California MLPA Master Plan Science Advisory Team

Summary of SAT Water and Sediment Quality Evaluations for the MLPA Blue Ribbon Task Force Recommendations as Adopted on October 26, 2010

Revised January 17, 2010

During its October 25-26 meeting, the Marine Life Protection Act (MLPA) Blue Ribbon Task Force (BRTF) adopted seven motions with recommendations related to marine protected areas (MPAs) and special closures in the MLPA North Coast Study Region. Only two of the BRTF's recommendations required attention by the MLPA Master Plan Science Advisory Team (SAT) for evaluating water and sediment quality.

The two BRTF recommendations considered by this summary include an alternative MPA proposal known as the North Coast Enhanced Compliance Alternative MPA Proposal (ECA), and a recommendation to retain three existing MPAs with modifications: MacKerricher, Russian Gulch and Van Damme state marine conservation areas (SMCAs). In addition, the MLPA North Coast Regional Stakeholder Group (NCRSG) forwarded to the BRTF minor suggested revisions to its Round 3 NCRSG MPA Proposal; this revised proposal is titled Revised Round 3 NCRSG MPA Proposal (RNCP).

The ECA and the revisions to the RNCP did not change the MPA cross-shore boundaries and generally reflect the MPA boundaries designed for the Round 3 NCRSG MPA proposal. Therefore, no further water and sediment quality evaluations are needed for these proposals as any new evaluation would be identical to the evaluation for the Round 3 NCRSG MPA Proposal (see Attachment A for Round 3 water and sediment quality evaluation)[1]. However, should the three existing SMCAs be added to any MPA proposal, as recommended by the BRTF, the water quality evaluation score for the proposal would be reduced because the MacKerricher SMCA has an urban stormwater discharge zone that drains into the MPA (weighted score for both EAC and RNCP would be 0.71). For more details on the water quality evaluation for this MPA please refer to Proposal 0 in the SAT's water and sediment quality evaluation document for the Round 3 NCRSG MPA Proposal[1].

The other two existing MPAs named in the BRTF recommendation (Russian Gulch and Van Damme SMCAs) did not have any water quality concerns associated with them.

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[1] This evaluation can also be found on the MLPA website under the BRTF's October 25-26, 2010 meeting agenda at http://www.dfg.ca.gov/mlpa/meeting_102510.asp.

ATTACHMENT A

California MLPA Master Plan Science Advisory Team
Summary of SAT Water and Sediment Quality Evaluation of Round 3 MLPA North Coast Regional Stakeholder Group Marine Protected Area Proposal

October 14, 2010

Overview of MPA Proposal Evaluations Regarding Water and Sediment Quality

While water quality is not subject to management under the Marine Life Protection Act (MLPA), it may be an important consideration in designing marine protected area (MPA) proposals. Where water quality is significantly compromised, living marine resources may be substantially affected, being subject to changes in key population parameters, such as abundance, growth, reproduction, mortality, and community parameters such as energetics, diversity, structure and organization. Quality of water and sediment is a concern in the MLPA North Coast Study Region (NCSR) and should be considered during the MPA planning and design process. However, it is important to remember that water quality evaluations are not mandated by the MLPA, and should therefore be considered secondary to other MPA design guidelines. Water quality considerations should be incorporated if other guidelines and criteria have been met.

This document discusses evaluation considerations and compares results for existing MPAs (Proposal 0 [P0]) and for the final Round 3 MLPA North Coast Regional Stakeholder Group MPA proposal (NCRSG MPA Proposal [NCP]).

Evaluation Considerations

On August 31, 2010, the NCRSG finalized a single MPA proposal that was advanced for evaluation. This proposal was evaluated for water quality. This evaluation was based on the presence or absence of the following scoring categories:

- Urban stormwater runoff, non-point source pollution (e.g. harbors), and dredge disposal sites
- Municipal sewage or industrial wastewater outfalls
- Co-location with an area of special biological significance (ASBS, a subset of State Water Quality Protection Areas [SWQPAs])

This summary document focuses on comparisons among the two proposals described above and their scores based on the three scoring categories.

