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Habitat Conditions: Overview

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2.1.0 Habitat Conditions Overview

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Santa Monica Bay and its watershed encompass many types of habitats. These habitats deliver essential ecosystem services, such as nutrient cycling, water purification, and flood control, as well as life's basic necessities for the species that inhabit them. It is important to periodically assess the health of these habitats so that resource managers can track changes over time, attribute causes to these changes, evaluate the effectiveness of current resource protection policies, and ultimately provide policy-makers with the information they need to plan for the future.

The assessments that follow are conducted under a framework developed by the Santa Monica Bay National Estuary Program Technical Advisory Committee (TAC) for identifying indicators and assessing habitat health that can be applied consistently to all major types of habitats in the Bay. A variety of quantitative and qualitative information and data are used for the assessment. The "how to" guide below provides general reading instruction for the habitat-specific assessment sections that follow (Sections 2.1.1–2.1.7). Appendix A provides more technical details regarding the indicator development process, categorization, identification, and scoring criteria.

How to Read the Assessments

The assessments contain two types of information: the habitat description and the status and trends. The habitat description explains where the habitat is found, its historic context, what it looks like in its undisturbed state, the organisms that live there, reasons for any degradation that exists, and challenges in restoring or managing it. The status and trends section describes how the assessment category is interpreted for the habitat, the indicators used in the assessment, why they were chosen, how they relate to management goals, any data gaps that exist, a summary of the status and trend findings using the data available, and a discussion of the confidence in the assessment.

Figure 2.1-1. Graphic interpretation of the habitat assessment scores. A) The color bar with boxes surrounding each of the possible condition scores (see Figure 2.1-2 for a description of each condition). B) Interpretation of a trend (from left to right: improving, constant, and declining). C) Interpretation of low confidence in status and trend (left) and in trend only (right).

It should be noticed that these assessments were based on the non-human components of the ecosystem only. The effects of the current condition of the habitats in the Bay and

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its watershed on human health and enjoyment of these resources are important and are discussed in other sections of the Report.

The status and trend scores are also represented graphically for each habitat (Figure 2.1-1). The graphic includes a color bar reflecting the range of possible conditions (Figure 2.1-2), a box outlining the condition score for the habitat, and a directional (or non-directional) arrow indicating the trend. Instances of low confidence are graphically represented using dashed lines and can be applied to the status component (the box), trend component (the arrow), or both.

Figure 2.1-2. Interpreting the habitat status color bar.

Status:	POOR	FAIR	GOOD	EXCELLENT
Characteristics:	Habitat does not support key ecosystem functions.	The number of ecosystem functions present is significantly reduced and those present are at a reduced level.	All major ecosystem functions are present, but may be at reduced level.	Ecosystem functions may not be equivalent to pristine habitat, but significance of differences is uncertain. Changes may be due to natural variations.	Ecosystem function is equivalent to the best expected for the region.

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Appendix A Habitat Assessment Development

In 2010, the State of the Bay Report included, for the first time, a standardized assessment of habitat condition for all habitats in Santa Monica Bay and its watershed. This assessment was a big step forward, but for many habitats, the assessment relied heavily on qualitative data and best professional judgment. In an effort to improve upon the assessment for the 2015 Report, the Santa Monica Bay National Estuary Program (SMBNEP) worked with its Technical Advisory Committee (TAC) to develop more quantitative, comprehensive, and objective assessments for each habitat type.

For this purpose, the TAC developed a framework for identifying indicators and assessing habitat health that can be applied to all major types of habitats in the Bay and ensures that the assessment includes comparable characteristics of habitat health. The framework builds off the assessments developed in the 2010 report. It identifies four categories of indicators that relate to specific expectations of habitat health: extent, vulnerability, structure and disturbance, and biological response.

Indicator Categorization

The Habitat Extent category encompasses spatial indicators that cover issues such as habitat loss, fragmentation, access, and temporal variability. The Habitat Vulnerability category covers indicators that relate to risk and potential disturbance, such as fishing pressure, exposure to water quality discharges, or interference with natural coastal processes. The Structure and Disturbance category includes indicators that describe

physical, chemical, and biological properties that impact the conditions of habitats. Examples of structure-type indicators include nutrient and chlorophyll concentrations in coastal pelagic waters, channel morphology of tidal wetlands, and wrack presence on beaches. Examples of disturbance-type indicators include the diversity and abundance of invasive species, eutrophication, and the intensity of collection or harvesting activities. Lastly, the Biological Response category encompasses indicators that measure changes to individuals, populations, communities, and ecosystems in response to changes in habitat quality. Examples include the presence/absence of amphibian species from streams, the reproductive success of nesting shorebirds, and the index of fish diversity.

