



Achieving Management and Conservation Goals through the Application of Ecosystem-based Management on the Central Coast of California

“WE CANNOT ADOPT THE WAY OF LIVING THAT WAS SATISFACTORY A HUNDRED YEARS AGO.
THE WORLD IN WHICH WE LIVE HAS CHANGED, AND WE MUST CHANGE WITH IT.”
- FELIX ALDER (D. 1933), FOUNDER OF ETHICAL CULTURE

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SLOSEA Strategic Plan - Executive Summary

The past decade has seen a significant paradigm shift in the management of marine natural resources. Both the Pew Oceans Commission Report and the US Commission on Ocean Policy call for a new “ecosystem based management” (EBM) approach that emphasizes a more holistic management concept that involves participation of scientists, stakeholders and managers in an institutional network that encompasses the linkages and the boundaries of ecosystems. The San Luis Obispo Science & Ecosystem Alliance (SLOSEA) has been working within the marine communities of San Luis Obispo County for the past two-and-a half years to bring ecosystem-based approaches to the management of our local marine resources.

Key Accomplishments - a Solid Foundation for Success

SLOSEA has made tremendous strides to create a collaborative management entity that consists of resource managers from state and federal agencies, public officials from local municipalities, stakeholders that live and work in the ecosystem, and scientists that study the ecosystem. The resulting integrated group has worked together during the past two and a half years to improve management in our area through application of the fundamental principles of marine ecosystem-based management. Our broad-scope accomplishments to that end include:

- Creation of an integrated, ecosystem-based management group across jurisdictional boundaries (SLOSEA Advisory Committee) that meets regularly to share knowledge, identify key needs, and plan actions;
- Increased communication and cooperation among staff at different resource agencies resulting in important collaborations and more efficient use of resources;
- Increased understanding of ecosystem dynamics and processes (including how people interact and use the ecosystem) to improve our framework for making resource management decisions;
- Incorporation of stakeholder knowledge and understanding into the management process that has improved mutual credibility and respect;
- Formal petitions to California Fish and Game Commission to change state regulations where SLOSEA has identified key ecosystem risks and management actions;
- Development of coordinated, ecosystem-based management plans combining the collective knowledge and input from multiple agencies and across jurisdictional boundaries; and
- Increased understanding of how to implement EBM on smaller geographic scales and how to link local activities with broader regional EBM activities.

These accomplishments have created a culture of commitment and performance that carries SLOSEA forward. Participants are not only thinking from an ecosystem perspective but also acting to manage the resources with an ecosystem framework. The sustained commitment of over 35 stakeholders, scientists, and resource managers testifies to the value that SLOSEA delivers.

Key Strategies - Targeted Actions to Enhance Ecosystem Health

From April to August 2008, SLOSEA engaged in a formal strategic planning effort with over 40 participants, including the SLOSEA Advisory Committee and other key experts. The key question was: “Given what we’ve accomplished and learned, how can SLOSEA optimize its value for the future?” In particular, we focused upon identifying specific pathways for SLOSEA’s results to lead to management actions that will make measurable improvements in ecosystem health.

SLOSEA’s strategic plan, developed using the Miradi Adaptive Management software tool, follows the steps outlined by the Conservation Measures Partnership (CMP)¹ in its Open Standards for the Practice of Conservation. The output of this effort has focused SLOSEA strategies over the next several years on the following areas. SLOSEA will:

- Address Key Pollutant Sources and Impacts
- Build Data and Framework for Regional Fisheries Management
- Guide Appropriate Levels of Human Access
- Identify, Detect, and Control Marine Invasives
- Inform Decision Making for a Diversified Marine Economy
- Characterize Climate Change Effects and Prioritize Local Actions

Summary of Strategic Plan Elements

Vision: A healthy, resilient coastal ecosystem that provides for thriving and interacting populations of plant, animal and human communities.

Scope: Morro Bay Estuary and the nearshore coast (to 100 fathoms) and associated watersheds from Point Lopez to Point Conception.

