



COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS'

CORAL REEF MANAGEMENT PRIORITIES



NOAA
CORAL REEF
CONSERVATION PROGRAM

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The Commonwealth Of the Northern Mariana Islands and NOAA Coral Reef Conservation Program. 2010.
Commonwealth Of The Northern Mariana Islands's Coral Reef Management Priorities. Silver Spring, MD: NOAA.

The NOAA Coral Reef Conservation Program would like to thank all those involved in the process to identify and publish the coral reef management priorities for the Commonwealth of the Northern Mariana Islands. The commitment, time and effort invested in this process is greatly appreciated. These priorities will play an important role in defining NOAA's partnership with the jurisdiction to work towards coral reef conservation. Special thanks to Zhe Liu for graphic design and Lauren Chhay for photo support.

Cover Photo Credit: Jose Quan, Coral Reef Initiative Summer Intern 2010

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INTRODUCTION

The purpose of this Priority Setting document is to articulate a set of strategic coral reef management priorities developed in consensus by the coral reef managers in Commonwealth of the Northern Mariana Islands (CNMI). NOAA will use this document in conjunction with its *NOAA Coral Reef Conservation Program Goals & Objectives 2010-2015* (available at www.coralreef.noaa.gov) to direct its investment in activities in each jurisdiction through grants, cooperative agreements and internal funding. NOAA will also make the document available to other potential funders (non-governmental organizations [NGOs], federal partners, etc.) and encourage leveraging and new or expanded partnerships to build common coral reef conservation goals.

The work presented here is being facilitated by the NOAA Coral Reef Conservation Program (NOAA CRCP) as part of an ongoing effort to develop place-based, local coral reef management priorities in each of the seven U.S. state and territorial coral reef jurisdictions (American Samoa, Commonwealth of the Northern Mariana Islands, Florida, Hawai`i, Guam, Puerto Rico and the U.S. Virgin Islands) and conduct capacity assessments to identify the support needed to accomplish those priorities. The first step in this effort has been to work with the core group of coral reef managers (local, place-based) in each jurisdiction to articulate a set of strategic coral reef management priorities. The second, and next, step will be to complete a capacity needs assessment that helps each state and territory realize these priorities.

This priority setting process stems from an external review of NOAA CRCP conducted in 2007 to independently assess how effectively the program has met its goals. The review included recommendations for future improvements. In response to the review, NOAA CRCP developed a "Roadmap for the Future," laying out new principles and priorities. A key part of this new Roadmap includes developing management priorities for each and all of the coral reef jurisdictions and conducting capacity assessments to achieve these priorities. NOAA CRCP is providing support to the jurisdictions to coordinate with the broader management community in each place to determine these strategic goals and objectives for each state and territory. Priority setting initiatives began in 2009 with implementation phased in two to three jurisdictions per year. The capacity assessments will follow, beginning in late 2010.

This Priority Setting document is divided into the following sections:

1

Scope, Development and Prioritization

Process: This section details the process by which the priority goals and objectives were reached, including the preparation for the workshop, work done at the workshop, and the post-workshop refining process.

2

Strategic Coral Reef Management

Priorities: This section presents the entire framework of goals and objectives developed and agreed upon by the core group during this process. In this section, the Priority Goals and Objectives are highlighted. These are the top priorities for management action as agreed upon by the core managers group.

3

Linkages to NOAA's National Goals

and Objectives: This section describes how the local jurisdiction management priorities align with NOAA CRCP's priorities and future direction.

SECTION ONE: SCOPE, DEVELOPMENT AND PRIORITIZATION PROCESS

This document captures the final set of priorities agreed upon by the core managers group at the priority setting workshop. The core managers group is defined as the “place-based” coral reef managers who have the direct responsibility for managing the coral reef ecosystem in a particular geographic location. The managers as well as those who were asked to participate in the initial analysis and review of this document are listed in Appendix One.

In preparation for the workshop, previously identified goals and objectives were taken from current management documents and presented in the Situation Analysis. The Situation Analysis is a preparatory document that summarizes: coral reef threats, condition and trends; key management issues; and key agencies’ management goals ahead of meetings and interviews. Its primary purpose is to compile and consolidate available management documents from various management bodies and geographic localities. Appendix Two presents a summary of the Situation Analysis’ findings.

This Situation Analysis was augmented by a series of interviews that captured managers’ working perceptions of management goals as they are stated in management documents.

Taken together, along with the current version of the Local Action Strategy (LAS) document, this information formed the basis for the workshop discussions by offering an initial set of goal areas to consider.

During the interviews with the core coral reef managers and management advisors in CNMI, facilitators identified challenges to and current deficiencies in achieving stated goals and objectives, noting specific capacity gaps that likely will need attention. This information will serve as the starting point for the capacity assessment, to be completed in the following year. It is summarized in Appendix Three.

