

Documenting and Evaluating a New Approach to Establishing Large-Scale  
Marine Protected Areas in the U.S.

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**Abstract**

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In 2006, U.S. President G.W. Bush drew upon the Antiquities Act of 1906 to establish Papahānaumokuākea Marine National Monument (PMNM) via Presidential Proclamations 8031/8112. The Marianas Trench (MTMNM) and Pacific Remote Islands Marine National Monuments (PRIMNM) were created in 2009 thru the same process, representing a relatively new approach to establishing large-scale Marine Protected Areas (MPA) in the U.S. Although the Antiquities Act approach can facilitate rapid establishment of new MPA, it may not incorporate the procedures that, by law, must precede other forms of protected area designation, such as management planning requirements. To characterize the effects of using the Antiquities Act to designate PMNM, MTMNM, and PRIMNM, this study assessed a series of monument characteristics, including current status of management planning. A final management plan was implemented for PMNM within three years of designation, likely attributable to extensive planning efforts incidentally completed *prior to* Proclamation 8031. Neither MTMNM nor PRIMNM was able to draw from similar pre-designation preparations and, perhaps as a result, planning at those sites continues, nearly six years after establishment. Combining the Antiquities Act approach with more conventional MPA designation procedures, integrating planning products with Proclamation language reflecting site-specific requirements, should enhance monument effectiveness, while allowing a U.S. President to establish a ‘blue legacy.’

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## **GLOSSARY OF ABBREVIATIONS**

ATBA	Area To Be Avoided
BLM	Bureau of Land Management
BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
CBD	Convention on Biological Diversity
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
CNMI	Commonwealth of the Northern Mariana Islands
CRER	Coral Reef Ecosystem Reserve
CZMA	Coastal Zone Management Act
DEIS	Draft Environmental Impact Statement
DLNR	Department of Land and Natural Resources (Hawaii)
DMP	Draft Management Plan
E.O.	Executive Order
EBM	Ecosystem-Based Management
EEZ	Exclusive Economic Zone
FEP	Fishery Ecosystem Plan
FMP	Final Management Plan
FOIA	Freedom of Information Act
HI	Hawaii
ICOSRMI	Interagency Committee on Ocean Science and Resource Management Integration
IMO	International Maritime Organization
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported, and Unregulated
MAC	Monument Advisory Council
MOA	Memorandum of Agreement
MPA	Marine Protected Area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSP	Marine Spatial Planning

## **GLOSSARY OF ABBREVIATIONS (cont.)**

MTMNM	Marianas Trench Marine National Monument
NEPA	National Environmental Policy Act
NERR	National Estuarine Research Reserve
NM	Nautical Mile
NMS	National Marine Sanctuary
NMSA	National Marine Sanctuaries Act
NMSP	National Marine Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWHI	Northwestern Hawaiian Islands
NWR	National Wildlife Refuge
OHA	Office of Hawaiian Affairs
ONMS	Office of National Marine Sanctuaries
PMNM	Papahānaumokuākea Marine National Monument
POC	Pew Oceans Commission
PRIMNM	Pacific Remote Islands Marine National Monument
PSSA	Particularly Sensitive Sea Area
RFMC	Regional Fishery Management Council
ROP	Reserve Operations Plan
SAC	Sanctuary Advisory Council
TEK	Traditional Ecological Knowledge
U.S.	United States
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
USCOP	United States Commission on Ocean Policy
USFWS	United States Fish and Wildlife Service
WPRFMC	Western Pacific Regional Fishery Management Council

## **1. INTRODUCTION**

Humans depend on the oceans for a range of ecosystem services, including food security, moderation of weather and climate patterns, flood and storm protection, global commerce, and historic, cultural, and recreational uses, as well as nutrient cycling and the absorption of atmospheric carbon dioxide. Existence value is also an important aspect of ocean-based ecosystem services (USCOP 2004; McLeod and Leslie 2009). However, the ever-increasing global human population and its reliance on these services exerts so much pressure on the oceans that multiple symptoms of decline are beginning to manifest at alarming rates, impacting not just ecosystems, but entire ocean basins. Some of the changes that are taking place include both commercial and non-commercial fisheries collapses, marine species extinctions, habitat loss, coral reef die-offs, ecosystem regime shifts, and altered ocean currents, affecting regional weather patterns. Additionally, sea levels, ocean temperatures, and ocean acidity levels are rising. Over time, some of these influences may begin to act synergistically, potentially accelerating rates of change and inflicting irreversible effects (IPCC 2014; Shackeroff, Hazen, and Crowder 2009).

Until fairly recently, efforts to address undesirable patterns of change have been limited to narrow, single-species and single-sector management measures. However, sector-by-sector management approaches have not adequately addressed rates and trajectories of change, and may prove even less effective as stressors begin to act synergistically upon entire ecosystems (UNEP, GRID-Arendal, and The Nicholas Institute for Environmental Policy Solutions 2012; Shackeroff, Hazen, and Crowder 2009; Murawski 2007; Secretariat of the Convention on Biological Diversity 2004). Therefore, coastal and ocean managers now recognize the need for holistic, Ecosystem Based Management (EBM) approaches, simultaneously considering and integrating the management of open ocean, nearshore, and intertidal habitats, as well as supratidal zones,

upland areas, and entire watersheds (McLeod and Leslie 2009; Jones and Ganey 2009). EBM also takes into account human population requirements and influences, embracing socio-economic objectives, while also attempting to minimize anthropogenically-derived stressors to which ocean and coastal areas are vulnerable (i.e. pollution, overfishing, sea level rise, etc.) (Murawski 2007). Operationally, EBM can be implemented through the use of Marine Spatial Planning (MSP) tools. Effective MSP compels relevant agencies to coordinate management efforts in order to set aside discrete spatial areas for various ocean uses, including conservation and restoration. Carefully-structured MSP frameworks can help to manage or avoid conflicts arising as a result of spatially or temporally-overlapping and/or competing ocean uses (Environmental Law Institute 2009; UNEP, GRID-Arendal, and The Nicholas Institute for Environmental Policy Solutions 2012).

No single management approach can resolve or fully mitigate the far-reaching, potentially synergistic effects of ocean ecosystem stressors. Instead, implementation of a suite of complementary ocean management approaches is warranted, including both regulatory and applied, field-based strategies (Toonen et al. 2013; Secretariat of the Convention on Biological Diversity 2004; Pew Oceans Commission 2003). Applied management strategies may include (Murawski 2007):

- Management of commercial fisheries through licensing, gear restrictions, quotas, seasonal closures, and fleet/capacity adjustments
- Management of the location and intensity of non-renewable resource extraction activities through permitting, quotas, lease placement and planning efforts, and engineering controls
- Management of the location and intensity of tourism and recreational activities through permitting, certification, recreational area placement and planning efforts, and tourism capacity limitations
- Marine spatial planning that integrates all of the above
- On-water enforcement

In addition to these options, the establishment of Marine Protected Areas (MPA) should be considered an important ocean management tool (Toonen et al. 2013; Halpern, Lester, and McLeod 2010). A technical advisory group established by the United Nations Conference of the Parties to the Convention on Biological Diversity (CBD) has defined a *Marine and Coastal Protected Area* as “any defined area within or adjacent to the marine environment, together with its overlying waters and associated flora, fauna, and historical and cultural features, which has been reserved by legislation or other effective means, including custom, with the effect that its marine and/or coastal biodiversity enjoys a higher level of protection than its surroundings (Secretariat of the Convention on Biological Diversity 2004, page 7).” In the United States (U.S.), Executive Order (E.O.) 13158 defined a *Marine Protected Area* as “any area of the marine environment 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 (U.S. President Clinton 2000a, page 1231).” Many MPA are managed in accordance with site-specific Final Management Plans, generated through standard management planning processes that typically incorporate a range of limitations on such activities as renewable and non-renewable resource extraction, commercial shipping, and recreation and tourism (Secretariat of the Convention on Biological Diversity 2004).

There are more than 1,770 MPA in the U.S., approximately 386 of which are managed at the federal level (National Marine Protected Areas Center 2014). Historically, responsibilities for federally-managed MPA have been assigned to the National Oceanic and Atmospheric Administration (NOAA), the National Park Service (NPS), or the U.S. Fish and Wildlife Service (USFWS). There are relatively few examples of MPA in U.S. waters that are managed through joint, multi-agency management structures (National Marine Protected Areas Center 2013a).

However, in June 2006 and January 2009, U.S. President George W. Bush drew upon authorities under the Antiquities Act of 1906 to designate three large MPA through declaration of Presidential Proclamations 8031, 8335, and 8336. The Proclamations established the Northwestern Hawaiian Islands Marine National Monument (later renamed Papahānaumokuākea Marine National Monument), as well as the Marianas Trench and Pacific Remote Islands Marine National Monuments, respectively. The Proclamations set forth multi-agency management frameworks and planning requirements for each site.

Prior to release of Proclamation 8031, most federally-managed MPA in the U.S. were established through agency-driven processes, involving pre-designation procedures such as: area studies and site characterizations; needs assessments; public scoping and interagency coordination activities; identification of management objectives; and submission of recommendations to the U.S. Congress (Kittinger et al. 2011; Vincent and Alexander 2010). However, the designation of Papahānaumokuākea, Marianas Trench, and Pacific Remote Islands Marine National Monuments through Presidential Proclamation neither explicitly included nor required completion of such pre-designation vetting procedures, thereby setting new precedents regarding large-scale MPA establishment in the U.S.

## **2. RESEARCH QUESTION**

Although all three monuments were designated via the same process, were subject to similar multi-agency management structures, and are located in similar geographic regions, there are distinct, observable differences in the ways that management planning has progressed at each site. An interagency Final Management Plan (FMP) was put into effect for Papahānaumokuākea Marine National Monument (PMNM) in 2008, reflecting completion of a multi-phase management planning process within three years of designation (NOAA, USFWS, and State of

Hawaii 2008). Conversely, Marianas Trench Marine National Monument (MTMNM) and Pacific Remote Islands Marine National Monument (PRIMNM) personnel have yet to prepare a Draft Management Plan, a prerequisite to the FMP finalization process. Given that, planning at MTMNM and PRIMNM has progressed significantly more slowly than was the case for PMNM.

This study evaluates issues that arose by using the Antiquities Act of 1906 to designate PMNM, MTMNM, and PRIMNM, in lieu of more conventional, agency-initiated MPA establishment processes. To bring those issues to light, the study uses a framework of four site-specific, qualitative assessments that consider the:

1. Site-specific management settings *prior to* designation;
2. Specificity of Presidential Proclamation requirements set forth for each site;
3. Current status of management planning at each site; and
4. Degree of implementation of seven specific MPA management best practices at each site.

The results of these qualitative assessments are used to: 1) characterize the degree to which planning and implementation can vary among MPA established through the same mechanism; 2) reveal monument-specific patterns of planning and management inertia; and 3) identify some of the barriers that may be contributing to such inertia. Detecting and highlighting divergent planning patterns among the three monuments helps to emphasize the importance of understanding the natural, socio-economic, and governance characteristics of an area *prior to* establishing an MPA, and subsequently providing adequate incentives to support effective management planning and implementation (Jones 2014a).

In September 2014, U.S. President Barack Obama signed Presidential Proclamation 9173, expanding PRIMNM by approximately 400,000 square miles (U.S. President Obama 2014). However, the following assessments consider the geographic configuration of, and planning progress for, PRIMNM *prior to* expansion. Nevertheless, the results of these assessments are

highly relevant, and may warrant even greater emphasis, as planning efforts are scaled-up to incorporate the newly-expanded areas.

### **3. BACKGROUND**

#### **3.1 History of Ocean Management in the U.S.**

In *Effective Use of the Sea* (1966), published during U.S. President Lyndon B. Johnson's administration, a Presidential Science Advisory Committee recommended that "a permanent system of marine wilderness preserves be established and managed as an extension of the basic principles established in the Wilderness Act of 1964 (U.S. President's Science Advisory Committee 1966, page 18)." The Wilderness Act of 1964 emphasizes the preservation of natural, intact landscapes, defining "wilderness" as follows:

*"A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (16 USC §1131-1136)."*

However, despite citing a need for a system of marine wilderness preserves, *Effective Use of the Sea* (1966) placed much greater emphasis on optimal use of what was believed to be a "virtually infinite" supply of ocean-based resources, in the interest of economic expansion (Christie 2007, page 534; U.S. President's Science Advisory Committee 1966). In 1969, another

presidentially-appointed group—the United States Commission on Marine Sciences, Engineering, and Resources, or “Stratton Commission”—conducted the first-ever formal evaluation of U.S. ocean policy. The Stratton Commission concluded that the U.S. could not “afford less than its best effort to utilize the global sea (U.S. Commission on Marine Sciences, Engineering, and Resources 1969, page 19),” and emphasized the importance of exploiting ocean resources in order to secure the nation’s “fair share of a major planetary resource (U.S. Commission on Marine Sciences, Engineering, and Resources 1969, page 19).” The Stratton Commission’s efforts resulted in passage of the Coastal Zone Management Act of 1972 (CZMA), enhancing coordination among federal and state agencies charged with ocean and coastal management, as well as establishment of NOAA. Although these accomplishments could have catalyzed a movement to ensure precautionary conservation of ocean ecosystems, the Commission’s overarching objective clearly prioritized development of the expertise and technological capacity needed to ensure continued, “effective” use of ocean and coastal resources (Christie 2007; Pew Oceans Commission 2003; Merrell, Katsouros, and Bienski 2001).

At the same time, the Stratton Commission recognized that coastal development and pollution were negatively impacting both the quality and availability of ocean resources. Coincidentally, the 1969 Santa Barbara Channel oil spill in California occurred during the same month when the Stratton Commission’s report was published (Christie 2007). The temporal intersection of the Stratton Commission’s report and the Santa Barbara oil spill, along with other highly-visible industrial pollution incidents, elicited significant, negative reactions from private citizens and public agency personnel alike. In response, Congress passed several ocean management acts over the course of the next four decades, including but not limited to, the aforementioned Coastal Zone Management Act of 1972, the Marine Protection, Research, and

Sanctuaries Act of 1972, and the Ocean Dumping Ban Act of 1988 (Chandler and Gillelan 2005; USCOP 2004; Pew Oceans Commission 2003).

In 2000, during U.S. President William Clinton's administration, the Oceans Act of 2000 was passed, establishing another commission, the United States Commission on Ocean Policy (USCOP). Similar to the Stratton Commission, the USCOP was tasked with reviewing U.S. ocean policy and formulating a "comprehensive, long-range national policy for the exploration, protection, and use of ocean and coastal resources (Rosenberg et al. 2009, page 303)." The USCOP's review revealed that as many as 140 laws addressing ocean and coastal management issues were in effect, involving 20 federal agencies (Bradley 2008; Christie 2007). The laws had been incorporated on a piecemeal, sector-by-sector basis, and did very little to recognize or promote inter-sectoral coordination. The resulting body of ocean and coastal regulations had become a confusing network of policies that overlapped in some areas, left gaps in other areas, and included some instances where the requirements and/or impacts of one policy countermanded the intentions of another policy (Richardson 2012; Owen 2003).

During U.S. President George W. Bush's administration, the USCOP documented the results of its review in a report titled, "An Ocean Blueprint for the 21<sup>st</sup> Century," with the objective of reconciling competing interests, promoting multiple uses, and addressing "distressing declines" affecting ocean and coastal environments (USCOP 2004, page 4). The report provided 212 recommendations intended to establish EBM as the standard for all ocean and coastal management programs and policies in the U.S. (Bradley 2008; USCOP 2004). The USCOP also identified three broad categories of actions deemed necessary to achieve those recommendations: 1) establishment of a "coordinated national ocean policy;" 2) installation of enhanced ocean observation systems and collection and interpretation of scientific information;

and 3) delivery of improved education for developing leaders (USCOP 2004, page 5).

As part of a mandatory response to the USCOP report, President George W. Bush's administration published a document in 2004, titled, "U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Ocean Commission on Policy (U.S. CEQ 2004)." The document acknowledged the need for: 1) better integration of federal ocean policy and management efforts, as well as 2) an "interagency coordinating structure" that could incorporate federal, state, and local input (U.S. CEQ 2004, page 6). At the same time, President George W. Bush also signed E.O. 13366, establishing a Committee on Ocean Policy within the U.S. Council on Environmental Quality (U.S. President G.W. Bush 2004). In 2007, the Committee on Ocean Policy updated the 2004 "U.S. Ocean Action Plan" with a subsequent report, titled, "U.S. Ocean Action Plan Implementation NOAA Update (U.S. CEQ Committee on Ocean Policy 2007)." The 2007 report addressed actions taken and progress made in several categories relevant to the 2004 "U.S. Ocean Action Plan," including ocean leadership and coordination; science and policy; management and conservation of ocean and coastal environments; and marine transportation (Upton and Buck 2010). The Committee on Ocean Policy also established a subordinate committee, the Interagency Committee on Ocean Science and Resource Management Integration (ICOSRMI), and in 2008, ICOSRMI released another report, providing additional "U.S. Ocean Action Plan" progress updates for 2006 and 2007 (Upton and Buck 2010).

Beginning in 2000, the Pew Oceans Commission (POC) also completed a comprehensive evaluation of U.S. ocean policy, and published the results of that evaluation in a 2003 report titled, "America's Living Oceans: Charting a Course for Sea Change (Pew Oceans Commission 2003)" (Upton and Buck 2010). Similar to the USCOP's recommendation for a coordinated national ocean policy framework, POC recommended that a National Ocean Policy Act be

created, resembling the National Park Service Organic Act of 1916 (16 USC §1-18), the Wilderness Act of 1964 (16 USC §1131–1136), or the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57) (Pew Oceans Commission 2003). These acts provided the authorities and procedural guidance necessary to facilitate effective protected area management, including limitations on high-impact commercial and recreational uses.

Based on the fact that POC and USCOP set forth similar and/or complementary recommendations to improve ocean policy and management in the U.S., the Joint Ocean Commission Initiative was formulated in 2005, in an attempt to coordinate efforts and collectively push for the recommended reforms (Upton and Buck 2010). In 2006, the Joint Ocean Commission Initiative released a report recommending 10 ways in which the U.S. Congress could support establishment of “more effective and integrated ocean policy (Upton and Buck 2010, page12).” Further, the Joint Ocean Commission Initiative released additional reports in 2007, 2009, 2011, 2012, and 2013, and remains actively involved in and committed to affecting ocean policy reform in the U.S.

In 2009, U.S. President Barack Obama established a temporary Interagency Ocean Policy Task Force, and required that Task Force to:

1. Develop a National Ocean Policy that “ensures the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources, enhances the sustainability of ocean and coastal economies, preserves our maritime heritage, provides for adaptive management to enhance our understanding of and capacity to respond to climate change, and is coordinated with our national security and foreign policy interests (U.S. President Obama 2009a);”
2. Establish a “framework for policy coordination of efforts to improve stewardship of the oceans, our coasts, and the Great Lakes (U.S. President Obama 2009a);” and
3. Develop a “framework for effective coastal and marine spatial planning (U.S. President Obama 2009a).”

The Interagency Ocean Policy Task Force responded with yet another series of

recommendations and, following on those efforts, E.O. 13547 was signed in 2010, formally establishing a national ocean policy and a National Ocean Council. E.O. 13547 also directed executive agencies to take a number of actions supporting stewardship of the oceans, coasts, and the Great Lakes, in accordance with the recommendations set forth by the Interagency Ocean Policy Task Force (U.S. President Obama 2010). In 2013, the National Ocean Council published the “National Ocean Policy Implementation Plan,” further obligating relevant federal agencies to take appropriate actions in support of a number of priorities, including: promoting economic growth, resilience, and diversity; ensuring maritime domain safety and security; understanding and preparing for the impacts of climate change; establishing interagency partnerships and supporting regional and local agency management efforts; and improving capacity for ocean observation, monitoring, and data collection and management (National Ocean Council 2013). However, despite on-going efforts to affect a major overhaul of ocean policy, the U.S. federal government has yet to pass an organic act streamlining the management of marine habitats and natural resources. As a result, federal agencies charged with ocean conservation and restoration obligations must still contend with myriad unintegrated policies, laws and regulations (Rosenberg et al. 2009).

### **3.2 MPA Management in the U.S.**

As the U.S. federal government began to understand the importance of integrating single-sector management strategies into a more holistic framework, the MPA concept started to gain increased attention as a potential means of incorporating EBM considerations into ocean management efforts. In addition to providing a standardized definition for MPA, E.O. 13158 also called for, 1) “[enhanced or expanded] protection of existing MPAs,” 2) creation of new MPA, and 3) establishment of a scientifically robust, comprehensive network of both new and existing

MPA that adequately represents the broad array of marine ecosystems located within U.S. waters (U.S. President Clinton 2000a, page 1231; National Marine Protected Areas Center 2013a). Additionally, E.O. 13158 required establishment of a National MPA Center that could oversee the development of an MPA network, maintain an inventory of sites included in the network, build MPA management and organizational capacity, support inter-organizational coordination and stakeholder involvement processes, and provide training and guidance to member sites (NOAA and U.S. Department of the Interior 2014b).

MPA designation and management has occurred and continues to occur at all levels of government, involving federal, tribal, state, and local agencies, as well as a limited number of private sector organizations. Within U.S. waters, including fresh water environments, there are more than 1,770 MPA in the National MPA Center's inventory, and approximately 386 of those sites are managed solely at the federal level (National Marine Protected Areas Center 2014). The remaining areas included on the National MPA Center inventory are managed by state agencies, U.S. territorial governments, and, to a limited extent, private organizations, local governments and multi-agency and/or multi-level (i.e. state-federal) partnerships (National Marine Protected Areas Center 2014). Particularly in the context of usual and accustomed fishing grounds in western Washington State and the Great Lakes region, some tribal communities also oversee and administer MPA management activities (National Marine Protected Areas Center 2014).

### 3.2.1 U.S. Federal Agencies with MPA Management Responsibilities

Most federally-managed MPA generally fall under the purview of NOAA, NPS, and USFWS. Examples of federal MPA include National Marine Sanctuaries and Fishery Management Areas, under NOAA purview; National Parks and National Seashores, within NPS; National Wildlife Refuges, within USFWS; and National Estuarine Research Reserves (NERR), managed jointly by NOAA and the state in which a specific NERR is located. To a limited

extent, the Bureau of Land Management (BLM) and Bureau of Ocean Energy Management, Regulation, and Enforcement (BOEMRE) also manage MPA in U.S. waters. Table 3.1 identifies five federal agencies/offices that have a well-established role in MPA management (Bradley 2008).

Federal MPA management authorities and obligations are derived from a number of statutes, such as the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, as amended; Public Law 109-479); the National Marine Sanctuaries Act (NMSA; 16 USC § 1431-1441); the National Park Service Organic Act of 1916 (16 USC §1-18); and the National Wildlife Refuge System Improvement Act (Public Law 105-57). The degree to which ocean uses are managed from one MPA to another is often highly dependent upon the mandates, jurisdiction, and priorities associated with a site’s managing agency. Area and agency-specific MPA objectives range from ensuring “ecosystem-level health and integrity,” to focusing on single-species management objectives, such as fostering the recovery of threatened or endangered species or supporting sustainable harvests of commercially valuable species (National Marine Protected Areas Center 2013a, page 9). MPA in the U.S. also reflect a wide variety of site design characteristics including, but not limited to, zoning schemes that incorporate both no-take and mixed-use areas; fishing gear closure areas; seasonal fishery closure areas; and no-access areas (Murawski 2007). Finally, there are many instances where the boundaries between two different types of federal MPA overlap, both geographically and in terms of managing authority (NOAA and U.S. Department of the Interior 2014a; Bradley 2008; National Marine Protected Areas Center 2014).