The MLPA Master Plan Science Advisory Team (SAT) determined that the best way to evaluate MPAs with regard to water quality is to allocate scores based on a presence or absence scoring system. For open coast MPAs the scoring system gives a range of values, with 0.17 being the least desirable, and a range of 0.67 to 1.00 considered the most desirable. Specifically for open coast MPAs, the upper range is influenced by the co-location of MPAs with areas of special biological significance (ASBSs). For example, MPAs that are absent any areas of water quality concern and are completely within an ASBS would receive 1.00, the highest possible score. Open coast MPAs that are absent any areas of water quality concern and are *not* co-located with an ASBS would score a 0.67. This 0.67 score is the upper threshold that a score could get without the presence of an ASBS, or in other words, 0.67 is a favorable score. Anything less than 0.67 indicates MPA co-location with an area having one or more water quality concerns. Methods for these analyses are described in an associated

document, *Draft SAT Methods Used to Evaluate Marine Protected Area Proposals in the North Coast Study Region* ("Evaluation Methods Document"). The scoring tables in the appendices can also be used as a reference if clarification is needed.

The NCRSG MPA Proposal included MPAs in enclosed bays and estuaries due to the important role these systems play in the marine ecosystem and because they include one or more of the many SAT-defined key habitats that should be included in MPA proposals. These embayments are productive and essential to the marine system as a whole largely because of their enclosed, protected nature at the mouths of coastal streams. Their productivity is related to natural nutrient deposition from coastal streams. However, the influence of developed watersheds adjacent to or upstream of some of these embayments can also make them vulnerable to pollution. Anthropogenic eutrophication and sedimentation from urban runoff, agriculture, and timber harvest can upset the natural nutrient balance in these embayments. Toxic pollutants, also derived from urban runoff, agricultural runoff, and from anthropogenic activities on the shoreline or in active harbors, adhere to the sediments in bays and estuaries. Therefore, the greater the number of bay and estuary MPAs included in a proposal that receive polluted stormwater runoff and other nonpoint source pollution, the greater the chance that the proposal's overall score will be reduced. However, not all bay and estuary MPAs in the MLPA North Coast Study Region (NCSR) are considered impacted enough to receive a reduced water quality score.

The SAT furthermore recognizes the differences between embayment (estuaries, lagoons, and bays) and open coast MPAs in terms of water quality issues. Whereas water pollution enters open coast waters from a nearshore discharge point and disperses toward the open ocean, discharges into enclosed bays and estuaries tend not to disperse quickly and can be retained through several tidal cycles. Per unit of area, semi-enclosed bays and estuaries have shoreline lengths roughly double those of straight shorelines along the open coast. Therefore, shoreline lengths for bays and estuaries were not used and instead the area (square miles) of the bay or estuary was used to make the weighting more proportional to the actual MPA area. In addition, there are no state water quality protection areas (SWQPAs) or ASBSs currently designated in enclosed bays and estuaries. Using the same scoring system would unequally weight scores for enclosed bays and estuaries relative to the open coast. For all these reasons, the SAT will provide, for each MPA proposal, separate evaluations of open coast, or coastal, MPAs and embayment MPAs. For embayment MPAs the scoring system gives a range of values, with 0.25 being the least desirable, and a score of 1.0 considered the most desirable.

