2021 Tricolored Blackbird (*Agelaius tricolor*) Surveys Across Western San Diego County

Conducted by: AECOM

Presented by: Andrew Fisher (AECOM)

San Diego Association of Governments

San Diego Management and Monitoring Program

Photos by Andrew Fisher

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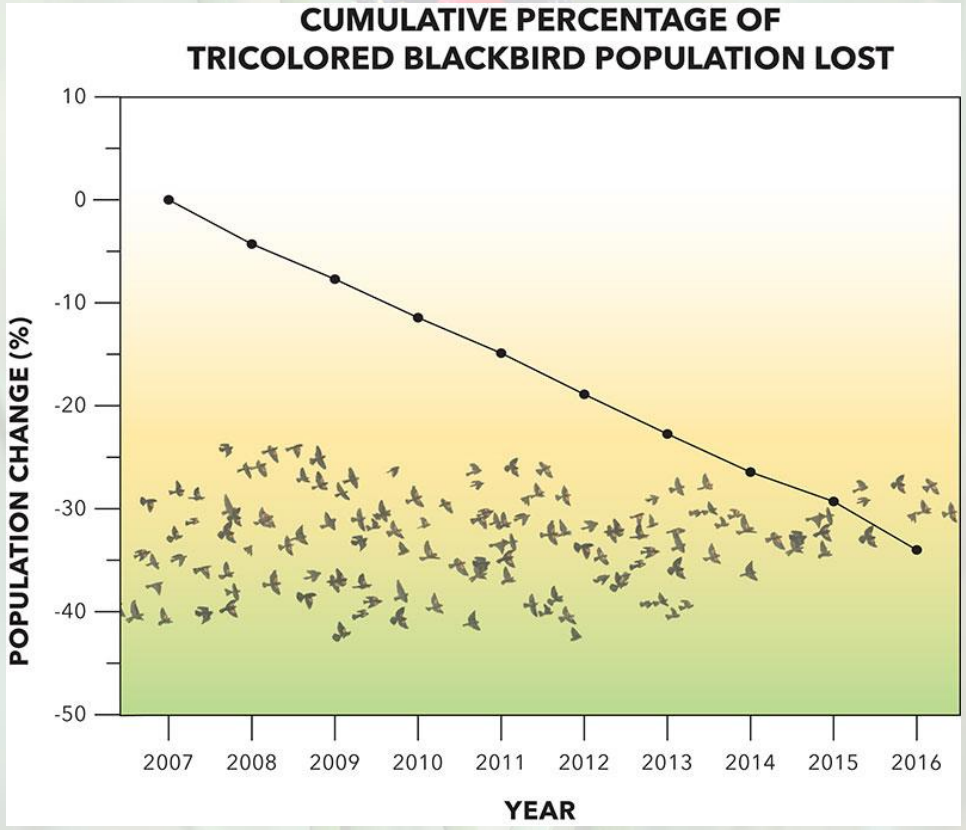
Background: Rationale for Surveys

- Historically, tricolored blackbirds (TRBL) were numerous with large colonies that numbered in the hundreds of thousands.
- California's TRBL population declined dramatically from millions of birds in the 1930s to less than 200,000 in 2017[1].
- Formerly abundant at large breeding colonies in San Diego County[2], only 665 birds were counted during 2017 statewide surveys[1].
- Loss of wetlands and grasslands, pesticide use, and harvesting of triticale in the breeding season led to massive, ongoing declines.
- Population estimated to have declined 34% between 2007 and 2016[3].
- TRBL was listed as Threatened under CA Endangered Species Act in 2019, but the USFWS found ESA listing wasn't warranted.
- SDMMP aims to develop a management strategy to facilitate TRBL recovery in western San Diego County; focused surveys are the 1st step.
- The purpose of 2021 surveys was 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 will be used to identify and prioritize regional management recommendations.



