

**WILDLIFE MOVEMENT STUDY
CANYON HILLS DEVELOPMENT PROJECT
LOS ANGELES, CALIFORNIA**

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April 2003

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1.0 INTRODUCTION

1.1 Purpose

This study addresses the potential impacts to wildlife movement, both local and regional, in and around the Canyon Hills project site (the "project site") [see Exhibits 1 and 2]. This study summarizes the methodology used in developing data on wildlife movement and the results of literature review and field surveys conducted according to that methodology. In addition, this study includes documentation on existing movement paths and evaluates potential disruption to movement paths associated with development of the proposed Canyon Hills project (the "project"). This study will be a Technical Appendix to the Biological Technical Report prepared by Glenn Lukos Associates ("GLA") in connection with the Draft Environmental Impact Report (the "DEIR") for the proposed project.

1.2 Wildlife Movement in Context

Wildlife movement, at the regional scale, has come under increasing scrutiny in areas of intensifying land use, where development has fragmented the landscape and left blocks of natural/native habitat separated by blocks of residential, commercial, industrial and institutional development, including roadways and other infrastructure. Where connectivity between blocks of habitat still exists in these fragmented areas, it is usually via wildlife movement corridors, typically consisting of narrow strips of habitat that provide opportunities for species to move between larger habitat blocks.

According to Noss¹ and Soule and Gilpin², regional movement through wildlife corridors is important for three reasons: (1) it allows the movement of animals between remaining large habitat blocks, thus replenishing populations and maintaining genetic diversity; (2) it provides escape routes from fire, predators and human disturbances; and (3) it provides a travel route for animals to disperse, forage and breed. If corridors are blocked or cut, the potential for inter-population genetic exchange within or between regions is severely limited. Lack of genetic exchange reduces the long-term viability of populations left in unconnected "islands" of remaining habitat, and is of special concern for larger mammals such as mountain lions, mule deer and bobcats, which require larger home ranges.

The identification and maintenance of local wildlife corridors, although less important than regional wildlife corridors, should also be considered when evaluating potential impacts associated with development projects. Local corridors serve many of the same functions as regional corridors, only at the local scale, such as genetic exchange, replenishment of populations, travel routes to food and water, and escape from fire and predators.

¹ Noss, R.F. 1991. Landscape Connectivity: different functions at different scales. In W.E. Hudson (Ed.) *Landscape Linkages and Biodiversity*. Island Press, Washington, D.C.

² Soule, M.E. and M.E. Gilpin. 1991. The Theory of Wildlife Corridor Capability. In D.A. Saunders and R.J. Hobbs, (Eds.) *Nature Conservation 2: The Role of Corridors*. Surrey Beatty & Sons Pty Limited, Chipping Norton, Australia.

For purposes of this study, “regional wildlife movement” is defined as movement between large blocks of non-contiguous habitat such as between the San Gabriel Mountains and the Verdugo Mountains or between the Verdugo Mountains and the Santa Monica Mountains. “Local wildlife movement” is defined as movement within the Verdugo Mountains and includes movement within the project site as well as between the project site and other portions of the Verdugo Mountains.

1.3 Focus

Consistent with these concerns, this study focuses on potential regional movement of large predatory mammals, including the mountain lion, bobcat, coyote, American badger and gray fox, along with mule deer, which provide a potential prey base for the mountain lion. In addition, local movement within or through the project site and the Duke Property by these large mammals is evaluated.

Most resident and all migratory avifauna that currently use the project site can easily disperse to other portions of the Verdugo Mountains, as well as across surrounding developed areas to other areas of open space such as the San Gabriel Mountains or the Santa Monica Mountains. Resident avifauna with lesser dispersal abilities can disperse easily across Interstate 210 (“I-210”) and La Tuna Canyon Road to the main body of the Verdugo Mountains. For these reasons, resident and migratory avifauna are not addressed in this study.

Dispersal to and from the project site by small mammals and reptiles has already been cut off by construction of the I-210 and surrounding development, and the proposed project will not change the existing conditions relative to dispersal/movement of such species. Therefore, the impact of the proposed project on small mammals and reptiles will not be addressed further in this study.

2.0 EXISTING CONDITIONS

2.1 Project Site Location

The Canyon Hills project site, which is located in the City of Los Angeles, Los Angeles County, California, comprises approximately 887 acres and is depicted on the U.S. Geological Survey (USGS) topographic map Sunland, California [dated 1966 and photorevised in 1988] and Burbank, California [dated 1966 and photorevised in 1972] [Exhibits 1 and 2]. In addition to the 887-acre project site, the adjacent 56-acre Duke property (the “Duke Property”) [Exhibits 1 and 2] was fully evaluated for biological resources and local wildlife movement.

The area proposed for development is bisected by I-210. The proposed development area north of I-210 (“Development Area A”) [Exhibits 2 and 5] is located at the eastern end of the project site adjacent to existing hillside development. Development Area A would cover approximately 142 acres and would largely preserve the major drainage feature (Drainage 4) that extends generally from north to south along the edge of the existing development to the east and the project site.³ South of I-210, the proposed development is limited to 52 acres (“Development

³ Drainage designations are from Glenn Lukos Associates. 2003. Letter Report to Chris Joseph: Jurisdictional Delineation of the Canyon Hills Site, Los Angeles County.

Area B”) [Exhibits 2 and 5] and includes two bridge crossings over La Tuna Canyon Creek (Development Area A and Development Area B are collectively defined herein as the “Development Areas”). Of the 887 acres, approximately 693 acres (78 percent) would remain open space. Essentially, more than three-quarters of the project site would be preserved as open space.

2.2 Study Area

In addition to the project site and the Duke Property, the study area also covers developed properties in the vicinity of the project site, including major arterials, residential, commercial and institutional development and the I-210. The study area also includes a potential linkage between the San Gabriel Mountains and the Verdugo Mountains via the Tujunga Wash and areas between Tujunga Wash and the Verdugo Mountains, identified by the “Missing Linkages” Conference as “Linkage #27: Angeles-Verdugo Mountains” [depicted on Exhibit 4]. This potential linkage (detailed in Section 5.1, below) is described in the document as a “Missing Link” (i.e., not an actual link) and is characterized by Reed Noss as follows:

This linkage would connect the Verdugo Mountains to the San Gabriel Mountains in Angeles National Forest. Missing Links describes this as a Missing Link, which is accurate because the existing connection is tenuous at best. There is some undeveloped private land and islands of public land. Highway 210 crosses the Big Tujunga Wash here, but an underpass is needed for wildlife movement, accompanied by a secure corridor to the Verdugo Hills.⁴

The project site, the Duke Property and the other areas described that comprise the “Linkage #27: Angeles-Verdugo Mountains” in the preceding paragraph are collectively defined in this study as the “Study Area”. The Study Area, in all of its components, contains a variety of habitat types, including native shrublands and woodlands, riparian areas, and limited areas of disturbed ruderal vegetation in addition to surrounding residential, industrial, commercial, and institutional development and associated arterial roadways, local streets and the I-210 Freeway.

2.3 Verdugo Mountains: Existing Biological Setting/Conditions

The Study Area (depicted on Exhibit 2) is located at the eastern end of the Verdugo Mountains, a rugged series of ridgelines and canyons near the base of the San Gabriel Mountains that cover an estimated 11,554-acre area that is fully within the Cities of Los Angeles, Burbank and Glendale.⁵ The Verdugo Mountains comprise an “island” as they are completely surrounded by urban development and are therefore not connected to other habitat blocks via continuous habitat or open space. The I-210 roughly bisects the Verdugo Mountains in a generally southeast-to-northwest alignment and La Tuna Canyon Road bisects the Verdugo Mountains from more-or-

⁴ Noss, R.F. 2001. *Final Report to Los Angeles and San Gabriel River Watershed Council, Task 3: Final Conservation Strategy and Map of Corridor Opportunities.*

⁵ PCR Services. 2002. *Los Angeles County Significant Ecological Area Update Study 2000.* Prepared for the County of Los Angeles.

less east to west. Tujunga Wash, which is a major drainage feature of the San Gabriel Mountains, is located to the north, approximately 4,000 feet from that portion of the Canyon Hills project site south of the I-210 and approximately 6,000 feet from the portion of the project site north of I-210.

The I-210 Freeway was approved as a chargeable Interstate on September 15, 1955. The first segment opened in 1955; the last, in 1981. Eight lanes (four on each side) bisect the northern and southern portions of the project site and effectively sever the Verdugo Mountains into two subareas.⁶ Three large culverts, which range from approximately 1,500 feet to almost 2,000 feet in length and are each eight feet or more in diameter, allow drainages extending from north to south to pass beneath the I-210. Two of the culverts are located where Drainage 4 discharges beneath the I-210 and the other is located where Drainage 5 discharges beneath the I-210 [see Exhibit 2 for location of drainages]. However, these culverts are not important wildlife connections between the north and south sides of the I-210 Freeway because their significant length discourages their use by wildlife.

Habitats associated with the rugged ridgelines and canyons consist of mostly chaparral with limited amounts of coastal sage scrub on the drier south-facing slopes. Steep canyons support oak woodlands. Other than La Tuna Canyon Wash, which traverses a portion of the Study Area, and Tujunga Wash to the north, there are no major drainages associated with the Study Area. The rugged landscape and dense vegetation generally restrict wildlife movement by larger mammals such as coyote and mule deer to existing wildlife trails along ridgelines, roads and firebreaks.

None of the drainages associated with the portion of the Verdugo Mountains in the Study Area, including La Tuna Canyon Wash, has the ability to provide for other than localized movement. The potential of La Tuna Canyon Wash to serve as other than a local corridor is limited by I-210, La Tuna Canyon Road, and development located west of the project.⁷ In addition to the culverts that conduct drainage from north to south beneath I-210, there are a number of culverts that vary in size from four to eight feet in diameter that carry flows northward from the steep hills immediately south of La Tuna Canyon Road beneath La Tuna Canyon Road to La Tuna Canyon wash. As discussed below, wildlife tracking stations were located at four culverts that discharge to La Tuna Canyon Wash within the project site boundaries [see Exhibit 2]. These culverts allow local movement within the Verdugo Mountains between the areas north and south of La Tuna Canyon Road.

