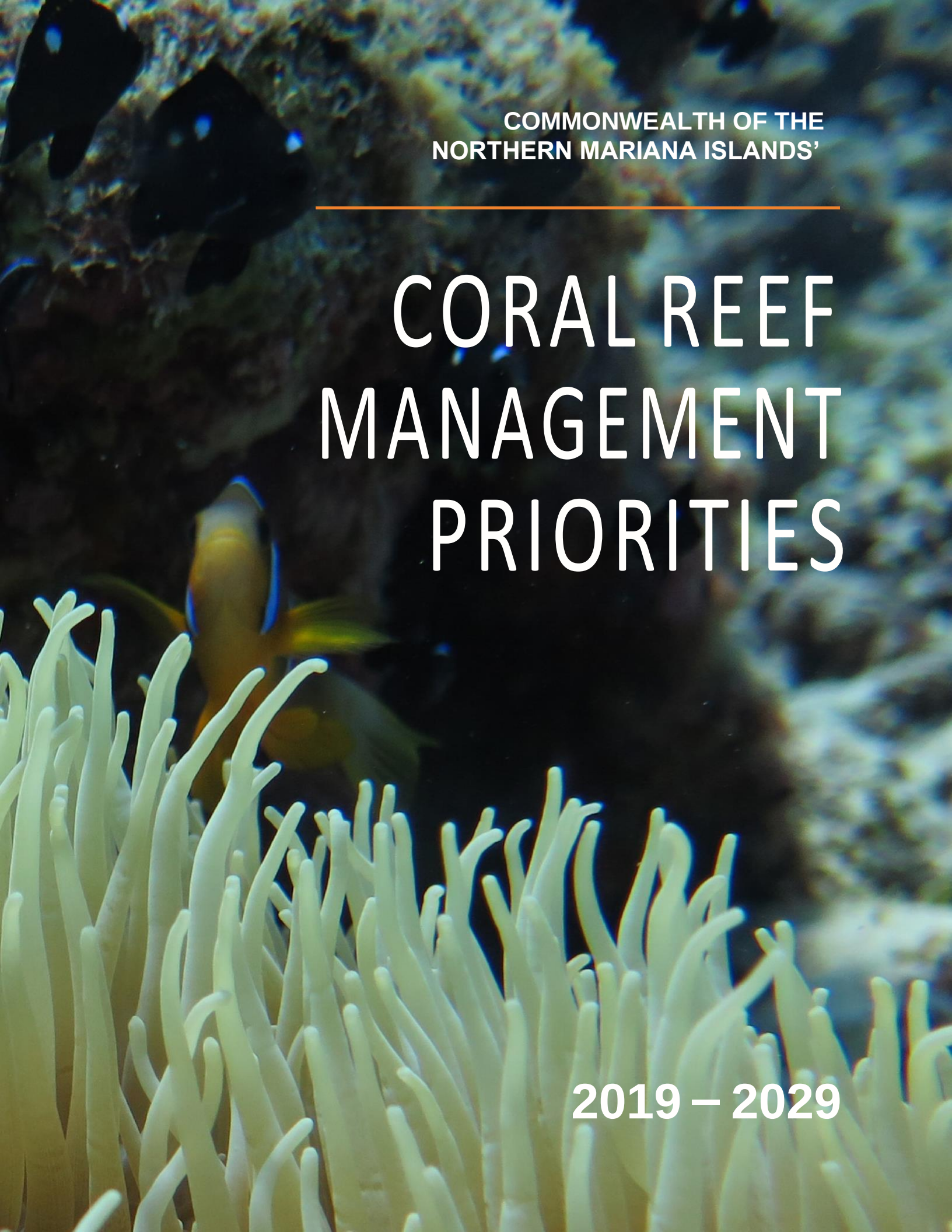

COMMONWEALTH OF THE
NORTHERN MARIANA ISLANDS'

CORAL REEF MANAGEMENT PRIORITIES

2019 – 2029

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ACRONYMS

BECQ	Bureau of Environmental and Coastal Quality
CAP	Conservation Action Plan
CC	Climate Change
CMP	Coral Management Priorities
CNMI	Commonwealth of the Northern Mariana Islands
COTs	Crown of Thorns
CRCP	Coral Reef Conservation Program
CRI	Coral Reef Initiative
DCRM	Division of Coastal Resources Management
DEQ	Division of Environmental Quality
DFEMS	Department of Fire and Emergency Management Services
DFW	Division of Fish and Wildlife
DLNR	Department of Lands and Natural Resources
DOF	Division of Forestry
HANMI	Hotel Association of the Northern Mariana Islands
JAMS	Johnston Applied Marine Sciences
LAS	Local Action Strategies
LBSP	Land-Based Sources of Pollution
MINA	Micronesia Islands Nature Alliance
MC	Micronesia Challenge
MES	Micronesia Environmental Services
MPA	Marine Protected Area
MVA	Marianas Visitors Authority
NGO	Non-Governmental Organization
NMDOA	Northern Marianas Dive Operators Association
NOAA	National Oceanic and Atmospheric Administration
PIFSC	Pacific Islands Fisheries Science Center
PIRO	Pacific Islands Regional Office
PL	Public Law
POC	Point of Contact
TNC	The Nature Conservancy
WESPAC	Western Pacific Fisheries Management Council

INTRODUCTION

The purpose of this Priority Setting document is to articulate a set of updated strategic coral reef management priorities developed in consensus by the coral reef managers in the Commonwealth of the Northern Mariana Islands (CNMI). Potential funders are encouraged to invest in activities listed in this priorities document and encourage leveraging and new or expanded partnerships to build common coral reef conservation goals.

The Commonwealth of the Northern Mariana Islands (CNMI) is made up of 14 islands extending over 600 kilometers and is located in the western Pacific basin. The people of the CNMI value coral reefs and are dedicated to their sustained use and conservation. Coral reefs have traditional and contemporary values including the production of food, income from tourism, protection of the coastal zone from storms, biological diversity, and educational and research uses.

CNMI is enriched with some of the most beautiful and diverse coral reefs in the world. It provides excellent recreational diving and snorkeling opportunities. These coral reefs are home to many forms of sea life. They are also important to the islands because they provide food, protect beaches from typhoon damage and erosion, support the economy, and help to maintain the environmental health of the oceans. Furthermore, coral reefs are a significant part of CNMI's culture and are part of one's daily life for many in CNMI.

