

Colorless Coral: The legal landscape of protecting Florida's coral from human impacts

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Graduation: May, 2022

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Introduction

Florida is the only state in the continental United States with extensive shallow coral reef formations near its coasts and the Florida reef is the third longest in the world.¹ Corals are a living, breathing sessile animals that are currently facing a mass extinction.² Human activity endangers biodiversity in the Florida Keys Reef Tract in at least four main ways: overfishing; pollution; sedimentation; and climate change.³ This article will discuss current threats to Florida's reefs, legal protections already in place for coral reefs, and address what additional practical protections should be implemented to help protect and restore this vital habitat.

As a native Floridian, this crisis is one that hits your author deep. Your author has personally witnessed the dramatic color changes of snorkeling trips in the Florida Keys over the past decade. Even without a scientific understanding of what was causing color-loss, there is a sense of dread for those who have seen the impacts of anthropogenic threats on Florida's reefs. Instead of boat trips to color-bursting coral reefs, a recent trip to the Keys presented only bits and pieces of colorless brain coral, a handful of spiny lobsters, and the few fish that are still hopeful for life to return to the Florida Reef Tract. On a more fundamental level, local boat captains urge visitors to help protect their livelihoods by using reef-safe mineral sunscreens. As will be demonstrated in this article, the micromovements of such sustainable choices are imperative to keeping the beloved corals alive.

Relevant Statutes, Administrative Rules, Federal Provisions

The State of Florida designated portions of the Florida Keys, pursuant to statute and by Florida Department of Environmental Protection (FDEP) rule, as an "Outstanding Florida Water: (OFW).⁴ The OFW states " [t]hat the level of protection afforded by the designation as

Outstanding National Resource Waters is clearly necessary to preserve the exceptional ecological or recreational significance of the waters.”⁵ This protection declares “the waters are of such exceptional recreational or ecological significance that water quality should and can be maintained and protected under all circumstances other than temporary degradation and the lowering allowed by Section 316 of the Federal Clean Water Act (CWA). . . .”⁶

The Florida Legislature also designated the Florida Keys an “Area of Critical State Concern.”⁷ A stated purpose of this designation is to protect and improve the Florida Keys nearshore water quality through construction and operation of wastewater facilities that meet the requirements of section 403.086(10), Fla. Stat (2018). Additionally, the Florida Legislature has enacted section 403.086(10), which addresses the discharge of domestic wastewater in the Florida Keys. That statute finds that the discharge of inadequately treated and managed domestic wastewater from small wastewater facilities and septic tanks and other onsite systems in the Florida Keys compromises the coastal environment.

Additionally, statutory protection is in place to regulate boating incidents that contribute to the degradation of Florida’s coral reefs. The "Florida Coral Reef Protection Act" declares “it is in the best interest of the state to clarify the department's powers and authority to protect coral reefs through timely and efficient recovery of monetary damages resulting from vessel groundings and anchoring-related injuries.”⁸ The statute was originally enacted in 2009 to make it illegal to anchor on or otherwise damage coral reefs in Florida. Five hundred ship groundings a year occur in the Florida Keys National Marine Sanctuary.⁹

Next, there are a number of federal provisions that attempt to address coral reef protection. First, the Endangered Species Act (ESA) of 1973 includes minor protection for a few Florida coral

species.¹⁰ Of the 45 species of stony coral species found along the Florida Reef Tract, two are currently listed as Threatened under the ESA, staghorn coral and elkhorn coral, which means NOAA's National Marine Fisheries Service must issue critical habitat protection.¹¹ Several more are currently being petitioned for listing by NOAA. Endangered and threatened species that have critical habitat protection are twice as likely to be recovering as those without it.¹² The State of Florida also listed five additional coral species as threatened and protects all stony corals within state waters.¹³

The Federal Clean Water Act (CWA) also sets out in part to prohibit the “discharge of toxic pollutants in toxic amounts.”¹⁴ Section 404 of the CWA regulates “the effect of disposal of pollutants on human health or welfare, including . . . shorelines, and beaches”¹⁵ Section 404 guidelines establish the environmental standards to be used by Environmental Protection Agency (EPA) and the Army Corps of Engineers (Corps) in the review of permit applications “to discharge dredged or fill material in the Nation's waters, including marine waters that are home to coral reefs.”¹⁶ Because of the limited reach of the Clean Water Act, waste and other harmful pollutants “are only minimally regulated near coastal waters of the United States and can be discharged untreated offshore.”¹⁷ Environmental advocates complained that these pollutants “contaminate our coastal waters resulting . . . [in] risk to public health for people swimming in our oceans and damage to coral reefs.”¹⁸

One additional federal protection is the Marine Protection, Research, and Sanctuaries Act (“MPRSA”). Also known as the Ocean Dumping Act, the MPRSA prohibits “the dumping of material into the ocean that would unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities.”¹⁹ Section 102 of the MPRSA requires the EPA, in consultation with the Corps, to develop environmental

criteria which must be met before any proposed ocean disposal activity is allowed to proceed to avoid adverse impacts on coral reefs.²⁰

Lastly, Florida's Governor Ron DeSantis signed a Senate Bill 172 into law this June that strikes down and preempts any local bans on the sale of sunscreen products that contain oxybenzone and octinoxate, two chemicals known to impact the health of corals.²¹ NOAA and the National Park Service urge consumers to avoid these chemicals; and bans are already in place in Hawaii and the U.S. Virgin Islands.²² SB172 essentially stripped Floridians of the ability to protect the Florida Reef Tract, one of the state's most precious ecological and economic assets.

