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 County[4] (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 Nigel, 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 pools[8], 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.

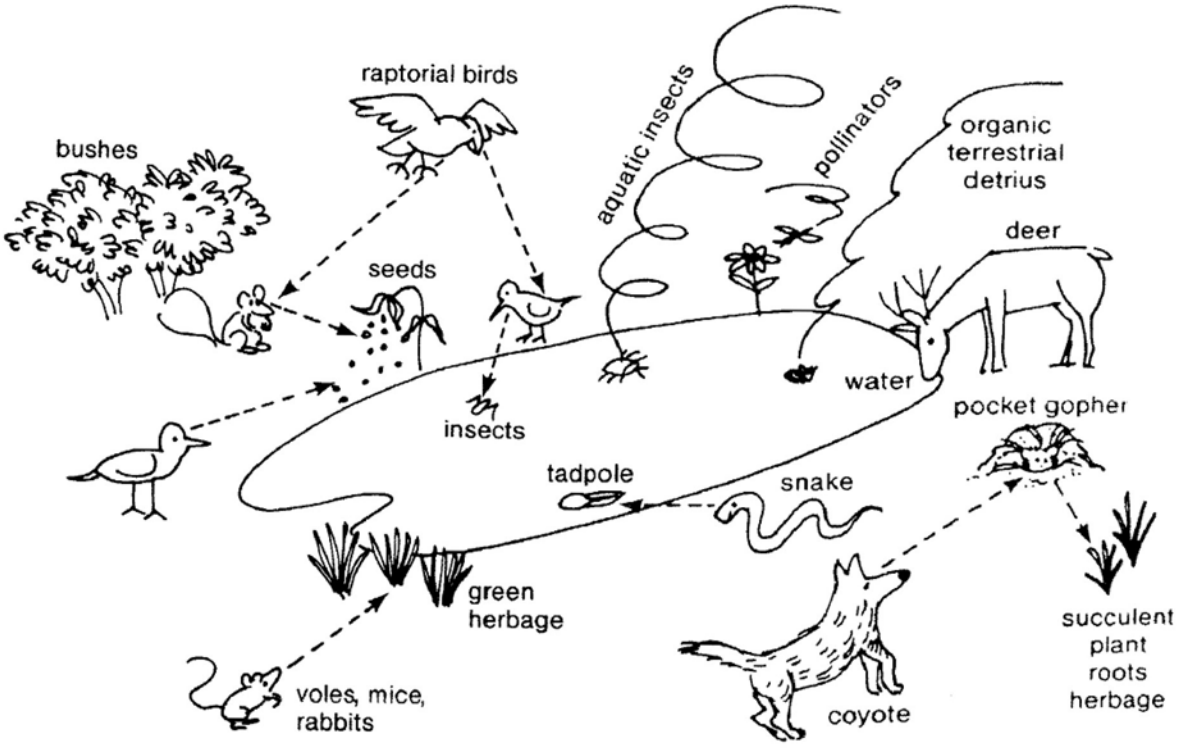

Figure 52. Some of the interactions between a vernal pool and its terrestrial surroundings.

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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 Element[11]:

> *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 a 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 (CNDDB). CNDDB 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 CDFW[12], the State and Federal government lists of rare, threatened or endangered plant and animal species[13], the natural communities and plant and animal species listed by NatureServe as Global and/or State-ranked 1, 2, or 3[14], 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 species [16].

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 location[17]. 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 CNDDB has used and continues to use Holland's classification to identify rare natural communities. More recently the CNDDB 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 CNDDB 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 available[19].

The vegetation of the Banning Ranch site has been mapped by various biological consultants over the years. According to the project EIR, 45 vegetation[20] 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 System[21], 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, waserroneously 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 surveys[26]. 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 rainfall[29]. 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 CNDDB.[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 (*Polioptila 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 disturbance[32]. 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 regions[33]. 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 communities[34]. 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 buckwheat[35].

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 (*Polioptila 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 habitats[36]. 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 Conception[37]. The CNDDB natural community rarity ranking ranks southern coastal bluff scrub as extremely rare[38]. 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 range[39]. 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-thorn[40]. The CNDDB natural community rarity ranking ranks maritime succulent scrub as extremely rare[41]. 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 CNDDB 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 range[43].

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 layer[44]. 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 CNDDB 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 soils[48], which are described as potentially hydric soils where appropriate topographic features exist (e.g. depressions), and have very slow permeability[49]. 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 mounds[50]. Mima mounds are typically located on stable landforms that are greater than 100,000 years old. The USFSW vernal pools recovery plan[51] 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-made[52]. 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 rare[53] by CNDDB, and the versatile fairy shrimp (*Branchinecta lindahli*). San Diego claypan and hardpan vernal pools are both listed as very rare[54] by the CNDDB natural communities list. Additionally, 15 acres on Banning Ranch have been identified as San Diego fairy shrimp critical habitat by the USFWS (Figure13). This is the only designated critical habitat for this species in Orange County.

Wetland delineations and vernal pool protocol level surveys to date[55] 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 communities[59]. 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 buckwheat[60]. Gnatcatcher densities in northern San Diego County were found to be highest in areas where California sunflower and California buckwheat were co-dominant with sagebrush[61]. 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 mustard[62]. They also use grassland, chaparral, and riparian habitats in proximity to sage scrub for dispersal and foraging[63].

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 1993[64]. The CNDDB rarity ranking identifies the California gnatcatcher as very rare[65]; 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, respectively[68].

In 2007, the USFWS identified and mapped critical gnatcatcher habitat in southern California[69]. 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 Gnatcacher (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 2007[70] (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 populations[74]. 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 ground[75]. 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 larger[76]. 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 pair[79].

[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 (*Polioptila 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 1996[82] (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 2007[83] (Figures 26, 27, & 28), gnatcatcher observations surveyed by BonTerra in 2009[84] (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 (*Polioptila californica californica*) Presence/Absence Survey Protocol. Washington, D.C.:USFWS.

[81] U.S. Fish and Wildlife (USFWS). 1997b (July 28). Coastal California Gnatcatcher (*Polioptila 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 2009[87]. 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 2012[88]).

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 species[89] by the CNDDB 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 2009[92]. 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 wildfires[93].

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 species[94] by the CNDDB 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 species[95] by the CNDDB 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 species[96] by the CNDDB 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 he 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 categories[97]. 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 buffer[98]. 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 actions[99] . 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	Wetlnd 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.l.	f.s.c.	o.s.	c.e.	Vernal Pool Veg	Wetlnd 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.l.	f.s.c.	o.s.	c.e.	Vernal Pool Veg	Wetlnd 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**

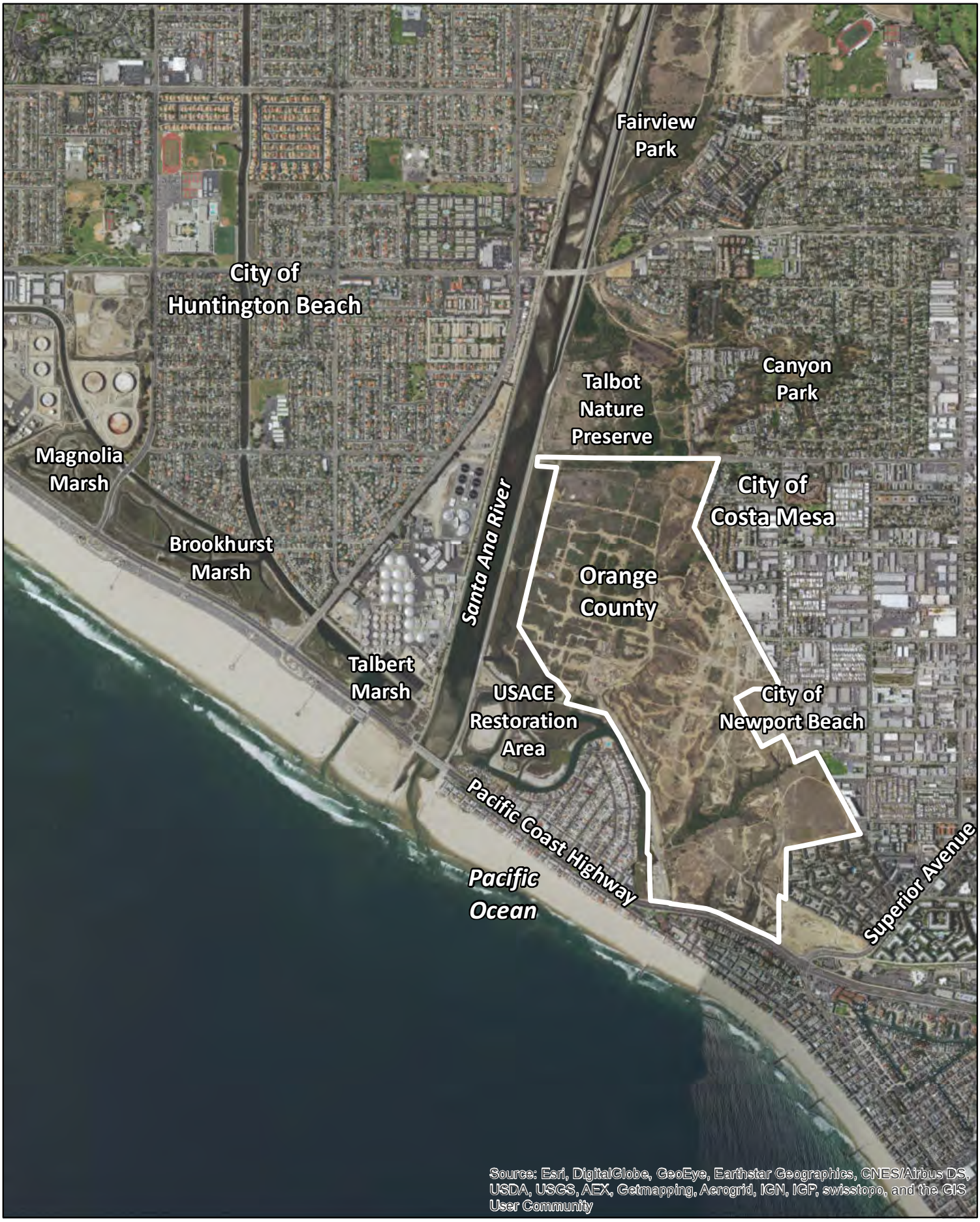

Figure 1. Aerial Photograph of the Banning Ranch Site and Surroundings.

For Illustrative Purposes Only
Source: ESRI.

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

Figure 3. USFWS National Wetland Inventory Map of the Banning Ranch Site.
For Illustrative Purposes Only. Source: USFWS NWI, ESRI.

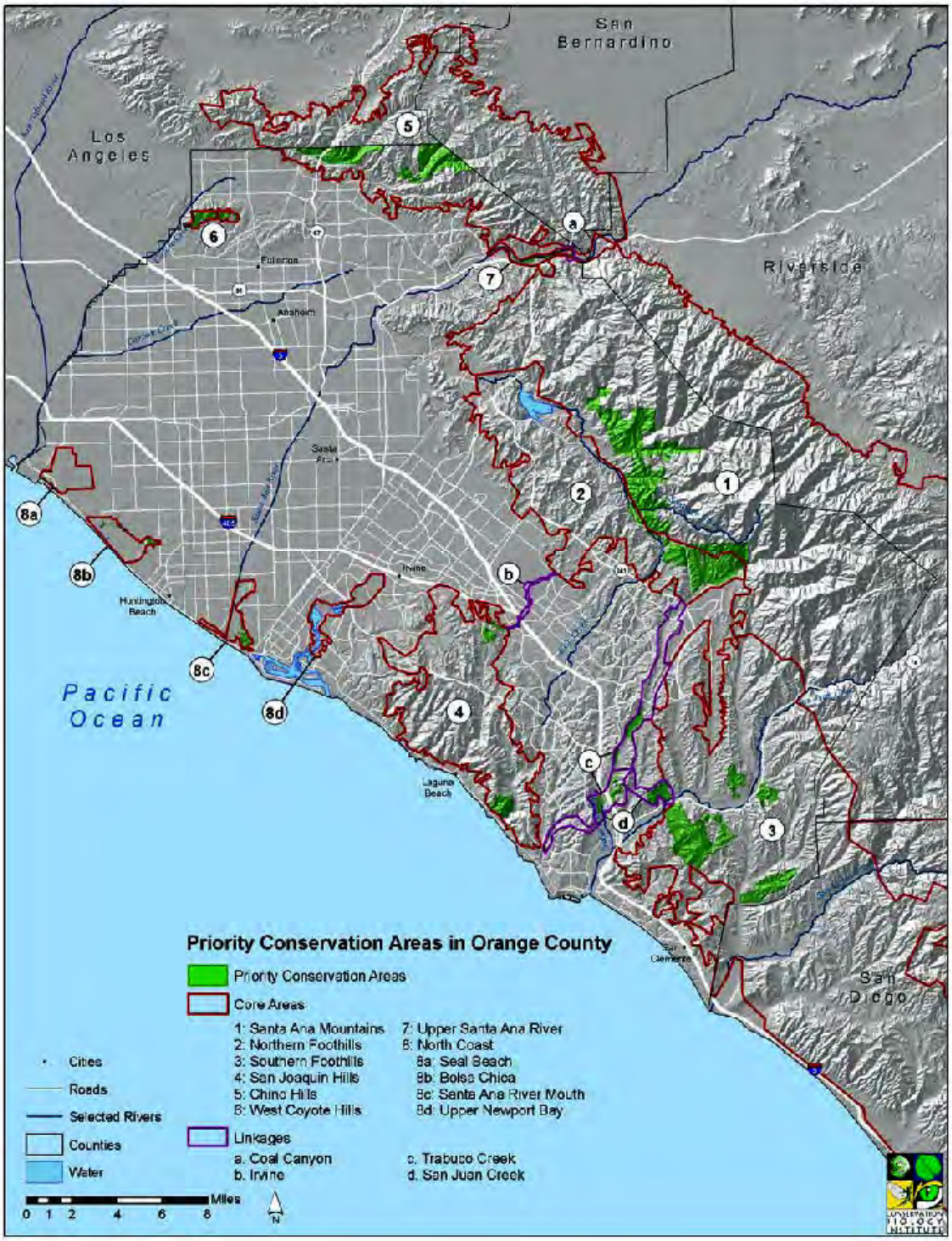


Figure 7. Priority Conservation Areas.

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

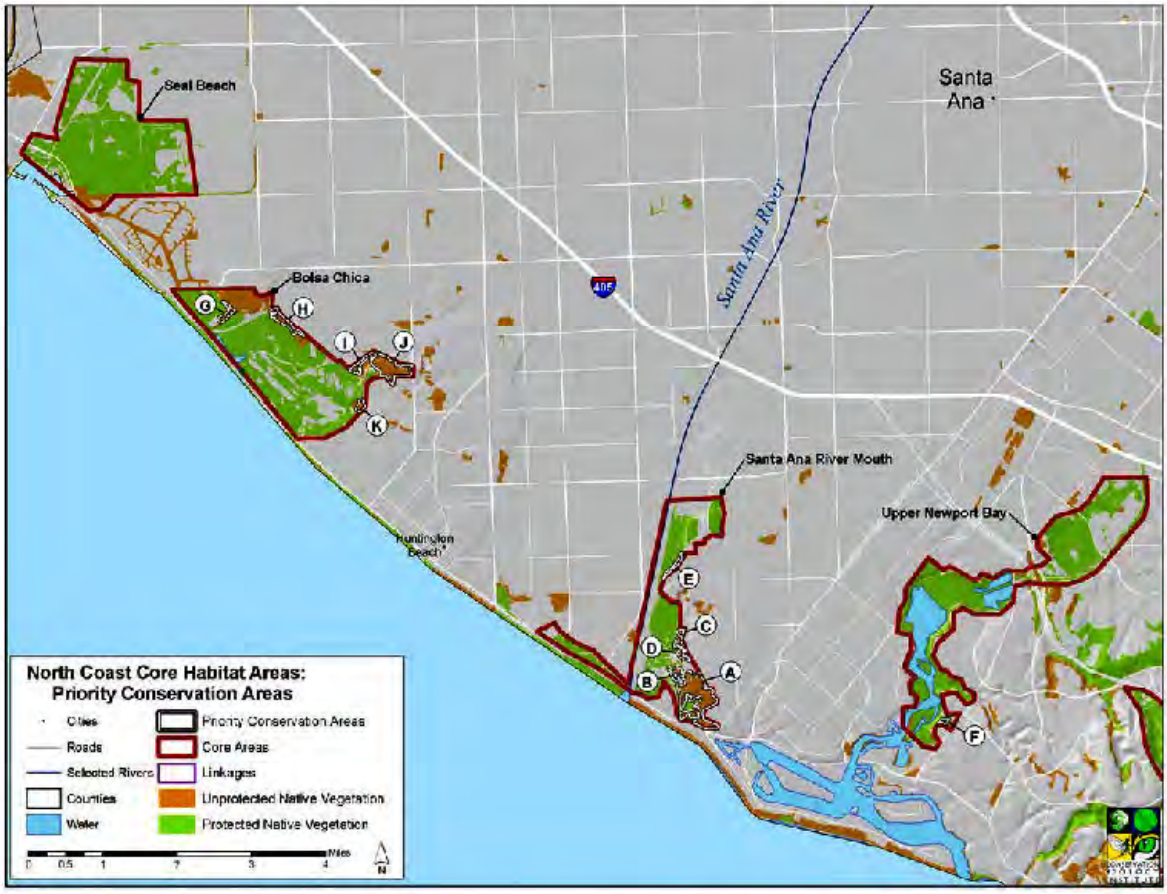


Figure 20. North Coast Core Habitat Areas: Priority Conservation Areas (Santa Ana River Mouth = A, B, C, D, E); Upper Newport Bay = F; Bolsa Chica = G, H, I, J, K).

