

Appendix A – United States Regulatory Mechanisms and Conservation Efforts Potentially Relevant to Addressing Local Threats Within the Ranges of the 82 Candidate Coral Species

Existing Regulatory Mechanisms

Within the U.S., the collective ranges of the 82 coral species are split between the Caribbean (seven species) and the Indo-Pacific (75 species). In the Caribbean, the seven species are collectively found in Florida and the US Territories of Puerto Rico and the US Virgin Islands (USVI). In the Indo-Pacific, the 75 species are collectively found in Hawaii, the US Territories of American Samoa and Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and Pacific Remote Island Areas (PRIA). In Florida, Puerto Rico, USVI, Hawaii, American Samoa, and Guam, the States and Territories have jurisdiction from the shoreline to 3 nautical miles (nm) from shore, and the federal government generally has management authority over fishery resources between 3 and 200 nm from shore. In CNMI and PRIA, federal jurisdiction extends from the shoreline to 200 nautical miles seaward. However, under the Fishery Ecosystem Plan for the Marianas Archipelago, fisheries management in waters 0-3 nautical miles of the CNMI is generally left to the CNMI government. In PRIA, the federal government exercises exclusive jurisdiction.

Existing federal regulatory mechanisms that provide the most benefits to corals are focused on addressing physical impacts, including damage from fishing gear, anchoring, and vessel groundings. Most of these mechanisms are relevant to the threats that the BRT identified as either low or negligible, with the exception of trophic effects of over-fishing, ranked as a medium threat.

The following section describes US regulatory mechanisms by region (Caribbean vs. Indo-Pacific) and includes: Federal statutes, Federal executive orders, Federal marine protected areas (MPAs), State statutes, State regulatory programs, State MPAs, County statutes, Territorial statutes, Territorial MPAs, Commonwealth statutes, and Commonwealth MPAs. The organization of this section is as follows:

1. Fisheries and Coastal Management Regulatory Mechanisms (description of relevant federal and non-federal regulatory mechanisms).
 - 1.1. Federal
 - 1.1.1. Federal Laws
 - 1.1.2. Federal Executive Orders
 - 1.2. Non-federal Caribbean
 - 1.2.1. Florida
 - 1.2.2. Puerto Rico
 - 1.2.3. US Virgin Islands
 - 1.3. Non-federal Indo-Pacific
 - 1.3.1. Hawaii
 - 1.3.2. American Samoa
 - 1.3.3. Guam
 - 1.3.4. CNMI

2. MPA Regulations (description of federal and non-federal MPAs and other relevant protected areas).
 - 2.1. Federal
 - 2.2. Non-federal Caribbean
 - 2.2.1. Florida
 - 2.2.2. Puerto Rico
 - 2.2.3. US Virgin Islands
 - 2.3. Non-federal Indo-Pacific
 - 2.3.1. Hawaii
 - 2.3.2. American Samoa
 - 2.3.3. Guam
 - 2.3.4. CNMI
3. Conservation Efforts
 - 3.1. Federal
 - 3.2. Non-federal Caribbean
 - 3.2.1. Florida
 - 3.2.2. Puerto Rico
 - 3.2.3. USVI
 - 3.3. Non-federal Indo-Pacific
 - 3.3.1. Hawaii
 - 3.3.2. American Samoa
 - 3.3.3. Guam
 - 3.3.4. CNMI

1. Fisheries and Coastal Management Regulatory Mechanisms

1.1 Federal

This section describes federal laws, federal executive orders, and federal MPAs that may have an effect on the status of the 82 coral species, and covers the Caribbean region (Florida, Puerto Rico, U.S. Virgin Islands (USVI)) and the Indo-Pacific region (Hawaii, American Samoa, Guam, Commonwealth of Northern Marianas Islands (CNMI)), and the Pacific Remote Island Areas (PRIA), consisting of Jarvis Atoll, Wake Island, Palmyra Atoll, and Howland and Baker Islands.

1.1.1 Federal Laws

Clean Water Act¹. The 1977 amendments to the Federal Water Pollution Control Act of 1948 and 1972 (PL 92-500) are commonly known as the Clean Water Act (CWA), due to a parenthetical revision in Section 518. Congress stated that the objective of the CWA was to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters” (33 U.S.C. §1251(A)).

Clean Water Act of 1987 Section 404 Program. Section 404 (a) of the CWA gives the authority to the Secretary of the Army (through the Corps of Engineers; “Corps”) to issue permits, after notice and opportunity for public hearings, for the discharge of dredged or fill material. Section 404 (b) states that disposal sites shall be specified through the

¹ http://cfpub.epa.gov/npdes/cwa.cfm?program_id=45

application of guidelines developed by the Administrator of the U.S. Environmental Protection Agency (USEPA), in conjunction with the Secretary. These “Guidelines for Specification of Disposal Sites for Dredged or Fill Material” (40 CFR 230) have become known as the “Section 404 (b)(1) Guidelines” (Guidelines); these were finalized on December 24, 1980, and remain in effect. Section 404 (c) authorizes the USEPA to prohibit, restrict, or deny (veto) any defined areas as a disposal site if it is determined that discharges of materials into such areas will have “an unacceptable adverse effect on municipal water supplies, shellfish beds and fisheries areas (including spawning and breeding areas), wildlife, or recreational areas.” Issuance of a Section 404 permit requires water quality certification by the appropriate state agency (33 U.S.C.1341, Section 401).

The above-described protections apply to “navigable waters,” which are defined as “waters of the United States” (33 U.S.C. §1362(7)). The Corps’ regulations (33 CFR 328 (a)) and the Section 404 (b)(1) Guidelines (40 CFR 230.3 (s)) define “waters of the United States to include seven categories:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands;
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, slough, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including and such waters:
 - which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - which are used or could be used for industrial purpose by industries in interstate commerce.
- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs 1-4 of this section;
 - The territorial sea;
 - Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs 1-6 of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR §423.11(m)) which also meet the criteria of this definition) are not waters of the United States.

The purpose of the Section 404 (b)(1) Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the U.S. through the control of discharges of dredged or fill material (40 CFR 230.1). Fundamental to the Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem, “unless it can be demonstrated that such a discharge will not have an unacceptable adverse

impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.” The Guidelines further state that: “From a national perspective, the degradation or destruction of special aquatic sites, such as filling operations in wetlands, is considered to be among the most severe environmental impacts covered by these Guidelines. The guiding principle should be that degradation or destruction of special sites may represent an irreversible loss of valuable aquatic resources.”

Special aquatic sites are defined as geographical areas, large or small, possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. 40 CFR § 230.3(q-1). These areas are generally recognized as significantly influencing or positively contributing to the general overall environmental health or vitality of the entire ecosystem of a region. The Guidelines lists the following communities to represent “Special Aquatic Sites”: sanctuaries and refuges; wetlands; mudflats; vegetated shallows; coral reefs; riffle and pool complexes. Thus, coral reefs are afforded special protection under the Guidelines.

Dredging and filling activities can adversely affect colonies of reef-building organisms by burying them, by releasing contaminants such as hydrocarbons into the water column, by reducing light penetration through the water, and by increasing the level of suspended particles in the water column. The Guidelines recognize that coral organisms are “extremely sensitive to even slight reductions in light penetration or increases in suspended particulates.” These adverse effects will cause a loss of productive colonies that in turn provide habitat for many species of highly specialized aquatic organisms.

Advanced Identification of Disposal Areas Under Section 404. A potential mechanism for providing additional protection to coral communities is through the use of Advanced Identification of Disposal Areas (ADID) (40 CFR 230.80). Under this action, the USEPA and the permitting authority, (e.g., the Corps or State in the case of a state-delegated program) on their own initiative or at the request of any other party after consultation with any affected State that is not the permitting authority, may identify sites which are considered as:

- Possible future disposal sites, including existing disposal sites and non-sensitive areas; or
- Areas generally unsuitable for disposal site specification.

To provide the basis for ADID of disposal areas and areas unsuitable for disposal, the USEPA and the permitting authority shall consider the likelihood that use of the area in question for dredge or fill material disposal will comply with the Guidelines. Thus, it is possible that coral reef sites may be determined through the ADID process as areas generally unsuitable for disposal of dredged or fill material.

Natural Resource Damages - Clean Water Act; Comprehensive Environmental Response, Compensation, and Liability Act and Oil Pollution Act of 1990. The CWA, as amended by the Oil Pollution Act of 1990 (33 USC §§ 2701 et seq.), and the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §§ 9601 et seq.),

mandate that parties that release oil or hazardous substances, pollutants, or contaminants into the environment are responsible not only for the cost of removing (cleaning up) the release, but they are also responsible for restoring, replacing or acquiring the equivalent of any natural resources injured, lost or destroyed as a result of an actual or threatened release of oil. These provisions are applied by state and federal resource agencies acting as natural resource trustees to address impacts to coral reefs under their jurisdictions from release incidents.

Coastal Zone Management Act². The Federal Coastal Zone Management Act (CZMA) of 1972 encourages coastal states to develop comprehensive management programs that ensure the beneficial use, protection and management of the Nation’s coastal resources. To encourage the adoption and implementation of these management programs, coastal states whose programs receive approval from the U.S. Department of Commerce, NOAA, are empowered to review federal activities that affect coastal zone resources and uses covered by the state’s approved management program. Federal agencies implementing any of the following activities that may affect a state’s coastal zone are required to determine whether the action is consistent with the state’s approved management program and seek the state’s concurrence with the determination:

- Activities conducted by or on behalf of a federal government agency;
- Federally funded activities;
- Activities that require a federal license or permit; and
- Activities conducted pursuant to the Outer Continental Shelf Lands Act minerals exploration plan or lease.

If a state with an approved management program objects to a consistency determination on the basis that the proposed federal activity is “inconsistent” with the requirements of the state’s approved program, the state may request mediation through NOAA’s Office of Ocean and Coastal Resource Management, and may appeal the determination to the Secretary of Commerce. As a general matter, state coastal management plans for areas that include coral reefs include specific provisions to ensure that these valuable ecosystems are not harmed. Consistent with the provisions of the CZMA, the ACOE will not issue any permits or authorizations under CWA Section 404, MPRSA Section 103, or RHA Section 10 that do not have a State CZMA consistency determination. Similarly, EPA will not designate an ocean dumping site under MPRSA Section 102 without meeting the requirements of the CZMA.

² [http://coastalmanagement.noaa.gov/czm/czm act.html](http://coastalmanagement.noaa.gov/czm/czm%20act.html)

Table 1. Summary of US states, territories and commonwealths with federally-approved Coastal Management Programs (CMP) enacted pursuant to the Coastal Zone Management Act.

State/ Territory	Year CMP approved	URL
American Samoa	1980	http://coastalmanagement.noaa.gov/mystate/american_samoa.html
CNMI	1980	http://www.crm.gov.mp/
Guam	1979	http://www.bsp.guam.gov/content/category/6/15/37/
Florida	1981	www.dep.state.fl.us/cmp
Hawaii	1977	http://hawaii.gov/dbedt/czm/
Puerto Rico	1978	www.coralpr.net www.gobierno.pr/drna
USVI	1976	www.viczmp.com

In an effort to develop a more comprehensive solution to the problem of polluted runoff in coastal areas, the U.S. Congress expanded the CZMA in 1990 to include a new section 6217 entitled "Protecting Coastal Waters." Section 6217 requires that states with approved coastal zone management programs develop Coastal Nonpoint Pollution Programs wherein state programs incorporate management measures to address land-based sources of run-off from agriculture, forestry, urban development, marinas, hydromodification (e.g., stream channelization), and the loss of wetlands and riparian areas. In keeping with the successful state-federal partnership to manage and protect coastal resources achieved by the CZMA, section 6217 envisioned that nonpoint source programs developed under section 319 of the Clean Water Act (CWA) would be combined with existing coastal management programs. By combining the water quality expertise of state agencies with the land management expertise of coastal zone agencies, section 6217 was designed to more effectively manage nonpoint source pollution in coastal areas. To facilitate development of state coastal nonpoint programs and ensure coordination between states, administration of section 6217 at the federal level was assigned to NOAA and the Environmental Protection Agency.

Continental Shelf Act, Outer Continental Shelf Lands Act of 1953 (43 U.S.C. 1331 - 1356, P.L. 212, Ch. 345, August 7, 1953, 67 Stat. 462) as amended by P.L. 93-627, January 3, 1975, 88 Stat. 2130; P.L. 95-372, September 18, 1978, 92 Stat. 629; and P.L. 98-498, October 19, 1984, 98 Stat. 2296.

The 1953 statute defines the Outer Continental Shelf (OCS) as all submerged lands lying seaward of State coastal waters (3 miles offshore) which are under U.S. jurisdiction. The statute authorized the Secretary of Interior to promulgate regulations to lease the OCS in an effort to prevent waste and conserve natural resources, as well as to grant leases to the highest responsible qualified bidder as determined by competitive bidding procedures.

Title II of the Outer Continental Shelf Lands Act Amendments of 1978 (P.L. 95-372) provides for the cancellation of leases or permits if continued activity is likely to cause serious harm to life, including fish and other aquatic life. It also stipulates that economic, social, and environmental values of the renewable and nonrenewable resources are to be considered in management of the OCS. The timing and location of leasing activities are to be based on several factors, including the relative environmental sensitivity and marine productivity of different areas of the OCS. An environmental studies program is authorized and the Secretary of the Interior is required to study any region included in a lease sale in order to assess and manage environmental impacts on the OCS (*Acropora* Biological Review Team 2005).

Coral Reef Conservation Act³. The Coral Reef Conservation Act (CRCCA) (16 U.S.C. 6401 et seq.) was passed in 2000. The CRCCA recognizes the unique nature of coral reef communities and has three main goals:

- The creation of a National Coral Reef Action Strategy;
- The financial promotion of governmental, educational, and non-governmental conservation programs; and
- Granting of additional power to the Secretary of Commerce to protect coral reef ecosystems.

The CRCCA charges NOAA with the development and periodic review of a National Coral Reef Action Strategy that addresses sustainable uses, monitoring, mapping, and public education of coral reef resources. Under the CRCCA, NOAA can provide grants to governmental, education, and non-governmental entities with expertise in coral reef conservation, and to fund monitoring, mapping, and education programs of coral reefs.

Endangered Species Act⁴. The Endangered Species Act (ESA)(16 U.S.C. § 1531, et.seq.) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead federal agencies for implementing ESA are the U.S. Fish and Wildlife Service (FWS) and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. Section 7 of the Act requires federal agencies, in consultation with the U.S. Fish and Wildlife Service and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. “Action,” in this case, is defined broadly to include federal grants, permitting, licensing, or other regulatory actions (16 USC 1536(a)(2)). In general, if a listed species may be

³ http://coris.noaa.gov/activities/actionstrategy/08_cons_act.pdf

⁴ <http://www.nmfs.noaa.gov/pr/laws/esa/>

present in an action area, the Federal action agency must conduct a biological assessment (or evaluation) to determine whether the proposed action may affect listed species. If a jeopardy or adverse modification determination is made, the biological opinion must identify reasonable and prudent alternatives (RPAs), if any, that would not jeopardize the continued existence of the listed species or adversely modify designated critical habitat and are economically and technologically feasible. If the activity will not jeopardize listed species or destroy or adversely modify critical habitat, the biological opinion includes an incidental take statement (ITS) to authorize take resulting from the action. The ITS also specifies reasonable and prudent measures (RPMs) considered necessary or appropriate to minimize the impact of the anticipated incidental take on the species.

The ESA also prohibits any action that causes an unauthorized "taking" of any listed species of endangered fish or wildlife. Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

Magnuson-Stevens Act⁵ (MSA). The Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et.seq.) is the primary law governing marine fisheries conservation and management in waters under U.S. jurisdiction. The Act was first enacted in 1976, amended in 1996, and reauthorized by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 on January 12, 2007. Eight regional fishery management councils were created under the MSA to manage fisheries and promote conservation. Among the goals of the MSA are to: achieve optimum yield in each U.S. fishery while preventing overfishing, rebuild overfished stocks, minimize bycatch and bycatch mortality, promote the safety of human life at sea, promote market-based management approaches, improve data collection and processing (including improvements in recreational data collection) giving it a larger role in the decision-making process, and enhance international cooperation by addressing IUU fishing and bycatch of protected living marine resources (NOAA, 2007). Corals are defined as “fish” for purposes of the MSA, as discussed below.

One provision established under the MSA is to establish and maintain essential fish habitat (EFH). EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (16 USC § 1802(10)). MSA requires that EFH be identified for all species which are federally managed. NMFS has designated coral substrate as EFH. MSA requires any Federal agency to consult with NMFS with respect to any action authorized, funded or undertaken, or proposed to be authorized, funded or undertaken by such agency that may adversely affect EFH. After receipt of a completed EFH Assessment, NMFS will provide EFH Conservation Recommendations to the federal agency detailing measures that can be taken by that agency to conserve EFH. Within 30 days of receiving NMFS recommendations, the federal agency must provide a detailed written response to NMFS. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case where a response is inconsistent with NMFS recommendations, the federal agency must explain its reasons for not following the recommendations, including the scientific justification for any

⁵ <http://www.nmfs.noaa.gov/msa2005/>

disagreements with NMFS over the anticipated effects of the proposed action and the measures needed to minimize, mitigate or offset such effects.

MSA: Fishery Management Councils in US Coral Reef Areas.

Within US coral reef areas, there are four regional fishery management councils: the Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils in the Caribbean, and the Western Pacific Fishery Management Council in the Pacific.

The Caribbean Fishery Management Council developed a FMP, Regulatory Impact Review, and Final EIS for corals and reef-associated plants and invertebrates of Puerto Rico and the U.S. Virgin Islands (USVI) in 1994. This FMP provides protection in the form of no-harvest for EEZ portions of the insular shelves of Puerto Rico and the USVI for all coral species. This alternative was selected due to the lack of biological information necessary to estimate a Maximum Sustainable Yield for the species, coupled with the extremely slow growth rates for most corals. In the case of the USVI, the EEZ starts at 3.0 nautical miles (nmi) from shore and in Puerto Rico, the EEZ starts at 10.2 nmi (*Acropora* Biological Review Team, 2005).

The Gulf of Mexico Fishery Management Council includes federal waters from Texas to the west coast of Florida. The Coral-Coral Reef FMP was developed by the Gulf of Mexico and the South Atlantic Fishery Management Councils and enacted in April 1982. The FMP identified the problems with corals conservation as: degradation from natural and man-made impacts; limited information on many of the species; susceptibility to stresses due to the northern location of the resources; complex and contradictory management objectives; poor public knowledge of the importance of corals and reefs; and poor enforcement of existing laws and regulations. All of the stony corals (*Scleractinia*, *Milleporina*) and the gorgonian sea fan (*Gorgonia*) are protected from harvest, sale, and destruction on the seabed in U.S. Federal waters. Note that the Coral-Coral Reef FMP can only regulate fishing related activities: a non-fishing activity that destroys corals is exempt from coral FMP regulation. Coral Habitat Areas of Particular Concern (HAPC) were established on the Florida Middle Grounds, East and West Flower Garden Banks, Gray's Reef, and the Oculina Banks off central eastern Florida. Subsequently, other HAPCs have been recommended by the Gulf of Mexico Fishery FMC to NOAA for approval, including Pulley Ridge off southwest Florida and the Stetson, McGrail, Bright, Geyer, and Sonnier Banks in the northwestern Gulf of Mexico (*Acropora* Biological Review Team, 2005).

The jurisdiction of the South Atlantic Fishery Management Council includes federal waters off the states of North Carolina, South Carolina, Georgia, and Florida. As with some other Fishery Management Councils, the South Atlantic Fishery Management Council is in the process of developing ecosystem-based management in lieu of individual single-species or multispecies FMPs. It released a South Atlantic Fishery Ecosystem Plan (FEP) in 2009 that replaces a previous Habitat Plan and supplements pre-existing FMPs. This effort aims at providing the South Atlantic Fishery Management Council with a foundation from which to attain a more comprehensive understanding of habitat and biology of species, fishery information, social and economic impacts of

management, and ecological consequences of conservation and management. The 2009 FEP is comprised of six volumes, and several amendments including the establishment of coral HAPCs⁶.

The Western Pacific Fishery Management Council (WPFMC), established under the Magnuson-Stevens Act, manages the U.S. EEZ waters of Hawaii, the American Samoa Archipelago, the Mariana Archipelago (Guam and CNMI), and the Pacific Remote Islands Areas (PRIA). In 2010, the WPFMC replaced its Fishery Management Plans (FMPs) with four archipelagic Fishery Ecosystem Plans (FEPs) for American Samoa, Hawaii, Mariana Islands, and PRIA to guide ecosystem-based approaches for fishery management in the US Western Pacific region. The FMPs had been used since 1980 to govern commercial fishing throughout the region’s EEZ, regulate harvests by annual catch quotas, close seasonal fisheries, place restrictions on gear, and establish minimum catch sizes, all based on species-level management. The new FEPs, on the other hand, restructure fishery management using a place-based ecosystem approach. Around CNMI and the PRIA, these boundaries extend from the shoreline to 200 nautical miles seaward (although CNMI generally manages fisheries conducted by its citizens within 3 nautical miles). The Territories of Guam and American Samoa manage fisheries from the shoreline to three nautical miles seaward. The remaining waters within their EEZs are managed under FEPs to 200 nautical miles seaward (71 FR 53605).

MSA: Federal Coral and Coral Reef Fisheries Management.

In the Caribbean, NMFS defines “prohibited coral” to include all coral belonging to the orders Gorgonacea, Scleractinia (stony corals), and Antipatharia (black corals) or of the Class Hydrozoa (fire corals and hydrocorals) (50 CFR 622.2). No person may fish for, harvest, or possess such prohibited coral without a Federal permit in the Caribbean U.S. EEZs. Moreover, no person may sell or purchase Scleractinia corals if taken from the EEZs; and if the corals are sold in Puerto Rico or U.S.V.I., it is presumed to have been harvested in the EEZs unless it is accompanied by documentation showing that it was harvested elsewhere (50 CFR 622.45(a)). A person harvesting live rock under a Federal permit is exempt from the prohibition on taking prohibited coral, however, if such coral settles on live rock (50 CFR 622.41(a)(1)). Coral fisheries in the Caribbean are managed under the FMPs described above administered by the Caribbean, Gulf of Mexico, and South Atlantic Fishery Management Councils.

