) of colonies (Beedy et al. 2017). In Riverside County, colonies are often located at or near dairy operations that provide an abundant source of water, grain for adults, and insects for young, often collected from mature (2–3 y old) alfalfa fields (*R. Cook, personal observation*).

Foraging is social, occurring away from the nest site. In moderate to large colonies of 5,000–60,000 birds or more, foraging flocks can be made up of hundreds or thousands of individuals. Adults feed on grain and insects throughout the year. Young up to 9 days old depend entirely on insects that are gathered from fields of native and non-native forblands and grass/forbland mixtures, irrigated pasture, lightly grazed rangeland, dry season pools, mowed alfalfa (*Medicago sativa*) fields, and various scrub vegetation associations. Colonies often disperse after the breeding season and individuals may join mixed flocks of songbirds, primarily other species of blackbirds, European Starlings (*Sturnus vulgaris*), and Brown-headed Cowbirds (*Molothrus ater*).

Tricolored Blackbirds colonies are often highly synchronous in development and nesting stage; however, a single colony can also be composed of 2 or more settlements by different groups of birds at different times, such that there is an overlap among subgroups in nesting stage. The behavioral stages of nesting are described in sequence as follows.

Settlement (2 days)

Males are extremely vocal and active and move from perch to perch high in the nesting substrate, often jostling with males on adjacent territories. Vocalizations include calling and singing. At this time females move slowly and silently from one territory to another, often several feet below the displaying males.

Nest building (3-4 days)

Females fly actively from nesting substrate to sources of nest materials (grasses and mud) and back again. They are silent but very conspicuous in the landscape. Males remain mostly on their territories perched atop the nesting substrate but display and call less frequently than during settlement. Territorial squabbles usually end by the time nests are built.

Incubation (10-12 days)

Females sit out of sight and incubate their eggs. Both sexes are silent and inconspicuous. Males may even spend the daylight hours in all male flocks away from the nest site. Colonies can appear unoccupied on initial observation even when several thousand birds are present.

Nestling (10-12 days)

Both parents provision young and form foraging flocks or flight lines of birds that may stretch for hundreds of yards and persist for several minutes as birds move from their nests to foraging destinations and back again. These foraging flocks are often conspicuous in the landscape and cross roads or other points of access which can lead observers to colony locations.

Fledging (3-4 days)

Fledglings are leaving the nest and perching on vegetation above it, begging for food from adults.

Post-fledging (4-6 days)

Juveniles perch and call conspicuously high in the nesting substrate, usually in groups and often joining adult flocks to forage away from the colony site. Although capable of obtaining their own food at this stage, juveniles may be fed by adults for up to a week.

Goals and Objectives

1. Assess the size of the Tricolored Blackbird breeding population within the MSHCP Plan Area.
 - a. Estimate the abundance of adult birds by conducting targeted searches for breeding colonies within the species' five Core Areas, extended search areas, and historic breeding sites over a three day period during second week of April.
2. Document the breeding-season distribution of Tricolored Blackbird within the MSHCP Plan Area.
 - a. Identify new breeding sites and assess the occupancy of historic breeding sites during the population assessment.
3. Document reproductive success of Tricolored Blackbird colonies within the MSHCP Plan Area. Reproductive success is defined as the production of at least one fledged young.
 - a. Revisit occupied breeding sites periodically until fledging occurs or all nests within the colony fail to fledge young.

METHODS

Survey Design

The 2018 survey will be conducted from 9-11 April during the peak of the breeding season (Beedy et al. 2017). The short duration of the survey period is intended to reduce the possibility of double-counting the same birds, since Tricolored Blackbirds may shift locations over relatively short periods of time during the breeding season (Hamilton 1998). Survey dates may be rescheduled in the event of heavy rain or extreme temperatures (over 37° C). Surveys will not be terminated due to wind speed unless it poses a risk to observers.

The area of inference includes the five MSHCP Tricolored Blackbird Core Areas, additional areas that support potentially suitable breeding habitat, and all sites known to have supported breeding colonies in the past (i.e., historic colony sites) within the MSHCP Plan Area.

Target Species and Incidental Observations

Target species of the survey include Tricolored Blackbirds wherever they are observed and species that prey on Tricolored Blackbird adults and young at breeding sites. Incidental observations include all other Covered and Non-Covered species observed within a survey station or during travel between stations.