Figure 5. Banning Ranch Identified as a Core Conservation Area within the Santa Ana River Mouth Priority Conservation Area by the Conservation Biology Institute.

Figure 6. Proposed Development Plan for Banning Ranch.

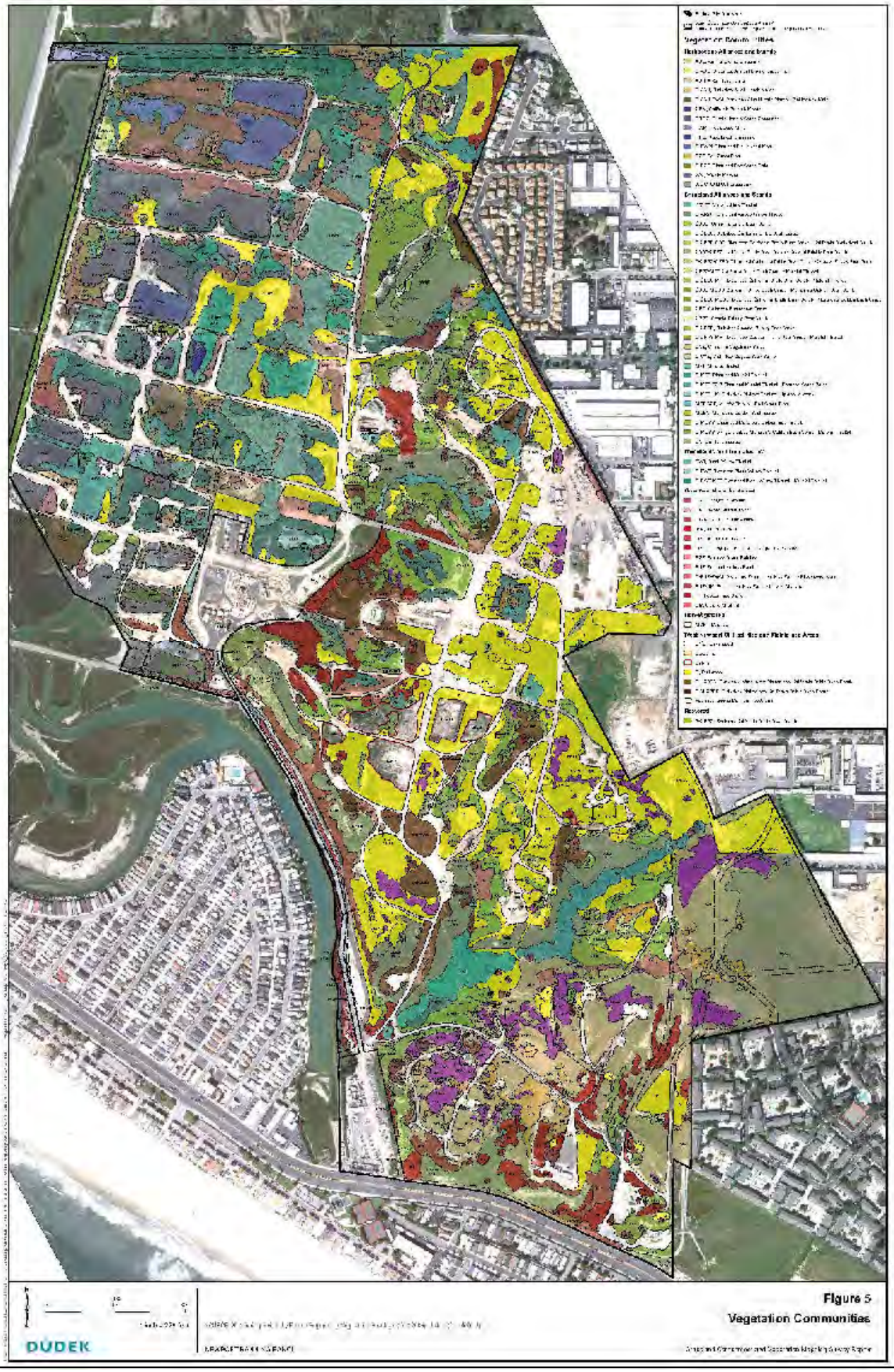


Figure 7. Dudek's Vegetation Map Based on Vegetation Surveys That Took Place Between Late-June and Mid-December 2012. Citation: J.H. IV (Dudek). February 2013. Grassland Assessment and Vegetation Mapping Survey Report for the Newport Banning Ranch. Prepared for Newport Banning Ranch LLC.

Figure 8. Areas on Banning Ranch that Commission Staff Estimated had been Mowed Before the Informal Agreement to Stop Mowing in 2012.

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.

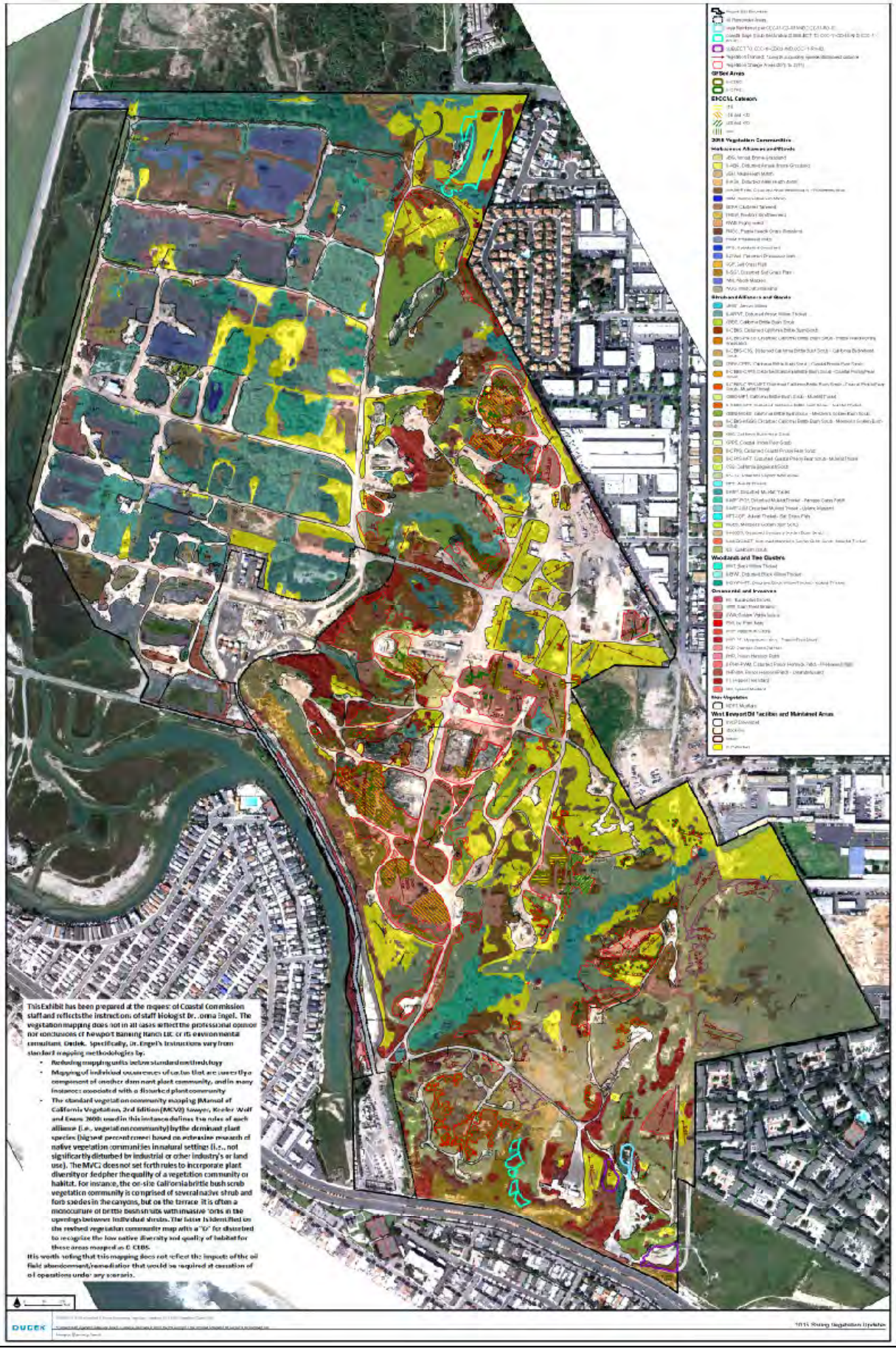


Figure 10. Dudek's Vegetation Map Based on Vegetation Surveys That Took Place in April 2015.

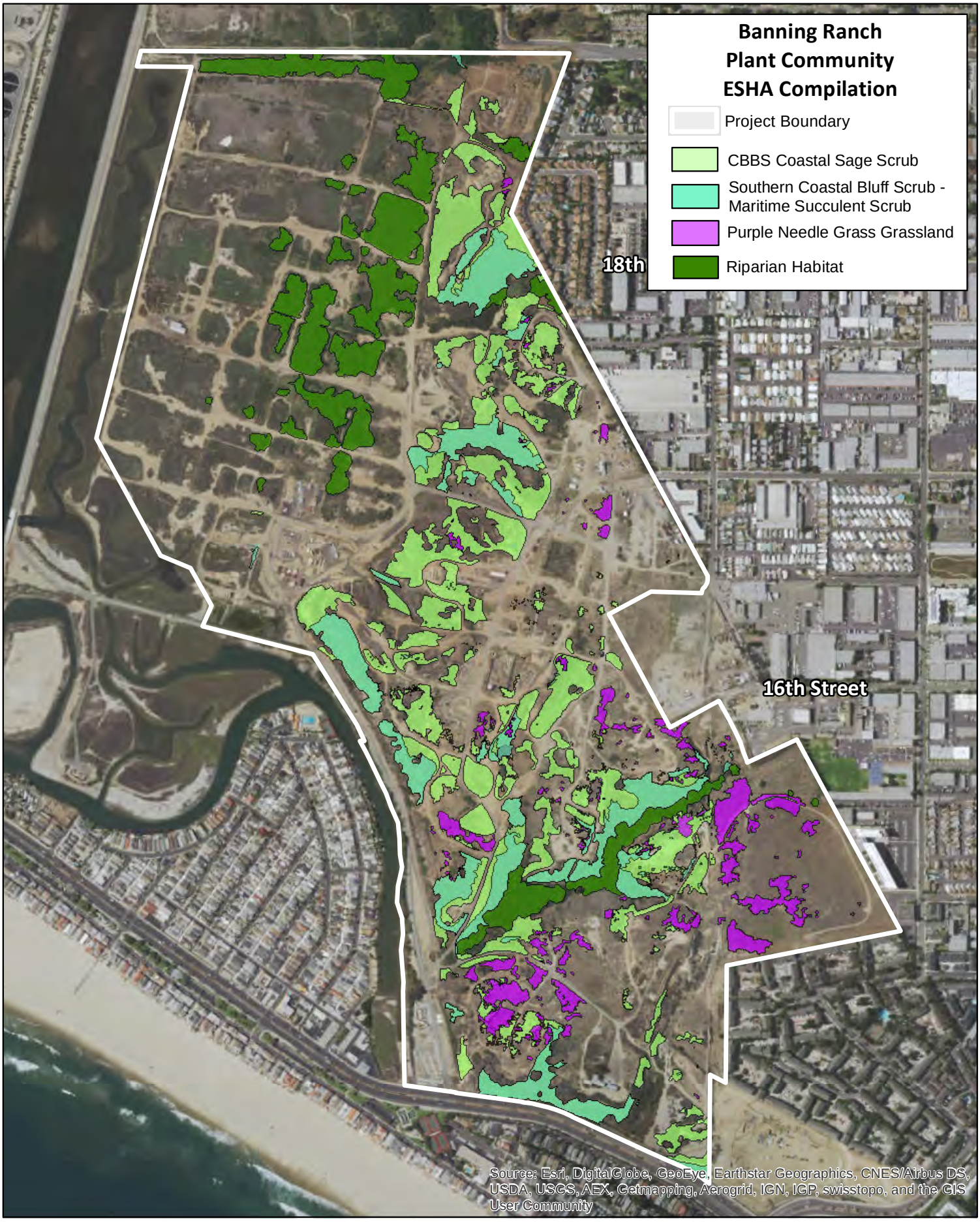


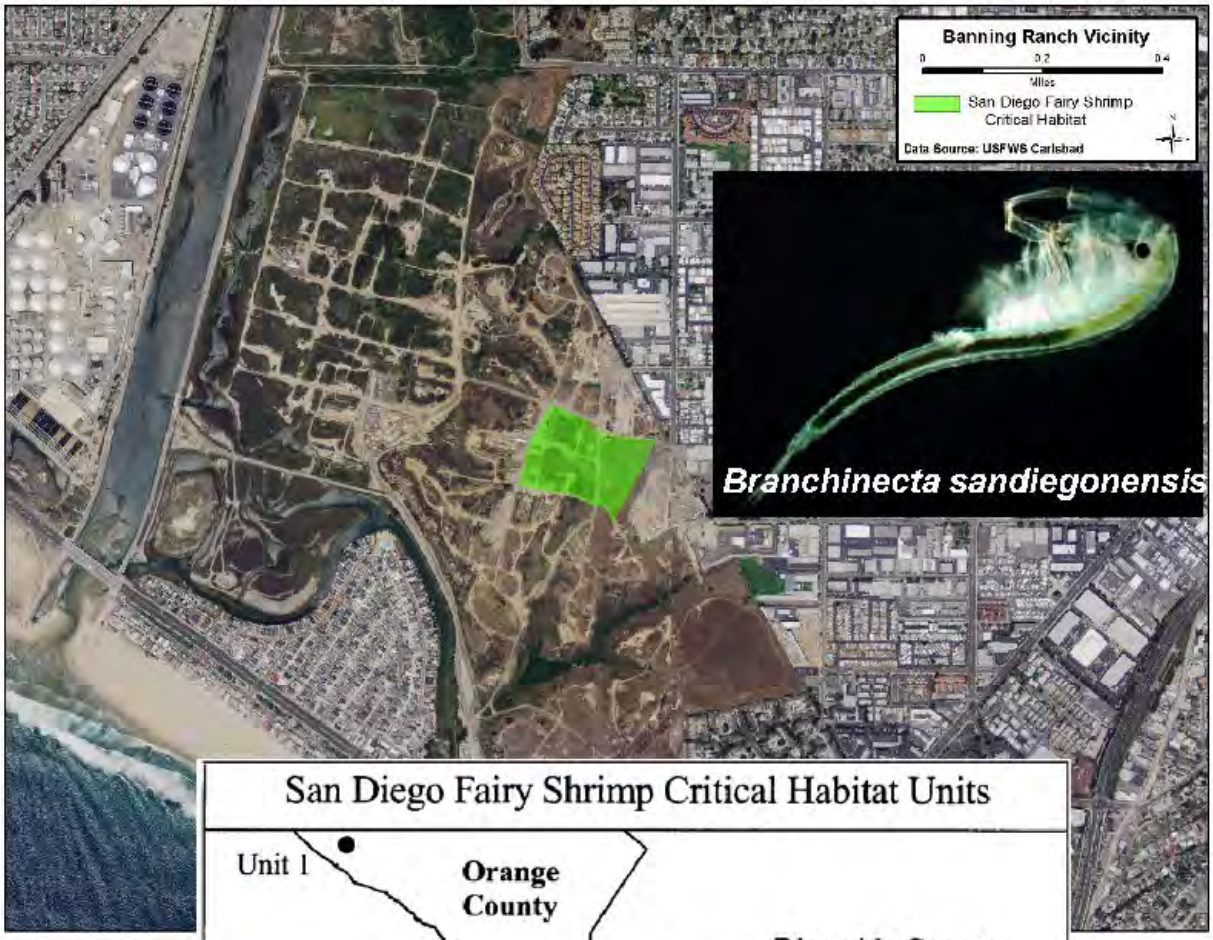
Figure 11. Plant Community Environmentally Sensitive Habitat (ESHA) Boundary Determination for Banning Ranch

