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**M E M O R A N D U M**

FROM: Jonna D. Engel, Ph.D., Ecologist
TO: Amber Dobson, Coastal Program Analyst
SUBJECT: ESHA and Wetland Determination for Banning Ranch, Orange County, California (CDP 5-13-032)
DATE: September 25, 2015

Documents Reviewed:

Ritenour, D., Vernal Pool Biologist (ICF International). August 9, 2015. Incomplete Jurisdictional Delineations for the Newport Banning Ranch. Report addressed to Marc Brown, Environmental Specialist, Santa Ana RWQCB.

Davis, J.H. IV (Dudek). August 3, 2015. 2015 Vegetation Update with CCC Staff Directed Changes.

Ortega, B.A. (Dudek). June 19, 2015. Focused California Gnatcatcher Survey, Newport Banning Ranch Project, Orange County, California. Report addressed to USFWS, Attn: Recovery Permit Coordinator.

Hamilton, Robert A. February 23, 2015. Letter report: Application No. 5-13-1100; NMUSD Unpermitted Fence, 975 West 16th Street, Newport Beach, California. Submitted To: Dr. Jonna Engel, California Coastal Commission.

Bramlet, D. July 7, 2014. Habitat Assessment for the Fencing at 975 W. 16th Street, Newport Beach, California. Prepared For: Newport-Mesa Unified School District.

Ortega, B.A. (Dudek). March 7, 2014. 2014 Focused Non-Breeding Season Burrowing Owl Surveys, Newport Banning Ranch Project, Orange County, California. Report addressed to Michael Mohler, Newport Banning Ranch, LLC.

Welsh, Terry (Banning Ranch Conservancy). November 30, 2013. Vernal Pools, Wetlands, Fairy Shrimp and the Unpermitted Newport Mesa Unified School District Fence.

Dudek. October 24, 2013. Review and Comparison of California Gnatcatcher Surveys Results for the Newport Banning Ranch Property, Orange County, California. Memorandum addressed to Newport Banning Ranch, LLC.

Vergne, P.J. (Dudek). August 26, 2013. 90-Day Protocol Survey Report for the Federally-Listed Pacific Pocket Mouse on the Newport Banning Ranch, City of Newport Beach and Unincorporated Orange County, Orange County, California. Permit Number *TE-068072-3*. Report addressed to Ms. Susie Tharratt, Recovery Permit Coordinator, Carlsbad Fish and Wildlife Office.

Ortega, B.A. (Dudek). May 31, 2013. Focused California Gnatcatcher Survey, Newport Banning Ranch Project, Orange County, California. Report addressed to U.S. Fish and Wildlife Service; Attn: Recovery Permit Coordinator.

Davis, J.H. IV (Dudek). May 2013. Jurisdictional Determination of Seasonal Features for the Newport Banning Ranch. Prepared for Newport Banning Ranch, LLC.

Davis, J.H. IV (Dudek). February 2013. Grassland Assessment and Vegetation Mapping Survey Report for the Newport Banning Ranch. Prepared for Newport Banning Ranch LLC.

Bomkamp, T (Glenn Lukos Associates) and J. H. Davis IV (Dudek). January 29, 2013. Summary of Protocol Surveys for Federally-Listed Vernal Pool Branchiopods Conducted on Newport Banning Ranch, City of Newport Beach and Unincorporated Orange County, California. Report addressed to Christine Medak, U.S. Fish and Wildlife Service.

Davis, J.H. IV (Dudek). January 2013. Raptor Survey Report for the Newport Banning Ranch. Prepared for Newport Banning Ranch LLC.

Bomkamp, T. (Glenn Lukos Associates). June 14, 2011. Clarification Regarding CAGN Mapping from 2002 Protocol Surveys Conducted by Glenn Lukos Associates for West Newport Oil. Memorandum to Christine Medak, USFWS.

Conservation Biology Institute. December 2009. Conservation Assessment of Orange County. Prepared for Orange County Transportation Authority.

BonTerra Consulting. June 25, 2009. Results of Coastal California Gnatcatcher Surveys for Newport Banning Ranch Project Site, Orange County, California. Letter addressed to Ms. Sandy Marquez, USFWS.

BonTerra Consulting. February 2009. Environmental Impact Report, SCH# 2009031061, Site: Newport Banning Ranch, Newport Beach, Orange County. Prepared for City of Newport Beach.

Glenn Lukos Associates. August 2008. The Newport Banning Ranch Biological Technical Report. Report prepared for Mike Mohler, Newport Banning Ranch, LLC.

Glenn Lukos Associates. July 19, 2007. Submittal of 45-Day Report for Coastal California Gnatcatcher Surveys for the 412.5 Newport Banning Ranch Property, City of Newport Beach and Unincorporated Orange County, Orange County, California. Survey report from Glenn Lukos Associates Biologist Ingrid Chlup to Sandra Marquez, USFWS.

Glenn Lukos Associates. July 25, 2006. Submittal of 45-Day Report for Coastal California Gnatcatcher Presence/Absence Surveys for the 412.5 Newport Banning Ranch Property, City of Newport Beach and Unincorporated Orange County, Orange County, California. Survey Report from Glenn Lukos Associates Biologist Jeff Ahrens to Daniel Marquez, USFWS.

Glenn Lukos Associates. October 14, 2002. Protocol Surveys for the Coastal California Gnatcatcher; West Newport Oil Property, Orange County California. Survey report from Glenn Lukos Associates Biologist Tony Bompkamp to Leonard Anderson, West Newport Oil Property.

Gnatcatcher Survey Map. 2000. Unknown Source (we believe the source is PCR Services).

PCR Services. 1998. Gnatcatcher Survey Map.

PCR Services. 1997. Gnatcatcher Survey Map.

LSA. 1996. Spring 1996 California Gnatcatcher Survey. Survey Report from LSA Biologist Richard Erickson to Leonard Anderson.

LSA. 1995. Spring 1995 California Gnatcatcher Survey. Survey Report from LSA Biologist Richard Erickson to Leonard Anderson.

LSA. 1994. Results of 1994 Gnatcatcher and Wren Surveys. Survey Report from LSA Biologists Robb Hamilton and Richard Erickson to Leonard Anderson, West Newport Oil Company.

I have examined the biological resources on Banning Ranch to determine the nature and extent of environmentally sensitive habitat (ESHA) and wetlands on the site. To do so I visited the site many times including on September 15, 2010; December 15, 2010; June 7, 2011; March 3, 2014; June 10, 2014; June 11, 2014; and January 29, 2015. In addition, I have carefully reviewed numerous biological studies conducted on the site dating from the 1990's to the present as well as biological reports for adjacent projects (see 'documents reviewed' above). I have also reviewed peer reviewed literature,

consulted with academic experts and agency biologists, and reviewed historical and recent aerial photographs.

Site Description

The Banning Ranch site consists of 401 acres; 361 acres are located within unincorporated Orange County, California and 40 acres are within the City of Newport Beach. NBR is the largest privately owned open space remaining along the coast in Orange County. It is bordered by the Santa Ana River to the west, a U.S. Army Corps of Engineers (USACE) wetlands restoration area to the southwest, Talbert Nature Preserve and Fairview Park to the north, residential development in the City of Costa Mesa to the northeast, residential properties and Superior Avenue in the City of Newport Beach to the southeast, and Pacific Coast Highway (PCH) to the south. The Huntington Beach wetland complex consisting of Magnolia, Brookhurst, and Talbert Marsh, abuts the west side of the Santa Ana River and is approximately 1000 feet from the site at its closest point. The Pacific Ocean is approximately 1000 feet to the southwest of the site at its closest point (Figure 1).

The Banning Ranch site has a diverse topography with a lowland area consisting of approximately 139 acres of saltwater, brackish and freshwater marsh and riparian habitat and an upper mesa that covers approximately 262 acres consisting of coastal scrub, riparian, and grassland habitats and vernal pools. The upper mesa is generally a flat plateau ranging from approximately 56 to 103 feet above sea level with steep slopes along the edge that are cut in several places by small canyons that open onto the lowland area. The upper mesa supports two main canyons, that are referred to as “arroyos”, which contribute to the topographic diversity of the site and subsequent biological diversity (Figure 2). The largest canyon, referred to as the “southern arroyo”, runs diagonally across the site in a southwest – northeast direction and includes several side canyons that split off from it. The other canyon, referred to as the “north-south arroyo”, is located in the middle of the property terminating as it merges with the southern arroyo (Figure 2). The U.S. Fish and Wildlife Services’ (USFWS) National Wetland Inventory maps a short “riverine” (stream) channel leading into a large area of “freshwater forested/shrub wetland” (riparian habitat) along the bottom of the southern arroyo, and a long riverine channel that feeds into a small freshwater forested/shrub wetland along the bottom of the north-south arroyo (Figure 3). The head of the north-south arroyo supports an extensive vernal pool complex with riparian habitat and at least two vernal pools scattered along the arroyo bottom. The slopes of both arroyos are characterized by patches of coastal scrub habitat.

Ecological Importance

The Banning Ranch site and surrounding area is extremely rare as one of the only reasonably intact wetland-bluff ecosystems remaining along the coast of southern California. There are no comparable areas to the south and only a few such areas north including the more intensely studied Bolsa Chica, six miles up the coast. In 1979 the USFWS identified the Bolsa Chica ecosystem as “one of the last remaining viable

wetland-bluff ecosystems in southern California.”¹ This viewpoint was echoed by conservation biologists over twenty years later. “...Bolsa Chica is one of the last remaining areas in coastal southern California with a reasonably intact upland-wetland gradient, which is of high ecological importance and generally lacking in representation in reserves in the region.”² This is because in nearly all coastal marsh ecosystems left in southern California, the upland components have been converted to urban development.

Like Bolsa Chica, the project site is a unique coastal location where several ecosystems (e.g. river mouth, lowlands with wetlands, uplands with coastal scrub and riparian habitat, and grasslands with vernal pools) converge and are defined by and dependent on complex interactions among the physical components and living organisms within each ecosystem. The juxtaposition of physical characteristics such as water quality, soil type, and varied topography and living organisms such as soil microbes and fungi, individual plants and plant communities, invertebrate and vertebrate animals that act as pollinators, dispersal agents, parasites, herbivores, and predators among other things, result in one of the most diverse settings biologically in Orange County. According to the Conservation Biology Institute (CBI), “Orange County falls within the South Coast Ecoregion of the California Floristic Province. The South Coast Ecoregion is considered a biodiversity ‘hotspot,’ supporting more endemic and imperiled species than any other region in the U.S. (Stein et al 2000), due in large part to its diversity of geologic substrates, topographic features, climatic regimes, soil types, and other physical factors.”³

In fact, the Banning Ranch property is included within one of 11 priority conservation areas (the Santa Ana River Mouth) identified by CBI that would contribute most to conserving the remaining natural resource values of Orange County⁴ (Figure 4). CBI also included Seal Beach, Bolsa Chica, and Upper Newport Bay among the 11 priority conservation areas (Figure 5) and stated that:

Although relatively small and isolated, each of these four areas supports valuable wetland habitat and among the largest concentrations of threatened and endangered species in Orange County. The significance of these wetlands extends far beyond their geographic boundaries. Situated along the Pacific Flyway in a section of California that has suffered extensive wetland habitat losses, they provide important wintering and migratory stepping-stone habitats

¹ U.S. Fish and Wildlife Service. Ecological Services, Laguna Niguel, CA. May 1979. U. S. Fish and Wildlife Service Special Report: Bolsa Chica Area.

² Noss, R. (U. Central Florida), T. Case (UCSD), and R. Fisher (USGS). No date (submitted to CCC on November 20, 2002). Evaluation of the biological significance of the Bolsa Chica Mesa. A report commissioned by the Bolsa Chica Land Trust.

³ Conservation Biology Institute. December 2009. Conservation Assessment of Orange County. Prepared for Orange County Transportation Authority.

⁴ CBI was contracted by the Orange County Transportation Authority to conduct a science-based conservation assessment to describe and map selected conservation values across Orange County to provide a tool to assist decision-makers in prioritizing lands for acquisition for Measure M (a voter approved transportation tax that is expected to raise 243 million dollars) mitigation purposes.

for numerous shorebirds and waterfowl. In addition, a number of endemic invertebrate species occur in these systems. Where these wetlands abut upland habitat, sensitive upland species such as coastal California gnatcatcher and coastal cactus wren occur. Extensive grasslands surrounding these wetlands provide significant raptor foraging areas, as well.

The Banning Ranch property is part of a wetland ecosystem along the lower Santa Ana River that includes extensive saltwater, brackish and freshwater marsh and riparian scrub habitats. The wetlands at Banning Ranch are part of a connected wetland system that includes the Huntington Beach Wetlands, lower Santa Ana River channel, Semeniuk Slough, USACE Wetlands (restored strip of salt marsh along the east side of the river channel, next to NBR), Talbert Regional Park (County of Orange), and Fairview Park (City of Costa Mesa). The property also supports one of very few coastal mesa upland ecosystems (including coastal scrub, grassland, riparian, and vernal pool habitats) remaining in Orange County. Uplands provide pollinators for wetland plants, nesting and denning sites for avian and mammalian predators that forage in wetlands, important alternative prey populations for many of those predators, and critical habitat for primarily upland species^{5,6,7}.

Vernal pools provide important seasonal water sources and foraging areas for a variety of wildlife, breeding areas for toads, frogs, and salamanders, and habitat for specialized invertebrate and plant species. Figure 52 in Paul H. Zedler's seminal report on the ecology of southern California vernal pools⁸, reproduced on the following page, is a schematic illustration of numerous biotic interactions that take place in vernal pool ecosystems. As Figure 52 indicates, vernal pools are not simply isolated seasonal ponds where invertebrates, frogs, and plants live out their life-cycles independent of their surroundings. They are defining features on the landscape that serve various roles that are vital to the functioning of the overall ecosystem. As stated by Zedler:

Pools isolated by roads or housing developments may lack pollinators essential to seed production of some species. The landscapes in which pools are found also are changed by the presence of the pools. Vernal pools are not merely isolated ecosystems but elements in complex systems that include humans. In an arid region, the presence of standing water for even a brief period represents a dramatic change in resources available to animal populations. For some birds and larger mammals the location of water is a major determinant of the patterns of movement. An increase in the supply of surface water means an

⁵ Noss, R. (U. Central Florida), T. Case (UCSD), and R. Fisher (USGS). No date (submitted to CCC on November 20, 2002). Evaluation of the biological significance of the Bolsa Chica Mesa. A report commissioned by the Bolsa Chica Land Trust

⁶ Raysbrook, C. (CDFG). January 16, 2002. Draft subsequent environmental impact report for the Brightwater Development Project, County of Orange and City of Huntington Beach, California (SCH 1993071064). Letter to G. Fong (County of Orange).

⁷ Zedler, J. (U. Wisconsin). Bolsa Chica Local Coastal Program, Land Use Plan Amendment No. 1-95. Letter to CCC concerning ecological implications of development on the mesa.

⁸ Zedler, P.H. 1987. The ecology of southern California vernal pools: a community profile. U.S. Fish Wildl. Serv. Biol. Rep. 35(7.11). 136 pp.

increase in the freedom and range of movement. Vernal pool areas should support more mammals and birds than comparable areas without vernal pools.

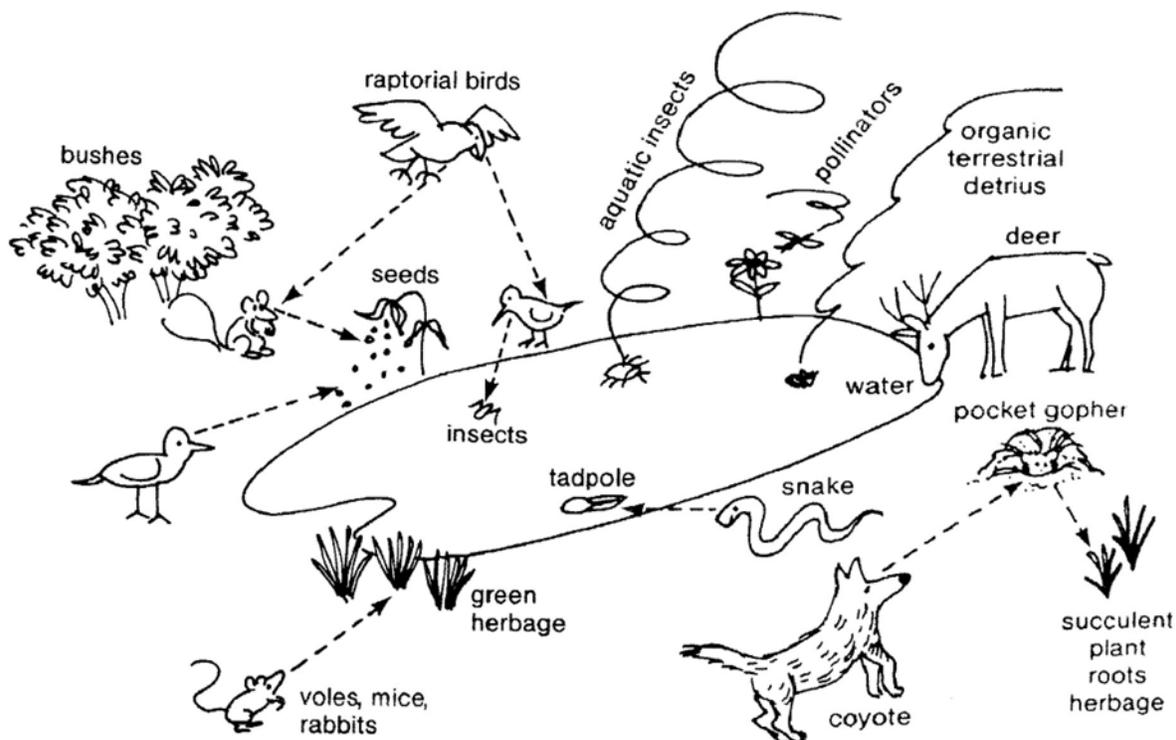


Figure 52. Some of the interactions between a vernal pool and its terrestrial surroundings.

95

More generally, numerous wildlife species have life-stages that rely on both wetland and upland habitats. For example, according to Wayne Ferren:

The caterpillar[s] of the Pygmy Blue Butterfly eat only marsh and edge species of plants belonging to the Spinach Family and the caterpillars of the Wandering Skipper eat only Saltgrass. Adults of both butterflies nectar mostly on summer and fall flowering plants belong (sic) to the Sunflower Family that occur in adjacent palustrine marshes (e.g. Western Goldenrod) and shrubs of coastal scrub, grassland, and dune habitats including Coast Golden Bush and Mock Heather. Because many native coastal butterflies are dependent on specific host plants, without an appropriate mix of native habitats that support native plant communities, these edge-dependent species are not likely to survive in coastal wetland ecosystems.^{9,10}

⁹ Ferren, W. (U.C. Santa Barbara). October 28, 2000. Wetland edges, transitions, and adjacent uplands. Letter to J. Dixon (CCC)

For these reasons, the coastal wetland and upland habitats found at the Banning Ranch site are considered to be of high ecological importance.

Site History

From the late 1800's to 1944 much of the property's upper mesa was used for agricultural purposes (e.g. farming and grazing). Since that time, oil and gas production operations have been going on at a variety of locations throughout the site. Over 470 production and injection wells have been drilled during these 71 years of operations, and access roads, pipelines, power lines, and other associated infrastructure have been installed and used. Over time, as operational practices changed and evolved and oil formations at different depths and locations on the site were targeted, wells and infrastructure were abandoned, removed, relocated, and replaced across the site. All this activity has resulted in both the disturbance and degradation and subsequent recovery of the natural resources on site as activity levels have waxed and waned. In addition to the above activities, vegetation mowing, in excess of what is necessary for fuel modification, has also taken place over the years; sometimes more area has been mowed, sometimes less. Recently, the project applicant, Newport Banning Ranch (NBR), entered into an agreement with the Commission (see CCC settlement agreement and cease and desist and restoration order numbers CCC-15-CD-01 & CCC-15-RO-01) to limit mowing to certain areas defined in the agreement that were deemed essential to meet fuel modification requirements for fire suppression. Limiting mowing helps to protect coastal California gnatcatcher habitat on the site. Despite the historic and current human activity on the project site, it continues to support high functioning lowland and upland mesa native habitats and sensitive plants and animals. The City of Newport Beach acknowledges this with the following statement in their General Plan Land Use Element¹¹:

Although the Banning Ranch site contains an assemblage of diverse habitats that have been historically disturbed, when this area is considered with the contiguous Semeniuk Slough and restored wetlands, it provides wildlife with a significantly large, diverse area for foraging, shelter, and movement. Biological studies performed for Banning Ranch indicate that, while disturbance associated with oil activities diminishes the quality of existing habitat to some extent, overall, the area should be regarded as relatively high-quality wildlife habitat due to its size, habitat diversity, and continuity with the adjacent Semeniuk Slough and federally-restored wetlands.

NBR is proposing a project that generally includes abandoning oil operations, treating and disposing of contaminated soil, and constructing a housing and mixed-use development on the 401 acre site. The proposed project involves mass grading, a

¹⁰ While the pygmy blue and wandering skipper butterflies are not necessarily on NBR, they are examples of how different areas of coastal lowland wetland and upland mesa ecosystems are integral and necessary for the survival of specific species.

¹¹ City of Newport Beach, General Plan, Chapter 3, Land Use Element:
http://www.newportbeachca.gov/PLN/General_Plan/04_Ch3_LandUse_web.pdf

habitat mitigation proposal, and a subdivision. The development proposal includes 72 acres of residential with 1,375 residential units, 4 acres of retail, and 6 acres of resort with a 75 room hotel and 8-10 bed hostel; 265 acres of open space, 25 acres of parks, 9.5 acres of public trails, and 17 acres of roads; 16.5 acres of the site would remain as active oil operations. The largest footprint of the proposed development is on the site's upper mesa (Figure 6)

Banning Ranch is within an area known as a "white hole" or an area of deferred certification which means it is not covered by a certified Local Coastal Plan (LCP). Therefore, the standard of review for the proposed development is the Coastal Act.

ESHA Definition

Section 30107.5 of the Coastal Act defines Environmentally Sensitive Habitat (ESHA) as:

Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

ESHA Determination

There are three important elements to the definition of ESHA. First, a geographic area can be designated ESHA, either because of the presence of individual species of plants or animals, or, because of the presence of a particular habitat. Second, in order for an area to be designated as ESHA, the species or habitat must be either, rare, or it must be especially valuable because of its special nature or role in the ecosystem. Finally, the area must be easily disturbed or degraded by human activities.

The first test for ESHA is whether a habitat or species is rare. To determine the rarity status of individual plants, animals, or habitats, Commission staff consult the California Natural Diversity Database (CNDDDB). CNDDDB is a state depository of lists of rare plant and animal species and rare natural communities, generated by an array of regional, state, national and international sources that are vetted, maintained, and continually updated by the Biogeographic Branch of the California Department of Fish and Wildlife (CDFW). In making an ESHA determination, the Commission staff ecologists review these lists including the list of natural communities identified as rare by CDFW¹², the State and Federal government lists of rare, threatened or endangered plant and animal species¹³, the natural communities and plant and animal species listed by NatureServe as Global and/or State-ranked 1, 2, or 3¹⁴, the plant and animal species listed as

¹² The CDFW Biogeographic Branch publishes the *List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program, California Department of Fish and Game. Sacramento, CA. September 2010* that includes the rarity rankings of plant communities, associations, and alliances.

¹³ Pursuant to the Endangered Species Act (ESA) and the California Endangered Species Act (CESA), the USFWS and CDFW, respectively, maintain lists of rare, threatened, and endangered plant and wildlife species. In addition to these categories they identify plant and animal species that are candidates for listing as well as candidates for delisting

¹⁴ NatureServe, originally developed and managed by The Nature Conservancy, has been in operation since the 1970s. It is a distributed network of biodiversity inventories that all employ a rigorous set of field

California Species of Special Concern (SSC)¹⁵, and California Native Plant Society's (CNPS) California Rare Plant Ranked (CRPR) 1B or 2B species¹⁶.

A second test for ESHA is whether a habitat or species is especially valuable. Areas may be valuable because of their "special nature," such as being an unusually pristine example of a habitat type, containing an unusual mix of species, supporting species at the edge of their range, or containing species with extreme variation. Or, habitats or species may be considered valuable because of their special "role in the ecosystem." For example, particular habitat areas may meet this test because they provide habitat for listed species, protect water quality, provide essential corridors linking one sensitive habitat to another, or provide critical ecological linkages such as the provision of pollinators or crucial trophic connections.

Finally, ESHAs are those areas that could easily be disturbed or degraded by human activities and developments. In most areas of southern California affected by urbanization, all natural habitats are in grave danger of direct loss or significant degradation as a result of many factors related to anthropogenic changes

ESHA Protection

Section 30240 of the Coastal Act, environmentally sensitive habitat areas (ESHA); adjacent developments, requires that ESHA is protected as follows:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

and data management standards and protocols known collectively as natural heritage methodology. This common methodology means data can be integrated across political boundaries, allowing species and ecosystems to be understood in a range-wide context, rather than only within individual states, provinces, or nations. NatureServe uses a 5 level global and state ranking system where the global rank reflects the overall status of a species or natural community throughout its global range whereas the state rank refers to the species or natural community status only within state boundaries. The ranking value reflects a combination of rarity, threat, and trend factors with weighting being heaviest on rarity. Global and state level 1 communities or species are identified as "critically imperiled - at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors". Global and state level 2 communities and species are identified as "imperiled - At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors". Global and state level 3 communities and species are identified as "vulnerable - at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors."

¹⁵ California Species of Special Concern (SSC) is a category of plants and animals maintained by the CDFW that have "declining populations levels, limited ranges, and/or continuing threats have made them vulnerable to extinction."

¹⁶ Rank 1B plants are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. Rank 2B are rare, threatened or endangered in California, but more common elsewhere.

Key provisions of Section 30240(a) are that it requires development to avoid adverse impacts to ESHA and specifies that the only uses allowable within ESHA are resource-dependent. Resource dependent uses include such things as low impact camping, trails, educational kiosks, nature study, and restoration.

Section 30240(b) requires appropriate siting, design, and buffers to ensure that development adjacent to ESHA does not result in negative impacts to ESHA. Buffers are important for preserving the integrity and natural functions of environmentally sensitive habitats. The purpose of a buffer is to create a zone where there will be little or no human activity, to “cushion” species and habitats from disturbance, and to allow native species to go about their “business as usual.”

Rare Natural Communities

California plant communities or habitats have been classified by numerous methods with different levels of detail and scale. Holland’s (1986) classification divides broad habitats such as dunes, scrub, chaparral, and woodlands into finer divisions based on species composition and geographic location¹⁷. Examples of Holland’s finer divisions include coastal prairie, southern coastal bluff scrub, maritime succulent scrub, Venturan coastal sage scrub and Diegan coastal sage scrub. Holland’s classification system is an invaluable tool for identifying vegetation types in the coastal zone. The CNDDDB has used and continues to use Holland’s classification to identify rare natural communities. More recently the CNDDDB has adopted an even finer division of natural communities used in the second edition of “A Manual of California Vegetation”¹⁸ (MCV2) which further divides vegetation types into associations and alliances based on the National Vegetation Classification System (NVCS) employed by NatureServe. The CNDDDB utilizes a system for “crosswalking” that translates between the Holland classification and NVCS. This allows Commission staff to continue using the Holland classification system to identify rare natural communities while simultaneously using the NVCS approach when finer scale vegetation data is available¹⁹.

The vegetation of the Banning Ranch site has been mapped by various biological consultants over the years. According to the project EIR, 45 vegetation²⁰ and land

¹⁷ Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. State of California. The Resources Agency. Department of Fish and Game.

¹⁸ Sawyer, J.O, T. Keeler-Wolf, & J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society Press, Sacramento, California.

¹⁹ Hierarchical List of Natural Communities with Holland Types, Sept. 2010. Users more familiar with Holland types can see the approximate relationships of those types to alliances and associations, and thus transition to the State’s new classification system.

<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=24716&inline=1>

²⁰ BonTerra’s list of vegetation types includes both Holland and MCV2 classifications. For instance, “Southern coastal bluff scrub” is a Holland classification and “Encelia scrub” is equivalent to MCV2’s “*Encelia californica* Shrubland Alliance”.

cover types, based on the County of Orange Habitat Classification System²¹, occur on the site.²²

The most recent vegetation maps submitted by the applicant are based on vegetation survey work performed by Dudek. Dudek mapped the vegetation on the site according to the NVCS classification system used by the MCV2. The first map Dudek produced was based on vegetation surveys conducted between late-June through mid-December 2012 (Figure 7)²³. The mapping was conducted during the summer dry season, two years into the continuing extreme drought, and through the following dry fall. It should be noted that Commission staff, NBR, and the oilfield operator reached an interim agreement in 2012, which was formalized with NBR pursuant to the 2015 Consent Orders. The agreement addressed the need to halt the widespread mowing of the site that had occurred during some of the previous years. Commission staff estimated the areas of the site that had been mowed before the informal agreement to stop in 2012 (Figure 8)²⁴. Thus, much of the vegetation mapping performed by Dudek reflects the site in a mowed condition. For that reason, and others, we closely scrutinized the areas of the site that had been mapped as “disturbed” or “developed”. In several notice of incomplete (NOI) application letters,²⁵ staff requested that the applicant’s biological consultant re-map the vegetation in the “disturbed” category. In our June 14, 2013 NOI application letter we wrote the following:

²¹ Gray, John and Bramlet, David. 1992. Habitat Classification System, Natural Resources, Geographic Information Systems (GIS) Project. County of Orange Environmental Management Agency, Santa Ana, California.

²² Southern coastal bluff scrub, California sagebrush scrub, Encelia scrub, coyote brush scrub, coyote brush scrub/mule fat scrub, goldenbush scrub, southern cactus scrub, southern cactus scrub/Encelia scrub, saltbush scrub, disturbed southern coastal bluff scrub, disturbed sage scrub, disturbed Encelia scrub/mule fat scrub, disturbed Encelia scrub, disturbed goldenbush scrub, disturbed goldenbush scrub/mule fat scrub/salt marsh, disturbed southern cactus scrub, disturbed southern cactus scrub/Encelia scrub, ruderal/disturbed Encelia scrub, ruderal/ disturbed Encelia scrub/disturbed mule fat scrub, ornamental/disturbed southern coastal bluff scrub, non-native grassland, non-native grassland/ruderal, ruderal, vernal pool, ephemeral pool, freshwater marsh, alkali meadow, disturbed alkali meadow, salt marsh, disturbed salt marsh, mudflat, open water, mule fat scrub, willow scrub, willow riparian forest, disturbed mule fat scrub, disturbed mule fat scrub/ruderal, disturbed mule fat scrub/goldenbush scrub, disturbed willow scrub, disturbed willow riparian forest, giant reed, cliff, ornamental, disturbed, and disturbed/developed.

²³ Davis, J.H. IV (Dudek). February 2013. Grassland Assessment and Vegetation Mapping Survey Report for the Newport Banning Ranch. Prepared for Newport Banning Ranch LLC.

²⁴ Commission staff analyzed a series of historical photographs to determine where the site had previously been mowed. Staff reviewed photographs dating back to before the passage of the Coastal Act for evidence of mowing (e.g. tractor lines, edges between cut and uncut vegetation, etc.). If an area had not been recently mowed or had only been mowed on a couple of occasions, or fewer, it was not included on the map of mowed areas.

²⁵ Letter to Ms. April Winecki, Dudek. March 1, 2013. Re: Notice of Incomplete Application, Application No. 5-13-032. From John Del Arroz, CCC Coastal Analyst and Karl Schwing, CCC Supervisor Regulation and Planning; Letter to Ms. April Winecki, Dudek. June 14, 2013. Re: Notice of Incomplete Application, Application No. 5-13-032. From John Del Arroz, CCC Coastal Analyst and Karl Schwing, CCC Supervisor Regulation and Planning; Letter to Mr. Michael Mohler. December 6, 2013. Re: Notice of Incomplete Application, Application No. 5-13-032. From John Del Arroz, CCC Coastal Analyst; Letter to Mr. Michael Mohler. February 7, 2014. Re: Notice of Incomplete Application, Application No. 5-13-032. From John Del Arroz, CCC Coastal Analyst.

The rules for what constitutes “disturbed” and what constitutes “disturbed native vegetation” remain unclear. First, while bare ground is identified as a factor for determining disturbed areas, a quantitative value for what amount of bare ground relegates a particular area into a “disturbed” category is not provided. Second, the criteria for whether an area is labeled “disturbed” or “disturbed native shrub vegetation” is not provided. According to Sawyer et al. (2009), the criteria for shrub cover to be considered shrub vegetation is that the absolute cover (total cover) must be 20% or greater. We believe that this is a logical criteria for distinguishing “disturbed” from “disturbed native vegetation”. In areas where the absolute cover is 20% or greater the MCV2 membership rules can be applied to determine the type of disturbed native shrub cover.

In addition to requesting that the applicant re-survey and map areas identified as “disturbed”, we also requested that Dudek map all the patches of prickly pear cactus on the site: “.....while patches of iceplant below the minimum mapping unit have been mapped across the entire site, similar size patches of prickly pear cactus (indicator species of coast prickly pear scrub which is a rare plant community) located within polygons mapped as ‘disturbed’ were not mapped. We believe that these patches of prickly pear cactus must be mapped.”

On several site visits spanning 2013-2015 it was apparent that the mapped vegetation was inconsistent with the vegetation on the ground in several locations. On each site visit staff reiterated the need for revising the 2012 vegetation map. On January 28, 2015, I visited the site along with Christine Medak, USFWS biologist, to point out to Dudek senior biologist, John Davis, examples of areas identified as ‘disturbed’ and patches of prickly pear cactus that should be re-surveyed and mapped. In spite of the ongoing four year drought, many of the areas mapped ‘disturbed’ in 2012, now supported a high cover of native shrubs, especially California sunflower (also called California brittle bush). This observation is consistent with the expectation that many previously mowed areas are recovering, and will continue to recover, from the effects of that activity, which impacted areas of native vegetation across the site (Figures 9a, 9b, & 9c). Despite staff’s repeated requests that the applicant re-survey the disturbed areas and map patches of prickly pear cactus, the work did not occur until summer 2015. We received the revised vegetation map several weeks ago on August 3, 2015 (Figure 10). Subsequently, in an e-mail dated August 17, 2015, biologist Robb Hamilton provided photographic evidence that an area along the southern project boundary, at Pacific Coast Highway, was erroneously mapped in the revised mapping effort as “myoporum grove” by Dudek, when in fact it supported native scrub dominated by native Brewer’s Saltbush (*Atriplex lentiformis* ssp. *breweri*) and Mulefat (*Baccharis salicifolia*). Commission ecologists have not had time to ground-truth the revised vegetation map but Mr. Hamilton’s observations suggest that additional site visits to spot-check the 2015 vegetation map are warranted.

In order to be able to proceed under these circumstances, we have based the boundaries of the rare plant communities on the site that meet the definition of ESHA on

mapping data from both the 2012 and 2015 Dudek surveys²⁶. It is important to note that NBR is required by the 2015 Consent Orders to establish 18.45 acres of natural habitats (e.g. grasslands, coastal sage scrub, etc.) in areas of the site currently mapped as disturbed or developed. In the interim, NBR and the Commission have agreed, through the Consent Orders, to immediately treat the proposed restoration areas as if they are restored with native habitat. Staff is currently reviewing the areas that NBR is proposing to restore, and thus, those areas were not mapped as ESHA here, but such areas will likely rise to the level of ESHA once established due to their species make-up, resultant ecological value, and proximity to existing ESHA. Until that process is complete, the boundaries of native plant communities on the site, and ESHA, cannot be precisely mapped.

Coastal Sage Scrub

Coastal sage scrub is increasingly rare in the coastal zone; loss of coastal sage scrub habitat in southern California is estimated to be 70 to 90 percent^{27,28}. Coastal sage scrub is comprised of dominant species that are semi-woody and low-growing, with shallow, dense roots that enable them to respond quickly to rainfall²⁹. The species composition and structure of individual stands of coastal sage scrub depend on moisture conditions that derive from slope, aspect, elevation and soil type. Characteristic species of coastal sage scrub include California sagebrush (*Artemisia californica*), California sunflower (*Encelia californica*)³⁰, California buckwheat (*Eriogonum fasciculatum*), coastal goldenbush (*Isocoma menziesii*), coyote brush (*Baccharis pilularis*), and deerweed (*Acmispon glaber*). The coastal sage scrub on Banning Ranch is best characterized as California Brittle Bush Scrub (CBBS), also called *Encelia californica* Alliance Shrubland, which is identified as a rare habitat by the CNDDDB.³¹

The project EIR states that:

Encelia scrub occurs in large areas in the northeastern portion of the Project site and along the bluffs and southern portions of the mesa. This vegetation type is dominated by bush sunflower, and it occurs as a monoculture in many of the northern patches. Other species present in lower densities include bladderpod, wreath plant (Stephanomeria virgata), goldenbush (Isocoma menziesii), California buckwheat, coastal prickly pear, and coastal cholla.

²⁶ "In" and "Out" ESHA boundary adjustments may be necessary following additional site visits to examine on-the-ground conditions against the Dudek vegetation maps.

²⁷ Westman, W.E. 1981. Diversity relations and succession in Californian coastal sage scrub. Ecology, Vol. 62: 170-184

²⁸ Department of the Interior, Fish and Wildlife Service, 50 cfr part 17, RIN 1018-AV38, Endangered and threatened wildlife and plants; Revised designation of critical habitat for the Coastal California Gnatcatcher (*Poliioptila californica californica*). 50; Federal Register 72:72069. (December 19, 2007).

²⁹ Holland (1986). op. cit.

³⁰ California sunflower (*Encelia californica*) has several other common names including California brittle brush, brittle brush, bush sunflower, and Encelia.

³¹ S3: Vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

Dudek placed California Brittle Bush Scrub (CBBS) in 13 different categories, depending on associated species and type of disturbance³². We combined these sub-types into one CBBS Coastal Sage Scrub layer for mapping purposes since the overwhelming dominant in each case is California brittle bush (*Encelia californica*).

Coastal sage scrub in southern California provides habitat for over 100 rare species, many of which are also endemic to limited geographic regions³³. One such species is the coastal California gnatcatcher, a threatened species on the federal endangered species list. The coastal California gnatcatcher is an obligate, year-round resident of coastal sage scrub communities³⁴. Gnatcatchers in southern California preferentially nest and feed in coastal scrub vegetation on mesas and gentle slopes that are characterized by varying abundances of California sunflower, California sagebrush, and California buckwheat³⁵.

California Brittle Bush dominated Coastal Sage Scrub is a rare habitat, provides an especially valuable ecosystem service when occupied by the coastal California gnatcatcher or other rare species, and is easily disturbed and degraded by human activities and development. Therefore the CBBS Coastal Sage Scrub on the project site meets the definition of ESHA (Figure 11).

Sunset Ridge Park Project Differentiation

In an action to approve the Sunset Ridge Park on property adjacent to Banning Ranch, the Commission found that a patch of California sunflower scrub (California brittle bush coastal sage scrub, CBBS) on that property did not rise to the level of ESHA. The patch can be differentiated from the CBBS on Banning Ranch, which does rise to the level of ESHA, in a number of ways. The Commission found that the patch of CBBS on Sunset Ridge did not qualify at the time as ESHA because: 1) the vast majority of the Sunset Ridge site was consistently maintained in a disturbed condition through grading and recurrent mowing of vegetation since before the Coastal Act, first by CalTrans and then by the City, after purchase by such (the CBBS patch was mowed to the ground once or twice a year), 2) there was no formal documentation of usage of the disturbed patch of CBBS by sensitive species, including the coastal California gnatcatcher, for foraging or

³² California Brittle Bush Scrub (CBBS), Disturbed Coast Brittle Bush Scrub (D-CBBS), Disturbed Coast Brittle Bush Scrub-California Buckwheat Scrub (D-CBBS-CBS), California Brittle Bush Scrub-Menzies Golden Bush Scrub (CBBS-MGBS), Disturbed California Brittle Bush Scrub-Menzies Golden Bush Scrub (D-CBBS-MGBS), California Brittle Bush Scrub-Coast Prickly Pear Scrub (CBBS-CPPS), Disturbed California Brittle Bush Scrub-Coast Prickly Pear Scrub (D-CBBS-CPPS), Disturbed California Brittle Bush Scrub-Coast Prickly Pear Scrub-Mule Fat Thicket (D-CBBS-CPPS-MFT), Disturbed California Brittle Bush Scrub-Purple Needle Grass Grassland (D-CBBS-PNGG), California Brittle Bush Scrub-Mule Fat Thicket (CBBS-MFT), Disturbed California Brittle Bush Scrub-Mule Fat Thicket (D-CBBS-MFT), Disturbed Infrequently Maintained California Brittle Bush Scrub (D-I-CBBS), and Disturbed Maintained California Brittle Bush Scrub (D-M-CBBS).

³³ Westman (1981) op. cit.

³⁴ Atwood, J.L. and D.R. Bontrager. 2001. California Gnatcatcher (*Poliophtila californica*). In The Birds of North America, No. 574 (A. Poole and F. Gill, eds.). The Birds of North America, Inc. Philadelphia, PA.

³⁵ Ibid.

nesting habitat, and 3) the patch of CBBS was subject to fuel modification purportedly required by the fire department to protect existing adjacent residential development from fire hazard. Due to these circumstances the patch of disturbed CBBS was found not to reach the level of significance necessary to qualify as ESHA and does not qualify as major vegetation.

Southern Coastal Bluff and Maritime Succulent Scrub

Southern coastal bluff scrub is a plant community with both woody and succulent plants of small stature, including dwarf shrubs, herbaceous perennials, and annuals, that intergrades with maritime succulent scrub, coastal sage scrub and grassland habitats³⁶. Characteristic species include saltbush (*Atriplex spp.*), liveforever (*Dudleya spp.*), California sunflower (*Encelia californica*), golden bush (*Haplopappus sp.*), prickly pear cactus (*Opuntia littoralis*), and lemonade berry (*Rhus integrifolia*). Southern coastal bluff scrub is found in localized areas along the coast below Point Conception³⁷. The CNDDDB natural community rarity ranking ranks southern coastal bluff scrub as extremely rare³⁸. The MCV2 scrubland alliance equivalent to southern coastal bluff scrub is Coast Prickly Pear Scrub (CPPS), or *Opuntia littoralis* Shrubland Alliance. The NBR EIR states that;

*Southern coastal bluff scrub occurs along the exposed bluffs and cliffs at the southern edge of the Project site overlooking West Coast Highway. These exposed areas contain low-growing native and non-native species and some elements of maritime succulent scrub, which can also be used to describe components of this vegetation type. Southern coastal bluff scrub is dominated by bush sunflower (*Encelia californica*), bladderpod (*Isomeris arborea*), California buckwheat (*Eriogonum fasciculatum*), coastal cholla (*Cylindropuntia prolifera*), coastal prickly pear (*Opuntia littoralis*), and at some locations, locally dense areas of California box-thorn (*Lycium californicum*). The most common non-native species in this area are hottentot fig (*Carpobrotus edulis*) and Myoporum (*Myoporum laetum*).*

Maritime succulent scrub is a low growing, open (25% - 75% ground cover) scrub community dominated by drought deciduous, semi-woody shrubs that grow on rocky or sandy soils of coastal headlands and bluffs with the proportion of cactus increasing at the southern end of its range³⁹. Maritime succulent scrub has a very limited distribution along the coast between southern California and northern Baja California and on the California Channel Islands. Characteristic species include prickly pear cactus, California sunflower, lemonade berry, and California box-thorn⁴⁰. The CNDDDB natural community rarity ranking ranks maritime succulent scrub as extremely rare⁴¹. As with

³⁶ Holland (1986) op. cit.

³⁷ Ibid

³⁸ S1: Critically imperiled - at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

³⁹ Holland (1986) op cit.

⁴⁰ Ibid.

⁴¹ S1: Critically imperiled - at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

southern coastal bluff scrub, the MCV2 scrubland alliance equivalent to maritime succulent scrub is Coast Prickly Pear Scrub (CPPS), or *Opuntia littoralis* Shrubland Alliance. The project EIR identifies maritime succulent scrub as “southern cactus scrub” and states that:

Southern cactus scrub occurs on the south-facing slopes along the canyons on the Project site. This vegetation type consists of 20 percent or more vegetative cover of cactus throughout the area, which was mapped according to the County of Orange Habitat Classification System (Gray and Bramlet 1992). The cactus cover is dominated by coastal prickly pear or coastal cholla. The sage scrub surrounding the cactus patches is comprised primarily of bush sunflower, California buckwheat, and bladderpod are also present.