Resource Management Targets and Goals:

SLOSEA identified eight resource management targets that the team felt it needed to maintain in order to ensure the health of the ecosystems and resources within its scope. These targets and their associated goals include:

TARGET 1: WATERSHEDS
Goal 1.1: By 2025, 80% of the aquatic habitat is “healthy” according to Regional Water Quality Control Board (RWQCB) standards and the remaining 20% exhibits positive trends in key indicators.
Goal 1.2: By 2025, 80% of the lands within any watershed will be supporting key watershed functions, and the remaining 20% will exhibit positive trends in key watershed parameters.
Goal 1.3: By 2025, 80% of the groundwater will test clean according to the standards of the RWQCB, and the remaining 20% will exhibit positive trends in key parameters.

¹ See <http://www.conservationmeasures.org> (CMP web site) and <http://miradi.org> (Miradi web site)

TARGET 2: ESTUARINE SYSTEMS
Goal 2.1: By 2015, acreage of eelgrass in Morro Bay will be on average 20% greater than levels recorded in 2000.
Goal 2.2: By 2025, dissolved oxygen levels in Morro Bay will remain above anoxic levels for 90% of the year.
Goal 2.3: By 2025, Nitrate levels in Morro Bay will be stay below 5 mg/L for more than 90% of the year.
TARGET 3: SHORELINE HABITATS
Goal 3.1: By 2025, there are 1200 breeding pairs of the Western Snowy Plover, and on average 1.0 chick per male.
Goal 3.2: By 2015, Foliose algal cover in rocky intertidal habitats will be greater than 25% coverage, which is found in most un-impacted intertidal areas. Likewise, in areas where mussels occur mussels will have coverage greater than 80%.
TARGET 4: NEAR SHORE SUBTIDAL
Goal 4.1: By 2020, Sea Otters, as keystone and indicator species of nearshore ecosystem health, will have a population size that exceeds 1,860 animals over a three year period (this goal and indicator are also used to measure the status of the iconic species conservation target).
Goal 4.2: By 2020, the nearshore rockfish assemblage will be substantially recovered compared to its status in the 1990's in terms of level of CPUE (>8), mean size (above median size at 50% maturity), and species composition (all historic species present). This goal and the following 3 indicators are also used to measure the status of the finish conservation target.
TARGET 5: ICONIC SPECIES
Goal 5.1: By 2020, sea otters, as keystone and indicator species of nearshore ecosystem health, will have a population size that exceeds 1,860 animals over a three year period (this goal and indicator are also used to measure the status of the nearshore subtidal conservation target).
Goal 5.2: By 2025, there are 1200 breeding pairs of the Western Snowy Plover, and on average 1.0 chick per male.
TARGET 6: MARINE INVERTEBRATES
Goal 6: By 2020, the abundance of native invertebrate species occupying hard substrata in Morro Bay will increase by 50% relative to values recorded in 2006.
TARGET 7: FINFISH
Goal 7: By 2020, the nearshore rockfish assemblage will be substantially recovered compared to its status in the 1990's in terms of level of CPUE (>8), mean size (above median size at 50% maturity), and species composition (all historic species present). This goal and the following 3 indicators are also used to measure the status of the nearshore subtidal conservation target.
TARGET 8: WORKING BAY/PORT SYSTEMS
Goal 8: By 2014, there is an active commercial and recreational fishing community that contributes to self-sustaining ice facility, fuel docks, and slip fees.

Understanding and Rating Threats

The SLOSEA team and partners identified a series of human actions that directly affect one or more of the resource management targets, which they prioritized according to three criteria: scope of the area or population affected; severity of the impact on the area or population affected; and the degree to which the effects of the threats could be undone if the threat were to cease (irreversibility). Identifying the priority threats allowed us to narrow down a suite of interventions to those that address the greatest threats to our conservation targets, rather than those actions whose impact on our targets is minimal. We present the results from the threat ranking in the following.