In the Western Pacific, NMFS defines precious coral management unit species as any coral of the genus *Corallium* in addition to pink (aka red), gold, black, and bamboo corals, in the US EEZs (American Samoa, Hawaii, Mariana Islands, and PRIA; 50 CFR 665.161, 665.261, 665.461, and 665.661). Federal regulations in 50 CFR 665 also set forth specific prohibitions and regulations for the permitting and take of precious coral management unit species within US jurisdiction in the Western Pacific. Coral management began in 1983 when the Western Pacific Fishery Management Council established the Precious Corals FMP banning bottom trawling and other potentially destructive and non-selective gear in the federally managed EEZ around Hawaii, American Samoa, the Mariana Islands, and the PRIA. The FMP also established

⁶ <http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx>

minimum sizes and quotas as well as no-take MPAs in the PRIAs. The FMP was amended several times to include certain species of coral as Management Unit Species. As described above, in 2010, the Council replaced the Precious Corals FMP and other FMPs with four archipelagic FEPs for American Samoa, Hawaii, Mariana Islands, and PRIA. Thus, rather than precious corals in the region being managed under a Precious Corals FMP, now precious corals in each archipelago are managed as a “Management Program for Precious Corals Fisheries” under the FEP for that archipelago⁷.

In addition to the management of precious corals as its archipelagic FEPs, the Western Pacific Fishery Management Council also manages coral reef fish species as a “Management Program for Coral Reef Ecosystem Fisheries” under the FEP for each archipelago. These archipelagic management programs include coral reef herbivorous fishes. This is important due to the role that herbivorous fish (e.g., parrotfish) have on reef ecosystem health and resilience. Herbivorous fish graze on algae which compete with corals for space. Healthy populations of herbivorous grazers maintain a balance within reef ecosystems between live coral cover and algae. If herbivorous fish populations are heavily fished and high mortality of coral colonies occurs, then algae can grow rapidly and inhibit the replenishment of coral populations (Brainard et al. 2011).

By establishing and implementing a number of management measures, these coral reef fisheries management programs aim to ensure sustainable coral reef fisheries while also preventing any negative impacts to stocks, habitat, protected species, or the ecosystem itself. Management measures in the coral reef fisheries management programs include the establishment of MPAs with zoning mechanisms, permits, monitoring, and restrictions on gear use and fishing methodologies. For example, within the FEPs for Hawaii, American Samoa, the Mariana Islands, and the PRIAs, certain gears are strictly prohibited for coral reef management unit species (including all important coral reef herbivores such as parrotfish, wrasses, sturgeonfish, etc.), including: gillnets, trawls, dredges, longlines, explosives, and poisons (WPRFMC 2009a, 2009b, 2009c, 2009d). Additionally, harvest using scuba-assisted spearfishing is prohibited at night in the PRIAs and northwestern Hawaiian Islands. Federal regulations for specific gear requirements in American Samoa, the Marianas, and PRIA are set forth in 50 CFR 665.127, 665.427, and 665.627. See sections on Federal MPAs, American Samoa Territorial Laws, and Guam Territorial Laws for further details within each area.

National Marine Sanctuaries Act⁸. The National Marine Sanctuaries Act of 1972 authorizes the Secretary of Commerce, with significant public input, to designate and manage national marine sanctuaries based on specific standards. It provides for supervision by the Secretary over any permitted private or federal action that is likely to destroy or injure a sanctuary resource, and requires periodic evaluation of implementation of management plans and goals for each sanctuary. The Act also specifies prohibited activities, penalties and enforcement.

⁷ <http://wpcouncil.org/hot/>

⁸ <http://sanctuaries.noaa.gov/about/legislation/>

The Act prohibits the following activities: destroying, causing the loss of, injuring a sanctuary resource managed under law or regulations for that sanctuary; possessing, selling, delivering, carrying, transporting, or shipping a sanctuary resource taken in violation of the Act; interfering with enforcement of the Act; and violating a provision of the Act or regulations of permits issued under it. Furthermore, the Secretary must conduct enforcement activities to carry out the Act. A person authorized to enforce the Act may board, search, inspect or seize a vessel, equipment, stores and cargo suspected of being used to violate the Act, and seize unlawfully taken sanctuary resources. The Act requires the Secretary to promote the use of national marine sanctuaries for research, monitoring, evaluation and educational programs as are necessary and reasonable to carry out the purposes and policies of the Act.

Rivers and Harbors Act⁹. The main purpose of the Rivers and Harbors Act (RHA) is to maintain navigation and prevent the obstruction or alteration of navigable waters of the U.S including its Territories and possessions (RHA; 33 USC §§ 401 *et seq.*). The RHA authorizes the U.S. Army Corps of Engineers (USACE) to issue permits to perform a variety of activities, including dredging, filling, or placement of structures in navigable waters. Section 9 prohibits the construction of bridges, causeways, dams, or dikes over any navigable water of the United States without the consent of Congress. In addition, a permit must be obtained from the U.S. Coast Guard for bridges and causeways, and from the Corps for dams and dikes (bridges and causeways 33 C.F.R. §114.01 *et seq.*; dams and dikes (33 C.F.R. §321 *et seq.*).

Section 10 of the RHA prohibits any unauthorized obstruction of the navigability of any waters of the U.S. and prohibits dredging or filling in navigable waters without the approval of the Corps. Permits are required under this section for wharfs, piers, breakwaters, jetties, and other obstructions to the “navigable capacity” of waters, and for activities that may “alter or modify the course, location, condition, or capacity” of any navigable water. Section 10 has consistently been given a broad interpretation by the Courts. Two examples of court rulings that show broad interpretation of what constitutes a dredging and/or filling activity include:

- United States v. M.C.C. of Florida, Inc. (772 F.2d 1501 (11th Cir. 1985)) found that repeatedly going back and forth across the same waters with tug equipment that is dredging a channel and dumping the spoil on the adjacent sea grass beds is illegal dredging and filling under Section 10.
- United States v. Republic Steel Corp. (362 U.S. 432 (1960) determined that discharges of solid industrial wastes that progressively decreased the depth of a water body constituted prohibited obstruction covered by Section 10.

In issuing RHA permits, the USACE conducts a “public interest balancing,” which can include evaluation of benefits and detriments of a project to fish and wildlife values, such as corals. As a general matter, adverse impacts to coral reefs and coral reef systems are considered to be detrimental to the public interest, and the USACE findings for Section

⁹ <http://www.fws.gov/laws/lawsdigest/riv1899.html>

10 permits should document how these impacts have been avoided. Through this evaluation, USACE requires applicants to avoid and minimize impacts to corals by altering the design of a project or by imposing mitigation actions (e.g., relocation and monitoring of corals).

Under 14 USC § 81, the USCG is charged with establishing, maintaining, and operating aids to navigation to serve the needs of U.S. armed forces and maritime commerce, and when those aids are electronic, air commerce as well when requested by the Federal Aviation Administration. Some of these aids to navigation are found in areas where scleractinian corals occur. For example, the USCG maintains navigational aids in the Florida Keys National Marine Sanctuary (FKNMS) that are intended to help ships avoid grounding on coral reefs.

Act to Prevent Pollution From Ships (APPS) As Amended by the Marine Plastic Pollution Research and Control Act (MPPRCA)¹⁰. The APPS, as amended by the MPPRCA, protects coral reefs by requiring all U.S. ships and all ships in U.S. navigable waters or the EEZ to comply with the International Convention for the Prevention of Pollution from Ships (33 USC §§ 1901 et seq.). Under the regulations implementing APPS as amended by MPPRCA, the discharge of plastics, including synthetic ropes, fishing nets, plastic bags, and biodegradable plastic into the water is prohibited. Discharge of floating dunnage, lining, and packing materials is prohibited in the navigable waters, and in areas offshore less than 25 nautical miles from the nearest land. Finally, food waste or paper, rags, glass, metal, bottles, crockery and similar refuse cannot be discharged in the navigable waters or in waters offshore inside 12 nautical miles from the nearest land. USCG has the primary responsibility of enforcing regulations under the APPS, and the APPS applies to all vessels, including cruise ships, regardless of flag, operating in U.S. navigable waters and the EEZ.

International Convention for the Prevention of Pollution from Ships (MARPOL)¹¹. The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It combines two treaties adopted in 1973 and 1978 respectively and includes the Protocol of 1997 (outlined in Annex VI). The Convention currently includes a total of six technical Annexes described below:

- Annex I are the Regulations for the Prevention of Pollution by Oil (entered into force 2 October 1983). It covers the prevention of pollution by oil from operational measures and accidental discharges. Amendments to Annex I in 1992 made it mandatory for new oil tankers to have double hulls and bringing in measures for existing tankers to be fit with double hulls. Annex I was subsequently revised again in 2001 and 2003.
- Annex II are the Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk (entered into force 2 October 1983). Annex II outlines the

¹⁰ <http://wildlifelaw.unm.edu/fedbook/shippoll.html>

¹¹ [http://www.imo.org/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-\(marpol\).aspx](http://www.imo.org/about/conventions/listofconventions/pages/international-convention-for-the-prevention-of-pollution-from-ships-(marpol).aspx)

discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk. There are 250 substances evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substances) are complied with. In any case, no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land.

- Annex III is the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form (entered into force 1 July 1992). Annex III contains general requirements for standards on packing, marking, labeling, documentation, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances. Since 1991, the International Maritime Dangerous Goods (IMDG) Code has also included marine pollutants.
- Annex IV is the Prevention of Pollution by Sewage from Ships (entered into force 27 September 2003). It contains requires to control pollution of the sea by sewage.
- Annex V is the Prevention of Pollution by Garbage from Ships (entered into force 31 December 1988). It specifies the distance from land, manner of disposal, and type of garbage allowed to be disposed of at sea. The requirements are much stricter in a number of "special areas" but perhaps the most important feature of this Annex is the complete ban on dumping all forms of plastic into the sea.
- Annex VI is the Prevention of Air Pollution from Ships (entered into force 19 May 2005). The regulations in this annex set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts as well as particulate matter and prohibit deliberate emissions of ozone depleting substances

Antiquities Act¹². The Antiquities Act authorizes the President of the United States to withdraw lands in order to provide for the “proper care and management” of “historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest.” 16 U.S.C. § 431. Many National Monuments are established under the authority of the Antiquities Act, including the Papahānaumokuākea Marine National Monument established in 2006 to protect extensive coral reef ecosystems in the Pacific Ocean. The Antiquities Act establishes penalties for destroying, injuring, removing, or excavating any historic or prehistoric object of antiquity or object of scientific interest located on federal lands identified for protection within the monument. Reference in the Act to objects of “scientific interest” has resulted in the identification of natural geological features and wildlife for protection within monument boundaries.

National Environmental Policy Act (NEPA)¹³. Title I contains the Declaration of National Environmental Policy requiring the federal government to “use all practicable means to create and maintain conditions under which man and nature can exist in productive harmony”. Section 102 requires all federal agencies to incorporate environmental considerations in planning and decision-making. Under this act, the impacts of federal actions on the quality of the human environment, including on natural resources, must be considered by conducting an appropriate environmental analysis,

¹² <http://www.cr.nps.gov/history/hisnps/npshistory/antiq.htm>

¹³ <http://www.epa.gov/compliance/nepa/>

which may consist of an Environmental Assessment (EA) or Environmental Impact Statement (EIS). Federal agencies are also required to lend appropriate support to initiatives and programs designed to “anticipate and prevent a decline in the quality of mankind’s world environment”. Title II established the Council on Environmental Quality to oversee NEPA by gathering information on conditions and trends in environmental quality; evaluating federal programs with respect to the goals of Title I, develop and promote national policies to improve environmental quality; and conduct studies, surveys, research, and analyses related to the ecosystems and environmental quality. Though NEPA is considered a procedural rather than a substantive statute, lawsuits may be brought under the APA to challenge the sufficiency of the environmental analyses for proposed federal actions.

National Park Service Organic Act¹⁴ of 1916. The National Park Service Organic Act, or the Organic Act, establishes the National Park Service within the Department of the Interior. The Organic Act promotes and regulates the use of national parks, monuments, and reservations “to conserve the scenery and the natural and historic objects and the wildlife therein, and to provide for the enjoyment...leaving them unimpaired for the enjoyment of future generations. This Act also contains a natural resource damages and restoration provision, similar to those in the oil pollution statutes and the sanctuaries act. Several national parks have been established for the protection of resources including coral reef ecosystems, such as Biscayne National Park.

National Wildlife Refuge System Administration Act of 1966¹⁵. The purpose of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.” 16 U.S.C. § 668dd(a)(2). The law also provides that compatible wildlife-dependent recreational uses are allowable activities on refuges. According to the Act, “no person shall knowingly disturb, injure, cut, burn, remove, destroy, or possess any real or personal property of the United States, including natural growth, in any area of the System; or take or possess any fish, bird, mammal, or other wild *vertebrate* or *invertebrate animals* or part or nest or egg thereof within any such area; or enter, use, or otherwise occupy any such area for any purpose; unless such activities are performed by persons authorized to manage such area, or unless such activities are permitted”. Accordingly, vertebrate and invertebrate species (i.e., corals) are protected within National Wildlife Refuges.

Refuge Recreation Act¹⁶. The Refuge Recreation Act was passed in recognition of mounting public demands for recreational opportunities on areas within the National Wildlife Refuge System, national fish hatcheries, and other conservation areas administered by the Secretary of the Interior for fish and wildlife purposes. Additionally, this act is instituted to assure that any present or future recreational use will be compatible with the primary purposes for which the conservation areas were acquired or

¹⁴ <http://www.nps.gov/dena/upload/NPS%20Organic%20Act.pdf>

¹⁵ <http://www.fws.gov/laws/lawsdigest/nwrsact.html>

¹⁶ <http://www.fws.gov/laws/lawsdigest/refrecre.html>

established. Ocean Dumping Ban Act¹⁷. The Ocean Dumping Ban Act of 1988 (also called the Ocean Dumping Act; formerly called the Marine Protection, Research, and Sanctuaries Act) prohibits any person from dumping, or transporting for the purpose of dumping, sewage sludge, medical or industrial waste into ocean waters without a permit after December 31, 1991 (16 USC §1411b). Permits cannot be issued to dump radiological, chemical, and biological warfare agents, high-level radioactive waste, and medical waste (16 USC §1412). The EPA has responsibility for regulating the dumping of all material except dredged material.

The Lacey Act¹⁸. The Lacey Act, as amended in 1981 (16 USC §§ 3372 et seq.), prohibits the trade of fish, wildlife, or plants taken in violation of any foreign, state, tribal or other U.S. law.

The Sikes Act¹⁹. The Sikes Act (16 U.S.C. § 670), requires the U.S. Department of Defense to provide for conservation and rehabilitation of natural resources on military installations, which in some locations include corals.

Water Resources Development Act²⁰. The Water Resources Development Act (33 USC §§ 2201 et seq.) authorizes the construction or study of United States Army Corps of Engineers (USACE) projects and applies to all features of water resources development and planning, including environmental assessment and mitigation requirements.

1.1.2 Federal Executive Orders

Following are descriptions of US Executive Orders that are relevant to protection of corals and coral reefs in the Caribbean and Indo-Pacific.

Executive Order 12962²¹. This Executive Order mandates that Federal agencies, to the extent permitted by law and where practicable, improve the quality, function, and sustainable productivity and distribution of U.S. aquatic resources for increased recreational fishing opportunities. It also established the National Recreational Fisheries Coordination Council. This order is applicable in the Pacific Remote Island Area National Monument (Proclamation No. 8336). The main provisions of this Executive Order are:

- Federal Agencies shall, to the extent permitted by law and where practicable, and in cooperation with States and Tribes, improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities.
- A National Recreational Fisheries Coordination Council is established, consisting of seven members from the Departments of the Interior, Commerce, Agriculture, Energy, Transportation and Defense and the Environmental Protection Agency. The

¹⁷ <http://www.epa.gov/history/topics/mprsa/02.htm>

¹⁸ <http://www.fws.gov/le/pdf/files/lacey.pdf>

¹⁹ <http://www.fws.gov/endangered/esa-library/pdf/2004SikesAct%20NMFVA.pdf>

²⁰ <http://www.fas.org/sgp/crs/natsec/IB10133.pdf>

²¹ <http://www.fedcenter.gov/Bookmarks/index.cfm?id=691>

representatives from the Departments of Commerce and the Interior will co-chair the Coordination Council.

- The Coordination Council, in cooperation and consultation with others, will develop a comprehensive Recreational Fishery Resources Conservation Plan setting forth a 5-year agenda for Federal agencies.
- All Federal agencies will aggressively work to identify and minimize conflicts between recreational fisheries and their respective responsibilities under the Endangered Species Act. The Fish and Wildlife Service and the National Marine Fisheries Service will develop a joint agency policy towards this end.
- The role of the Sport Fishing and Boating Partnership Council will be expanded to assist in the implementation of the Order.

Executive Order 12996²². Executive Order 12996 for “Management and General Public Use of the National Wildlife Refuge System” declares the National Wildlife Refuge System main purposes are to “preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plant resources of the United States for the benefit of present and future generations”. The Order also defines six compatible wildlife-dependent recreational activities (involving fishing, hunting, wildlife observation and photography, and environmental education and interpretation); defines four guiding principles for management; directs the Secretary to undertake several actions in support of management and public use; directs the Secretary to ensure the maintenance of the biological integrity and environmental health; and provides for the identification of existing wildlife-dependent uses that will continue to occur as lands are added.

Executive Order 13089²³. Executive Order 13089, “Coral Reef Protection”, issued by President William J. Clinton on 11 June 1998, established the U.S. Coral Reef Task Force (USCRTF) with a central goal of preserving and protecting the biodiversity, health, heritage, and social and economic value of U.S. coral reef ecosystems and the marine environment. In 2000, the USCRTF published “The National Action Plan to Conserve Coral Reefs²⁴” identifying two fundamental themes for immediate and sustained national action. These include: 1) understanding coral reef ecosystems and the natural and anthropogenic processes that determine their health and viability and 2) quickly reducing the adverse impacts of human activities on coral reefs and associated ecosystems. The action plan also identified marine protected areas (MPAs) as a promising conservation tool and proposed critical conservation goals. The goals were to 1) strengthen protection within existing MPAs; 2) establish no-take ecological reserves in 20 percent of all representative U.S. coral reefs and associated habitats by 2010; 3) conduct a national assessment of the remaining gaps in coverage; and 4) strengthen support for international cooperation to conserve global biodiversity.

Executive Order 13158²⁵. President Clinton issued Executive Order 13158 on Marine Protected Areas on May 26, 2000 to strengthen the management, protection, and

²² http://teeic.anl.gov/lr/dsp_statute.cfm?topic=3&statute=149

²³ <http://www.coralreef.gov/execorder.cfm>

²⁴ <http://www.coralreef.gov/CRTFAxnPlan9.pdf>

²⁵ <http://www.mpa.gov>

conservation of existing marine protected areas and establish new or expanded MPAs; to develop a scientifically based, comprehensive national system of MPAs representing diverse U.S. marine ecosystems, and the Nation’s natural and cultural resources; and to avoid causing harm to MPAs through federally conducted, approved, or funded activities (65 FR 34909). The Department of Commerce and the Department of the Interior are the lead agencies charged with carrying out the Executive Order; however, other pertinent agencies must be consulted to develop the national system of MPAs, ensuring agencies coordinate and share information, tools, and strategies. To aid in coordination efforts, the Order called for the creation of a MPA Center within NOAA. Furthermore, a Federal Advisory Committee, consisting of non-Federal scientists, resource managers, and other interested persons, was established to provide advice and guidance for developing the national system of MPAs.

1.2 Non-Federal Caribbean

1.2.1 Florida

Florida statutes and rules protect all of the Scleractinia and Milleporina corals from collection, commercial exploitation, and injury/destruction on the sea floor (FS 253.001, 253.04, Chapter 68B-42.008 and 68B-42.009). Additionally, Florida has a comprehensive state regulatory program that regulates most land, including upland, wetland, and surface water alterations throughout the state. The comprehensive nature of the state program is broader than the federal program in that it also regulates alterations of uplands that may affect surface water flows. This regulatory program also includes a Federal-State Programmatic General Permit and implementation of a state-wide National Pollutant Discharge Elimination System (NPDES) program. In addition, activities located on or using State-owned sovereign submerged lands also require applicable proprietary authorizations, including consent agreements, leases, and easements. *The John Pennkamp Coral Reef State Park* was established in 1960 as the first coral reef MPA worldwide (*Acropora* Biological Review Team 2005).

Florida statute 253.001 - Board of Trustees of the Internal Improvement Trust Fund; duty to hold lands in trust

The existence of the Board of Trustees of the Internal Improvement Trust Fund is reaffirmed. All lands held in the name of the board of trustees shall continue to be held in trust for the use and benefit of the people of the state pursuant to s. 7, Art. II, and s. 11, Art. X of the State Constitution

Florida Statute 253.04 - Duty of board to protect, etc., state lands; state may join in any action brought

(1) The Board of Trustees of the Internal Improvement Trust Fund may police; protect; conserve; improve; and prevent trespass, damage, or depredation upon the lands and the products thereof, on or under the same, owned by the state as set forth in s. 253.03. The board may bring in the name of the board all suits in ejectment, suits for damage, and suits in trespass which in the judgment of the board may be necessary to the full protection and conservation of such lands, or it may take such other action or do such other things as may in its judgment be necessary for the full protection and conservation of such lands; and the state may join with the board in any action or suit, or take part in

any proceeding, when it may deem necessary, in the name of this state through the Department of Legal Affairs.

(2) In lieu of seeking monetary damages pursuant to subsection (1) against any person or the agent of any person who has been found to have willfully damaged lands of the state, the ownership or boundaries of which have been established by the state, to have willfully damaged or removed products thereof in violation of state or federal law, to have knowingly refused to comply with or willfully violated the provisions of this chapter, or to have failed to comply with an order of the board to remove or alter any structure or vessel that is not in compliance with applicable rules or with conditions of authorization to locate such a structure or vessel on state-owned land, the board may impose a fine for each offense in an amount up to \$10,000 to be fixed by rule and imposed and collected by the board in accordance with the provisions of chapter 120. Each day during any portion of which such violation occurs constitutes a separate offense. This subsection does not apply to any act or omission which is currently subject to litigation wherein the state or any agency of the state is a party as of October 1, 1984, or to any person who holds such lands under color of title. Nothing contained herein impairs the rights of any person to obtain a judicial determination in a court of competent jurisdiction of such person's interest in lands that are the subject of a claim or proceeding by the department under this subsection.

