

memorandum

date October 11, 2023
to Rosanne Humphrey, City of Carlsbad
cc Karla Alcaraz, Environmental Science Associates
from Adrienne Lee, Environmental Science Associates
subject Roadkill Study Results – Rancho Santa Fe and El Camino Real

This memorandum summarizes the results of roadkill monitoring along Rancho Santa Fe Road and El Camino Real for one year from November 2021 to November 2022.

Introduction

The City of Carlsbad (city) identified the following three primary regional east-west wildlife movement corridors within the city during wildlife movement studies conducted in 2015: East/West 1 (EW1), East/West 2 (EW2), and East/West 3 (EW3).¹ EW3 is a crucial wildlife movement corridor, connecting Batiquitos Lagoon to Rancho La Costa Preserve via two routes, one along the San Marcos Creek and the other following the Encinitas Creek. The resulting report highlighted potential wildlife movement barriers (i.e., pinch points) at La Costa Avenue (EW3-7), El Camino Real and Rancho Santa Fe Road (EW3-13), as depicted in **Figure 1** (see **Attachment A, Figures**). Additionally, Levante Street (EW3-8) and Calle Barcelona (EW3-9) were identified as potential pinch points. All identified pinch points pose barriers to wildlife movement, and the risk of direct harm from vehicle collisions is a concern. Pinch points were grouped into two types based on shared characteristics:

- **Priority pinch points.** EW3-7 is a box culvert 17 meters high and 2 meters wide with apron fencing, surrounded by relatively dense shrub vegetation. EW3-13 is a box culvert 9.2 meters high and 1.6 meters wide, surrounded by scattered, open tree vegetation. The pinch points EW3-7 and EW3-13 were recognized as *priority* due to their role as bottlenecks that hinder wildlife passage. EW3-7 lacks fencing that could guide wildlife to the undercrossings in these areas creating pinch points, which can increase the potential for wildlife to cross “at grade,” at the street level. Rancho Santa Fe Road, Calle Barcelona, and El Camino Real are all highly traveled four-lane roads with speed limits of 45 to 50 miles per hour. Culverts like EW3-13 might face challenges with sedimentation, leading to a reduction in undercrossing height and hindering movement for certain species, particularly deer.
- **Potential pinch points.** EW3-8 is a bridge 5.2 meters high and 40 meters wide dominated by trees but remaining relatively open under the bridge, allowing for easy movement. EW3-9 is a bridge approximately 3.8 meters high and 30 meters wide dominated by dense tree vegetation on each end, but it should allow for easy movement. Species detected within EW3 included: coyote, mule deer, rabbit, raccoon, skunk, and opossum. EW3-8 and EW3-9 were labeled as *potential* because they provide relatively unimpeded wildlife

¹ ESA. 2015. *City of Carlsbad Wildlife Movement Analysis Final Report*. Prepared for City of Carlsbad.

movement but are still vulnerable due to dense vegetation potentially obstructing entrances, as well as the frequent presence of people.

The present study documented roadkill at the pinch points along Rancho Santa Fe Road to Calle Barcelona and El Camino Real. Since 2017, Environmental Science Associates (ESA) has been monitoring animal disposal logs from the city’s Public Works department to identify pinch points and monitoring locations. City records indicated three coyote fatalities at Calle Barcelona and Rancho Santa Fe Road, as well as along Rancho Santa Fe Road near Las Olas Court, which is close to pinch point EW3-13. Thus, the year-long study was initiated along this route to document roadkill.

Methodology

On November 15, 2021, ESA biologists, Preserve Calavera volunteers, and the city’s Habitat Management Program staff finalized the survey area (Figure 1). The survey area—from Gelson’s shopping area off La Costa Avenue, west to the El Camino Real intersection, south on El Camino Real until Calle Barcelona, east on Calle Barcelona until Rancho Santa Fe Road, and south on Rancho Santa Fe Road until Olivenhain Pioneer Elementary School—was monitored for one year from November 15, 2021, to November 15, 2022, with a minimum of two surveys completed per week.

Roadkill tends to remain visible for multiple days. The collected data is assumed to accurately represent wildlife fatalities within the survey area. For the full list of survey dates, see **Attachment B, Rancho Santa Fe Road and El Camino Real Roadkill Survey Dates and Results**. Monitoring results were supplemented by cross-referencing roadkill pickup logs maintained by the city’s Public Works Department throughout the monitoring period.