RESOURCE MANAGEMENT TARGETS

THREATS	Estuarine Systems	Finfish	Iconic Species	Marine Inverts	Near Shore Subtidal	Shoreline Habitats	Watershed	Working Bay/Port Systems/M	Summary Threat Rating
Overfishing		Low		Medium	Low			Low	Low
Land Based Pollution	High	Medium	Medium	Medium		Medium	High		High
Trawling		Low		Low	Low				Low
Freshwater Withdrawal	Low		High				High		High
Lack of Enough Dredging								High	Medium
Erosion/ Sedimentation	High	Low	High	Low		Medium	High	High	High
Changing Marine Economy								High	Medium
Invasive Species	Very High			Very High		High	High		Very High
Recreational Use (active)	Low	Low	Low	Medium		Medium	Low		Medium
New Development	Medium					Medium	High		Medium
Global Climate Change	High	High	High	High	High	High	High	High	Very High
Summary Target Rating	Very High	Medium	High	High	Medium	High	Very High	High	Very High

Strategies and Objectives

To help conserve and enhance these resource targets, SLOSEA identified six strategies and associated objectives. To identify these objectives, the strategic planning team used a results chains tool, defining the assumed causal pathways by which the strategies will yield tangible and valuable results.

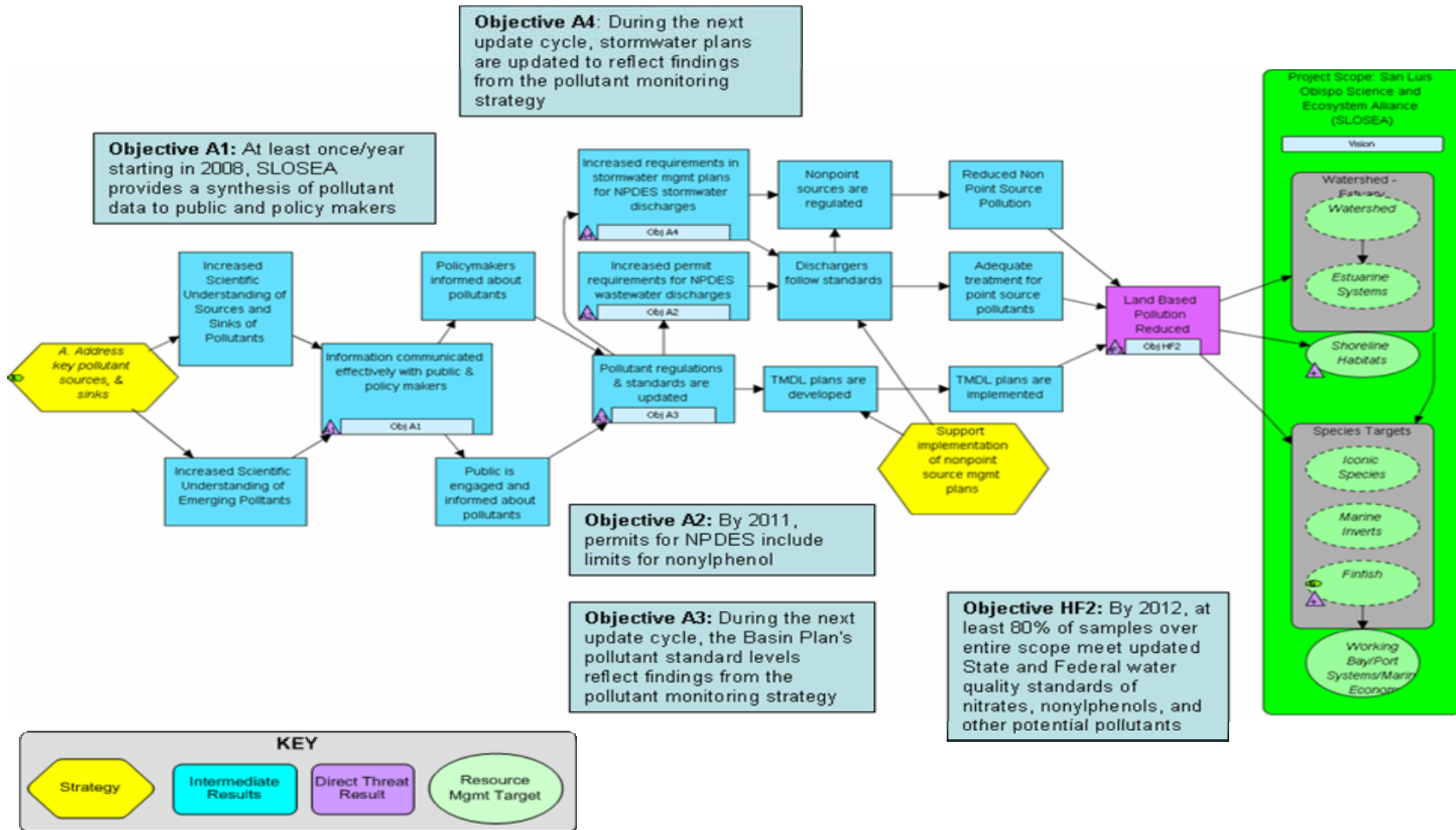
On the following pages, we provide the results chains for the proposed strategies. These chains summarize how SLOSEA intends to move forward, the key stakeholders and resource management linkages, concrete objectives to track progress, and the ultimate benefits. The detailed strategic plan provides the full site conceptual model that underlies these chains and the specifics of how SLOSEA will monitor its progress.