Threats to CNMI's coral reef systems are many and have grown due to the expansion in its large resident population base, tourist industry, and as of recent, major developments along the shorelines. The population of CNMI decreased between 2000 and 2010, and increased slightly from 2010–2016, but is still down over 20% since 2000 (Gorstein 2019). In addition to a declining population, the jurisdiction faces a number of other social challenges including a declining real median household income, an increasing poverty rate, and increasing dependence upon public assistance income in the territory. Coral bleaching, coral diseases, invasive species, and physical damage have contributed to the declining health of the reefs. This fact, coupled with the increased frequency of natural disturbances and pressures from coastal development (Puglise and Kelty, 2007), exemplifies the influence humans can have on the environment in this region. Conversely, it is also important to note that island and coastal communities are positively connected to coral reef resources through continued subsistence and cultural-based fishing, the tourism industry, commercial fishing, and a range of recreational activities enjoyed by residents (Gorstein, et al., 2019). From a long-term perspective, the decline in coral-reef health threatens the CNMI's cultural heritage, fisheries production, and economy. As a result, the CNMI government places coral reef ecosystem conservation and management as a priority.

Possibly the greatest threat to CNMI's reefs are thermal stress and coral bleaching events over the

last five years. The first of these major bleaching events occurred in 2013 when bleaching was observed in 85% of coral taxa on Saipan and Guam (Reynolds et al. 2014). This was followed in 2014 by a second mass bleaching event that impacted the entire archipelago (Heron et al. 2016). These

consecutive annual bleaching events resulted in over 90% loss of staghorn *Acropora* spp. corals in Saipan Lagoon (BECQ-DCRM, Long-Term Monitoring Program, unpub. data) and high mortality of shallow water coral communities throughout the island chain (Heron et al. 2016; NOAA Coral Reef Ecosystem Program (CREP) unpub. data). In 2015, the Marianas experienced El Niño Southern Oscillation (ENSO)related extreme low tides that exposed reef flats for prolonged periods during the dry season as well as a direct hit from the Category 4 Typhoon Soudelor.

In 2016, mild bleaching occurred throughout the region and a dramatic increase in coral disease was recorded in Guam (Raymundo 2017). In 2017, the most severe mass bleaching event on record occurred across the region. On Saipan, nearly all coral taxa were impacted down to at least 20 m depth (BECQ-DCRM unpub. data) and preliminary data indicate that 90% of *Acropora* spp. corals and 70% of *Pocillopora* spp. corals died on shallow (<10 m) reefs (Saipan 2018 Resilience Study, in development). Aside from thermal stress and coral bleaching events, other local stressors remain a threat, specifically surface upland runoff that ends up in the lagoon system, where shallow water hydrodynamics are relatively more static than along the windward coastline.

The economic valuation study of coral reefs by van Beukering (2006) indicated Saipan's coral reefs to be valued at $61 million. Interviews of local residents showed 94% of residents swim and wade in the ocean, have beach picnics and barbeques, 25% are active fisherman that target reef fish, and 15% snorkel on a regular basis. The strong fishing tradition and the use of the resource provides the basis for a clear tie between the ocean and the people of CNMI. A recent coral economic valuation study covering Saipan, Tinian and Rota states the current total value of coral reefs and seagrass in CNMI generate an annual value of $114.8 million (ERG, 2019; unpub. data). Therefore, marine resources continue to play a crucial role in the lives of citizens in the CNMI.

Tourism is the primary industry in CNMI providing jobs and an increase in revenues from businesses catering to tourists. Tourist arrival statistics from MVA show a steady increase in arrivals from 442,963 in 2014 to a high of 607,593 in 2018 (MVA Report, 2019). With a focus on ensuring the future of the CNMI's tourism industry, it has become essential to understand the economic value and underlying public perception of those natural resources that support the tourism industry; namely coral reefs and water-based recreational activities.

CNMI CORAL REEF INITIATIVE

The CNMI Coral Reef Initiative is a cross-agency program under the Office of the Governor and between the Bureau of Environmental and Coastal Quality's Divisions of Coastal Resources Management and Environmental Quality, as well as the Department of Lands and Natural Resources'

Division of Fish and Wildlife. The program is managed by the Coral Reef Point of Contact (POC) housed under the BECQ-DCRM. The POC's main responsibility is to manage and coordinate all coral reef related matters for the CNMI, and to ensure funding is available to address coral reef management priorities. The program

was formally established on November 3, 2003 through Governor's Executive Directive 235. The resource agencies work together to protect and preserve CNMI's coral reef ecosystems and ensure responsible management of these resources. This work is achieved through biological monitoring, habitat restoration, research, enforcement, and education and outreach.

A. Bureau of Environmental and Coastal Quality – Established on November 12, 2013 under Executive Order No. 2013-24, which merged the Division of Environmental Quality and the Coastal Resources Management Office into one Bureau under the Executive Branch. The purpose of the merger is to enhance efficiency and collaboration through integration of services and strategic goals, shared resources, and elimination of overlapping responsibilities. BECQ's Mission is to serve the public through wise management of CNMI natural resources, and by supporting healthy communities, a sustainable environment, and a vibrant economy.

    1) Division of Coastal Resources Management (DCRM) – Established on 11 February 1983 by Public Law 3-47 within the Office of the Governor, and reorganized under the Bureau of Environmental and Coastal Quality (BECQ) under the Governor's Executive Order 201324, the DCRM program was established in order to promote conservation and wise development around our coastal resources;

    2) Division of Environmental Quality – Established in 1982 under the Commonwealth Environmental Protection Act (PL 3-23) to protect the right of each person to a clean and healthful public environment.

B. Division of Fish and Wildlife – Empowered by PL 2-51 to conserve fish, game and wildlife, and to protect threatened and endangered species. DFW was created to help conserve and preserve the CNMI's unique natural resources and habitat.

