

San Diego County 2023 Tricolored Blackbird Surveys: Breeding Surveys, Habitat, and Threat Assessment Information

Project Background

The tricolored blackbird (*Agelaius tricolor*, TRBL) is endemic to California and northern Baja California. Historically, the species nested in very large colonies in freshwater marshes and foraged in nearby grasslands, pastures, agricultural fields, and open scrub. California's TRBL population declined dramatically from millions of birds in the 1930s to less than 200,000 in 2017 (Meese 2017). In 2018 the state of California listed TRBL as a threatened species. Once considered abundant at large breeding colonies in San Diego County (Unitt 2004), only 665 birds were counted during the 2017 statewide survey (Meese 2017). Approximately 1,050 birds were documented in 2021 surveys in San Diego County, and hence the species continues to show a population decline.

San Diego Management and Monitoring Program (SDMMP) was established by SANDAG in 2008 to coordinate regional monitoring and management of rare, threatened, and endangered species and their habitats on conserved lands in western San Diego County. SDMMP identified TRBL breeding surveys as an important step to developing a management strategy to facilitate the species' recovery in western San Diego County. The purpose of these surveys is to document TRBL status at historic and recently occupied breeding colonies on conserved lands, map suitable habitat, and evaluate current habitat conditions and threats.

Data collected during the 2023 surveys will be used to identify and prioritize regional management recommendations. It is anticipated that land managers will use these recommendations to develop projects to improve TRBL breeding habitat. There is potential for land managers to obtain funding for high priority TRBL management actions through SANDAG's TransNet Land Management Grant Program.

2023 TRBL Survey Instructions

This survey protocol outlines the methods for conducting TRBL surveys across San Diego County in April through June 2023. Biologists will collect data using two different software packages-Fulcrum and ArcGIS Field Maps. All point data will be collected in Fulcrum and all polygon data will be collected in Field Maps. Please remain on trails and roads when on conserved lands. When biologists arrive at their survey area here are the steps to complete:

1. Open a new TRBL Fulcrum form and record the initial information. Once you select YES for Tailgate Safety Meeting Complete, additional fields will appear. Complete the **Weather Information Section** and start filling out the **Survey Effort Section**.
2. Review the aerial map and determine a suitable survey route for assessing the habitat within the survey area.
3. Walk around the survey area and locate the first patch (aka sub-polygon) of potential TRBL breeding habitat.
4. Watch and listen for 15 minutes at the first patch of potentially suitable breeding habitat.
 - a. Depending upon the survey area, there may only be one patch, or there may be multiple patches or a long linear patch. We want biologists to **spend at least 15 min per suitable habitat patch** (regardless of occupancy). For large survey areas, spend 15 min for every 1,000 feet/300 meters if in good continuous habitat, or 15 minutes per 1/2 acre patch. Ensure all survey areas have 100 percent visual coverage of areas with potentially suitable habitat. For large areas with vast amount of habitat, or if a colony is present, expect to spend at least 1-2 hours observing the TRBL.