Also, near the northern edge of the project site, a Southern California Edison (SCE) transmission line right-of-way extends generally from east to west through rugged topography and dense chaparral. When viewed in “plan view” [see Exhibits 4 and 5], it appears that this right-of-way

⁶ Brodsky, David. 1971. *LA Freeway*. University of California Press, Berkeley, California.

⁷ As discussed in detail in Section 5.1.2, below, the reach of La Tuna Canyon Wash on the project site may serve as a component segment of a regional movement path between the Tujunga Wash to the north and the main body of the Verdugo Mountains. When considered by itself, however, it is clear that it is only capable of providing for local movement within and just beyond the boundaries of the project site.

represents an east-west corridor; however, due to the dense chaparral and steep topography, this feature does not represent an existing corridor or link through this portion of the project site.

Tujunga Wash to the north is the nearest and most accessible link between the Verdugo Mountains and the San Gabriel Mountains to the north. Tujunga Wash is a major drainage feature of the San Gabriel Mountains, and although dammed higher in the watershed, it still represents a viable movement path (for both local and potentially for regional movement) for animals to move in or out of the San Gabriel Mountains. Beginning at the base of San Gabriel Mountains, Tujunga Wash is a broad braided channel several hundred feet wide, vegetated with alluvial scrub habitat that is largely undisturbed. However, while the Tujunga Wash itself provides the beginning of a link between the San Gabriel Mountains and the Verdugo Mountains, the fragmented character of the intervening area between Tujunga Wash and the project site may preclude or substantially limit regional movement between the San Gabriel Mountains and the Verdugo Mountains. For this reason, and as discussed above (and in Section 5.1.2, below), this intervening area has been described as a “Missing Link” that provides, at best, a tenuous link between the two mountain ranges. It is important to note that, even if animals move out of the San Gabriel Mountains via Tujunga Wash, they would not necessarily move toward the Verdugo Mountains via the “Missing Link”. Rather, it is expected that many animals moving from the San Gabriel Mountains into Tujunga Wash would move in a westerly direction under the I-210 moving away from the project site to the west within the large braided and vegetated wash.

3.0 METHODS

Data regarding wildlife movement through or within the Study Area were obtained through literature review and extensive field investigations. The field surveys to document and evaluate wildlife movement were initiated in March 2002 and continued through December 2002. The initial step included general “reconnaissance-level” surveys using aerial photographs and topographic maps to identify potential corridors or movement paths. The reconnaissance-level surveys were conducted in concert with the literature review that provided additional insight into potential corridors using previous studies or documentation associated with the project environs.

3.1 Literature Review

A broad "literature review" was conducted relative to wildlife movement, including documents that address general characteristics of wildlife movement and theories regarding corridor requirements, as well as documents specific to the region. The review included the following: field guides⁸; scientific papers⁹; symposia proceedings^{10, 11}; Master Theses¹²; letters responding

⁸ Ingles, L.G. 1965. *Mammals of the Pacific States: California, Oregon, and Washington*. Stanford University Press. Jameson, E.W. Jr. and H.J. Peeters. M 1988. *California Mammals*. University of California Press, Berkeley, California.

⁹ Beier, P. 1993. Determining minimum habitat areas and habitat corridors for cougars. *Conservation Biology* 7(1)94-108.

to the Notice of Preparation regarding preparation of the DEIR for the proposed project¹³; personal communication with Paul Edelman¹⁴ of the Santa Monica Mountains Conservancy and Paul Beier¹⁵ a national expert on wildlife movement at Northern Arizona University; EIRs prepared for projects in northern and western Los Angeles County and eastern Ventura County¹⁶; wildlife movement studies prepared for projects in the region¹⁷; and other pertinent documents.¹⁸ Where appropriate, information provided by local residents regarding observations of large mammals such as bobcats, coyotes and the American badger was also included.¹⁹

3.2 Field Surveys

GLA conducted wildlife movement surveys from March to December 2002 within the approximately 887-acre project site, the adjacent 56-acre Duke Property, and other offsite areas such as Tujunga Wash and areas between Tujunga Wash and the northwest corner of the project site (which collectively comprise the Study Area) [Exhibit 1 and 2]. GLA biologists who conducted the surveys inspected the Study Area for evidence of wildlife concentration and movement during all visits. GLA biologists experienced in conducting wildlife movement studies mapped wildlife movement paths or potential paths as indicated by the presence of

¹⁰ Swift, C., A. Collins, H. Gutierrez, H. Lam, and I. Ratiner. 1993. Habitat linkages in an urban mountain chain. In *Interface between ecology and land development in California*. Edited by J. E. Keeley. Southern California Academy of Sciences, Los Angeles.

¹¹ Beier, P. 1992. Cougars, corridors and conservation. Abstracts of the annual meeting of the Southern California Academy of Sciences, Los Angeles, CA.

¹² Lyren, L. M. 2001. Movement patterns of coyotes and bobcats relative to roads and underpasses in the chino hills area of southern California. Masters Thesis. California State Polytechnic University, Pomona.

¹³ Santa Monica Mountains Conservancy. September 23, 2002. Comment Letter addressed to Maya Zaitzevsky.

¹⁴ Edelman, Paul. 2002. Personal Communication with Jeff Ahrens of GLA via email regarding lack of Mountain Lion sightings in Verdugo Mountains.

¹⁵ Beier, Paul. 2002. Personal Communication with Jeff Ahrens of GLA via email regarding lack of radio-collared Mountain Lions in Verdugo Mountains.

¹⁶ City of Los Angeles. 1997. Draft Environmental Impact Report: Hillview Estates, EIR No. 89-1163-SUB(ZC/GPA), SCH No. 93021045.

¹⁷ Envicom Corporation. 1993. *A Consideration of Wildlife Movement in the Santa Susana Mountains*. Prepared for HMDI, Inc. Los Angeles, California. Envicom Corporation. 1993. *A Study of Wildlife Movement in Dry Canyon*. Prepared for HMDI, Inc. Los Angeles, California.

¹⁸ Noss, R.F. 2001. *Final Report to Los Angeles and San Gabriel River Watershed Council, Task 3: Final Conservation Strategy and Map of Corridor Opportunities*.

¹⁹ Crouch, Steve. 2003. Mr. Crouch, who is associated with the conservation group Canyon Area Preservation (or "CAP"), provided a list of species he has observed on or in the vicinity of the project site to Jeff Ahrens at GLA via email.

indicators or “sign” characteristic of regular wildlife movement or usage. Such indicators include (a) direct observation of target species, (b) remains of dead animals, (c) tracks, (d) scat, (e) unusually heavy presence of ticks and (f) browsed vegetation along existing wildlife trails, roads and firebreaks [Exhibit 3, Photographs 1-10]. Track stations were also installed and monitored at selected key locations, including culverts beneath I-210 and La Tuna Canyon Road and on wildlife trails [Exhibit 3, Photographs 11-19]. The surveys identified and mapped all locations of field evidence of wildlife movement or usage (e.g., scat, tracks, etc.) [Exhibit 3, Photograph 3].²⁰ Exhibit 2 depicts the location of all documented field indicators by type. The following subsections provide a detailed discussion of the rationale and methods employed for the evaluation of the project site, the Duke Property, and the larger Study Area.

3.2.1 Canyon Hills Project Site

The first objective was to determine and document the presence or absence of wildlife on and immediately adjacent to the project site and the Duke Property. For this task, GLA biologists familiar with identification of tracks, scat, and vocalizations of wildlife (including coyotes, domestic dog, deer, bobcat, gray fox, badger, mountain lion, raccoon, opossum, etc. and their habitat requirements in southern California traversed slowly and methodically along established wildlife trails, hiking trails, accessible ridgelines, drainage courses and roads (paved and unpaved), including fire break roads. The periphery of the property boundary, including Verdugo Crestline Drive (a fire access road) to the north and east, the eastern boundary of Duke property, La Tuna Canyon Road (north side) to the south and west, and Green Verdugo Fire Road to the north, generally approximate the boundaries of the project site and the Duke Property. In addition to the focused surveys aimed at identifying and evaluating wildlife movement paths, opportunistic observations of wildlife and their sign were recorded by GLA biologists while conducting numerous other biological studies for the proposed project, including California gnatcatcher surveys, least Bell's vireo surveys, reptile surveys, sensitive plant surveys, tree survey, jurisdictional delineation and vegetation mapping.

3.2.2 Study Area Beyond Limits of Canyon Hills Project Site

In addition to the focused surveys of the project site and Duke Property described above, other portions of the Study Area beyond the limits of the project site and Duke Property were carefully surveyed in the ways noted above for wildlife or their sign, including (a) both sides of La Tuna Canyon Road (e.g., shoulders, pathways or walkways, etc.) west and east of the I-210, (b) four culverts linking La Tuna Canyon Park to the project site to the south (including four track stations described in Section 3.2.3 and Table 1, below)²¹, (c) the La Tuna Canyon Park access road and associated wildlife trails adjacent to the parking area immediately south of the I-210 along La Tuna Canyon Road (i.e., at track station T-20 depicted on Exhibit 2), the La Tuna

²⁰ Mapping in the field was performed using a Garmin global positioning device (GPS) with the data then transferred to a Geographic Information System (GIS).

²¹ La Tuna Canyon Park is an approximately 1,000-acre natural area immediately south of La Tuna Canyon Wash that is managed by the Santa Monica Mountains Conservancy. The location of this park is depicted on Exhibit 2.

Canyon Road underpass and Lehman underpass to the west, (d) the La Tuna Canyon Wash east of La Tuna Dam just west of the project site, (e) various points along Sunland Boulevard northwest of the project site, (f) the Green Verdugo Fire Road entrance from Sunland Boulevard, (g) Nohles Drive between Sunland Boulevard and Wentworth Street, (h) Wentworth Street east and west of the I-210, adjacent residential access streets between Wentworth Street and Tujunga Wash, (i) the I-210 off-ramps and on-ramps between the Lehman and Wheatland eastbound off-ramp, (j) westbound shoulder lanes of the I-210 from Sunland/Foothill Boulevard to La Tuna Canyon Road, the narrow strip between the west side of I-210 and existing development between Tujunga Wash and Sunland/Foothill Boulevard, and Haines Canyon Avenue and associated side streets with access to the east side of the project site.