1. Meese, R. J. 2017. Results of the 2017 tricolored blackbird statewide survey. UC Davis.
2. Unitt, et al. 2004. *San Diego County bird atlas*. San Diego: San Diego Natural History Museum.
3. Robinson et al. 2018. *Biological Conservation*, 227, pp. 361-368
Graph: Cornell Lab of Ornithology, Bartels Science Illustrator Jessica French

Background: Biology and Natural History of TRBLs

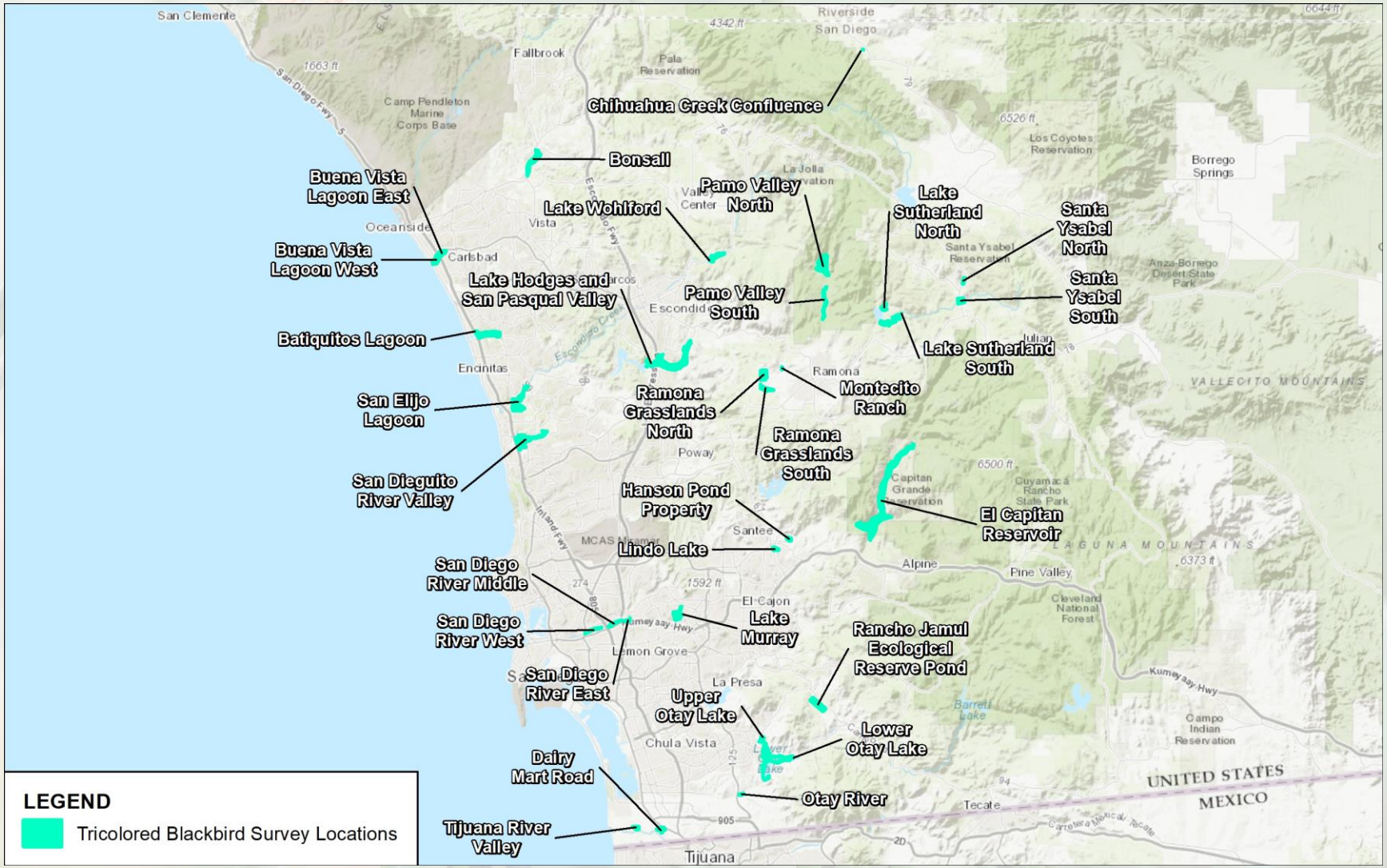
- TRBL found from northern Mexico to southeast Washington, but approximately 99% of the population occurs in California.
- TRBL are colonial breeders (similar to colonial seabirds) that formerly nested in colonies of more than 200,000 nests.
- San Diego County population was estimated at 5,000-8,000 birds located in 20-30 colonies during the San Diego Bird Atlas[1].
- Prefer nesting in emergent vegetation (cattail and bullrush) in wetlands/ponds but will use Himalayan blackberry.
- Require reliable source of large-bodied insects near colony to feed nestlings/fledglings (young cannot digest plant-based materials).
- Nesting typically begins in April/May and can continue into July. Nesting within a colony is often synchronized.
- During the nonbreeding season, TRBL forage in dairies, lawns, public parks, and artificial habitats.
- In San Diego County, during the nonbreeding season, TRBL do not appear to shift a great distance away from their breeding areas[1].