Field Methods

Field methods and data collection were designed to meet the requirements and data standards of both the Triennial Tricolored Blackbird Statewide Survey (Meese 2017) and annual monitoring efforts of the Biological Monitoring Program. We will use datasheets designed for the Biological Monitoring Program which mirror, in content, the datasheets developed for the 2017 statewide survey, with the addition of several data elements.

Surveys will consist of untimed area searches and visits to historic Tricolored Blackbird breeding sites. Area searches consist of traveling the routes indicated on the maps and stopping at vantage points marked on the maps to scan for Tricolored Blackbirds. Observers may stop at other points that appear to support suitable habitat, are convenient vantage points for scanning the landscape, or where Tricolored Blackbirds are present. Observers should spend at least 10 minutes at each vantage point if the appears to be suitable nesting habitat present.

Survey participants will be provided 1) a set of paper maps depicting survey routes, vantage points, and historic colony site locations, and 2) a set of data sheets. Geographic coordinates of colony sites, available in .gpx and .tpo format, will be available in Common\Projects\Birds\TRBL\2018. Additional datasheets will be available in Common\ Projects\Birds\TRBL\2018\Datasheets.

Historic colony sites will be marked on the area search maps, and located along the marked driving routes. Most search areas have one or more historic colony site within them but some have none. All historic colony sites are within view of a roadway or a short walking distance from a road. Colony site visits require a minimum of 15 minutes of search time if suitable habitat is present and 5 minutes if not. Colony sites on private land should be observed from the nearest public point of access.

Surveys may be conducted by a single observer or teams of two. We will assign two observers to survey search areas and historic colony sites that have been occupied by Tricolored Blackbird colonies at least once during the last five years, and one observer to all other survey areas. Teams of two will estimate abundances independently. Surveys within the following geographic areas will be conducted over the 3-day survey period:

- Aguanga Valley, Garner Valley (two observers)
- Collier Marsh and Lake Elsinore Core Area, Alberhill Core Area (one observer)
- Winchester, Diamond Valley (two observers)
- Lake Perris, Mystic Lake/San Jacinto Wildlife Area – Davis Unit Core Area (two observers)
- Lake Skinner (two observers)
- Prado, Mill Creek, Hidden Valley (one observer).

- San Jacinto Valley North (two observers)
- San Jacinto River Floodplain Core Area (one observer)
- San Timoteo Canyon, San Jacinto Wildlife Area - Potrero Unit (two observers)
- Sycamore Canyon (one observers)
- Temecula Creek, Vail Lake, Wilson Valley Core Area (one observer)

Occupied colony sites will be revisited at least once a week by the project lead person to monitor the size, status, and success of reproduction until the completion of nesting.

Observations

Tricolored Blackbirds are usually but not always associated with breeding colonies during the period of the survey. The best way to find a colony is to look for flocks of birds or flight lines actively coming from one direction and returning the same way, then following the birds back to the colony site. Most movement between colony sites and foraging grounds occurs within 3 km.

Flocks of birds unassociated with a colony will tend to linger in one area for more than 10-15 minutes, and show little or no strong directional movement. Composition of the flock can sometimes help reveal the nature of the association and the likelihood of a nesting colony nearby. Flocks that display this kind of behavior and include males and females in approximately equal proportions are most likely not associated with a colony. Alternatively, all-male flocks can consist of non-breeding adults but could also be associated with a colony that is in the incubation stage of nesting, usually no more than a few kilometers away.

Estimating Colony Size

In Riverside County, Tricolored Blackbird colonies range in size from 20 to 5,000 birds. For very small colonies (< 100 birds), precise counts might be possible; an estimation will be necessary for larger colonies. Estimating the size of colonies can be very challenging as there can be a great deal of activity during the nesting period. Estimates need only be made within orders of magnitude in round whole numbers (e.g., colonies of less than 100 birds can be estimated to the nearest 10, and colonies of 1,000 or more, to the nearest 100). There are two ways to estimate numbers depending on whether birds are in flight or perched within the nesting or roosting site.