(3) The Department of Environmental Protection is authorized to develop by rule a schedule for the assessment of civil penalties for damage to coral reefs in state waters. The highest penalty shall not exceed \$1,000 per square meter of reef area damaged. The schedule may include additional penalties for aggravating circumstances, not to exceed \$250,000 per occurrence. Penalties assessed according to this section may be doubled for damage to coral reefs located within the boundaries of John Pennekamp Coral Reef State Park. (*Acropora* Biological Review Team, 2005)

68B-42.009 Prohibition on the Taking, Destruction, or Sale of Marine Corals and Sea Fans; Exception; Repeal of Section 370.114, Florida Statutes

(1) Except as provided in subsection (2), no person shall take, attempt to take, or otherwise destroy, or sell, or attempt to sell, any sea fan of the species *Gorgonia flabellum* or of the species *Gorgonia ventalina*, or any hard or stony coral (Order Scleractinia) or any fire coral (Genus *Millepora*). No person shall possess any such fresh, uncleaned, or uncured sea fan, hard or stony coral, or fire coral.

The prohibitions of this provision do not apply to sea fans, hard or stony corals, or fire corals legally harvested outside of state waters or federal EEZ waters adjacent to state waters and entering Florida in interstate or international commerce. The prohibitions also do not apply to any sea fan, hard or stony coral, or fire coral harvested and possessed pursuant to state permit for scientific or educational purposes. Last, the prohibitions are not applicable to any sea fan, hard or stony coral, or fire coral harvested and possessed pursuant to the aquacultured live rock provisions of Florida Statutes, or pursuant to a Live Rock Aquaculture Permit issued by the National Marine Fisheries Service under 50 C.F.R. Part 638 (*Acropora* Biological Review Team 2005).

House Bill 1423- Coral Reef Protection Act 2009

In 2009, the Florida Legislature passed the Coral Reef Protection Act to increase protection of coral reef resources on sovereign submerged lands off the coasts of Martin, Palm Beach, Broward, Miami-Dade, and Monroe counties. This law will increase the protection of Florida's endangered coral reefs by helping raise awareness of the damages associated with vessel groundings and anchoring on coral reefs off the coasts of Broward, Martin, Miami-Dade, Monroe, and Palm Beach counties. The law also authorizes penalties for the destruction of reef resources and provides for efficient repair and mitigation of reef injuries. The new law will allow the Department of Environmental Protection to restore coral reefs by ensuring that those responsible for damaging coral reefs can face fines and penalties to help restore the damage. The law also allows the state to issue "first time" warnings in lieu of a fine to recreational boaters in certain instances, and specifies higher penalties for repeat offenders and for injuries which occur within a state park or aquatic preserve. The law allows the Department of Environmental Protection to delegate authority through agreements with the Florida Fish and Wildlife Conservation Commission, coastal counties and other local governments to investigate reef damages, recover costs, provide restoration and seek compensatory mitigation (*Acropora* Biological Review Team 2005).

Florida Endangered Species Act

Only one of the 82 coral species, *Dendrogyra cylindrus* (pillar coral), is listed as an imperiled species under the Florida Endangered Species Act. FL Fish and Wildlife Commission 2008. Because it was designated prior to June 23, 1999, *Dendrogyra cylindrus* is afforded the protections of Chapter 68A-27.003 of the Florida Endangered Species Act which prohibits take, including harm, of protected species without a permit (*Acropora* Biological Review Team 2005).

Chapter 18-20 Florida Administrative Code – Florida Aquatic Preserves

All sovereignty lands within a preserve shall be managed primarily for the maintenance of essentially natural conditions, the propagation of fish and wildlife, and public recreation, including hunting and fishing where deemed appropriate. Aquatic preserves which are described in Part II of Chapter 258, Florida Statutes, were established for the purpose of being preserved in an essentially natural or existing condition so that their aesthetic, biological and scientific values may endure for the enjoyment of future generations. Preserves were established to preserve, promote, and utilize indigenous life forms and habitats, including but not limited to: sponges, soft coral, hard corals, submerged grasses, mangroves, salt water marshes, fresh water marshes, mud flats, estuarine, aquatic, and marine reptiles, game and non-game fish species, estuarine, aquatic and marine invertebrates, estuarine, aquatic and marine mammals, birds, shellfish and mollusks (*Acropora* Biological Review Team 2005).

State of Florida Clean Vessel Act and Designation of Waters of the State Surrounding the Florida Keys as a No Discharge Zone

The State of Florida's Clean Vessel Act of 1994 requires houseboats to store sewage in holding tanks (Type III Marine Sanitation Device) that must be pumped out and disposed

at approved facilities. However, vessels other than houseboats could legally discharge wastewater from Type I or Type II Marine Sanitation Device that disinfect the wastewater but do not remove nutrients. For that reason, on July 26, 2001, the USEPA, under authority of Section 312 of the CWA, published a proposed rule to establish a No Discharge Zone in State of Florida waters within the boundaries of the FKNMS. That action was taken at the request of the Governor of Florida, with support by the Monroe County Board of County Commissioners and the FKNMS Water Quality Steering Committee. The rule became effective in June 2002 and makes it illegal to dump sewage, whether treated or not, into State waters. NOAA is pursuing establishment of a No Discharge Zone in federal waters of the FKNMS. The Clean Vessel Act administers a grant program to fund construction of vessel sewage pump out facilities and toilet dump stations at marinas (*Acropora* Biological Review Team 2005).

Chapter 99-395, Laws of Florida

In 1999, the Florida State Legislature approved Chapter 99-395 that was adopted as a Law of Florida. This law prohibits new surface water wastewater discharges, requires existing wastewater facilities discharging to cease surface water disposal by 2006, and requires all other discharges to meet specific treatment and disposal standards by July 1, 2010. Facilities with flows greater than or equal to 100,000 gallons per day are required to provide basic disinfection and produce advanced water treatment effluent. Facilities with flows less than 100,000 gallons per day and onsite systems (e.g., septic tanks) are required to provide disinfection and produce an effluent that meets best available technology requirements. Facilities with a wastewater flow of 1 million gallons per day or greater must use a deep injection well for disposal, while facilities with flows less than 1 million gallons per day must discharge to a shallow injection well (*Acropora* Biological Review Team 2005).

Oceans and Coastal Resources Act

The Oceans and Coastal Resources Act states that the coral reefs of southeast Florida and the barrier reef of the Florida Keys are a national treasure and must continue to be protected (Florida Statute §161.72(e)). Both the FDEP and Florida Fish & Wildlife Conservation Commission (FWC) are authorized to promulgate regulations under this act (Florida Statute §161.75). Florida law prohibits taking, attempting to take, or otherwise destroy, or sell or attempt to sell any hard or stony coral (Order Scleractinia) in state waters, with exceptions for permitted scientific research, educational purposes and aquaculture (Chapter 68B-42.009 of the Florida Administrative Code; <http://fac.dos.state.fl.us/faconline/chapter68.pdf>). The Act also prohibits possession of such fresh, uncleaned or uncured coral. Any person who willfully violates the above prohibitions is subject to fines (section 253.04 of Florida Statutes). Any person in possession of elkhorn or staghorn coral legally harvested outside of Florida waters or the U.S. EEZ adjacent to state waters and entering Florida in interstate or international commerce must establish the chain of possession from the initial transaction after harvest, by appropriate receipt(s), bill(s) of sale, or bill(s) of lading, and any customs receipts, and to show that such species originated from a point outside Florida waters or the U.S. EEZ adjacent to state waters and entered the state in interstate or international commerce (68B-42.009(2)(a)) (*Acropora* Biological Review Team 2005).

The Florida Aquatic Preserve Act

One of the goals of the Florida Aquatic Preserves Act (18 Florida Administrative Code 258) is to preserve, promote, and utilize indigenous life forms and habitats, including hard corals. The Florida Aquatic Preserve Act implemented a system of protected areas within Florida, such as Biscayne Bay Aquatic Preserve. Biscayne Bay Aquatic Preserve was established in 1974 and it encompasses 69,000 acres of State submerged lands. The preserve extends from Miami-Dade County to Monroe County. The Act establishing Biscayne Bay Aquatic Preserve restricts dredge and fill activities and alteration of physical conditions, and discharge of wastes that substantially inhibit the purposes of the preserve. Coupon Bight Aquatic Preserve is the southern most aquatic preserve located in the lower half of the Florida Keys. It is a shallow semi-enclosed basin approximately 3.5 kilometers (2.2 miles) long and 2.5 kilometers (1.6 miles) wide with an average depth near the center of 1.8 meters (6 feet). Its waters have been designated as Outstanding Florida Waters, and as such, the FDEP cannot issue permits for direct pollutant discharges, which would lower existing water quality, and indirect discharges, which would significantly degrade that water body (*Acropora* Biological Review Team 2005).

Outstanding Florida Waters

Marine waters surrounding the Florida Keys have been declared as “Outstanding Florida Waters” by the State of Florida (FDEP, 1985). By regulation, input of materials that could be considered pollutants to open surface waters cannot exceed the concentration of those materials that naturally occur in the waters. Because of Outstanding Florida Waters designation, direct surface water discharges of pollutants have been eliminated or are being phased out in the Florida Keys. The Florida Keys have also been designated a region of “critical State concern” which requires the development and approval by the Florida Department of Community Affairs a “Monroe County Comprehensive Plan” that addresses elimination of sources of pollution and land-management options (*Acropora* Biological Review Team 2005).

Environmental Resource Permitting and Wetland Resource Permit

The Environmental Resource Permit Program is an independent State permit program that operates in addition to the federal dredge and fill program. The Environmental Resource Permit Program regulates activities involving the alteration of surface water flows. This includes new activities in uplands that generate stormwater runoff from upland construction, as well as dredging and filling in wetlands and other surface waters. Environmental Resource Permit applications are processed by either the Florida Department of Environmental Protection (FDEP) or one of the State’s water management districts, in accordance with the division of responsibilities specified in operating agreements. The Environmental Resource Permit Program is in effect throughout the State except for the Florida Panhandle (Northwest Florida Water Management District). In northwest Florida, a Wetland Resource Permit (Chapter 62-312 F.A.C.) is required for any dredging, filling or construction in, on, or over waters that are connected (naturally or artificially) to “named waters.” Named waters include the Gulf of Mexico, bays, bayous, sounds, estuaries, lagoons, river, streams, and natural lakes that are not wholly owned by one person other than the State. This permitting system does not regulate dredging or

filling in isolated wetlands and is implemented solely by the FDEP. In peninsular Florida, the Environmental Resource Permit Program regulates virtually all alterations to the landscape, including all tidal and freshwater wetlands and other surface waters, as well as storm water runoff quality and quantity. This program regulates everything from construction of single family residences in wetlands, convenience stores in uplands, dredging and filling for any purpose in wetlands and other surface waters, construction of roads, and agricultural alterations that impede or divert the flow of surface waters. Application of this permitting program ensures that water quality is not degraded, and that wetlands and other surface waters continue to provide productive habitat for fish and wildlife, including corals. Issuance of an Environmental Resource Permit constitutes water quality certification or waiver thereto under Section 401 of the CWA (33 U.S.C. 1341). Finally, issuance of an Environmental Resource Permit in coastal counties constitutes a finding of consistency under the Florida Coastal Zone Management Program (Section 301 Coastal Zone Management Act) (*Acropora* Biological Review Team 2005).

Submerged Lands Authorization

In addition to the above regulatory program, Submerged Land Authorization is required for any construction on or use of submerged lands owned by the State (sovereign submerged lands) (F.S. Chapter 253). Such lands generally extend waterward from the mean high water line of tidal waters, or the ordinary high water line of freshwaters, out to the State's territorial limit. The State's territorial limit is approximately 3 miles into the Atlantic Ocean and nine miles into the Gulf of Mexico. If such lands are located within certain designated Aquatic Preserves, the authorization must also meet the requirements of Chapter 258 of Florida Statutes. Such authorization considers issues such as riparian rights, impacts to submerged land resources, and preemption of other uses of the water by the public. Authorizations typically are in the form of consent of use, easements, and leases. This program is implemented jointly by the FDEP and four (of five) of the State's water management districts in accordance with the same operating agreement that governs the Environmental Resource Permit Program. The program is structured so that applicants who do not qualify at the time of the permit application for both the regulatory permit and the propriety authorization cannot receive either permit or authorization (*Acropora* Biological Review Team 2005).

National Pollution Discharge Elimination System

In addition to the State regulatory program, Florida has statewide authorization to implement the Federal NPDES permit program for stormwater. Areas of regulation include municipal separate storm sewer systems, certain industrial activities, and construction activities. New construction may require a stormwater permit if the clearing, grading, or excavation work disturbs five or more acres of land and discharges to either surface waters of the State or to a Municipal Separate Storm Sewer System (*Acropora* Biological Review Team 2005).

Florida Administrative Code, Chapter 18-21

Chapter 18-21 of the Florida Administrative Code prohibits installation of telecommunication lines that originate from or extend into federal waters on or under submerged lands within Biscayne Bay Aquatic Preserve, Biscayne Bay National Park,

and Monroe County. Moreover, the law requires conduits for telecommunication lines to be directionally drilled under nearshore benthic resources, including the first reef and any other more inshore reefs off Southeast Florida, to the maximum extent practicable and to punch out in a location that avoids or minimizes the impacts to benthic resources such as seagrasses and live bottom communities including corals and sponges. The same chapter also requires that activities on submerged sovereignty lands be designed to minimize or eliminate any adverse impacts on fish and wildlife habitat, and other natural or cultural resources, with special attention and consideration given to endangered and threatened species habitat (*Acropora* Biological Review Team 2005).

Florida's Coastal Zone Management Act of 1978

Florida's Coastal Zone Management Act of 1978 authorized the development of a comprehensive state Coastal Management Program (CMP) based on existing Florida Statutes and regulations. Florida's CMP is comprised of 23 statutes, which are administered by nine State agencies and five water Districts. The Federal CZMA and Florida law requires Federal agencies and applicants to provide a detailed description of proposed Federal activities that may affect the State's coastal resources, and the State's Department of Community Affairs coordinates the review of such activities to ensure that they are consistent with the State's CMP and Coastal Zone Management Act.

Section 403.061 of the Florida Statutes is part of the State's CMP and it authorizes FDEP to identify "Outstanding Florida Waters", and the designation is intended to protect existing good water quality. FDEP cannot issue permits for direct pollutant discharges to Outstanding Florida Waters, which would lower existing water quality, and indirect discharges, which would significantly degrade that water body. Waters with the Outstanding Florida Water designation in which elkhorn and staghorn corals occur are: (a) in Palm Beach County: John D. MacArthur Beach State Park; (b) in Broward County: John U. Lloyd Beach State Recreation Area, and North Beach; (c) in Miami-Dade County: Biscayne National Park, ITT/Hammock, and Biscayne Bay; (d) in Monroe County: Dry Tortugas National Park, Key West National Wildlife Refuge, National Key Deer National Wildlife Refuge, Bahia Honda State Park, Bill Baggs Cape Florida State Recreation Area, Hugh Taylor Birch State Recreation Area, Long Key State Recreation Area, Fort Zachary Taylor Historic Site, Indian Key State Historic Site, Indian Key State Historic Site, Key Largo Hammock State Botanical Site, Windley Key Fossil Reef State Geological Site, San Pedro Underwater Archaeological Preserve, Coupon Bight, Curry Hammock, North Key Largo Hammock, Port Bougainville, and Biscayne Bay.

FDEP regulates activities that involve alteration of surface water flows through the Environmental Resource Permit Program. The purpose of the Environmental Resource Permit Program is to ensure that construction activities do not degrade water quality, cause flooding, or degrade habitat for aquatic or wetland dependent wildlife. Activities requiring permits involve, but are not limited to involving, the following: 1) solid waste, hazardous waste, domestic waste, and industrial waste facilities; 2) mining; 3) docking facilities and attendant structures and dredging that are not part of a larger plan of residential or commercial development; navigational dredging conducted by government entities, except when part of a larger project that a Water Management District has the responsibility to permit; systems located in whole or in part seaward of the coastal

construction control line; seaports; and smaller, separate water-related activities not part of a larger plan of development, such as boat ramps, mooring buoys, and artificial reefs. Similar to the process described under the Federal RHA, the state of Florida requires project modifications and mitigation measures for corals through the Environmental Resource Permit review process (*Acropora* Biological Review Team 2005).

Pollution Discharge Prevention and Control Act

The Pollution Discharge Prevention and Control Act (28 Florida Statutes §§ 376.011 et seq.) prohibits the discharge of pollutants into or upon any coastal waters, estuaries, tidal flats, beaches, or lands adjoining the seacoast of the state. Pollution is defined as the presence in the outdoor atmosphere or waters of the state any one or more substances or pollutants in quantities which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property or which may unreasonably interfere with the enjoyment of life or property, including outdoor recreation (*Acropora* Biological Review Team 2005).

Florida and Cruise Ship Industry MOU

In 2001, the State of Florida entered into a Memorandum of Understanding (MOU) with the cruise ship industry through the International Council of Cruise Lines and related organizations. Under the MOU, cruise lines must eliminate wastewater discharges in Florida waters within 4 nautical miles of the State's coast, report hazardous waste off-loaded in the U.S. by each vessel on an annual basis, and submit to environmental inspections by USCG (Congressional Research Service 2005; *Acropora* Biological Review Team 2005).

Monroe County Code of Ordinances.

The Monroe County Code of Ordinances does not permit dredging of hard bottom communities to construct a boat ramp (section 9.5-349(1)(7)). Docking facilities may be permitted which terminate over hardbottom communities where the water depth at the terminal platform is at least 4 feet above the top of all corals at mean low water and access to open water is continuous (section 9.5-349(m)(5)). Water access walkways are not permitted when designed to terminate over hardbottom communities (section 9.5-349(n)(1)(f)) (*Acropora* Biological Review Team 2005).

Phosphate Detergent Ban in Monroe County, Florida.

The Monroe County Board of County Commissioners (Florida Keys) (MCBCC) recognized that phosphate-laden detergents are a significant source of phosphate pollution of canals and other near shore waters of the Florida Keys. The board also recognized that phosphate enrichment of near shore waters can result in the growth of nuisance algae and can alter ecosystem structure and function, including coral reefs. The MCBCC passed Monroe County Ordinance 029-1989 in October 1989 making it unlawful for any person, firm, or corporation to sell, offer to expose for sale, give or furnish any detergent containing more than 0% to 0.5% phosphorus by weight within unincorporated and incorporated areas of Monroe County. An exemption is given for detergents used in machine dishwashing that contain 0% to 5.9% phosphorus by weight (*Acropora* Biological Review Team 2005).

1.2.2 Puerto Rico

Law for the Protection, Conservation, and Management of Coral Reefs in Puerto Rico, Law 147

This law explicitly mandates the conservation and management of coral reefs in order to protect their functions and values. The Department of Natural and Environmental Resources (DNER) is in charge of implementing the law. Law 147 provides for the creation of zoned areas in order to mitigate impacts from human activities, including (1) Reef Recuperation Areas and (2) Ecologically Sensitive Areas. These zones will facilitate the DNER in controlling human activity that can directly impact coral species such as anchoring. Law 147 also directs the DNER to identify and mitigate threats to coral reefs from degraded water quality due to pollution, and additionally requires an EIS for projects or activities that can negatively affect coral reefs. Additionally, the law directs the DNER to designate priority areas as marine reserves, including a minimum of 3% of the insular platform within three years (2003). Marine reserves are defined as areas where all extractive activities are prohibited in order to help recover depleted fishery resources and protect biodiversity, and can protect corals by preventing impacts from fishery gear. There are currently an additional 13 natural reserves in Puerto Rico that have coral reefs within their boundaries, all of which are located on all coasts and offshore islands. This spatial distribution of protected areas provides an infrastructure for management measures to protect coral populations (*Acropora* Biological Review Team 2005).

Fishery Law 83 of 1936

Fishery Law 83 of 1936 prohibits harvest or take of corals or live rock for commercial purposes (except under permit) and use of poisonous substances when fishing. The territory prohibits fishing by means of explosives in its maritime waters (12 LPRA §57), and it is illegal to transport or sell articles derived from rare or endangered species as designated by the DNER (12 LPRA §107d; *Acropora* Biological Review Team 2005).

Law 430 of 2000 Navigation and Aquatic Safety Law

The Navigation and Aquatic Safety Law and its associated Regulation 6979 of 2005, establish measures to protect the marine flora and fauna from recreational and other human activities. For instance, Article 24 of Regulation 6979 prohibits the mooring of any vessel in mangroves, coral reefs, or seagrass beds. The fine for violating this regulation is \$250 and can be issued in the form of a ticket by any enforcement official (Article 35). The regulation also contains requirements related to the reporting of groundings. DNER is working to become more active in the documenting of recreational vessel groundings in order to characterize the cumulative impacts of these accidents on the coral reef ecosystem (Lilyestrom, pers obs. in *Acropora* Biological Review Team 2005).

1.2.3 U.S. Virgin Islands

U.S.V.I. Coastal Zone Management Act of 1978 (12 VIC § 906)

This statute provides provisions for development activities conducted near the coastal zone. Provisions in this statute include considerations and protections for significant natural areas for their contributions to marine productivity and value as habitats for

endangered species and other wildlife. Also included are provisions to protect complexes of marine resource systems of unique productivity, including reefs, marine meadows, salt ponds, mangroves and other natural systems, and assure that activities in or adjacent to such complexes are designed and carried out so as to minimize adverse effects on marine productivity, habitat value, storm buffering capabilities, and water quality of the entire complex. The U.S.V.I CZMA states that sand, rock, mineral, marine growth and coral, natural materials or other natural products of the sea, excepting fish and wildlife, shall not be taken from the shoreline without first obtaining a coastal zone permit, and no permit shall be granted unless it is established that such materials or products are not otherwise obtainable at reasonable cost, and that the removal of such materials or products will not significantly alter the physical characteristics of the area or adjacent areas on an immediate or long-term basis. This law is generally used to prevent the taking of coral anywhere in the U.S.V.I (*Acropora* Biological Review Team 2005).

Chapter 1 Wildlife. Subchapter VII Wildlife and Marine Sanctuaries § 97. Establishment of wildlife or marine sanctuaries. This statute provides for the establishment of wildlife or marine sanctuaries for the purpose of propagating, feeding, and protecting birds, fish and other wildlife. This statute provides the legal basis for the establishment of the St. Croix East End Marine Park.

Chapter 1 Wildlife. Subchapter VII Wildlife and Marine Sanctuaries § 98. This statute legally established the St. Croix East End Marine Park to protect territorially significant marine resources, promote sustainability of marine ecosystems, including coral reefs, sea grass beds, wildlife habitats and other resources and to conserve and preserve significant natural areas for the use and benefit of future generations.

