

Supplemental Information

Table S1. Additional data describing size, design, and location of underpasses selected to monitor with cameras for desert bighorn sheep use. Openness was calculated as (width * height) / length. Mean UD is the average utilization distribution (UD) value for a buffer zone around each underpass. The buffer was equivalent to the average maximum step length per individual (927 m), and the UD raster was based on movement simulations informed by habitat preferences and movement behavior of GPS-collared desert bighorn (see Aiello et al. 2023 for full details of movement simulation and UD methods). UD values range from 1–20, where the likelihood of bighorn use of an area increases as UD value increases.

Name	Code	Guzzler Added	Hwy	Mile Marker	Type	Width (m)	Length (m)	Height (m)	Openness	mean UD
Rocky Wash	ROCK	No	I-15	116.82	Box Culvert	4.27	83.4	3.7	0.19	11.8
Mojave River Overflow	MOJA	No	I-15	120.05	Bridge	61.6	49.4	4.0 ^a	4.99	11.0
Oat Ditch	OATD	No	I-15	130.59	Bridge	30.4	63.1	2.28	1.1	6.73
Kali Ditch	KALI	No	I-15	154.67	Bridge	13	59.4	2.1	0.46	4.21
Clark Mountain Ditch	CLAR	No	I-15	168	Bridge	21.9	58.2	3.9	1.47	10.8
Bristol Mountain Wash	BRIS	No	I-40	58.97	Bridge	45.1	162.5	9.0 ^a	2.5	4.32
Orange Blossom Wash	ORAN	Yes	I-40	71.75	Bridge	39.3	75.9	3	1.55	8.41
Old Dad Wash	OLDD	Yes	I-40	74.51	Bridge	32.4	67.7	3.1	1.48	9.52
Willow Springs Wash	WILL	No	I-40	77.37	Bridge	53.6	89.6	3.3	1.97	11.1
Culvert A	CULA	No	I-40	78.3	Circular Culvert	3.4	148.1	3.4	0.08	11.1
Marble Wash	MARB	Yes	I-40	80.41	Bridge	32.3	76.8	2.9	1.22	11.2

^a Approximated height

Table S2. Detection rates (detections / camera effort * 100) of mammal species at underpass cameras along I-15 and I-40. Cameras either viewed approach habitat (faced away from underpass tunnels) or viewed underpass tunnels. Approach cameras collected both motion-triggered photos and timelapse videos while tunnel cameras only collected motion-triggered photos. Only medium- to large-bodied mammals were identified in timelapse data; therefore, small mammals are marked with NA in tlapse columns. The highest detection rate within each dataset is shown in bold.

Common name	I-15 approach (tlapse)	I-15 approach (photo)	I-15 tunnel (photo)	I-40 approach (tlapse)	I-40 approach (photo)	I-40 tunnel (photo)
American badger	0.08	0.01	0.52	0.13	0.22	0.66
Black-tailed jackrabbit	NA	0.82	1.16	NA	3.24	7.64
Bobcat	0.27	1.62	3.6	0.19	0.72	4.12
Coyote	0.69	5	1.35	1.3	4.13	7.81
Desert bighorn sheep	0.02	0	0	1.32	0	0.14
Desert cottontail	NA	0	1.22	NA	0.14	7.12
Desert woodrat	NA	0	0.14	NA	0.05	0.04
Domestic cat	0	0.04	0.02	0	0	0
Domestic cattle	0.02	0.03	0.03	0	0	0
Feral burro	2.61	4.94	1.39	0	0	0
Gray fox	0	0.05	0.39	0	0.02	1.05
Kit fox	0	0.71	0.14	0	0.24	0.08
Mule deer	0.07	0.3	0.13	0	0	0
Rock squirrel	NA	0	0.05	NA	0	0
Western spotted skunk	0	0	0	0	0	0.02
White-tailed antelope squirrel	NA	0	0.39	NA	0	0.65