1. *Within substrate:* Since Tricolored Blackbirds usually roost and nest in very close proximity to each other, densities within the colony tend to be rather uniform. In these cases, it is effective to count the number of birds that fill a specific, repeatable field of view, such as the field of view in your binoculars. Within this field of view, count precisely, or by fives or tens for more dense concentrations, to obtain a reasonable estimate of the number of birds within that view. Then, multiply that number by the number of fields of view that comprise the entire colony. In cases where the density of birds clearly varies, apply the same method within subsections of occupied area and sum the counts for a total. Variations in density can usually be detected by sight or sound.

2. *In flight:* Depending on the time of day and breeding status of the colony, there may be groups of birds flying between the colony and off-site food or water

sources. Good estimates can often be made by counting all birds flying out of, or into, the colony over a 10 minute period. Practice identifying a group of 10-20 birds in flight. Then, extrapolate to larger flocks by blocking and counting the number of groups of 10 or 20 within the flock. This method is most accurate during the provisioning stage of nesting when both males and females are actively feeding young. In general, the average size of flocks leaving or arriving to a colony can also be indicative of colony size during any stage of nesting. Groups of birds in the low 10's tend to be associated with colonies in the low 100's, middle tens with middle 100s, and higher 10s with higher 100s or 1,000, and similar relations appear to be associated often with larger colonies (Rosamonde Cook, personal observation). This observation should not be the only method used to estimate numbers but it can be a useful aid in addition to within-colony estimates.

In many cases, the most effective strategy is a combination of the two methods. It is best to estimate density within nesting substrate but also to count birds in flight, especially whole groups as they emerge to fly out together. Fly-outs often occur about every 10-20 minutes. Foraging trip typically last about 10 minutes, so counts should be made within this time frame. As birds begin to fly out, obtain a count of the flocks first. Then, assess the density of birds remaining in the nesting substrate either by sight or sound level. If for example, you observe the same number of birds in the substrate after the fly-out as before, you can reasonably assume that the total number is at least twice that you observed in the fly-out, although it can also be many more than that. At times too, multiple fly-outs may occur in rapid succession. Wait until they have stopped to observe the birds remaining in the nesting substrate. Count all birds coming and going over the next 10 minutes and add these to the number remaining over the observation period and the number observed flying out.

It is important to observe long enough for observers to feel confident in their estimates, bearing in mind that an initial estimate might be refined with a longer observation period. Good estimates are most likely to be obtained while observing for 1 hr or more. It is also important to remember that the accuracy of the count can depend on the stage of the nesting cycle as reflected in behavior and activity levels as described above. Observations on vocalizations, sex ratio, nest building and food carrying activities can be helpful in staging the colony. Obtaining an accurate assessment of occupied nesting substrate may also be used to provide a reasonable estimate of the number of breeding birds.

Field Procedure

Area Searches

1. Area Search datasheets will be pre-filled with Station (Search Area) names.
2. Additional datasheets will be available in Common\Projects\Birds\TRBL\2018\Datasheets.
3. Spend at least 10 minutes surveying for birds at each vantage point marked with a blue dot on the area search map.
4. At minimum, the following information must be included on each datasheet:
 - a. Date

- b. Start and end time
 - c. Total miles driven
 - d. Weather conditions at the start and end of the survey
 - e. Observer's initials
 - f. Wind speed at the start and end of the area search
 - g. Ambient temperature at the start and end of the area search
 - h. Cloud cover at the start and end of the area search
5. The remainder of the datasheet should be completed only if a new colony site or a flock of birds not associated with a colony is discovered.
 - a. Record coordinates and create a temporary site name. This name will link the site to the Station ID on the Colony Site Visit datasheets. The name should include the identity of the search area followed by a number equal to the order in which the observations are made. Provide a description of the location (e.g., general habitat, nearby roads, property name if known).
 - b. Spend a minimum of 25 minutes estimating the number of birds in the colony or unassociated flock.
 6. Make a record of your survey route by using the tracks feature on your GPS. Be sure to start recording tracks at the beginning of the area search and stop recording at the end of the survey.