These categories are broad and inclusive so as to be applicable in the context of the seven habitats assessed. For example, a strict interpretation of habitat extent makes sense for coastal wetlands, but not for coastal pelagic habitat. Also, in many cases, extent indicators, vulnerability indicators, and disturbance indicators can be hard to differentiate. In general, the type of metric used determines the distinction between extent and structure indicators. For example, the area covered by a biogenic habitat (i.e., surfgrass or kelp) is included in the extent category because they are spatial metrics, whereas the presence and diversity of native vegetation is included in the structure category. In the case of the vulnerability vs. disturbance category, it relates to whether or not the indicator directly or indirectly measures impacts. For example, past fishing behavior is categorized as a vulnerability indicator because it indicates the risk of fishing pressure on rocky reefs, whereas time-activity budgets of people collecting organisms from rocky intertidal sites is a disturbance indicator.

Identifying Indicators

The SMBNEP identified working groups for each of the seven habitats included in the assessment. With the exception of the rocky reef habitat, each working group consisted of at least one member of the TAC and at least one outside expert. The rocky reef habitat assessment was solely the work of one TAC member and the SMBNEP staff. For the other habitats, working group size ranged from three to seven members.

The SMBNEP staff developed a list of possible indicators for each habitat that drew from the Comprehensive Monitoring Program (CMP, SMBRC, 2007), prior State of the Bay Reports, and other report card and habitat assessment efforts. For the three habitats that relied most heavily on best professional judgment in the 2010 Report—beaches and dunes, the rocky intertidal habitat, and the coastal pelagic (open water) habitat—the SMBNEP hosted workshops to identify additional indicators and data sources. Participants also gave recommendations on prioritizing indicators and identifying the best ones to use for the assessment at the workshops. For the other four habitats, conference calls were held to do the same.

Recommended indicators were evaluated for data availability and quality, and a database was created that includes information about data availability, coverage (geographic and temporal), source, and format, among other things. The experts then reviewed this list

and made final recommendations on which should be included in the 2015 assessment based on the following criteria: sensitivity to changing conditions locally, responsiveness in a time-frame that can be measured in 5–10 years, connection to current or future management actions, relationship to the framework (which category does it fit into and how many other indicators are already in that category), and data quality and coverage. A target of three indicators per category was identified, but not always followed. For some habitats, only one indicator represents the entire category, while for others, four indicators were included in one category.

It is important to note that, while the availability of data was considered, it is not the most important factor for inclusion. Instances where an indicator was strongly recommended for inclusion but no data exist did occur. In these cases, these indicators were still included in the framework and this assessment without being scored. It is expected that these gaps will serve as a reminder of the need to find a way to procure these data. Indicators identified through this process that were not included in the Comprehensive Conservation and Management Plan of the Santa Monica Bay National Estuary Program, known colloquially as the Bay Restoration Plan, may be added when it is updated.

Assessing Habitat Health

Data for selected indicators were gathered, analyzed, and presented to the respective working groups as part of a best professional judgment (BPJ) exercise. Using a three-level system, experts were asked to score the indicator status (good, fair, or poor) and trend (improving, constant, or declining) based on the presented data. In instances where data were not available, experts had the option of scoring by relying on their experience. Experts were also asked to rate their level of confidence in the status and trend scores, also using a three-level system (high, moderate, or low). During the conference calls, scores were discussed and agreed upon unanimously. However, some indicators were not scored during the conference calls or when agreement could not be reached. In these cases, experts were asked to provide their scores individually. These scores were later combined using rules laid out in Table 2.1-1. The confidence scores assessed by the experts and a factor relating to the agreement between reviewers determine the combined indicator confidence score.

Scores for each category were then combined using a different set of rules to convert three-level scores to the system used in the 2010 report: a five-level status score, three-level trend score, and three-level confidence score (Table 2.1-2). Confidence in the score for each category is based on the confidence in the score for each indicator within the category and a factor relating to the completeness of the category (the percentage of indicators scored within the category). A high completeness factor results in the combined indicator confidence score being reported. A moderate completeness factor results in a high combined indicator confidence score being lowered to moderate, but does not change a moderate or low combined indicator confidence score. A low completeness factor results in the combined indicator confidence score being lowered by one (i.e., high becomes moderate, or moderate becomes low).