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

San Diego Fairy Shrimp Critical Habitat



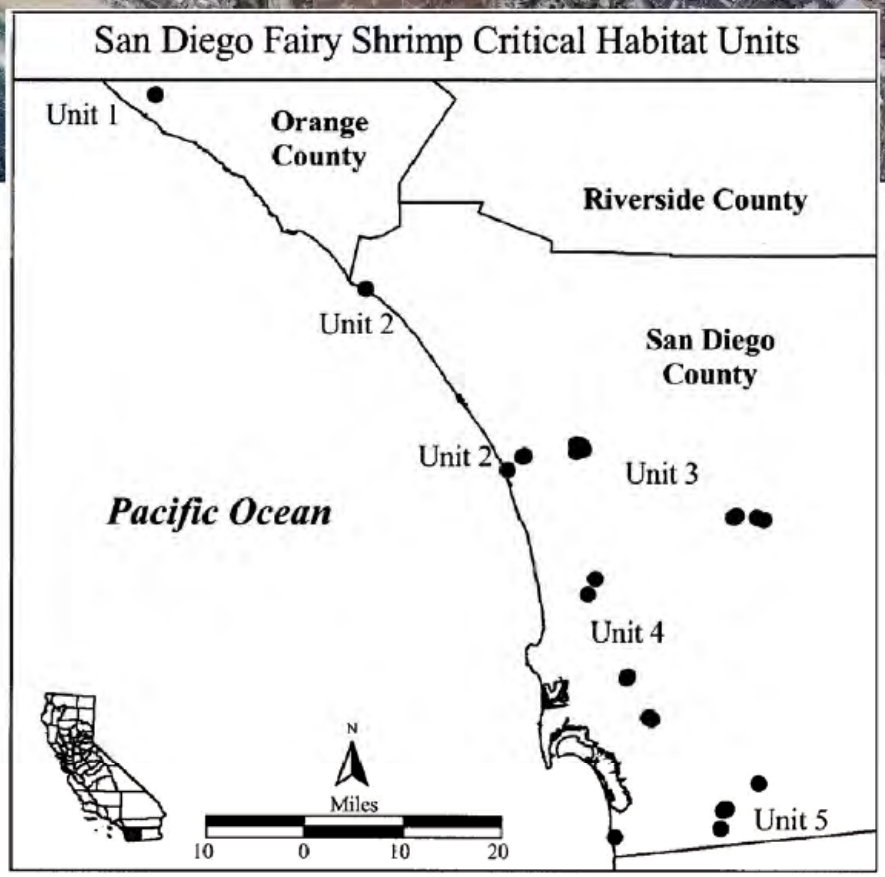


Figure 13. USFWS San Diego Fairy Shrimp Critical Habitat.
For Illustrative Purposes Only. Source: USFWS.

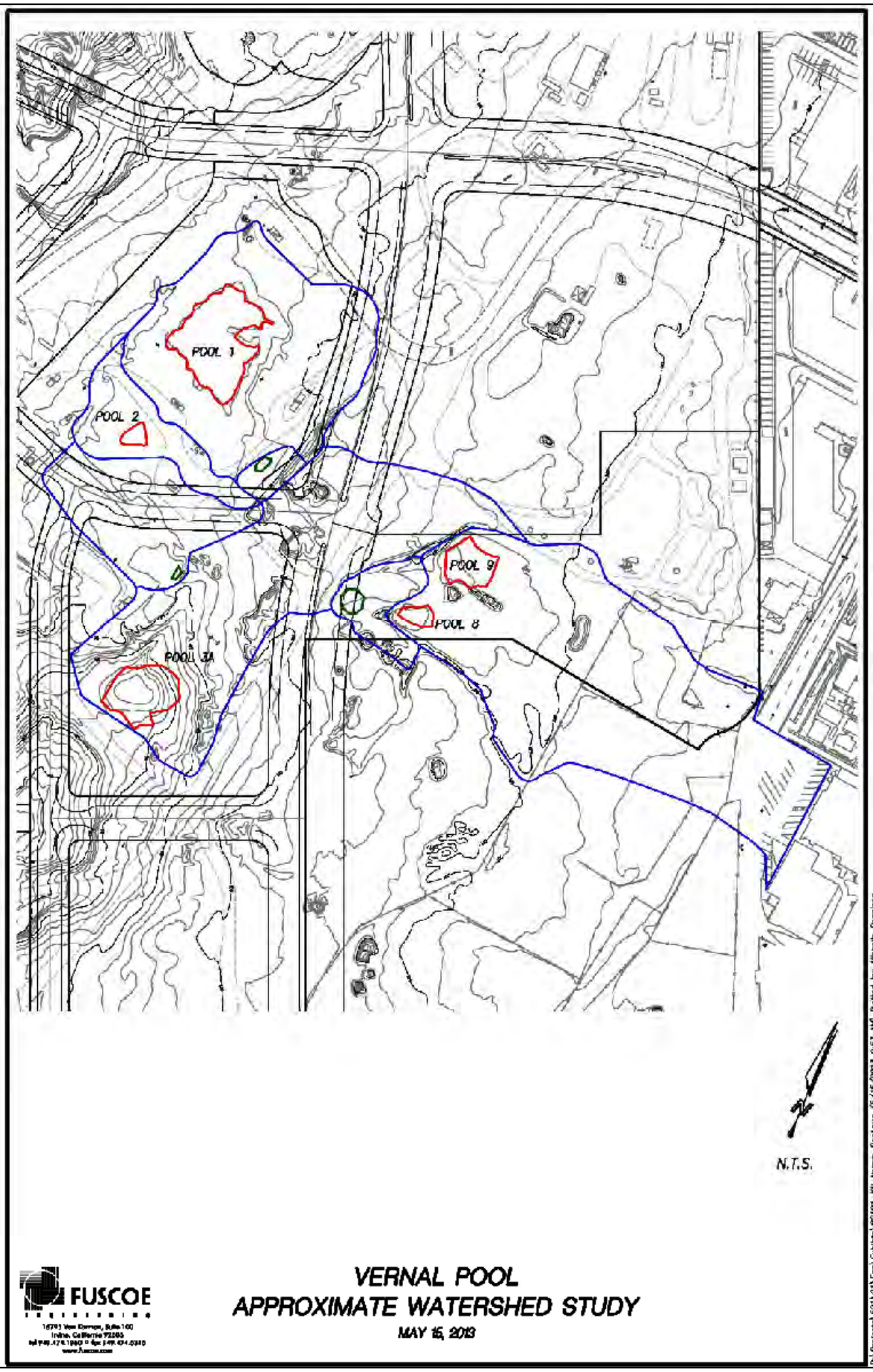


Figure 14. Fuscoe Vernal Pool Watershed Determination for Vernal Pools 1 (VP1), 2 (VP2), 3A (E), 9 (J), and 8 (I).

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

For Illustrative Purposes Only. Source: Dudek, ESRI.

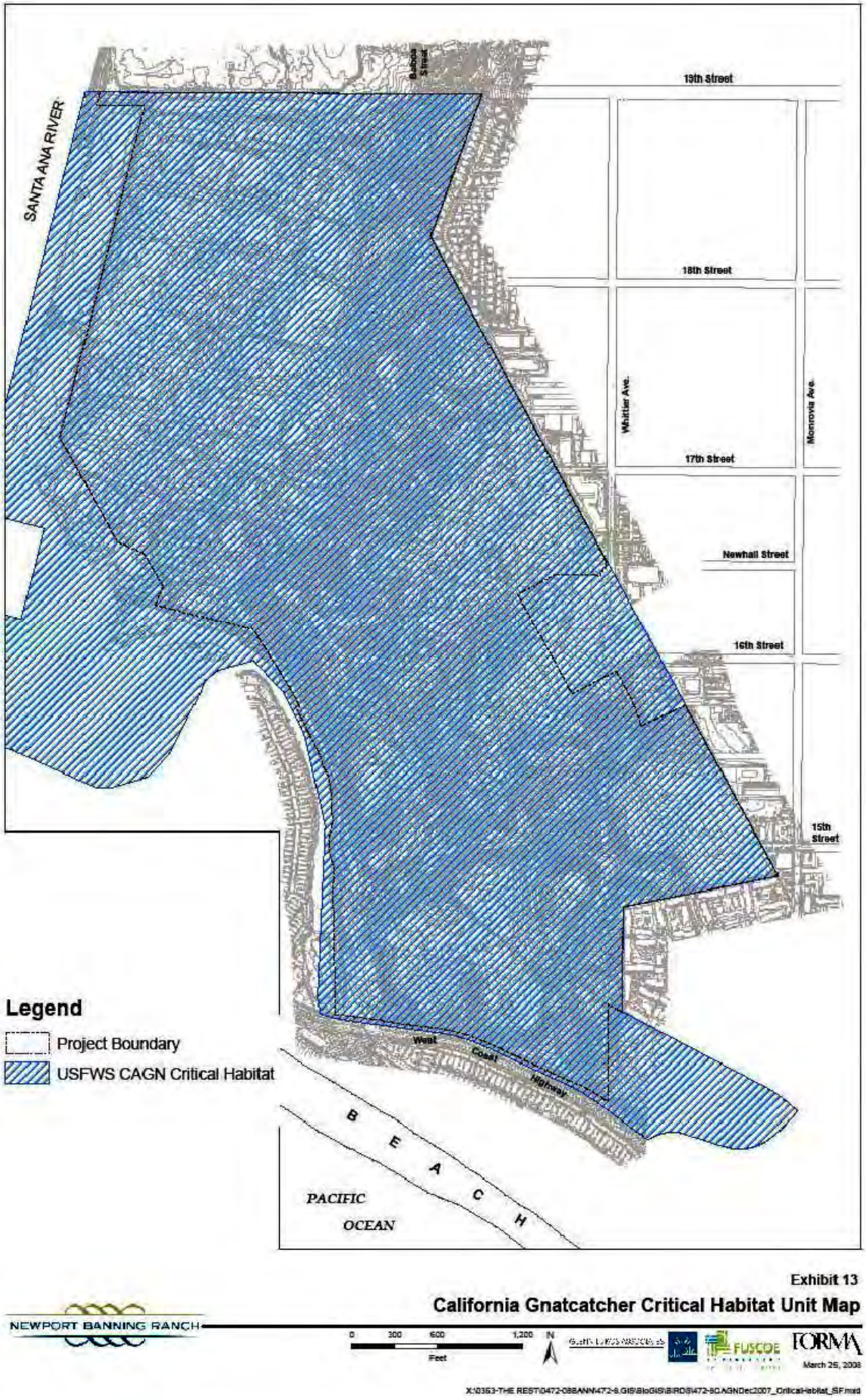


Figure 16. USFWS Coastal California Gnatcatcher Critical Habitat.
For Illustrative Purposes Only. Source: GLA.

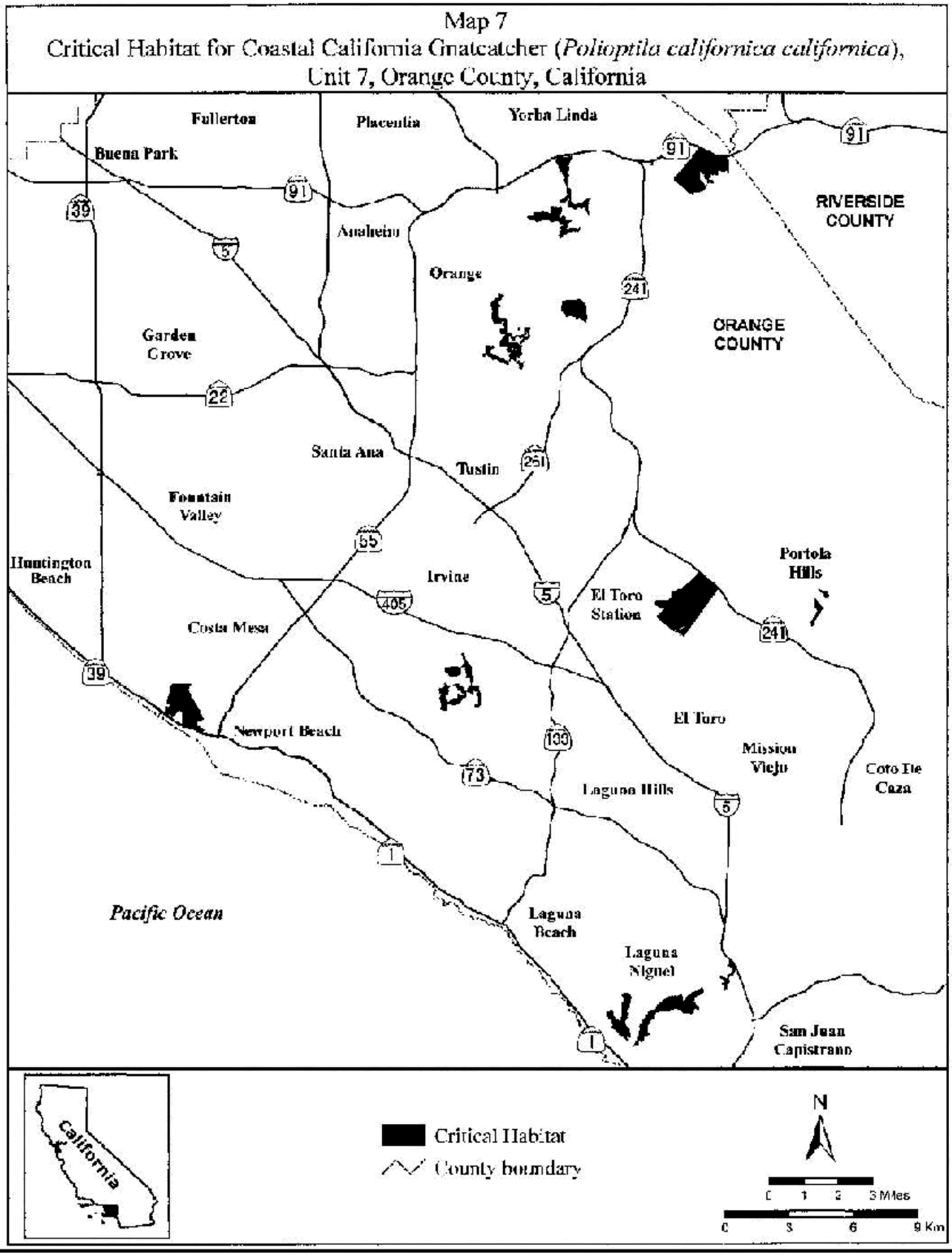


Figure 17. Banning Ranch is the Only Immediately Coastal Land Mapped as Critical Coastal California Gnatcatcher Habitat in Unit 7 in Orange County.
For Illustrative Purposes Only. Source: USFWS.