Workshop participants worked from the Situation Analysis, interviews and a current version of CNMI’s LAS document to create a comprehensive set of goals and objectives for four priority areas. These were agreed upon by the core group as needed areas that were most important to the successful management and conservation of the CNMI’s coral reefs. They are:

- Impacts of Land-Based Sources of Pollution
- Fisheries and Impacts of Fishing



On the first day of the priority setting workshop, small groups presented their recommendations to all participants for discussion and evaluation. Each participant then identified his or her top eight priority objectives. Photo Credit: Kathy Chaston, NOAA CRCP

- Impacts of Military Build-Up
- Impacts of Climate Change and Ocean Acidification

These four priority areas are encompassed by two larger overarching goals that guide coral reef management efforts in the CNMI. The first is the Micronesia Challenge (www.micronesiachallenge.org). This regional commitment to effectively conserve at least 30 percent of the near-shore marine resources and 20 percent of the terrestrial resources across Micronesia by 2020 provides a framework to guide resource management and conservation in the CNMI. The government of CNMI and its coral reef managers are committed to achieving the goals of the Challenge in CNMI. Closely related to the Micronesia Challenge is the need to increase the resiliency of CNMI's reefs and coastal communities in the face of climate change and ocean acidification. The theme of reef resiliency is an important component of reef management on CNMI and serves as a connection between all four priority areas.

FOR THE PURPOSE OF THIS EXERCISE, THE FOLLOWING DEFINITIONS WERE USED:

Goals are defined as the highest-level result the jurisdiction seeks to achieve (e.g., stable, sustainable coral reef ecosystems) in the next five to seven years.

Objectives are defined as the environmental, social and institutional outcomes the jurisdiction must achieve to reach the end goal. Objectives are generally actionable within a three- to five-year time frame.

Actions are projects, procedures or techniques intended to implement an objective.

On the first day of the workshop, small groups presented their recommendations to all participants for discussion and evaluation. Each participant then identified his or her top eight priority objectives. Actions were

developed after the workshop in consultation with the core group.

This document presents both the comprehensive set of goals and objectives as developed by the core group as well as the Priority Goals and Objectives. **The Priority Goals and Objectives are those the core group identified through the above process as requiring immediate attention over the short term.** These Priority Goals and Objectives will guide NOAA CRCP funding allocations for management activities. The CRCP understands and respects the flexibility required by coral reef managers in implementing complex conservation and management programs. Should the partners seek funding for projects related to off-priority issues (either in the comprehensive framework of goals and objectives in this document or a new emerging issue not reflected in this document) it will need to be fully explained why the requested funding is most appropriate for the off-priority work versus efforts to address the priority Goals and Objectives identified through this process.

Priority Goals and Objectives are highlighted in **olive/bold** and *olive/italic* font, respectively. The attendees selected the Priority Goals and Objectives during the workshop and a follow-up a meeting.

THE TOP FOUR PRIORITY GOALS AS IDENTIFIED AND RANKED BY THE WORKSHOP PARTICIPANTS ARE:

1. Improve the condition of CNMI's coral reef ecosystems by reducing the amount of sediment, nutrients and other land-based sources of pollution in CNMI's watersheds.

2. Increase the abundance and average size of CNMI's key coral reef fishery species to protect trophic structure and biodiversity and improve coral reef ecosystem condition (within and outside of existing marine protected areas [MPAs]).
3. Develop the legal and administrative authority and capacity to monitor and assess impacts of military build-up activities on coral reefs by 2012.
4. Monitor the short- and long-term impacts of global climate change as part of a longer-term adaptation strategy.

These management actions primarily focus on the commonwealth's populated Southern Mariana Islands, although some activities extend to the Northern Islands and offshore banks and reefs.

Several objectives call out specific priority locations for activities. Objectives highlighted LaoLao Bay Watershed (Saipan), Garapan Watershed (defined as American Memorial Park to Garapan Fishing Base, Saipan), and Talakahaya Watershed (Rota) as priorities for working toward the reduction of land-based sources of pollution. Objectives related to protection of CNMI's fishery resources prioritize activities in the existing marine preserves.

SECTION TWO: STRATEGIC CORAL REEF MANAGEMENT PRIORITIES

This section presents the entire framework of goals and objectives developed and agreed upon by the core group during this process. In this section, the Priority Goals and Objectives are highlighted in **olive/bold** and *olive/italic* font, respectively. These are the top priorities for management action as agreed upon by the core managers group. These Priority Goals and Objectives will guide funding allocations for management activities.

IMPACTS OF LAND-BASED SOURCES OF POLLUTION

GOAL 1: Improve the condition of CNMI's coral reef ecosystems by reducing the amount of sediment, nutrients and other land-based sources of pollution in CNMI's watersheds.

Objectives:

1.1 Implement LaoLao Conservation Action Plan (CAP) as a model approach to site-based planning and management by 2013 (coinciding with the end of the American Recovery and Relief Act [ARRA] road improvement project in LaoLao Bay).

Key Actions To Achieve this Objective:

- a. Coordinate with ARRA road improvement project to implement remaining best management practices and revegetation projects by 2011.
 - b. Provide effective enforcement against illegal activities (e.g., burning, poaching, dumping, land-clearing, etc.).
 - c. Engage social marketing expert to plan targeted outreach campaign by 2010 to increase stakeholder participation. Implementation to begin by 2011.
 - d. Ensure that ongoing coral reef monitoring is designed to measure the effectiveness of implemented CAP projects by 2010.
 - e. Evaluate data to assess the effectiveness of management measures. Begin baseline in 2010.
 - f. Revisit CAP annually to assess progress and revise if necessary. Draw lessons that can be applied to future CAPs.
- 1.2 Develop and begin implementing a CAP or comprehensive watershed management plan in Garapan (defined as American Memorial Park to Garapan Fishing Base) by 2015 to improve water quality and condition of adjacent coral reefs.*



Sediment plumes like the one shown introduce a number of pollutants and smothering silt into coral reef ecosystems.
Photo Courtesy: CNMI DEQ

Key Actions To Achieve this Objective:

- a. Understand status of current planning efforts, identify what actions are being considered or implemented and update watershed plan by 2010.
- b. Develop public participation strategy to garner support for a watershed stormwater management plan and other initiatives by 2012.
- c. By 2011 begin implementing stormwater improvement strategies developed during the Municipal Stormwater Training conducted by the Center for Watershed Protection and Horsley Witten in September 2009.
- d. Select and implement key strategic actions from existing plans and designs (i.e. Garapan Watershed Plan) by 2011.
- e. Revise or create new architecture and engineering plan for stormwater infrastructure (if needed) by 2012.