- b. Within the Survey Effort Section, please record the Dominant Surrounding Land Use(s) as descriptive text.
 - c. Record the Nesting Substrate Suitability for each survey area. This is a “broad” view of the nesting substrate. Choose 1 for locations with vegetation suitable for nesting, 2 for locations where nesting substrate is present but it appears to be unsuitable for nesting (e.g., it is immature, too short, lacks sufficient foliage, too sparse, or has recently been burned); choose 3 for locations where nesting substrate is currently absent but could potentially return (e.g., a dry basin that could have cattails with sufficient water), or choose 4 if the site is permanently unsuitable (e.g., has been converted to urban development, orchard, or vineyard). Briefly describe why you came to your conclusion on nesting substrate suitability in Comments.
5. There are 2 types of sub-polygon data that will be recorded in BOTH Fulcrum and Field Maps: **Occupied/Unoccupied Breeding Habitat sub-polygons**, and **Occupied Foraging Area sub-polygons**. For sub-polygons, please make sure the location of the data you collect is near the center of the polygon. Move the “Locate” icon to the center of the sub-polygon when recording data. Use a bad-elf or other higher accuracy GPS to record/delineate the sub-polygons in Field Maps.
 - a. Generally, create as few sub-polygons as possible, and avoid overly segmenting the survey area. If there are one or two ponds per survey area, you might only have one or two sub-polygons. If there are large stretches of unsuitable habitat between patches of suitable habitat, then several sub-polygons may be necessary.
 - b. Avoid mapping patches of habitat that are smaller than 50-feet wide or thin narrow bands of fringe freshwater marsh around a lake/pond that are too narrow for nesting. Map the bulk of the area where birds are likely to nest.
6. For breeding habitat patches that are **UNOCCUPIED**, select **NO** for the question: Is Breeding Survey Area Polygon Occupied by TRBL?
 - a. Then complete the **Sub-Polygon Form** for each sub-polygon that is unoccupied. Ensure the sub-polygon dropdown menu survey area name and number used in Fulcrum corresponds to the same one in Field Maps (i.e., San Elijo Lagoon 01 is the first sub-polygon of suitable breeding habitat).
 - b. Delineate each sub-polygon (aka habitat patch) in Field Maps using the same naming scheme as Fulcrum. Please be specific in your drawing and delineate the specific suitable breeding habitat vegetation community (e.g., marsh vegetation/cattails/tules, blackberry tangles, etc.) that is considered unoccupied. Exclude large areas of open water, to the greatest extent feasible, when mapping the suitable habitat.
 - i. If you get to an area and there is currently no suitable breeding habitat (dry pond with dried cattails), please map the pond, label it as unoccupied, and then fill out the list of threats and management recommendations, which will help land managers determine how to make the pond more suitable for TRBL in the future.
 - ii. If you get to an area that has no potential to support any habitat for breeding (open grassland, southern willow riparian forest, saltwater marsh, coastal sage scrub, chaparral, heavily disturbed, etc., there is no need to map any polygons.
 - c. Fill out **ALL data in the form** for EACH sub-polygon. The questions include all the Habitat and Threat Assessment Form detailed in the protocol below. For multiple sub-polygons in an area where the Habitat and Threat Assessment is the same, be consistent and thorough between the sub-polygons.

- d. Take several photographs for each sub-polygon (from different angles/viewsheds) and label/describe them. **ONLY TAKE PHOTOS IN FULCUM**. Please add a description to each photo including the direction taken and if the photo is of breeding habitat and/or foraging habitat.
7. For habitat patches that are **OCCUPIED**, select **YES** for the question: Is Breeding Survey Area Polygon Occupied by TRBL.
 - a. Watch the birds for at least 15 minutes to obtain an accurate count and determine what phase in the nesting cycle they are in (e.g., courtship and display, nest building, incubation, feeding young, etc.).
 - b. Complete the form detailed above for every sub-polygon that is occupied.
 - c. Record ALL data in the **Colony Observation Form**. Be as detailed as possible and take your time to understand what the birds are doing. Add comments/notes where necessary.
 - d. Please spend the time necessary to count the birds and obtain a min/max estimate. This can be done by counting all bird leaving/arriving at the colony over a certain amount of time.
 - e. Complete the threats and management recommendations.
 - f. Please take several photographs for each sub-polygon and label/describe them (only in Fulcrum). Take both zoomed out/landscape photos, and more zoomed in habitat based/nesting substrate type photos.
 - g. If TRBL are detected foraging around occupied habitat, an occupied foraging sub-polygon should be delineated as detailed in the number 8, below.
8. For **FORAGING AREA** sub-polygons, only delineate the area(s) where TRBL were detected foraging during the survey. It may be helpful to watch where birds are foraging for 30 mins or more to understand the extent of the foraging area(s). It may be necessary to reposition away from the occupied colony to see where birds are flying too. Complete Fulcrum questions and delineate the occupied foraging sub-polygon(s) in Field Maps. Delineation of foraging sub-polygons can be more broad/general and is meant to characterize the type of foraging habitat that TRBL are using.
 - a. We also want to know what food items the adults are bringing back to their young. To do this, observe/photograph adults while they pick prey items from the ground, carry them back to the nest, and are perched on vegetation before feeding young, etc. It's often convenient to stand off to the side of the colony and photograph birds right as they land on the vegetation with prey in the beaks before they drop down into the vegetation to feed young. Photograph as many adults as possible to get a representative sample of prey items being provisioned too young.
9. If you observe any nonbreeding TRBL not associated with breeding habitat, please record/document them using the **Non-Breeding TRBL and Wildlife Observations** section of the form.
10. For incidental species record if you see red-winged blackbirds using the habitat and any potential predators (both mammalian, avian, and others) that are near the TRBL habitat in the Non-Breeding TRBL & Wildlife Observations form. We don't want an exhaustive list of all species detected but want to know what species might be using the habitat that could affect the success of the nesting colony (e.g., record if you see a Cooper's hawk nest nearby, etc.).