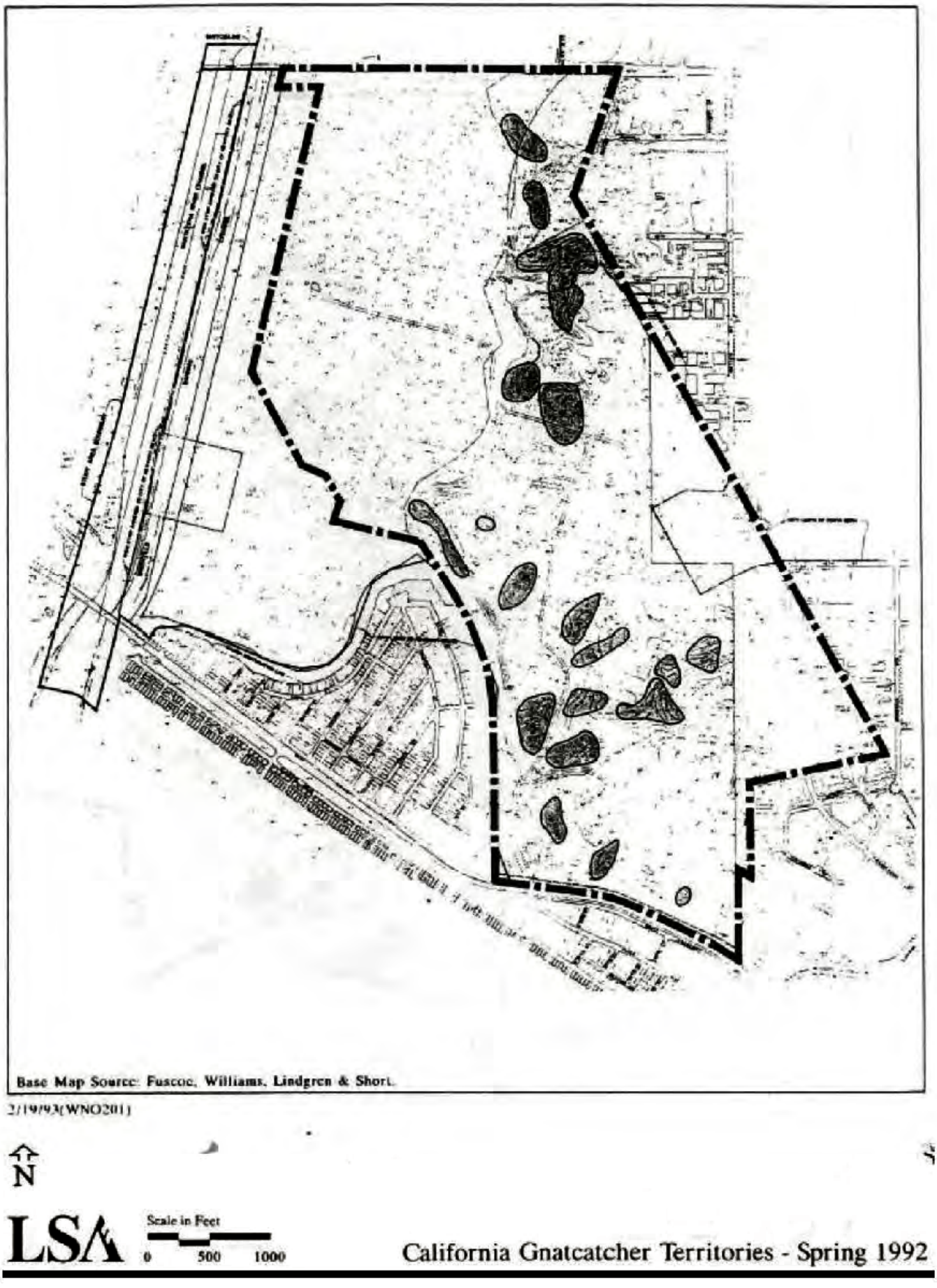
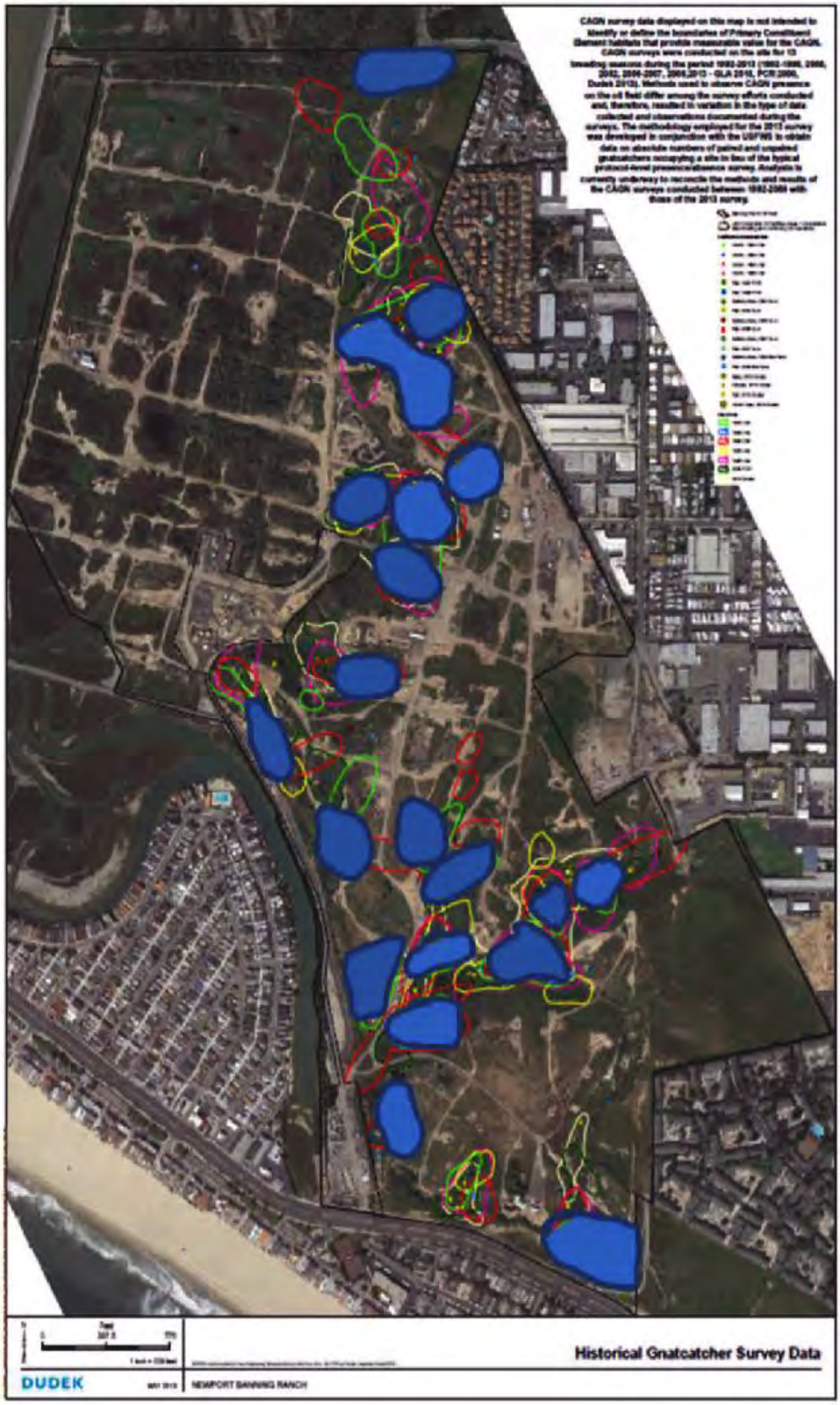


Figure 18. LSA 1992 Gnatcatcher Survey Data.



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.
For Illustrative Purposes Only. Source: LSA.

Figure 20. LSA 1994 Gnatcatcher Survey Data.

For Illustrative Purposes Only. Source: LSA.

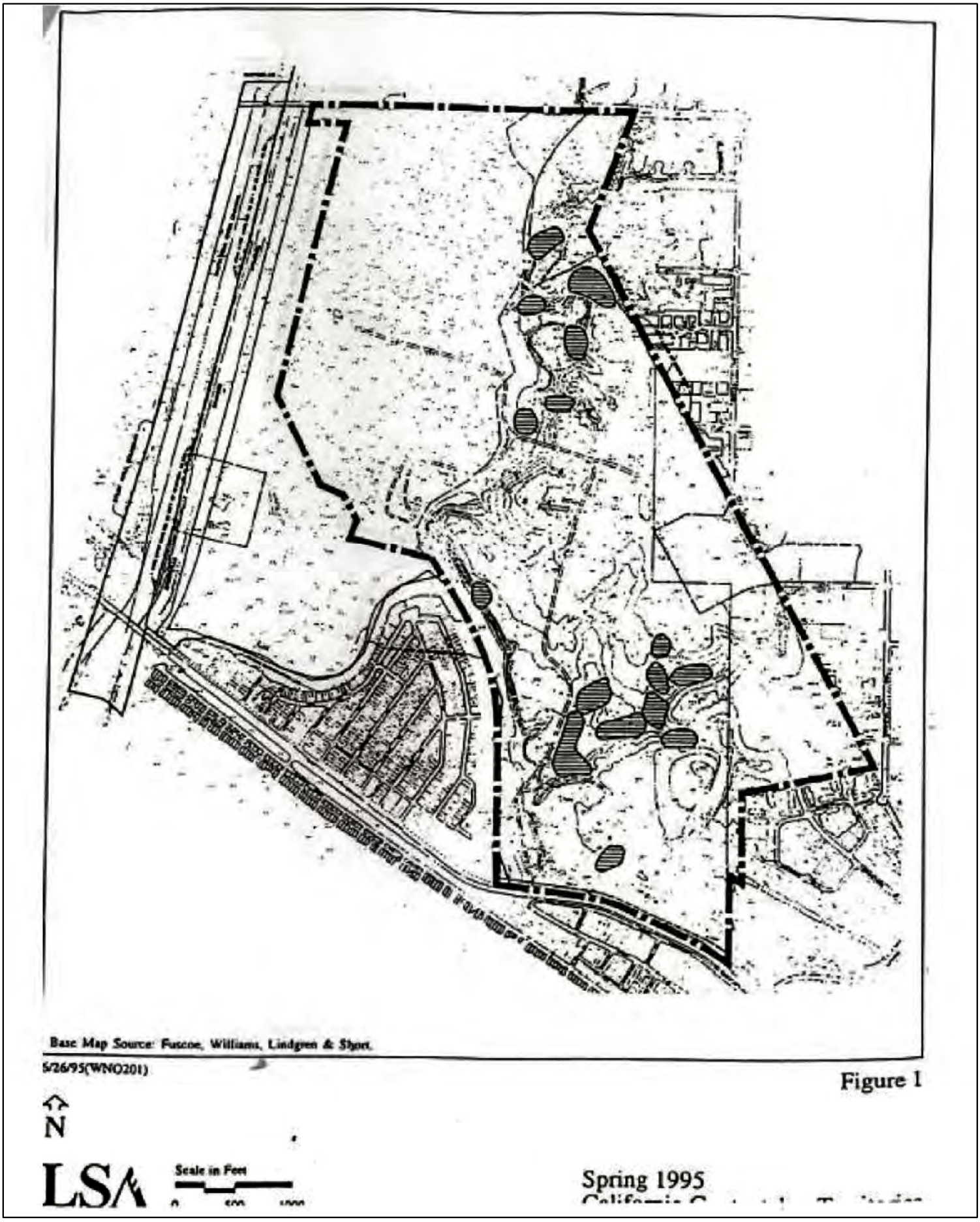


Figure 21. LSA 1995 Gnatcatcher Survey Data.

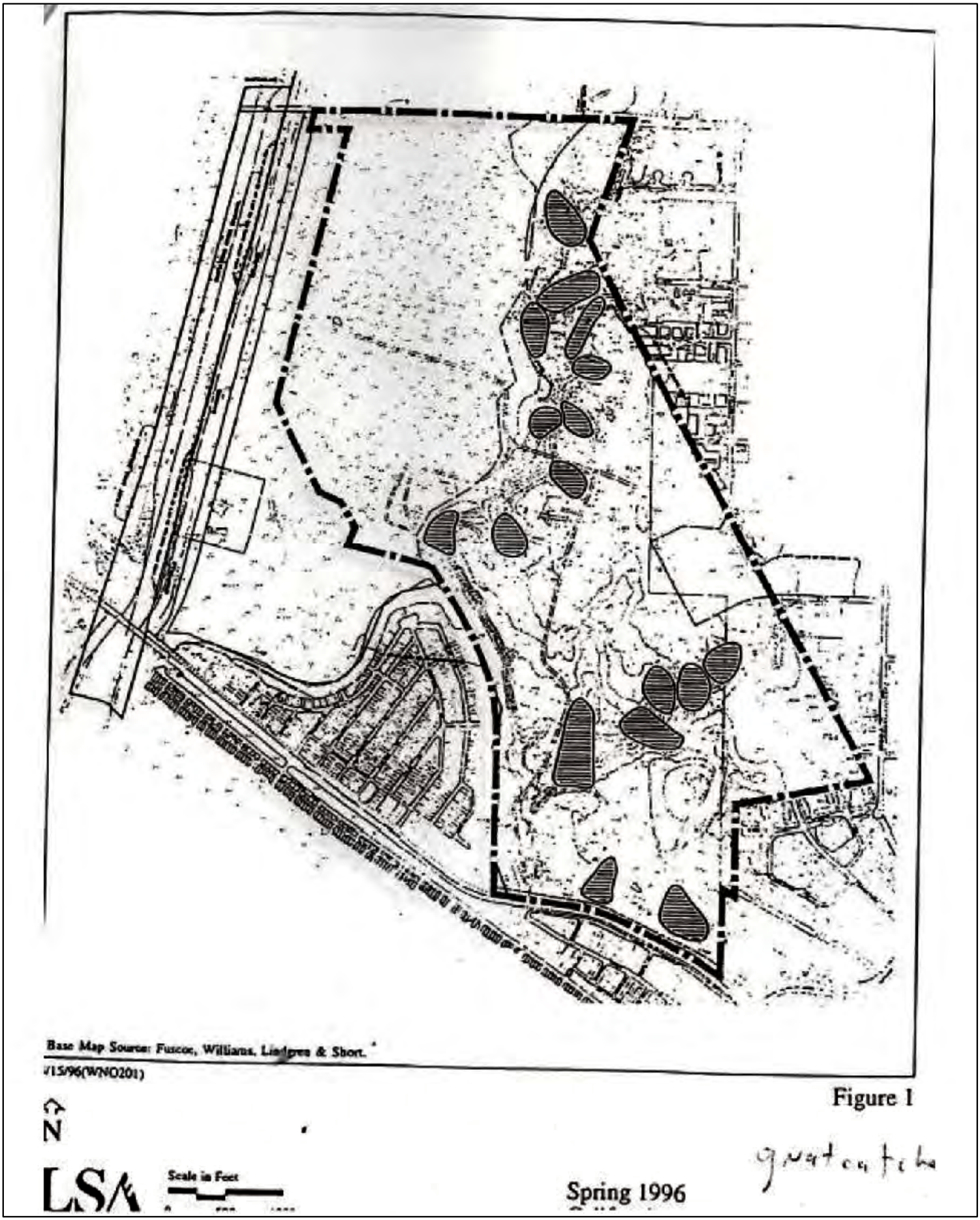


Figure 22. LSA 1996 Gnatcatcher Survey Data.

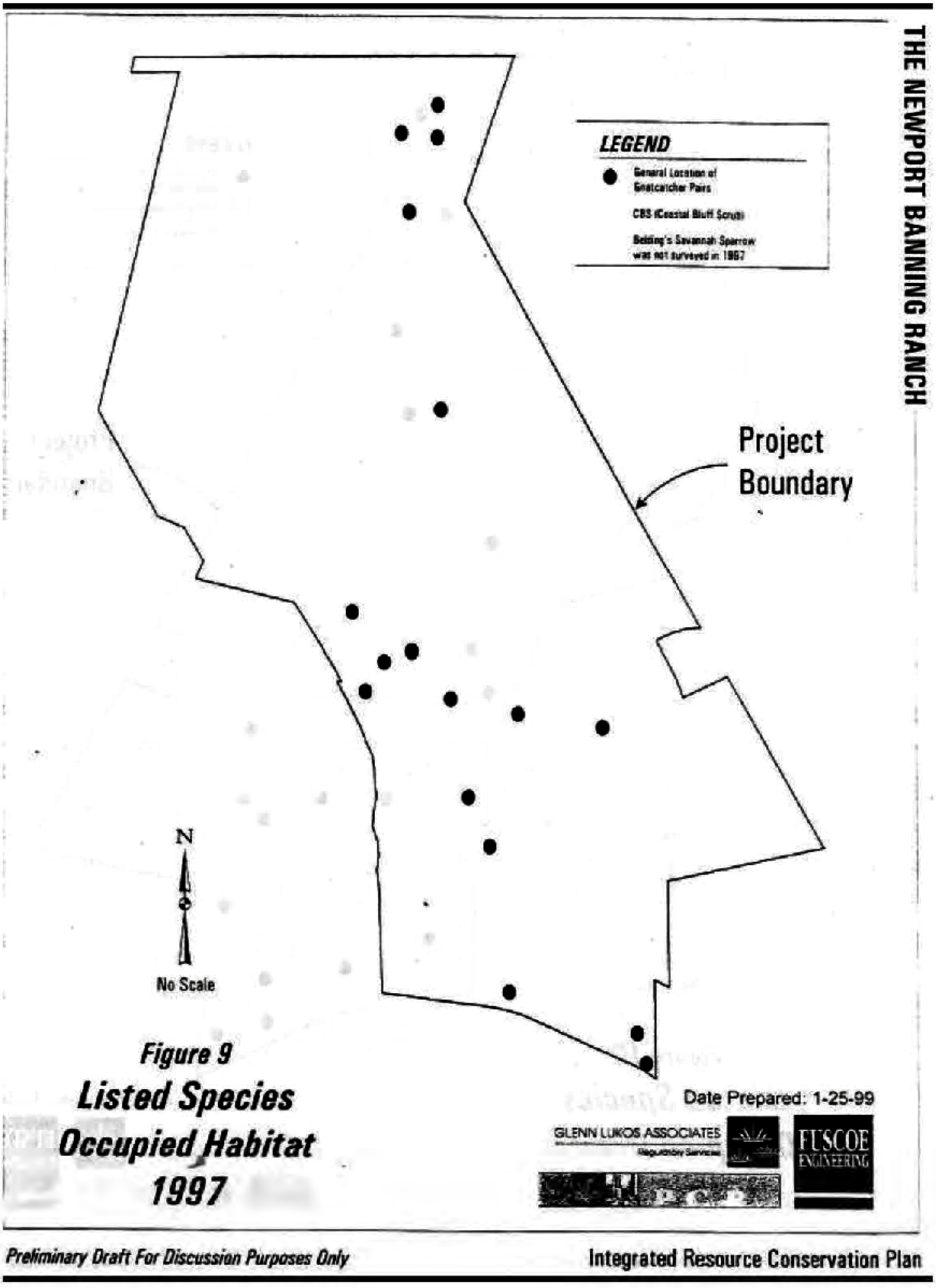


Figure 23. PCR 1997 Gnatcatcher Survey Data.
For Illustrative Purposes Only. Source: PCR.