Table 3.1. U.S. Federal Agencies with a Role in MPA Management

Agency (Department)	Primary Authorities	Designation Process	MPA Site Inventory	Mission
National Marine Protected Areas (MPA) Center (U.S. Department of Commerce and U.S. Department of the Interior)	Executive Order 13158	N/A; the National MPA Center does not designate MPA sites to be managed under its own purview, but instead serves as a coordinating body and “resource to all federal, state, territorial, and tribal programs responsible for the health of the nation’s oceans.” <sup>7</sup>	The National MPA Center inventory currently tracks 1,775 sites managed at all levels of government, including federal sites, as described above <sup>8</sup>	“To connect and strengthen the nation’s diverse marine protected area programs and to create a National System of Marine Protected Areas.” <sup>9</sup>
National Park Service (U.S. Department of Interior)	National Park Service Organic Act of 1916; National Park Service General Authorities Act of 1970	After completing Congressionally-directed candidate area studies, Secretary of Interior submits recommendations identifying specific areas deemed appropriate for designation; approved designations then promulgated via Act of Congress	Over 70 sites, including parks, monuments, seashores, lakeshores, and recreation areas	“To provide for the public enjoyment of “natural and historic objects and the wild life therein,” and “leave them unimpaired for the enjoyment of future generations.” <sup>1</sup>
U.S. Fish and Wildlife Service (U.S. Department of Interior)	National Wildlife Refuge System (NWRS) Administration Act of 1966; Refuge Recreation Act of 1962; Executive Order 12996; NWRS Improvement Act of 1997; NWRS Centennial Act of 2000	USFWS recommends designation of candidate areas to the Secretary of Interior; the recommendation is then vetted to the U.S. President and Congress; once approvals are secured, sites are designated via Act of Congress	Nearly 180 refuge areas, including both submerged resources and/or coastlines	“To conserve, protect, and enhance fish, wildlife, and plants and their habitats for the benefit of the American people.” <sup>2</sup>

Table 3.1 (cont.). U.S. Federal Agencies with a Role in MPA Management

Agency (Department)	Primary Authorities	Designation Process	MPA Site Inventory	Mission
NOAA Office of National Marine Sanctuaries (U.S. Department of Commerce)	National Marine Sanctuaries Act	Secretary of Commerce generates a site candidate list; candidate sites subject to EIS assessments and consistency determinations, as well as input from Regional Fishery Management Councils, relevant State officials, and the general public; draft management plan, proposed regulations, and other documents compiled and submitted to Congress for review and approval	13 sanctuaries in the Atlantic and Pacific Oceans, the Gulf of Mexico, and Lake Huron. Co-management responsibilities shared for PMNM	“To serve as the trustee for a network of 14 marine protected areas,” and to “identify, protect, conserve, and enhance the natural and cultural resources, values, and qualities of the National Marine Sanctuary System for this and future generations.” <sup>3</sup>
NOAA National Marine Fisheries Service (U.S. Department of Commerce)	Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA); Endangered Species Act; Marine Mammal Protection Act	Appropriate Regional Fishery Management Council assesses adverse effects impacting Essential Fish Habitats for managed species, evaluates conservation alternatives, and recommends establishment of conservation areas (or similar) to Secretary of Commerce; if/when approved by Secretary, rule-making and implementation proceed	Approximately 180 sites, including Gear Closure Areas, Essential Fish Habitat Conservation Areas, single species restricted or protected areas, and marine reserves	“Stewardship of living marine resources through science-based conservation and management and the promotion of healthy ecosystems.” <sup>4</sup>

Table 3.1 (cont.). U.S. Federal Agencies with a Role in MPA Management

Agency (Department)	Primary Authorities	Designation Process	MPA Site Inventory	Mission
National Estuarine Research Reserve System (U.S. Department of Commerce and relevant state- level agencies)	Coastal Zone Management Act of 1972	Relevant state submits a Letter of Interest to NOAA; NOAA Administrator and State Governor then create a designation document and joint Memorandum of Understanding	28 research reserves	“Long term research, monitoring, education and stewardship throughout the coastal United States.” <sup>6</sup>

<sup>1</sup> 16 U.S.C. 1; Curdts 2011

<sup>2</sup> USFWS 2009b

<sup>3</sup> NOAA ONMS 2014

NOAA National Marine Sanctuary Program 2005b

<sup>4</sup> NOAA NMFS (Date unknown)

<sup>5</sup> NOAA NMFS Pacific Islands Regional Office 2014

<sup>6</sup> NERRS 2012

<sup>7</sup> NOAA and U.S. Department of the Interior 2014

<sup>8</sup> National MPA Center 2014

<sup>9</sup> National MPA Center 2013b

### 3.2.2 De Facto MPA in U.S. Waters

In addition to tracking MPA intended to improve or restore ecosystem integrity, the National MPA Center also recognizes over 1,200 areas within the U.S. Exclusive Economic Zone (EEZ) that have been set-aside for purposes unrelated to environmental protection. These areas, referred to as “De Facto MPA,” have legally-defined boundaries, within which “access or activities are restricted by law for reasons other than conservation or natural resource management (National Marine Protected Areas Center 2008, page 4).” De Facto MPA occupy approximately 3% of U.S. waters, covering more than 133,750 square statute miles (roughly 347,000 square kilometers; not accounting for some areas of overlap). There are a number of U.S. federal agencies with a role in De Facto MPA management, including all five of the U.S. armed services (Coast Guard, Air Force, Navy, Army, Marine Corps), as well as the Environmental Protection Agency, the U.S. Army Corps of Engineers, and the National Aeronautical and Space Administration (National Marine Protected Areas Center 2008).

The three primary objectives of De Facto MPA are: 1) to afford a measure of security for military operations; 2) to protect public and private infrastructure; and 3) to safe-guard public

health and safety. Examples of De Facto MPA include vessel traffic separation schemes; security zones established around certain types of infrastructure; regulated navigation areas guiding vessel movements in/near ports and harbors; and danger zones in which military operations take place (National Marine Protected Areas Center 2008).

An extensive body of research documenting the effects of De Facto MPA on ocean ecosystem integrity has not yet been developed. However, because many sites are located in close proximity to coastlines and estuaries that provide essential habitat for marine species, De Facto MPA may positively impact ecosystem integrity, even if such effects are not central to most De Facto MPA management objectives (National Marine Protected Areas Center 2008). Future research efforts should include assessment of the ways in which De Facto MPA contribute to ocean conservation objectives.

### **3.3 Large-Scale MPA**

Most MPA around the world are relatively small, and are located in close proximity to developed coastlines and human population centers (Toonen et al. 2013). This includes the U.S., where almost three-quarters of the MPA of known area are smaller than 30 square statute miles, and are located within 12 nautical miles (nm) of the U.S. coastline (National Marine Protected Areas Center 2014; National Marine Protected Areas Center 2013a). However, marine ecosystem dynamics, including species life histories and species interactions, span large geographic areas and multiple habitat types, extending far beyond nearshore environments. Given that, many members of the international MPA community are rethinking ocean protection and management needs in such a way that favors establishment of much larger MPA, encompassing multiple interconnected habitats that include offshore environments (Toonen et al. 2013; Pew Oceans Commission 2003).

The Big Ocean Network, which is a consortium of ocean professionals charged with managing some of the largest MPA around the world, has defined large-scale MPA as marine conservation areas that cover at least 100,000 square statute miles (nearly 259,000 square kilometers), and are “actively managed for protection across the entire geographic boundary of the site (Wilhelm, Taei, and Teroroko 2011; Big Ocean Network 2014).” The Great Barrier Reef Marine Park, established in 1975, was the first MPA to meet such criteria, followed by the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, established in 2000 and later designated as PMNM (Australia Office of Legislative Drafting and Publishing 2011; Big Ocean Network 2014; U.S. President Clinton 2000b; U.S. President G.W. Bush 2006, 2007). Since that time, nearly 10 additional large-scale MPA have joined the Big Ocean Network, and other potential locations around the world are under consideration (Big Ocean Network 2014). Although MTMNM encompasses fewer than 100,000 square statute miles, the site is, nevertheless, a member of the network. Upon its expansion in September 2014, PRIMNM was also added to the network (Big Ocean Network 2014).

### 3.3.1 Rationale Supporting Large-Scale MPA

The use of large-scale MPA appears to be gaining momentum, playing an increasingly active role in global ocean conservation. There are several possible reasons for this emerging trend, as follows.

#### **1. Food Security and Scientific Justification**

Human population growth places continually increasing pressure on commercially-valuable fish species, potentially impacting rates of extinction among those species. However, current research suggests that populations of large, predatory, pelagic fish are less vulnerable to fishing-related mortality when the habitats upon which they depend are set-aside in large,

isolated MPA, even if such MPA include only a portion of such species' entire geographic ranges (Edgar et al. 2014). Establishment of such areas may prove effective in not only restoring populations of large fish, but also enhancing human food security through eventual dispersal of protected species beyond MPA boundaries and into important fishing grounds (Roberts et al. 2001).

Some species must rely on different habitats for different life history stages, such as growth, development, foraging, settlement, and reproduction. Incorporating habitat connectivity considerations into MPA site design, providing species with access to a range of habitats with minimal exposure to intense human activity, should contribute to improved population persistence, and may even increase overall biomass, thereby enhancing accomplishment of MPA objectives (Secretariat of the Convention on Biological Diversity 2004).

## 2. Paradigm Shifts Favoring EBM and MSP

There is increasing consensus that single-species management, a practice common within the fisheries management sector, tends to overlook whole-ecosystem considerations such as habitat integrity, predator-prey dynamics, and primary productivity. The single-species approach may prioritize economic gain or the protection of highly valued species over ecosystem integrity, and generally does not emphasize or encourage system-wide monitoring (Palumbi 2002; Pew Oceans Commission 2003). Further, the application of multiple, single-species management plans within a single region can be confusing, unwieldy, ineffective, and sometimes even conflicting (Rosenberg et al. 2009; Bradley 2008; Palumbi 2002). As such, the incorporation of more holistic ocean management tools, such as EBM, MSP, and MPA that consider all species and habitat dynamics as components of a larger system, should prove more effective in preserving ecosystem services in their entirety, including economic services. In particular, large-

scale MPA that protect long-distance migration corridors for commercially valuable, highly migratory species may be a critically important aspect of supporting or enhancing sustainable fisheries harvests (Secretariat of the Convention on Biological Diversity 2004).

### **3. International Agreements and Targets**

During the 2004 United Nations (UN) Convention on Biological Diversity (CBD), convention participants agreed that rates of biodiversity loss had become unacceptably high, within both terrestrial and aquatic environments. In response, the members drafted a series of specific conservation objectives intended to slow or even reverse trends of biodiversity loss. One of those objectives included Aichi Biodiversity Target 11, which recommended that 10% of the world's oceans be placed into a system of networked MPA by the year 2010 (Secretariat of the Convention on Biological Diversity 2011; National Marine Protected Areas Center 2013a). Although the Aichi Biodiversity Target 11 deadline was eventually postponed to 2020, meeting the ambitious objective will, nevertheless, require a concerted, collective effort to establish several MPA of unprecedented size around the world (National Marine Protected Areas Center 2013a; Toonen et al. 2013). The monuments evaluated in this report allow the United States to contribute to the 10% protection target, despite the fact that the U.S. is not a signatory to the CBD.

### **4. Additional Rationale for Larger MPA**

Many large-scale MPA are located in remote, hard-to-access areas that are quite distant from urban population centers. These areas are generally not subjected to the same stressors as MPA located in closer proximity to urban areas and, therefore, may eventually represent the last remaining fully-functioning ecosystems (Toonen et al. 2013; Wilhelm, Taei, and Teroroko 2011). Large-scale MPA may also become “natural barometers,” providing ocean scientists with opportunities to identify functional baselines, study the dynamics of intact ocean ecosystems, and

monitor those dynamics as the effects of climate change continue to manifest (Wilhelm, Taei, and Teroroko 2011, page 3). Although it will likely be extremely difficult to reverse various aspects of climate change through local or regional management efforts, protecting intact systems may allow for repopulation of collapsed systems over time, thereby potentially enhancing overall ecosystem resilience (Lausche 2011; Secretariat of the Convention on Biological Diversity 2004). Therefore, large-scale MPA may complement the use of small, coastal MPA, ensuring more complete representation of ocean ecosystems within protected areas and broader application of EBM and MSP principles (Toonen et al. 2013; Wilhelm, Taei, and Teroroko 2011).

### 3.3.2 Questions Regarding Large-Scale MPA Effectiveness

Although large-scale MPA may represent a viable means of addressing marine ecosystem threats, some have argued that achieving targeted objectives may be neither as simple nor as likely as expected. The following sections summarize some of the rationale for such skepticism.

#### 1. Enforcement Capacity

In “Protecting America’s Pacific Marine Monuments: A Review of Threats and Law Enforcement Issues,” Richardson (2012) asserted that illegal fishing activity represents one of at least three realistic threats facing marine national monument waters. The review also identified several concerns regarding U.S. federal agency ability to fulfill enforcement obligations, as follows:

- “USFWS, NOAA, and U.S. Coast Guard are underfunded and underequipped to carry out their expanding portfolio of environmental protection mandates in the Pacific Islands region (Richardson 2012, page 5).”
- “The vast size and discontinuous nature of the U.S. EEZ pose a huge logistical and operational challenge for enforcement agencies that has yet to be sufficiently recognized and accepted by national level agency leadership (Richardson 2012, pages 4-5).”
- “The [U.S.] Coast Guard has far too few physical assets to patrol the vast EEZ (Richardson 2012, page 6).”

While Richardson (2012) focuses specifically on PRIMNM, the capacity limitations addressed in the report are inherent to many large-scale MPA, particularly those that are isolated and lack ready access to the infrastructure and resources needed to facilitate regular enforcement operations. Over time, technological improvements such as Vessel Monitoring Systems (VMS), unmanned vessels and aircraft, and buoys outfitted with remote monitoring equipment will likely enhance enforcement capabilities. However, because the procurement and installation of updated equipment is constrained by financial resource shortages, monitoring and enforcement in many large-scale MPA remains deficient, and such deficiencies may not meet the standards required to prosecute violators.

## **2. Illegal, Unreported, and Unregulated Fishing**

Without widespread monitoring, detection, and enforcement capabilities, it can be extremely difficult to deter illegal, unreported, and unregulated (IUU) fishing activity in large, remote MPA. Additionally, because such areas are likely inaccessible for conscientious fishing vessels, tourism operators, or community members, managing agencies are unable to take advantage of community-based volunteer monitoring or self-policing programs, adding to the complexity of detecting and addressing IUU activity. Consequently, IUU may jeopardize accomplishment of large-scale MPA conservation and management objectives.

## **3. Fisheries Management-Based Interests**

Researchers within the fisheries management sector have raised additional concerns regarding MPA effectiveness, largely related to food security and sustainability considerations (Rice and Garcia 2011; Garcia and Rosenberg 2010). Although MPA objectives and fisheries management objectives are often distinct enough to nullify comparisons of the two fields, it is still important to understand the concerns that have been raised, in an attempt to enhance both MPA management and future research efforts addressing MPA effectiveness.

Some representatives from the fisheries management sector contend that investing in improved fisheries technologies would likely be more effective than MPA program development, particularly in terms of increasing biomass and fisheries yields. Some researchers also claim that the positive impacts of MPA spillover effects on fisheries yields remain unproven, and more reliable benefits could be accomplished through fisheries management measures alone (Roberts and Hilborn 2013; Roberts et al. 2001). Such measures might include seasonal area closures, year-round area closures, effort reductions, gear restrictions, and carefully-monitored catch limits (Jones 2014a). Skeptics are also concerned that attempts to enhance biomass and yield may actually be *hindered* by the use of MPA, particularly when density-dependent species must compete for limited space and resources within MPA boundaries (Roberts and Hilborn 2013). In turn, resource competition could create unanticipated outcomes that may be counter-productive, relative to fisheries-related objectives.

Finally, government-initiated actions that incorporate fishing prohibitions into MPA without empowering affected fishers in the decision-making process may threaten community buy-in. Failing to secure community support for an MPA could complicate enforcement and other MPA management functions, ultimately compromising the likelihood of accomplishing management objectives.

#### **4. Displaced Environmental Impact**

Some conservation managers have argued that closing-off extensive areas of ocean space to fishing may force nations to intensify other forms of food production, including both aquaculture and agriculture. In either case, intensified production could exacerbate existing water quality concerns due to run-off, sedimentation, and the introduction of concentrated fertilizers, antibiotics, and fish food and waste products into regional waters. Both industries may contribute

to biosimplification, habitat destruction, and genetic diversity loss, compromising overall ecosystem resilience. Some scientists also warn that growth in these industries could lead to increased carbon emissions, which could have a more pronounced, negative impact on ocean ecosystem integrity than well-managed fisheries (See debate between Roberts and Hilborn 2013).

### **3.4 MPA Site Design and Management Considerations**

#### **3.4.1 Pre-designation Site Assessments**

Bennett and Dearden (2014) suggest that simply establishing an MPA without first understanding various characteristics of a candidate site *prior* to designation will not guarantee accomplishment of conservation objectives, and could render an otherwise well-designed site ineffective (Bennett and Dearden 2014; Hirschnitz-Garbers and Stoll-Kleemann 2011; Ostrom, Janssen, and Anderies 2007). However, most research and monitoring efforts have historically focused on scientifically-based outputs and outcomes occurring well *after* designation (Hockings et al. 2006). Less attention has been devoted to understanding the socioeconomic and governance characteristics influencing a candidate site, despite the fact that these variables can exert significant influence on MPA effectiveness (Bennett and Dearden 2014). As such, it is critically important to invest in a comprehensive, standardized program to assess such variables *prior* to establishment of a new site, in an attempt to identify the most appropriate management framework and provide all essential inputs and incentives (Bennett and Dearden 2014).

The NOAA Office of National Marine Sanctuaries (ONMS) sanctuary designation process, which must adhere to standardized procedures set forth in both the National Marine Sanctuaries Act and regulations published in the U.S. Code of Federal Regulations (CFR),

represents one example of a formalized MPA establishment process that includes consideration of site characteristics prior to designation. An ONMS National Marine Sanctuary (NMS) cannot be established until specific, pre-designation procedures are completed, vetted through Congress, and subsequently granted Congressional approval (16 USC § 1431-1441; 15 CFR § 922, Subpart C).

In order to be considered for designation as an NMS, a site must bear “special national significance due to conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational or esthetic qualities,” conferring a need for new or supplemental federal authorities intended to enhance management functions (16 USC § 1431-1441). Once a site has been deemed appropriate for NMS consideration, the Secretary of Commerce must generate, assemble, and submit to Congress a portfolio of documents, including: a Draft Environmental Impact Statement (DEIS) for the proposed action; a summary of resources, as well as current and potential uses of the candidate area; a draft management plan; proposed regulations; and maps outlining the geographic extent of the proposed area. To ensure full consideration, the Secretary (or his/her delegates) must also (15 CFR § 922, Subpart C):

- Publish a Notice of Intent in the Federal Register and local newspapers, describing the proposed action, advising the public of the intent to prepare a DEIS, and summarizing the terms of a draft management plan for the proposed site;
- Consult with the House of Representatives Committee on Resources and the Senate Committee on Commerce, Science, and Transportation;
- Consult with the governor and relevant agencies within affected state(s) to ensure the proposed designation is “acceptable,” and meets Coastal Zone Management Act “consistency” requirements;
- Consult with the appropriate Regional Fishery Management Council (RFMC), and allow the RFMC 120 days to generate proposed fishing regulations for the candidate site;
- Compile draft regulations for the site that incorporate RFMC-derived proposed fishing regulations;
- Ensure that at least one public hearing is held in the affected area.

Members of the public must be allowed the opportunity to comment on any portion of the designation process. Further, a Sanctuary Advisory Council (SAC) is created for each NMS, lending a degree of vertical governance diversity to NMS decision-making by incorporating input from local, regional, and state agencies, as well as private organizations (NOAA ONMS 2013).

Similarly, NPS and USFWS protected area establishment procedures also require completion of candidate area studies prior to designation.

### 3.4.2 Incentives

In addition to the need for pre-designation site assessments, personnel charged with implementing new MPA require incentives to fulfill management obligations. An incentive is any instrument that is intended to encourage and or induce behaviors likely to stimulate accomplishment of desired policy outcomes, and can include clear, comprehensive, and enforceable regulations; enforcement authorities; mechanisms for shared decision making among co-managing agencies; staff training and public outreach programs; long-term sources of funding; and mechanisms to acquire operational assets for enforcement, monitoring, and other field-based operations (Jones 2014a; Weimer and Vining 2011). In the context of MPA management, ‘desired outcomes’ might include passage of enforceable regulations, development of enhanced enforcement capacity, and observation of increased levels of compliance or other forms of public support for MPA rules and requirements. Incentives may take the form of and/or build upon market forces; legal requirements; relevant collections of technical and traditional knowledge; or public outreach mechanisms facilitating community participation. The sources from which incentives can be derived are equally diverse, including government agencies, private markets, and community-based grass-roots organizations (Jones 2014a).

The identification of necessary inputs and incentives must occur early in the MPA site designation process, in order to best facilitate establishment of a sound governance and management framework for the site. Failure to do so could render access, monitoring, and enforcement efforts nearly impossible, potentially placing an area at risk of becoming little more than a ‘paper park.’ In a research report titled, “Threats to Forest Protected Areas: A Research Report,” the term “paper park” is defined as, “a legally established protected area where experts believe current protection activities are insufficient to halt degradation,” as well as an “unimplemented” or “under-managed” protected area (IUCN 1999, page 7). Paper parks remain continually vulnerable to the impacts of unmanaged threats, such as undetected or unregulated resource extraction, pollution, and/or intense tourism and recreational activities. Particularly in the context of large, remote MPA, it may be tempting to assume that the size of a site alone will ensure successful accomplishment of conservation objectives, with or without pre-designation assessments and provision of appropriate incentives. However, Bennett and Dearden (2014) warn that “quality is being lost in the push towards quantity,” providing additional justification for comprehensive site characterizations and needs assessments prior to implementation (Bennett and Dearden 2014, page 96).

#### 3.4.3 MPA Management Best Practices

Emerging research indicates that there are five key elements that, when incorporated into MPA site design and implementation processes, may significantly improve the effectiveness of a site, despite the challenges and costs inherent to large-scale MPA (Edgar et al. 2014).

Additionally, protected area management guidance documents such as “Guidelines for Protected Areas Legislation (Lausche 2011),” “Technical Advice on the Establishment and Management of a National System of Marine and Coastal Protected Areas (Secretariat of the Convention on

Biological Diversity 2004),” and “Marine Reserves: A Tool For Ecosystem Management and Conservation (Palumbi 2002)” have also set forth management recommendations. Based on input that consistently appears throughout those and other documents, the following list presents 10 best practices that should be considered critical to comprehensive, effective MPA management, reflecting a modified set of Edgar et al.’s (2014) five key elements, as well as five additional elements derived from the literature.

### 10 MPA Management Best Practices

1. Extractive use limitations: incorporation of no-take zones and/or strict limitations on fishing and other forms of resource extraction; emphasis on preservation;
2. Enforcement: facilitation of on-going, active enforcement efforts; promulgation of clearly defined authorities and tables of penalties for non-compliance;
3. Organizational stability: implementation of stable management framework(s), leading to site longevity that exceeds 10 years; integration of horizontal and vertical levels of governance; establishment of clearly-defined inter-institutional roles, including mechanisms for coordination and decision making; establishment of clearly defined, long-term funding sources, including allowances for flexibility and innovation;
4. Spatial considerations: incorporation of at least 100,000 square statute miles (nearly 259,000 square kilometers) into site boundaries; implementation of geographically-defined boundaries encompassing and supporting ecosystem connectivity, representation, and replication;
5. Location: incorporation of remote, isolated locations that encompass multiple, contiguous habitats, allowing freedom of movement across habitat ‘boundaries;’
6. Scientific foundations: incorporation of EBM and/or MSP considerations and science-based decision making;
7. Management planning procedures: promulgation of clearly defined requirements for and means of developing formal, comprehensive management plan(s); documentation of roles and responsibilities for all co-managing agencies; incorporation of the Precautionary Principle and adaptive management considerations;
8. Monitoring: Establishment of clearly-defined objectives, corresponding metrics/indicators, and a program of regular monitoring for effectiveness;
9. Stakeholder/trustee involvement: Facilitation of on-going stakeholder/trustee participation, including methods for collecting direct input from indigenous groups; establishment of formal education and outreach programs;
10. Institutional learning: Establishment of mechanisms for incorporating lessons learned from protected area management peers.

(Sources: Edgar et al. 2014; Australia Office of Legislative Drafting and Publishing 2011, 2012; Wilhelm, Taei, and Teroroko 2011; Lausche 2011; Lundquist and Granek 2005; Secretariat of the Convention on Biological Diversity 2004; GBRMPA 2003; Palumbi 2002)

#### 3.4.4 Barriers

MPA management planning and implementation are frequently affected by barriers, which can be defined as any organizational or cultural characteristic or condition that can impede accomplishment of planning milestones. Barriers often arise as a result of incentive and input shortages, and can be sorted into a number of general categories, including organizational inefficiencies; poor planning practices; outdated agency paradigms; inadequate policies and mandates; insufficient capacity; and inadequate revenue streams (Viet Nam Environment Agency 2009; Davis 1994; Hirschnitz-Garbers and Stoll-Kleemann 2011; Lane 2003).

Expanding on these categories, the following is a short list of barriers that may hinder MPA management planning and implementation processes (Davis 1994; Hirschnitz-Garbers and Stoll-Kleemann 2011; Lane 2003; Ostrom, Janssen, and Anderies 2007; Robles et al. 2007):

- Shortage of interested actors (stakeholders)
- Inadequate incentives to plan
- Inadequate capacity, including personnel training
- Inadequate opportunities for stakeholder participation in planning processes
- Inadequate political commitment and support
- Inadequate financial resources
- Inability to communicate benefits and need to decision makers and/or stakeholders
- Unclear or conflicting mandates
- Divergent horizontal or vertical agency relationships/missions
- Inability to equitably disburse benefits to stakeholders and citizens
- Poor morale among personnel

In particular, barriers related to capacity, actors (stakeholders), incentives, mandates, and political will can negatively affect implementation of any of the 10 MPA management best

practices. Anticipating and devising means of overcoming barriers is a critically important aspect of identifying the resources necessary to support effective site implementation and management.

