Issue/ Habitat	Current Status	Existing Index (if applicable)	Limitations, Obstacles, and Constraints	Next Steps
Swimming Health Risks	Heal the Bay's Beach Report Card, which is in essence a water quality index, has been used and widely accepted for nearly 20 years	The Beach Report card is based on a grading system that takes into consideration the magnitude and frequency of an exceedance above bacterial indicator thresholds (single sample standards, and/or 30-day geometric mean standards) over the course of a year. Quality of water is ranked with letter grade (A-F).	Bacterial indicators are not always indicative of pathogens	Develop, standardize, and measure pathogen-specific indicators. Revise the Beach Report Card accordingly.
Seafood Consumption Health Risks	Seafood consumption advisory has been issued based on fish tissue concentration and seafood consumption rate	The consumption advisory was developed and updated based on health risk assessment which is made by evaluating tissue concentrations of the contaminants of concern (DDT and PCBs and seafood consumption rate of anglers. The result of the risk assessment is published in the form of a safe-eating guideline, which specifies the species and the suggested eating amount of	Difficulty in dealing with risks caused by other contaminants such as mercury in the same advisory - Fish consumption data used in the latest advisory is outdated	Conduct new seafood consumption study - Update, revise, and implement the seafood monitoring program recommended by the CMP
Creeks and Streams	The Southern California Index of Biotic Integrity (IBI) has been developed and used to assess the condition of creeks and streams in coastal Southern California. Multivariate tools, such as the RIVPACS (River Prediction and Classification System) ratio of observed to expected taxa (O/E) and California Rapid Assessment Method have also been used for evaluating riparian conditions in coastal watershed. A periphyton index of biotic integrity for southern California is currently under development. An IBI specific to streams in the Malibu Creek watershed was developed by Heal the Bay with funding support from SMBRC.	An IBI compares and ranks changes in riparian conditions against conditions at reference area. The Southern California Index of Biotic Integrity is a composit index that combines scores of a selected set of metrics measuring the condition of macroinvertebrate communities. The metrics selected to include in the IBI are considered most responsive to the stressor gradients for a specific stream class. The periphyton index under development is similar to the Southern California IBI except it uses measurements of periphyton communities.	Existing IBI is based primarily on benthic macroinvertebrate assemblages and do not necessarily capture all type of impacts such as the impact to algal-based food web changes from nutrient over-enrichment. - the current IBI may be overridden by biocriteria developed by the State in few years. - There is still difficult in define reference condition especially for flood plains. - the threshold used in current IBI is not ecosystem function based..	Develop an algal Index of Biotic Integrity. - Integrate multiple communities (e.g. Fish and algae) - Conduct regional monitoring of riparian habitats in the Bay watershed to collect data that can be used for IBI ranking

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Coastal Wetlands and Lagoons	California Rapid Assessment Method (CRAM) has been developed and applied to assess the status and trends in the condition of wetlands in California including local wetlands.	CRAM assesses wetland condition based on four attributes: landscape context, hydrology, physical structure, and biotic structure. Each of the four attributes has associated metrics, which are scored by matching the correct score from a list of descriptive narrative conditions for each metric to what is observed in the wetland. Metric scores are then compiled into numerical scores for each attribute and an overall score for the wetland. The overall score for a wetland indicates condition relative to the best achievable condition for that wetland type in the state.	CRAM may favors large, structurally complex wetlands within each wetland class and the scoring system may not best reflect or be applicable to several small wetlands in the Bay watershed.	TBD
Coastal Dunes and Bluffs	There was no known habitat health index for coastal dunes and bluffs. Status of reintroduced native species and endangered species have been used as primary indicator of the success/failure of due and bluff restoration projects	N/A	The coastal dunes and bluff have been tremendously impacted. Most of them are either paved over by development or artificially stabilized by non-native vegetation and fencing. These changes pose a great challenge to find and define “natural state” for this habitats.	As a first step, reconstruct the historical ecology of the dune and bluff habitat as much as possible in order to define the reference condition needed for index development
Sandy Beaches	There was no known habitat health index for sandy beaches. State of the Beach report published by Surfrider Foundation (http://www.surfrider.org/stateofthebeach/01-bi/index.asp) uses a slew of beach indicators but acknowledges that little readily-available information on the ecology of sandy beaches. Its report says that the beach seems to be a neglected niche, despite its importance as a vital land/sea link and the home of many species of plants and animals. Beach ecology issues were raised in connection with beach fill projects in Florida, North Carolina and New Jersey.	N/A	Several constraints make development of health index for sandy beach rather difficult. Very limited number of people working on beach ecology. Most of those who do focus on single species and not on the ecosystem level. The massive human impacts on sandy beach makes it almost impossible to separate human impacts from the natural setting, The mobile nature of the sandy substrate makes monitoring of a permanent transit very difficult.	Set up a working group with people having experience in index development, people with knowledge of beach ecology and involve beach managers to jumpstart the index development.

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Rocky Intertidal	A rocky intertidal health index is under development led by the MARINe group. There is general consensus on classifying different rocky reef data sets by the amount of disturbance	The index will likely to be based on biodiversity-associated attributes, either all species or a handful of indicator species, that correspond to various degrees of disturbance.	It is difficult to define what disturbance means. Different group interpret disturbance differently. It is also difficult to differentiate natural from anthropogenic disturbance.	Finalize definition of disturbance and reference conditions. Develop indicators, select matrices and formula for scoring, ranking, etc.
Seagrass Beds	No index is known to have been developed for assessing the condition of seagrass beds in Southern California. Elsewhere, only nutrient-related health index (water clarity, phytoplankton pigments, organic nitrogen, and dissolved oxygen) are known to have been used to indicate the condition of seagrass beds (e.g. Buzzards Bay).	N/A	TBD	TBD
Rocky Reefs	A habitat value index was developed and used for the first time in the 2010 State of the Bay report.	The habitat health index is based on a three parameter model where fish assemblages are quantified based upon feeding guilds (using mean size as a surrogate for biomass), density, and fidelity. The three parameters are treated equally. Habitat value for a sampling site is the sum of the values calculated for each depth zone at the site.	The habitat health index is based on fish assemblages only and has not considered, nor has it taken into account other matrices such as vegetation (primarily algae), and invertebrate.	Next steps could include expansion of existing index to involve other data sets. Analyze how the existing index respond to other parameters, such as kelp density, algal cover styles density. As for fish assemblage parameters used in the current index, conceivably the fish mean size can be replaced with direct biomass measurement.

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Soft Bottom	At least three indices have been developed and used to assess the condition of this habitats: benthic response index (BRI), fish response index (FRI), and megabenthic invertebrate response index (MIRI). nse index (TRI)	The three indices compare and rank changes in benthic macroinvertebrate, fish assemblage, and megabenthic invertebrate, respectively, against conditions at reference areas. The BRI, for example, is the abundance weighted average pollution tolerance score of organisms occurring in a sample. It sets thresholds that can be used to assess whether species occurring in a sample meet reference condition criteria and whether they are impaired in terms of biodiversity, community function, or defaunation.	The FRI Difficult differentiating chemically-based effects and food supply effects, It has only one threshold.	TBD.
Open Ocean	TBD	TBD	TBD	TBD