Appendix D

Biological Resources Constraints Report

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March 13, 2019

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VIA EMAIL
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Subject: Biological Resources Constraints Report for Long Range Development Plan at University of California, Riverside

Dear Ms. Thrasher:

This Letter Report presents the findings of a biological resources assessment for the University of California, Riverside's (UCR's) Long Range Development Plan (LRDP). The purpose of the survey was to evaluate potential biological constraints on future development implemented as part of the LRDP.

PROJECT DESCRIPTION AND LOCATION

The current LRDP in use by the campus was last updated in 2011 and bases its land use assumptions on a projected maximum population of 25,000 students. The LRDP is being updated to guide campus planning through 2035 to support continued future growth on the campus.

The LRDP covers the approximately 1,127-acre UCR campus located in the City of Riverside, California (Exhibit 1). The campus is generally bound by Blaine Street in the north, Valencia Hill Drive in the east, Le Conte Drive in the south, and Chicago Avenue in the west. It occurs on the U.S. Geological Survey's (USGS') Riverside East 7.5-minute quadrangle in Sections 19, 20, 29, and 30 of Township 2 South, Range 4 West (Exhibit 2). Surrounding land uses include commercial and residential development to the north, south, and west; undeveloped open space in the Box Springs Mountains is located to the east. Interstate 15 (I-15) separates the main campus facility in the east from campus agricultural uses and a large parking lot in the west.

Topography on the main campus and west campus is relatively flat with an elevation of approximately 1,000 to 1,100 feet above mean sea level (msl). Topography in the southeast portion of the campus consists of gently sloping hills with a peak elevation of 1,548 feet above msl. A variety of soils are mapped on campus, including loam and sandy loam soils of the Arlington, Buren, Cieneba, Gorgonio, Hanford, Madera, Monserate, Ramona, and Vista series and terrace escarpments (Exhibit 3).

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SURVEY METHODS

Psomas Senior Biologists Allison Rudalevige and Lindsay Messett conducted a general plant and wildlife survey, mapped vegetation, and performed an assessment of potential jurisdictional waters for the LRDP on December 12 and 13, 2018. The survey area includes the entire LRDP area. Representative photographs are provided in Attachment A-1 through A-6.

Prior to the survey, a literature review was conducted to identify special status plants, wildlife, and habitats that have been reported to occur in the vicinity of the survey area. Resources reviewed included the California Native Plant Society's (CNPS') Inventory of Rare and Endangered Plants (CNPS 2018), the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CDFW 2018a), and previous reports for the LRDP area.

Vegetation was mapped on a 1 inch equals 350 feet (1″=350′) scale color aerial. The minimum mapping unit was approximately 0.25 acre. Nomenclature for vegetation types generally follows that of *A Manual of California Vegetation* (CNPS 2019). All plant species observed were recorded in field notes. Plant species were identified in the field or collected for subsequent identification using keys in Baldwin et al. (2012). Nomenclature of plant taxa conform to the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW 2018d) for special status species and the Jepson eFlora (Jepson Flora Project 2017) for all other taxa. It should be noted that, since the general plan survey occurred in the winter season, many annual species were not detectable (because they will not germinate until closer to spring) or were not identifiable to species because they were not blooming. Surveys conducted in the spring or summer would likely record higher diversity of annual species. Perennial species and vegetation types were observable and are sufficient for the purposes of this report.

All wildlife species detected during the course of the surveys were documented in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic sign, including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows the *Special Animals List* (CDFW 2018c) for special status species and, for other species, Center for North American Herpetology (2015) for amphibians and reptiles, the American Ornithological Society (2018) for birds, and the Smithsonian National Museum of Natural History (2011) for mammals.

An assessment of potential jurisdictional water resources on the campus was made concurrently with the general survey. This included mapping the location of drainages and waterbodies and noting potential wetlands based on the presence of hydrology and vegetation. Resources reviewed to assist in the assessment of potential jurisdictional waters included the U.S. Department of Agriculture, Natural Resources Conservation Service's (USDA NRCS') Web Soil Survey, the USDA NRCS' Hydric Soils List (USDA NRCS 2018), and the USFWS' National Wetlands Inventory (NWI) Wetland Mapper (USFWS 2018).

SURVEY RESULTS

Vegetation Types and Other Areas

The 2005 LRDP EIR described on-campus biological resources as natural, naturalistic, landscaped, and agricultural areas (EIP 2005). For continuity, vegetation types mapped in the survey area have been grouped into these broad categories. Generally, unvegetated areas have been mapped as other areas and include basins, disturbed areas, and developed areas. Exhibit 4 and Table 1 show the vegetation types and other landcover mapped in the survey area.

TABLE 1
VEGETATION TYPES AND OTHER AREAS IN THE SURVEY AREA

Vegetation Type and Other Area	Amount in Survey Area (acres)	CNPS 2019 Equivalent	CDFW Sensitive Natural Community
Natural Areas			
Brittle Bush Scrub	65.73	*Encelia farinosa* Shrubland Alliance	No
Rock Outcrop	16.16	*Encelia farinosa* Shrubland Alliance	No
Prickly Pear Scrub	2.75	*Opuntia littoralis* – *Opuntia oricola* – *Cylindropuntia prolifera* Shrubland Alliance	Yes
Annual Grassland	42.40	Varies, including the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Herbaceous Semi-natural Alliance, *Bromus rubens* – *Schismus* (*arabicus*, *barbatus*) Herbaceous Semi-natural Alliance, or *Avena* (*barbata*, *fatua*) Herbaceous Semi-natural Alliance	No
Naturalistic Areas			
Sage Scrub Restoration	5.96	Not a natural community; similar to various shrubland Alliances including *Artemisia californica*, *Eriogonum fasciculatum*, and *Salvia mellifera* Shrubland Alliances	Not a natural community; not sensitive
Mixed Scrub	2.31	Not a natural community; similar to *Isocoma menziesii* Shrubland Alliance associated with non-native shrubs	Not a natural community; not sensitive
Quailbush Scrub	1.08	*Atriplex lentiformis* Shrubland Alliance	No
Upland Mustards	1.80	No named equivalent, but functionally similar to the *Brassica nigra* – *Raphanus* spp. Herbaceous Semi-natural Alliance	No
Annual Grassland	8.13	Varies, including the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Herbaceous Semi-natural Alliance, *Bromus rubens* – *Schismus* (*arabicus*, *barbatus*) Herbaceous Semi-natural Alliance, or *Avena* (*barbata*, *fatua*) Herbaceous Semi-natural Alliance	No
Mixed Riparian	8.26	Not a natural community; similar to various woodland Alliances such as *Salix gooddingii* and *Platanus racemosa* Woodland Alliances associated with non-native trees	Not a natural community; not sensitive
Walnut Grove	0.57	Not a natural community; similar to *Juglans californica* Woodland Alliance or *Juglans hindsii* and Hybrids Woodland Special Stands and Semi-natural Alliance	Not a natural community; not sensitive
Ash Grove	1.52	Not a natural community, but functionally similar to the *Fraxinus latifolia* Forest Alliance	Not a natural community; not sensitive
Mulefat Thicket	0.58	*Baccharis salicifolia* Shrubland Alliance	No
Tamarisk Thicket	0.35	*Tamarix* spp. Shrubland Semi-natural Alliance	No
Eucalyptus Grove	13.96	*Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-natural Alliance	No

TABLE 1
VEGETATION TYPES AND OTHER AREAS IN THE SURVEY AREA

Vegetation Type and Other Area	Amount in Survey Area (acres)	CNPS 2019 Equivalent	CDFW Sensitive Natural Community
Botanic Garden	22.86	Not a natural community; no equivalent	No
Landscaped Areas			
Landscaped Area	124.45	Not a natural community; no equivalent	No
Agricultural Areas			
Jojoba Scrub	4.28	Not a natural community; similar to the *Simmondsia chinensis* Provisional Shrubland Alliance	Not a natural community; not sensitive
Giant Reed Stand	0.25	*Phragmites australis – Arundo donax* Herbaceous Semi-natural Alliance	No
Orchard	227.29	Not a natural community; no equivalent	No
Agriculture	165.22	Not a natural community; no equivalent	No
Other Areas			
Basin	7.07	Not a natural community; no equivalent	No
Disturbed	26.36	Not a natural community; no equivalent	No
Developed	377.59	Not a natural community; no equivalent	No
Total	**1,126.93**		

Natural Areas

Natural areas are defined as undeveloped open space areas that are composed of native and naturally occurring plant species.

Brittle Bush Scrub

Brittle bush scrub occurs on the hillsides and drainages in the southeast corner of the campus. This area is relatively undeveloped, with dirt access roads/trails closer to campus. The dominant shrub is brittlebush (*Encelia farinosa*). Native shrubs present in lower amounts include California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). Other scattered natives include wishbone bush (*Mirabilis laevis* var. *crassifolia*), filago-leaved sand-aster (*Corethrogyne filaginifolia*), phacelia (*Phacelia* sp.), and cryptantha (*Cryptantha* sp.). The shrub canopy is relatively open over most of the area. At the time of the survey, the understory and spaces between shrubs were either bare or contained annual species such as redstem filaree (*Erodium cicutarium*), eastern sisymbrium (*Sisymbrium orientale*), and non-native grasses (immature, but likely including species such as cheat grass [*Bromus tectorum*], ripgut grass [*Bromus diandrus*], red brome [*Bromus madritensis* ssp. *rubens*], Mediterranean grass [*Schismus* sp.], or oat [*Avena* sp.]). Other annual understory species expected to occur based on previous documentation includes tidy-tips (*Layia platyglossa*), cream cups (*Platystemon californicus*), California poppy (*Eschscholzia californica*), ovate plantain (*Plantago ovata*), splendid mariposa lily (*Calochortus splendens*), and blue dicks (*Dichelostema capitatum*) (EIP 2005).

Rock Outcrop

Rock outcrops occur throughout the hillsides in the southeast corner of the campus. These areas contain exposed granitic rock with many crevices and soil between individual rocks. Vegetation growing between the rocks is similar to that of the brittle bush scrub.

Prickly Pear Scrub

Prickly pear scrub occurs naturally on the slopes along the botanical garden road and in a small patch in the west campus. It is dominated by Vasey's prickly-pear (*Opuntia vaseyi*) with lesser amounts of cholla (*Cylindropuntia* sp.) and brittle bush.

Annual Grassland

Annual grassland is patchily distributed on slopes in the southeastern corner of campus. This vegetation type is dominated by non-native grasses that were immature at the time of the survey. Species composition likely includes cheat grass, ripgut grass, red brome, Mediterranean grass, and/or oat. Redstem filaree and eastern sisymbrium were also observed in these areas. Other annual understory species expected to occur based on previous documentation includes common fiddleneck (*Amsinckia intermedia*), common goldenstar (*Bloomeria crocea*), baby blue-eyes (*Nemophila menziesii*), and California croton (*Croton californicus*) (EIP 2005). It should be noted that annual grassland occurring in areas subject to disturbance (such as graded slopes) on the main campus or the west campus are discussed below under Naturalistic Areas.