Tricolored Blackbird Observations

1. Tricolored Blackbird Observation datasheets are used to record data on occurrences of nesting colonies and unassociated flocks.
2. For historic colony sites, the name of the Station will match that of paper area search maps provided. For new colony sites or unassociated flocks of birds, the Station ID will match the temporary name provided on the Area Search datasheet.
3. Additional datasheets will be available in Common\Projects\Birds\TRBL\2018\Datasheets.
4. At the start of the site visit, record:
 - a. Date and start time
 - b. Weather conditions and noise level
 - c. Observer's initials
 - d. Suitability of the site for nesting
5. Period of observation will depend on condition of any nesting substrate present and occupancy by Tricolored Blackbirds.
6. Historic colony sites must be observed for a minimum of 15 minutes if suitable nesting substrate is present at the site or within observable distance. Remember, locations that appear to be unoccupied may indeed be occupied by birds in the incubation stage of the breeding cycle.
7. You need only spend five minutes at a historic site if nesting substrate is absent or permanently unsuitable (i.e., permanently absent).
8. Occupied colony sites must be surveyed for a minimum of 25 minutes to obtain an accurate estimate of colony size.

9. If a site is inactive, circle a suitability option. Do not complete the rest of the sheet. Take at least one digital photo of the colony site.
10. If a site is active, complete all of the sections on this sheet and as much data in each section as possible. Take at least one digital photo of the colony site.
 - a. Record both primary (dominant) and secondary substrate type if present and percent cover of each type.
 - i. Wetland habitats of Tricolored Blackbirds consist primarily of freshwater marsh dominated by cattail or bulrush, but may also include flooded small willows (*Salix* spp.), cottonwoods (*Fremontia* spp.), and Tamarisk (*Tamarix ramosissima*).
 - ii. Upland nesting substrates include, in addition to those listed above, Himalayan blackberry (*Rubus armeniacus*), California blackberry (*Rubus ursinus*), California wild rose (*Rosa californica*), Cheeseweed mallow (*Malva parviflora*), mustard (*Brassica* spp.), giant reed (*Arundo donax*), prickly lettuce (*Lactuca seriola*), mule fat (*Baccharis salicifolia*), coyote brush (*Baccharis pilularis*), poison hemlock (*Conium maculatum*), and others.
 - b. Record the approximate length and width of 1) available suitable nesting substrate and 2) nesting substrate occupied by the colony.
 - i. If multiple patches of substrate are occupied by a single colony, sum the dimensions of each patch into a single measure.
 - ii. You may estimate dimensions in the field by pacing or later in the office by using the ruler in Google Earth.
 - c. Describe the dominant type of land use surrounding the colony (e.g., agriculture, nature reserve, suburban, etc.), the source of water available within 0.8 km (0.5 miles) and the presence or absence of stored grains within 8 km (5 miles). The availability of stored grains may be difficult to assess in the field. This item refers primarily to the proximity of dairy farms which can be assessed from aerial photos on Google Earth.
 - d. Always make observations on private property from the nearest public point of access.
 - e. It is best to avoid any disturbance of nesting birds so do not approach occupied substrates and do not enter active colonies.
 - f. Colonies should be surveyed from a distance at which the birds are unaffected by the observer's presence. Since colonies may be located in a variety of contexts, it is up to the observer to determine how close is too close, but under most circumstances, colonies can be surveyed from 20-100 meters outside the boundaries of the vegetation in which the birds are nesting.
 - g. Be alert for changes in the birds' activity, and if they display defensive behavior such as flushing in groups and flying away from the nest site, move away until they resume normal activities.
 - h. Observe colonies for a minimum of 25 minutes. For larger colonies (more than a few hundred birds), it may be necessary to observe for up to an

hour to arrive at a good estimate. For colonies and unassociated flocks, record the number of birds observed (including an exact count or best estimate, and a minimum and maximum estimate), sex ratio if possible, and method of detection.