GLA biologists also conducted a detailed analysis of the area characterized as a “Missing Link” [see Exhibit 4] in order to identify potential movement paths or routes through developed areas between Tujunga Wash and the northwest corner of the project site that exhibit potential paths used for regional movement. This analysis was conducted on foot, searching for sign of wildlife movement between Tujunga Wash and the project site. This included both sides of the I-210. However, initial surveys on the north side of I-210 detected no sign of wildlife movement (not even coyotes sign was detected) and most of the survey efforts were expended on the south side of the I-210. A detailed description of the potential paths (and obstacles) that an animal would have to negotiate in traveling from Tujunga Wash to the project site is provided in Section 5.1, below.

3.2.3 Access Points

Another major objective of the field surveys was to document wildlife access points to the project site from other portions of the Study Area, as well as to identify movement paths or routes within or through the project site beginning or ending at those access points. This was an important step, necessary to determine whether such routes exhibited any potential as component segments of regional movement corridors. To more accurately document the usage of potential access points to the project site, biologists installed 21 track stations in areas both on the project site and off the project site that exhibited potential as wildlife movement paths between offsite areas and the project site [the track stations are summarized on Table 1 and their locations are depicted on Exhibit 2]. This included three large culverts beneath the I-210 [see Exhibit 2]. All track stations were located in constricted areas, or “pinch points”, which exhibited evidence of wildlife activity during initial reconnaissance-level surveys [see Exhibit 2]. Where repeated visits failed to detect any “sign”, such as the culvert beneath the I-210 at Drainage 5, track stations were not installed (as noted in Section 2.3, above, this culvert is approximately 1,500 feet in length and does not provide a link between the two sides of I-210 because of its extreme length).

Track stations were installed and monitored at locations connecting portions of the project site, including the two of the culverts beneath the I-210 where Drainage 4 is carried beneath the I-210 which, unlike the third culvert (as noted in the paragraph above), exhibited at least minimal sign of animal use near the mouth of the culverts. After locating a suitable pinch point, track stations were created by sweeping an area clear of debris or loose litter approximately five feet by five feet, or of sufficient length and width to prevent an animal such as a coyote from jumping over the track station without leaving prints. Some biologists place a rock in the center of track

stations and spray animal scent on the rock to attract wildlife. Scent was not used at any time in this study because this could have biased the results by attracting target species that would not have normally approached the track station otherwise. In addition, some track stations were located at the entrance to culverts beneath La Tuna Canyon Road and the scent potentially could have increased the likelihood of an animal investigating the track station being injured or killed by an automobile.

After an area was cleared, gypsum was placed and smoothed until a uniform layer was achieved. Use of gypsum allows the biologist to determine the identity of the species that created the track, as well as the direction that the animal was moving. In some instances, tracks left within the track station may be disturbed by increased wildlife activity. In these situations, biologists can determine what species created the track, as well as the direction of movement, because the gypsum adheres to the pad of the foot as the animal walks through the track station (for most species), thus leaving a trail of white footprints for distances up to approximately three meters [e.g., Photographs 18, 19, and 25].

TABLE 1
SUMMARY OF WILDLIFE SIGN OBSERVED AT TRACK STATIONS

<i>Station Number</i>	<i>Location</i>	<i>Species Detected</i>
1	La Tuna Canyon Park wildlife trail	Coyote
2	La Tuna Canyon Park wildlife trail	Coyote, peromyscus sp. (mice) ²²
3	La Tuna Canyon Park wildlife trail	Coyote, gray fox
4	La Tuna Canyon Park wildlife trail	Coyote
5	La Tuna Canyon Park wildlife trail	Coyote, spotted skunk, raccoon, unidentified rodent
6	La Tuna Canyon Park wildlife trail	Coyote, raccoon
7	Corrugated Pipe (East La Tuna Canyon Park access) - base of pipe	Coyote, striped skunk, raccoon, unidentified bird, peromyscus sp. (mice)
8	Corrugated Pipe (East La Tuna Canyon Park access) – in pipe	Coyote, striped skunk, raccoon
9	La Tuna Canyon Park Access Trail	Coyote, raccoon

²² While this study focuses on large mammals, the presence of small (e.g., mice) and mid-sized (e.g., skunk and raccoon) mammals have been included for sake of completeness.

<i>Station Number</i>	<i>Location</i>	<i>Species Detected</i>
10	Corrugated Pipe (North side) of La Tuna Canyon Road	Coyote, raccoon
11	Corrugated Pipe (South side) of La Tuna Canyon Road	Coyote, raccoon
12	Concrete Culvert beneath I-210	Western fence lizard on fringe of station
13	Concrete Culvert beneath I-210	No detection
14	Area above Station 13	Coyote
15	Area above Station 13	Coyote, unidentified snake
16	Area above Station 13	Coyote, peromyscus sp. (mice)
17	Area above Station 13	Coyote
18	Area above Station 13	Coyote
19	Crestline Drive - border open space	Coyote, mule deer
20	Stone drainage ditch into La Tuna Canyon	Coyote
21	Stone drainage ditch into La Tuna Canyon	Coyote

Twenty-one track stations were established and monitored during a four-day sampling period during the week of April 8, 2002. Because offsite areas, including La Tuna Canyon Park, exhibit high recreation usage from hikers, mountain bikers and people walking dogs, track stations were hidden from the general public where possible and were set active during dusk hours. Remote track stations on the project site were active 24 hours a day to maximize visitation usage. Track stations located in close proximity to recreation usage were inspected each morning before sunrise to minimize human interference. Track stations not likely to receive human visitation were checked thereafter. For each station, tracks were identified to species. If a track was not identifiable, the species was recorded as “unknown”. Each track station was then reset, either the same evening (if it was located adjacent to recreation area) or immediately after identifying the tracks (if the track station was not adjacent to a recreational area).

4.0 BACKGROUND: SPECIES ACCOUNTS FOR TARGET MAMMALS

4.1 Mountain Lion (*Felis concolor*)

The mountain lion (also called Puma or Cougar) is the largest member of the felid family found locally, ranging from six feet (1.8m) to eight feet (2.4m) in length. Mountain lions occur throughout most of the forested and brushy regions of California, but tend to avoid open areas or areas that do not support its primary prey (mule deer), which make up 60-80 percent of its diet. Mountain lions have been reported to consume one mule deer per week, and have been estimated

to kill approximately 50 deer in the course of a year. Other species comprising a mountain lion's diet include skunks, porcupines, rabbits, dogs, squirrels and mice.

Mountain lions require large home ranges, with the average home range of a female covering approximately 48 square miles and a male requiring up to 187.3 square miles.²³ In contrast, the Verdugo Mountains cover approximately 18 square miles.

The scat of a mountain lion can only be confused with bear, but a mountain lion scat will contain hair and very rarely grass. In addition, mountain lions tend to deposit scat at "scrapes" along its trails, where it has scraped leaves and grass into a little pile over the scat.

4.2 Mule Deer (*Odocoileus hemionus*)

The mule deer is a member of the ungulate cervid family and is common resident throughout most of California. Mule deer are characterized by short and nearly completely white tails with a black tip, and a white patch going over the base of the tail and onto the rump. Mule deer are migratory except in coastal southern California and foothill areas where snow does not cause range shifts. Mule deer will forage on clover, alfalfa, huckleberry, salal, blackberry, bitterbrush, and snowbrush.

Current mule deer populations are probably larger than they were prior to European contact. Like the coyote, deer are able to persist close to human settlements and will often visit residential communities in the cover of darkness taking advantage of more palatable herbs and ornamental species.

Mule deer tracks and scat are unmistakable (only in certain areas would they be confused with domestic sheep) and where they occupy an area, evidence of their occupation is usually easily to identify, due to established trails traversing the side of slopes, abundance of deer droppings, and greater concentrations of deer ticks in the immediate area.

4.3 Bobcat (*Lynx rufus*)

The bobcat is a medium-sized member of the felid family and is found throughout the Pacific States in practically every habitat and life zone, from below sea level in Death Valley to timberline areas. Bobcats are readily identifiable by their pointed ears, spotted coloration, and short tail (unlike the mountain lion). Bobcats are larger than a house cat, and are similar in shape, but much smaller in size, than a mountain lion. Bobcats prefer rocky, brushy country for hunting and raising young and are opportunistic feeders, with their food source varying due to availability more than any apparent preference. They will commonly prey on a variety of small mammals including ground squirrels, pocket gophers, meadow mice, white-footed mice, cottontails, brush rabbits, hares, wood rats, small reptiles and birds.

²³ Chartier-Grable, S. 1997. *The Cougar in Orange County, California*. Master's Thesis presented to the faculty of California State University, Fullerton.

4.4 Coyote (*Canis latrans*)

The coyote is a medium-sized member of the canid family and is common throughout California, but typically is found in various open terrain habitats. Coyotes are gray to brown in coloration; their tracks are similar to those of domestic dogs, but are usually more oval and linear in placement. Coyote scat is similar to dogs, but is usually full of hair, fruit stains and bone fragments. With few exceptions, coyote scat is almost always deposited along existing trails, with accumulations typically observed at the intersection of trails.

The coyote is very adaptable to changing environments, including encroachment of human development²⁴, and in some instances has been documented shifting from diurnal to nocturnal activity patterns²⁵. Coyotes prey extensively upon cottontails and jackrabbits where they occur, and supplement their diet with small mice and ground squirrels, and also with fruits, berries, insects, and carrion. Coyote dens are generally located on slopes of canyons and hillsides. Coyotes mate beginning in February in California, producing a litter of five to ten pups approximately two months later.