Naturalistic Areas

Naturalistic areas are defined as mostly undeveloped areas that have been subject to disturbance/ modification and/or the introduction of ornamental trees and shrubs.

Sage Scrub Restoration

Sage scrub restoration occurs along the drainage in the eastern portion of the main campus. It is considered a Naturalistic Area because the slopes have been modified, the vegetation has been planted, and the area is actively maintained. This vegetation type contains a mix of planted sage scrub species, including California sagebrush, California buckwheat, black sage (*Salvia mellifera*), brittle bush, coyote brush (*Baccharis pilularis* ssp. *consanguinea*), mule fat (*Baccharis salicifolia* ssp. *salicifolia*), and deer grass (*Muhlenbergia rigens*).

Mixed Scrub

Mixed scrub occurs between parking lot 13 and Big Springs Road. It is considered a Naturalistic Area because the vegetation has been planted. This vegetation type contains a mix of native (e.g., coastal goldenbush [*Isocoma menziesii*] and California buckwheat) and non-native (primarily acacia [*Acacia* sp.]) shrubs along a potential drainage feature.

Quailbush Scrub

Quailbush scrub occurs on the slopes immediately surrounding the botanic garden basin. It is considered a Naturalistic Area because the slopes have been modified and the vegetation has been planted. This vegetation type is dominated by big saltbush (*Atriplex lentiformis*) with a lesser amount of mule fat and coastal goldenbush. Weedy, non-native species, such as grayish shortpod mustard (*Hirschfeldia incana*)

and tree tobacco (*Nicotiana glauca*), are abundant. The slopes in this area are covered with an erosion control mat.

Upland Mustards

Upland mustards occur on a slope in the west campus. It is considered a Naturalistic Area because the slopes have been modified. This vegetation type is dominated by eastern sisymbrium, a non-native species.

Annual Grassland

Annual grassland occurring in areas subject to disturbance, such as graded slopes on the main campus or the west campus, are considered Naturalistic Areas. This vegetation type is dominated by non-native grasses that were immature at the time of the survey. Species composition likely includes cheat grass, ripgut grass, red brome, Mediterranean grass, and/or oat.

Mixed Riparian

Mixed riparian occurs along drainages in the main campus. The riparian area in the eastern portion of the main campus is considered a Naturalistic Area because the slopes have been modified and the vegetation has been planted as mitigation for a previous project (i.e., Glen Mor 2 Student Apartments Arroyo Improvements). This vegetation consists of a mix of riparian species such as Goodding's black willow (*Salix gooddingii*), arroyo willow (*Salix lasiolepis*), western sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), Mexican palo verde (*Parkinsonia aculeata*), and coast live oak (*Quercus agrifolia*). There is scattered mule fat in the drainage and along the banks. The understory of this vegetation type is generally open.

The riparian area along University Avenue is considered a Naturalistic Area because the area has been historically modified (i.e., historic aerial imagery from 1948 shows orchards in this area). This vegetation contains similar species as above, including Goodding's black willow, western sycamore, Fremont cottonwood, walnut (*Juglans* sp.), and mule fat. It also contains escapee ash trees such as shamel ash (*Fraxinus uhdei*) and velvet ash cultivars (*Fraxinus velutina*). The understory contains leaf litter and scattered species such as California blackberry (*Rubus ursinus*) and hoary nettle (*Urtica dioica* ssp. *holosericea*).

Walnut Grove

A walnut grove occurs in the northwestern portion of the main campus. It is considered a Naturalistic Area because it occurs on a graded parcel, and the vegetation likely consists of escapees. This vegetation type consists of a stand of mature walnuts (likely a hybrid of southern California black walnut [*Juglans californica*], northern California black walnut [*Juglans hindsii*], and/or black walnut [*Juglans nigra*]).

Ash Grove

An ash grove occurs in the eastern portion of the main campus. It is considered a Naturalistic Area because the vegetation likely consists of escapees. This vegetation type is dominated by shamel ash and velvet ash cultivars with lesser amounts of coast live oak (*Quercus agrifolia*), walnut (*Juglans* sp.), and mule fat. The understory contains leaf litter and scattered herbs such as petty spurge (*Euphorbia peplus*) and milk thistle (*Silybum marianum*).

Mulefat Thicket

Mulefat thicket occurs around the basin in the botanic garden. It is considered a Naturalistic Area because it is part of a manufactured basin. This vegetation type is dominated by mule fat, with scattered, immature red willow (*Salix laevigata*), arroyo willow, and Mexican palo verde; mugwort (*Artemisia douglasiana*) occurs in the understory.

Tamarisk Thicket

Tamarisk thicket occurs around water tanks at the edge of open space in the southeast corner of the main campus. It is considered a Naturalistic Area because it consists of non-native species. This vegetation is dominated by saltcedar (*Tamarix ramosissima*) with scattered brittlebush and an understory of non-native grasses.

Eucalyptus Grove

Eucalyptus groves occur along drainages in west campus and south of Eucalyptus Drive in the main campus. It is considered a Naturalistic Area because it consists of non-native species. This vegetation type is dominated by mature gum trees (*Eucalyptus* spp.). Individual gum trees intermixed with other species are included as landscaped areas, described below.

Botanic Garden

The UCR Botanic Gardens is considered a naturalistic landscaped area. It contains a mix of native and non-native planted species, primarily from Mediterranean climates and arid areas similar to California, including geographical collections from Australia; Baja California, Mexico; South Africa; and temperate deciduous forests. Paved and unpaved trails in the gardens are not mapped separately. The botanic garden is mapped separately from landscaped areas on the main campus because it has a more natural topography and generally lacks turf grass as a ground cover.

Landscaped Areas

Landscaped areas are considered open spaces that have been developed with turf-covered lawn areas or groundcover, mature trees, and shrubs.

Landscaped Area

Landscaped areas occur throughout the main campus and consist of ornamental vegetation planted in open areas between buildings, in road medians, and along the edges of walkways and roads. This vegetation type includes a variety of mature trees such as jacaranda (*Jacaranda mimosifolia*), bottlebrush (*Melaleuca* sp.), gum tree, deodar cedar (*Cedrus deodara*), pepper tree (*Schinus molle*), Brazilian pepper tree (*Schinus terebinthifolius*), walnut, and coast live oak. Understory vegetation is limited. The primary groundcover is turf grass; other areas contain rock, leaf litter, bare ground, or mulch.

Agricultural Areas

Agricultural areas are used for agricultural teaching and research and are dominated by row crops and orchards.

Jojoba Scrub

Jojoba scrub occurs on a single plot in the Agricultural Area of west campus. It is dominated by jojoba (*Simmondsia chinensis*) with scattered pepper trees around the edges of the plot. This was part of an experimental plot of Dr. Yermanos planted in the 1970s/1980s (Sanders pers. comm.).

Giant Reed Stand

Giant reed stand occurs in the Agricultural Area of west campus. It consists of giant reed (*Arundo donax*) growing on debris piles in a fallow field.

Orchard

Orchards occur primarily on the west campus but also in small areas on the main campus. Trees, of varying levels of maturity, include different types of citrus (*Citrus* spp.), avocado (*Persea americana*), and European olive (*Olea europeaea*).

Agriculture

These areas include all undeveloped portions of the west campus that are not described above. These consist of currently fallow fields, other planted crops (e.g., corn [*Zea mays*]), weedy vegetation (e.g., cheeseweed [*Malva parviflora*]), or turf grass.

Other Areas

Other areas include basins, disturbed areas, and developed areas. These areas are generally unvegetated, though they may include ornamental landscaping that is closely associated with a structure and smaller than the 0.25-acre minimum mapping unit.

Basin

Basins occur throughout the west campus, at the edge of the main campus adjacent to undeveloped open space, and along the road to the botanic garden. The botanic garden basin is unlined but has concrete weirs and a concrete spillway. The center of the basin lacks vegetation and contains built-up sediment, but the outer portion of the basin and banks are vegetated. This basin holds water intermittently. The other basins are unvegetated; some are concrete-lined while others are soft bottomed. Based on a review of historic aerials, these basins appear to hold water for extended periods of time and/or year-round.

Disturbed

Disturbed areas occur throughout the campus and consist of bare ground that has been graded or otherwise altered. This includes an active construction site east of Iowa Avenue. It should be noted that unpaved access roads (e.g., in the agricultural areas and the southeast corner of the campus) have not been mapped separately from the surrounding vegetation.

Developed

Developed areas occur throughout the campus and include structures (such as buildings, water tanks, greenhouses, etc.) and paved surfaces (such as paved roads and parking lots). Most developed areas occur on the main campus; but water tanks occur in the southeast corner of the campus while various offices,

greenhouses, and laboratories occur on the west campus. Ornamental vegetation that is closely associated with these structures (i.e., not meeting the 0.25-acre minimum mapping unit) was not mapped separately.

Jurisdictional Resources

The National Wetlands Inventory (NWI) maps riverine wetlands and freshwater ponds on the campus (Exhibit 5).

The NWI identifies four basins in the west campus; these are mapped as freshwater ponds classified as PUBK (i.e., in the Palustrine System with unconsolidated bottom and artificially flooded water regime). These artificial basins were also observed during the field survey and contain surface water. They are potential jurisdictional resources.

The NWI identified another freshwater pond classified as PUBK in the middle of the eastern edge of the botanical garden. Mature trees and an access road currently occur in this area, so it is not considered a jurisdictional resource.

The basin in the botanic garden was not identified by the NWI. This basin was artificially created as part of the UCR Flood Control Management Plan for the University Arroyo Watershed (Jones & Stokes 2005). It is a potential jurisdictional resource.

The basin adjacent to undeveloped open space in the southeastern portion of the survey area is artificial and was not identified by the NWI, though is similar to the basins in the west campus described above. This area is a potential jurisdictional resource.

Two drainage features were identified by the NWI. Gage Canal is located outside the survey area but is adjacent to the western campus. A second channel flows through the agricultural area south of Martin Luther King Boulevard. This drainage was referred to as the Box Springs Arroyo in the previous LRDP (EIP 2005). The eastern portion was classified as R4SBC, while the western portion was classified as R4SBA (i.e., streambeds in the Riverine System with intermittent flow that are either seasonally flooded or temporarily flooded). The field-verified alignment of this drainage varies slightly from the NWI mapping (Exhibit 5). Both of these drainages are potential jurisdictional resources.

The main drainage on campus was referred to as the University Arroyo in the previous LRDP (EIP 2005). It runs along Big Springs Road, North Campus Drive, and University Avenue. Portions of this drainage have been channelized and are diverted underground via culverts. The tributary between Pentland Hills and Lothian residence halls is surrounded by riparian and sage scrub habitat that has been planted as part of a restoration effort. The western end of University Arroyo was referred to as Gage Basin (EIP 2005). This drainage and its tributaries are potential jurisdictional resources.

An arroyo also runs through the northern edge of the botanic garden, along the road leading to the garden, and into the botanic garden basin, which was discussed above. A tributary of the arroyo extends from the hills south of the main campus. These drainages are potential jurisdictional resources.

