Comparing Mitigation Strategies: Ecological Outcomes and Policy Implications

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Background

California state law requires local permitting agencies to develop and enforce mitigation requirements for environmental impacts from development projects. When project impacts cannot be avoided they must be replaced or compensated under the California Environmental Quality Act. In the City and County of Santa Barbara removal of native trees is historically mitigated with replacement trees in nearby locations at a 10 to 1 ratio. Mitigation replaces social and environmental benefits lost through development.

Mitigation is a major driver for conservation and restoration efforts in California. Sub-par mitigation can threaten critical species and their habitats, cause time delays and high risks for developers, and result in fragmented project-by-project outcomes. Well-designed local mitigation programs can result in better outcomes for ecosystems, developers, and communities. This project characterized mitigation in Santa Barbara and identified mechanisms for improvement to the current program through a review of alternative mitigation frameworks, such as Regional Advanced Mitigation Planning, Habitat Conservation Planning, and wetlands banking.

Environmental Mitigation in Santa Barbara

The structural elements of environmental mitigation in Santa Barbara determine whether mitigation can create the best outcomes for ecosystems and stakeholders. Mitigation in Santa Barbara is:

On-site
Reactive
Short-term planning horizon
Single species replacement
In-kind

Seven important values of mitigation programs, shown right, were identified through a literature review and stakeholder interviews. Mitigation in Santa Barbara fails to capture all but two of these values; it is only implementable and reduces time and costs for permitting agencies.

Mitigation Values	Santa Barbara
Regional and landscape level in scope	
Improves ecosystem function and process	
Based on best available science	
Implementable	
Reduces time/cost for developers	
Economically efficient	
Reduces time/cost for agencies	

Case Study Overview



The Santa Barbara Museum of Natural History proposed a multi-phase redevelopment project to upgrade its Mission Creek campus. Though the project was tabled in favor of a simpler plan, the original project proposal served as a useful case study of environmental mitigation in Santa Barbara.