1. Unitt, et al. 2004. *San Diego County bird atlas*. San Diego: San Diego Natural History Museum.

Tricolored blackbird flock in Central Valley, 2007. Photo credit: Bob Meese

Survey Sites

- Site selection occurred based on a review of the San Diego County Bird Atlas, Statewide Survey Locations, iNaturalist, and eBird records.
- Only conserved lands were surveyed.
- Historical colony locations were evaluated and surveyed if there was a reasonable potential for TRBL to exist (known detection in last 5-10 years).
- Warner Valley/Lake Henshaw, Mesa Grande, and Jacumba were not surveyed.
- GIS polygons that encompassed the extent of potentially suitable nesting habitat were generated for each survey site.
- Access permits obtained from land-owners/managers.



Field Protocol-TRBL Surveys

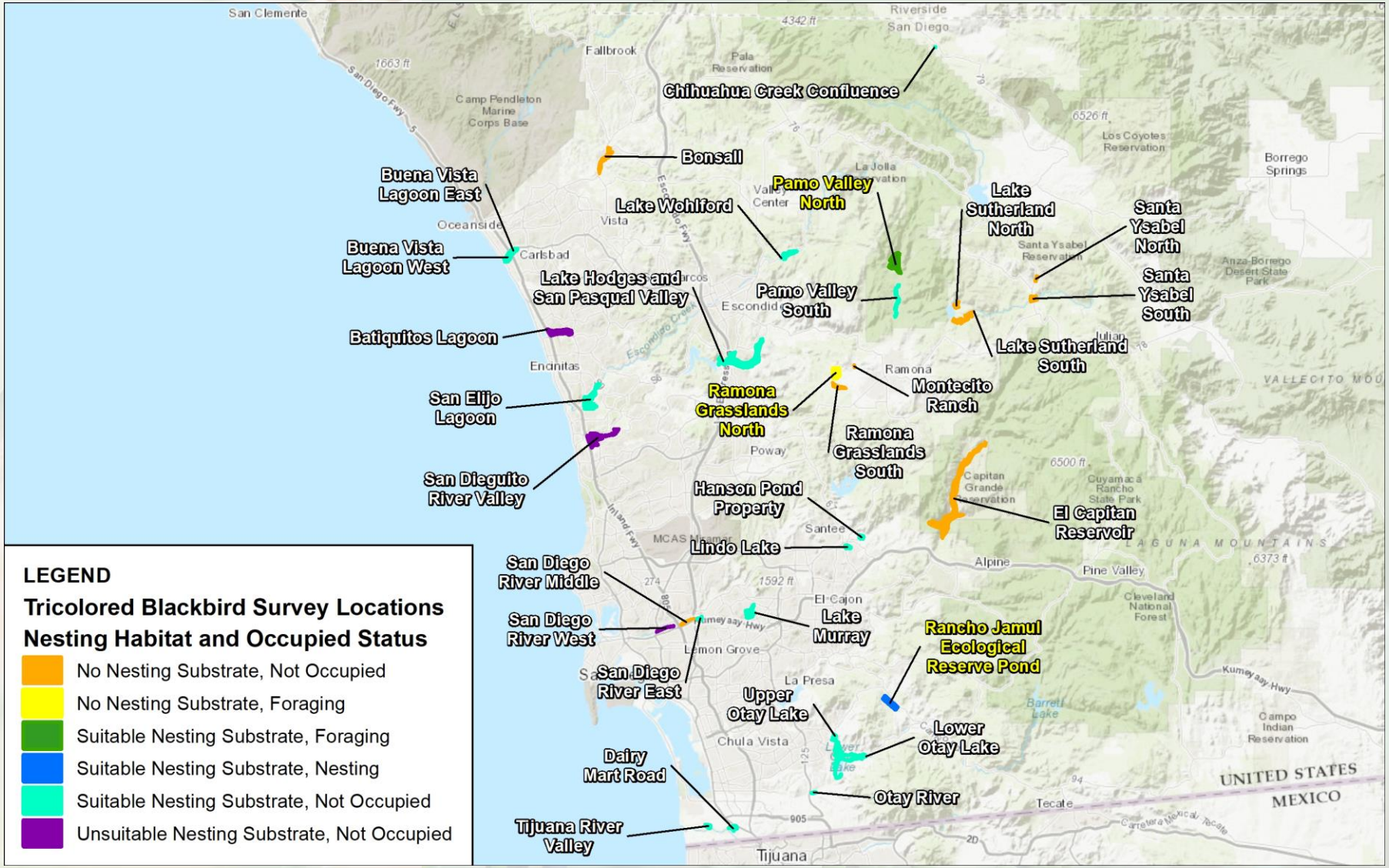
- Surveyors used a customized electronic data form in Fulcrum to record survey effort which included a multi-layered series of subforms depending on data being collected.
- Potentially suitable nesting habitat was observed for at least 15 min. per patch of habitat (consistent with the 2021 Statewide Survey Protocol).
- Metrics were recorded about the suitability of the nesting habitat.
- If suitable nesting habitat was detected, habitat was mapped on an aerial using ArcGIS Collector.
- If the nesting habitat was unoccupied, a series of questions were populated about the nesting habitat characteristics, threats to TRBL and nesting habitat, vegetation management, water management, predation management, and other threats management.
- If nesting habitat was occupied, a series of questions related to TRBL occupancy were completed in addition to the nesting habitat characteristic questions.
- If the survey site had no suitable nesting habitat, site characteristics were detailed, and no habitat was mapped.
- Forms were designed with simple Yes/No questions and drop-down lists to minimize errors and standardize data collection.
- Multiple site photographs were taken for all survey sites.