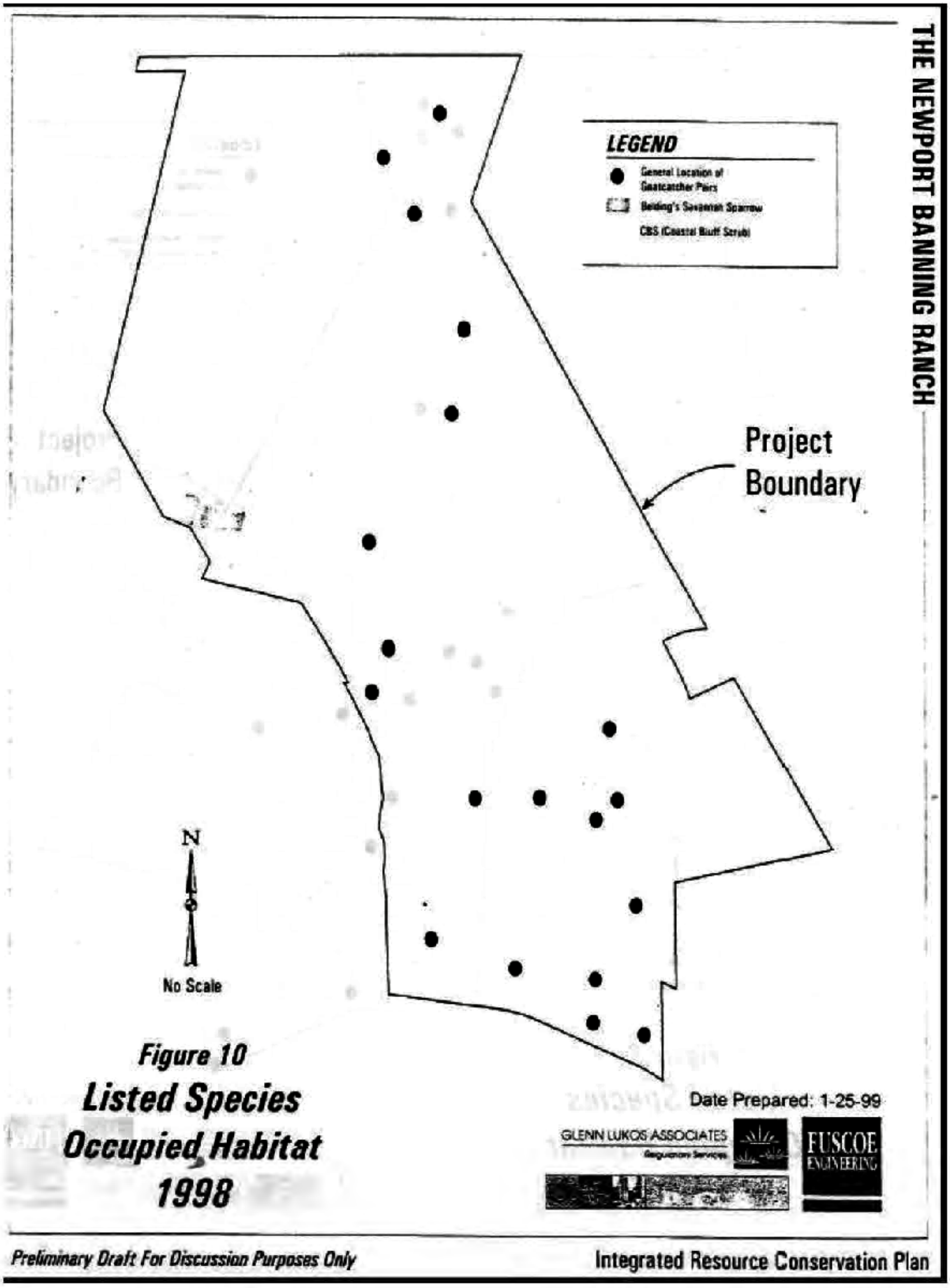


Figure 24. PCR 1998 Gnatcatcher Survey Data.
For Illustrative Purposes Only. Source: PCR.

Figure 25. 2000 Gnatcatcher Survey Data.
Collector Unknown, We Believe It Was PCR

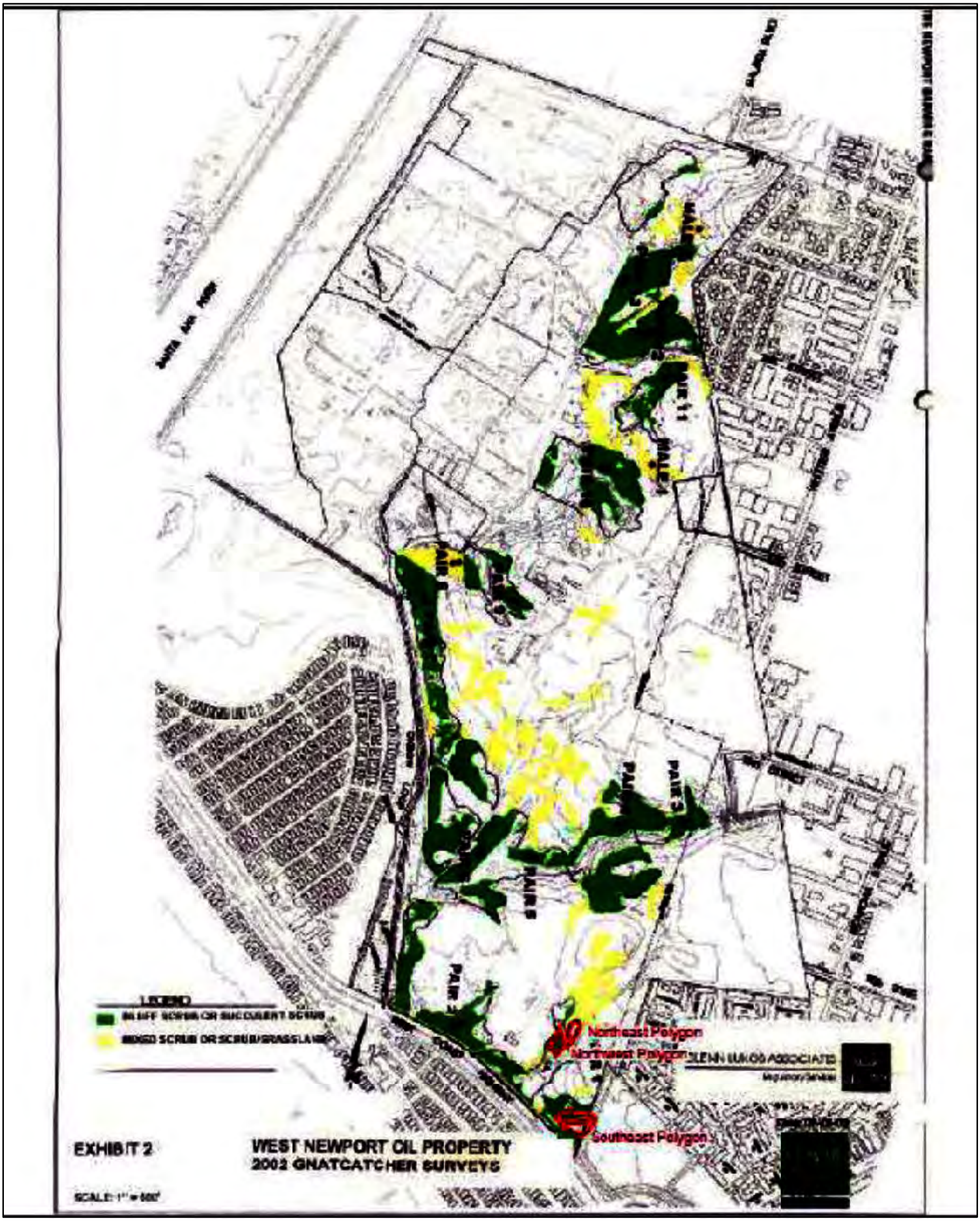


Figure 26. GLA 2002 Gnatcatcher Survey Data.

For Illustrative Purposes Only. Source: GLA.

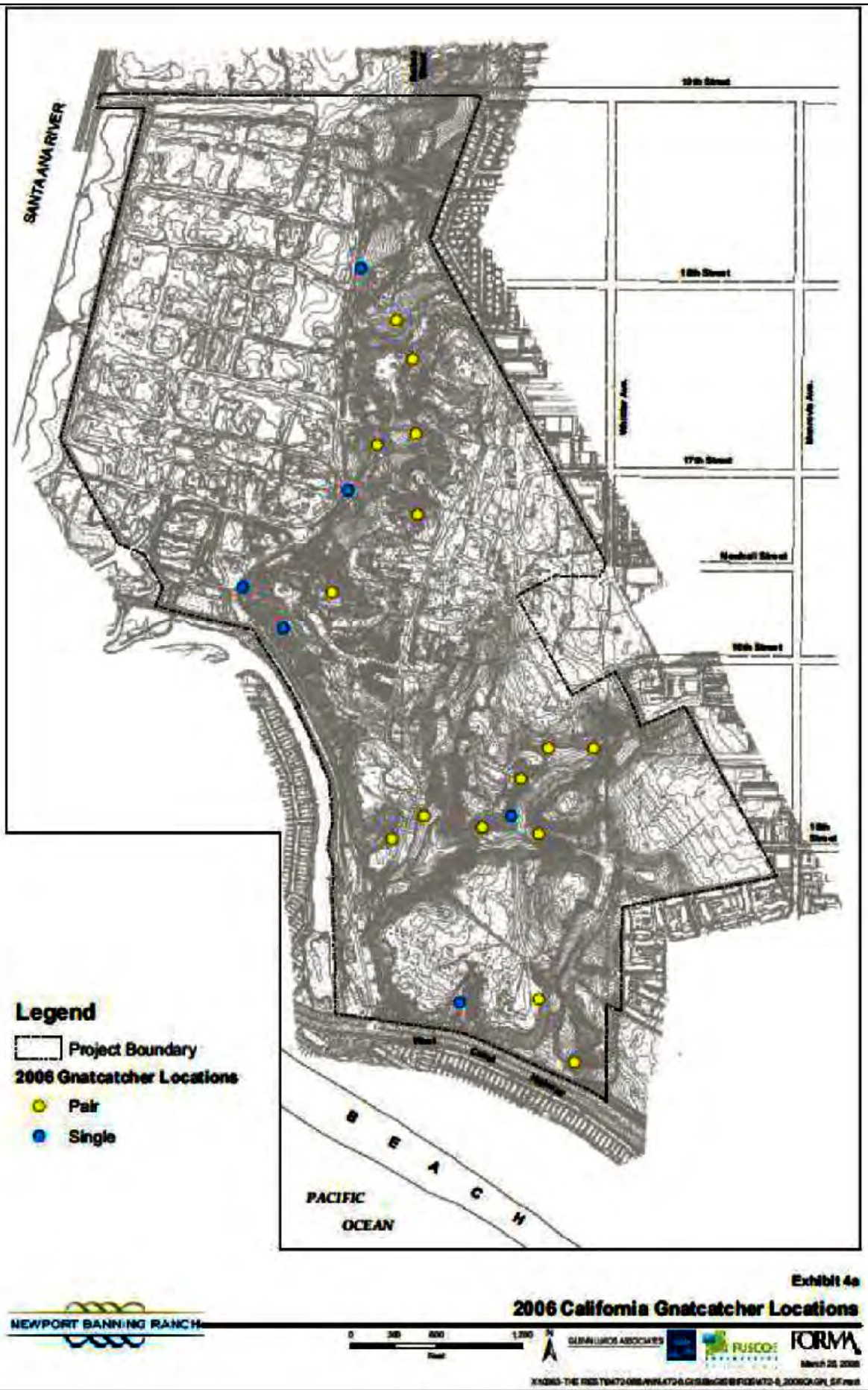


Figure 27. GLA 2006 Gnatcatcher Survey Data.
For Illustrative Purposes Only. Source: GLA.

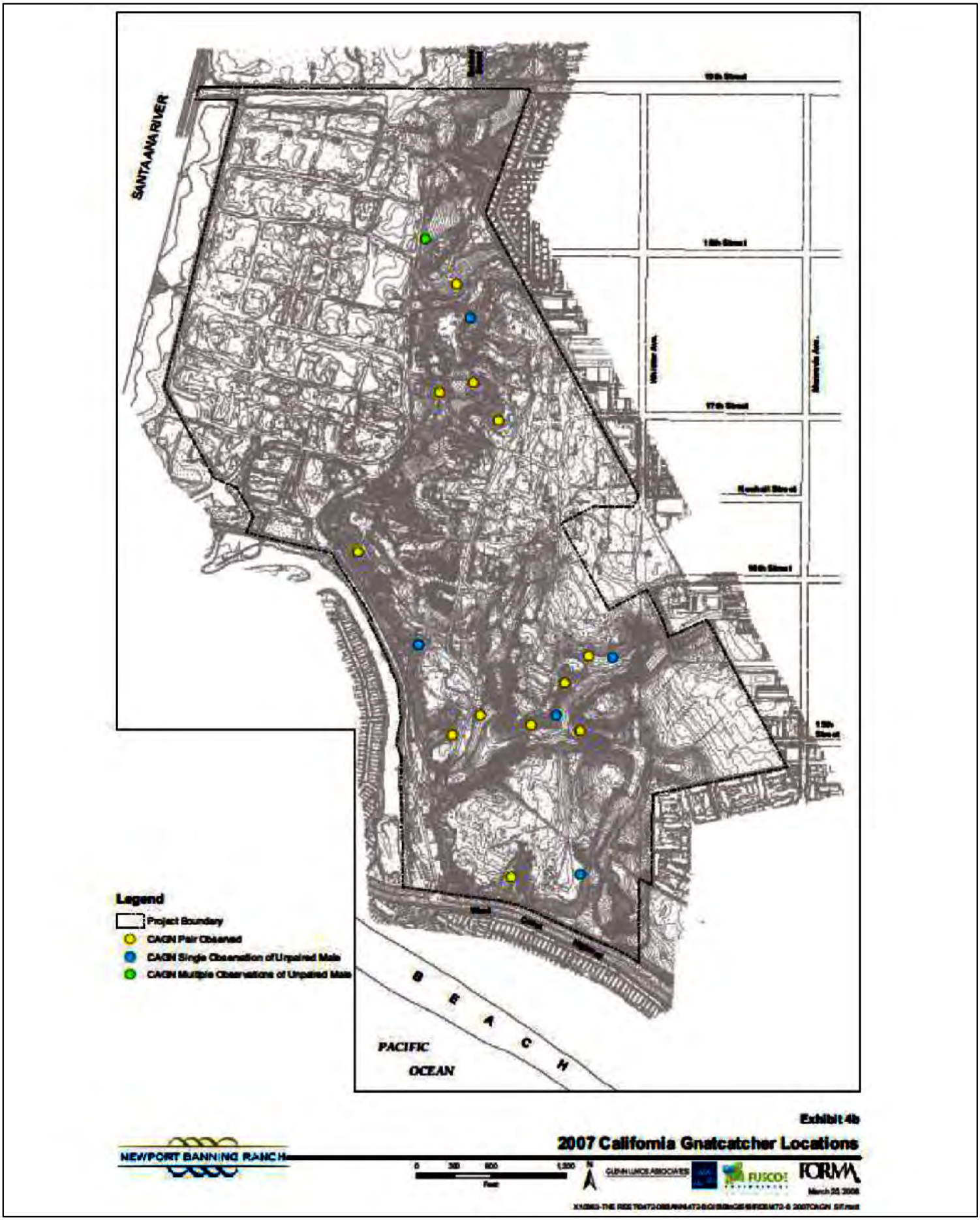


Figure 28. GLA 2007 Gnatcatcher Survey Data.