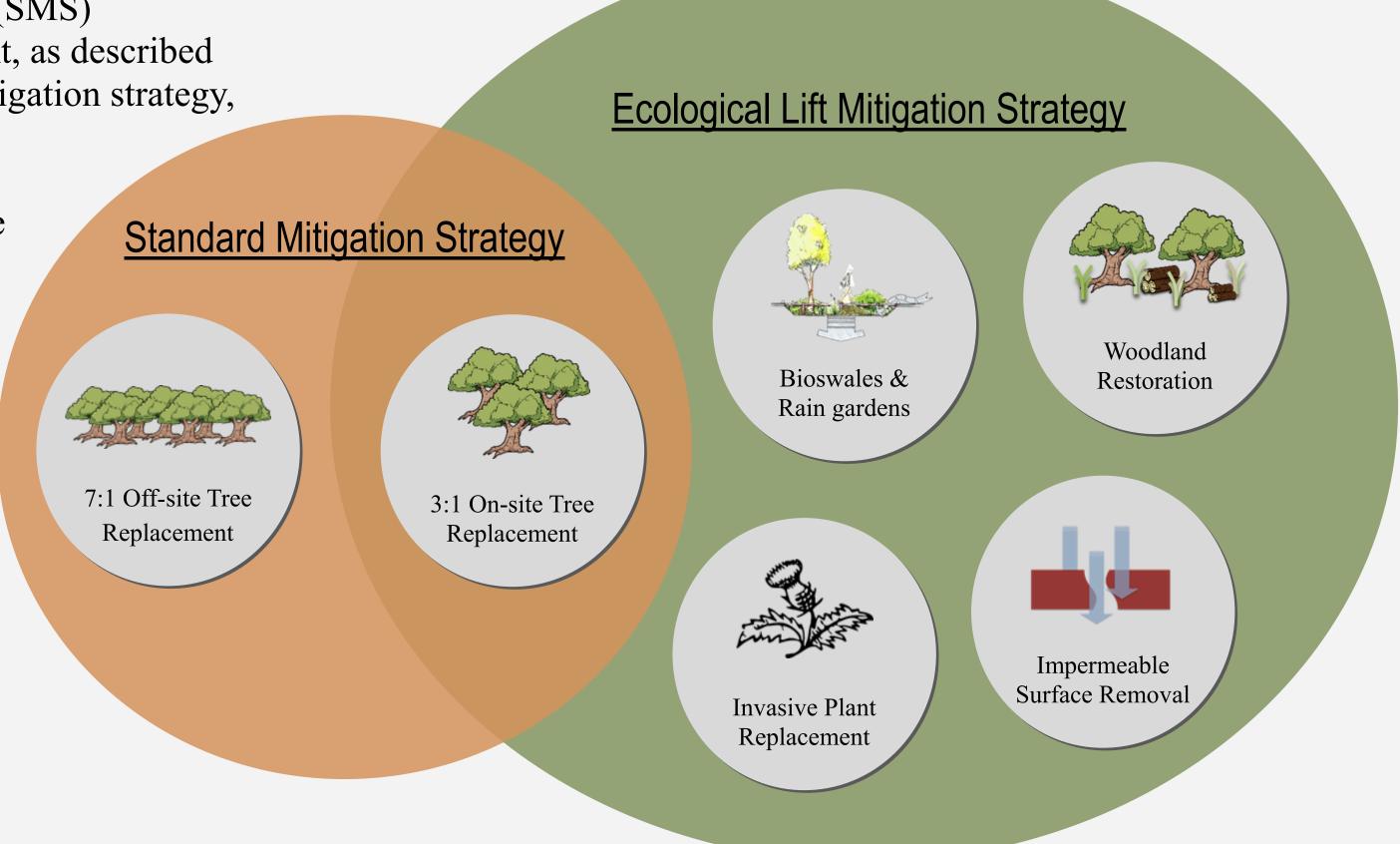
Throughout the redevelopment project, more than 70 protected coast live oak (*Quercus agrifolia*) and Western sycamore (*Platanus racemosa*) trees would have been significantly impacted, triggering CEQA's mitigation mandate. Santa Barbara's standard 10 to 1 tree replacement mitigation approach would require planting over 700 new trees and require at least 4 acres of land. The Museum's campus cannot physically accommodate the high number of replacement trees, suggesting off-site mitigation would be necessary.

Mitigation Strategies

Santa Barbara's Standard Mitigation Strategy (SMS) encompasses the 10:1 replacement requirement, as described above. The Museum proposed an alternate mitigation strategy, termed the Ecological Lift Mitigation Strategy (ELMS). The components, or "Management"

(ELMS). The components, or "Management Actions," of each Strategy are illustrated in the diagram on right. These Actions are on-the-ground steps that satisfy ecological, legal, or outreach goals.

Right: Management Actions grouped by Mitigation Strategy. SMS encompasses two tree replacement actions due to on-site space constraints. ELMS includes the on-site tree replacement action and additional actions.



Project Objectives

Case Study

Conduct an independent analysis comparing two mitigation strategies' expected environmental and social outcomes at the

Policy Analysis

Characterize current environmental mitigation in Santa Barbara and identify mechanisms for improvement.

Highlighted Results

As shown below, Santa Barbara's SMS would likely achieve fewer environmental and social outcomes than the Museum's ELMS would generally create more environmental benefits to a wider range of ecological targets, such as native plant and animal habitat quality, flood control, and water quality. ELMS better aligns with current Santa Barbara policies and community values, would cost less to implement

alues, would cost less to implement and would better fulfill important social and institutional goals.

Top left: ELMS outperforms SMS across all four Ecology Metrics.
Performance is in terms of the number of Targets one Strategy achieves better than the other (the Target Achievement Differential).

Top right: ELMS aligns with 30 out of 31 Policy Targets, outperforming SMS, which aligns with only 24.