- i. For teams of two observers, exact counts or estimates should be made by each observer. Observers may discuss with each other how their estimates are made, but each observer should arrive at their own counts. Record both estimates with the initials of the observer next to each one.
- j. Estimates need only be made within orders of magnitude in round whole numbers (e.g., colonies of less than 100 birds can be estimated to the nearest 10, and colonies of 1,000 or more, to the nearest 100). Bracket this estimate with your best estimate of the minimum and maximum number of birds present.
- k. In most cases it will be necessary to employ both exact count and estimation strategies. Position yourself somewhere with good visibility and use a timed count of the flying birds as they leave the colony. Once the flow of birds has dropped off, conduct a scanning count of the visible birds remaining within the colony itself. The scanning count of the colony should be repeated a few times to improve the estimate. Add the estimate of birds flying away from the colony to the count of birds within the colony.
- l. Estimate the sex ratio as males:females. Teams of observers should enter a single ratio.
- m. For colonies, record the best estimate of the number of fledgling and of juvenile birds.
- n. Record your best estimate of the number of fledglings observed. Teams of two observers may combine estimates and record the average.
- o. Estimates based on sound or a combination of sight and sound are difficult for inexperienced observers. Use the Comments field to make notes about level of confidence in estimations.
- p. Post-fledging juveniles are similar in size and appearance to adult females but have shorter tails. For colonies that nest in synchrony, most or all of the juveniles will be as visible as adults and you can use the same method described above for estimating within-substrate numbers. Use the blocking technique for counting juvenile flocks or creches.
- q. Record behavior of the colony, including:
 - i. *Vocalization*: a pronounced to almost deafening chorus of males heard singing at a colony indicates settlement.
 - ii. *Carrying Nest Material*: females observed carrying nest material such as grass or strips of cattail leaves indicated nest-building.
 - iii. *Carrying Food*: adults observed carrying food (usually insects protruding from bill) indicates nestling stage.

- r. Record any type of disturbance to the colony site or within 50 meters of it. Refer to the Disturbance footnote of the datasheet for a list of disturbance types.
 - i. Record the presence or sign of any predator species listed in the Predators footnote on the datasheet and the estimated number of individuals.
 - ii. Provide a description of the disturbance (minimum: severity and where observed). Note the presence of any dead adults and young or remains.
 - s. Take at least one digital photo of each occupied site.
 - t. Take digital video of occupied colony sites for at least 3 minutes if possible, to record the activity of birds within and around the colony site and the flocks of birds coming and going from it. Video can be useful for refining estimates of colony size after the survey.
 - u. Take at least one photo to document disturbance.
11. Report all observations of Tricolored Blackbirds to the project lead person as soon as possible.

Colony Site Revisits

1. Colony site revisit datasheets are to be used for monitoring active colony sites.
2. At the start of the site visit, record:
 - a. Date and start time
 - b. Weather conditions and noise level
 - c. Observer's initials
3. Occupied colony sites must be surveyed for a minimum of 25 minutes to detect fledglings and obtain an accurate estimate of colony size.
4. If a site is active, complete all of the sections on this sheet and as much data in each section as possible. Take at least one digital photo of the colony site.
5. Follow the instructions for Tricolored Blackbird Observations above.
6. Record end time at the end of the site visit.

Equipment

- Datasheets
- Pens/pencils
- Paper maps of search areas and historic colony sites
- Highlighter markers for drawing routes on paper survey maps
- GPS units with historic colony site points loaded
- Binoculars and/or spotting scope
- Camera
- Video recorder (optional)

TRAINING

All survey participants will receive training in the identification of Tricolored Blackbirds by sight and sound. Training will also include the objectives and methods of the survey, types of nesting substrates used by Tricolored Blackbirds, and the identification of important predator species. At least one member of surveys teams will have had experience estimating the numbers of Tricolored Blackbirds using one or more of the techniques described above during one or more previous Tricolored Blackbird surveys.

Training Results

All field personnel will have achieved proficiency in 1) the visual and aural identification of Tricolored Blackbirds and the methods of colony and flock size estimation described above prior to conducting surveys; 2) identification of the types of nesting substrates used by Tricolored Blackbirds in southern California; and 3) methods of staging nesting colonies and estimating area of occupation.

DATA MANAGEMENT

Data management will include data collection, conversion to electronic form, and quality assurance and control (QA/QC). Data will be collected on paper datasheets that are designed to match in order and content, the data entry form designed for the MSHCP electronic database to help assure inferential integrity of the data. Data sheets will be filed in a folder labeled “Tricolored Blackbird Data 2018” at the end of each survey. Datasheets will be reviewed by the project lead person, and entered as soon as is practical, into the MSHCP’s centralized database. Data will also be entered into the Tricolored Blackbird Data Portal (<http://tricolor.ice.ucdavis.edu/>), a centralized repository of Tricolored Blackbird statewide monitoring data.

