

MARINE PROTECTED AREAS FEDERAL ADVISORY COMMITTEE

**Marine Protected Areas and Healthy Coastal Communities:
Recommendations of the Marine Protected Area Federal Advisory Committee to the United
States Secretaries of Commerce and Interior, with a Supporting Analysis**

November 2011

Table of Contents

<u>Section</u>	<u>Page</u>
Executive Summary and Recommendations	ii
Analysis Supporting the MPA FAC’s Recommendations on Marine Protected Areas and Healthy Coastal Communities	1
I. Introduction	1
II. The Case Study Approach	2
III. Conservation and Management are Social Processes	4
IV. Guiding Principles Regarding Human Communities and Marine Protected Areas	6
V. The Social Sciences of Marine Protected Areas	14
VI. Conclusion	19
Bibliography	20
Appendix 1: What is a marine protected area?	26
Appendix 2: Template for the seven case studies on MPAs and communities	30
Appendix 3: Marine Protected Areas and Human Communities - Seven Case Studies Compared (Working Document)	34
Appendix 4: A Sample of Federal Mandates Requiring Social, Economic, and/or Cultural Analyses of Federally Created Marine Protected Areas	44
Appendix 5: Land, Sea and Communities Subcommittee Member List	45

Marine Protected Areas and Healthy Coastal Communities: **Executive Summary and Recommendations**

In April 2010, the United States Secretary of Commerce requested advice from the Marine Protected Areas Federal Advisory Committee (MPA FAC) on marine protected areas and healthy coastal (human) communities. The charge to the MPA FAC was as follows:

The Committee [the MPA FAC] has developed recommendations regarding how the national system [of marine protected areas] can help support ecological resilience despite widespread human impacts on the ocean, including climate change impacts. A similar analysis is needed to address how the national system of MPAs can help support coastal community resilience in the context of present and future impacts. These recommendations should address the linkages between social, cultural, economic, and ecological health.

Key Questions:

1. How can the national system help sustain healthy coastal communities while fulfilling its priority conservation objectives?
2. How can the national system use traditional and local ecological knowledge to more effectively meet this challenge?
3. How can community-based MPAs help sustain healthy ecosystems and communities, and how can the national system support community-based MPAs? [¹]

The MPA FAC provides here its response to the first of the three questions of the charge, which we understand broadly as the question *whether and how marine protected areas (and the national system of marine protected areas) can help sustain healthy coastal (human) communities while meeting priority conservation objectives*. We propose to respond to the second and third questions in the next round of recommendations.

Conservation and management are social processes, and marine protected areas (MPAs) are social institutions. This means that, whatever else a marine protected area is (an area of water and/or submerged lands, a set of ecological processes, a cultural resource, fragile structures, and so on), it is also – and always – a set of rules that govern whether and how human beings may access or use a geographical area in the marine environment. This fundamental point – that conservation and management are social processes and MPAs are social institutions – is at the base of our response to the question regarding MPAs and healthy coastal communities. Our response consists of a set of recommendations, for the United States Secretaries of Commerce and the Interior and an analysis supporting our recommendations. Our recommendations are threefold; they concern: (1) a set of guiding principles for entities developing and/or managing MPAs; (2) significantly increased use of the social sciences by

¹ Furgione 2010:6; NOAA 2010c.

entities developing and managing MPAs; and (3) a national center of excellence for the social sciences of MPAs.

**Recommendation I:
Guiding principles for marine protected areas that can help support healthy coastal communities**

The MPA FAC recommends that the United States Secretaries of Commerce and the Interior use the following set of guiding principles in creating and managing marine protected areas (MPAs) under their respective jurisdictions, as these lay the groundwork for MPAs that can help sustain healthy coastal communities. In addition, the MPA FAC recommends that the Secretary of Commerce direct the National Marine Protected Areas Center (MPA Center) to promote and disseminate these guiding principles among MPAs participating in the National System of Marine Protected Areas (national system) created under Executive Order 13158, among the wider set of MPAs in the United States, and among entities considering the development of new MPAs.²

These guiding principles are inter-related and mutually reinforcing, and are most effective when adopted as a whole. They are presented here in very broad terms, and they can and should be adapted to suit circumstances and contexts of particular MPAs. Adhering to these principles' core insights is essential for producing MPAs that can support healthy coastal communities in the United States.³

These guiding principles apply to any entity promoting, designing, developing, managing, and modifying MPAs in the United States. All such entities should:

- (1) Articulate and adopt, through public processes, clear, precise, and site-specific goals for each MPA or modification to an existing MPA. **(Goals)**
- (2) Collect, develop, and use site-specific, empirical data from the natural sciences and the social sciences in developing and managing each MPA. **(Data)**
- (3) Enable and promote meaningful, continuous engagement of all persons, groups, and communities involved in, affected by, or potentially affected by a MPA in the development and operation of that MPA. **(Participation)**
- (4) Map, analyze, and identify the expected and actual effects of a MPA on specific human communities, in the short and long term, identifying communities benefitted and communities burdened; acknowledge burdens and work to minimize them. **(Benefits and burdens)**

² As of October 2011, the national system comprised 297 marine protected areas, and the MPA Inventory listed 1689 marine protected areas in the United States (this includes the national system sites). See www.mpa.gov.

³ Discussions supporting each of these ten principles may be found at pp. 6-14 of the Analysis Supporting the MPA FAC's Recommendations on Marine Protected Areas and Healthy Coastal Communities.

(5) Design each MPA or modification to meet its stated goals, and, in meeting stated goals, to provide multiple, inter-related benefits – conservation, economic, social, and/or cultural – to communities, including, where appropriate, specific benefits to specific communities.

(Multiple, inter-related benefits)

(6) Recognize and uphold, where applicable, the public trust responsibilities of governments in publicly-held waters and submerged lands and resources within them. **(Honoring the public trust)**

(7) Recognize that MPAs are one among many tools for ocean-related conservation and management and work to assure that MPAs – and the specific regimes of rules adopted in MPAs – are appropriate for the specific conservation or management goal. **(Appropriateness and context)**

(8) Be on the alert for conflict in the development and application of an MPA's set of governing rules, and adopt and use conflict resolution mechanisms. **(Conflicts and conflict resolution)**

(9) Work to enhance voluntary compliance with MPA rules (using education) and to ensure fair and effective enforcement against violations. **(Compliance and enforcement)**

(10) Expect and understand that planning and development of MPAs is a process that takes time, and that MPAs, following implementation, continue to evolve over time. **(Process)**

Recommendation II:

Significantly greater use of social sciences by marine protected area management entities

The MPA FAC recommends that the Secretaries of Commerce and the Interior enable and direct the agencies within their respective departments with responsibility for marine protected areas (MPAs) to significantly increase their use of social sciences in creating and managing the MPAs within their jurisdictions, and to ensure that social, economic, and cultural analyses of these MPAs are undertaken by trained social scientists. The MPA FAC also recommends that the Secretaries of Commerce and the Interior encourage MPA management entities outside their respective two Departments – elsewhere in the federal government and in states, tribes, localities, and territories – to increase their use of the social sciences and to ensure that social analyses are undertaken by trained social scientists.

**Recommendation III:
A national center of excellence for marine protected area social sciences**

The MPA FAC recommends that the Secretaries of Commerce and the Interior advocate for and/or support a national center of excellence for the social sciences of marine protected areas (MPAs). This center of excellence would consist of highly trained and experienced social scientists, across multiple disciplines, who would work to rapidly advance our knowledge of the role of social, economic, and cultural factors in MPAs in the United States. The center would produce and/or fund work to assess and develop tools and methods for examining social, economic, and cultural factors in marine protected areas in the United States and work to examine social, economic, and cultural factors in MPAs (and networks of MPAs) in the United States. The center would assist federal agencies that manage MPAs and, through the MPA Center, MPA management entities around the nation. The center of excellence could be internal to the federal government, or external to it at a university or research institution.

MARINE PROTECTED AREAS FEDERAL ADVISORY COMMITTEE

Analysis Supporting the MPA FAC’s Recommendations on Marine Protected Areas and Healthy Coastal Communities

I. Introduction

In April 2010, the Secretary of Commerce charged the Marine Protected Areas Federal Advisory Committee (MPA FAC) with a set of questions concerning human communities and marine protected areas. The language of this charge (the “communities charge”) is as follows:

The Committee [the MPA FAC] has developed recommendations regarding how the national system [of marine protected areas] can help support ecological resilience despite widespread human impacts on the ocean, including climate change impacts. A similar analysis is needed to address how the national system of MPAs can help support coastal community resilience in the context of present and future impacts. These recommendations should address the linkages between social, cultural, economic, and ecological health.

Key Questions:

1. How can the national system help sustain healthy coastal communities while fulfilling its priority conservation objectives?
2. How can the national system use traditional and local ecological knowledge to more effectively meet this challenge?
3. How can community-based MPAs help sustain healthy ecosystems and communities, and how can the national system support community-based MPAs? [4]

This whitepaper describes the MPA FAC’s approach to addressing the first of the three questions of the charge, which we understand broadly as the question *whether and how marine protected areas (and the national system of marine protected areas) can help sustain healthy coastal (human) communities while meeting priority conservation objectives*. The paper supports and accompanies the MPA FAC’s recommendations on this question (pp. iii – v above). As the first question is broad and important, the MPA FAC has focused its efforts on developing recommendations on this one question. The MPA FAC proposes to develop recommendations on the second two questions, which we view as equally important but more specific, in the next round of recommendations.

As is customary in MPA FAC operations, the MPA FAC delegated the initial work on developing recommendations on the communities charge to a subcommittee of its members, the Land,

⁴ Furgione 2010:6; NOAA 2010c.

Sea, and Communities subcommittee.⁵ The subcommittee was aided in its work on the communities charge by liaisons from the MPA FAC's Cultural Heritage Resources Working Group, federal agency staff, and professional staff from the MPA Center of the National Oceanic and Atmospheric Administration (NOAA). The Subcommittee's work was thoroughly vetted by the MPA FAC as a whole, and both this whitepaper and the recommendations it supports are products of the MPA FAC.

II. The Case Study Approach

Following extensive discussions of the first question of the charge, the MPA FAC's Land Sea/Communities Subcommittee decided to undertake a set of detailed case studies of specific MPAs and the human communities involved in and affected by them. The Subcommittee made this decision because it believed that recommendations about how MPAs (and the national system) can help support healthy coastal communities should begin from a basic understanding of the ways in which MPAs and human communities inter-relate and that, for this understanding, it would be best to begin with concrete examples, preferably ones about which much was known.

The Subcommittee had among its members and liaisons persons with decades-long experience with specific MPAs, and the Subcommittee tasked individual members and liaisons to prepare case studies and present them to the Subcommittee. Seven case studies were selected, each one chosen for the breadth it would offer the group of studies and for the expertise of its drafter. Each drafter had helped to manage, develop, protest, study or modify the MPAs about which he or she wrote (in some cases the drafter had done several of these things, over time, with respect to the MPA addressed).

The Subcommittee prepared and approved a template of questions for the case studies. The questions – a first round, and then a second round – focused on, among other things, the histories and purposes of the MPAs, the rules they impose, natural science and social science studies, if any, undertaken during development, implementation, monitoring, or evaluation of the MPAs, the human communities involved in or affected by the MPAs, and the specific ways in which the human communities have been involved in or affected by the MPAs. See Appendix 2 for the template.

The seven case studies were:

- Channel Islands MPA complex in California (comprised of a national sanctuary, national park, state marine reserves, state conservation areas, international biosphere designation), which has its origin in the 1938 designation of two Channel Islands as a national monument under executive powers granted by the 1906 Antiquities Act.

⁵ The Land, Sea, and Communities subcommittee was assigned two charges to address, this communities charge and another charge which concerned land/sea interface issues (see MPA FAC 2011c). For a list of Land, Sea, and Communities Subcommittee members, see Appendix 5.

- South Atlantic Fishery Management Council/US Dept of Commerce’s Oculina [Coral] Habitat Area of Particular Concern (HAPC) – and Experimental Research Reserve (ERR) within the HAPC – off the east coast of Florida, which, while altered over time, dates from 1984.
- South Atlantic Fishery Management Council/US Dept of Commerce’s Deep Water Type II MPAs (Type II MPAs prohibit some fishing but allow other fishing; here bottom fishing is prohibited but pelagic trolling is allowed), comprising eight offshore sites off North Carolina, South Carolina, Georgia, Florida (east coast), first proposed in 1990, adopted in 2009.
- Regina Underwater Archaeological Preserve, a cultural resource (shipwreck) preserve created by the Florida Division of Historical Resources and maintained by a private non-profit, citizens group (“Friends of Regina”), off the west coast of Florida, first nominated in 2001, designated in 2004.
- Mo’omomi Community Based Subsistence Fishing Area, off the island of Molokai, in Hawaii, an area created under the auspices of a Hawaii law allowing native Hawaiian management, using traditional practices, of subsistence fisheries in specific areas; created in 1994; as of 2011, operational but not formally approved by state authorities.
- Edward F. Ricketts State Marine Conservation Area off Monterey, California, and three other state MPAs along same coast (two reserves and one conservation area), created under the Marine Life Protection Act (MLPA) process and managed by the California Department of Fish & Game, adopted in 2007.
- San Salvador Island (Masinloc, Zambales, Philippines) traditional fishing reserve and sanctuary, one of the best known and most successful (in producing sought-after natural and social effects) MPAs outside the United States, first adopted in 1989.[⁶]

Six of the seven case studies concerned MPAs in the United States; the seventh, San Salvador Island in the Philippines, was chosen because it has been much-studied and is considered successful on many fronts. Taken together, the six United States cases span much – but by no mean all – of the diversity of MPAs in the United States.⁷ Two are located off the west coast of the United States, two off the southeastern coast of the United States, one off the western coast of Florida, and one off the northern coast of a small Hawaiian island.⁸ The oldest of the six dates, in its earliest form, to 1938, the most recent (under development for 19 years) to 2009. The smallest is 141 acres, the largest is nearly a million acres (.94 million). Two consist of

⁶ Aspects of the seven case studies are summarized in a case study matrix, which is appended to this paper as Appendix 3. The case studies themselves, which contain rich detail about the cases (including histories of the MPAs and accounts of the communities involved in and affected by them), remain as working drafts and have not been finalized.