Additional small drainage features are located in the hills in the southeastern corner of the campus. Culverts are located at the downstream ends of these features at I-215. Each of these drainages are potential jurisdictional resources.

U.S. Army Corps of Engineers

Section 404 of the federal Clean Water Act (CWA) regulates activities affecting water resources under the jurisdiction of the United States Army Corps of Engineers (USACE). Waters of the United States under the jurisdiction of the USACE include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce.

The University Arroyo, including its tributaries and the botanic garden basin, connects with the campus storm drain system, which enters the Gage Basin and then the City of Riverside storm drain system. This ultimately connects to the Santa Ana River, which flows to the Pacific Ocean. With a significant nexus to a traditional navigable water (TNW), these areas would likely be considered waters of the United States.

The drainage features in the hills in the southeastern corner of the campus go underground at the I-215. If these connect to the City of Riverside storm drain system and the Santa Ana River, they may be considered waters of the United States.

Except for the basin in the botanic garden, the on-campus basins are isolated and so would not be considered waters of the United States.

A formal jurisdictional delineation of these potential waters is recommended to map the extent of waters of the United States. If jurisdictional waters are determined to be present and would be impacted, a Section 404 permit from the USACE may be required.

Regional Water Quality Control Board

Section 401 of the CWA provides the Regional Water Quality Control Board (RWQCB) with the authority to regulate, through a Water Quality Certification, any proposed federally permitted activity that may affect water quality. The RWQCB also has jurisdiction over isolated wetlands and waters under the Porter-Cologne Water Quality Control Act.

The RWQCB would take jurisdiction over waters of the United States, described above. The isolated basins were artificially created within uplands and do not support vegetation; however the RWQCB may take jurisdiction over them.

A formal jurisdictional delineation of these potential waters is recommended prior to construction in order to map their extent. Issuance of the USACE Section 404 permit (described above), if needed, would be contingent upon the approval of a Section 401 Water Quality Certification from the RWQCB. The RWQCB requires an Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required in all complete applications.

California Department of Fish and Wildlife

Section 1602 of the *California Fish and Game Code* regulates activities affecting water resources under the jurisdiction of the CDFW. The CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes.

Drainages on the campus have defined bed and banks, with some areas supporting riparian vegetation. The CDFW is expected to take jurisdiction over the on-campus drainages. Although the isolated basins

were artificially created within uplands and do not support vegetation, they provide pond habitat for wildlife.

A formal jurisdictional delineation of these potential waters is recommended prior to construction in order to map their extent. Impacts on waters under CDFW jurisdiction would require a Lake or Streambed Alteration Agreement from the CDFW.

Wildlife Habitat

The quality of wildlife habitat varies across the survey area. Natural Areas (undeveloped areas with native vegetation) and Naturalistic Areas (larger areas of vegetation such as the Botanic Garden) provide relatively high quality habitat. Landscaped Areas (smaller patches of vegetation among developed areas) and the Agricultural Areas of the west campus provide moderate quality habitat. Densely developed areas with limited vegetation generally provide low quality wildlife habitat. The presence of non-native vegetation, human activity, and surrounding urban development generally decrease the wildlife value relative to undisturbed areas. Wildlife species present are expected to be relatively urban-tolerant and acclimated to human activity.

No fish species were observed during the biological survey, and suitable aquatic habitat is minimal. The drainages are ephemeral and travel underground for portions of their length, so are not expected to provide fish habitat. The basins may hold introduced species, such as western mosquitofish (*Gambusia affinis*).

No amphibian species were observed during the biological survey. Common species that may occur include Baja California treefrog (*Pseudacris hypochondriaca*) and American bullfrog (*Lithobates catesbeianus*).

Reptile species observed in the survey area include western fence lizard (*Sceloporus occidentalis*) and side-blotched lizard (*Uta stansburiana*). Other common reptile species expected to occur in the survey area include southern alligator lizard (*Elgaria multicarinata*), Belding's orange-throated whiptail (*Aspidoscelis hyperythra beldingi*), and gopher snake (*Pituophis catenifer*).

Bird species observed on or adjacent to the survey area include mallard (*Anas platyrhynchos*), ring-necked duck (*Aythya collaris*), hooded merganser (*Lophodytes cucullatus*), pied-billed grebe (*Podilymbus podiceps*), rock pigeon (*Columba livia*), white-throated swift (*Aeronautes saxatalis*), Anna's hummingbird (*Calypte anna*), Allen's hummingbird (*Selasphorus sasin*), American coot (*Fulica americana*), killdeer (*Charadrius vociferus*), great egret (*Ardea alba*), red-tailed hawk (*Buteo jamaicensis*), belted kingfisher (*Megaceryle alcyon*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), Cassin's kingbird (*Tyrannus vociferans*), California scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), blue-gray gnatcatcher (*Polioptila caerulea*), wrentit (*Chamaea fasciata*), hermit thrush (*Catharus guttatus*), northern mockingbird (*Mimus polyglottos*), American pipit (*Anthus rubescens*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), spotted towhee (*Pipilo maculatus*), rufous-crowned sparrow (*Aimophila ruficeps*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*), western meadowlark (*Sturnella neglecta*), great-tailed grackle (*Quiscalus mexicanus*), and yellow-rumped warbler (*Setophaga coronata*).

No mammal species were directly observed during the survey; however, evidence of mammal presence (e.g., scat, tracks, and/or burrows) was observed. California ground squirrel (*Otospermophilus beecheyi*) burrows, bobcat (*Lynx rufus*) scat, coyote (*Canis latrans*) scat and tracks, and southern mule deer

(*Odocoileus hemionus*) tracks were present in the survey area. Other mammal species that may occur include Botta's pocket gopher (*Thomomys bottae*), common raccoon (*Procyon lotor*), Virginia opossum (*Didelphia virginiana*), and striped skunk (*Mephitis mephitis*). Common bat species with potential to forage in the survey area include big brown bat (*Eptesicus fuscus*) and California myotis (*Myotis californicus*). Bats may also roost in trees, buildings, and rock crevices on campus.

Wildlife Movement

Within large, open space areas where few or no man-made or naturally occurring physical constraints to wildlife movement are present, wildlife corridors may not yet exist. However, once open space areas become constrained and/or fragmented as a result of urban development or the construction of physical obstacles (e.g., roads and highways), the remaining landscape features or travel routes that connect the larger open space areas become corridors as long as they provide adequate space, cover, food, and water and do not contain obstacles or distractions (e.g., man-made noise, lighting) that would generally hinder wildlife movement.

UCR is located at the edge of urban development in the eastern portion of the City of Riverside. Because of this, there is no regional connection to other open space areas to the north, west, and south.

The southeast corner of the survey area consists of undeveloped open space linking in the Box Springs Mountains to the northeast with Sycamore Canyon Wilderness Park to the southwest. It should be noted that the Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) identifies the hillside areas to the northeast as important for wildlife movement (see MSHCP discussion below for information about Proposed Constrained Linkage 7; Exhibit 7). Although UCR is not required to follow the requirements of the MSHCP, any future development in the southeastern portion of the survey area should minimize indirect effects on the wildlife movement corridor planned by the MSHCP.

Although the main campus is developed, University Arroyo, Gage Canal, and the drainage south of Martin Luther King Boulevard provide opportunities for local wildlife movement. Wildlife would also be expected to move through the agricultural portions of the survey area west of I-215.

Special Status Vegetation Types

The CDFW provides a list of vegetation Alliances, Associations, and Special Stands that are considered "Sensitive Natural Communities" based on their rarity and threat (CDFW 2018b). As discussed in Table 1, prickly pear scrub would be considered a sensitive natural community. Impacts on sensitive communities may require mitigation depending on the amount of habitat impacted. Sensitive communities that are providing compensatory mitigation for a previous project should be avoided and would require mitigation if impacted.

Special Status Plant and Wildlife Species

Plants or wildlife may be considered "special status" due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts.

Special Status Plants

Forty-one special status plant species have been reported in the vicinity of the survey area based on the results of the literature review or were analyzed in the previous LRDP EIR.

Of these, eight species are federally and/or State-listed Endangered or Threatened: Munz's onion (*Allium munzii*), San Diego ambrosia (*Ambrosia pumila*), marsh sandwort (*Arenaria paludicola*), Nevin's barberry (*Berberis nevinii*), salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*), slender-horned spineflower (*Dodecahema leptoceras*), Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*), and Gambel's water cress (*Nasturtium gambelii*). Marginally suitable habitat for Munz's onion, San Diego ambrosia, Nevin's barberry, and slender-horned spineflower occur in the Natural vegetation types in the survey area (Exhibit 6); therefore, these species have low potential to occur. They are only expected to occur in Naturalistic vegetation types if seed washes down from a Natural area (e.g., into the basin at the botanic garden) or if they were planted. Any impact on Threatened or Endangered plant species would require mitigation and additional consultation/permitting with the resource agencies under the federal or State Endangered Species Acts. The remaining species are not expected to occur in the survey area because the survey area does not support suitable habitat or soils for these species; all records in the region are historic; and/or the survey area is outside the current known range of the species.

A total of 23 species reported in the vicinity of the survey area have a California Rare Plant Rank (CRPR) of 1A, 1B, or 2B, which may be considered constraints on development per Section 15380 of the California Environmental Quality Act (CEQA) Guidelines. Suitable or marginally suitable habitat for 14 of these species occurs in the Natural vegetation types in the survey area (Exhibit 6). They are only expected to occur in Naturalistic vegetation types if seed washes down from a Natural area (e.g., into the basin at the botanic garden) or if they were planted. These 14 species are chaparral sand-verbena (*Abronia villosa* var. *aurita*), smooth tarplant (*Centromadia pungens* ssp. *laevis*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*), snake cholla (*Cylindropuntia californica* var. *californica*), many-stemmed dudleya (*Dudleya multicaulis*), mesa horkelia (*Horkelia cuneata* var. *puberula*), California satintail (*Imperata brevifolia*), Parish's desert-thorn (*Lycium parishii*), Brand's star phacelia (*Phacelia stellaris*), chaparral ragwort (*Senecio aphanactis*), salt spring checkerbloom (*Sidalcea neomexicana*), prairie wedge grass (*Sphenopholis obtusata*), and San Bernardino aster (*Symphyotrichum defoliatum*). These species have low potential to occur in the survey area. Impacts on these species may require mitigation, depending on the size of the population impacted relative to the regional population status. The remaining species are not expected to occur in the survey area because the survey area does not support suitable habitat or soils for these species; all records in the region are historic; the species is considered extirpated from the region; and/or the survey area is outside the current known range of the species

Plant species with a CRPR of 3 or 4 are not typically considered constraints on development. One species, Robinson's pepper-grass (*Lepidium virginicum* ssp. *robinsonii*) has been reported from the southeastern portion of the survey area (CCH 2019).