Like southern coastal bluff scrub, maritime succulent scrub intergrades with other scrub community types, as is the case on Banning Ranch. On Banning Ranch the southern coastal bluff and maritime succulent scrub are intermixed along the edge of the upper mesa and along the slopes of the canyons and arroyos scattered across the site.

These rare habitats, are captured together under the umbrella of Coastal Prickly Pear Scrub (CPPS). Dudek placed Coastal Prickly Pear Scrub (CPPS) in two different categories; Coastal Prickly Pear Scrub (CPPS) and D- Coastal Prickly Pear Scrub (D-CPPS). We combined these sub-types into one Southern Coastal Bluff and Maritime Succulent Scrub layer for mapping purposes since the overwhelming dominant in each case is Prickly Pear (*Opuntia littoralis*).

The Southern Coastal Bluff and Maritime Succulent Scrub on the project site meet the definition of ESHA because they are rare habitats and because they are easily disturbed and degraded by human activities and development (Figure 11).

Purple Needle Grass Grassland

Purple needle grass (*Stipa pulchra*), the California state grass, is a tuft or bunch grass species once found abundantly throughout California grasslands. Purple needle grass grasslands have become increasingly rare due to intensive conversion to agricultural land, urban development, and invasion European annual grasses. The CNDDDB ranks purple needle grass grasslands as a rare habitat.⁴² In California, native coastal grasslands (coastal prairie) once covered vast areas of the coast, but today they have been extirpated from approximately 95% of their former range⁴³.

The NVCS membership rule for purple needle grass grassland is greater than 10% relative cover of purple needle grass of the herbaceous layer and/or greater than 5% absolute cover as a characteristic to dominant species in the herbaceous layer⁴⁴. The

⁴² S3: Vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

⁴³ National Park Service. 2000. Draft general management plan & environmental impact statement. Santa Monica Mountains National Recreation Area – California.

⁴⁴ Sawyer, J.O, T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, 2nd Edition, California Native Plant Society Press, Sacramento, CA.

plant alliances mapped by Dudek that meet the membership rules for purple needle grass grassland, include Purple Needle Grass Grassland (PNGG) and Disturbed-Coastal Brittle Brush Scrub-Purple Needle Grass Grassland (D-CBBS-PNGG). We combined these sub-types into one Purple Needle Grass Grassland layer for mapping purposes.

Large patches of purple needle grass that in aggregate form purple needle grass grassland are located across the Banning Ranch upper mesa area. Not only is purple needle grass grassland a rare habitat, it also provides dwelling habitat for burrowing animals and significant foraging habitat for numerous species of mammals, birds, and reptiles. Burrowing owls, and many species of raptors, including red-tailed hawks, Cooper's hawks, American kestrels, and peregrine falcons, have been observed perching and foraging at various locations within and in the vicinity of the purple needle grass grassland across the entire site. The purple needle grass grassland on Banning Ranch meets the definition of ESHA because it is a rare habitat that also provides an especially valuable ecosystem function as foraging habitat for many species of animals, including the burrowing owl (a Species of Special Concern) and numerous raptor species, and because it is easily disturbed and degraded by human activities and development (Figure 11).

Riparian

Riparian habitat consisting of arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), mulefat (*Baccharis salicifolia*) and California blackberry (*Rubus ursinus*) is found on the lowland area and in the arroyos on the upper mesa. The project EIR classifies the riparian habitat on the site as 'willow riparian forest', 'willow scrub', and 'mule fat scrub' and states that:

Willow riparian forest occurs along the northern edge of the Project site in patches in the lowland and in three of the largest arroyos on the Project site. This vegetation type occurs along the main drainage that is fed by nuisance runoff and in the lowland where the ground water is high with lower salinities. This vegetation type is dominated by black and arroyo willows that are greater than 20 feet in height. Other species present in the understory include mule fat, poison hemlock, pampas grass, and California blackberry (Rubus ursinus).

Willow scrub occurs in a patch in the northern portion of the lowland. This vegetation type is similar to willow riparian forest; however, the Gooding's black willow (Salix gooddingii) and arroyo willow (Salix lasiolepis) are smaller in size and there is a higher percentage of mule fat.

Mule fat scrub occurs in patches in the western portion of the Project site, typically surrounding alkali meadow areas and adjacent to areas of disturbed mule fat scrub. Although many of these areas are adjacent to roads, they have minimal ornamental species or disturbance. This vegetation type is dominated by dense stands of mule fat with scattered goldenbush, alkali heath, and telegraph weed.

Riparian habitat is greatly reduced in extent from its historical distribution in southern California; the CNDDDB ranks “Southern Arroyo Willow Riparian Forest” as a very rare habitat.⁴⁵ Dudek placed riparian habitat in five different categories, depending on associated species and type of disturbance.⁴⁶ We combined these sub-types into one Riparian habitat layer for mapping purposes.

The riparian habitat on the project site rises to the level of ESHA because it is a rare habitat type, it supports rare and endangered species such as the least Bell’s vireo (*Vireo bellii pusillus*)⁴⁷, and it is easily disturbed and degraded by human activities and development (Figure 11).

Vernal Pools

Vernal pools are rare and unique seasonal aquatic habitats consisting of shallow depressions that typically fill with water during winter and spring rains. Perched on a layer of impervious soil, the pools usually persist for several weeks, then gradually evaporate. The pools on the Banning Ranch site are situated on Myford soils⁴⁸, which are described as potentially hydric soils where appropriate topographic features exist (e.g. depressions), and have very slow permeability⁴⁹. Vernal pools in the nearby Fairview Park vernal pool complex are also situated on Myford soils. Historical aerials show that the project property was characterized by round mounds, sometimes called mima mounds, which are typically found on landscapes with shallow base layers such as bedrock, hardpan, or claypan (Figure 12). Within California, vernal pools are commonly associated with mima mounds⁵⁰. Mima mounds are typically located on stable landforms that are greater than 100,000 years old. The USFSW vernal pools recovery plan⁵¹ states that “After sufficient rainfall, pools form in depressions above an impervious soil layer or layers. Typically, the depressions are part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages. This landscape is frequently called “mima-mound” topography, after the Mima Prairie in Washington where these soil mounds were first described (Cox 1984 a, b)”. Given the

⁴⁵ S2: Imperiled – At high risk of extinction due to very restricted range, very few populations (often 20 or fewer) steep declines, or other factors.

⁴⁶ Arroyo Willow Thickets (ARWT), Disturbed Arroyo Willow Thickets (D-ARWT), Black Willow Thickets (BWT), Disturbed Black Willow Thickets (BWT), Disturbed Black Willow Thickets-Mule Fat Thicket (D-BWT-MFT).

⁴⁷ Kus, B. 2002. Least Bell’s Vireo (*Vireo bellii pusillus*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

⁴⁸ U.S. Department of Agriculture (USDA). 2015. Web Soil Survey. Available: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>

⁴⁹ USDA Natural Resources Conservation Service (NRCS). 2014. National List of Hydric Soils.

⁵⁰ Reed S. E. and Amundson R. G. 2007. Sediment, Gophers, and Time: A Model for the Origin and Persistence of Mima Mound—Vernal Pool Topography in the Great Central Valley. In Vernal Pool Landscapes.(eds. R. A. Schlising and D. G. Alexander). California State University, Chico, CA. 15-27.

⁵¹ U.S. Fish and Wildlife Service. 1998. Vernal Pools of Southern California Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 113pp.

association of vernal pools with mima mounds, it is not surprising that numerous vernal pools are scattered across the project site.

Dudek asserts that all but one of the pools (A) on the project site are man-made⁵². This raises the question: What came first? Vernal pools or anthropogenic disturbance? Commission staff ecologists believe the answer is vernal pools for several reasons. Coastal terraces or mesas are exactly where vernal pools occur in southern California (e.g. More Mesa and Carpinteria Bluffs in Santa Barbara County, Kearney Mesa and Clairemont Mesa in San Diego County), the Banning Ranch site has Myford soils which are conducive to the formation of vernal pools, vernal pool complexes are found at Fairview Park immediately north of Banning Ranch, and historical photographs reveal the presence of mima mounds on the site, which are associated with vernal pools.

A number of plant and animal species are endemic to (found only in) vernal pools. Plant species indicative of vernal pools, including woolly marbles (*Psilocarphus sp.*), hyssop loosestrife (*Lythrum hyssopifolia*), and water clover (*Marselia vestida*), occur in nine of the vernal pools on the project site. Fairy shrimp are also vernal pool indicators, and two species are present in the vernal pools on the project site: the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*), which is listed as very rare⁵³ by CNDDDB, and the versatile fairy shrimp (*Branchinecta lindahli*). San Diego claypan and hardpan vernal pools are both listed as very rare⁵⁴ by the CNDDDB natural communities list. Additionally, 15 acres on Banning Ranch have been identified as San Diego fairy shrimp critical habitat by the USFWS (Figure 13). This is the only designated critical habitat for this species in Orange County.

Wetland delineations and vernal pool protocol level surveys to date⁵⁵ have documented San Diego fairy shrimp, versatile fairy shrimp, fairy shrimp cysts, and/or indicator vernal pool plant species in at least 39 vernal pools on the project site (see appendix A)⁵⁶. Eight of the pools are occupied by the San Diego fairy shrimp (those marked with the following labels: VP1, VP2, VP3, E, G, H, I, and J)⁵⁷. While watershed delineations were requested for all the potential vernal pools, we only received one completed vernal pool watershed delineation (Figure 14).

⁵² From the 2013 Dudek Jurisdictional Determination, in reference to pool A, "The depression is potentially the only "natural" depression on the Project site".

⁵³ S2: Imperiled – At high risk of extinction due to very restricted range, very few populations (often 20 or fewer) steep declines, or other factors.

⁵⁴ Ibid.

⁵⁵ Many of the vernal pool protocol level surveys conducted on Banning Ranch to date are incomplete for various reasons including lack of the required number of surveys, absence of the second required wet or dry season survey, missing data on data sheets, and absence of watershed delineations. This missing information was requested in numerous incomplete letters including those dated March 1, 2013, June 14, 2013, and March 1, 2014..

⁵⁶ VP1, VP2, VP3, A, B, C, D, E, G, H, I, J, K, L, M, N, P, Q, R, S, T, V, W, X, Y, Z, BB, CC, DD, EE, FF, GG, HH, II, KK, LL, MM, OO, and PP - As labeled in Dudek's May 2013 *Jurisdictional Determination of Seasonal Features for the Newport Banning Ranch*.

⁵⁷ As labeled in Dudek's May 2013 *Jurisdictional Determination of Seasonal Features for the Newport Banning Ranch*.

According to Dale Ritenour, vernal pool biologist for the consulting firm, ICF International:

Banning Mesa is a unique vernal pool complex that supports large areas of listed San Diego fairy shrimp and vernal pool endemic versatile fairy shrimp and even more expansive pool areas with Branchinecta cysts have yet to be properly identified. The mesa's pools also support a variety of wetland plants largely or completely restricted to vernal pools. The role of these specialized plants in the local ecosystem has been downplayed because vegetative sampling has been conducted during the driest part of the year, after many annual wetland species become virtually undetectable. Although this area has received heavy anthropogenic modifications in the last 100 years, the site has appropriate soils for vernal pools and exhibits historical evidence of vernal pools and vernal pool topography. It is remarkable that this site has weathered several decades of oil operations and associated land alterations, yet continues to support a widespread and varied assemblage of vernal pool flora and fauna. Banning Mesa represents not only one of the last vernal pool complexes in Orange County, but it appears to be one of the most significant vernal pool complexes remaining in the coastal zone of southern California.⁵⁸

The vernal pools on the project site meet the definition of ESHA because they are rare, because they are aggregated and form vernal pool complexes which play an especially valuable ecosystem role, and because they are easily disturbed and degraded by human activities and development (Figure 15).

Rare Animals

Coastal California Gnatcatchers

The coastal California gnatcatcher is an obligate, year-round resident of coastal sage scrub communities⁵⁹. California gnatcatchers typically live 4 to 6 years. They primarily feed on insects, which are eaten directly off coastal scrub and other vegetation. Gnatcatchers in southern California preferentially nest and feed in coastal scrub vegetation on mesas and gentle slopes that are characterized by varying abundances of California sagebrush, California sunflower; and California buckwheat⁶⁰. Gnatcatcher densities in northern San Diego County were found to be highest in areas where California sunflower and California buckwheat were co-dominant with sagebrush⁶¹. Where these species are in low abundance, California gnatcatchers will forage on other

⁵⁸ Ritenour, D., Vernal Pool Biologist (ICF International). August 9, 2015. Incomplete Jurisdictional Delineations for the Newport Banning Ranch. Report addressed to Marc Brown, Environmental Specialist, Santa Ana RWQCB.

⁵⁹ Atwood, J.L. and D.R. Bontrager. 2001. California Gnatcatcher (*Polioptila californica*). In The Birds of North America, No. 574 (A. Poole and F. Gill, eds.). The Birds of North America, Inc. Philadelphia, PA.

⁶⁰ Ibid.

⁶¹ Weaver (1998) op. cit.

species, including some non-natives such as black mustard⁶². They also use grassland, chaparral, and riparian habitats in proximity to sage scrub for dispersal and foraging⁶³.

In the last 60 years extensive southern California suburban sprawl and other human disturbance has reduced and fragmented coastal scrub habitats, resulting in a significant decline in California gnatcatcher populations. These disturbances include an increase in recreational use of habitats, fire frequency, trash dumping, air pollution, invasive animal species, predators, cowbird parasitism, domestic pets, herbicides and pesticides and artificial lighting. In addition, the majority of remaining coastal scrub habitats are disturbed to a greater or lesser extent by the invasion of non-native and invasive plant species and by urban and agricultural development. In response to the drop in gnatcatcher numbers in southern California resulting from habitat loss and fragmentation, the northernmost subspecies (*Polioptila californica californica*) was listed as federally threatened in 1993⁶⁴. The CNDDDB rarity ranking identifies the California gnatcatcher as very rare⁶⁵; it is also a California Species of Special Concern. Loss of gnatcatcher coastal scrub habitat in southern California is estimated to be 70 to 90 percent^{66,67} and, in 1999, the United States Fish and Wildlife Service (USFWS) estimated the number of gnatcatcher breeding pairs in Los Angeles, Orange and San Diego Counties at only 144, 643, and 1,917, respectively⁶⁸.

In 2007, the USFWS identified and mapped critical gnatcatcher habitat in southern California⁶⁹. In determining areas to designate they “consider the physical and biological features (primary constituent elements (PCEs)), that are essential to the conservation of the species”. Primary constituent elements define the actual extent of habitats that contribute to the primary biological needs of foraging, nesting, rearing of young, intra-specific communication, roosting, dispersal, genetic exchange, or sheltering. Primary constituent elements for California gnatcatcher critical habitat include not only intact sage scrub habitats, but also “non-sage scrub habitats such as chaparral, grassland, riparian areas, in proximity to sage scrub habitats that provide space for dispersal, foraging, and nesting.” The USFWS defines sage scrub as a broad

⁶² Dixon, J. Dec. 18, 2002. ESHA Determination for the Marblehead Property. Memorandum to Karl Schwing.

⁶³ Ibid.

⁶⁴ Department of the Interior, Fish and Wildlife Service, 50 cfr part 17, RIN 1018–AV38, Endangered and threatened wildlife and plants; Notice of determination to retain the threatened status for the coastal California gnatcatcher under the endangered species act. Federal Register 60:72069. (March 1993).

⁶⁵ S2: Imperiled-At high risk of extinction due to very restricted range, very few populations (often 20 or fewer) steep declines, or other factors.

⁶⁶ Westman (1981) op. cit.

⁶⁷ Michael Brandman Associates. 1991. Unpubl. Report. A range-wide assessment of the California Gnatcatcher (*Polioptila californica*). Prepared for Building Industry Assoc. of Southern California; July 23.

⁶⁸ Department of the Interior, Fish and Wildlife Service, 50 cfr part 17, RIN 1018–AV38, Endangered and threatened wildlife and plants; Revised designation of critical habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*). 50; Federal Register 72:72069. (December 19, 2007).

⁶⁹ Ibid.

category of vegetation that includes coastal sage scrub, coastal bluff scrub, and maritime succulent scrub in their extensive list of the various sage scrub plant communities. The USFWS designated all of the Banning Ranch site as critical habitat for California gnatcatchers in 2007⁷⁰ (Figure 16). In designating this block of land as critical habitat, USFWS noted that the area was occupied by gnatcatchers at the time of listing and at the time of designation of critical habitat and the area “contains all the features essential to the conservation of the coastal California gnatcatcher.”⁷¹ This block of land is the only coastal land mapped as critical gnatcatcher habitat in Unit 7 in Orange County (Figure 17). USFWS pointed out in the final rule that the critical habitats in northern Orange County “may require special management considerations or protection to minimize impacts associated with habitat type conversion and degradation occurring in conjunction with urban and agricultural development.” It is important to note that specific observations of gnatcatchers within any particular area are not necessary in order to conclude that the area is “occupied” by gnatcatchers. If gnatcatcher foraging or nesting is observed in the general proximity of a site, it is considered “occupied.” Therefore, based on the many observations of gnatcatcher use, the USFWS concluded that all of the Banning Ranch site is occupied by coastal California gnatcatchers.

California gnatcatcher breeding season territories range in size from less than 2.5 acres to 25 acres^{72,73}, with a mean territory size generally greater for inland populations than coastal populations⁷⁴. Nesting territories typically have greater than 50 percent shrub cover and an average shrub height that exceeds 2.3 feet; nests are most often at 3 feet above the ground⁷⁵. The relative density of shrub cover influences gnatcatcher territory size, with territory size increasing as shrub cover decreases presumably as a result of limited resources. In a 1989 to 1992 study of two sites in San Diego County, breeding season territories averaged 20 acres; non-breeding season territories were larger⁷⁶. In studies by Bontrager (1991)⁷⁷ and Preston et al. (1998)⁷⁸, territory size during the non-breeding season increased 82 percent and 78 percent, respectively. Small, disjunct patches of coastal sage scrub, distributed within grassland areas, may be incorporated into nonbreeding season home range even if too small to support a breeding pair⁷⁹.

⁷⁰ Ibid. See also Exhibit 13, Banning Ranch DEIR.

⁷¹ USFWS (Dec. 19, 2007) op. cit.

⁷² Atwood, J.L., S.H. Tsai, C.H. Reynolds, J.C. Luttrell, and M.R. Fugagli. 1998. Factors affecting estimates of California Gnatcatcher territory size. *Western Birds*, Vol. 29: 269-279.

⁷³ Preston, K.L., P.J. Mock, M.A. Grishaver, E.A. Bailey, and D.F. King. 1998. California Gnatcatcher territorial behavior. *Western Birds*, Vol. 29: 242-257.

⁷⁴ Ibid.

⁷⁵ Beyers, J.L. and W.O. Wirtz. 1997. Vegetative characteristics of coastal sage scrub sites used by California gnatcatchers: Implications for management in a fire-prone ecosystem. In Greenlee, J. M. (ed.), *Proceedings: First conference on fire effects on rare and endangered species and habitats, Coeur d'Alene, Idaho, November 1995*. International Association of Wildland Fire, Fairfield, Washington. pp. 81-89.

⁷⁶ Atwood and Bontrager (2001) op. cit.

⁷⁷ Bontrager, D.R. 1991. Unpublished Report: Habitat requirements, home range and breeding biology of the California Gnatcatcher (*Poliioptila californica*) in south Orange County. Prepared for Santa Margarita Co., Rancho Santa Margarita, CA; April.

⁷⁸ Preston et. al. (1998) op. cit.

⁷⁹ Birds of North America online: <http://bna.birds.cornell.edu/bna/>

Increase in non-breeding season territory size is thought to serve two purposes; to allow gnatcatchers to acquire more habitat resources and to obtain information about potential mates. Coastal California gnatcatchers are known to occupy (i.e., to breed, nest, and forage in) year round various locations of coastal scrub habitat on Banning Ranch. Gnatcatcher surveys have been conducted on the project site dating back to 1992. The USFWS gnatcatcher survey protocols, published in 1997, require multiple visits, typically during the gnatcatcher breeding season, which extends from February 15 to August 30^{80,81}. All surveys must take place during the morning hours and no more than 80 acres of suitable habitat may be surveyed per visit. Typically gnatcatcher survey reports include a compilation of gnatcatcher observations (dot/point locations) in the form of a map of gnatcatcher breeding pair use areas (breeding territories).

The gnatcatcher survey data for the project site includes the following: gnatcatcher breeding territories surveyed by LSA from 1992 through 1996⁸² (Figures 18, 19, 20, 21, & 22), breeding territories surveyed by PCR in 1997 and 1998 (Figure 23 & 24), gnatcatcher breeding territories surveyed in 2000 (Figure 25), collector unknown (we believe it may have been PCR), gnatcatcher observations surveyed by GLA in 2002, 2006, and 2007⁸³ (Figures 26, 27, & 28), gnatcatcher observations surveyed by BonTerra in 2009⁸⁴ (Figure 29), gnatcatcher observations and breeding territories surveyed by Dudek in 2013 and 2015^{85,86} (Figure 30 & 31). Dudek prepared a

⁸⁰ U.S. Fish and Wildlife (USFWS). 1997a (February 28). Coastal California Gnatcatcher (*Poliophtila californica californica*) Presence/Absence Survey Protocol. Washington, D.C.:USFWS.

⁸¹ U.S. Fish and Wildlife (USFWS). 1997b (July 28). Coastal California Gnatcatcher (*Poliophtila californica californica*) Presence/Absence Survey Protocol. Washington, D.C.:USFWS.

⁸² LSA surveyed for nine days in 1992, three in 1993, and four each from 1994 through 1996. Regarding the presentation of their data LSA states that "Each year of the LSA surveys, composite maps were prepared that showed the distribution of approximate gnatcatcher territory boundaries at [Banning Ranch]. ...The composite territories thus identified generally represented the most conservative polygons possible that combined all observation points. Notions of what might constitute gnatcatcher habitat were put aside; only those areas where gnatcatchers were observed were mapped. However, because polygons were mapped by combining all outlying observation points, on a finer scale many areas within polygons never were actually used by gnatcatchers. Most of the polygons depicted include suitable habitat as well as unused pockets (e.g., ice plant, barren of developed areas), and the territory maps do not distinguish suitable habitat from unsuitable habitat such as solid ice plant, roads, and structures." Quote from December 9, 2010 "California Gnatcatcher Issues at the Sunset Ridge Park/Newport Banning Ranch Site" letter to Mike Sinacori, City of Newport Beach, Department of Public Works from Art Homrighausen and Richard Erickson of LSA

⁸³ Glenn Lukos Associates and BonTerra present gnatcatcher sightings for individuals and breeding pairs as dot/point observations on their annual survey maps. We asked Glenn Lukos Associates to interpret their dot/point observations and they said they represent an interpolation of a few to multiple individual gnatcatchers and/or a gnatcatcher pair within a use area (pers. comm. Tony Bomkamp, January 3, 2011). We asked BonTerra the same question and they said their dot/point observations were their best approximation or estimation of the center point of observed gnatcatcher activity (pers. comm. Ann Johnston, December 15, 2010).

⁸⁴ Ibid.

⁸⁵ In 2013 Dudek conducted a modified gnatcatcher protocol survey specifically requested by Christine Medak of the USFWS. The modified protocol survey, while consisting of more hours, only occurred on two days. Furthermore, to be effective, the modified protocol survey should have occurred in January or February when male gnatcatchers are setting up territories and are very noisy. However, the modified protocol survey took place in April after territories would be expected to have been established and the

gnatcatcher survey compilation exhibit that includes the data for 1992 through 2013 (Figure 32). For some years we have the reports associated with the data maps (1994 - 1996, 2002, 2006, 2007, 2009, 2013, and 2015) and for other years we do not (1992, 1993, 1997, 1998, and 2000).

The gnatcatcher survey efforts for the project site (number of days per annual survey), methodology (timing, areal coverage, etc.), and data presentation vary among the biological consulting firms. Surveys conducted in the early '90's did not always meet the six-day minimum, however, they did take place in the morning during the breeding season. I am assuming that surveys for which we don't have the associated reports, conducted from 1997 on, followed the USFWS gnatcatcher survey protocols.

Over the span of nearly 25 years during which coastal California gnatcatchers have been studied on the project site, their numbers were relatively steady with an average of 19 territories between 1992 and 2009⁸⁷. In 2013 and 2015 the territory numbers dropped to 10 and 9, respectively. The recent decrease is likely a result of the extreme drought (2011-present) as well as adverse impacts and direct loss of scrub habitat due to mowing (USFWS has estimated that a total of 7+ acres of coastal scrub habitat has been lost on Banning Ranch between 1979 and 2012⁸⁸).

Having nearly 25 years of gnatcatcher survey data makes identifying the boundary of gnatcatcher ESHA straightforward because the overlapping use areas clearly elucidate the habitat that is favorable to gnatcatchers on the project site. Factors that would be used in situations where only one or two years of survey data are available include the gnatcatcher nesting territories, as well as contiguity of coastal scrub habitat, and presence of corridors. These might consist of bare areas, such as roads and oil field development (as is the case on Banning Ranch), or areas vegetated with non-native or non-coastal scrub habitat that provide habitat connectivity and foraging areas. Such areas adjacent to gnatcatcher nesting territory provide connectivity to core coastal scrub habitat and are critical to minimize edge effects. If development such as houses and fuel modification, as well as people, dogs and notably domestic cats, are placed within core gnatcatcher coastal scrub habitat, the impacts would probably extirpate gnatcatchers from the site. In past actions the Commission has found that important connections between core gnatcatcher habitat must be included within the ESHA boundary to reflect the actual area required for gnatcatcher survival and persistence.

Commission staff ecologists find that the area on the project site defined by the boundary of the compiled coastal California gnatcatcher breeding territories spanning 1992 to 2014 rises to the level of ESHA because it supports the rare coastal California

gnatcatchers would be quieter. In any event, gnatcatcher dot/point observations and use areas were documented during this time and a total of 10 pairs were identified on the project site.

⁸⁶ The most recent protocol-level presence/absence gnatcatcher survey occurred between April 3 and May 13, 2015. Dudek observed approximately nine pairs, 34 individuals, and 18 fledglings.

⁸⁷ Total number of coastal California gnatcatcher territories each year they were surveyed: 1992, 19; 1993, 20; 1994, 29; 1995, 16; 1996, 7; 1997, 18; 1998, 19; 2000, 19; 2002, 15; 2006, 21; 2007, 18; 2009, 17; 2013, 10; 2015, 9.

⁸⁸ Pers. Comm. September 21, 2015. Christine Medak, USFWS Biologist.

gnatcatcher, and is easily disturbed and degraded by human activities and development (Figure 33). It is important to note that the gnatcatcher ESHA boundary is conservative because it is solely based on gnatcatcher breeding territories that represent a small percentage of the area that gnatcatchers use for foraging during the rest of the year. In addition, while it would be appropriate to consider any suitable gnatcatcher habitat on the project site as “occupied”, given the fact that the entire site is identified as USFWS critical gnatcatcher habitat (as noted above), we have not extrapolated beyond the actual gnatcatcher breeding territory survey data.

Coastal Cactus Wren

The coastal cactus wren (*Campylorhynchus brunneicapillus*) is a small non-migratory bird that nests in, and is restricted to, areas of prickly pear and cholla cactus. It is identified as a rare species⁸⁹ by the CNDDDB and is also listed as a California Species of Special Concern by CDFW and a bird of conservation concern by USFWS. Since 1993, the number of coastal cactus wren nesting pairs along the Orange County coast has declined by at least 80%^{90,91}. A total of eight cactus wren surveys have been performed on Banning Ranch from 1992 to 2009 including the following: cactus wren breeding territories surveyed by LSA from 1992 through 1996 (Figures 34, 35, 36, 37, & 38), cactus breeding territories surveyed by PCR in 1998 (Figure 39), cactus wren observations surveyed by GLA (Figure 40), and cactus wren observations surveyed by BonTerra in 2009 (Figure 41). During the surveys cactus wren were always observed nesting, and almost always observed foraging, in southern coastal bluff and maritime succulent scrub. From 1992 to 1996 there was an average of 12 breeding pairs on Banning Ranch. However, surveys since 1998 show a steep drop in cactus wrens on the project site and no pairs or individuals have been observed on the site since 2009⁹². The reasons for cactus wren decline in coastal southern California are not precisely known, but appear to be due to a combination of loss, degradation, and fragmentation of cactus scrub habitats associated with large-scale development and wildfires⁹³.

Coastal cactus wrens are obligate southern coastal bluff and maritime succulent scrub species, and that is where they were consistently observed nesting and foraging on the project site from 1992 through 2009 (Figure 42). None have been observed since 2009 and they may be extirpated from the site. Southern Coastal Bluff and Maritime Succulent Scrub meet the definition of ESHA on Banning Ranch because they are rare habitat types and they support coastal California gnatcatchers, but they are not currently performing the important ecosystem function of supporting coastal cactus wrens.

⁸⁹ S3: Vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

⁹⁰ “87% decline in the area of cactus scrub habitat occupied in the Coastal Reserve of the Nature Reserve of Orange County from 1992 to 2006” (Mitrovich and Hamilton 2007).

⁹¹ “Greater than 80% decline in the Nature Reserve of Orange County in the last two decades” (Preston and Kamada 2012)

⁹² Cactus wren surveys found 12 pairs in 1992, 12 pairs in 1993, 14 pairs in 1994, 11 pairs in 1995, 10 pairs in 1996, 7 pairs in 1998, 6 pairs in 2008, and 1 pair in 2009.

⁹³ Hamilton, R. A., G. A. Proudfoot, D. A. Sherry, and S. Johnson. 2011. Cactus Wren (*Campylorhynchus brunneicapillus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <http://bna.birds.cornell.edu/bna/species/558>.

Burrowing Owl

Burrowing owls (*Athene cunicularia*) are identified as a rare species⁹⁴ by the CNDDDB and are also listed as a California Species of Special Concern by CDFW, a bird of conservation concern by USFWS, and as a sensitive species by the Bureau of Land management (BLM). Burrowing owls hunt for prey in open grasslands and areas of ruderal vegetation. In addition to foraging over grasslands, burrowing owls use the abandoned burrows of the California ground squirrel and other small rodents as shelter during the nesting and wintering seasons. Burrowing owls have declined dramatically in California, especially along the southern coast, due to loss and fragmentation of grassy, open landscapes from development and the use of rodent control activities.

Burrowing owls have been observed to winter in three locations on NBR. No burrowing owls have been observed during burrowing owl breeding season surveys. GLA identified one burrowing owl in each of the three locations in winter 2008; the center right (east) side of the property near vernal pools H, I, J, and K, the southern right (east) side of the property near vernal pool W (Ticonderoga Pond), and in the center of the southern end of the property (Figure 43). BonTerra observed one burrowing owl each in winter 2009 and 2010 near vernal pools H, I, J, and K (Figure 44). Dudek observed one burrowing owl in winter 2014 near the burrowing owl identified by GLA on the southern end of the property (Figure 45). During my January 29, 2015 site visit I observed a burrowing owl perching and flying in the area of vernal pools H, I, J, and K.

Burrowing owls have been observed in winter near vernal pools H, I, J, & K in 2008, 2009, 2010, and 2015. In addition, photographs of a burrowing owl near these pools, taken in January 2013 by a member of the public, were submitted to the Commission. On the other two locations where burrowing owls have been observed, one owl was observed in 2008 near vernal pool W, and one owl was observed in 2008 and another in 2014 in the center of the southern portion of the property. Based on the consistency of wintering burrowing owls near vernal pools H, I, J, & K, Commission ecologists find this area to rise to the level of ESHA because the area supports wintering burrowing owls, a rare species, and because the area is easily disturbed and degraded by human activities and development (Figure 46). The ESHA was delineated by creating the smallest convex polygon that encompassed the documented locations of burrowing owl use. The burrowing owl winter survey data for two southern portions of the property suggest that these areas are not frequently occupied by over-wintering burrowing owls and while they represent sensitive areas there are insufficient data to designate a particular area as ESHA.

In addition to the coastal California gnatcatcher, coastal cactus wren, and burrowing owl, a number of other special status bird species occur on the project site including; loggerhead shrike, listed as a California Species of Special Concern by CDFW and a

⁹⁴ S3: Vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

bird of conservation concern by USFWS; yellow warbler, listed as a rare species⁹⁵ by the CNDDDB and also listed as a California Species of Special Concern by CDFW and a bird of conservation concern by USFWS; yellow-breasted chat, listed as a rare species⁹⁶ by the CNDDDB and also listed as a California Species of Special Concern by CDFW; and least Bell's vireo, a federal and stated listed endangered species (Figure 47).

Annual grassland on the project site is dominated by a mix of non-native species including ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), black mustard (*Brassica nigra*), and tocalote (*Centaurea melitensis*). Annual grasslands, although dominated by non-native species, provide dwelling habitat for burrowing animals and significant foraging habitat for numerous species of mammals, birds, and reptiles including burrowing owls and many species of raptors. Burrowing owls as well as several species of raptors, including red-tailed hawks, Cooper's hawks, northern harriers, osprey and American kestrels, have been observed perching and/or foraging at many locations across (Figure 48).

Small, ground-dwelling mammals observed on Banning Ranch include California ground squirrel, Botta's pocket gopher, dusky-footed woodrat, and black rat. And medium to large-sized mammals observed on the site include bobcats, mule deer, coyote, red fox, raccoon, brush rabbit, and skunk.

Wetland Definition

Coastal Act Section 30121 defines wetlands as lands:

...which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."

The Coastal Commission's regulations establish a "one parameter definition" that only requires evidence of a single parameter to establish wetland conditions (Title 14 California Code of Regulations Section 13577 (b))

...land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated soil at some time during each year and their location within, or adjacent to, vegetated wetland or deepwater habitats.

⁹⁵ S2: Imperiled – At high risk of extinction due to very restricted range, very few populations (often 20 or fewer) steep declines, or other factors.

⁹⁶ S3: Vulnerable, at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

The Coastal Commission relies upon the definition in the Commissions regulations for providing the technical basis for identifying wetlands in the field. This requires the evidence of only one of the three parameters (e.g., hydrology, hydric soils, or hydrophytic vegetation) for an area to qualify as a wetland.

Banning Ranch Wetlands

In addition to the vernal pools described above, which are unique wetland habitats that are also ESHA, there are saltwater, brackish, and freshwater marshes (as well as areas of mulefat and willow riparian habitat) present on the Banning Ranch lowlands. Saltmarsh on the lowland is dominated by pickleweed (*Salicornia virginica*), alkali heath (*Heliotropium curassavicum*), saltwort (*Batis maritima*), and woolly seablite (*Suaeda taxifolia*). Areas of brackish/alkali marsh support pickleweed, alkali heath, alkali mallow (*Malvella leprosa*), and alkali weed (*Cressa truxillensis*). The areas of freshwater marsh are dominated by cattail (*Typha sp.*) and southern bulrush (*Schoenoplectus californicus*). Dudek mapped the wetlands in 9 different categories⁹⁷. We combined these sub-types into one wetland layer for mapping purposes (Figure 49).

These wetland areas are subject to the provisions of Sections 30230, 30231 and 30233 of the Coastal Act relative to habitat protection.

The rare natural communities and habitat that supports rare species that rise to the level of ESHA (California Brittle Bush Coastal Sage Scrub, Southern Coastal Bluff and Maritime Succulent Scrub, Purple Needle Grass Grassland, Riparian Habitat, Vernal Pools, Coastal California Gnatcatcher, and Burrowing Owl Habitat) and the wetlands on Banning Ranch (Exhibit 50), exist within a maze of roads, oil wells, and other oil field development that are kept clear of vegetation; some of them are small, isolated fragments. This maze of disturbance with the bounds of the respective ESHA and wetlands delineated by Commission ecologists (Figures 11, 15, 33, 46, 49, & 50) is not singled out in this document because Coastal Act section 30240 requires protection of ESHA, and once habitat buffers are applied to the ESHA, these barren areas would be part of the buffer⁹⁸. Any future development would have to be sited outside of the buffers, and designed to prevent impacts that would significantly degrade ESHA, and to be compatible with the continuance of those habitat areas.

Buffers

The Commission protects ESHA and wetlands by applying buffers (development setbacks). Buffers serve several important functions. They allow for some error in assigning boundaries (for example, extent of wetlands or gnatcatcher use areas), they

⁹⁷ Alkali Heath Marsh (ASH), Disturbed Alkali Heath Marsh (D-ASH), Disturbed Alkali Heath Marsh-Pickleweed Mats (D-ASH-PWM), California Bulrush Marsh (CBM), Fivehorn Smotherweed (FHSW), Pigmy Weed (PIWE), Pickleweed Mats (PWM), Rabbits Foot Grass (RFG), Disturbed Pickleweed Mats (D-PWM).

⁹⁸ The maze of roads, oil wells, and other oil field development within the areas mapped as ESHA on Banning Ranch will be mapped to distinguish these areas from the adjacent ESHA; this just has not been done yet for the ESHA maps presented here.

keep disturbance at a distance, they provide important auxiliary habitat (e.g., foraging or pollinator habitat), and they provide water quality functions around wetlands. Buffers are important for preserving the integrity and natural function of individual species and habitats. Habitat edges that demarcate areas of transition from low human use to high human use are marked by intensification of noise, artificial lighting, and the presence of domestic animals; the additional hazards of herbicide and pesticide use and of other pollutants, the shading and the effects of landscaping activities. Healthy buffer zones can reduce all of these impacts. Buffers also protect against invasive plant and animal species that are often associated with humans and development.

We recommend that 100-ft buffers be established around the salt marsh, brackish marsh and seasonal freshwater wetlands (including vernal pools), and around terrestrial ESHA defined by coastal California gnatcatcher use areas or by the presence of rare upland vegetation communities (Figure 51). The Commission has found that these standards are adequately protective of wetlands, sensitive vegetation, and California gnatcatcher nesting habitat in past actions⁹⁹. In the special case of vernal pools, we recommend that the buffer be 100 feet or the edge of the pool's watershed, whichever is larger. A buffer that includes the watershed is necessary to account for natural changes in the basin dimensions over time in response to varying hydrological conditions and to prevent alterations to the watershed that could impact the duration and extent of ponding. In order to avoid disturbance to burrowing owls, the California Burrowing Owl Consortium and the California Department of Fish and Wildlife recommend 50-m buffers during the non-breeding season.¹⁰⁰ Given that the existing use at Banning Ranch is by wintering and migrant birds, we recommend that a 50-m (164-ft) buffer be established around the defined burrowing owl habitat, which is in accord with previous Commission action.¹⁰¹

Conclusion

The Banning Ranch site is the largest remaining privately owned coastal open space remaining in Orange County. There have been a number of efforts to develop this area through the years. As a result, there is a detailed record of the site's natural resources from biological studies dating back to the early 1990s. In fact more biological surveys and studies have occurred on Banning Ranch compared to any other property I have examined during my nearly 10 years with the CCC. Banning Ranch supports a wealth of natural resources despite over a hundred years of agricultural activities and oil and gas production. While these uses have resulted in some habitat degradation and disturbance, the natural resources have persisted remarkably well. The situation at Banning Ranch is akin to the large military bases along the coast such as Camp Pendleton, Point Mugu, and Fort Ord, which have all functioned as refugia for native habitats and species despite active military operations. At Banning Ranch and the

⁹⁹ For example, Brightwater 5-05-020, Marblehead 5-03-013, and the Malibu Local Coastal Program.

¹⁰⁰ California Burrowing Owl Consortium. April 1993. Burrowing Owl survey protocol and mitigation guidelines. California Department of Fish and Game. September 25, 1995. Staff Report on Burrowing Owl Mitigation.

¹⁰¹ Brightwater 5-05-020.

military bases, the degradation and disturbance footprints have been below the critical survival and reproductive thresholds of the natural resources on these properties.

In fact, the project site supports large areas of native habitat, much of which rises to the level of ESHA. The ESHA on Banning Ranch includes California Brittle Bush Sage Scrub, Southern Coast Bluff and Maritime Succulent Scrub, Purple Needle Grass Grassland, Riparian Habitat, and Vernal Pools. The ESHA on the site also includes the California Brittle Bush Sage Scrub, Southern Coast Bluff and Maritime Succulent Scrub and other habitats that supports the federally threatened coastal California gnatcatcher and Purple Needle Grass Grassland, Vernal Pools as well other habitat including annual grassland that support over-wintering burrowing owl (California Species of Special Concern) burrow territories. The lowland on the site supports saltwater, brackish, and freshwater marsh wetlands and riparian habitat. The saltwater and brackish marsh and riparian habitat in the lowland support the federally and state endangered least Bell's vireo.

Appendix 1.

San Diego Fairy Shrimp, *Branchinecta sandiegonensis* = B.s.

Versatile Fairy Shrimp, *Branchinecta lindahli* = B.l.

Fairy shrimp cysts = f.s.c.

Ostracod shells = o.s.

Cladoceran ephippia = c.e.

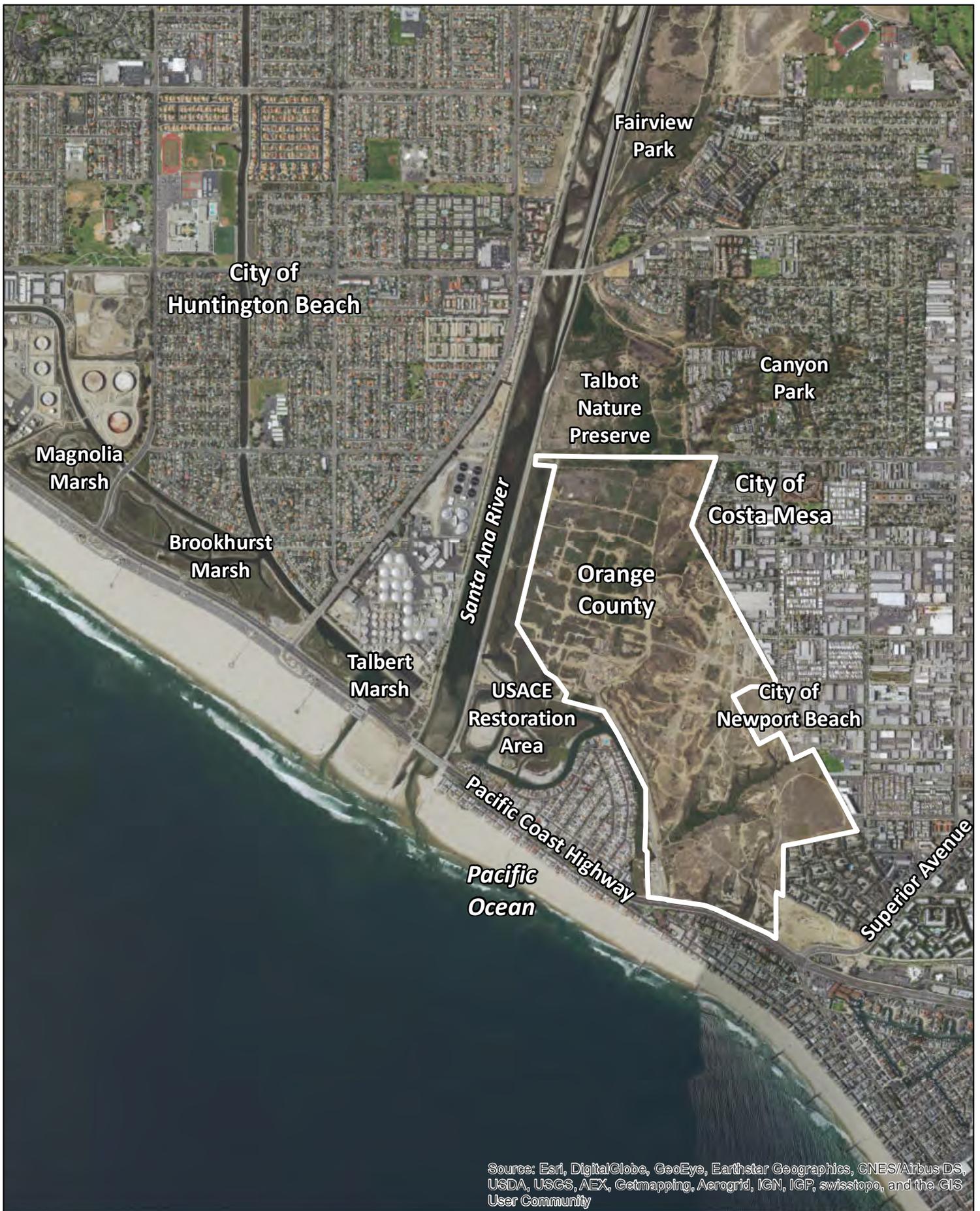
Vernal Pool Veg from Zedler & USFWS

Wetland Veg = ACOE criteria

I.D.	Size (sq ft)	Diameter of Equivalent Circle (ft)	B.s	B.l.	f.s.c.	o.s.	c.e.	Vernal Pool Veg	Wetland Veg	v.p.e.v.	Notes
VP1	13,262	130.0	X					X	X	X	Marsilea vestita
VP2	919	34.2	X					X	X	X	Lythrum hypssopifolia
VP3	282	19.0	X							X?	
A	1,609	45.3		X				X	X	X	Psilocarpus brevissimus
B	1,297	40.6		X							
C	35.6	6.7		X		X	X	X	X	X	L. hypssopifolia
D	104	11.5		X						X?	
E	2,129	52.1	X								
F	1,303	40.7								X?	NO INDICATORS
G	128	12.8	X							X?	
H	934	34.5	X							X?	
I	1,201	39.1	X							X?	
J	3,810	69.7	X							X?	
K	621	28.1		X		X		X			Bramlet: P. brevissimus
L	127	12.7			X	X					
M	608	27.8		X		X				X?	
N	1,258	40.0		X	X			X			

I.D.	Size (sq ft)	Diameter of Equivalent Circle (ft)	B.s	B.I.	f.s.c.	o.s.	c.e.	Vernal Pool Veg	WetInd Veg	v.p.e.v.	Notes
O	154	14.0									NO INDICATORS
P	402	22.6		X					X	X?	
Q	195	15.8			X	X					Asphalt under dirt
R	260	18.2		X				X	X	X	L. hyssopifolia
S	128	12.8						X		X	L. hyssopifolia
T	188	15.5		X							
U	97	11.1									NO INDICATORS
V	3,918	70.6		X					X	X?	
W	11,477	120.9		X		X					
X	291	19.3		X		X				X?	
Y	53.3	8.2		X		X					
Z	312	19.9		X		X				X?	
AA	108	11.7				X				X?	NO INDICATORS
BB	84	10.3			X	X					
CC	116	12.2		X		X		X	X	X	L. hyssopifolia
DD	131	12.9		X		X	X				
EE	139	13.3		X						X?	
FF	223	16.9		X							
GG	120	12.4		X							
HH	318	20.1		X							
II	103	11.5			X	X		X		X	L. hyssopifolia
JJ	210	16.4				X					NO INDICATORS
KK	745	30.8		X		X				X?	
LL	26.2	5.8		X						X?	
MM	141	13.4		X		X			X	X?	
NN	132	13.0								X?	NO INDICATORS
OO	41.2	7.2		X					X	X?	