⁷ Appendix 1 to this whitepaper reviews the definition of “marine protected area” and the diversity of programs included within the definition.

⁸ None is located off the coasts of the northeastern United States, Alaska, Puerto Rico or United States territories in the Caribbean, or United States territories in the western Pacific.

single units, uniformly zoned; four are complexes, either a string of areas, or a complex of overlapping zones. One uses “traditional,” culturally-specific rules to manage for sustainable production goals (as does San Salvador); the other five do not rely on traditional or culturally specific methods of management. One is managed by several different federal and state authorities, two are managed by a federal agency and a federally-created regional body (a regional fishery management council), one by a state agency, one by a citizens’ group (after having been set up by a state agency), and one by an indigenous institution (operating under a state scheme that would, but has not yet, granted the indigenous institution authority).

In addition to preparing and reviewing the seven case studies, the Subcommittee invited a panel of experts to present to the MPA FAC on topics in the social science of MPAs. These presentations were made to the MPA FAC in the fall of 2010: Dr. Charles Wahle, NOAA, presented “Acknowledging the Human Dimension and Engaging Stakeholders in MPA Design and Management”; Dr. Robert Pomeroy, University of Connecticut (and MPA FAC and Land Sea/Communities Subcommittee member), presented “People Matter: Social Impacts of Marine Protected Areas”; and Dr. Matthew Lauer, San Diego State University, presented “Indigenous Knowledge as Situated Practices: Understanding Fishers’ Knowledge in the Solomon Islands.”⁹

Drawing on iterative discussions of the seven case studies, the three expert presentations, and the experience and knowledge of Subcommittee members, the Subcommittee extracted ten guiding principles for entities designing, managing, evaluating, or modifying MPAs. These ten guiding principles are elaborated below. First, however, we elaborate one overarching point that emerged very plainly from each of the case studies: Conservation and management are social processes, and MPAs are social institutions.

III. Conservation and Management are Social Processes

Conservation and management are social processes, and MPAs are social institutions. This means that, whatever else an MPA is (an area of water and/or submerged lands, a set of ecological processes, a cultural resource, fragile structures, and so on), it is also – and always – a set of rules that govern whether and how human beings may access or use a geographical area in the marine environment. Moreover, in the United States, the rules are always issued under the authority of a government, and, in the usual case, carry a threat of official

⁹ These presentations are available at www.mpa.gov/fac/meetings/ (November 2-4, 2010 (Santa Barbara)). Two previous expert presentations to the MPA FAC on related topics were: Dr. Patrick Christie, University of Washington, “Society and MPAs: Understanding the Human Dimensions (February 2005), and Dr. Richard Pollnac, University of Rhode Island, “Socioeconomic Indicators for MPAs & Systems of MPAs” (April 2009). Both are available online, Christie at <http://www.mpa.gov/fac/history/> and Pollnac at <http://www.mpa.gov/fac/meetings/>.

government sanction for violation.¹⁰ These are human-made rules, for humanly decided goals, designed to affect human behavior, and are changeable – and changed – over time.¹¹

In general, the rules that constitute an MPA are rules that limit or prohibit behaviors understood to disturb or damage natural or cultural resources associated with a site, and that allow, either by implication or affirmatively, other behaviors. Almost always, when the rules are introduced, they prohibit or limit some behaviors previously allowed and undertaken while permitting other previously allowed and undertaken behaviors to continue (this occurs as well as rules are changed over time). In some cases, by design or not, rules encourage or stimulate new behaviors at a site. At all events, these are rules that are designed to change human use of, and behavior at, a site, and that do, in fact – although this is always subject to empirical inquiry in particular cases – change human use of, and behavior at, a site.

Understanding how thoroughly conservation and management – in this case, the creation, implementation, and ongoing management of MPAs – are social processes helps us to make sense of the fact that conservation and management – MPAs – can and often do provoke sharp, lengthy, and costly controversies. (In the seven case studies we investigated, for example, only one – the cultural heritage resource MPA, which marks off an area around a shipwreck – was absent of controversy; the six others were marked by controversies, although widely varied in complexity, intensity, and duration.) Also, understanding conservation and management as social processes can help us to anticipate, address, and work to find satisfactory resolutions of the matters provoking these controversies. It can lead us to develop and support successful MPAs, including ones that help sustain healthy coastal communities.

A Note on Human Communities and Marine Protected Areas

As conservation and management are social processes, MPAs always involve and affect human communities. Human communities *create* MPAs; they, also, depending on particulars, *maintain, study, value, use, protest* and/or *are displaced from* MPAs (or the sites of the areas). The number and types of communities or groups involved in or affected by a given site vary with the characteristics and histories of the site (but even small, locally-managed sites can involve and implicate multiple communities or groups).

The human communities involved in or affected by MPAs are varied and include *geographic, interest-based, practice-based, and/or identity-based* or *culturally-based* communities:

-- *Geographic* communities are place-based communities or groups, which may or may not correspond to political jurisdictions (towns and other localities whose economies, cultures, and histories are tied to an area of ocean in or near an MPA). They are usually

¹⁰ See Appendix 1.

¹¹ For the work of social scientists on this point, see e.g., R. Pomeroy et al 2006; SSWG 2009:3; P. Christie et al 2003; Mascia et al 2003; Brechin et al 2002a, 2002b; and others.

thought of as land-based communities (where people reside) but they can also be water- or ocean-based (as in the case of fishermen, divers, or scientists who regularly co-locate at a place on or in the water).

-- *Interest-based* communities are non-geographic communities or groups of persons who share interests, concerns, or values (a concern for the ocean environment, for example).

-- *Practice-based* communities are non-geographic communities or groups of persons who undertake a common practice (fishermen, divers, tourists, scientists, activists, and many others).

-- *Identity-based* or *cultural* communities are communities or groups whose members self-identify as members of a common culture, undertake common cultural practices, and/or share cultural values (regarding, for example, relationships with the ocean). Native, tribal, and indigenous communities are identity-based or cultural communities. (However, non-native, non-tribal, and non-indigenous groups may also self-identify as cultural groups or communities, and all persons have “culture.”)

We use the term “community” broadly here, so that it encompasses groups whose members know one another and interact as well as groups that consist of persons who share an affinity, a practice, or a culture, and may or may not know one another or interact. We do so in order to capture the wide range of people and groups involved in or affected by MPAs. In other contexts involving MPAs there are reasons to define “community” more narrowly or with greater specificity.¹² In addition, there are terms and concepts other than “community” that are useful for understanding and analyzing conservation and management – the creation and management of MPAs, in particular – as social processes. These include: organizations, institutions, processes, groups, categories, individuals, and associations.¹³

IV. Ten Guiding Principles Regarding Human Communities and Marine Protected Areas:

Deliberating on the seven case studies, considering the expert presentations, and drawing from members’ knowledge and experience concerning MPAs, the Subcommittee identified ten guiding principles concerning MPAs and human communities. *These ten guiding principles apply to any entity promoting, designing, developing, managing, and modifying MPAs in the United States.* The guiding principles are aimed at: (1) producing good, respectful relationships among human communities involved in and affected by MPAs; (2) reducing or minimizing controversies that can – and all too often do – arise in the development, adoption, and management of MPAs; and (3) creating value for human communities (ecological, social,

¹² One such context is in analyses of the benefits and burdens expected or generated by specific MPAs for and on specific human communities over time (see the discussion of benefits and burdens below, at pp. 11-13).

¹³ See Agrawal & Gibson 2001; Brosius, Tsing & Zerner 2005.

economic, and cultural, etc.) in the creation and management of MPAs. In all three respects – promoting good, respectful relationships, reducing grounds for controversy, and creating value – these guiding principles lay the groundwork for MPAs that help sustain healthy coastal communities. Each guiding principle is put forth below, followed by a discussion of the principle.

(1) **Goals**

Guiding Principle: Articulate and adopt, through public processes, clear, precise, and site-specific goals for each MPA or modification to an existing MPA.

Discussion: MPAs require very specific and clear goals. Entities creating an MPA or seeking to modify an existing MPA should articulate, put out for discussion, decide upon, and record specific and clear goals – not generic or vague ones – for the area or the modification. Further, these specific and clear goals should be site-specific. The existence of specific and clear goals (both as to aim and as to site) allows members of communities and other entities to understand, consider, and debate the purpose of an MPA, and to contribute meaningfully to discussions about the best design and placement for the MPA given its purpose. Also, specific and clear goals enable creation of clear, specific, and measurable objectives to implement goals, as well as meaningful monitoring and evaluation to determine if goals and objectives are being met.¹⁴

The creation of specific and clear goals for MPAs is a social process, and the goals themselves reflect social choices and values. Social groups may choose to establish MPAs to achieve natural, social and/or scientific goals. Science (social and natural science) is essential for understanding, developing, and refining the goals of an MPA, but the adoption of goals is a social choice, as are decisions to set into place social structures - and expend social resources - to achieve these goals.¹⁵

The importance of recognizing that goals for MPAs embody social choices about what in the marine environment to value, and how to value it, is that it focuses our attention on questions – and specifics – of value. It enables discussions about *what* should be valued, *why* it should be valued, and *how* it should be valued. These discussions, in turn, help produce the specific and clear goals for MPAs that are so critically needed.

¹⁴ We reiterate here our recommendations regarding evaluation of MPAs; see MPA FAC 2009b (Evaluation Recommendations).

¹⁵ This point was made forcefully by ecologist and conservation biologist John Lawton (1997:4): “What many people fail to realize, and which is therefore a source of endless confusion, is that the very establishment of these protected areas (the species or ecosystems to be targeted, where the reserves are, their size, and the degree of protection afforded to them) is not in itself a scientific process. Science may help to inform the process of establishment, but the decisions are ultimately political, ethical, aesthetic, even religious, and embrace much more than just scientific information.” See also Miller, Gale, and Brown 1987:17 (“resource management objectives derive not from the natural sciences, but from the values of society”).

The articulation of clear and specific goals must identify the problem or need to be addressed by the MPA, and how the MPA can be expected to solve or meet that problem or need. This in turn must rest on knowledge or data about the problem or need and on site-specific analyses of how restrictions on access and use of a body of water can be expected to address the problem or need (see guiding principle 2 below). In practice, the articulation of goals – the *honing* of specific and clear goals – is inter-related with the development of data.¹⁶

(2) **Data**

Guiding Principle: Collect, develop, and use site-specific, empirical data from the natural sciences and the social sciences in developing and managing each MPA.

Discussion: The creation of an MPA requires data about the natural or cultural phenomena associated with the area, about how creation of the area will help protect those phenomena (and from what exactly they will be protected), and about the expected effects – direct and indirect – of creating and implementing the area (and its rules). Baseline data, on the natural or cultural phenomena associated with the site and on the human or social environment into which the site (and its rules) would be introduced, are especially important. Also, once an MPA has been created, data continue to be required: for implementation, maintenance, evaluation, and adaptive management of the area, and to help ensure goals are met and decisions are science-based. Production of these various data requires scientific studies and analyses from across a range of the natural and social sciences. This is a point frequently recognized, as it has been reiterated many times (including by the MPA FAC) that MPAs must be science-based.¹⁷

While data are required on the natural environment *and* the social environment of an MPA, data on the social environment are conspicuously absent in many (likely, most) MPAs in the United States.¹⁸ This was so among the seven case studies: One case concerned an MPA in which long-term ecological monitoring had been underway for decades (and was continuing), but in which socio-economic monitoring, while planned for and promised, materialized only six years after planning (in 2009, after planning in 2003) and with a financial commitment below 4% of that planned (at \$100,000, as compared to the planned \$2.5 million). In only one of the seven case studies were social and economic data collected over time, and this was San Salvador, an instance framed and supported by development goals and funds. To be sure, there can also be lacks in natural science data: In one of the case studies, an experimental MPA was created; however, when authorities sought to renew the area ten years after its creation, there was no ecological research on the site to report or learn from (the site was renewed, in any event, and as of yet there is still no research reported or data on the site offered to managers).

¹⁶ On social dynamics in the production of goals for MPAs, see Jentoft, Chuenpagee, & Pascual-Fernandez 2011.

¹⁷ See National MPA Center 2008 (Framework for National System) & MPA FAC 2011a (Coastal and Marine Spatial Planning recommendations).

¹⁸ See NCCR 2002; Wahle et al 2003; C. Pomeroy 2002; compare P. Christie et al 2003 & Charles & Wilson 2009.

When a management entity states that it will collect data – social science data or natural science data – on an MPA, and then does not do so, or does so in a much-diminished manner, this is, effectively, a breach of trust between the government (the management entity) and the public. The breach precludes analysis and use of the data not collected; as bad, it can corrode the public’s trust in the management entity (often hard-won) and its support for the MPA (also hard-won). The consequence can be reduced compliance with rules and regulations of the MPA and recalcitrance toward any future MPAs.