### **3.5 U.S. Presidential Designations of MPA in the U.S.**

In 2006, U.S. President George W. Bush drew upon Antiquities Act of 1906 authorities to establish a relatively new form of MPA via Presidential Proclamation. The Antiquities Act of 1906 authorizes a President to establish National Monuments for the purposes of managing and protecting “objects of historic or scientific interest (16 USC § 431-433),” and specifies that the Secretary of the Interior, the Secretary of Agriculture, and/or the Secretary of the Army must set any regulations necessary for the “purpose of carrying out the provisions of the Act (16 USC § 431-433).” Through this process, President Bush signed Presidential Proclamation 8031, establishing the Northwestern Hawaiian Islands Marine National Monument, later renamed Papahānaumokuākea Marine National Monument (U.S. President G.W. Bush 2006, 2007). Proclamation 8031 assigned joint, co-management responsibilities to the Secretary of Commerce (through the NOAA Office of National Marine Sanctuaries) and the Secretary of the Interior (through USFWS), in consultation with the State of Hawaii (HI). The co-managing agencies were required to generate a comprehensive, interagency management plan, documenting management objectives and activities for the entire monument and acknowledging each agency’s role in fulfilling those objectives and activities (U.S. President G.W. Bush 2006).

The establishment of PMNM marked the first time that an Antiquities Act designation: 1) called upon a Department/agency *other* than those specified in the Act to manage a marine-based site; and 2) extended beyond the boundaries of U.S. territorial waters (Hollis and Rosen 2010). Despite several complexities associated with the implementation and management of PMNM,

President George W. Bush signed three additional Presidential Proclamations in 2009, establishing MTMNM and PRIMNM, as well as Rose Atoll Marine National Monument. Although PMNM, MTMNM, and PRIMNM were all subject to similar multi-agency co-management frameworks, each Proclamation provided varying degrees of specificity in terms of management planning requirements (U.S. President G.W. Bush 2006, 2009b, 2009c, 2009d). As a result of these and other dissimilarities, management planning has progressed differently at all three sites, and each monument currently occupies a very different phase in the planning process.

The following sections describe the results of a systematic assessment of five qualitative indicators describing, in part, the management and governance settings for PMNM, MTMNM, and PRIMNM *prior* to monument designation. That assessment then leads into an evaluation of the degree of specificity provided in the Presidential Proclamation requirements set forth for each site. Finally, the current, post-designation status of management planning and degree of implementation of seven of the 10 MPA management best practices are evaluated. The results of this suite of evaluations are then analyzed to: 1) characterize the degree to which planning and implementation can vary among MPA established through the same mechanism; 2) reveal monument-specific patterns of planning and management inertia; 3) identify some of the barriers that may be contributing to such inertia; and 4) illustrate the importance of understanding site-specific governance and management characteristics and anticipated barriers *before* establishing a new MPA. Doing so should allow responsible personnel to define appropriate management objectives that are neither too coarse nor too fine, and subsequently identify the incentives needed to fulfill management obligations.

Presidential Proclamation 9173, which expanded PRIMNM by approximately 400,000 square miles in September 2014, is not included in this analysis (U.S. President Obama 2014).

Nevertheless, the fundamental outcomes of the analysis would likely remain the same, with or without consideration of Proclamation 9173.

#### **4. RESEARCH APPROACH**

This evaluation takes the form of an exploratory, single-case study, investigating the use of the Antiquities Act of 1906 to establish large-scale MPA (Yin 2009). Three units of analysis are embedded within this study: PMNM, MTMNM, and PRIMNM. The study includes qualitative characterizations of each monument, assessing:

1. Site-specific management settings *prior to* designation;
2. Specificity of Presidential Proclamation requirements for each site;
3. Current status of management planning at each site;
4. Degree of implementation of seven MPA management best practices at each site.

Although 10 MPA management best practices were identified in the preceding section, the following evaluation does not include assessment of the “spatial considerations,” “location,” and “organizational stability” best practices. Once each monument was established by Presidential Proclamation, the “spatial considerations” and “location” best practices could not easily be influenced and/or implemented through post-designation management activity. Further, comprehensive assessments of “organizational stability,” requiring long-term observation of management structure and activity, are beyond the scope of this study. Although these three MPA management best practices have been omitted from this particular evaluation, they remain important aspects of effective MPA management, and will be revisited to a limited extent in Chapter 6 of this report.

The results of the four assessments listed above are compiled in tabular form and translated into a series of radar plots, allowing rapid visual comparison of site-specific planning and implementation progress. The site-specific patterns are then used to highlight barriers that

are likely causing management inertia and/or contributing additional complexity to already-difficult planning scenarios. The ultimate objective of this sequence of analyses is to illustrate the importance of understanding the natural, socioeconomic, and governance dynamics characterizing a site *prior* to MPA designation, and using such information to identify and assign the incentives and resources necessary to ensure effective implementation.

#### **4.1 Sources of Information**

The evidence used to conduct the following analyses was derived from U.S Presidential Proclamations 8031, 8335, and 8336 (U.S. President G.W. Bush 2006, 2009b, 2009c, 2009d); monument-specific planning documentation and websites; USFWS National Wildlife Refuge documentation and websites; notices published in the U.S. Federal Register; various sections of the U.S. CFR; nautical charts published by NOAA’s National Ocean Service (NOS); Fishery Ecosystem Plans (FEP) published by the Western Pacific Regional Fishery Management Council (WPRFMC); information presented on “Friends” organization websites (i.e., Friends of Midway; Friends of Marianas Trench); and peer-reviewed journal articles. The monument and National Wildlife Refuge-specific documentation included draft and final management plans, USFWS Comprehensive Conservation Plans (CCP), management planning update documents, and monument advisory council information such as by-laws, membership information, and meeting minutes. Additionally, in response to Freedom of Information Act (FOIA) requests, NOAA and USFWS personnel provided documents describing monument and National Wildlife Refuge staffing models and budget planning exercises.

## 4.2 Site Descriptions

### 4.2.1 Papahānaumokuākea Marine National Monument

The Northwestern Hawaiian Islands Marine National Monument was established through signage of Proclamation 8031 in June 2006. Proclamation 8112, signed in March 2007, amended Proclamation 8031 to rename the site to ‘Papahānaumokuākea Marine National Monument (U.S. President G.W. Bush 2006, 2007).’

PMNM occupies a single, contiguous footprint spanning over 139,000 square statute miles (more than 362,000 square kilometers). All of the natural and historic resources that lie within the monument’s boundaries are under various forms of legal protection, including but not limited to those protections inherited upon passage of Proclamation 8031 (U.S. President G.W. Bush 2006). The eastern-most boundary of the monument is located approximately 138 statute miles northwest of Kauai, HI, within the main Hawaiian Islands. Kauai is closer to PMNM than any other U.S. municipal area featuring seaports and/or airports. The western-most boundary of PMNM is located approximately 1,339 statute miles northwest of Kauai, and more than 2,530 statute miles northeast of Guam (NOAA NMSP 2006; DistanceFromTo.net 2014).

PMNM contains coral reef atolls, coral islands, lagoons, shoals, and deep water environments, providing habitat for threatened green sea turtles, endangered Hawaiian monk seals, 14 million seabirds, and more than 7,000 marine species, approximately one-quarter of which are endemic to the Hawaiian islands (NOAA, USFWS, and State of Hawaii 2014; U.S. President G.W. Bush 2006). PMNM features the northern-most coral reefs in U.S. waters, many of which are largely-intact apex predator-dominated systems (NOAA Coral Reef Conservation Program 2014). Several sites within the monument are listed on the State of Hawaii and/or National Register of Historic Places, based on significant cultural and historic value related to

ancient Polynesian community practices and traditions; World War II historic battles; and 19<sup>th</sup> century whaling activities (NOAA, USFWS, and State of Hawaii 2014).

Based on the suite of natural and cultural resources contained within its boundaries, PMNM has been designated a United Nations Educational, Scientific, and Cultural Organization (UNESCO) “mixed” World Heritage site (NOAA, USFWS, and State of Hawaii 2014).

Figure 4.1. Papahānaumokuākea Marine National Monument

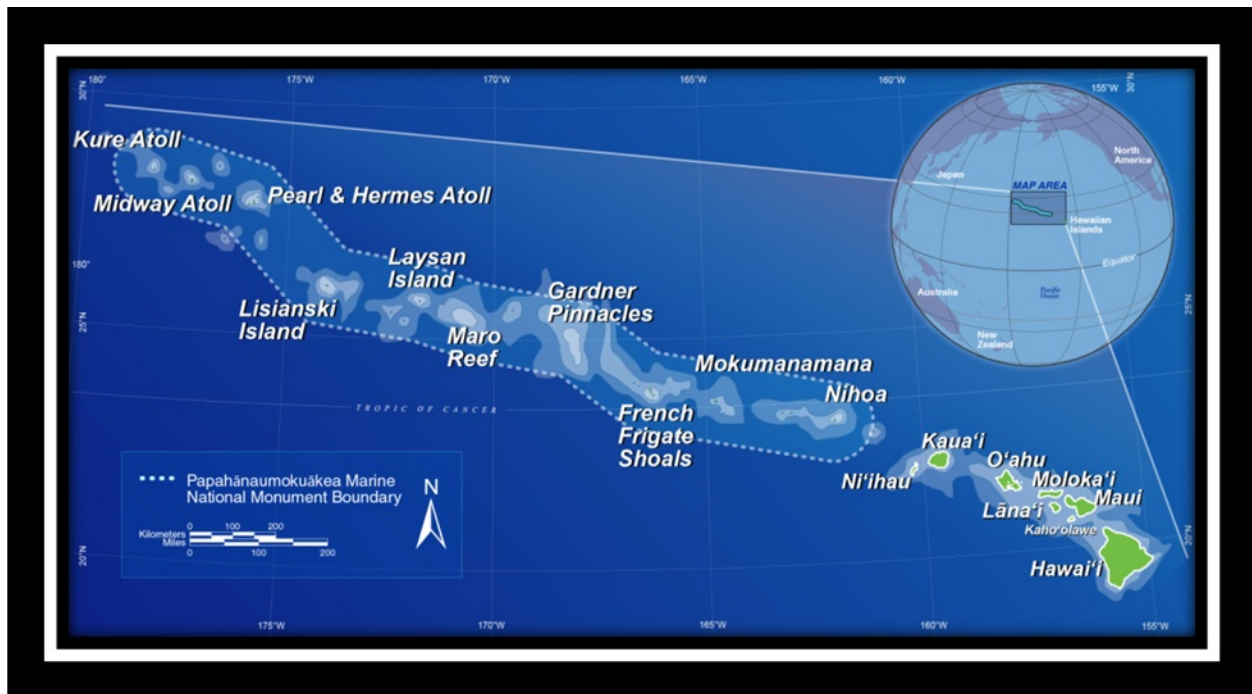


Photo Credit: [http://apps.ksbe.edu/kaiwakiloumoku/papahanaumokuakea\\_marinenationalmonument](http://apps.ksbe.edu/kaiwakiloumoku/papahanaumokuakea_marinenationalmonument)

#### 4.2.2 Marianas Trench Marine National Monument

MTMNM was established upon signage of Proclamation 8335 in January 2009. The site comprises three distinct units, including an Islands Unit, a Volcanic Unit, and a Trench Unit (U.S. President G.W. Bush 2009b). The Islands Unit encompasses Farallon de Pajaros, Maug, and Asuncion Islands, all of which are located in the northern portion of the Commonwealth of the Northern Mariana Islands (CNMI). The Volcanic Unit is composed of 21 separate, specifically-identified underwater volcanic “features.” Some of those features are located within

the Islands and Trench Units, while others are external to those units. In either case, a one-mile radius of protection surrounds each feature. The Trench Unit, containing the Marianas Trench itself, is a crescent-shaped area that wraps around the northern, eastern, and southern portions of Guam and CNMI, extending approximately 1,100 miles from north to south, and 44 miles from east to west (U.S. President G.W. Bush 2009b). In 2014, the population of CNMI was estimated to be 51,483 people, over 90% of whom are concentrated in Saipan, in the southern portion of CNMI (U.S. CIA 2014).

Although MTMNM is expansive, many portions of the monument are reasonably accessible, and provide an important source of both protein and economic opportunity for the people who reside in the region. Within the Trench and Volcanic Units, protection is afforded *only* to submerged lands. Commercial fishing is allowed in both units, subject to relevant NOAA National Marine Fisheries Service (NMFS) fisheries regulations (NOAA NMFS 2014). Protection within the Islands Unit applies to both submerged lands *and* the overlying waters, extending 50 nm from the mean low water line around each of the three islands in the unit. Commercial fishing is prohibited in the Islands Unit (NOAA NMFS 2014). Combined, all three units encompass 95,216 square statute miles (more than 246,000 square kilometers). Co-management responsibilities for the monument have been assigned to the U.S. Secretary of the Interior (through USFWS) and the Secretary of Commerce (through NOAA), in consultation with the government of CNMI and the U.S. Department of Defense (U.S. President G.W. Bush 2009b).

In addition to protecting nearly 300 species of stony coral and some of the highest shark and fish biomass levels in the western Pacific region, MTMNM also protects unique, submerged geologic features. The Champagne vent is one of only two known areas in the world that emit

liquid carbon dioxide, and the Daikoku subsea volcano features the only known pool of liquid sulfur on this planet. Additionally, some of the hydrothermal vents within the monument emit highly acidic, boiling water that rises to the surface, and many coral reef communities have developed in close proximity to those areas. MTMNM also hosts a great diversity of extremophile communities, including one of the only locations in the world where photosynthetic and chemosynthetic organisms coexist. Working to preserve MTMNM should, therefore, support unique and critically important research opportunities that could reveal important information about trends arising in the face of ocean acidification (USFWS and NOAA 2012).

Figure 4.2. Marianas Trench Marine National Monument

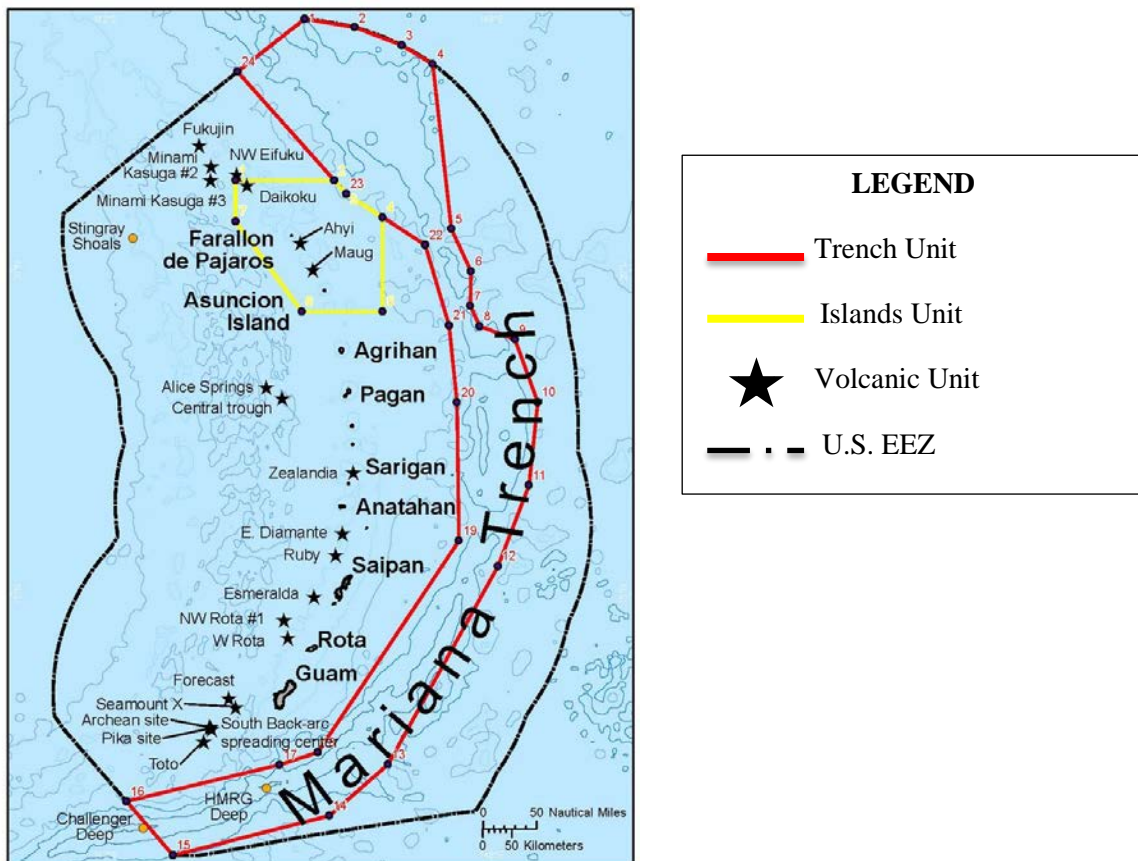


Photo Credit: <http://www.marianamonument.org/images/monumentmap.jpg>

#### 4.2.3 Pacific Remote Islands Marine National Monument

PRIMNM was established through signing of Proclamation 8336, in January 2009. The site includes Wake, Jarvis, Howland, and Baker Islands, Johnston and Palmyra Atolls, and Kingman Reef. Proclamation 8336 also set aside all waters extending 50 nm from the mean low water line surrounding each of the islands and atolls, including coral reef atoll lagoons. The islands and atolls are widely dispersed across the central/western Pacific Ocean and as such, the monument comprises a patchwork of five geographically separate, non-contiguous ‘sub-units’ that have been administratively assembled into the same monument. Collectively, the monument sub-units that were established in accordance with Proclamation 8336 occupy 86,888 square statute miles (more than 225,000 square kilometers; U.S. President G.W. Bush 2009b). Each of the islands and atolls in the monument, including all waters extending three nm from the mean low water lines, were managed as USFWS National Wildlife Refuges (NWR) prior to monument designation, and continue to be managed as such.

Similar to PMNM, Kauai, HI appears to be the closest U.S. developed area to any of the PRIMNM sub-units, lying nearly 750 statute miles east-northeast of Johnston Atoll. Wake Island is one of the most remote portions of the monument, located 2,293 statute miles west of Honolulu, HI, and 1,506 miles northeast of Guam (State of Hawaii DBEDT 2011; DistanceFromTo.net 2014).

Collectively, the sub-units of PRIMNM are home to as many as 400 reef fish species, 100 coral species, and 15 species of seabirds and migratory shorebirds, as well as pearl oysters, giant clams, multiple shark and sea turtle species, and spinner dolphins and other cetaceans. The PRIMNM region contains twice as much fish biomass as that found in PMNM, and also includes some of the world’s oldest deep-water coral forests [USFWS (Date unknown)].

In June 2014, U.S. President Barack Obama announced a proposal to expand the boundaries of PRIMNM, potentially as far as the seaward limits of the U.S. EEZ surrounding all of the islands and atolls in the monument. As proposed, the expansion would have increased the size of the monument by nearly 700,000 square statute miles, more than eight times its original size, and may have applied commercial fishing prohibitions throughout all newly-expanded areas, as well (U.S. White House Office of the Press Secretary 2014; Eilperin 2014).

The proposed expansion most likely came about in response to a letter that was submitted to U.S. President Obama from researchers and ocean conservation professionals from the National Geographic Society, the Marine Conservation Institute, and numerous universities, institutions, and non-governmental organizations around the world. The letter requested that the U.S. government “dramatically accelerate protections for U.S. waters,” by setting 20% of all biogeographic habitats aside as no-take reserves (Marine Conservation Institute 2014). The letter also asserted that no-take reserves can help to increase economic diversity, improve ecosystem resilience, enhance commercial fisheries, and provide “insurance” against biodiversity and ecosystem service losses occurring in areas not subject to protection (Marine Conservation Institute 2014).

Although the letter did not specifically recommend expansion of PRIMNM, the proposed expansion was likely derived, at least in part, in response to the letter. However, based on the results of a public comment period, including input from WPRFMC and the tuna fishing industry, the U.S. President Obama Administration opted to reduce the scale of the expansion. Presidential Proclamation 9173, signed in September 2014, expanded only three of the sub-units within PRIMNM, shifting the boundaries surrounding Jarvis Island, Wake Island, and Johnston Atoll out to the seaward limits of the U.S. EEZ. Collectively, the expanded areas encompass

approximately 400,000 square miles, and commercial fishing prohibitions have been extended throughout those areas (U.S. President Obama 2014).

The evaluations documented in this report were completed before the decision to expand PRIMNM was finalized and implemented. Therefore, the following analyses are limited to the pre-expansion configuration of PRIMNM.

Figure 4.3. Pacific Remote Islands Marine National Monument

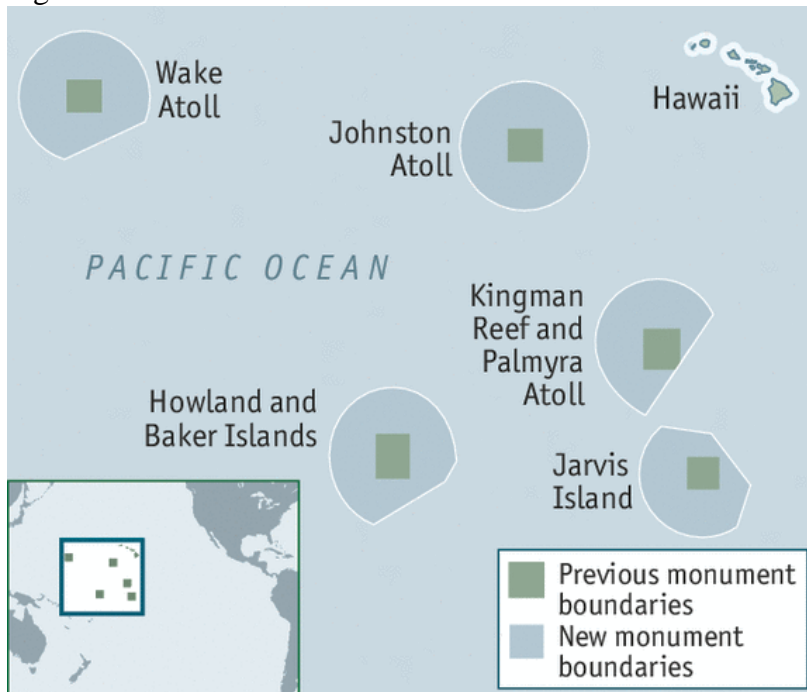


Photo Credit: <http://www.economist.com/blogs/democracyinamerica/2014/10/marine-preservation>

Figure 4.4. Geographic Configuration of PMNM, MTMNM, and PRIMNM



Photo Credit: <http://blog.marine-conservation.org/2012/02/protecting-pacific-marine-monuments.html>

### 4.3 Qualitative Monument Analyses

#### 4.3.1 Site-Specific Management Settings Prior to Designation

In their “framework for analyzing marine protected area inputs,” Bennett and Dearden (2014, page 105) set forth a means of completing pre-designation site assessments intended to improve MPA effectiveness, addressing more than 50 governance, management, and development inputs. Similar to incentives, inputs can include any resource, procedure, authority, or information necessary to enhance the likelihood of accomplishing MPA objectives (Bennett and Dearden 2014). Table 4.1 presents an excerpt from the Bennett and Dearden (2014) framework, identifying governance and management inputs, characterization of which is considered instrumental to the process of describing pre-designation monument settings. For the purposes of this thesis, the inputs were then modified to establish a set of five indicators intended to represent various components of the management settings for each monument *prior* to designation (Table 4.2) (Bennett and Dearden 2014).

Table 4.1. Governance and Management Inputs and Input-Specific Assessment Questions (Bennett and Dearden 2014, page 105)

<b>Input</b>	<b>Corresponding Question</b>
<b>Governance Category</b>	
Planning process	Is there a clearly articulated MPA planning process?
Appropriate co-management	Are collaborative management arrangements contextually appropriate, inclusive, efficacious, equitable and representative?
Integrated in broader scale management	Is the MPA integrated within a broader scale system of management (e.g., EBM, ICZM)?
MPA network	Is the MPA part of a representative and connected network of MPAs?
Incorporates local governance	Are local and informal governance systems incorporated into management structures and processes?
<b>Management Category</b>	
Site specific management strategies	Are site specific management strategies being taken to mitigate and adapt to threats within and around the MPA?
Multiple use zones	Have zones for different uses been established and marked?
No take areas	Are “no-take” areas an integral part of the MPA and adequate to achieve conservation targets?
Visitor facilities and services	Are there adequate facilities and services for visitors?

Table 4.2. Inputs and Input-Derived Management Setting Indicators (Bennett and Dearden 2014)

<b>Relevant Inputs</b>	<b>Input-derived Indicators</b>
<ul style="list-style-type: none"> <li>• MPA network</li> <li>• No take areas</li> <li>• Multiple use zones</li> </ul>	Presence of pre-existing MPA within monument boundaries
<ul style="list-style-type: none"> <li>• Visitor facilities and services (used as a proxy for proximity to infrastructure)</li> </ul>	Geographic and logistical constraints
<ul style="list-style-type: none"> <li>• Incorporates local governance</li> <li>• Appropriate co-management</li> </ul>	Vertical governance diversity
<ul style="list-style-type: none"> <li>• Planning process</li> <li>• Integrated in broader scale management</li> </ul>	Degree of pre-designation planning for entire monument footprint
<ul style="list-style-type: none"> <li>• Planning process</li> <li>• Site specific management strategies</li> </ul>	Degree of pre-designation planning for portions of monument footprint

Once the suite of five indicators was established, a range of plausible, qualitative measurements was defined for each indicator. The indicator-specific ranges were then normalized on numeric rating scales from “0” to “4,” adapting Jones’ (2014a) approach to assessing MPA managing agency efforts to address anthropogenic impacts (Jones 2014a). For each indicator, a “4” rating indicated favorable planning conditions and/or high likelihood that the real-world component represented by the indicator could positively influence management planning progress. A “0” rating indicated sub-optimal management planning conditions. In general, sites with higher indicator scores would be expected to progress through the management planning process more efficiently and effectively than sites with lower overall ratings. The rating scales for each indicator are presented in Table 4.3.