Monitoring was conducted by ESA biologists and Preserve Calavera volunteers. The survey area was monitored by driving the intersection slowly and scanning the entire roadway and adjacent sidewalk for roadkill. If something was not identifiable from the car, the surveyor wore a safety vest and walked the survey area, using binoculars to scan the road. If roadkill was detected, a photo was taken when road conditions were safe and uploaded it onto the citizen scientist mobile application iNaturalist² to create an “observation” within the University of California, Davis, California Roadkill Observation System (CROS) Project.³ Once the observation was recorded, the surveyor notified the city’s Public Works department to arrange for the pickup and disposal of the deceased animals.

Results

Rancho Santa Fe Road and El Camino Real

Twelve roadkill occurrences were recorded during the survey year. The recorded instances included various animal species, such as skunks, rabbits, coyotes, opossums, cats, and raccoons. Of these incidents, ten were small- to medium-sized mammals (rabbits, opossums, skunks, raccoons, and cats) and two were medium- to large-sized mammals (coyotes). All roadkill observations and their associated survey dates, surveyor information, and locations are listed in **Table 1**. Locations of all roadkill observations are displayed in **Figure 2** (see Attachment A).

² iNaturalist. Available from <https://www.inaturalist.org>.

³ iNaturalist. California Roadkill Observation System (CROS). Available from: <https://www.inaturalist.org/projects/california-state-roadkill>

TABLE 1
RANCHO SANTA FE AND EL CAMINO REAL ROADKILL DETECTIONS

Date	Surveyor/Source	Species	Location
4/22/22	City of Carlsbad ^a	Skunk	Southbound El Camino Real - Calle Barcelona and Leucadia
4/25/22	ESA ^b	Rabbit	Near the intersection of El Camino Real and La Costa Avenue
4/26/22	City of Carlsbad ^a	Rabbit	Calle Barcelona - Paseo Avellano and Paseo Arrayan
5/18/22	City of Carlsbad ^a	Skunk	Southbound El Camino Real and Calle Barcelona
7/14/22	City of Carlsbad ^a	Coyote	El Camino Real and Calle Barcelona
7/18/22	City of Carlsbad ^a	Cat	Paseo Aliso and Calle Barcelona
8/7/22	Preserve Calavera ^c	Opossum	South of El Camino Real, just beyond La Costa Avenue
8/9/22	City of Carlsbad ^a	Coyote	Calle Barcelona - Paseo Aliso and Paseo Avellano
9/6/22	City of Carlsbad ^a	Raccoon	Eastbound La Costa Avenue and El Camino Real
10/11/22	Preserve Calavera ^c	Opossum	Rancho Santa Fe, west of Calle Barcelona
10/11/22	City of Carlsbad ^a	Cat	Westbound La Costa Avenue and El Camino Real
11/7/22	City of Carlsbad ^a	Raccoon	Paseo Aliso and Calle Barcelona

Notes:

^a City Disposal Log

^b Environmental Science Associates biologist

^c Volunteer from Preserve Calavera

Discussion

ESA continues to monitor animal disposal logs from the city's Public Works department to determine potential pinch points within the city that may benefit from future roadkill monitoring. The present study resulted in the following re-grouping of pinch point types and recommendations.

- **Priority pinch point.** EW3-9 has potential barriers that limit wildlife movement underneath the EW3-9 bridge, causing wildlife to cross at grade at the El Camino Real and Calle Barcelona intersection. This is evidenced by the six roadkill detections at the intersection, ranging from small to medium wildlife species (opossum, raccoon, and skunk) to medium to large wildlife species (coyote).

It is recommended that management and monitoring occur at this location. Site conditions around EW3-9 should be inspected to determine and implement the appropriate management (e.g., vegetation trimming to open up habitat). Before-and-after photographs should be taken to document conditions before and after management. Wildlife cameras should be installed and monitored to document management effectiveness.

- **Potential pinch point.** Potential barriers to wildlife movement occur at EW3-7 as small mammal roadkill were detected at grade. No management or monitoring is recommended based on study results.
- **No pinch point.** No roadkill was detected at EW3-13 or EW3-8, suggesting that current infrastructure around these pinch points is functioning appropriately to support wildlife movement. No management or monitoring is recommended based on study results.

Attachments

A. Figures

B. Rancho Santa Fe and El Camino Real Roadkill Survey Dates and Results

Attachment A

Figures



SOURCE: ESRI, 2023; ESA, 2023.

Carlsbad Roadkill Study

Figure 1
Rancho Santa Fe Road and El Camino Real Roadkill Survey Area





SOURCE: ESRI, 2023; ESA, 2023.