One powerful but underutilized way to generate high-quality data on natural and social aspects of MPAs is through collaborations between social or natural scientists (or both) and persons with experiential (‘local’) or traditional (‘cultural’) knowledge on the matters at issue. The matters at issue may be ecological, and concern fine-grained ecological histories or patterns, or they may be social, economic, or cultural, and involve human use patterns, values, or local management regimes.¹⁹

(3) **Participation**

Guiding Principle: Enable and promote meaningful, continuous engagement of all persons, groups, and communities involved in, affected by, or potentially affected by an MPA in the development and operation of that MPA.

Discussion: Interested and potentially affected communities, groups, and persons must be involved from the very start in any MPA process: in helping to articulate the goals for the MPA, and in helping to design it (its size and location, the suite of rules that will apply in the MPA, sanctions or consequences for rule violations, etc). Involvement of these communities, groups, and persons must be meaningful and should be continuous. Involvement should also continue, in some form, after implementation of an MPA, during management, monitoring, and evaluation, and so on. The reasons for this include:

-- Communities, groups, and persons often have strong opinions and views about the appropriateness of an MPA. Without meaningful opportunity to participate in the process of defining objectives, deliberating designs, and so on – and to learn from others in the process – they can become alienated from the process and turn elsewhere to be heard. In so doing, they can derail the development of an MPA, through appeal to elected officials, use of the press, litigation, or other means. If they are not alienated, however, and if their views are heard and meaningfully taken account of in a transparent process, this may generate an MPA that these communities, groups, and persons can and will support.

-- MPAs change patterns of use in and access to a geographically specified area of ocean. The change is intended to produce benefits and may impose burdens.

¹⁹ For collaborative or cooperative studies and discussions thereof, see Haggan, Neis & Baird, eds. 2007; Hartley & Robertson 2006; Read & Hartley, eds. 2006; Kaplan & McCay 2004; and National Research Council 2003.

Communities, groups, and persons bearing or potentially bearing the burdens of the MPA – as well as those reaping or potentially reaping the benefits – have basic, democratic rights to participate in processes that decide the measures that produce these benefits and impose these burdens.

-- Communities, groups, and persons will likely have knowledge important to the development of the MPA. This can include ecological knowledge garnered from use and observation of the area over a long period of time; human use knowledge (including their own, if relevant); knowledge of attitudes, beliefs, values, perceptions, etc, of the area (again, including their own). (While collaborative research is one important way to put forth experiential, local, or traditional knowledge – see guiding principle 3 – this information and knowledge can also be put forward directly, through public processes.)

Participation does not and cannot take the place of scientific studies (either natural science or social science studies), nor can scientific studies take the place of participation. (To be clear, collaborative research studies also do not take the place of public participation.) Public participation is critical to MPAs, as are social science and natural science.²⁰

(4) **Benefits and burdens of MPAs**

Guiding Principle: Map, analyze, and identify the expected and actual effects of an MPA on specific human communities, in the short and long term, identifying communities benefitted and communities burdened; acknowledge burdens and work to minimize them.

Discussion: MPAs are intended to change existing patterns of use in and access to a marine area (except in cases where they formalize existing practices). The aim in adopting an MPA and changing use patterns is to produce multiple benefits, direct or indirect, for people. This is so even when the benefits are very indirect (for example, when use patterns are changed so as to

²⁰ We reiterate here the MPA FAC's 2005 recommendations regarding the importance of a "highly participatory process at all points of planning and implementation" and the importance of identifying and engaging "interested, affected, and effecting parties" from the "beginning of the process." MPA FAC 2005:14. An *interested party* is "[a]n individual, group, or organization with direct and expressed interest in an MPA through a recognized stake in the outcome—or a more general concern with the issues involved. Interested parties could be the users of an MPA (e.g., for ocean transportation, tourism, national defense, or fishing) or of the products of an MPA (i.e., fish that are protected in an MPA and travel outside of it. They could also be parties that are more broadly concerned about ocean management or marine conservation." *Id.*, at 24. An *affected party* is "[a]n individual, group, or organization that may or may not express an interest in an MPA but is likely to be affected by MPA-related decisions. An affected party is typically one who uses an MPA or uses the MPA location (e.g., for ocean transportation or/or national defense); one on whom a specific MPA or National System of MPAs will have a noticeable impact, either beneficial or adverse." *Id.*, at 25. *Effecting parties* are "[i]ndividuals or entities whose action or inaction may cause changes to the marine or social environment that affects an MPA. Examples would be coastal developers and residents, upstream farmers, municipal water authorities, businesses, or any individual or organization whose activities affect water quality or other ecological processes important to maintaining the ecological integrity of an MPA." *Id.*

foster ecological resilience of ocean ecosystems²¹). Benefits to people can be direct or indirect, diffuse or targeted, and planned or unplanned. In producing benefits to people, however, MPAs also impose costs, or burdens, on people. These too can be direct or indirect, diffuse or targeted, and planned or unplanned. As is the case with other forms of conservation and management, benefits and burdens can and often do fall unevenly on groups and communities; the groups or communities receiving benefits are often different from the groups or communities bearing the costs or burdens. Analyses of the distributive effects of MPAs can be extremely helpful; they provide useful social data (see guiding principle 3) to inform decisions about MPAs. Equity concerns are best addressed directly and openly, and with the benefit of high quality data on impacts.

(5) **Multiple, inter-related benefits**

Guiding Principle: Design each MPA or modification to meet its stated goals, and, in meeting stated goals, to provide multiple, inter-related benefits – conservation, economic, social, and/or cultural – to communities, including, where appropriate, specific benefits to specific communities.

Discussion: The goals of MPAs vary widely, and, as noted (guiding principle 1), each MPA requires very specific and clear goals. An MPA can and should be designed to meet its very specific and clear goals and to generate (in the course of meeting its very specific and clear goals) multiple, inter-related benefits – environmental, social, economic, and/or cultural – for multiple human communities. In some instances, the goals of an MPA include a goal of producing specific, multiple, and inter-related benefits for particular, identified communities. In the usual case, these are geographic communities adjacent to or near the MPA, practice-based communities whose members share a common practice at or near the site, and/or identity- or culturally-based communities to whom the site is important.

The Mo'omomi, *Regina*, and San Salvador case studies are instances of MPAs designed to provide specific benefits to particular, identified communities. (While the other case studies also involve benefits to communities, the number and types of communities are greater and more varied than in these three cases.) The communities in Mo'omomi, *Regina*, and San Salvador are geographically adjacent, practice-based, and cultural. Each is, in large measure, reaching its goals and producing the specific, varied, and inter-related benefits it was designed to produce: in Mo'omomi, restored fish stocks, local control, and a renaissance of cultural identity and practices; in *Regina*, preservation of a locally-valued treasure (the wreck of *Regina*, whose crew – all but one – had been saved by residents of the town adjacent to the wreck and the Coast Guard), education, enhanced dive opportunities, and tourist monies; and in San Salvador, increased coral cover, restored fish stocks, higher yields, income increases to households, and new local institutional capacities, among others. Notably, the communities participate in caring for the MPA, in various respects and degrees, and in producing its benefits

²¹ See MPA FAC 2010 (Climate Change in the Ocean recommendations).

(in Mo'omomi, a local cultural association manages the fishing; in *Regina*, a citizens association raises money for – and cares for – the site; and in San Salvador local residents help enforce the site's rules.) In these cases, the communities receive benefits *and* take responsibility.

In MPAs such as these, benefits afforded specific, identified communities often occur to the exclusion or limitation of comparable benefits to other communities. In Mo'omomi, for example, persons other than Molokai residents and certain individually-permitted others are pressured not to fish in the MPA (the mechanism of exclusion is informal social pressure as the management entity has not yet received formal authorization from the State of Hawaii), and persons permitted to fish may fish only for subsistence, that is, household consumption, sharing, or bartering. In San Salvador, only island residents and certain recognized mainland residents with a long history in the area may fish in the area (in the zone in which fishing is allowed and regulated; no one may fish in the no-take zone); others seeking to fish in the San Salvador MPA may not do so. This said, the benefits afforded the identified communities can and often do radiate out – in other forms – beyond the identified communities themselves. In Mo'omomi, for example, non-residents seeking to fish for recreation are finding increased opportunities to do so just outside the boundaries of the Mo'omomi MPA; also, the use of Native Hawaiian cultural practices inside the Mo'omomi MPA may be providing benefits to others seeking to assert Native Hawaiian cultural practices and identities in other contexts and places. In the case of *Regina*, the provision of benefits locally (economic, cultural, recreational) provides secondary benefits more remotely (recreation and education for persons who travel to the area to dive, and, potentially, a state-wide or even a national pride in the local community that worked to save the victims of the wreck.)

One of the challenges in designing and implementing MPAs to provide specific benefits for particular, identified communities is that communities are rarely the homogenous or bounded entities they are sometimes imagined to be by resource managers or presented as being by community leaders or spokespersons. Significant divisions and differences, as well as commonalities, can exist within communities; these differences and divisions can lead to uneven and inequitable distributions of benefits *within* communities.²²

One way to create multiple, inter-related benefits is to design and implement networks of MPAs.²³

²² See Agrawal & Gibson 2001; Brosius, Tsing & Zerner 2005; Brondo, Brown & Woods 2011; Igoe 2006.

²³ For the MPA FAC's recommendations concerning ecological benefits of networks of marine protected areas, see MPA FAC 2009a (Ecological Resilience recommendations) and MPA FAC 2010 (Climate Change in the Ocean recommendations). These two sets of recommendations did not address ways in which networks of marine protected areas can create multiple and inter-related benefits for human communities; instead, they were addressed solely to the ecological benefits provided by networks of MPAs.

(6) Honoring the public trust

Guiding Principle: Recognize and uphold, where applicable, the public trust responsibilities of governments in publicly-held waters and submerged lands and resources within them.

Discussion: The public trust doctrine, while complex and varied, holds that public waters and submerged lands within the boundaries of states (and the resources within these waters and submerged lands) are held by the individual states in ‘trust’ for their citizenries or publics. It has also been argued that, since creation of the United States’ fishery conservation zone in 1977 (reconceived, in 1983, as the United States’ exclusive economic zone), the United States has public trust responsibilities to its national citizenry and public in the resources, waters, and submerged lands in this zone (which runs from the coastal states’ seaward boundaries to 200 nautical miles from shore, measured from baselines).²⁴ One of the challenges in developing and maintaining MPAs in state or federal waters is to reconcile the benefits and burdens delivered or imposed by an MPA to or on specific communities or groups with the public trust responsibilities of state or federal authorities to whole citizenries.

(7) Appropriateness and context

Guiding Principle: Recognize that MPAs are one among many tools for ocean-related conservation and management and work to assure that MPAs – and the specific regimes of rules adopted in MPAs – are appropriate for the specific conservation or management goal.

Discussion: MPAs are one among many tools for ocean management, and should be used in the context of and in conjunction with these other tools. Moreover, the larger institutional contexts of MPAs should also be taken into account. In some international development contexts, for example, the creation of MPAs can be a mechanism for taking control of an area in an absence of other structures of authority.

(8) Conflicts and conflict resolution

Guiding Principle: Be on the alert for conflict in the development and application of an MPA’s set of governing rules, and adopt and use conflict resolution mechanisms.

²⁴ For the purpose of federal fishery management, the inner boundary of the exclusive economic zone is the coastal states’ seaward boundaries (see Magnuson-Stevens Act, section 3 (11), 16 U.S.C. 1802(11)). For other purposes, the inner boundary of the exclusive economic zone is the seaward boundary of the United States territorial sea (see Presidential Proclamation 5030, 48 Fed. Reg. 10605, March 10, 1983, regarding the exclusive economic zone, and Presidential Proclamation 5928, 54 Fed. Reg. 777, January 9, 1989, regarding the territorial sea). Regarding the public trust doctrine in the exclusive economic zone, see Turpinseed et al 2009. Also, with respect to fishery resources, the Magnuson-Stevens Act, the United States’ federal fisheries management legislation, describes fishery resources within the exclusive economic zone as “fishery resources of the United States” and as “the Nation’s fishery resources.” Magnuson-Stevens Act, section 2(a)(6), 16 USC 1801(a)(6). Regarding states’ public trust doctrines and MPAs, see D. Christie 2004.

Discussion: Given the variety of communities involved in and affected by MPAs, the benefits and burdens that MPAs produce, and the simple fact that MPAs are regimes of rules governing – and changing – human use patterns in areas of the marine environment, it is not surprising that conflicts emerge, when areas are being designed and implemented. Thus, conflict resolution mechanisms are key, both as protected areas are being developed and during their operation. Also, tools and processes that encourage identification of common ground in MPAs—such as facilitation, clear science guidelines, joint fact finding, and incentives for cross-interest support – are important aids for designing MPAs so as to reduce the potential for conflict.

(9) Compliance and enforcement

Guiding Principle: Work to enhance voluntary compliance with MPA rules (using education) and to ensure fair and effective enforcement against violations.

Discussion: As regimes of rules and/or regulations, MPAs depend upon compliance with rules and regulations, and on fair and effective enforcement to address non-compliant behavior. In past recommendations, the MPA FAC elaborated principles for effective compliance and enforcement, including the critical importance – once again – of meaningful participation in the development of the rules and/or regulations, and extensive education about the rules and regulations. We reiterate our full set of earlier recommendations here; see MPA FAC 2008. In addition, we note that new tools are being developed (through the social sciences) to create a systematic approach to gain optimal compliance with MPA regulations, and for enforcement strategies and tactics that effectively and fairly address non-compliant behavior.