I.D.	Size (sq ft)	Diameter of Equivalent Circle (ft)	B.s	B.I.	f.s.c.	o.s.	c.e.	Vernal Pool Veg	WetInd Veg	v.p.e.v.	Notes
PP	47.1	7.7		X					X	X?	
QQ	141	13.4									NO INDICATORS
RR	22.1	5.3									NO INDICATORS
SS	86	10.5									NO INDICATORS
TT	40.3	7.2									NO INDICATORS



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Figure 1. Aerial Photograph of the Banning Ranch Site and Surroundings.

For Illustrative Purposes Memo by Dr. J. Engel 09/25/2015
 Source: ESRI.

5-15-2097, EXHIBIT 12a



Figure 2. Site Topography Illustrating the Lowland Area, Upper Mesa, North-South Arroyo, and the Southern Arroyo.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: ESRI.

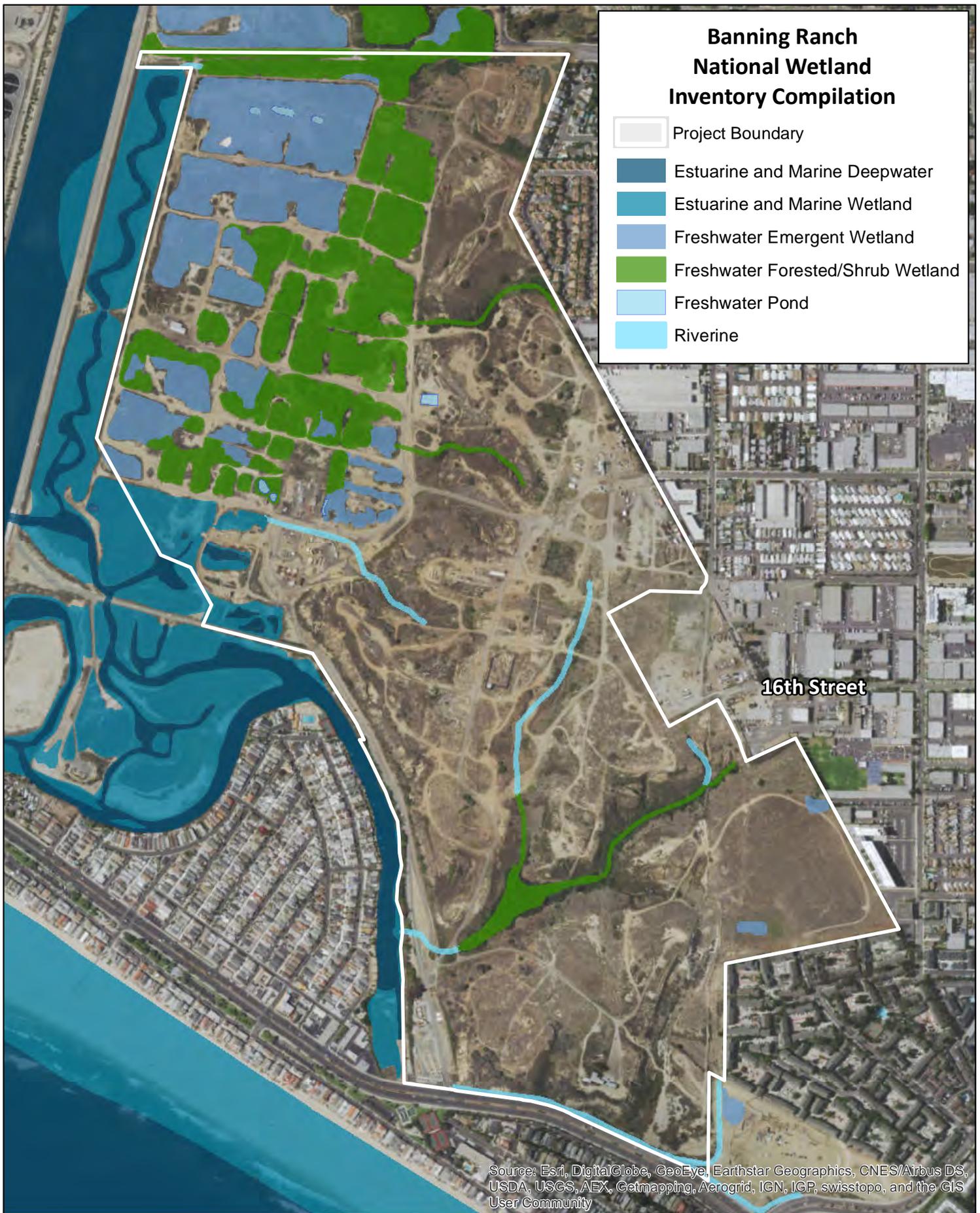


Figure 3. USFWS National Wetland Inventory Map of the Banning Ranch Site.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: USFWS NWI, ESRI.

Page 37 of 87

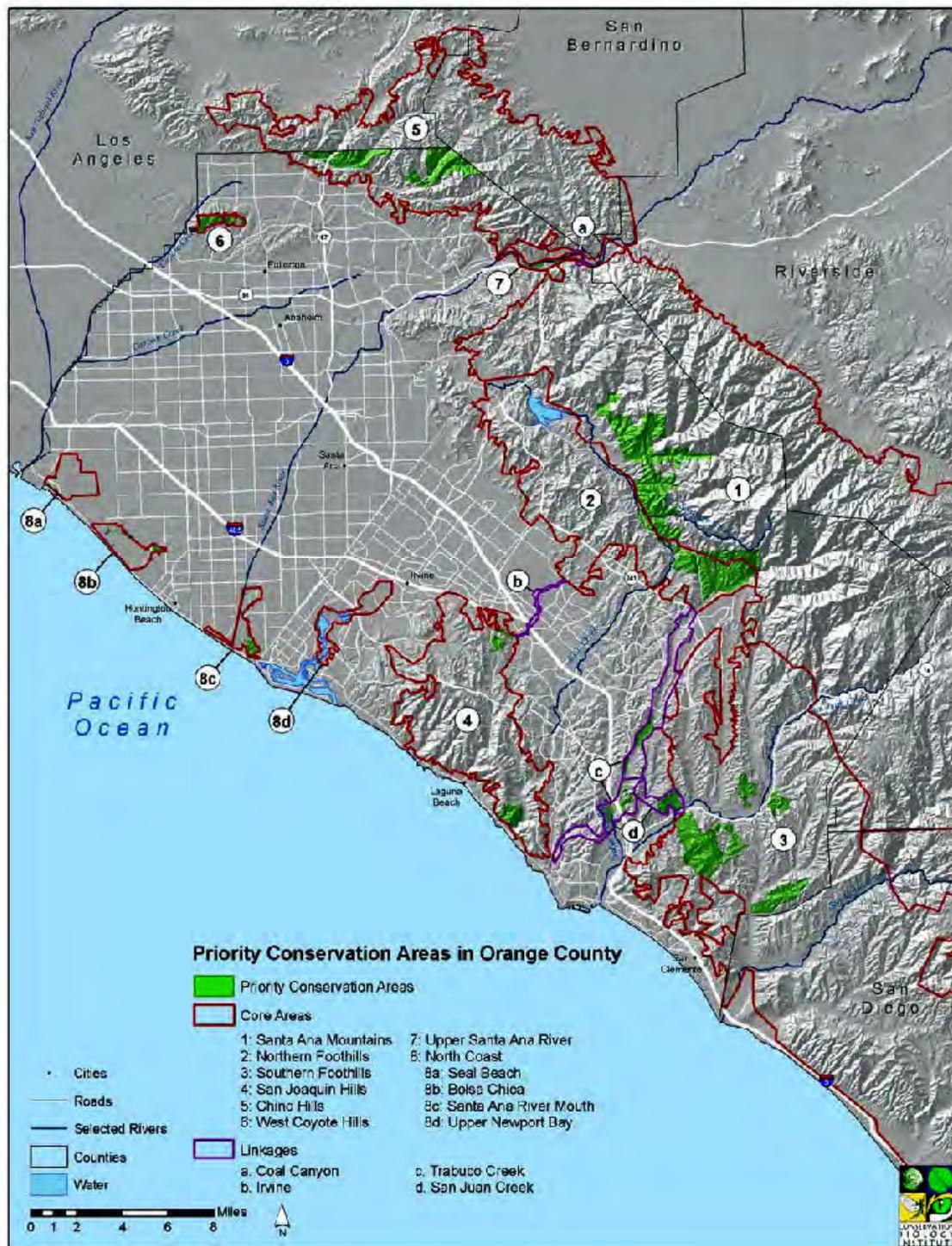


Figure 7. Priority Conservation Areas.

Figure 4. 8c, The Santa Ana River Mouth, Including all of Banning Ranch; Identified as a Priority Conservation Area by the Conservation Biology Institute.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Conservation Biology Institute .

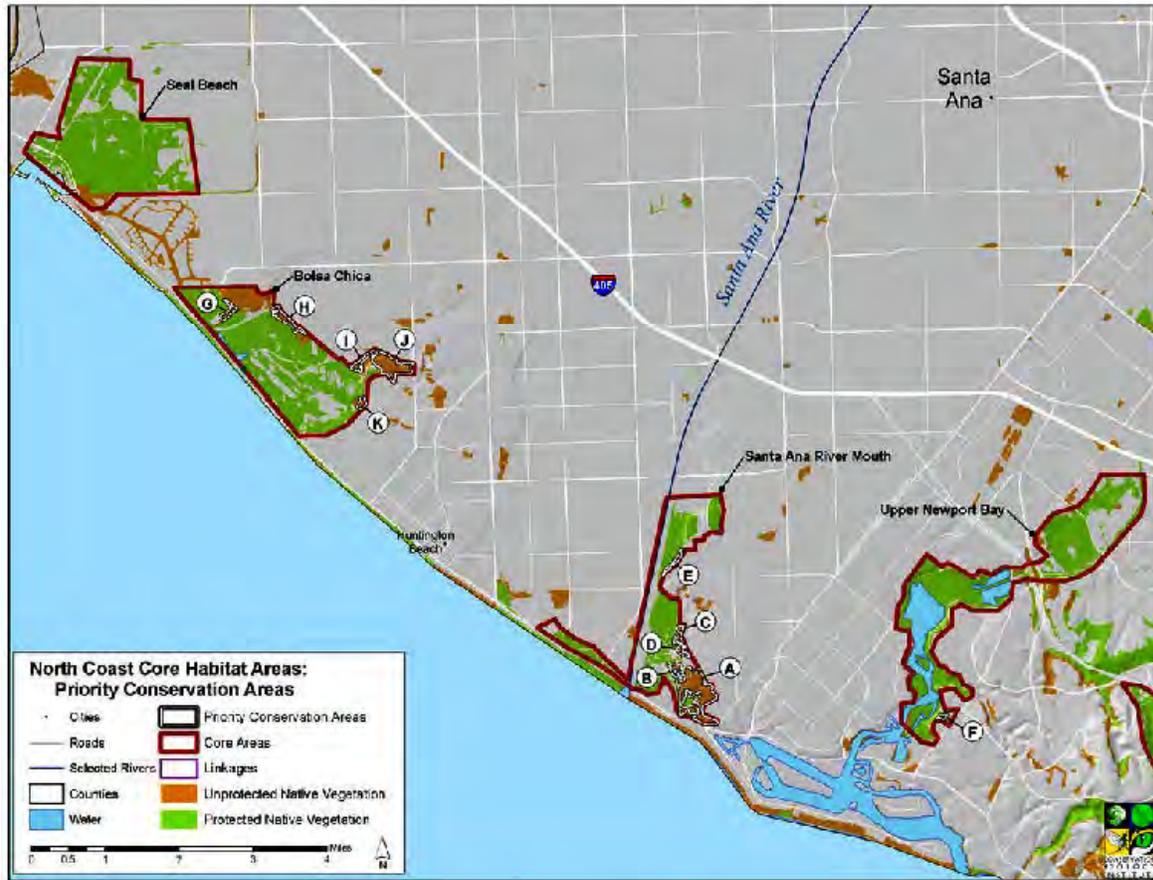


Figure 20. North Coast Core Habitat Areas: Priority Conservation Areas (Santa Ana River Mouth = A, B, C, D, E); Upper Newport Bay = F; Bolsa Chica = G, H, I, J, K).



COMPOSITE SITE PLAN
NEWPORT BANNING RANCH
 NEWPORT BEACH, CA

NEWPORT BANNING RANCH



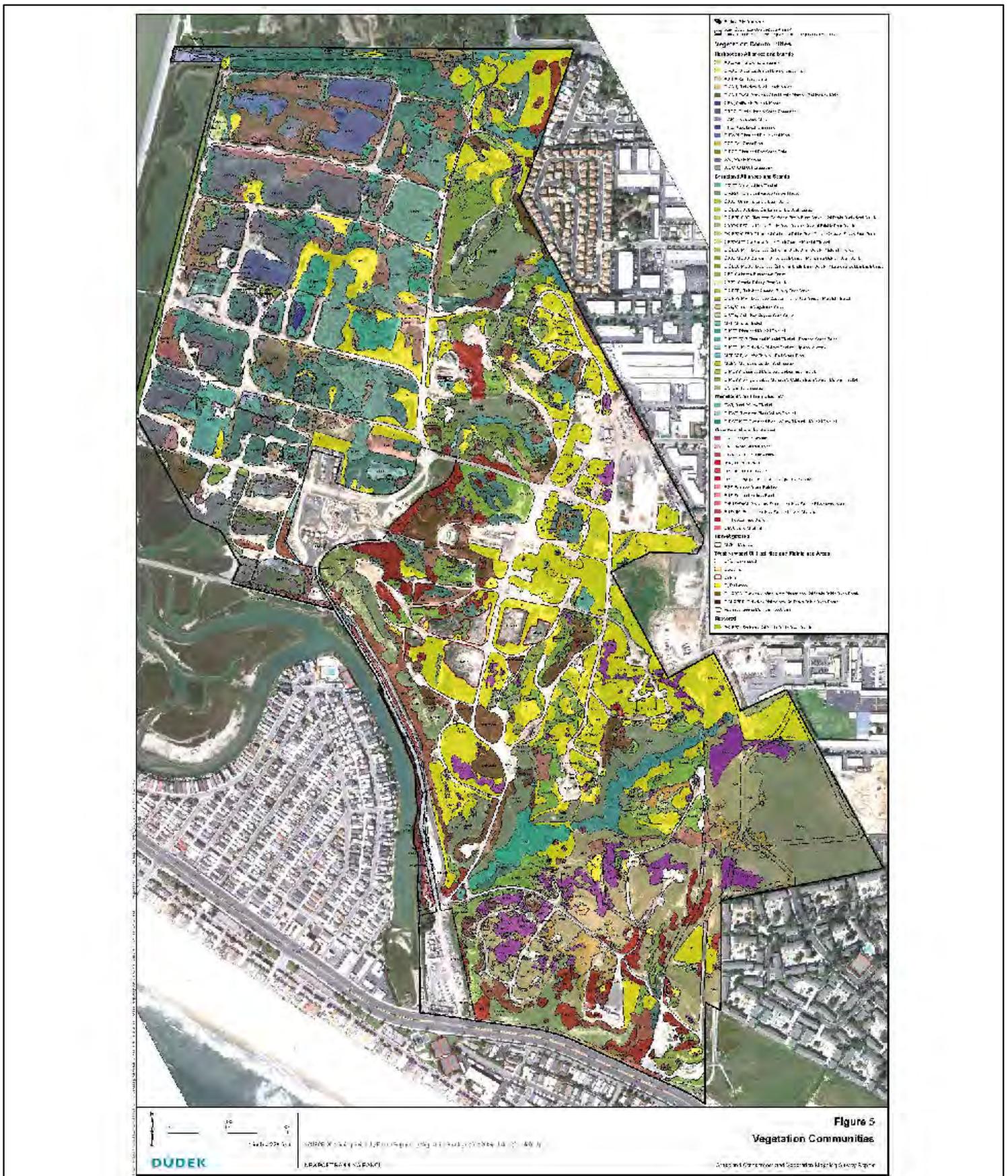


Figure 7. Dudek's Vegetation Map Based on Vegetation Surveys That Took Place Between Late-June and Mid-December 2012. Citation: J.H. IV (Dudek). February 2013. Grassland Assessment and Vegetation Mapping Survey Report for the Newport Banning Ranch. Prepared for Newport Banning Ranch LLC.



Gnatcatchers Observed Foraging in this Habitat in June 2011 (Aerial taken March 26, 2012)



Habitat Area Shown Above Mowed in Late Spring 2012.

Figure 9a. Impact of Mowing on Banning Ranch – Habitat Area on Southern Half of Site Away From Roads and Oil and Gas Development.



September 19, 2012. Area Scraped to Bare Ground.



January 29, 2015 – Area covered with *Encelia* and *Isocoma*..

Figure 9b. Before Mowing Has Ended and After Mowing Has Ended – California Brittle Bush Coastal Sage Scrub is Flourishing in January 2015



May 30, 2012. Area Mapped By Dudek as "Disturbed".



January 29, 2015. Regrowth of California Brittle Bush Since Early 2012.

Figure 9c. Regrowth of California Brittle Bush Coastal Sage Scrub Following Cessation of Mowing.

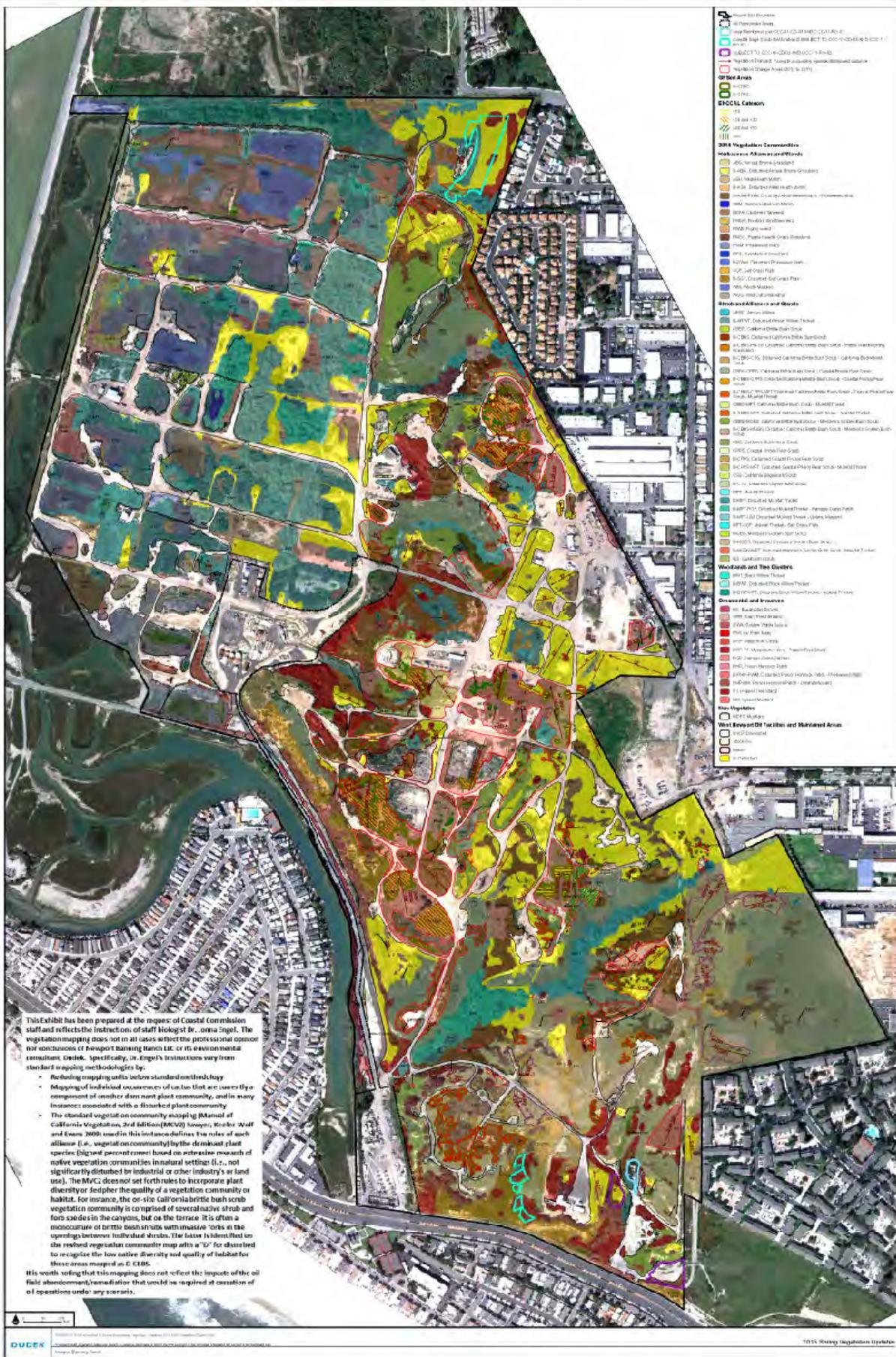


Figure 10. Dudek's Vegetation Map Based on Vegetation Surveys That Took Place in April 2015.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudek.

Page 46 of 87

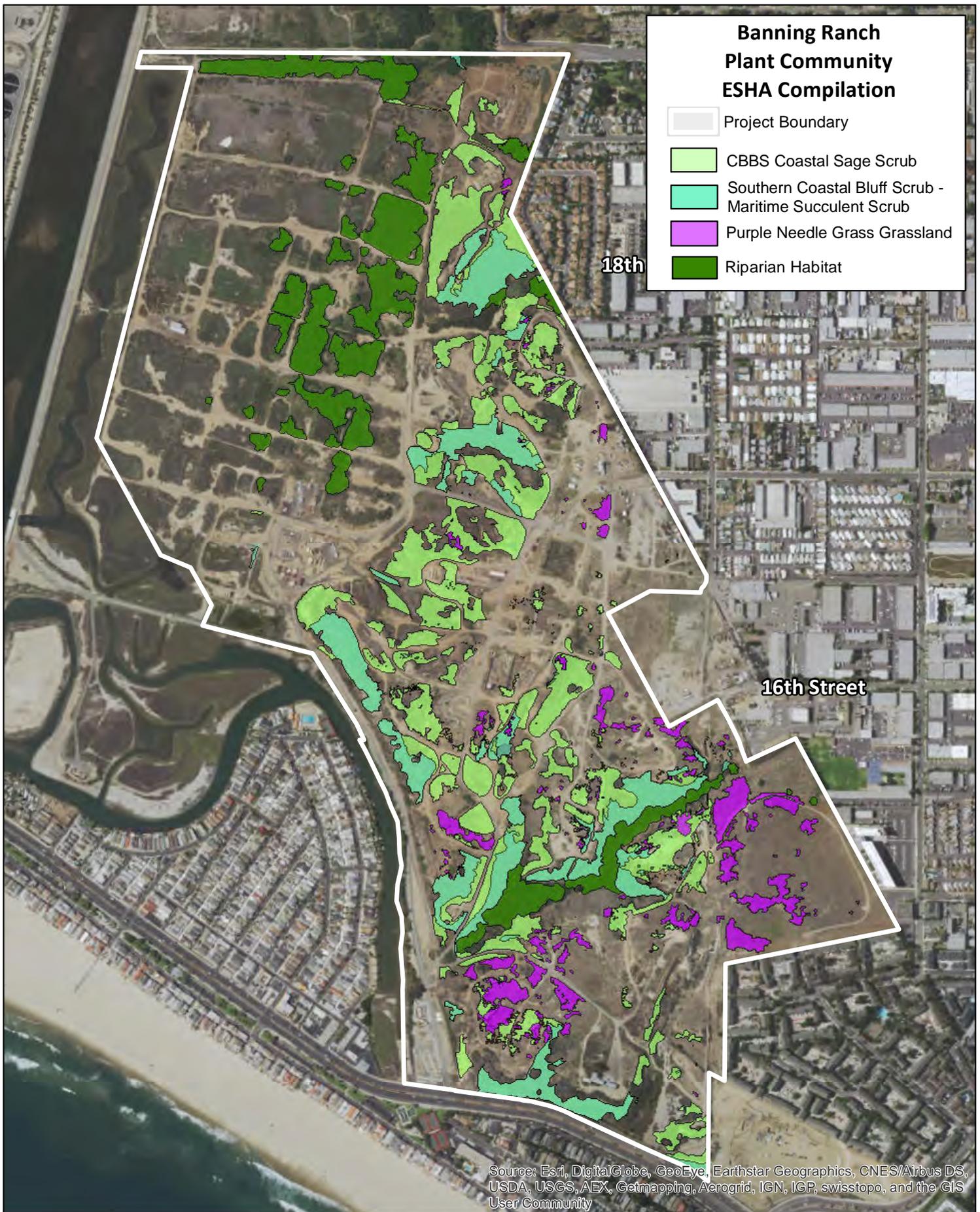


Figure 11. Plant Community Environmentally Sensitive Habitat (ESHA) Boundary Determination for Banning Ranch.

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5-15-2097, EXHIBIT 12a

Mima Mounds



1928 Aerial Showing Extent of Mima Mounds and Associated Vernal Pools Over Mesa



Figure 12. 1928 Photograph Depicting Mima Mounds on the Southern Portion of Banning Ranch. Photo Source: www.historicaerials.com

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: www.historicaerials.com.

Page 48 of 87

San Diego Fairy Shrimp Critical Habitat

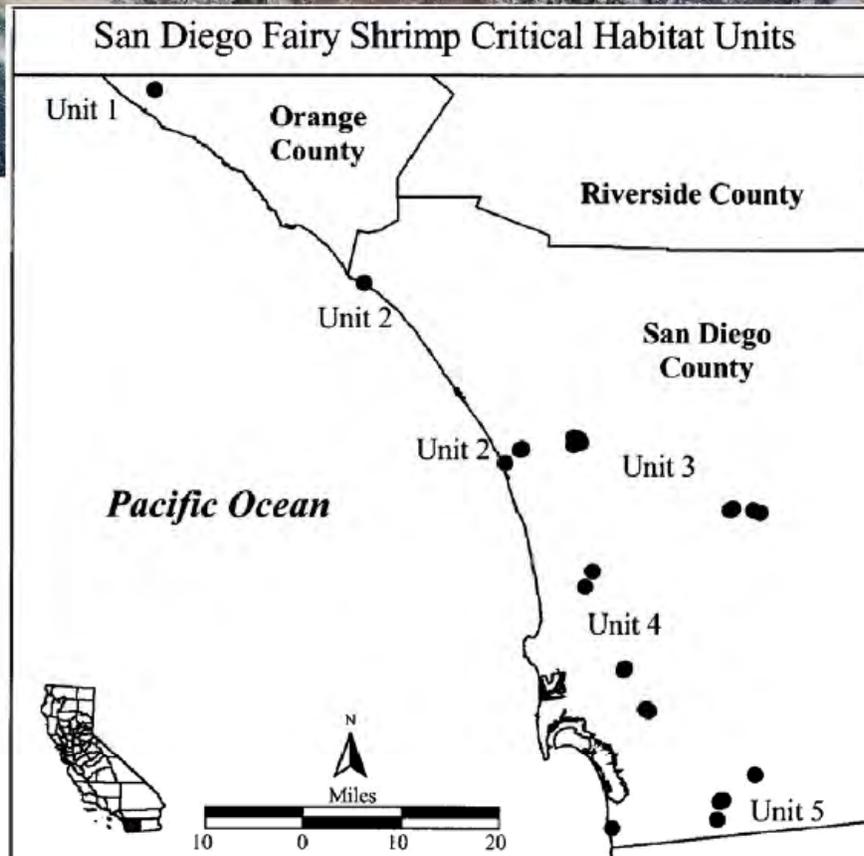
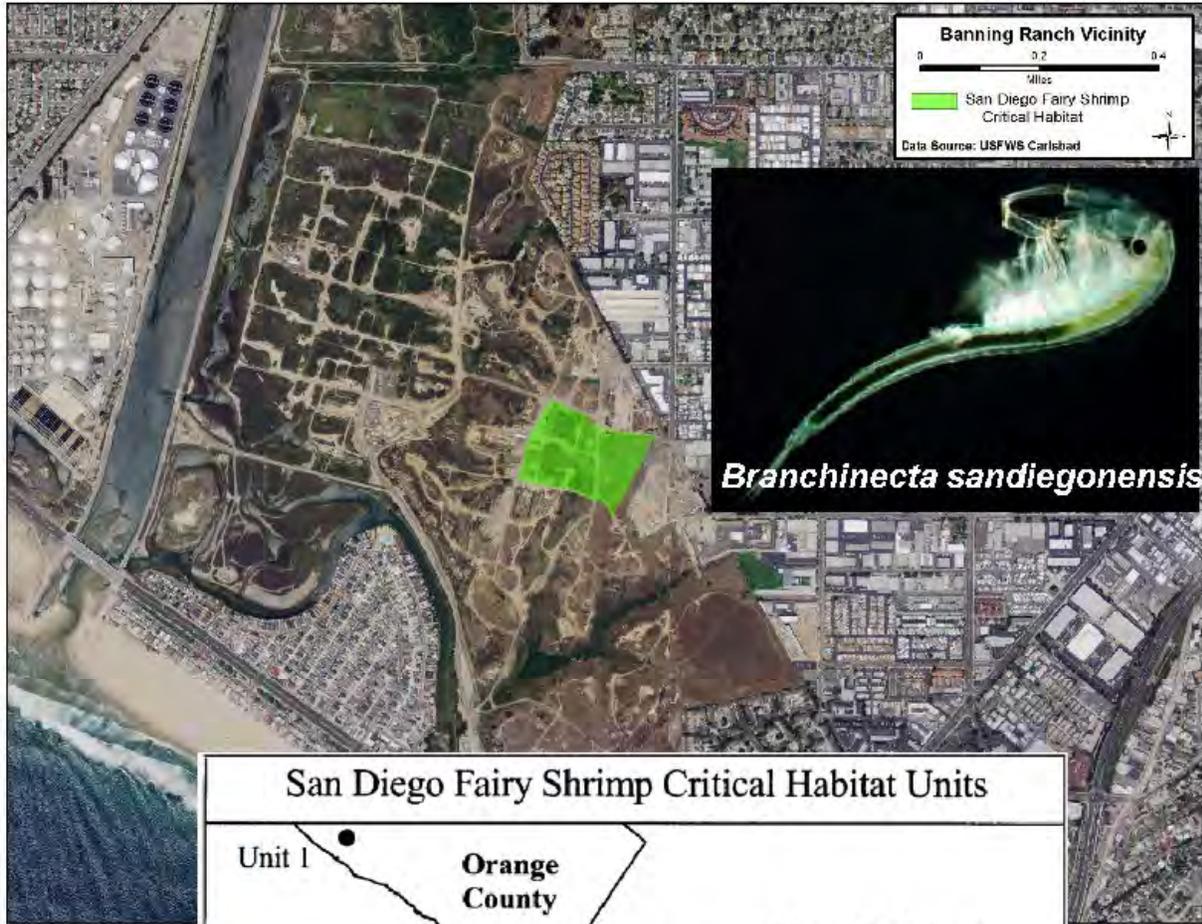


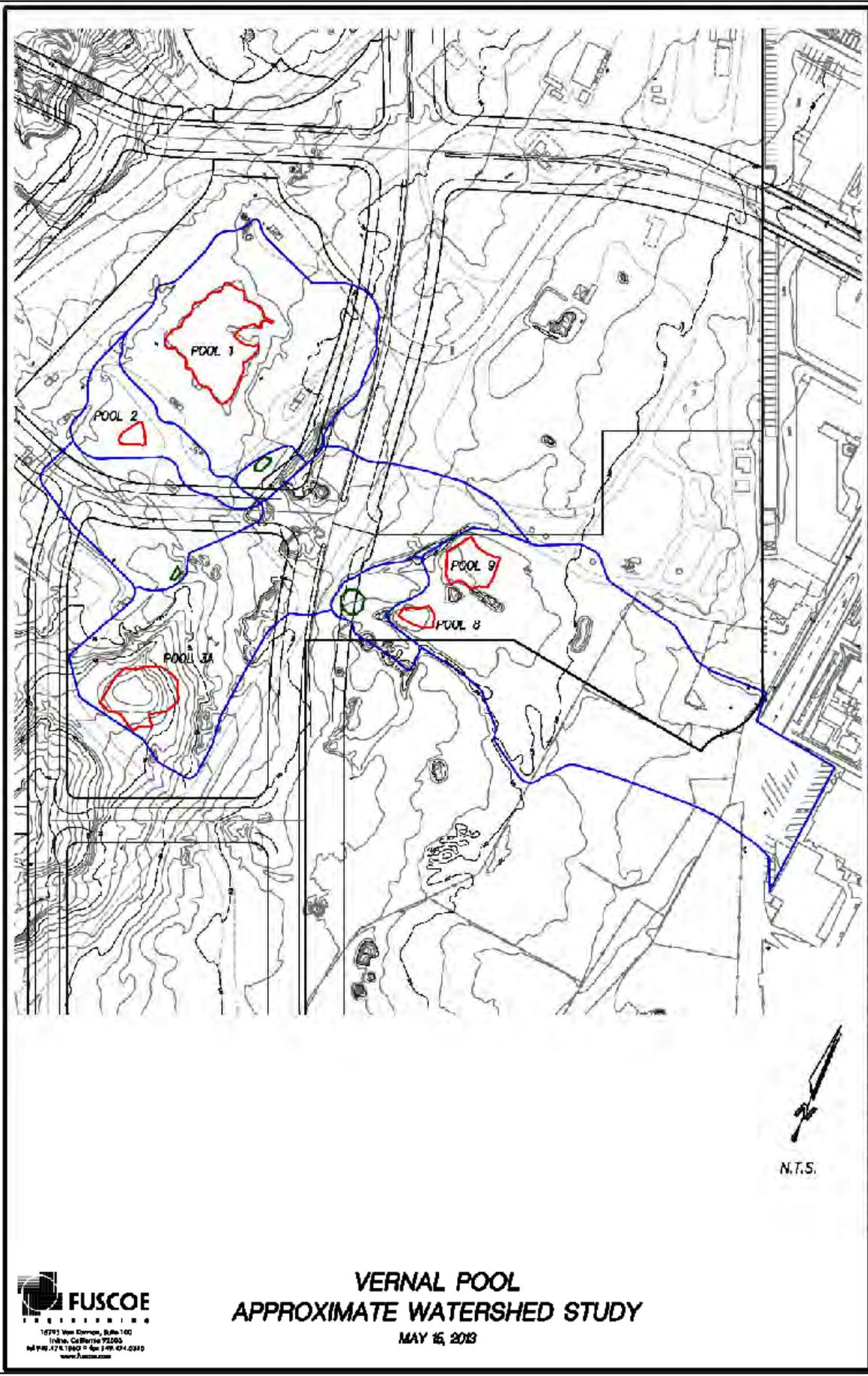
Figure 13. USFWS San Diego Fairy Shrimp Critical Habitat.

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For Illustrative Purposes Only. Source: USFWS.

Page 49 of 87



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 16703 Van Damme, Suite 100
 Irvine, California 92618
 tel 949.474.1982 fax 949.474.0310
 www.fuscoe.com

**VERNAL POOL
 APPROXIMATE WATERSHED STUDY
 MAY 16, 2013**

C:\projects\02\101\Map\Output\06101-01-Vernal_Pooling (E\15/2013 9:53 AM) Plotted by: Allurede Fencliar



Figure 15. Vernal Pool Environmentally Sensitive Habitat (ESHA) Boundary Determination for Banning Ranch.

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5-15-2097, EXHIBIT 12a

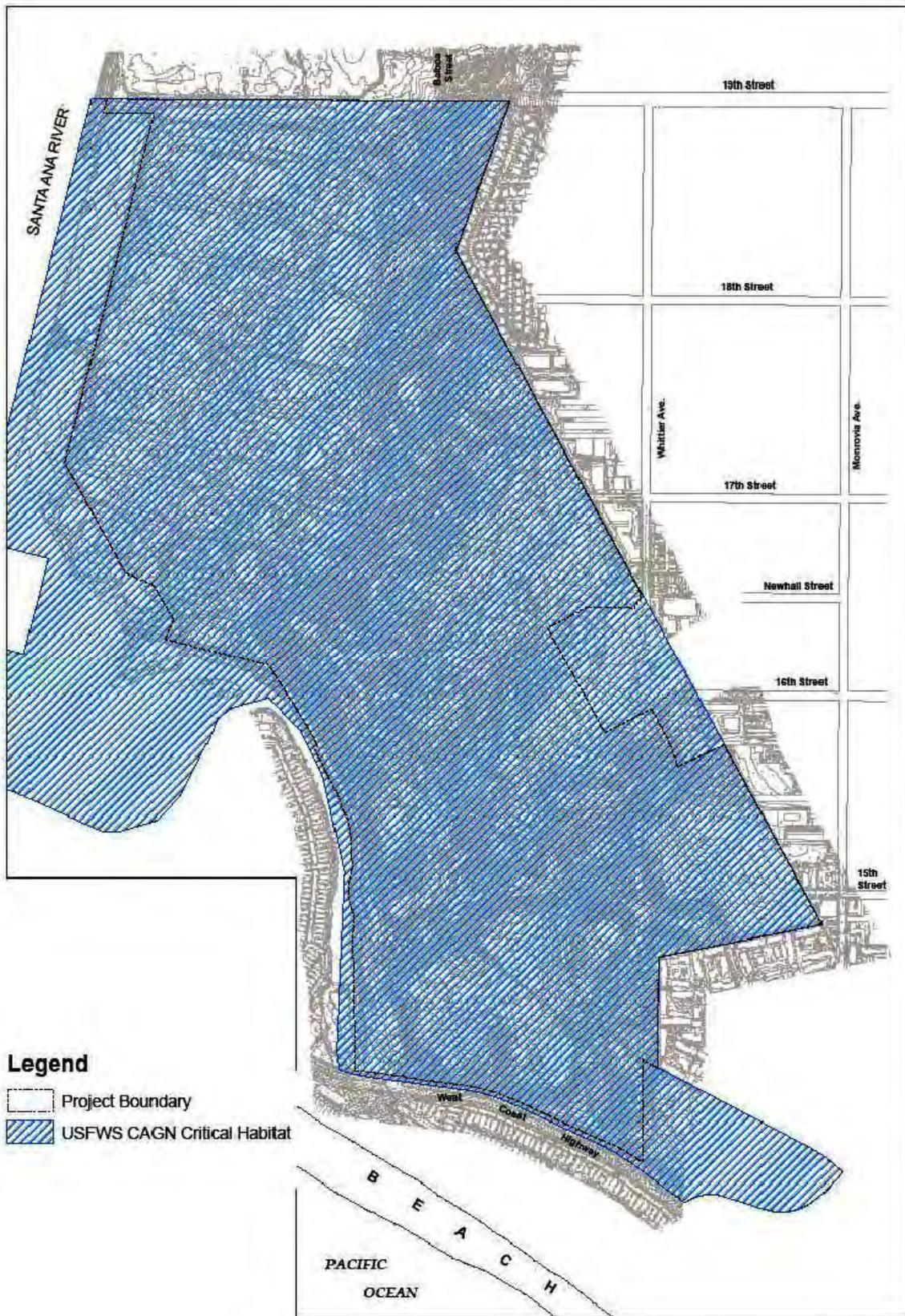
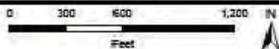


Exhibit 13

California Gnatcatcher Critical Habitat Unit Map



X:\0363-THE REST\0472-08BANN\472-6.GIS\BIOGIS\BRD\0472-08CAGNDec2007_CriticalHabitat_SF.mxd

Figure 16. USFWS Coastal California Gnatcatcher Critical Habitat.

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5-15-2007, EXHIBIT 12a

For Illustrative Purposes Only. Source: GLA.