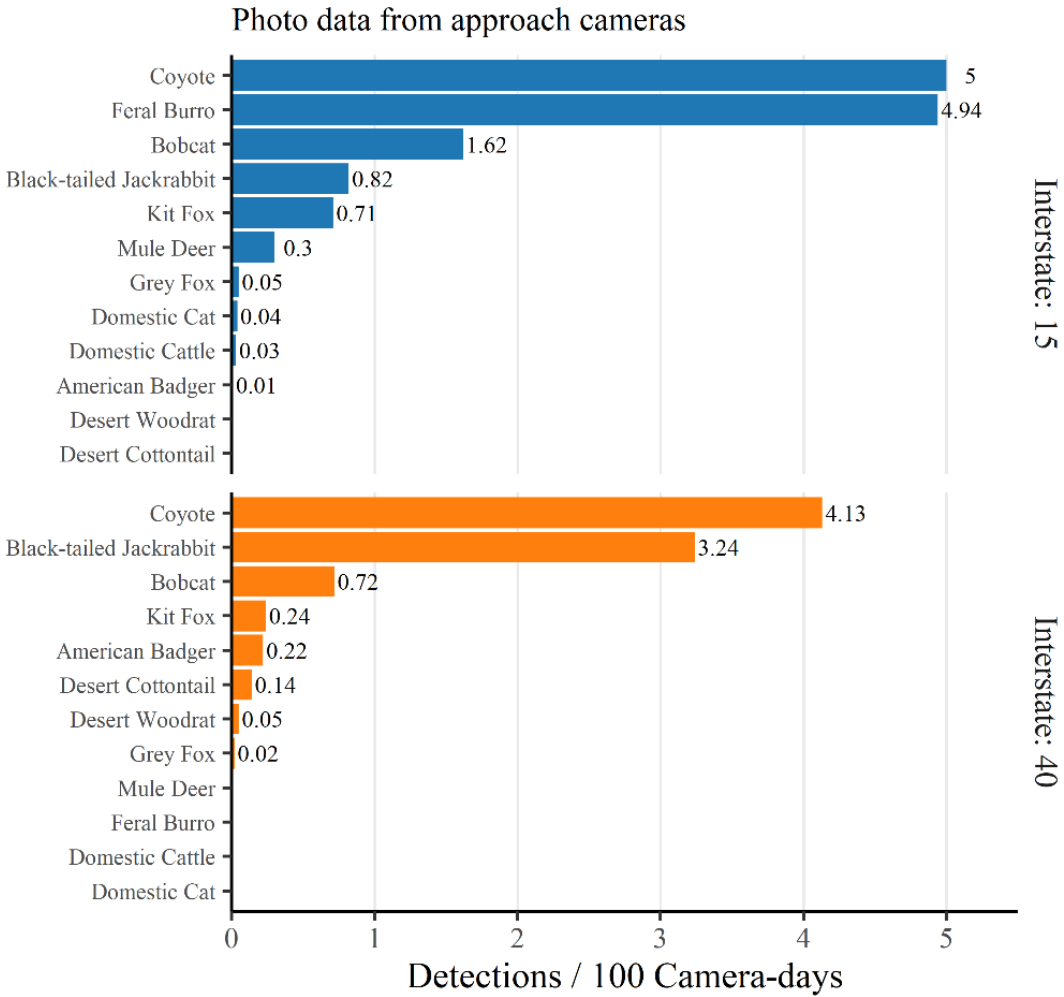


Figure S1. Mammal species detection rates from motion-triggered photos taken by cameras facing the approach area to underpasses along I-15 and I-40. Species without a value displayed were not detected during the study at any site along the specified highway. Species not plotted were not detected in approach camera photos at any site.