For each strategy, we provide a brief description of the questions addressed, how SLOSEA's actions will make a difference, the critical resource management benefits, and how the results will be of value to resource management in other ecosystems. The section in the Strategic Plan entitled "SLOSEA Investment, Projected Returns, and Financial Sustainability" describes these points in more detail.

SLOSEA benefits from investments of time and money from many contributors. As stewards of those investments, we have developed strategies that will not only yield direct management benefits in SLOSEA's scope but also provide a laboratory from which other ecosystems can learn and apply the proven tools that SLOSEA creates.

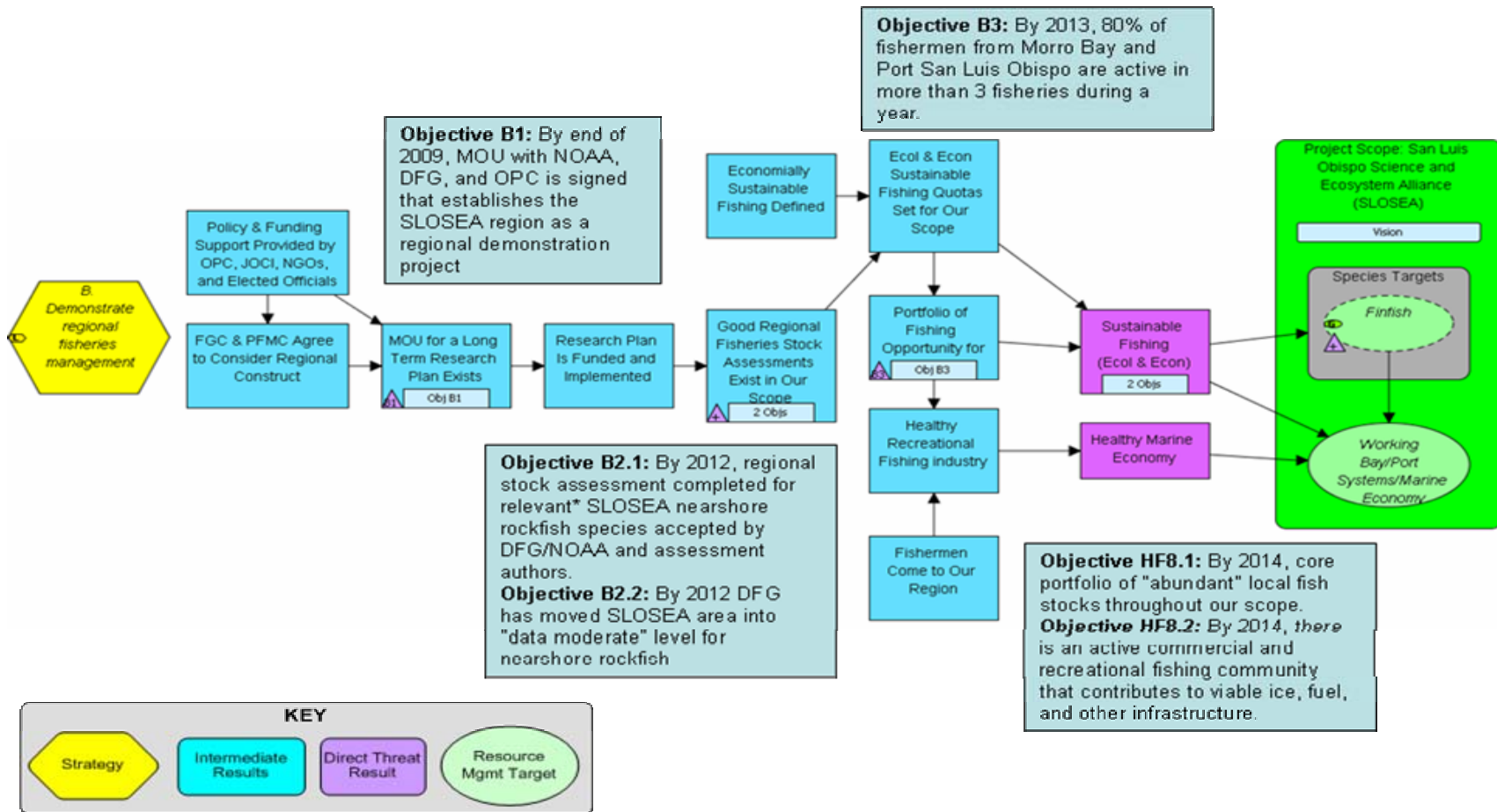
Strategy A: Address Key Pollutant Sources and Impacts