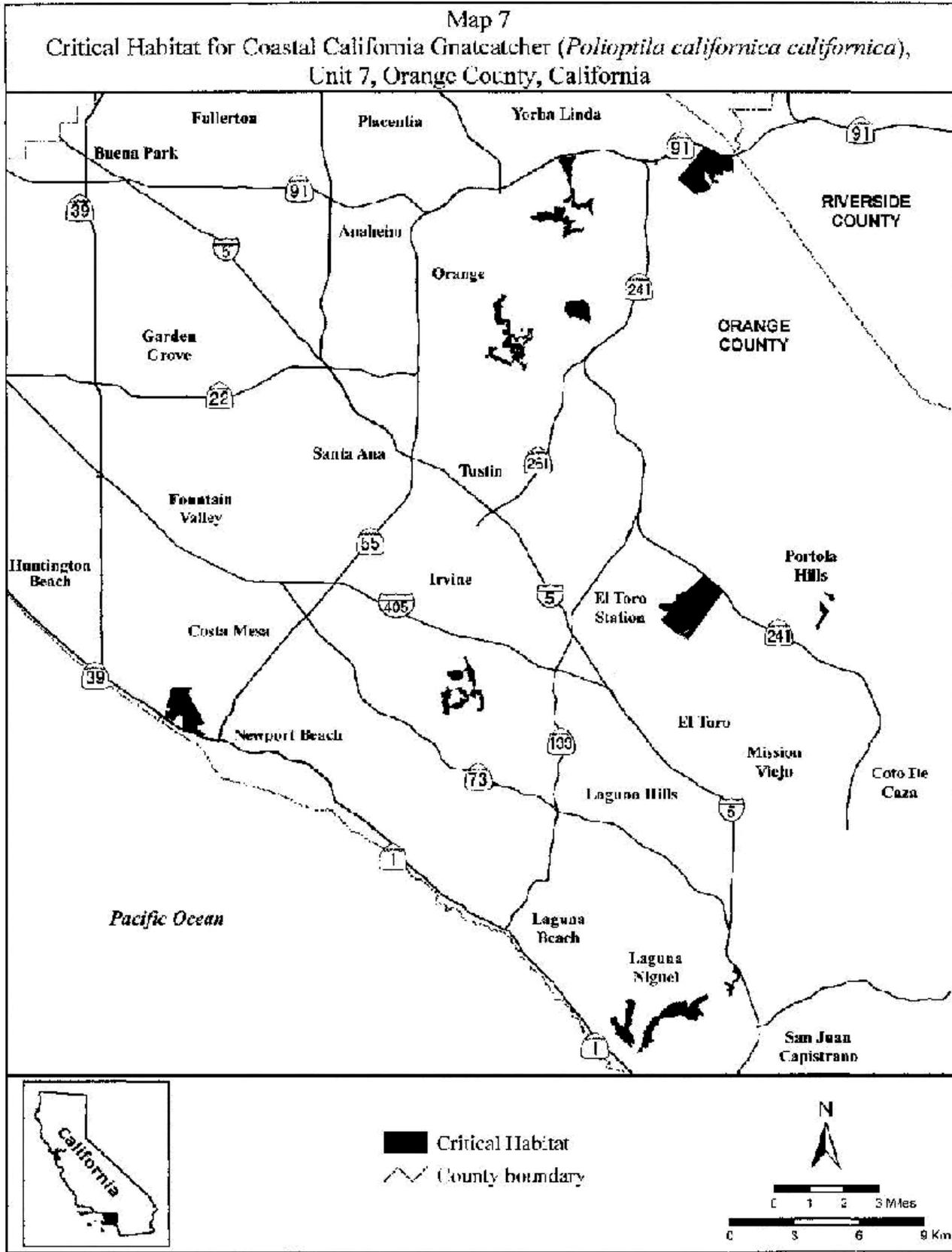
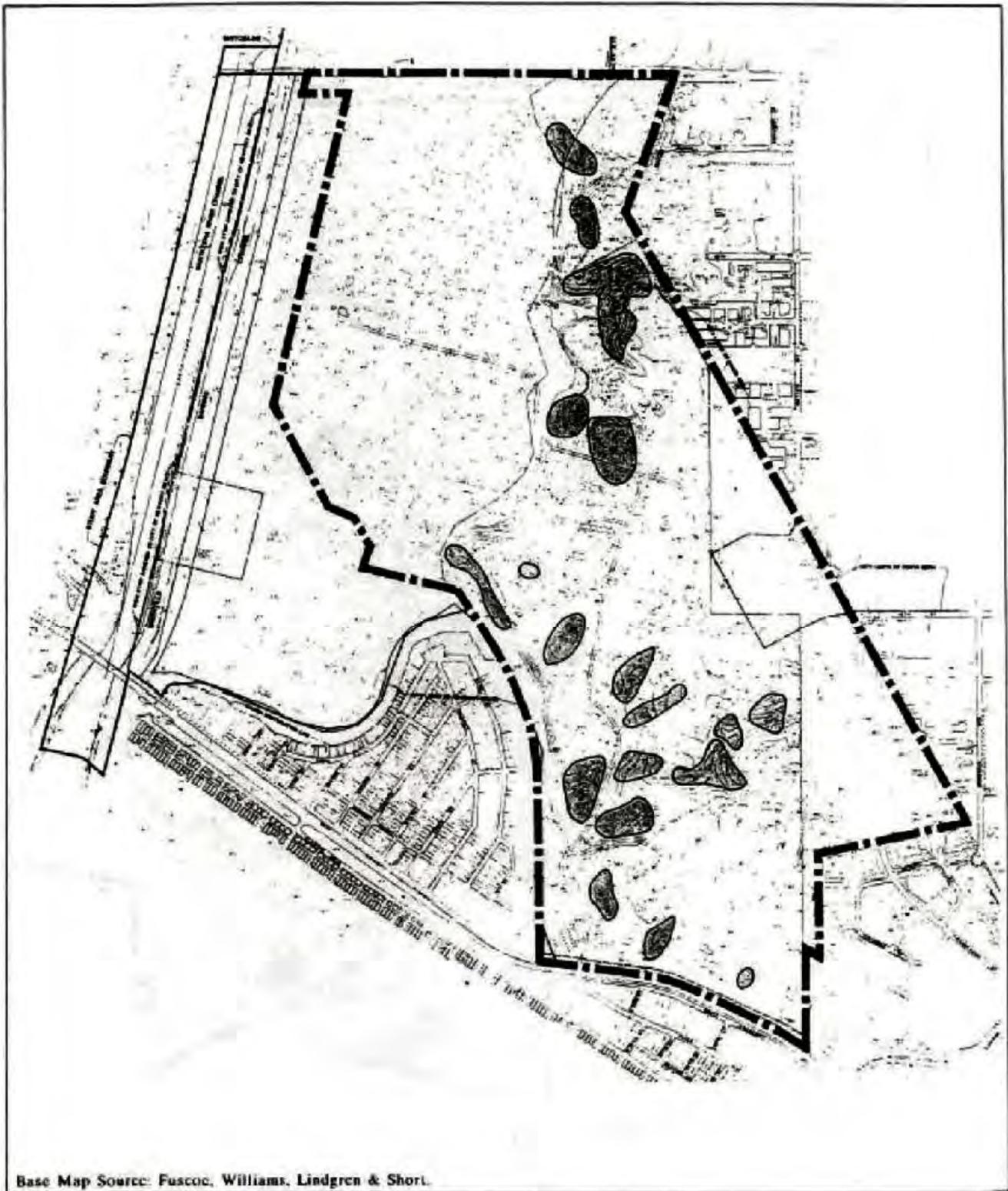


Figure 17. Banning Ranch is the Only Immediately Coastal Land Mapped as Critical Coastal California Gnatcatcher Habitat in Unit 7 in Orange County.
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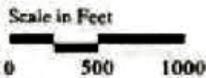
For Illustrative Purposes Only. Source: USFWS.



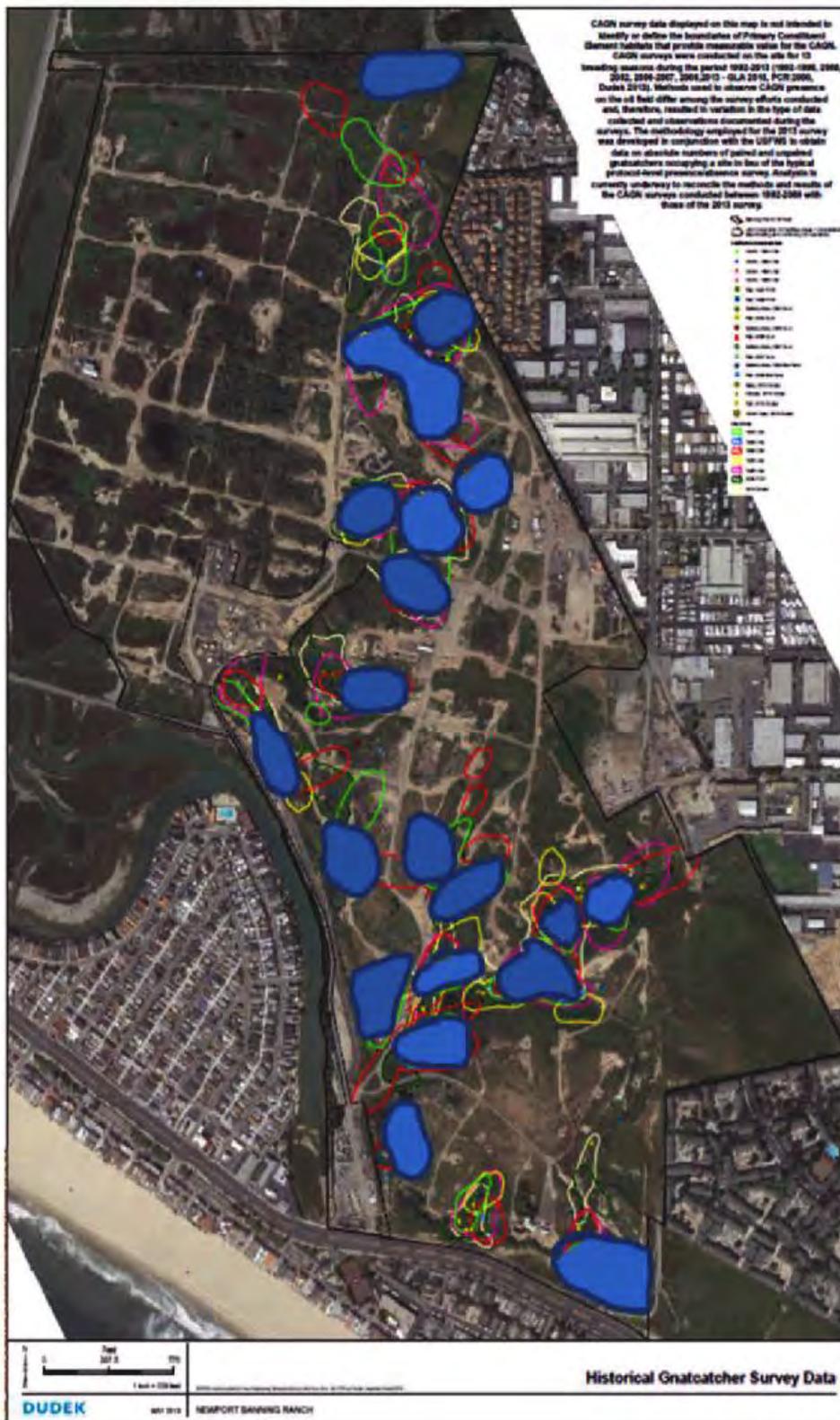
2/19/93(WNO2011)



LSA



California Gnatcatcher Territories - Spring 1992



California Gnatcatcher 1993 [Back to Main Section](#)

[Back to CAGN Menu](#)

Note: The 1993 map was created by taking the map in Figure 1, and highlighting the “use polygons” from 1993.

Figure 19. LSA 1993 Gnatcatcher Survey Data Highlighted in Solid Blue on Dudek’s “Historical Gnatcatcher Survey Data” Figure.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: LSA.

Page 55 of 87

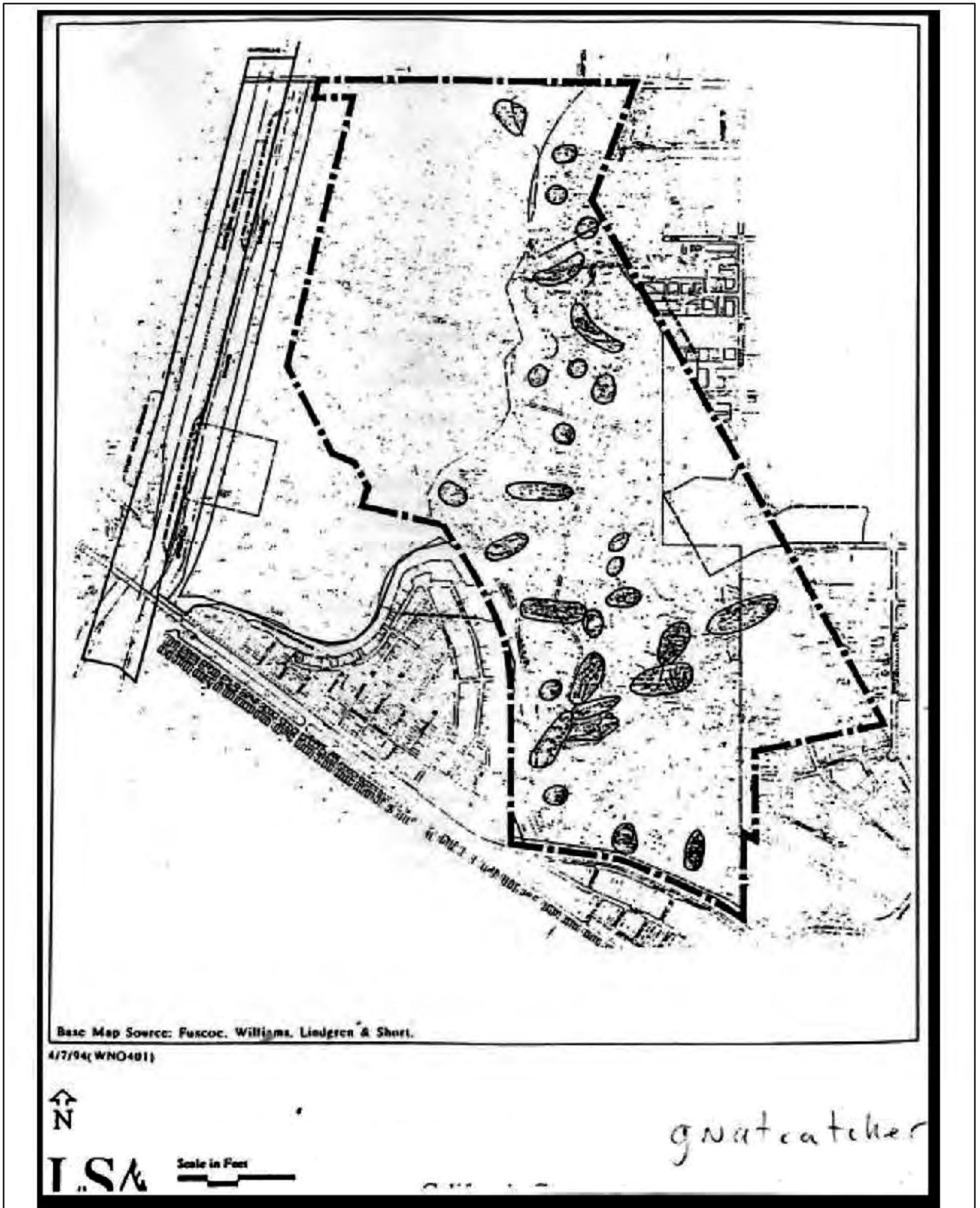


Figure 20. LSA 1994 Gnatcatcher Survey Data.

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5-15-2007, EXHIBIT 12a

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Page 56 of 87

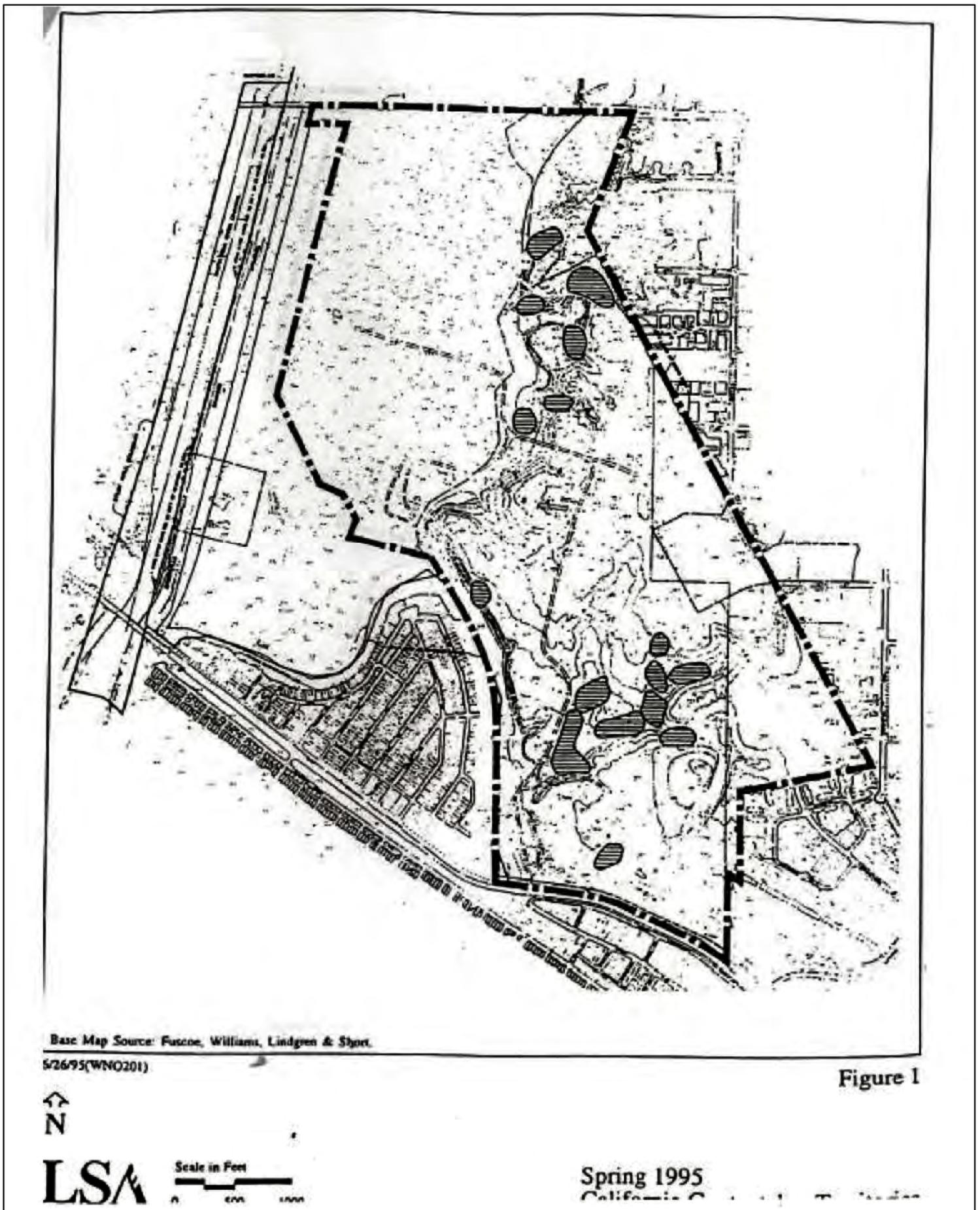


Figure 21. LSA 1995 Gnatcatcher Survey Data.

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Page 57 of 87

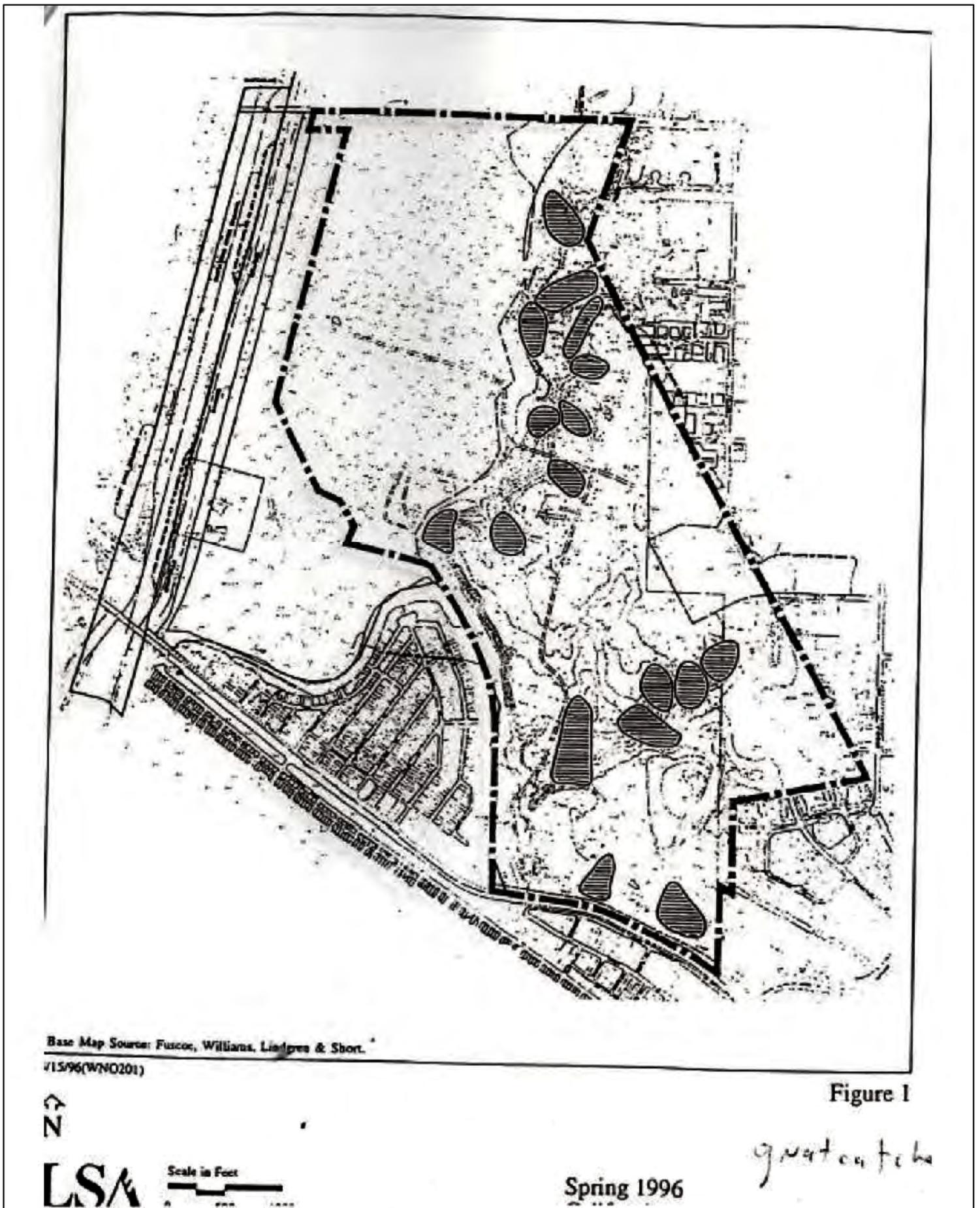


Figure 22. LSA 1996 Gnatcatcher Survey Data.

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5-15-2097, EXHIBIT 12a

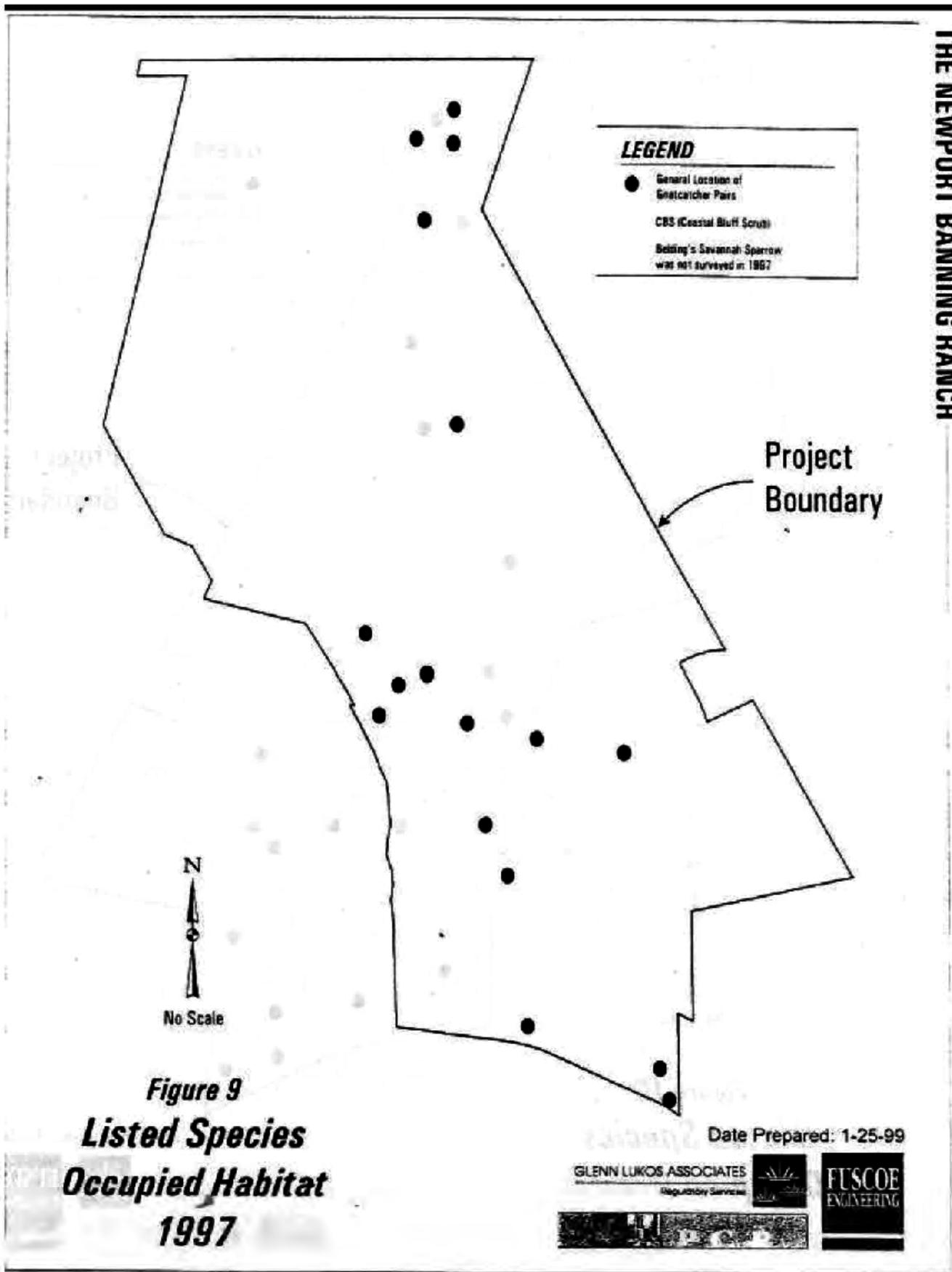


Figure 9
Listed Species
Occupied Habitat
1997

Date Prepared: 1-25-99

GLENN LUKOS ASSOCIATES
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Preliminary Draft For Discussion Purposes Only

Integrated Resource Conservation Plan

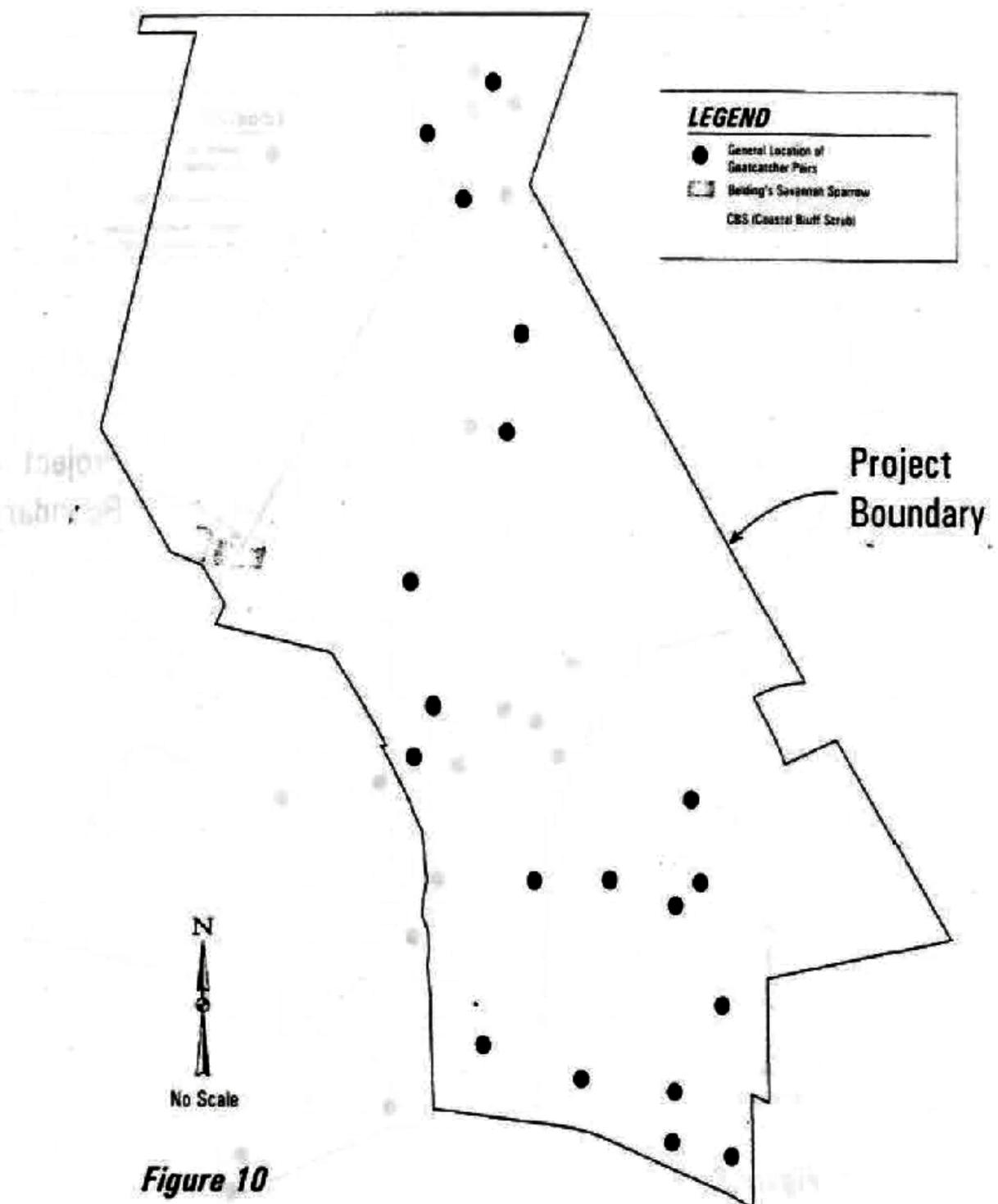


Figure 10
Listed Species
Occupied Habitat
1998

Date Prepared: 1-25-99

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California Gnatcatcher 2000 [Back to Main Section](#)

[Back to CAGN Menu](#)

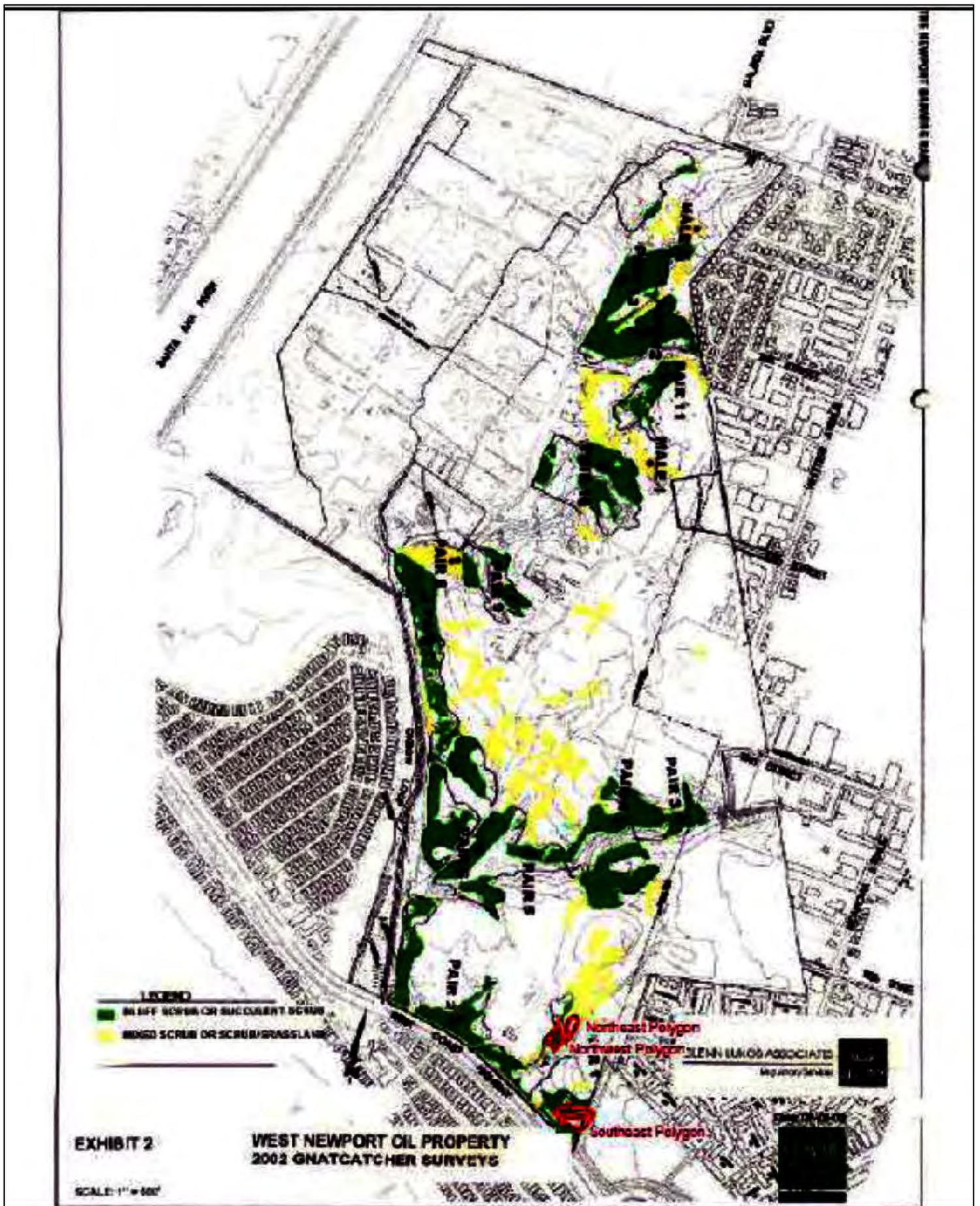
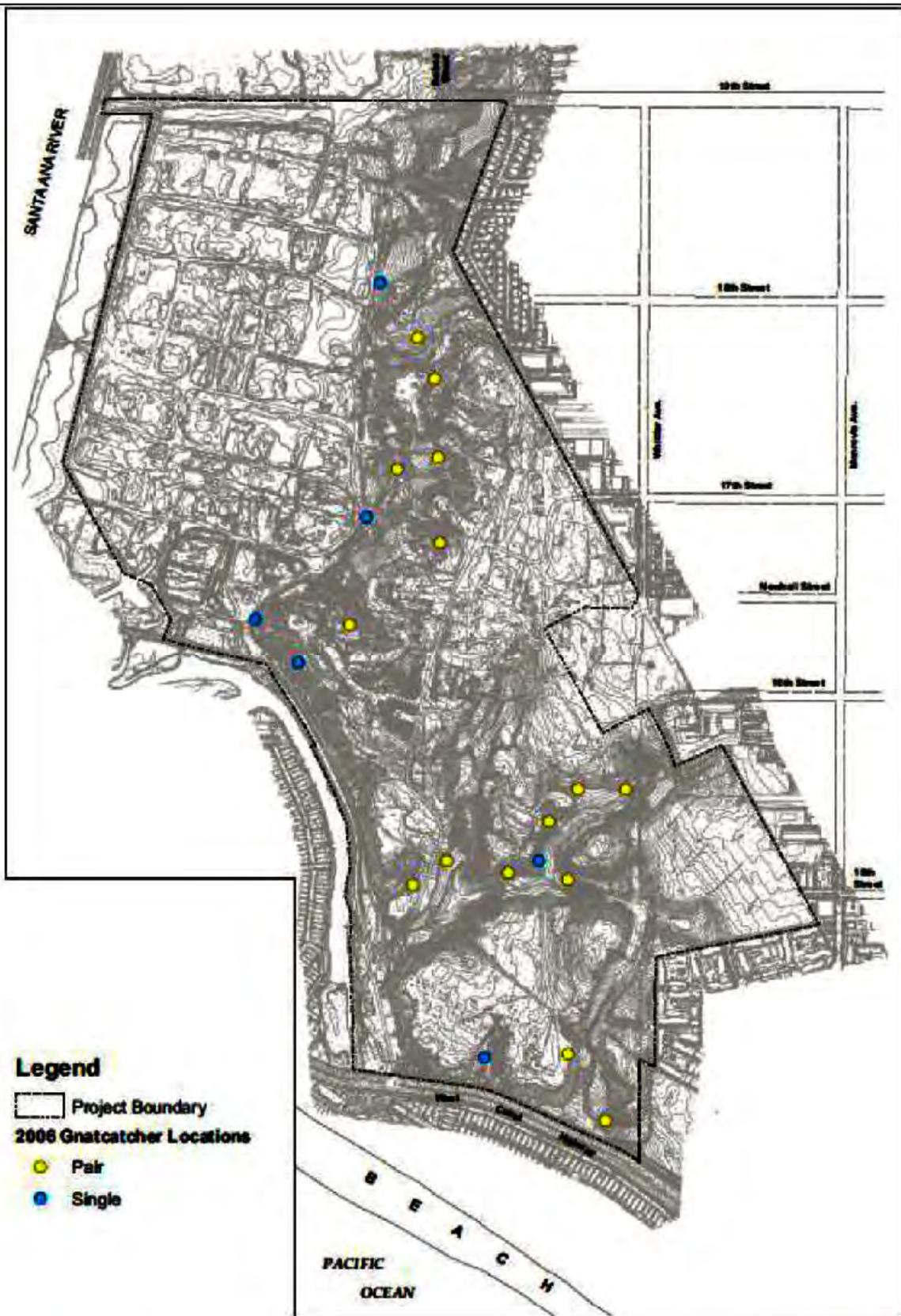


Figure 26. GLA 2002 Gnatcatcher Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: GLA.



Legend

Project Boundary

2006 Gnatcatcher Locations

● Pair

● Single

Exhibit 4a

2006 California Gnatcatcher Locations

NEWPORT BANNING RANCH

0 300 600 1,200 Feet

GLAN LUGOS ASSOCIATES

FORMA

March 20, 2008

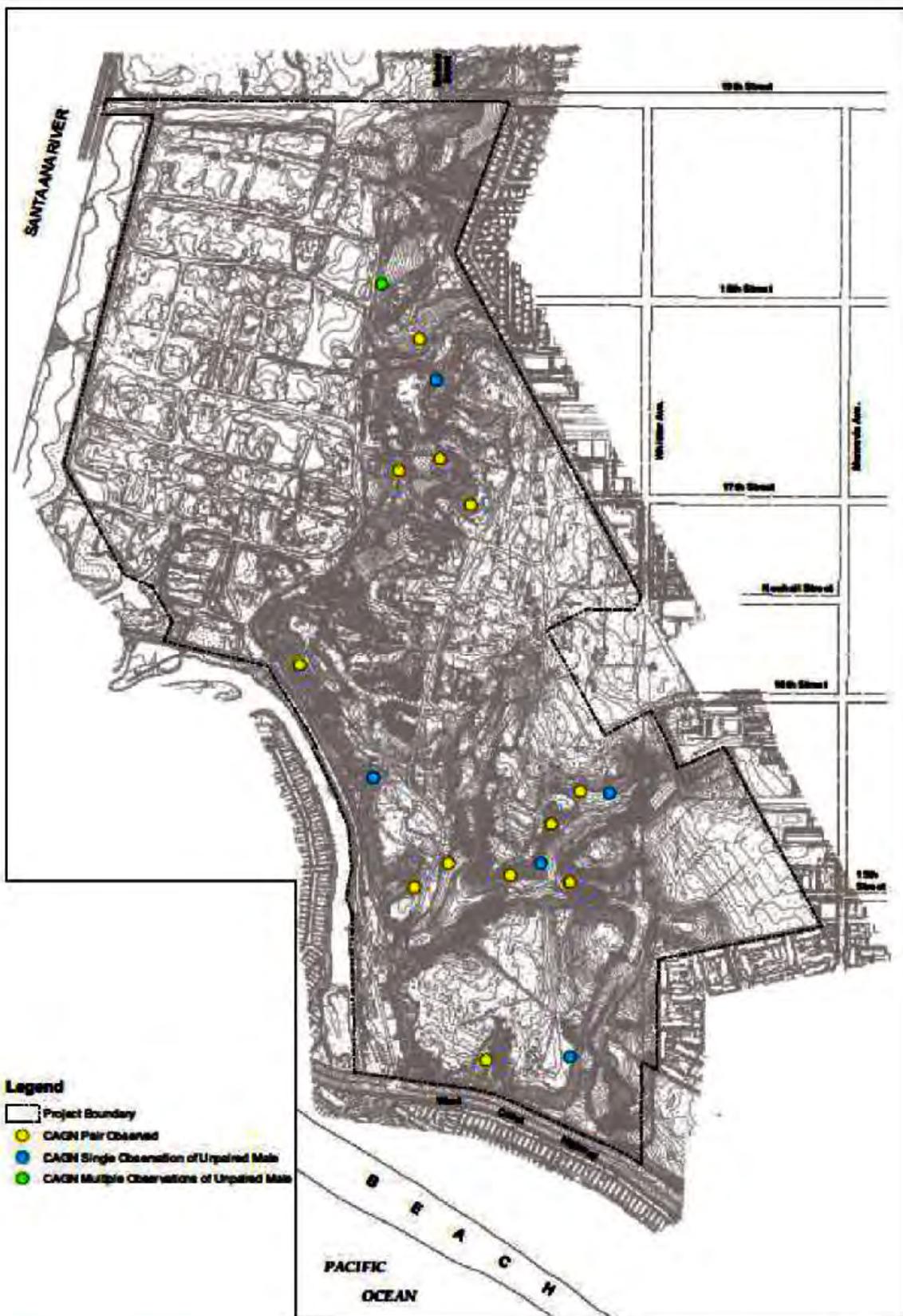
X:\NSRS-1\RES\TNT2\08\WPLAT\GIS\GNC\GNC\FIGMENTS-4_2006\GATPL_SF.mxd

Figure 27. GLA 2006 Gnatcatcher Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: GLA.



- Legend**
- Project Boundary
 - GAGN Pair Observed
 - GAGN Single Observation of Unpaired Male
 - GAGN Multiple Observations of Unpaired Male

Exhibit 4b

2007 California Gnatcatcher Locations



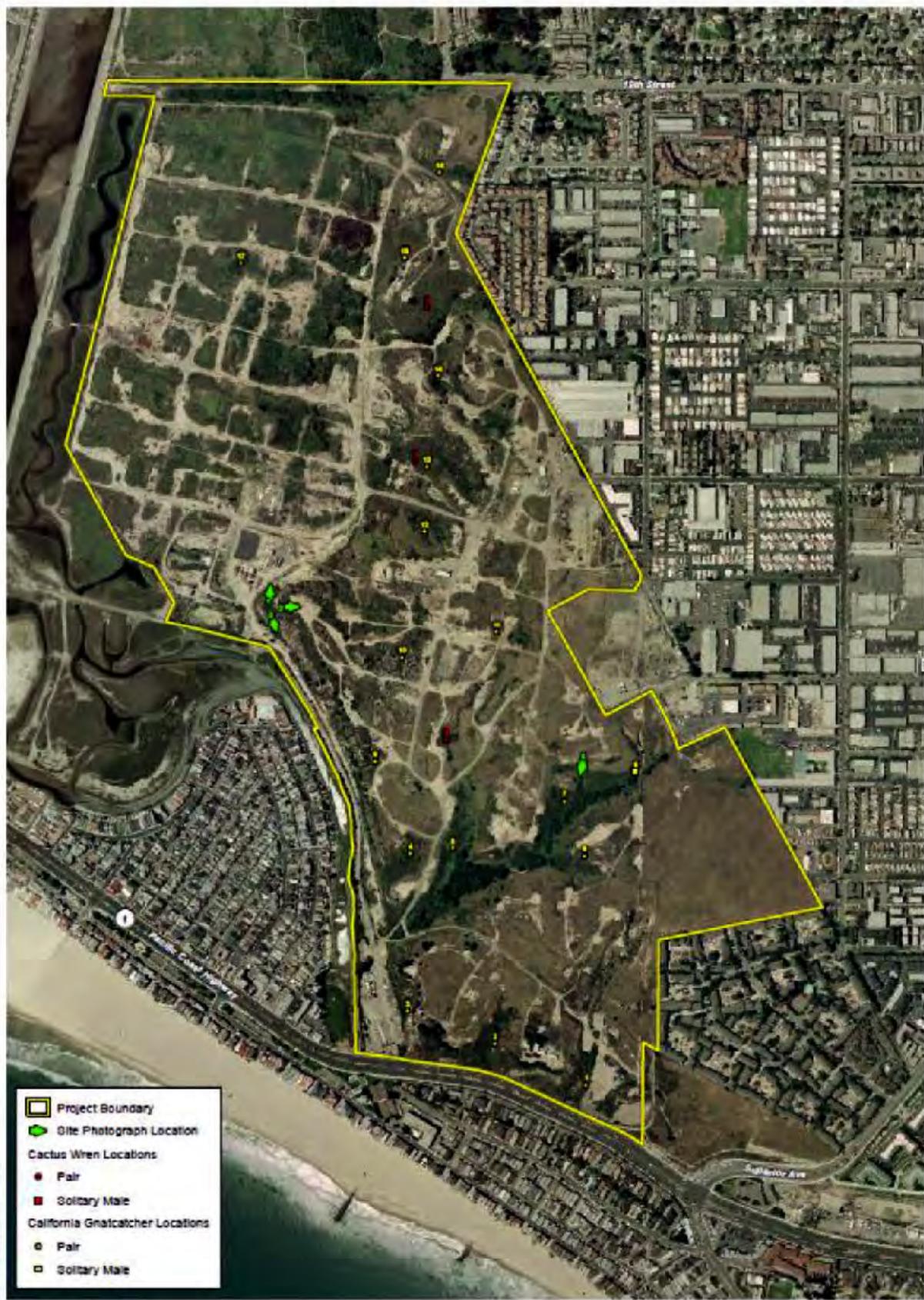
X:\MS03-TR-001\T0208\NBPATR2007\GIS\GAGN2007\FIGURE4-B 2007GAGN_01.mxd

Figure 28. GLA 2007 Gnatcatcher Survey Data.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: GLA.