Agricultural and Human Waste: Impact on Coral Reefs

The EPA identified sedimentation from coastal development, urban stormwater runoff, forestry, and agriculture as a primary stressor for the existence and recovery of coral species and their habitats.²³ Sediment deposited onto reefs "can smother corals and interfere with their ability to feed, grow, and reproduce." *Id.* Furthermore, "[p]esticides can affect coral reproduction, growth, and other physiological processes. Agricultural runoff from Florida's mainland, and sewage dumping from 22,000 septic tanks, 5000 cesspools and 139 marinas all contribute to pollution in the Keys sanctuary.²⁴ Agricultural fertilizer and herbicides applied to fields far from the reefs are creating total "dead zones" in the oceans and harming life on the reefs, which require clean, nutrient-free waters to thrive.²⁵ Rain causes agricultural fertilizers containing nitrogen and phosphorous to run off into the ocean, making coral death more common.²⁶ Those increased nutrients in the water cause algae blooms, "which in turn seemed to predict mass coral deaths."²⁷ A great deal of the effect of these added nutrients could be mitigated by improved water-treatment plants.²⁸

At the same time, however, coral reef systems are “extremely susceptible to sewage . . . resulting from poor land management.”²⁹ Sewage is “likely to kill coral in the vicinity of the outlet because of reduction in light caused by the sediment.”³⁰ In Florida, as mentioned above, § 380.0552, F.S. is in place to ensure discharge of domestic wastewater in the Florida Keys in properly treated via a permitting system. However, at least one nonprofit group in the Keys has failed when challenging wastewater facility treatment sites along the protected area of the coral reef system in the Keys for allegedly violating state water quality standards.³¹ Partially treated waste-water remains a concern for Florida’s coral reef system.

On the local level, the Florida Keys implemented a Reasonable Assurance Plan (“RAP”) to set forth and accelerate the actions to reduce nutrient loadings to near shore waters throughout the Florida Keys so that the water quality standards are met, and beneficial uses are restored.³² The 2018 status report indicates that canal nutrient pollution levels are decreasing with the measures put in place, and FDEP will continue to monitor the RAP progress until water bodies are not longer listed as critically impairs.³³

Unfortunately, it appears sanctuary status has not prevented the steep decline in the Florida reef system. The Keys sanctuary program would benefit from coordination with state and local efforts to eliminate these sources of pollution. Currently only one percent of the total sanctuary area in Florida is designated as no-take marine reserves.³⁴ Those areas show signs of recovery, indicating that there should be more no-take designations.³⁵ No-take marine reserves a specific type of marine protected area (MPA). According NOAA, “no-take MPAs totally prohibit the extraction or significant destruction of natural or cultural resources.”³⁶ These measures and a commitment to continue funding the efforts of the sanctuary programs are essential to preserving coral reefs.

Toxic Sunscreen: A Major Florida Setback

Chemicals found in most sunscreens are toxic to coral reefs, adding to the stressors coral already faces for survival in the popular Florida Keys.³⁷ The Center for Biological Diversity, which says oxybenzone and octinoxate contribute to coral bleaching and death, petitioned the U.S. Food and Drug Administration (FDA) to outlaw the two chemicals found in many personal health products, including sunscreen lotion.³⁸ High concentrations of oxybenzone can be found in many areas popular with tourists, including the Florida Keys. NOAA estimates that “90% of snorkeling/diving tourists are concentrated on 10% of the world’s reefs. This means that our most popular reefs, such as those in our national parks, are exposed to the majority of sunscreens.”³⁹ A measure outlawing the two chemicals passed in Hawaii and will go into effect in 2021.⁴⁰ That bill explains the chemicals “have also been shown to degrade corals’ resiliency and ability to adjust to climate change factors and inhibit recruitment of new corals.”⁴¹

On the local level in Florida, several communities attempted to ban the sale of sunscreen products that contain oxybenzone and octinoxate, because of their well-known adverse impacts on the health of corals. However, Governor Ron DeSantis signed SB172 to preempt any local ordinance to provide protection from harmful chemicals in Florida. Therefore, it is up to Florida natives and visitors to make conscious cosmetic choices to help keep excess toxins from bleaching already stressed corals to extinction.