- f. Find funding and implement architecture and engineering plan by 2015.

1.3 Develop and begin to implement a CAP or comprehensive watershed management plan for a key watershed in Rota to improve water quality and condition of adjacent coral reefs.

Key Actions To Achieve this Objective:

- a. Conduct Rota CAP in 2010 and begin implementing in 2011–12.
- 1.4 Increase public awareness of how changes in household and commercial land-use activities can contribute to improved reef condition.

Key Actions To Achieve this Objective:

- a. Engage social marketing expert to develop targeted outreach campaigns by 2011. (Social marketing is the application of marketing tools to change attitudes and behaviors. It has been successfully applied to



Soil stabilization projects, such as this one in the Talakahaya watershed, are included in the key actions necessary to reduce the impacts of land-based sources of pollution in CNMI. Photo Credit: Kathy Chaston, NOAA CRCP

- such issues as seatbelt use, smoking, pollution, teen drug abuse, and reproductive health.)
 - b. Integrate social marketing plan with CAPs and other ongoing watershed management initiatives rather than implement separate awareness activities by 2010. Build off messaging from LaoLao CAP.
 - c. Partner with NGOs to implement targeted outreach campaigns by 2010.
- 1.5 Strengthen watershed management in San Jose, Tinian, by conducting a watershed inventory, in preparation for CAP by 2013.

Key Actions To Achieve this Objective:

- a. Gather flow direction and rate data.
- b. Gather water quality data.
- c. Examine conductivity between watershed discharge and near-shore marine environment.

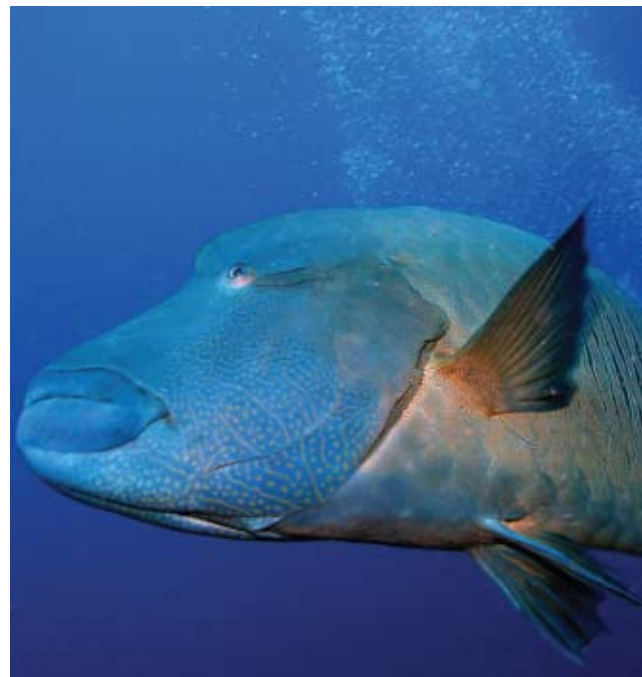
- 1.6 Reduce sediments and other land-based sources of pollution in Talakhaya, Rota, by continuing revegetation and public outreach.

FISHERIES AND IMPACTS OF FISHING

GOAL 2: Increase the abundance and average size of CNMI's key coral reef fishery species to protect trophic structure and biodiversity and improve coral reef ecosystem condition (within and outside of existing MPAs).

Objectives:

- 2.1 Increase compliance with fishing laws and regulations that affect key coral reef fishery species by 2015. Focus these efforts in priority watersheds (those with completed CAPs).



Left Image: Impaired water quality impacts fishing and swimming activities at American Memorial Park, Saipan. Photo Credit: Kathy Chaston, NOAA CRCP Right Image: The Napoleon Wrasse is one of the largest reef fish and is listed as endangered by the IUCN. Photo Credit: Dave Burdick

Key Actions To Achieve this Objective:

- a. Work with a social marketing expert to plan targeted outreach and awareness campaigns to increase compliance with fishing laws and regulations by 2011. The aim is to educate fishers, consumers and commercial entities (businesses) about coral reef fish life histories, the need for fisheries management and the impacts of specific fishing practices.
- b. Improve enforcement of fishery laws and regulations by 2012 through providing additional capacity, equipment and resources to local enforcement offices. Create opportunities, through social marketing campaign, for enforcement officers to engage with local communities to raise awareness about existing rules and regulations.
- c. Monitor effectiveness of existing enforcement program and review and revise enforcement plan annually starting in 2012. Vet results of the monitoring with affected community and seek input from resource users about how compliance could be improved.
- d. Provide regular training for enforcement staff in enforcement, investigation and community engagement techniques. (Need for frequent training opportunities on multiple subjects—fish identification, new laws, technologies, techniques and underwater investigation.)
- e. Improve interagency collaboration and cross-training opportunities through a joint enforcement agreement.
- f. Support the development of community management programs to increase public knowledge of, support for and participation in fishery management activities (e.g., Tasi watch in LaoLao Bay) by 2013.