4.5 Gray Fox (*Urocyon cinereoargenteus*)

The gray fox is a medium-sized member of the canid family and is found commonly throughout California and Oregon in chaparral-covered foothills. The gray fox is steel gray in color, with varying amounts of yellowish red fur along the sides and legs. Darker dorsal hairs become conspicuous along the top of the tail, distinguishing the gray fox from any other animal in the same habitat, including the coyote. Gray foxes prey on pocket gophers, rabbits, white-footed mice, wood rats, and occasionally bird species, supplementing their diet with vegetable matter including berries from toyons (*Heteromeles arbutifolia*) and big berry manzanita (*Arctostaphylos glauca*). Gray foxes live under large rocks or in crevices in cliffs.

4.6 American Badger (*Taxidea taxus*)

The American badger is a medium-sized member of the mustelid family found commonly from south-central Canada over the western and central United States and into central Mexico. Badgers are characterized by silvery-gray coloration with a white central stripe running through an otherwise dark head, short bushy tail, and black-and-white markings on the face with a single white line extending from the nose over the forehead to the neck. Badger tracks are distinctive, with the very long front claws showing in all but the shallowest tracks.

Badgers reside in open stages of many habitat types where friable soils (including sandy soils) prevail. With very long front claws, badgers are superbly equipped to dig out prey consisting almost exclusively of burrowing rodents, including ground squirrels, pocket gophers and

²⁴ Jameson, E. W. 1988. California mammals. Berkeley: University of California Press. Sheldon, I. 1998. Animal tracks of Southern California. Lone Pine Publishing.

²⁵ McClennen, Nathan, T. Wigglesworth, S. Anderson and D. Wachob. 2001. The Effect of Suburban and Agricultural Development on the Activity Patterns of Coyotes (*Canis latrans*). American Midland Naturalist 146:27-36.

occasionally smaller mice. The presence of badgers is suggested by large, freshly dug, elliptical burrows eight or more inches in diameter in the vicinity of concentrations of ground squirrels dens. Badgers are most active late afternoon and prefer friable soils, but can be observed almost anywhere a reliable food source persists.

5.0 RESULTS

As depicted on Exhibit 2 and documented in the Study Area photographs [Exhibit 3], GLA identified moderate to high use of the project site and the Duke Property by coyote, moderate use of the project site by gray fox and limited use (one set of tracks and two piles of scat) by mule deer. It is difficult to determine the exact number of coyotes; however, based upon documented home range sizes for coyote, it is expected that up to five coyotes would use the project site and Duke Property at any given time. Similarly, the number of gray foxes using the site is not easy to quantify; however, based upon the amount of scat observed, gray fox is not as common either on the project site or within the Study Area as coyotes.

Bobcats were not detected during surveys; however, based upon habitat preferences and reported observations by residents in the adjacent developed areas, bobcats are likely present in the area. However, lack of detection during extensive surveys between March and December 2002 indicates that bobcats are present on the project site and Duke Property in very low numbers.

American badger was also not detected during surveys and, based upon habitat preferences and requirements, is expected to be uncommon on the project site. This is due to the lack of friable soils (most of the site is granitic material overlain with very thin soils making burrow creation essentially impossible for badgers over much of the site. Additionally, badgers prefer open habitats and grasslands, whereas most of the project site and the Duke Property exhibit dense chaparral or coastal sage scrub. A local resident reported an observation of a badger in the residential area. Even so, because of the general lack of suitable habitat, confirmed by no observed sign during nearly a year of site surveys, movement by badgers either through or within the project site or Duke Property is not common.

Mountain lions are not found in the Study Area or any portion of the Verdugo Mountains. Therefore, regional movement by the mountain lion within or through the study area does not occur (see Section 5.1, below).

Specific movement patterns, organized by potential corridors and target species, are addressed in Section 5.2, below. As set forth below, one tenuous regional movement corridor has been identified through Tujunga Wash and Missing Link #27. In addition, four local movement areas or corridors were identified: (1) La Tuna Canyon Wash along the southern boundary of the project site; (2) Drainage 4 along the eastern boundary of the project site; (3) Drainage 14 at the western boundary of the project site; and (4) Verdugo Crestline Drive along the northern boundary of the site. Finally, local movement by coyotes was noted on a dirt access road across the Duke Property that provides a movement path between existing development and the La Tuna Canyon undercrossing of the I-210 and along a ridgeline fire break that originates on the Duke Property, extending to the southwest onto the project site.

5.1 Regional Movement Trends and Corridor

5.1.1 Tujunga Wash Corridor

Development of the Los Angeles Basin, including the construction of I-210, has isolated the Verdugo Mountains and severed them from blocks of habitat of sufficient size to support mountain lions. As a result of that development, the only possible regional movement corridor into the Verdugo Mountains is the potential Tujunga Wash corridor north of the project site [Exhibit 2]. Beier suggests that “(w)ith *excellent* connectivity, [the Verdugo Mountains] could be a useful *part* of a home range for an individual [large] animal or two.”²⁶ However, Noss notes that the Verdugo Mountains are only *tenuously* connected, at best, to other suitable regional habitat. Based upon the identification of this potential connection, and as noted in Section 3.2.3, above, GLA carefully documented all potential travel routes through this area as described below.

5.1.2 Description of the “Missing Link”

GLA biologists carefully evaluated the potential connection between the Tujunga Wash and the project site, described as a “Missing Link” by the Missing Links Conference and identified the possible routes available to wildlife [Exhibit 4 depicts the potential routes through this area]. For animals using Tujunga Wash (north or south forks) there are two potential routes. One route would require exiting Tujunga Wash upstream of the I-210 from where they must travel along Foothill Boulevard to Wentworth Street, which, under this scenario, provides the only safe location to cross beneath I-210 [Exhibit 2, Photographs 39, 40, 41, 43, 45, and 46]. Under the alternate scenario, an animal could travel beneath the I-210 in Tujunga Wash. Once under the I-210, an animal would be required to move through existing development (either residential or institutional or move along the slope at the base of the I-210 to Wentworth Street. Under either scenario, an animal would reach the same general location on Wentworth Street immediately west of the I-210. Once safely under the I-210 (under either scenario), an animal can travel from Wentworth Street up a north-facing hillside [Photographs 45, 46, 47, and 48] and move in one of two ways toward the project site. They can either move along the east-facing slope overlooking I-210 and the Sunland Boulevard on- and off-ramps to Sunland Boulevard (potentially crossing one or both of the ramps) or over the hill to Nohles Drive, from which they can access Sunland Boulevard [Photographs 49 and 51]. In either case, they must then successfully cross Sunland Boulevard, traverse residential lots, some of which are fenced while others are not [Photographs 51-54]. If they are able to get past the residential lots they can travel along the slope that overlooks I-210, moving at any point over the ridge, accessing the wildlife trail associated with Drainage 14 or they can use Green Verdugo Fire Road that would also lead to the upper portions of Drainage 14.

In traversing this route between Tujunga Wash and the project site, they must depend on holes in fences (e.g., Photograph 42) or sites where animals have previously burrowed beneath fences. Coyote and fox scat was detected on the hillside between Wentworth Street and Nohles Drive and it appears that the animals presently using these areas are familiar with the specific locations where

²⁶ Beier, Paul. October 31, 2002. Personal Communication via email to Jeff Ahrens of GLA.

they can pass through or under fences.²⁷ An occasional mountain lion reaching these spots would not likely find these specific locations and would be too large to squeeze through these passageways. In all, from the South Fork of Tujunga Wash, any animal leaving the wash would have to travel over one-half mile using or crossing up to four streets (depending on the specific route) including Foothill Boulevard, Wentworth Street, Nohles Drive and Sunland Boulevard.

If an animal reaches the upper portions of Drainage 14, there is an unconstrained path southward to La Tuna Canyon Wash and/or La Tuna Canyon Road [see Exhibit 5]. Drainage 14 consists of a well-defined drainage that exhibits good cover associated with coast live oak riparian forest that extends for most of the length of the drainage. The drainage ultimately empties into La Tuna Canyon Wash at the extreme southwest corner of the project site, at the upper end of the debris basin constructed in La Tuna Canyon Wash. When moving from the northwestern corner of the project site toward La Tuna Canyon Wash or Road, it is expected that most animals will take the path of least resistance and follow Drainage 14. However, animals could also move southward through the large swath of open space to the east and west of Drainage 14 to reach La Tuna Canyon Wash or Road, allowing them to continue to the main body of the Verdugo Mountains.

Once an animal has reached the debris basin or other locations in La Tuna Canyon Wash, it can move directly across La Tuna Canyon Road into the main body of the Verdugo Mountains or can move either to the east or west in La Tuna Canyon Wash. Once in La Tuna Canyon Wash, an animal can move up the slope, crossing La Tuna Canyon Road anywhere along the approximately three-mile stretch between the locations depicted near the left edge of Exhibit 2 and the underpass at the I-210. Numerous culverts also provide access beneath La Tuna Canyon Road. GLA biologist documented coyote use of all four culverts beneath La Tuna Canyon Road where track stations were placed. Additionally, GLA observed at least two dead coyotes along the shoulder of La Tuna Canyon Road, indicating that animals attempt to, and in most instances successfully, cross the road.

To the extent that Drainage 14 and La Tuna Canyon Wash provide “links” in the connection between Tujunga Wash and the main body of the Verdugo Mountains, they would be considered part of a regional movement corridor (although that corridor is tenuous at best). As more specifically discussed below, individual coyotes and gray foxes may be using segments of the potential corridor between Tujunga Wash and La Tuna Canyon Wash/Road and it appears that they are familiar with the specific locations where they can pass through yards and or through/under fences. However, as noted above, it is not possible to determine whether the coyotes and gray foxes are using portions or segments of this corridor for local movement or for regional movement between the San Gabriel Mountains and the Verdugo Mountains. For purposes of this study, it is assumed that this connection provides a potential linkage between the San Gabriel Mountains and the Verdugo Mountains for coyotes and potentially for gray foxes. However, none of the larger target animals, such as mountain lion and mule deer, were observed using any portion of the “Missing Link” or associated segments (noted above) in the GLA

²⁷ There is no evidence that the coyotes and gray fox using this area are utilizing it for regional movement. Rather, the concentration of fox scat above an area of dense chaparral on the hillside above Wentworth Street suggests that the scat was produced by a “resident” animal or animals and that this is part of a territory subject to local movement.

studies. GLA observations confirm the assessment by Noss that this is not a viable corridor for mountain lions.