THREATS TO REEFS

ENVIRONMENTAL AND ANTHROPROGENIC PRESSURES

Threats to CNMI's coral reef systems are many and have grown due to the expansion in the CNMI's large resident population base, tourist industry and as of recent, major developments along the shorelines. The greatest localized threats are (i) the surface upland runoff that ends up in the lagoon and nearshore reefs, and (ii) growing fishing pressure and impacts to nearshore fish assemblages, and growing tourism impacts in a few popular areas associated with reef damage such as Mañagaha Island (Houk and Van Woesik 2010, Houk, Benavente et al. 2014, Cuetos-Bueno, Houk et al. 2015, Houk, Camacho et al. 2015, Maynard, McKagan et al.
2015, Cuetos-Bueno, Hernandez-Ortiz et al. 2019). Runoff can contain sediment, oil and other organics, fertilizers, pesticides, and a host of other toxics and hazardous materials found commonly on the island. Heavy rains can create conditions where many of these substances enter the marine environment and may have detrimental impacts on sessile benthic organisms, such as corals, seagrasses, and other marine-life. Over-exploitation associated with fishing and tourism activities have direct impacts on marine resources, and subsequent indirect impacts from fisheries based upon the loss of ecosystem services. Coral reefs in the CNMI are simultaneously threatened by global stressors such as climateinduced high-temperature coral bleaching that has impacted our reefs especially over the past five

years. Preliminary surveys are showing 70%-90% loss of branching corals.

LAND BASED SOURCES OF POLLUTION

Nonpoint source pollution is a leading cause of coral reef degradation in the southern CNMI. Water quality is particularly impacted by urban runoff, improper treatment of sewage systems, unpaved roads, farms, land clearing, and development. Stormwater that drains to the sea carries sediment and excess nutrients, which smother coral and cause algal blooms, severely compromising reef health and resilience. Over the years, the CNMI has steadily increased watershed management efforts to curb land-based pollution by implementing best management practices in its priority watersheds on the islands of Saipan and Rota. A multi-disciplinary, advisory Watershed Group composed of both government and private sector professionals have been actively engaged in addressing the chronic erosion/sedimentation problems in CNMI.

FISHING PRESSURE AND LOSS OF HERBIVORES

Coral reef fisheries are difficult to manage, as these fisheries are typically multi-species and harvested by a wide variety of gear types. In the CNMI, conventional controls on catch are hard to justify socially, however, gear restrictions such as gill net ban, SCUBA fishing ban, explosives and poisons ban exist with some level of success but not formally documented, and size limits are still virtually impossible to administer. Fishing pressures combined with land-use perturbations have been detrimental to reef habitats and subsequently to reef fish resources. In short, management of coral reef fisheries in the CNMI has not provided protection against the overexploitation of reef fish resources (Cuetos-Bueno, Hernandez-Ortiz et al. 2019), while ongoing data collection is helping to identify species trends (Trianni, Gourley et al. 2018). In general, CNMI fisheries are in fair condition, although local depletion has been determined to exist in the southern islands, especially on the leeward sides of the islands. Proposed legislation HB 21-017 (Feb. 2019) to prohibit the taking and selling of certain sizes of fish species for commercial purposes was introduced and passed in the House and waiting for Senate action.

CLIMATE CHANGE

The CNMI's reefs have suffered mass coral bleaching events in the last two decades with increased exacerbation in the last five years resulting in reduced coral cover and changes in community composition. It is imperative to reduce local stressors that negatively affect the reef's ability to withstand climatic changes as well as to protect resilient coral populations. The recovery of CNMI reefs to large-scale disturbances has been linked to the extent of local stressors (Houk, Benavente et al. 2014). Thus, improving the management of local stressors is one of the top recommended strategies to best cope with the uncertainties of climate change.

GROUNDED VESSELS

Development in recent years has brought more vessel traffic into the Saipan Lagoon and harbor. Some vessels bring cargo, while others are used for recreational purposes or commercial marine sports operations and are anchored in the Saipan Lagoon. High intensity storms have caused several of these vessels to ground on coral reefs. Grounded vessels have been left in the Lagoon while resolution between the CNMI government and the responsible parties are conferred. The CNMI has a few derelict vessels needing removal, however, funding and local expertise capable of handling the removal has been challenging. Additionally, the anchoring of large commercial and naval vessels on shallow reef platforms impacts additional reef habitat outside of the Lagoon.

At present, new federal laws and local regulations have been enacted as a mechanism to address activities which are harmful for two threaten coral species under the Endangered Species Act, and requires consultation for activities that may impact these threatened species *Acropora globiceps* and

Seriatopora aculeata. In November 2018, PL 20-79, CNMI Coral Reef Protection Act was enacted into law providing the CNMI with an instrument to impose fines for grounded vessel incidences, anchor related injuries, destructive fishing practices, and nonpermitted taking of threatened species.

LACK OF ENFORCEMENT

Historically, coral reefs surrounding CNMI have been impacted by human uses. Military defense activities during World War I and II has heavily impacted reef habitat. Heavy artillery, an aircraft and sunken ships are still present in CNMI waters.

The CNMI has eight MPAs combined and some are heavily used by tourists to showcase coral reefs, fish, and other marine-life. Tourism has been a very important economic driver in CNMI and managing human impacts on coral reefs continues to be a challenge with limited resources and training for conservation officers to effectively enforce regulations. At times, cultural practices and respect may also inhibit enforcement along with the lack of political will.

OTHER DISTURBANCES

High Intensity Storms

Tropical cyclones and typhoons are a routine part of the annual seasonal cycles in the CNMI. These storms can affect coral reefs even when they do not pass directly over an island. Increased swells can cause coral damage through direct wave impact and by shifting loose objects (e.g., coral, rubble, debris, grounded vessels) around the reef. The precipitation associated with typhoons also tends to increase sedimentation and nutrient inputs from polluted runoff. In 2015, Typhoon Soudelor, a Category 4 storm directly hit the island of Saipan leaving a trail of destruction across the island. In 2018, Super Typhoon Yutu made landfall on Tinian and the southern part of Saipan at peak intensity. Yutu was designated as a Category 5 storm and both islands sustained significant damage to public infrastructure. The CNMI economy took a downturn due to lack of available utilities (i.e. power and water), resulting in the cease of visitors arriving into Saipan. The Saipan Lagoon was littered with marine debris from housing tin roofs, and at least three vessels were ripped from their moorings which grounded on coral reefs.