Round 3 MPA Proposal Evaluated

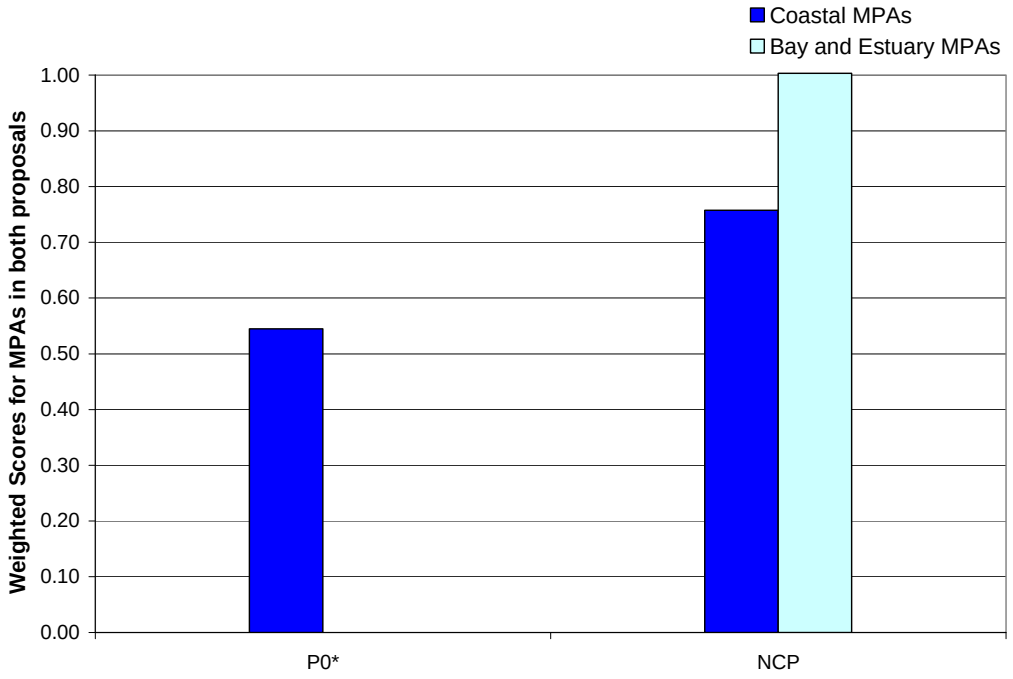
The NCRSG MPA Proposal submitted in Round 3 adhered completely to the MLPA Master Plan Science Advisory Team's (SAT) water quality guidelines and had no MPAs co-located with water quality concern areas. The NCRSG MPA Proposal improved its water quality scores by completely eliminating MPAs that overlapped with water quality concern areas proposed during the Round 2 process. However, the NCRSG avoided placing MPAs near harbors. While this decreased the likelihood of co-locating MPAs with water quality concern areas, this action increased the probability of not meeting other SAT guidelines such as size and spacing for certain key habitats.

The NCRSG MPA Proposal did an excellent job of co-locating MPAs within ASBSs. Two of the four ASBSs in the NCSR were utilized (the two larger ASBSs – Redwood National and State Park ASBS and Kings Range National Conservation Area ASBS). There were some lost opportunities to utilize the other two smaller ASBSs in the study region; Jughandle Cove ASBS near Fort Bragg and Trinidad Head ASBS near Trinidad. However, all four MPAs were 100% co-located within the ASBS in those areas that were utilized.

Coastal MPAs Summary

The NCRSG MPA Proposal scored very well for coastal MPAs, with a weighted score of 0.76 (Figure 1). Scores were influenced by the co-location with ASBSs and the number of MPAs proposed in a given proposal, rather than the co-location in areas of water quality concern. This proposal scored better than Proposal 0, which had a weighted score of 0.54. Proposal 0 contains an MPA adjacent to MacKerricher State Park and an urban stormwater drainage area empties into this existing MPA, which the NCRSG MPA Proposal avoided. While not significant, this proposal had a weighted score (0.76) for open coastal MPAs that is only slightly less than the two proposals during Round 2 that had the most favorable scores (Ruby 2 with 0.77 and Sapphire 2 with 0.80). This is due to the higher number of MPAs proposed in the final proposal. While the water quality score for the final proposal may have been lower, the overall protection gained by area is much greater when compared to Round 2 proposals because the final proposal contained more MPAs without compromising water quality.

Figure 1. Weighted scores for all water-quality evaluation categories in a given proposal for Round 3