GLA also investigated the potential movement between Tujunga Wash and the northern subarea of the project site along the north side of the I-210. No evidence of wildlife movement, including coyote scat or tracks, was detected on the north side of the I-210 Freeway between Tujunga Wash and the northwest corner of the project site. Examination of Exhibits 2 and 4 show that the north side of the I-210 between Tujunga Wash and the project site (a distance of nearly 4,000 feet) exhibits dense development and no open space. At some locations, barriers such as fences along the I-210 make access very difficult for animals, which would explain the complete lack of wildlife sign on the north side of the I-210.

In the unlikely event that an animal was able to reach the northern subarea of the project site from the Tujunga Wash, it could potentially access the main body of the Verdugo Mountains by traveling west along La Tuna Canyon Road under the I-210. However, no regional movement could occur either to the north or to the east. Limited local movement is possible to the east along La Tuna Canyon Road, which could be accessed from the eastern portion of the project site or from the Duke Property. However, an animal moving along La Tuna Canyon Road to the east would encounter heavily developed areas that begin at the intersection of La Tuna Canyon Road and Tujunga Canyon Boulevard. Animals reaching this intersection would not move farther to the east because of the existing developed residential areas and a complete lack of native habitat that would either attract them or provide potential dispersal routes. From the La Tuna Canyon Road/Tujunga Canyon Boulevard intersection, movement to the south is blocked by fencing and the I-210, which means that access to the main body of the Verdugo Mountains is precluded from here. Similarly, movement to the north from this intersection is precluded by existing residential and commercial development. There is also a golf course at the northwest corner of this intersection, which does not provide a movement path either to the north or west due to fencing that completely surrounds it.

An animal that reaches the northern subarea of the project site would also be limited in its movement to the west. Existing development to the west of the project site, which gradually increases in density as one moves to the west, ultimately precludes anything more extensive than localized movement in this direction. Accordingly, neither the project site nor the Duke Property contributes to an east-west regional movement corridor.

5.2 Local Movement

5.2.1 La Tuna Canyon Wash

La Tuna Canyon Wash originates east of the project site boundary between La Tuna Canyon Road and I-210 as a dry, ephemeral drainage that is only a few feet wide [Exhibit 2 depicts the beginning of the drainage with a symbol consisting of a blue-line]. The drainage increases in size at the confluence with Drainage 4, approximately 1,300 feet west of the eastern project site boundary [see Exhibit 2].

As discussed above, La Tuna Canyon Wash exhibits potential as a “component” of a potential regional movement corridor; however, it appears, based upon field observations, that La Tuna

Canyon Wash supports only local movement. Coyotes and raccoons were the only species for which sign was detected. La Tuna Canyon Wash begins about 1,300 hundred feet east of the eastern project site boundary and existing fencing, within the Caltrans right-of-way between La Tuna Canyon Road and the I-210 restricts east to west (and west to east) movement. Movement is possible to the east from the eastern edge of the project site along La Tuna Canyon Road; however, as discussed above, this is essentially a “dead end” for any animals that move along La Tuna Canyon Road to the east from the project site or from the Duke Property.

Animals that reach La Tuna Canyon Wash or La Tuna Canyon Road from the project site or from the Duke Property are also limited in their movement to the west. As discussed above, existing development to the west of the project site, which gradually increases in density as one moves to the west, ultimately precludes anything more extensive than localized movement in that direction.

5.2.2 Drainage 4

GLA studies indicate that Drainage 4, which originates immediately below (south of) Verdugo Crestline Drive, supports only local movement along the eastern boundary of the project site north of I-210 [Exhibit 2]. Existing residential development is situated along the entire eastern edge of this drainage and coyotes and raccoons were the only species detected using this drainage. GLA established track stations where Drainage 4 intersects a large fill slope constructed during grading for the I-210 and discharges into two culverts. No movement was detected through either culvert. Drainage 4 is expected to provide only local movement along the eastern boundary of the project site. From Drainage 4, animals can move into the existing development to the east of Drainage 4 or toward the Duke Property using Tributary 4.9 (see Section 5.2.6, below, for an expanded discussion on potential movement through the Duke Property).

5.2.3 Drainage 14

GLA studies indicate that Drainage 14 supports movement of coyote and limited movement by mule deer along the western boundary of the project site. This drainage and associated oak woodland provides the most direct connection between the northwest corner of the project site and La Tuna Canyon Wash to the south. While no evidence of regional movement was detected, this movement path provides a component segment of the potential connection between the main body of the Verdugo Mountains south of the project site and the Tujunga Wash north of the project site. Thus, Tributary 14 provides local movement and at least the potential for movement through the project site between the main body of the Verdugo Mountains and Tujunga Wash.

5.2.4 Verdugo Crestline Drive

Verdugo Crestline Drive supports local movement by gray fox and coyote and at least limited movement by mule deer along the northern edge of the project site. Based on the amount of scat, both coyote and gray fox exhibited moderate to heavy use of this movement path, although it is difficult to determine the actual number of animals using this road for movement. The Verdugo Crestline Drive movement path leads directly into existing residential development to the northwest and the east. While it is possible for animals to move east and then into Drainage 4 (as

discussed in Section 5.2.2, above), movement beyond this is severely restricted by I-210. Animals moving to the northwest run into existing development and movement along the north side of I-210 is limited by fencing and development, which accounts for the general lack of sign on the north side of I-210.

5.2.5 Northwest to Southeast Movement

The local movement areas described above constitute specific areas that are either used or potentially used for local movement through the project site. For example, Verdugo Crestline Drive provides an opportunity for coyotes or gray fox to move from the northwest corner of the project site along the northern site boundary to developed areas located east of proposed Development Area A. Animals may also travel along much shorter segments of Verdugo Crestline Drive, covering distances of only a few hundred feet or yards moving from habitat patch to habitat patch. However, extended local movement through the project site from northwest to southeast or southeast to northwest is currently severely restricted by the substantial northeast to southwest trending ridgelines and alternating deep canyons in conjunction with the dense chaparral that occupies much of the project site. This is the case for areas within the project site on both the north and south sides of I-210.

5.2.6 Duke Property

Local movement by coyote was detected on the Duke Property, primarily along the ridge road that traverses the central portion of that site in a generally south to north direction. Local movement on or through the Duke Property is limited by adjacent development to the north and east and by La Tuna Canyon Road and the I-210 to the south. Limited areas of open space occur immediately east of the Duke Property, along La Tuna Canyon Road. Animals originating in this area could move through the Duke Property, reaching Tributary 4.9, which would provide access to Drainage 4. From Drainage 4, these animals could then access the eastern portion of the project site. Animals originating in the eastern portion of the project site could move in the reverse direction, through the Duke Property to the limited areas of open space to the east; however, movement to the east or south of the Duke Property is entirely cut off by existing development, La Tuna Canyon Road and I-210.

5.3 Species-Specific Movement Results

A 1993 report summarizing local agency records of road kills and wild animals in the Verdugo Mountains noted the presence of coyote, mule deer and other small mammals only.²⁸ Mountain lions, bobcats, gray fox and badgers were not noted in the study.

GLA studies, conducted from March to November 2002, either directly observed or observed sign of coyote, gray fox and mule deer. GLA biologists noted local residents' observations of

²⁸ Swift, C., A. Collins, H. Gutierrez, H. Lam, and I. Ratiner. 1993. Habitat linkages in an urban mountain chain. In *Interface between ecology and land development in California*. Edited by J.E. Keeley. Southern California Academy of Sciences, Los Angeles, summarizing records of the Los Angeles County Department of Animal Control and Los Angeles County Department of Sanitation.

bobcat and badgers, but GLA found no sign of these animals. GLA studies detected no evidence of mountain lion, nor was any evidence of mountain lion activity reported to GLA biologists.

5.3.1 Mountain Lion (*Felis concolor*)

Site surveys, extensive review of literature, and personal communications with experts on mountain lions in southern California indicate that mountain lions do not currently use the Verdugo Mountains.^{29, 30}

(a) Regional Movement

Historically, the Verdugo Mountains were likely used by mountain lions. However, isolation by development of the Los Angeles Basin and the construction of I-210 has severed the Verdugo Mountains from blocks of habitat of sufficient size to support mountain lions. As discussed above, the only possible way a mountain lion could reach the Verdugo Mountains is through the Tujunga Wash (north or south fork). However, as noted by Reed Noss, the connectivity between the Tujunga Wash and the Verdugo Mountains is “tenuous at best” and has more accurately been described as a “Missing Link” rather than an actual link. Furthermore, in order for a mountain lion to travel from Tujunga Wash to the project site, it would have to travel over one-half mile and overcome a series of man-made obstacles. As discussed above, individual coyotes and gray foxes may be using part, or all, of this tenuous corridor, and it appears that they are familiar with the specific locations where they can pass through yards and or through/under fences. In the unlikely event that a mountain lion reached the Missing Link area from Tujunga Wash, it would not likely find these specific locations and would be too large to "squeeze" through these passageways.

In the very unlikely event that a mountain lion surmounts these obstacles and manages to reach the northwestern portion of the project site, then, as discussed above, the mountain lion could travel in a southerly direction along Drainage 14 (or the extensive open space areas on both sides of Drainage 14) to La Tuna Canyon Wash, and then either across La Tuna Canyon Road or through one of the many culverts beneath La Tuna Canyon Road into the open space owned by the Santa Monica Mountains Conservancy on the south side of La Tuna Canyon Boulevard.