Bottom left: In terms of short-term, long-term, and annual maintenance costs, ELMS is less expensive than SMS. However, land acquisition costs are the greatest component of SMS and if avoided, SMS would be less expensive.

Bottom right: ELMS outperforms SMS across both Outreach Targets, evaluated using qualitative scales.

Recommendations

Independent Panel of Scientists

To focus on ecosystem function and process, the team recommends an independent panel of scientists be used to develop mitigation requirements. An independent panel could lend credibility and could contribute ecosystem service, conservation planning, and mapping expertise.

Regional Planning Area

A regional planning area would leverage environmental mitigation projects to fulfill comprehensive and strategic regional goals. An integrated resource management plan would balance expected development and mitigation opportunities. This would help identify high value natural resource areas and incorporate strategic goals and visions from Santa Barbara's existing City and County plans.

Broad Stakeholder Involvement Cross-j Involving citizen groups, landowners.

Involving citizen groups, landowners, and developers in the planning process is essential for balancing diverse landuse objectives and values.

Improving Santa Barbara Mitigation

Mitigation Banking

Income from credits supporting a well designed and expertly managed mitigation bank may be more effective than tasking developers with the placement, management, and monitoring of separate mitigation projects.

Cross-jurisdictional Oversight Committee

An oversight committee that includes local, state and federal representatives and an adaptive management process is recommended to ensure the success of a regionally focused mitigation

program. Representation from multiple jurisdictions would facilitate implementation.

Strategic Site Selection

To advance carefully identified regional goals, mitigation must be strategically sited on or off-site. Areas with high natural resource value should be identified in both the City and the County. Mitigation sites would then be strategically selected in areas that maximize benefits to healthy ecosystem functions and processes.

Case Study Methodology

The team developed an analytic framework, shown right, to compare SMS and ELMS across four major environmental and social impact categories or "Parameters."

The Parameters contain 13 measurable factors or "Metrics", some further divided into "Targets" (59 in total), used to estimate the Management Actions' effects on the environmental and social landscape.

The Metrics, shown right in full, capture biodiversity impacts, alignment with City General Plan policies, and educational utility; example Targets, not shown, include carbon sequestration, water quality improvements, and native habitat changes.

