

# Vegetation Mapping and Classification of the Palos Verdes Nature Preserve



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## Introduction

The Palos Verdes Peninsula Land Conservancy (PVPLC) partnered with the California Native Plant Society (CNPS) to produce a fine-scale, spatially and floristically accurate vegetation map of the 1200 acre Palos Verdes Nature Preserve (PVNP), Los Angeles County, CA (Figure 1). The project area represents several biologically rare habitat types, including coastal sage and cactus scrub, in addition to hosting several rare and endangered plant and animal species. A primary objective of this project was to create an accurate baseline vegetation map for the Rancho Palos Verdes Natural Community Conservation Plan (NCCP) area.

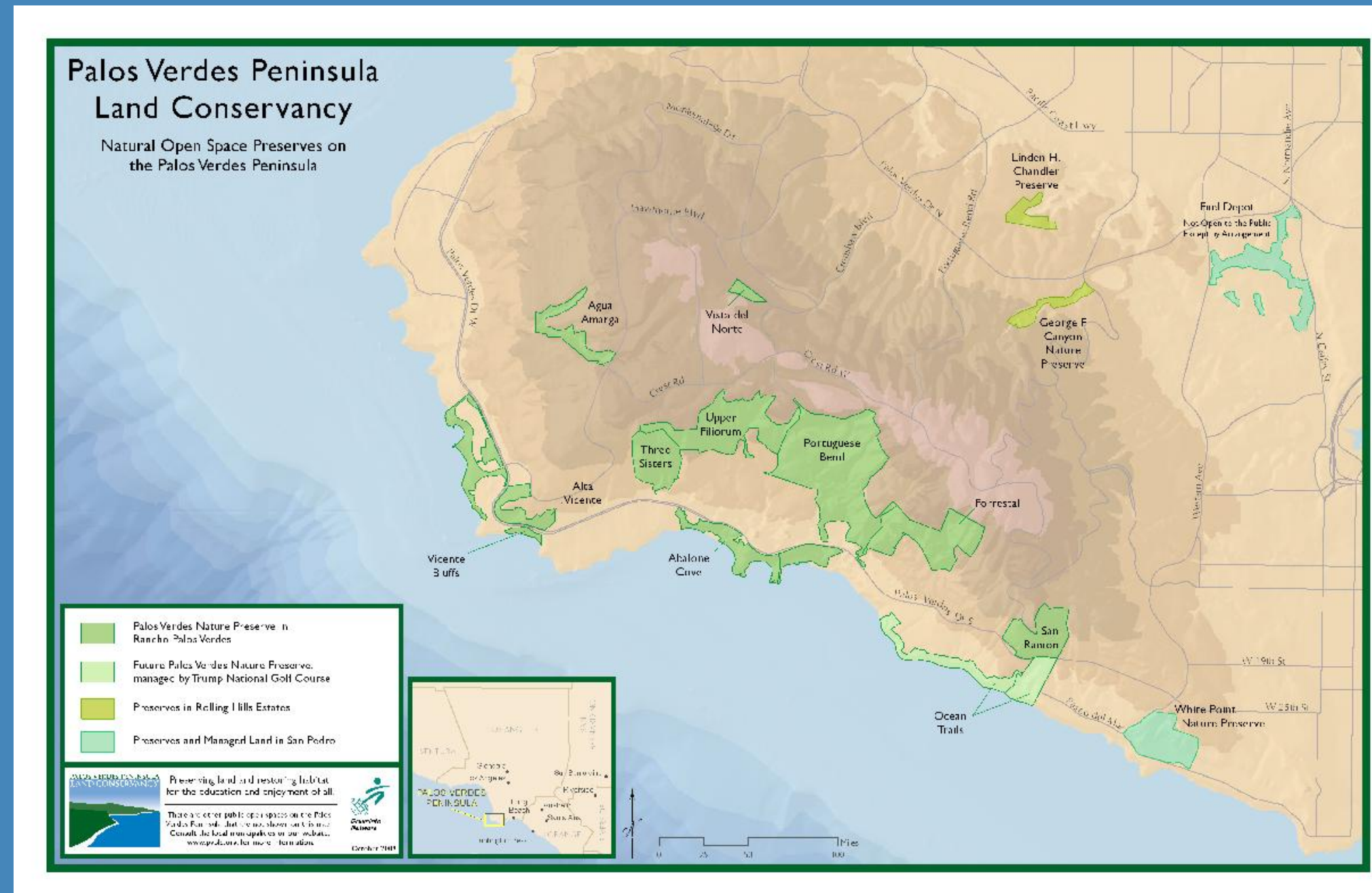


Figure 1: A location map of the Palos Verdes Peninsula, outlining the PVNP and other lands managed by the PVPLC.

## Methods

Vegetation Rapid Assessment and Relevé sampling protocol (CNPS 2007, 2009) was used to survey vegetation stands, recording both vegetation and environmental data, from February – May 2009.

To establish an alliance and association level classification, multivariate cluster analysis with a hierarchical agglomerative technique was employed using Sorenson distance and flexible beta linkage method at -0.25, based on species abundance (cover) values converted to 7 different classes as defined in the sampling protocols. The data also were compared to existing classifications in southern California (Keeler-Wolf and Evens 2006).

GIS mapping software was used to digitize the vegetation stands into polygons with individual attributes associated with each polygon stand (Figure 3). Reconnaissance-level field verification was conducted, as well as, quality assessment and quality check in both GIS and the field to ensure a high degree of floristic and spatial accuracy in the map.

## Acknowledgments

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## Results

In the 152 vegetation surveys of the PVNP, 150 vascular plant taxa were identified, including 28 vegetation alliances (Figure 2). Some of the more common native vegetation types found in the PVNP include *Baccharis pilularis* (coyotebrush), *Artemisia californica* (California sagebrush), *Salvia leucophylla* (purple sage), and *Rhus integrifolia* (lemonadeberry), and *Salix lasiolepis* (arroyo willow) alliances. Uncommon