Finally, even if a mountain lion managed to reach the main body of the Verdugo Mountains as described above, the area would not represent suitable habitat due to the limited area relative to home range requirements and the low density of mule deer, the main food source for the mountain lion. That this is not a likely event is confirmed by Paul Beier, who suggested that, at best, "[w]ith excellent connectivity, it could be a useful part of a home range for an individual

²⁹ Edelman, Paul. 2002. Personal Communication with Jeff Ahrens of GLA via email regarding lack of Mountain Lion sightings in Verdugo Mountains.

³⁰ Beier, Paul. 2002. Personal Communication with Jeff Ahrens of GLA via email regarding lack of radio-collared Mountain Lions in Verdugo Mountains.

animal or two." However, as noted above, the Tujunga Wash to Missing Link movement path is tenuous at best.³¹

(b) Local Movement

There is no potential for local movement by mountain lions on the project site or the adjacent Duke Property due to (1) a lack of regional connectivity that would provide for connection to the site and (2) due to food sources (i.e., mule deer) on the project site or the adjacent Duke Property.

5.3.2 Mule Deer (*Odocoileus hemionus*)

Over the course of the GLA biological studies, evidence of mule deer presence was recorded in only two areas of the project site, and both of those areas were outside of proposed Development Areas. The first occurrence was a set of mother and fawn tracks observed north of I-210 along the firebreak road that extends along the northern edge of the project site. The second observation was recorded south of the I-210 in Drainage 14, which offers unrestricted access from La Tuna Canyon Wash northwest to the northwest corner of the project site and continues offsite on a fire break road [Exhibit 2 depicts these locations]. Mule deer were observed numerous times in the La Tuna Canyon Park area immediately above the visitor parking areas walking on established trails within chaparral. No evidence of mule deer sign was observed within Development Areas A and B on either side of I-210. Although no evidence of mule deer sign was observed in Development Area B on the south side of I-210, it is expected that mule deer visit this area from time to time by crossing La Tuna Canyon Road.

(a) Regional Movement

As noted above, the Verdugo Mountains are completely isolated from other large blocks of habitat and mule deer appear to have been reduced substantially within areas north of I-210. Areas south of La Tuna Canyon Road appear to support mule deer in higher numbers. The Verdugo Mountains do not provide any connection between other larger habitat blocks. There was no evidence of deer movement in the potential Missing Link/Tujunga Wash regional corridor. Dead mule deer were recorded and documented in urbanized portions of the Study Area by Swift in 1993 both to the east and west of the project site and the Duke Property. However, mule deer will typically move into urban areas occurring at the wildland interface to feed on landscape plants and herbs. The road-killed mule deer recorded by Swift likely represent foraging individuals rather than dispersing or migrating individuals.

³¹ As discussed above, the scientific literature and the third-party experts consulted by GLA uniformly state that the Verdugo Mountains no longer represent meaningful or viable habitat for the mountain lion, and that no mountain lion or their sign have been observed or detected for many years. As also discussed above, GLA detected no evidence of mountain lions in the Study Area. It should be noted, however, that in a May 19, 1998 article in the Los Angeles Times, a reporter indicated that he observed a mountain lion track at an unspecified location in the Verdugo Mountains. If this anecdotal statement is accurate (which may or may not be the case), it indicates that it remains possible, albeit very difficult and uncommon, for a mountain lion to reach the Verdugo Mountains.

(b) Local Movement

Local movement of mule deer - likely attributable to foraging individuals - is extremely limited as indicated by the low number of individuals actually occurring on the project site and no sign at all on the Duke Property. As noted above, the only local movement of mule deer was observed along Drainage 14 and to a lesser extent in the area along Verdugo Crestline Drive.

5.3.3 Bobcat

Bobcats were not detected at any time on the project site, the Duke Property, or elsewhere in the Study Area, including track stations. However, presence of appropriate habitat for and local observations of bobcats³² indicate that bobcats may occur on the project site and access Drainage 14 from areas south of project site. It is fully expected that bobcats cross Verdugo Crestline Drive to and adjacent undeveloped areas. Like coyotes, bobcats are able to coexist with human development and are able to subsidize their diet with increased rodent populations that often occur and thrive along the urban/wildland interface.

(a) Regional Movement

As previously discussed, the Verdugo Mountains retain little regional connectivity to other large blocks of habitat. It is possible that bobcats could use the potential Tujunga Wash/Missing Link corridor for regional movement to and from the project site as well as Drainage 14 and La Tuna Canyon Wash. However, GLA biologists did not observe any evidence of bobcats using any of segments of this potential regional movement path.

(b) Local Movement

Bobcats that occupy areas to the north of I-210 can move to the north, east and/or west to the limits of existing development. Verdugo Crestline Drive would be a likely east-to-west route through the project site. I-210 presents a significant barrier to southward movement, and bobcats may only cross the I-210 by (1) crossing the eight-lane freeway, with a high potential for being killed or injured, (2) using existing culverts associated with Drainages 4 or 5 (which is very unlikely due to lengths in excess of 1,500 feet), or (3) using the La Tuna Canyon Road underpass of the I-210 (the most likely location for southward movement). No evidence of local movement through the Duke Property was detected; however, there is at least limited potential for bobcat to use portions of the Duke Property for local movement to and from the project site.

5.3.4 Coyote

GLA studies indicate that coyotes are still common in the Verdugo Mountains where areas of open space occur adjacent to residential development. Coyotes commonly use residential streets at night or during early morning hours as they move in and out of residential neighborhoods in search of prey or other dietary components/subsidies. Coyotes were the most commonly

³² In all of the reported observations, the bobcats were reportedly observed in close proximity to existing residences and in a few cases observed within the yards.

detected mammal within the Study Area, occurring almost entirely on existing trails, ridgelines and fire roads [Exhibit 3, Photographs 1-10 and 35-37]. GLA studies conducted on the project site and Duke Property identified a number of paths used by coyotes [Exhibit 2]. Coyotes likely use portions of the project site as local corridors when moving in and out of adjacent neighborhoods and it was presumed that coyotes occasionally move through the project site and/or Duke Property as they disperse to other areas, often using roads or residential areas.

The wildlife movement studies also indicate that coyotes and raccoons are the only species that regularly utilize the major drainages (i.e., Drainage 4 and La Tuna Canyon Wash) for local movement on the project site.

(a) Regional Movement

As discussed above, the Verdugo Mountains are an isolated island and provide no connection between other large blocks of habitat and therefore provide no regional connectivity for the coyote. As noted for the mountain lion, mule deer and bobcat, the only connection, albeit tenuous, between the Verdugo Mountains and other blocks of open space is through Tujunga Wash/Missing Link corridor. Despite its tenuous condition, unlike mountain lions and mule deer, coyotes are able to use the "Missing Link" between Tujunga Wash and the northwest corner of the project site. Because of the high level of adaptability exhibited by the coyote and their ability to operate and thrive at the wildland/urban interface, the provision of a corridor for coyotes is unnecessary.

(b) Local Movement

As depicted on Exhibit 2, coyotes are common within the project site and Duke Property and move between portions of the Study Area, including existing residential areas, freeway undercrossings and arterials, and the project site itself without any apparent restrictions.

5.3.5 Gray Fox

Gray foxes were detected in the Study Area entirely by scat evidence both north and south of I-210. Gray foxes were detected at Track Station 4 and south of La Tuna Canyon Road in close proximity, but above, Track Station 9 [Exhibit 2]. Concentrations of scat were detected along Wentworth Street, both north and south of I-210, and also long Verdugo Crestline Drive (north of I-210). The majority of fox scat showed a high percentage of large seed pits indicative of forays into residential areas.

(a) Regional Movement

As discussed above, the Verdugo Mountains are an isolated island and the only possible connection, albeit tenuous, between the Verdugo Mountains and other blocks of open space is through Tujunga Wash. Like coyotes, grey foxes appear to be resourceful enough to use the "Missing Link" between Tujunga Wash and the northwest corner of the project site. Gray foxes likely continue navigating the Tujunga Wash area because, although not as adaptable as the coyote, gray foxes are able to survive at the wildland/urban interface.

(b) Local Movement

As depicted on Exhibit 2, gray foxes occur within the project site and move between portions of the Study Area, primarily along Verdugo Crestline Drive. No evidence of gray fox use was recorded on the Duke Property. GLA biologists noted seeds from non-native landscape species within fox scat, indicating that the foxes are using residential areas to subsidize their diet.

5.3.6 American Badger

There was no direct observation of badgers or detection of badgers sign within the project site or elsewhere in the Study Area. No observations of badgers, large ground-squirrel complexes or evidence of badger activity (including excavated burrows or dens) were recorded. In particular, the Development Areas were thoroughly traversed during the performance of the wildlife movement studies, California gnatcatcher surveys, tree surveys, reptile surveys, botanical surveys and jurisdictional delineations. Although GLA biologists did not detect badgers or their sign within the Study Area, the badger is expected to occur within the Study Area, albeit in low numbers. One local resident reported a badger observation to one of the GLA biologists as occurring north of the Duke Property near Tranquil Drive, within the confines of an existing residential area. GLA biologists noted very low occurrences or evidence of California ground squirrels, pocket gophers, woodrats or Audubon's cottontails on both north and south portions of the project site and on the Duke Property, which means that potential food sources for the American badger are not present in quantities that would support substantial numbers. Combined with the overall lack of suitable habitat (i.e., open areas with friable soil that allows burrow creation) and the low availability of food sources, it is not expected that American badgers are common on the project site or the Duke Property.

(a) Regional Movement

As discussed above, the Verdugo Mountains retain little regional connectivity to other large blocks of habitat. There is no indication that badgers are using the Tujunga Wash area for regional movement, nor is there indication that badgers would be inclined to do so.

(b) Local Movement

Badgers typically occupy open areas and, as such, much of the project site represents sub-optimal habitat. The only marginally suitable habitat for badgers occurs near the east end of the project site including offsite areas associated with existing residences, where fuel modification zones and other areas that have been cleared of dense chaparral are found. This would be consistent with the observation of a badger in the adjacent neighborhood. Other suitable areas occur in more open coastal sage scrub near the west end of the project site.

6.0 IMPACTS

There would be no significant impacts to regional or local wildlife movement associated with the proposed development on the project site.