Identify

Effects on

Metrics

Scale to

Museum

Resources

• City Planning Documents

• Museum Plans

Below: Analytic Process

Resources

Management

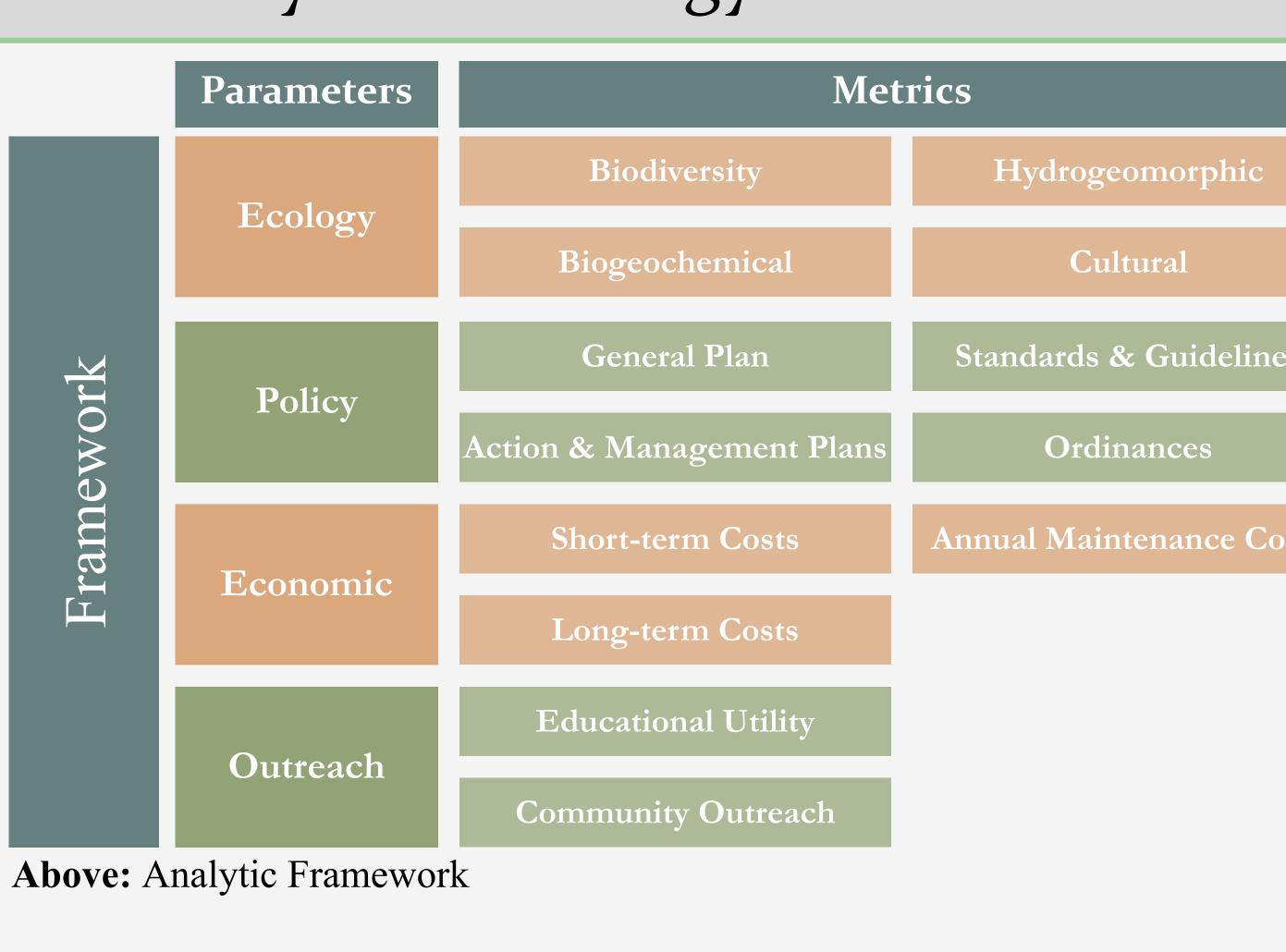
Actions

• Literature Review

Qualitative Scales

Stakeholder Interviews

Agency Guidance and Tool



Compare

Strategies

An extensive literature review, stakeholder interviews, and external reports informed the analytic process of estimating each Management Actions' effects on the Framework's Metrics and Targets.

These resources were used to estimate how the Actions affected Targets via use of the analytic framework above. These impacts were then scaled to the Museum's site, project and anticipated mitigation requirements.

The Management Actions' net effects were then aggregated to compare the anticipated environmental and social outcomes generated by each Strategy.

Conclusions

Aggregate

Results

These recommendations would identify a local and regional network of valuable natural areas based on Santa Barbara's environmental and social goals. This network would facilitate the effective design and siting of future mitigation projects to incrementally enhance environmental health and quality throughout Santa Barbara. Over time, mitigation efforts would efficiently and strategically ensure that important ecosystem services are not lost and that a balance is maintained between important land-use values.

- ◆ Environmental mitigation in Santa Barbara typically is on -site, reactive, and utilizes short-term planning horizons, single species replacement, and in-kind transfers.
- ◆ Compensatory environmental mitigation should maximize seven important values to create the best outcomes for ecosystems, developers, planners and communities. Santa Barbara mitigation fails to capture all but two of these values.
- ◆ The Museum Case Study confirms that existing mitigation practices produce suboptimal results and that mitigation projects could be leveraged to create better environmental and social outcomes.
- ♦ We identified six proven policy mechanisms that Santa Barbara should adopt to improve its environmental mitigation process.