(10) Process

Guiding Principle: Expect and understand that planning and development of MPAs is a process that takes time, and that MPAs, following implementation, continue to evolve over time.

Discussion: MPAs take time, and they take place *in* time. They take time in the planning and development phases, and, once implemented, they develop and change over time. Among the case studies, one MPA took 19 years to come from first proposal to implementation; one, which was implemented in 2007, has its roots in efforts first made in the 1920s; and one, first implemented in 1994, still awaits a formal approval (but operates openly without the formal approval). All but two – the cultural heritage resources MPA, adopted in 2004, and the fishery management MPAs adopted in 2009 – have seen significant changes since first implementation. One, begun in 1938, saw significant changes over nine years in the 2000s. The time that MPAs take to develop may be time that the phenomena the areas are designed to protect do not have. Adhering to the ten guiding principles articulated here through a transparent process can, ultimately, reduce the time required to develop and implement a successful MPA.

V. The Social Sciences of Marine Protected Areas

Many social science disciplines can contribute to developing a more robust understanding of social factors in MPAs, including geography, anthropology, political science, sociology, economics, history, and others. Researchers trained in these disciplines have made substantial contributions to understanding social aspects of MPAs (*inquiring into matters related to the ten principles outlined above*). Some work concerns MPAs generally, synthesizing individual empirical studies or providing theoretical treatment, while much work addresses individual MPAs. Much of this work, so far, has addressed MPAs that are *outside* of the United States, some of which have been - or are being - created as part of international development programs.²⁵

Social scientists across disciplines have argued that the social sciences are critical to improving conservation and management practice generally and MPAs in particular. In 2003, seven social scientists from various disciplines wrote, in *Conservation Biology*, that “[t]o preserve the earth’s natural heritage, the social sciences must become central to conservation science and practice,” and argued for “mainstreaming social sciences in conservation.”²⁶ Also in 2003, seventeen (other) social scientists (from multiple disciplines) wrote, in *Fisheries*, that MPAs “are destined to fall short of biological and social goals unless social sciences are deliberately integrated into the design and evaluation process.”²⁷ In 2009, the Social Sciences Working Group (SSWG) of the Society for Conservation Biology made it its science goal for the next five years (2009-2014) to “advance scientific understanding of conservation as a social process”; SSWG comprised 700 members when it adopted this goal.²⁸

Also, social scientists have shown that social factors play critical roles in MPAs. In 2004, the International Union for the Conservation of Nature (IUCN) published *How is Your MPA Doing?*, the result of a comprehensive study on management effectiveness in MPAs by a social scientist and two natural scientists. The study identified 42 indicators of effectiveness in MPAs; of these 42, 10 are biophysical indicators while 32 are social indicators (16 socio-economic indicators and 16 governance indicators).²⁹ In 2011, the United Nations Environment Program (UNEP) published a study by three geographers that synthesized 20 case studies on governance in

²⁵ See, e.g., Mascia, Claus, Naidoo 2010; Mascia & Claus 2006; Mwaipopo 2008; C. Pomeroy 2002; Jones 2009, 2008, 2004; Pollnac et al 2010; compare McLanahan et al 2006. See generally NRC 2005.

²⁶ Mascia et al 2003:649. A search on ISI Web of Science (4/6/2011) indicates that Mascia et al has been cited 72 times in the scientific literature; a search on Google Scholar (4/6/2011) indicates 123 citations.

²⁷ P. Christie et al 2003:23. Cited by 48 in ISI Web of Science (4/6/2011); 95 in Google Scholar (4/6/2011).

²⁸ SSWG 2009:3. See also NRC 2005. Compare Samonte, Karrer & Orbach 2010:3 (there is “an awakening within the conservation community that the human relationship with coastal and ocean environments must be evaluated in cultural, social, and economic – as well as ecological – dimensions.”). See also Newing 2011.

²⁹ Pomeroy, Parks, & Watson 2004:47.

MPAs (examining five types of governance) to offer insights on “equitable and effective approaches to MPA governance.”³⁰

In the United States, there are, on the one hand, multiple strong mandates requiring social scientific studies of MPAs – for a sample of some of the mandates that apply to federally-created MPAs, see Appendix 4 – but there is, on the other hand, a fairly widespread recognition that social, economic, and cultural analyses of MPAs are severely lacking. In a 2002 MPA Needs Assessment, NOAA’s Coastal Services Center, together with the MPA Center, found: “[S]ocial science research related to MPAs is extremely limited. . . . The needs assessment identified a host of research needs, but the overwhelming sentiment was that much more social science is needed.”³¹ In 2001, even before the Needs Assessment, the MPA Center had created a Social Science Planning Team to develop a national social science research strategy for MPAs. In 2002, the Center hosted a national two-day workshop to develop the strategy, and in 2003, released the strategy. The strategy called for research across social science disciplines in: human uses of ocean areas; economics of MPAs; attitudes, perceptions, and beliefs; community organization; governance and institutional structure; and cultural heritage and resources.³² In his 2010 presentation to the MPA FAC on the strategy and its aftermath, Dr. Charles Wahle reported that the strategy had “catalyzed” the MPA Center’s work on ocean uses, but that “much remains to be done.”³³

There remains a startling lack of capacity to understand social factors in MPAs. This is not at all in accord with the wide and growing understanding that social factors are critical in conservation and management and that the social sciences play an essential role in understanding and enabling conservation and management successes. The lack of social science capacity within the National Oceanic and Atmospheric Administration (NOAA), for

³⁰ Jones, Qiu, & De Santo 2011:50.

³¹ NOAA CCR 2002:34.

³² Wahle et al 2003. In introducing the strategy, then-MPA Science Institute Director (and marine ecologist) Dr. Charles Wahle wrote: “MPA design has traditionally relied heavily on natural science information about the ecology and oceanography of specific marine resources or ecosystems; however, it is now *inescapably clear* that the successful design, establishment and stewardship of any MPA do not rest solely on biological data. Instead, it is also an intensely human endeavor that is profoundly influenced by how society values the oceans and how we perceive our role in marine ecosystems, now and in future generations. To ignore or marginalize the human dimension of MPAs risks prolonged and counterproductive user conflicts, legal challenges, procedural delays, and ineffective outcomes for both the protected ecosystems and the human users they support. Recognizing this, our challenge as a nation is now to actively develop the social science foundation needed to ensure that MPA decisions are sound, science-based, equitable and effective at meeting their conservation objectives. [Emphasis added.]” Id. at iv.

³³ See Wahle presentation 2010 (noted *infra* at p. 4 & note 10); see also Wahle et al 2003. The National Marine Protected Areas Center’s work on ocean uses – the Ocean Atlas Project, which is partly privately funded by non-governmental organizations – is extremely important, both substantively and methodologically. It is coast-wide, however, and so not focused on marine protected area dynamics per se; see www.mpa.gov/dataanalysis/atlas/.

example, was made clear in a 2009 study by NOAA’s Science Advisory Board.³⁴ This 2009 study was a follow-up to a 2003 study by the NOAA Science Advisory Board’s Social Science Review Panel.³⁵ The 2009 study reported that the 2003 study had found that “the capacity” of NOAA to “meet its mandates and mission is diminished by the underrepresentation and underutilization of social science” and that “this finding remains true in 2009.”³⁶ Among other 2009 findings were that “NOAA lacks sufficient social science expertise to meet its mission and objectives”; “social science literacy has improved somewhat since the 2003 report, but it is still weak in many areas”; “NOAA’s social science capabilities declined between 2005 and 2008”; and “[o]verall, there is inadequate high level commitment among NOAA administrators to strengthening NOAA’s use of the social sciences”).³⁷

The lack of capacity within NOAA is also evident from a quick look at the resources dedicated to social science in NOAA: A 2010 article by two NOAA social scientists reported that, after a “long voyage,” there were, as of 2010, 85 social scientists at NOAA (across all social disciplines, including economics), 72 of whom were in NOAA Fisheries, and 13 of whom were in all other NOAA programs combined.³⁸ In 2010, NOAA was budgeted 12,321 full time equivalent positions, of which 2823 positions were budgeted for NOAA Fisheries, and 9498 for all other NOAA programs combined.³⁹ In 2010, the 85 social scientists in NOAA comprised 0.69% of all positions in NOAA (85/12,321); the 72 social scientists in NOAA Fisheries comprised 2.55% of the positions in NOAA Fisheries (72/2823); and the 13 social scientists across NOAA’s other programs comprised 0.14% of the positions in those programs (13/9498). The 2009 Science Advisory Board study reported that, in terms of monetary figures, funding for social science in NOAA in 2008 comprised 0.6% of the total NOAA budget in 2008 (and had comprised 0.7% in 2005).⁴⁰ (The NOAA budgets in 2008 and 2005 were, in both years, in round numbers, 3.9 billion dollars; in 2010, the NOAA budget was 4.7 billion dollars.⁴¹)⁴²

³⁴ NOAA SAB 2009.

³⁵ SSRP 2003.

³⁶ NOAA SAB 2009:4.

³⁷ NOAA SAB 2009: 6-7. For NOAA’s response to the Science Advisory Board’s 2009 Report (in which NOAA commits to undertake a social science needs assessment for NOAA), see NOAA 2010b.

³⁸ Abbott-Jamieson & Clay 2010:30.

³⁹ See NOAA 2010a (Introduction, p. VII (enacted FY 2010 figures)) for the NOAA-wide figures; see NOAA 2010a (Chapter 2, p. 2-41 (enacted FY 2010 figures)) for the NOAA Fisheries figures.

⁴⁰ NOAA SAB 2009:20.

⁴¹ Lubchencho n.d.

⁴² These numbers are both over- and under- inclusive: NOAA is only one of many federal agencies with authority over marine protected areas (others, for example, are within the United States Department of Interior), and the federal government itself is only one of many governments or levels of government with authority over marine protected areas (the states, tribes, localities, and territories have authority over marine protected areas in their

The critical role that social, economic, and cultural factors play in the success of MPAs, combined with our current lack of capacity to assess and understand the role that these factors play in MPAs in the United States, calls for creation of a national center of excellence in the social sciences of MPAs. This center of excellence would consist of highly trained and experienced social scientists, across multiple disciplines, who would work to rapidly advance our knowledge of the role of social, economic, and cultural factors in MPAs in the United States. The center would produce and/or fund work to assess and develop tools and methods for examining social, economic, and cultural factors in MPAs in the United States and work to examine social, economic, and cultural factors in MPAs (and networks of MPAs) in the United States. The center would assist federal agencies that manage MPAs and, through the MPA Center, protected area management entities around the nation.

The center of excellence could be internal to the federal government, or external to it at a university or research institution.⁴³ The center would catalyze work to understand social, economic, and cultural factors in MPAs, and to put new understandings to work to enable successful MPAs and support of healthy coastal communities. In addition, the center would be very well positioned to provide critically needed social science expertise to support coastal and marine spatial planning.⁴⁴

Priority actions for the national center of excellence in the social sciences of MPAs would include:

- Further develop and specify the ten recommended guiding principles for MPAs that can help support healthy coastal communities (see Recommendation I, pp. iii-iv).
- Promote and exemplify the principles that (1) research and analyses in the social sciences of MPAs should be undertaken by persons with graduate level training in social science disciplines, and (2) research and analyses in the social sciences of MPAs should be of the highest caliber.
- Promote understanding that social science research and analyses of social factors in a marine protected area is fundamentally different from public participation in marine protected area development and management.
- Prioritize work in the social sciences that reveals effective ways of ensuring meaningful, long-term public engagement in MPA processes.

respective jurisdictions). Further, within NOAA, there is a portfolio of programs that extends well beyond those under which marine protected areas are created or managed.

⁴³ Among models for the center of excellence are the cooperative institutes established by the National Oceanic and Atmospheric Administration (see www.nrc.noaa.gov/ci/index.html) and the various centers of excellence, in many fields of inquiry, established by the National Science Foundation. Other models, which rely in whole or in part on private funding, are also apt.

⁴⁴ See MPA FAC 2011a (Recommendations for the Coastal and Marine Spatial Planning Process).

- Support the development of methods, tools, and standards within and across social science disciplines for site-specific analyses of expected and actual social, economic, and cultural effects of MPAs, and of social factors associated with MPAs.
- Promote quantifiable studies on the social and economic impacts of MPAs and on how these impacts vary over time, across spatial scales and levels of social organizations, and within and across social groups.
- Promote social and economic monitoring to inform decision-making.
- Encourage and enable collaborative research among social scientists and persons with experiential and/or historical knowledge of the natural, cultural, and/or social environments of MPAs in the United States.
- Encourage and enable interdisciplinary investigations into MPA processes, through collaborations among persons trained in social science disciplines and persons trained in natural science disciplines.
- Apply and adapt knowledge and insights developed from the study of MPAs outside the United States to MPAs inside the United States and under the jurisdictions of the federal government, states, tribes, localities, or territories in the United States.
- Ensure that hands-on knowledge of long-time MPA managers in the United States is collected and used, and ensure peer to peer learning among MPA managers in the United States on ways in which MPAs can best help support healthy coastal communities.
- Support development and use of the cultural landscape approach to analyzing cultural resource MPAs (see MPA FAC 2011b, Cultural Landscape Approach recommendations).