2.2 *Strengthen the information base for fisheries management by 2012. Collect, analyze and manage fishery-dependent and -independent data about the status of stocks, including relevant life history information for targeted coral reef fishes. (Refer to Summary Recommendations [Urgent/Critical] in “Coral Reef Stock Assessment Workshop” [Western Pacific Regional Fishery Management Council (WPRFMC), Feb. 2008]).*

Key Actions To Achieve this Objective:

- a. Expand creel survey on Saipan, and perhaps to Tinian and Rota. Prior to expansion, ensure that current surveys follow a reportable, defensible, complete design.
- b. Conduct a Northern Islands shallow-water bottomfish stock assessment.
- c. Collect additional catch data from market surveys to determine:
 - What types of fish make up the majority of market sales?
 - Are fish being caught before they can reproduce?
 - How do markets compare between all other islands?

2.3 *Enact the Fishery Management Act and accompanying regulations by 2010.*

Key Actions To Achieve this Objective:

- a. Educate the legislature on how a fisheries act will benefit/affect them.
- b. Ensure appropriate legal support to make any changes to act necessary for passage.

2.4 Take necessary action to ensure that CNMI is a decision-making partner in Mariana Trench Marine National Monument management. Ensure that the Monument incorporates local initiatives and laws.

Key Actions to Achieve this Objective:

- a. Ensure locally designated points of contact communicate with appropriate federal managers to start dialogue on management issues.

2.5 Implement major objectives in the NOAA National Marine Fisheries Service (NMFS) Habitat Assessment Improvement Plan, which are relevant to CNMI coral reefs.

Key Actions To Achieve this Objective:

- a. Conduct improved habitat assessments to refine/narrow definitions of Essential Fish Habitat (EFH) and Habitat of Particular Concern.
- b. Prioritize habitat protection, restoration and mitigation.
- c. Improve accuracy of EFH consultations regarding proposed (fishing or non-fishing) impacts.
- d. Improve quantification of habitat value/loss and mitigation recommendations.
- e. Improve integrated ecosystem assessments (Ecosystem Based Fishery Management).

IMPACTS OF MILITARY BUILD-UP

GOAL 3: Develop the legal and administrative authority and capacity to monitor and assess impacts of military build-up activities on coral reefs by 2012.

Objectives:

3.1 *Establish protocols for joint CNMI-federal agency involvement in the environmental assessment and monitoring of military activities (e.g., landing boats, sonar exercises) in proximity to reefs by 2012.*

Key Actions To Achieve this Objective:

- a. Establish a working group to coordinate development and implementation of protocols. Include CNMI representative for Navy Joint Guam Program Office meetings to ensure coordination. Review examples from Farallon De Medinilla, Guam and Hawai'i as a guide. (The aim is for CNMI agencies to be involved in the design and implementation of military monitoring activities in proximity to coral reefs. If monitoring is not adequate to assess impacts, CNMI agencies should partner with other federal agencies to supplement monitoring activities.)

3.2 Rapidly assess and collect baseline information on reef conditions in existing or proposed military training areas. Work with military to establish these baselines and long-term monitoring of these sites.

Key Actions To Achieve this Objective:

- a. Establish an interagency monitoring team to develop monitoring protocols and begin monitoring coral reefs in existing or proposed military training areas by 2013.
- b. Develop biosecurity baselines and monitoring protocols to reduce the risk of aquatic and terrestrial invasive plants and animals in the major harbors and military landing zones within CNMI by summer 2011.

3.3 Establish protocols to avoid and minimize impacts of military vessel anchors on CNMI's reef systems by 2011.

Key Actions To Achieve this Objective:

- a. Establish a working group to coordinate development and implementation of protocols by 2010.

- b. Review established protocols and management strategies for minimizing anchor damage from other areas and adapt for CNMI (e.g., see Great Barrier Reef Marine Park Authority, CORAL guidelines, Florida) by 2010.
 - c. Work with local enforcement agencies to enforce and monitor compliance with protocols by 2011.
 - d. Monitor coral reefs area for anchor damage (add to existing monitoring programs) by 2011.
- 3.4 Develop strategies for managing increased recreational uses related to increased military presence.

Key Actions To Achieve this Objective:

- a. Conduct socioeconomic monitoring of increased marine recreational activity (by military, dependents and contractors) in CNMI waters, and related impacts to reefs.

IMPACTS OF CLIMATE CHANGE AND OCEAN ACIDIFICATION

GOAL 4: Monitor the short- and long-term impacts of global climate change as part of a longer-term adaptation strategy.

Objectives:

4.1 Create and build capacity to implement a response plan by 2012 to quantify and characterize bleaching events, building on recommendations from NOAA climate change workshop held in Guam, September 2009.

Key Actions To Achieve this Objective:

- a. Establish an interagency working group to oversee development.



Left Image: Implementing a bleaching response plan is an outcome of the 2009 climate-change workshop. Photo Credit: Britt Parker, NOAA Coral Reef Watch Right Image: Coral bleaching can lead to coral mortality and transition of a reef to an algae-dominated ecosystem. Photo Credit: Dave Burdick

4.2 Work with NOAA and CNMI Coastal Resources Management Office (CRM) to increase capacity to monitor and mitigate impacts to CNMI's coastlines from sea-level rise.