For some habitats, obvious differences within areas of the Bay resulted in separate regional scores rather than one score for the entire Bay. Typically, the break was between the northern and southern portions of the Bay, but in some cases, was more related to the system differences and data availability (i.e., there were three regions used for coastal wetlands, one for the Ballona Reserve, one for Malibu Lagoon, and one for the other smaller systems that are far less studied).

Table 2.1-1. Rules for combining scores from different experts or different sites. From top to bottom: rules for combining status scores, trend scores, and confidence scores, and rules for assessing agreement.

SCORE	RULES FOR COMBINING STATUS SCORES
GOOD	All experts scored indicator good or all sites were scored good
FAIR	All scores good or fair
FAIR	Majority of scores fair
FAIR	50% of scores good, 50% of scores poor
POOR	Majority of scores fair or poor (when less than a majority are fair)
POOR	Majority of scores poor
* When something is not scored, it is ignored.	

SCORE	RULES FOR COMBINING TREND SCORES
IMPROVING	Majority of experts scored indicator as improving or majority of sites were scored as improving
IMPROVING	50% of scores improving, 50% of scores constant
CONSTANT	Majority of scores constant
CONSTANT	50% of scores improving, 50% of scores declining
DECLINING	50% of scores constant, 50% of scores declining
DECLINING	Majority of scores declining
* When something is not scored, it is ignored.	

SCORE	RULES FOR COMBINING CONFIDENCE SCORES
HIGH	Majority of experts scored confidence for indicator as high
MODERATE	All scores high or moderate
MODERATE	Majority of scores moderate
MODERATE	50% of scores high, 50% of scores low
LOW	50% of scores moderate, 50% of scores low
LOW	Majority of scores moderate or low (when less than a majority are moderate)
LOW	Majority of scores low
* When something is not scored, it is ignored.	

SCORE	RULES FOR SCORING AGREEMENT
HIGH	All experts agree
MODERATE	50% or more of experts agree or have similar scores
LOW	Majority of experts disagree (i.e., good/poor)
* When something is not scored, it is ignored.	

In cases where some indicators in the category were scored for the entire Bay and some for the regions, scores for the Bay were extrapolated to the regions. However, when assessing the completeness factor for the category confidence score, this extrapolation counts as half rather than a whole (i.e., if two of four indicators were scored in a category, but one of those two indicators was scored for the Bay rather than the region, the completeness factor is 1.5/4 not 2/4).

In future assessments, these category scores will also be combined into one overall score for the habitat. This was not done for this report, due to the nature of the data available now and the high level of uncertainties. It is the intention of the SMBNEP to continue building on these assessments in future reports, including revising the CCMP to better meet the needs of these assessments and working with researchers and agencies to further implement it.

Table 2.1-2. Rules for combining indicator scores into category scores. From top to bottom: combining status and confidence scores, and scoring completeness. Trend scores are combined as described in Table 2.1-1.

SCORE	RULES FOR COMBINING STATUS SCORES
EXCELLENT	All experts scored indicator good
GOOD	Majority of scores are good
FAIR	All scores are good or fair (when less than a majority are good)
FAIR	Majority of scores are fair
FAIR	50% of scores are good, 50% of scores are poor
POOR	Majority of scores are fair or poor (when less than a majority are fair)
POOR	Majority of scores are poor
CRITICAL	All scores are poor
* When something is not scored, it is ignored.	

SCORE	RULES FOR COMBINING CONFIDENCE SCORES
HIGH	Majority of experts scored confidence for indicator as high
MODERATE	All scores high or moderate
MODERATE	Majority of scores moderate
MODERATE	50% of scores high, 50% of scores low
LOW	50% of scores moderate, 50% of scores low
LOW	Majority of scores moderate or low (when less than a majority are moderate)
LOW	Majority of scores low
* When something is not scored, it is ignored.	

SCORE	RULES FOR SCORING COMPLETENESS
HIGH	66% or more indicators are scored
MODERATE	Less than 66% but more than 50% of indicators are scored
LOW	Majority of indicators are not scored

References

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