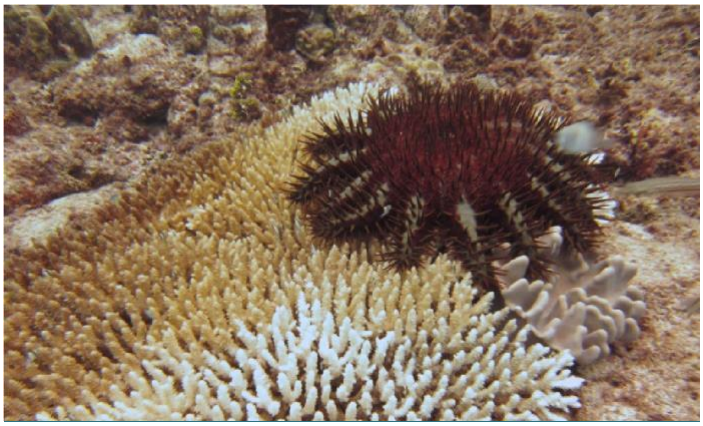
Coastal Development

The boom in rapid urban development from 2012 to present has led to overburdened and failing infrastructure, and an increase in negative effects from sedimentation.

Acanthaster planci or Crown of Thorns (COTs) Outbreaks

Intermittent outbreaks of *Acanthaster planci* have occurred on CNMI's reefs over at least the past three decades (Houk, Bograd et al. 2007). Crown of thorns

outbreaks can quickly decimate a reef and impede coral recovery from other stressors. Control programs during outbreaks have been discussed over the years but no formal program has been established. Similar to bleaching events, managing local stressors is imperative for reefs to recover from predator starfish outbreaks in a timely manner.



COLLABORATIVE PLANNING PROCESS

The CNMI coral reef management priorities were developed through a coordinated effort among the CNMI's natural resource management agencies, in particular, the Division of Coastal Resource Management Office (DCRM), Division of Environmental Quality (DEQ), Division of Fish and Wildlife (DFW), and key stakeholders. This document encompasses priorities for Saipan, Tinian, and Rota. The planning process resulted in the review and assessment of existing priorities, objectives and actions, and the development of a new pillar, new priority watershed, new goals, objectives and actions. The resulting list of priority projects will address relevant focus areas previously identified in the Local Action Strategies and 2010 Coral Management Priorities and aligned with NOAA CRCP's Strategic Plan. The planning process included initial meetings with Rota and Tinian natural resource agencies and key stakeholders to flush out new background information relevant to their islands. Participants brainstormed about coral reef protection challenges, problems and needs related to each priority pillar. The groups reviewed past actions and identified projects to address the issues. Each priority pillar was assigned a lead recorder tasked with taking the information gathered from the breakout sessions to report out and for use in developing draft goals, objectives, and actions.

Existing documents such as the LAS, 2010 Coral Reef Management Priorities, Laolao Bay, Talakhaya, and Garapan conservation action plans, the CNMI Capacity Building Assessment and the published studies referenced below were then used as a basis for further development and refinement of the priorities at a two-day stakeholder workshop held on Saipan. Over 40 participants from the three islands representing governmental agencies, non-profits, and business interests attended these stakeholder meetings.

The Nature Conservancy Micronesia Program facilitated the two-day stakeholders' workshop on Saipan, and the Division of Coastal Resources Management facilitated the Tinian and Rota meetings. The participants provided support and leadership offering input on threats, targets, and actions in the compilation of the coral management priorities as a result of the workshop. This document contains an overview of each coral reef management priority area which lists the goals, objectives, and actions that were selected as priorities.

These four priority areas are encompassed by two larger overarching themes that guide coral reef management efforts in the CNMI. First, the Micronesia Challenge, a shared commitment by the

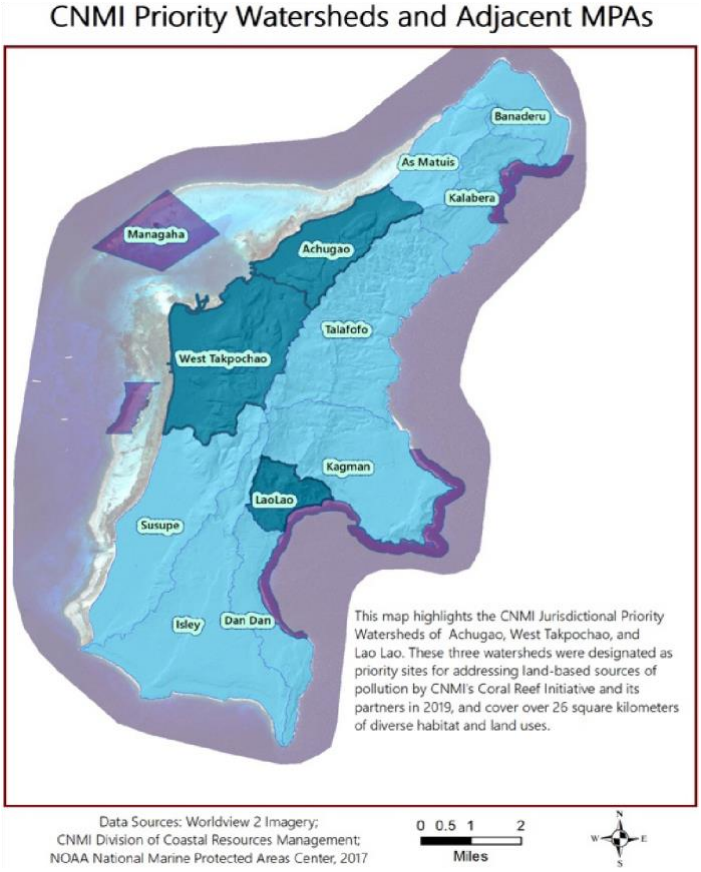
Republic of Palau, Federated States of Micronesia, Republic of Marshall Islands, Territory of Guam, and the Commonwealth of the Northern Mariana Islands to effectively conserve 30% nearshore marine resources and 20% terrestrial resources across Micronesia by 2020. Moving on after 2020, the Chief Executives have renewed the commitment between the jurisdictions and revised it from effective conservation to "effectively manage at least 50% of marine resources and 30% of terrestrial resources across Micronesia". The second theme guiding coral management in the CNMI is the need to increase the resiliency of CNMI's reefs and coastal communities in the face of climate change. Reef resiliency is an important component of reef management in CNMI and serves as a connection between all four priority pillar areas.