Key Actions To Achieve this Objective:

- a. Continue beach profiling to prioritize locations most susceptible to inundation.
- b. Create geographic information system-based situation models based on sea-level rise scenarios by 2013.
- c. Create/develop adaptation plans focusing on vulnerable areas and infrastructures relocation strategies by 2015.

4.3 Develop a climate change awareness program for the community.

Key Actions To Achieve this Objective:

- a. Develop a communications plan (including outreach to media, key

leaders, stakeholders, etc.) as part of the CNMI Coral Bleaching Response Plan by 2010.

- b. Coordinate with community dive groups, businesses and individuals to build participation in BioSearch program as a tool to assist in early warning for bleaching, Crown of Thorns Starfish, and other climate driven events by 2011.
- c. Coordinate with local media (print, broadcast and radio) to provide a coral bleaching watch update to run at regular intervals during summer months by 2010.

4.4 Increase capacity (e.g., Integrated Coral Observing Network expansion) for monitoring ocean temperature change, bleaching, acidification and other potential impacts of global climate change.

SECTION THREE: LINKAGES TO NOAA'S NATIONAL GOALS AND OBJECTIVES

Table 1 shows how CNMI's Priority Goals and Objectives correlate to the NOAA CRCP National Goals and Objectives for coral reef conservation. Table 1 was developed after the CNMI Coral Reef Management Priority Setting Process was complete to explicitly identify potential partnerships between the managers in CNMI and NOAA CRCP. Addressing both local jurisdictional priorities and national goals and objectives will increase efficiency and leveraging of the resources available for coral reef conservation. NOAA CRCP will use this table to inform future investments in coral reef conservation in CNMI.

CNMI's Priority Goals and Objectives	NOAA's National Goals and Objectives for Coral Reef Conservation	Explanation of Correlation (as needed)
GOAL 1: IMPROVE THE CONDITION OF CNMI'S CORAL REEF ECOSYSTEMS BY REDUCING THE AMOUNT OF SEDIMENT, NUTRIENTS AND OTHER LAND-BASED SOURCES OF POLLUTION IN CNMI'S WATERSHEDS.		
OBJECTIVE 1.1: Implement LaoLao CAP as a model approach to site-based planning and management by 2013 (end of ARRA road improvement project in LaoLao Bay).	Land-Based Sources of Pollution (LBSP) Impacts Objective 1.3: Implement watershed management plans and relevant LAS within priority coral reef ecosystems and associated watersheds to improve water quality and enhance coral reef ecosystem resilience. Where needed, develop (or update) watershed management plans that incorporate coral reef protection measures.	CAPs are site-based plans that address watershed management and other issues and identify specific actions at the local level to reduce threats to resources.
OBJECTIVE 1.2: Develop and begin implementing a CAP or comprehensive watershed management plan in Garapan (defined as American Memorial Park to Garapan Fishing Base) by 2015 to improve water quality and condition of adjacent coral reefs.	LBSP Impacts Objective 1.3: Implement watershed management plans and relevant LAS within priority coral reef ecosystems and associated watersheds to improve water quality and enhance coral reef ecosystem resilience. Where needed, develop (or update) watershed management plans that incorporate coral reef protection measures.	See Objective 1.1.
OBJECTIVE 1.3: Develop and begin to implement a CAP or comprehensive watershed management plan for a key watershed in Rota to improve water quality and condition of adjacent coral reefs.	LBSP Impacts Objective 1.3: Implement watershed management plans and relevant LAS within priority coral reef ecosystems and associated watersheds to improve water quality and enhance coral reef ecosystem resilience. Where needed, develop (or update) watershed management plans that incorporate coral reef protection measures.	See Objective 1.1.
GOAL 2: INCREASE THE ABUNDANCE AND AVERAGE SIZE OF KEY CORAL REEF FISHERY SPECIES TO PROTECT TROPHIC STRUCTURE AND BIODIVERSITY AND IMPROVE CORAL REEF ECOSYSTEM CONDITION (WITHIN AND OUTSIDE OF EXISTING MPAs).		
OBJECTIVE 2.1: Increase compliance with fishing laws and regulations that affect key coral reef fishery species by 2015. Focus these efforts in priority watersheds (those with completed CAPs).	Fishing Impacts Goal 3: Increase stakeholder engagement and capacity to improve local compliance with and enforcement of fisheries management regulations that further coral reef ecosystem conservation.	No explanation needed.