Indigenous and Endangered Species Act of 1990

Virgin Islands Law VIC, T. 12, Ch. 2, Section 103 (a), also known as the Indigenous and Endangered Species Act of 1990: states that “No person may take, catch, possess... any indigenous species, including live rock (includes coral)... without a valid scientific or aquarium collecting permit, or indigenous species retention permit...” Aquarium permits have not been issued except for private aquarists; and no permits for coral collections are approved (*Acropora* Biological Review Team 2005).

1.3 Non-Federal Indo-Pacific

The following subsections describe non-federal existing regulatory mechanisms for the states, territories, and commonwealths that have local governments (Hawaii, American Samoa, Guam, CNMI) within the range of the 75 Indo-Pacific coral species. Some coral species also occur on Jarvis Atoll, Wake Island, Palmyra Atoll, and Howland and Baker Islands of the Pacific Remote Island Areas (PRIA). However, PRIA does not have a local government, and is thus controlled entirely by the federal government. Therefore, there are no non-federal regulatory mechanisms in PRIA.

1.3.1 Hawaii

The management of coastal and marine areas in Hawaii occurs through various statutes. Application of these laws is commonly undertaken through administrative regulations promulgated for specific areas. A primary focus of marine regulation in Hawaii is the

control of “fishing” and the prohibition or restriction of marine organism collection. The underlying motivation for the regulatory system is the maintenance and (if necessary) restoration of marine ecosystems and/or the reduction of user conflicts. Most of Hawaii’s coral ecosystems lie in State-regulated waters. The Department of Land and Natural Resources (DLNR) and Division of Aquatic Resources (DAR) have identified critical coral ecosystems and, using statutory authority, identified various Marine Management Areas. All corals belonging to the order *Scleractinia* are protected under Hawaii’s Administrative Code Title §13-95-1.1.

Hawaii Administrative Rules Title 13.

HAR Title 13 Department of Land and Natural Resources Sub-Title 10 Land Management Chapter 221 Unencumbered Public Lands

The purpose of this chapter is to control public activities on unencumbered public lands. Unencumbered public lands include, but are not limited to, beach and coastal areas, submerged lands, and mountainous non-forest reserve, wildlife, or park areas. Provisions that affect the coastal marine environment are described below.

§13-221-23 Geological features

No person shall destroy, disturb, or mutilate any geological features or dig, or remove sand, earth, gravel, minerals, rocks, fossils, coral or any other substance on the premises. No person shall excavate or quarry any stone, or lay, set, or cause any blast or explosion, or assist in these acts within the premises, except as provided by law or with the written permission of the board or its authorized representative.

§13-221-34 Wildlife

No person shall molest, disturb, injure, trap, take, catch, possess, poison, or kill any wild bird or mammal, or disturb their habitat within the premises, except when otherwise authorized by all applicable federal, state and county laws and rules. [Eff FEB 06 1988] (Auth: HRS §171-6) (Imp: HRS §171-6)

§13-5-1 “Conservation Districts”

The purpose of this chapter is to regulate land-use in the conservation district for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. [Eff DEC 12 1994] (Auth: HRS §183c03) (Imp: HRS §183c-1) “Conservation district” means those lands within the various countries of the State and state marine waters bounded by the conservation district line, as established under the provisions of Act 187, Session Laws of Hawaii 1961, and Act 205, Session Laws of Hawaii 1963, or future amendments thereto.

§225M-2 Office of planning, establishment; responsibilities

There is established within the department of business, economic development, and tourism an office of planning. The office of planning shall gather, analyze, and provide information to the governor to assist in the overall analysis and formulation of state policies and strategies to provide central direction and cohesion in the allocation of

resources and effectuation of state activities and programs and effectively address current or emerging issues and opportunities. More specifically, the office shall engage in the following activities:

- Coastal and ocean policy management
- Carry out the lead agency responsibilities for the Hawaii coastal zone management program, as specified in chapter 205A.
- Develop and maintain an ocean and coastal resources information, planning, and management system
- Further develop and coordinate implementation of the ocean resources management plan
- Formulate ocean policies with respect to the exclusive economic zone, coral reefs, and national marine sanctuaries

§190-3 Rules

The Department of Land and Natural Resources pursuant to chapter 91, shall adopt rules governing the taking or conservation of fish, crustacean, mollusk, live coral, algae, or other marine life as it determines will further the state policy of conserving, supplementing and increasing the State's marine resources. The rules may prohibit activities that may disturb, degrade, or alter the marine environment, establish open and closed seasons, designate areas in which all or any one or more of certain species of fish or marine life may not be taken, prescribe and limit the methods of fishing, including the type and mesh and other description of nets, traps, and appliances, and otherwise regulate the fishing and taking of marine life either generally throughout the State or in specified districts or areas.

§171-58.5 Prohibitions

The mining or taking of sand, dead coral or coral rubble, rocks, soil, or other marine deposits seaward from the shoreline is prohibited.

§190-1 Conservation area; administration

All marine waters of the State are hereby constituted a marine life conservation area to be administered by the department of land and natural resources subject to this chapter and any other applicable laws not inconsistent herewith or with any rules adopted pursuant hereto. No person shall fish for or take any fish, crustacean, mollusk, live coral, algae or other marine life, or take or alter any rock, coral, sand or other geological feature within any conservation district established.

§188-68

Permits for coral and rock with marine life attached. The department may issue permits, as authorized by this section, section 187A-6, chapter 183C, or under rules adopted pursuant to chapter 91 necessary for collecting live stony corals or marine life visibly attached to rocks placed in the water for a commercial purpose.

[§188F-3] West Hawaii regional fishery management area; purpose: The purpose of the West Hawaii regional fishery management area shall be to:

- Ensure the sustainability of the State's nearshore ocean resources;

- Identify areas with resource and use conflicts;
- Provide management plans as well as implementing regulations for minimizing user conflicts and resource depletion, through the designation of sections of coastal waters in the West Hawaii regional fishery management area as fish replenishment areas where certain specified fish harvesting activities are prohibited, and other areas where anchoring and ocean recreation activities are restricted;
- Establish a system of day-use mooring buoys in high-use coral reef areas and limit anchoring in some of these areas to prevent anchor damage to corals;
- Identify areas and resources of statewide significance for protection;
- Carry out scientific research and monitoring of the nearshore resources and environment; and
- Provide for substantive involvement of the community in resource management decisions for this area through facilitated dialogues with community residents and resource users. [L 1998, c 306, pt of §2]

Hawaii Coral & Live Rock Statutes

“Stony coral” means any of a variety of invertebrate species belonging to the order Scleractinia characterized by having a hard, calcareous skeleton that are native to the Hawaiian Islands.

§13-95-70 Stony corals.

(a) It is unlawful for any person to take stony coral, or to break or damage any stony coral with a crowbar, chisel, hammer, or any other implement. (b) It is unlawful for any person to sell any stony coral; except that stony coral rubble pieces or fragments imported for the manufacture and sale of coral jewelry or stony coral obtained through legal dredging operations in Hawaii for agricultural or other industrial uses may be sold. [Eff 12/03/98; am Dec 9 2002] (Auth: HRS §187A-5) (Imp: HRS §187A-5)

§13-95-71 Live rocks

(a) It is unlawful for any person to take live rock, or to break or damage with crowbar, chisel, or any other implement, any rock or coral to which marine life is visibly attached or affixed. (b) It is unlawful for any person to sell any rock or coral to which marine life is visibly attached or affixed. [Eff 12/03/98; am Dec 9 2002] (Auth: HRS §§187A-5, 189-6) (Imp: HRS §§187A-5, 189-6)

1.3.2 American Samoa

American Samoa Code Annotated Title 24 Ecosystem Protection and Development²⁶

Chapter 1 Environmental Quality Act (A.S.C.A. §§ 24.0101 et seq). The two main objectives of this Act are: (a) to achieve and maintain levels of air and water quality as will protect human health and safety, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development, and facilitate the enjoyment of the natural attractions; and (b) to provide for a coordinated Territory-wide program of air and water pollution prevention, abatement,

²⁶ <http://www.asbar.org/>

and control; and provide a framework within which all values may be balanced in the public interest.

The Act defines “water pollution” as “the presence in the water of visible floating materials, oil, grease, scum, foam or other materials which produce visible turbidity or settle to form deposits; or materials which produce color, odor or taste, either of themselves or in combination, or in the biota; or materials which induce undesirable aquatic life; or materials which are toxic or an irritant to humans, animals, plants, or aquatic life”. The Act pertains to all “waters of American Samoa” of which include all streams, lakes, ponds, rivers, bays, lagoons, navigable water, groundwaters, underground waters, and coastal waters.

Chapter 2 Water Quality Standards (A.S.C.A. §§ 24.0201 et seq). This chapter agrees with the Federal Water Pollution Control Act and asserts that existing water uses and water quality standards must be maintained in such a way as is consistent with the Clean Water Act.

Chapter 9 Fishing (A.S.C.A. §§ 24.0901 et seq). Section 24.0907 of these regulations outlines activities regulated in Fagatele Bay National Marine Sanctuary. In zones A and B, it is prohibited to gather, take, break, cut, damage, destroy, or possess any invert, shellfish, coral, bottom formation, or marine plant; prohibited to possess or use spearguns (Hawaiian slings, pole slings, arbalettes, pneumatic and spring loaded spearguns), blow and arrows, bang sticks, or similar taking device; no person shall possess seines, trammel nets, or any fixed net; no vessel anchor in living coral or anchor in any manner that causes damage to living coral; and no vessel shall discharge, or cause to be discharged, in the marine environment any substance that may damage fish habitat (this includes but is not limited to garbage, human waste, or oily bilge). Within subzone A no person shall possess or use fishing poles, hand lines, or trawls and commercial fishing is prohibited.

Section 24.0909 of these regulations describes activities regulated at Rose Atoll National Wildlife Refuge (operates in conjunction with federal regulations). The boundaries include all lands within extreme low water line of the outside perimeter reef except at the entrance to the channel where the boundary line is a line extended between extreme low waterlines on each side of the entrance channel. It is prohibited to gather, take, break, cut, damage, destroy, or possess any invert, shellfish, coral, bottom formation, or marine plant; prohibited to take or attempt to take fish; and no person shall enter without a special use permit from DMWR.

Section 24.0910 states it is unlawful to use or possess in a fishing area any gear prohibited by annual proclamation.

Section 24.0911 states it is unlawful to take or attempt to take fish or shellfish with dynamite or any explosive.

Section 24.0912 states it is unlawful to place or explode dynamite or any explosive, or cause to be placed or explode dynamite or any explosive in the waters of American

Samoa for any reason except as may be authorized by the American Samoa Government pursuant to all applicable regulations and permits

Section 24.0913 states it is unlawful to take or attempt to take fish or shellfish using any substance that has a poisonous or intoxicating effect on fish or shellfish. Includes bleach, quinaldine, insecticides, herbicides, and traditional fish poisons derived from plant and animal materials such as Barrintonia (futu) and Derris (Ava niu kini).

Section 24.0915 states it is unlawful to take, attempt to take, or assist in taking fish or shellfish (or both) using SCUBA or any underwater breathing apparatus, except with a permit issued by the director under 24.0938.

Section 24.0916 states it is unlawful to possess SCUBA or any underwater breathing apparatus and spear on any vehicle, vessel, or along the shoreline, unless the person in possession holds a permit issued by the director under 24.0938.

Section 24.0917 states it is unlawful to be in possession of explosives, poisonous substances, or electrical devices.

Section 24.0926 states it is unlawful to willfully damage coral during fishing operations.

Section 24.0927 states it is unlawful to willfully damage or destroy fish habitat at any time unless authorized by the American Samoan Government pursuant to all applicable permits and regulations.

Section 24.0929 states it is unlawful to collect any living coral in water less than 60 feet deep. No commercial harvest of coral is permitted without a valid permit from the department.

Section 24.0937 states a permit is needed to collect aquarium fish, for coral harvesting, or for scientific collection.

Section 24.0938 states a license is needed for commercial fishing. Applicants must be a resident of American Samoa for one year to obtain a license.

Section 24.0943 states laws are fully enforceable by ASG department of Public Safety Officers and other authorized persons. Primary enforcement is from agents of the DMWR staff.

Chapter 10 Community-Based Fisheries Management Program (A.S.C.A. §§ 24.1001 et seq.). These regulations govern the Community-based Fisheries Management Program in an effort to protect traditionally valuable resources; such as traditional fishing gear, fishing methods, and Village Marine Protected Areas; in the waters surrounding American Samoa. Designation of Village Marine Protected Areas and Village Bylaws are recognized under Sections 24.1005 and 24.1006. According to Section 24.1009, prohibits the use of poisons, explosives, and other noxious substances.

Section 24.1008 addresses Fishing or Taking Fish in a Village Marine Protected Area. The following methods are approved within Village Marine Protected Areas: rod and reel, bamboo pole, hand line, Gleaning, hand thrown pole spear, throw net, Fish or Shellfish Trap, traditional use of Lau and the enu and spear, and spear gun. All other methods are illegal. The village has the right to ban certain types of fishing gear, methods, or declare no take areas within the Village Marine Protected Area.

American Samoa Code Annotated Title 26 Environmental Safety and Land Management²⁷

Chapter 2 Coastal Management (A.S.C.A. §§ 26.0201 et seq.). The American Samoa Coastal Management Program Administrative Rules were adopted from the American Samoa Coastal Management Act of 1990 with the purpose of establishing a system of environmental review that includes economic and technical guidance for land-use decisions. These regulations develop standards, procedures for designating, planning, and managing Special Management Areas that are consistent with the Coastal Zone Management Act of 1972. Some specific regulations within this chapter are described below.

Section 26.0221 declares Special Management Areas in mangrove habitat that are “unique and irreplaceable habitat”. The two areas specifically mentioned are Leone Pala Lagoon and Nuuuli Pala Lagoon.

Section 26.0222 states that wetlands management must include delineation of boundaries, policy, jurisdictional limits, buffer zones, permitted and prohibited activities, and permissible uses and violations.

American Samoa Coastal Management Program Administrative Rules 1997²⁸. These rules developed the Project Notification and Review System, which is a system of environmental review used when making land-use decisions.

1.3.3 Guam

Guam Code Annotated (GCA), Organic Act of Guam²⁹,

Title 5 Government Operations, Chapter 63 (Fish, Game, Forestry, and Conservation). Take and harvesting of coral is regulated and coral reefs in general are protected under this act. Article 1 (Game and Fish).

Section 63104 states it is unlawful to take any fish using dynamite or explosive.

Section 63105 states it is unlawful for explosives to be thrown, dropped, or exploded in any waters of the Territory of Guam.

Section 63106 states taking fish by means of poisons or intoxicant substances is unlawful.

²⁷ <http://www.asbar.org/>

²⁸ http://www.asbar.org/Regs/asac26_02.htm

²⁹ <http://www.justice.gov.gu/compileroflaws/GCA/title5.html>

Section 63107 states the use of poison or intoxicant substances is unlawful.

Section 63108 states the use of electric devices is unlawful.

Section 63113 states it is unlawful to willfully destroy coral for purposes of flushing fish from their habitat or for clearing an area for net fishing.

Section 63116.1 states the purpose of marine preserves is to protect, preserve, manage and conserve aquatic life, habitat, and marine communities and ecosystems. Ensure the health, welfare and integrity of marine resources and qualities for current and future generations by managing, regulating, restricting or prohibiting activities to include but not limited to fishing, development, or human uses (Amended by Bill 228, in 2005).

Section 63116.2 gives information related to activities within marine preserves. All forms of fishing and the taking or altering of aquatic life including living or dead coral is unlawful except as specifically identified as allowable by the Department of Agriculture through regulations (Amended by Bill 228, in 2005).

Section 63129 states anyone violating sections 63104, 63105, 63106, 63107, or 63108 is guilty of felony punishable by imprisonment or fine (Amended by Bill 228, in 2005).

Article 4 (Conservation Reserves). The Department of Agriculture, Department of Parks and Recreation, and other agencies of the government of Guam are in charge of managing land and waters set aside as Conservation Reserves.

Article 6 (Live Coral and Fish Nets) Section 63601 states it is unlawful to remove coral from the area surrounding the Island of Guam extending ten meters inland from the main high tide line then seaward within the waters of Guam, except in accordance with the Article (Amended by Bill 228, in 2005).

Section 63602 and 63603 regulate harvesting of coral. A license is required for commercial harvest. The Director of Agriculture can limit the maximum time of the license to 5 days and may restrict the amount of coral taken to insure conservation.

Section 63609 authorizes the use of poisons, electric devices, and mesh nets for scientific purposes. Permits are issued by the Department of Agriculture for bona fide scientific research.

Article 9 (The Guam Coral Reef Protection Act). Under the Coral Reef Protection Act, the responsible party that has run aground, struck, released pollutants, or otherwise damaged coral reefs must notify the Department of Agriculture 24 hours after the occurrence. They are responsible for a damage assessment and primary restoration in a timely fashion. The vessel must be removed, without causing additional damage, within 72 hours of the initial grounding, weather permitting. If there is a pollutant release, clean-up must begin within 72 hours. The responsible party is financially responsible up to 3 years after the incident and fines vary with the size of the site impacted. The Act also creates the Coral Reef Restoration Fund used exclusively for purposes of this Article and proceeds from fines are added to the fund (Cruz, 2010).

Title 10 Health and Safety, Chapter 45 (Guam Environmental Protection Agency Act)³⁰. The purpose of this Act is to “provide a united, integrated and comprehensive territory-wide program of environmental protection and to provide a framework to fulfill that task”. The Guam Environmental Protection Agency is responsible for implementing the Water Resources Conservation Act, the Water Pollution Control Act, Toilet Facilities and Sewage Disposal Act, the Air Pollution Control Act, the Guam Pesticides Act, and Solid Waste regulations.

Bill 397 (proposed in 2009): The Prohibition of Spearfishing with the use of a Self Contained Underwater Breathing Apparatus (SCUBA). This bill proposes a ban on the use of SCUBA spearfishing in Guam waters or in any vessel Guam waters Chapter 63 of Title 5 Guam Code Annotated (§ 63116.3). It recognizes that despite the establishment of marine preserves, the fishing stocks of certain species are declining in Guam waters. The authors acknowledge that fish stocks within marine preserves thrive with continued sediment and pollution into these areas. Declining populations are due to SCUBA fishing. A ban on SCUBA spearfishing is proposed to allow for repopulation of herbivorous fish species, revitalize dive tourism, enable residents to see a fish that once thrived in Guam waters, and preserve vital marine resources for future generations. It would be unlawful to take any fish with a spear or other device while using SCUBA within Guam waters.

Guam Comprehensive Planning Enabling legislation (1989). These laws govern land-use planning, zoning, and adapting and planning for growth.

Guam Seashore Protection Act of 1974. The Seashore Reserve is the land and water area of Guam extending seaward to the 10 fathom contour line, including all islands within government jurisdiction except Cabras Island and those Villages where residences are constructed on the shoreline prior to the effective date of this act. The Guam Territorial Seashore Reserve is seen as a distinct and valuable resource and must be preserved and protected for the resources of the shoreline. Under this act, this area can be studied and development must be consistent with the objectives of this chapter.

Guam Coastal Zone Management Program (1979)³¹. This program guides the use, protection, and development of land and ocean resources within Guam’s coastal zone, which is the entire Territory of Guam. The program was developed under the Federal Coastal Zone Management Act of 1972 and is overseen by the Bureau of Statistics.

Guam’s Comprehensive Development Plan and Master Plan. The Bureau of Statistics and Plans is comprised of the Administrative Office of the Director, the Guam Coastal Management Program, the Socio-Economic Planning Program, the Business and Economic Statistics Program, the Planning Information Program and Land Use Planning, and has the authority to oversee this plan. This plan takes into account proposed future military expansion, federal regulations, and environmental impacts while focusing on sustainable and well-planned development efforts.

³⁰ <http://www.guamcourts.org/CompilerofLaws/GCA/title10.html>

³¹ <http://coastalmanagement.noaa.gov/mystate/guam.html>

Guam Compensatory Mitigation Policy (revised in 2010) provides guidance for developing and evaluating aquatic and terrestrial compensatory mitigation proposals. The goal is to have no net loss of habitat function by offsetting losses at the impact site though gains in other locations. This policy will assist Guam in issuing permits or reviewing actions under Section 401 of the Clean Water Act; Guam Coastal Management Program Federal Consistency review; Seashore Protection Act of 1974; Water Pollution Control Act; Fish, Game, Forestry, and Conservation (5 GCA Ch 63); and Wetland Areas.

Guam Comprehensive Wildlife Conservation Strategy (2006). Under Guam's Comprehensive Wildlife Conservation Strategy, hard corals are considered species of concern. Threats identified by the Strategy include pollution, development, sedimentation, and climate change. Some abatement measures given in the plan are to assess the current population structure and size by the in situ surveys by determining the percent cover and species; to protect the habitat by restoring vegetation in watersheds and monitoring water quality; and to reduce take by educating local residents and outreach to recreational users (GDAWR, 2006).

1.3.4 CNMI

Division of Fish and Wildlife, Northern Mariana Islands Administrative Codes, Title 85:

§ 85-30.1-201 (2004) states a license is required to take regulated fish species. Unprotected wildlife may be taken year-round without a license. Precious corals (Corallium spp., hermatypic and other hard corals, soft corals and stony hydrozoans) are regulated. Also, any species of fish or marine invertebrate taken by a method or for a purpose is regulated by part 400.

§ 85-30.1-401 (2004) prohibits the use of explosives, poisons, electric shocking devices, SCUBA or hookah and use of certain nets, including drag nets/beach seines (Chenchulun and lagua), trap net (Chenchulun managam), surround nets (Chenchulun umesugon) or gill nets (Tekken). Use of explosives, poisons, electric shocking devices, SCUBA or hookah by Division employee for scientific collection is allowed with a permit.

§ 85-30.1-410 (2004) states collection and/or removal from the water of CNMI of any and all species of hard Hermatypic reef building corals, soft corals, or stony hydrozoans is prohibited, but an exception can be granted and a license issued by the Director for the collection of dead coral from the beach above the lower low water mark for the purpose of manufacturing “afuk” (calcium carbonate).

§ 85-30.1-445 (2004) prohibits the sale or export of marine aquarium fish. A license is required by any person who captures aquarium fish for personal use or enjoyment. No poisons may be used to collect aquarium fish, except for scientific research.

