

**Western Riverside County Multiple Species Habitat Conservation Plan
Biological Monitoring Program
2022 Turkey Vulture Nest Searching and Monitoring**

INTRODUCTION

The Turkey Vulture (*Cathartes aura*, vultures) is one of 45 bird species covered by the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP; Dudek & Associates 2003). The species is widespread throughout the United States (Kirk and Mossman 2020) and is common throughout the state of California during the breeding season (Grinnell and Miller 1944). In southern California, including within the Plan Area, Turkey Vultures occur within relatively small numbers during the summer months, and nesting is usually restricted to secluded, hilly terrain (Garrett et al. 2012).

Turkey Vultures nesting west of 100 degrees longitude, which includes the entire state of California, tend to nest in sites characterized as rocky cliffs or slopes. Further, most nest sites west of 100 degrees longitude are within caves, with the remaining sites characterized as being cliff ledges; among rocks; on bare ground; in a hollow tree, log, or stump; beside a tree or log; in a thicket; or in a building (Jackson 1983). Reuse of nest sites for several years is common, with some sites being active for at least 19 years (Kirk and Mossman 2020).

Turkey Vultures nesting at the latitudes that include the Plan Area typically begin egg-laying during the first half of April. Clutches most often contain two eggs, although as many as four have been reported. Both parents incubate and the incubation period lasts 28–41 d, with longer periods likely being more accurate (Jackson 1983). Nest exchanges during this period generally occur in the morning, before 1000 h (Davis 1983). Eggs can hatch simultaneously, or up to 72 h apart (Jackson 1983), and the nestling period in California is generally 62–64 d (Work and Wool 1942). Both parents participate in brooding of the young, which occurs continuously for the first five days post-hatching, then gradually ceases by two weeks post-hatching. During the nestling phase, adults visit the nest site every 3.8–4.3 h, with the frequency decreasing as the nestlings age. Following fledging, young may remain in the vicinity of the nest site for up to 12 weeks, after which they may join nearby communal roosts or perches if they are available (Davis 1983).

The MSHCP identifies five species objectives for Turkey Vultures. Objective 1 requires the conservation of $\geq 457,160$ ac ($\geq 185,006$ ha) of foraging habitat including montane coniferous forest, oak woodlands and forests, coastal sage scrub, desert scrub, Riversidean alluvial fan sage scrub, grassland, and playas and vernal pools. Objective 2 requires the inclusion of five areas, hereafter considered Core Areas, that may function as important foraging locations for Turkey Vultures. These Core Areas include Lake Mathews-Estelle Mountain, Sedco Hills, Lake Skinner/Diamond Valley Lake, Wilson Valley/Sage, Badlands, Prado Basin/Santa Ana River, and a portion of the Santa Rosa Plateau (Figure 1). Objective 3 requires the conservation, and buffering from disturbance, of the two known nesting locations of Turkey Vultures in the Plan Areas, including within the Bernasconi Hills and Rawson Canyon (Figure 1). Objective 4 requires the continued use of, and successful reproduction

within, the two known nesting locations and any additional nesting locations identified subsequent to the implementation of the MSHCP, at least every three years. Finally, Objective 5 requires the inclusion within the Conservation Area of cliff areas that are capable of supporting nesting Turkey Vultures (Dudek & Associates 2003).

Biological Monitoring Program (BMP) biologists have detected Turkey Vultures 164 times on Conserved Land within the prior three-year reporting period (2019–2021). These data include detections within six of the seven aforementioned Core Areas, including Lake Mathews-Estelle Mountain, Lake Skinner/Diamond Valley Lake, Prado Basin/Santa Ana River, Santa Rosa Plateau, Sedco Hills, and Wilson Valley Sage. The last BMP detection on Conserved Land within the Badlands occurred in 2016. Finally, BMP biologists have documented two Turkey Vulture nests in the Plan Area. The first nest was found in 2008 in the Bernasconi Hills south of Lake Perris (Biological Monitoring Program 2009), and the second nest was found in 2020 west of Lake Mathews (Figure 1). Both nests ultimately fledged two young.

For this project, we will survey for nesting Turkey Vultures by monitoring the two nest site locations described in the MSHCP (Dudek & Associates 2003), as well as the Lake Mathews nest site we identified in 2020. If we identify active nests, we will monitor the sites until fledging or failure occurs. We will conduct surveys from April 2022 through August 2022.

Goals and Objectives

1. Determine whether Turkey Vultures are nesting in any of the locations identified in the MSHCP, or at the Lake Mathews site identified by BMP biologists in 2020.
 - a. Conduct nest searching and monitoring surveys at the Bernasconi Hills, Lake Mathews, and Rawson Canyon sites, and continue monitoring any active nests until fledging or failure occurs.