Description: This strategy seeks to answer questions what are the most serious pollutants, where do they come from, where do they go, and how do they affect people and organisms within the ecosystem? SLOSEA has established monitoring methods to analyze these questions and identify new threats such as nonylphenols, which have been implicated in tumors in estuarine fish. Pressing issues include sewage treatment, estuary restoration strategies, oyster farming, and unregulated hazardous pollutants. The models, methods, and results developed by SLOSEA have relevance for watersheds and nearshore areas elsewhere.



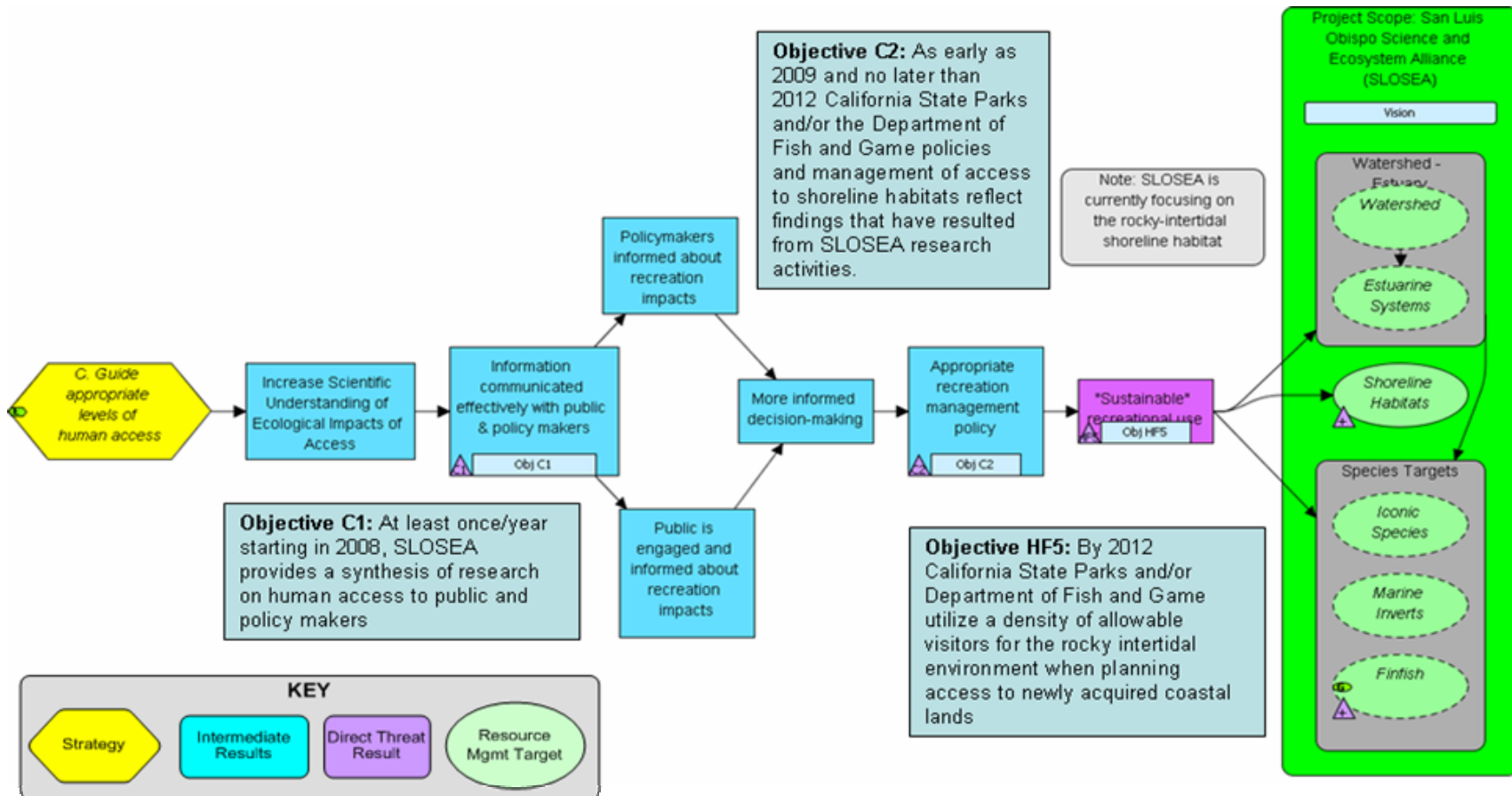
Strategy B: Build Data and Framework for Regional Fisheries Management

Description: This strategy focuses on the abundance and health of nearshore groundfish stocks in the region and how resource managers could structure a portfolio of fishing opportunities to support sustainable fisheries and fishing communities. SLOSEA has developed and implemented collaborative fisheries research with scientifically rigorous protocols and is building the long-term data sets to address these issues. As fishing communities on the Central Coast and elsewhere struggle to define their future, a replicable model for spatially-specific management will be key for healthy fisheries and thriving fishing communities.