© 2009 BonTerra. All rights reserved. 09/25/15

Survey Results **Exhibit 3b**

Newport Banning Ranch

0 300 600 Feet

BonTerra

Figure 29. BonTerra 2009 Gnatcatcher Survey Data.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: BonTerra.




 California Coastal Commission
 Joint Development Outcomes Areas - Consultative
 State Planning and Community Development
 CCO's Bureau/Unit
 CCA/COA/Map

0 425 851
 Feet
 1 inch = 250 feet

DRAFT/CONFIDENTIAL

DUDEK

2013 Gnatcatcher Survey Data
 Newport Banning Ranch

Figure 3
California Gnatcatcher Use Areas

CAGN Survey Report



Figure 3
California Gnatcatcher Survey Results

CAGN Survey Report 2015

Figure 31. Dudek 2015 Gnatcatcher Survey Data.

Memo by Dr. J. Engel 09/25/2015

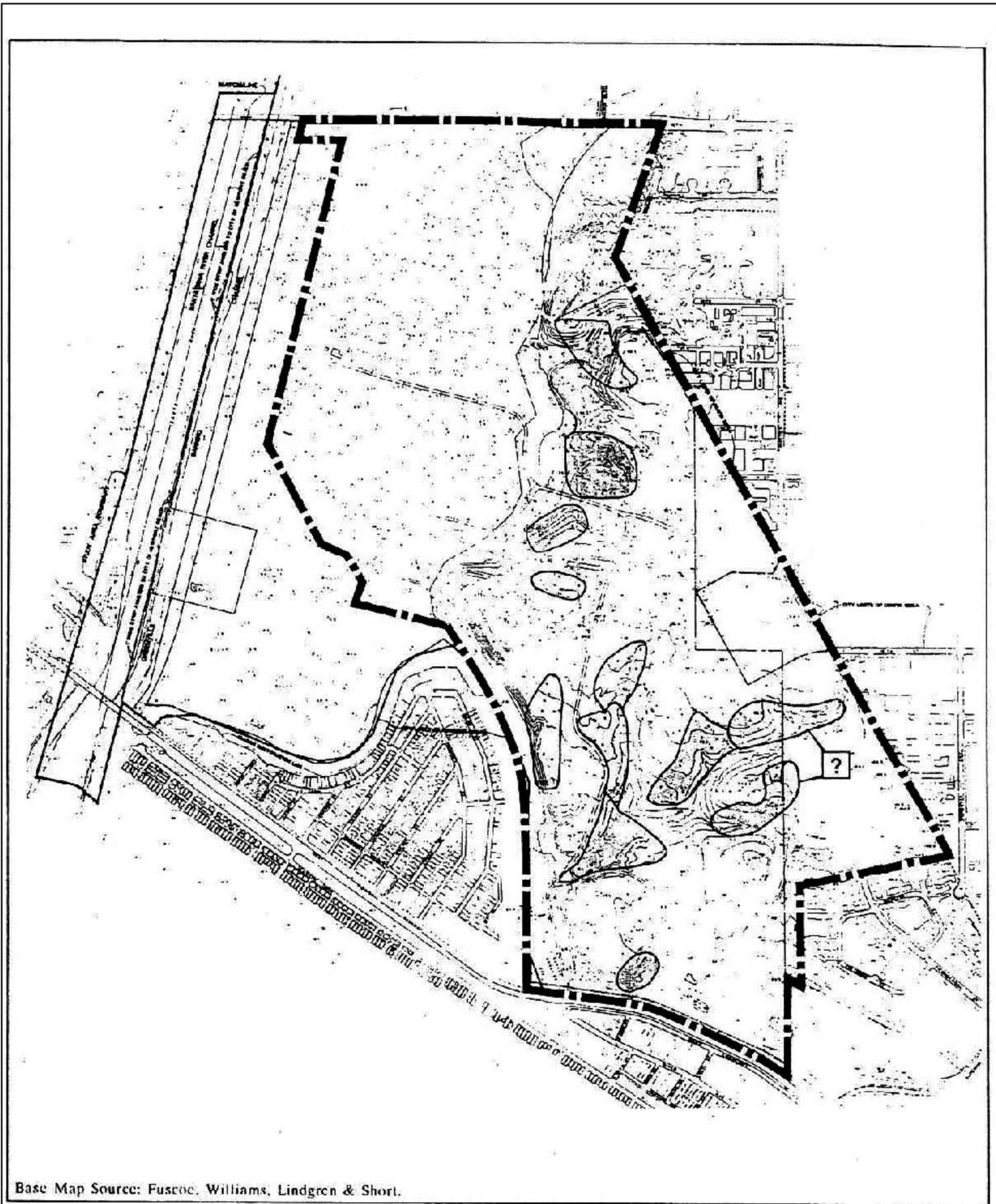
5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudek.

Page 67 of 87



Figure 33. Coastal California Gnatcatcher Environmentally Sensitive Habitat (ESHA) on Banning Ranch Defined by the Boundary of Compiled Breeding Territories Spanning 1992 to 2005/2015



Base Map Source: Fuscoe, Williams, Lindgren & Short.

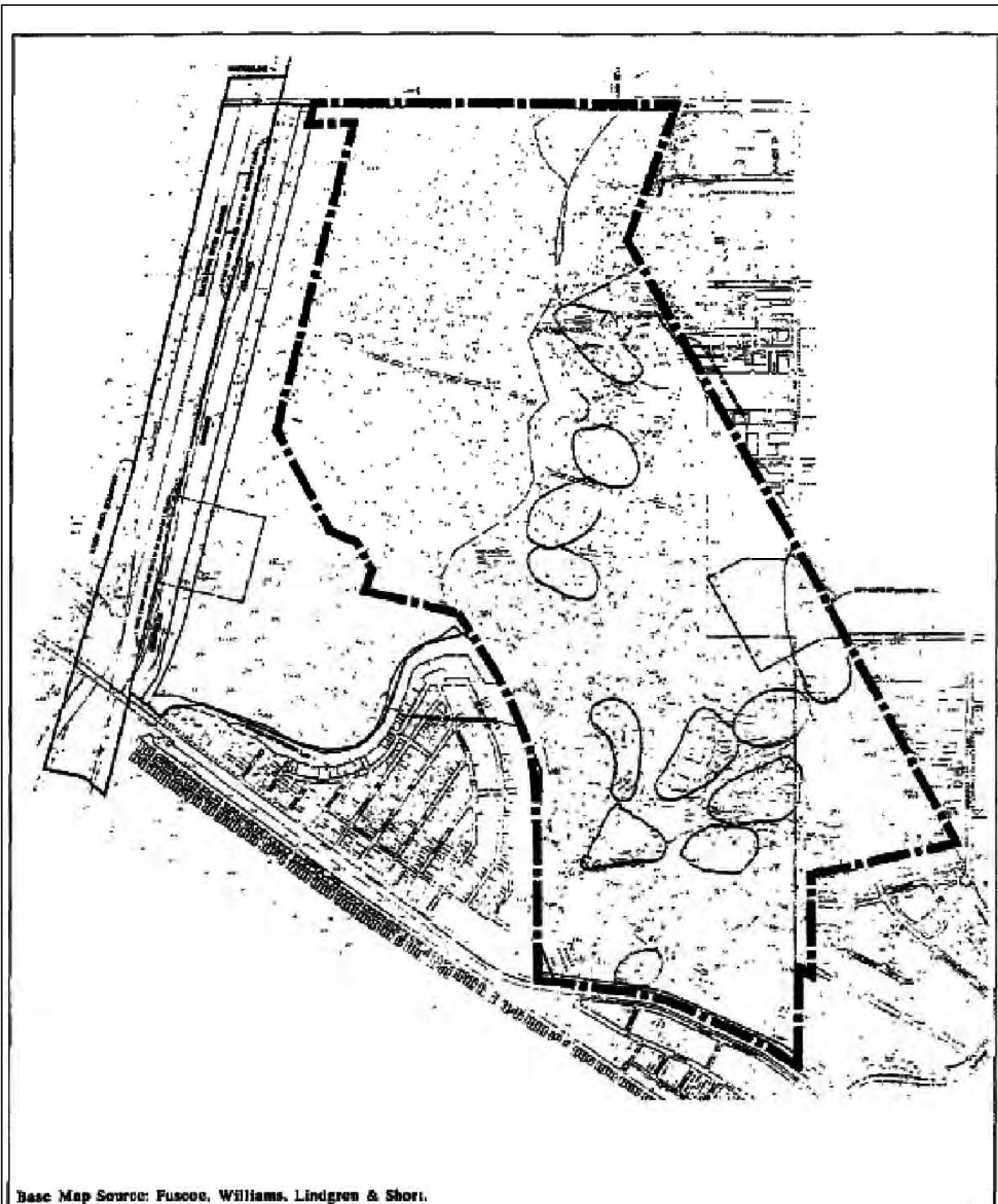
2/19/93(WNO201)

Figure 34. LSA 1992 Cactus Wren Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: LSA.



Base Map Source: Fusco, Williams, Lindgren & Shori.

3/17/92(WNO001)

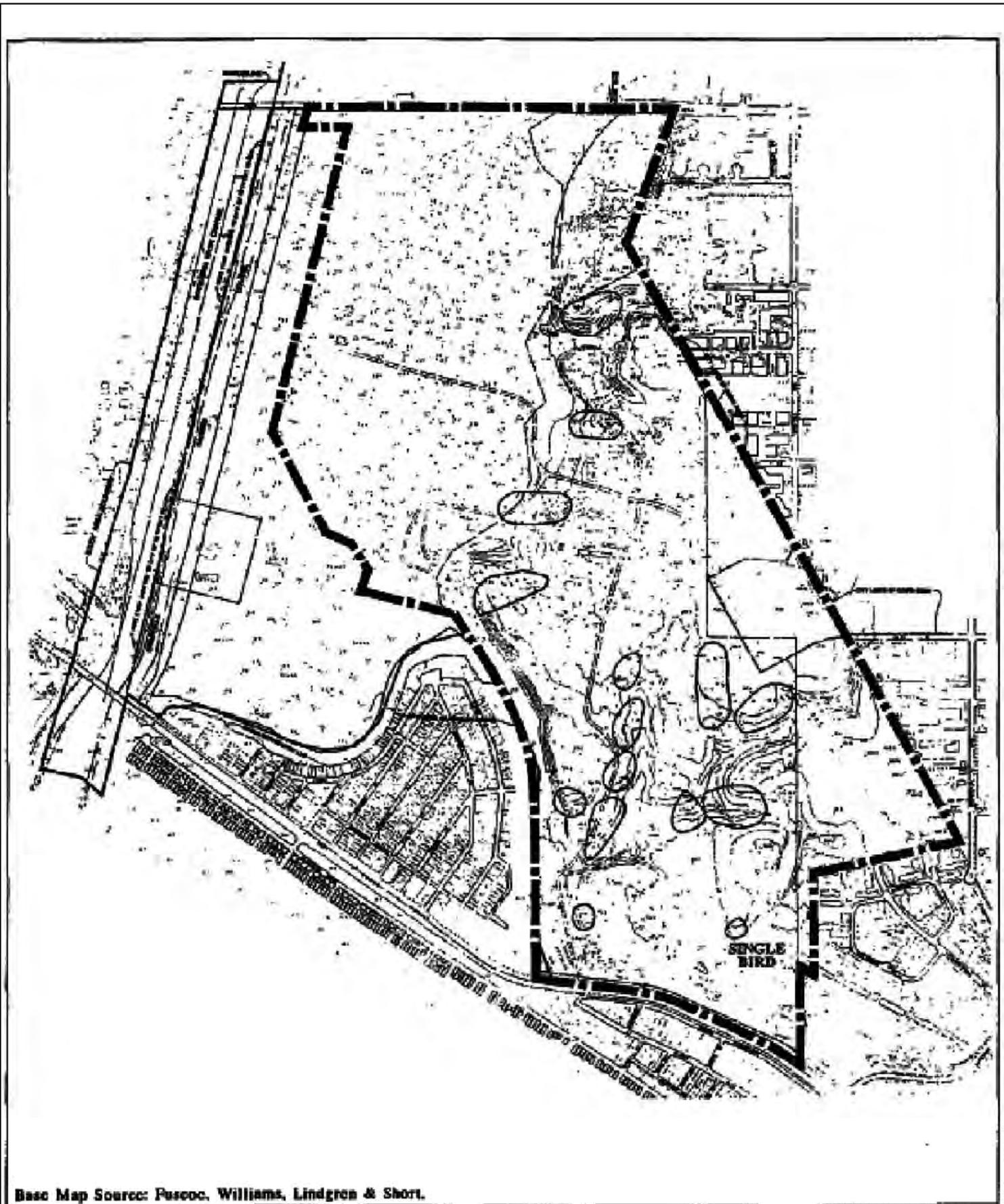
Figure 35. LSA 1993 Cactus Wren Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: LSA.

PSM 9/25/15
Page 71 of 87



Base Map Source: Purcoc, Williams, Lindgren & Short.

4/7/94(WNO481)



Base Map Source: Fuscoe, Williams, Lindgren & Short.
6/26/95(WNO201)

Figure 2



Scale in Feet
0 500 1000

Spring 1995
Cactus Wren Territories

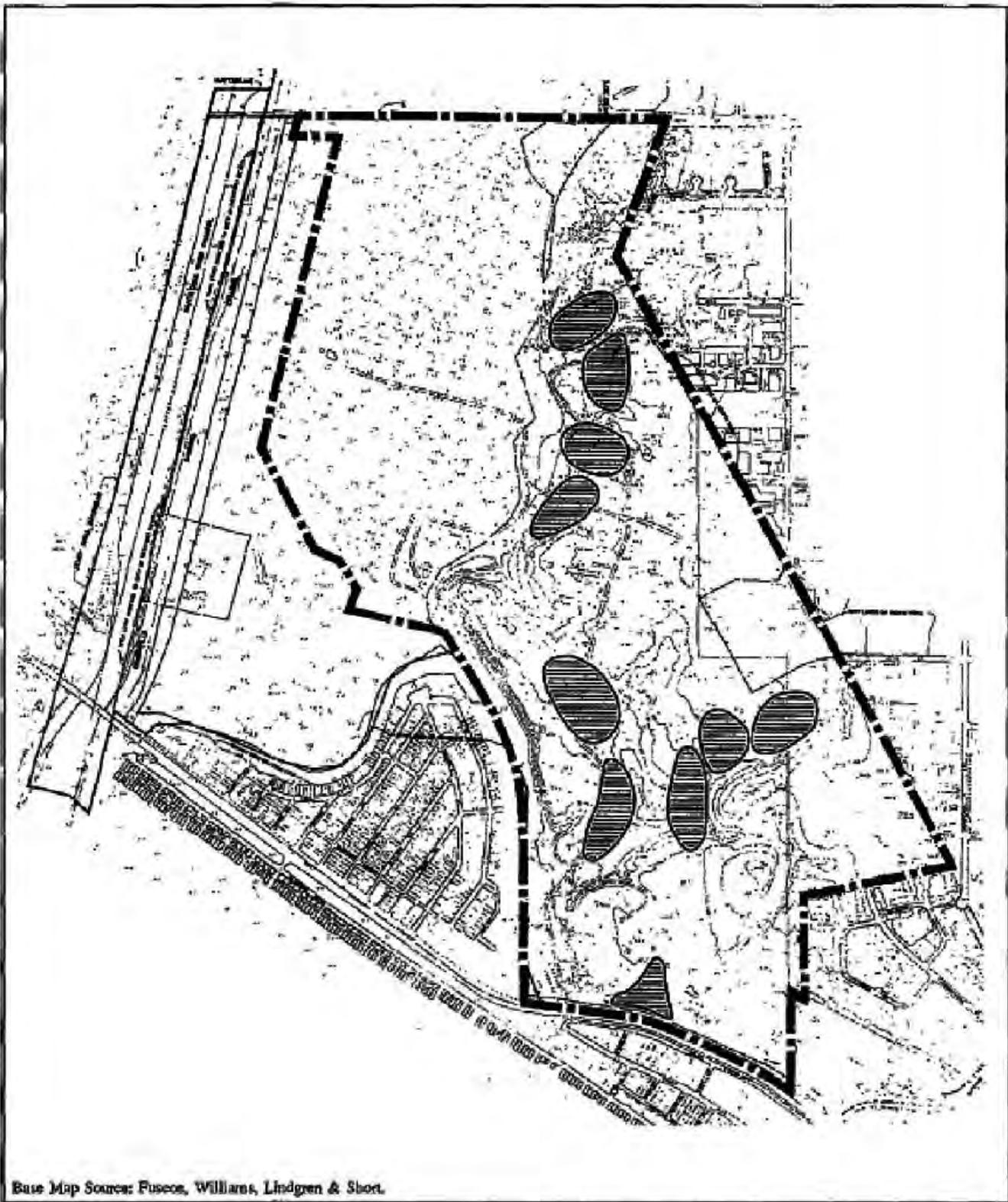
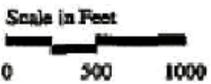


Figure 2

Base Map Source: Fusco, Williams, Lindgren & Short.

4/15/96(WNO201)



Spring 1996
Cactus Wren Territories

Figure 38. LSA 1996 Cactus Wren Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: LSA.

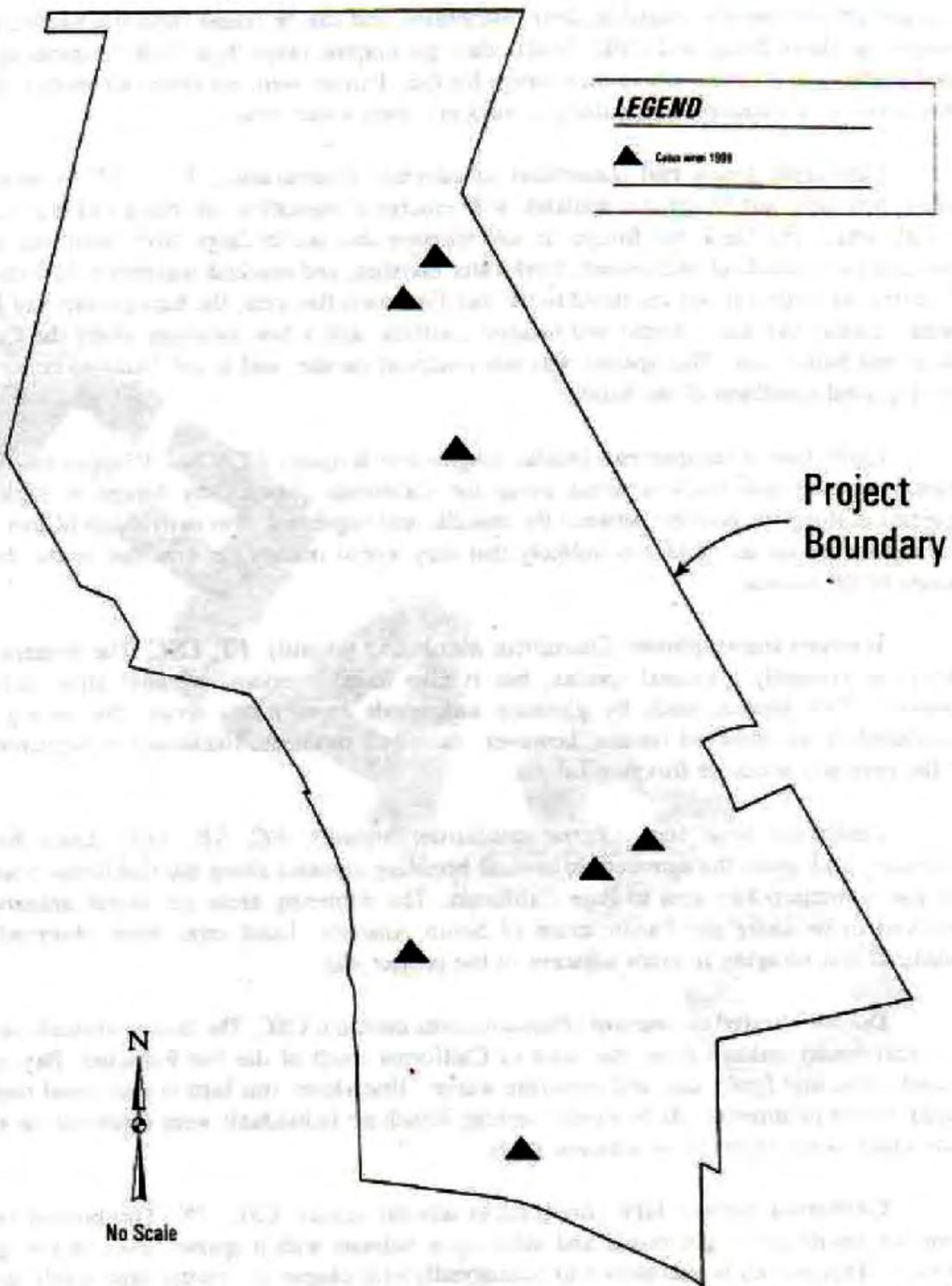


Figure 11
Cactus Wren Nesting
Locations - 1998

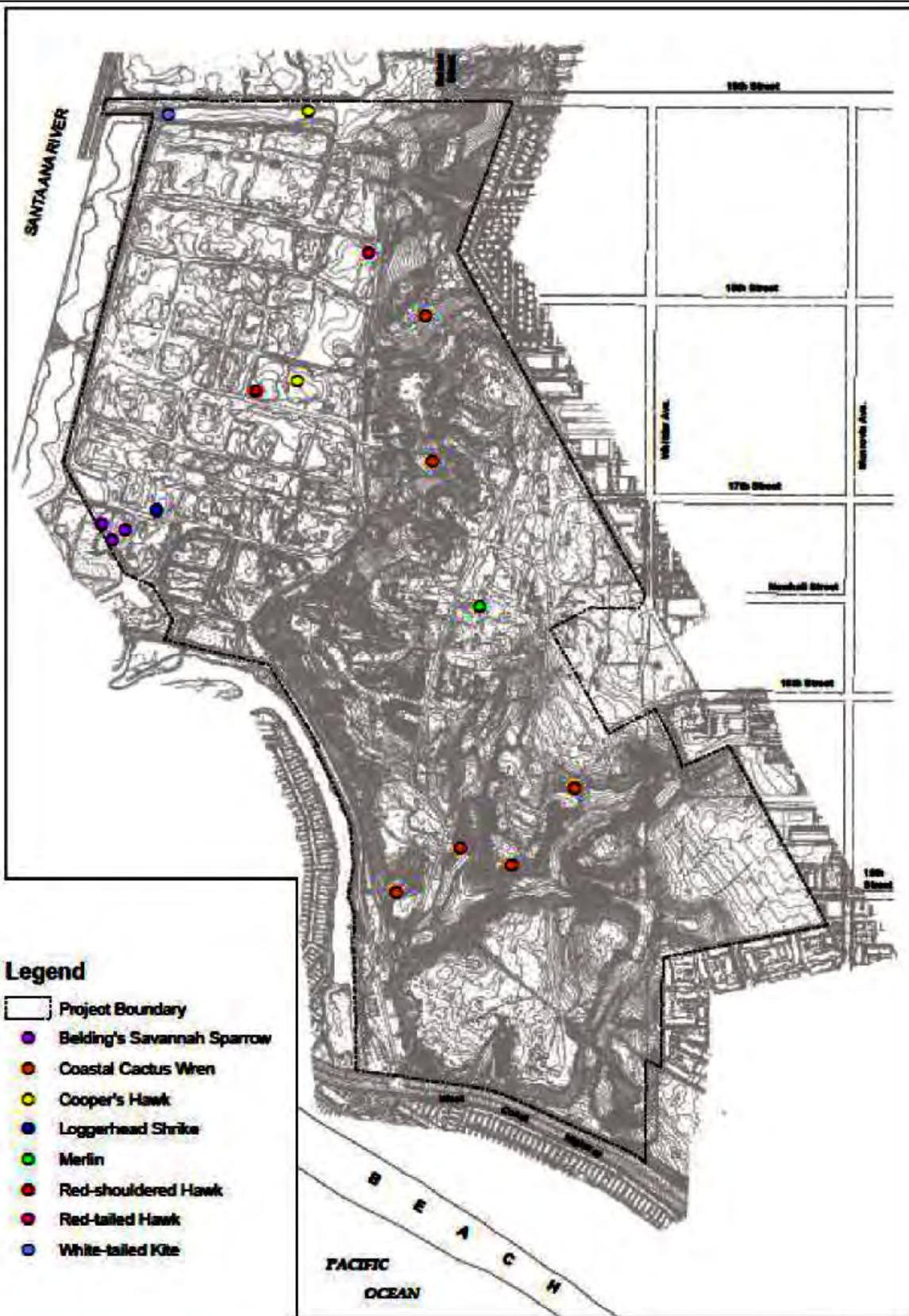
Date Prepared: 1-25-99

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Integrated Resource Conservation Plan



Legend

- Project Boundary
- Belding's Savannah Sparrow
- Coastal Cactus Wren
- Cooper's Hawk
- Loggerhead Shrike
- Merlin
- Red-shouldered Hawk
- Red-tailed Hawk
- White-tailed Kite

Exhibit 11

Other Special Status Birds Location Map

NEWPORT BANNING RANCH



GLP/UNION ASSOCIATES

 March 25, 2008

X:\085-THE REST\073-084\073-0-GIS\073-084\073-0-OtherSpecialStatusBirds_07.mxd



Figure 41. BonTerra 2009 Cactus Wren Survey Data.

Memo by Dr. J. Engel 09/25/2015

5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: BonTerra.



1992 – 2009 Compilation of Cactus Wren nesting season “use areas” on the Banning Ranch mesa

Figure 42. Coastal Cactus Wren Sensitive Habitat (NOT ESHA) on Banning Ranch Defined by the Boundary of Compiled Breeding Territories Spanning 1992 to 2009.
 Memo by Dr. J. Engel 09/25/2015 5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: BonTerra.



Legend
 [] Project Boundary
 ● Burrowing Owl Location

Exhibit 7
2008 Wintering Burrowing Owl Location Map

NEWPORT BANNING RANCH

0 300 600 1,200 Feet

GLWILLIAMS ASSOCIATES FUSCO FORM

March 25, 2008

X:\985-THE REST\0473-08BANN\073-8-GIS\GIS\BORDER\08-073-8_073-08_2008_WinteringBurrowingOwl.mxd

Figure 43. GLA 2008 Winter Burrowing Owl Survey Data.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: GLA.



Exhibit 8a



(REV: 06/24/11 JFC) D:\Projects\Biosurvey\B10\Map\Map of Road_Spots_Survey.pdf

Map of 2009 and 2010 Burrowing Owl surveys

[Back to Main Section](#)

[Back to Owl Survey Menu](#)



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NEWPORT BANNING RANCH

Burrowing Owl Survey Report



Figure 46. Burrowing Owl Over-Winter Burrowing Habitat Environmentally Sensitive Habitat (ESHA) on Banning Ranch.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudek, ESRI.

Page 82 of 87



- Legend**
- Project Site Boundary
 - Survey Areas
 - Raptor Species**
 - American Kestrel
 - Croaking Area
 - Perch
 - Prey Capture
 - Prey Sink
 - American Peregrine Falcon
 - Croaking Area
 - Prey Capture
 - Cooper's Hawk
 - Croaking Area
 - Nest
 - Perch
 - Prey Sink
 - Inaccessible Nest
 - Osprey
 - Croaking Area
 - Nest
 - Perch
 - Red-Tailed Hawk
 - Croaking Area
 - Nest
 - Perch
 - Prey Capture
 - Prey Sink
 - White-Tailed Kite
 - Croaking Area
 - Nest
 - Perch



DUDEK U.S. HQ: 703.420.2100
 7240-31
 JULY 2012 New 2011 Banning Ranch

FIGURE 3
Survey Results

ES&S Survey Results

Figure 48. Raptor Sightings on Banning Ranch.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudek.

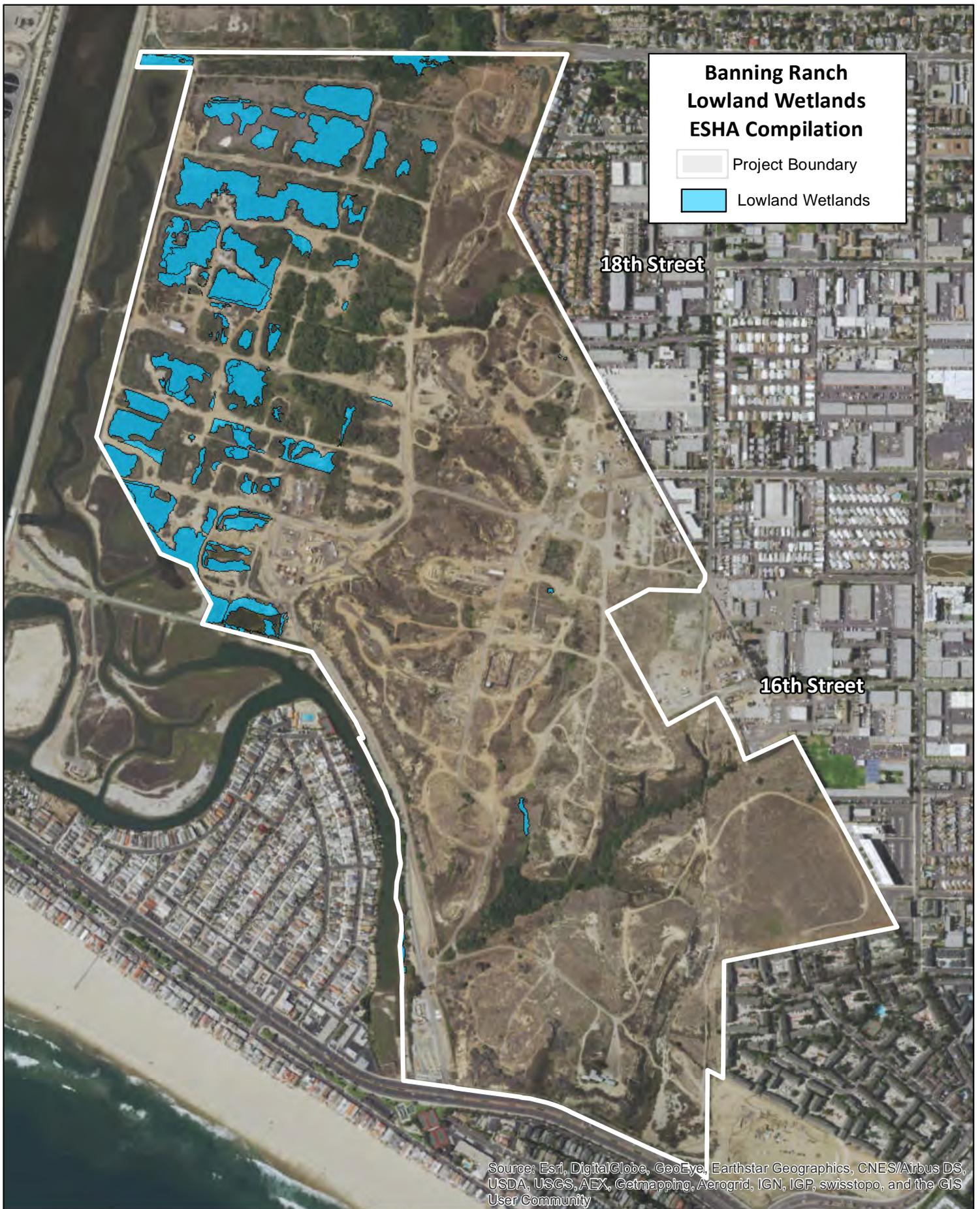


Figure 49. Lowland Wetlands on Banning Ranch.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudek, ESRI.

Page 85 of 87

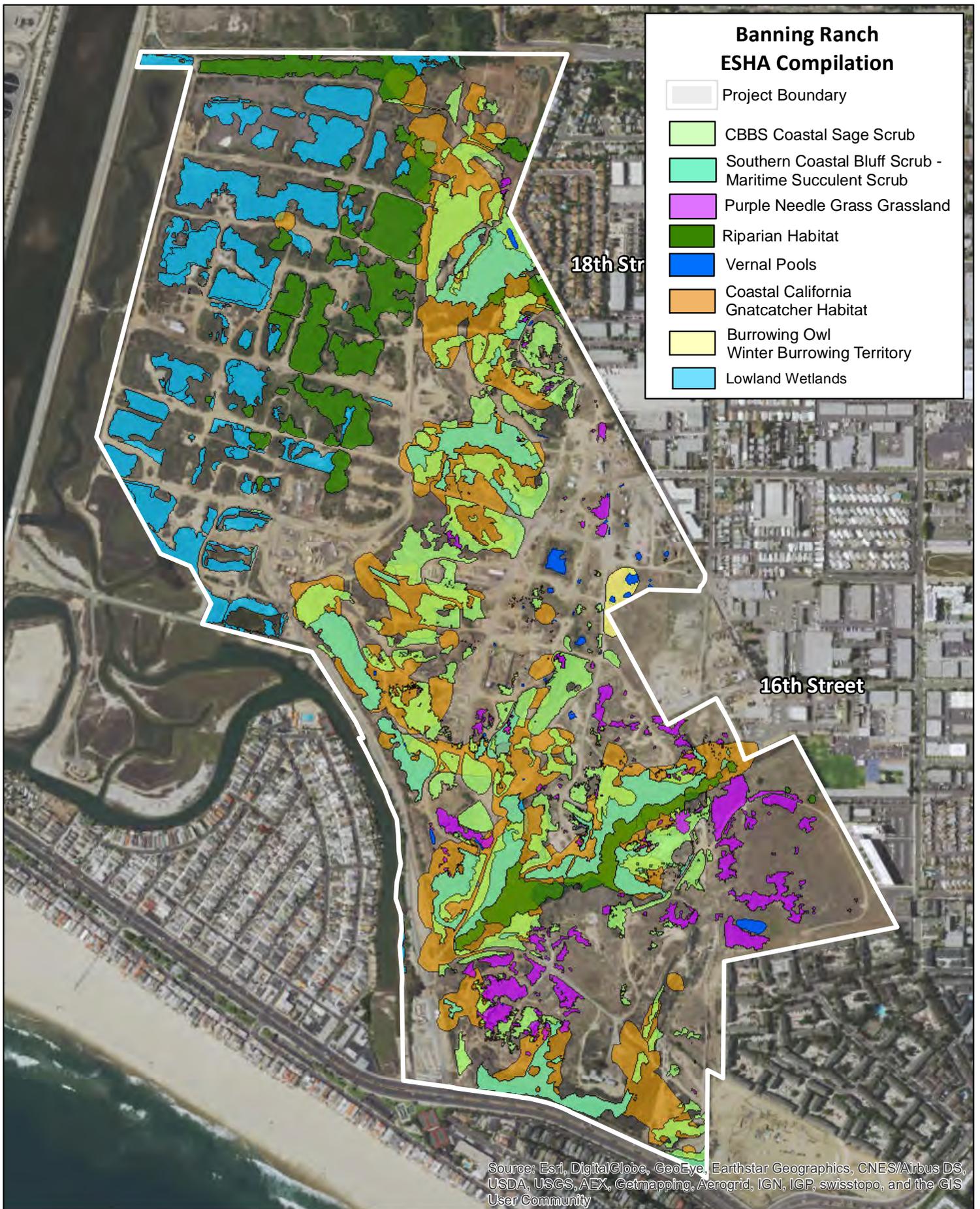


Figure 50. Banning Ranch ESHA and Wetland Boundaries.

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5-15-2097, EXHIBIT 12a

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Page 86 of 87

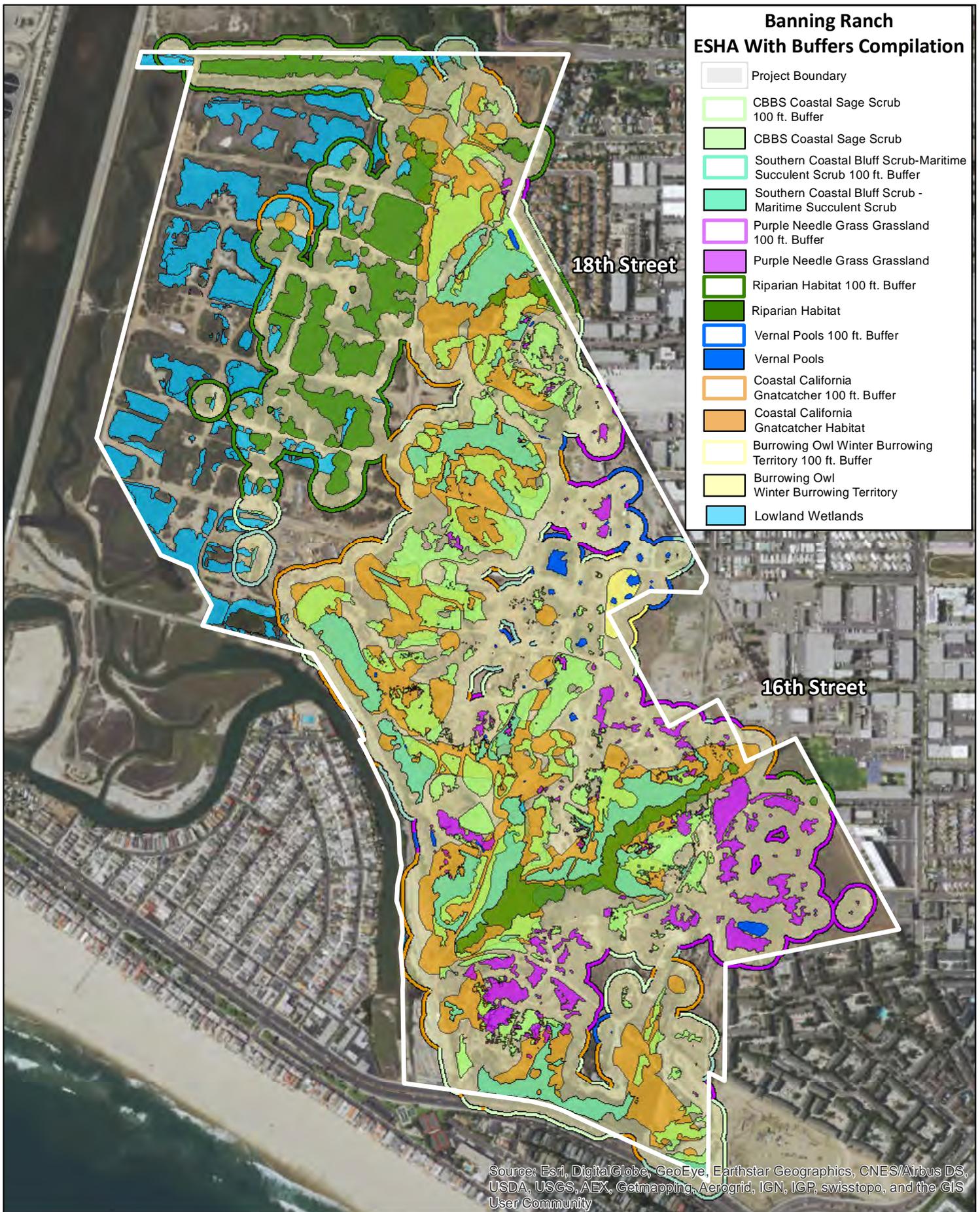


Figure 51. Banning Ranch ESHA and Wetlands with 100 Foot Buffers.

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5-15-2097, EXHIBIT 12a

For Illustrative Purposes Only. Source: Dudekl, ESRI.

Page 87 of 87

CALIFORNIA COASTAL COMMISSION

NORTH COAST DISTRICT
1385 8th Street, Suite 130
ARCATA, CA 95521
(707) 826-8950

**M E M O R A N D U M**

FROM: John D. Dixon, Ph.D.
Jonna D. Engel, Ph.D.
Ecologists

TO: Amber Dobson, Coastal Program Analyst

SUBJECT: Site-specific analysis of wetlands and ESHA on Banning Ranch

DATE: April 29, 2016

Documents reviewed:

Atwood, J.L. 1993. California gnatcatchers and coastal sage scrub: The biological basis for endangered species listing. Pages 149-169 in Keeley, J.E. (ed.), Interface between ecology and land development in California. Southern California Academy of Sciences, Los Angeles.

Atwood, J.L. and D.R. Bontrager. 2001. California gnatcatcher (*Polioptila californica*). In A. Poole and F. Gill, eds., The Birds of North America, No. 574. The Birds of North America, Inc., Philadelphia, PA.

Atwood, J.L. 2015. Letter dated October 5, 2015 to J. Ainsworth (CCC) regarding coastal California gnatcatchers at Newport Banning Ranch.

Bauder, E. T., D. A. Kreager, and S. C. McMillan. 1998. Vernal pools of Southern California: Recovery plan. Fish and Wildlife Service, Region 1, U. S. Department of the Interior, Portland, OR.

Bauder, E.T., A.J. Bohonak, B. Hecht, M.A. Simovich, D. Shaw, D.G. Jenkins, and M. Rains. 2011. A draft Regional Guidebook for applying the Hydrogeomorphic Approach to assessing wetland functions of vernal pool depressional wetlands in southern California. San Diego State University, San Diego, CA. [Originally published December 2009, updated November 8, 2011]

Berchtold, K. (Santa Ana Regional Water Quality Control Board). 2015. Comments on revised remedial action plan - Newport Banning Ranch oil field abandonment, 1080 west 17th street, Costa Mesa, Orange County, California. Letter to M. Klancher (Aera Energy) dated December 15, 2015.

Bomkamp, T. 1995. Vernal Pools: Environmental Sensitivity of and Description of Vernal Pools and Associated Resources. Appendix C of the City of Costa Mesa Fairview Park Master Plan as revised and updated. 2008. Costa Mesa, CA

Bomkamp, T. 2000. Results of Wet Season Surveys for the Federally Listed Endangered San Diego Fairy Shrimp, Newport Banning Ranch, Orange County, California. Letter report to M. Schlesinger (Taylor Woodrow Homes) dated October 18, 2000.

Bomkamp, T. (Glenn Lukos Assoc.). 2015a. Memorandum to J. Dixon (CCC) regarding "Delineation Data for Seasonal Features at Newport Banning Ranch" dated November 24, 2015.

Bomkamp, T. (Glenn Lukos Assoc.). 2015b. Memorandum to J. Dixon (CCC) regarding "Substrate Underlying Feature P at Newport Banning Ranch" dated December 9, 2015.

Bomkamp, T. (Glenn Lukos Assoc.). 2015c. Memorandum to J. Dixon (CCC) regarding "Clarification Regarding Seasonal Features MM and PP at Newport Banning Ranch" dated December 10, 2015.

Bomkamp, T. (Glenn Lukos Assoc.). 2016a. Memorandum to A. Dobson (CCC) regarding "Wetland status for mulefat scrub beyond the limits of Vernal Pool 1, Feature E and Feature M at Newport Banning Ranch, Orange County, California" dated March 10, 2016.

Bomkamp, T. (Glenn Lukos Assoc.). 2016b. Memorandum to J. Engel and J. Dixon (CCC) regarding "Vegetation Mapping at Proposed Intersection of Bluff Road and Pacific Coast Highway, Newport Banning Ranch, Orange County, California" dated March 21, 2016.

Bomkamp, T. (Glenn Lukos Assoc.). 2016c. Memorandum to J. Engel and J. Dixon (CCC) regarding "Feature C and immediately surrounding areas and feature CC at Newport Banning Ranch" dated March 22, 2016.

Bomkamp, T. (Glenn Lukos Assoc.). 2016d. Memorandum to J. Engel and J. Dixon (CCC) regarding "Results of purple needlegrass grassland assessment in March of 2016, Newport Banning Ranch, Orange County" dated April 4, 2016.

Campbell, K.F., R.A. Erickson, W.E. Haas, and M.A. Patten. 1998. California gnatcatcher use of habitats other than coastal sage scrub: Conservation and management implications. *Western Birds* 29:421-433.

Davis, J. (Dudek). 2016. Spring 2016 purple needlegrass grassland assessment for Newport Banning Ranch. A letter report to M. Mohler (Newport Banning Ranch LLC) dated April 12, 2016. Dudek. 2013a. Jurisdictional determination of seasonal features for the Newport Banning Ranch. A report prepared for Newport Banning Ranch LLC dated May 2013.

Dudek. 2013a. Revised Grassland Assessment and Vegetation Mapping Survey Report for the Newport Banning Ranch. A report prepared for Newport Banning Ranch LLC dated May 2013.

Dudek. 2013b. Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property City of Newport Beach and Unincorporated Orange County, California. A report prepared for Newport Banning Ranch LLC dated October 2013.

Dudek and Glenn Lukos Associates 2013. Summary of Protocol Surveys for Federally-Listed Vernal Pool Branchiopods Conducted on Newport Banning Ranch, City of Newport Beach and Unincorporated Orange County, California. Letter report to C. Medak (USFWS) dated January 29, 2013.