Table 1

CNMI's Priority Goals and Objectives	NOAA's National Goals and Objectives for Coral Reef Conservation	Explanation of Correlation (as needed)
GOAL 2: INCREASE THE ABUNDANCE AND AVERAGE SIZE OF KEY CORAL REEF FISHERY SPECIES TO PROTECT TROPHIC STRUCTURE AND BIODIVERSITY AND IMPROVE CORAL REEF ECOSYSTEM CONDITION (WITHIN AND OUTSIDE OF EXISTING MPAs).		
<p>OBJECTIVE 2.1 (<i>continued from previous page</i>): Increase compliance with fishing laws and regulations that affect key coral reef fishery species by 2015. Focus these efforts in priority watersheds (those with completed CAPs).</p>	<p>Fishing Impacts Objective 3.1: Increase participation of stakeholder or citizen groups in fisheries management planning, decision-making and monitoring activities that improve conservation of coral reef ecosystems.</p> <p>Fishing Impacts Objective 3.2: Strengthen local agency and community capacity for effective and consistent enforcement of regulations or behaviors that reduce impacts of fishing on coral reef ecosystems.</p> <p>Fishing Impacts Objective 3.3: Work with partners to identify economic alternatives that reduce effects of non-traditional extractive livelihoods on coral reef ecosystems and provide options for communities impacted by coral reef fisheries management actions.</p> <p>Fishing Impacts Objective 3.4: Conduct biological and socioeconomic research and monitoring necessary to assess the effectiveness of compliance and enforcement activities, understand community concerns, flag roadblocks to implementation and incorporate into management efforts.</p>	<p>No explanation needed.</p>
<p>OBJECTIVE 2.2: Strengthen the information base for fisheries management by 2012. Collect, analyze and manage fishery-dependent and -independent data about the status stocks, including relevant life history information for targeted coral reef fishes. (Refer to Summary Recommendations [Urgent/Critical] in "Coral Reef Stock Assessment Workshop" [WPRFMC, Feb. 2008]).</p>	<p>Fishing Impacts Objective 1.3: Obtain essential life history and ecological information on key species or functional groups to support management actions.</p> <p>Fishing Impacts Objective 1.4: Obtain necessary information on fishing effort in U.S. coral reef ecosystems by measuring fishing intensity, fishing mortality, frequency, area coverage, community dependence, etc., to inform management activities.</p> <p>Fishing Impacts Objective 1.5: Predict appropriate levels of extraction for key species or groups by developing and utilizing valid, precise, place-based and realistic ecosystem dynamics models.</p> <p>Fishing Impacts Objective 1.6: Conduct applied biological, social, and economic research and monitoring to evaluate effectiveness of coral reef ecosystem management actions on key species or groups.</p>	<p>No explanation needed.</p>

Table 1 continued

CNMI's Priority Goals and Objectives	NOAA's National Goals and Objectives for Coral Reef Conservation	Explanation of Correlation (as needed)
<p>OBJECTIVE 2.3: Enact the Fishery Management Act and accompanying regulations by 2010.</p>	<p>Fishing Impacts Objective 3.2: Strengthen local agency and community capacity for effective and consistent enforcement of regulations or behaviors that reduce impacts of fishing on coral reef ecosystems.</p> <p>Fishing Impacts Objective 3.4: Conduct biological and socioeconomic research and monitoring necessary to assess the effectiveness of compliance and enforcement activities, understand community concerns, flag roadblocks to implementation, and incorporate into management efforts.</p> <p>Fishing Impacts Objective 4.3: Develop targeted, locally-relevant outreach and communication strategies to increase community understanding and support for regulations to protect key coral reef ecosystem species/functional groups and expanded use of marine protected areas.</p>	<p>The CNMI Fishery Management Act articulates CNMI's fisheries management policy and the rules and regulations established to enforce the policy. The national fishing impacts objectives each relate to aspects of enforcing fisheries rules and regulations that the CRCP can support in partnership with CNMI.</p>
<p>GOAL 3: DEVELOP THE LEGAL AND ADMINISTRATIVE AUTHORITY AND CAPACITY TO MONITOR AND ASSESS IMPACTS OF MILITARY BUILD-UP ACTIVITIES ON CORAL REEFS BY 2012.</p>		
<p>OBJECTIVE 3.1: Establish protocols for joint CNMI-federal agency involvement in the environmental assessment and monitoring of military activities (e.g., landing boats, sonar exercises) in proximity to reefs by 2012.</p>	<p>None</p>	
<p>OBJECTIVE 3.2: Rapidly assess and collect baseline information on reef conditions in existing or proposed military training areas. Work with military to establish these baselines and long-term monitoring of these sites.</p>	<p>None</p>	
<p>OBJECTIVE 3.3: Establish protocols to minimize impacts of military vessel anchors on CNMI's reef systems by 2011.</p>	<p>None</p>	
<p>GOAL 4: MONITOR THE SHORT- AND LONG-TERM IMPACTS OF GLOBAL CLIMATE CHANGE AS PART OF A LONGER-TERM ADAPTATION STRATEGY.</p>		
<p>OBJECTIVE 4.1: Create and build capacity to implement a response plan by 2012 to quantify and characterize bleaching events, building on recommendations from NOAA climate-change workshop held in Guam, September 2009.</p>	<p>Climate Impacts Objective 1.3: Develop and implement climate-related crisis response plans in all U.S. coral reef jurisdictions to provide a framework for early warning, communication, monitoring, research and management response to protect coral reef ecosystems from acute events such as coral bleaching, infectious disease outbreaks, tropical storm impacts and major rainfall events.</p>	<p>No explanation needed.</p>

Table 1 continued

APPENDIX ONE: PRIORITY SETTING PROCESS PARTICIPANTS

Core Group: place-based managers of specific coral reef areas.

Each member of this group was invited to attend the workshop, to partake in an interview prior to the workshop and to participate in document revisions.