The ratings assigned for each of the five indicators for each site were compiled and plotted onto site-specific radar plots. Each plot has five spokes radiating from a center point, where each spoke represents one of the five indicators. The “0” to “4” rating scales were superimposed onto the spokes, with “0” ratings located closest to the center of each plot, and “4” ratings located along the perimeter. Indicator ratings were then transferred to the appropriate positions along the corresponding spokes within each site-specific plot. Lines were then drawn to connect the numerical ratings from one spoke to the next, until five lines connected all five spokes, formulating a polygon. Each polygon was then shaded to allow rapid visual comparison of pre-designation management conditions from site to site. A fully shaded polygon would reflect a site with “4” ratings for all indicators, suggesting highly favorable management planning conditions. Conversely, a minimally-shaded polygon would reflect indicators with much lower ratings, suggesting more challenging management planning conditions.

Table 4.3. Numerical Rating Scheme for Assessing Site-Specific Management Setting Indicators *Prior* to Designation

Indicator	Numerical Rating Scale
Presence of pre-existing MPA within monument boundaries	<ol style="list-style-type: none"> <li>0. No protected areas in place prior to Monument designation</li> <li>1. Small terrestrial protected areas and/or blended terrestrial-marine protected areas in place prior to monument designation</li> <li>2. Small coastal and/or submerged MPA in place prior to monument designation, in addition to terrestrial protected areas</li> <li>3. Large MPA, encompassing terrestrial, coastal, and/or offshore environments in place prior to monument designation</li> <li>4. Entire monument area under protection prior to monument designation</li> </ol>
Geographic and logistical constraints	<ol style="list-style-type: none"> <li>0. Monument monitoring possible through remote or virtual means only (overflights, unmanned aerial surveys, Vessel Monitoring Systems, etc.)</li> <li>1. Vessels must transit 60 or more hours to reach monument; entire monument is discontinuous, requiring extensive transits between monument components/sub-areas; monument does not include infrastructure supporting operations; <i>in situ</i> surveys and enforcement extremely limited</li> <li>2. Vessels can reach monument within approximately 48-60 hours upon departure from nearest U.S. port; entire monument contiguous, but does not include infrastructure supporting operations; <i>in situ</i> surveys and enforcement limited</li> <li>3. Vessels can reach monument within approximately 24 hours upon departure from nearest U.S. port; entire monument contiguous, and includes some infrastructure supporting operations; farthest boundary limits access and/or efficiency of prolonged, regular presence for surveys and enforcement</li> <li>4. Vessels can reach monument within approximately 12 hours upon departure from nearest U.S. port; entire monument contiguous, and includes some infrastructure supporting operations; all areas readily accessible by vessel and aircraft for surveys and enforcement</li> </ol>
Vertical governance diversity	<ol style="list-style-type: none"> <li>0. No other agencies with management interests/obligations in the area</li> <li>1. One additional, non-federal agency with management interests/obligations in the area</li> <li>2. Two additional, non-federal agencies with management interests/obligations in the area</li> <li>3. Three additional, non-federal agencies with management interests/obligations in the area</li> <li>4. Four additional, non-federal agencies with management interests/obligations in the area</li> </ol>

Table 4.3 (cont.). Numerical Rating Scheme for Assessing Site-Specific Management Setting Indicators *Prior* to Designation

Indicator	Numerical Rating Scale
Degree of pre-designation planning for entire monument footprint	0. None 1. Exploratory committees established, preliminary management needs and objectives identified 2. Threat assessments completed, baseline info collected, initial public comments requested 3. Extensive, relevant, comprehensive management plan drafted but not finalized; issue-specific management plans published, but not consolidated into single, comprehensive management plan. 4. Comprehensive management plan fully implemented for precursor MPA
Degree of pre-designation planning for discrete areas located within monument boundaries	0. None 1. Management plans implemented for small terrestrial protected areas in place prior to monument designation 2. Management plans implemented for small, blended terrestrial-marine protected areas 3. Management plans implemented for small coastal (submerged) MPA in place prior to monument designation 4. Management plans implemented for large, offshore MPA in place prior to monument designation

#### 4.3.2 Specificity of Presidential Proclamation Requirements

The next phase of this evaluation assessed the specificity of the requirements and guidance set forth in Presidential Proclamations 8031, 8335, and 8336, establishing PMNM, MTMNM, and PRIMNM, respectively. This process began with a comprehensive inventory of the subject matter captured in each Proclamation. Those inventories were then consolidated, resulting in a combined list of 27 subject areas addressing management requirements, prohibited activities, and permitted activities. The degree to which each subject area is addressed in each Proclamation was rated according to a numerical “0-to-4” rating scale, similar to the approach used for the pre-designation management setting indicator assessments above. A “4” rating indicated that the evaluated Proclamation provided specific, comprehensive management guidance for the corresponding subject area, including planning and/or implementation requirements. Conversely, a “0” rating indicated that a Proclamation was silent on the

corresponding subject area. Table 4.4 identifies the general rating scheme used for this portion of the analysis. Table A1.1, in the Appendix, provides more detail regarding individual rating schemes used for each of the 27 subject areas.

Table 4.4. General Rating Scheme for Assessing the Specificity of Presidential Proclamation Requirements

Numerical Rating	Specificity of Guidance Provided
0	Subject not addressed in Proclamation
1	General considerations set forth; requirements or implementation guidance not provided
2	Requirements for subject area-specific permitting program and/or zoning scheme set forth; geo-referenced locations or implementation guidance not provided
3	Requirements for subject area-specific permitting program and/or zoning scheme set forth for specific, geo-referenced locations within the monument, <i>including</i> explicit requirements and implementation guidance
4	Requirements for subject area-specific permitting program and/or zoning scheme set forth for entire monument, <i>including</i> explicit implementation guidance

The Proclamation specificity ratings were compiled and plotted onto site-specific radar plots, using the same plotting process as that described in the preceding section. Whereas the pre-designation management setting indicator radar plots have five spokes corresponding to the five indicators, the Proclamation radar plots have 27 spokes, corresponding to the 27 subject areas addressed (to varying degrees) in each Proclamation. A fully shaded radar plot would indicate that the corresponding Proclamation provided specific, detailed management guidance and requirements. A minimally shaded radar plot would indicate that the guidance provided was much more limited, if not absent altogether.

#### 4.3.3 Current Status of Management Planning at Each Site

Characterizing the current, post-designation status of management planning at each site began with selection of a standardized planning process, based on Thomas and Middleton's

“Guidelines for Management Planning of Protected Areas (Thomas and Middleton 2003; Figure 4.5).” The process begins with public scoping activities, definition of the planning process, and site assessments, and concludes with implementation of a final management plan, followed by monitoring and adjustment of the plan as necessary for increased effectiveness. Although exact management planning details will likely vary from one MPA to another, Thomas and Middleton’s (2003) guidelines were chosen to serve as a generalized benchmark, allowing comparisons of actual planning progress at PMNM, MTMNM, and PRIMNM. For the purposes of this report, the management planning process is considered complete upon implementation of a final management plan (FMP). The “monitoring and evaluation” and “periodic review/update of FMP” phases depicted in the planning diagram were not evaluated (Thomas and Middleton 2003; Figure 4.5).

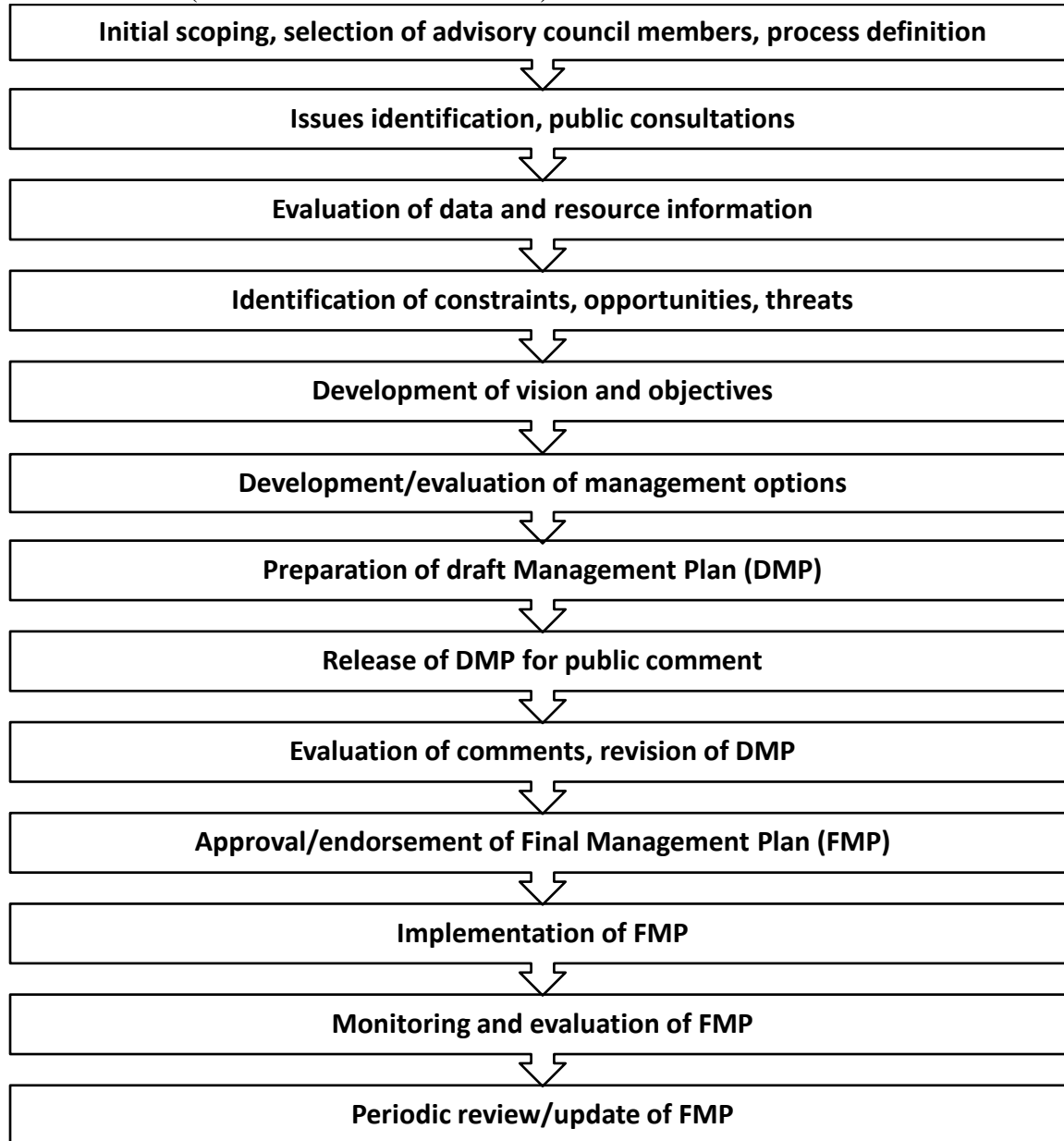
The selection of a standardized management planning process was followed by comprehensive reviews of draft and final management plans, publicly-posted management planning updates, information published in the U.S. Federal Register, National Wildlife Refuge CCPs, Western Pacific Regional Fishery Management Council (WPRFMC) Fishery Ecosystem Plans (FEP), and published summaries of monument advisory council activity. These document reviews facilitated determination of the extent to which each phase of the management planning process has been completed at each site. Phase completion status was then rated on a numerical scale, as described in Table 4.5.

Table 4.5. General Rating Scheme for Assessing the Current Status of Management Planning at Each Marine National Monument

<b>Rating</b>	<b>Degree of Management Planning Phase Completion</b>
0	Planning phase not addressed
1	General intentions for phase completion set forth and/or process defined in published Notice(s) of Intent or Monument Planning Updates
2	Schedule of phase completion set forth in published Notice(s) of Intent or Monument Planning Updates
3	Planning phase initiated and on-going, not completed
4	Planning phase fully completed

The management planning phase completion ratings were compiled in a table and transferred onto site-specific radar plots with 10 spokes. On each plot, the top spoke represents the initial phase of the management planning process, and all subsequent phases are represented by the spokes radiating clockwise from the first (top) spoke. A fully shaded radar plot would indicate that a site has completed the entire management planning process, including implementation of a final management plan. A radar plot with shading that is limited to the top right quadrant would describe a site that remains in the initial scoping, issues definition, and information gathering phases of the process.

Figure 4.5. General Protected Area Management Planning Process  
(Thomas and Middleton 2003)



#### 4.3.4 Degree of Implementation of Seven MPA Management Best Practices

The final portion of this evaluation assessed the degree to which seven MPA management best practices have been incorporated into monument operations. To begin this phase of the evaluation, a range of qualitative implementation descriptors was defined for each of the seven best practices. Those descriptors were then normalized on numeric rating scales

from “0” to “4,” where a “4” rating indicated full implementation of the corresponding best practice into monument operations. A “0” rating indicated that no actions have been taken towards implementing the corresponding best practice. Table 4.6 identifies the general rating scheme used for this portion of the analysis. Table A1.2, in Appendix 1, provides more detail regarding individual rating schemes used to describe the degree of implementation of each of the seven MPA management best practices evaluated.

Table 4.6. General Rating Scheme for Assessing the Degree of Implementation of Seven MPA Management Best Practices

<b>Numerical Rating</b>	<b>Degree of Implementation</b>
0	No implementation actions taken
1	Planning activities initiated via published Notice(s) of Intent, public scoping meetings, preliminary interagency coordination efforts, etc.
2	Planning and implementation in progress via Monument Advisory Council activities, dissemination of education/outreach products, workshops, planning committee meetings, etc.
3	Best practice partially implemented via publication and revision of a draft management plan and/or execution of issue-specific plan(s) addressing discrete portions of the monument
4	Best practice fully implemented throughout entire monument, in accordance with a comprehensive Final Management Plan

Based on a review of draft and final management plans, publicly-posted planning updates, information published in the U.S. Federal Register, National Wildlife Refuge and WPRFMC plans, and advisory council activity, best practice implementation was rated for each site. Once assigned, the ratings were compiled and transferred onto site-specific radar plots, using the same process as that used for the preceding evaluations. Each radar plot has seven spokes radiating from a center point, and each spoke represents one of the seven evaluated MPA management best practices. A fully-shaded radar plot would suggest complete, comprehensive implementation of all of the evaluated best practices into a site’s operations. Conversely, a

minimally-shaded plot would indicate very little implementation progress for most or all of the evaluated best practices.

## **5. FINDINGS**

### **5.1 Site-specific Management Settings Prior to Designation**

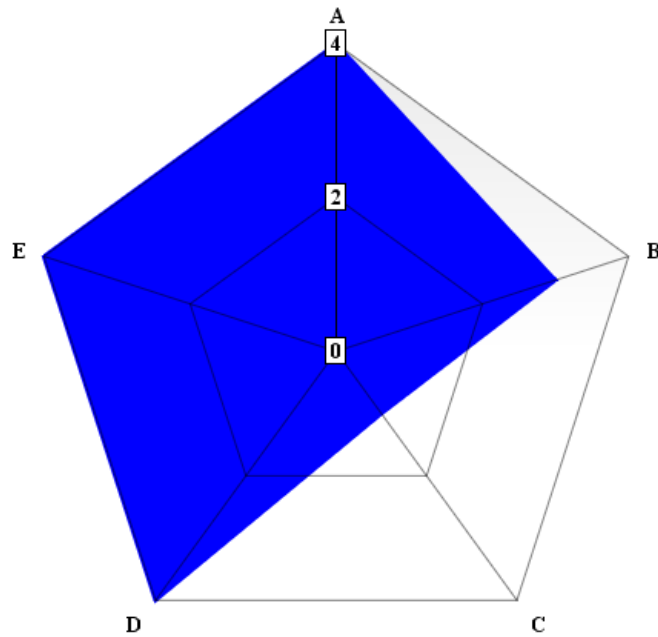
For PMNM, with the exception of the “Vertical Governance Diversity” category, all indicators were assigned ratings of either “3” or “4,” and the corresponding radar plot is 80% shaded. For MTMNM, with the exception of the “Pre-designation Planning for Entire Monument Footprint” category, all indicators were assigned ratings of either “2” or “3,” resulting in a radar plot that is 50% shaded. For PRIMNM, two indicators were assigned a “2” rating, and all others were assigned either “0” or “1” ratings. The resulting radar plot is 25% shaded (Figure 5.1).

Collectively, the ratings suggest that pre-designation conditions in the PMNM region were most conducive to timely and effective management planning, relative to the other monuments evaluated. Conditions in the PRI region were least favorable for efficient management planning.

Table A2.1, in Appendix 2, itemizes the ratings assigned for each of the five pre-designation management setting indicators for each monument. Tables A2.2, A2.3, and A2.4, also in Appendix 2, provide explanations to support all indicator ratings.

Figure 5.1. Radar Plots Illustrating Site-Specific Management Settings Prior to Designation

**Papahānaumokuākea MNM**



**LEGEND**

- A: Pre-existing MPA
- B: Geographic/logistical constraints
- C: Vertical governance diversity
- D: Pre-designation planning, entire monument footprint
- E: Pre-designation planning, discrete areas within monument

**Marianas Trench MNM**

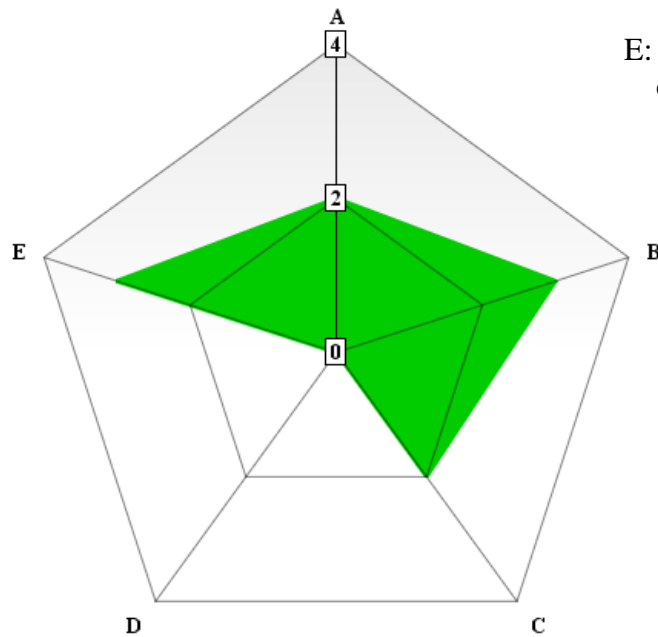
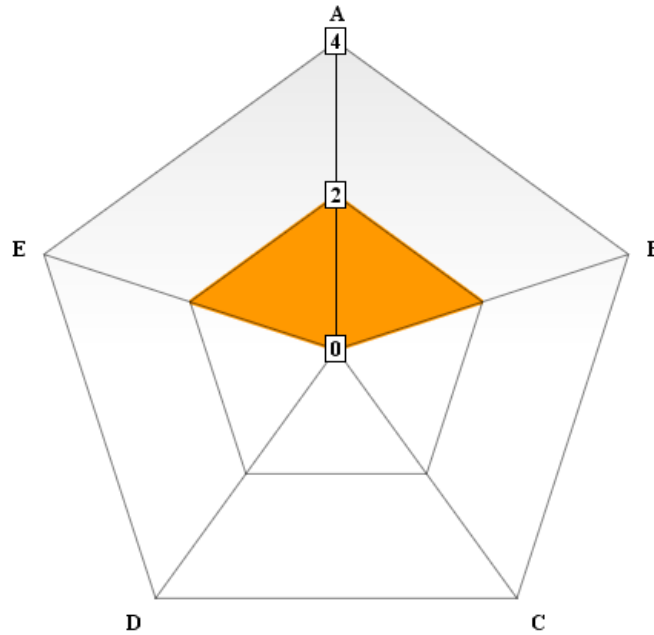


Figure 5.1 (cont.). Radar Plots Illustrating Site-Specific Management Settings Prior to Designation

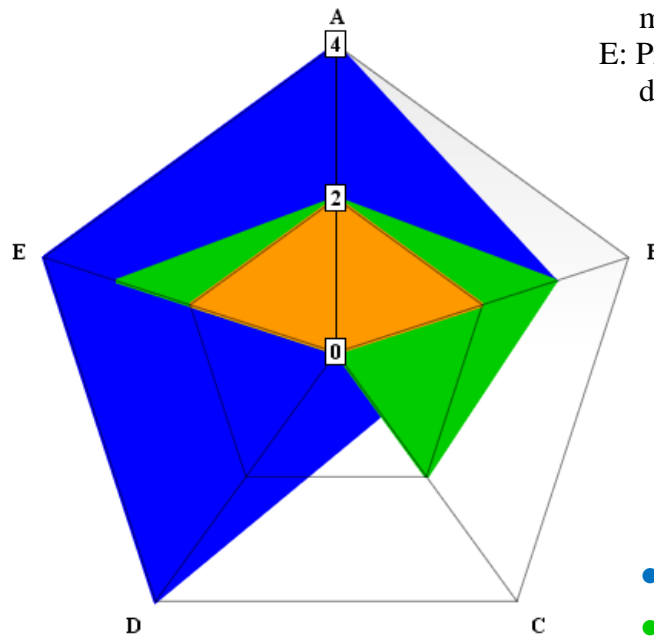
**Pacific Remote Islands MNM**



**LEGEND**

- A: Pre-existing MPA
- B: Geographic/logistical constraints
- C: Vertical governance diversity
- D: Pre-designation planning, entire monument footprint
- E: Pre-designation planning, discrete areas within monument

**Composite of All 3 MNM**



- Papahānaumokuākea
- Marianas Trench
- Pacific Remote Islands

## 5.2 Specificity of Presidential Proclamation Requirements

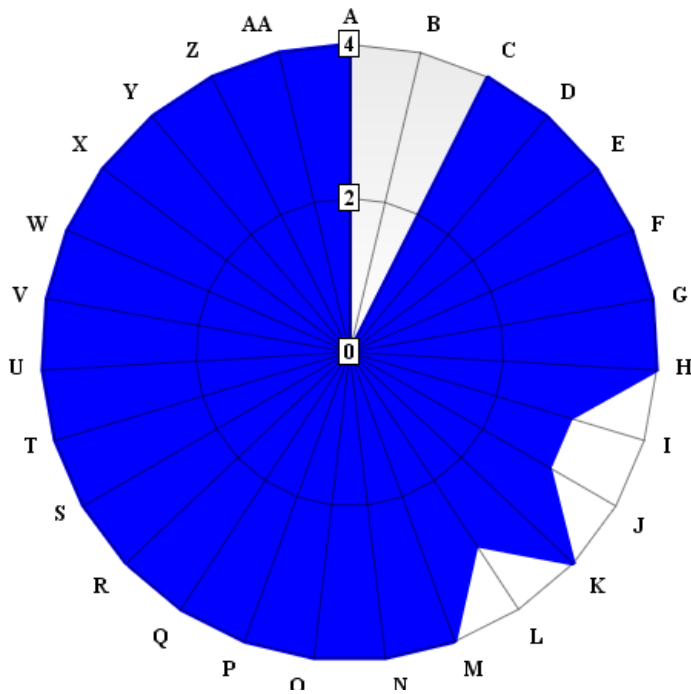
Collectively, Presidential Proclamations 8031, 8335, and 8336 addressed 27 different subject areas, including management planning requirements, that responsible agencies were expected to address (U.S. President G.W. Bush 2006, 2007, 2009b, 2009c). Proclamation specificity ratings, assessing the degree to which each of the 27 subjects was addressed in each Proclamation, were assigned for all three monuments, as detailed in Table A2.5 in Appendix 2.

For PMNM, with the exception of the “Advisory Council” category, all subject areas were rated either “3” or “4,” resulting in a radar plot that is approximately 93.5% shaded (Figure 5.2). The ratings assigned for both MTMNM and PRIMNM were much more varied, including several “0,” “1,” and “2” ratings. Because Proclamation 8336 (PRIMNM), in particular, addressed just six of the 27 subject areas, “0” ratings were assigned for 21 of the 27 subjects. Further, Proclamation 8336 did not set forth any requirements that were unique or specifically tailored to PRIMNM. Proclamation 8335 (MTMNM) was only slightly more comprehensive, addressing 10 subject areas and remaining silent on the remaining 17 subjects.

The radar plots for MTMNM and PRIMNM are approximately 20% and 14% shaded, respectively, allowing for rapid visual confirmation that Proclamation 8031 set forth significantly more detailed guidance and expectations for a broader range of subject areas, relative to Proclamations 8335 and 8336 (Figure 5.2). As such, MTMNM and PRIMNM personnel have had/will have to determine whether and how to address several monument management issues independently, without formal guidance (U.S. President G.W. Bush 2006, 2009b, 2009c).