vegetation types in the PVNP include: the special stand *Crossosoma californicum* (crossosoma), *Opuntia littoralis* and *Cylindropuntia prolifera* (cactus), *Nassella lepida* (foothill needlegrass), *Leymus condensatus* (giant wildrye), *Hazardia squarrosa* (sawtooth goldenbush) alliances, and all associations including *Eriogonum cinereum* (ashy buckwheat) (Figure 4).

Non-native vegetation was commonly identified throughout the PVNP, repeating across the landscape as large, dominant stands, as well as, individual plants within native stands. In general, most herbaceous stands were observed and documented to have an abundance of non-native species such as *Brassica nigra*, *Bromus* spp., and *Foeniculum vulgare*. Some native species including forbs may occur in these stands, and they may fluctuate seasonally.

Vegetation stands adjacent to urban areas tended to be disturbed by non-native species and other human-level disturbance factors unless the area was sloped and generally inaccessible. In these cases, native vegetation on the slopes was dense and generally undisturbed by non-native species and other human impacts. Another common trend found was that along trails and roads, non-native species were most dense. Rare and covered species were generally found in areas less accessible with limited trails and roads.

## Discussion

The results of this project are a detailed, accurate map of the vegetation in the PVNP. This information can now be used to answer questions ranging from species-specific management to targeting the most likely places to reduce fuel loads. We can now find precise location information for specific habitats of NCCP-covered species, identify areas for conservation within sensitive natural communities and habitats with invasive species, restore habitat value based on various attributes, and create linkages to wildlife habitats through restoration.

When considering management issues across the entire PVNP, it is important to view the land in its entirety and how it functions within the surrounding urban matrix. Approximately 41% of vegetation polygons are adjacent to urban areas. Management activities should be approached with the goal of sustaining native habitat and populations in the context of an urban environment. Invasive species and unauthorized trails appear to be the largest threat to preserving intact native vegetation stands in the PVNP.