Frank Rabauliman, Division of Environmental Quality (DEQ)
Fran Castro, DEQ
Kathleen Herrmann, DEQ/NOAA
Janice E. Castro, DEQ
Lisa Huyhn Eller, DEQ
Dr John Joyner, CRM
John Starmer, CRM
Brooke Nevitt, CRM
Sylvan Igisomar, Division of Fish and Wildlife (DFW)
Michael Trianni, DFW
Ray Roberto, DFW
Tony Mareham, DFW
Mike Tenorio, DFW
Dr. Peter Houk, Pacific Marine Resources Institute (* Included due to previous position with DEQ)
Steve McKagan, NOAA, NMFS, Pacific Islands Regional Office (PIRO)
Jack Ogumoro, WPRFMC

Advisors: managers of jurisdictions and populations impacting CNMI's coral reefs.

Each member of this group was invited to interview prior to the workshop and to participate in document revisions.

Nate Hawley, DFW
Ana Agulto, CRM
Doris Chong, CRM
Kathy Yuknavage, Mariana Islands Nature Alliance (*Included due to previous position with CRM)
Kate B. Fuller, DEQ

Science Advisors: members of the scientific community with expertise in various aspects of coral reef ecosystems.

Each member of this group was invited to review documents and to offer revisions.

Jacob Asher, NMFS, Pacific Islands Fisheries Science Center (PIFSC), Coral Reef Ecosystem Division (CRED)
Rusty Brainard, NOAA, PIFSC, CRED
Joyce Miller, NOAA, PIFSC, CRED
Benjamin Richards, NOAA, PIFSC, CRED
Bernardo Vargas-Angel, NOAA, PIFSC, CRED
Arielle Levine, NOAA, PIFSC
Robert Van Woesik, Florida Institute of Technology
Bob Schroeder, NOAA, PIRO

APPENDIX TWO: CONTEXT

The Situation Analysis is a preparatory document that summarizes coral reef threats, condition and trends; key management issues; and key agencies' management goals. As an initial step in the priority setting process, it was used ahead of meetings and interviews to provide a reference point and boundary for priority setting discussions with place-based coral reef managers in CNMI. The documents that make up the basis of this analysis were identified during interviews with place-based coral reef managers in CNMI and via a desk review of existing management plans from those agencies that are responsible for or affect CNMI's coral management. The coral reef managers interviewed for this study were identified by the NOAA CRCP team with input from the NOAA CRCP point of contact in CNMI and included NOAA CRCP, NOAA National Marine Fisheries Service (NMFS)/Pacific Islands Regional Office, NOAA–NMFS/Western Pacific Regional Fishery Management Council, Department of Planning and Natural Resources (DPNR)–Division of Environmental Quality, DPNR–Coastal Resources Management, DPNR–Division of Fish and Wildlife, Mariana Islands Nature Alliance and Pacific Marine Resources Institute.

The Situation Analysis identified the following issue areas—which reflect both specific threats as well as tools to mitigate threats—as those that were most commonly referred to in the documents reviewed. These results are listed in no particular order.

Water Quality includes monitoring and data collection from a number of sites for bacteria and nutrient levels as well as turbidity reduction from runoff. Many of the efforts to improve water quality overlap with issues of construction and development: road stabilization and

stormwater control reduce runoff and turbidity. Other efforts include soil stabilization and establishing treatment wetlands. This topic is closely connected to the issue of land-based sources of pollution as well as construction and development, both noted point and non-point sources of pollution.

Education, Outreach and Community

Involvement is the most prolific goal set. These goals cut across all areas of management and conservation. Because the economy of the islands relies heavily on coral reefs, both as a tourism draw and a fishery, the status of the ecosystem depends upon sustainable users. Education and outreach programs are vital to public and visitor understanding of human impact and sustainable use. The vast majority of actions and objectives include using volunteers to implement plans.

In addition, the following issues were particularly noteworthy: Regulation and Enforcement, Construction and Development, Land-Based Sources of Pollution and Research, Maintaining Natural Habitats, Fishing and Zoning and Moorings.

Regulation and Enforcement refers to enforcing regulations already in place and updating regulations to reflect current needs and stresses. Regulations must evolve to meet the needs of an ecosystem changing due to new and increased anthropogenic stresses as well as the effects of global climate change. As such, research and monitoring are often linked to updating regulations. In addition, this issue often coincides with significant education and outreach goals, as dispersing information on regulations is the first step toward user group compliance.



Bird Island Marine Sanctuary is a no-take marine protected area on Saipan that extends 1,000 feet from the coast. It was established to promote the concept of conserving and protecting natural resources; to serve as a natural laboratory for the continued propagation of wildlife and marine species; and to serve as an educational laboratory for educators and students. Photo Credit: Leslie Ware

Construction and Development refers both to development meant to improve environmental quality and efforts to mitigate human impacts due to construction and commercial development. Major construction efforts in CNMI revolve around stormwater management, such as road stabilization. Revegetation of unstable areas to prevent soil erosion and nutrient runoff are often mentioned as well. Construction and development supports recreational activities and includes expanding and maintaining trail networks and park facilities. It is also closely linked with water quality and land-based sources of pollution discussed below.

Land-Based Sources of Pollution pertains to actions that degrade water quality or have a direct impact on reef health. As is noted above, water quality and construction and development are linked and pertain to land-based sources of pollution. As such, both of these topics could fall under the broader topic of land-based sources of pollution.

Research and Maintaining Natural Habitats includes research and monitoring in high-impact areas, such as popular snorkel/dive sites and highly developed coastlines. Research and habitat maintenance goals also include designating and enforcing no-motor and no-take areas. This issue frequently links to various other conservation management areas, as the goals are often to maintain habitats with as little impact as possible.