Engel, J. (CCC). September 25, 2015. Memorandum to Amber Dobson (CCC) regarding: "ESHA and wetland determination for Banning Ranch, Orange County, California (CDP 5-13-032)."

Gavin, J.P. 1998. Breeding and dispersal biology of the California gnatcatcher in central Orange County. *Western Birds* 29:323-332.

Geosyntec. 1996. Phase 1 description Environmental Restoration Program Newport Banning Ranch West Newport Oil Company, Orange County, Ca. A report to West Newport Oil Company dated January 31, 1996.

Grishaver, M.A, P.J. Mock, and K.L. Preston. 198. Breeding behavior of the California gnatcatcher in southwestern San Diego County, California. *Western Birds* 29:299-322.

Hamilton, R.A. (Hamilton Biological). 2014. Letter to J. Ainsworth (CCC) regarding "Comments on Dudek's California gnatcatcher surveys, Newport Banning Ranch Property, Orange County, California" dated January 21, 2014.

Hamilton, R.A. (Hamilton Biological). 2015. Letter to J. Engel (CCC) regarding "Delineation of ESHA at Newport Banning Ranch staff report w9b, Application No. 5-13-032" dated September 30, 2015.

Hamilton, R.A. (Hamilton Biological). 2016a. Letter to J. Snyder (USFWS) regarding "Request for USFWS to consult with CCC staff, Banning Ranch, Newport Beach, California" dated April 6, 2016.

Hamilton, R.A. (Hamilton Biological). 2016b. Email report to J. Dixon and J. Engel (CCC) regarding "Tony Bomkamp/GLA Remapping of Myoporum Scrub" dated April 8, 2016.

Hathaway, S.A. and M.A. Simovich. 1996. Factors affecting the distribution and co-occurrence of two southern Californian Anostracans (Branchiopoda), *Branchinecta sandiegonensis* and *Streptocephalus woottoni*. *Journal of Crustacean Biology* 16:669-677.

Holland, R. and S. Jain. 1988. Vernal Pools. Pages 515-553 in: M.G. Barbour and J. Major, eds. *Terrestrial vegetation of California*, 2nd ed., California Native Plant Society, Sacramento, CA.

Keeley, J.E. and P.H. Zedler. 1998. Characterization and global distribution of vernal pools. Pages 1-14 in: C.W. Witham, E.T. Bauder, W.R. Ferren, and R. Ornduff (eds.), *Ecology, conservation, and management of vernal pool ecosystems – Proceedings from a 1996 conference*. California Native Plant Society, Sacramento, CA.

Kirkpatrick, J.B. and C.F. Hutchinson. 1977. The community composition of Californian coastal sage scrub. *Vegetatio* 35:21-33

- Newport Banning Ranch. 2015a. NBR response to Commission staff purple needle grass grassland ESHA recommendation. Comments dated December 1, 2015.
- Newport Banning Ranch. 2015b. NBR response to Commission staff gnatcatcher/scrub pool ESHA recommendation. Comments dated December 1, 2015.
- Newport Banning Ranch. 2015c. NBR response to Commission staff burrowing owl ESHA recommendation. Comments dated December 1, 2015.
- Newport Banning Ranch. 2015d. NBR response to Commission staff Vernal Pool ESHA Recommendation. Comments dated December 1, 2015.
- Purer, E.A. 1939. Ecological study of vernal pools, San Diego County, California. *Ecology* 20:217-229.
- Preston, K.L., P.J. Mock, M.A. Grishaver, E.A. Bailey, and D.F. King. 1998. California Gnatcatcher Territorial Behavior. *Western Birds* 29:242-257.
- Riefner, R.E. and D.R. Pryor. 1996. New locations and interpretation of vernal pools in southern California. *Phytologia* 80:296-327.
- Riefner, R.E., S. Boyd, and R.J. Shlemon. 2007. Notes on native vascular plants from mima mound-vernal pool terrain and the importance of preserving coastal terraces in Orange County, California. *Aliso* 24:19-28.
- Ripley, B.J., J. Holtz, and M.A. Simovich. 2004. Cyst bank life-history model for a fairy shrimp from ephemeral ponds. *Freshwater Biology* 49:221-231.
- Sawyer, J.O., T. Keeler-Wolf, and J. Evans. 2008. A manual of California vegetation, 2nd edition. California Native Plant Society, Sacramento, California.
- Solomeshch, A.I., M.G. Barbour, and R.F. Holland. 2007. Vernal Pools. Pages 394-424 in: M.G. Barbour, T. Keeler-Wolf, and A.A. Schoenherr (eds.), *Terrestrial vegetation of California*. 3rd edition. University of California Press, Berkeley, CA
- Tippet, W.E. (CDFW). 2000. Letter to D. Bartlett (Bartlett & Associates) regarding "Comments on the Hellman Ranch biological assessment (1/6/00), burrowing owl survey (2/23/00) and subsequent confirmation of the biological assessment (5/31/00)" dated June 19, 2000.
- U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants; Determination of threatened status for the coastal California gnatcatcher. Final Rule. *Federal Register* 58:16742-16757.
- U.S. Fish and Wildlife Service. 1997. Endangered and threatened wildlife and plants; Determination of Endangered status for the San Diego fairy shrimp. Final Rule. *Federal Register* 62:4925-4939.
- U.S. Fish and Wildlife Service. 2015. Survey Guidelines for the Listed Large Branchiopods. A guidance document dated May 31, 2015. USFWS, Pacific Southwest Region, Sacramento, CA.

U.S. Fish and Wildlife Service. 2003. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*) and Determination of Distinct Vertebrate Population Segment for the California Gnatcatcher (*Polioptila californica*). Proposed Rule. Federal Register 68:20228-20312.

Weaver, K.L. 1998. Coastal sage scrub variation of San Diego County and their influence on the distribution of the California gnatcatcher. *Western Birds* 29:392-405.

Welsh, T. (Banning Ranch Conservancy). 2015. Vernal Pool E is relatively clean. A report submitted to the Coastal Commission dated November 17, 2015.

Zedler, P.H. 1987. The ecology of southern California vernal pools: a community profile. U.S. Fish and Wildlife Service Biological Report 85(7.11).

Executive Summary

The environmental constraints analysis and associated maps that were before the Commission in October 2015 were primarily based on the identification of wetlands, rare natural communities, and rare species by the applicant's consultants. Although Dr. Engel made multiple site visits with the applicant's biologists, the focus was on resolving ambiguities and errors in the mapping efforts and insuring that the descriptions of natural resources were accurate and complied with the standards established by the California Department of Fish and Wildlife and the Manual of California Vegetation, 2nd edition rather than on the determination of Environmentally Sensitive Habitat Areas or the delineation of wetlands. The applicant's consultants completed their field work in April 2015 and final maps were supplied by the applicant in August 2015. This information was the basis for the technical analysis (Engel 2015) that supported the staff's recommendation to the Commission.

Since the October 2015 Commission Hearing on this matter, we have completed a site-specific review and analysis of all the resource constraints at Banning Ranch. This has involved a critical assessment of the applicant's biological submissions, three site visits to examine the natural resources on the ground, and an extensive review of pertinent literature. The applicant has facilitated this analysis by conducting several additional field studies.

The recent field studies have demonstrated that some sensitive habitats have expanded and others have contracted and the constraints maps have been revised to reflect these changes. After examining areas identified as CCC wetlands in the field, we critically reviewed the wetland delineation and found errors in the interpretation of the wetland guidance in the Commission's Regulations. Correcting those errors resulted in a reduction in the number of wetlands on the site. We also conducted a site-by-site analysis of the rare vegetation communities, taking into account the size of patches, relative isolation, impacts of legal development, and importance to rare wildlife species. As a result of this analysis, small isolated patches and patches surrounded by development were not designated as Environmentally Sensitive Habitat Areas (ESHA), whereas other patches that were contiguous with areas used by the rare and

Threatened coastal California gnatcatcher were added to the ESHA. The salient changes in wetlands and upland ESHA on the Banning Ranch are summarized below.

Wetlands

Following heavy rainfall during the unusually wet winter of 2010-2011, 49 ponds of water were identified and mapped using aerial photographs and later examined in the field. In spring 2012, the applicant's consultant assessed each of these ponds for wetland characteristics using the standard methodology developed by the Army Corps of Engineers. Nine of these features had no wetland characteristics when examined on the ground. Each of the remaining 40 were described by the applicant's consultant as "CCC Wetland since at least one wetland criterion was met." Although each had at least one field indicator of wetland hydrology, 28 of those feature were both lacking wetland soil and either had upland vegetation or were unvegetated or occurred on asphalt. We found that these were not wetlands because they did not meet the definition in the Commission's Regulations. The remaining 12 periodically ponded areas do meet the definition of wetland under the Coastal Act and the Commission's Regulations and are mapped in Figure 1. We recommend a 100-ft development setback from wetlands.

Rare Vegetation Community: Coastal Sage Scrub

"Coastal sage scrub" (CSS) is a generic vegetation type referring to habitats dominated by semi-woody, low-growing species with shallow, dense roots that enable them to respond quickly to rainfall. These communities perform extremely important roles in the Mediterranean ecosystem, including providing critical habitat for many rare and endangered species. Most of the historic extent of this habitat along the southern California coast has been destroyed by development, and many types of coastal sage scrub are now considered rare and imperiled by the California Department of Fish and Wildlife.

There are three rare coastal sage shrub communities that occur in the areas proposed for development at Banning Ranch: southern coastal bluff scrub, maritime succulent scrub, and California brittle bush scrub. With the exception of small isolated patches and patches surrounded by industrial development, these habitat types meet the definition of ESHA under the Coastal Act because they are rare and easily disturbed by human activities. Large areas on Banning Ranch support healthy stands of CSS ESHA (Figure 4). Of these, the most abundant and widely distributed is California brittle bush scrub. This vegetation type is dominated ($\geq 30\%$ cover) by California bush sunflower, *Encelia californica*, which often appears as a monoculture, especially after colonizing previously disturbed areas. This drought-adapted species has recruited and is thriving in many parts of Banning Ranch where it was previously absent or in low abundance, including in areas where routine mowing has ceased. During our March 2016 site visit, most of the slopes and canyons were painted yellow with blossoms. We recommend a 50-foot development setback around CSS ESHA to prevent impacts that would significantly degrade the ESHA.

Rare Vegetation Community: Purple Needlegrass Grassland

Purple needlegrass grasslands (PNGG) have become increasingly rare in California and the Department of Fish and Wildlife finds this vegetation community to be of high conservation value. On Banning Ranch, purple needlegrass (*Nassella pulchra*) has occurred in patches of various sizes and with various coverage. Where it occurs with greater than ten percent relative vegetative cover, it is classified as purple needlegrass grassland, a rare habitat type that meets the definition of ESHA in the Coastal Act. In 2012 PNGG was present in many areas. Although we did not identify small isolated patches of PNGG and patches that were surrounded by industrial development as ESHA we concluded that patches in larger clusters that aggregated to several acres were ESHA due to the rarity of such grassland communities and because PNGG is easily disturbed and degraded by human activities and development. Since 2012 there has been a severe and continuing drought that has resulted in a general reduction in the vegetative cover of purple needlegrass due to a lack of growth, increased herbivory, and death of individual plants. Although there was a significant reduction in the extent of PNGG by 2015, this rare vegetation community was still widely present on the southern terrace. Since the plants were still present in all the mapped polygons, albeit reduced in cover because of the drought, we continued to use the 2012 PNGG polygons in our constraints analysis based on the expectation that the needlegrass would quickly recover with rainfall. Despite the El Niño event, Orange County continues to suffer drought and needlegrass has continued to decline with many plants dead or reduced to tiny rosettes at ground level in many areas. A focused survey of PNGG in areas proposed for development was conducted by the applicant's consultants in March and April of 2016. At that time, most of the areas examined had from <1% to 5% relative vegetative cover of purple needlegrass, a few areas had between 5% and about 8% relative cover, but only three areas had sufficient relative cover (> 10%) to be classified as PNGG. These are the only areas that we have continued to map as ESHA (Figure 6). We recommend a 50-foot development setback around PNGG ESHA to prevent impacts that would significantly degrade the ESHA.

Rare Animals: Coastal California Gnatcatcher

The coastal California gnatcatcher is an obligate and permanent, non-migratory resident of coastal sage scrub (CSS) in southern California and northern Baja California. It was listed as threatened under the Endangered Species Act in 1993 as a result of the extirpation or severe decline of populations throughout its original range due to habitat loss from agricultural and urban development. The gnatcatcher preys upon invertebrates, especially insects and other arthropods, by "gleaning" or plucking them from the foliage of native and non-native plants within or adjacent to their primary habitat. Although not dependent on any particular shrub species, their preferred habitat, especially during the breeding season is coastal sage scrub with at least 50 percent shrub cover about one meter in height that is dominated by California sagebrush, California brittle bush, California buckwheat, or a combination of these species. Although territories are maintained throughout the year, they are most strongly defended during the breeding and nesting season from February through July. Extra-

territorial wandering is common outside the nesting season and foraging in non-CSS habitats, such as mulefat scrub and riparian scrub, is most frequent during that time. All of Banning Ranch is mapped as “critical habitat” under the federal Endangered Species Act. U.S. Fish and Wildlife biologists believe that gnatcatchers utilize most of the upland areas at one time or another.

In past actions, the Commission has designated relatively undisturbed coastal sage scrub that is appropriate habitat for California gnatcatchers as ESHA, regardless of whether gnatcatchers were documented on any particular parcel, in recognition of the fact that only through the protection of their habitat can the rare species persist. In such cases, the ESHA is coincident with the extent of the appropriate habitat and is easily mapped. In one previous case where the habitat was highly degraded and fragmented, the Commission found that only the estimated use areas during the nesting season based on the cumulative locations of gnatcatcher sightings over several years, which included both remnant scrub habitats and ruderal vegetation, were ESHA. The situation at Banning Ranch is intermediate between the two previous examples. The coastal sage scrub, although degraded in many areas, in all cases considered meets both the membership rules for the California Brittle Bush Scrub Alliance or other rare scrub type, and the definition of ESHA under the Coastal Act. Although the habitat is fragmented by roads and other oil field development, from 1992 through 2015 the vegetation on the site has supported an average of 17 pairs of gnatcatchers. We mapped the gnatcatcher habitat by first creating cumulative use areas based on all the years of observations and then clipping these areas to currently existing appropriate vegetation, such as California brittle bush scrub. This excluded inappropriate habitat, such as roads, oil field infrastructure, debris piles, and iceplant. We then defined and mapped gnatcatcher occupied areas as the remaining use areas and any contiguous appropriate vegetation because all such areas are used during the year, regardless of whether birds were observed there during the brief survey periods. Those areas of vegetation that are occupied by the coastal California gnatcatcher meet the definition of ESHA because they are especially valuable due to their role in the ecosystem of providing habitat that supports a rare species and they are easily disturbed or degraded by human activities and developments (Figures 13-15). In a few areas, ESHA takes the form of several linear patches because the habitat areas used by the gnatcatchers are divided by roads or other bare space. The small gaps created by these roads and bare spaces do not affect foraging by gnatcatchers and it is important that these linear patches of habitat be recognized as occupied gnatcatcher habitat and be protected.

Scattered areas of non-native species (e.g., black mustard) and common native species (e.g., quailbush or upland patches of mulefat) that are not recommended for protection are known to be periodically used for foraging, especially during the non-breeding season when territory defense is lax and adults commonly forage outside their usual territories. However, in such a disturbed location, we believe that the only strong and defensible basis for identifying particular areas as important gnatcatcher habitat and ESHA is the testimony of the birds themselves over time. Given that the actual area used throughout the year by these rare birds is undoubtedly larger by some unknown amount, it is critical for the continued maintenance of a significant gnatcatcher population at Banning Ranch that the identified areas be conserved, restored where appropriate, and buffered from the impacts of development as part of the approved

Habitat Management Plan (HMP). We recommend a 100-foot development setback around gnatcatcher ESHA to prevent impacts that would significantly degrade the ESHA.

Rare Animals: San Diego Fairy Shrimp

The federally endangered San Diego fairy shrimp is a small aquatic crustacean that is restricted to vernal pools in coastal southern California and northwestern Baja California, Mexico. San Diego fairy shrimp are usually found in small, shallow vernal pools that range in depth from approximately 2 to 12 inches. Their lifecycle includes an embryonic egg stage in the form of cysts that have reduced metabolic activity and are resistant to harsh drying conditions. The embryonic cysts persist as a cyst bank consisting of different generations. Adult San Diego fairy shrimp are typically found from January to March; however, during years with extended rainfall they may occur earlier and later. While each generation of adults lives for approximately one month, San Diego fairy shrimp exhibit staggered hatching such that adults may be present throughout an entire wet season.

A portion of Banning Ranch has been identified as “critical habitat” for the San Diego fairy shrimp under the federal Endangered Species Act. San Diego Fairy Shrimp have been identified in 8 pools in or near the area designated as critical habitat for the species (Figure 1: Pools VP1, VP2, VP3, E, G, H, I, & K). This area is not proposed for residential or commercial development. However, the soil in and around some of the pools is contaminated and will require remediation. To maintain the viability of this endangered species, we recommend that vernal pools be created in several areas as part of the approved HMP to provide habitat for the San Diego fairy shrimp and that destruction of vernal pools containing San Diego fairy shrimp due to remediation be mitigated at a 10:1 ratio (area created or restored:area impacted) by restoring the vernal pools in place and creating vernal pools nearby or in other areas approved by the U.S. Fish and Wildlife Service.

Raptor foraging habitat

Both native and non-native grasslands provide important foraging opportunities for burrowing owls and other birds of prey. In recent years wildlife biologists have realized that most of the remaining raptor foraging habitat along the southern California coast was largely comprised of non-native species and, being unprotected, was rapidly being developed. As a result, the California Department of Fish and Wildlife (CDFW) began recommending in their CEQA analyses and Natural Community Conservation Planning that losses of such raptor foraging habitat be mitigated at a ratio of 0.5:1.0. The Commission has required such mitigation for loss of foraging habitat in past actions.

On Banning Ranch much of the coastal terrace that is proposed for development is currently grassland that provides foraging habitat for burrowing owl and other birds of prey. We recommend that all grassland and ruderal areas that are appropriate for raptor foraging and that are lost to development be mitigated on the upper mesas at the ratio of 0.5 acres of preserved foraging habitat for every 1.0 acre of lost foraging habitat

as part of the approved HMP. Such mitigation has independently been proposed in the applicant's Habitat Conservation and Conceptual Mitigation Plan (Dudek 2013b).

Combined Biological Constraints

The revised constraints analysis based on the appropriately delineated wetlands and Environmentally Sensitive Habitat Areas has resulted in the identification of 54.3 acres of potentially developable land within the area of interest demarcated by the applicant. The results of our biological constraints analysis are shown in Figures 16-18.

Introduction

An earlier assessment of the location and extent of wetlands, vegetation communities and rare species on the Banning Ranch (Engel, 2015) was based on the report of resources provided by the applicant's consultants. Vegetation communities mapped by those consultants and categorized as rare and "highly imperiled" in California (S1-S3) by the Department of Fish and Wildlife were designated environmentally sensitive habitat areas (ESHA) due to their rarity classification without regard to size, condition, location, or adjacent land use. Reported use areas of rare wildlife species were also designated ESHA. All areas that were designated "CCC wetland" in the applicant's wetland determination (Dudek 2013a) were mapped as such and those that supported aquatic invertebrates commonly found in vernal pools were given the latter designation. Although we performed several site visits prior to fall of 2015, they were narrowly focused on resolving problems regarding the accuracy of the vegetation mapping rather than on site-specific assessments of wetland or ESHA status. At staff's request, several areas were resurveyed by the applicant in April 2015 and the final vegetation map was completed by the applicant on August 24, 2015 and served as the basis for the habitat maps in Engel (2015), which were prepared for the Commission Hearing conducted in October 2015.

Since that time we have more critically reviewed the earlier mapping effort. We have conducted a site-specific analysis of the applicant's submissions, including three site visits. On November 12, 2015 we examined areas where ponding had been observed and on January 19 and March 16, 2016 we examined specific areas of native vegetation to assess their ESHA status, including areas where native vegetation has become established following the cessation of mowing and other areas where native vegetation has declined due to drought and invasion by non-native species. In the course of this work, several errors or ambiguities were found in the 2013 wetland report, which have been resolved by the applicant's consultant (Bomkamp, 2015a,b,c, 2016a,c). During the November site visit there were a few areas identified that appeared incorrectly mapped and there were also changes in the character of the vegetation in several areas since April 2015. These areas have been remapped by the applicant's consultants (Davis 2016; Bomkamp 2016a,b,c,d) and GIS files reflecting the changes have been provided to the Commission's mapping unit. We also extensively reviewed the scientific literature concerning vernal pools and their biota, which has altered our characterization

of several of the periodically ponded features that have supported aquatic invertebrates. More detailed descriptions of the rare species and rare vegetation communities present on Banning Ranch may be found in Engel (2015).

The purpose of this memorandum is to provide the scientific rationale for changes to the determinations and recommendations in Engel (2015) and to respond to comments from the applicant and the interested public.

Wetlands

The applicant mapped 53 areas on the upland terraces at Banning Ranch that at least periodically have ponded water following rainstorms. These areas were identified by low-level aerial photographs taken during the winter of 2010-2011 and provided by the Banning Ranch Conservancy, or documented during various fairy shrimp surveys by the applicant's consultants. The winter of 2010-2011 was a good time to identify potential wetlands because rainfall was about 170% of normal and depressions capable of ponding water were unlikely to be overlooked. One of the 53 features was outside the property line and three were not apparent during a 2011 ground-level survey and so were not sampled. The remaining 49 features (Figure 1) were analyzed for field indicators of the hydric soil parameter and the wetland (hydrophytic) vegetation parameter in May or June 2012, following the Army Corps of Engineers' protocols¹. Field indicators of wetland hydrology were not assessed at that time. Wetland hydrology was apparently assessed based on previous observations of field indicators, including during fairy shrimp surveys. Thirty-six of the 49 features were examined for fairy shrimp during the 2010-2011 wet season and 34 were sampled during the 2012 dry season for fairy shrimp and other aquatic invertebrates. A few of these features were also surveyed for fairy shrimp during the wet seasons of 2000, 2008, 2009, and 2012. The delineation report provides estimates of the size of ponded areas but does not include a map of the pond boundaries, the features used to define those boundaries, or the location of sample points. However, GIS files provided later by the applicant do show pond boundaries.

Nine of the 49 features had no wetland indicators when examined in the field². Most of the remaining 40 ponded areas did not have hydric soils and were lacking wetland vegetation, but most did have one or more field indicators of wetland hydrology: the

¹ Wetland parameters are defined attributes of wetlands that are the basis of wetland delineation. It is generally accepted among scientists and regulators that there are three wetland parameters: wetland hydrology, hydrophytic vegetation, and hydric soils. An intrinsic feature of wetland parameters is that they cannot be directly observed in the field during one or several site visits. This is most obvious in the case of quantitative definitions of wetland hydrology that require a minimum frequency and duration of inundation or soil saturation. With intensive observations the duration of water-logging could be determined for a given year, but the determination of long-term frequency would require years of observations. There are analogous problems with directly observing hydric soil and hydrophytic vegetation parameters. The solution to the problem of identifying wetland parameters in nature is the use of field indicators. Field indicators are physical, chemical, or biological features of an area that can be easily observed or assayed and that are usually correlated with the presence of a wetland parameter. Unlike parameters, which are either present or not, the field indicators of those parameters are subject to error.

² Areas F, O, AA, JJ, NN, QQ, RR, SS, and TT.

presence of the common fairy shrimp or other aquatic invertebrates, an observation of standing water or saturated soils, or surface soil cracks. In the 2013 Dudek report, all 40 of these periodically ponded depressions were designated “CCC Wetland since at least one wetland criterion was met.” In most cases (29 of the 40 depressions), this determination was based only on the presence of a field indicator of hydrology. In 2012 when the field sampling was done, 28 of those 29 features did not have hydric soils and all were either unvegetated (2) or had upland vegetation (26). For one feature, Pond KK, the wetland determination was based on field indicators of hydrology and hydric soil.

Wetland delineation in the Coastal Zone is based upon the wetland definition in Section 13577 of the Commission’s Regulations:

Wetland shall be defined as land where the water table is at, near, or above the land surface long enough to promote the formation of hydric soils or to support the growth of hydrophytes, and shall also include those types of wetlands where vegetation is lacking and soil is poorly developed or absent as a result of frequent and drastic fluctuations of surface water levels, wave action, water flow, turbidity or high concentrations of salts or other substances in the substrate. Such wetlands can be recognized by the presence of surface water or saturated substrate at some time during each year and their location within, or adjacent to, vegetated wetlands or deep-water habitats. For purposes of this section, the upland limit of a wetland shall be defined as

- (A) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover;
- (B) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or
- (C) in the case of wetlands without vegetation or soils, the boundary between land that is flooded or saturated at some time during years of normal precipitation, and land that is not.

None of the 40 periodically ponded depressions on Banning Ranch that were characterized as a CCC wetland by Dudek (2013a) are areas where “vegetation is lacking and soil is poorly developed” for the enumerated reasons and circumstances, and we interpret the boundary determination described in (C) as only applying to the latter, specified type of wetlands under natural, unaltered conditions³. Because none of those reasons and circumstances existed for the ponds that were surveyed on the upland terraces, subdivision (C) does not apply and, in such cases, hydrology alone does not define a wetland.

Under most circumstances, the presence of upland vegetation⁴ is *prima facie* evidence that the wetland hydrology parameter⁵ is not met even though hydrology field indicators,

³ We know of no normal circumstances, other than those enumerated in the regulation, where wetland hydrology would be present but wetland vegetation would be absent. Under “atypical” circumstances where indicators of hydric soils or wetland vegetation have been removed by human activities or natural events, the Commission has identified wetlands based solely on hydrology (e.g., Shea Homes, CDP 5-11-068).

⁴ Where fewer than 50% of the dominant species are wetland indicator species classified as OBL, FACW, or FAC, the plants (including the wetland indicator species) are generally presumed not to be growing as hydrophytes and the vegetation community is defined as “upland.”

⁵ The definition of wetlands in the Commission’s Regulations defines the hydrology parameter as inundation or shallow soil saturation sufficient to support a predominance of hydrophytes or the development of predominantly

such as soil cracks, aquatic invertebrates or ponded water, may sometimes be present. Were wetland hydrology present, a predominance of upland vegetation could not persist.⁶ Therefore, we conclude that 24 periodically ponded areas that have upland vegetation and that do not have hydric soil are not Coastal Commission jurisdictional wetlands⁷.

Of the remaining 16 periodically ponded areas, three, Ponds R, T and U, occur in a roadway or parking area, do not have hydric soils, and were unvegetated at the time of our November 2015 site visit⁸. The lack of vegetation appears to be a result of the highly compacted substrate and of frequent disturbance from traffic. This is the normal situation in these areas and under these conditions wetlands cannot develop⁹. We conclude that these areas that did not have hydric soils and that were unvegetated are not Coastal Commission wetlands. Two periodically ponded areas, Pond P and Pond T, were located on asphalt. Pond P had strong wetland vegetation, including vernal pool species, and indicators of wetland hydrology. Both areas have been shown to be shallow depressions with a thin veneer (0-5") of sediment that has accumulated over a layer of asphalt that was installed as part of the oil field operations (Bomkamp 2015b). We recommend that these features not be considered wetlands under the meaning of the Coastal Act and Commission's Regulations, not because they are anthropogenic, but rather because they are based on an artificial substrate and are unable to support the normal processes that promote the formation of hydric soils¹⁰. Although Pond P supports a predominance of wetland indicator species, we do not believe that "lands" in

hydric soil. The Regulations do not provide a quantitative definition of hydrology. For the Corps, the hydrology parameter is defined as continuous inundation or shallow soil saturation for at least 14 days during half of all years (i.e., 50 out of 100). In unusual circumstances, which are generally due to human disturbance of the vegetation and soil, a quantitative hydrology criterion is needed for the Commission's analysis. In such cases, the Commission has relied on technical staff's recommendation that continuous inundation or soil saturation for at least 14 days during most years is sufficient to support hydrophytes and the development of hydric soil, for less than 7 days is insufficient, and for 7 – 14 days is indeterminate and requires additional site-specific assessment.

⁶ After several years of drought, wetlands could be taken over by upland species. However, in this case the vegetation was assessed at the end of the 2011-2012 rain year which was the first year of relative drought. There were 6.18 inches of rainfall in 2011-2012 compared to an average of 10.67 inches (Orange County Public Works Station 88 Newport Harbor, 40-year record). Although the winter was dry, the spring (Mar-May 2012) rainfall of 2.71 inches was similar to the average of 2.67 inches. The vegetation was assessed on June 9. A similar rainfall pattern was observed at the Costa Mesa Station 219 (35-year average: 11.67"; 2011-2012: 7.31"; Av Mar-May: 2.84"; 2012 Mar-May: 2.77") Rainfall in the 2010-2011 rain year when extensive ponding was documented was 18.66 inches at Newport Harbor and 19.28 inches at Costa Mesa, roughly 170% of normal. We think it unlikely that the character of the vegetation would shift from wetland to upland following one dry winter after a year of extreme rainfall. However, diagnostic vernal pool species may well have been suppressed by the lack of winter rainfall.

⁷ Areas VP3, B, D, G, H, I, J, K, L, N, Q, S, X, Y, Z, BB, DD, EE, FF, GG, HH, II, LL, PP. Area PP was shown as having wetland vegetation in Dudek (2013a), but we found that to be a transcription error when we examined the original field notes and this was verified by Bomkamp (2015c).

⁸ Area R is located along the edge of an unpaved roadway and supported wetland indicator species in June 2012. This vegetation is no longer present probably because of vehicular disturbance.

⁹ Commission staff did allege that some of the development that occurred on the site occurred in violation of the Coastal Act, and in that situation, the Commission generally considers what conditions would likely have existed in the absence of such development. However, there was never any allegation that the roadways or parking areas in this area were the result of any Coastal Act violation.

¹⁰ Because the "soil" is so shallow and underlain by impermeable asphalt many processes such as iron depletion cannot take place and anaerobic conditions are unlikely to prevail long enough or frequently enough to produce characteristic hydric features.

the wetland definition in Section 30121 of the Coastal Act¹¹ was meant to include asphalt, concrete, and the like, even where sediments sufficient to support some plants have accumulated at the surface.

We have mapped the 12 remaining periodically ponded areas¹² as wetlands as defined by the Coastal Act and the Commission's Regulations (Figure 1). Within the proposed disturbance area, Pond C and Pond CC had a predominance of wetland vegetation and indicators of wetland hydrology and meet the definition of wetlands under the Coastal Act and the Commission's Regulations¹³. Pond M had wetland hydrology, as indicated by the presence of aquatic invertebrates, but in 2012 only one of the two dominant plant species was a wetland indicator. This did not meet the wetland vegetation criterion (>50% of dominants are wetland indicators). Since that time, hydric soil has been identified (Bomkamp 2016c) and another wetland indicator species (woolly marbles, FACW), which is also a diagnostic species for vernal pools, has become abundant (personal observations) and we therefore recommend that Pond M be designated a vernal pool wetland. At Pond E, a wetland indicator species provided 70 percent of the vegetative cover in 2012, but since it was one of only two dominant species, it did not meet the wetland vegetation criterion. In 2016, at least one area did have a predominance of wetland vegetation (Bomkamp 2016c). The wetland boundary was not based on vegetation, but rather on evidence of hydrology, which was more inclusive. Since Pond E supports the endangered San Diego fairy shrimp, it also meets the definition of an Environmentally Sensitive Habitat Area (ESHA) under the Coastal Act due to its important ecosystem function, regardless of its jurisdictional wetland status. Pond E is adjacent to abandoned well 58 and to a suspected oil sump¹⁴. There does

¹¹ "Wetland" means lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens.

¹² Ponds VP1, VP2, A, C, E, M, V, W, CC, KK, MM, and OO.

¹³ One hundred percent of the species observed in each of Areas C and CC are obligate wetland species and the presence of aquatic invertebrates and observations of surface water following rainfall are field indicators of wetland hydrology. These wetlands appear to be partially or completely the result of man-made excavations. It is not known whether wetland conditions were present prior to disturbance. However, even assuming that the wetland conditions are entirely anthropogenic, the Commission's Regulations do not exclude such features from the definition of wetlands, and the Commission in past actions has applied the Coastal Act's wetland protection provisions to man-made wetlands (e.g., Hillside Village South 5-92-188-A4). On our March 16, 2016 site visit, at wetland C there was evidence outside the delineated wetland boundaries of recent inundation or surface saturation in the form of soil cracks, and the vernal pool species woolly marbles was present. We requested that the area be resurveyed to determine whether there was a change in the wetland boundary. Based on an examination of sample points along several transects, it appears that the boundary has not changed (Bomkamp 2016c).

¹⁴ Two oil production features are located at Pool E – Well No. 58 and a suspected historic oil sump. Well No. 58 was abandoned and capped in 1994 under the oversight of the California Department of Oil, Gas, & Geothermal Resources, the Orange County Health Care Agency, the Orange County Building Department and the Santa Ana Regional Water Quality Control Board. As part of that work, the concrete well pad was removed, the well was filled and capped at six feet below the ground surface, and approximately 40 cubic yards of soil at the well head was excavated and removed. The excavation was backfilled with clean soil and soil testing was carried out. This testing was completed by Geosyntec and indicates that soil at the well site contains less than 5 ppm of hydrocarbon contamination (essentially non-existent). The location of well 58 was verified at: <http://maps.conservation.ca.gov/doggr/Index.html?api=05921710#close>. The suspected historic oil sump is located approximately 40 feet to the north of Well No. 58 within the depression known as Pool E and was investigated by Geosyntec in 2006 and 2007. Reports from these investigations are available from the Santa Ana Regional Water Quality Control Board at: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=SL0605921271. These

not appear to be evidence of significant soil contamination at the Well 58 location (Geosyntec 1996, Welsh 2015) but the sump may require remediation (Dudek 2013a, NBR 2015d, Footnote 14, above). Vernal pools VP1, E, and M support stands of mulefat, a wetland indicator species, that are adjacent to the polygons mapped as wetland by Dudek (2013a). Typically vegetation dominated by wetland indicator species that are adjacent to observed ponded areas delineate as part of the wetland, regardless of whether shallow soil saturation is observed. These three areas have recently been resurveyed, and areas that contain mulefat have been explicitly characterized as either upland or wetland based on location and associated vegetation (Bomkamp 2016c).

Wetlands outside the proposed disturbance area are Ponds VP1, VP2, A, E, W, V, KK, MM, and OO. In addition to wetlands VP1 and VP2, San Diego fairy shrimp ESHA outside the proposed disturbance area include the periodically ponded areas VP3, G, H, I, and J (Figure 1).

We recommend that development be set back a minimum of 100 feet from the edge of wetlands or 10 feet from the edge of vernal pool watersheds, whichever is greater. In the case of wetlands C and CC, we recommend that the buffers be merged (Figure 2) to prevent wetland CC from being surrounded by development and to provide a sufficiently large protected area (c. 2 acres) to function as a vernal pool complex that could accommodate significant vernal pool creation as part of the approved HMP. We also recommend that the vernal pool complex proposed by the applicant that includes vernal pool VP1 be expanded to include the vernal pools Pond E and Pond M, which would provide a greater opportunity for significant vernal pool restoration and creation. These measures incorporated into the approved HMP will enhance the chances for the survival and recovery of the endangered San Diego fairy shrimp.

Vernal Pools

“Vernal pool” is a term of art that refers to a particular type of seasonal wetland with habitat characteristics that present severe physiological constraints for both plants and animals, resulting in a unique biota (Zedler 1987, Holland & Jain 1988, Bauder et al. 1998, Keeley & Zedler 1998, Solomeshch et al. 2007). Vernal pools are patchily distributed from Oregon to Baja California and were once common on coastal terraces in southern California. These pools tend to occur in aggregations, often in a landscape

investigations included removal of all surface vegetation, including several trees, from the area around the suspected sump as well as the excavation of three 2 foot wide by 8 foot deep trenches within and adjacent to Pool E. Visual observations, soil sampling, and laboratory analysis indicate the presence of low levels of hydrocarbons in shallow soils below Pool E. These hydrocarbons consist predominantly of heavy end, degraded and weathered materials. No free oil was found. When sampling was carried out nine years ago, detectable hydrocarbon concentrations were estimated to extend from near the surface to about 5 feet below the ground surface across an approximately 40 foot wide area. Heaviest concentrations were located in a 2 foot deep by 15 foot wide patch in the center of this area with a maximum concentration of 5,000 ppm. The allowable concentration established by the Regional Water Quality Control Board for this depth range on the project site is 1,000 ppm in areas of open space, parks, and streets and 100 ppm in residential areas. If additional soil sampling reveals that levels of hydrocarbons or other regulated pollutants at the site of the suspected historic sump have not degraded to below these allowable concentrations, clean-up work would be carried out and restoration of the remediated area should take place *in situ*.

of more-or-less uniformly arrayed low hummocks and swales. The hummocks, often termed mima mounds, vary from a few inches to a few feet in height and are vegetated with upland grasses and shrubs. The contrast in vegetation between the hummocks and swales makes them obvious in aerial photographs. These hummocks and swales are underlain by a shallow aquitard that prevents the soil from draining. In southern California this impermeable layer is generally comprised of dense clay. Hydrology is based on rainfall and the watershed for each pool is generally the surrounding area within a distance of only about five to ten pool diameters (Bauder et al. 2011). The areas supporting vernal pools have a Mediterranean climate with winter rainfall and dry, hot summers. The pools fill during the first significant rainfall, remain inundated for several weeks at a time during the winter, maintain moist soils into the spring, and completely dry out during the summer. The periods of inundation are too brief to support aquatic plants (e.g., cattails) and too long to allow the development of persistent upland vegetation. They may fill and dry several times during normal winters, but may remain dry throughout drought years. The plants and animals that have adapted to this unpredictable habitat generally have an annual habit with seeds or diapausing eggs or embryo-containing cysts that are resistant to desiccation. At any given time, most of the population of each species is dormant in the soil with only a portion developing into adults during a given year's rainy season.

The physical difference between vernal pools and other seasonal wetlands is subtle and apparently not well-understood. Perhaps the main differences of vernal pools are the extreme lack of permeability of vernal pool soils, hydrology based only on rainfall, and relatively small watersheds. The principal diagnostic characteristic of vernal pools is the presence of a number of species, mostly small vascular plants, that are seldom found in other habitats. The species that are found within or along the edges of vernal pools in southern California can be divided into three groups (Zedler 1987; the examples are species that have been observed at Banning Ranch¹⁵): 1. Plants that are largely restricted to vernal pools within the region, e.g., woolly marbles (*Psilocarphus brevissimus*), loosestrife (*Lythrum hyssopifolia*), water pigmy weed (*Crassula aquatica*), waterfern (*Marsilea vestita*), and little moustails (*Myosurus minimus*), 2. Plants that are found in vernal pools in the region, but are more common in other wetlands, e.g., brass buttons (*Cotula coronopifolia*), rabbit's foot grass (*Polypogon monspeliensis*), common spikerush (*Eleocharis palustris* (= *E. macrostachys*)), and curly dock (*Rumex crispis*), 3. Plants that are often in vernal pools but are also common in adjacent upland habitats, e.g., long-beaked storke's bill (*Erodium botrys*), rattail fescue (*Festuca* (= *Vulpia*) *myuros*), and sandspurry (*Spergularia marina* (= *S. salina*)). Similarly, some aquatic invertebrates are largely restricted to vernal pools, e.g., San Diego fairy shrimp (*Brachinecta sandiegonensis*); whereas others are frequently found in vernal pools, but are more common in other wetlands, e.g., versatile fairy shrimp (*B. lindahli*). Plants and animals that are either endemic to vernal pools or most frequently found in that habitat are considered diagnostic species when evaluating the status of a wetland. Species that are commonly found in both vernal pools and other wetlands may be characteristically present in vernal pools, but are not diagnostic of that habitat.

¹⁵ Dudek 2013a; Dudek and Glen Lukos, 2013; Bomkamp 2000.

Prior to widespread urban development, there were extensive fields of mima mounds in southern California and there were many thousands of vernal pools in San Diego County (Purer 1939) and probably also in Orange County (Riefner & Pryor 1996, Riefner et al. 2007). Mima mounds are obvious in historical aerial photographs of the Corona Del Mar area south of Newport Bay and of Banning Ranch to the north (Figure 3). In 1994, a vernal pool complex that supports vernal pool plants and both the versatile fairy shrimp and the endangered San Diego fairy shrimp was discovered just north of Banning Ranch at Costa Mesa's Fairview Park (Bomkamp, 1995). It is very likely that the coastal terraces of Banning Ranch supported vernal pool complexes within the mima mound landscape prior to ground disturbance from agriculture and oil field operations. Extensive vernal pool complexes are no longer evident. However, wetlands are still present and some have vernal pool characteristics. All have been disturbed to various degrees. Some may have been recently created by human activities, whereas others may be the result of ground disturbance to areas of previously existing pools. There is no way after-the-fact to distinguish the one type of wetland from the other.

Engel (2015) identified as vernal pools those putative wetlands delineated by the applicant's consultants (Dudek 2013a) that were inhabited by known vernal pool species, in particular, by the versatile fairy shrimp. However, when we examined in the field each area that had ponded during the 2010-2011 rain year, it was apparent that many did not meet the wetland definitions in the Coastal Act and the Commission's Regulations (see above). In a less disturbed and manipulated habitat, it could be appropriately conservative to identify vernal pools based on the presence of characteristic species. However, after examining each of the previously ponded areas, many of which occur in unpaved roadways, parking lots, and other industrial areas, we decided that at this location the designation "vernal pool" should only be applied to areas that support diagnostic species. However, it is possible for accidental or man-made habitats to provide some of the ecological functions of vernal pools. Bauder et al. (1998) addressed this issue from the point of view of the U. S. Fish and Wildlife Service as follows:

"Road ruts, man-made ponds, minor impoundments on drainages, and abandoned borrow sites, are generally not considered vernal pools. However, these areas may function as vernal pool habitat by supporting vernal pools species, and may even be a consequence of previous land alterations to historical pool habitat. These areas remain subject to Endangered Species Act requirements if they support listed species, with a determination of their significance to recovery addressed individually."

Rare Terrestrial Vegetation Communities

The vegetation at Banning Ranch is discussed in detail by Engel (2015). The California Department of Fish and Wildlife¹⁶ ranks species and natural communities by degree of

¹⁶ Rarity ranking may be found at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=24716&inline=1>

imperilment (as measured by rarity, trends, and threats) and considers communities and species with state ranks of S1, S2, and S3 to be rare and “highly imperiled”¹⁷. In past actions, the Coastal Commission has consistently regarded natural communities and species with these rankings to be “rare” for purposes of the definition of Environmentally Sensitive Habitat Areas (ESHA) in Section 30107.5 of the Coastal Act. The determination of whether a particular area containing elements of such natural communities or individuals of such species meets the definition of ESHA requires a site-specific analysis that takes into consideration such matters as the size of the area, the degree of isolation, adjacent development and other disrupting activities (and the legality thereof), amount of existing degradation, and potential jeopardy to regional populations by loss of the area¹⁸.

Here we address only those rare vegetation communities that potentially constrain development within the proposed disturbance area, in particular the *Encelia californica* Shrubland Alliance (California brittle bush scrub, S3), southern coastal bluff scrub (S1), maritime succulent scrub (S1), and *Nassella pulchra* Herbaceous Alliance (purple needle grass grassland, S3?¹⁹). Southern coastal bluff scrub and maritime succulent scrub are now considered “legacy classifications” and are being replaced by nomenclature developed by CDFW as part of their new standard classification system. These two systems do not map one to one and these two scrub habitats are now most closely approximated by the *Opuntia littoralis* Shrubland Alliance (coast prickly pear scrub, S3). There seems to be no disagreement as to the status and locations of southern coastal bluff scrub or maritime succulent scrub, so we will focus our analysis on purple needle grass grassland and brittle bush scrub.

Patches of these rare vegetation communities that occurred within the northern industrial area and were fragmented, isolated, and surrounded by unvegetated roads, parking and storage areas were not designated ESHA. Similarly, in all areas, small islands of habitat that were not contiguous or closely adjacent to large areas of rare habitat or to gnatcatcher use areas, and areas within containment berms or those surrounded by infrastructure were not designated ESHA²⁰. All excluded areas large enough to show up on a map are shown in Figures 4 and 5.