## References

- California Native Plant Society (CNPS). 2007. CNPS Vegetation Rapid Assessment Protocol (February 21, 2007). <http://www.cnps.org/cnps/vegetation/protocol.php>.
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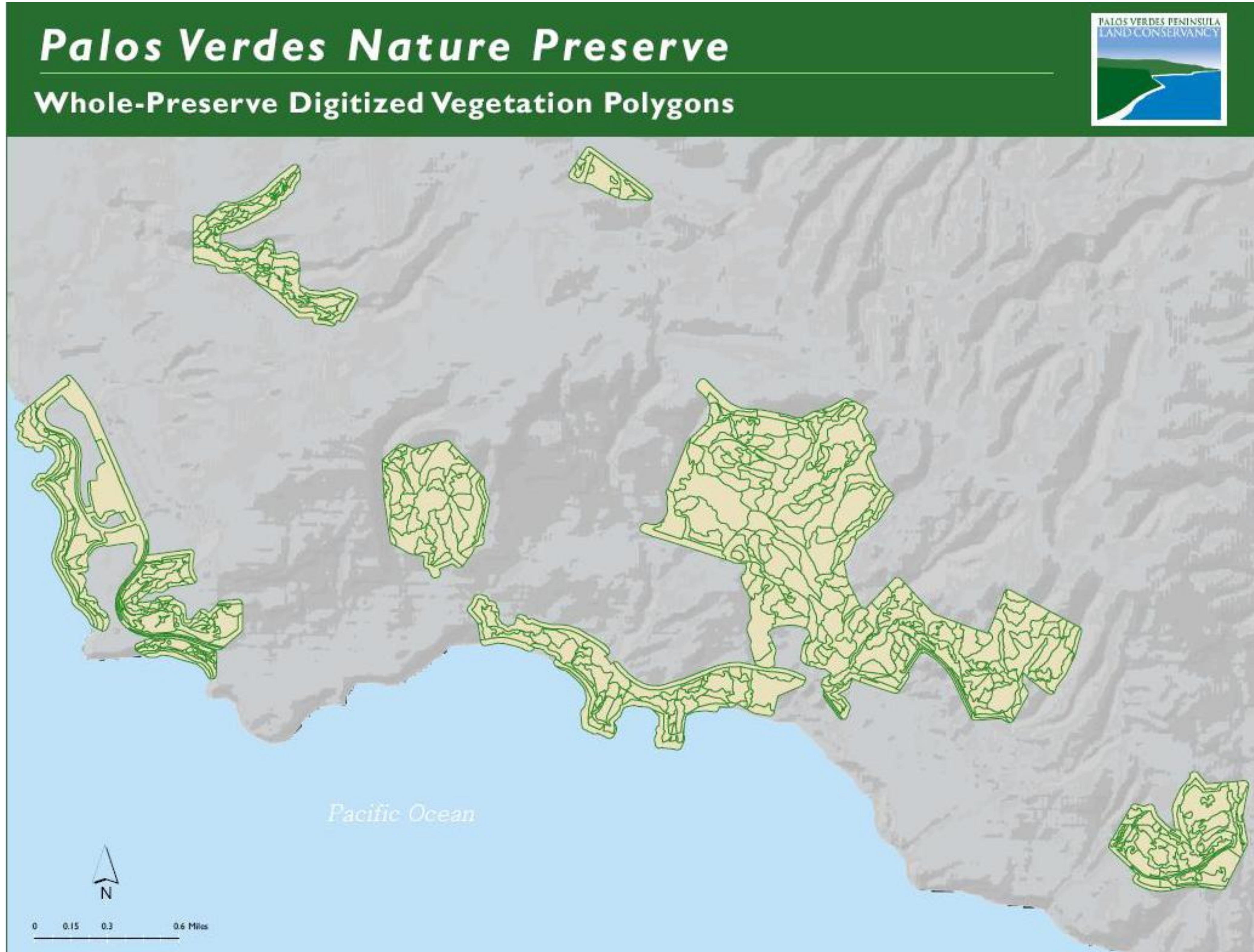


Figure 2: A Preserve-wide map depicting all digitized vegetation polygons.



*Crossosoma californicum*



*Lotus scoparius*  
(with PVB butterfly)



*Cylindropuntia prolifera*

Figure 4: Examples of uncommon vegetation types found in the PVNP.