Notes on Completing the Habitat and Threat Assessment Form

When completing the habitat and threats assessment, please complete all fields on the form. In the next section, there are descriptions of high-quality habitat, threats, and management techniques. Please review this to help you evaluate habitat and threats.

Please provide descriptions of habitat conditions and the level and details of each threat. For example, if the nesting substrate is cattails, it is important to mention whether they are young and lush or if there are a lot of dead stems. It should also be noted if the substrate is less than 50 feet wide or is short (less than 4 feet) or sparse. It is helpful to provide an approximate depth of water under the breeding substrate and whether water is likely to remain during the TRBL nesting cycle. It is also important to mention if you see the birds flying to an area to forage or know of foraging habitat less than 3 miles away.

This **descriptive information is critical** for developing management recommendations after the surveys are completed. If you have ideas for management, please provide them. The insight from biologists is very important for considering how best to manage threats or improve habitat conditions.

Notes on Foraging Areas

For 2023, it is important to understand where TRBL are foraging, what types of food items they are provisioning young, how far they are flying to acquire food, etc. Since young TRBL cannot digest plant-based materials, high quality invertebrates are important for rapidly developing young birds. A few high quality photographs of invertebrate prey items will be sent to an entomologist for identification. As such, if you are able to bring a camera with you to the field to document what the birds are eating (and/or carrying in their beaks) that would be great. If not, please try to get looks through binoculars or a spotting scope of what the birds are eating and provisioning their young.

For foraging area Management Recommendations consider possible techniques that may facilitate both increased prey item production and allow for TRBL to access prey items. Dense, thick, nonnative grassland is difficult for TRBL to walk through while searching for prey items and hence management to open up the vegetation may be necessary. Conversely, overgrazing may limit prey item production. Consider some of the following options:

- a. Mow/graze vegetation if it appears too tall and thick for TRBL to walk through
- b. Conduct a controlled burn of the vegetation to decrease thatch cover and increase new vegetation growth
- c. Implement cattle/grazer rotation to prevent overgrazing
- d. Prevent use of pesticides/ insecticides to kill prey items
- e. Others

Descriptions of TRBL Breeding Habitat, Threats, and Potential Management Techniques

The following descriptions of TRBL habitat and management are from Meese and Beedy (2015) unless otherwise noted. Please refer to their publication for more detail. This information is useful in evaluating habitat condition and risk from various types of threats. There is also information on management techniques that might help in completing management recommendations for various threats.

Habitat and Threats

Nesting Habitat Characteristics

- Historically, nesting habitat was primarily freshwater marsh with large contiguous blocks of young, lush cattails and bulrushes in their first or second year of growth.
- Optimal marsh habitat includes emergent vegetation at least 4 feet high and submerged in shallow water 6-18 inches deep. Cattail stands must be at least 50 feet wide to support successful TRBL nesting.

- Cattails are preferred nesting substrate due to their dense growth with multiple closely spaced stems.
- TRBL will abandon breeding attempts if water is drawn off wetlands before the young fledge.
- Nesting colonies can also be situated in drier habitats in dense spiny or prickly vegetation. The most common drier habitat substrates include Himalayan blackberry, stinging nettle, milk thistle and Triticale (*Triticum x Secale*) (Meese 2017).