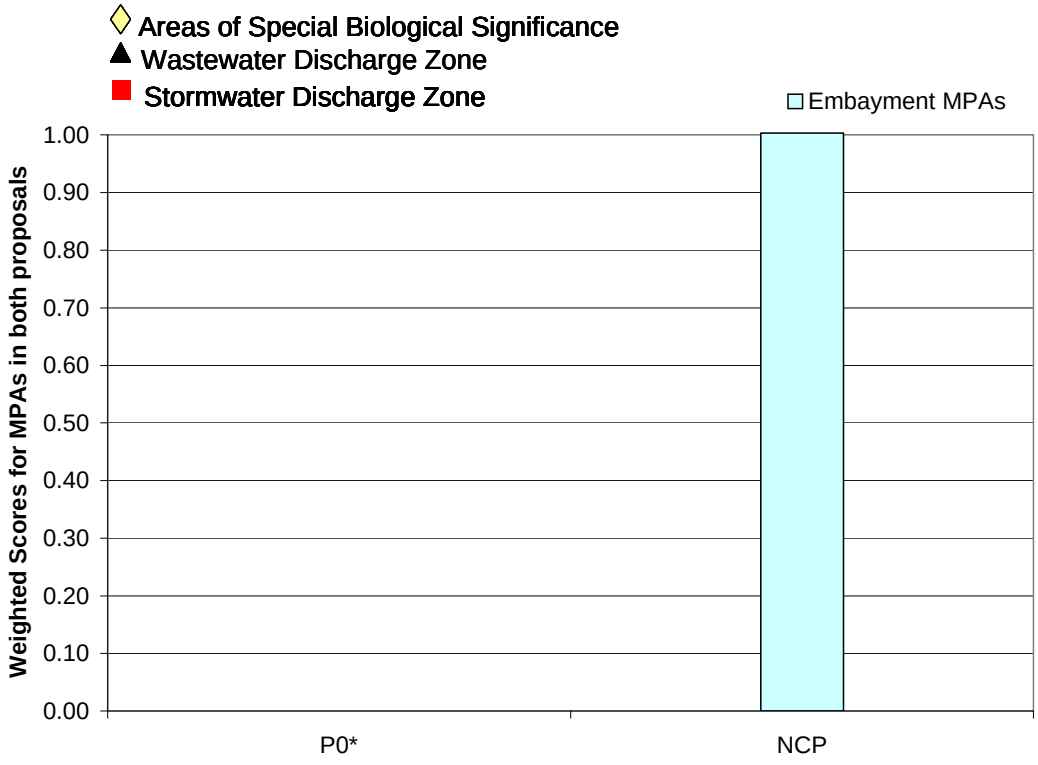


Notes: Proposal 0 did not have any bay or estuary MPAs.
Scores between 0.67 and 1.0 indicate MPA placement without area of water quality concern. Scores less than 0.67 indicate placement of MPAs within areas of water quality concern.

Embayment MPAs Summary

The NCRSG MPA Proposal did very well (weighted score 1.00) and did not contain any MPAs that were located in areas where available data indicated water quality concerns. The NCRSG MPA Proposal improved their score by removing an MPA proposed during Round 2 that was located in a water quality concern area in North Humboldt Bay.

Figure 2. Weighted scores and the associated water quality concerns for the Round 2 NCRSG MPA Proposal with embayment MPAs



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**Proposal 0 does not have any bay or estuary MPAs*

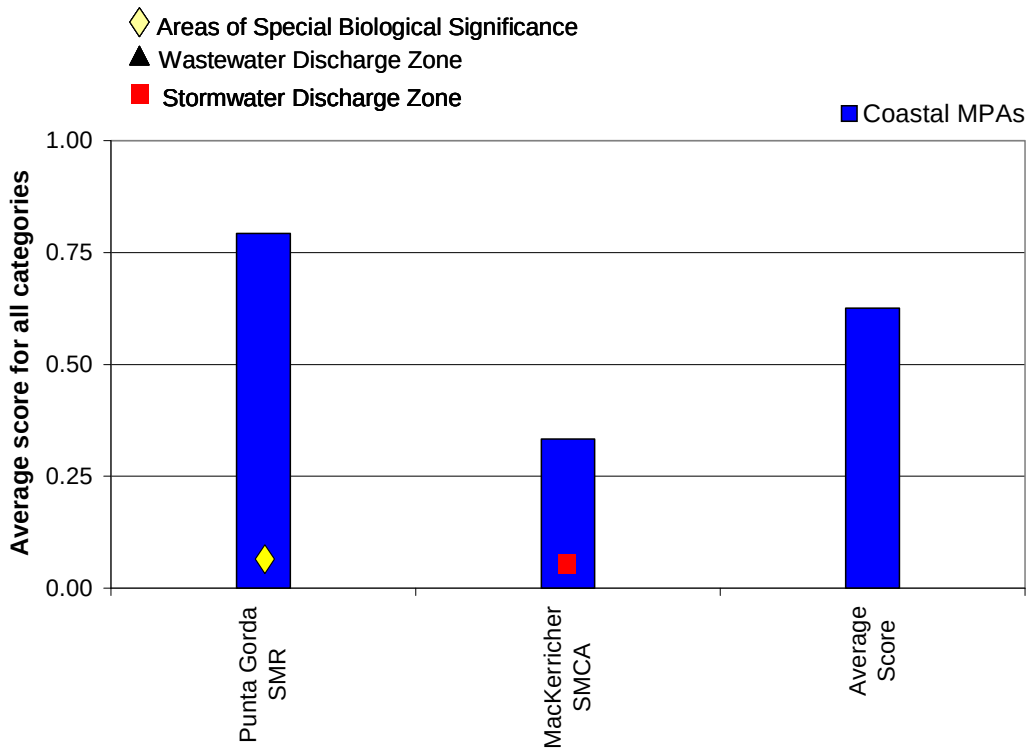
The following individual summaries focus on the specific co-location with areas of water quality concern and water quality opportunities (ASBSs). By reviewing the individual MPA proposal charts and appendices, it is possible to determine which, if any, MPAs could be adjusted to include areas without water quality concerns. Again, these considerations should be secondary and supplemental to other SAT guidelines, such as size, spacing, and habitat representation and replication.

