

Evaluating Ecological Conservation Gaps Across a Proposed Sentinel Landscape



Photo: Gaviota Coast Conservancy

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OBJECTIVES

1. Map and identify ecological conservation priorities in the proposed Vandenberg Space Force Base (VSFB) Sentinel Landscapes Partnership (SLP) region based on an assessment of conservation priority indicators.
2. Understand and analyze regional stakeholder conservation project implementation strategies.
3. Create a geodatabase of conservation projects in the proposed SLP region.
4. Compare identified projects to high-priority conservation areas and provide recommendations for project opportunities to be included in an SLP designation application.

SIGNIFICANCE & BACKGROUND

Santa Barbara County, located within the California Floristic Province, is renowned for its rich biodiversity. Its unique biogeography and Mediterranean climate produce a diverse landscape that can support a wide variety of plants and animals, many of which are endemic or rare. This biodiversity contributes to regional ecological health and essential ecosystem services necessary to support the natural and human communities in the region.

Despite Santa Barbara County's designation as a global biodiversity hotspot, infrastructure development, urban expansion, and climate change threaten biodiversity in this region. To tackle this challenge, conservation projects are implemented to mitigate the impacts of these threats; however, these projects often face delays and funding issues. Delayed implementation of conservation projects is often referred to as the planning-implementation gap. Stakeholder engagement and collaboration are crucial to addressing the implementation gap, as they promote a commitment to developing shared conservation priorities.

The Sentinel Landscapes Partnership (SLP) offers an opportunity to balance the needs of development with conservation. SLP is a federal designation for a military base that can provide the area with the necessary funding to advance projects that address the conservation needs of the region. An SLP is currently being proposed for the Gaviota region in partnership with Vandenberg Space Force Base (VSFB), which would bring funding to conserve natural resources, bolster agricultural and forestry economies, and increase resilience to climate change in Santa Barbara County.

For our project, we propose to understand local conservation priorities and identify opportunities to implement projects that advance the SLP mission. We plan to map and identify ecological conservation priorities in the proposed VSFB-SLP region based on an assessment of conservation priority indicators. Through interviews with SLP stakeholders, we plan to identify critical insights and project-based interventions that would address the conservation needs of the region in support of the application for SLP designation. Finally, we will compare identified projects to high-priority conservation areas and provide recommendations for project opportunities to be included in an SLP designation application.

EQUITY

This project will utilize demographic and indicator data from CalEnviroScreen to identify high-priority conservation areas in regard to environmental burdens faced by disadvantaged communities. This equity and conservation priority map will be integrated into a final conservation priority map to support equity and environmental justice considerations in future conservation planning. In addition, our commitment includes facilitating collaborative stakeholder engagement ensuring residents' concerns shape project planning.

APPROACH

Factor and composite priority maps

- Factor maps - Composite priority map - add the individual factor maps to identify areas of high and low conservation priority, where areas of low quality, high risk, high implementation feasibility, and high equity priority indicate areas of high conservation priority.
- In ArcGIS Pro, create four-factor maps (ecological quality status, threat status, project implementation feasibility, and equity) using multiple indicators of priority areas and attribute rankings, where high-rank values indicate areas of high conservation priority.

Stakeholder interview analysis

- Interview stakeholder organization representatives to understand their project implementation strategies and motivations.
- Gather the following project information from stakeholders: title, description, timeframe, and location (coordinates/shapefile).
- Utilize multivariate analysis in R (clustering and ordination) to reveal overlapping motivations that advance a project to implementation and assess how an SLP designation could bolster on project implementation.

Conservation gap analysis

- Geographically compare the locations of stakeholder projects to areas of high ecological conservation priority to determine if and where interventions align and where conservation gaps are located.

AVAILABLE DATA

Source	Data Description
CAL FIRE FRAP	Vegetation classifications, fire threat, land ownership
USGS	National Land Cover Database, Digital Elevation Models
USDA	SSURGO database, NAIP imagery, conservation easements, watersheds
Data Basin	Landscape intactness, CA soil, climate change projections, CA Roads, habitat connectivity, protected areas, critical habitat
CalEnviroScreen	Pollution burden, demographic indicators
U.S. Census Bureau	TIGER/Line shapefiles, demographic data
Global Biodiversity Information Facility	Species occurrences

DELIVERABLES

- Individual factor maps and composite conservation priority areas map.
- Geodatabase of ongoing and proposed projects integrated into an ArcGIS Online Dashboard for use by LegacyWorks Group and for incorporation in the Vandenberg SFB SLP application.
- Final report outlining project findings and suggestions for future conservation project opportunities in the proposed SLP region.

INTERNSHIP

LegacyWorks Group, in partnership with the Coastal Ranches Conservancy and Gaviota Coast Conservancy, will provide funding for one full-time summer internship, allowing a group member to continue working on the Group Project through the summer.