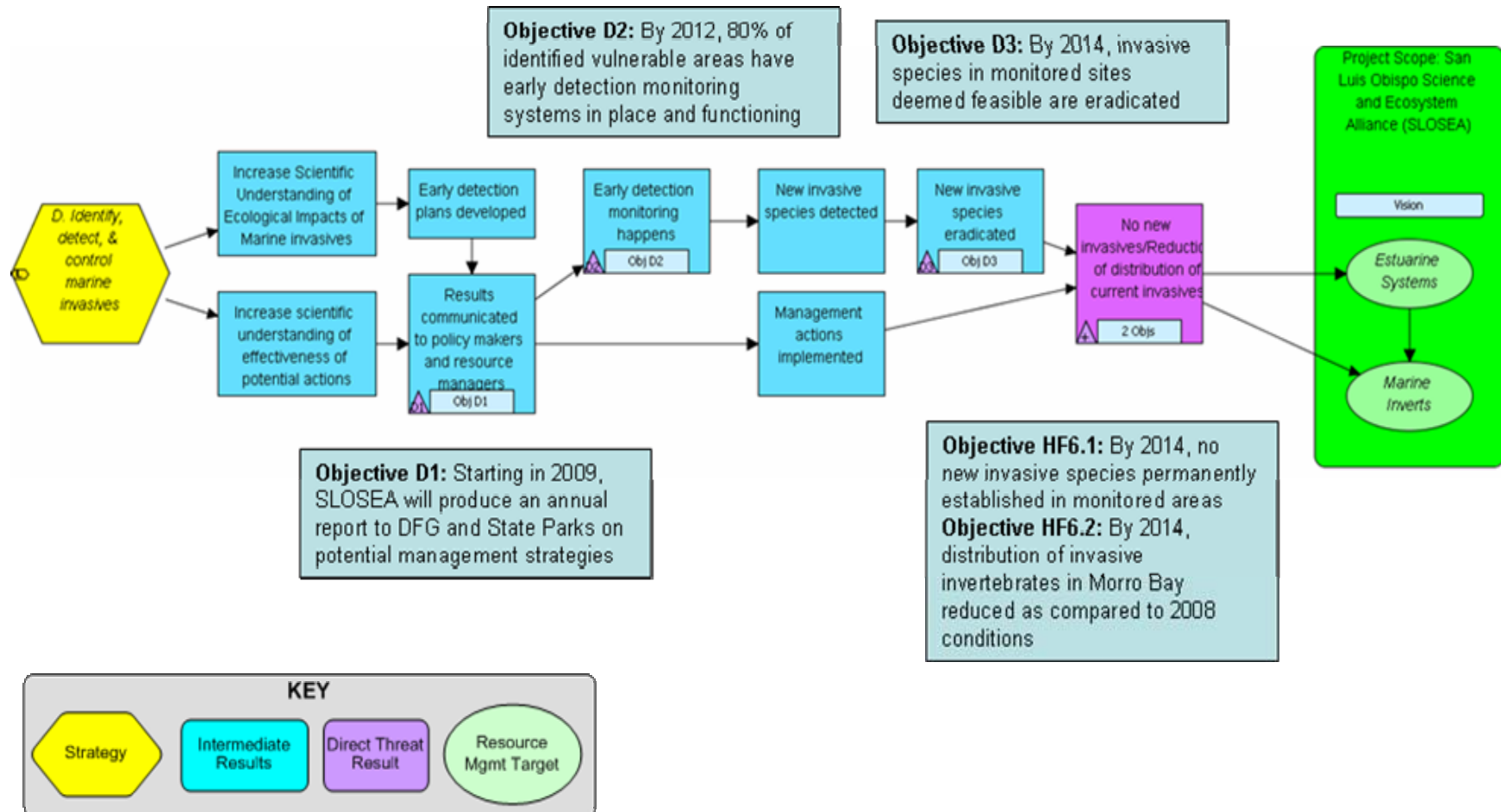
Strategy C: Guide Appropriate Levels of Human Access

Description: Questions addressed by this strategy include: what impact does human use have on intertidal areas, what levels of access are sustainable, and how can managers use this knowledge? SLOSEA is completing its data gathering and analysis to address these issues. Key management issues include 18 miles of coast entering public ownership from Hearst Ranch, public access to coastal trails in the Diablo Canyon area, and other coastal acquisitions (e.g., Sea West Ranch). As acquisitions and conservation easements occur elsewhere along the coast, this research will provide a framework for management assessment and action.



Strategy D: Identify, Detect, and Control Marine Invasives

Description: This strategy gathers critical information to control the spread of invasive species in the Morro Bay harbor and estuary. Previous work by SLOSEA investigators has documented invasive species that have crowded out established shellfish populations. Building on that foundation, SLOSEA will identify vulnerable areas, provide early detection, and recommend management strategies to protect valuable resources. These results will offer a template for researchers and managers in other estuarine areas.