VI. Conclusion

Conservation and management are social processes, and MPAs are social institutions. This means that, whatever else an MPA is (an area of water and/or submerged lands, a set of ecological processes, a cultural resource, fragile structures, and so on), it is also – and always – a set of rules that govern whether and how human beings may access or use a geographical area in the marine environment. This fundamental point – that conservation and management are social processes and MPAs are social institutions – is at the base of our recommendations regarding MPAs and healthy coastal communities. Our recommendations are threefold; they concern: (1) a set of guiding principles for entities developing and/or managing MPAs; (2) significantly increased use of the social sciences by entities developing and managing MPAs; and (3) a national center of excellence for the social sciences of MPAs. See Marine Protected Areas and Healthy Coastal Communities, Executive Summary and Recommendations, pp. ii – v.

BIBLIOGRAPHY

- Abbott-Jameison, Susan, and Patricia M. Clay. 2010. "The Long Voyage to Including Sociocultural Analysis in NOAA's National Marine Fisheries Service." *Marine Fisheries* 72(2):14-33.
- Agrawal, Arun, and Clark C. Gibson, eds. 2001. *Communities and the Environment: Ethnicity, Gender, and the State in Community-Based Conservation*. New Brunswick: Rutgers University Press.
- Belsky, Jill. 2003. "Unmasking the "Local": Gender, Community, and the Politics of Community-Based Rural Ecotourism in Belize." In S.R. Brechin, P.R. Wilshusen, C.L. Fortwangler, P.C. West, eds., *Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-first Century*.
- Brechin, S.R., P.R. Wilshusen, C.L. Fortwangler, and P.C. West (eds.). 2003. *Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-first Century*. Albany: SUNY Press.
- Brechin, S.R., P.R. Wilshusen, C.L. Fortwangler, and P.C. West. 2002a. "Reinventing a Square Wheel: Critique of a Resurgent "Protection Paradigm" in International Biodiversity Conservation." *Society & Natural Resources* 15:17-40.
- Brechin, S.R., P.R. Wilshusen, C.L. Fortwangler, and P.C. West. 2002b. "Beyond the Square Wheel: Toward a More Comprehensive Understanding of Biodiversity Conservation as a Social and Political Process." *Society & Natural Resources* 15:41-62.
- Brondo, K. V., N. Brown, and L. Woods. 2011. "Protecting Garifuna Territory for Whom? Gender, Power, and Ecotourism in the Cayos Cochinos Marine Protected Area." *Practicing Anthropology* 33(4):13-18.
- Brosius, J. Peter, Anna Lowenhaupt Tsing, & Charles Zerner. 2005. *Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management*. Lanham, MD: Alta Mira Press.
- Burdge, Rabel J. 1998. *A Conceptual Approach to Social Impact Assessment* (rev. ed.). Middleton, WI: Social Ecology Press.
- Charles, Anthony, and Lisette Wilson. 2009. "Human Dimensions of Marine Protected Areas." *ICES Journal of Marine Science* 66:6-15.
- Christie, Donna. 2004. "Marine Reserves, the Public Trust Doctrine, and Intergenerational Equity." *J. Land Use & Environmental Law* 19(2):427-434.
- Christie, Patrick. 2004. "Marine Protected Areas as Biological Successes and Social Failures in Southeast Asia." *American Fisheries Society Symposium* 42:155-164.
- Christie, Patrick, Bonnie J. McCay, Marc L. Miller, Celia Lowe, Alan T. White, Richard Stoffle, David L. Fluharty, Liana Talaue Mcmanus, Ratana Chuenpagdee, Caroline Pomeroy, Daniel O. Suman, Ben G. Blount, Daniel Huppert, Rose-Liza Villahermosa Eisma, Enrique Oracion, Kem Lowry & Richard B. Pollnac. 2003. "Toward developing a complete understanding: A social science research agenda for marine protected areas." *Fisheries* 28(12):22-26.
- Clay, Patricia M., and Julia Olson. 2007. "Defining Fishing Communities: Issues in Theory and Practice." *NAPA Bulletin* 28:27-42.

- Dudley, N. (ed.). 2008. *Guidelines for Applying Protected Area Management Categories*. Gland, Switzerland: International Union for Conservation of Nature (IUCN).
- Friedlander, Alan; Kelson Poepoe; Kaipo Poepoe; Kanoho Helm; Paul Bartram; James Maragos; and Isabella Abbott. . 2002. "Application of Hawaiian traditions to community-based fishery management." In Proceedings of the Ninth International Coral Reef Symposium, Bali (M.K Moosa, S. Soemodihardjo, A. Soegiarto, K. Romimohtarto, A. Nontji, Soekarno and Suharsono, eds.), Vol. 2:813-818. Jakarta: Ministry of Environment.
- Furgione, Laura. 2010. "Charge for the Marine Protected Areas Federal Advisory Committee" (April). U.S. Department of Commerce, National Oceanic and Atmospheric Administration.
- Geisler, Charles. 2003. "Your Park, My Poverty: Using Impact Assessment to Counter the Displacement Effects of Environmental Greenlining." In S.R. Brechin, P.R. Wilshusen, C.L. Fortwangler, P.C. West, eds., *Contested Nature: Promoting International Biodiversity with Social Justice in the Twenty-first Century*.
- Gilden, Jennifer. 2005. Social Science in the Pacific Fishery Management Council Process. Pacific Fishery Management Council.
- Guerreon-Montero, Carla. 2005. "Marine Protected Areas in Panama: Grassroots Activism and Advocacy." *Human Organization* 64(4):360-373.
- Haggan, Nigel, Barbara Neis, and Ian G. Baird (eds.). 2007. *Fishers' Knowledge in Fisheries Science and Management*. UNESCO.
- Hartley, Troy, and Robert A. Roberston. 2006. "Stakeholder Engagement, Cooperative Fisheries Research and Democratic Science: The Case of the Northeast Consortium." *Human Ecology Review* 13(2):161-171.
- Igoe, Jim. 2006. "Measuring the Costs and Benefits of Conservation to Local Communities." *J. Ecological Anthropology* 10:72-77.
- International Union for the Conservation of Nature (IUCN) 1994. *Guidelines for Protected Area Management Categories*. IUCN: Gland, Switzerland.
- Jentoft, Svein, Ratana Chuenpagdee and Jose J. Pascual-Fernandez. 2010. "What are MPAs for? On goal formation and displacement." *Ocean & Coastal Management* 54:75-83.
- Johannes, R. E. 2002. "The Renaissance of Community-Based Marine Resource Management in Oceania." *Annual Review of Ecological Systems* 33:317-40.
- _____. 1978. "Traditional Marine Conservation Methods in Oceania and their Demise." *Annual Review of Ecological Systems* 9:349-364
- Jones, P.J.S. 2009. "Equity, justice, and power issues raised by no-take marine protected area proposals." *Marine Policy* 33(5):759-765.
- _____. 2008. "Fishing industry and related perspectives on the issues raised by no-take marine protected area proposals." *Marine Policy* 32(4):749-758.
- _____. 2006. "Collective action problems posed by no-take zones." *Marine Policy* 30(2):143-156.

- Jones, P.J.S., W. Qiu, & E. De Santo. 2011. *Governing Marine Protected Areas: Getting the Balance Right*. Technical Report. United Nations Environment Program.
- Kaplan, Ilene M. and Bonnie J. McCay. 2004. "Cooperative research, co-management and the social dimension of fisheries science and management." *Marine Policy* 28:257-258.
- Kareiva, Peter. 2006. "Conservation Biology: Beyond Marine Protected Areas." *Current Biology* 16(14):R533-R535.
- Karras, Constance, and Juan J. Agar. 2008. "Cruzan Fishers' Perceptions of the Socio-economic and Biological Performances of Marine Closures in St. Croix." *Proceedings of the 61st Gulf and Caribbean Fisheries Institute* 380-390.
- Kelleher, G. 1999. *Guidelines for Marine Protected Areas*. IUCN: Gland, Switzerland.
- Kelleher, G., and C. Recchia. 1998. "Editorial: lessons from marine protected areas around the world." *Parks* 8(2):1-4.
- Kelleher, G., and R. Kenchington. 1992. *Guidelines for Establishing Marine Protected Areas*. IUCN: Gland, Switzerland.
- Lawton, John. 1997. "The science and non-science of conservation biology." *Oikos* 79:3-5.
- Lubchenco, Jane. n.d. FY 2011 NOAA Budget Summary. Available at www.rdc.noaa.gov/nbo/11bluebook_highlights.html.
- Marine Protected Areas Federal Advisory Committee (MPA FAC). 2011a. Recommendations for the Coastal and Marine Spatial Planning Process. Available at http://www.mpa.gov/pdf/helpful-resources/mpa_fac_recommendations_sep2011.pdf.
- MPA FAC. 2011b. Recommendations for Integrated Management Using a Cultural Landscape Approach in the National MPA System. Available at www.mpa.gov/fac/products/.
- MPA FAC. 2011c. White Paper and Recommendations on Managing Marine Resources Across the Land/Sea Interface. Available at www.mpa.gov/fac/products/.
- MPA FAC. 2010. Climate Change in the Ocean: Implications and Recommendations for the National System of Marine Protected Areas. Available at http://www.mpa.gov/pdf/helpful-resources/mpafac_tor_doi_5-3-10-1.pdf.
- MPA FAC. 2009a. Ecological Resilience and Gap Analysis of the National System of Marine Protected Areas. Available at www.mpa.gov/pdf/fac/facfac_recommend300409.pdf.
- MPA FAC. 2009b. Evaluating the National System of Marine Protected Areas: Considerations and Planning Tool. Available at http://www.mpa.gov/pdf/fac/mpa_fac_recommendations_91109.pdf.
- MPA FAC. 2008. MPA Management Principles – Compliance And Enforcement. Available at www.mpa.gov/pdf/fac/f_recommendations5_08.pdf.

MPA FAC. 2005. Protecting America's Marine Environment: A Report of the Marine Protected Advisory Committee on Establishing and Managing a National System of Marine Protected Areas (June 2005). Available at http://www.mpa.gov/pdf/fac/mpafac_report_06_05.pdf .

Mascia, Michael B., C. Annie Claus, Robin Naidoo. 2010. "Impacts of Marine Protected Areas on Fishing Communities." *Conservation Biology* 24(5):1424-1429.

Mascia, Michael B. and C. Anne Claus. 2006. "A Property Rights Approach to Understanding Human Displacement from Protected Areas: the Case of Marine Protected Areas." *Conservation Biology* 23(1):16-23.

Mascia, Michael B., J. Peter Brosius, Tracy A. Dobson, Bruce C. Forbes, Leah Horowitz, Margaret A. McKean, Nancy J. Turner. 2003. "Conservation and the Social Sciences." *Conservation Biology* 17(3):649-650.

McClanahan, T. R., M.J. Marnane, J.E. Cinner, & W.E. Kiene. 2006. "A Comparison of Marine Protected Areas and Alternative Approaches to Coral-Reef Management." *Current Biology* 16(14):1408-1413.

Millennium Ecosystem Assessment (Conceptual Framework Working Group). 2003. *Ecosystems and Human Well-being: A Framework for Assessment*. Washington: Island Press.

Miller, M.L., R.P. Gale, & P.J. Brown. 1987. *Social Science in Natural Resource Management Systems*. Boulder and London: Westview Press.

Mwaipopo, Rosemarie Nyigulila. 2008. The Social Dimensions of Marine Protected Areas: A Case Study of the Mafia Island Park in Tanzania. Samudra Monograph. International Collective in Support of Fishworkers. Chennai: India.

National Centers for Coastal Ocean Science. 2007. Human Dimensions Strategic Plan, FY 2009-2014. NOS, NOAA, DOC.

National Coastal Services Center (NCCR). 2002. Marine Protected Areas Needs Assessment Final Report (March 2002). Prepared by the NOAA Coastal Services Center in cooperation with the National MPA Center.

National Marine Fisheries Service (NMFS). 2007. *Guidance for Social Impact Assessment*. NMFS Instruction 01-111-02 (effective date, Dec. 24, 2007). www.nmfs.noaa.gov/directives.

National Marine Protected Areas (MPA) Center. 2011. Personal Communication.

National MPA Center. 2010. Snapshot of United States MPAs (April 2010).

National MPA Center. 2008. Framework for the National System of Marine Protected Areas in the United States (November). Available at www.mpa.gov/pdf/national-system/finalframework_full.pdf.

National MPA Center. 2006. "A Functional Classification System for Marine Protected Areas in the United States." Available at http://www.mpa.gov/pdf/helpful-resources/factsheets/class_system_0806.pdf.

National MPA Center (n.d.). "Clarifying Misconceptions about Marine Protected Areas." Available at www.mpa.gov/pdf/helpful-resources/factsheets/mpamiskonceptions2.pdf .

National Oceanic and Atmospheric Administration Science Advisory Board (NOAA SAB) 2009. Integrating Social Science Into NOAA, Planning, Evaluation and Decision Making: A Review of Implementation to Date and Recommendations for Improving Effectiveness. Available at http://www.sab.noaa.gov/Reports/2009/SAB_SSWG_Report_FINALtoNOAA_041609.pdf.

National Oceanic and Atmospheric Administration (NOAA) 2010a. FY 2011 Budget Summary (aka “NOAA Blue Book”). Available at http://www.rdc.noaa.gov/nbo/11bluebook_highlights.html.

National Oceanic and Atmospheric Administration (NOAA) 2010b. “NOAA Response to: Integrating Social Science into NOAA Planning, Evaluation, and Decision Making.” Available at www.sab.noaa.gov/Reports/sswg/2010/NOAA_response_SSWG_FINAL.pdf.