CORAL REEF MANAGEMENT PRIORITY PILLARS, GOALS, OBJECTIVES, AND ACTIONS

The coral reef management priority pillars, goals, objectives, and actions described in this section originated from the 2003 CNMI Local Action Strategies, 2010 CNMI Management Priorities, the conservation action plans for Laolao Bay, Talakhaya and Garapan, and the recommendations from the Capacity Building Assessment performed in February 2014 by Sustainmetrix. The working group added coral restoration as a new pillar and Achugao as a new priority watershed. In February and May 2019, stakeholder meetings were held on the islands of Saipan, Tinian and Rota to engage stakeholders and seek their input on coral management priorities, to review and assess existing priorities, and to create new priorities as appropriate. These priorities, goals, objectives, and actions reflect the priorities of coral reef management efforts in CNMI from 2019 to 2029 and are aligned with the 2018-2023 NOAA CRCP Strategic Plan. CNMI's priority pillars for coral reef management are: 1) Land-Based Sources of Pollution; 2) Fisheries management; 3) Climate Change; and 4); Coral Restoration.

Background

In 2003, the CNMI developed a set of local action strategies which were designed to address priority threats at the local, jurisdictional level. The LAS provided a framework for USCRTF member agencies to identify and address priority threats and additional local needs, connect local priorities to national goals, coordinate federal agency actions with local management of reef resources, and increase collaboration and resources to implement conservation actions. This approach allows the USCRTF members to tailor their goals and activities to address local issues and support on-the ground action. In 2010, the CNMI updated their management priorities based on NOAA's external review and revised national goals to align priorities and have a more focused management plan on the current threats at the time.



For the purpose of this exercise, the CNMI's coral reef managers and stakeholders have adopted from the LAS and 2010 priorities the definition of these terms:

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.

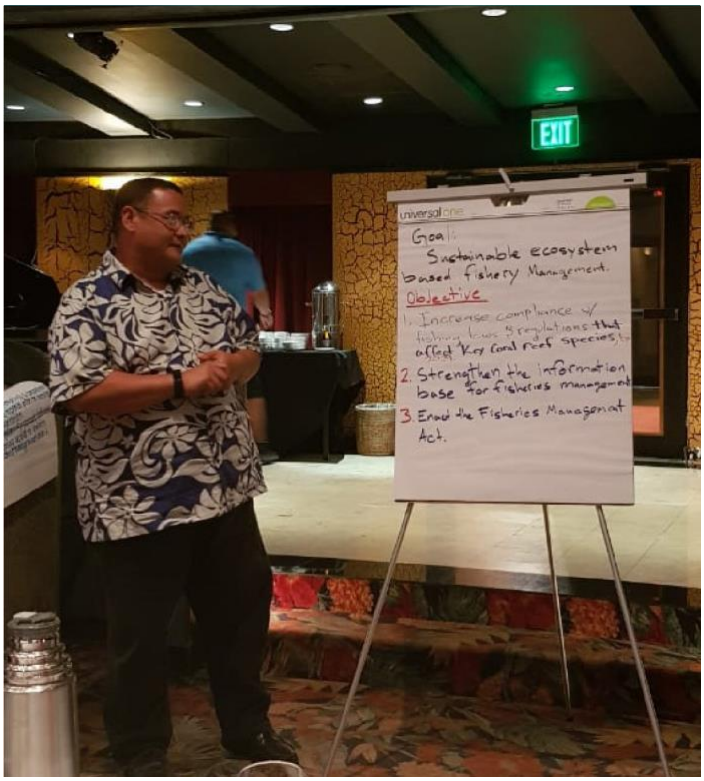
Objectives are defined as the environmental, social and institutional outcomes the jurisdiction must achieve to reach the end goal. Objectives are generally actionable within a three- to five-year time frame.

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

While the LAS and 2010 priorities document were completed and being implemented, the CNMI began to develop conservation action plans (CAPs) in three priority watersheds to target site-base efforts. Many actions in these CAPs have been implemented but there is still a wide-range of needs and actions which need to be addressed.

In February and May 2019, the CNMI Coral Program led by the Bureau of Environmental and Coastal Quality-Division of Coastal Resources Management (BECQ-DCRM) held stakeholder meetings in Saipan to revisit and assess their management priorities. The stakeholder meetings for Tinian and Rota were also held on Saipan and was led and facilitated by BECQ-DCRM. The Saipan stakeholder meeting was led by BECQ and facilitated by The Nature Conservancy Micronesia Program. Participants included the Division of Fish and Wildlife (DFW), Division of Environmental Quality (DEQ), Division of Forestry, the Western Pacific Fishery Management Council (WESPAC), NOAA Pacific Islands Fisheries Science Center, NOAA Coral Reef Conservation Program, NOAA Pacific Islands Regional Office, and various stakeholders from the Micronesia Islands Nature Alliance (MINA), Micronesian Environmental Services (MES), and Johnston Applied Marine Sciences (JAMS). As a result of these meetings, four priority pillars were identified as the CNMI's focus for the next 10 years.

Stakeholder meetings for Tinian and Rota were held in Saipan and key participants from each island were in attendance along with BECQ staff and NOAA CRCP CNMI Field Office staff. Threats and targets for Tinian and Rota were identified by participants on each respective island's issues and were recorded in a matrix form (Appendix B). The overall CNMI stakeholder meeting held in May 2019 on Saipan began with welcome remarks by the Director of DCRM and CNMI's Coral Point of Contact (POC). The Nature Conservancy Micronesia Program gave participants an overview of why the coral reef management priorities need to be updated. A brief description of the process was also provided.



The agenda also included a recap of the Tinian and Rota stakeholder meeting presented by the NOAA Coral Management Liaison to ensure their concerns were also discussed during the priority setting process. A review of the 2010 Coral Management Priorities was provided to the entire group by the facilitator as an initial assessment.

The entire group was divided into the four priority pillars and each group was tasked to review and assess priorities, goals, objectives, and actions from the previous priorities and strategies documents. The working groups were asked to develop new goals, objectives and actions in their respective groups / pillars, followed by a report out to the entire group in an effort to collect feedback and gain consensus to move forward. Participants were provided with the LAS document, 2010 Coral Management Priorities, conservation action plans, and the Capacity Building Assessment report as a reference to accomplish the assigned tasks.

After a report out of the new goals, objectives, and actions, the working groups gathered for a second round of discussions to address the feedback received from the entire group. The facilitators compiled the new information and presented it to the entire group. The groups opted not to vote using dots but rather gave a physical nod, raised a hand, or verbal "yes" if they were in agreement with each goal, objective and action. The group reach a final consensus on CNMI's coral management priorities at the end of a two-day meeting.