Proposal 0: Individual Summary

Proposal 0 comprises the five existing MPAs. All five MPAs are located along the coast.

The average score for existing coastal MPAs is 0.63 and the weighted score is 0.54 (Appendix A). Four of the five coastal MPAs (80%) scored 0.67 or higher. Also, one of the existing MPAs is co-located within an ASBS (Figure 3). Only one out of five coastal MPAs scored lower than 0.67 (located within urban stormwater discharge drainage area [Fort Bragg MS4] near MacKerricher State Park) (Figure 3).

Figure 3. Proposal 0: Scores for coastal MPAs with water quality concerns and opportunities and the proposal's average score.



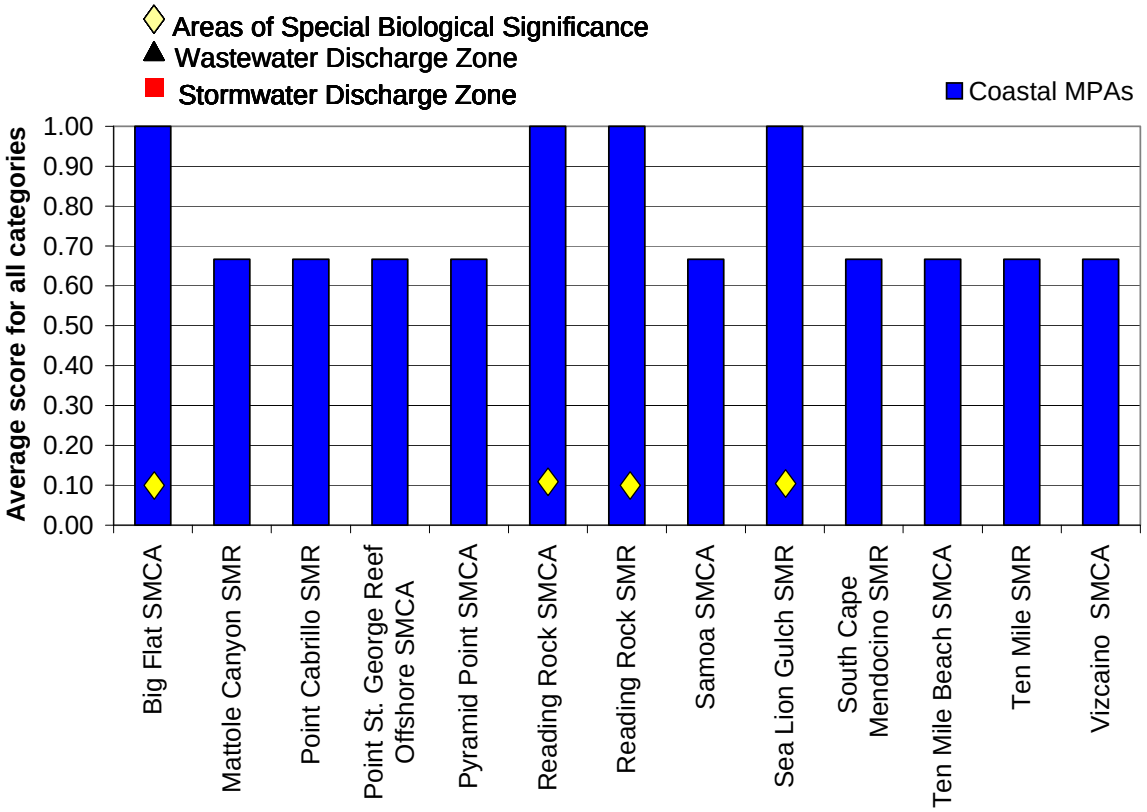
NCRSG MPA Proposal: Individual Summary

All four MPAs proposed in the NCRSG MPA proposals located in bays and estuaries scored the highest score of 1.00. There were no MPAs located in areas that had SAT defined water quality concerns per SAT guidelines.