§ 85-30.1-450 (2004) states the Director may acquire and designate aquatic habitats or easements as marine reserves, which are created to protect important fish and aquatic species populations and their habitats. The marine reserves managed by the department are Sasanhaya Fish Reserve and Managaha Conservation Area. It is prohibited to kill or

remove, or attempt to kill or remove, any marine animal or plants, including but not limited to any fishes, coral (live or dead), lobster, shellfish, clams, or octopus. It is prohibited to anchor unless for an emergency or for scientific research. Also, it is prohibited to dump or deposit rubbish, waste material or substance that would degrade or alter the quality of the environment.

The Commonwealth Constitution³²

Article XIV: Natural Resources. The waters off the coast of the CNMI are managed by the local government and have jurisdiction under United States law to be managed, controlled, protected, and preserved by the legislature for the people. The islands of Managaha, Maug, Uracas, Asuncion, and Guguan are maintained as uninhabited places for either cultural or recreational purposes or for the preservation and protection of natural resources.

Public Law No. 3-23 Commonwealth Environmental Protection Act. Some of the objectives of this Act affecting the marine environment and coral reefs include:

- Establishing and enforcing environmental standards to protect and preserve the marine resources, in implementation of Section 1 of Article XIV of the Constitution;
- Protecting vigorously the environment of uninhabited islands, thus furthering the purpose of Section 2, Article XIV of the Constitution, which requires that they be maintained as uninhabited places and used for cultural and recreational purposes, and for preservation of bird, fish, wildlife, and plant species;
- Affording special consideration to the environmental quality of places and things of cultural and historical significance to contribute to the protection and preservation thereof, in implementation of Section 3 of Article XIV of the Constitution;
- Maintaining optimal levels of air, land, and water quality in order to protect and preserve the public health and general welfare;
- Assuring that necessary or desirable economic and social development proceeds in an environmentally responsible manner in order to promote the highest attainable quality of life for present and future generations; and
- Preserving, protecting, and improving the aesthetic quality of the land, water, and natural resources in order to promote the beauty of the CNMI for the enjoyment of its residents and visitors.

The provisions of this Act and regulations issued pursuant to this Act shall apply to the air, land, water, wetlands, and submerged lands, including the Exclusive Economic Zone and other areas established by the Marine Sovereignty Act of 1980 (P.L. 2-7).

Public Law No. 3-47 Coastal Resources Management Act 1983. This Act establishes the Coastal Resources Management (CRM) Program and Policy. The CRM Program was established on February 11, 1983, with the implementation of Public Law 3-47 within the Office of the Governor. It was established in order to promote the conservation and wise

³² http://www.cnmilaw.org/constitution_article14.htm

development of coastal resources. The goals of the Coastal Resources Management Policy are to:

- Encourage land-use master planning, floodplain management, and the development of zoning and building code legislation;
- Promote, through a program of public education and public participation, concepts of resource management, conservation and wise development of coastal resources;
- Promote more efficient resources management through the coordination and development of resource management laws and regulations into a readily identifiable program by revising existing unclear laws and regulations, improving coordination among local agencies, improving coordination between local and federal agencies, and establish of educational and training programs for local government personnel and refinement of supporting technical data;
- Plan for and manage any use or activity with the potential for causing a direct and significant impact on coastal, significant adverse impacts shall be mitigated to the extent practicable;
- Give priority for water-dependent development and consider the need for water-related and water-oriented locations in its siting decisions;
- Provide for adequate consideration of the national interest, including that involved in planning for, and in the siting of, facilities(including energy facilities in, or which significantly affect, the coastal zone) which are necessary to meet requirements which are other than local in nature;
- Not to permit to the extent practicable, development of identifiable hazardous lands, including floodplains, erosion-prone areas, storm wave inundation areas, air installation crash and sound zones and major fault lines, unless it can be demonstrated that such development does not pose unreasonable risks to the health, safety or welfare of the people, and complies with applicable laws;
- Mitigate, to the extent practicable adverse environmental impacts, including those aquifers, beaches, estuaries and other coastal resources while developing an efficient and safe transportation system;
- Require any development to strictly comply with erosion, sedimentation, and related land and water use districting guidelines, as well as other related land and water use policies for such areas;
- Maintain or improve coastal water quality through control of erosion, sedimentation, runoff, siltation, sewage and other discharges;
- Recognize and respect locations and properties of historical significance, and ensure that development which would disrupt, alter, or destroy these, is subject to local laws and regulations;
- Recognize areas of cultural significance, the development which would disrupt the cultural practices associated with such areas, which shall be subject to a consultation process with concerned ethnic groups and any applicable laws and regulations;
- Require compliance with all local air and water quality laws and regulations and any applicable federal air and water quality standards;
- Not permit, to the extent practicable, development with the potential for causing significant adverse impact in fragile areas such as designated and potential historic and archaeological sites, critical wildlife habitats, beaches, designated and potential

pristine marine and terrestrial communities, limestone and volcanic forests, designated and potential mangrove stands and other wetlands;

- Manage ecologically significant resource areas for their contribution to marine productivity and value as wildlife habitats, and preserve the functions and integrity of reefs, marine meadows, salt ponds, mangroves and other significant natural areas;
- Manage the development of the local subsistence, sport and commercial fisheries, consistent with other policies;
- Protect all coastal resources, particularly sand, coral and fish from taking beyond sustainable levels and in the case of marine mammals and any species on the CNMI Endangered Species List, from any taking whatsoever;
- Encourage preservation and enhancement of and respect for scenic resources through the development of, increased enforcement of, and compliance with, sign, litter, zoning, building codes, and related land use laws;
- Discourage, to the maximum extent practicable, visually objectionable uses so as not to significantly degrade scenic views;
- Encourage the development of recreation facilities which are compatible with the surrounding environment and land uses;
- Encourage the preservation of traditional rights of public access to and along the shorelines consistent with the rights of private property owners;
- Pursue agreements for the acquisition of use of any lands necessary to guarantee traditional public access to and along the shorelines; and
- Encourage agricultural development and the preservation and maintenance of critical agricultural lands for agricultural uses.

Public Law No. 11-112 H. B. No. 11-492 Cyanide Fishing Act of 1999. The Cyanide Fishing Act prohibits use of cyanide in water of CNMI and defines Cyanide Fishing as: “... a method in which fishermen harvest marine life by spraying such poisonous material into the coral reefs to stunt fishes and crustaceans, extract them by breaking apart the coral rocks, and finally, selling them in aquarium and live food markets around world. Although cyanide does not kill the marine life harvested, it kills and destroys the other life forms that inhabit and make up the coral reef.” This Act designates the Division of Fish and Wildlife to promulgate rules and regulations to enforce its intent.

Public Law No. 12-87 (2001). It is unlawful for any commercial or non-commercial fisherman to use explosives, poison, or electric shocking devices when fishing for reef fish and harvesting other marine life within the waters of the CNMI. It is also unlawful for any commercial or non-commercial fisherman to fish with SCUBA or hookah within the lagoon or reef or outside the lagoon or reef on the coastal waters of Saipan from Puntan Agingan to Puntan Sabaneta. Fishing with SCUBA or hookah by commercial or non-commercial fisherman in the First and Second Senatorial Districts is defined as a subject of local law as permitted by Article II, Section 6 of NMI Constitution, may enact laws prohibiting fishing with SCUBA or hookah within the lagoon or reef or outside the lagoon or reef on the coastal waters of their respective districts.

Public Law No. 12-66 (Phosphate Detergent Ban). The Legislature finds that detergent products containing phosphates are causing nutrient overloading, leading to potential

eutrophication of the coastal waters of the CNMI, which in turn leads to destruction of the coral reefs and the habitat they provide for many marine organisms. Public Law 12-66 is an act prohibiting the sale, manufacturing, distribution or use of certain cleaning agents containing phosphates; conferring powers and duties on the Division of Environmental Quality; and providing penalties; and for other purposes.

Public Law No. 15-90 An Act To Create A Marine Reserve Area On Tinian From Southwest Carolinas Point And to Puntan Diablo, And For Other Purposes. This Act created a marine reserve area, located from the Southwest Carolinas Point to Puntan Diablo Point, specifically encompassing all the areas from Tachogna Beach, Taga Beach, YCC Beach, Kammer Beach, Tinian Harbor, Breakwater area to Leprosarium Beach (aka Nasarinu) and Barcinas Bay, from the high-tide mark on shore to one-half mile out to the reef. The Department of Lands and Natural Resources, in consultation with the Tinian Resident Director of the Department of Lands and Natural Resources, were the designated authorities to delineate the boundaries of said areas by installing buoys to ensure that the boundaries are visible to the general public. Regulations of the Reserve Area are as follows:

- The removal, disturbance, damage, or destruction of any marine life or habitat, including any fish, coral, lobster, shellfish, clams, octopus or any shellfish, shall be prohibited within the Marine Reserve Area, except that seasonal fish may be removed only during their respective seasons.
- Any other activities which are exploitative or destructive to the marine life or to any historical value of this Area are strictly prohibited, except that aquaculture and marine studies conducted in the area shall not be considered a violation of this Act.

Public Law No. 17-13 (2010). It is unlawful for any commercial and non-commercial fishermen to use explosives, poisons, electric shocking devices, scuba tank or hookah when fishing for reef fish and harvesting other marine life within water of the CNMI. The use of throw nets (talaya) or the use of the following types of nets must have mesh sizes no smaller than two inches, drag nets (chenchulun lagua), surround nets (chenchulun umesugon) or trap nets (chenchulun managam), shall be legal in waters surrounding the First Senatorial District when used for non-commercial purposes only.

Executive Orders

Executive Directive 235³³. This directive established CNMI's Coral Reef Initiative Program under the Office of the Governor, with an interagency structure to coordinate coral reef issues. The Coral Reef Initiative Program includes the following agencies: the Coastal Resources Management Office, the Division of Fish and Wildlife and the Division of Environmental Quality. The interagency group is tasked with protecting coral reefs and implementation of Local Action Strategies projects.

³³ <http://www.deq.gov.mp/section.aspx?secID=9>

Local Laws³⁴

Saipan Local Law No. 13-13 (2002). It is unlawful for any commercial or non-commercial fishermen to use SCUBA and other related devices when fishing for reef fish, other types of fish, or harvesting other marine life within the lagoon and coastal waters of the island of Saipan and the Northern Islands. Enforcement is the responsibility of the Secretary of the Department of Lands and Natural Resources in consultation with the Director of Fish and Wildlife.

Tinian Local Law No. 13-1 (2002). It is unlawful for any commercial or non-commercial fisherman to use scuba tanks and other related device when fishing for reef fish and harvesting other marine life within the lagoon and coastal waters of the municipality of Tinian and Aguiguan.

2. MPA Regulations

2.1 Federal

One of the most common mechanisms implemented to help regulate activities on and around coral reefs is the establishment of marine protected areas (MPAs). Depending on the specifics of zoning plans and regulations, MPAs can help prevent damage from collection, fishing gear, groundings and anchoring. Because all corals are susceptible to such impacts, MPAs can afford some immediate protection from this type of damage. This section provides descriptions of U.S. Federal MPAs that protect corals and coral reefs in the Caribbean and Indo-Pacific Regions. Some of these MPAs were implemented through regulatory mechanisms discussed above.

Three National Parks have been designated in the south Florida marine environments. Two of these, Dry Tortugas National Park (1992) and Biscayne National Parks (1980) include significant coral reefs. In addition, Everglades National Park (1947) includes much of Florida Bay, an important subtropical lagoon with vital ecological connections with the Florida Reef Tract (*Acropora* Biological Review Team 2005).

The National Marine Sanctuary Program (NOAA) has managed segments of the Florida Reef Tract since 1975. *The Key Largo National Marine Sanctuary* (1975) was established to protect 353 km² (103 nmi²) of coral reef habitat offshore of the upper Florida Keys adjacent to John Pennekamp Coral Reef State Park. In 1981, the 18-km² (5.3-nm²) *Looe Key National Marine Sanctuary* was established to protect the heavily used Looe Key Reef in the lower Florida Keys. By the late 1980s it had become evident that a broader, more holistic approach to protecting and conserving the health of coral reef resources in the Florida Keys had to be implemented. Irrespective of the intense management of small areas of the Florida reef tract, sanctuary managers were witnessing declines in water quality and the health of corals that apparently had a wide range of sources. In November 1990, President G.H.W. Bush signed into law the Florida Keys National Marine Sanctuary and Protection Act (FKNMS Act). The FKNMS Act designated 9,515 km² (2,774 nm²) of coastal waters surrounding the Florida Keys as the

³⁴ <http://www.cnmilaw.org/publicandlocallaws.htm>

Florida Keys National Marine Sanctuary and addressed two major concerns. First, there was an immediate prohibition on oil drilling, including mineral and hydrocarbon leasing, exploration, development, or production within the Sanctuary. In addition, the legislation prohibited the operation of vessels longer than 50 m (164 ft) in an internationally recognized “Area to Be Avoided” within and near the boundary of the Sanctuary. Activities prohibited in the FKNMS include:

- Mineral and hydrocarbon exploration, development and production;
- Removal of, or injury to, or possession of coral or live rock;
- Alteration or, or construction on the seabed, except as an incidental result of anchoring, traditional fishing activities not prohibited, installation and maintenance of navigational aids, harbor maintenance, and construction, repair, replacement, or rehabilitation of docks, seawalls, breakwaters, piers, or marinas with less than ten slips that receive valid leases or permits;
- Discharging or depositing of materials or other matter;
- Operating a vessel in such a manner as to strike or otherwise injure coral, seagrass, or any other immobile organism attached to the seabed;
- Diving or snorkeling without a flag;
- The release of exotic species;
- Damaging or removing markers;
- Movement of, removal of, or injury to, or possession of Sanctuary historical resources;
- Taking or possessing protected wildlife;
- Possession or use of explosives or electrical charges;
- Harvesting or possessing any marine life species, or part thereof, except in accordance with pertinent regulations of the Florida Administrative Code (46-42.001 through 46-42.003, 46-42.0035, 46-42.004 through 46-42.007, and 46-42.009), and
- Interference with law enforcement

Additionally, the sea around the Florida Keys is one of seven Particularly Sensitive Sea Areas (PSSA) that has been designated by the International Maritime Organization. A major benefit of this designation, which became official in December 2002, is that it provides international recognition of the ATBAs and no-anchoring zones on the Tortugas Bank.

The FKNMS Waterway Management Program includes a comprehensive and effective waterway marking and management system for boaters within the sanctuary. In addition to markers, this program incorporates several surveys and databases that aid in waterway management. The databases include several studies of propeller scar data, the location of existing markers (permitted and unpermitted), the location and function of marine facilities, depth of entrance and exit channels from subdivisions throughout the Keys, and a vessel grounding database (*Acropora* Biological Review Team 2005).

Corals in general are afforded a number of mechanisms of protection under the various Action Plans that comprise the FKNMS Management Plan. One management mechanism of great importance is the comprehensive zoning action plan of the FKNMS.

Buck Island Reef National Monument (BIRNM) was expanded to approximately 18,000 acres through Presidential Proclamation under the Antiquities Act on 17 January 2001. The proclamation and draft interim regulations prohibit anchoring, except in an area of deep sand off the west end of the island, and the harvest of any marine life. The expanded BIRNM protects approximately 7% of the St. Croix insular shelf above 100 fathoms (600 ft) in depth (*Acropora* Biological Review Team 2005).

Virgin Islands National Park (VINP) was established on St. John, U.S. Virgin Islands in 1956 (16 USC Sec. 398). Marine portions surrounding St. John were added in 1962 (76 Stat. 746) and include 5,650 acres of water. Interpretation of recent aerial photographs (1999) shows the VINP marine environment consist of 28% unknown (areas deeper than 20 m), 34% coral reef and colonized hard-bottom, 20% submerged aquatic vegetation, and 17% sand (NOAA 2001). Numerous reefs occur in the park with regulations prohibiting the taking or harming of any corals. Moorings are provided for vessels to prevent damage to coral reef and hard-bottom habitats (*Acropora* Biological Review Team 2005).

Virgin Islands Coral Reef National Monument was created by Presidential Proclamation under the Antiquities Act on 17 January 2001. It includes approximately 12,708 acres of submerged lands. The proclamation and draft interim regulations prohibit anchoring, except under emergency situations, and the harvest of any marine life with the exception of Blue Runner (a migratory coastal pelagic fish) off the southern coast of St. John and baitfish in Hurricane Hole. Virgin Islands Coral Reef National Monument effectively protects approximately 3% of the St. Thomas/St. John insular shelf above 100 fathoms (600 ft) in depth (*Acropora* Biological Review Team 2005).

*Navassa Island*³⁵.

Navassa Island is an uninhabited, unincorporated, and unorganized insular territory of the U.S. It is a National Wildlife Refuge that was legally established in 1999, the main purpose of which is to protect and preserve coral reefs. The area is closed to the public; however there is no active protection, management or enforcement of the refuge. Due to the remoteness of the refuge, the reefs are still generally healthy and not subject to the pressures of the aquarium trade or threats of invasive species. The biggest threats to the reefs of Navassa Island include subsistence fishing by transient Haitian fishers. There are some signs of change in the composition of fisheries due to serial fishing (fishing down the food chain), increase in aggressive fishing techniques, and a complete lack of fishing management. Additionally, the extent of commercial fishing in Navassa waters is unknown.

*Flower Garden Banks National Marine Sanctuary*³⁶.

³⁵ <http://www.fws.gov/caribbean/refuges/PDF/navassa.pdf>

³⁶ <http://flowergarden.noaa.gov/about/about.html>

The Flower Garden Banks is the only designated National Marine Sanctuary in the Gulf of Mexico and is located approximately 70-115 miles off the coasts of Texas and Louisiana. Fishermen discovered the Banks in the late 1800's and subsequently named them after the brightly colored sponges, plants, and other marine life they sometimes snagged and brought to the surface. In the late 1960's, Robert Alderdice and James Covington established the Flower Gardens Ocean Research Center, which brought about a period of intense multi-agency, interdisciplinary research, which continues today. Results of this on-going research prompted government agencies to begin discussing the need to protect the banks from increasing human activities, including oil and gas extraction, anchoring on the reefs and harvesting fish, corals and other invertebrates. With passage of the Marine Research and Sanctuaries Act in 1972, researchers began discussing the Flower Garden Banks as a candidate for designation as a National Marine Sanctuary.

Continued interest in the biological diversity and beauty of the reefs at East and West Flower Garden Banks led to their designation as a sanctuary under the National Marine Sanctuary Act (NMSA) in 1992. The coral-sponge communities of Stetson Bank were added to the sanctuary in 1996.

The sanctuary actually protects three separate areas: East Flower Garden Bank, West Flower Garden Bank, and Stetson Bank. These banks are separated from each other by miles of open ocean ranging from 200 to 400 feet (61-122 meters) deep, and each bank has its own set of boundaries.

Activities that are prohibited in the Sanctuary include:

- Anchoring any vessel within the sanctuary
- Mooring a vessel over 100 feet in registered length on a sanctuary mooring buoy
- Injuring or removing, or attempting to injure or remove, any coral or other bottom formation, coralline algae or other plant, marine invertebrate (e.g., spiny lobster, queen conch, shell, sea urchin), brine-seep biota or carbonate rock within the sanctuary.
- Possessing within the sanctuary (regardless of where collected, caught, harvested or removed), any carbonate rock, coral or other bottom formation, coralline algae or other plant, or fish (except for fish caught by use of conventional hook and line gear).
- Drilling into, dredging or otherwise altering the seabed of the sanctuary; or constructing, placing or abandoning any structure, material or other matter on the seabed of the sanctuary.

Enforcement at Flower Garden Banks National Marine Sanctuary is difficult, at best, given the sanctuary's remote location. The sanctuary lacks resources to maintain a physical presence on-site, and instead, relies on fisherman and dive operators as well as patrolling efforts by the U.S. Coastguard.

*The Hawaiian Islands National Wildlife Refuge*³⁷ is part of the Pacific Remote Islands National Wildlife Refuge Complex. Established in 1909 by Theodore Roosevelt's Executive Order 1019, the refuge covers the northwestern Hawaiian Islands, with the exception of Midway and Kure Atolls. The Refuge consists of a chain of islands, reefs, and atolls, including Nihoa, Necker, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan Island, Lisianski Island, and Pearl and Hermes Reef. These remote islands extend about 800 miles northwest of the main Hawaiian Islands. The many small islands provide bare rocky, lowland shrub and grass, sand, and wetland habitat for over 30 species and 14 million breeding sea birds, wintering shorebirds, and endangered endemic songbirds and waterfowl. These islands and reefs also provide breeding and foraging habitat for the endangered Hawaiian monk seal and the threatened Hawaiian green turtle. The over 1,805,403 acres of submerged coral reefs are home to over 7,000 species of coral, algae, mollusks, fish, crustaceans, and other marine vertebrates and invertebrates. Visitation to the refuge is by special use permit only.

*Midway Atoll National Wildlife Refuge*³⁸ includes nearly 300,000 acres of lagoon and surrounding nearshore waters. Over 250 species of fish and a huge diversity of marine invertebrates inhabit the lagoon and surrounding waters. It is now part of the Papahānaumokuākea Marine National Monument, described below.

*Papahānaumokuākea Marine National Monument*³⁹ was established on June 15, 2006, by President George W. Bush. The Papahānaumokuākea Marine National Monument is the single largest conservation area under U.S. jurisdiction, spanning 139,797 square miles. The extensive coral reefs found in the Monument are home to over 7,000 marine species including rare species such as the threatened green sea turtle and the endangered Hawaiian monk seal.

About 132,000 square miles (340,000 km²) of the monument were already part of the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, which was designated in 2000. The monument also includes the Midway Atoll National Wildlife Refuge (590,991.50 acres (2,391.7 km²)) and Battle of Midway National Memorial, the Hawaii State Seabird Sanctuary at Kure Atoll, the Northwestern Hawaiian Islands State Marine Refuge, and the Hawaiian Islands National Wildlife Refuge. The mission of the Monument is to implement seamless integrated management to ensure ecological integrity and achieve strong, long-term protection and perpetuation of NWHI ecosystems, Native Hawaiian culture, and heritage resources for current and future generations. Management of the Monument is the responsibility of three Co-Trustees: the State of Hawaii via the Department of Land and Natural Resources (DLNR); the U.S. Department of the Interior (DOI), through the FWS; and the U.S. Department of Commerce (DOC), through NOAA. The Co-Trustees are committed to preserving the ecological integrity of the Monument and perpetuation of the NWHI ecosystems, Native Hawaiian culture, and historic resources. NOAA and FWS promulgated final regulations for the Monument under Title 50 Code of Federal Regulations (CFR) Part 404 on August 29, 2006. These

³⁷ <http://www.fws.gov/hawaiianislands/>

³⁸ <http://www.fws.gov/midway/>

³⁹ <http://www.papahanaumokuakea.gov/>

regulations codify the scope and purpose, boundary, definitions, prohibitions, and regulated activities for managing the Monument.