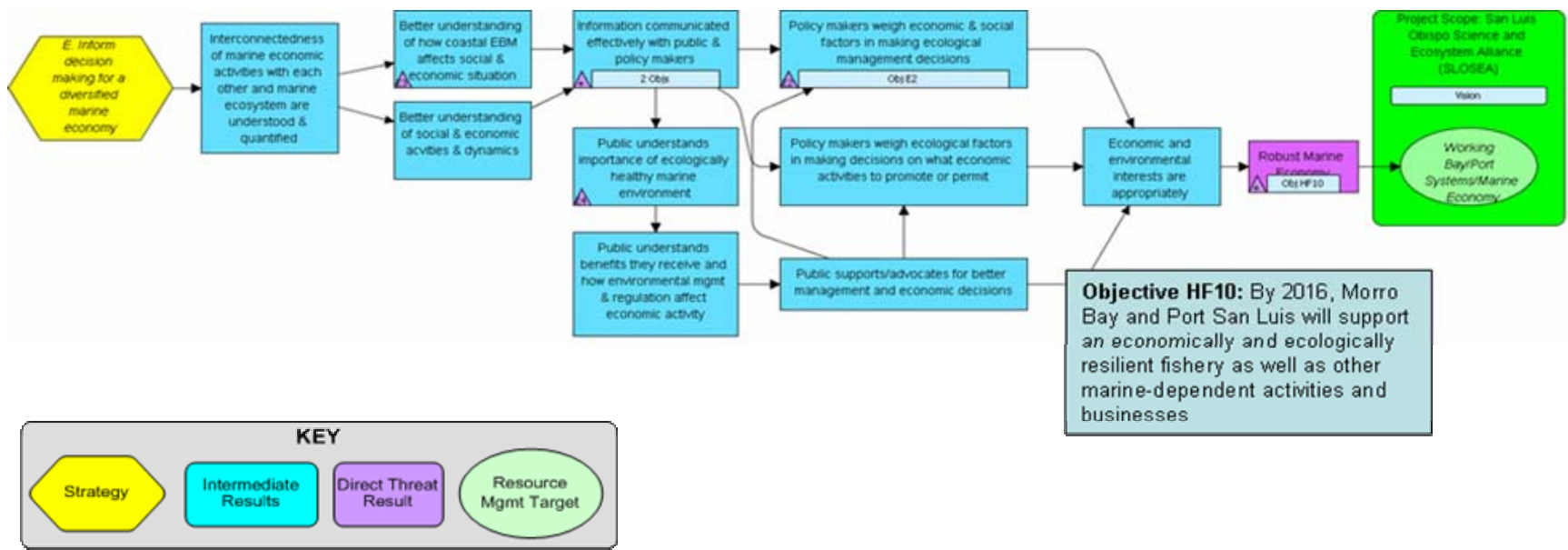
Strategy E: Inform Decision Making for a Diversified Marine Economy

Description: This strategy generates solid economic data about user preferences to address the relationship of the ecosystem to local and regional economic decisions. Inadequate information has stymied efforts to reach agreement on critical issues faced by marine economies. SLOSEA is completing survey data collection and analysis and the development of interactive analytical models that will enable stakeholders and decision makers to formulate plans for a diversified and sustainable marine economy. Parallel studies in other areas along the Pacific Coast will help distinguish between the impacts of local ecosystem dynamics and larger-scale economic trends.

Objective E1.1: By 2011, SLOSEA has developed and shared with policymakers a mixed use plan that includes options for commercial fishing, CPFV, waterfront access, recreation, wildlife viewing, and private recreational fishing

Objective E1.2: By 2011, SLOSEA has developed and shared with policy makers a plan that identifies important ecological areas and attributes and potential tradeoffs between restricting access and tourism satisfaction.

Objective E2: By 2012, at least 50% of management plans incorporate findings from marine economic research



Strategy F: Characterize Climate Change Effects and Prioritize Local Actions

Description: Scientists, stakeholders, and resource managers noted that global climate change is the “elephant” in the estuary. This strategy uses the water quality monitoring data, bathymetry, and hydrodynamic model developed in Strategy A to anticipate the impacts of likely changes. Shifts in factors such as water volume (sea level), salinity, and productivity will affect habitats and the people and species dependent upon them. Characterizing these effects and prioritizing key actions will help coastal communities be prepared and respond constructively. These tools will be applicable to other estuaries.