For Illustrative Purposes Only. Source: GLA.

Figure 29. BonTerra 2009 Gnatcatcher Survey Data.
For Illustrative Purposes Only. Source: BonTerra.

Figure 30. Dudek 2013 Gnatcatcher Survey Data.

For Illustrative Purposes Only. Source: Dudek.

Figure 31. Dudek 2015 Gnatcatcher Survey Data.

For Illustrative Purposes Only. Source: Dudek.

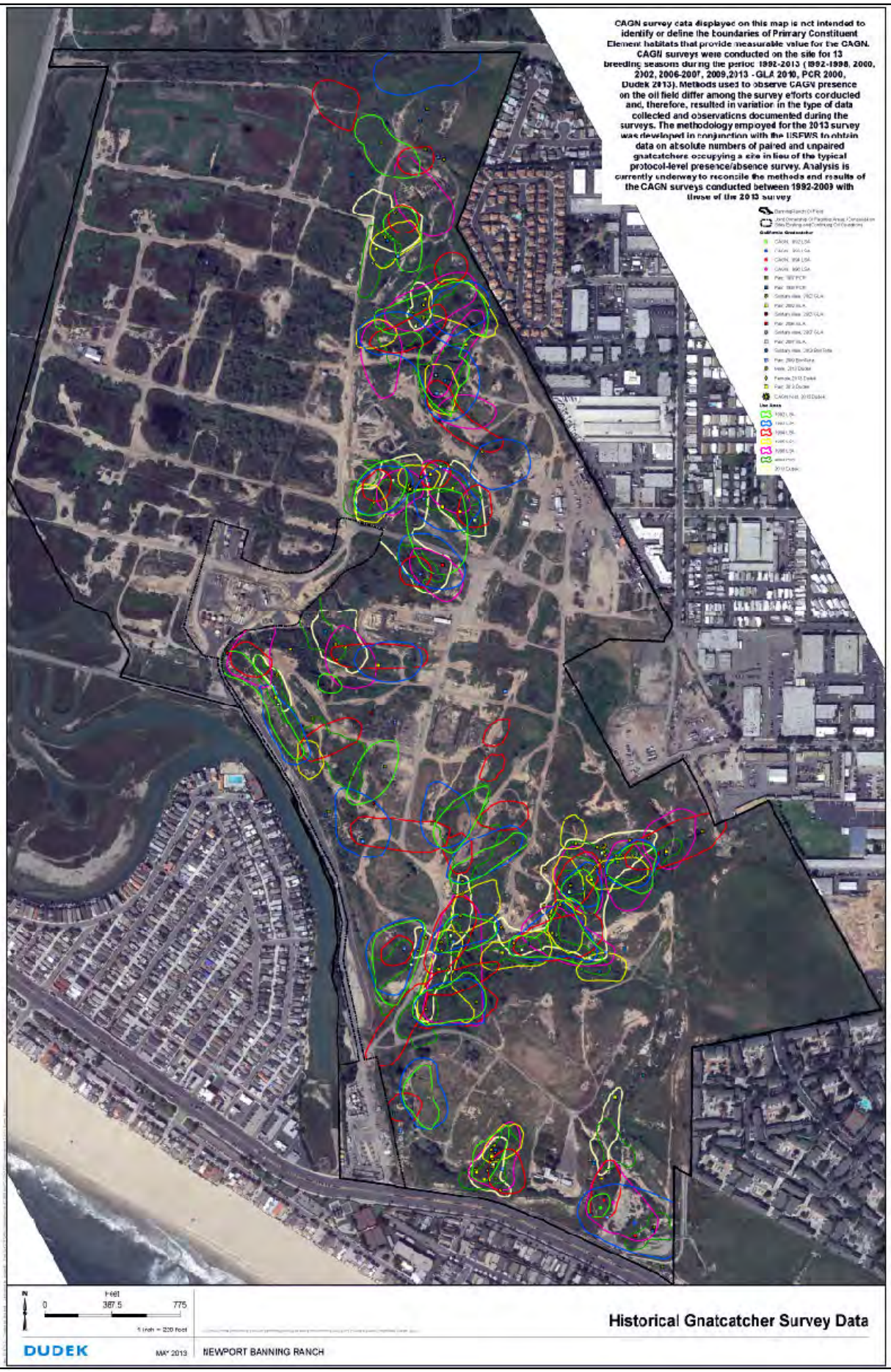


Figure 32. Dudek 1992-2013 Gnatcatcher Compilation Data.

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For Illustrative Purposes Only. Source: Dudek.

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

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

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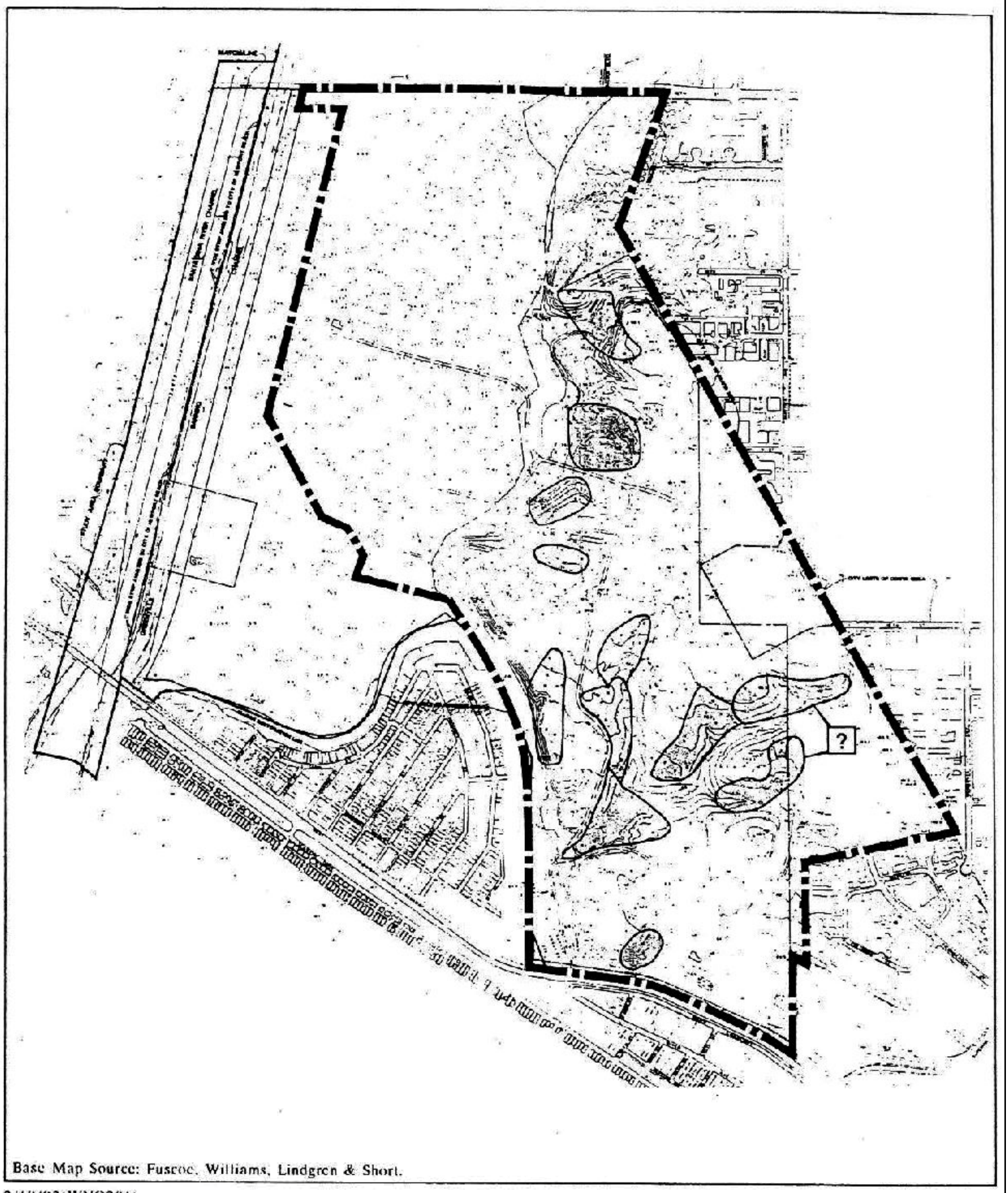

Figure 34. LSA 1992 Cactus Wren Survey Data.
For Illustrative Purposes Only. Source: LSA.

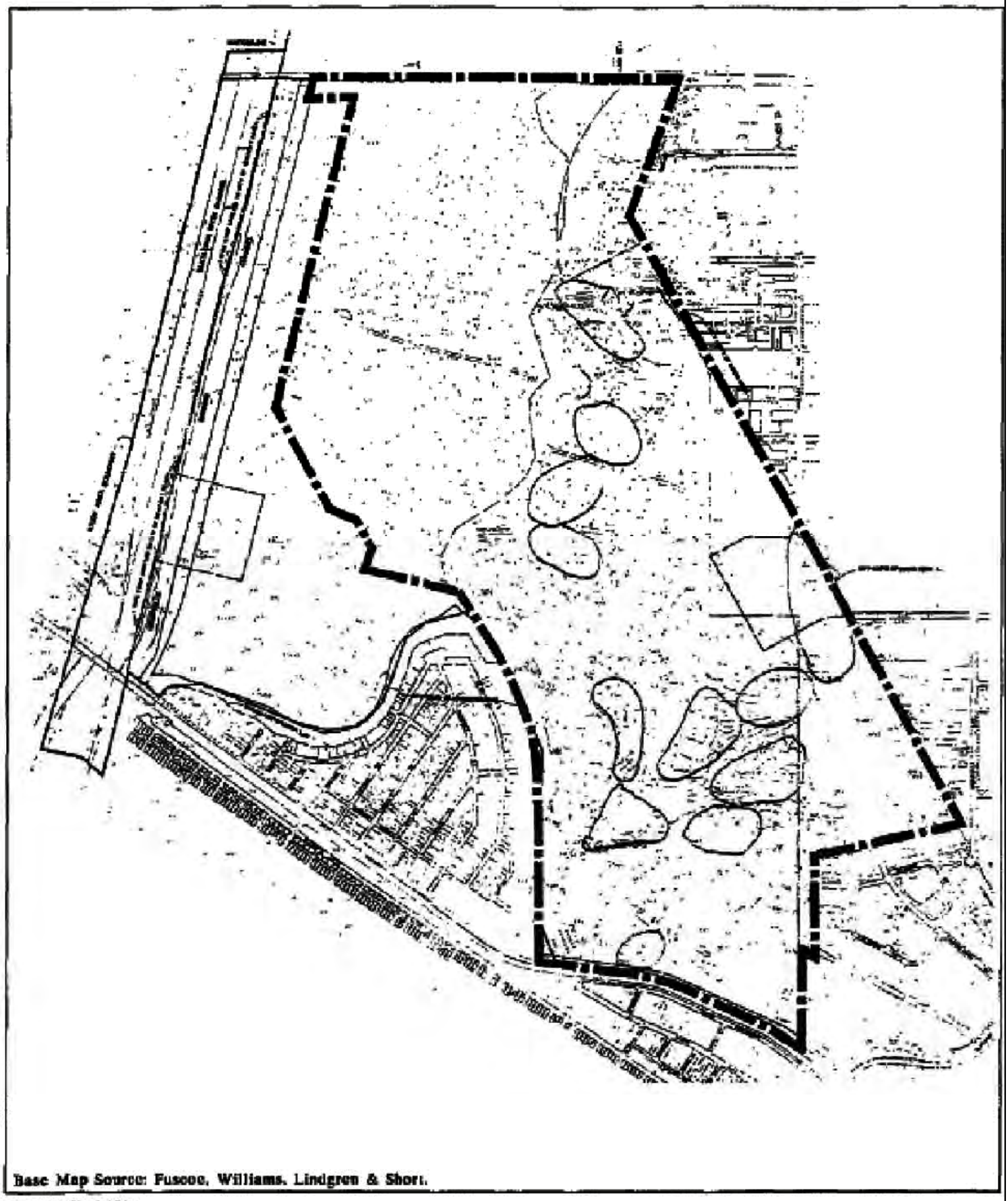

Figure 35. LSA 1993 Cactus Wren Survey Data.

For Illustrative Purposes Only. Source: LSA.

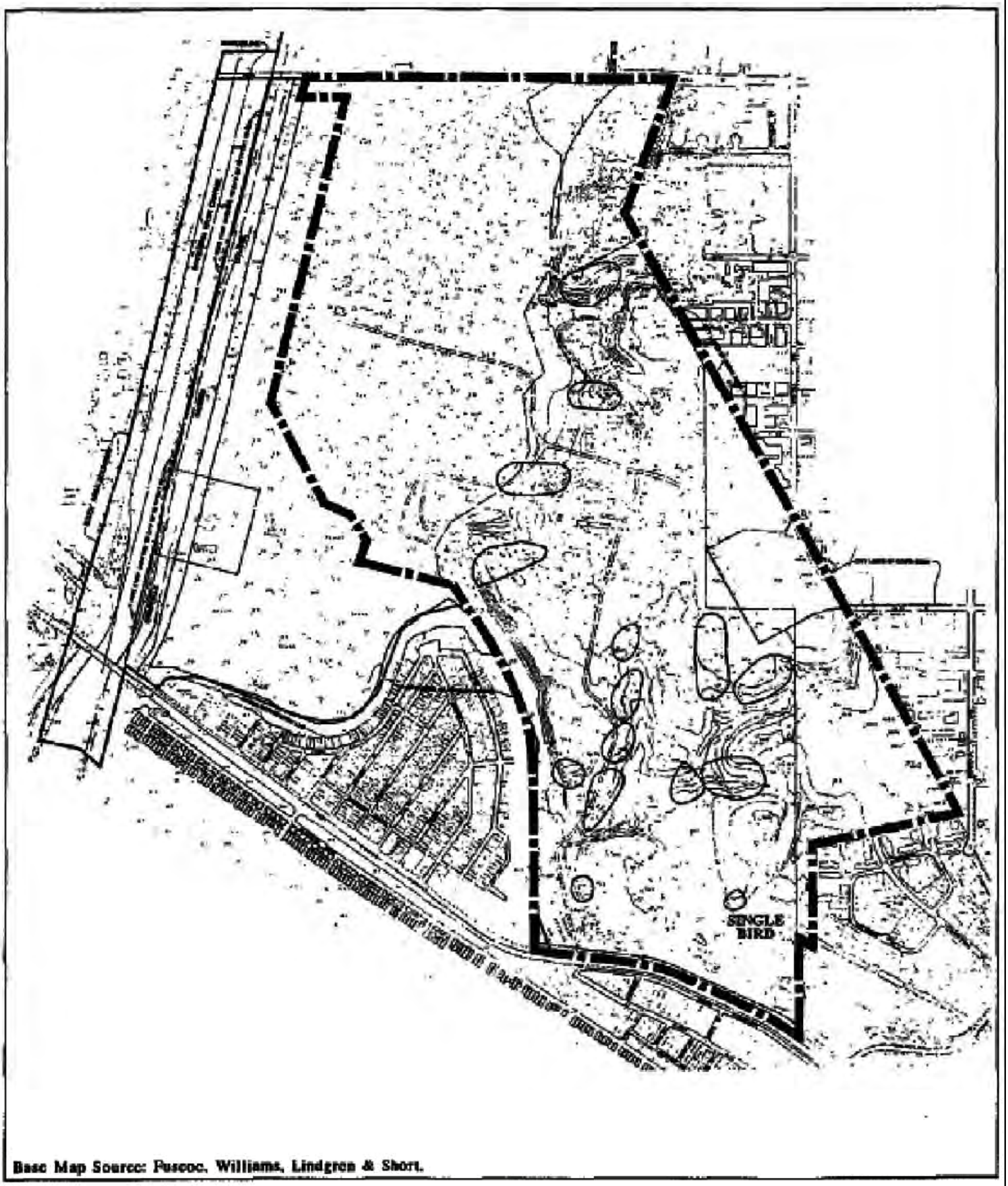

Figure 36. LSA 1994 Cactus Wren Survey Data.
For Illustrative Purposes Only. Source: LSA.