PRIORITY PILLARS

LAND-BASED SOURCES OF POLLUTION

Land-based sources of pollution are negatively affecting water quality and benthic resources in and adjacent to CNMI watersheds. Watersheds in the CNMI have faced a variety of rapid changes in the last five years, creating new challenges for resource managers.

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: FY2020–2029, ensure watershed management capacity is funded along with associated restoration and coordination activities.

Key Actions to Achieve this Objective:

1.1.1 Recruit and hire a full-time Watershed Coordinator devoted to working in CNMI's watersheds from 2020–2029.

1.1.2 The Watershed Working Group meets quarterly with time and effort is devoted to identifying funding opportunities.

1.1.3 Maintain local partnerships with NGOs and key implementing partners to ensure watershed work is continued.

OBJECTIVE 1.2: By 2021, develop and implement watershed management plans that meet EPA's A-I criteria for Laolao, Garapan, Talakhaya, and Achugao.

Key Actions to Achieve this Objective:

1.2.1 Ensuring stakeholders are involved in the completion and rollout of watershed management plans

1.2.2 Implement updated comprehensive watershed management plans from 2020–2029.

1.2.3 Build strong partnership with Water Quality Surveillance, Non-Point Source Pollution Program and the Long-Term Marine Monitoring Program to integrate continuous data availability into updated watershed management plans.

OBJECTIVE 1.3: By 2021, build public-private partnerships to ensure new and existing development integrates best management practices.

Key Actions to Achieve this Objective:

1.3.1 Provide opportunities for certification and training on best management practices for contractors and consultants.

1.3.2 From 2020–2029, Watershed Coordinator reviews and makes recommendations on major developments and reports significant permit updates to WWG.

1.3.3 Establish MOA with local government agencies responsible for various aspects of watershed management (CUC, DFW, DLNR, DPW, DFEMS)

OBJECTIVE 1.4: By 2022, key decision makers are informed and aware of watershed threats and impacts and are supporting watershed management work.

Key Actions to Achieve this Objective:

1.4.1 Coordinate site visits for decision makers with surveillance and monitoring team to observe watershed threats and impacts.

1.4.2 Provide opportunities for decision makers to participate in field-based restoration activities.

1.4.3 Share information and data that will promote informed decision making that supports watershed management.

OBJECTIVE 1.5: By 2022, develop and begin implementing a comprehensive wildfire post disturbance response plan to restore affected areas with native vegetation.

Key Actions to Achieve this Objective:

1.5.1 Engage DFEMs with developing a comprehensive wildfire mitigation and post disturbance response plan.

1.5.2 Work with CNMI Forestry to expand inventory of native seedlings.

1.5.3 Develop guidance on succession plantings and areas of replanting.

1.5.4 Coordinate with key partners and NGOs to participate in revegetation efforts.

1.5.5 Increase awareness and education of the community about how wildfires are affecting the watershed.

OBJECTIVE 1.6: By 2023, water quality and benthic data is being used to inform implementation of watershed management plan and evaluate efficacy.

Key Actions to Achieve this Objective:

1.6.1 Water quality and benthic data is shared with Watershed Working Group quarterly.

1.6.2 Ensure that ongoing water quality monitoring includes data on indicators and parameters that are identified in watershed management plans.

1.6.3 Annual analysis of water quality data and summary of efficacy of associated restoration efforts.

FISHERIES MANAGEMENT

A clear understanding of fisheries in the CNMI is still obscured by limited information regarding fish stocks and population trends. Data only exists through unique historical reports and government records that have not been consistently collected through time. Standardized fisheries data collection has been ongoing and aims to fill in the lack of life history data for key fishery species and to understand population trends in the CNMI. Priority should be placed on blending both existing and new data to generate stock assessments and fisheries trends for both pelagic and reef fishery species.

GOAL 2: BUILDING AN ECOSYSTEM BASED FISHERY MANAGEMENT APPROACH THAT SUSTAINS FISHERY RESOURCES FOR CULTURAL, RECREATIONAL, AND COMMERCIAL PURSUITS

OBJECTIVE 2.1: By 2029, provide accurate and informed statuses on the CNMI's near-shore fishery resources by characterizing fishery habitats for Saipan, Tinian, and Rota.

Key Actions to Achieve this Objective:

2.1.1 Compile existing data and identify gaps for Saipan, Tinian, and Rota.

2.1.2 Execute benthic surveys for Saipan, Tinian, and Rota to fill data gaps; complete data collection, accuracy assessment.

2.1.3 Draft summary report for benthic habitats.

OBJECTIVE 2.2: By 2029, determine the status of stocks and assess sustainability of current fishing practices for selected species.

Key Actions to Achieve this Objective:

2.2.1 Compile, collect, analyze, and manage fishery dependent data including market surveys and in-shore CREEL surveys

2.2.2 Compile, collect, analyze, and manage fishery independent data, including underwater visual surveys, acoustic surveys, and sampling seagrasses/ mangroves.

2.2.3 Compile, collect, and analyze relevant life history (growth, age of maturity) for targeted coral reef fishes

2.2.4 Conduct social science / socioeconomic surveys focusing on fishery concerns.

2.2.5 Quantify the size and use of habitats used by select juvenile reef fish.

2.2.6 Create and implement a Fisheries Science Committee, chaired by DLNR by 2021.

2.2.7 DLNR/DFW will create a communications strategy and a data sharing plan to share all results

OBJECTIVE 2.3: By 2029, increase compliance with fishing laws and regulations that affect key coral reef fishery species.

Key Actions to Achieve this Objective:

2.3.1 Work with a social marketing expert to plan targeted outreach and awareness campaigns to increase compliance with fishing laws and regulations by 2022. 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.

2.3.2 Improve enforcement of fishery laws and regulations by 2025 through providing additional capacity, equipment and resources to local enforcement offices.

2.3.3 Provide regular training for enforcement staff in enforcement, investigation and community engagement techniques. (Need for frequent training opportunities on multiple subjects—fish ID, new laws, technologies, techniques and underwater investigation.)

2.3.4 Improve interagency collaboration and cross-training opportunities through a joint enforcement agreement.

2.3.5 Support the development of community management programs to increase public knowledge of, support for and participation in fishery management activities (e.g., Eyes of the Reef, Tasi Watch, etc.) by 2024.