¹⁷ http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_background.asp

¹⁸ The Commission has occasionally found that small, relatively isolated patches or scattered individuals of a rare species or habitat are not rare or ESHA (e.g., small isolated patches of southern tarplant at Hearthwide Homes 5-05-020); on the other hand, the Commission found that an area on a capped toxic waste site supporting a small population of Ventura marsh milk-vetch was ESHA because it was the only known remaining population of the species (City of Oxnard LCP No. Oxnmaj-1-00: North Shore at Mandalay Bay Annexation).

¹⁹ The question mark (?) “denotes an inexact numeric rank due to insufficient samples over the full expected range of the type, but existing information points to this rank” (footnote 16, Op. Cit.).

²⁰ The rationale for excluding small, isolated patches of habitat or patches that occur within industrial development is that the rarity rankings apply to “natural communities” (footnote 16, Op. Cit.). This suggests an undefined but sufficiently large area where normal community processes, such as interspecific competition and predation, can take place without destroying the patch and where individual species have sufficient resources to successfully complete their various life stages, growing, reproducing, and replacing themselves within the patch or among a mosaic of such patches. It also suggests an area that is not so small or so constrained by development that the constituent species are prevented from functioning more-or-less normally and where regional processes, such as immigration, emigration, and colonization or use by wildlife, are not severely constrained. In addition, we suggest that whereas a vegetation community type may be rare, little insular patches of the constituent species that meet the inclusion

Encelia californica Shrubland Alliance (California brittle bush scrub)

“Coastal sage scrub” is a generic vegetation type that is inclusive of variously classified subtypes (Kirkpatrick and Hutchinson 1977; Holland 1986; Sawyer et al. 2008). In general, coastal sage scrub is comprised of dominant species that are semi-woody and low-growing, with shallow, dense roots that enable them to respond quickly to rainfall. Under the moist conditions of winter and spring, they grow quickly, flower, and produce light, wind-dispersed seeds, making them good colonizers following disturbance. Coastal sage scrub communities perform extremely important roles in the Mediterranean ecosystem, including providing critical habitat for many rare and endangered species. However, this vegetation community has been drastically reduced in area as a result of habitat loss due to development. In the early 1980’s it was estimated that 85 to 90 percent of the original extent of coastal sage scrub in California had already been destroyed (Westman 1981). Losses since that time have been large and particularly severe along the southern California coast.

At Banning Ranch, California brittle bush scrub is perhaps the most widely distributed of the three rare coastal sage shrub communities that occur in the areas proposed for development. The California Brittle Bush Scrub Alliance (S3) usually occurs close to the coast in the summer fog zone and is comprised of a number of vegetation Associations defined by particular species compositions²¹, but in each case *Encelia californica* has at least 30% cover in the shrub canopy. *Encelia californica* is the principle or sole dominant species in an Association that is common on Banning Ranch. The habitat was described as follows in the EIR: “This vegetation type is dominated by bush sunflower, and it occurs as a monoculture in many of the northern patches. Other species present in lower densities include bladderpod, wreath plant (*Stephanomeria virgata*), goldenbush (*Isocoma menziesii*), California buckwheat, coastal prickly pear, and coastal cholla.” Brittle bush is a good colonizer of disturbed areas, sprouting and growing rapidly following winter rainfall. Such areas also tend to be rapidly colonized by non-native annual species, but under favorable conditions are shaded out by the brittle bush, which is a perennial species that lives 30 years or longer. Areas colonized by *Encelia californica*, especially after cessation of disturbances like periodic mowing, should be considered an early stage in the development of an important and rare vegetation community rather than denigrated as weedy and degraded. Dr. Keeler-Wolf stated that despite the “weedy” habits of its eponymous dominant, the California Brittle Bush Scrub Association has become quite rare in coastal California.²²

With the exception of small, isolated patches or patches surrounded by oil field development, we recommend that areas identified as having at least 30 percent cover

criteria within a small area may be widely distributed and relatively common. Such patches are often prevented from expanding and functioning normally due to surrounding disruptive conditions, such as development, high cover of invasive species, or periodic ground disturbance.

²¹ Within the hierarchical vegetation classification system used in California, the Alliance is defined by the dominant species. Within each Alliance, Associations are defined by secondary species. The rarity designation of Associations within an Alliance will be at least as rare at the Alliance itself. Some Associations within an Alliance may be of greater conservation concern than others. Alliances and Associations are relatively low level, local or regional classifications. A higher level, broader class is the Division, which includes, for example, grassland and Mediterranean California scrub.

²² Personal telephone communication between J. Dixon and T. Keeler-Wolf on December 6, 2015.

by California brittle bush scrub on Banning Ranch be designated as ESHA and incorporated into the HMP because they are rare and also because they are especially valuable due to the role of this vegetation type in the ecosystem of providing important habitat for the federally threatened coastal California gnatcatcher, and because they are demonstrably easily disturbed and degraded by human activities and development. The location of *Encelia californica* ESHA is shown in Figure 4. We recommend that development be set back at least 50 feet from this ESHA to prevent significant disruption of habitat values and that this habitat buffer be restored to appropriate native vegetation as part of the approved HMP. No fuel modification activities for fire safety should take place within the ESHA or ESHA buffer.

Nassella pulchra Herbaceous Alliance (purple needle grass grassland)

Native grassland is one of the most endangered habitats in California. Once covering vast areas of the Central Valley and coastal terraces, native grasslands have been largely replaced by non-native annual species. More-or-less intact examples of these communities are now largely restricted to the coastal fog belt of central and northern California and in other areas to soils, such as serpentine, that present physiological challenges to the exotics. However, stands of native grasses, often dominated by purple needle grass, persist along the coast as islands of various sizes and densities within a sea of mostly annual, Mediterranean species. Significant stands of purple needle grass grassland are considered rare and imperiled, and of high conservation value by the California Department of Fish and Wildlife and the Commission has designated the habitat ESHA in previous actions (e.g., 4-04-085 Comstock Homes, 5-03-013 Marblehead, DPT-MAJ-1-03 Dana Point Headlands). This vegetation community has been present in a mosaic of patches on the coastal terraces of Banning Ranch (Figure 5).

The applicant argues that the purple needle grass grassland on the site should not be considered ESHA because it is degraded, has low native species diversity and low cover of needle grass (c. 20%), the patches are small, and the grassland does not represent a unique wildlife habitat (NBR 2015a). In addition, the applicant's consultants have documented that several of the areas that support purple needle grass no longer meet the vegetative cover criterion (> 10 relative vegetative cover) established by the Manual of California Vegetation (Sawyer, et al. 2008) for classification as part of the rare Purple Needle Grass Grassland Alliance (Figure 6). This reduction in vegetative cover has probably occurred because the diagnostic plants have died back and been heavily grazed, apparently by rabbits, during the continuing drought that is now in its fourth year. However, the membership criterion is >10% vegetative cover relative to the total cover of vegetation present rather than absolute ground cover. Therefore, where all the vegetation has died back proportionally, the membership criterion may still be met, as was the case in many areas in 2015. The eastern-most area south of the east-west arroyo was heavily invaded by the non-native Russian thistle (*Salsola tragus*) in summer 2015.

The first issue is whether significant occurrences of this habitat constituted ESHA when first mapped in 2012 and the average relative vegetative cover of purple needle grass

was around 20 percent. To this, the clear answer is “Yes.” The criterion for inclusion in this natural community Alliance was met (> 10% relative cover of purple needle grass) and low native diversity is now characteristic of most stands of native grassland as a result of human disturbance and the invasion by European annual grasses. Purple needle grass as a species is not rare, and we conclude that very small, isolated patches, or patches closely surrounded by industrial development do not function as a unique grassland habitat. However, we mapped patches in larger clusters that aggregate to several acres as ESHA due to the rarity of such grassland communities (Figure 5).

The second issue to consider is the current condition of the habitat. In earlier draft constraints maps that we shared with the applicant and the interested public for purposes of discussion and planning, we based the purple needlegrass grassland locations on the results of 2012 mapping rather than the 2015 surveys, because we did not think that the habitat should be assessed during a drought year, since most of the individual tussocks of native grass were still present, albeit smaller due to reduced growth and to increased grazing pressure from herbivores that are themselves stressed from a drought-related reduction in available forage. In fact, many patches of native grassland still met the membership criterion for this rare habitat type and we thought that the rest of the habitat would recover with normal rainfall. The presence of Russian thistle was a function of drought and likely to be ephemeral. Contrary to predictions, the 2015-2016 El Niño event did result in sufficient rainfall to break the drought in southern California. With the continuing drought it was apparent during our March 16, 2016 site visit that the purple needlegrass had severely declined, many plants had died, and survivors were generally present only as tiny rosettes with little above-ground tissue, and very few have flowered. There is little likelihood that most of the remaining purple needlegrass plants can recover and flourish, and we now think that our assessment must be based on existing conditions. The applicant again surveyed for purple needlegrass grassland in March and April 2016 and we have used the results of those studies in our constraints analysis. In most areas, relative vegetative cover varied from less than 1% to around 5%. However, in three areas significant patches of purple needlegrass grassland (>10% relative vegetative cover of needlegrass) persist²³ (Figure 6).

Purple needle grass grassland meets the definition of ESHA in the Coastal Act because it is rare and easily disturbed by human activities. We recommend that development be set back at least 50 feet from the edge of the mapped habitat areas to prevent significant disruption of habitat values and, as part of the approved HMP, that the

²³ In each case, we averaged the cover from the sample transects to characterize the polygon. Area 1 (the farthest to the west in Figure 6) has average relative vegetative cover of 18.9%. Area 2 (the area to the northeast in Figure 6) has average relative cover of 22.9%. Area 3 adjacent to wetland “W” in Figure 6 was sampled by biologists from both Glen Lukos Associates and Dudek. Glen Lukos biologists sampled 5 transects and Dudek biologists sampled 2. Glen Lukos found that the polygon was not purple needlegrass grassland because the average relative cover of needlegrass on their transects was less than ten percent. Dudek mapped a small polygon as having greater than ten percent cover of needlegrass but recorded less than ten percent cover on their transects. However, their analysis was based on the absolute cover of needlegrass and not the relative vegetative cover. When the latter was calculated cover was greater than 20 percent on their transects. We averaged all the transect data (8.89%, 6.42%, 7.15%, 2.14%, 6.26, 20.62, 20.56). The average relative cover for the whole polygon is 10.3%, which meets the membership rule for purple needlegrass grassland.

habitat buffer be restored to appropriate native vegetation. No fuel modification activities for fire safety should take place within the ESHA or ESHA buffer.

Finally, one other factor contributed to the mapping of ESHA on the site and warrants a brief explanation. From mid-2012 to the beginning of 2015, Commission staff and the owners and operators of the site engaged in discussions regarding alleged unpermitted development at the site. At the beginning of 2015, they entered into a settlement agreement and jointly proposed consent enforcement orders to the Commission to implement the settlement. At that time the owners and operators of the site agreed not to engage in the large-scale mowing activities in the upland areas previously undertaken by the oilfield operator that resulted in impacts to native habitats. The Commission issued those orders in March of 2015. Section 3.2.D of the consent orders states that, through issuance of those orders, the Commission was “resolving contested issues regarding whether and where [illegal] development has occurred.” It goes on to explain that the Commission and NBR agreed that the Commission would treat 24.6 acres of deed-restricted areas:

as if they were 1) vegetated with native plants consistent with surrounding plant communities, and 2) limited to open space and restoration (subject to [one] contingency),²⁴ for all purposes, including analysis of project impacts for CDP application No. 5-13-032 [later replaced by the present application].

Pursuant to Section 3.1.I of the orders, the areas that were to receive such treatment were identified in an exhibit and include 18.45 acres proposed for restoration and an additional 6.15 acres of wetlands preserved as open space (i.e. deed restricted) for the purpose of resolving the Commission’s claims for civil penalties, the majority of which are on the upper mesas (Figure 7). Were these areas vegetated as indicated, they, too, would become rare vegetation communities and constitute ESHAs. Thus, consistent with the guidance provided in the consent orders, we recommend that the areas to be restored within proposed restoration polygons also be considered ESHAs and incorporated into the approved HMP, and that development be set back 50 feet from rare vegetation or 100 feet from wetlands or gnatcatcher habitat to prevent significant disruption of habitat values and that the habitat buffer be restored to appropriate native vegetation. No fuel modification activities for fire safety should take place within the ESHA or ESHA buffer.

Raptor foraging habitat

As noted by the applicant (NBR 2015a) and the Banning Ranch Conservancy (Hamilton 2015) both native and non-native grasslands provide important foraging opportunities for raptors. For many years, there was no attempt to protect non-native grasslands and ruderal areas in coastal California because of their exotic status. However, more recently wildlife biologists have realized that most of the remaining raptor foraging habitat along the southern California coast was largely comprised of non-native species and, being unprotected, was rapidly being developed. As a result, the California Department of Fish and Wildlife (CDFW) began recommending in their CEQA analyses

²⁴ The one contingency referenced in section 3.2.D addresses alternative restoration requirements in the event that the Commission allows development in any of these protected areas

and Natural Community Conservation Planning that losses of such raptor foraging habitat be mitigated at a ratio of 0.5:1.0 (e.g., Tippet 2000).

Commission technical staff has also been concerned with this issue. There is certainly a rationale for identifying raptor foraging habitats as Environmentally Sensitive Habitat Areas because raptors will only occupy sections of the coast where such habitats are present and the amount of foraging habitat appears to be a limiting factor for both breeding success and the size and health of wintering populations. Therefore, foraging habitats are especially valuable due to their role in the ecosystem of supporting raptors, including sensitive species such as burrowing owls and white-tailed kites. However, Environmentally Sensitive Habitat refers to a particular "area," and defining such an area is difficult because potential areas could include hundreds of acres of annual grasses and ruderal vegetation. Even when there are data indicating the presence of foraging raptors, there is generally not sufficient information to identify those particular areas of habitat that are especially important. Therefore, in order to maintain critical foraging habitat for raptors staff has recommended and the Commission has implemented the policy adopted by CDFW (e.g., Hellman Properties 5-97-367-A1). Therefore, we recommend that at Banning Ranch in order to protect foraging habitat for burrowing owls and other raptors all grassland and ruderal areas that are appropriate for raptor foraging and that are lost to development be mitigated on the upper mesas at the ratio of 0.5 acres of preserved foraging habitat for every 1.0 acre of lost foraging habitat and that these areas be included in the approved HMP. The approximate extent of grassland foraging habitat at Banning Ranch is shown in Figure 8. Such mitigation has independently been proposed in the applicant's Habitat Conservation and Conceptual Mitigation Plan (Dudek 2013b).

Rare Animal Species

San Diego Fairy Shrimp (Brachinecta sandiegonensis)

The federally endangered San Diego fairy shrimp is a small aquatic crustacean in the order Anostraca that is restricted to vernal pools in coastal southern California and northwestern Baja California, Mexico (USFWS 1997). San Diego fairy shrimp are usually found in small, shallow vernal pools that range in depth from approximately 2 to 12 inches (Hathaway and Simovich 1996). Their lifecycle includes an embryonic egg stage in the form of cysts that have reduced metabolic activity and are resistant to harsh drying conditions. The embryonic cysts persist as a cyst bank consisting of different generations. The lifespan of adult San Diego fairy shrimp is approximately 30 days with adults reaching sexual maturity within 7 to 20 days (Ripley et al. 2004). Adult San Diego fairy shrimp are typically found from January to March; however, during years with extended rainfall they may occur earlier and later. While each generation of adults lives for approximately one month, San Diego fairy shrimp exhibit staggered hatching such that adults may be present throughout an entire wet season.

Complete US Fish and Wildlife Service vernal pool protocol level surveys for determining the presence or absence of San Diego fairy shrimp consist of either two full

wet season surveys done within a five year period, or two consecutive seasons of one full wet season survey and one dry season survey in any order. The protocol level procedures for both wet and dry season surveys are biologically and technically rigorous as well as time-consuming. For instance, during the wet season, pools must be sampled once every two weeks, beginning no later than two weeks after initial inundation and continuing until pools are no longer inundated or until 120 days of continuous inundation have elapsed. Detailed requirements for vernal pool protocol level surveys are provided in USFWS (2015).

San Diego Fairy Shrimp have been identified in 8 pools (VP1, VP2, VP3, E, G, H, I, J) on Newport Banning Ranch. The applicant has asserted that they have completed the requirements for vernal pool protocol level surveys (Dudek and Glenn Lukos Associates 2013). However, Christine Medak, US Fish and Wildlife Service biologist stated in an April 8, 2013 email response to that report that, "Based on our review of the information provided, we recommend one more protocol wet season survey (USFWS 1996) during a year of at least average rainfall year [sic] is conducted in all pools that pond sufficiently (i.e. 3 cm) to be sampled, with the exception of the pools occupied by *Branchinecta sandiegonensis* (i.e. 1,2,3,E, G, H, I, J)". When we examined the record, it appeared that many ponds were not sampled through the entire wet season, data sheets for ponds determined to have no fairy shrimp were missing, and most data sheets for ponds that were sampled had missing data, making it impossible to verify that the surveys were conducted in accordance with survey protocol. Therefore, while eight ponds have been determined to support San Diego fairy shrimp, the presence or absence of San Diego fairy shrimp in the other ponds remains inconclusive and an additional wet season vernal pool protocol level survey may be required by the Service.

Should an additional survey or other actions be required by the U.S. Fish and Wildlife Service pursuant to the federal Endangered Species Act, we recommend that the Service's requirements be completed prior to issuance of a Coastal Development Permit and that additional restrictions, as necessary or appropriate to protect the San Diego fairy shrimp, be observed and incorporated into the approved HMP.

To maintain the viability of this endangered species, we recommend that vernal pools be created in several areas and be incorporated into the approved HMP to provide habitat for the San Diego fairy shrimp, and that destruction of vernal pools containing San Diego fairy shrimp due to remediation be mitigated at a 10:1 (area created or restored:area impacted) by restoring the vernal pools in place and creating vernal pools nearby or in other areas approved by the U.S. Fish and Wildlife Service.

Coastal California Gnatcatcher (Polioptila californica)

The coastal California gnatcatcher is an obligate and permanent, non-migratory resident of coastal sage scrub (CSS) in southern California and northern Baja California (Atwood 1993, USFWS 1993). It was listed as threatened under the Endangered Species Act in 1993 as a result of the extirpation or severe decline of populations throughout its original range due to habitat loss from agricultural and urban development (USFWS 1993). The gnatcatcher preys upon invertebrates, especially insects and other

arthropods, by “gleaning” or plucking them from the foliage of native and non-native plants within or adjacent to their primary habitat. Although not dependent on any particular shrub species, their preferred habitat, especially during the breeding season is coastal sage scrub with at least 50 percent shrub cover about 1 m in height that is dominated by California sagebrush (*Artemisia californica*), California brittle bush (*Encelia californica*), California buckwheat (*Eriogonum fasciculatum*), or a combination of these species (Atwood 1993, Atwood and Bontrager 2001, Breyer and Wirtz 1997, Weaver 1998). Although territories are maintained throughout the year, they are most strongly defended during the breeding and nesting season from February through July (Atwood 1993, Preston et al. 1998). Extra-territorial wandering is common outside the nesting season and foraging in non-CSS habitats, such as mulefat scrub and riparian scrub, is most frequent during that time (Campbell 1998, USFWS 2003). Dispersing juveniles generally settle less than half a mile from their natal territory (USFWS 2003, Gavin 1998).

In past actions, the Commission has designated relatively undisturbed coastal sage scrub that is appropriate habitat for California gnatcatchers as ESHA, regardless of whether gnatcatchers were documented on any particular parcel or area that was the subject of the Commission’s action (e.g., LCPA 3-03B, Crescent Heights). Only through the protection of appropriate habitat can the rare species that periodically depend upon it be protected. In such cases, the ESHA is coincident with the extent of the appropriate habitat and is easily mapped.

Determining the boundaries of gnatcatcher ESHA is more difficult where the habitat is highly degraded and fragmented. This was the case in San Clemente at the site proposed for the Marblehead development. The mesa top was routinely disked and adjacent slopes and canyons that supported remnant stands of coastal sage scrub had been invaded by non-native species such as black mustard. Most of the coastal sage scrub was so degraded that it did not rise to the level of ESHA itself and could not be assumed to be used by the gnatcatchers. However, one to three pairs of nesting gnatcatchers were periodically present and their locations were mapped during the winter or spring of seven years between 1990 and 2001. On two occasions actual use areas were estimated. Although the field methods differed from year to year, the Commission found that the estimated use areas during the nesting season based on the cumulative locations of gnatcatcher sightings, which included both remnant scrub habitats and ruderal vegetation²⁵, were ESHA. At Marblehead, 100-foot development setbacks planted with appropriate native vegetation were required, except in a few special circumstances where a 50-foot setback was allowed in view of the extensive habitat restoration that was proposed for all the slopes and canyons (CDP 5-03-013 Marblehead).

The situation at Banning Ranch is intermediate between the two previous examples. The coastal sage scrub, although degraded in many areas, in all cases considered meets both the membership rules for the California Brittle Bush Scrub Alliance or other rare scrub type, and the definition of ESHA under the Coastal Act. However, the habitat

²⁵ These degraded slopes and canyons at Marblehead have been restored to high quality coastal sage scrub as a condition of development and in 2015 supported 15 pairs of gnatcatchers that fledged 14 broods during the breeding season. A brood is generally made up of 3 to 4 chicks.

is fragmented by roads and other oil field development and not all areas of sage scrub have documented use by gnatcatchers. Nevertheless, from 1992 through 2015, the vegetation on the site has supported an estimated 7 to 29 breeding pairs of gnatcatchers, with an average of 17 pairs (Engel 2015). Although the actual number of breeding pairs may differ from the estimates for a variety of reasons (NBR 2015b), this is immaterial to our ESHA determination.

We have mapped gnatcatcher ESHA following a protocol intermediate between that used for large expanses of undisturbed gnatcatcher habitat in the San Diego area and that used by the Commission for the highly degraded area at Marblehead. Banning Ranch differs significantly from Marblehead in that the native vegetation communities that are present are in relatively good shape compared to the Marblehead habitats even though interspersed with areas degraded by oil field activities. In addition, areas where mowing previously took place are rapidly recovering and becoming dominated by California brittle bush scrub. As at Marblehead, we initially identified gnatcatcher habitat as the cumulative use areas during the nesting season mapped by the applicant (Engel 2015), which were based on documented gnatcatcher territories and sightings (Figure 9). The applicant has noted that the survey methods and intensity have varied over the years, as have the estimated locations of gnatcatcher use (NBR 2015b). This was also the case at Marblehead. The mapped use areas in both cases are the best estimates that fit the existing data. At Banning Ranch, as is typical, the actual areas used by gnatcatchers varied from year to year. We agree with the applicant that there are insufficient data to definitively ascribe the observed shifts in use to any particular cause, including habitat alterations from human activities. We do not agree that it is inappropriate to use all the available data simply because it includes multiple generations of gnatcatchers living under differing habitat conditions. In fact, we consider that the benefit of using all the data, and note that nearly all the observations are clustered within currently existing habitat. We recognize that the level of effort devoted to identifying gnatcatcher use areas has varied over the years and that it is difficult to determine the actual number of individuals present without intensive studies. However, for our purposes, the area of use is more important than the number of birds present. We feel strongly that all the available data should be used to identify that cumulative use area. We believe that restricting gnatcatcher ESHA to only those use areas mapped during recent drought years or years with optimal surveying effort would be a prescription for local extinctions of this species.

The polygons shown in Engel (2015) and in Figure 9 include open space, oil field infrastructure, and disturbed areas. In addition, the vegetation has shifted over the years, which could result in a shift of gnatcatcher use. Therefore, we clipped the gnatcatcher use areas to the coastal scrub habitats²⁶ within the use boundaries in order to exclude debris stockpiles, roads, other unvegetated areas, and discrete areas of non-native vegetation, such as iceplant²⁷ (Figures 10-12). Exceptions are unvegetated areas and areas of non-native habitat that are surrounded by native habitat. Finally,

²⁶ In some areas, other native habitats, such as mulefat, are included within the boundaries of the coastal scrub.

²⁷ Engel (2015) explicitly excluded such areas from gnatcatcher habitat in her text, but they were included within the use areas shown on the maps to facilitate production. They have now been removed from the maps also, as recommended by the applicant (NBR 2015b).

following a protocol similar to that which the Commission has applied in less disturbed areas, we identified as occupied coastal California gnatcatcher habitat all appropriate native habitat within and contiguous to the cumulative use areas documented during breeding season surveys (Figures 13-15). This differs from the protocol applied in more pristine areas where all appropriate habitat is considered occupied, regardless of whether gnatcatchers have been documented to be present in any particular location. Nearly all the historical gnatcatcher observations fall within the defined occupied habitat. Observations outside of the current occupied habitat are shown in Figures 13-15. The historical observations that now occur outside of appropriate gnatcatcher nesting and foraging habitat probably reflect a change in site-specific habitat conditions and have not been used to identify occupied gnatcatcher habitat except for one case in the most northern area. There the observation of a gnatcatcher individual was mapped as occurring outside but close to appropriate coastal sage scrub and that habitat was included as occupied gnatcatcher habitat.

Those areas of vegetation that are occupied by the coastal California gnatcatcher meet the definition of ESHA because they are especially valuable due to their role in the ecosystem of providing habitat that supports a rare species and they are easily disturbed or degraded by human activities and developments (Figures 13-15). In a few areas, ESHA takes the form of several linear patches because the habitat areas used by the gnatcatchers are divided by roads or other bare space. The small gaps created by these roads and bare spaces do not affect foraging by gnatcatchers and it is important that these linear patches of habitat be recognized as occupied gnatcatcher habitat and be protected.

Scattered areas of non-native species (e.g., black mustard) and common native species (e.g., quailbush or upland patches of mulefat) that are not recommended for protection are known to be used periodically for foraging, especially during the non-breeding season when territory defense is lax and adults commonly forage outside their usual territories. For example, gnatcatchers have been observed in quail bush (*Atriplex lentiformis*) along the Pacific Coast Highway on the adjacent property and no doubt forage in these habitats on Banning Ranch too (Hamilton 2015). Extra-territorial foraging is probably also more common during periods of drought-induced stress when prey are less common. Christine Medak of the U.S. Fish and Wildlife Service thinks that over time gnatcatchers utilize most of the upland areas of Banning Ranch and forage in most native and non-native shrubby vegetation (personal communication April 20, 2016). The most conservative approach would be to protect all the upland vegetation. However, in such a disturbed location, we believe that the only strong and defensible basis for identifying particular areas as important gnatcatcher habitat and ESHA is the testimony of the birds themselves over time. Given that the actual area used throughout the year by these rare birds is undoubtedly larger by some unknown amount, it is critical for the continued maintenance of a significant gnatcatcher population at Banning Ranch that the identified areas be conserved, restored where appropriate, and buffered from the impacts of development as part of the approved HMP. We recommend that the gnatcatcher ESHA be given 100-foot habitat buffers or development setbacks, and that these areas be restored to appropriate native vegetation. In addition, degraded scrub habitats outside the development footprint should be restored to high quality coastal sage scrub appropriate for gnatcatcher use as

partial mitigation for the inevitable environmental impacts of development, such as predation by domestic cats. No fuel modification activities for fire safety should take place within ESHA or ESHA buffers.

Habitat Management Plan

Banning Ranch and the surrounding area is unique and ecologically valuable as one of the only reasonably intact wetland-bluff ecosystems, including river mouth and estuary habitat, lowlands with wetlands, uplands with coastal scrub and riparian habitat, and grasslands with vernal pools, remaining along the coast of southern California. There are no comparable areas to the south and only a few such areas north including Bolsa Chica, six miles up the coast. As detailed above, Banning Ranch supports a number of wetlands and rare habitats and species that rise to the level of ESHA. A Habitat Management Plan should be developed, in consultation with the USFWS and CDFW, to ensure that the existing wetlands and ESHA are protected, preserved, and enhanced and to restore and mitigate wetlands and ESHA impacted by the project activities. The approved Habitat Management Plan will serve as the umbrella guidance document for the protection, enhancement, restoration, and mitigation of wetlands, ESHA, and open space outside the approved developable areas required by the Coastal Development Permit (CDP) and will be designed to complement the restoration required, independent of the CDP, pursuant to the settlement agreement between the applicant and the Commission (CCC-15-CD-01 & CCC-15-RO-01, dated May 12, 2015).

Combined Biological Constraints Analysis

The results of our analysis and the location of areas identified as wetlands and environmentally sensitive habitats as defined in Sections 30121 and 30107.5 of the Coastal Act and Section 13577 of the Commission's regulations Act are shown in Figures 16, 17, and 18 for the northern, central, and southern portions of Banning Ranch, respectively. Only the area of ground disturbance associated with the proposed development was subjected to a site-specific analysis in the field, although habitat types and wetlands that occur outside the disturbance footprint are also depicted on the maps. ESHA boundaries outside the disturbance area that is associated with proposed residential and commercial development have not been checked and verified in the field. The recommended development setbacks of 50 feet for sensitive vegetation (including proposed restoration areas) and 100 feet for wetlands and gnatcatcher habitat are shown, but clipped and joined wherever two of the buffers meet in order to form a single continuous setback line. If fuel modification zones are required by the local fire authority, additional setbacks or other protective measures may be required to prevent intrusion into ESHA and ESHA buffers.

Figure 1. Wetlands, San Diego fairy shrimp ponds, and non-wetland periodically inundated areas.



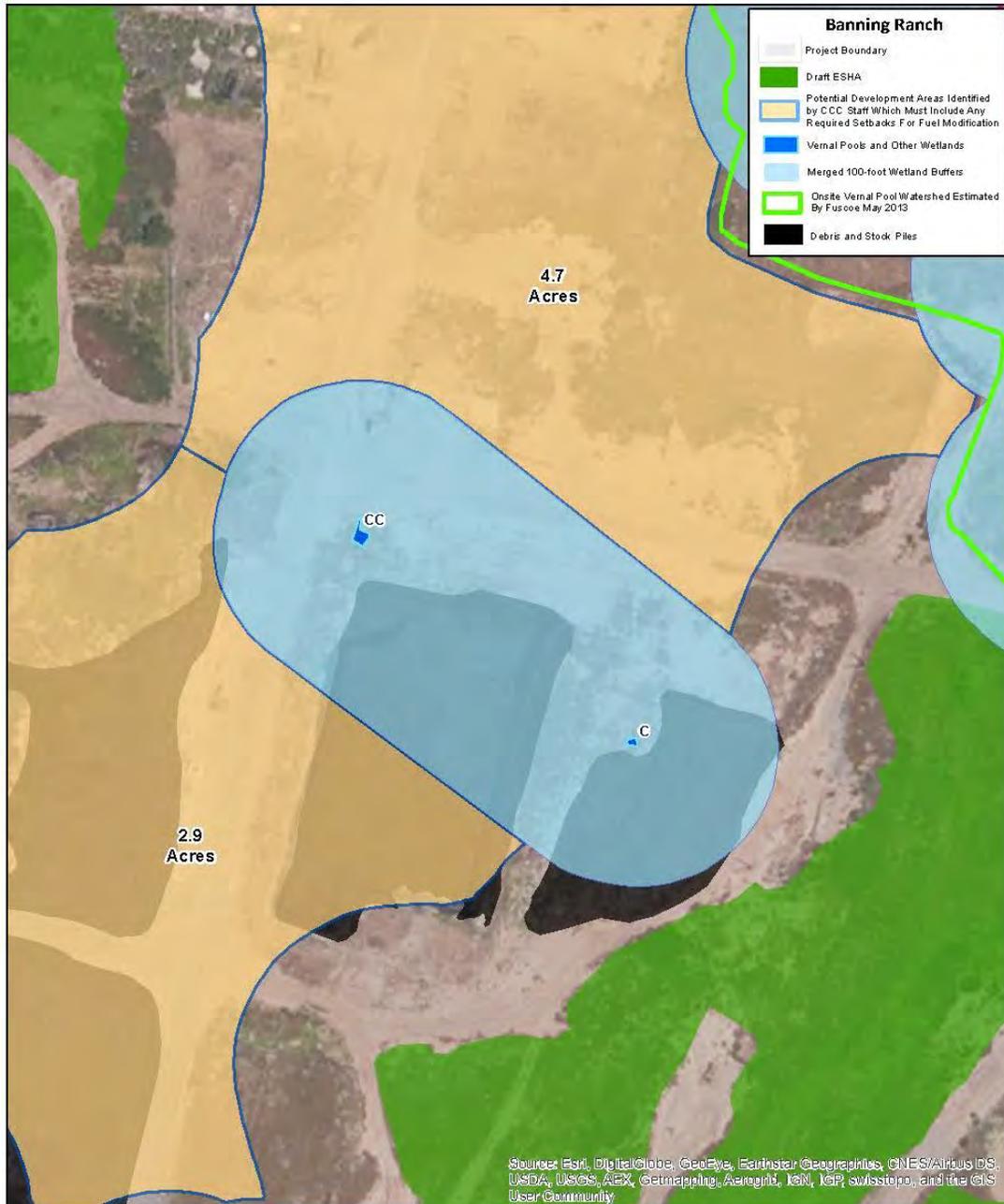
Wetlands and Non-Wetland Periodically Pondered Areas at Banning Ranch



For Illustrative Purposes Only. Source: Dudek, CCC.

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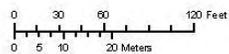
Figure 2. Wetlands C and CC with merged 100-foot buffers.



Wetlands CC and C With Combined Buffer - Banning Ranch



Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, CCC.



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Figure 3. Mima mounds near Corona del Mar and at Banning Ranch apparent in aerial photographs taken prior to urban and industrial development.

A. Area near Corona del Mar in 1952 (from Riefner et al. 2007, Figure 1)



B. Banning Ranch in 1938

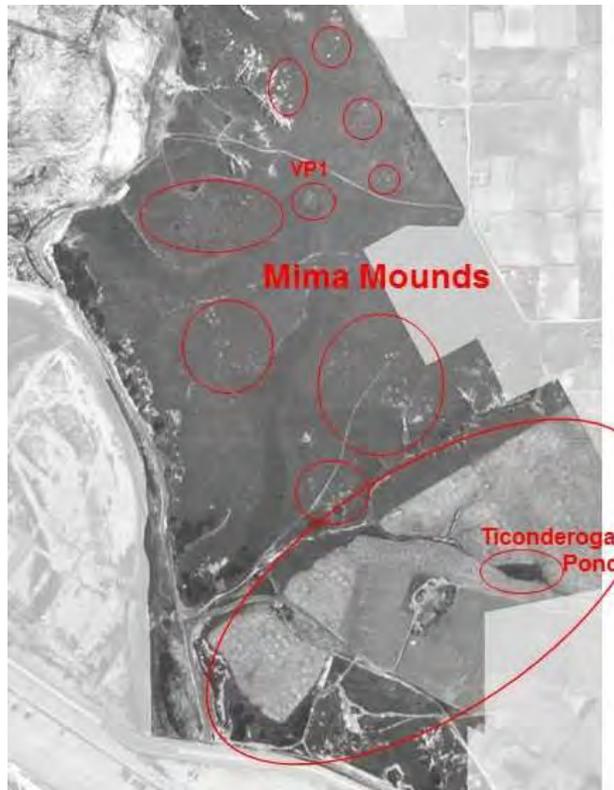


Figure 4. Brittle bush scrub recommended for designation as Environmentally Sensitive Habitat Areas.



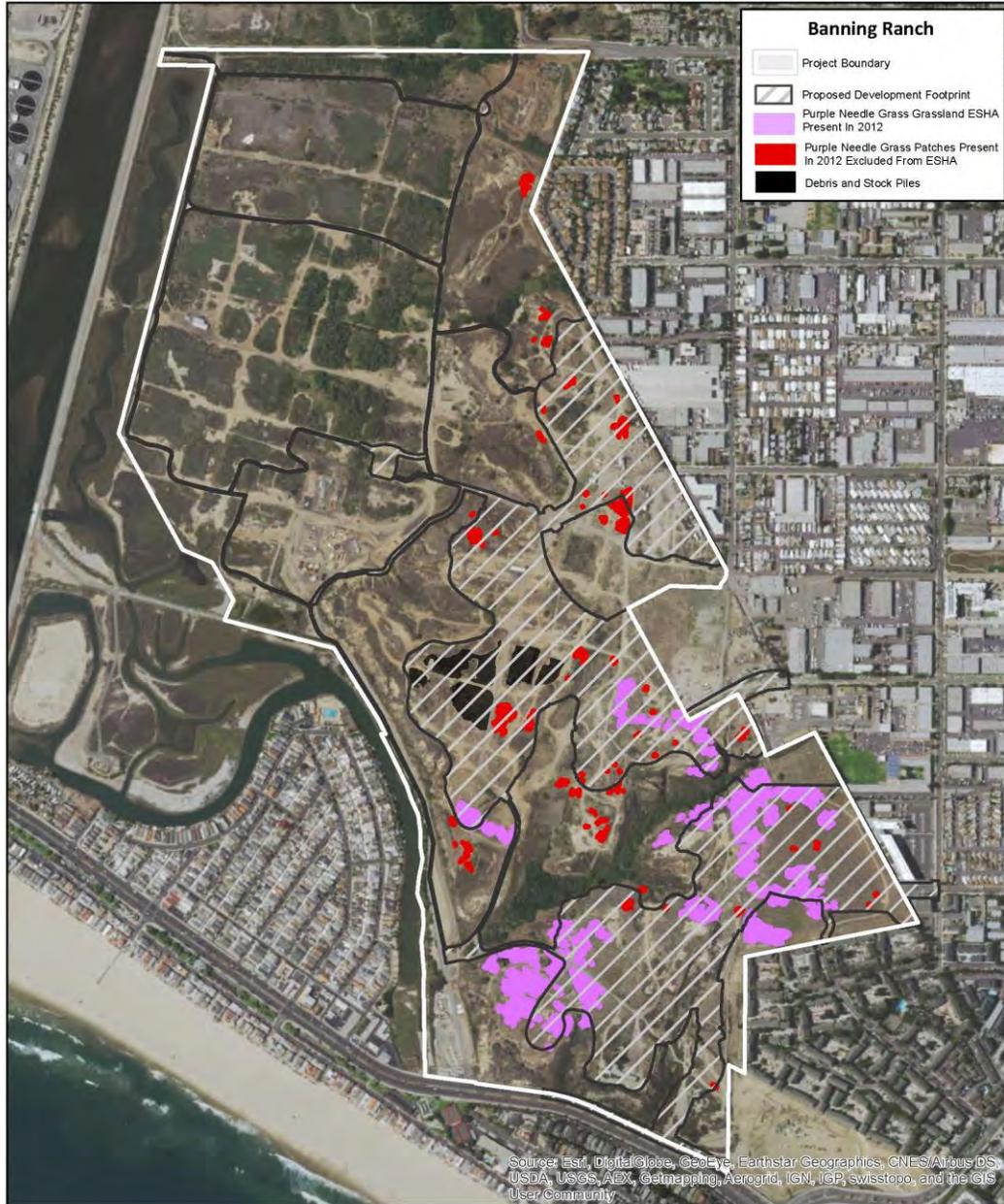
California Brittle Brush Scrub, Coastal Bluff Scrub and Maritime Succulent Scrub On Banning Ranch



For Illustrative Purposes Only. Source: Brooks-Street, Dudek, ESRI, CCC.

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Figure 5. Purple needle grass grassland present in 2012 and recommended for designation as Environmentally Sensitive Habitat Areas in 2015.



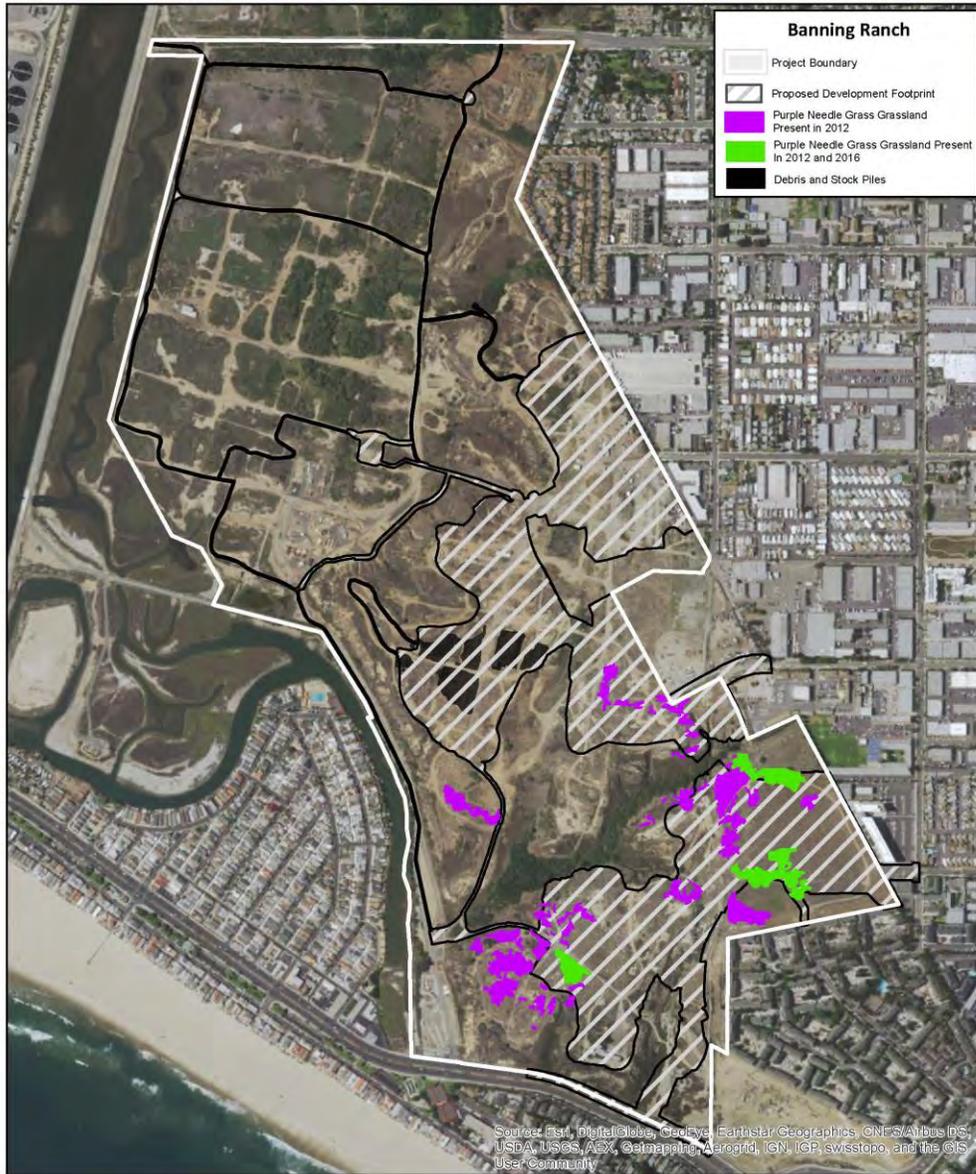
Purple Needle Grass Grassland On Banning Ranch



For Illustrative Purposes Only. Source: Brooks-Street, Dudek, ESRI, CCC.

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Figure 6. Patches of purple needlegrass grassland present in both 2012 and 2016, and patches that were present in 2012 but “absent” ($\leq 10\%$ relative vegetative cover) in 2016. A few patches outside the proposed development area shown as present in 2012 were not surveyed in 2016 and may still be present with greater than 10% relative vegetative cover but would not create a constraint on development because of their location.