Special Status Wildlife

Fifty-six special status wildlife species have been reported in the vicinity of the survey area based on the results of the literature review or were analyzed in the previous LRDP EIR. Of these, 15 species are federally and/or State-listed Endangered or Threatened or are candidates for listing: Santa Ana sucker (*Catostomus santaanae*), steelhead – southern California Distinct Population Segment (*Oncorhynchus mykiss irideus* pop. 10), Riverside fairy shrimp (*Streptocephalus woottoni*), Delhi Sands flower-loving fly (*Rhaphiomidas terminates abdominalis*), southern mountain yellow-legged frog (*Rana muscosa*), Swainson's hawk (*Buteo swainsoni*), bald eagle (*Haliaeetus leucocephalus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), California black rail (*Laterallus jamaicensis coturniculus*), southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), tricolored blackbird (*Agelaius tricolor*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), and Stephens' kangaroo rat (*Dipodomys stephensi*). Marginally suitable habitat for Riverside fairy shrimp occurs in the basins on campus.

Marginally suitable habitat for least Bell's vireo occurs in the mixed riparian vegetation and the mulefat thicket in the survey area. Suitable habitat for coastal California gnatcatcher occurs in the brittle bush scrub, rock outcrops, sage scrub restoration, mixed scrub, and prickly pear scrub in Natural and Naturalistic areas on campus. Marginally suitable habitat for Stephens' kangaroo rat occurs in the annual grassland in Natural Areas on campus. Any impacts on these species would be considered significant and require mitigation. Exhibit 6 shows areas of potentially suitable habitat for these species. Swainson's hawks may forage in the larger open space areas of campus as migrants but do not nest in the project region. Any potential impact on Threatened or Endangered wildlife species and/or its habitat, would require mitigation and additional consultation/permitting with the resource agencies under the federal or State Endangered Species Acts. The remaining listed species are not expected to occur in the survey area due to lack of suitable habitat.

In addition to species formally listed by the resource agencies, several special status species (California Species of Special Concern, Watch List, and Fully Protected species) have been reported near the survey area. Species having potential to occur and for which impacts may be significant per Section 15380 of the CEQA Guidelines include western spadefoot (*Spea hammondii*), burrowing owl (*Athene cunicularia*), and Los Angeles pocket mouse (*Perognathus longimembris brevinasus*). Impacts on these species may require mitigation, depending on the size of the population impacted relative to the regional population status.

In addition, the following special status species have potential or limited potential to occur in the survey area due to the presence of suitable or marginally suitable habitat: San Diego banded gecko (*Coleonyx variegatus abbottii*), coast horned lizard (*Phrynosoma blainvillii*), orange-throated whiptail, coastal whiptail (*Aspidoscelis tigris stejnegeri*), southern California legless lizard (*Anniella stebbinsi*), California glossy snake (*Arizona elegans occidentalis*), coast patch-nosed snake (*Salvadora hexalepis virgultea*), two-striped garter snake (*Thamnophis hammondii*), red-diamond rattlesnake (*Crotalus ruber*), white-tailed kite (*Elanus leucurus*), Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), merlin (*Falco columbarius*), loggerhead shrike (*Lanius ludovicianus*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), Bell's sage sparrow (*Artemisiospiza belli belli*), yellow-breasted chat (*Icteria virens*), yellow warbler (*Setophaga petechia*), northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), southern grasshopper mouse (*Onychomys torridus ramona*), San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), western yellow bat (*Lasiurus xanthinus*), pallid bat (*Antrozous pallidus*), and American badger (*Taxidea taxus*). For these non-listed species, impacts on a small amount of habitat (relative to the availability of habitat in the region) are not expected to reduce the regional population below a self-sustaining level. Typical avoidance and minimization measures (e.g., nesting bird surveys, roosting bat surveys) are used to avoid direct mortality to special status bird and bat species.

The remaining species reported from database searches are not expected to occur in the survey area due to lack of suitable habitat.

Critical Habitat

Critical Habitat is designated for the survival and recovery of species listed as Threatened or Endangered under the Federal Endangered Species Act (FESA). The survey area is not located in areas designated or proposed as Critical Habitat.

OTHER CONSIDERATIONS

Western Riverside County Multiple Species Habitat Conservation Plan

UCR is located within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) area. The MSHCP is a comprehensive, multi-jurisdictional plan that focuses on conservation of species and their associated habitats in Western Riverside County. The MSHCP is used to allow the participating jurisdictions to authorize "take" of plant and wildlife species identified within the Plan Area. UCR is given the option of utilizing the MSHCP as a "Participating Special Entity" (PSE).[1] If processing a project under the MSHCP, UCR would need to follow all aspects of the MSHCP for that project. However, if choosing not to process a project under the MSHCP, the project would have to be processed under traditional consultation/permitting mechanisms.

The relationship of the UCR campus to the MSHCP is shown on Exhibit 7. The survey area is located in the Cities of Riverside/Norco Area Plan. The target conservation acreage range for this area plan is 3,465–3,615 acres. The southeast portion of the campus is part of the Area Plan Subunit 2: Sycamore Canyon – West. Biological issues and considerations for this subunit include augmentation of conservation in Subunit 1 of the Highgrove Area Plan; conservation of grasslands adjacent to sage scrub to provide foraging habitat for raptors; maintenance of a linkage area for bobcat; and conservation of upland habitat supporting Bell's sage sparrow and southern California rufous-crowned sparrow. The planning species for this subunit include Bell's sage sparrow, loggerhead shrike, southern California rufous-crowned sparrow, and bobcat.

The southeast portion of the survey area is located in an MSHCP Criteria Area, specifically Criteria Cell 634. Conservation in this cell will contribute to assembly of Proposed Constrained Linkage 7, which is the only connection between existing core habitat in Sycamore Canyon Wilderness Park to the southwest and existing noncontiguous habitat block A in the Box Springs Mountains to the northeast. Conservation in this cell is planned to focus on upland scrub habitat to connect upland scrub habitat proposed for conservation in Cell 635 to the east with Cell 719 to the south. Conservation in Cell 634 will be approximately 5 percent of the cell, focusing on the eastern portion of the Cell. Since the UCR campus boundary only extends over the western half of Cell 634, future development of this area as part of the LRDP would not conflict with the conservation goals for Cell 634.

If a future project would impact habitat occupied by Riverside fairy shrimp, least Bell's vireo, coastal California gnatcatcher, or Stephens' kangaroo rat, using the MSHCP for take authorization may be beneficial. The MSHCP requires focused surveys to be conducted for Riverside fairy shrimp and least Bell's vireo; this would be the same whether or not UCR acted as a PSE. If these species are present, and UCR elects to act as a PSE, take could be obtained through preparation of a Determination of Biologically Equivalent or Superior Preservation (DBESP). If UCR chooses not to act as a PSE, then the project would be processed under Section 7 or 10 of the Endangered Species Act. If acting as a PSE, no surveys would be required for coastal California gnatcatcher, or Stephens' kangaroo rat, even though they have potential to occur; but all other MSHCP requirements would also need to be followed for the project. If not acting as a PSE, and potentially suitable habitat would be impacted, focused surveys would be required for coastal California gnatcatcher. If the species is observed, then the project would be processed under Section 7 or 10 of the Endangered Species Act. The benefit of using the MSHCP would depend on the

[1] A "Participating Special Entity" is any regional public facility provider (e.g., a utility company, a public district or agency) that operates and/or owns land within the MSHCP Plan Area and that applies for Take Authorization pursuant to Section 11.8 of the Implementing Agreement.

types of habitat being impacted and whether take authorization would be needed; this would be determined on a project by project basis.

The portion of the campus that overlaps Cell 634 is in an additional survey needs area for Criteria Area plant species (i.e., Nevin's barberry, smooth tarplant, and round-leaved filaree [*California macrophylla*]).[2] As discussed above, suitable habitat for Nevin's barberry and smooth tarplant is present in the survey area. Therefore, if a project is planned in this area, focused surveys would be required for these species whether or not UCR acted as a PSE.

The survey area is in the additional survey needs area for burrowing owl. As discussed above, suitable habitat for burrowing owl is present in the survey area. Therefore, if a project is planned in an area with suitable burrowing owl habitat, focused surveys would be required for this species whether or not UCR acted as a PSE.

The MSHCP provides guidelines pertaining to the urban/wildlands interface. These indirect effects (i.e., "edge effects") are associated with locating development in proximity to the MSHCP Conservation Area. These impacts affect the quality of nearby wildlife habitat resulting from disturbance by construction (such as noise, dust, night lighting, spread of invasive species, and urban pollutants), and/or the long-term use of the site. Measures would be in place to avoid or minimize these indirect effects whether or not UCR acted as a PSE. Relevant indirect effects are discussed below.

Stephens' Kangaroo Rat

In response to the federal listing of Stephens' kangaroo rat, the Riverside County Habitat Conservation Agency (RCHCA) was formed. Its purpose is to acquire and manage habitat for the Stephens' kangaroo rat and other associated special status species. The RCHCA Stephens' Kangaroo Rat Habitat Conservation Plan (HCP) was developed to meet the requirements of the program's Federal Endangered Species Act Section 10(a) permit. The HCP for this species is managed by the RCHCA. The HCP establishes a Reserve System where activities in the core reserve areas are limited and/or restricted. Areas outside the Reserve System are within a designated Fee Area.

The survey area is located within a designated Fee Area. For projects within a Fee Area, focused surveys for the Stephens' kangaroo rat are not required, and all potential impacts are mitigated through the RCHCA.

Water Quality

Future projects and their construction could impact water quality. Discharges or runoff from project operation may carry pollutants, while runoff from construction may carry excessive silt, petroleum, or other chemical contaminants. The impact on water quality could affect habitat quality and the species using the waters. BMPs should be used to avoid and minimize indirect impacts on water quality.

Noise

Future projects and their construction could increase the noise in adjacent habitat areas. During operation, additional human activity and noise from vehicles and other machinery (generators) would increase the noise level in adjacent habitat. During construction, equipment noise would temporarily increase noise levels in adjacent areas. Increased noise could discourage use by wildlife that are not urban-tolerant

[2] While the MSHCP considers this a Criteria Area plant species, its status has recently changed and it does not currently have a CRPR.

and/or has the potential to disrupt foraging, nesting, roosting, and/or denning activities for a variety of wildlife species. This impact would be minimal for construction located on the main campus where ambient noise presently exists and wildlife is expected to be urban-tolerant. This impact could adversely affect wildlife if located adjacent to undeveloped open space, particularly in the southeast portion of the survey area next to areas planned for conservation by the MSHCP as discussed above. BMPs should be used to avoid and minimize indirect impacts due to noise.

Dust

Grading activities would disturb soils and result in the accumulation of dust on the surface of the leaves of trees, shrubs, and herbs in adjacent open space areas. The respiratory function of the plants in the area could be impaired when dust accumulation is excessive. This impact could represent an adverse effect on native plants in the vicinity of active construction. BMPs should be used to avoid and minimize indirect impacts due to dust.

Night Lighting

Night lighting of new facilities, roads, or pathways could result in an indirect impact on the behavioral patterns of nocturnal and crepuscular (i.e., active at dawn and dusk) wildlife adjacent to the lighted areas. Of greatest concern is the effect on small ground-dwelling animals that use the darkness to hide from predators (e.g., owls), which are specialized night foragers. Additional night lighting in areas that are currently developed is not expected to adversely impact wildlife species. However, new lighting in areas adjacent to undeveloped open space, particularly in the southeast portion of the survey area next to areas planned for conservation by the MSHCP as discussed above, could adversely affect wildlife. BMPs should be used to avoid and minimize indirect impacts due to night lighting.