Monument regulations include:

- Prohibit unauthorized access to the Monument;
- Provide for carefully regulated educational and scientific activities;
- Preserve access for Native Hawaiian cultural activities;
- Establish marine zones to manage human activities;
- Provide for visitation in a special area around Midway Atoll;
- Phase out commercial fishing over a 5-year period;
- Ban exploring for, developing, or producing oil, gas, or minerals and using or attempting to use poisons, electrical charges, or explosives in the collection or harvest of Monument resources;
- Prohibit introducing alien species from within or into the Monument; and
- Prohibit anchoring on corals.

Monument regulations also define three types of marine zones to manage activities. The zones are: Special Preservation Areas, Ecological Reserves, and the Midway Atoll Special Management Area. Each zone addresses protection of habitat and foraging areas of threatened and endangered species; inclusion of a representative range of the diverse array of marine habitats, including shallow coral reef environments, as well as deepwater slopes, banks, and seamounts; and minimization of risks associated with specific activities such as fishing and recreational activities. Zones also protect the ecological linkages between habitats. While the remote location of the NWHI has helped to protect them, it also provides a potential source of cover for those interested in exploiting the area illegally. Illegal access to the monument, discharge, dumping, and poaching are particular causes of concern. While the establishment of the monument provides an additional layer of protection to the area, protections remain difficult to enforce. Historically, enforcement has relied on occasional USCG over-flights and vessel patrols, as well as reports passed along by fishermen, researchers, and agency personnel working in the area. Now the monument co-trustees plan to use remote surveillance (satellites, radar, vessel monitoring systems) to inform on-the-water law enforcement officers of potential violations as well.

*Hawaii Humpback Whale National Marine Sanctuary*⁴⁰

Established by Congress in 1992, the Hawaiian Islands Humpback Whale National Marine Sanctuary is the nation's 12th established marine sanctuary. It protects the winter breeding, calving and nursing range of the largest Pacific population of the endangered humpback whale (*Megaptera novaeangliae*). The boundary of the sanctuary encompasses approximately 1,218 square nautical miles of coastal and ocean waters (including coral reefs) around the main Hawaiian Islands. The sanctuary extends seaward from the shoreline to the 100-fathom isobath. It includes areas around the islands of Maui, Lanai, and Molokai, and parts of Oahu, Kauai and Hawaii. The sanctuary is jointly managed via a cooperative federal-state partnership between NOAA and the State of Hawaii.

⁴⁰ <http://hawaiihumpbackwhale.noaa.gov/welcome.html>

Regulations within this sanctuary are mainly focused on protecting Hawaiian humpback whales; however, one provision prohibits discharging or depositing any material or other matter in the Sanctuary; altering the seabed of the Sanctuary, or discharging or depositing any material or other matter outside the Sanctuary if the discharge or deposit subsequently enters.

Hawaii National Parks

There are 4 national parks in Hawaii that contain coral reef environments, and include at least 1 of the 82 candidate species of coral:

- Kaloko-Honokōhau National Historic Park, Hawai'i
- Puukoholā Heiau National Historic Site, Hawai'i
- Puuhonua o Hōnaunau National Historic Park, Hawai'i
- Kalaupapa National Historic Park, Moloka'i

These parks are accessible by the public in exchange for an entrance fee. The purpose of these parks is to preserve and perpetuate Hawaiian cultural heritage. Recreational activities, as well as fishing, are permitted unless the activities contradict the purpose of the parks.

*Fagatele Bay National Marine Sanctuary*⁴¹ in American Samoa was designated in 1986 in response to a proposal from the American Samoa Government. The Fagatele Bay National Marine Sanctuary (FBNMS) is located in an eroded volcanic crater on the island of Tutuila. and encompasses the 0.25 square miles of the bay. Prohibited or otherwise regulated activities within the FBNMS can be found in Sec. 922.102 of 15 CFR Part 222, Subpart J--Fagatele Bay National Marine Sanctuary, and includes the following provisions:

“Except as may be necessary for national defense or to respond to an emergency threatening life, property, or the environment, or as may be permitted by the Director in accordance with Sec. 922.48 and Sec. 922.104, the following activities are prohibited and thus are unlawful for any person to conduct or to cause to be conducted within the Sanctuary:

- Gathering, taking, breaking, cutting, damaging, destroying, or possessing any invertebrate, coral, bottom formation, or marine plant.
- Taking, gathering, cutting, damaging, destroying, or possessing any crown-of-thorns starfish (*Acanthaster planci*).
- Possessing or using poisons, electrical charges, explosives, or similar environmentally destructive methods.
- Possessing or using spearguns, including such devices known as Hawaiian slings, pole spears, arbalettes, pneumatic and spring-loaded spearguns, bows and arrows, bang sticks, or any similar taking device.
- Possessing or using a seine, trammel net, or any type of fixed net.

⁴¹ <http://fagatelebay.noaa.gov/>

- There shall be a rebuttable presumption that any items listed above found in the possession of a person within the Sanctuary have been used, collected, or removed within or from the Sanctuary.
- Operating a vessel in a manner which causes the vessel to strike or otherwise cause damage to the natural features of the Sanctuary.
- Littering, depositing, or discharging, into the waters of the Sanctuary, any material or other matter.
- Disturbing the benthic community by dredging, filling, dynamiting, bottom trawling, or otherwise altering the seabed.
- Removing, damaging, or tampering with any historical or cultural resource within the boundary of the Sanctuary.
- Ensnaring, entrapping, or fishing for any sea turtle listed as a threatened or endangered species under the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.
- Except for law enforcement purposes, using or discharging explosives or weapons of any description. Distress signaling devices, necessary and proper for safe vessel operation, and knives generally used by fishermen and swimmers shall not be considered weapons for purposes of this section.
- Marking, defacing, or damaging in any way, or displacing or removing or tampering with any signs, notices, or placards, whether temporary or permanent, or with any monuments, stakes, posts, or other boundary markers related to the Sanctuary.
- In addition to those activities prohibited or otherwise regulated under paragraph (a) of this section, the following activities are prohibited and thus are unlawful for any person to conduct or to cause to be conducted landward of the straight line connecting Fagatele Point (14 deg.22'15" S, 170 deg.46'5" W) and Matautuloa Benchmark (14 deg.22'18" S, 170 deg.45'35" W).
- Possessing or using fishing poles, handlines, or trawls.
- Fishing commercially.”

*The National Park of American Samoa*⁴² was established by Congress “to preserve and protect the tropical forest and archeological and cultural resources of American Samoa, and of associated reefs, to maintain the habitat of flying foxes, preserve the ecological balance of the Samoan tropical forest, and, consistent with the preservation of these resources, to provide for the enjoyment of the unique resources of the Samoan tropical forest by visitors from around the world” (16 USC 410qq). The National Park of American Samoa has jurisdiction over 2,550 acres of coral reefs along 17 miles of coastline within park units on Tutuila, Ofu, and Ta’u Islands in American Samoa. The park is part of the Pacific West Region of the National Park Service and allows fishing or gathering for subsistence purposes only in the marine areas of the park. Traditional agriculture is also permitted.

Rose Atoll is located approximately 130 nautical miles east-southeast of Pago Pago Harbor, American Samoa, is the easternmost Samoan island, and the only atoll in the Samoan Archipelago. It is part of the Territory of American Samoa and is both a National

⁴² <http://www.nps.gov/npsa/naturescience/coral-reef-studies-and-products.htm>

Wildlife Refuge and part of a Marine National Monument. The National Wildlife Refuge was established by cooperative agreement between the Government of American Samoa and the Bureau of Sport Fisheries and Wildlife (a predecessor of the U.S. Fish & Wildlife Service) on August 24, 1973. Rose Atoll National Wildlife Refuge⁴³ managed by the U.S. Fish and Wildlife Service and is the southernmost unit of the National Wildlife Refuge System sharing the distinction of being the only National Wildlife Refuges located south of the equator with Jarvis Island. The Wildlife Refuge includes Rose Atoll itself which is about 1 mile in length and consists of two low sandy islets, Rose and Sand Islands, each covering areas of about 14 and 7 acres, respectively. A coralline algal reef rim encloses the lagoon within Rose Atoll. A single, natural pass with a minimum depth of 8 to 48 feet deep links the lagoon to the sea. The lagoon is a maximum of 1.2 miles wide and up to about 65 feet deep, and includes 1,575 acres.

On January 6, 2009, President George W. Bush established Rose Atoll Marine National Monument⁴⁴ under the authority of the Antiquities Act of 1906 by Presidential Proclamation 8337 (74 FR 1577, 12 January 2009). The Marine National Monument surrounds Rose Atoll National Wildlife Refuge extending from the mean low water line of Rose Atoll out 50 nautical miles. The Fish & Wildlife Service has management responsibility for the Monument, including Rose Atoll National Wildlife Refuge, in consultation with the Secretary of Commerce, except that NOAA has primary management authority over fishery related activities seaward of the mean low water mark. The total area of the Marine National Monument is approximately 13,451 square miles. Within the Marine National Monument, all commercial fishing is prohibited. The Secretaries may permit non-commercial and sustenance fishing, and after consultation with the American Samoa government, traditional indigenous fishing as sustainable activities. The Western Pacific Fishery Management Council also has taken action to recommend the establishment of no-take zones from 0-12 nautical miles around Rose Atoll. Consistent with the Proclamation, NOAA has initiated the process to add the marine areas of the monument to the Fagatele Bay National Marine Sanctuary in accordance with the National Marine Sanctuaries Act.

*Guam National Wildlife Refuge*⁴⁵ was established in 1993, to protect and recover endangered and threatened species, protect habitat, control non-native species, protect cultural resources, and provide recreational and educational opportunities to the public. The refuge is composed of 1,203 acres (371 acres of coral reefs and 832 acres of terrestrial habitat) owned by the U.S. Fish and Wildlife Service, and 22,456 acres (mostly forest) of refuge overlay owned by the Department of Defense in Air Force and Navy installations. According to the Guam National Wildlife Refuge Comprehensive Conservation Plan (2009), recreational fishing, including using gears such as rod-and-reel, throw net, hand spears and Hawaiian slings are allowed within the boundaries.

43 <http://www.fws.gov/roseatoll/>

44 <http://www.fws.gov/roseatollmarinemonument/>

45 <http://www.fws.gov/refuges/profiles/index.cfm?id=12518>

*The War in the Pacific National Historical Park*⁴⁶, authorized on August 18, 1978, was established to commemorate those participating in the campaigns of the Pacific Theater of World War II, and to conserve and interpret outstanding natural, scenic, and historic values and objects on the Island of Guam. The park itself has seven separate units located in or near the villages of Asan, Piti, and Agat, on the west side of the island facing the Philippine Sea. The park contains over 3,500 marine species and 200 species of coral. Scientific activities within the park include inventories of flora and fauna and long-term monitoring of the coral reefs. It is unlawful to disturb or remove artifacts from public lands; therefore, underwater natural objects (such as corals) are protected within the park.

Marianas Trench Marine National Monument. On January 6, 2009, President George W. Bush established the Marianas Trench Marine National Monument under the authority of the Antiquities Act of 1906 by Presidential Proclamation 8335 (74 FR 1557, 12 January 2009). The Marianas Trench Marine National Monument (Northern Mariana Islands and Guam)⁴⁷ is approximately 940 nautical miles long and 38 nautical miles wide within the United States Exclusive Economic Zone and incorporates waters below the mean low water line of three islands of the Mariana Archipelago, Farallon de Pajaros or Uracas, Maug, and Asuncion. The waters of the archipelago's northern islands are biologically diverse surrounded by coral reef ecosystems and the deep waters are inhabited by seamount and hydrothermal communities. The monument consists of two units the Mariana Trench and the Volcanic Unit. The Mariana Trench Unit is almost 1,100 miles long and 44 miles wide and includes only the submerged lands. The Volcanic Unit consists of small circles (2.3 miles in diameter) around 21 undersea mud volcanoes and thermal vents along the Mariana Arc, again only the submerged lands. Fisheries related activities are managed by the National Oceanic and Atmospheric Administration, in consultation with the Fish & Wildlife Service. Commercial fishing is prohibited within the waters around the islands, but subsistence, recreational, and traditional fishing are allowed under sustainable management via Executive Order 12962 for recreational fisheries. Other agencies involved with management activities within the monument are the Secretary of Defense, the U.S. Coast Guard, and the Government of the Commonwealth of the Northern Mariana Islands. The U.S. Fish and Wildlife Service also has management responsibilities with the Mariana Trench and Volcanic Units as they are within the Mariana Trench and Mariana Arc of Fire National Wildlife Refuges.

Pacific Remote Island Area. The U.S. Pacific Remote Island Area (PRIA) includes seven islands, atolls and reefs in the Central Pacific that are under the jurisdiction of the United States. Baker, Howland, and Jarvis Islands; Johnston and Palmyra Atolls; and Kingman Reef all lie between Hawaii and American Samoa. Wake Island is located between the Northwestern Hawaiian Islands and Guam. Terrestrial activities on each of the islands are managed by different agencies. All islands except Wake Island and Johnston Atoll are managed by the U.S. Fish and Wildlife Service. Johnston Atoll is managed by the Department of Defense (DOD). Also, both Johnston and Palmyra are owned by the

⁴⁶ <http://www.nps.gov/wapa/index.htm>

⁴⁷ <http://www.fws.gov/marianastrenchmarinemonument/>

Nature Conservancy. Wake Island is an unincorporated territory of the U.S. that is administered by the DOI and the U.S. Air Force (part of the DOD). Inland waters surrounding the islands are administered by the U.S. Fish and Wildlife Service as the Pacific Remote Islands National Wildlife Refuge Complex⁴⁸.

*The Pacific Remote Islands National Marine Monument*⁴⁹ was established by President George W. Bush on January 6, 2009 under the authority of the Antiquities Act of 1906 by Presidential Proclamation 8336 (74 fr 1565; 12 January 2009). The Monument includes the waters and submerged and emergent lands of the Pacific Remote Islands from the mean low water lines of Wake, Baker, Howland, and Jarvis Islands, Johnston Atoll, Kingman Reef, and Palmyra Atoll seaward to approximately 50 nautical miles. The National Oceanic and Atmospheric Administration has primary management authority over fishery-related activities. Resource destruction or extraction, waste dumping, and commercial fishing are prohibited in the PRIA. Scientific research, innocent passage, and recreational fishing on a sustainable basis are allowed.

WPFMC-developed no-take MPAs within the PRIA include Baker, Howland, and Jarvis Islands, and Kingman Reef from 0 to 50 fathoms (fm); and low-use MPAs are Johnston and Palmyra Atolls, and Wake Island from 0 to 50 fm. 50 C.F.R. § 665.599. Fishers may not fish within a low-use MPA without a special permit. 50 C.F.R. § 665.625. Poisons, explosives, or intoxicating substances may not be used to harvest this species. 50 C.F.R. § 665.605. At Wake, Howland, Baker, and Jarvis Islands, and at Johnston and Palmyra Atolls, there is no SCUBA spearfishing from 6pm to 6am in the EEZ (WPRFMC, 2005; NOAA, 2009). Within Palmyra Atoll National Wildlife Refuge, the Secretary shall ensure that recreational fishing is managed sustainably in accordance with the purposes of the monument (Executive Order 12962)⁵⁰.

2.2 Non-Federal Caribbean

2.2.1 Florida

Florida has over 400 MPAs, which is more than any other state⁵¹. John Pennekamp Coral Reef State Park in Monroe County encompasses 178 nautical square miles of coral reefs, seagrass beds, and mangrove swamps and is contained within the FKNMS. Florida Statute §258.083 states it is unlawful for any person, firm, or corporation to (1) bring into or transport through any part of the state, including its waters, any coral or other material taken from the subsoil or seabed of any portion of the John Pennekamp Coral Reef State Park adjacent to or in the vicinity of the state which has been taken in violation of any law or regulation of the Federal Government, or (2) destroy, damage, remove, deface, or take away any coral, rock or other formation or any part thereof, of any portion of the John Pennekamp Coral Reef State Park adjacent to or in the vicinity of the state in which such action is in violation of any law or regulation of the Federal Government. The

⁴⁸ <http://www.fws.gov/pacificislandsrefuges/>

⁴⁹ <http://www.fws.gov/pacificremoteyislandsmarinemonument/>

⁵⁰ <http://www.fws.gov/pacificremoteyislandsmarinemonument/PP%20PRIMNM.pdf>

⁵¹ http://www.mpa.gov/pdf/helpful-resources/us_mpas_snapshot.pdf

Park's management plan requires protection of the park's marine resources from among other things, all dredging, filling, and other construction activity by outside sources, and requires installation and maintenance of channel markers and mooring buoys to reduce anchor and boating impacts (*Acropora* Biological Review Team 2005).

2.2.2 Puerto Rico

The Island Government (DNER) and the Caribbean Fisheries Management Council share responsibility for managing 24 MPAs, with most sites having some year-round protection (Wilkinson, 2004). Law 137 (2000) directs the DNER to designate priority areas as marine reserves, including a minimum of 3% of the insular platform within three years (2003). Marine reserves are defined as areas where all extractive activities are prohibited in order to help recover depleted fishery resources and protect biodiversity; such reserves can protect corals by preventing impacts from fishery gear.

To date, four marine reserves have been established: Luis Peña Channel Reserve in Culebra (1999), Desecheo Island Reserve (2000), Mona Island, Monito Island Reserve (2004), and Tres Palmas Reserve in Rincon (2003). With the exception of Tres Palmas, the marine reserves are all no-take and all have mooring buoys to protect benthic habitats. There are currently an additional 13 natural reserves in Puerto Rico that have coral reefs within their boundaries. These are managed by the DNER and are located on all coasts and offshore islands thus providing an infrastructure for management measures to protect coral reefs. The DNER has been utilizing mooring buoys since 1990, principally in the Natural Reserves in Fajardo, Culebra, Guánica, and La Parguera. It should be noted that natural reserves probably have minimal success in preventing impacts to coral reefs from degraded water quality because reserve boundaries do not prevent these impacts.

Enforcement of marine protected areas in Puerto Rico is patchy due to limited numbers of officers and patrol vessels. As elsewhere, DNER officers are responsible for enforcing a wide variety of marine and terrestrial environmental regulations and are therefore unable to devote sufficient time to patrolling marine protected areas (*Acropora* Biological Review Team, 2005).

2.2.3 USVI

Virgin Islands law (VIC, T. 12, Ch. 1, Section 97) provides for the establishment of wildlife or marine sanctuaries for the purpose of propagating, feeding and protecting birds, fish and other wildlife (which includes coral). Marine sanctuaries established under this law include:

- Cas Cay/Mangrove Lagoon Marine Reserve and Wildlife Sanctuary, St. Thomas (1994). This sanctuary includes many acres of mangrove wetlands, shallow seagrass beds and coral reefs. The taking of any living organism or part thereof from this area is prohibited.
- St. James Marine Reserve and Wildlife Sanctuary, St. Thomas (1994). This sanctuary includes many acres of shallow seagrass beds, coral reefs and some algal plain. The taking of any living organism is prohibited except with a valid scientific collecting permit.

- Salt River Bay Marine Reserve and Wildlife Sanctuary, St. Croix (1995). This site includes many acres of mangrove wetlands, shallow seagrass beds and coral reefs.
- St. Croix East End Marine Park (2002). This site includes many acres of shallow back-reef habitats, seagrass beds and fringing and deeper coral reefs (see below for more information and regulations).

In 2002 the Virgin Islands Legislature passed Bill 12 that approved the establishment of additional large marine park on the eastern end of St. Croix (St. Croix East End Marine Park). The U.S.V.I. established the St. Croix East End Marine Park in 2002 to protect territorially significant marine resources, promote sustainability of marine ecosystems, including coral reefs, and to conserve and preserve significant natural areas for the use and benefit of future generations.

The park surrounds the entire east end of St. Croix and encircles Buck Island Reef National Monument and is managed by the Virgin Islands Department of Planning and Natural Resources. The park encompasses an area of approximately 60 square miles (155 square kilometers). Moving, removing, taking, harvesting, damaging, disturbing, breaking, cutting, or otherwise injuring, or possessing any living or dead coral or coral formation or attempting any of these activities is prohibited throughout the park, except when permitted (Virgin Islands Code, Title 12, Chapter 1, Section 98-4). The following activities are also regulated or prohibited in the St. Croix East End Marine Park (ibid):

- Drilling into, dredging, or otherwise altering the seabed of the Park, or engaging in prop dredging; or constructing, placing or abandoning any structure, material, or other matter on the seabed of the Park, except as an incidental result of otherwise allowed activities.
- Discharging, depositing, placing or abandoning, or allowing the discharge, deposit, placement or abandonment of, any natural or man-made material that a person or vessel has brought into the Park from outside the Park.
- Operating a vessel in such a manner as to strike or otherwise injure coral, seagrass, or any other immobile organism attached to the seabed, including, but not limited to, operating a vessel in such a manner as to cause prop scarring.
- Operating a vessel outside officially marked channels that creates a wake within 100 yards of navigational aids that indicate emergent or shallow reefs or operating in such a manner as to endanger marine resources.
- Anchoring a vessel in hardbottom or coral communities (*Acropora* Biological Review Team, 2005).

2.3 Non-Federal Indo-Pacific

2.3.1 Hawaii

Hawaii's reefs have been valued at over U.S. \$10 billion. There are 34 state-managed areas which limit fishing activities in nearshore marine waters: 11 MLCDs (areas designed to conserve and replenish marine life), 20 FMAs (areas designed to resolve conflicts among users, including fishers), and three other marine managed areas: Ahihi-Kinau Natural Area Reserve (NAR), Kahoolawe Island Reserve and Coconut Island

Hawaii Marine Laboratory Refuge (HMLR). In addition, members of the public have limited or no access to the shoreline and nearshore waters within and around military or security areas on Oahu and Kauai (Pearl Harbor, Kaneohe Bay Marine Corps Base Hawaii, Barking Sands Pacific Missile Range Facility and Honolulu Reef Runway) or in the Hawaii Volcanoes National Park (Friedlander *et al.* in Waddell and Clarke 2008). The various types of protected areas are described below.