Figure 5.2. Radar Plots Illustrating Specificity of Proclamation Requirements for Each Site

**Papahānaumokuākea MNM**



**LEGEND**

- A: Management plan
- B: Advisory council
- C: Interagency agreement
- D: Monument access
- E: Entry notification requirements
- F: Zoning framework
- G: Commercial fishing
- H: Non-commercial fishing
- I: Traditional use
- J: Scientific research, exploration
- K: Recreation and tourism
- L: Education and outreach
- M: Vessel monitoring systems
- N: Oil, gas, mineral exploration
- O: Use of poisons, charges, explosives
- P: Introduction of introduced species
- Q: Anchoring on coral
- R: Removing, taking, harassing monument resources
- S: Altering submerged lands
- T: Anchoring
- U: Deserting a vessel
- V: Discharging, depositing material in SPA or SMA
- W: Discharging, depositing material into monument
- X: Touching coral
- Y: Possessing fishing gear
- Z: Swimming, snorkeling, diving in SPA or SMA
- AA: Attracting monument resources

**Marianas Trench MNM**

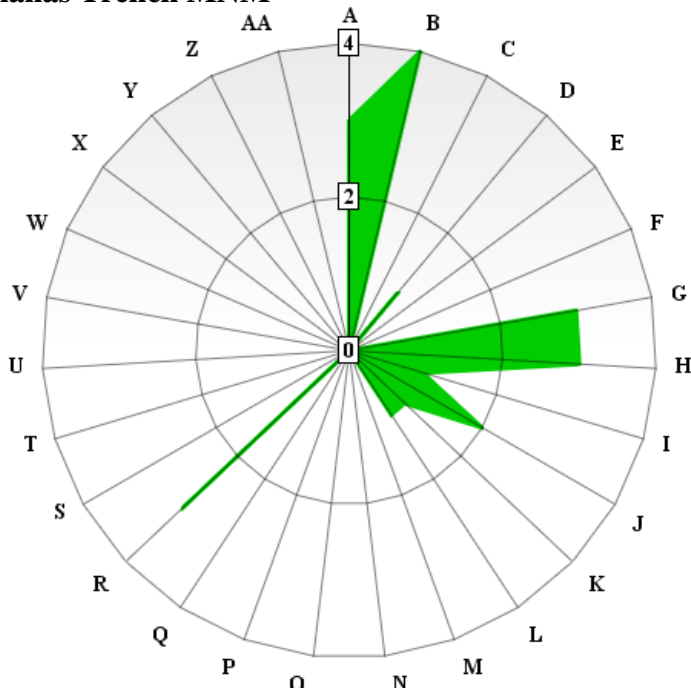
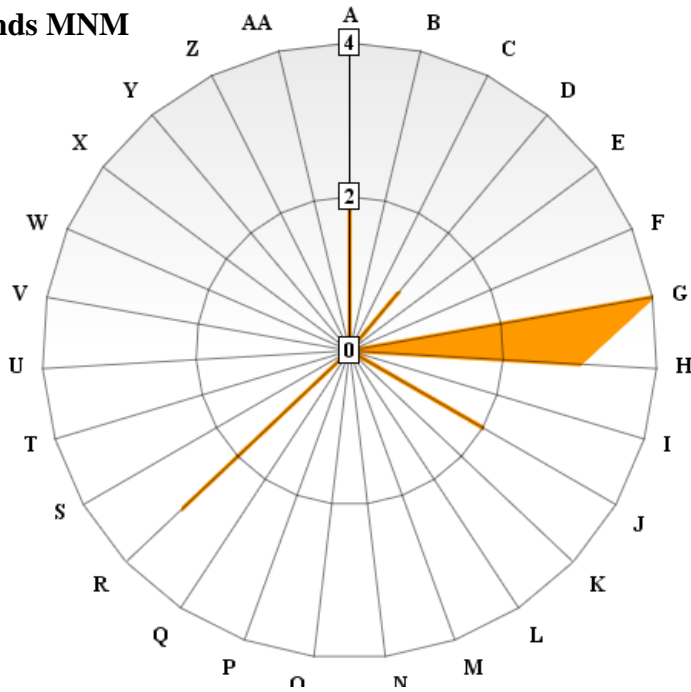
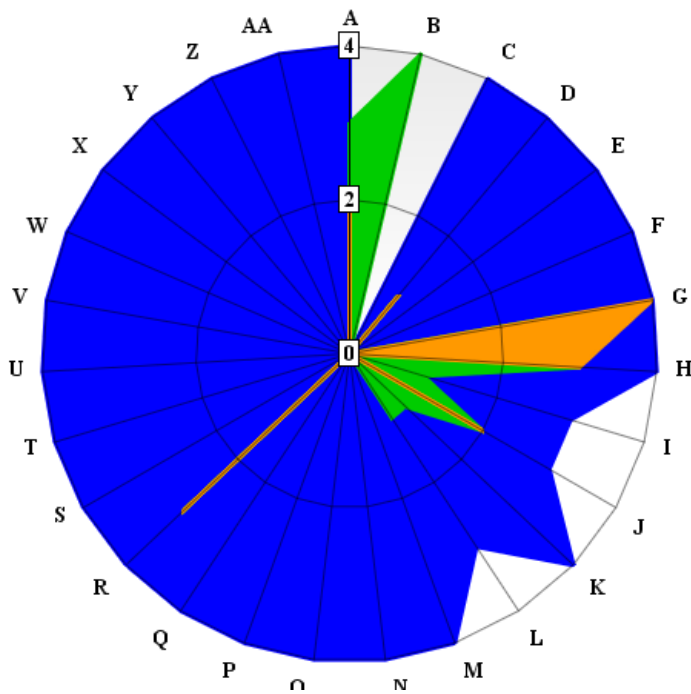


Figure 5.2 (cont.). Radar Plots Illustrating Specificity of Proclamation Requirements for Each Site

**Pacific Remote Islands MNM**



**Composite of All 3 MNM**



**LEGEND**

- A: Management plan
- B: Advisory council
- C: Interagency agreement
- D: Monument access
- E: Entry notification requirements
- F: Zoning framework
- G: Commercial fishing
- H: Non-commercial fishing
- I: Traditional use
- J: Scientific research, exploration
- K: Recreation and tourism
- L: Education and outreach
- M: Vessel monitoring systems
- N: Oil, gas, mineral exploration
- O: Use of poisons, charges, explosives
- P: Introduction of introduced species
- Q: Anchoring on coral
- R: Removing, taking, harassing monument resources
- S: Altering submerged lands
- T: Anchoring
- U: Deserting a vessel
- V: Discharging, depositing material in SPA or SMA
- W: Discharging, depositing material into monument
- X: Touching coral
- Y: Possessing fishing gear
- Z: Swimming, snorkeling, diving in SPA or SMA
- AA: Attracting monument resources

- Papahānaumokuākea
- Marianas Trench
- Pacific Remote Islands

### 5.3 Current Status of Management Planning at Each Site

PMNM personnel have completed all phases of the management planning process, including implementation of a final management plan, resulting in a fully shaded radar plot. MTMNM personnel have completed the first three phases of the management planning process, and have initiated three additional phases. The final four phases, including preparation, vetting, and implementation of a final management plan, have been discussed in planning update documents but not yet initiated, resulting in a radar plot that is 72.5% shaded. For PRIMNM, the first four planning phases have been initiated, but remain incomplete. The remaining six phases have not been initiated, resulting in a radar plot that is 50% shaded (Appendix 2, Table A2.6; Figure 5.3).

#### 5.3.1 Papahānaumokuākea Marine National Monument

In the context of planning, Proclamation 8031 required modification and implementation of two specific documents, including a Memorandum of Agreement for co-management of the monument and a draft management plan (U.S. President G.W. Bush 2006). Both documents had been nearly finalized and readied for implementation *before* the President signed the Proclamation, based on the original expectation that the area was to be designated a NOAA National Marine Sanctuary, as initiated by President William Clinton in E.O. 13178. Table 5.1 identifies the source documents that were modified in accordance with Proclamation requirements, the final documents that are now in effect for PMNM, and the dates on which those final documents were implemented. The final documents listed in Table 5.1 confirm that PMNM personnel were able to put an FMP into effect less than three years after Proclamation 8031 was signed. As such, the site has successfully completed all phases of the management planning process, as illustrated in Figure 5.3. PMNM is currently in the FMP monitoring phase,

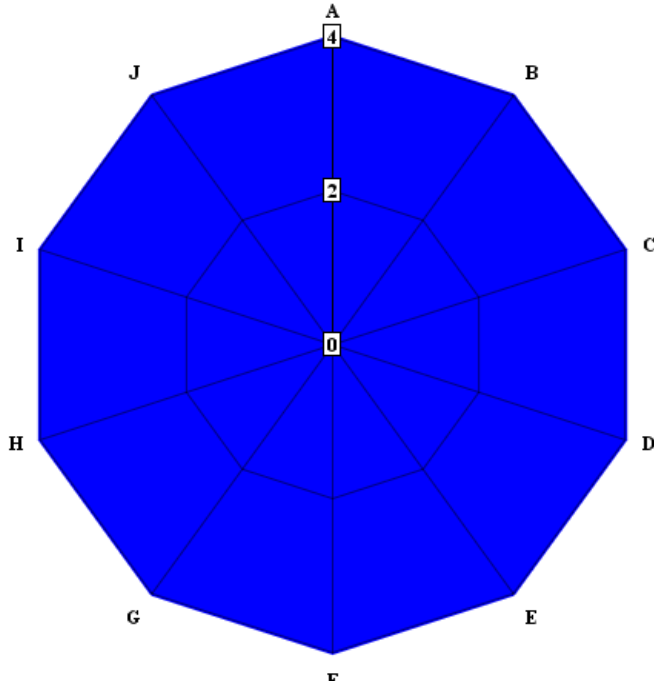
and will likely progress through management plan review and revision processes at the end of the current plan's stated 15-year lifetime.

Table 5.1. PMNM Management Planning Documents Implemented in Accordance With Proclamation 8031

<b>SOURCE DOCUMENT</b>	<b>MODIFIED DOCUMENT</b>	<b>DATE OF PUBLICATION</b>
<i>Memorandum of Agreement (MOA) for Promoting Coordinated Management in the Northwestern Hawaiian Islands</i> (May 2006)	<i>Memorandum of Agreement (MOA) for Promoting Coordinated Management of the Northwestern Hawaiian Islands Marine National Monument</i>	December 08, 2006 (approximately 6 months after designation)
<i>Northwestern Hawaiian Islands Proposed National Marine Sanctuary Draft Management Plan</i> (April 2006)	<i>Papahānaumokuākea Marine National Monument Management Plan</i>	December, 2008 (approximately 30 months after designation)
*Note: Date of Presidential Proclamation 8031: June 26, 2006		

Figure 5.3. Radar Plots Illustrating Current Status of Management Planning at Each Site

**Papahānaumokuākea MNM**



**LEGEND**

- A: Scoping, process definition
- B: Definition of issues; public consults
- C: Evaluation of data and resources
- D: Identification of constraints, opportunities, threats
- E: Definition of vision, objectives
- F: Evaluation of management options
- G: Preparation of draft management plan (DMP)
- H: Completion of DMP comment period
- I: Preparation of final management plan (FMP)
- J: Implementation of FMP

**Marianas Trench MNM**

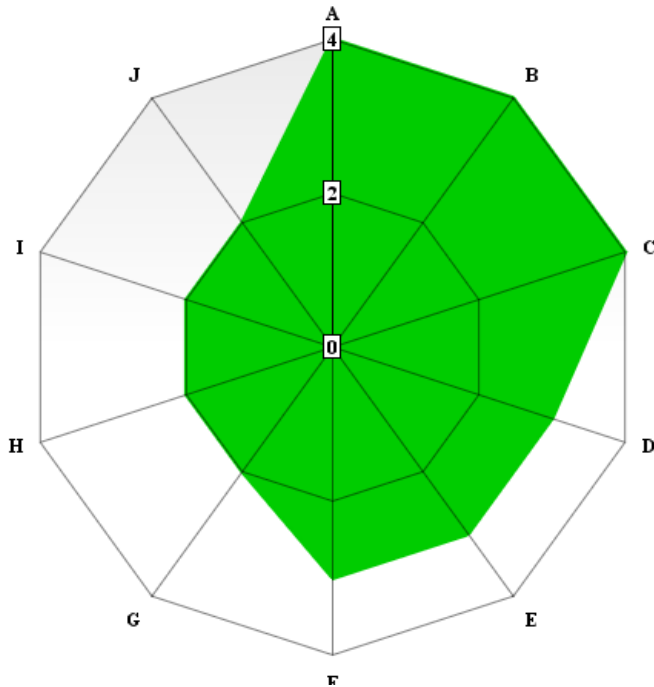
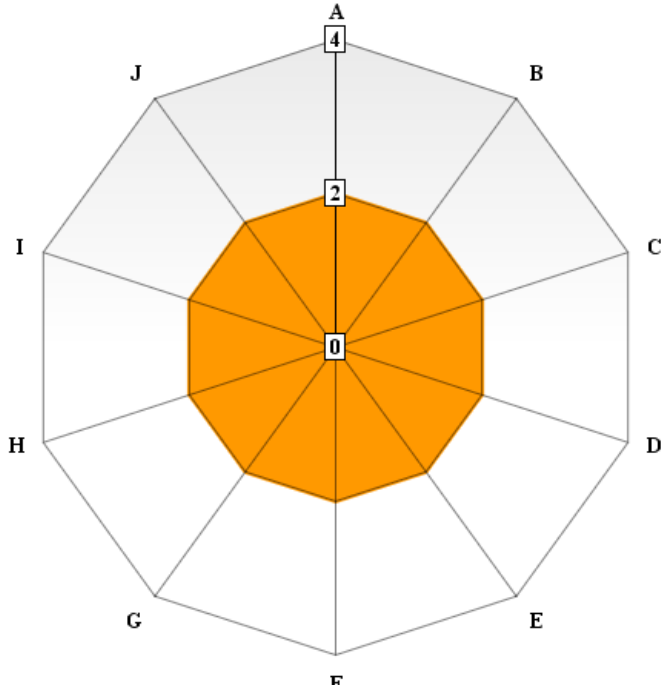


Figure 5.3 (cont.). Radar Plots Illustrating Current Status of Management Planning at Each Site

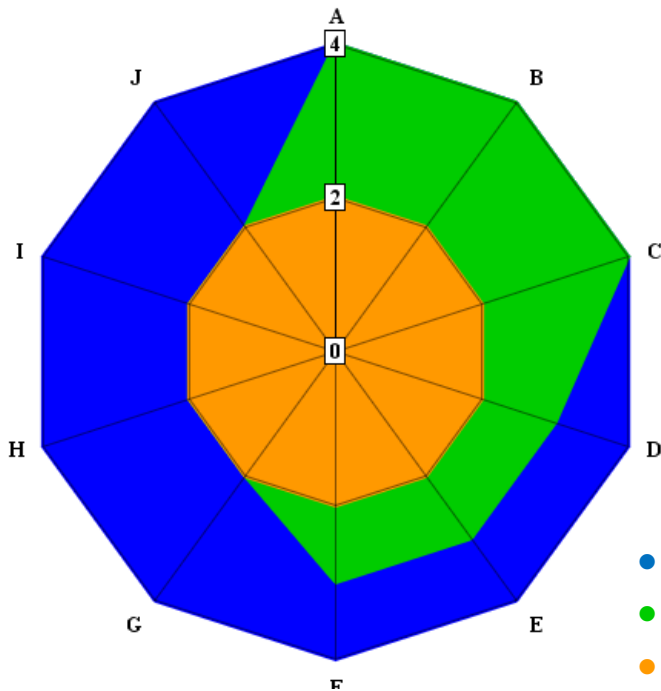
**Pacific Remote Islands MNM**



**LEGEND**

- A: Scoping, process definition
- B: Definition of issues; public consults
- C: Evaluation of data and resources
- D: Identification of constraints, opportunities, threats
- E: Definition of vision, objectives
- F: Evaluation of management options
- G: Preparation of draft management plan (DMP)
- H: Completion of DMP comment period
- I: Preparation of final management plan (FMP)
- J: Implementation of FMP

**Composite of All 3 MNM**



- Papahānaumokuākea
- Marianas Trench
- Pacific Remote Islands

### 5.3.2 Marianas Trench Marine National Monument

Proclamation 8335 required the Secretaries of Commerce and the Interior to establish a monument advisory council (MAC) and create management plans within their respective authorities. In accordance with those requirements, USFWS and NOAA personnel, acting on behalf of the Secretaries, assembled a MAC in February 2012, and the council has convened on at least seven occasions since that time (NOAA NMFS Pacific Islands Regional Office 2014a). Additionally, monument personnel have facilitated at least four public scoping workshops, and have published annual updates documenting management planning accomplishments since 2011. Table 5.2 lists those documents, as well as additional documents that detail MAC activities and accomplishments since February 2012. Although Proclamation 8335 did not explicitly require preparation of a joint, interagency management plan, these activities reflect a concerted effort to progress through a standardized planning process, with the eventual goal of implementing a multi-agency monument management plan (USFWS Pacific Islands Fish and Wildlife Office 2014).

Table 5.2. MTMNM Documents/Activities Supporting Monument Management Planning

<b>DOCUMENT or ACTIVITY</b>	<b>SUBJECT MATTER and/or RESULTANT PLANNING PRODUCTS</b>	<b>DATE OF PUBLICATION</b>
“Marianas Trench Marine National Monument, Commonwealth of the Northern Mariana Islands, et al; Monument Management Plan, Comprehensive Conservation Plans, and Environmental Assessment”	Notice of intent to prepare a Monument Management Plan, and request for public input	April, 2011
Planning Update #1	Description of management planning process; identification of issues and activities to be addressed in Monument Management Plan	May, 2011

Table 5.2 (cont.). MTMNM Documents/Activities Supporting Monument Management Planning

<b>DOCUMENT or ACTIVITY</b>	<b>SUBJECT MATTER and/or RESULTANT PLANNING PRODUCTS</b>	<b>DATE OF PUBLICATION</b>
Establishment of Monument Advisory Council (MAC)	MAC By-Laws; MAC Charge Document; Meeting Minutes for seven MAC meetings	February, 2012- (on-going)
Public Scoping Processes	Description of in-person public scoping meetings held in Saipan, Tinian, Rota, and Guam	February, 2012- (on-going)
Planning Update #2	Schedule of public scoping meetings; summary of public comments received to-date; Monument Management Plan Vision Statement	February, 2012
Planning Update #3	Summary of Monument Advisory Council activity; responses to public comments	March, 2013
Planning Update #4	Draft Monument Management Plan goals; summary of Visitor Center Working Group activity	September, 2014

### 5.3.3 Pacific Remote Islands Marine National Monument

Management planning progress for PRIMNM is not as advanced as is the case for PMNM and MTMNM. Although a 2012 NOAA/National Marine Fisheries Service (NMFS) briefing document set forth an intention to develop both a management plan and a science plan for PRIMNM, in conjunction with co-managing agency partners, those plans have not yet been generated (NOAA NMFS 2012a). Table 5.3 identifies the few management planning documents that have been posted for PRIMNM, largely limited to a Notice of Intent and two planning updates.

Table 5.3. PRIMNM Documents Supporting Monument Management Planning

<b>DOCUMENT or ACTIVITY</b>	<b>SUBJECT MATTER and/or RESULTANT PLANNING PRODUCTS</b>	<b>DATE OF PUBLICATION</b>
Palmyra Atoll and Kingman Reef National Wildlife Refuges Planning Update Number One	Statement of USFWS intent to collect public input and create a refuge CCP, to be integrated into eventual monument management plan	March, 2011
Notice of Intent	Notice of USFWS and NOAA intent to prepare a Monument Management Plan for the Pacific Remote Islands Marine National Monument, as well as new/revised CCPs for Baker Island, Howland Island, Jarvis Island, Johnston Atoll, Kingman Reef, Palmyra Atoll, and Wake Atoll	April, 2011
PRIMNM Planning Update Number 1	Explanation of planning process, anticipated schedule, and methods for submitting public input; statement of intent to incorporate all CCPs and NOAA fishery management plans into comprehensive monument management plan; definition of potential issues to be addressed in plan	September, 2011

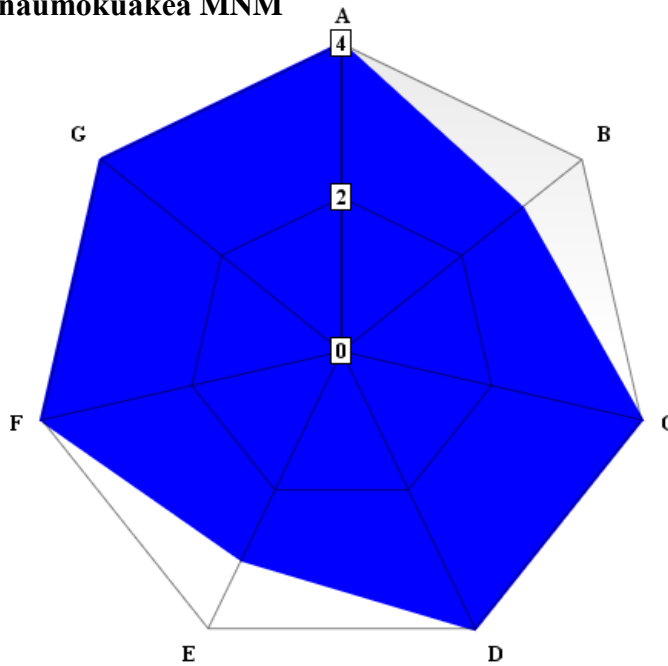
#### 5.4 Degree of Implementation of Seven MPA Management Best Practices

For PMNM, with the exception of “Enforcement Activity” and “Objectives-based Monitoring,” each of the evaluated best practices was assigned a rating of “4.” The corresponding radar plot is nearly 93% shaded. The ratings for MTMNM were scattered between “2” and “4,” resulting in a radar plot that is nearly 68% shaded. For PRIMNM, the “Extractive Use Limitations” best practice was assigned a rating of “3.” All other best practices were given either “2” or “1” ratings, and the resulting radar plot is approximately 36% shaded (Figure 5.4).

Table A2.7, in Appendix 2, provides the ratings assigned to describe the degree of implementation of seven MPA management best practices for each monument. Tables A2.8, A2.9, and A2.10, provide rationale for those ratings.