Human Activity

An increase in human activity may impact wildlife species in adjacent open space as a result of unauthorized public access, illegal dumping, and domestic animal predation. Human disturbance could disrupt normal foraging and breeding behavior of wildlife remaining in the area adjacent to the development, diminishing the value of the habitat. Wildlife stressed by human activity may be extirpated from the natural open space adjacent to the development, leaving only wildlife tolerant of human activity. Given the high level of human activity presently on the campus, this impact is not expected to adversely affect wildlife species except when new facilities, roads, or pathways are located adjacent to undeveloped open space, particularly in the southeast portion of the survey area next to areas planned for conservation by the MSHCP as discussed above. A substantial increase in human activity near MSHCP Proposed Constrained Linkage 7 has the potential to prevent wildlife from moving between habitat in Sycamore Canyon Wilderness Park and the Box Springs Mountains. BMPs should be used to avoid and minimize indirect impacts due to increased human activity.

Invasive Species

Landscaping that includes the use of non-native, invasive plant species (e.g., species listed in the California Invasive Plant Council's [Cal-IPC's] invasive plant inventory) can be detrimental to surrounding native habitat. Invasive species have the potential to spread into the surrounding natural open space and displace native species, hybridize with native species (thereby impacting the genetic integrity of the native species), alter biological communities, or alter ecosystem processes. This would degrade the quality of the adjacent vegetation, including vegetation communities that provide suitable habitat for Threatened or Endangered species. Additionally, construction vehicles can carry the seeds of non-native

invasive species to a construction site, where they can escape into open space areas with the same effects as described above. BMPs should be used to avoid and minimize indirect impacts due to invasive species.

Nesting Birds and Raptors

The Migratory Bird Treaty Act (MBTA) protects migratory birds and their nests and eggs, both common and special status. Bird species protected under the provisions of the MBTA are identified by the List of Migratory Birds (50 *Code of Federal Regulations* [CFR] §10.13, as amended). Since the 1970s, the MBTA has been interpreted to prohibit the accidental or "incidental" take of migratory birds. However, in December 2017, the acting Solicitor of the Department of the Interior issued a new memorandum disclaiming the interpretation of the MBTA as prohibiting incidental take of migratory birds (DOI 2017). In response to the federal changes in interpretation of the MBTA, the CDFW and the California Attorney General have issued an advisory affirming California's protections for migratory birds (CDFW and Attorney General 2018).

Multiple sections of *California Fish and Game Code* provide protection for nesting birds and raptors unless the *California Fish and Game Code* or its implementing regulations provide otherwise. Section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically addresses raptors (i.e., birds of prey in the orders *Falconiformes* and *Strigiformes*) and makes it unlawful to take, possess, or destroy these birds or their nest or eggs. Section 3513 prohibits the take or possession of migratory non-game birds as designated by the MBTA or any part of such bird.

Nesting birds and raptors have the potential to nest on buildings, in culverts, in shrubs and trees, in rocky outcrops, and on bare ground throughout the survey area. To the extent possible, construction should be initiated outside the peak nesting season (February 1 to August 31). If timing requires that construction be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to January 31). If construction and/or vegetation removal must occur during the peak breeding season, a pre-construction nesting bird survey should be conducted prior to vegetation removal, building demolition, and/or the initiation of construction activities.

Bird Strikes

A potential long-term, operational impact of future development concerns bird strike mortality and injury. Ornithologists estimate that up to a billion birds are killed or injured annually by collisions with clear and reflective sheet glass and plastic (Klem 2009). It is thought that birds cannot distinguish between the reflection on the glass/plastic surface and the natural landscape. Construction of glass-fronted buildings or other structures using exposed glass (e.g., glass-topped walls) has the potential to result in bird strikes, especially if the structures are located adjacent to natural areas. The use of ultraviolet patterns in the glass are not detectable to humans but can substantially reduce bird strikes. BMPs should be used to avoid and minimize bird strikes.

Roosting Bats

Several bat species may forage and roost throughout the survey area. Impacts on a small amount of foraging habitat are not expected to decrease the regional population below self-sustaining levels. Therefore, impacts on foraging habitat would be less than significant. Bat species may also roost in buildings, culverts, mature trees, and in rock outcrops throughout the survey area. The CDFW is increasingly recommending/requiring the use of pre-construction roosting bat surveys prior to impacts on potential roost structures and mature vegetation to avoid and minimize impacts on these species.

RECOMMENDATIONS

This section provides recommendations for future projects.

1. A jurisdictional delineation is recommended for any project that could impact one of the areas identified as a potential jurisdictional water resource. Permits/certifications/agreements from the USACE, the RWQCB, and/or the CDFW may be required for impacts to waters under the regulatory authority of those agencies. A pre-application meeting with these agencies is recommended prior to submittal of permit applications to discuss existing conditions, to confirm the agencies' jurisdiction over water resources in the survey area, to discuss impacts to these resources that would result from the project, and to discuss the regulatory permitting process. Following the pre-application meeting, UCR would prepare and process the appropriate permits, which may include a Section 404 Permit, a Section 401 Water Quality Certification, a Report of Waste Discharge, and/or a CDFW Section 1602 Notification of Lake or Streambed Alteration. The resource agencies would be expected to require mitigation for impacts to areas under their respective jurisdictions. Compensatory mitigation may include restoration (i.e., re-establishment or rehabilitation), establishment (i.e., creation), enhancement, and/or preservation of jurisdictional resources. Compensatory mitigation may occur through permittee-responsible mitigation, payment to an in-lieu fee program, or purchase of compensatory mitigation credits from an approved mitigation bank. Mitigation ratios (i.e., the amount of mitigation acreage compared to the amount of impacted habitat) would be negotiated with each regulatory agency on a project-by-project basis.
2. Impacts on sensitive vegetation communities should be avoided to the extent practicable. If a future project would result in removal of sensitive vegetation, then compensatory mitigation may be required depending on the amount of vegetation impacted. Mitigation should ensure no net loss of habitat following implementation of the project. This mitigation may be in the form of habitat preservation, restoration, enhancement, and/or establishment (i.e., creation). Compensatory mitigation may be in the form of permittee-responsible mitigation, in which the permittee maintains liability for the construction and long-term success of the mitigation site or through mitigation banking or an in-lieu fee program, where liability for project success is transferred to a third party (i.e., a mitigation bank or an in-lieu fee sponsor). For permittee-responsible mitigation, preparation of a Habitat Mitigation Monitoring Plan (HMMP) may be required.
3. Focused surveys for special status plants and wildlife species with potential to occur in the survey area are recommended prior to impacts on areas of suitable habitat for each respective species (Exhibit 6). This would include surveys for special status plant species, Riverside fairy shrimp, burrowing owl, coastal California gnatcatcher, and least Bell's vireo. Surveys should be performed by a qualified Biologist with the appropriate federal/State permits, if necessary, and follow approved survey protocol, which includes appropriate timing of surveys. If listed species are observed and habitat areas cannot be avoided, then consultation/permitting would be required to obtain take authorization. Appropriate avoidance, minimization, and compensatory mitigation will be required for each listed species that could be impacted. Depending on the listed species present, it may be desirable for UCR to act as a PSE under the MSHCP to obtain the necessary take authorization.
4. In order to minimize impacts on water quality associated with both construction activities, as well as long-term operation of future projects, project-related construction activities will be in compliance with UCR's Stormwater Management Plan and their Phase II Small Municipal Separate Storm Sewer System (MS4) general storm water permit, which includes BMPs to

maintain water quality. If a project would disturb one acre or more, preparation of a storm water pollution prevention plan would be required.

5. In order to avoid indirect impacts on areas planned for conservation by the MSHCP, it is recommended that development be limited in the southeast portion of the survey area. If development occurs in this area, various measures are recommended to minimize impacts to these areas:

    - Appropriate setbacks or barriers (e.g., berms or walls) are recommended to minimize noise and human activity impacts. Buffer areas should be vegetated with native species to help screen these indirect effects.
    - Active construction areas should be sprayed with water periodically to minimize dust.
    - New lighting and night lighting during construction should be shielded and/or directed away from adjacent open space.
    - Barriers (e.g., fencing or walls) or signage directing the public away from off-site open space should be installed to minimize unauthorized human activity.
    - Landscaping plans should be reviewed by a qualified Biologist to ensure that no plants identified on the Cal-IPC's plant inventory are included in the plant palette.

6. In order to avoid impacts on nesting birds and raptors (common or special status), the initiation of construction should be scheduled outside the peak nesting season (generally between September 1 and January 31). If timing requires that construction activities be initiated during the peak nesting season, vegetation removal and/or tree removal should be planned to occur outside the nesting season (September 1 to January 31). If construction and/or vegetation removal must occur during the peak breeding season (February 1 to August 31), a pre-construction nesting bird survey should be conducted by a qualified Biologist within three days prior to vegetation removal, building demolition, and/or the initiation of construction activities.

    If the Biologist finds an active nest within or adjacent to the construction area, the Biologist will identify an appropriate protective buffer zone around the nest depending on the sensitivity of the species, the nature of the construction activity, and the amount of existing disturbance in the vicinity. In general, the Biologists should designate a buffer of 50 to 200 feet for common nesting birds and 200 to 500 feet for special status nesting birds and nesting raptors. No construction activities will be allowed within the buffer until nesting activity has ended to ensure compliance with *California Fish and Game Code.*

7. In order to minimize mortality to due bird strikes against glass, it is recommended that glass-fronted buildings or other structures with exposed glass (e.g., glass-topped walls) incorporate measures to minimize the risk of bird strikes. This may include (1) the use of opaque or uniformly textured/patterned/etched glass, (2) angling of glass downward so that the ground instead of the surrounding habitat or sky is reflected, (3) installation of one-way film that results in opaque or translucent covering when viewed from either side of the glass, (4) installation of a uniformly dense dot pattern created as ceramic frit on both sides of the glass, and/or (5) installation of a striped or grid pattern of clear ultra-violet (UV)-reflecting and UV-absorbing film applied to both sides of the glass. It should be noted that single decals (e.g., falcon silhouettes or large eye patterns) are ineffective and are not recommended unless the entire glass surface is uniformly covered with the objects or patterns (Klem 1990).

8. If future projects would impact rocky outcrops, mature vegetation, existing buildings, or other structures that could be used for roosting, a passive acoustic survey is recommended to identify the species using the area for day/night roosting. If special status roosting bats are present and their roosts would be impacted, a qualified bat biologist should prepare a plan to identify the proper exclusionary methods. Removal of mature trees should be monitored by a qualified bat Biologist and occur by pushing down the entire tree (without trimming or limb removal) using heavy equipment and leaving the felled tree on the ground untrimmed and undisturbed for a period of at least 24 hours. To exclude bats from buildings/structures or rocky outcrops, exclusion measures should be installed on crevices by placing one-way exclusionary devices that allow bats to exit but not enter the crevice.
9. The determination of whether UCR should be a PSE in the MSHCP should occur on a project-by-project basis depending on the potential take authorization needed for each project.