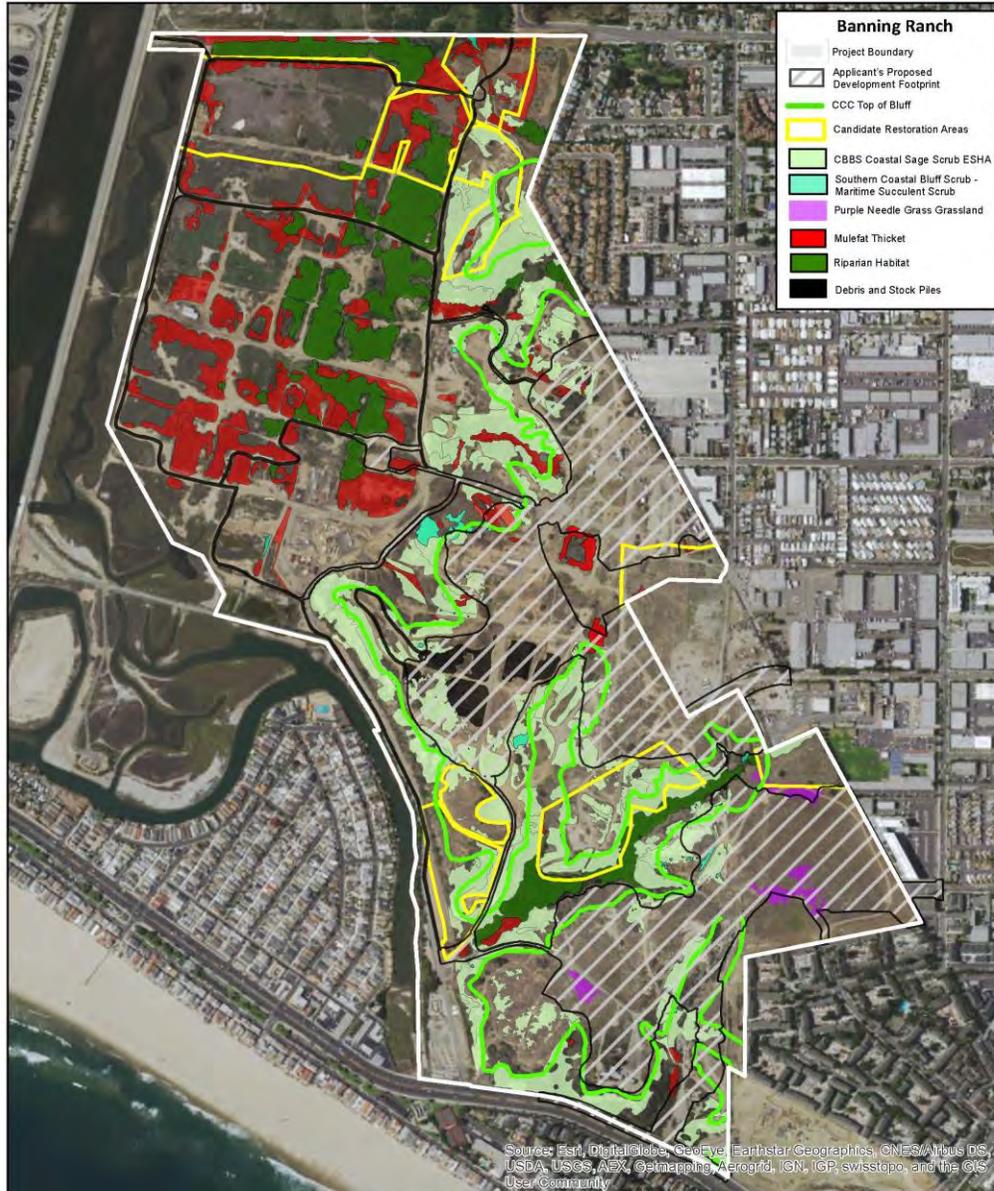
Purple Needle Grass Grassland On Banning Ranch



For Illustrative Purposes Only. Source: Brooks-Street, Dudek, ESRI, CCC.

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Figure 7. Candidate restoration areas (outlined in yellow) identified in the context of consent enforcement orders regarding alleged unpermitted development on Banning Ranch.



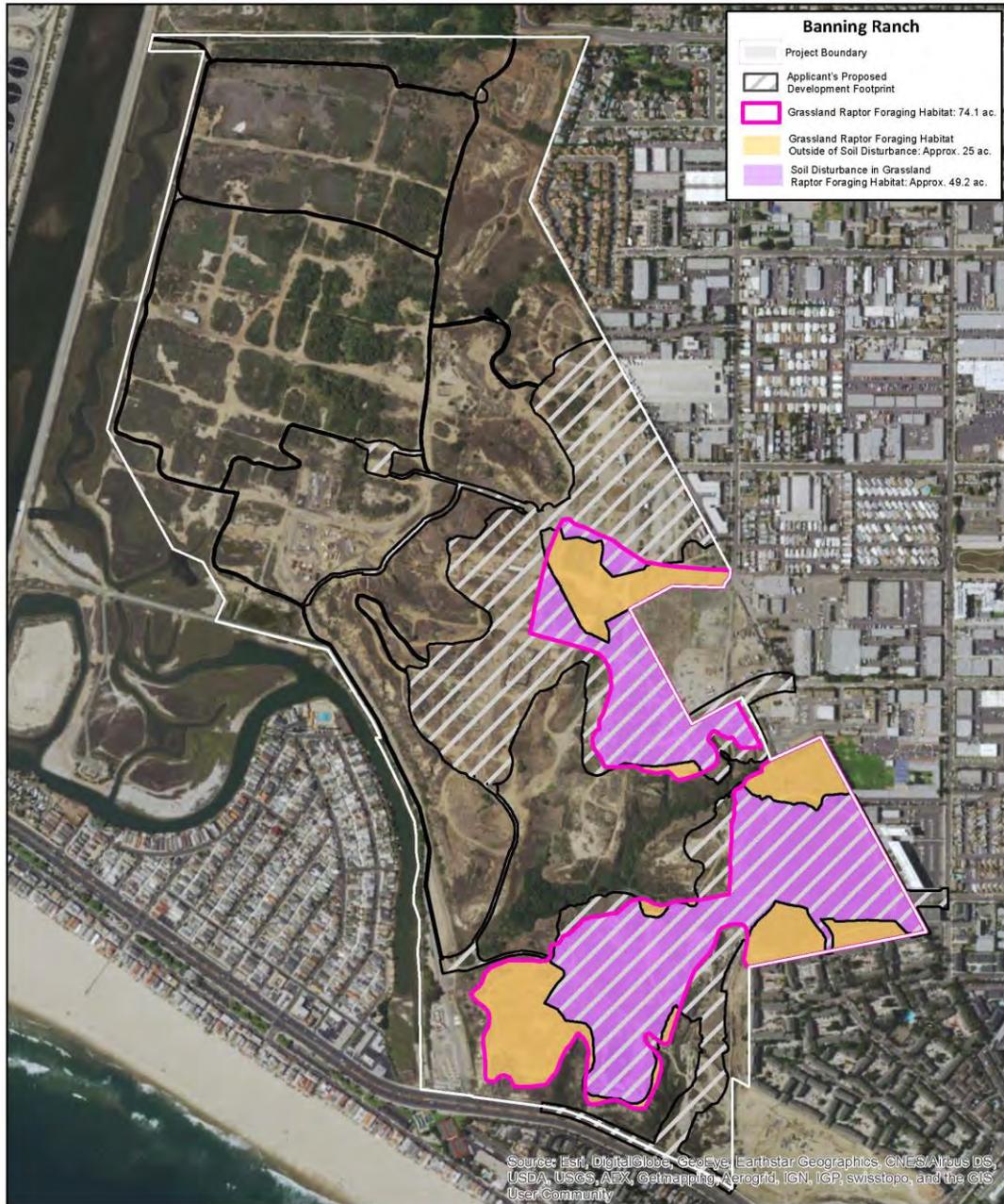
Sensitive Vegetation, CCC Top of Bluff and Candidate Restoration Areas On Banning Ranch



For Illustrative Purposes Only. Source: Brooks-Street, Dudek, ESRI, CCC.

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Figure 8. Approximate location of existing grassland raptor foraging habitat at Banning Ranch relative to the proposed area of development.



Grassland Raptor Foraging Habitat On Banning Ranch



For Illustrative Purposes Only. Source: Brooks-Street, Dudek, ESRI, CCC.

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Figure 9. Unadjusted cumulative gnatcatcher use areas 1992-2015. Although never considered part of the gnatcatcher ESHA (Engel 2015), unvegetated areas, such as roads and other disturbed oil field areas, and areas dominated by invasive species, such as iceplant, are included within the mapped polygons.



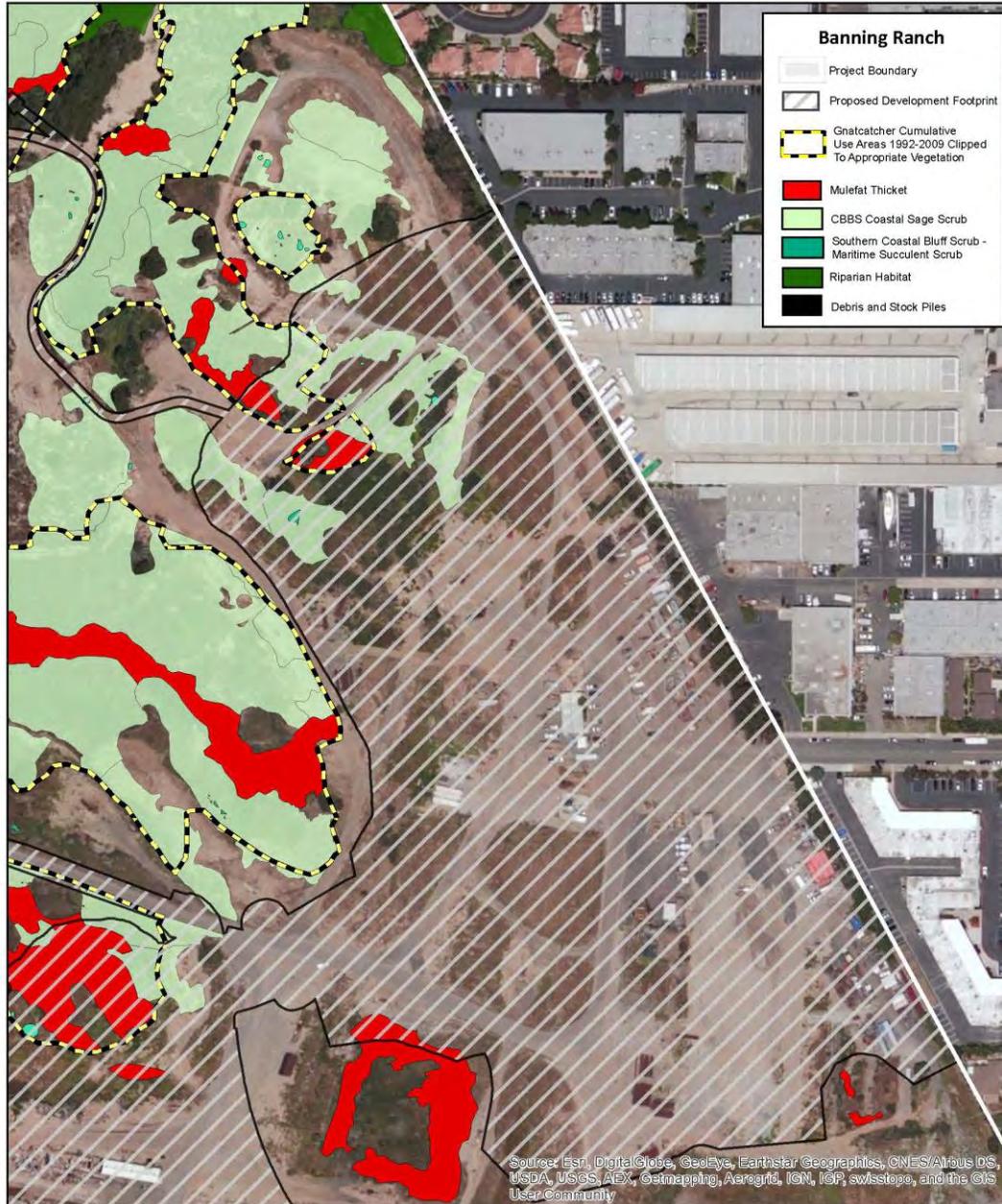
Coastal California Gnatcatcher Cumulative Use Areas on Banning Ranch Based on Observed Breeding Territories from 1992 to 2015. In Some Areas Mapped Cumulative Use Areas Overlap Existing Oil Field Development Such As Roads and Well Pads.



For Illustrative Purposes Only. Source: LSA, PCR, BonTerra, Dudek, ESRI.

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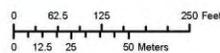
Figure 10. Gnatcatcher cumulative use areas in the northern portion of Banning Ranch clipped to currently existing native vegetation.



Gnatcatcher Cumulative Use Areas in the Northern Area of Banning Ranch

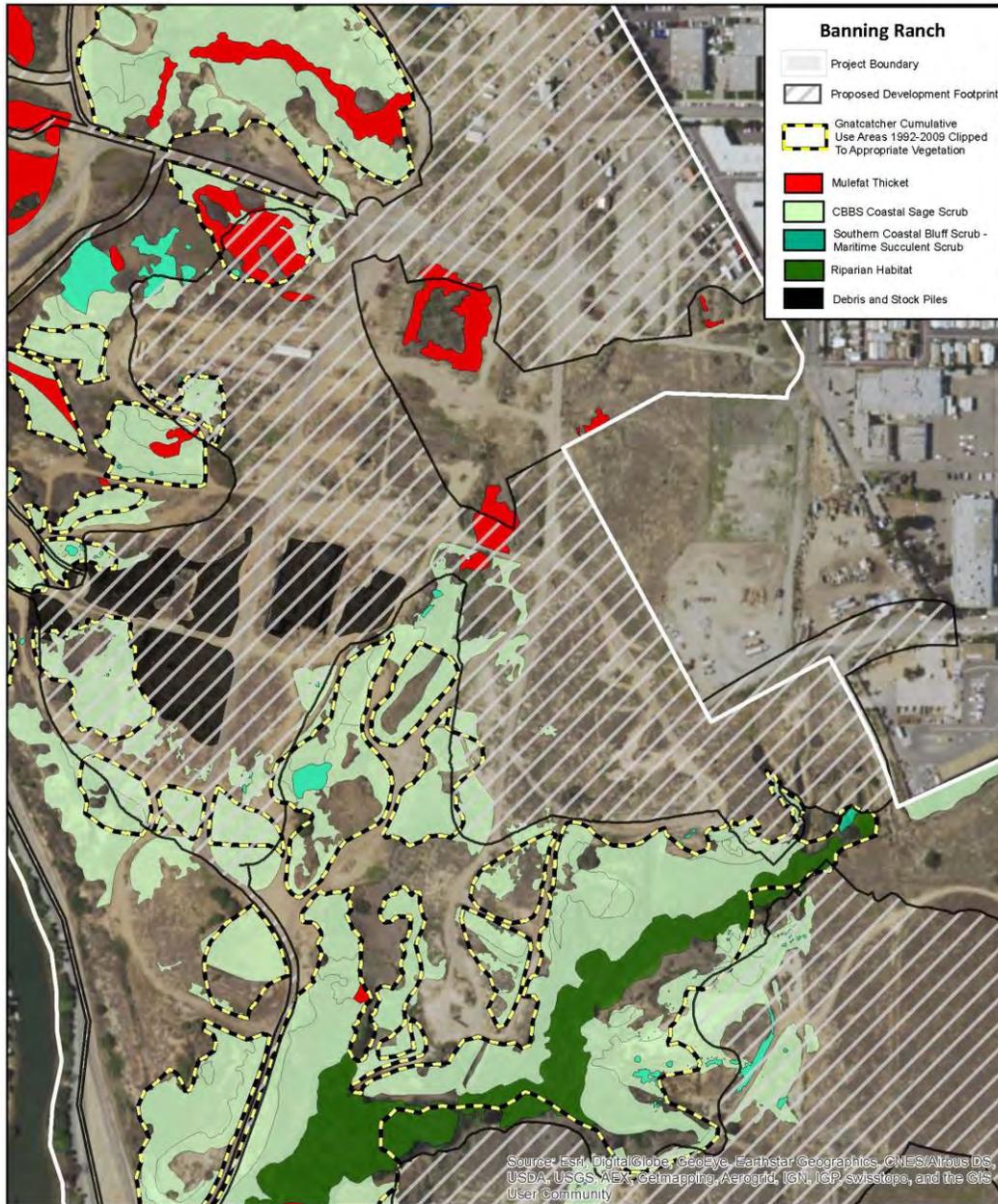


For Illustrative Purposes Only.
Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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Figure 11. Gnatcatcher cumulative use areas in the central portion of Banning Ranch clipped to currently existing native vegetation.

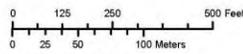


Gnatcatcher Cumulative Use Areas in the Central Area of Banning Ranch



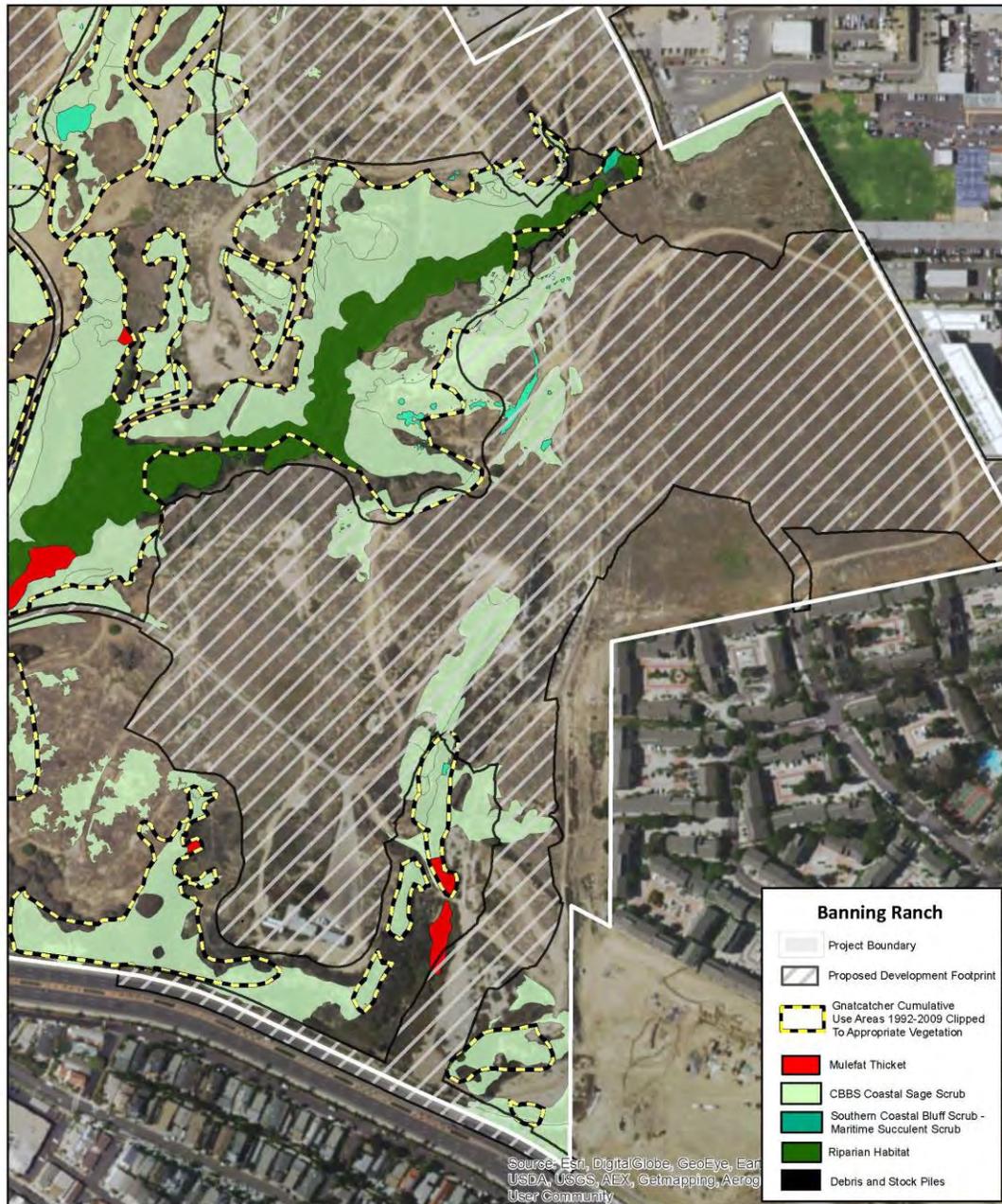
For Illustrative Purposes Only.

Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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Figure 12. Gnatcatcher cumulative use areas in the southern portion of Banning Ranch clipped to currently existing native vegetation.

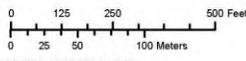


Gnatcatcher Cumulative Use Areas in the Southern Area of Banning Ranch



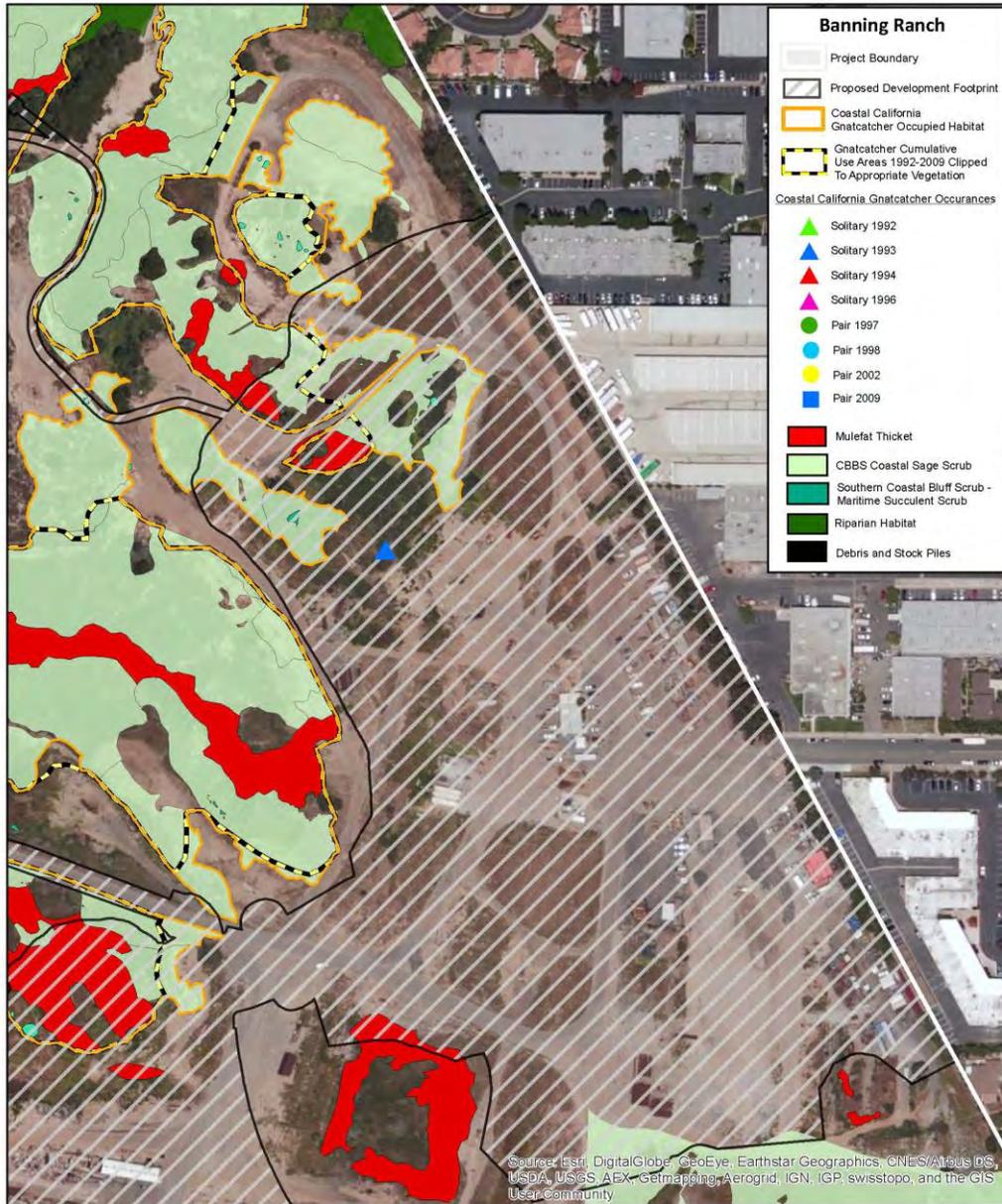
For Illustrative Purposes Only.

Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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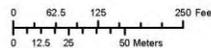
Figure 13. Occupied coastal California gnatcatcher habitat in the northern portion of Banning Ranch. Occupied habitat (orange polygons) includes appropriate native gnatcatcher habitat that is adjacent to documented cumulative use areas (dashed polygons). Historical gnatcatcher observations outside of the currently occupied habitat are also shown (see text).



Occupied Gnatcatcher Habitat in the Northern Area of Banning Ranch

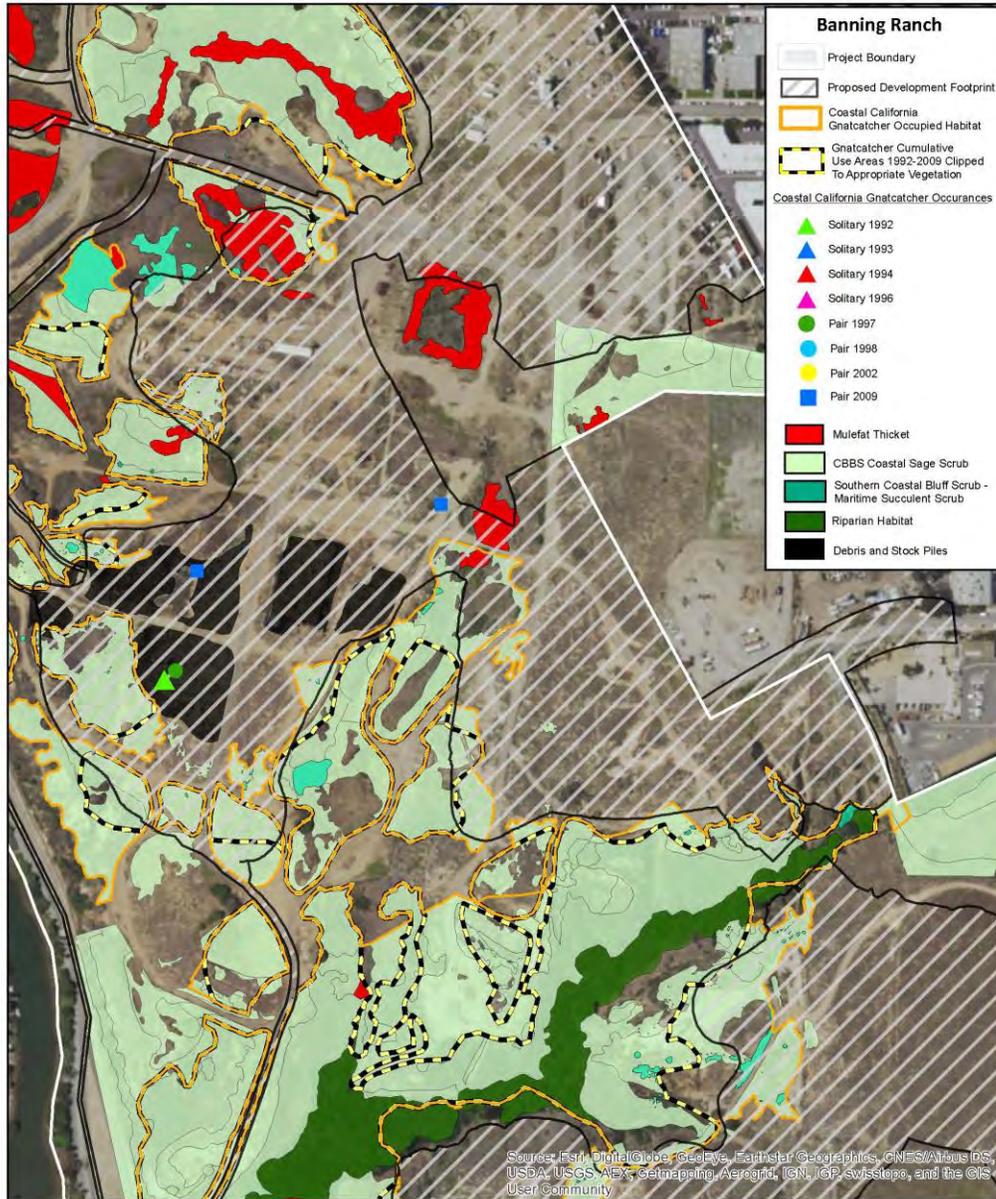


For Illustrative Purposes Only.
Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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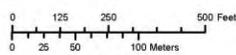
Figure 14. Occupied coastal California gnatcatcher habitat in the central portion of Banning Ranch. Occupied habitat (orange polygons) includes appropriate native gnatcatcher habitat that is adjacent to documented cumulative use areas (dashed polygons). Historical gnatcatcher observations outside of the currently occupied habitat are also shown (see text).



Occupied Gnatcatcher Habitat in the Central Area of Banning Ranch

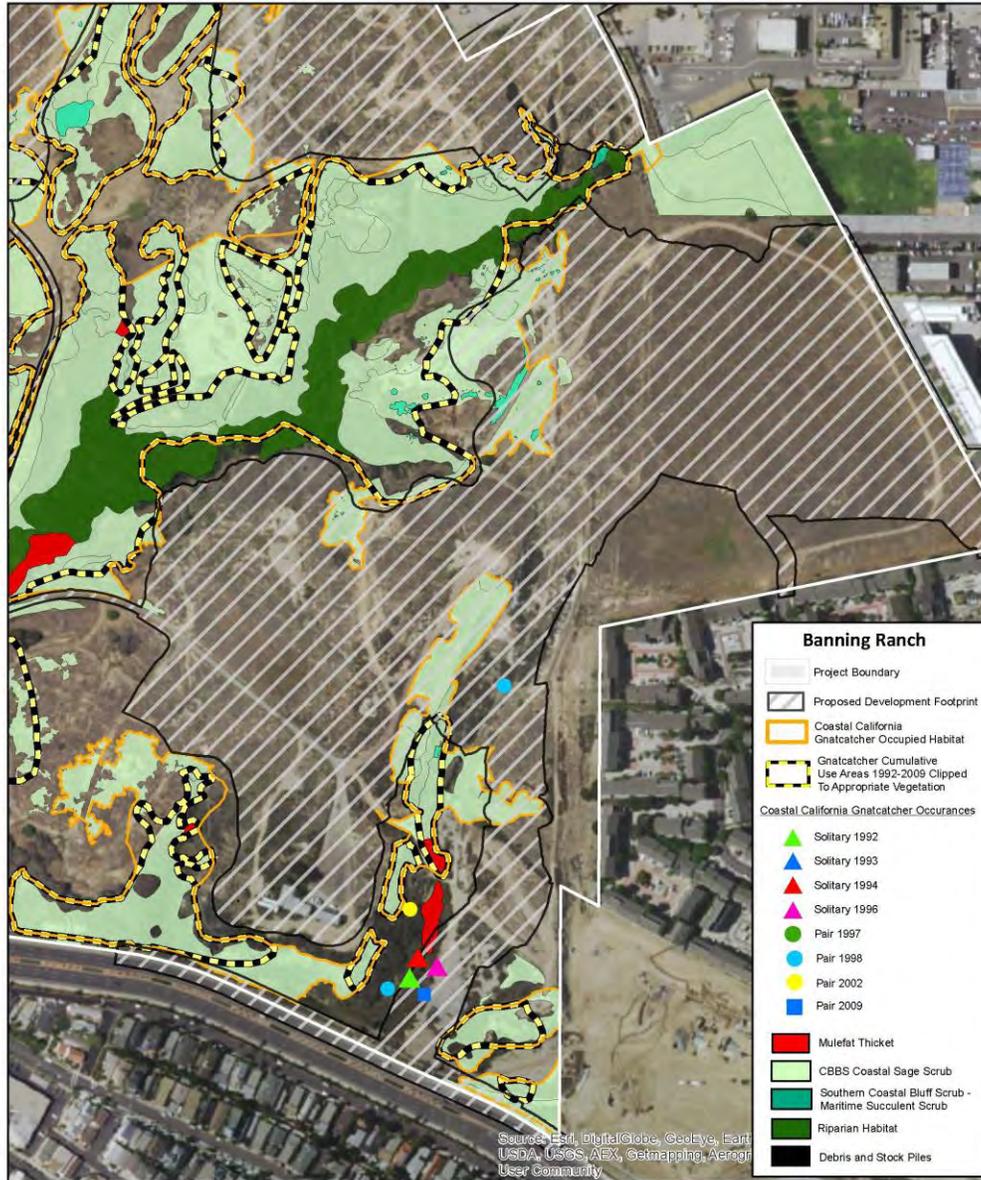


For Illustrative Purposes Only.
Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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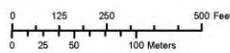
Figure 15. Occupied coastal California gnatcatcher habitat in the southern portion of Banning Ranch. Occupied habitat (orange polygons) includes appropriate native gnatcatcher habitat that is adjacent to documented cumulative use areas (dashed polygons). Historical gnatcatcher observations outside of the currently occupied habitat are also shown (see text).



Occupied Gnatcatcher Habitat in the Southern Area of Banning Ranch

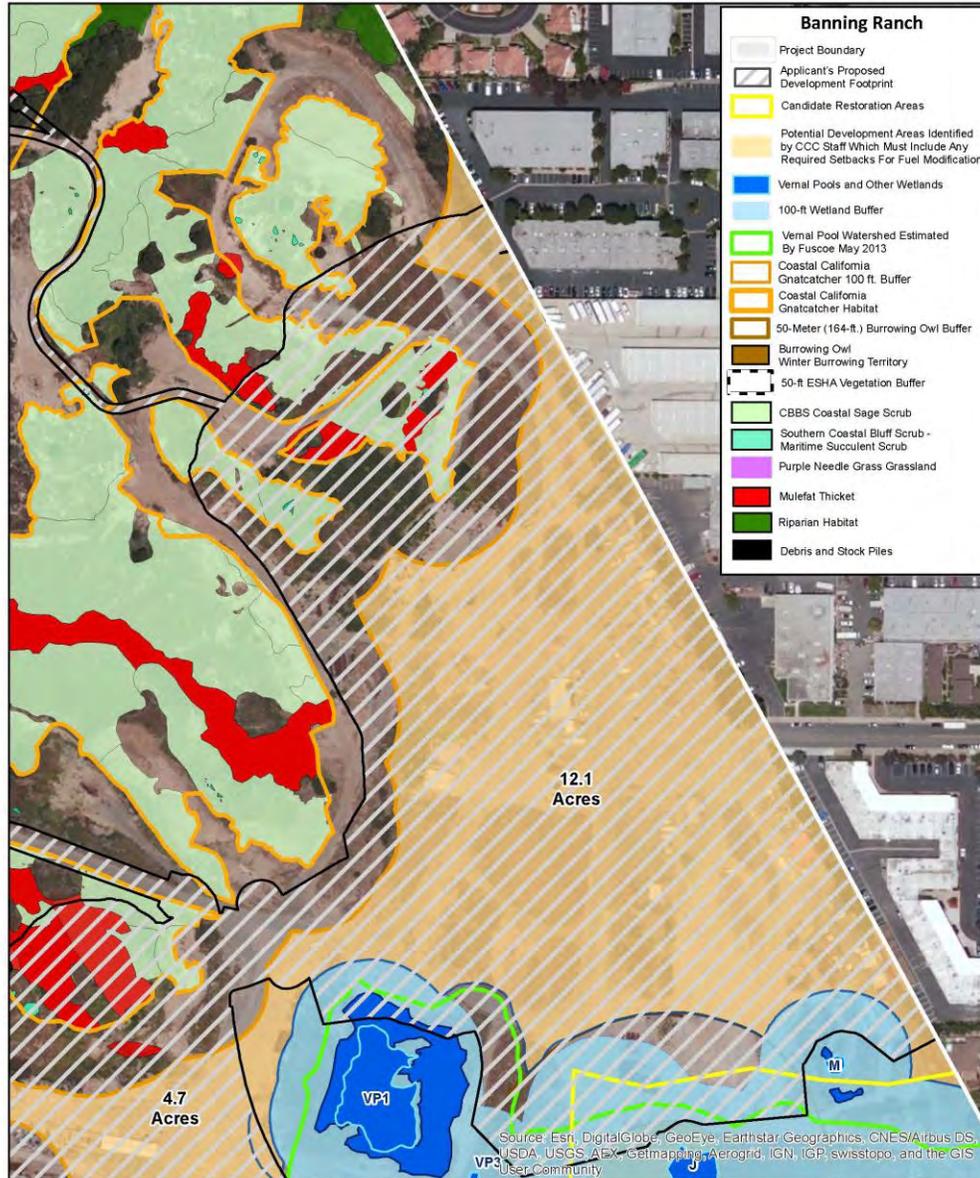


For Illustrative Purposes Only.
Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, GLA, CCC.



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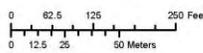
Figure 16. Cumulative constraints map for the northern portion of the proposed development area at Banning Ranch. Environmentally Sensitive Habitat Areas, wetlands and vernal pools, and development setbacks (habitat buffers) are shown. Development setbacks for rare vegetation communities are 50 feet. Setbacks for wetlands and occupied gnatcatcher habitat are 100 feet.



Habitat Constraints and Potential Development Areas in the Northern Area of Banning Ranch

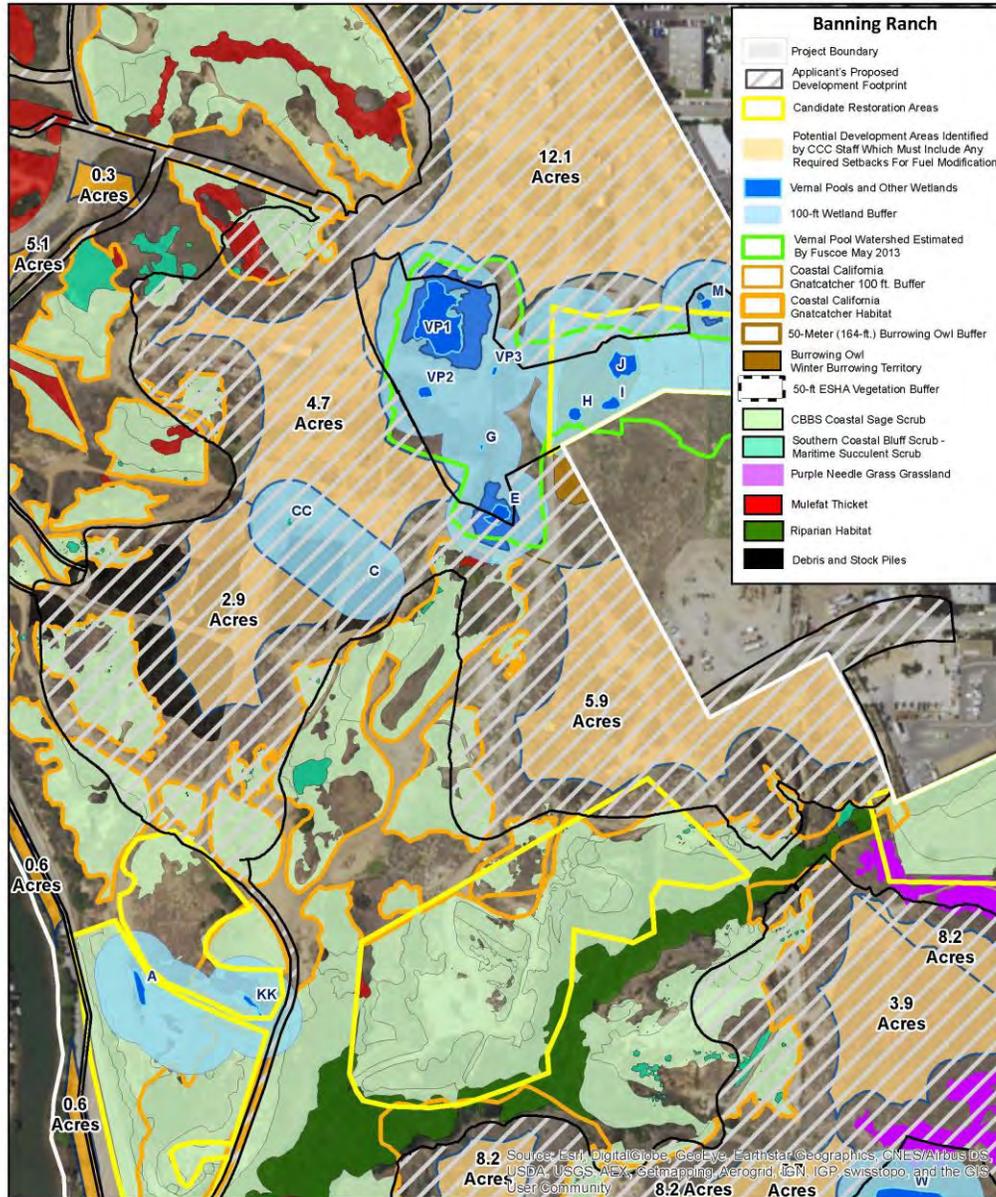


For Illustrative Purposes Only.
Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, CCC.



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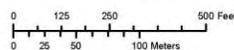
Figure 17. Cumulative constraints map for the central portion of the proposed development area at Banning Ranch. Environmentally Sensitive Habitat Areas, wetlands and vernal pools, and development setbacks (habitat buffers) are shown. Development setbacks for rare vegetation communities are 50 feet. Setbacks for wetlands and occupied gnatcatcher habitat are 100 feet.



Habitat Constraints and Potential Development Areas in the Central Area of Banning Ranch

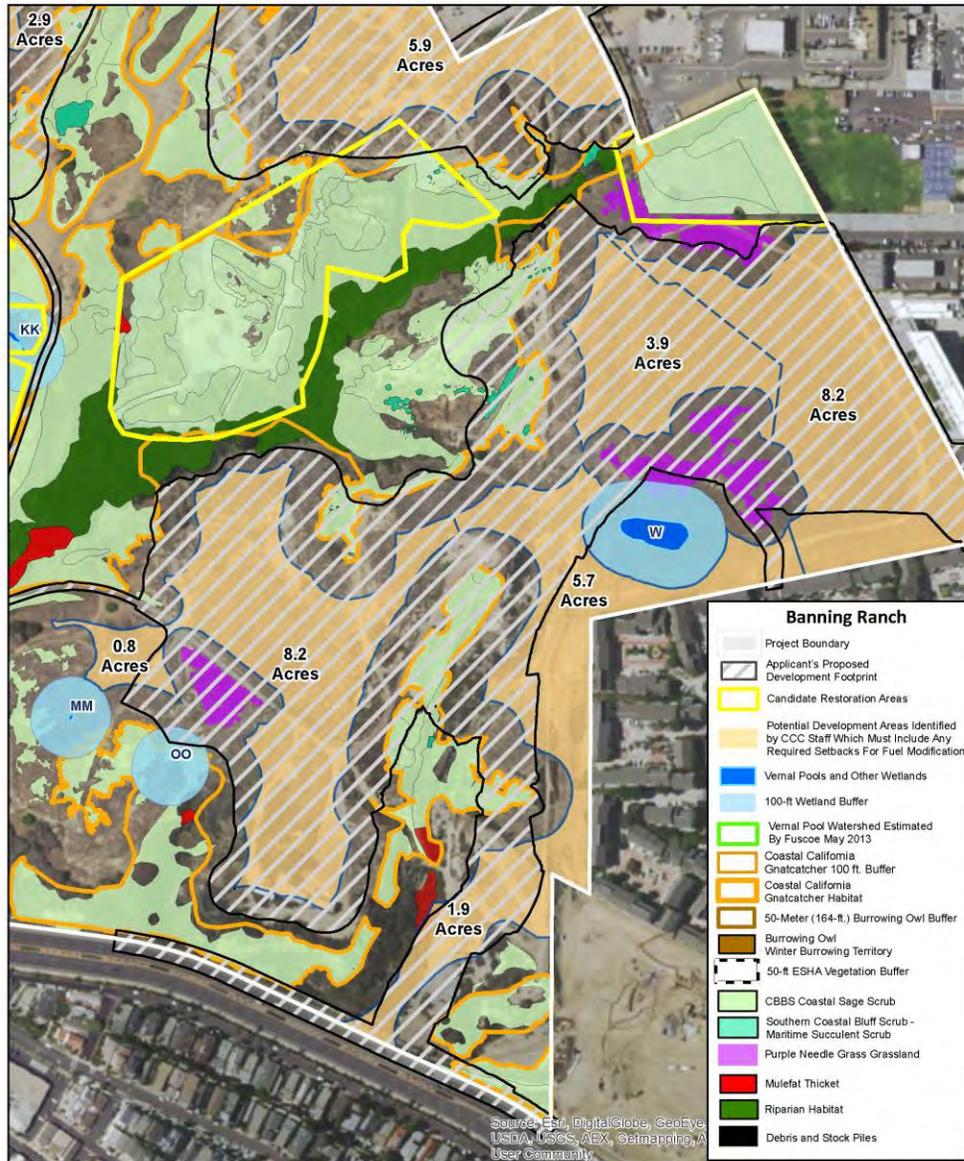


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Source: Brooks-Street, Dudek, USACE, CDFW, ESRI, CCC.



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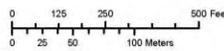
Figure 18. Cumulative constraints map for the southern portion of the proposed development area at Banning Ranch. Environmentally Sensitive Habitat Areas, wetlands and vernal pools, and development setbacks (habitat buffers) are shown. Development setbacks for rare vegetation communities are 50 feet. Setbacks for wetlands and occupied gnatcatcher habitat are 100 feet.



Habitat Constraints and Potential Development Areas in the Southern Area of Banning Ranch



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