Figure 5.4. Radar Plots Illustrating Degree of Implementation of Seven MPA Management Best Practices at Each Site

**Papahānaumokuākea MNM**



**LEGEND**

- A: Extractive Use Limitations
- B: Enforcement Activity
- C: EBM-based Decision Making
- D: Management Plan Procedures
- E: Objectives-based Monitoring
- F: Stakeholder Opportunities
- G: Institutional Learning

**Marianas Trench MNM**

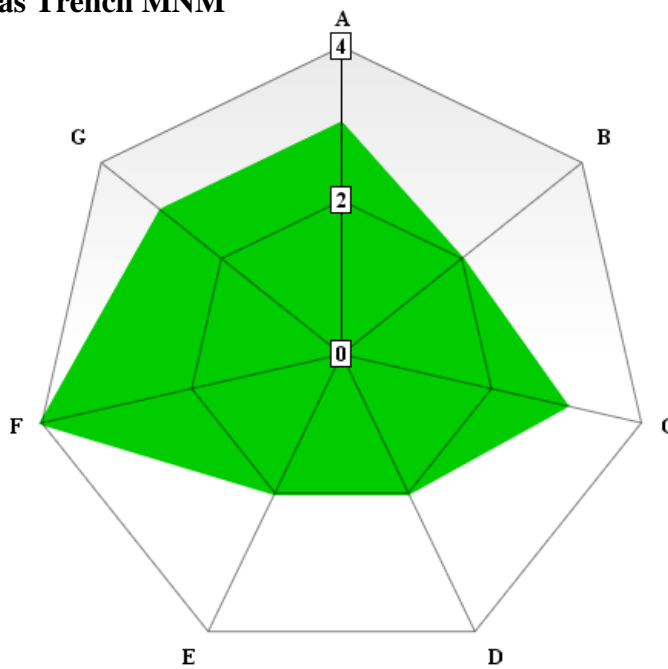
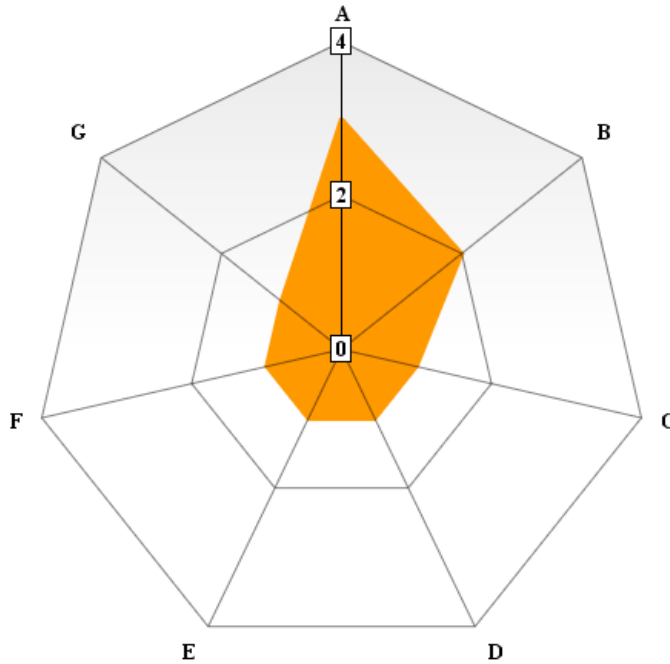
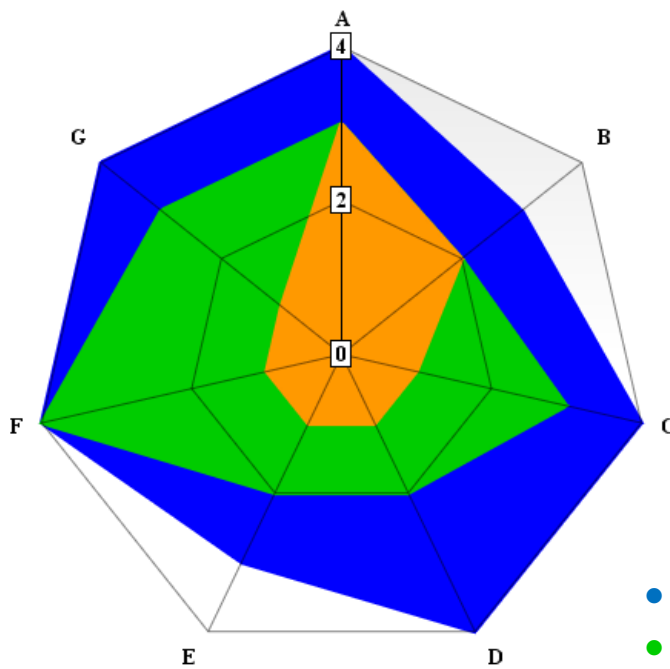


Figure 5.4 (cont.). Radar Plots Illustrating Degree of Implementation of Seven MPA Management Best Practices at Each Site

**Pacific Remote Islands MNM**



**Composite of All 3 MNM**



**LEGEND**

- A: Extractive Use Limitations
- B: Enforcement Activity
- C: EBM-based Decision Making
- D: Management Plan Procedures
- E: Objectives-based Monitoring
- F: Stakeholder Opportunities
- G: Institutional Learning

- Papahānaumokuākea
- Marianas Trench
- Pacific Remote Islands

#### 5.4.1 Papahānaumokuākea Marine National Monument

In addition to the documents itemized in Table 5.1, individual species and/or sector-specific management plans have also been incorporated into PMNM operations. Those plans address such issues as Laysan duck and other bird species population management; Hawaiian monk seal and sea turtle population management; and measures to prevent introduction of non-native species into the monument. Further, the International Maritime Organization (IMO) officially designated PMNM as both a Particularly Sensitive Sea Area (PSSA) and an Area To Be Avoided (ATBA). In particular, the PSSA designation enables passage of measures to manage various activities, including vessel routing, monitoring, and equipment carriage requirements (IMO 2014). The IMO also established explicit reporting requirements that apply to ships passing through PMNM waters, and those requirements were subsequently codified in the U.S. CFR (50 CFR § 404.4).

Table 5.4 identifies a selection of additional documents defining management priorities and activities that supplement the Monument Management Plan. Although Table 5.4 does not provide an exhaustive list of supplemental plans, it does help to illustrate the broad range of management issues that the PMNM co-managing agencies have considered and continue to consider over the course of day-to-day monument management.

Table 5.4. Additional PMNM Plans and Regulations Incorporating Various MPA Management Best Practices

<b>Regulation/Plan</b>	<b>Scope and Purpose</b>	<b>Date of Publication</b>
50 CFR 404, Northwestern Hawaiian Islands Marine National Monument	“...[to] codify the provisions of Presidential Proclamation 8031, and govern the administration of the Northwestern Hawaiian Islands Marine National Monument”	Updated July, 2014

Table 5.4 (cont.). Additional PMNM Plans and Regulations Incorporating Various MPA Management Best Practices

Regulation/Plan	Scope and Purpose	Date of Publication
50 CFR 665 Subpart C, Hawaii Fisheries	“...[to] govern fishing for western Pacific fishery ecosystem MUS by vessels of the United States...including the Main Hawaiian Islands and Northwestern Hawaiian Islands”	Updated January, 2014
50 CFR 665 Subpart F, Western Pacific Pelagic Fisheries	“...[to] govern fishing for western Pacific fishery ecosystem MUS by vessels of the United States”	Updated January, 2014
WPRFMC Fishery Ecosystem Plan (FEP) for the Hawaii Archipelago	“...to implement ecosystem approaches to fishery management in the Hawaiian Archipelago”	September, 2009
WPRFMC Fishery Ecosystem Plan (FEP) for the Pacific Pelagic Fisheries of the Western Pacific Region	“...to implement ecosystem approaches to fishery management for western Pacific pelagic species”	September, 2009
USFWS Visitor Services Plan	“...to guide visitor activities within the Midway Atoll Special Management Area”	December, 2008
USFWS Refuge Use Compatibility Determinations for Hawaiian Islands National Wildlife Refuge and PMNM	Determinations of compatibility of various refuge and monument uses with management objectives: scientific research, education, outreach, commercial photography, cultural practices activities, etc.	2008-2009
USFWS Findings of Appropriateness of a Refuge Use	Findings of appropriateness for various refuge and monument uses: scientific research, education, outreach, commercial photography, cultural practices activities, etc.	2008-2009
PMNM Natural Resources Science Plan 2011-2015	“...to characterize research needs and activities to achieve these goals over the next 15 years....and outline priorities for the next 5 years”	April, 2011
PMNM Maritime Heritage Research, Education, and Management Plan	“...to broaden the scope of maritime heritage in the Monument...[and] develop the foundation for more integration with other Monument programs”	October, 2011
NOTE: The Western Pacific Regional Fishery Management Council (WPRFMC) Fishery Ecosystem Plans (FEP) provide management frameworks for five types of fisheries within and beyond the PMNM, main Hawaiian Islands, Marianas Archipelago, and Pacific Remote Islands regions. The FEPs were <i>not</i> written in response to the establishment of PMNM, nor were they written to forward PMNM management responsibilities. The plans do, however, address issues and processes that affect PMNM and as such, they have been included above.		

#### 5.4.2 Marianas Trench Marine National Monument

Table 5.5 identifies plans and guides that, while not directly part of the MTMNM multi-agency management planning process, facilitate certain aspects of MPA management. Actual application of the seven evaluated MPA management best practices generally remains in the planning phase and, with the exception of commercial fishing restrictions, monument-wide regulations have not yet been codified for MTMNM.

Table 5.5. MTMNM Documents and Regulations Incorporating Various MPA Management Best Practices

<b>Regulation/Plan</b>	<b>Scope and Purpose</b>	<b>Date of Publication</b>
50 CFR 665 Subpart G, Marianas Trench Marine National Monument	Codification of certain provisions of Proclamation 8335, primarily providing oversight of the administration of fishing in MTMNM	June, 2013
Compliance Guide for Monument Fishing	Commercial, non-commercial, and recreational fishing restrictions; permitting, reporting, and customary exchange guidance	August, 2013
WPRFMC Fishery Ecosystem Plan (FEP) for the Mariana Archipelago	“...to implement ecosystem approaches to fishery management in Guam and the Commonwealth of the Northern Mariana Islands”	September, 2009
WPRFMC Fishery Ecosystem Plan (FEP) for the Pacific Pelagic Fisheries of the Western Pacific Region	“...to implement ecosystem approaches to fishery management for western Pacific pelagic species”	September, 2009
MTMNM and Mariana Archipelago Ecosystem Science Implementation Workshop	“Formulation of a five-year (2014 - 2019) research implementation strategy to address knowledge gaps,...and contribute baseline data”	May, 2013
*NOTE: As was the case for PMNM (Table 5.4), the FEPs listed above were <i>not</i> written specifically in response to the establishment of MTMNM, nor were they written solely to forward MTMNM management responsibilities. The plans do, however, address issues and processes that affect MTMNM and as such, they have been included above.		

### 5.4.3 Pacific Remote Islands Marine National Monument

Table 5.6 below identifies a number of plans that are currently in effect within PRIMNM, individually addressing agency-specific areas of responsibility with little or no apparent integration into a joint, multi-agency management framework. As a result, implementation of the seven evaluated MPA management best practices appears to remain compartmentalized. As is the case for MTMNM, with the exception of commercial fishing restrictions, comprehensive, monument-wide regulations have not yet been codified for PRIMNM in its entirety, limiting agency options for enforcement.

Table 5.6. PRIMNM Documents and Regulations Provisionally Incorporating MPA Management Best Practices on Limited, Sector-specific Bases

<b>Regulation/Plan</b>	<b>Scope and Purpose</b>	<b>Date of Publication</b>
50 CFR 665 Subpart H, Pacific Remote Islands Marine National Monument	“...to codify certain provisions of [Proclamation 8336] and.....govern the administration of fishing in the Monument.”	June, 2013
Baker Island National Wildlife Refuge Comprehensive Conservation Plan (CCP)	“...to specify a management direction for [Baker Island NWR] for the next 15 years”	September, 2008
Howland Island National Wildlife Refuge Comprehensive Conservation Plan (CCP)	“...to specify a management direction for [Howland Island NWR] for the next 15 years”	September, 2008
Jarvis Island National Wildlife Refuge Comprehensive Conservation Plan (CCP)	“...to specify a management direction for [Jarvis Island NWR] for the next 15 years”	September, 2008
WPRFMC Fishery Ecosystem Plan (FEP) for the Pacific Remote Island Areas	“...to implement ecosystem approaches to fishery management in the Pacific Remote Island Areas...”	September, 2009
WPRFMC Fishery Ecosystem Plan (FEP) for the Pacific Pelagic Fisheries of the Western Pacific Region	“...to implement ecosystem approaches to fishery management for western Pacific pelagic species...”	September, 2009

Table 5.6 (cont.). PRIMNM Documents and Regulations Provisionally Incorporating MPA Management Best Practices on Limited, Sector-specific Bases

Regulation/Plan	Scope and Purpose	Date of Publication
50 CFR 665 Subpart E, Pacific Remote Island Area Fisheries	Regulations governing fishing for Pacific Remote Island Areas	Updated January, 2014
50 CFR 665 Subpart F, Western Pacific Pelagic Fisheries	Regulations governing Western Pacific pelagic fisheries	Updated January, 2014
*NOTE: As was the case for PMNM (Table 5.4), the FEPs listed above were <i>not</i> written specifically in response to the establishment of PRIMNM, nor were they written solely to forward PRIMNM management responsibilities. The plans do, however, address issues and processes that affect PRIMNM and as such, they have been included above.		

## 6. DISCUSSION

This section begins with a description of the management and MPA planning contexts that characterized Papahānaumokuākea Marine National Monument (PMNM), Marianas Trench Marine National Monument (MTMNM), and Pacific Remote Islands Marine National Monument (PRIMNM) prior to monument designation. Examining the history of PMNM, in particular, helps to reveal why that site has demonstrated noticeably more advanced planning and implementation progress relative to MTMNM and PRIMNM. The section then describes how establishment of a multi-agency Monument Advisory Council may have helped to catalyze planning momentum for MTMNM. Despite the fact that the MTMNM planning process is proceeding more slowly than was the case for PMNM, MTMNM personnel are seemingly making important progress towards creating and implementing an FMP. Management planning at PRIMNM appears to be progressing more slowly than both PMNM and MTMNM, and this section identifies several potential barriers that may explain why that pattern exists. The discourse then transitions into a discussion of some of the strengths and weaknesses of using the Antiquities Act of 1906 to designate large-scale MPA. Especially when considered alongside the results of this evaluation, those strengths and weaknesses confirm the importance of approaching

future Antiquities Act MPA designations with caution. Given that, the discussion follows with recommendations for such an approach, building on lessons learned from the PMNM experience. Coupling pre-designation site assessment procedures with the promulgation of comprehensive Presidential Proclamation language, as was the case for PMNM, should help to ensure that future designations provide the incentives necessary to establish the management frameworks and infrastructure necessary for accountable, sustainable monument management.

### **6.1 Site History: Papahānaumokuākea Marine National Monument**

The PMNM region has a history of management planning and implementation that began well before passage of Proclamation 8031. The products of those pre-monument planning efforts likely enabled, at least in part, the timely and seemingly successful completion of the management planning process for PMNM.

The Northwestern Hawaiian Islands (NWHI) Coral Reef Ecosystem Reserve (CRER) was designated via passage of E.O. 13178 in 2000, and shared the same boundaries as the area that would eventually become PMNM (U.S. President Clinton 2000b). Management responsibilities for the site were assigned to NOAA's Office of National Marine Sanctuaries (ONMS), then referred to as the National Marine Sanctuary Program (NMSP). NWHI CRER was managed according to the terms of a Reserve Operations Plan (ROP), which was written in accordance with the requirements of E.O. 13178, and identified management principles, agency partnerships, jurisdictional authorities, and Native Hawaiian interests in the area (NOAA NMSP 2005a). In addition, the ROP set forth strategies for accomplishing objectives related to research and monitoring, education and outreach, enforcement, and ecosystem response and restoration. A 14-member Reserve Advisory Council, including representatives from Native Hawaiian communities, the commercial and recreational fishing sectors, the tourism sector, the state of

Hawaii, the U.S. Coast Guard, the U.S. Department of Defense, and other U.S. federal agencies, was directly involved in the process of writing the ROP. ONMS personnel also held public comment periods, providing opportunities for members of the general public to comment on the Reserve planning process (NOAA NMSP 2005a).

In addition to establishing NWHI CRER, E.O. 13178 also required that the Secretary of Commerce, through ONMS, take the planning and administrative actions necessary to prepare the site for eventual designation as a National Marine Sanctuary (NMS), in accordance with Sections 303 and 304 of the National Marine Sanctuaries Act (U.S. President Clinton 2000b). In response, ONMS proceeded through the standardized NMS designation process, and created a Draft Management Plan (DMP) titled, “Northwestern Hawaiian Islands Proposed National Marine Sanctuary Draft Management Plan.” The DMP was released for public comment in April 2006 (NOAA NMSP 2006). During the process of creating the DMP, ONMS personnel also drafted a document titled, “Memorandum of Agreement (MOA) for Promoting Coordinated Management in the Northwestern Hawaiian Islands,” to which Department of Commerce, Department of the Interior, and State of Hawaii personnel were signatories (State of Hawaii, USFWS and NOAA 2006).

Similar to the ROP, the proposed sanctuary DMP identified goals and objectives, partnerships, regulations, and zoning schemes for the area, while also setting forth 22 Action Plans intended to address five general “Priority Management Needs” (NOAA NMSP 2006). Each Action Plan included cost estimates that accounted for personnel, facility, and vessel and equipment requirements for the first five years after NMS designation. Overall, the content of the DMP espoused several MPA management best practices, including EBM, adaptive management, and Traditional Ecological Knowledge (TEK) considerations (NOAA NMSP 2006).

Much of the content of Proclamation 8031 was derived from the products of ONMS' planning efforts for the NWHI region, including the NWHI CRER ROP and proposed sanctuary DMP. Proclamation 8031 also incorporated content from E.O. 13178, E.O. 13196, which established Reserve Preservation Areas and commercial fisheries caps within NWHI CRER, and regulations pertaining to ONMS sanctuaries located in other regions of the U.S. EEZ. In several instances, the subject matter reflected in Proclamation 8031 was transferred from the aforementioned precursor documents without any modification, addressing such issues as vessel monitoring system requirements, various categories of prohibited and regulated activities, permitting considerations, and emergency response, law enforcement, and armed services activities (U.S. President Clinton 2000b; U.S. President G.W. Bush 2006; NOAA NMSP 2005a, 2006).

Proclamation 8031 required that the proposed sanctuary DMP and MOA for co-management of the area be modified for application to the newly-created monument (U.S. President G.W. Bush 2006). Both documents and planning processes had been essentially completed prior to passage of the Proclamation and as a result, monument personnel could focus solely and immediately on fulfilling the final stages of the management planning process, modifying the draft documents in accordance with Proclamation requirements. Having inherited a measure of planning momentum, PMNM representatives may have been better able to manage barriers related to interagency tensions, power imbalances, and financial and capacity gaps, thereby facilitating implementation of a comprehensive final management plan less than three years after monument designation (Kittinger et al. 2011).

## **6.2 Site Histories: Marianas Trench and Pacific Remote Islands Marine National Monuments**

Aside from the subject matter that was derived from pre-existing documents and regulations, much of the content of Proclamation 8031 was similar to Presidential Proclamations 8335 and 8336, designating MTMNM and PRIMNM, respectively. This suggests that a standardized, general template may have been used for not just Proclamations 8031, 8335, and 8336, but also Proclamation 8337, establishing Rose Atoll Marine National Monument in American Samoa (U.S. President G.W. Bush 2006, 2009b, 2009c, 2009d). However, neither the Marianas Archipelago nor the Pacific Remote Islands region was subject to extensive, regional management planning activity prior to monument designation, and there were fewer pre-existing documents upon which the templates for Proclamations 8335 and 8336 could be expanded. As a result, Proclamations 8335 and 8336 are silent on more than half of the subject areas addressed in Proclamation 8031.

Proclamations 8335 and 8336 delegated monument management responsibilities to the Secretary of the Interior, in Consultation with the Secretary of Commerce. The Secretary of Commerce was specifically assigned primary management responsibilities for fishing-related activities, in consultation with the Secretary of the Interior. Additionally, both Proclamations required that the Secretary of Commerce and Secretary of the Interior prepare management plans within their respective authorities, within two years of initial designation. However, the Proclamations did *not* explicitly require preparation of a joint, interagency management plan and/or formal documentation of co-managing agency roles, responsibilities, and coordination mechanisms (U.S. President G.W. Bush 2009b, 2009c).

### 6.2.1 Marianas Trench Marine National Monument

Prior to passage of Proclamation 8335, there were at least 21 small, coastal MPA in effect within the Mariana Archipelago. Eleven of those sites fell under the purview of the CNMI Division of Fish and Wildlife. The remaining 10 sites were located in Guam, five of which were under U.S. Navy jurisdiction (National Marine Protected Areas Center 2014). Among all 21 sites, site-specific management plans had been implemented for five sites, and 13 sites were managed in accordance with programmatic management plans. The three remaining areas, all of which were U.S. Navy sites, were not subject to any management plan. The largest of all 21 sites was less than seven square statute miles (20 square kilometers), and none of the sites overlapped with any of the MTMNM units. Although the cumulative spatial extent of the pre-existing MPA was highly limited relative to large-scale MPA standards, the fact that 21 MPA had been established suggests that there was some degree of experience with and general public awareness of protected areas in the region. Further, because tourism, fishing, aquaculture, and other marine-based activities are critical components of the economies of both Guam and CNMI, many residents likely have a vested interest in coastal and ocean management matters.

Although Proclamation 8335 did not require the Secretaries of Commerce and the Interior to prepare a joint, interagency management plan, it did require establishment of a Monument Advisory Council (MAC), including representatives from USFWS, NOAA, the government of CNMI, the U.S. Department of Defense, and the U.S. Coast Guard. Once established, the MAC convened for the first time in February 2012, initiating a comprehensive management planning process that should conclude with implementation of a multi-agency final management plan. In response to comments received during public comment periods, the MAC may eventually incorporate representatives from the Guamanian government, as well.

Soon after its first meeting in February 2012, the MAC scheduled a number of public scoping meetings in Saipan, Tinian, Rota, and Guam, to address community member questions and collect input on issues to be addressed in a monument management plan. Over the course of at least seven subsequent meetings, the MAC drafted a monument vision statement, identified management issues and management plan goals, provided general information about the management planning process, and generated formal responses to input received during the public scoping meetings. The MAC also held a workshop to initiate the process of creating an ecosystem science implementation plan, as well as additional public sessions addressing the establishment of a monument visitor center. Additionally, four annual, interagency management planning updates have been posted since 2011, including one update published as recently as September 2014.

To address fisheries-related Proclamation requirements, NMFS, acting on behalf of the Secretary of Commerce, codified fishing regulations in the U.S. CFR, titled “Marianas Trench Marine National Monument.” The regulations were intended to provide “oversight of the administration of fishing in the Monument (50 CFR § 665 Subpart G).” Additionally, the Western Pacific Regional Fishery Management Council published two Fishery Ecosystem Plans (FEP) in September 2009, incorporating “ecosystem approaches” into the management frameworks in effect for fisheries in the Mariana Archipelago. The FEPs were titled “Fishery Ecosystem Plan (FEP) for the Mariana Archipelago” and “Fishery Ecosystem Plan for Pacific Pelagic Fisheries of the Western Pacific Region” (WPRFMC 2009a, 2009b).

At present, the MTMNM management planning process lags behind the two year preparation deadline stipulated in Proclamation 8335. Further, some monument functions, such as fisheries governance, are still addressed via compartmentalized, single-agency action.

Nevertheless, the MAC's on-going activities and accomplishments indicate that monument personnel are committed to implementing a comprehensive management plan that integrates USFWS, NOAA, and other agency operations into a single monument management framework.

#### 6.2.2 Pacific Remote Islands Marine National Monument

Proclamation 8336 assigned the Secretary of Commerce with management responsibilities for all monument waters that lie in a zone from 12 to 50 nm offshore of the mean low waterline around each of the islands and atolls within PRIMNM. The Secretary of the Interior was assigned management responsibilities for all terrestrial areas, as well as all monument waters extending 12 nm from the mean low waterline around each island and atoll.

Before the monument was established, all of the terrestrial areas located within the region that was to become PRIMNM had been designated as National Wildlife Refuges (NWR), under USFWS jurisdiction. In 2008, USFWS implemented Comprehensive Conservation Plans (CCP) for the Baker Island, Howland Island, and Jarvis Island NWRs, addressing management objectives for all emergent lands, as well as all marine waters extending three nm beyond the mean low water line around each island (USFWS 2008a, 2008b, 2008c). An additional CCP has been under development for the Palmyra Atoll and Kingman Reef NWR since 2011 (USFWS 2011). Soon after the passage of Proclamation 8336, Secretary of the Interior Order 3284 was issued, extending the outer boundaries of the NWR within PRIMNM from three to 12 nm beyond the mean low water line around each island (U.S. Secretary of the Interior 2009). Although the current CCP have not been updated to reflect the expanded NWR boundaries and/or address the establishment of PRIMNM, they are presumed to remain in effect for the expanded refuges. The U.S. Department of Defense maintains management responsibilities for both Wake and Johnston Islands.

To address fisheries management obligations, WPRFMC issued a Pacific Remote Islands FEP, resembling the FEP that are relevant to the PMNM and MTMNM regions. The most recent Pacific Remote Islands FEP was finalized in 2009, and covers not just PRIMNM, but also all U.S. EEZ waters in the PRI region (WPRFMC 2009c). Additionally, NMFS, acting on behalf of the Secretary of Commerce, codified fisheries regulations titled, “Pacific Remote Islands Marine National Monument,” in order to “govern the administration of fishing in the Monument (50 CFR § 665 Subpart H).”

Although USFWS and NOAA personnel stated an intent to create a joint monument management plan for PRIMNM, there is very little documentation of the current status of interagency planning efforts, beyond one management planning update posted in 2011 (USFWS and NOAA 2009). The patchwork of USFWS CCP, NMFS fishing regulations, and WPRFMC FEP *may* be sufficient to meet the somewhat-vague requirements set forth in Proclamation 8336. However, the plans generally do not incorporate additional, broader MPA management objectives, such as education and outreach, and monument-wide staffing, funding, and administrative requirements. Further, the unintegrated, compartmentalized nature of plans, addressing NWR management and fisheries management in isolation, lacks a holistic, EBM orientation, and is not consistent with MPA best practices.

### **6.3 Divergent Management Planning Patterns**

Although PMNM, MTMNM, and PRIMNM were established via the same process, involving signing of a Presidential Proclamation under the authority of the Antiquities Act of 1906, management planning has progressed very differently at each site. Regarding PMNM, the extensive degree of planning that took place prior to signage of Proclamation 8031 allowed monument personnel to overcome complicated interagency dynamics and capacity gaps and put

an FMP into effect less than three years after designation. Conversely, management planning for PRIMNM appears to remain in much earlier phases of the management planning process, despite having been established nearly six years ago. Although MTMNM personnel have not yet prepared a DMP, the MAC appears to remain actively engaged in and committed to the planning process, having convened on multiple occasions and posted regular management planning updates since 2011.

Based on these analyses, PRIMNM appears to be impacted by the most numerous and most complicated barriers, the combination of which may have contributed to management inertia at that site. Financial resource shortages and disjointed agency missions can significantly influence planning and implementation processes for any given MPA. Moreover, *intra*-agency cultural differences between ONMS, the NOAA Line Office charged with co-management responsibilities for PMNM, and NMFS, the NOAA Line Office assigned co-management responsibilities for MTMNM and PRIMNM, may have contributed to differences among the three sites, a question that warrants additional research. The following sections identify additional barriers that may be causing and/or exacerbating planning complexities, particularly for PRIMNM.