Fishing is an economic keystone for CNMI. Fishing is both a commercial and personal livelihood for residents as well as a recreational activity for visitors and locals alike. Because fishery regulation has significant community impact, outreach programs and interagency management with private stakeholders is often necessary to determine the most effective management practice.

Zoning and Mooring refers to the need to designate specific areas for specific activities and includes recommendations for general calls for area-wide zoning schemes, such as a mix of marine protected areas, anchoring/no-anchoring areas, multi-use areas, no-take marine reserves, etc.

APPENDIX THREE: PRELIMINARY IDENTIFICATION OF CAPACITY GAPS

During the interviews with coral reef managers in CNMI, facilitators worked to understand the working relationship between managers and management documents. Facilitators noted and identified challenges to and current deficiencies in achieving stated goals and objectives, noting specific capacity gaps that likely will need attention.

The Coastal Resources Center at the University of Rhode Island developed and applied common tools for comparative assessments of coastal ecosystem governance. This approach involves three categories, phrased as key statements, for enabling conditions that allow an initiative to successfully execute a sustained plan of action designed to influence the course of events in an ecosystem.

The three categories are: constituencies, commitment and capacity. This baseline will also identify the immediate capacity gaps that are directly related to implementing this strategic approach. These gaps will be explored further, and a capacity assessment will be developed in phase II of this effort, beginning in fiscal year 2010.

CONSTITUENCIES

Premise:

To achieve success, a core of well-informed and supportive **constituencies** comprised of stakeholders in both the private sector and government agencies must actively support the program.

Measures:

1. The user groups who are affected by your program understand and support the goals, strategies and targets.
2. There is public support for your program.
3. The institutions that assist in implementing your program, or the institutions that are affected by the plan, understand and support it.

Results:

A core group of resource managers in the DEQ, CRM, DWF and among nongovernmental organizations understands and supports reef management objectives. Other management personnel are not opposed to DEQ's reef management initiatives, but have other management priorities. Support among resource user groups seems to be uneven. Fishers, in particular, show mixed support. CNMI coral reef initiative is seeking to build support for greater self-management among fishers through a social marketing plan that applies marketing tools to the promotion of fishing practices that reduce negative impacts on reef systems. Recreational operators generally understand and support resource management objectives, according to management resource people with whom we spoke.

COMMITMENT

Premise:

To achieve success, it is necessary that the delegated authorities have expressed **commitment** to the policies of a program and to the allocation of financial resources required for long-term program implementation.

Measures:

1. The appropriate level of government has formally approved the plan of action.
2. The government provided the program with the authorities it needs to successfully implement its plan of action.
3. Sufficient financial resources have been committed to fully implement the program over the long-term.

Results:

Commitment is strong in DEQ from the director down, among experienced staff in CRM and DFW and among nongovernmental experts including some of whom are former government staff. There appears to be strong agreement among resource management professionals about the need for greater management of land-based sources of pollution, more rigorous management of fishing activities and increased attention focused on climate change and the military build-up. Place-based funding for managing land-based sources of pollution will require support from multiple agencies. Regarding funding, CNMI relies heavily on federal funds. Local funding for management, particularly for managing land-based sources of pollution, will be essential. Commitment to increased enforcement of fishing activities is problematic.

CAPACITY

Premise:

To achieve success, it is necessary for sufficient **capacity** be present within the institutions responsible for the program to implement its policies and plan of action.

Measures:

1. Your program possesses the human resources to implement its plan of action.
2. Your program possesses the institutional resources (equipment, materials, etc.) to implement its plan of action.
3. There are internal or external barriers to successfully implement plan of action. What are these?

Results:

There is a core of skilled and knowledgeable resource management specialists among DEQ, CRM, DFW and nongovernment organizations who care passionately about reef management issues. There appear to be a few specialist gaps in the CRM program, some of which may be remedied with increased experience and mentoring. The more serious capacity issues relate to institutional infrastructure and higher-level leadership. A number of respondents mentioned difficulties in applying for and managing project funding. Some addressed the difficulties in navigating the grants Web site and forms and the relatively small grants they received. This required them to be constantly applying for additional funding. Several suggested having an intermediary financial management agency such as the Research Corporation of the University of Hawai`i with which to work. There were also concerns about the perceived Honolulu-centric scientific research agenda and the lack of equipment and other resources to do scientific research, including climate-change research, more directly related to CNMI's management priorities.



Resilient coral ecosystems are better able to recover from adverse impacts, such as coral bleaching. Resiliency in the face of climate change and ocean acidification is one of two overarching goals within CNMI's management priorities. Photo Credit: Greg Moretti

Regarding the impacts of fishing activities on reefs, enforcement and prosecution of existing regulations is problematic at best. CNMI's Coral Reef Initiative hopes to initiate a more intensive social marketing effort to educate fishers and other users. Regarding managing land-based sources of pollution, several significant place-based efforts are underway and many projects have been completed or are underway at LaoLao Bay. Management leadership now wants to focus on Garapan where near-shore waters are frequently polluted. Several plans have already been completed, but the needed sewer lines, treatment facilities and stormwater facilities would be expensive.

This initial assessment will be followed by a more detailed assessment and analysis that will focus on capacity gaps in relation to the specific management goals and objectives that are finalized in this priority setting process.

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