Quality assurance will include a manual check of each datasheet against the data entered into the MSHCP database by someone other than the person who entered the data. Quality control will include a review by the project lead person of the data with respect to assessing the accuracy of the data listed in in the spreadsheet *Common\Projects\Reports\2018\Lead_Data_Review_Checkoff_Table.xls*, and a review for completeness by the Data Manager. These reviews can be facilitated with data queries available in *Common\Database\LeadsQueries.mdb*. After any corrections are made, the data are certified as being accurate and complete by the Data Manager.

DATA ANALYSIS

Assessment of population size will consist of summarizing all observations of Tricolored Blackbirds made within the 3-day survey period and drawing comparisons and contrasts to the results of previous surveys. The distribution of breeding activity will be mapped in GIS, and the location of breeding colonies will be examined with respect to land conservation status, species-specific Core Areas, previous patterns of site occupancy, and potential environmental and anthropogenic threats to nest sites. Trends in successful reproduction and reproductive success will be analyzed by comparing observations from 2018 with those of previous surveys.

TIMELINE

- 1 February – Requests for written permits
- 15 March – Initial requests for permission via email
- 15 April – Population assessment completed
- 21 April – Data entered into the Tricolored Blackbird Data Portal
- 15 July – Completion of nest site monitoring
- 15 August – Data entered into the Biological Monitoring Program Database
- 15 September – Data QA/QC
- 30 November – Draft report

LITERATURE CITED

- Beedy, E. C., Hamilton, W. J. III, Meese, R. J., Airola, D. A., and P. Pyle. 2017. Tricolored Blackbird (*Agelaius tricolor*). In P. G. Rodewald (editor), *The Birds of North America*. Ithaca: Cornell Lab of Ornithology. Retrieved from the Birds of North America: <https://birdsna.org/Species-Account/bna/species/tribla> DOI: 10.2173/bna.423
- Biological Monitoring Program. 2011. Western Riverside County MSHCP Biological Monitoring Program. Tricolored Blackbird (*Agelaius tricolor*) Survey Report, 2010. Report prepared for the Western Riverside County Multiple Species Habitat Conservation Plan. Riverside, CA. Available from: <http://wrc-rca.org/about-rca/monitoring/monitoring-surveys/>.
- Biological Monitoring Program. 2018. Western Riverside County MSHCP Biological Monitoring Program Tricolored Blackbird (*Agelaius tricolor*) Survey Report, 2017. Report prepared for the Western Riverside County Multiple Species Habitat Conservation Plan. Riverside, CA. Available from: <http://wrc-rca.org/about-rca/monitoring/monitoring-surveys/>.
- Dudek & Associates. 2003. Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP). Final MSHCP, Volumes I and II. Prepared for County of Riverside Transportation and Lands Management Agency. Riverside, CA.
- Hamilton, W. J. III. 1998. Tricolored blackbird itinerant breeding in California. *Condor* 100:218-226.
- Meese, R. J. 2017. Results of the 2017 Tricolored Blackbird Statewide Survey. California Department of Fish and Wildlife, Wildlife Branch, Nongame Wildlife Program Report 2017-04, Sacramento, CA. 27 pp. + appendices.

**2018 TRICOLORED BLACKBIRD SURVEY
AREA SEARCH DATASHEET**

Search Area: _____ Date: _____ Start time: _____ End time: _____ Miles driven: _____ Observer(s): _____	Start wind: _____ km h ⁻¹ End wind: _____ km h ⁻¹ Start temp.: _____ C End temp.: _____ C Start Sky: _____ End Sky: _____
---	--

New Colony 1	UTM X: _____	UTM Y: _____
Temporary Name: _____		
Site Description: 		

New Colony 2	UTM X: _____	UTM Y: _____
Temporary Name: _____		
Site Description: 		

New Colony 3	UTM X: _____	UTM Y: _____
Temporary Name: _____		
Site Description: 		

Comments

Weather: 0 = clear or few clouds; 1 = partly cloudy; 2 = mostly cloudy; 3 = fog or smoke; 4 = light drizzle; 5 = constant snow; 6 = constant rain.