If you have any questions or comments, please contact Amber Heredia at (714) 751-7373.

Sincerely,
PSOMAS

Amber O. Heredia
Senior Project Manager

Enclosures: Exhibits 1–7
Attachment A – Representative Photographs

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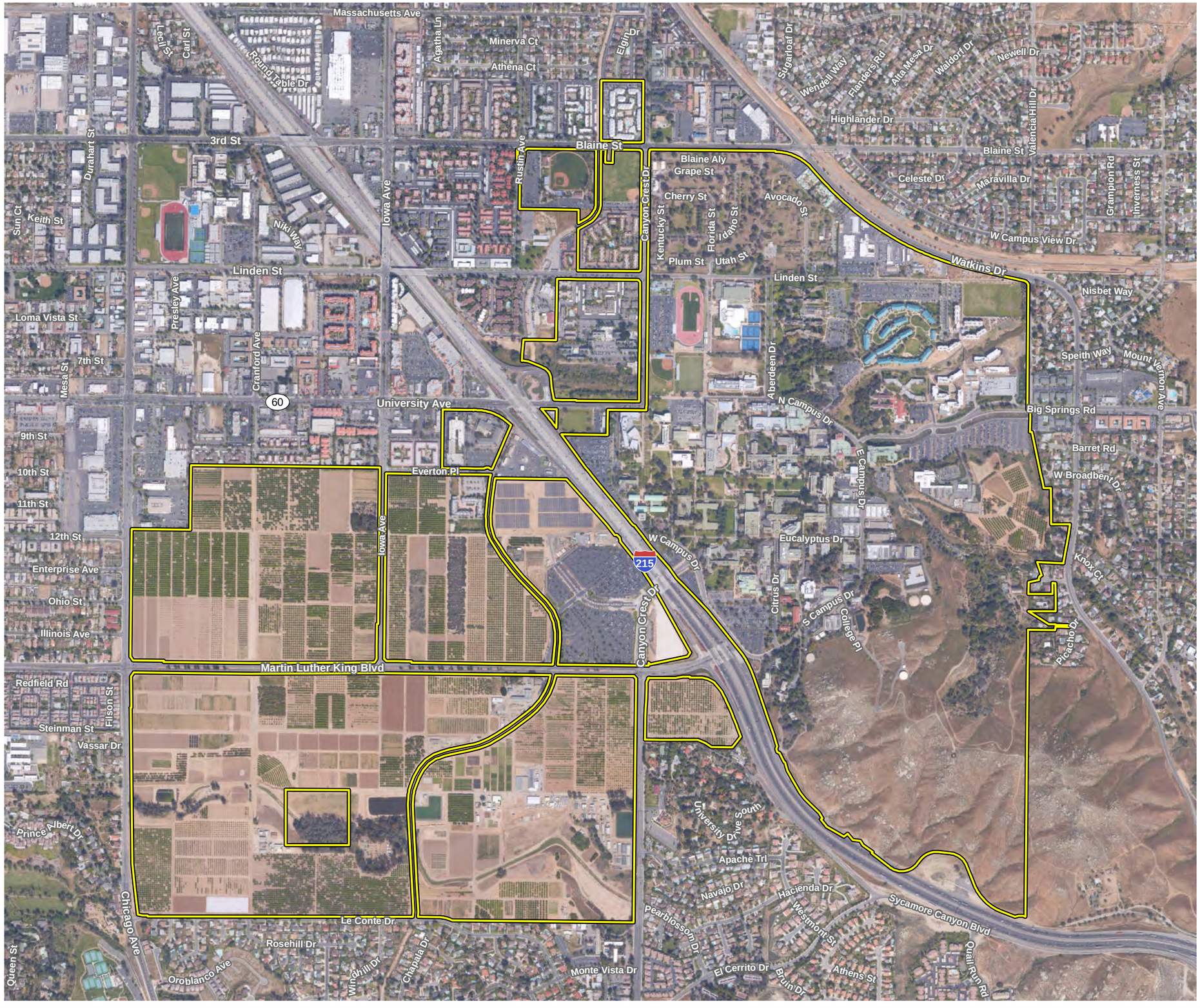

Survey Area

N
W E
S

1,000 500 0 1,000
Feet

Aerial Source: UC Riverside 2015

Project Location — Exhibit 1

Long Range Development Plan for the University of California, Riverside

PSOMAS

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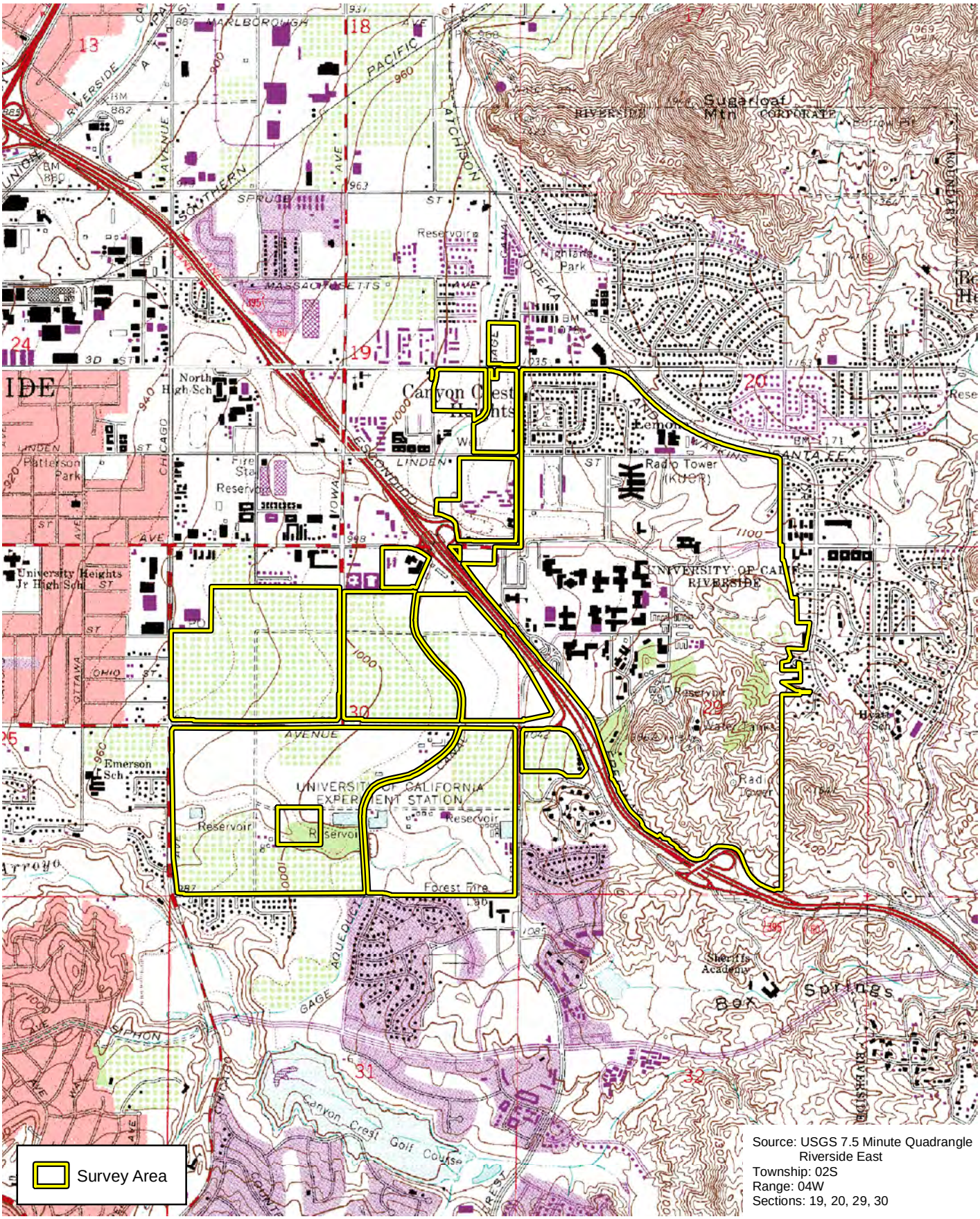

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U.S. Geological Survey 7.5-Minute Digital Quadrangle

Exhibit 2

Long Range Development Plan for the University of California, Riverside

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

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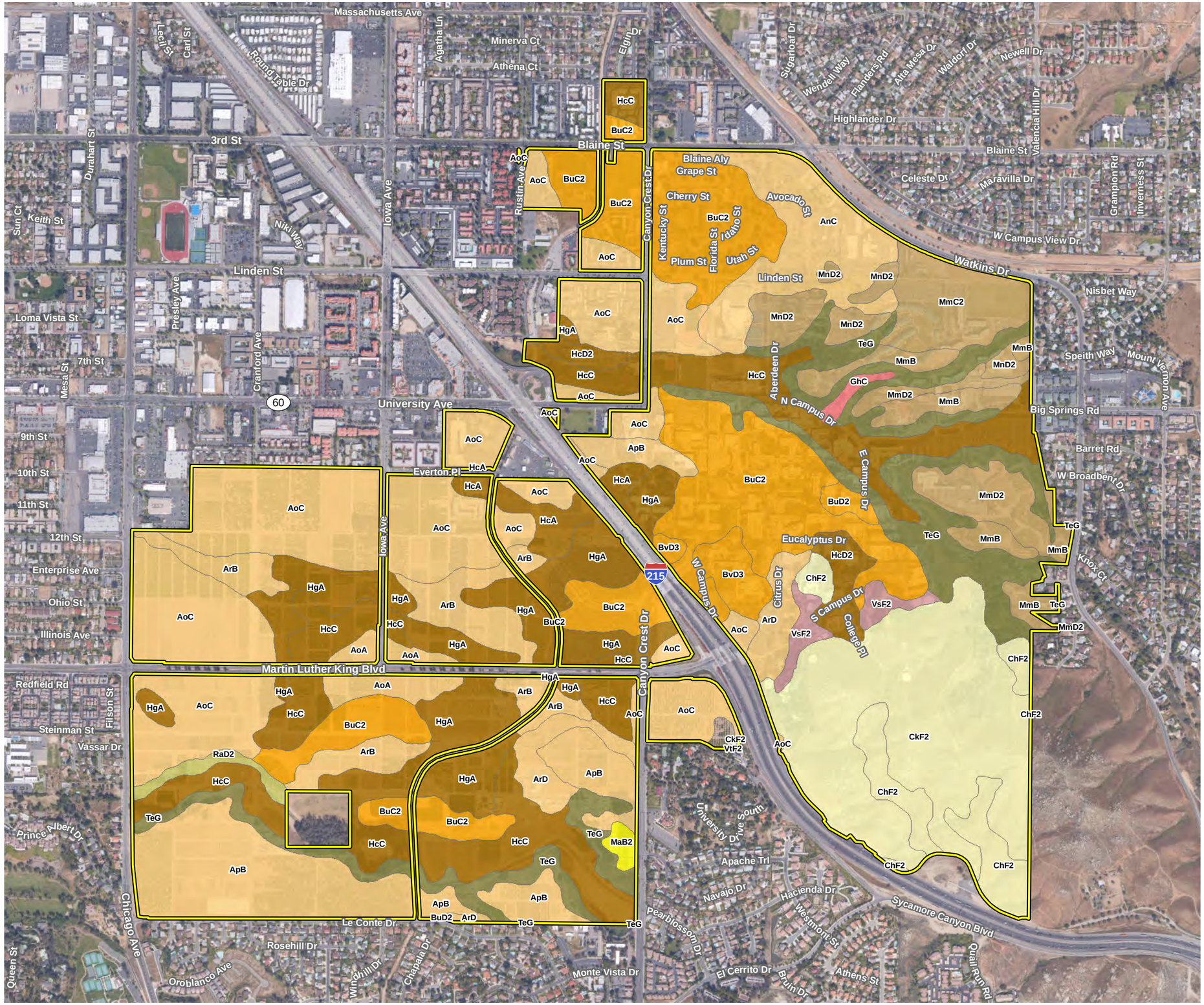