#### 6.3.1 Shortage of Interested Actors (Stakeholders)

With the exception of Palmyra Atoll, there is virtually no permanent human presence within the boundaries of PRIMNM, whether in the form of local residents, resource managers, tourists, tourism operators, or other locally-based stakeholders. Even on Palmyra Atoll, the population is generally limited to 20 people, affiliated with USFWS, The Nature Conservancy, and academic and research institutions. Further, there are no non-federal (municipal, state, or territorial) agencies with jurisdiction in the region, eliminating any option for vertical governance diversity.

The shortage of local actors in the PRIMNM region significantly complicates several processes related to MPA management, including:

- Incorporating both horizontal and vertical governance diversity into management frameworks;
- Collecting diverse stakeholder input and ideas regarding management needs and options;
- Gaining access to Traditional Ecological Knowledge (TEK), supplementing scientific research;
- Collecting diverse, innovative ideas for securing sources of funding;
- Establishing community-based enforcement, monitoring, and education and outreach programs;
- Pooling resources among interested agencies, as well as non-government and grass-roots organizations;
- Establishing an advisory council with local members who can competently represent the best interests of multiple aspects of the site;
- Providing opportunities for economic diversification and, therefore, socioeconomic resilience.

Although the PMNM region is also essentially uninhabited, many residents of the main Hawaiian Islands retain an active, vested interest in preserving the resources and native Hawaiian history that characterize the region. The State of Hawaii Department of Land and Natural Resources (DLNR) and the Office of Hawaiian Affairs (OHA) each oversee and/or fulfill specific aspects of PMNM operations, thereby providing a measure of vertical governance diversity within the PMNM management framework. Similarly, representatives from the governments of Guam and CNMI have participated in MTMNM MAC activities, lending vertical governance diversity to MTMNM operations, as well. Further, both PMNM and MTMNM receive input from private citizens, tourism operators, recreational fishing industry representatives, and representatives who advocate for native Hawaiian/Mariana Island interests, collectively embodying a much more diverse suite of actors than that available for PRIMNM.

### 6.3.2 Geography, Logistics, and Inadequate Capacity

Although assessment of the “spatial considerations,” “location,” and “organizational stability” MPA management best practices was beyond the scope of this particular study, the vast, remote, and uninhabited nature of PRIMNM has likely complicated management planning and implementation progress, warranting not just preliminary consideration, but also future research into the impacts of geographic barriers on new-site establishment.

PRIMNM is comprised of five separate, non-contiguous sub-units: Wake Island; Johnston Atoll; Kingman Reef and Palmyra Atoll; Jarvis Island; and Howland and Baker Islands. All of the sub-units are fairly distant from one another, rendering it extremely difficult to survey multiple sub-units during a single voyage/expedition. Although Palmyra Atoll has a small airport and seaport, neither facility offers services such as fuel, shore power, potable water, or the supplies and provisions necessary to support prolonged research, monitoring, or enforcement operations. Additionally, Palmyra cannot support extended vessel or aircraft berthing or repair periods.

While PRIMNM’s remote location satisfies the “isolation” component of the 10 MPA management best practices and relieves the site of some degree of extractive use pressure, it also poses great difficulty in terms of accessing the site for monitoring and enforcement purposes (Edgar et al. 2014). A vessel that travels 15 knots (15 nm per hour) would require approximately four days of transit time to access Johnston Atoll (round trip). That same vessel would require approximately nine days to reach the more distant Howland and Baker Islands (round trip). In order to conduct operations in multiple monument areas during a single expedition, vessel crew would need to plan for significantly longer transits. For example, a vessel traveling from Honolulu, HI to Johnston Atoll, Palmyra Atoll, and back to Honolulu would have to transit over 2,825 statute miles through non-monument waters. Coordinating operations within the three

more-distant PRIMNM sub-units would require even longer transits through non-monument waters. Lengthy transits incur significant costs related to fuel, maintenance, supplies, and labor, and it can take up to one year or longer to reschedule operational days lost due to inclement weather, vessel malfunction, or other delays.

The logistics associated with PMNM operations are arguably significantly less challenging. This is due, in part, to the fact that the monument is slightly closer to U.S. seaports and airports. The nearest PMNM boundary is located 138 statute miles northwest of Kauai, HI, and the most distant boundary is 1,339 miles northwest of Kauai (State of Hawaii DBEDT 2011; DistanceFromTo.net 2014; Table 6.1). Perhaps more importantly, the contiguous, linear nature of the monument allows researchers and enforcement officers to monitor monument areas that are proximal to ports of departure while en route to more remote monument working grounds. Like Palmyra, Midway Atoll has an airport and a small seaport, but those facilities can neither resupply operational assets nor support extended layovers.

With regards to MTMNM, the southwestern portions of the Trench Unit are located less than 115 miles from both Guam and the populated islands of southern CNMI. The northern half of the Trench Unit and the adjacent Islands Unit are more remote, particularly given that the northern islands of CNMI are largely unpopulated. Nevertheless, the distance from Saipan, the capital of CNMI, to Asuncion, within the Islands Unit, is approximately 310 statute miles. As such, both MTMNM and PMNM are somewhat less remote than the Pacific Remote Islands region, rendering monitoring and enforcement operations slightly less logistically complicated than is the case for PRIMNM (DistanceFromTo.net 2014).

Table 6.1. Geographic Distances from Various Monument Locations to U.S. Cities/Territories

<b>Monument Location</b>	<b>U.S. Destination</b>	<b>Approximate Distance (statute mi.)</b>
<b>PMNM</b>		
Southeastern monument boundary	Kauai (Port Allen or Lihue), HI	138
Northwestern monument boundary	Kauai (Port Allen or Lihue), HI	1,339
<b>PRIMNM</b>		
Johnston Atoll	Kauai (Port Allen or Lihue), HI	750
Palmyra Atoll and Kingman Reef	Kailua-Kona, HI (Big Island, HI)	1,035
Jarvis Island	Kailua-Kona, HI (Big Island, HI)	1,409
Howland and Baker Islands	Honolulu, HI	1,897
Wake Atoll	Guam	1,506
Wake Atoll	Honolulu, HI	2,293

(State of Hawaii DBEDT 2011; DistanceFromTo.net 2014)

### 6.3.3 Inadequate Incentives to Plan and Unclear or Conflicting Mandates

Because an extensive library of documents had been written for NWHI CRER prior to passage of Proclamation 8031, the language of the Proclamation itself could be grounded in relevant agency expertise and local knowledge, incorporating the planning activities that began more than five years prior to monument designation (Ostrom, Janssen, and Anderies 2007). PRIMNM personnel did not benefit from similar pre-designation planning opportunities. As a result, there were few, if any, planning documents from which the language of Proclamation 8336 could be developed. Proclamation 8336 was, therefore, fairly general, remaining silent on several of the issues that were addressed in the more comprehensive Proclamation 8031, such as oil, gas, and mineral exploration; ocean zoning; ocean use restrictions; monument entry notification requirements; and vessel monitoring system requirements. The management

planning requirements set forth in Proclamation 8336 were imprecise, and the Proclamation was also silent on advisory council and public participation requirements, all important aspects of effective MPA management (U.S. President G.W. Bush 2006, 2009b).

Proclamation 8335, establishing MTMNM, was similarly vague in terms of management planning requirements, and was also silent on more than half of the subjects addressed in Proclamation 8031. However, MTMNM personnel were required to establish a monument advisory council within three months of designation, and the resultant council has demonstrated on-going efforts to prepare a comprehensive, interagency management plan that incorporates several of the 10 MPA management best practices. Given that, the explicit advisory council requirement may have supplemented and/or compensated for otherwise insufficient policy guidance.

In many cases, general MPA designation language might afford responsible personnel the freedom to make individual decisions regarding site needs and objectives. However, PRIMNM has so few local actors and so little infrastructure that providing more detailed guidance and incentives in Proclamation 8336 may have better facilitated management planning amidst numerous inherent barriers. Although certain types of incentives are not likely to be effective in PRIMNM, such as socio-economic or community-oriented incentives, the Proclamation could have set forth, at a minimum:

- Legal incentives facilitating implementation of clear, comprehensive, and enforceable regulations;
- Economic incentives intended to fund planning, implementation, and day-to-day monument operations; or
- Timelines supporting the phased implementation of specific management programs or milestones (Toonen et al. 2013).

Providing more explicit policies and incentives that are better suited to the “exigencies of the local situation (Bennett and Dearden 2014, page 100)” may have helped to overcome or

prevent management barriers and inertia, a critically important aspect of demonstrating accountability and preventing a site from becoming a paper park (IUCN 1999).

#### 6.3.4 Inability to Communicate Need/Benefits

The potential benefits associated with protecting the PRI region, such as the preservation of intact coral reef ecosystems for scientific research, are likely to be difficult to monitor, and neither fully quantifiable nor immediate. Further, any positive outcomes related to protection may be too abstract to resonate with citizens and decision makers who live thousands of miles from the area, many of whom may not consider marine conservation to be a priority issue. As such, efforts to convince a polarized, impatient society of the need to invest in an isolated, unpopulated, virtually inaccessible area may remain largely unfulfilled (Hirschnitz-Garbers and Stoll-Kleemann 2011; Mitchell 2010). Despite participation from both the governments and residents of Hawaii, Guam, and CNMI, this barrier likely affects all three monuments at the U.S. federal level.

#### 6.3.5 Inadequate Political Commitment/Support

Based on the remote nature of the site and virtual absence of permanent constituents, garnering lasting political support for PRIMNM is likely to remain an ever-present challenge. Effective management of the site, including planning, monitoring, and enforcement, will require long-term sources of funding, necessitating iterative Congressional allocations that are sufficient to combat the barriers described in this section (Hirschnitz-Garbers and Stoll-Kleemann 2011). However, most “centralized, defense and economics-oriented” governments prioritize the “physical and economic security of their citizens” over environmental protection (Mitchell 2010, page 62). Further, elected officials may be unable to secure and maintain constituent support for their own administrations if the public perceives that too many resources have been assigned to a cause that appears to contribute very little to national, state or local economies. Therefore,

securing and maintaining adequate, long-term support for PRIMNM will likely be a constant struggle. During a recent web-based discussion hosted by the *LinkedIn* Marine Protected Area Governance Group, Jones (2014b) asserted that “if political will to designate MPAs is not matched by political will to [fund] them, we are building a network of MPAs that achieves coverage targets [i.e., Aichi Target 11], but does little to actually conserve and restore marine ecosystems and their constituent fish populations (Jones 2014b).” The ultimate result of political ignorance, indifference, and/or inattention could be relegation of any affected site to paper park status (IUCN 1999), and this risk could apply to any of the monuments evaluated in this report.

#### **6.4 Limitations of Using the Antiquities Act of 1906 to Establish Large-Scale MPA**

The use of the Antiquities Act of 1906 to designate large-scale MPA within U.S. EEZ waters represents a departure from more standard, agency-initiated processes. For that and other reasons, the Antiquities Act process has been subject to some criticism, as described in the following sections.

##### **6.4.1 Scope of Objects Protected**

Some critics have argued that the Antiquities Act was intended to protect small, discrete areas and/or individual objects of historic or scientific interest, rather than large tracts of land or water. Additionally, some contend that the original intent of the Act was to keep U.S. presidential authority “narrow and limited (Vincent and Alexander 2010, page 4).” However, those intentions were never officially approved, promulgated, or explicitly documented (Vincent and Alexander 2010). The language of the Act simply states that the size of a monument must be the “smallest area compatible with the proper care and management of the objects to be protected (16 USC § 431-433),” and does not provide size limitations or guidelines. As evidenced by an unsuccessful legal action in 2002 challenging the size of Grand Sequoia National Monument,

U.S. courts have chosen to defer to the judgment of the U.S. president (or his/her advisors) regarding appropriate monument size determinations (Vincent and Alexander 2010).

#### 6.4.2 Applicability in U.S. Territorial and EEZ Waters

The Antiquities Act states that a president may designate as a national monument any “objects that are situated upon the lands owned or controlled by the Government of the United States (16 USC § 431-433),” without addressing its applicability, if any, to adjacent waters. Based on the vague nature of the language of the Act, critics have questioned whether a U.S. president’s Antiquities Act authorities extend to the U.S. Territorial Sea or EEZ waters. However, in 1983 and 1988, U.S. President Ronald Reagan passed Presidential Proclamations 5030 and 5928, claiming sovereign rights over the U.S. EEZ and Territorial Sea, respectively, in accordance with international law (U.S. President Reagan 1983, 1988).

The United Nations Convention on the Law of the Sea (UNCLOS) requires a nation exercising sovereign rights over its EEZ to take any actions “necessary to protect and preserve rare or fragile ecosystems as well as the habitat of depleted, threatened, or endangered species or other forms of marine life (UNCLOS Part XII, Article 194 (5)).” Through Proclamations 5030 and 5928, President Reagan assumed those responsibilities, while also confirming U.S. authority to:

1. Exercise sovereign rights over affected waters in the same manner as a nation “has in respect to its land territory (U.S. President Reagan 1983, 1988; USDOJ 2000);”
2. “Conserve and manage natural resources...of the seabed, subsoil, and superadjacent waters (U.S. President Reagan 1983, page 10605);” and
3. Protect the marine environment (U.S. President Reagan 1983).

Although neither case law nor any Congressional reports define the term “control,” as used in the Antiquities Act, the U.S. Department of Justice has concluded that, having assumed

sovereign rights over territorial and EEZ waters, the U.S. has conferred adequate “control” to authorize and substantiate the use of the Antiquities Act to designate marine national monuments in those zones (USDOJ 2000).

#### 6.4.3 Consistency with International Fisheries Agreements

Many highly migratory pelagic species that transit U.S. marine national monument waters, including several species of tuna, marlin, sailfish, and swordfish, are managed in accordance with international agreements and/or treaties. Proclamation 5030, which claimed sovereign rights in U.S. EEZ waters, explicitly stated that “this Proclamation does not change existing United States policies concerning fisheries, including highly migratory species of tuna which are not subject to United States jurisdiction (U.S. President Reagan 1983, page 10605).” Given that, large-scale MPA designations in U.S. EEZ waters and corresponding fisheries management requirements must account for and adhere to international agreements and treaties, and cannot supersede any related obligations.

#### 6.4.4 Consistency with Environmental Laws and Standard Procedures

Some feel that monument designation procedures are generally inconsistent with many environmental protection laws in the U.S., such as the National Environmental Policy Act (NEPA), NMSA, and the organic acts with which NPS, USFWS, and other federal agencies must comply (Vincent and Alexander 2010). The Antiquities Act process neither explicitly incorporates nor requires completion of critically-important protected area pre-designation procedures, such as: area studies and assessments; local, state, and federal agency reviews; tribal community reviews; Congressional reviews; and public comment periods. Further, when requesting consideration of new protected areas, the documents submitted for Congressional review must include cost estimates, accounting for personnel, facilities, and operational

requirements (16 USC § 1431-1441; NPS 2006). If a protected area is approved and enacted, those cost estimates can then be used to inform subsequent Congressional allocations. The Antiquities Act, however, is silent on funding considerations. Therefore, unless funding guidance is provided in site-specific Presidential Proclamations, which does not apply to the monuments evaluated in this study, responsible agencies must reconcile funding requirements independently, potentially exacerbating existing barriers.

Although the Antiquities Act approach can significantly reduce the amount of time required to establish a protected area, omitting more traditional establishment mechanisms could force planning, budgeting, and stakeholder relationship building to occur from a reactive standpoint. In turn, this could prolong implementation timeframes and incur increased costs relative to sites established through more common procedures. Delayed implementation could then lead to opportunity costs, such as continued ecosystem decline, compromised social capital among stakeholders, or the inability to enforce commercial fishing or other resource extraction prohibitions. Any of these opportunity costs could negatively impact a responsible agency's ability to demonstrate management effectiveness and accountability.

## **6.5 Opportunities and Recommendations for Future Use of the Antiquities Act of 1906 to Establish Large-Scale MPA**

Despite numerous challenges affecting the monuments evaluated in this study, any actions taken to preserve the sites, even those actions that appear insignificant, may eventually bestow unanticipated positive outcomes that complement or even surpass current management objectives. Integrating large-scale conservation measures into spatially-explicit areas may deter various forms of potentially-injurious development from encroaching upon those areas, such as high-end tourism or technologically-advanced resource extraction operations. Incorporating

commercial fisheries restrictions into such areas may also shelter populations and/or habitats from future harvesting pressure, should current fisheries operations exhaust existing resources and, in response, attempt to expand into other areas (Stevenson et al. 2014, in review). Finally, Antiquities Act designations may require less time to take effect, relative to more conventional MPA establishment processes.

Regarding future marine national monument designations, coupling the Antiquities Act process with more conventional MPA pre-establishment planning procedures may better facilitate new-site management and implementation. Although unplanned, the establishment of PMNM resembled such a coupled process, beginning with standard, legally-defined pre-designation procedures, and ultimately concluding with monument designation via Presidential Proclamation. Based on the relative timeliness according to which site personnel were able to implement an FMP, the PMNM process may have revealed a viable, alternative means of formally establishing MPA in the U.S., blending standard, step-by-step MPA establishment procedures with the efficiency that the Antiquities Act process allows.

Combining these processes would likely elicit support from some members of the U.S. Congress. In April 2013, U.S. House of Representatives member Rob Bishop, representing Utah, sponsored a bill known as, “H.R. 1459: Ensuring Public Involvement in the Creation of National Monuments Act,” proposing a number of adjustments to the current Antiquities Act designation process. H.R. 1459 was passed in the U.S. House of Representatives in March 2014, and subsequently forwarded to the Senate for further consideration (U.S. Library of Congress 2014a). U.S. House of Representatives member Steve Southerland of Florida sponsored similarly oriented legislation in June 2014, titled, “H.R. 4988: Marine Access and State Transparency (U.S. Library of Congress 2014b).” Additionally, in July 2014, U.S. Senator Lisa Murkowski,

representing Alaska, sponsored another bill, known as, “S. 2608: Improved National Monument Designation Process Act (U.S. Library of Congress 2014c).” Collectively, these bills recommended similar revisions to the Antiquities Act designation process, such as the incorporation of: 1) National Environmental Policy Act (NEPA) procedures into all national monument designations; 2) state governor approval processes for those states that are located within 100 miles of a proposed marine national monument; and 3) mandatory pre-designation stakeholder review processes. Finally, all future national monument designations, particularly those located in the U.S. EEZ, would require approval and passage of an Act of Congress in order to become effective. Both S. 2608 and H.R. 4988 remain under review in Committee, and have been passed to neither the U.S. House of Representatives nor the U.S. Senate for consideration (U.S. Library of Congress 2014a, 2014b, 2014c). Nevertheless, these actions reflect a general sentiment among some federal lawmakers that favors completion of several preparatory actions prior to establishment of a national monument under the Antiquities Act, similar to the recommendations set forth in this thesis, as well as National Marine Sanctuaries Act requirements.

The following procedural considerations could be developed into a formal pre-designation MPA planning process, leading to passage of a Presidential Proclamation that facilitates establishment of effective and appropriate monument management frameworks.

## 7. RECOMMENDATIONS

### 7.1 Coupling Traditional MPA Establishment Procedures with Antiquities Act Designations

From a planning standpoint, comparisons between PMNM, MTMNM, and PRIMNM confirm the importance of conferring with appropriate personnel and understanding the unique dynamics of a candidate site *before* imposing Antiquities Act-based MPA designation requirements upon that site. National MPA Center personnel could play a critical role in facilitating initial contact between U.S. Presidential administration representatives and candidate site representatives, and subsequently acting as liaisons and advisors. Once contact among all appropriate personnel has been established, the pre-designation planning process should proceed to a site assessment phase, identifying:

- Ecological integrity;
- Socioeconomic and political indicators;
- Threats facing the area;
- Capacity requirements, gaps, and anticipated costs associated with filling those gaps.

Completion of initial site assessments should then lead to determination of appropriate expectations, objectives, and milestones for the site (Devilleers et al. 2014; Hirschnitz-Garbers and Stoll-Kleemann 2011). Realistic, objectives-based management milestones could involve any or all of the following activities (Toonen et al. 2013; Weimer and Vining 2011; Thomas and Middleton 2003):

- Fostering partnerships with agencies or organizations that could supplement capacity or facilitate resource pooling;
- Establishing an advisory council and/or formal means of collecting community member input;
- Devising creative methods of securing stable, long-term sources of funding;
- Procuring and installing remote monitoring capabilities;
- Incorporating conservation targets, monitoring protocols, and increasingly-restrictive ocean use limitations over time.

Maintaining realistic expectations may require consideration of balanced options that incorporate no-take zones in some areas, while allowing carefully-regulated activities (i.e. commercial fishing) to continue in other areas, supporting both conservation and economic interests. Such an approach could include options to annex additional area closures or no-take zones in the future, if deemed appropriate and/or as resources become available.

Once collected, information describing the site assessments, requirements, and expectations could be packaged into comprehensive Proclamation language that couples diverse incentives with appropriate, place-based directives that are suited to the individual needs of the candidate area (Hirschnitz-Garbers and Stoll-Kleemann 2011; Jones 2014a). Providing opportunities for pre-planning and more detailed guidance in Antiquities Act-derived Proclamations should help to incorporate aspects of more common MPA designation processes, while still allowing a U.S. president to contribute to international marine conservation targets and establish a ‘blue legacy’ for his/her administration. MPA that are designated via this coupled process and prove to be effective over time could simplify efforts to garner support for subsequent designations.

## **7.2 Future Research**

The framework used in this study could be standardized for application to virtually any protected area setting, in order to monitor implementation and identify those circumstances requiring additional incentives for enhanced execution. Future research could expand this process, evaluating more mature MPA in an attempt to determine whether the incentives provided during initial establishment actually supported realization of desired MPA outcomes

(Bradley 2008; Leslie 2005). Future research efforts should attempt to: characterize cultural differences among those agencies tasked with MPA co-management, and quantify the impacts of such differences on planning and day-to-day operations; assess the contributions, if any, of De Facto MPA to ocean conservation; explore the concept of using the Antiquities Act of 1906 to establish marine national monuments near/along populated coastlines, and forecast the barriers likely to be encountered; and evaluate the contrasting treatment of funding considerations by NMSA, the Antiquities Act, and other MPA designation authorities.

## **8. CONCLUSION**

The management challenges associated with large, remote MPA are inherently numerous and complex. Although PMNM, MTMNM, and PRIMNM were all designated through Presidential Proclamation under the Antiquities Act of 1906, there are significant disparities in the ways that management planning has progressed at each site, suggesting that ‘one size does not fit all’ (Toonen et al. 2013). PMNM personnel put an interagency Final Management Plan into effect within three years of designation, whereas MTMNM and PRIMNM personnel are still working through the management planning process, nearly six years after designation.

In addition to revealing divergent patterns of planning progress among the three sites, this study also identified several barriers that may underlie management planning inertia, particularly for PRIMNM. For starters, PRIMNM personnel were not afforded opportunities to work through initial planning procedures prior to designation. Additional barriers include:

1. The absence of locally-based stakeholders, limiting options for knowledge sharing (including TEK) and co-management partnerships with non-federal agencies;
2. Geographic isolation and inadequacies in the infrastructure needed to support operations;
3. Shortages of the incentives necessary for effective implementation, as evidenced by overly general Presidential Proclamation requirements and guidance; and
4. Shortages in political visibility and/or agreement regarding the importance of preserving and maintaining the site.

Particularly with regards to PRIMNM, signs of management planning inertia have been evident, placing the site at risk of remaining little more than a paper park (IUCN 1999).

Incorporating incentives into the site establishment process may have helped to preemptively address these concerns. Examples of potentially beneficial incentives might include: providing pre-designation planning opportunities; providing more detailed Proclamation guidance and specifications; establishing avenues for integrating private organizations into site management frameworks; and establishing means of pooling resources with peer organizations.

Presidential Proclamation 9173, expanding PRIMNM by approximately 400,000 square miles in September 2014, was not considered in this analysis. Nevertheless, the results detailed in this report are highly relevant, and may warrant even greater emphasis as planning efforts are scaled-up to incorporate the newly-expanded areas. The combination of apparent management inertia and PRIMNM expansion requirements that could intensify paper park concerns highlights the importance of ensuring that U.S. Presidential orders directing specific marine conservation actions are preceded by: 1) coordination with appropriate, local subject matter experts; 2) realistic assessments of capacity gaps and requirements; and 3) identification of the incentives necessary to overcome such gaps and facilitate accountable management (Devillers et al. 2014). Neglecting these procedures may either cause or perpetuate management planning inertia, resulting in sites that do not reflect intended results. Conversely, completing the procedures and integrating the results into a comprehensive Presidential Proclamation could facilitate formation of effective management frameworks, and may even accelerate MPA establishment timelines relative to more conventional approaches. This approach should also allow U.S. Presidential

administrations to contribute to large-scale conservation objectives in a more accountable manner.

Future investigations of the use of the Antiquities Act to establish large-scale MPA should attempt to: evaluate policy and cultural differences among USFWS, NMFS, ONMS, and other relevant agencies, and assess the impacts of such differences on planning and day-to-day operations; explore potential applications of the Act along populated coastlines, and anticipate the implementation barriers likely to be encountered; and deconstruct the disparate treatment of funding considerations by NMSA, the Antiquities Act, and other MPA designation approaches, and estimate the influence of such differences on site implementation and management.