6.1 Missing Link/Tujunga Wash

The project site is located almost two miles south of the Tujunga Wash/Missing Link connection identified by the Missing Links Conferences as Missing Link # 27. The proposed development on the project site would not affect this connection in any manner, either directly or indirectly. As discussed above, animals that successfully traverse this connection and reach the project site could then reach the main body of the Verdugo Mountains south of La Tuna Canyon Road through the Drainage 14 movement path (or the large swath of open space surrounding Drainage 14) and La Tuna Canyon Wash, both of which are located on the project site. As discussed in more detail below, neither Drainage 14, the open space in the western portion of Development Area B, nor La Tuna Canyon Wash would be affected by the proposed project, as those features would be retained in open space. As such, the ability (albeit tenuous) of the Tujunga Wash/Missing Link connection to provide for regional movement would not be affected by the project.

6.2 La Tuna Canyon Wash

Construction of Development Area B would not require either placement of fill or installation of culverts within La Tuna Canyon Wash. The proposed project does include the construction of two span bridges over La Tuna Canyon Wash, which, among other things, will permit the continued undisturbed passage of wildlife through this reach of the drainage. Thus, there would be no impact to wildlife movement to this movement path, so that local wildlife movement would be unaffected by construction of the proposed project. To the extent that La Tuna Canyon Wash serves as a segment in the potential Tujunga Wash-Missing Link-Drainage 14-La Tuna Canyon Wash corridor, such function would also be unaffected by the proposed project.

It is also important to note that there would be no changes to the existing culverts beneath La Tuna Canyon Road that currently connect La Tuna Canyon Wash with the canyons to the south in La Tuna Canyon Park. Construction within Development Area B would in no way restrict the ability of animals to cross La Tuna Canyon Road or move through the existing culverts under La Tuna Canyon Road.

6.3 Drainage 14

Drainage 14 would be preserved within the open-space portion of the project site, over 2,000 feet from the edge of the proposed development. There would be no impacts to local wildlife movement along this movement path and the ability of this feature to function as a segment of the potential Tujunga Wash-Missing Link-Drainage 14-La Tuna Canyon regional corridor would not be affected by construction within the Development Areas.

6.4 Drainage 4

As described above, Drainage 4 is used only for local movement in between the area of existing development east of the project site and proposed Development Area A. To the extent that regional movement occurs on the project site, it occurs only on the south side of I-210 along Drainage 14 (or the open space area surrounding Drainage 14) and in La Tuna Canyon Wash (or along or across La Tuna Canyon Road). Development of the site would not affect Drainage 14, La Tuna Canyon Wash or La Tuna Canyon Road. Drainage 4 would be subject to partial grading

for roadway construction, slope stabilization and construction of a multi-purpose wetland/water quality basin at the southern end of the drainage, before the drainage reaches the culvert inlet that allows discharge to pass beneath the I-210. One bridge would be constructed across Drainage 4 to allow a road crossing necessary for traffic circulation through this part of the site. The proposed bridge/roadway would be located immediately upstream of the constructed multi-purpose wetland/water quality basin and neither the road crossing nor the constructed wetland basin would affect the ability of coyotes and raccoons (the only other species identified as using this Drainage) to use this local movement path. Instead, they retain its function as a local movement path (and potentially enhance its function as a local movement path).

Since this feature (Drainage 4) does not provide for regional movement, the proposed bridge construction and creation of a multi-purpose wetland/water quality basin would not affect regional movement in any manner.

6.5 Verdugo Crestline Drive

The western portion of Verdugo Crestline Drive would remain in its current state, while the eastern portion may be paved as part of an emergency access road, generally along the existing alignment. Coyotes and gray foxes, both of which were detected using this local movement path, will easily adapt to this change in the character of Verdugo Crestline Drive. The project design preserves the existing roadway and therefore would not significantly affect the ability of these species to use this portion of the project site. Movement paths in the vicinity of Verdugo Crestline Drive, along the northern edge of the Development Area A and outside the boundaries of the project site, would also be preserved. In addition, to the extent that local movement occurs along or in the vicinity of the transmission line right-of-way owned by Southern California Edison, it would continue to occur in the post-project condition.³³

6.6 Northwest to Southeast Movement

As noted in Sections 6.1 through 6.5, above, the proposed project would not result in impacts to regional or local movement corridors, including Tujunga Wash, the Missing Link connection, and the four on-site movement corridors (i.e., La Tuna Canyon Wash, Drainage 14, Drainage 4 and Verdugo Crestline Drive) discussed throughout this study. As discussed in Section 5.2.5, above, no movement patterns were detected from the northwest to southeast (or southeast to northwest) on either side of the I-210 by any of the large mammals discussed in this study, presumably because such movement is severely restricted by the alternating deep canyon and protruding ridgelines that are covered with dense chaparral. As such, construction within either Development Area A or B would not disrupt movement because such movement is very uncommon (if it occurs at all).

³³ As noted above, steep topographic and dense vegetation characterize the existing condition along the transmission line right-of-way and, as such, local wildlife movement is limited or essentially non-existent. During project construction, there will be some grading for roads within the right-of-way, which will actually result in creation of a potential path for very localized movement through this portion of the project site.

Nevertheless, both Development Areas A and B will include movement paths that would allow for local movement by coyotes, bobcats, gray foxes and badgers through the proposed Development Areas. Exhibit 5 depicts the routes (designated as Corridors A and B) that would be available for local movement.

6.7 Duke Property

Wildlife movement on the Duke Property is limited to two areas. The first area is an access road that provides a connection for coyotes between developed areas north of the Duke Property with La Tuna Canyon Road (and potentially, the La Tuna Canyon Road undercrossing of the I-210, leading to the main body of the Verdugo Mountains). The access road exhibited sign of coyote, as shown on Exhibit 2 by the numerous overlapping blue dots that represent locations of coyote scat. A fire break provides a limited connection between the Duke Property and the project site slightly west of the access road and is also marked by locations of coyote scat. As discussed in Section 5.2.6, above, limited movement to the east by animals that originate on the project site or on the Duke Property is possible; however, such movement is severely restricted by development to the located east of Tujunga Canyon Boulevard. First, animals that exit the Duke Property to move east along La Tuna Canyon Road encounter heavily developed areas that begin at the intersection of Tujunga Canyon Boulevard and La Tuna Canyon Road. Animals that reach this intersection cannot move farther to the east because of heavily developed residential areas. Similarly, animals that reach this intersection cannot move to the north because of heavily developed residential and commercial areas. From the intersection, movement to the south is blocked by fencing and the I-210, so that access to the main body of the Verdugo Mountains is precluded. Development of the proposed project would not affect the limited north-south local movement by animals on the Duke Property, nor would it affect any regional east-west movement through the Duke Property because no such movement occurs under existing conditions.

6.8 Mountain Lion

As discussed in Section 5.3, above, mountain lions do not currently inhabit the Verdugo Mountains. The only potential linkage with an area that supports the mountain lion (i.e., the San Gabriel Mountains) is Tujunga Wash. However, as discussed above, the linkage between Tujunga Wash and the Verdugo Mountains is "tenuous at best" and has been characterized as a "Missing Link" (see Section 5.1.2, above, for a detailed description of this "connection"). In any event, the development of the proposed project would not affect this potential linkage in any manner because it is not located on the project site and the proposed Development Areas are located over two miles away (Tujunga Wash is depicted on Exhibits 2 and 3, and the "Missing Link" is depicted on Exhibits 2, 3, and 4 as well).

If a mountain lion or other large mammal moved from the Tujunga Wash environs through the "Missing Link" and reached the project site on the south side of I-210, it would come to preserved open space. From this point, there is an existing movement corridor along Drainage 14 (or the significant open space that surrounds Drainage 14) that connects to La Tuna Canyon Wash. Drainage 14 would not be affected by the proposed development because it is located at least 1,800 feet from proposed Development Area B. In addition, La Tuna Canyon Wash will be fully bridged and therefore unaffected by the proposed construction of Development Area B. As

such, in the highly unlikely event that a mountain lion gains access to the northwest corner of the project site by any means, it would continue to have unobstructed access to the main body of the Verdugo Mountains across La Tuna Canyon Wash and La Tuna Canyon Road.

6.9 Mule Deer

As discussed above, no mule deer were detected within the proposed Development Areas for the proposed project, and there was no evidence of any kind of mule deer movement through the proposed Development Areas. There is currently very limited use by mule deer of Drainage 14 in the southern portion of the project site, but the proposed development would not affect that limited local movement because Drainage 14 will remain in open space well removed from areas of potential development. Thus, there would be no impact to mule deer movement associated with the proposed project.

6.10 Bobcat

As discussed in Section 5.3.3, above, GLA studies detected no evidence of bobcats or their sign within the Study Area, though local residents reported observations of bobcat. Although GLA studies did not identify any movement by bobcats through the site or at access points to the project site or Duke Property, it may be expected that a limited number of bobcats would utilize the same movement path as those used by coyotes.³⁴ Based on documented home range sizes for bobcats in southern California reported by Lyren (as referenced in footnote 33), it not expected that more than a few bobcats inhabit the entire project site and Duke Property, which cover approximately 1.5 square miles. This conclusion is based on the fact that male bobcats typically exhibit ranges that vary between 0.8 and 2.5 square miles and female ranges averaging about 0.6 miles.

Regardless of the number of bobcats on the site or in adjacent areas, regional movement between Tujunga Wash and the main body of the Verdugo Mountains would not be affected by the project. As noted above, Development Area A is approximately two miles from the Tujunga Wash/Missing Link connection with no direct or indirect impacts to either. Based on the finding of Lyren that bobcats will readily cross streets and move through underpasses, it is expected that bobcats could traverse the Missing Link area between Tujunga Wash and the northwest corner of the project site. If a bobcat reached the project site, it would be able to travel through Drainage 14 (or the significant open space surrounding Drainage 14) and La Tuna Canyon Wash to access the main body of the Verdugo Mountains by crossing La Tuna Canyon Road or through one of the several culverts under La Tuna Canyon Road. Bobcats moving from the main body of the Verdugo Mountains could reach Tujunga Wash by traversing the same path in reverse. In addition, development of the proposed project would retain existing culverts associated with Drainages 4 and 5, which allow potential undercrossing of I-210, although GLA detected no such use and considers it very unlikely due to the extreme length of the culverts.