METHODS

Survey Design

We began study site selection by identifying Turkey Vulture nest sites previously found by BMP biologists (Bernasconi Hills and Lake Mathews) and likely nest sites based upon MSHCP descriptions (Rawson Canyon; Dudek & Associates 2003). Likely nest sites will contain rocky hills or slopes that can support caves in which Turkey Vultures can nest. We also identified areas from which we could observe these sites from a distance of ≥ 100 m. Where multiple observation points are required to adequately monitor an area, those points will be separated by ≥ 500 m.

We will conduct surveys for nesting Turkey Vultures by making at least three visits to observation points ($n = 11$ points) near the Bernasconi Hills, Lake Mathews, and Rawson Canyon sites (Figure 1). We will visit survey points prior to commencing surveys to confirm

their suitability for nesting Turkey Vultures, and to verify that they are accessible and within the aforementioned habitat types.

Field Methods

We will define individual survey efforts by a single observation point from which we will survey for nesting Turkey Vultures. We will survey each site at least three times during this project and our surveys will occur from April through August 2022. We will conduct surveys within the first five hours following sunrise, during which time Turkey Vultures are most likely to leave nest sites to forage (Kirk and Mossman 2020). We will not conduct surveys during periods of rain or heavy fog, either of which will reduce our ability to detect Turkey Vultures.

Surveys will begin when an observer reaches an observation point. Upon arrival, observers will record on the datasheet (Appendix A) the date, their initials, and the survey point number. Next, observers will record the starting weather, temperature, and wind speed. After these initial data are recorded, observers will record on their datasheet the survey start time. Observers will record information on their datasheet for all bird species detected while at the observation point. For non-Covered Species, observers will record the four-letter species code, age class information, and sex for only the first individual of that species detected, which provides species richness data for the site. For Covered Species, observers will record the four-letter species code, age class, and sex for every individual detected during the survey. If observers are unsure whether they have already recorded data on an individual (i.e., they are double-counting), they will err on the side of caution and record information on that individual. Observers will conduct surveys at one point per day, remaining at the point until approximately five hours after sunrise.

If observers see Turkey Vultures exhibiting nesting behavior (e.g., an adult entering a cave feature), they will complete a nesting datasheet (Appendix B) for the site. At no time will observers approach active nests to inspect contents; rather, suspected or confirmed active nest sites will be observed from a distance of ≥ 100 m to avoid disturbing vultures. We will re-visit suspected or confirmed nest sites weekly until fledging or failure occurs. If we are unable to establish that a nest site remains active following three consecutive visits, biologists may approach the nest site to determine whether it has failed. If vultures appear at any time during such visits, biologists shall immediately retreat to a distance of ≥ 100 m to monitor the site.

TRAINING

All field personnel will demonstrate proficiency at visual identification of Turkey Vultures prior to conducting surveys. Proficiency will be demonstrated by biologists having participated in, and successfully passing identification quizzes for, any avian surveys in 2021 or 2022. All such quizzes have required biologists to be able to identify more than 50 avian species, including Turkey Vultures.

DATA MANAGEMENT

While observers are in the field, they will collect data on paper datasheets that are designed to correspond with a data entry form within the MSHCP electronic database. This will assure inferential integrity of collected data. After observers have returned to the office, they will enter their field data into an electronic Microsoft Access database, after which the data sheet will be marked as having been entered. Datasheets that have been entered into the database will be double-checked by another biologist and subsequently certified by the data manager.

DATA ANALYSIS

We do not anticipate having enough nesting data to perform statistical analyses on nest survival. If, however, we have a sufficient amount of data, we will perform nest survival analyses using the nest survival model available in Program MARK (White and Burnham 1999).

TIMELINE

- Winter 2021–2022: GIS work, specifically identifying potential nest sites and assigning survey points.
- February and March 2022: Distribution of study materials, getting access to survey areas, and ground-truthing potential survey sites.
- April 2022–August 2022: Surveys will be conducted. Data will be entered concurrently with surveys.
- Fall 2022: Report writing.