Marine Life Conservation Districts (MLCDs)⁵²

Chapter 190 of the Hawaii Revised Statutes gives Hawaii's Department of Land and Natural Resources (DLNR) the authority to establish, modify and adopt rules governing the use of MLCDs. Areas to be included in the MLCD system may be suggested from the State Legislature or the general public. Moreover, the DLNR's Division of Aquatic Resources (DAR) regularly conducts surveys of marine ecosystems throughout the state, and may recommend MLCD status for areas that appear particularly promising. An area that is recommended for designation as an MLCD is then evaluated in terms of a number of criteria by DAR. These criteria include: public accessibility, marine life and future potential values, safety from a public usage standpoint, compatibility with adjoining area usage, and minimal environmental or ecological changes from the undisturbed natural state. In addition, in the interest of adequate compliance and enforcement, the area should have clearly defined boundaries. Finally, the area must also be of suitable size - large enough so that fish populations can be restored even with ongoing fishing activity outside the MLCD, but small enough so that fishermen are not denied the use of unreasonably vast fishing areas. The main purpose of MLCDs is to protect marine life to the greatest extent possible; thus, the taking of any type of living material (e.g., fishes, eggs, shells, corals, algae, etc.) and non-living habitat material (e.g., sand, rocks, coral skeletons, etc.) is generally restricted, if it is permitted at all. These restrictions encourage non-consumptive uses of the area, such as swimming, snorkeling and diving. There are signs located at each MLCD to indicate the District's boundaries and describe regulations for the area.

Fisheries Management Areas (FMA)

Act 58 of 1953 enabled DLNR to acquire access to fishing rights via agreements with the owners of bodies of freshwater. In 1981, Act 85 expanded this statute to include marine areas, and grant DLNR a broad authority to regulate fish, game, forest and conservation under general policies established by the legislature. Under this authority, DLNR may establish, manage, maintain and operate freshwater and marine fishing reserves, refuges and fishing areas to conserve and propagate introduced freshwater fishes and other freshwater and marine life. The main policy goals of these areas are to maintain the resources for economic purposes (such as tourism), as well as for the enjoyment of present residents of Hawaii, and for future generations (Cesar 2004).

Bottomfish Restricted Fishing Areas (BFRFA)

BFRFAs are designed specifically for the conservation and management of the bottomfish resources in the Main Hawaiian Islands. The strategy of BFRFAs is to restrict fishing in certain areas for the purpose of conserving the spawning populations of

⁵² <http://hawaii.gov/dlnr/dar/coral/mlcd.html>

bottomfish. Created by Administrative Rule in 1998, BFRFAs restrict fishing in about twenty percent of known bottomfish spawning areas. Within the BFRFAs, it is unlawful to take bottomfish with any trap, trawl, bottom fish longline or net, or to possess both bottomfish and any trap trawl, bottom fish longline or net (Cesar 2004).

Natural Area Reserve System (NARS)

The NARS legislation (created by Act 139 of 1970) authorized DLNR to designate and manage reserved areas. The intention of NARS areas is to preserve and protect Hawaii's unique terrestrial and aquatic resources so that present and future generations may be able to learn about and enjoy these natural resource assets. In order for an area to be selected as a NARS, the area should be representative of one or more major, natural and relatively unmodified ecosystems; have significant potential for scientific research or the preservation of genetic material; and be easily identifiable both on maps and on the ground. The legislation includes a provision for the establishment of an advisory commission to set criteria for selecting such areas, and for policies to be placed under their management. The policy goal of these reserves was for the designated NARS areas to provide baselines against which changes in other native ecosystems could be measured (Cesar 2004).

De Facto Protected Areas (around military reserves):

The numerous military areas within Hawaii form de facto protected areas because entry by outsiders for recreational and/or fisheries purposes is strictly prohibited. By being military areas, enforcement of the regulations in these zones is incomparably stricter than in any other protected areas (Cesar 2004).

Overall, only 4.8% of the Main Hawaiian Islands (MHI) nearshore waters are closed, in which all fishing or access is prohibited or heavily restricted. In a study of MPA efficacy in the MHI, results showed that a number of fish assemblage characteristics (e.g., species richness, biomass, diversity) vary among habitat types, but were significantly higher in MLCDs compared with adjacent fished areas across all habitat types. In addition, apex predators and other resource species were more abundant and larger in the MLCDs, illustrating the effectiveness of these closures in conserving fish populations within their boundaries. However, the state of Hawaii is home to approximately 1.2 million residents (over 70% of which live on Oahu) as well as a vacation destination for over seven million tourists each year, resulting in increasing pressure on Hawaii's coral reefs (Friedlander *et al.* in Waddell and Clarke 2008).

2.3.2 American Samoa

American Samoa only has one Territorial MPA. Ofu Vaoto Territorial Marine Park was established in 1994 by Territorial legislation and encompasses a small area (less than one mile in width). The main purpose of establishing the park was to protect unique coral habitats while allowing public access and enjoyment. Only residents of Ofu Island may

fish and/or harvest shellfish in the boundaries of the park, while all others are restricted from such activities. The terrestrial part of the park is to remain unimproved⁵³.

Additionally, within 7 villages, Community-based Fisheries Management Programs are implemented via the Department of Marine and Wildlife Resources. Replenishing resources through no-take areas is the main objective of these programs, where villages manage their own local MPAs.

2.3.3 Guam

In 1997, Public Law 24-21 was implemented creating 5 marine preserves and making changes to Guam's fishing regulations. The names of the preserves are the Pati Point Preserve, the Tumon Bay Preserve, the Piti Bomb Holes Preserve, the Sasa Bay Preserve, and the Achang Reef Flat Preserve. Within a marine preserve, the taking of aquatic animals is restricted. Unless specifically authorized, all types of fishing, shell collecting, the use of gaffs, and the removal of sand and rocks are prohibited in a preserve. Violators of these regulations are subject to fines up to \$500 and/or imprisonment up to 90 days. Commonwealth of Northern Mariana Islands MPAs

2.3.4 CNMI

The CNMI has several marine protected areas with varying levels of restricted activities⁵⁴. No-take reserves prohibit the fishing or harvesting of any marine species of plant or animal, including prohibiting the take of coral (live or dead), and ban all exploitive or destructive activities to marine life. In Saipan, there are three no-take reserves Managaha Marine Conservation Area, Forbidden Island Marine Sanctuary, and Bird Island Marine Sanctuary. The island of Rota has a no-take reserve called Sasanhaya Fish Reserve. The island of Tinian has a marine reserve which extends from the Southwest Carolinas Point to Puntan Diablo that is primarily a no-take reserve allowing for the seasonal fishing of atulai, i'i, and ti'ao only and prohibiting destruction of marine habitat (Public Law 15-90).

3. Conservation Efforts

The following sections describe U.S. federal and U.S. non-federal conservation efforts that may be relevant to addressing threats to corals and coral reefs or coral conservation. Federal conservation efforts include national programs and initiatives for coral reef conservation while non-federal conservation efforts include State and Territorial conservation programs, initiatives and local action plans.

3.1 U.S. Federal

The United States has numerous federal programs in place aimed at the conservation of coral reefs. Below is a brief description of these different programs and their aims.

53 http://faolex.fao.org/cgi-bin/faolex.exe?database=faolex&search_type=query&table=result&query=LEX-

FAOC050989&format_name=@ERALL&lang=eng

54 <http://www.dfw.gov.mp/Fisheries/Marine%20Protected%20Areas.html>

FKNMS Education and Outreach Program⁵⁵

In the FKNMS, education and outreach have played a primary role in resource protection. The FKNMS Education and Outreach Program seeks to raise conservation awareness among target audiences, positively affect public attitudes, and increase the value people place on the Florida Keys ecosystem. Some examples of education and outreach activities include Coral Reef Classrooms, reaching 3,314 students in nine years, adult environmental education events, distributing educational materials to businesses, helping to found and lead the statewide Seagrass Outreach Partnership to raise awareness of the significance of seagrass beds, and publishing the Florida Keys Dive and Snorkel User's Guide.

Marine Protected Areas Inventory⁵⁶. This is a geospatial database that catalogs and classifies marine protected areas within U.S. waters.

National Coral Reef Institute (NCRI)⁵⁷. NCRI was initiated in 1998 with the primary goal of protection and preservation of coral reefs through applied and basic research on coral reef assessment, mitigation, monitoring, restoration, and biodiversity, as well as through training and education. This goal is addressed through multidisciplinary scientific research as well as through applied engineering, operations, and public education.

NOAA Species of Concern Program⁵⁸. “Species of Concern” is an initiative implemented under the Endangered Species Act (ESA) that identifies species for which there is concern or uncertainty about their status, but insufficient information to support a determination to add the species to the list of threatened and endangered species. Thus, Species of Concern are not protected by the ESA. As resources permit, NOAA Fisheries conducts a review of the status of each Species of Concern. NOAA Fisheries believes it is important to highlight species for which additional information and management may be warranted so that Federal and state agencies, Native American tribes, and the private sector are aware of which species could benefit from proactive conservation efforts. NOAA has external and internal grant programs to fund such efforts.

NOAA Coral Reef Conservation Program (CRCP)⁵⁹. The NOAA CRCP is a partnership between the NOAA Line Offices that work on coral reef issues: the National Ocean Service, the National Marine Fisheries Service, the Office of Oceanic and Atmospheric Research, and the National Environmental Satellite, Data and Information Service. The CRCP brings together expertise from across NOAA for a multidisciplinary, ecosystem based approach to managing and understanding coral reef ecosystems. Themes of conservation include: appropriately placed and well managed MPAs; research, restoration, and/or monitoring expeditions; coral reef ecosystem monitoring, mapping and assessment. Conservation methods of CRCP include the following programs:

⁵⁵ <http://floridakeys.noaa.gov/coraleducation.html>

⁵⁶ <http://www.mpa.gov/dataanalysis/mpainventory/>

⁵⁷ <http://www.nova.edu/ncri/>

⁵⁸ <http://www.nmfs.noaa.gov/pr/species/concern/>

⁵⁹ <http://coralreef.noaa.gov/>

National Coral Reef Ecosystem Monitoring Program (NCREMP)⁶⁰. In 2000, the Coral Reef Conservation Act authorized and implemented the NCREMP to support local coral reef ecosystem monitoring activities in numerous U.S. coral-bearing jurisdictions. The goal of NCREMP is to provide a long-term monitoring program to: assess the condition of US shallow-water coral reef ecosystems, evaluate the efficacy of coral reef ecosystem management, and communicate progress toward conservation of coral reef ecosystems.

NOAA Coral Reef Watch (CRW)⁶¹. As part of the Coral Reef Conservation Program, Coral Reef Watch uses satellite sea surface temperature data to alert managers and scientists around the world of the risk of coral bleaching. CRW also recently developed a new system, which uses NOAA experimental sea surface temperature forecasts, to predict coral bleaching events. The prediction system uses forecast models to develop bleaching outlooks up to three months in advance. To continue addressing the threat of coral bleaching, reef managers are provided with tools to understand climate change and coral bleaching and information about how to take action in response to alerts of potential bleaching conditions.

NOAA Coral Reef Management Fellowship Program⁶². In response to the need for additional coral reef management capacity in U.S. Pacific and Caribbean jurisdictions, NOAA established a Coral Reef Management Fellowship Program. The program provides state and territorial coral reef management agencies with candidates whose education and work experience meet each jurisdiction's specific needs. In turn, the fellows receive professional experience in coral reef ecosystem management. Separate Statements of Work are developed for each jurisdiction, containing information on the projects itself, goals and objectives, minimum and desired qualifications, and salary, among other information. The Statements of Work uniquely reflect each jurisdiction's particular needs, while complementing other ongoing local projects and management activities.

NOAA Coral Health and Monitoring Program (CHAMP)⁶³. The mission of CHAMP is to provide services to help improve and sustain coral reef health throughout the world.

Long term goals of CHAMP include:

- Establish an international network of coral reef researchers for the purpose of sharing knowledge and information on coral health and monitoring.
- Provide near real-time data products derived from satellite images and monitoring stations at coral reef areas.
- Provide a data repository for historical data collected from coral reef areas.
- Add to the general fund of coral reef knowledge.

NOAA Coral Reef Information System (CoRIS)⁶⁴. NOAA's CoRIS is designed to be a single point of access to NOAA coral reef information and data products, especially those

⁶⁰ http://ccma.nos.noaa.gov/ecosystems/coralreef/coral_grant.aspx

⁶¹ <http://coralreefwatch.noaa.gov/satellite/index.html>

⁶² <http://coralreef.noaa.gov/aboutcrmp/fellowship/>

⁶³ <http://www.coral.noaa.gov/>

⁶⁴ <http://coris.noaa.gov/>

derived from NOAA's Coral Reef Conservation Program. CoRIS is a web-based information portal that provides access to products from NOAA coral reef research, monitoring, and management activities, with emphasis on the U.S. states, territories, and remote island areas. NOAA activities include coral reef mapping, monitoring and assessment; natural and socioeconomic research and modeling; outreach and education; and management and stewardship.

Coral Reef Conservation Fund⁶⁵. Responding to widespread serious declines in both the quantity and productive quality of the world's coral reef ecosystems, the National Fish and Wildlife Foundation partnered with NOAA to establish the Coral Reef Conservation Fund. Through this Fund, the Foundation supports local to ecosystem level projects that restore damaged reef systems and prevent further negative impacts through both on-the-water and up-the-watershed projects by focusing on specific areas of human impact such as anchor damage and sedimentation.

Pacific Reef Assessment and Monitoring Program (Pacific RAMP)⁶⁶. Pacific RAMP institutes principles of ecosystem management through development of an ecosystem observing system to map, assess, and monitor coral reef ecosystems in the Pacific. There are 50 islands and atolls in the Hawaiian and Mariana Archipelagos, American Samoa, and U.S. Line and Phoenix Islands monitored by NOAA's Coral Reef Ecosystem Division (CRED). In 2010, the 5th biennial Pacific RAMP expedition took place in American Samoa. The strategic goal of this research program is to improve scientific understanding of coral reef ecosystems throughout the Pacific, and serve as the basis for improved conservation and resource management.

U.S. Coral Reef Initiative (USCRI)⁶⁷. The United States is one of the first countries with coral reefs to launch a national Coral Reef Initiative. Announced in 1996, the USCRI is designed to be a platform of U.S. support for domestic and international coral conservation efforts. The goal is to strengthen and fill the gaps in existing efforts to conserve and sustainably manage coral reefs and related ecosystems (sea grass beds and mangrove forests) in U.S. waters. USCRI is a partnership of federal, state, territorial and commonwealth governments, the scientific community, the private sector and other organizations. The primary objective of USCRI is to foster innovative partnerships and cross-disciplinary approaches that reduce the threats to U.S. coral ecosystems.

U.S. All Islands Coral Reef Committee (AIC)⁶⁸. The AIC was created in 1999 by governor-appointed Points of Contact (POCs) to represent each coral reef jurisdiction in the United States. The creation of the AIC formally established the Committee consisting of the U.S. island jurisdictions of Guam, American Samoa, Commonwealth of the

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http://www.nfwf.org/AM/Template.cfm?Section=Charter_Programs_List&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=60&ContentID=18269

⁶⁶ http://www.nova.edu/ncri/11icrs/abstract_files/icrs2008-002024.pdf

⁶⁷ <http://oceanservice.noaa.gov/aa/ia/cr.html>

⁶⁸

ftp://ftp.nodc.noaa.gov/pub/data.nodc/coris/library/NOAA/CRCP/project/1204/us_islands_coral_reef_com_m_strategic_plan_2008-13.pdf

Northern Marianas, Hawaii, Puerto Rico, and the U.S. Virgin Islands, which had been meeting informally since 1993 after the U.S. Department of State proposed creating the Coral Reef Initiative to ameliorate future global degradation of coral reef ecosystems. The State of Florida became a full member of the Committee in 2007. The Committee works closely with the Coral Reef Conservation Program, NOAA, U.S. Department of Commerce, and the U.S. Department of the Interior, Office of Insular Affairs. The AIC also actively collaborates with other federal agencies who are members of the U.S. Coral Reef Task Force. The AIC is a made up of marine resource managers from state, commonwealth, territorial agencies and freely associated states working collaboratively with federal agencies to conserve and protect coral reefs in the United States.

U.S. Department of Agriculture Coral Reef Initiative⁶⁹. The U.S. Department of Agriculture (USDA) provided \$1 million from the Environmental Quality Incentives Program (EQIP) in Fiscal Year 2010 to reduce sediment and nutrient run-off from the watershed to help protect near shore coral reef ecosystems in the Guánica Bay Watershed in southwest Puerto Rico. The pilot project's objective was to protect coastal and stream water quality, improve wildlife habitat, and enhance near shore coastal and coral reef health through land-based management. USDA's Natural Resources Conservation Service (NRCS) assists agricultural producers in voluntarily establishing systems of conservation practices specifically tailored to their operations. These practices are redesigned to avoid, control and trap sediment and nutrient runoff, and include nutrient management, cover crops, grassed waterways, and field borders. The \$1 million dedicated to improving coral reef health in the watershed in Fiscal Year 2010 originated from funds NRCS allocated to Puerto Rico. Future projects are planned in Florida, U.S. Virgin Islands, Hawaii and the Pacific Islands..

3.2 US Non-federal Caribbean

For each state/territory, information on state programs for coral reef conservation as well as Coral Reef Local Action Strategies (LASs) is summarized in the following sections. For complete information on each individual LAS, visit (<http://www.coralreef.gov/las/>). Numerous other projects in each state and territory are conducted every year through grants funded by the Coral Reef Conservation Fund. These projects and their descriptions can be found in the online grants library⁷⁰. It is also recognized that other smaller coral reef conservation projects conducted by various organizations, academic institutions and/or NGOs are conducted frequently, signifying an increase in public awareness on coral reef issues.

3.2.1 Florida

Summary of Florida Coral Reef Conservation Projects

There are numerous coral reef conservation projects undertaken in Florida's waters every year. These projects range from monitoring programs to education and outreach programs. Monitoring of the Florida Reef Track has taken priority in recent years for

⁶⁹ <http://www.coralreef.gov/>
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http://www.nfwf.org/AM/Template.cfm?Section=Library_Search&Template=/customsource/ProjectSearch/cindex.cfm.

bleaching and disease events in order to help managers increase their management capacity. Many of the projects in Florida are multi-faceted and have several different components. Many of Florida's coral reef conservation efforts take place in the Florida Keys National Marine Sanctuary, home of the 3rd largest barrier reef system in the world. These efforts are usually in partnership with NOAA and various NGOs. Coral reef restoration projects and coral nurseries are also increasingly popular reef conservation projects.

Florida Department of Environmental Protection Coral Reef Conservation Program (DEP CRCP)

Through its role in supporting Florida's membership on the U.S. Coral Reef Task Force, and the U.S. All Islands Committee, the CRCP leads the implementation of the Southeast Florida Coral Reef Initiative and contributes to the National Action Plan to conserve coral reefs. The CRCP is also charged with coordinating response to vessel groundings and anchor damage incidents in southeast Florida, and developing strategies to prevent coral reef injuries.

Southeast Florida Coral Reef Initiative (SEFCRI)⁷¹

The Southeast Florida Coral Reef Initiative (SEFCRI) is a local action strategy for collaborative action among government and non-governmental partners to identify and implement priority actions needed to reduce key threats to coral reef resources in southeast Florida. The targeted area includes Miami-Dade, Broward, Palm Beach and Martin counties.

Southeast Coral Reef Evaluation and Monitoring Project (SECREMP)⁷²

SECREMP is a long-term reef monitoring project along Florida's southeast coast (Miami-Dade, Broward, Palm Beach, and Martin Counties). SECREMP is an extension of the Florida Keys Coral Reef Evaluation and Monitoring Project (CREMP), utilizing the same sampling protocols. SECREMP, as an expansion of CREMP ensures that important parameters are being monitored for the full extent of the Florida coral reef ecosystem.

Florida's Coral Reef Local Action Strategy

Led by the Florida Department of Environmental Protection's Coral Reef Conservation Program, and actively engaging over sixty regional agencies, non-governmental organizations, academic institutions and stakeholder organizations, Florida's Local Action Strategy, named the Southeast Florida Coral Reef Initiative, identifies the key threats to the health of southeast Florida's reefs and implements priority actions needed to reduce those threats, including:

Public Outreach and Awareness

- Creating and distributing outreach materials including brochures, portable exhibits, websites and signage at boat ramps

⁷¹ <http://www.southeastfloridareefs.net/>

⁷² <http://www.nova.edu/ncr/research/a12.html>

- Developing and distributing English and Spanish language public service announcements in print, audio and video formats
- Providing coral reef education kits and teacher training workshops for educators

Fishing, Diving and Other Uses

- Using aerial surveys to determine vessel usage patterns on southeast Florida’s coral reefs, and in-water surveys to investigate links between vessel anchoring and reef injuries
- Working with stakeholders to identify concerns and explore options for developing a management plan for the northern third of the Florida reef tract

Land-Based Sources of Pollution and Water Quality

- Mapping the extent of the coral reef tract and characterizing benthic habitats
- Conducting coral reef condition evaluation and monitoring
- Researching the sources and flux of pollution transported to reef communities and the links between pollution and coral reef health

Maritime Industry and Coastal Construction Impacts

- Identifying innovative technologies and establishing best management practices to avoid and minimize impacts to coral reefs associated with coastal construction
- Developing regional standard operating procedures for rapid response to, and restoration of, coral reef injuries

3.2.2 Puerto Rico

Summary of Puerto Rico Coral Reef Conservation Projects

Many of the individual conservation projects in Puerto Rico focus on education of the public with outreach campaigns. A particular focus is educating Puerto Rico’s youth about the importance of the ocean and coral reefs. Another common conservation focus of Puerto Rico is coral reef restoration. There are several sites where coral nurseries and coral farms have been implemented to attempt to restore some of Puerto Rico’s degraded reef areas. Puerto Rico also has several projects related to its Land-Based Sources of Pollution Local Action Strategy, including the promotion and implementation of integrated watershed and land-use management.

Department of Natural and Environmental Resources Coral Reef Program⁷³

The Coral Reef Program has two main categories of tasks for maintaining and improving the integrity of coral reefs:

- Conservation and Management
The work described in this category focus on local management strategies (i.e., LAS-local action Strategies). These are areas of special interest which cover lack

⁷³ http://www.drna.gobierno.pr/oficinas/arn/recursosvivos/costasreservasrefugios/coral/programa-de-conservacion-y-manejo-de-arrecifes-de-coral?set_language=en-us&cl=en-us

of awareness, overfishing, pollution from diffuse sources, and recreational use (see below).