Survey Area

Arlington

AnC: Arlington fine sandy loam, 2 to 8 percent slopes

AoA: Arlington fine sandy loam, deep, 0 to 2 percent slopes

AoC: Arlington fine sandy loam, deep, 2 to 8 percent slopes

ApB: Arlington loam, 2 to 5 percent slopes

ArB: Arlington loam, deep, 0 to 5 percent slopes

ArD: Arlington loam, deep, 5 to 15 percent slopes

Buren

BuC2: Buren fine sandy loam, 2 to 8 percent slopes, eroded

BuD2: Buren fine sandy loam, 8 to 15 percent slopes, eroded

BvD3: Buren loam, 5 to 15 percent slopes, severely eroded

Cieneba

ChF2: Cieneba sandy loam, 15 to 50 percent slopes, eroded

CkF2: Cieneba rocky sandy loam, 15 to 50 percent slopes, eroded

Gorgonio

GhC: Gorgonio loamy sand, 0 to 8 percent slopes

Hanford

HcA: Hanford coarse sandy loam, 0 to 2 percent slopes

HcC: Hanford coarse sandy loam, 2 to 8 percent slopes

HcD2: Hanford coarse sandy loam, 8 to 15 percent slopes, erod ed

HgA: Hanford fine sandy loam, 0 to 2 percent slopes

Madera

MaB2: Madera fine sandy loam, 2 to 5 percent slopes, eroded

Monserate

MmB: Monserate sandy loam, 0 to 5 percent slopes

MmC2: Monserate sandy loam, 5 to 8 percent slopes, eroded

MmD2: Monserate sandy loam, 8 to 15 percent slopes, eroded

MnD2: Monserate sandy loam, shallow, 5 to 15 percent slopes, eroded

Ramona

RaD2: Ramona sandy loam, 8 to 15 percent slopes, eroded

Terrace

TeG: Terrace escarpments

Vista

VsF2: Vista coarse sandy loam, 15 to 35 percent slopes, erode d

VtF2: Vista rocky coarse sandy loam, 2 to 35 percent slopes, eroded

N W E S

1,000 500 0 1,000 Feet

Data Source: U.S. Department of Agriculture; Natural Resources Conservation Service
Aerial Source: UC Riverside 2015

Soil Types

Exhibit 3

Long Range Development Plan for the University of California, Riverside

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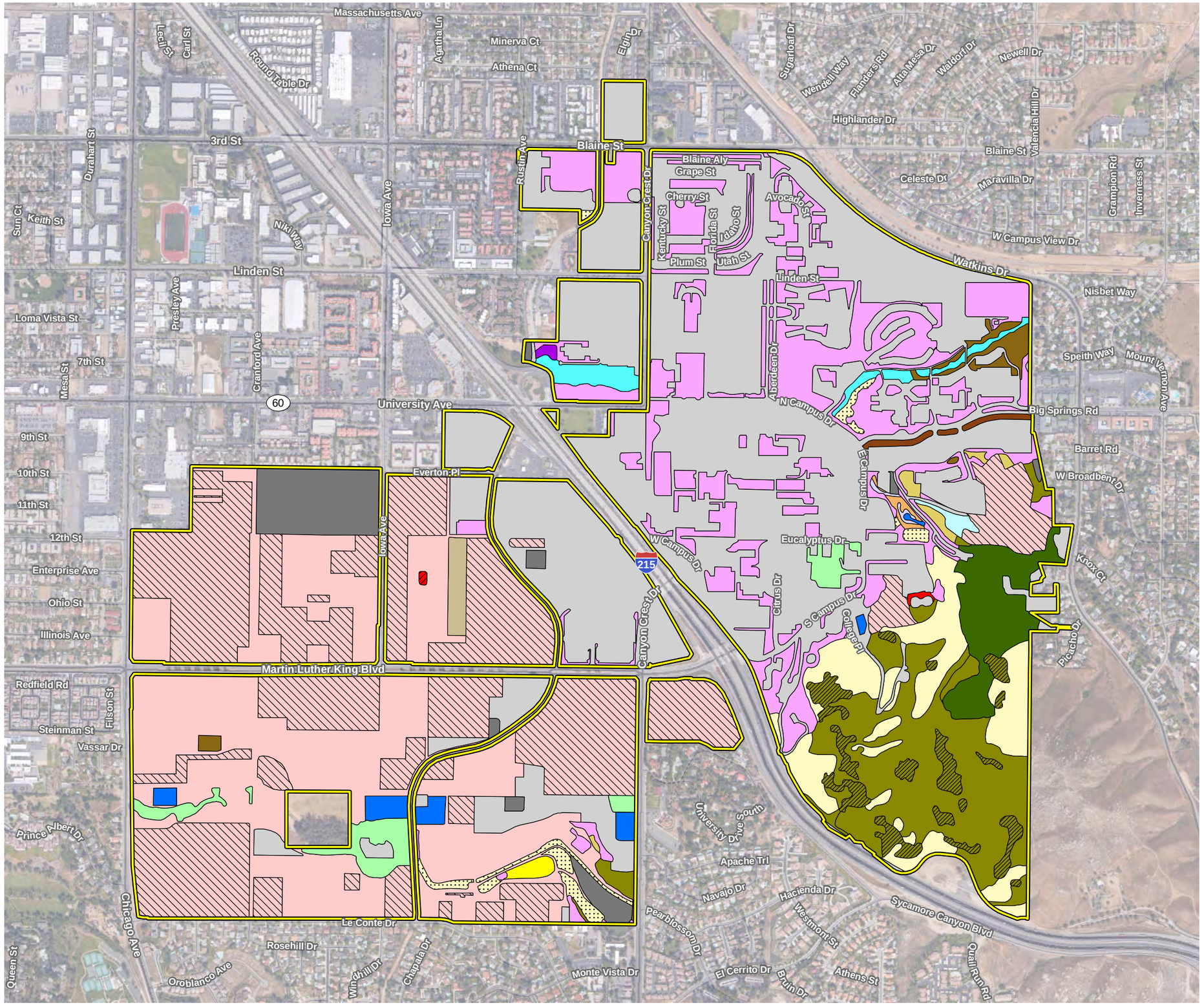

Survey Area

Natural Area

- Brittle Bush Scrub
- Rock Outcrop
- Prickly Pear Scrub
- Annual Grassland

Naturalistic Area

- Sage Scrub Restoration
- Mixed Scrub
- Quailbrush Scrub
- Upland Mustards
- Annual Grassland
- Mixed Riparian
- Walnut Grove
- Ash Grove
- Mulefat Thicket
- Tamarisk Thicket
- Eucalyptus Grove
- Botanic Garden

Landscaped Area

- Landscaped Area

Agricultural Area

- Jojoba Scrub
- Giant Reed Stand
- Orchard
- Agriculture

Other Area

- Basin
- Disturbed
- Developed

N W E S

1,000 500 0 1,000 Feet

Aerial Source: UC Riverside 2015

Vegetation Types and Other Areas

Exhibit 4

Long Range Development Plan for the University of California, Riverside

PSOMAS

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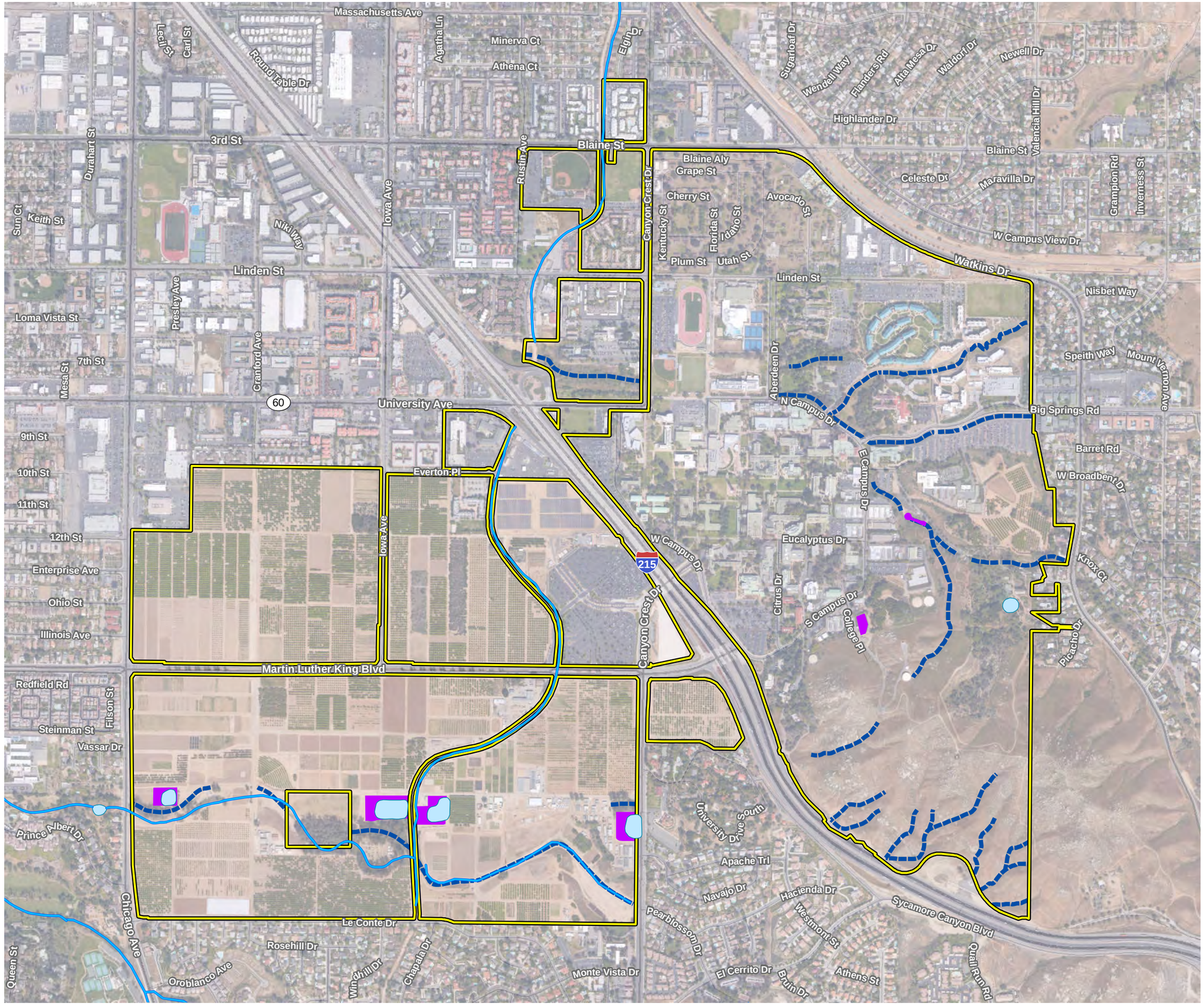