Field Protocol-Habitat Assessment and Threats

- Suitable nesting habitat characteristics
  - Freshwater marsh vegetation (cattails and bulrushes) that is over 4-feet in height, submerged in shallow water 6-18 inches deep and at least 50-feet wide
  - Vegetation should be dense, green/actively growing
  - Drier habitats (near Mesa Grande) often contain Himalayan blackberry
- Unsuitable nesting habitat characteristics
  - Dense senescent freshwater marsh vegetation that lacks suitable surrounding shallow water
  - Brackish/estuarine waters
- Threats to TRBL and nesting habitat
  - Drought, fire, siltation
  - Avian and mammalian predators
  - Disease: *Knemidokoptes* mites

Survey Results

- Surveys conducted April 10 through June 22, 2021
- Surveyed 31 Sites
  - 18 had suitable nesting substrate
  - 3 had unsuitable nesting substrate
  - 10 had no suitable nesting substrate
- 3 survey sites occupied by TRBL
  - 2 (Ramona Grasslands North and Pamo Valley North) had birds foraging
  - 1 (Rancho Jamul Ecological Reserve) had a breeding colony



Survey Results

- Up to 12 TRBL were detected at a historical colony in northern Pamo Valley. Nesting could not be confirmed. The site has restoration potential and is located adjacent to areas of suitable foraging habitat.
- Around 450 TRBL were detected foraging within conserved lands on the east side of Rangeland Road. The breeding colony was located at a Ramona Municipal Water District Pond on the west side of the road.
- Colony at Rancho Jamul Ecological Reserve had estimated 400 birds. Birds successfully fledged young, and by June, birds were beginning to disperse away from the breeding colony.
  - Birds seen foraging in nearby grasslands and bringing invertebrates (lots of earwigs) back to nests
  - Nesting colony located in small pond with thick freshwater marsh vegetation consisting primarily of bulrushes, surrounded by a moat of water to prevent predation.
  - Lots of suitable foraging habitat nearby.
- April 2021 Statewide Survey Results observed 2459 birds in 5 counties in Southern California. In San Diego County, 1,050 birds were detected at 5 locations[1]. [1] Meese, B. 2022. Results of 2021 Southern California Survey; and Anita Hayworth pers. comm.