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**APPENDIX 1 – RESEARCH APPROACH**

**TABLE A1.1. Numerical Rating Scheme for Assessing the Specificity of Presidential Proclamations 8031, 8335, 8336**

<b>Subject Area</b>	<b>Specificity Rating</b>
Management Plan Requirements	<ol style="list-style-type: none"> <li>0. Subject not addressed</li> <li>1. General management plan requirement set forth, with little/no explicit guidance</li> <li>2. set forth, including 2-year time frame for preparation</li> <li>3. Management Plan requirement set forth, citing content requirements and 2-year time frame for preparation</li> <li>4. Management Plan requirement set forth, citing content requirements, source documents, and 2-year time frame for preparation</li> </ol>
Advisory Council Requirements	<ol style="list-style-type: none"> <li>0. Subject not addressed</li> <li>1. General requirement for Advisory Council set forth, with little/no additional guidance</li> <li>2. Requirement for Advisory Council set forth, including establishment time frame</li> <li>3. Requirement for Advisory Council set forth, including establishment time frame and membership requirements</li> <li>4. Requirement for Advisory Council set forth, including establishment time frame, and membership and other requirements</li> </ol>
Interagency Agreement	<ol style="list-style-type: none"> <li>0. Subject not addressed</li> <li>1. General requirement for interagency agreement set forth, with little/no additional guidance</li> <li>2. Requirement for interagency agreement set forth, including specific time frame for preparation</li> <li>3. Requirement for interagency agreement set forth, citing content requirements and time frame for preparation</li> <li>4. Requirement for interagency agreement set forth, citing content requirements, source documents, and time frame for preparation</li> </ol>

TABLE A1.1 (cont.). Numerical Rating Scheme for Assessing the Specificity of Presidential Proclamations 8031, 8335, 8336

<b>Subject Area</b>	<b>Specificity Rating</b>
Limitations on Monument Access	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. General guidance set forth for specific zones within the monument; zone locations not specified 3. Explicit guidance set forth for specific, geo-referenced areas within the monument 4. Explicit guidance set forth addressing access limitations for entire monument
Entry Notification Requirements	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. General guidance set forth for specific zones within the monument 3. Explicit guidance set forth, addressing notification requirements for specific, geo-referenced areas within the monument 4. Explicit guidance set forth, addressing notification requirements for entire monument, including occasions for and means of submitting monument access notifications
Use of Zoning Schemes	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. General guidance provided, identifying types of zones to be incorporated into monument 3. Explicit guidance provided, incorporating specific, geo-referenced zones into portions of the monument 4. Explicit guidance provided, incorporating zoning scheme into entire monument
Commercial Fishing Prohibitions	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. Commercial fishing prohibitions/expectations set forth without reference to specific, geo-referenced areas 3. Commercial fishing prohibitions/expectations set forth for specific, geo-referenced portions of the monument 4. Commercial fishing prohibitions/expectations set forth for entire monument

TABLE A1.1 (cont.). Numerical Rating Scheme for Assessing the Specificity of Presidential Proclamations 8031, 8335, 8336

<b>Subject Area</b>	<b>Specificity Rating</b>
Non-commercial Fishing Considerations	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. Use required to be regulated by permit, with little/no additional guidance 3. Use regulated by permit, in accordance with specified conditions 4. Use regulated by permit, in accordance with specified conditions including specific, geo-referenced zoning limitations
Traditional Use Considerations	(same rating scale as that applied to “Non-commercial Fishing Considerations”)
Scientific Research / Exploration Considerations	(same rating scale as that applied to “Non-commercial Fishing Considerations”)
Recreation and Tourism Considerations	(same rating scale as that applied to “Non-commercial Fishing Considerations”)
Education and Outreach Considerations	(same rating scale as that applied to “Non-commercial Fishing Considerations”)
Vessel Monitoring System Requirements	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. Vessel monitoring required, with little/no guidance regarding specific procedures 3. Vessel monitoring required, in accordance with specific procedures 4. Vessel monitoring required, in accordance with specific procedures <i>and</i> equipment carriage/use requirements
Oil, Gas, Mineral Exploration Prohibitions	0. Subject not addressed 1. General considerations set forth with little/no explicit guidance 2. Activity prohibitions set forth without reference to specific, geo-referenced areas 3. Activity prohibitions set forth for specific, geo-referenced portions of the monument 4. Activity prohibitions set forth for entire monument

TABLE A1.1 (cont.). Numerical Rating Scheme for Assessing the Specificity of Presidential Proclamations 8031, 8335, 8336

Subject Area	Specificity Rating
Limitations on Use of Poisons, Electrical Charges, Explosives to Extract Resources	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Introduction or Release of Introduced Species	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Anchoring on Living or Dead Coral	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Removing, Taking, Harassing, etc. Any Monument Resource, Living or Non-Living	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Altering the Submerged Lands	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Anchoring	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Deserting a Vessel Aground, At Anchor, Adrift	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Discharging or Depositing Material into SPA or SMA (excluding vessel cooling water, weather-related run-off, exhaust)	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Discharging or Depositing Material into Monument, or into Areas Where Discharge Could Re-enter Monument and Cause Harm to Monument Resources	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Touching Coral	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Possessing Fishing Gear, Unless Stowed for Passage Through the Monument	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Swimming, Snorkeling, Diving Within SPA or SMA	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)
Limitations on Attracting Any Living Monument Resources	(same rating scale as that applied to “Oil, Gas, Mineral Exploration Prohibitions”)

**TABLE A1.2. Numerical Rating Scheme for Assessing the Degree of Implementation of Seven MPA Management Best Practices at Each Site**

MPA Management Best Practice	Rating
Extractive Use Limitations	<ol style="list-style-type: none"> <li>0. No zoning, planning or implementation actions taken</li> <li>1. Planning and/or zoning processes initiated via published Notices of Intent, public comment periods, public scoping meetings, etc.</li> <li>2. Planning and/or implementation in progress, via regular Advisory Council or planning committee activities and workshops, including opportunities for public input and/or participation</li> <li>3. Extractive use limitations incorporated to a limited extent via partial codification in enforceable regulations, and/or implementation of partial zoning schemes</li> <li>4. Extractive use limitations set forth in Proclamation; zoning schemes and geo-referenced no-take areas incorporated through codified, enforceable regulations and/or fully implemented Final Management Plan(s)</li> </ol>
Enforcement Activity	<ol style="list-style-type: none"> <li>0. No actions taken in support of monument enforcement</li> <li>1. Strategic planning, regulations, and joint, interagency enforcement agreements under development for the site, including consideration of emerging threats and technologies</li> <li>2. Outreach products (i.e. compliance guides) published and distributed for interested stakeholders; occasional vessel patrols and aircraft overflights conducted</li> <li>3. Enforcement capacity includes monitoring of specific, registered vessels/users and notifications received in accordance with monument entry reporting requirements</li> <li>4. Enforcement capacity includes regularly-scheduled patrols; remote monitoring equipment providing monument-wide coverage and detection of multiple types of activities</li> </ol>
EBM/MSP and Science-based Decision Making	<ol style="list-style-type: none"> <li>0. No planning or implementation actions taken</li> <li>1. Intentions to establish an EBM or MSP-based management framework set forth in published Notices of Intent, and/or during public comment periods, public scoping meetings, etc.</li> <li>2. EBM/MSP planning in progress, via regular Advisory Council or planning committee activities and workshops, including opportunities for public input and/or participation</li> <li>3. Formal EBM/MSP implementation plans drafted as a result of planning processes, but not finalized</li> <li>4. EBM or MSP-based management framework established, implemented, and incorporated into comprehensive Final Management Plan(s)</li> </ol>

TABLE A1.2 (cont.). Numerical Rating Scheme for Assessing the Degree of Implementation of Seven MPA Management Best Practices at Each Site

<b>MPA Management Best Practice</b>	<b>Rating</b>
Management Planning Procedures	<ol style="list-style-type: none"> <li>0. No planning or implementation actions taken</li> <li>1. Management planning processes initiated via published Notices of Intent, public comment periods, public scoping meetings, etc.</li> <li>2. Management planning and implementation in progress, via regular Advisory Council or planning committee activities and workshops, including opportunities for public input and/or participation</li> <li>3. Issue-specific or partial management plans implemented; comprehensive Final Management Plan addressing all relevant monument operations still under development</li> <li>4. Comprehensive Final Management Plan completed and fully implemented, addressing all monument operations</li> </ol>
Objectives-based Monitoring	<ol style="list-style-type: none"> <li>0. No planning or implementation actions taken</li> <li>1. Tentative monitoring objectives/intentions set forth in published Notices of Intent and/or during public comment periods, public scoping meetings, etc.</li> <li>2. Monitoring program planning in progress via regular Advisory Council or planning committee activities and workshops, including opportunities for public input and/or participation</li> <li>3. Monitoring program goals and objectives drafted and implemented via limited, issue-specific management plan(s)</li> <li>4. Monitoring, adaptive management, and/or management evaluation schedules set forth and fully implemented via integration into comprehensive Final Management Plan</li> </ol>

TABLE A1.2 (cont.). Numerical Rating Scheme for Assessing the Degree of Implementation of Seven MPA Management Best Practices at Each Site

MPA Management Best Practice	Rating
Stakeholder Opportunities to Participate	<ol style="list-style-type: none"> <li>0. No opportunities for public participation</li> <li>1. Public participation opportunities limited to submission of comments by mail, e-mail, social media, or other remote/virtual methods</li> <li>2. Public participation opportunities include in-person attendance at workshops, meetings, etc.</li> <li>3. Public participation opportunities include membership on planning committees, advocacy or non-profit groups, etc.; Advisory Council established, including members from public agencies sharing jurisdiction in the area</li> <li>4. Public participation opportunities include a measure of control over/direct input on planning and implementation decisions; Advisory council established, including members from both public agencies and interested private/civilian sectors</li> </ol>
Mechanisms for Institutional Learning	<ol style="list-style-type: none"> <li>0. Mechanisms for institutional learning not addressed</li> <li>1. Importance of institutional learning acknowledged in published Notices of Intent and/or during public comment periods, public scoping meetings, etc.</li> <li>2. Planning in progress via regular Advisory Council or planning committee activities and workshops, including opportunities for public input and/or participation</li> <li>3. Institutional learning program goals and objectives drafted and described in regular management planning updates and/or implemented via limited, issue-specific management plan(s)</li> <li>4. Efforts facilitating institutional learning in progress via participation in internationally-sanctioned MPA consortia or heritage programs</li> </ol>

## APPENDIX 2 - FINDINGS

**TABLE A2.1. Numerical Ratings of Management Setting Indicators Describing Each Site *Prior* to Designation**

<b>Management Setting Indicator</b>	<b>Papahānaumokuākea</b>	<b>Marianas Trench</b>	<b>Pacific Remote Islands</b>
Pre-existing MPA	4	2	2
Geographic / Logistical Constraints	3	3	1
Vertical Governance Diversity	1	2	0
Degree of Pre-Designation Management Planning for Entire Monument Footprint	4	0	0
Degree of Pre-Designation Management Planning for Discrete Areas Located Within Monument Boundaries	4	3	2

**Table A2.2. Rationale Supporting Numerical Ratings Describing PMNM Management Setting Indicators *Prior* to Designation**

<b>Management Setting Indicator</b>	<b>Rating</b>	<b>Papahānaumokuākea MNM</b>
Pre-existing MPA	4	The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve (NWHI CRER) was established in 2000, with the same boundaries as the area that would eventually become PMNM
Geographic / Logistical Constraints	3	Eastern-most PMNM boundary is 120 nm northwest of Kauai, HI; entire monument is contiguous (occupying one single footprint) and largely linear, allowing surveys of areas proximal to ports of departure (i.e. Kauai or Honolulu, HI), while en route to more distant monument locations; airport and small seaport located on Midway Atoll, but neither offers the means to fully resupply vessels in preparation for expeditions
Vertical Governance Diversity	1	State of Hawaii the only non-federal agency available and appointed to participate in monument co-management
Degree of Pre-Designation Management Planning for Entire Monument Footprint	4	NWHI CRER was managed via fully-implemented Reserve Operations Plan, prior to passage of Proclamation 8031; comprehensive draft Management Plan also written prior to passage of Proclamation 8031, in preparation for designation as a National Marine Sanctuary; all CRER and NMS planning activities were relevant and/or transferrable to monument operations
Degree of Pre-Designation Management Planning for Discrete Areas Located Within Monument Boundaries	4	Comprehensive management plans implemented for all terrestrial, intertidal, and offshore areas located within monument boundaries, including National Wildlife Refuges, prior to passage of Proclamation 8031

**Table A2.3. Rationale Supporting Numerical Ratings Describing MTMNM Management Setting Indicators *Prior to Designation***

<b>Management Setting Indicator</b>	<b>Rating</b>	<b>Marianas Trench MNM</b>
Pre-existing MPA	2	Inventory of small, pre-existing protected areas included 10 areas in Guam, 11 areas in CNMI, all managed at the territorial government level
Geographic / Logistical Constraints	3	Nearest monument boundary is fewer than 200 nm from Guam and Saipan, offering access to international airports, deep water ports, vessel berthing, and U.S. military installations; the locations of most portions of the monument are conducive to occasional monitoring and enforcement operations
Vertical Governance Diversity	2	The government of CNMI and U.S. Territorial government of Guam both available and appointed to participate in co-management framework
Degree of Pre-Designation Management Planning for Entire Monument Footprint	0	No opportunities for pre-designation management planning for entire monument footprint prior to passage of Proclamation 8335
Degree of Pre-Designation Management Planning for Discrete Areas Located Within Monument Boundaries	3	Programmatic management plans in effect for most pre-existing protected areas; site-specific management plans in effect for 3 of the pre-existing protected areas in CNMI

**Table A2.4. Rationale Supporting Numerical Ratings Describing PRIMNM Management Setting Indicators *Prior to Designation***

<b>Management Setting Indicator</b>	<b>Rating</b>	<b>Pacific Remote Islands MNM</b>
Pre-existing MPA	2	Pre-existing protected areas limited to USFWS National Wildlife Refuges, encompassing Baker, Jarvis, and Howland Islands, as well as Palmyra, Johnston, and Wake Atolls, including the waters surrounding each island/atoll out to 3 nm
Geographic / Logistical Constraints	1	Nearest monument boundary is more than 500 nm from any U.S. municipal area; entire monument is comprised of six non-contiguous 'units,' requiring extensive transits between individual units; minimal infrastructure readily available to support prolonged or sustained operations
Vertical Governance Diversity	0	There are no territorial, state, county, or local agencies available to participate in monument co-management
Degree of Pre-Designation Management Planning for Entire Monument Footprint	0	No opportunities for pre-designation management planning for entire monument footprint prior to passage of Proclamation 8336
Degree of Pre-Designation Management Planning for Discrete Areas Located Within Monument Boundaries	2	USFWS Comprehensive Conservation Plans (CCP) were written and implemented for Baker, Jarvis, and Howland Islands prior to passage of Proclamation 8336; CCPs were under development for Palmyra Atoll and Kingman Reef

**Table A2.5. Numerical Ratings of Specificity of Presidential Proclamations 8031, 8335, 8336**

	<b>Proclamation Subject Area</b>	<b>Proc. 8031 (PMNM)</b>	<b>Proc. 8335 (MTMNM)</b>	<b>Proc. 8336 (PRIMNM)</b>
1	Management Plan	4	3	2
2	Advisory Council	0	4	0
3	Interagency Agreement	4	0	0
4	Access	4	1	1
5	Entry Notification Requirements	4	0	0
6	Zoning Framework, Implementing a Range of Restrictions on Ocean Uses	4	0	0
7	Commercial Fishing	4	3	4
8	Non-commercial Fishing	4	3	3
9	Traditional Use	3	1	0
10	Scientific Research, Exploration	3	2	2
11	Recreation and Tourism	4	1	0
12	Education and Outreach	3	1	0
13	Vessel Monitoring Systems	4	0	0
14	Oil, Gas, Mineral Exploration	4	0	0
15	Use of Poisons, Electrical Charges, Explosives to Extract Resources	4	0	0
16	Introduction or Release of Introduced Species	4	0	0
17	Anchoring on Living or Dead Coral	4	0	0
18	Removing, Taking, Harassing, etc. Any Monument Resource, Living or Non-Living	4	3	3
19	Altering the Submerged Lands	4	0	0
20	Anchoring	4	0	0
21	Deserting a Vessel Aground, At Anchor, Adrift	4	0	0
22	Discharging or Depositing Material into SPA or SMA (excluding cooling water, weather-related run-off, exhaust)	4	0	0

Table A2.5 (cont.). Numerical Ratings of Specificity of Presidential Proclamations 8031, 8335, 8336

	<b>Proclamation Subject Area</b>	<b>Proc. 8031 (PMNM)</b>	<b>Proc. 8335 (MTMNM)</b>	<b>Proc. 8336 (PRIMNM)</b>
23	Discharging or Depositing Material into Monument, or into Areas Where Discharge Could Re-enter Monument and Cause Harm to Monument Resources	4	0	0
24	Touching Coral	4	0	0
25	Possessing Fishing Gear, Unless Stowed for Passage Through the Monument	4	0	0
26	Swimming, Snorkeling, Diving Within SPA or SMA	4	0	0
27	Attracting Any Living Monument Resources	4	0	0

**Table A2.6. Numerical Ratings Describing Current Status of Management Planning at Each Marine National Monument**

<b>Management Planning Phase</b>	<b>Papahānaumokuākea</b>	<b>Marianas Trench</b>	<b>Pacific Remote Islands</b>
Scoping, Advisory Council establishment, process definition	4	4	2
Issues identification, public consultations	4	4	2
Evaluation of data and resource information	4	4	2
Identification of constraints, opportunities, and threats	4	3	2
Definition of vision and objectives	4	3	2
Evaluation of management options	4	3	2
Preparation of draft management plan (DMP)	4	2	2
DMP public comment period	4	2	2
Preparation of final management plan (FMP)	4	2	2
Implementation of FMP	4	2	2

**Table A2.7. Numerical Ratings Describing Degree of Implementation of Seven MPA Management Best Practices at Each Site**

<b>MPA Management Best Practice</b>	<b>Papahānaumokuākea</b>	<b>Marianas Trench</b>	<b>Pacific Remote Islands</b>
Extractive Use Limitations	4	3	3
Enforcement Activity	3	2	2
EBM-based Decision Making	4	3	1
Management Planning Procedures	4	2	1
Objectives-based Monitoring	3	2	1
Stakeholder Opportunities	4	4	1
Institutional Learning	4	3	1

**Table A2.8. Rationale Supporting Numerical Ratings Describing Degree of Implementation of Seven MPA Management Best Practices for PMNM**

MPA Mgmt. Best Practice	Rating	Papahānaumokuākea MNM
Extractive Use Limitations	4	Explicit prohibitions on commercial fishing and other extractive activities set forth in Proclamation 8031 and subsequently codified in U.S. CFR. Monument zoning scheme includes zones of increasing use limitations. Use permitting frameworks set forth in ' <i>Permitting Action Plan</i> ,' within Monument Management Plan
Enforcement Activity	3	All Proclamation requirements fully codified in 50 CFR 404, and commercial fishing regulations codified in 50 CFR 665 Subparts C, F; enforcement burden shared among NOAA Office of Law Enforcement, U.S. Coast Guard, USFWS, and the Hawaii Department of Land and Natural Resources. Proclamation set forth Vessel Monitoring System (VMS) equipment carriage and access notification requirements for vessels entering monument waters; VMS allows monitoring of fishing vessel activity in monument waters. ' <i>Enforcement Action Plan</i> ' set forth in Monument Management Plan
EBM or MSP-based Decision Making	4	EBM considerations set forth in four separate Action Plans comprising the ' <i>Understanding and Interpreting the NWHI</i> ' Priority Management Area of the Monument Management Plan
Management Planning Procedures	4	Monument Management Plan completed and fully implemented in 2008
Objectives-based Monitoring	3	' <i>Evaluation Action Plan</i> ' and ' <i>Adaptive Management Cycle</i> ' set forth in Monument Management Plan; ' <i>Monument Managers and Accomplishments Reports</i> ' published annually through 2011
Stakeholder Opportunities	4	Monument Advisory Council established, 2-4 meetings held annually; meetings are open to the public. Stakeholder involvement further addressed in four Action Plans comprising the ' <i>Coordinating Conservation and Management Activities</i> ' Priority Management Area of the Monument Management Plan. Visitor use considerations set forth in ' <i>Midway Atoll Visitor Services Action Plan</i> '
Institutional Learning	4	PMNM is a member of the Big Ocean Consortium. Learning/information considerations set forth in several Action Plans within the Monument Management Plan: ' <i>Coordinated Field Operations Action Plan</i> ;' ' <i>Agency Coordination Action Plan</i> ;' and ' <i>Evaluation Action Plan</i> .' PMNM also participates in World Heritage activities with other World Heritage area managers

**Table A2.9. Rationale Supporting Numerical Ratings Describing Degree of Implementation of Seven MPA Management Best Practices for MTMNM**

<b>MPA Mgmt. Best Practice</b>	<b>Rating</b>	<b>Marianas Trench MNM</b>
Extractive Use Limitations	3	Commercial fishing prohibited within the Island Unit. Sustenance, recreational, and traditional indigenous fishing to be managed as a “sustainable” activity. Proclamation silent on oil/gas exploration. No zoning scheme or relevant action plans published to date
Enforcement Activity	2	Commercial fishing regulations codified in 50 CFR 665 Subpart G, but other monument requirements/regulations not yet codified; enforcement burden shared among NOAA Office of Law Enforcement, U.S. Coast Guard, USFWS, and the Guam Division of Aquatic and Wildlife Resources and CNMI Division of Fish and Wildlife. Occasional vessel patrols and/or overflights conducted. Outreach products (i.e. compliance guides) published. No relevant action plans posted to date; no known, regular (i.e. 24-7) use of remote monitoring technologies
EBM or MSP-based Decision Making	3	Public scoping comments included statement of need for holistic approach to management, including terrestrial areas and entire "stretch" of Marianas Trench; in response, monument staff stated intention to use scientific data collected during research expeditions to inform conservation management strategies. MTMNM and Marianas Archipelago Ecosystem Science Implementation workshop held in 2013, and Ecosystem Science Implementation Plan drafted
Management Planning Procedures	2	Monument management planning intentions set forth on MTMNM website, including implementation of a multi-agency management plan intended to “guide the management of the monument’s resources.” Annual management planning updates posted since 2011, most recent update posted September, 2014
Objectives-based Monitoring	2	Recent science, exploration, and research efforts have focused on 1) conducting baseline assessments and Rapid Ecological Assessments, and 2) establishing basic understandings of monument resources, all of which will be fundamental to long-term monitoring efforts
Stakeholder Opportunities	4	Monument Advisory Council established, six meetings held since 2012. Public scoping processes implemented, including completion of at least four workshops in Guam, Saipan, Tinian, and Rota, collecting input on monument issues and management. Point of contact provided on monument website for education/outreach program support
Institutional Learning	3	MTMNM is a member of the Big Ocean Consortium. Monument management planning update posted in March, 2013 cites lessons learned from the PMNM “model”

**Table A2.10. Rationale Supporting Numerical Ratings Describing Degree of Implementation of Seven MPA Management Best Practices for PRIMNM**

<b>MPA Mgmt. Best Practice</b>	<b>Rating</b>	<b>Pacific Remote Islands MNM</b>
Extractive Use Limitations	3	Explicit prohibitions on commercial fishing and the taking, harassing, etc. of monument resources set forth in Proclamation 8336. Non-commercial and recreational fishing to be managed as a “sustainable” activity. Proclamation silent on oil/gas exploration limitations. No zoning scheme or relevant action plans published to date
Enforcement Activity	2	Commercial fishing regulations codified in 50 CFR 665 Subpart H, but other monument requirements/regulations not yet codified; enforcement burden shared among NOAA Office of Law Enforcement, U.S. Coast Guard, and USFWS. Occasional vessel patrols and/or overflights conducted. Outreach products (i.e. compliance guides) published. No relevant action plans posted to date. No known, regular (i.e. 24-7) use of remote monitoring technologies
EBM or MSP-based Decision Making	1	Although research, monitoring, Ecosystem Assessments, etc. are mentioned in Notice of Intent, there is no discussion of linking such activities to EBM or science-based decision making. No relevant action plans posted to date. Monument "Fact Sheet" addresses using knowledge gained through scientific research to enhance coral reef management in other regions of the world
Management Planning Procedures	1	Notice of Intent to publish a Monument Management Plan posted in 2011. Documents published/posted to date limited to two planning updates posted in 2011
Objectives-based Monitoring	1	Tentative objectives/management intentions addressed in Notice of Intent; not yet incorporated into a Monument Management Plan or relevant action plans
Stakeholder Opportunities	1	Opportunities for public content broadcast in 2011 Notice of Intent. Monument contact information provided on Monument website. The uninhabited, remote nature of the site significantly complicates opportunities for regular, in-person stakeholder involvement
Institutional Learning	1	Notice of Intent to publish a Monument Management Plan acknowledges the potential importance of international cooperation and coordination. No relevant action plans posted to date, no known memberships in international consortia