Threats to TRBL and Nesting Habitat

- As cattails and bulrush get older, there are a lot of old, senescent stems and these should be removed. Older stems are less dense and likely to fall over providing greater access to predators.
- Catastrophic fires that cover a large portion of the watershed can result in post-fire soil movement and cause siltation of ponds supporting breeding colonies.
- Predators include raccoons, northern harriers, Cooper's hawks, red-tailed hawks, black-crowned night herons, cattle egrets, white-faced ibis, and common ravens, among others. Raccoons are the most serious of the mammalian predators. TRBL breeding colonies are vulnerable to large-scale nest loss where there are colonies of ibis/egrets etc. or congregations of predators.
- Disease: *Knemidokoptes* mite infestation has been documented in TRBLs in San Diego County and the Central Valley (Clark et al. 2019). This mite causes scaly-leg and can result in the loss of toes or feet. It may also be associated with decreased survival. Indications are that the prevalence of birds affected by these mites is increasing in southern California. Mite infestations that have caused toe or foot loss may be detected at times using a spotting scope or with a camera.

Management Techniques

Note: some of the habitat management methods need to be researched to see if permitted or suitable for conserved wetlands in southern CA.

Vegetation Management:

- Freshwater marshes require management to maintain young growth that support breeding TRBL and are beneficial for other sensitive species.
- Types of management to maintain young, dense, rapidly growing stems include effective water management plus removal of dead stems by burning, cutting, grazing, discing, or masticating.
 - Burning- preferred method to maintain wetland vegetation as it mimics natural conditions and rapidly and completely removes old growth. (This is probably more feasible for Central Valley than San Diego County). Burning is best done in late autumn over water or well saturated soil. (see Meese and Beedy 2015 for more detail).
 - Cutting cattails – more labor intensive way to remove dead stems. Can use tractor mounted mowers that typically flail the vegetation and produce a mulch of small stem fragments that can be left in place. Handheld hedge trimmers can be used but it's important to remove and mechanically harvest the cut stems.

- Grazing – livestock grazing is an effective means of removing dead cattail stems if the water level can be controlled and cattle allowed into the wetland for 1-4 weeks. Cattle typically graze stems down to soil level and is best scheduled for late autumn and then the cattle need to be removed.
- Discing – method to delay the re-growth of new cattails, prevent their expansion or when it is difficult to get a burn permit. Not recommended if rapid regrowth of wetland is required. Recommended for late autumn as it requires dry soil and cattails need 3+ months to regrow.
- Mastication – a specialized vegetation masticator is used to shred vegetation into small pieces. It can be used where cattail and bulrush growth is thick and difficult to manage with other control methods. Care must be taken not to dig too deeply into the soil and damage rhizomes. This method may require specialized expertise to ensure it is properly done.
- Removal of invasive plants and restoration with cattails can improve breeding habitat. Removal of dense, overhanging vegetation that is encroaching into a marsh is also important.

Water Management:

- Maintain a water regime of perennial flooding to maintain optimal vegetation conditions that can last for several months throughout spring and summer. Seasonal flooding requires active management so young cattails are at least 4 feet tall by April 1 in southern California and remain flooded throughout the TRBL breeding cycle.
- Standing water 6-18 inches deep is required during the breeding season to minimize mammalian predation and maintain a cooler microclimate around nests.

Predation Management

- A perimeter “moat” of deeper water (up to 3 feet deep and 30 feet wide) is desirable to discouraging mammalian predators, such as raccoons, from accessing breeding habitat.
- Trapping and removal of predators that are detected depredate nests.

Other Threats Management

- Miticides are used to effectively treat *Knemidokoptes* infestations in birds (Clark et al. 2019). One potential method to control outbreaks of mites at TRBL colonies may be to place baited trays of miticide soaked pads on the ground for birds to walk through. This method should be tested first to determine efficacy in controlling mites and to ensure there are no negative effects to the birds.
- Remove soil from ponds that have been silted in so that they can fill with water and restore cattail vegetation.
- Use signs, fencing, temporary trail closures, and ranger patrols to reduce human disturbance near breeding colonies.

References:

Clark, K. B., B. Rideout, K. L. Garrett, P. Unitt, and B. OConnor. 2019. Historical and geographic patterns in Knemidokoptes mite infestations in southern California birds. *Western Birds* 50:26-36.

Meese, R. J. and E. C. Beedy. 2015. Managing nesting and foraging habitats to benefit breeding tricolored blackbirds. *CVBC Bulletin* 17:79-96.

Meese, R. J. 2017. Results of the 2017 tricolored blackbird statewide survey. UC Davis.