- **Monitoring of Coral Reefs**
A database of characterization and monitoring of reefs and their associated communities is maintained for different areas of PR. Among these are: Desecheo Island, Rincon, Mayaguez, Guanica, Ponce and Caja de Muertos.

Caribbean Coral Reef Institute (CCRI)⁷⁴

The CCRI is a cooperative program between the University of Puerto Rico – Mayagüez (UPRM) and NOAA. The Institute sponsors scientific research and monitoring programs addressing short and long-term management priorities for the U.S. Caribbean coral reef ecosystem. The goals of CCRI include:

- Development, implementation, and administration of research and monitoring activities that improve the management of coral reef ecosystems and build management capability
- Interacting as appropriate with the Federal and Commonwealth agencies as well as other public and private organizations having a demonstrated capacity to assist in the management of coral reef ecosystems
- Fully utilizing the resource base of the region to collaborate and conduct research and monitoring activities on coral reef ecosystems.

Puerto Rico's Local Action Strategy

The Puerto Rico Department of Natural and Environmental Resources (DNER) is the main agency responsible for coral reef management. Puerto Rico's Local Action Strategies (LAS) builds on the experience of many different stakeholders. Coral reef management efforts are strengthened through increased coordination between state and federal partners and local agencies in the following activities:

Public Outreach and Awareness

- Completed an economic valuation study of coral reefs and related resources in Eastern Puerto Rico in December 2007.
- Utilizing an interactive CD on coral reefs as educational material for outreach activities in schools and the community.
- Installing several signs in certain coastal areas to educate users on the different marine ecosystems and ways to protect them.
- Distributing educational information to coastal businesses, navigation course students, and the public about the importance of coral reefs to Puerto Rico's economy. Outreach activities, including user surveys, are conducted.

Land-Based Sources of Pollution

- Increasing public awareness and reaching farmers to encourage them to implement best management practices to reduce pollution from agriculture through an effort made by the DNER, the Natural Resources Conservation Service and the Agricultural Extension Program (NRCS).

⁷⁴ <http://ccri.uprm.edu/>

- Conducting training workshops for marina operators, the agriculture community and agencies on ways to reduce coastal pollution and promote watershed protection.

Overfishing

- Conducting educational workshops explaining current fisheries regulations to Rangers, fishers and other stakeholders.
- Assessing fishing resources that are of commercial and recreational importance using fishcatch data and reproduction studies taken from the Fisheries Research Laboratory.

Recreational Misuse/Overuse

- Assessing damage by anchoring or trampling at target coral reef and seagrass sites within priority natural reserves around the island.
- Completing and implementing management plans for the Cordillera Reefs, Canal Luis Peña, Tres Palmas, Mosquito Bioluminescent Bay Natural Reserves, La Parguera, Caja de Muertos and Isla de Mona Natural Reserves.
- Installing hundreds of buoys at target sites listed above.

Land-based Sources of Pollution Local Action Strategy

This strategy addresses the impacts to coral reefs caused by erosion and sedimentation transported by runoff, rivers and creeks. The land-based sources of pollution (LBS) planning group based their work plan on the Puerto Rico's Coastal Nonpoint Source Pollution Plan. This document was developed by DNER in coordination with 15 commonwealth agencies and 6 federal advisory agencies and includes information provided by local scientists. This plan considers fine sediments transported by ocean currents (which depend on local patterns of water circulation near the coastal zone) as main pollutants and stressors affecting coral reefs. Agricultural compounds and nutrients were also identified as major stressors to wetlands and coral reefs within the watersheds. In order to address problems affecting corals, key projects were identified that entail the BMP's and MM's by: 1) category type of non point source pollution which include agricultural, urban, marinas, wetlands, etc. 2) inventory of all the non point sources of pollution and 3) training for agronomists and marina operators.

The proposed projects are being implemented in watersheds that are affected by: intensive agricultural activities, urban areas, high number of septic tanks and areas with large land cover removal. These pilot projects are being implemented in the JBNNER watershed and will be subsequently replicated at important watersheds on the island municipality of Culebra, Arrecifes de la Cordillera, Añasco, La Parguera, Guánica and Cabo Rojo as identified by the Coastal Nonpoint Source Pollution– Coral Reef Committee. The group of people working on this strategy includes representatives from state and federal agencies that manage or regulate activities that may impact coral reef ecosystems in close coordination with university and local community representatives.

3.2.3 USVI

Summary of USVI Coral Reef Conservation Projects

Much of the conservation efforts within the USVI focus on activities conducted within St. Croix East End Marine Park. The Park hosts the coral reef monitoring program of USVI as well as the most predominant education/outreach program. The East End Marine Park is also the predominant focus of USVI's LASs, as the initial implementation period of USVI's LASs were conducted entirely within in the Park. Future plans include expanding the LASs to other areas of the islands after the initial implementation period at East End Marine Park.

Virgin Islands Coastal Zone Management Program (VICZMP)

One of VICZMP's goals is to protect, preserve and, where feasible, enhance and restore the overall quality of the environment in the coastal zone. VICZMP works, coordinates and partners with various local and national government agencies to develop and implement a variety of projects and programs, including review, processing and enforcement of minor and major development permits in the first tier of the coastal zone. Major programs managed and administered by Coastal Zone Management include but are not limited to coastal zone permitting, public access, public outreach, Federal consistency, and the St. Croix East End Marine Park (STXEEMP).

St. Croix East End Marine Park (STXEEMP) Programs⁷⁵

- Territorial Coral Reef Monitoring Program

The main goal of the Territorial Coral Reef Monitoring Program is to document long-term trends in benthic and fishery resources for the USVI. A secondary goal of this program is to document baseline conditions prior to establishing marine reserves. This program utilizes a video methodology that was developed by the US Geological Survey on St. John, and is currently being used in the Virgin Islands National Park, Buck Island Reef National Monument (BIRNM) and the territorial program, thus providing standardized data throughout the territory. Two of the long-term monitoring sites are within the STXEEMP.

- Caribbean Coral Reef Ecosystem Monitoring Program

In association with NOAA's Biogeography Program and the National Park Service (NPS), STXEEMP staff and local coral reef monitoring partners are working to implement NOAA's protocol within the park. The Biogeography Team and NPS have been using this protocol to monitor marine resources within the BIRNM since 1999. As part of that project, the northern waters of the STXEEMP were also studied, providing important data prior to the establishment of the park. This protocol will be used to complete a comprehensive baseline survey of marine resources within the STXEEMP

St. Croix East End Marine Park Education and Outreach Program⁷⁶

⁷⁵ <http://www.stxeastendmarinepark.org/programs.htm>

⁷⁶ <http://www.stxeastendmarinepark.org/education.htm>

The goals of the St. Croix East End Marine Park education and outreach program are to facilitate environmental education opportunities for community members, promote a holistic view of the park ecosystem as an interrelated and interdependent system of habitats, encourage and promote a sense of user stewardship regarding the marine environment, and promote the awareness of and support for the St. Croix East End Marine Park. Available education and outreach services provided by this program include presentations on management issues, monitoring results, coral reefs, marine protected areas, and other marine related topics.

Protective Navigational Measures

The Virgin Islands National Park (VINP) maintains a number of navigational aids to prevent vessels from striking underwater objects, including coral reefs. These aids range from boat exclusion buoys around shallow reefs, seagrass areas and beaches, to larger, lighted discretionary buoys around offshore reefs. Buoys have prevented, in many cases, vessels from striking reefs and producing significant damage.

USVI's Local Action Strategy

For the first phase of the Local Action Strategy (LAS) initiative, the U.S. Virgin Islands (USVI) developed action plans to address 4 priority topics and focused implementation of projects within the territory's first marine park, the St. Croix East End Marine Park (STXEEMP). Management of the STXEEMP and coordination of the LAS are led by the Department of Planning and Natural Resources, Division of Coastal Zone Management. Recently, the USVI has begun a process to review, revise and expand the territory's LAS, expanding current strategies territory-wide, and evaluating the adoption of new focal areas including:

Lack of Awareness

- Promoting environmental and cultural education through establishing, (in 2004) and providing leadership for the VI Network of Environmental Educators (VINE). VINE is comprised of St. Croix and St. Thomas/St. John chapters and has a membership that represents 25 territorial agencies including local government, federal government, NGOs and academia. Through collaboration, a sister chapter is being developed in the neighboring British Virgin Islands.
- Providing bayside walking and snorkel tours for thousands of students and community members through STXEEMP Interpretive Program since its inception in Fall 2007.
- Supporting the Park's education and outreach events with the mobile STXEEMP EcoVan using a specialized curriculum developed in collaboration with numerous local partners.

Fishing

- Conducting biological monitoring to provide data on benthic habitats, reef fish, *Acropora* species and spiny lobster populations.
- Hiring Park Interpretive Rangers to support park education and outreach activities and, enforcement efforts, and as a mechanism to provide alternative livelihood opportunities for displaced fishers.

- Installing interpretive signage along roadsides and bayside access points in order to educate the public about the STXEEMP, its management strategies, rules and regulations.

Recreational Use

- Reducing damage to seagrass and coral reef habitats through the installation of a system of daytime use moorings within the park.
- Holding snorkel clinics to teach snorkelers safe, environmentally-friendly practices.

Land-Based Sources of Pollution

- Development of island-specific Best Management Practices to manage land-based sources of pollution within the STXEEMP.
- Using signage installed on roadsides in areas adjacent to the STXEEMP to address pollution impacts from land-based activities.

3.3 U.S. Non-Federal Indo-Pacific

3.3.1 Hawaii

Summary of Hawaii Coral Reef Conservation Projects

Many of the coral reef conservation projects in Hawaii are aimed at increasing management capacity in the form of recovering certain reef areas, mitigating land-based sources of pollution, and implementing invasive species control. Hawaii engages in community based monitoring of its reefs through programs like the Makai Watch Foundation and other foundations throughout the islands. The Coral Reef Alliance also sponsors conservation projects in Hawaii including developing voluntary standards for marine tourism activities, development of an online monitoring portal for reef monitoring volunteers, and the creation of educational “Respect Coral Reefs” signs to educate the public on coral reef ecosystems. Monitoring, education, and mitigation of land-based sources of pollution and invasive species are key components to conservation efforts of Hawaii’s reefs.

*DLNR Division of Aquatic Resources Coral Reef Monitoring Program*⁷⁷

The basic goal of the Division of Aquatic Resources Coral Reef Monitoring Program is to provide the necessary information sufficient for the agency to be able to fulfill its mission to “manage, conserve and restore the state's unique aquatic resources and ecosystems for present and future generations.” The two main objectives of this Program include:

- Providing data on the status and trends of key coral reef resources and key components of the ecosystems they are part of. Important resources are identified as fishes of commercial and/or social importance as well as hard corals. Other monitoring foci include grazing and corallivorous invertebrates (sea-urchins and crown of thorns starfish); algae; water quality, and reef structure.

⁷⁷ http://hawaii.gov/dlnr/dar/coral/coral_monitoring.html

- Providing data sufficient for the Department of Aquatic Resources to be able to assess the effectiveness of marine managed areas. A minimum monitoring goal is to include all MLCDs, the Waikiki Diamond Head FMA, and protected sites within the West Hawaii Regional FMA in routine monitoring, together with a sufficient number of 'control' sites.

Monitoring efforts include surveys for disease and bleaching as well as water quality surveys.

*Makai Watch Program*⁷⁸

The Makai Watch Program was created as a partnership effort by the DLNR and several non-governmental organizations including Community Conservation Network, TNC, Hawai'i Wildlife Fund, and several community-based organizations. Makai Watch is a coastal education, monitoring and resource protection initiative. Now officially sanctioned by the State of Hawaii, Makai Watch works to restore and sustain Hawaii's coastal resources through community involvement. The three focal points of the Makai Watch Program include:

- *Raising Awareness and Outreach*- Makai Watch volunteers provide ocean users with information about the area's marine ecology, geography, culture, history, regulations, safety, best fishing practices and proper reef etiquette.
- *Observing and Encouraging Compliance*- Makai Watch volunteers observe sites and encourage ocean users to learn and obey regulations. Volunteers are also trained in how to identify illegal activities and collect evidence so that violations can be reported to DOCARE.
- *Biological and Human-Use Monitoring*- Participants collect information on human use as well as biological condition of marine resources. Ongoing monitoring helps to gauge the effectiveness of management efforts, through increased fish counts or improved coral health.

Hawaii's Local Action Strategy

Hawaii used a collaborative planning process to develop local action strategies (LAS) for the six selected focus areas. This process supported and expanded on existing efforts already underway in the State. In cases where coordinating bodies did not already exist, steering committees were formed to facilitate the development and implementation of the particular LAS. These committees include members from state and federal government agencies, non-governmental organizations, academia, industries, and community groups. The six selected focus areas include:

- Main Hawaiian Island Coral Reef Fisheries Management
- Land-Based Sources of Pollution
- Lack of Public Awareness / Hawaii's Living Reef Program
- Aquatic Invasive Species
- Recreational Overuse
- Climate Change and Marine Disease

⁷⁸ http://hawaii.gov/dlnr/dar/coral/coral_las_makaiwatch.html

Local Action Strategy: Climate Change and Marine Debris

Hawaii and American Samoa are the only states/territories with focal areas of climate change within their LASs. The goal of Hawaii's Climate Change and Marine Debris LAS is to understand and manage impacts to reef ecosystems from climate change and marine disease for increased resistance and resilience. The following objectives are outlined in the LAS:

- To support research that provides a scientific basis for managing impacts to reef ecosystems from climate change and disease.
- To increase public awareness and engage stakeholders in monitoring and reporting bleaching and disease.
- To develop rapid-response contingency plan for events of bleaching and disease.
- To develop proactive and mitigative long-term management strategies to increase resistance and resilience of reef ecosystems to impacts from climate change and marine disease.
- To develop a program to monitor the impacts of climate change and marine disease on the reefs of the Hawaiian archipelago.

3.3.2 American Samoa

Summary of American Samoa Coral Reef Conservation Projects. Conservation of coral reefs in American Samoa is a joint effort of government agencies and community-based management. Like other states and territories, American Samoa's reef conservation efforts include monitoring, education and outreach, as well as community participation in management. The most relevant conservation programs instituted by the local government in American Samoa are summarized below.

American Samoa Coral Reef Initiative (ASCRI)⁷⁹. American Samoa's Coral Reef Initiative is administered by the Governor's Coral Reef Advisory Group (CRAG), an inter-agency task force established to provide the Government of American Samoa with advice, guidance and project management regarding coral reef related issues. Instrumental to its success is the direct and active role that each of the five agencies play in collaborative project development and implementation. Important projects implemented under the ASCRI include:

American Samoa Coral Reef Monitoring Plan. This plan was designed by the Coral Reef Monitoring Coordinator and CRAG Monitoring Working Group to create a management driven program that is achievable with on-island staff and resources and resilient to staff turnover. American Samoa began implementing the integrated coral reef monitoring plan in early 2005. This program consists of 11 core sites, distributed geographically around the island. It will also assist individual agency monitoring efforts, as well as the Community-based Fisheries Management Program at the DMWR. For the first time, the Territory will have a single point of reference and contact for monitoring activities, as well as a centralized database.

⁷⁹ <http://crag.as/?nav=Home&cont=home>

Education and Outreach. The main objective of CRAG's Education and Outreach Coordinator is to increase public awareness of issues affecting American Samoa's coral reefs. The Education and Outreach Coordinator conducts regular visits to schools, develops educational equipment, and disseminates information via newspaper articles, slides and brochures relevant to coral reef issues. One notable project is the distribution of grants to teachers in American Samoa through the American Samoa Teachers' Challenge Awards. Le Tausagi, an interagency working group consisting of environmental educators who collaborate on conservation programs and community outreach, administers this program.

American Samoa Marine Protected Area (MPA) Network Strategy. American Samoa has 11 Village Marine Protected Areas which rely on management by the local communities in coordination with local governments. The American Samoa MPA Network Strategy was developed to link the Territory's MPA programs and agencies together to be more effective in protecting and managing the marine resources. The goal of the MPA Network Strategy is to effectively coordinate existing and future MPAs to ensure the long-term health and sustainable use of the Territory's coral reef resources. Collaboration and integration among agencies through existing programs in education, research, monitoring, enforcement, and administration are emphasized.

American Samoa's Local Action Strategy⁸⁰. In American Samoa, the Coral Reef Advisory Group (CRAG) is responsible for implementing the Local Action Strategies (LAS) via initiatives developed by the U.S. Coral Reef Task Force. LASs are the result of a continuing process incorporating input from territorial agencies, non-profit groups, interested individuals, stakeholder groups, and federal agency partners. American Samoa has LASs addressing population pressure, overfishing, land-based sources of pollution, public outreach and awareness, and local response to global climate change.

3.3.3 Guam

Summary of Guam's Coral Reef Conservation Efforts. A broad network of agencies, educational/research institutions and non-governmental organizations continue to carry out a range of activities aimed at mitigating the threats to Guam's coral reefs, improving public awareness of coral reef issues and monitoring the vitality of Guam's coral reef resources. Progress towards short- and long-term increases in human capacity to effectively carry out these activities has been made with the establishment of two scholarship programs for graduate study in marine biology/natural resource management, the NOAA Coral Management Fellowship, the Pacific Islands Technical Assistantship program, the NOAA Pacific Islands Regional Office (PIRO) Guam Field Office and various training opportunities for managers, technicians and teachers. Many of the goals and objective of coral reef management projects in Guam are directly linked to the U.S. National Action Plan to Conserve Coral Reefs through Local Action Strategies developed locally (Waddell et al., 2008). The most relevant conservation programs instituted by the government of Guam are summarized below.

⁸⁰ <http://www.coralreef.gov/las/lasfactsheets2009/las09/lasas.pdf>

Guam Coastal Management Program (GCMP)⁸¹. The Guam Coastal Management Program, instituted in 1979, is responsible for coordinating and assisting the development and implementation of plans, policies and programs which affect the management, use and preservation of Guam’s land and ocean resources. The objectives of the GCMP are to ensure consistency amongst the plans, policies and programs such that Guam’s resources are effectively used for the benefit of present and future generations. It is overseen by the Bureau of Statistics and Plans, and guides the use, protection, and development of land and ocean resources within Guam’s coastal zone. Because Guam is a small island, the entire land area is included within this coastal zone. The Coastal Program provides overall coordination and direction to a network of government agencies to ensure a balanced approach to coastal management. Some of the most prominent coastal management issues for Guam are coral reef and watershed habitat degradation, water quality degradation, coastal hazards, and cultural and historic resource preservation.

Guam Coral Reef Initiative (CRI) and Local Action Strategy (LAS)⁸². In 1997, the Government of Guam established the CRI and instituted a LAS to address threats to the reefs via initiatives developed by the U.S. Coral Reef Task Force. The Bureau of Statistics and Plans, Guam Coastal Management Program, Department of Agriculture, Division of Aquatics and Wildlife Resources, and Guam Environmental Protection Agency lead most of the efforts of the CRI. Guam LASs on land-based sources of pollution, fishery management, public outreach and awareness, recreational use and misuse, and coral bleaching and global climate change.

3.3.4 CNMI

Summary of the CNMI Coral Reef Conservation Efforts. Many coral research and monitoring programs funded in recent years by the U.S. Coral Reef Initiative (CRI) have increased the CNMI’s capacity to manage its coral reef ecosystem resources. This has assisted the CNMI in assessing and monitoring coral resources, educating the public, and enforcing coral reef management policy through an increase in both personnel and the development of locally applicable management tools (Waddell et al., 2008). The most relevant conservation programs instituted by the government of the CNMI are summarized below.

Coastal Resources Management (CRM) Office Marine Monitoring Program⁸³. The CRM Marine Monitoring Program is funded by a grant from NOAA that supports the Coral Reef Ecosystem Monitoring Program in the CNMI. This program is a long-term interagency project between local and national agencies including the CNMI Coastal Resources Management Office, the Division of Environmental Quality, the Division of Fish and Wildlife, NOAA, U.S. EPA, and the USACE. The main goal of this program is to provide the information necessary for effective management of reef resources. It provides a means to document how reef communities change over time in response to natural fluctuations, acute disturbances (e.g. typhoons), and chronic disturbances (e.g.

⁸¹ <http://coastalmanagement.noaa.gov/mystate/guam.html>

⁸² <http://www.coralreef.gov/las/lasfactsheets2009/las09/lasguam.pdf>

⁸³ <http://www.crm.gov.mp/programs/monitoring/how.asp>

pollution). Documenting changes over time allows for assessing the impacts of land-based pollution and determining if management actions are needed, or working. Monitoring also provides information as to what organisms live on the coral reefs in the CNMI. This provides knowledge of areas that are most precious and endangered so prioritization of limited management resources to these regions can be made.

CNMI's Mooring Buoy Program⁸⁴. In order to protect coral reefs and fisheries habitats from anchor damage at frequently visited sites, while assuring public access to marine resources, CNMI's Coastal Resources Management Office (CRM) and the Northern Mariana Dive Operators Association (NMDOA) worked together to install and maintain public marker and mooring buoys.

CNMI's Nonpoint Source Pollution, Marine Monitoring, and Coral Reef Program⁸⁵. This branch of the Department of Environmental Quality (DEQ) is responsible for keeping CNMI waters clean and healthy for beneficial uses. It was established from the CNMI Coral Reef Initiative. Through this program, the DEQ provides demonstrations for best management practices and education and outreach campaigns concerning water quality issues through fairs and festivals such as the Environmental Symposium and Expo during Earth Day and the EcoArts Festival.

CNMI's Local Action Strategy⁸⁶. The Local Action Strategies (LAS) the CNMI were developed through a coordinated effort among three natural resources management agencies: the Coastal Resources Management Office, the Division of Fish and Wildlife and the Division of Environmental Quality. Stakeholder meetings and input also contributed to the development of the strategies. LAS serve as tools to encourage stewardship towards coastal resource protection and restoration. CNMI has LASs on land-based sources of pollution, fishery management, recreational use, public outreach and awareness, and coral resources management.

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⁸⁴ <http://cnmibouymooring.blogspot.com/>

⁸⁵ <http://www.deq.gov.mp/section.aspx?secID=9>

⁸⁶ <http://www.coralreef.gov/las/lasfactsheets2009/las09/lascnmi.pdf>

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