2.3.6 Resurrection and passage of fisheries management act (HB10-472 Marine Sovereignty Act, 1997).

CLIMATE CHANGE

Climate change associated stressors, including ocean warming, ocean acidification, and sea level rise have become major threats to coral reef ecosystems worldwide. The CNMI has already experienced substantial coral loss and reef degradation due to mass bleaching events associated with ocean warming. Coral reef managers now face the challenge of understanding and mitigating the impacts of climate change by protecting and enhancing the resilience of the CNMI's coral reef ecosystems.

GOAL 3: HEALTHY, RESILIENT CORAL REEF ECOSYSTEMS BETTER ADAPTED TO THE EFFECTS OF CLIMATE CHANGE

OBJECTIVE 3.1: By 2021, create a working group to address impacts of climate change and coral reef ecosystem resilience in the CNMI.

Key Actions to Achieve Objective:

3.1.1 By 2021, develop CNMI wide disturbance response plans to address acute disturbances such as: bleaching, natural disasters, oil spills, ship groundings,

disease and Crown-of-Thorns (COTS) outbreaks.

3.1.2 By 2021, develop communications strategy for distributing CNMI data, research products, and management priorities at a regional and national level. Engage with leadership of federal agencies such as NOAA and DOD to effectively share CNMI data on the Open Data Portal and other local resources.

OBJECTIVE 3.2: By 2029, CNMI has an improved monitoring program that assesses the long and short-term impacts of climate change Key Actions to Achieve this Objective:

3.2.1 By 2025, assess and monitor protective capacity of the CNMI's coral reefs in the face of sea level change (SLC) including developing hydrodynamic models to assess the wave energy absorption of the reef, and monitor changes in structural complexity, accretion, and erosion.

3.2.2 From 2020–2029, continue beach profiling to prioritize locations most susceptible to inundation to help identify areas for potential restoration or site enhancement along the coast.

3.2.3 From 2020–2029, partner with federal agencies and academia to monitor ocean acidification and improve capacity to utilize innovative technologies through trainings.

3.2.4 From 2020–2029, ensure climate change data are incorporated into the CNMI Open Data Portal.

OBJECTIVE 3.3: By 2027, Develop and implement adaptive, resilience-based management strategies. Key Actions to Achieve Objective:

3.3.1 By 2027, improve understanding of drivers, thresholds and ecological feedbacks that influence coral reef resilience, resistance, and recovery.

3.3.2 Develop a resilience-based management plan with a timeline for implementing strategies and identifying potential funding sources.

OBJECTIVE 3.4: By 2025, Raise community awareness regarding climate change impacts on local reefs and improve stewardship of CNMI's reefs.

Key Actions to Achieve Objective:

3.4.1 By 2023, coordinate with dive groups, businesses and individuals to build participation in community programs as a tool to assist in early warning for bleaching, COTS outbreak, and other ecosystem stressors.

3.4.2 Develop a communications plan that includes a coral bleaching watch update to run at regular intervals during summer months (including outreach to media, key leaders, stakeholders, etc.) as part of the CNMI Coral Bleaching Response Plan by 2022.

CORAL RESTORATION

Coral reefs are among the most diverse and productive ecosystems on the planet. They provide food and habitat for over 25% of all marine species, including many commercially valuable fishes and invertebrates. They also protect coastlines and contribute directly to

coastal economies through fisheries, tourism, and recreation. Coral reefs are particularly important to Pacific island communities that heavily rely on them for food, protection, and income. Coral reefs in the CNMI have declined drastically over the last five years due to multiple mass bleaching events, ship groundings, typhoons, and other acute disturbances. It has become clear that active conservation and restoration strategies are urgently needed to maintain coral populations and vital ecosystem functions.

GOAL 4: IMPROVED CORAL REEF ECOSYSTEM HEALTH AND ACCELERATED RECOVERY THROUGH RESTORATION EFFORTS

OBJECTIVE 4.1: From 2020-2029, create a coral reef ecosystems restoration program in the CNMI.

Key Actions to Achieve this Objective:

4.1.1 By 2020, create the Coral Reef Restoration Working Group and build rapport with HANMI, NMDOA, state/federal agencies, NGO's, and regional and international subject matter experts.

4.1.2 By 2021, hire a Restoration Coordinator to oversee the Coral Reef Restoration Working Group, identify potential funding sources and environmental compliance support for ongoing and future projects, establish synergy between all current and future restoration projects in the CNMI, and responsible for the daily management of nursery and restoration activities.

4.1.3 Establish a sustainable coral cultivation and nursery network that includes an array of nursery designs and representative biodiversity, including important habitat building species and threatened and endangered species.

4.1.4 Restore coral reef habitats dependent on level of degradation or other management priorities.

4.1.5 Develop local capacity to implement coral sexual propagation methods to improve coral diversity and recruitment.

LINKAGES TO NOAA CRCP STRATEGIC PLAN

Alignment of CNMI's Priority Goals and Objectives with NOAA CRCP Strategic Plan

CNMI'S PRIORITY GOALS AND OBJECTIVES	NOAA'S CORAL REEF CONSERVATION STRATEGIC PLAN	HOW IT CORRELATES (EXPLAIN AS NEEDED)
GOAL 1: LAND-BASED SOURCES OF POLLUTION 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: FY2020–2029, ensure watershed management capacity is funded along with associated restoration and coordination activities	**STRATEGY L1:** Develop, coordinate, and implement watershed management plans **STRATEGY L2:** Build and sustain watershed management capacity at the local level. **TARGET L2.1:** By 2024, 100 percent of the program's key watersheds have coordinators **TARGET L2.2:** By 2024, 50 percent of the program's key watersheds' priority management activities that improve water quality and enhance coral reef ecosystem resilience are implemented by jurisdictional partners in at least one key watershed per jurisdiction	The CNMI has existing site-based conservation action plans (CAPs) for priority watersheds which identifies strategies and actions to reduce threats to resources. All existing CAPs, as well as the newly identified priority watershed, are in the process of being converted into watershed management plans. CNMI is currently recruiting for a watershed coordinator.
OBJECTIVE 1.2: By 2021, develop and implement watershed management plans that meet EPA's A-I criteria for Laolao, Garapan, Talakhaya, and Achugao	**STRATEGY L1:** Develop, coordinate, and implement watershed management plans. **TARGET L1.1:** By 2024, 100 percent of the key watersheds have watershed management plans that address EPA's A-I criteria. **TARGET L.1.2:** By 2024, 50 Percent of the key watershed have water quality targets for sediments or nutrients appropriate for healthy coral reef habitats. **TARGET L1.3:** By 2024, the efficacy of key erosion and sediment control practices and stormwater management practices to reduce sediments or nutrients is quantified. **TARGET L1.4:** By 2024, sediment and nutrient loads meet established watershed quality targets for receiving coastal waters in >50 percent of the key watersheds	The CNMI has site-based conservation action plans (CAPs) for its priority watersheds which will be updated into watershed specific watershed management plans.