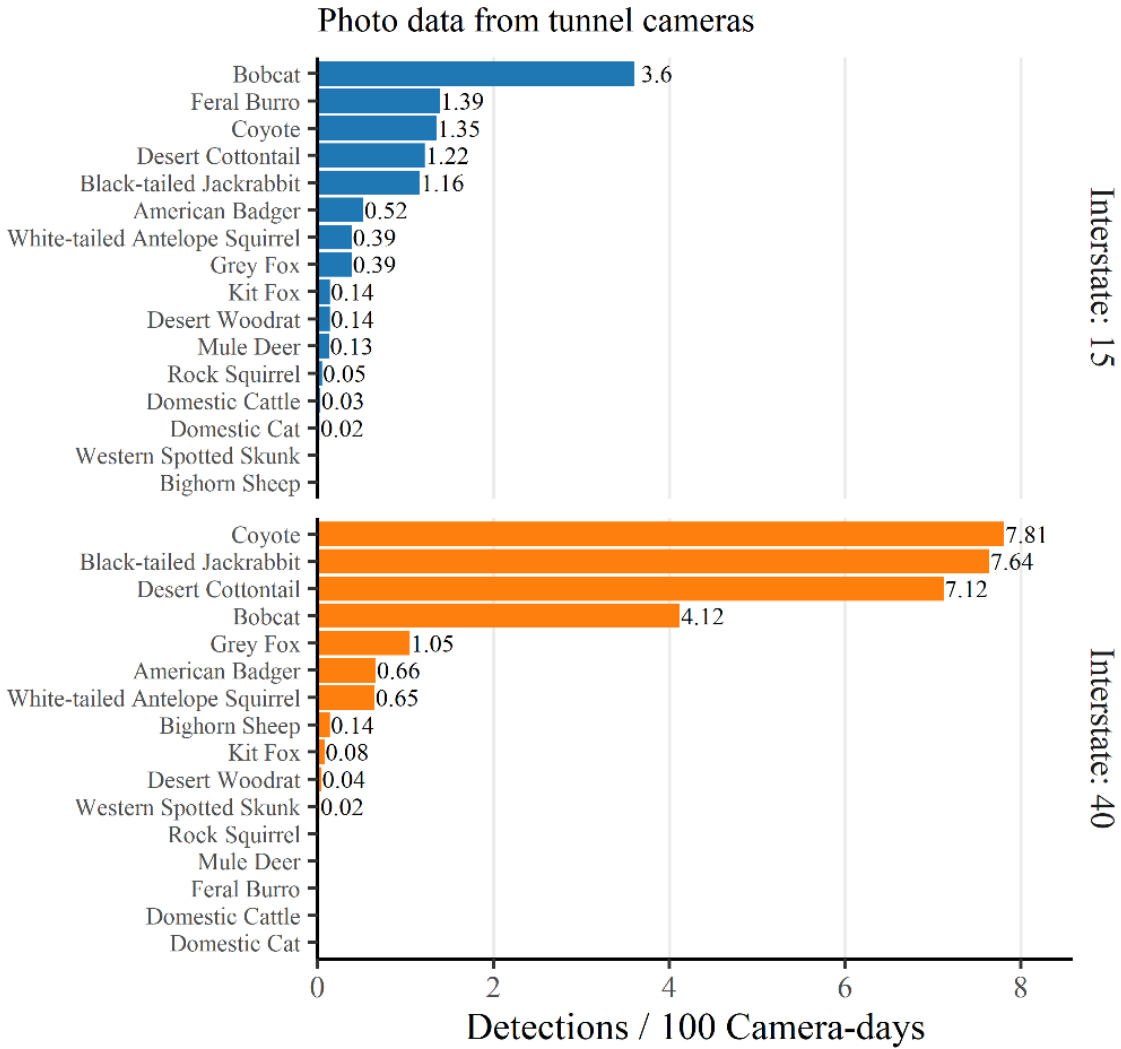


Figure S2. Mammal species detection rates from motion-triggered photos taken by cameras facing underpass tunnels along I-15 and I-40. Species without a value displayed were not detected during the study at any site along the specified highway. Species not plotted were not detected in tunnel camera photos at any site.