National Oceanic and Atmospheric Administration (NOAA) 2010c. Charge from National Oceanic and Atmospheric Administration and the Department of the Interior to the Marine Protected Areas Federal Advisory Committee, 2010-2011. (Available from the National MPA Center.)

National Research Council (NRC) 2005. *Decision Making for the Environment: Social and Behavioral Science Research Priorities*. Washington, DC: National Academy Press.

National Research Council (NRC). 2003. *Cooperative Research in the National Marine Fisheries Service*. Washington, DC: National Academy Press.

National Research Council (NRC). 2001. *Marine Protected Areas: Tools for Sustaining Ocean Ecosystems*. Washington, DC: National Academy Press.

Newing, Helen. 2011. *Conducting Research in Conservation: Social Science Methods and Practice*. London and New York: Routledge.

Oracion, Enrique G., Marc L. Miller, & Patrick Christie. 2005. “Marine protected areas for whom? Fisheries, tourism, and solidarity in a Philippine community.” *Ocean & Coastal Management* 48:393-410.

Poepoe, Kelson K.; Paul K. Bartram; and Alan M. Friedlander. 2007. “The use of traditional knowledge in the contemporary management of a Hawaiian community’s marine resources.” In *Fishers’ Knowledge in Fisheries Science and Management* (N. Haggan, B. Neis, and I. Baird, eds.), pp. 119-143. UNESCO.

Pollnac, Richard, et al. 2010. “Marine reserves as linked social-ecological systems.” *Proceedings of the National Academy of Sciences* 107(43):18262-18265.

Pomeroy, Caroline. 2002. “Effectiveness of Marine Reserves: Socio-Economic Considerations.” In R. Starr, et al, *A Review of the Ecological Effectiveness of Subtidal Marine Reserves in Central California*, A Report to the Monterey Bay National Marine Sanctuary (August 2002), (Chapter 6: pp. 73-88).

Pomeroy, Robert S., Michael B. Mascia, and Richard B. Pollnac. 2006. “Marine Protected Areas: The Social Dimension.” Background Paper 3, FAO Fisheries Report No. 825. Report & Documentation of the Expert Workshop on MPAs and Fisheries Management: Review of Issues and Considerations (Rome, 12-14 June, 2006). Food and Agricultural Organization FIEP/R825.

Pomeroy, Robert S., John E. Parks, and Lani M. Watson. 2004. *How is your MPA doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness*. IUCN. Gland, Switzerland, and Cambridge, UK.

Samonte, G., L. Karrer, M. Orbach. 2010. *People and Oceans*. Science and Knowledge Division, Conservation International, Arlington, VA, USA.

Smallwood, C.B., L.E. Beckley, S.A. Moore, & H.T. Kobryn. 2011. "Assessing patterns of recreational use in large marine parks: A case study from Ningaloo Park, Australia." *Ocean and Coastal Management* 54:330-340.

Social Science Review Panel (SSRP). 2003. Social Science Research within NOAA: Review and Recommendations: Final Report to the NOAA Science Advisory Board.

Social Science Working Group (SSWG), Society for Conservation Biology. 2009. Strategic Plan, 2009-2014). Available at www.conbio.org/workinggroups/sswg/downloads/SSWGStrategicPlanFinal.pdf .

Turpinseed, Mary, Stephen Roady, Raphael Sagarin & Larry Crowder. 2009. "The Silver Anniversary of the United States' Exclusive Economic Zone: Twenty-Five Years of Ocean Use and Abuse, and the Possibility of a Blue Water Public Trust Doctrine." *Ecology Law Quarterly* 36(1):1-70.

Wahle, Charles, et al. 2003. Social Science Research Strategy for Marine Protected Areas. NOAA, National Marine Protected Areas Center, MPA Science Institute.

West, Paige, James Igoe, & Dan Brockington. 2006. "Parks and Peoples: The Social Impact of Protected Areas." *Annual Review of Anthropology* 35:251-277.

APPENDIX 1:

What is a marine protected area?

For the purposes of the national system of marine protected areas in the United States, the governing definition of marine protected area is provided by Executive Order 13158 (May 26, 2000), the order that directed development of the national system (and, among other things, created the MPA FAC). E.O. 13158 defines marine protected area as “*any area of the marine environment [defined as areas of coastal or ocean waters and/or submerged lands⁴⁵] that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein.*”⁴⁶

This is a broad definition; many types of arrangements fit within its scope. As the National MPA Center has explained: “The term marine protected area is actually a broad umbrella term that encompasses a wide, and sometimes surprising, variety of area-based approaches to marine conservation[.]”⁴⁷ A sense of that variety is evident from a quick look at the national inventory of marine protected areas. This inventory, created by the National MPA Center under the mandate of E.O. 13158, uses a “functional classification scheme” to classify and sort the 1,689 marine protected areas in the United States. Among the classification criteria in this scheme are:

- the government that created the MPA:
 - state,
 - federal,
 - territorial,
 - tribal, or
 - local;
- the overriding purpose of the MPA (its “primary conservation objective”):
 - marine heritage,
 - cultural heritage, or
 - sustainable production;
- characteristics of the rules that govern persons’ access to or use of the site where the MPA is located (the “level of protection” provided the site): rules may provide for

⁴⁵ E.O. 13158 defines “marine environment” as “*areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands thereunder, over which the United States exercises jurisdiction, consistent with international law.*”

⁴⁶ Executive Order 13138 (May 26, 2000), section 2(a) & (b). Several terms – *area, marine environment, reserved, lasting, and protection* – are elaborated on and interpreted in the Framework for the National System of Marine Protected Areas in the United States. See National MPA Center 2008:19-20 (table 2).

⁴⁷ National MPA Center (n.d.): 1.

- multiple uses, uniformly throughout the site;
- multiple uses, with different uses in different zones;
- multiple uses, different zones, with at least one zone from which extraction of natural and/or cultural material is prohibited (at least one “no-take” zone);
- access to and use of the site but no extraction of natural or cultural material throughout the site (“no-take”);
- access to and use of the site but no extraction of natural or cultural material, nor installation, disposal, or discharge at the site (“no impact”); or
- no access to or use of the site (but with exceptions for permitted research, monitoring, or restoration) (“no access”)[⁴⁸].

These criteria (government, purpose, rules characteristics) are only three of several in the inventory, but they help provide a sense of the diversity of arrangements that are marine protected areas under E.O. 13158’s definition. Moreover, the diversity suggested by these three criteria is *less* than the actual diversity of marine protected areas in the United States. First, as noted, there are criteria on the inventory beyond these three (government, purpose, rules characteristics); second, the inventory criteria (these three and the others) are broad and contain diversity within; and, third, there are criteria by which marine protected areas can be usefully classified and sorted – ecological characteristics, for example – beyond those in the inventory.

It is worth looking, for comparative purposes, at the definition of marine protected area used by the International Union for the Conservation of Nature (IUCN), the global environmental organization/ network that has worked for terrestrial protected areas since the 1950s and for marine protected areas since the 1970s. The IUCN definition of marine protected area has had worldwide influence and so helps us to understand how marine protected areas are understood outside the United States.⁴⁹ The IUCN defines “marine protected area” as *“any area of intertidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.”*⁵⁰ As can be seen, this IUCN definition is similar in some respects to the US definition (the E.O. 13158 definition reviewed above).⁵¹

⁴⁸ See MPA Inventory, www.mpa.gov, metadata tab. See also National MPA Center 2006.

⁴⁹ Marine protected areas have been created in many jurisdictions outside the United States, and social scientists have studied some of these non-US marine protected areas (arguably, social scientists have studied *more* non-US marine protected areas than US marine protected areas).

⁵⁰ Kelleher and Kenchington 1992: Chapter 3 (citing IUCN resolution of 1988). This is IUCN’s definition of a *marine* protected area. IUCN also defines the more general term “protected area,” which, at least since 1999, has been understood to include “marine protected area” within its scope (see Kelleher 1999:xvii-xviii). From 1994 through 2008, IUCN defined “protected area” as *“an area of land and/or sea especially dedicated to the protection of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means* (IUCN 1994). In 2008, IUCN revised its definition of “protected area”; under this revised definition a protected area (which, as before, includes “marine protected area” within its scope) is: *“a clearly defined*

The variety of arrangements considered marine protected areas under the IUCN definition is evident from a look at the seven categories of protected areas – marine or terrestrial – specified by IUCN. The IUCN categorization scheme looks to *management objectives* to categorize protected areas; it categorizes protected areas as: strict nature preserves (Ia), wilderness areas (Ib), national parks (II), natural monuments (III), habitat/species management areas (IV), protected landscapes/ seascapes (V), and protected areas with sustainable use of natural resources (VI).⁵² More recently, IUCN has begun to use a secondary classification scheme that sorts protected areas on the basis of types of *governance*: governance by government (federal or national, sub-national, or delegated), shared governance (transboundary, collaborative, or joint), private governance (individual landowners, non-profit organizations, for-profit organizations), or governance by indigenous peoples and local communities (indigenous peoples, local communities). (For a matrix that combines a sort by management objective with a sort by governance type, see Dudley 2008:27).

The term “marine protected area” has been taken, by some, to mean arrangements that prohibit the take of biota from a marine site (a ‘no-take’ area). As can be seen from the preceding discussion, this meaning does not comport with the United States or the IUCN definition of marine protected area; both definitions *include but are not limited to* ‘no-take’ arrangements or programs. (More recently, the term “marine reserve” has been used in some quarters to refer to that subset of marine protected areas in which take of biota is prohibited.) It is worth a quick review of the figures regarding marine protected areas in the United States: The MPA Center reports that there are 1689 MPAs in United States waters, and of these 1689 sites, about 14% are no-take sites (no take, no access, or no impact) or are multiply-zoned sites that include no-take zones.⁵³ About 86% of the 1689 sites allow some take at the site (these include sites at which take of biota is not controlled, as is the case in some cultural heritage sites, and sites at which take of certain species or take from certain strata is controlled or banned while take of other species or from other strata is allowed, impliedly or explicitly).⁵⁴

geographical space recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley (ed.) 2008:8).

⁵¹ The IUCN definition preceded the US definition by 12 years (the former was adopted in 1988, the latter in 2000); that, and the similarity between the US and IUCN definitions indicate that the IUCN definition may have been influential in the United States as it has been elsewhere.

⁵² IUCN has provided guidance on how these seven protected area categories can be applied to *marine* protected areas; see Dudley 2008:55-58; Kelleher 1999; Kelleher & Recchia 1998, and the articles in vol. 8, no.2 (June 1998), of *Parks* (the publication of the IUCN’s World Commission on Protected Areas).

⁵³ These comprise the sites classified on the inventory as no-take, no-access, no-impact, or zoned multiple use with no-take.

⁵⁴ These are the zones classified as uniform multiple use. In terms of area rather than numbers of sites, the figures are as follows: The 1689 sites, taken together, sum to 1,931,035 sq mi (5,001,357 sq. km) and cover approximately 40% of United States marine waters (waters from 0 to 200 miles from United States’ shores, including Great Lakes). The combined area of the sites that are no-take sites or that include no-take zones (the approximately 14% of sites), taken together, sums to 148,066 sq mi (383,490 sq. km), which comprise 3% of the combined area of all

In short, a marine protected area is an area-based marine conservation program. In the United States formulation, it is an area-based marine conservation program created and implemented by a government (or an agency of government); in the IUCN formulation, it is an area-based marine conservation program created and implemented by a government (an agency thereof) or a private entity. In the United States formulation (as interpreted and elaborated by the National MPA Center in the 2008 Framework for the National System of Marine Protected Areas) it is an area-based marine conservation program with a declared purpose of providing long-term protection to natural heritage and/or cultural heritage and/or supporting sustainable production. In the IUCN formulation, it is an area-based marine conservation program with a declared purpose of protecting “part or all of the enclosed environment.”

1689 sites and 1% of the total US marine waters. The combined area of the sites that allow some take (the approximately 86% of sites), taken together, sums to 1,782,973 sq mi (4,617,879 sq. km.), which comprises 92% of the combined area of all 1689 sites and 37% of the total US marine waters. National MPA Center, pers. comm. 2011. While there are 1689 sites on the MPA Inventory, the MPA Center’s analysis of sites was done on a subset of 1452 sites for which GIS data were available, *id.*

APPENDIX 2:

Land & Sea/Communities Subcommittee: Template for the seven case studies on MPAs and communities

I. Preliminary

- (1) What is the name of the MPA and where is it located? How far offshore (in state and/or federal waters)? What are the dimensions of the MPA?
- (2) What is your connection to this MPA? (Helped establish it, helped administer it, use it, studied it, protested it, etc.)
- (3) Does this MPA border or include land? Is it adjacent to or near a protected land area (government-protected or privately protected)? If so, what agency or entity manages or holds the protected land area? (This question is designed to help us with our land/sea charge).

II. Purpose, Authority, Rules

- (1) Who has management authority over this MPA at present? (If multiple agencies or governments, please elaborate.)
- (2) What is the official purpose of this MPA, at present? (If more than one, please elaborate; if purposes are prioritized and/or if specific purposes are linked to specific locations or zones within the MPA, please indicate.)
- (3) What are the rules, at present, that govern use of and access to this MPA? (Do different rules apply to different areas/zones within the MPA? If so, please detail.) Are there seasonal variations in the rules and/or are there provisions for making seasonal adjustments in the rules (if yes, please explain).