The average score for NCRSG MPA Proposal coastal MPAs is 0.77 and the weighted score is 0.76 (Appendix B). All 13 coastal MPAs scored 0.67 or higher and did not have any water quality concerns associated with them. Furthermore, 4 of 13 (31%) coastal MPAs are entirely co-located within the boundaries of an ASBS and received the highest average score of 1.00 (Figure 7). Two of these MPAs (Reading Rock SMR and Reading Rock SMCA) were co-located within Redwood National and State Park ASBS. The third and fourth MPAs (Sea Lion Gulch SMR and Big Flat SMCA) were co-located within the Kings Range National

Conservation Area ASBS. There were no coastal MPAs located in areas that had SAT defined water quality concerns per SAT guidelines.

Figure 4. NCRSG MPA Proposal: Scores for all coastal MPAs.



Appendix A. Raw Scoring Table for Proposal 0 Based on SAT Water-Quality Evaluation Methods

MPA	MPA Shoreline Length (miles)	Stormwater, Other Nonpoint Source Discharge, and Dredge Disposal Sites	Municipal/ Industrial Discharge Zone	Co-Located with ASBS	Average Score	Weighted Score
			Coastal MPAs			
MacKerricher SMCA	4.28	0.00	1.00	0.00	0.33	0.14
Point Cabrillo SMCA	2.43	1.00	1.00	0.00	0.67	0.16
Punta Gorda SMR	1.36	1.00	1.00	0.38	0.79	0.10
Russian Gulch SMCA	1.87	1.00	1.00	0.00	0.67	0.12
Van Damme SMCA	0.35	1.00	1.00	0.00	0.67	0.02
Average Score		0.80	1.00	0.08	0.63	0.54

Appendix B. Raw Scoring Table for NCRSG MPA Proposal Based on SAT Water-Quality Evaluation Methods

MPA	MPA Size[a]	Stormwater, Other Nonpoint Source Discharge, and Dredge Disposal Sites	Wastewater Discharge	Co-Located with ASBS	Average Score	Weighted Score
			Coastal MPAs			
Big Flat SMCA	3.21	1.00	1.00	1.00	1.00	0.08
Mattole Canyon SMR	3.44	1.00	1.00	0.00	0.67	0.05
Point Cabrillo SMR	2.45	1.00	1.00	0.00	0.67	0.04
Point St. George Reef Offshore SMCA	3.44	1.00	1.00	0.00	0.67	0.05
Pyramid Point SMCA	2.97	1.00	1.00	0.00	0.67	0.05
Reading Rock SMCA	2.97	1.00	1.00	1.00	1.00	0.07
Reading Rock SMR	2.87	1.00	1.00	1.00	1.00	0.07
Samoa SMCA	3.67	1.00	1.00	0.00	0.67	0.06
Sea Lion Gulch SMR	2.55	1.00	1.00	1.00	1.00	0.06
South Cape Mendocino SMR	1.57	1.00	1.00	0.00	0.67	0.02
Ten Mile Beach SMCA	1.00	1.00	1.00	0.00	0.67	0.02
Ten Mile SMR	6.37	1.00	1.00	0.00	0.67	0.10
Vizcaino SMCA	6.05	1.00	1.00	0.00	0.67	0.09
Average Score		1.00	1.00	0.31	0.77	0.76
			Bays and Estuary MPAs			
Big River Estuary SMP	0.12	1.00	1.00	N/A	1.00	0.10
Navarro River Estuary SMRMA	0.06	1.00	1.00	N/A	1.00	0.05
South Humboldt Bay SMRMA	0.79	1.00	1.00	N/A	1.00	0.69
Ten Mile Estuary SMRMA	0.18	1.00	1.00	N/A	1.00	0.16
Average Score		1.00	1.00		1.00	1.00

a *For coastal MPAs, size is the MPA's shoreline length. For bay/estuary MPAs, size in the MPA's area in square miles.*