2018 TRICOLORED BLACKBIRD SURVEY
TRICOLORED BLACKBIRD OBSERVATION DATASHEET

Colony Site (or New Colony Name) _____ **Occupied:** Yes No

Date: _____ Avg. wind: _____

Start time: _____ Air temp.: _____

End Time: _____ Sky: _____

Observer(s): _____ Noise: _____

Nesting Substrate Suitable Unsuitable Absent Permanently Unsuitable (circle one)

Primary nesting substrate: _____ Percent primary substrate: _____

Secondary nesting substrate: _____ Percent secondary substrate: _____

Total length (m): _____ Total width (m): _____

Occupied length (m): _____ Occupied width (m): _____

Distance to water (meters) _____ Source of water: _____

Dominant Surrounding Land Use: _____

Nearby Stored Grains? Y N Unknown

Tricolored Blackbirds Colony Flock (circle one)

Observer 1: Initials: _____ Adults: _____ Estimated / Exact Min estimate: _____ Max estimate: _____

Observer 2: Initials: _____ Adults: _____ Estimated / Exact Min estimate: _____ Max estimate: _____

Estimated adult sex ratio (males:females): _____ Detection: Visual Audial

Estimated number of fledglings: _____ Estimated number of juveniles: _____

Vocalizing: Singing Calling Quiet Females carrying nest material: Y N

Adults carrying food: Y N Nesting Stage Inferred (Settlement, Nest Building, Incubating, Nestling, Fledging, Not Nesting, NA)

Disturbance

Type _____ If predator: Species _____ number: _____

Type _____ If predator: Species _____ number: _____

Type _____ If predator: Species _____ number: _____

Description: _____

Photos: Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Videos: Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Photographer _____ Type (Nest Substrate, Foraging Habitat, Species) Number(s) _____

Comments

Weather: 0 = clear or few clouds; 1 = partly cloudy; 2 = mostly cloudy; 3 = fog or smoke; 4 = light drizzle; 5 = constant snow; 6 = constant rain.

Noise Codes: 0 = no noise; 1 = noise, but not affecting bird detection; 2 = moderate noise, may be affecting detection; 3 = loud noise, reducing ability to detect birds; 4 = very loud noise, difficult to hear anything at all.

Types of Disturbance: Predators, Human foot traffic, Vehicle tracks, Water Supply, Land Use, Other

Predators: Black-crownd Night Heron, Great Blue Heron, Cattle Egret, Raven, Crow, Great-tailed Grackle, Coyote, Raccoon, Wild pig

2018 TRICOLORED BLACKBIRD SURVEY COLONY SITE REVISIT DATASHEET

Colony Site _____	Occupied: Yes No
Date: _____	Avg. wind: _____
Start time: _____	Air temp.: _____
End time: _____	Sky: _____
Observer(s): _____	Noise: _____

Number of adults: _____	exact/estimate	Min estimate: _____	Max estimate: _____
Estimated adult sex ratio (males:females): _____		Detection: Visual Audial	
Vocalizing: Singing Calling Quiet		Females carrying nest material: Y N	
Adults carrying food: Y N			
Estimated number of fledglings: _____		Estimated number of juveniles: _____	

Disturbance

Type _____	If predator: Species _____	number: _____
Type _____	If predator: Species _____	number: _____
Type _____	If predator: Species _____	number: _____
Type _____	If predator: Species _____	number: _____

Description: _____

Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____
Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____
Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____

Videos: Photographer _____

Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____
Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____
Circle One (Nest Substrate, Foraging Habitat, Species)	Number(s) _____

Comments

Sky Codes: 0 = clear or few clouds; 1 = partly cloudy; 2 = mostly cloudy; 3 = fog or smoke; 4 = light drizzle; 5 = constant snow; 6 = constant rain.

Noise Codes: 0 = no noise; 1 = noise, but not affecting bird detection; 2 = moderate noise, may be affecting detection; 3 = loud noise, reducing ability to detect birds; 4 = very loud noise, difficult to hear anything at all.

Types of Disturbance: Predators, Human foot traffic, Vehicle tracks, Water Supply, Land Use, Other

Predators: Black-crowned Night Heron, Great Blue Heron, Cattle Egret, Raven, Crow, Great-tailed Grackle, Coyote, Raccoon, Wild pig