III. History of the MPA, with a focus on human dimensions/communities

- (1) Before the MPA was established, what uses were made of the body of water that is now the MPA, and by whom (what groups, what communities, what uses)?
- (2) Where did the idea for creating an MPA with that body of water come from? Whose was it? What was the idea (what were the reasons for wanting to create the MPA)? What was sought to be accomplished with the creation of the MPA?
- (3) Was any social science research or data collection conducted during the process of MPA proposal, development, and design? What kind of work and by whom (what questions, what methods, what institutions, what disciplines)? (For example, was a social/ economic/cultural baseline developed?) Was this research or data put to use in the design of the MPA?

(4) Was any natural science research or data collection (re ecology and biology) conducted during the process of MPA proposal, development, and design? Please sketch briefly what was collected, and how.

(5) Was any effort made to collect and to use traditional/local ecological knowledge in the design or implementation of the MPA? If so, how was this traditional/local ecological knowledge gathered? Was it used in the design or implementation of the MPA, and, if so, how?

(6) What was the public process used to propose and to design the MPA? What kinds of meetings were held? Who set up the meetings and who ran them? How were people invited? What was the format of the meetings? How many meetings, over what period of time? How was attendance at the meetings? Who attended? How did people identify themselves (by community? by organization? as individual?). Did people speak at the meetings? What did they say? What written submissions were made? What kinds of public processes were used other than meetings & written submissions?

(7) Was there any litigation concerning the creation, design, or implementation of the MPA? If so, please describe: who sued whom over what & what was the outcome? What was the effect of the litigation itself (i.e., apart from the outcome of the case) on the process of designing and implementing the MPA?

(8) What was the design of the MPA, as adopted? What was the articulated purpose of the MPA when it was adopted? What were the rules for use and the rules for access? (Answers may overlap with answers to questions in Part II, Purpose, Authority, Rules; if so, simply refer back.)

(9) Have use and/or access rules for the MPA changed since the MPA was adopted? If so, what changes were made, and how were these changes made (use of social science research/data? public process?)?

(10) Did the articulated purpose of the MPA – as adopted and/or as modified – include any goals regarding coastal communities? If so, what were they? Were there any other articulated social, economic, cultural goals? Was there any reference to social resilience or community resilience?

(11) Please provide a timeline of key decisions regarding development, design, adoption, implementation, and management of the MPA, from early beginning to the present.

IV. Operation of the MPA today, with a focus on human dimensions/communities

(1) How is the MPA managed today? What decisions are made and by whom? Do communities or the public play any role in management? If so, what role(s)?

(2) Is there any social science research or data collection regarding the MPA taking place (on an ongoing or periodic basis)? If yes, please detail.

(3) Is there any natural science research or data collection regarding the MPA taking place, i.e., regarding biological and ecological phenomena (on an ongoing or periodic basis)? If yes, please detail.

(4) Is there any traditional or local ecological knowledge research or data collection regarding the MPA taking place (on an ongoing or periodic basis)? If so, please detail.

(5) Have performance measures been adopted for the MPA? What are these performance measures? Are they formal or informal? Are these performance measures being met?

(6) What evaluation processes are in place for the MPA? Do these evaluation processes include examination of social/economic/cultural factors? Do they include engagement with the public?

(7) What is the level of compliance with use and access rules? What enforcement mechanisms are in place? How are they working?

(8) Is there an education and/or outreach effort associated with the MPA? What is it? At whom is it targeted?

(9) Are there any efforts at ecological restoration underway in the MPA? Do these involve members of the public or adjacent communities?

V. Overarching matters

(1) What ‘communities’ are or have been affected by the MPA? What types of communities are these? Are there individuals or groups affected that are not in ‘communities’? How were – or are – communities, individuals, groups affected (positively and/or negatively)?

(2) Did the creation and/or implementation of the MPA generate controversy? Why or why not? If there was – or is – controversy, what was it – or is it - about? Was there any controversy *within* “communities”?

(3) Is this MPA achieving its biological or ecological goals (in the case of cultural heritage MPAs, is the MPA achieving its cultural heritage goal)? If this MPA has social goals, is it achieving these social goals?

(4) Does this MPA affect the “resilience” or “health” of “coastal communities”? Of any other communities?

(5) Do you consider this MPA a community-based or community-managed MPA? Why or why not? (Do the persons managing the MPA consider it a community-based or community-managed MPA?)

(6) Does this MPA make use of traditional or local ecological knowledge? Does it make good use of traditional or local ecological knowledge?

VI. Studies

Please list (and provide web links, if you have them) any studies that you or others have made of the MPA, the processes by which it was created, evaluation of the MPA, etc.

VII. Addendum: Additional Communities Questions

(1) What communities are involved in or affected by MPA?

(2) What types of communities are these (geographic, interest-based, practice-based, indigenous, cultural, etc.)?

- (3) In what ways is each of these communities or groups involved or affected?
- (4) What communities or groups receive benefits from the MPA? What are these benefits?
- (5) What communities or groups bear costs of MPA? What are these costs?
- (6) Was tourism considered in the creation of the mpa? What was the expected effect on tourism? The actual effect? Where do the tourists come from?
- (7) Was fishing (recreational, commercial, subsistence) considered in the creation of the mpa? What were the expected effects on fishing (recreational, commercial, subsistence)? The actual effects? Where did/do the fishermen/women come from?
- (8) Did the creation of the MPA generate controversy? If so, what was the controversy about?
- (9) Does the operation of the MPA generate controversy? If so, what about?

APPENDIX 3:

Marine Protected Areas and Human Communities – Seven Case Studies Compared (Working Document)

<i>Name</i>	Channel Islands (CI) MPA Complex: CI National Marine Sanctuary, CI National Park, California (CA) Marine Reserves, CA Marine Conservation Areas	South Atlantic Fishery Management Council (SAFMC) Oculina Habitat Area of Particular Concern (HAPC) and Experimental Research Reserve (ERR) within the Oculina HAPC	South Atlantic Fishery Management Council (SAFMC) Deep Water Type II MPAs (8 total)	Regina Underwater Archaeological Preserve	Mo’omomi Community Based Subsistence Fishing Area	Edward F. Ricketts State Marine Conservation Area; Lovers Point State Marine Reserve; Pacific Grove Marine Gardens State Marine Conservation Area; Asilomar State Marine Reserve	San Salvador Island (Masinloc, Zambales)
<i>Location</i>	Southern California	Florida (east coast)	North Carolina, South Carolina, Georgia, Florida (east coast)	Florida (west coast)	Molokai, Hawaii	Central California adjacent to the City of Monterey and the City of Pacific Grove	Philippines
<i>Jurisdiction(s)</i>	State waters (CA) and federal waters	Federal waters	Federal waters	State waters (FL)	State waters (HI)	State waters (CA)	Municipal waters (waters under municipal jurisdiction, not national jurisdiction) – point clarified after site established
<i>Single or complex</i>	Complex	Complex	Complex (8 mpas, each with same rules)	Single	Single	Complex (geographically linked set of mpas, each with different rules)	Complex (two zones in a single mpa)
<i>Size</i>	Network of reserves and conservation areas within the national marine sanctuary: 11 state reserves and 2 state conservation areas, with federal	HAPC: 254,250 acres 102,900 ha 300 sq nm ERR (w/in HAPC) 78,818 acres 31,889 ha	The 8 range in size from: 6,780 acres 2,744 ha 8 sq nm to	162 acres 65 ha (a circle with a 500 yard radius)	847 acres 343 ha	Ed Ricketts: 0.22 sq mi, or 140.8 acres Lovers Pt: 0.30 sq mi, or 192 acres Pacific Grove: 0.93 sq mi, or 595.2 acres	Sanctuary (no take): 314 acres 127 ha Traditional Fishing Reserve, which encircles the 380 ha/ 939 acre island from shore out to

Name	Channel Islands (CI) MPA Complex:	(SAFMC) Oculina (HAPC) ...	(SAFMC) Deep Water Type II MPAs	<i>Regina</i>	Mo'omomi	Edward F. Ricketts and 3 adjacent areas	San Salvador Island (Masinloc, Zambales)
<i>Size continued</i>	<p>extensions (extensions into federal waters): combined area = 241 sq nm, or 203,520 acres</p> <p>Sanctuary: 1110 sq nm, or 940,800 acres (water area only – waters from mean HWM to 6 nm out)</p> <p>Park: 249,561 acres (islands and waters out 1 nm)</p> <p>http://www.dfg.ca.gov/marine/channel_islands/flyer.pdf</p> <p>http://channelislands.noaa.gov/focus/about.html</p>	93 sq nm	127,125 acres 51,450 ha 150 sq nm			Asilomor: 1.51 sq mi, or 966.4 acres (FEIR, 3/2007, p. 3-3)	2 km (and in which the no take sanctuary is located): - size not noted
<i>Land bordered or included?</i>	Yes, borders land and includes land	No 16 nm to 23 nm from shore	No 9 nm to 69 nm from shore	No 75 yards from shore	Yes borders land	Yes borders land	Yes, borders land
<i>Purpose</i>	State & federal reserves & conservation areas: - “protect & restore habitats and ecosystems” - “provide a refuge for all sea life” - “provide reference	To protect Oculina varicosa coral from bottom tending gear and from anchoring	To help achieve – together with other measures -- fishery management objectives for deep water snapper grouper species: “The intended effects of this final rule are to	To promote education through recreation & to protect submerged cultural resource (The <i>Regina</i> , a ship wrecked in	Management of fisheries adjacent to Native Hawaiian Homestead using customary Hawaiian fishery management practices; fishing	<u>Ed Ricketts</u> : “The primary purpose of this area is to provide for recreational opportunities (both consumptive and non-consumptive) in an area that is minimally impacted	“ . to reverse the downward trend in fish yields from the coral reef through community involvement in fishery resource management [cite]. . . to enhance institutional capabilities, develop and implement

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<p><i>Purpose continued</i></p>	<p>areas for research and educational opportunities” - “protect our nation’s marine natural heritage for future generations”</p> <p>http://channelislands.noaa.gov/marinere/s/main.html</p> <p>Park: - conserve scenery and natural and historic objects and leave them “unimpaired” & others</p> <p>Sanctuary (purposes for all national marine sanctuaries, not particular to CINMS): - maintain biological communities, protect & restore natural habitats, populations, processes; - enhance public awareness . . . - research & monitoring - facilitate uses not incompatible with primary objective of</p>		<p>protect a portion of the population and habitat of long-lived, slow growing, deepwater snapper-grouper from fishing pressure to achieve a more natural sex ratio, age, and size structure within the proposed MPAs, while minimizing adverse social and economic effects. “ 74 FR 1621 (2009)</p>	<p>1940)</p>	<p>by Native Hawaiians for subsistence purposes (fish may be eaten and shared but not sold) in this customarily managed fishery; maintenance of fish resources – and sustainable fishing by Native Hawaiians - over the very long term.</p>	<p>by other consumptive activities.”</p> <p><u>Lovers Point</u>: “The primary goal of this MPA will be to provide for recreational non-consumptive uses in an area minimally impacted by human take.”</p> <p><u>Pacific Grove</u>: “The primary purpose of this area is to provide for recreational opportunities (both consumptive and non-consumptive) in an area that is minimally impacted by other consumptive activities.”</p> <p><u>Asilomar</u>: “The primary goals of this MPA will be to provide for recreational nonconsumptive uses in an area minimally impacted by human take, and to provide benefits to an</p>	<p>a marine resource management plan, and establish a coral reef fish sanctuary and a traditional fishing reserve area. . . . [to] encourage[] community development through the formation and strengthening of local core groups responsible for marine resource management and alternative income-generating projects.” (Katon, Pomeroy, Salamanca 1997:6)</p>

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<i>Purpose continued</i>	resource protection					adjacent fished area through spillover of adult fishes and increased potential for larval production."	
<i>Managing authority</i>	<ul style="list-style-type: none"> -- Channel Islands National Park (park) -- Channel Islands National Marine Sanctuary (sanctuary) -- CA Fish & Game Commission (state reserves and state conservation management areas) -- others ? 	South Atlantic Fishery Management Council (SAFMC) & NOAA Fisheries, US Dept of Commerce	South Atlantic Fishery Management Council (SAFMC) & NOAA Fisheries, US Dept of Commerce	Florida Division of Historical Resources, and "Friends of <i>Regina</i> " (a citizens' organization)	Hawaii Division of Land and Natural Resources & Hui Malama o Mo'omomi (latter is managing; former has not yet granted formal approval of arrangement, as is required by HI law)	California Department of Fish and Game	<p>The village (<i>barangay</i>) of San Salvador Island (thru its people's organization: <i>Samahang Pangkaunlaran San Salvador (SPSS)</i>) AND the municipal government (Manisloc Municipal Council): a co-management arrangement.</p> <p>NB: A US Peace Corps volunteer and, later, a Philippines-based NGO (The Haribon Foundation) worked to develop the site, local interest in, and local capacity to manage the site. The NGO was funded by international development monies (from the Netherlands and elsewhere). The NGO project continued fulltime through 1993, or four years <i>after</i> the site was first established in 1989; the NGO remained involved episodically</p>