Carlsbad Roadkill Study

Figure 2
Roadkill Monitoring Results

Attachment B

Rancho Santa Fe and El Camino Real Roadkill Survey Dates and Results

TABLE B-1
RANCHO SANTA FE AND EL CAMINO REAL ROADKILL SURVEY DATES AND RESULTS

Date	Time (Start-End)	Surveyor	Species	Photo/Uploaded to iNaturalist	Spray-Painted
11/15/2021	12:20-12:27 pm	K. Merrill	None	N/A	N/A
11/21/2021	8:48-9:00 am	K. Merrill	None	N/A	N/A
11/30/2021	8:52-9:15 am	P. DeCino	None	N/A	N/A
12/8/2021	10:54-11:06 am	K. Merrill	None	N/A	N/A
12/10/2021	8:40-8:55 am	P. DeCino	None	N/A	N/A
12/19/2021	11:05-11:20 am	K. Merrill	None	N/A	N/A
12/21/2021	11:16-11:40 am	S. Vargas	None	N/A	N/A
12/23/2021	10:25-10:35 am	K. Merrill	None	N/A	N/A
12/29/2021	12:58-1:08 pm	K. Merrill	None	N/A	N/A
1/6/2022	9:10-9:20 am	K. Merrill	None	N/A	N/A
1/17/2022	12:15-12:30 pm	K. Merrill	None	N/A	N/A
1/27/2022	9:30-9:42 am	K. Merrill	None	N/A	N/A
2/1/2022	9:35-9:45 am	K. Merrill	None	N/A	N/A
2/1/2022	11:04-11:25 am	P. DeCino	None	N/A	N/A
2/10/2022	7:17-7:34 am	P. DeCino	None	N/A	N/A
2/14/2022	1:35-1:50 pm	K. Merrill	None	N/A	N/A
2/24/2022	3:25-3:51 pm	P. DeCino	None	N/A	N/A
3/6/2022	10:20-10:35 am	K. Merrill	None	N/A	N/A
3/9/2022	11:03-11:22 am	S. Vargas	None	N/A	N/A
3/17/2022	8:33-8:52 am	P. DeCino	None	N/A	N/A
3/22/2022	9:50-10:05 am	K. Merrill	None	N/A	N/A
3/30/2022	1:02-1:25 pm	P. DeCino	None	N/A	N/A
3/31/2022	10:00-10:20 am	A. Lee	None	N/A	N/A
4/4/2022	9:00-9:12 am	K. Merrill	None	N/A	N/A
4/14/2022	10:00-10:12 am	K. Merrill	None	N/A	N/A
4/22/2022	10:30-10:45 am	P. DeCino	None	N/A	N/A
4/24/2022	2:45-2:55 pm	K. Merrill	None	N/A	N/A
4/25/2022	11:16-11:40 am	S. Vargas	Rabbit	Yes	No
5/4/2022	10:10-10:26 am	P. DeCino	None	N/A	N/A
5/13/2022	10:15-10:30 am	K. Merrill	None	N/A	N/A
5/23/2022	1:40-1:55 pm	K. Merrill	None	N/A	N/A

Date	Time (Start-End)	Surveyor	Species	Photo/Uploaded to iNaturalist	Spray-Painted
6/8/2022	9:20-9:32 am	K. Merrill	None	N/A	N/A
6/15/2022	11:11-11:22 am; 12:20-12:29 pm	S. Vargas/K. Alcaraz	None	N/A	N/A
6/27/2022	8:40-8:52 am	K. Merrill	None	N/A	N/A
7/13/2022	10:35-10:45 am	K. Merrill	None	N/A	N/A
7/24/2022	3:45-4:00 pm	K. Merrill	None	N/A	N/A
8/2/2022	9:30-9:50 am	K. Merrill	None	N/A	N/A
8/7/2022	10:40-10:52 am	K. Merrill	Opossum	No	No
8/16/2022	10:50-11:05 am	S. Vargas/M. Cozy	None	N/A	N/A
8/21/2022	9:15-9:30 am	K. Merrill	None	N/A	N/A
8/26/2022	10:00-10:13 am	K. Merrill	None	N/A	N/A
9/8/2022	10:46-11:05 am	K. Merrill	None	N/A	N/A
9/15/2022	9:16-9:31 am	K. Merrill	None	N/A	N/A
9/24/2022	8:50-9:05 am	K. Merrill	None	N/A	N/A
10/11/2022	11:15-11:35 am	K. Merrill	Opossum	No	No
10/20/2022	11:02-11:19 am	K. Alcaraz	None	N/A	N/A