Survey Area

Field Mapped Waters

Basin

Potential Jurisdictional Waters

NWI Mapped Waters

Freshwater Pond

Riverine

N W E S

1,000 500 0 1,000 Feet

Data Source: U.S. Fish & Wildlife Service; National Wetlands Inventory December 2016
Aerial Source: UC Riverside 2015

Potential Jurisdictional Waters

Exhibit 5

Long Range Development Plan for the University of California, Riverside

PSOMAS

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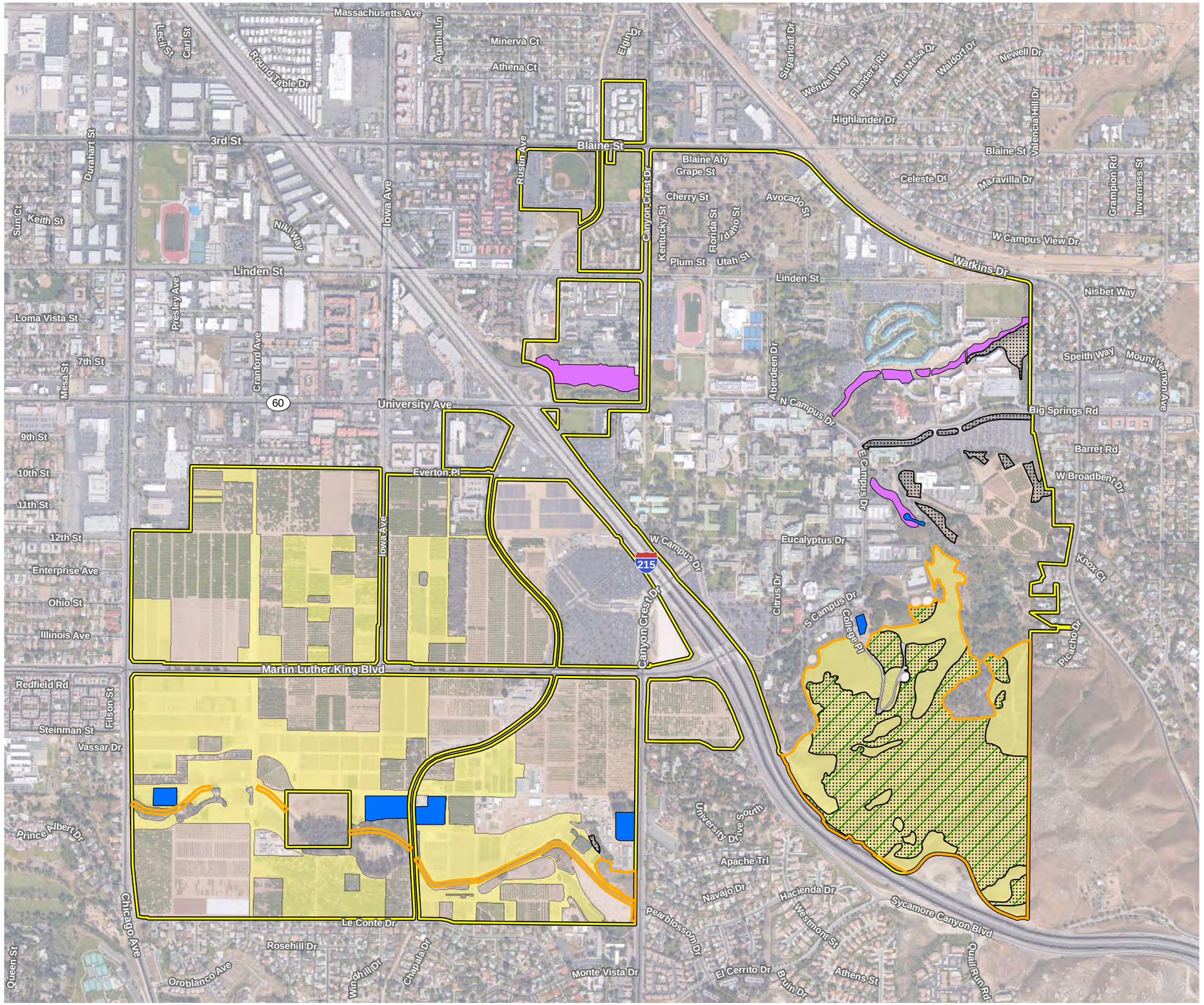

Aerial Source: UC Riverside 2015

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Areas of Potential Habitat for Special Status Species

Exhibit 6

Long Range Development Plan for the University of California, Riverside

PSOMAS

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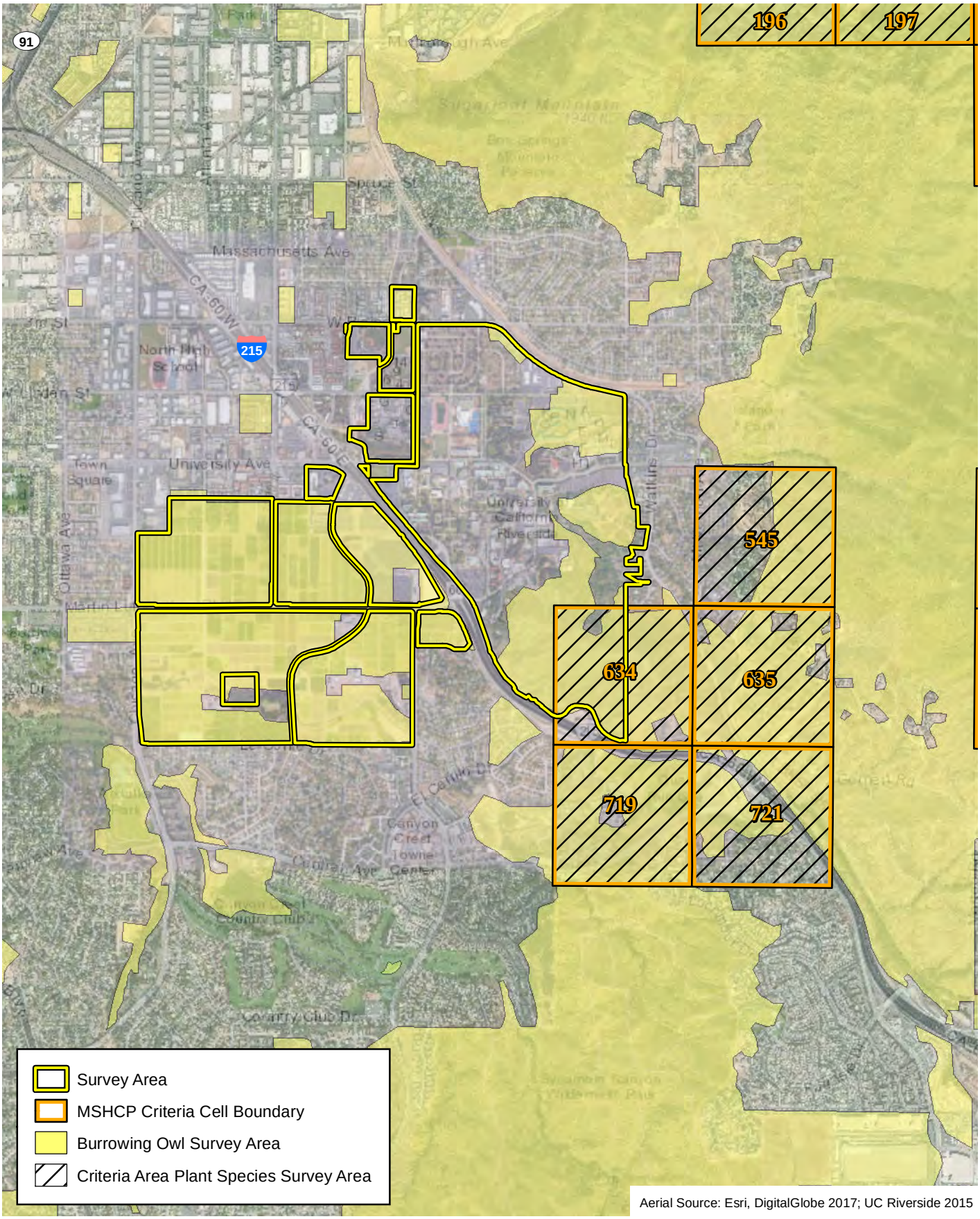

Aerial Source: Esri, DigitalGlobe 2017; UC Riverside 2015

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Relationship to MSHCP

Exhibit 7

Long Range Development Plan for the University of California, Riverside

N W E S

2,500 1,250 0 2,500

Feet

PSOMAS

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ATTACHMENT A

REPRESENTATIVE SITE PHOTOGRAPHS

Brittle bush scrub in a Natural Area in the southeastern corner of the Survey Area.

Rock outcrop in a Natural Area in the southeastern corner of the Survey Area.

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Representative Photographs

Exhibit A-1

Long Range Development Plan for the University of California, Riverside

PSOMAS

Potential jurisdictional water resource in the southeastern corner of the Survey Area.

Sage scrub restoration in a Naturalistic Area in the eastern portion of the main campus.

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Representative Photographs

Exhibit A-2

Long Range Development Plan for the University of California, Riverside

PSOMAS

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Overview of the botanical garden basin.

Mixed riparian surrounded by sage scrub restoration in a Naturalistic Area in the eastern portion of the main campus.

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Representative Photographs

Exhibit A-3

Long Range Development Plan for the University of California, Riverside

PSOMAS

Mixed riparian with a canopy of willows, Fremont cottonwood, and other trees and an understory containing mulefat, Mexican fan palm, and non-native grasses.

Representative landscaped area on the main campus.

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Representative Photographs

Exhibit A-4

Long Range Development Plan for the University of California, Riverside

PSOMAS

Representative landscaped area on the main campus.

Representative developed area on the main campus showing closely-associated vegetation.

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Representative Photographs

Exhibit A-5

Long Range Development Plan for the University of California, Riverside

PSOMAS

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Representative fallow field in the Agricultural Area in the west campus.

Active Agricultural Area (foreground) and Eucalyptus grove (background) in the west campus.

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Representative Photographs

Exhibit A-6

Long Range Development Plan for the University of California, Riverside

PSOMAS

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