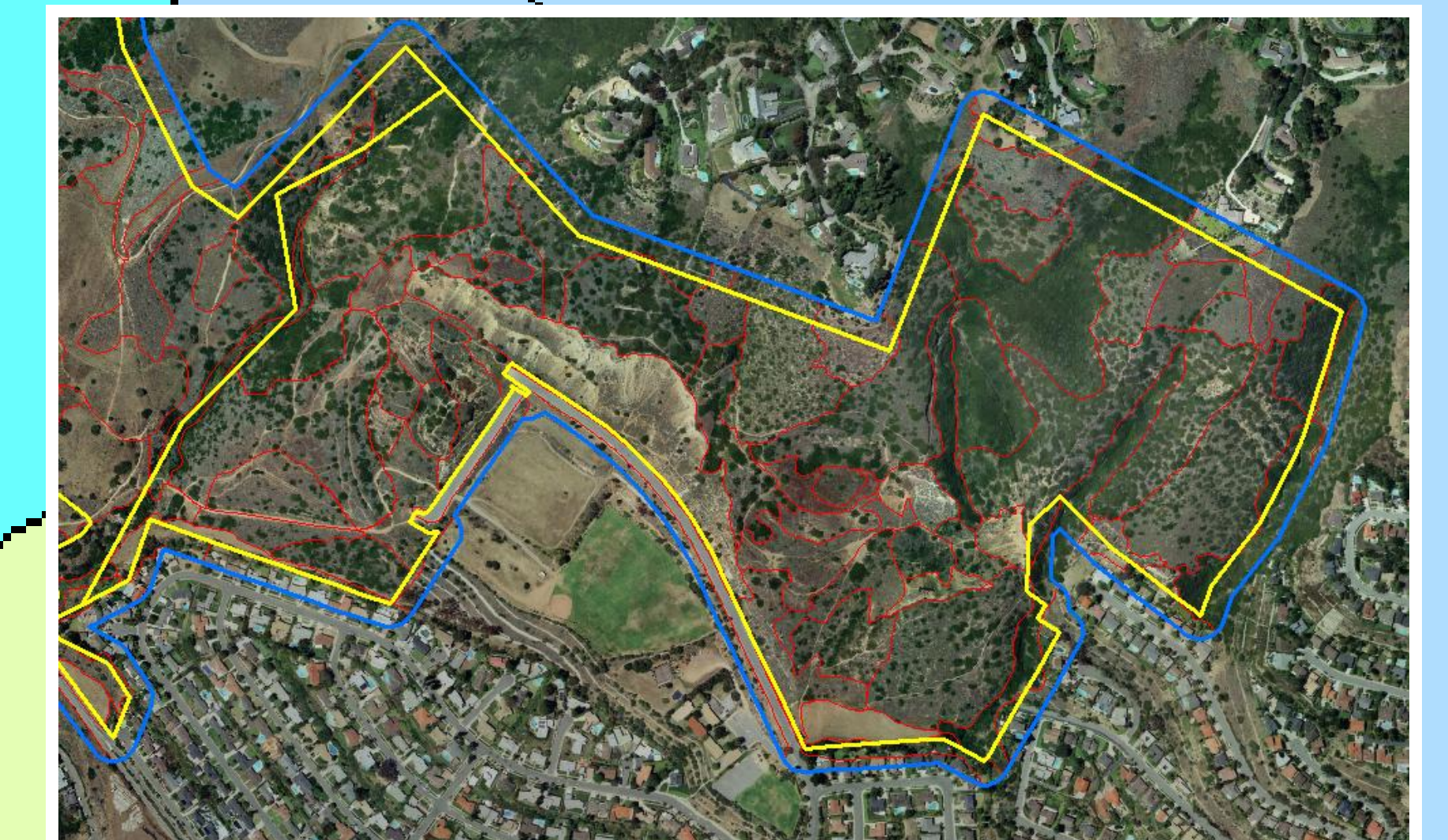


Figure 3: Vegetation stands surveyed in the field (above), then digitized using GIS (below).