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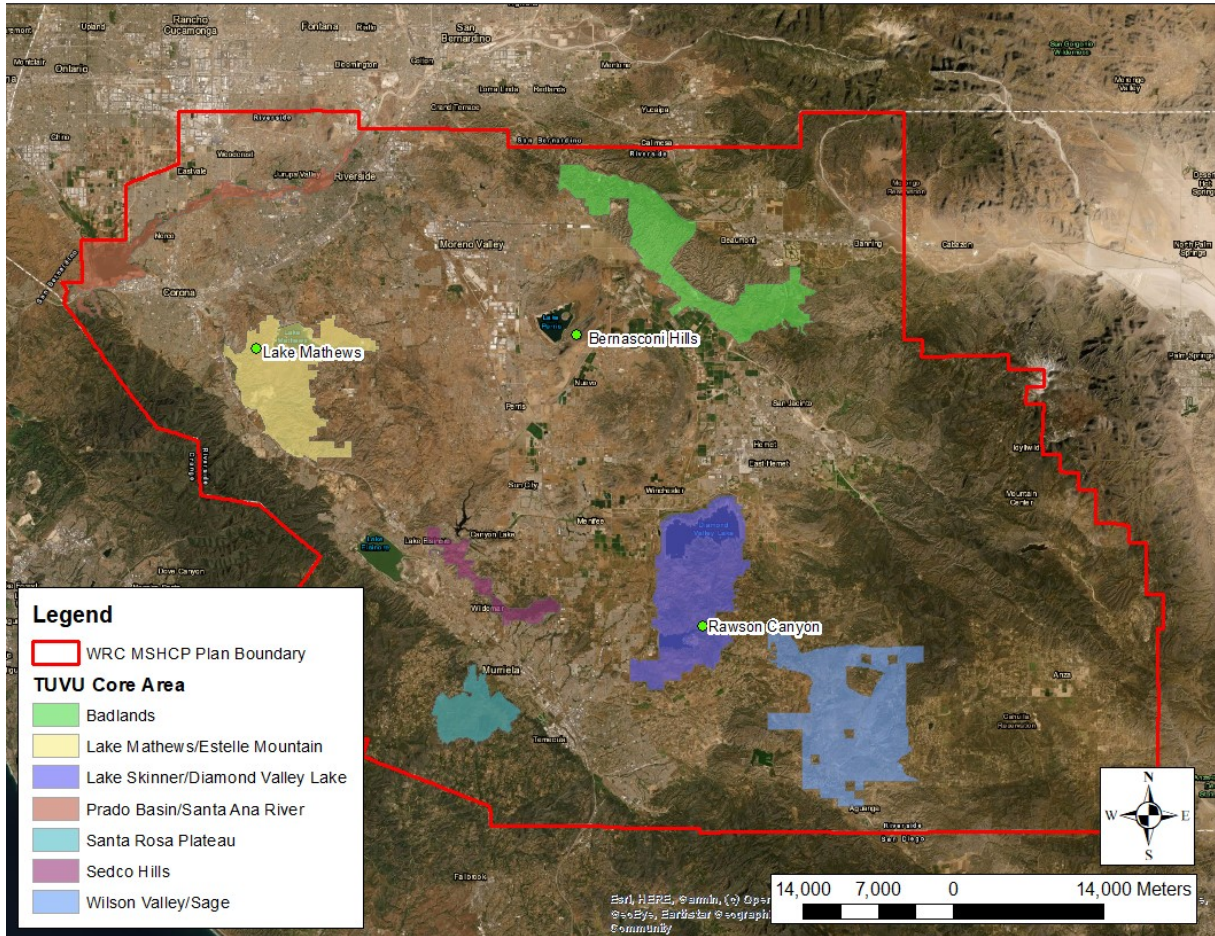


Figure 1. Locations of Turkey Vulture (TUVU) Core Areas identified by the MSHCP. Green dots with labels generally indicate locations of prior Turkey Vulture nest locations and will be where BMP biologists will be conducting nesting vulture surveys in 2022.

Appendix B. Nesting monitoring datasheet for 2022 Turkey Vulture surveys.

**MSHCP Biological Monitoring Program
2022 Nest Monitoring Data Sheet**

General Nest Information

Species: Turkey Vulture	ID:
Nesting substrate:	Substrate height (m):
Nest height (m):	XY coordinates:

Visit Information

Observer	Date (mm/dd/yyyy)	Nest status ²	Behavior ¹		Target Species			BHCO	
			Male	Female	# eggs	# nestlings	# fledglings	# eggs	# nestlings
								N/A	N/A
								N/A	N/A
								N/A	N/A
								N/A	N/A
								N/A	N/A

Notes:

¹ Visible, Singing, Calling, CaRry nest material, Carry/give Food, Incubating, Carry fEcal sac, Brooding, or NL (Not Located)

² Construction, LaYing, Incubating, Nestlings, Fledged, Depredated, Abandoned, FaiLed, Unknown, or NL (Not Located)