³⁴ Lyren, L.M. 2001. *Movement Patterns of Coyotes and Bobcats Relative to Roads and Underpasses in the Chino Hills of Southern California*. Master Thesis Present to Faculty of California State Polytechnic University, Pomona.

With respect to local movement, bobcats will continue to be able to use Verdugo Crestline Drive as a likely east-west path through the project site. Unlike larger mammals such as mule deer and mountain lions and, to a lesser degree, coyotes, bobcats could also use the SCE transmission line right-of-way for local east-west travel, at least to the extent that they use it under existing conditions. Drainage 14 (and the rest of the project site west of Development Area B) will be preserved in open space, so that local travel along the western edge of the project site (south of I-210) will be maintained. La Tuna Canyon Wash will be bridged so that movement along this path will be maintained, and there will be no changes to the existing culverts beneath La Tuna Canyon Road that would affect the ability of bobcats to move back and forth across La Tuna Canyon Road. The corridor functions of Drainage 4 will be maintained through creation of a multi-purpose wetland/water quality basin in conjunction with bridging for a roadway over Drainage 4. Finally, as depicted on Exhibit 5, in the post-development condition, movement paths will be available through both Development Areas A and B (designated as Corridors A and B), allowing animals to move from west to east and east to west (although, as noted in Section 5.2.5, above, such movement is likely limited due to the severe topography and dense chaparral that would cause animals to depend on the other corridors described throughout this study). Thus, there would be no significant impacts to local bobcat movement associated the development of the proposed project.

6.11 Coyote

As discussed in Section 5.3.4, above, GLA studies detected coyotes and coyote sign throughout the project site, including Verdugo Crestline Drive, Drainage 4, Drainage 14 and La Tuna Canyon Wash. Coyote use of the Duke Property was also common. Coyote regional movement between Tujunga Wash and the main body of the Verdugo Mountains would not be affected by the project. As noted above, Development Area A is approximately two miles from the Tujunga Wash/Missing Link connection with no direct or indirect impacts to either. Based on the finding of Lyren, who found that coyotes will readily cross streets and move through underpasses and GLA's observations of coyote scat within the potential "Missing Link" pathways, it is expected that coyotes could traverse the "Missing Link" between Tujunga Wash and the northwest corner of the project site. If a coyote reached the project site, it would be able to travel through Drainage 14 (or the extensive open space on both sites of Drainage 14) and La Tuna Canyon Wash to access the main body of the Verdugo Mountains from La Tuna Canyon Wash. Once they reach La Tuna Canyon Wash, coyotes can travel within the Wash, crossing La Tuna Canyon Road either through one of many culverts (as discussed above, all four track stations installed for the study exhibited use by coyote) or across La Tuna Canyon Road. Coyotes moving from the main body of the Verdugo Mountains could reach Tujunga Wash by traversing the same path in reverse. In addition, development of the proposed project would retain existing culverts associated with Drainages 4 and 5, which allow potential undercrossing of I-210, although GLA detected no such use and considers it unlikely due to the extreme length of the culverts.

With respect to local movement, coyotes will continue to be able to use Verdugo Crestline Drive as a likely east-west path through the project site. Drainage 14 and the surrounding open space will be preserved in so that local travel through the southwest portion of the project site (south of I-210) will be maintained. La Tuna Canyon Wash will be bridged, so that movement along this path will be maintained, and there will be no changes to the existing culverts beneath La Tuna Canyon Road affecting the ability of coyotes to move back and forth across La Tuna Canyon

Road. The corridor functions of Drainage 4 will be maintained through creation of a wetland/water quality basin in conjunction with bridging of the drainage to allow traffic circulation without affecting potential wildlife movement. In addition, as noted above and depicted on Exhibit 5, east-west movement paths through Development Areas A and B would be available (although there is no evidence suggesting that coyotes use these areas due to the steep terrain and dense chaparral). Finally, coyotes currently roam freely between portions of the Study Area, including existing residential areas, roadway undercrossings, and arterials without any apparent restrictions. Therefore, the proposed development of the project site would not, in any event, result in a measurable reduction in the ability of coyotes to move through the project site or the Duke Property. Thus, there would be no significant impact to local coyote movement associated the development of the proposed project.

6.12 Gray Fox

As discussed in Section 5.3.5, above, GLA studies detected fox usage on the project site mainly along Verdugo Crestline Drive, which will only be minimally impacted by the proposed development. Offsite use within the Study Area was concentrated at the “Missing Link” connection on the hillside immediately south of Wentworth Street.

Regional movement of the gray fox would not be precluded, as it is clear, based upon scat observations, that the gray fox can potentially traverse the “Missing Link” area. The analysis provided for the mountain lion, bobcat, and coyote is fully applicable to the gray fox in considering potential impacts to regional movement associated with the project. Based upon the analysis provided above, there would be no impacts to regional movement by the gray fox associated with the project.

Similarly, local movement by the gray fox would not be affected by the project for the reasons set forth in Sections 6.8 and 6.9, above, regarding potential impacts on bobcats and coyote. Like the bobcat, the gray fox exhibits some potential for using the dense chaparral within the SCE transmission line right-of-way for local movement in the existing condition and with the expected improvements (i.e., grading for roads) could use this area in the post project condition. Also, as discussed for coyote and bobcat, the gray fox would also have Corridors A and B (depicted on Exhibit 5) available for use through the Development Areas in the post-project condition.

6.13 American Badger

As noted in Section 5.3.6, above, GLA studies did not observe badgers nor detect sign of badgers, including their distinctive burrows. Badger use of the project site is likely limited, as they prefer open habitats to dense shrublands that dominate most of the project site. However, one local report of a badger observation within the adjacent eastern residential area is likely based on the favorable (though very limited) areas of habitat, consisting of cleared or sparsely vegetated areas that have the potential to attract this species.

Regional movement would not be affected. The analysis provided above for the mountain lion, bobcat, and coyote is fully applicable to the American badger in considering potential impacts to

regional movement associated with the project. Based on that analysis, there would be no impacts to regional movement by the American badger associated with the project.

Similarly, local movement by the American badger would not be affected by the project for the reasons set forth in Sections 6.8 and 6.9, above, regarding potential impacts on bobcats and coyote. In particular, badgers are potentially attracted to development areas, possibly due to subsidies associated with high rodent populations along the urban edge. For that reason, badgers already appear to move freely in and out of the existing residential areas to the north and east of proposed Development Area A. Therefore, it is not expected that the proposed development would impact the ability of this species to move locally through the project site.

7.0 MITIGATION/RECOMMENDATIONS

7.1 Regional Movement

Regional movement between the San Gabriel Mountains and the main body of the Verdugo Mountains may at least be possible through the potential Tujunga Wash-Missing Link-La Tuna Canyon Wash corridor, although the ability of large mammals to traverse the “Missing Link” portion of this connection is tenuous at best. In any event, the proposed project would not affect Tujunga Wash or the “Missing Link” areas because these areas are not on the project site. In addition, Drainage 14, and the significant areas of open space around it, will be preserved after the construction of the project and linkages with La Tuna Canyon Wash will remain in place. Similarly, La Tuna Canyon Wash will be preserved.

As such, development of the project site would in no way alter potential existing regional connections to the north and south of the project site. Since the potential connections will remain unaffected, mitigation for potential impacts on regional movement is unnecessary.

In addition to the preservation of the potential connections that comprise the segments in the potential regional linkage, additional potential local corridors will be available through both Development Area A and Development Area B. As discussed in Section 5.2.5, above, the corridor study did not detect movement patterns from the northwest to southeast on either side of the I-210 (or southeast to northwest) because the severe topography consisting of generally northeast to southwest trending ridges and valleys do severely restrict such movement. Rather, both potential regional movement and local movement occur along the four local movement paths described throughout this report (i.e., La Tuna Canyon Wash, Drainage 4, Drainage 14, and Verdugo Crestline Drive). Nevertheless, a potential movement path will be provided through the central portion of Development Area A, connecting open space on the north and west to Drainage 4 and the Duke Property, as depicted on Exhibit 5. Similarly, a potential local movement path will be provided through the central portion of Development Area B, connecting open space on the north and west to La Tuna Canyon Wash, also depicted on Exhibit 5. Also, the proposed Equestrian Trail depicted on Exhibit 5 will provide another potential movement path between open space areas associated with the western half of the project site through Development Area B, ultimately connecting to La Tuna Canyon Wash.

7.2 Local Movement

Mountain lion are not present and mule deer are rarely, if at all, present within the project site. Therefore, the proposed project would have no impact on local movement for these species and mitigation is unnecessary.

Species more commonly present (coyote and gray fox) and those possibly present (bobcat and badger) can easily adapt their movement patterns to the wildland/urban interfaces that remain after development of the proposed project. Since no significant impacts are expected to the local movement pathways, no mitigation is necessary. Nevertheless, it is recommended that the proposed project should incorporate the following design features in order to minimize further any potential impacts on local movement:

- Lower-intensity lighting for the bridges that cross La Tuna Canyon Wash and Tributary 4
- Lower-intensity lighting along paved portions of Verdugo Crestline Drive if Verdugo Crestline Drive is improved for an emergency access road
- Incorporate native vegetation along equestrian trail edges
- Incorporate native vegetation into the streetscape along Verdugo Crestline Drive, if Verdugo Crestline Drive is improved for an emergency access road
- Maintain openings in walls at key locations within the Development Areas to maintain local movement paths.

8.0 CONCLUSIONS

A comprehensive analysis of the Study Area, including detailed field investigations and a thorough review of literature that addresses wildlife movement within both the Study Area and the project site, determined that there would be no impact to potential regional movement associated with construction of the proposed project. Furthermore, local wildlife movement corridors identified within the project site and the adjacent Duke Property would not be affected by the proposed project.