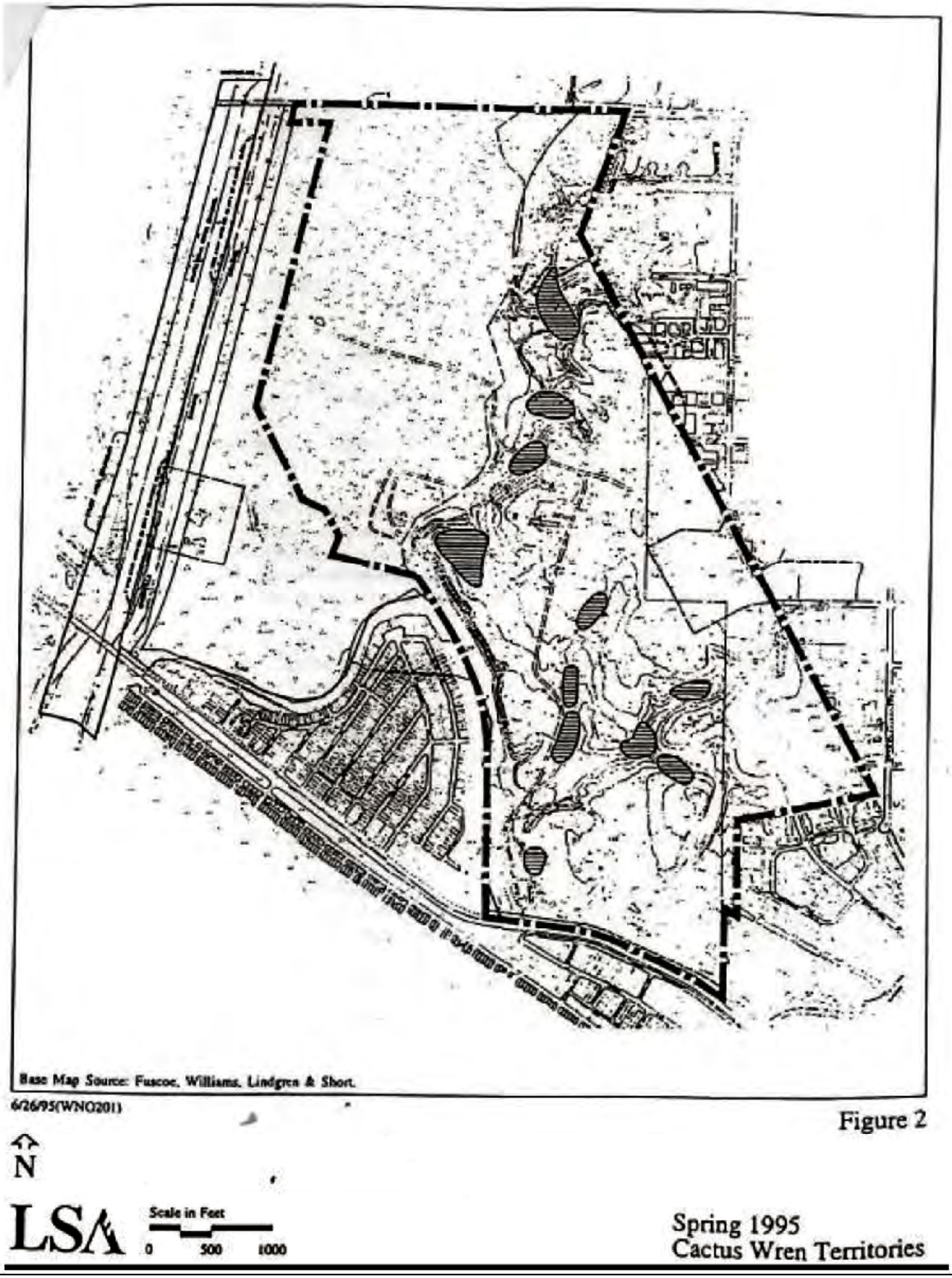

Figure 37. LSA 1995 Cactus Wren Survey Data.

Figure 38. LSA 1996 Cactus Wren Survey Data.
For Illustrative Purposes Only. Source: LSA.

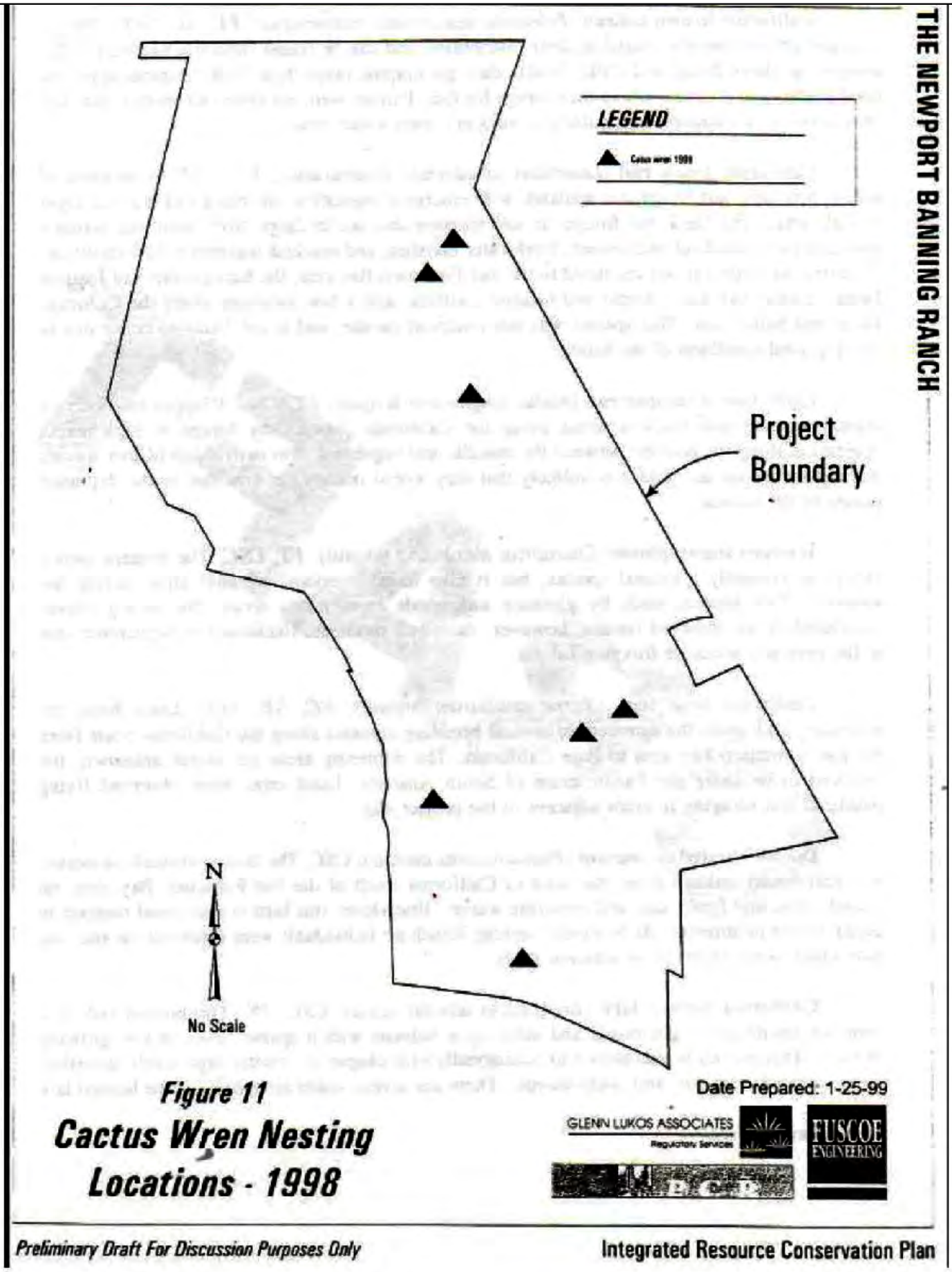

Figure 39. PCR 1998 Cactus Wren Survey Data.
For Illustrative Purposes Only. Source: PCR.

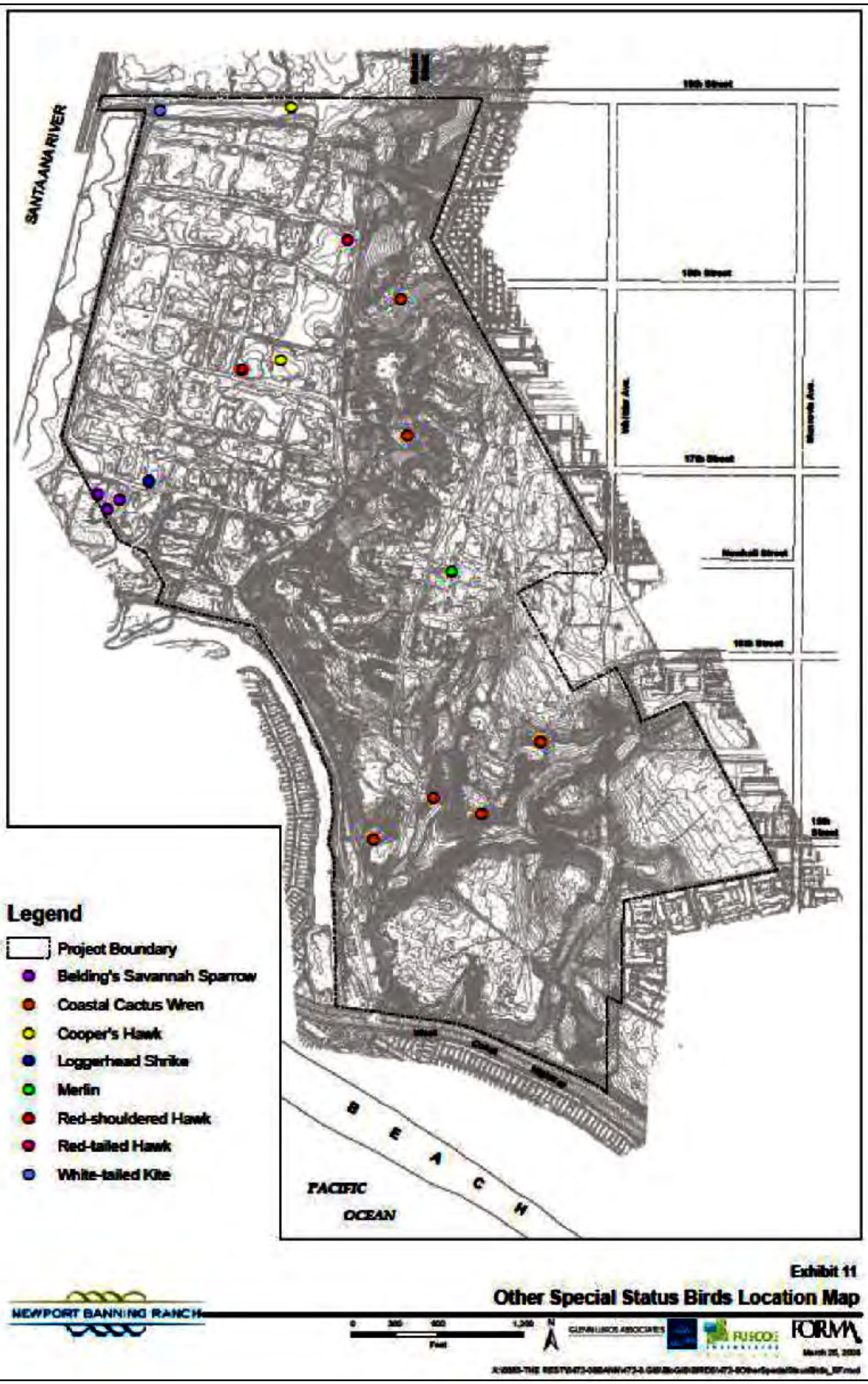

Figure 40. GLA 2008 Cactus Wren Survey Data.

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For Illustrative Purposes Only. Source: GLA.

Figure 41. BonTerra 2009 Cactus Wren Survey Data.

For Illustrative Purposes Only. Source: BonTerra.

Figure 42. Coastal Cactus Wren Sensitive Habitat (NOT ESHA) on Banning Ranch Defined by the Boundary of Compiled Breeding Territories Spanning 1992 to 2009.