Management Recommendations

- Vegetation Management
  - maintain young, dense, rapidly growing freshwater marsh vegetation.
  - remove dead stems by burning, cutting, grazing, discing, or masticating.
  - conduct vegetation management actions in fall/winter to permit vegetation to grow back at least 4-feet tall prior to the start of the nesting season.
  - maintain suitable adjacent foraging habitat.
- Water Management
  - maintain a water regime of perennial flooding for optimal vegetation conditions. Seasonal flooding requires active management so that cattails are at least 4 feet tall by April 1 and remain flooded throughout the tricolored blackbird breeding cycle.
  - standing water 6-12 inches deep is required during the breeding season to minimize mammalian predation and maintain a cooler microclimate around nests.
- Predation Management
  - determine if predation is a risk to TRBL colonies, conduct surveys and removal actions, if warranted.
- Other Threats Management
  - prevent siltation of ponds to maintain water to prevent predation and restore cattail vegetation.
  - use signs, fencing, temporary trail closures, and ranger patrols to reduce human disturbance near breeding colonies (if determined to be a risk).

Management Recommendations

Survey Site with Suitable but Unoccupied Habitat	Assessment for Lack of Occupancy	Realistic Management Recommendations
Buena Vista Lagoon East and West, Batiquitos Lagoon, Lake Wohlford, Lindo Lake, Lake Murray, San Diego River East, Tijuana River Valley, Dairy Mart Road, Otay River, San Elijo Lagoon, Upper and Lower Otay Lake	Lack of adjacent foraging habitat. TRBL do not appear to favor coastal marsh habitats or large, deep lakes.	Not ideal locations to target for TRBL habitat-based restoration
Lake Hodges and San Pasqual Valley	Inadequate portions of freshwater marsh vegetation surrounded by sufficient water levels, lack of foraging areas	Create shallow ponds where freshwater marsh vegetation is managed adjacent to foraging habitat
Pamo Valley South	Lack of dense freshwater marsh vegetation	Create ponded areas that support freshwater marsh vegetation and exclude cattle
Chihuahua Creek Confluence	Pond is filled with desiccated stems, water seems low-quality, adjacent overhanging vegetation hides the pond	Remove old senescent stems, maintain water levels, expand existing pond, open up surrounding tree canopy
Hanson Pond Property	Possibly lack of adjacent foraging habitat, hydrology issues	Identify nearby properties for purchase or management as foraging areas

Conclusions

- There are few TRBL breeding colonies left in San Diego County, with only one colony on conserved lands (Rancho Jamul).
- Most recent loss of the Jacumba nesting colony on private lands.
- In 2021, surveys in Baja California found only a single colony of about 150 breeding birds. According to the authors: “Chronic drought, rising temperatures, and habitat losses due primarily to intensification of agriculture in Mexico are largely responsible for the decline, as in the core of the species’ range in California. Because of the reduction of breeding and foraging habitat, we fear the imminent extirpation of the species in Mexico.”[1]
- While this study focused on nesting habitat, surveys found that a lack of nearby suitable foraging habitat likely precluded site occupancy, even when nesting substrate was high quality.
- Focus efforts on restoration of nesting habitat at Pamo Valley North by expanding ponds and ensuring they exclude cattle.
- Conservation efforts should focus on maintaining both high quality nesting substrate, and adjacent suitable foraging habitat.

1. Erickson et al. 2021. Requiem for the Tricolored Blackbird in Mexico?

Future Plans

- Surveys in 2022 at locations with 2021 TRBL occupancy, plus additional conserved lands not surveyed in 2021 (including the Henshaw Valley).
- Two rounds of surveys for sites with breeding activity to gain additional information on productivity/fledgling.
- Habitat assessment for foraging areas near breeding colonies. To understand if vegetation management techniques could improve habitat year-round for TRBLs.
- Diet assessment via photograph and ID of food items being carried to nests to understand food items being provisioned to young.

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Thank You

Questions?