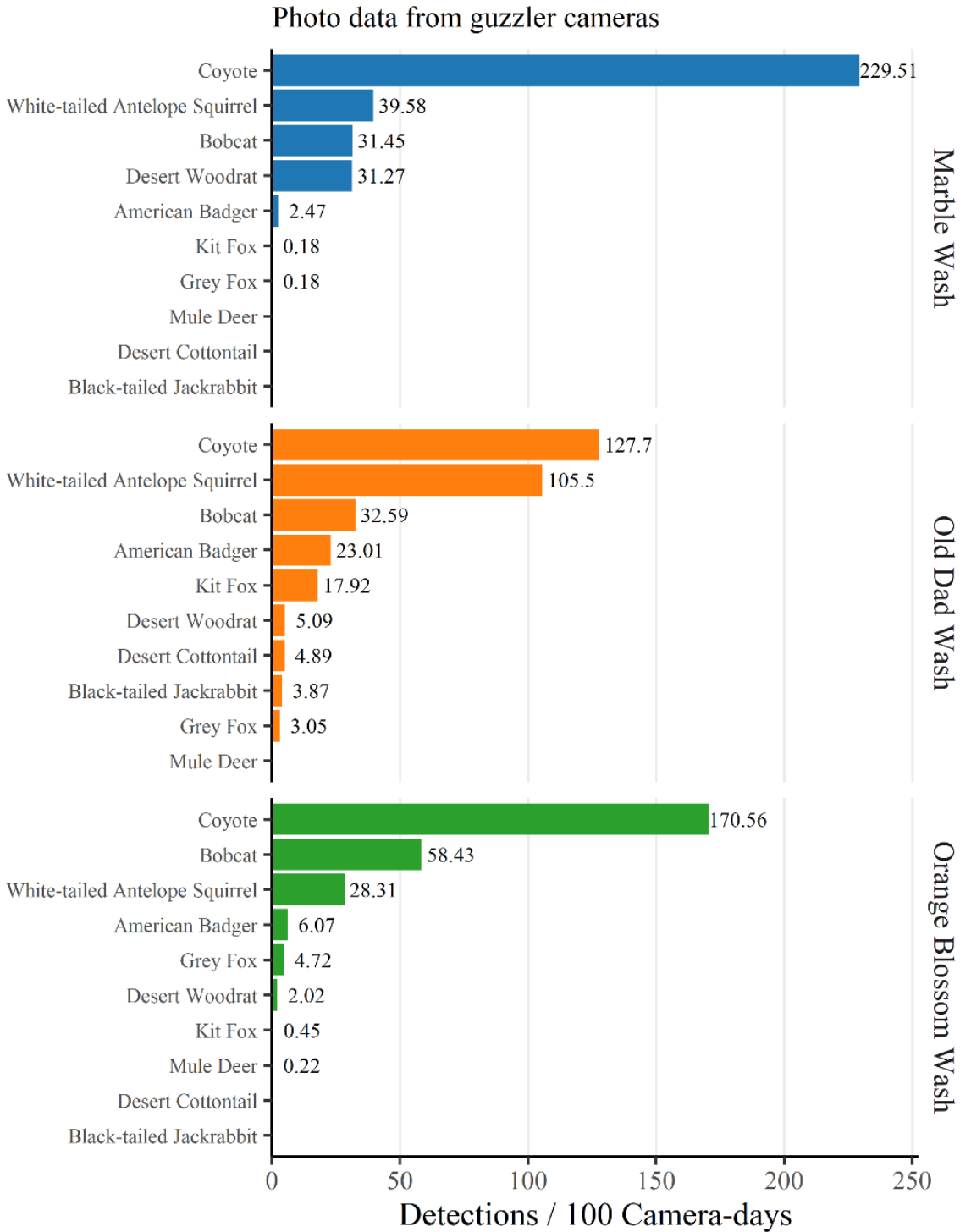


Figure S3. Mammal species detection rates from motion-triggered photos taken by cameras facing guzzlers installed near three underpasses along I-40. Species without a value displayed were not detected during the study at the specified site. Species not plotted were not detected in guzzler camera photos at any site.