Name	Channel Islands (CI) MPA Complex:	(SAFMC) Oculina (HAPC) ...	(SAFMC) Deep Water Type II MPAs	Regina	Mo'omomi	Edward F. Ricketts and 3 adjacent areas	San Salvador Island (Masinloc, Zambales)
<i>Managing authority continued</i>							after that. In the mid-1990s, the Danish government funded an extensive review/evaluation of the site by ICLARM and the Haribon Foundation (see Katon, Pomeroy, Salamanca 1997).
<i>Enforcement authority</i>	-- NOAA Law Enforcement, -- US Coast Guard, -- CA environmental enforcement (via JEAs with NOAA)	-- NOAA Law Enforcement, -- US Coast Guard, -- FLA FWC Enforcement (via JEA with NOAA)	-- NOAA Law Enforcement, -- US Coast Guard, -- State environ enforcement (via JEAs with NOAA)	None (citizens group keeps watch)	None Enforced through social pressure	California Department of Fish & Game	<i>Bantay Dagat</i> (enforcement group from the village)
<i>Prohibited Uses</i>	State and federal reserves: - no take State and federal conservation area: - no take EXCEPT recreational fishing for pelagic finfish and comm. & rec fishing for lobster Park: - no entry to certain sea caves - no landing on offshore rocks, islets (kayaks) - others Sanctuary: -no exploration,	-- No use of bottom fishing gear (bottom longline, bottom trawl, dredge, pot, trap) -- No anchoring from a fishing boat -- No fishing for or possession of rock shrimp -- No removal or retention of snapper grouper species -- No possession of Oculina coral	-- No fishing for or possession of snapper grouper species (possession allowed if transiting non-stop w/ fishing gear stowed) -- No use of shark bottom longline gear	-- No unauthorized disturbance of wreck -- no excavation -- no removal of artifacts	Fishing in manner other than that prescribed and by others than those prescribed	<i>Edward Ricketts:</i> - no commercial fishing - limits on kelp gathering - no recreational fishing by spear -recreational finfish by hook and line only -no invertebrate take <i>Pacific Grove Marine Gardens</i> - no commercial fishing - limits on kelp gathering <i>Lovers Point:</i> - No recreational or commercial take allowed.	Within the traditional fishing reserve: -- no dynamite fishing -- no muro-ami fishing or related methods w weighted scare lines or poles -- no spearfishing w compressor or SCUBA -- no cyanide or other strong poisons -- no use of small mesh gillnets (no use of mesh < 3 cm) Within the marine sanctuary (no take zone): -

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<i>Prohibited Uses continued</i>	development, production of hydrocarbons or minerals (exceptions for pre-1981 leases) - no discharges as specified (some allowed) - no drilling, dredging - no personal motor boats in area of sanctuary that overlaps with park (w/in 1 nm from shores) - others - certain DOD exceptions					-Scientific take with permit <i>Asilomar:</i> - No recreational or commercial take allowed.	
<i>Allowed Uses</i>	State and federal reserves: - "to extent feasible . . . open for managed enjoyment" - permitted monitoring, research, restoration State and federal conservation areas: - recreational fishing for pelagic finfish and comm. & recreational fishing	- Trolling for coastal pelagic species and highly migratory species (commercial and recreational?)	-- Trolling for pelagic species (eg tuna, dolphin, mackerel, billfish), by commercial and recreational vessels	-- Fishing, snorkeling, diving, etc – all uses not prohibited by reserve rules <i>or by any other rules</i>	Native Hawaiians or those permitted by Native Hawaiian managers may engage in subsistence fishing (for personal use or sharing), and in doing so must follow practices prescribed by the Hui (seasonal requirements, size requirements,	<i>All four sites:</i> " . . .non-consumptive activities, such as diving, surfing, swimming and boating are allowed within the MPAs, as long as take restrictions are followed." <i>Edward Ricketts:</i> - Recreational take of finfish by hook and line. - Commercial take of giant and bull kelp by	Within the traditional fishing reserve: - 'traditional fishing' Within the sanctuary: - none (?)

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<i>Allowed Uses, continued</i>	for lobster - research, education, recreational Park: Sanctuary:				ban on taking for commercial purposes, and others). Other activities – activities that do not involve extraction of living marine resources -- permitted by implication.	hand in specifically defined areas. <i>Pacific Grove Marine Gardens:</i> - Recreational take of finfish. - Commercial take of giant and bull kelp by hand. http://www.dfg.ca.gov/mlpa/pdfs/ccmpas_brochure.pdf	
<i>Years from conception to formal adoption</i>	5 years (1998-2003): state marine reserves and state marine conservation areas 9 years (1998-2007): federal extensions of state reserves and conservation areas	20 years (from first stage to third stage) - 1984 (original HAPC) - 1994 (ERR & HAPC expansion) - 2004 (decision to maintain indefinitely, with 10 year review)	19 years First proposed: 1990 Implemented: 2009	4 years (or more) Nominated 2001, Designated 2004	16 years and counting: Process begun in 1994 and not yet (in 2011) formally adopted by the state, although in operation nonetheless; in operation w/o formal (state) approval since 1996.	Edwards F. Ricketts: 15 years (1989-2006) conception and organizing begun in 1989, and established via California's Marine Life Protection Act in 2006; Lovers Point, Pacific Grove Marine Gardens, and Asilomar MPAs, 72 years; They were initiated by the residents of the City of Pacific Grove in 1934 by act of the California Legislature	2 years -- efforts begun in 1987, reserve and sanctuary created in 1989; -- municipal authority issues municipal ordinance recognizing reserve & sanctuary in 1989 --

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<i>Communities involved in or affected by the MPA (preliminary analysis)</i>	Commercial fishing community (practice based community, with participants from AK, WA, and CA); adjacent land communities where fish are landed and processed; recreational fishing community; other recreational communities (tourists, divers, kayakers, photographers, whale watchers, bird watchers); U.S. Navy; > 100 research institutions; citizens in surrounding region (volunteer corps, public lectures); schools (CI Live); non-govt organizations; Native Americans (Chumash) (former inhabitants of the islands); others	Commercial fishing sector ('community') affected b/c designation "closed the commercial sector's primary bottom area" and "limited fishing area" (case study, page 6). Recreational fishing sector ('community') also affected. Scientific community affected (opportunities for research)	Commercial fishing sector ('community') affected; Recreational fishing sector ('community') affected; Scientific community affected (opportunities for research)	Dive communities, snorkeler communities; nearby coastal towns/cities (economic benefits through increased use of dive shops, restaurants, hotels, etc; recreational benefits to residents; cultural pride benefits to local citizens); professional archaeologists & biologists (state and university); FLA as a whole ... (tourism pride, identity, etc.)	Native Hawaiians on island of Molokai; other Native Hawaiians (other islands),	Recreational SCUBA diving community from Central and Northern California initiated Ricketts and Lovers MPA. This is the most scuba-dived area in California, with a reported 64,000 divers per year. Residents of the City of Pacific Grove initiated Pacific Grove Marine Gardens and Asilomar in 1934, and passed a City initiative again during the MLPAL process to establish these as Marine Reserves. The Monterey Bay Aquarium, Monterey Bay National Marine Sanctuary, and the City of Monterey were involved in the process.	Residents of San Salvador, and some non-residents of San Salvador who fished around San Salvador before the site was created. Researchers who study San Salvador; Other communities & managers who learn from San Salvador.
<i>Communities or groups that benefit from the MPA & nature of the benefits (preliminary analysis)</i>	Commercial fishing community; adjacent land communities; recreational fishing community; other recreational communities	Commercial fishing community and recreational fishing community will both receive benefits, over time, as ecological benefits of protecting	Commercial fishing community and recreational fishing community will both receive benefits, over time, as ecological benefits of protecting	Dive communities, snorkeler communities; nearby coastal towns/cities (economic benefits through increased use of	Native Hawaiians on island of Molokai (who may fish in the mpa); Hawaiians from other islands who benefit from the	The recreational SCUBA diving community receives benefits from greater protection of marine life, creating an enriched dive experience;	Residents of San Salvador; Researchers who study San Salvador; Other communities & managers who learn from San Salvador.

Name	Channel Islands (CI) MPA Complex:	(SAFMC) Oculina (HAPC) ...	(SAFMC) Deep Water Type II MPAs	Regina	Mo'omomi	Edward F. Ricketts and 3 adjacent areas	San Salvador Island (Masinloc, Zambales)
<i>Communities or groups that benefit from the MPA & nature of the benefits (preliminary analysis), continued</i>	(tourists, divers, kayakers, photographers, whale watchers, bird watchers); U.S. Navy; > 100 research institutions; citizens in surrounding region (volunteer corps, public lectures); schools (CI Live); non-govt organizations; Native Americans (Chumash) (former inhabitants of the islands); others	benthic habitat, spawning aggregations, and juveniles will, over time, improve stock abundance. Scientists receive potential benefits thru new research opportunities associated with closures.	benthic habitat, spawning aggregations, and juveniles will, over time, improve stock abundance. Scientists receive potential benefits thru new research opportunities associated with closures.	dive shops, restaurants, hotels, etc; recreational benefits to residents; cultural pride benefits to local citizens); professional archaeologists & biologists (state and university); FLA as a whole ... (tourism pride, identity, etc.); Benefits include: increased heritage tourism to local area & increased knowledge of local history/heritage.	return to management practices based on cultural protocols; scientists who study there; state of HI as a whole (due to successful management); others.	Monterey Bay Aquarium benefits from higher protection of marine life, seals, sea otters, egrets on kelp, enriching tourists' experience. Stanford University received an extended No Take area near their Marine Lab; Pacific Grove City residents received some marine protection along their coastline. Recreational fishers continue to take fin fish. National Sanctuary gets increased marine protection.	
<i>Communities or groups burdened by the MPA & nature of the burden(s) (preliminary analysis)</i>	no evidence of burdens has been identified as yet with existing data	Both the recreational fishing and commercial fishing communities were burdened as bottom fishing was prohibited. The commercial fishing community was burdened the most as the area was the principal bottom fishing area and is very large.	The recreational fishing and commercial fishing sectors (communities) were both burdened by the designations. The Florida recreational fishing and commercial fishing communities were burdened most in that these Deep Water MPAs were in addition to	None		Dive community did not receive Marine Reserve status at Ricketts, only conservation MPA; residents of Pacific Grove did not get all of their coastline protected as a no take MPA; commercial fishing industry is subject to no commercial take rule within these MPAs;	Non-residents of San Salvador. After the site was implemented, non-residents no longer permitted to fish in the area of the site (which they had fished prior to site creation). Any resident of San Salvador wishing to fish in the area of the reserve using the now-banned fishing techniques.

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<i>Communities or groups burdened by the MPA & nature of the burden(s) (preliminary analysis), cont.</i>			the Oculina HAPC & ERR already in place (Oculina MPAs, like some of the Deep Water MPAs, are off the east coast of Florida).			Aquarium is subject to no take rule regarding invertebrates for tank display in these MPAs;	
<i>PCO (from inventory for sites on inventory; for others, guessed at)</i>	Natural Heritage (CINMS, CINP, Footprint)	Natural Heritage -- ERR, 1994 Sustainable Production -- HAPC, 1984	Sustainable Production	Cultural Heritage	Sustainable Production	Natural Heritage	Sustainable Production
<i>In the national inventory of MPAs?</i>	Yes (CINMS) Yes (CINP) Yes (Footprint)	Yes (ERR, 1994) Yes (HAPC, 1984)		No	No	Yes (all 4)	N/A
<i>National system status</i>	Member (CINMS) Member (CINP) Eligible (Footprint)	No, but Eligible -- (ERR) -- (HAPC)		None	None	Member (all 4)	N/A

APPENDIX 4:

A Sample of Federal Mandates Requiring Social, Economic, and/or Cultural Analyses of Federally Created Marine Protected Areas

Statutes and Regulations

National Environmental Policy Act of 1969, as amended

- Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR Parts 1500-1800
- U.S. Forest Service NEPA Procedures, 36 CFR Part 220
- U.S. Department of the Interior NEPA Procedures, 43 CFR Part 46
- National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999), Environmental Review Procedures for Implementing the National Environmental Policy Act

Regulatory Flexibility Act of 1980, 5 U.S.C. 601 *et seq.*, as amended

Magnuson-Stevens Act, 16 U.S.C. 1801 *et seq.*, as amended

National Marine Sanctuaries Act, 16 U.S.C. 1431 *et seq.*, as amended

National Forest System Land Management Planning, 36 CFR Part 219 (forthcoming)

Executive Orders

E.O. 12866, "Regulatory Planning and Review" (Sept. 30, 1993)

E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (Feb. 16, 1994)

APPENDIX 5:

List of Members of the Land, Sea and Communities Subcommittee, Marine Protected Areas Federal Advisory Committee

Rick Gaffney, Pacific Boats and Yachts (Chair)

Dr. Sarah Robinson, Critical Inquiries Research (Vice Chair, communities)

Capt. Phil Renaud, Living Oceans Foundation (Vice Chair, land/sea issues)

Dr. Felicia Coleman, Florida State University

Dr. Gary Davis, National Park Service (ret); GEDavis & Associates

John Frampton, South Carolina Department of Natural Resources

George Geiger, recreational fishing

Melissa Miller-Henson, California Resources Agency

Dr. Robert Pomeroy, Connecticut Sea Grant

David Wallace, Wallace & Associates (commercial fishing)

* Victor T. Mastone (FAC), Massachusetts Board of Underwater Archaeological Resources

* Alvin Osterback (FAC) Port of Dutch Harbor

* Jesús Ruiz (FAC), California Divers

* Dr. Della Scott-Ireton (FAC), Florida Public Archeology Network

* Bonnie Newsom, Penobscot Indian Nation

* Dr. Valerie Grussing, Cultural Resources Coordinator, MPA Center

Federal Agency staff and MPA Center staff:

Bret Wolfe, Department of the Interior, USFWS

Rick Swanson, US Forest Service

Dr. Mimi D'Iorio, National Marine Protected Areas Center

Denise Ellis-Hibbett, National Marine Protected Areas Center

* Liaisons from Cultural Heritage Resources Workgroup