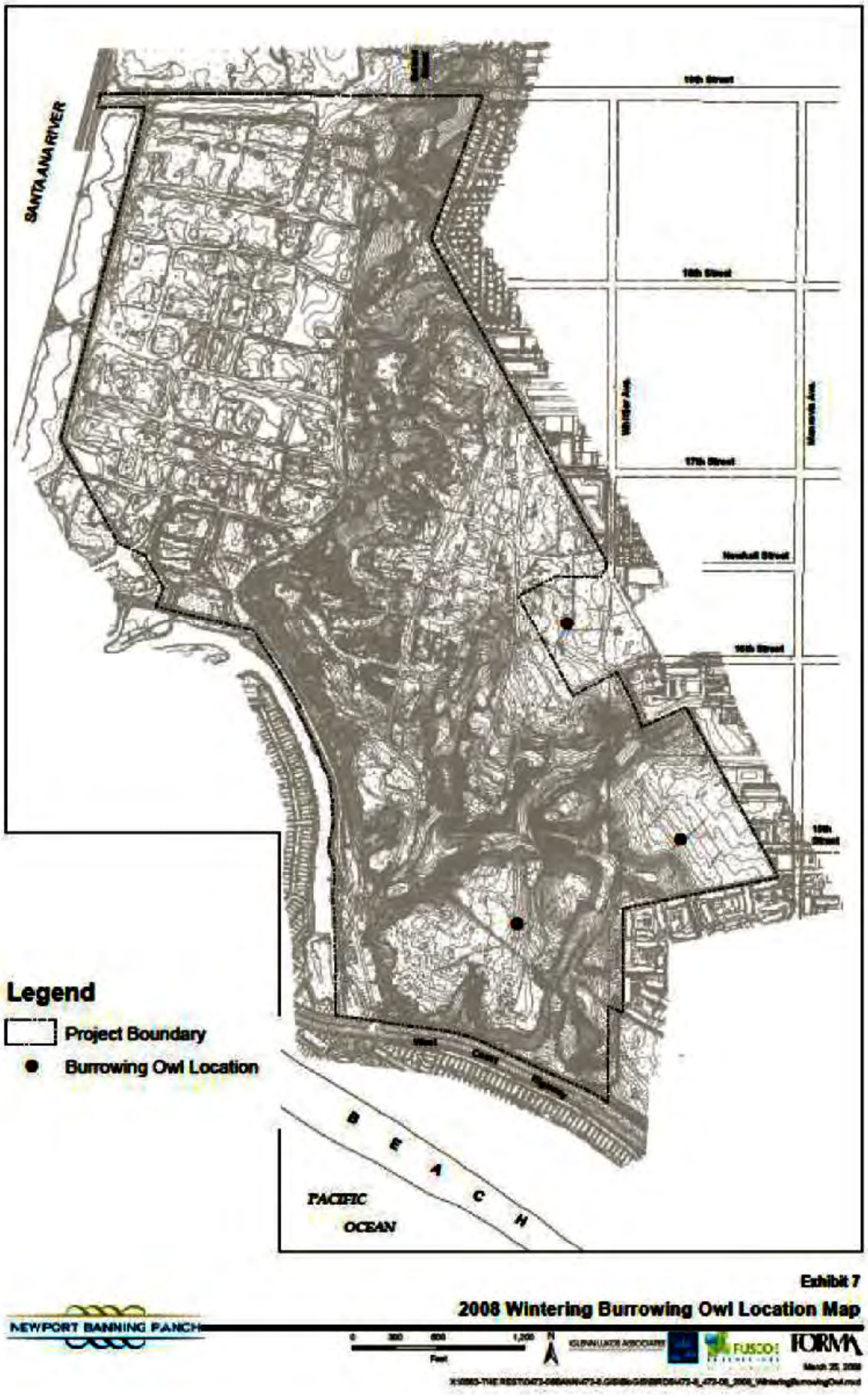
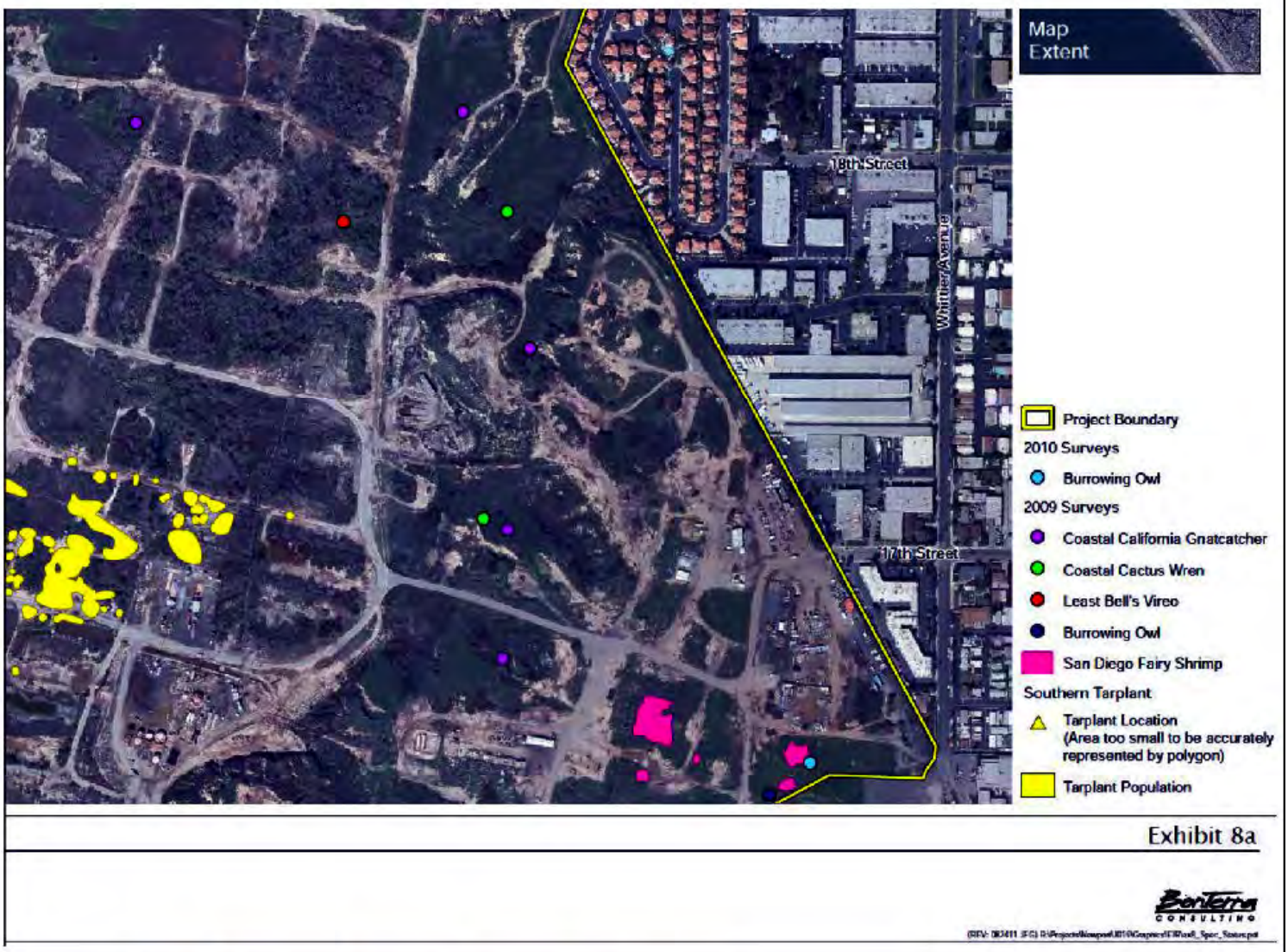


Figure 43. GLA 2008 Winter Burrowing Owl Survey Data.
For Illustrative Purposes Only. Source: GLA.



Map of 2009 and 2010 Burrowing Owl surveys

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Figure 44. BonTerra 2009 and 2010 Winter Burrowing Owl Survey Data.
For Illustrative Purposes Only. Source: BonTerra.

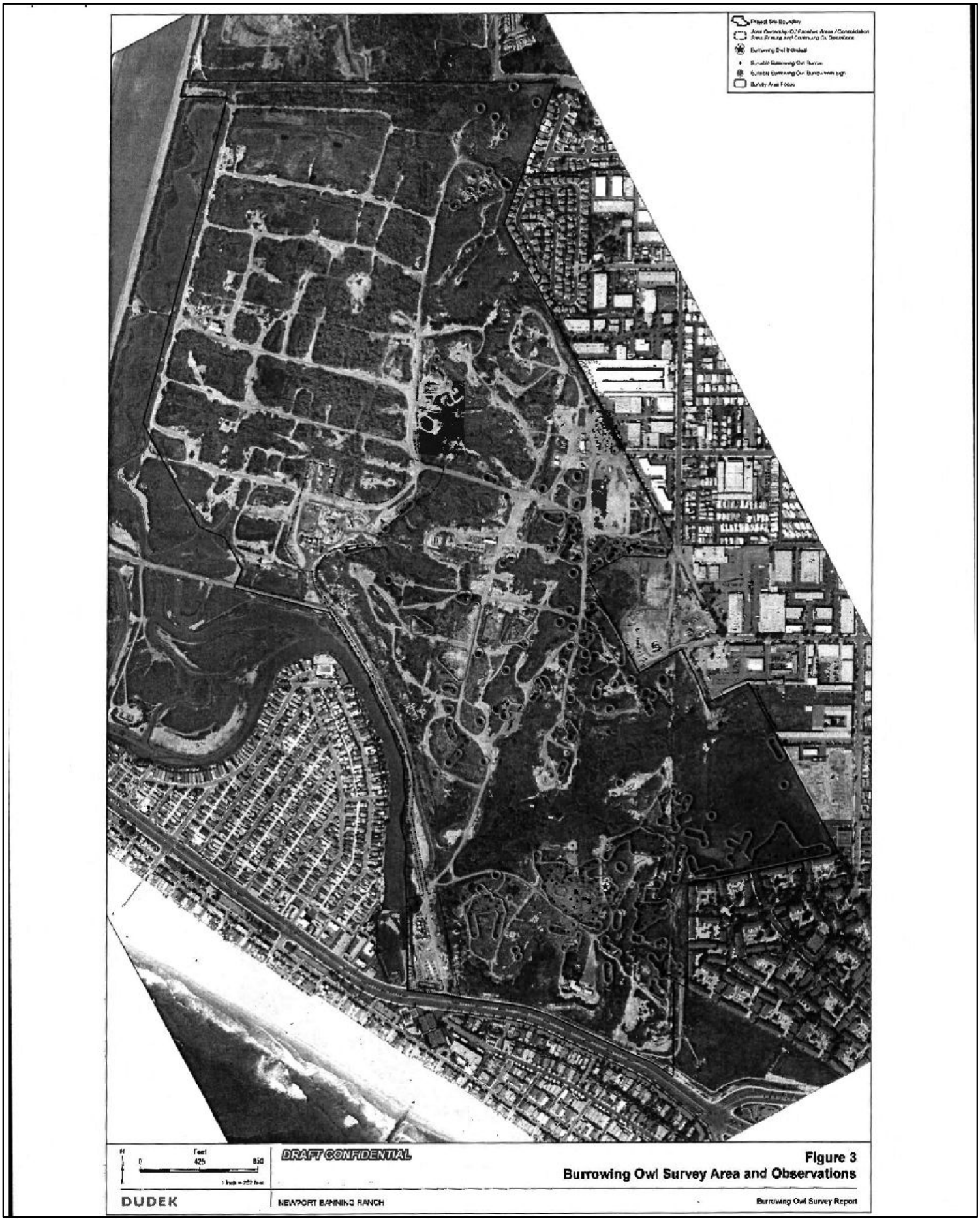

Figure 45. Dudek 2014 Winter Burrowing Owl Survey Data.
For Illustrative Purposes Only. Source: Dudek.

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

Figure 47. Special Status Species on Banning Ranch.
For Illustrative Purposes Only. Source: Dudek.

Figure 48. Raptor Sightings on Banning Ranch.
For Illustrative Purposes Only. Source: Dudek.

Figure 49. Lowland Wetlands on Banning Ranch.

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For Illustrative Purposes Only. Source: Dudek, ESRI.

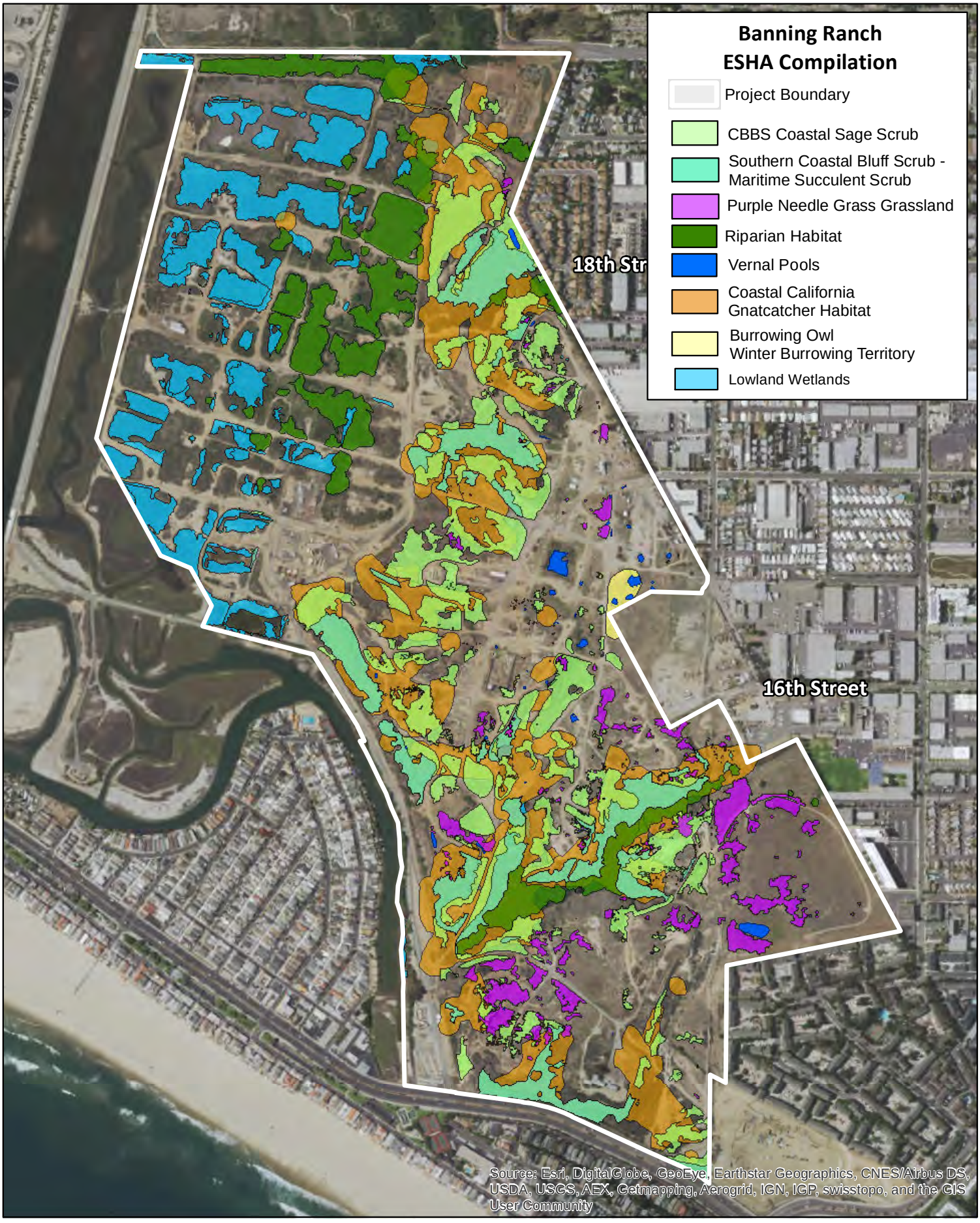

Figure 50. Banning Ranch ESHA and Wetland Boundaries.

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For Illustrative Purposes Only. Source: DudekI, ESRI.

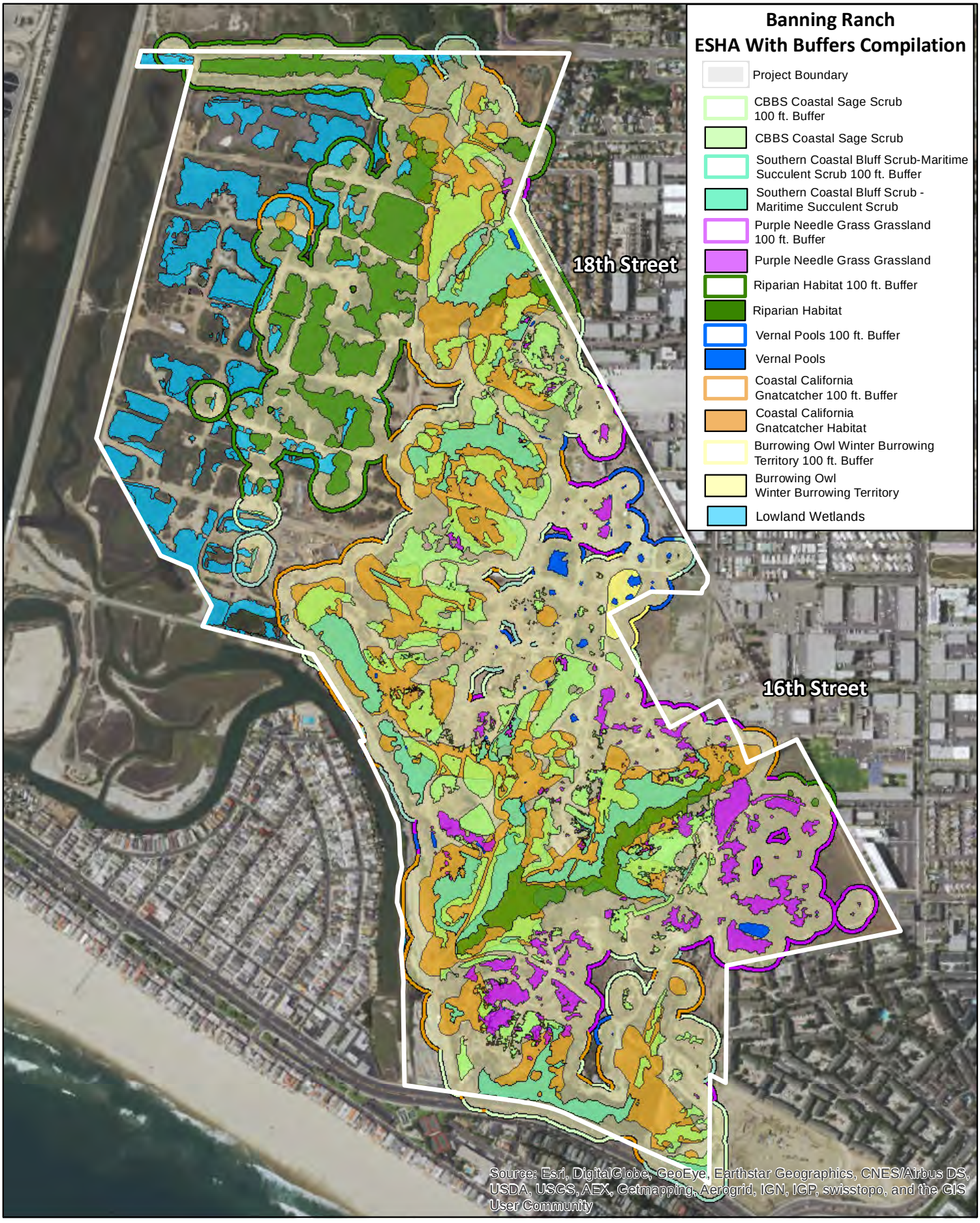

Figure 51. Banning Ranch ESHA and Wetlands with 100 Foot Buffers.

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For Illustrative Purposes Only. Source: DudekI, ESRI.