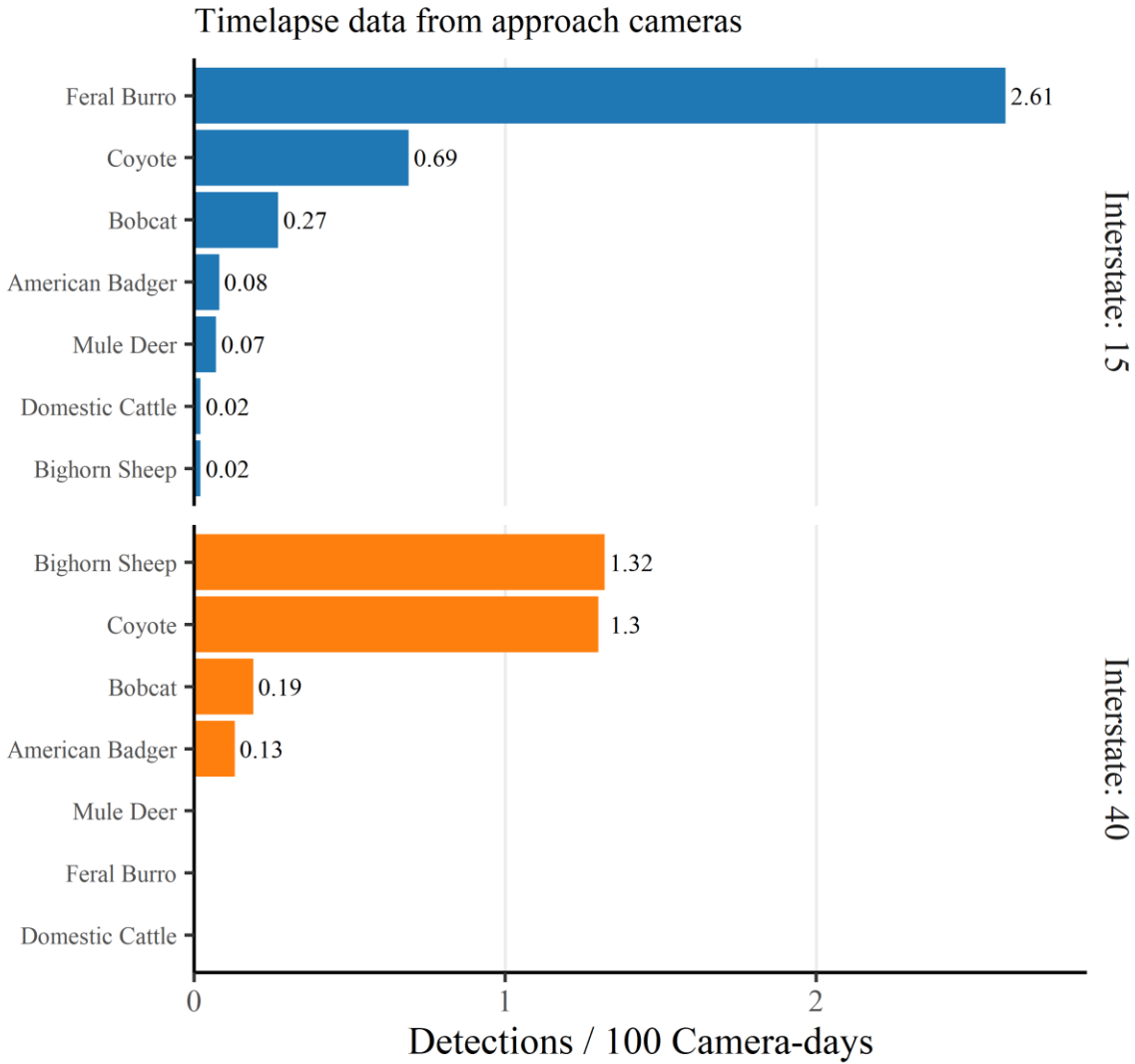


Figure S4. Medium- to large-bodied mammal species detection rates from timelapse videos taken by cameras facing the approach area to underpasses along I-15 and I-40. Species without a value displayed were not detected during the study at any site along the specified highway. Species not plotted were not detected in approach camera timelapse videos at any site.