OBJECTIVE 1.3: By 2021, build public-private partnerships to ensure new and existing development integrates best management practices	**STRATEGY L2:** Build and sustain watershed management capacity at the local level **TARGET L2.3:** By 2024, the ratio of funding (external partner funds to Coral Program funds) is greater than 1:1 for implementing priority watershed management activities that improve water quality and enhance coral reef ecosystem resilience within key watersheds in at least one key watershed per jurisdiction	The CNMI's watershed coordinator is tasked with maintaining and expanding existing local partnerships through the CNMI Watershed Working Group, and will participate in permit reviews for new development to explore potential, additional partnerships

OBJECTIVE 1.4: By 2022, key decision makers are informed in watershed threats and impacts and supporting the watershed management network	**STRATEGY L2:** Build and sustain watershed management capacity at the local level	Key actions in the CNMI priorities document align with NOAA strategy and target.
OBJECTIVE 1.5: By 2022, develop and begin implementing a comprehensive wildfire post disturbance response plan to restore affected areas with native vegetation		
OBJECTIVE 1.6: By 2023, water quality and benthic data is being used to inform implementation of watershed management plan and evaluate efficacy	**STRATEGY L1:** Develop, coordinate, and implement watershed management plans	Key actions in the CNMI priorities document align with NOAA strategy and target.
GOAL 2: FISHERIES MANAGEMENT An ecosystem-based fishery management approach that sustains fishery resources for cultural, recreational, and commercial pursuits		
OBJECTIVE 2.1: By 2029, Provide accurate and informed statuses on the CNMI's nearshore fishery resources by characterizing fishery habitats for Saipan, Tinian, and Rota.	**STRATEGY F1:** Provide data essential for coral reef fisheries management **TARGET F1.1:** By 2022, the Coral Program's fish monitoring data can be statistically compared with data from at least five partners' monitoring programs and share in a way that managers would use. **STRATEGY F2:** Build capacity for coral reef fisheries management	Key actions in the CNMI priorities document align with NOAA strategy and target.

OBJECTIVE 2.2: By 2029, determine the status of stocks and assess sustainability of current fishing practices for selected species.	**STRATEGY F1:** Provide data essential for coral reef fisheries management **TARGET F1.1:** By 2022, the Coral Program's fish monitoring data can be statistically compared with data from at least five partners' monitoring programs and share in a way that managers would use. **TARGET F1.3:** By 2026, 75 percent of key coral reef fisheries taxa have completed stock or population assessments that inform current stock or population status and provide quantitative management advice.	Key actions in the CNMI priorities document align with NOAA strategy and target.
OBJECTIVE 2.3: By 2029, increase compliance with fishing laws and regulations that affect key coral reef fishery species	**STRATEGY F1:** Provide data essential for coral reef fisheries management **TARGET F1.4:** 50 percent of the Coral Program fisheries research projects include engagement, participation, and cooperation with local stakeholders in development and implementation. **TARGET F1.6/F2.3:** By 2029, Coral Program data and technical assistance have contributed to the body of science informing regulations relevant to key coral reef fisheries taxa in 100 percent of jurisdictions and councils. **STRATEGY F2:** Build capacity for coral reef fisheries management **TARGET F2.2:** By 2026, 50 percent of domestic and/or foreign partner agencies have adopted or implemented a new or improved approach to strengthen enforcement and compliance	Key actions in the CNMI priorities document align with NOAA strategy and target.
GOAL 3: CLIMATE CHANGE Healthy, resilient coral reef ecosystems better adapted to the effects of climate change		

OBJECTIVE 3.1: By 2021, create a working group to address impacts of climate change and coral reef ecosystem resilience in CNMI.	**STRATEGY C1:** Support a resilience-based management approach	Key actions in the CNMI priorities document align with NOAA strategy and target.

OBJECTIVE 3.2: By 2029, CNMI has an improved monitoring program that assesses the long and shortterm impacts of climate change	**STRATEGY L1:** Develop, coordinate, and implement watershed management plans. **STRATEGY C1.1:** By 2022, seven of the jurisdictions and/or foreign management partners have the technical capacity and management support to implement resiliencebased management **TARGET C1.3:** By 2022, NOAA is collecting data and providing technical assistance to support the jurisdictions to integrate modeling and monitoring efforts, including status and trends monitoring, response monitoring, effectiveness monitoring, and reassessments of climate vulnerability.	Key actions in the CNMI priorities document align with NOAA strategy and target.
OBJECTIVE 3.3: By 2027, develop and implement adaptive, resilience-based management strategies	**STRATEGY C1:** Strategy C1: Support a resilience-based management approach **STRATEGY C1.1:** By 2022, seven of the jurisdictions and/or foreign management partners have the technical capacity and management support to implement resiliencebased management	Key actions in the CNMI priorities document align with NOAA strategy and target.
OBJECTIVE 3.4: By 2025, raise community awareness regarding climate change impacts on local reefs and improve stewardship of CNMI's reefs	**TARGET C1.4:** By 2024, the top five CRCP prioritized research needs, identified by management partners are conducted and results are used to inform and implement resilience-based management	Key actions in the CNMI priorities document align with NOAA strategy and target.

GOAL 4: CORAL RESTORATION

Improved coral reef ecosystem health and accelerated recovery through restoration efforts

OBJECTIVE 4.1: From 2020-2029, create a coral reef ecosystems restoration program in the CNMI	**STRATEGY R1:** Improve coral recruitment habitat quality **STRATEGY R2:** Prevent avoidable losses of coral and their habitat **STRATEGY R3:** Enhance population resilience	The objectives and targets for strategy R1, R2 and R3 will be beneficial to the creation of a restoration program in CNMI.

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