Global Warming and a Coral Reef Phenomenon

Coral reefs also suffer from global warming. Much has been debated about the impacts of climate change and global warming on the earth’s oceans and marine life. However, United States leaders have failed to provide practical solutions to the clear adverse consequences of warming

temperatures on the environment. “[E]levated sea water temperatures and increased CO2 concentrations due to greenhouse gas emissions” have been linked to a phenomenon known as coral bleaching.⁴² Bleaching often mean that the coral reefs die. Warmer sea temperatures alone will account for coral reefs “declining by a further 70–90 per cent . . . causing massive bleaching episodes with high coral mortality rates.”⁴³

In the Florida Keys, the U.S. Geological Survey (USGS) Coral Reef Ecosystems Studies (CREST) project dataset provides underwater temperature data recorded every fifteen minutes from 2009 to 2019 at six off-shore coral reefs.⁴⁴ The data helps the USGS to assess the dynamic, underwater temperature environment experienced by coral reef organisms.⁴⁵ The current average water temperature in the Florida Keys, during August which is consistently the month when Florida’s ocean temperatures peak, is currently 87-88 degrees Fahrenheit.⁴⁶ The average water temperature continues to remain around 86 degrees in September.⁴⁷ USGS analysis from a 2014 temperature study indicated “[w]hen corals are exposed to water temperatures above 84 F they grow more slowly and, during extended exposure periods, can stop growing altogether or die.”⁴⁸ The USGS further explained “mortality usually ensues if corals remain bleached longer than a month or two.”⁴⁹

“Non-human” Threat: Coral Disease

Finally, scientists are reporting more incidences of coral disease, particularly in the Caribbean. FDEP reported the Florida Reef Tract has been experiencing an outbreak of a coral disease termed Stony Coral Tissue Loss Disease (SCTLD), which can wipe of a coral colony in a matter of months.⁵⁰ SCTLF has affected more than 20 of approximately 45 species of Florida’s reef-building corals. This includes two species listed pursuant to the Endangered Species Act.⁵¹

Scientists are replanting coral in the Florida Keys but are unsure if the ecosystem will be able to stand up to climate change, making global climate action critical for the survival of the Florida Reef Tract.⁵²

This year Florida Aquarium sought up to \$1.5 million in 2020-21 Appropriations, some of which would help to enhance its coral laboratory. Governor Ron DeSantis vetoed the Center for Conservation in Apollo Beach's request in June.⁵³ This conservation program deemed "Project Coral" is an effort to help save corals in the Florida Reef Tract from going extinction.⁵⁴ The research lab saw a "historic breakthrough" in 2019: for the first time ever, an endangered species of Atlantic coral spawned through lab-induced techniques.⁵⁵ The Aquarium said this breakthrough was a "world-first" coral reef restoration and research advancement.⁵⁶ The appropriations money would have helped the research lab expand the recovery efforts.

The Bigger Picture: Life Without Coral

Healthy and resilient coral reefs safeguard against extreme weather, shoreline erosion, and coastal flooding. Coral Reef extinction would also threaten Florida's \$1.1 billion Coral Reef tourism economy, which is highly tied to the coral reefs and dependent on their health.⁵⁷ Additionally, coral reefs are estimated to annually support 71,000 jobs in south Florida.⁵⁸ The world's third-largest barrier reef along the Florida Keys is struggling and on the verge of collapse, with less than a tenth of the reef system now covered in living coral. Later in 2020, the report on the status of coral reefs of the world will be released by the Global Coral Reef Monitoring Network, the first global report in 12 years. This report will provide further information about the state of coral reefs and will hopefully ring alarm bells to initiate restorative and protective actions needed to prevent a mass coral extinction.

Conclusion

A mass coral extinction is on the horizon, and the legal protections currently in place are not enough to keep up with rapid reef degradation in the Florida Reef Tract. While there is little that communities living near coral reefs can do to stop global warming, there is a lot they can do to reduce nitrogen runoff. Addressing smaller scale issues like agricultural and toxic pollution is critical to protecting the dying coral reef systems in the Florida Keys. From properly disposing of household waste and chemicals to choosing sustainable sunscreens – tourists and Florida residents alike can help reduce local threats to reef health. Finally, implementing proper waste treatments and agricultural pollutant reduction programs can also help slow coral death rates, especially with proper funding and oversight. There is hope with Florida’s current state administration, as improving water quality is a priority. Florida’s Senate Bill 712 was recently adopted, which offers more stringent water pollution oversight and regulations.

¹ See Mary Gray Davidson, *Protecting Coral Reefs: The Principal National and International Legal Instruments*, 26 Harv. Envtl. L. Rev. 499, 504 (2002).

² *Id.* at 532.

³ *Id.* at 505.

⁴ See § 403.061(27), Fla. Stat. (2018); see also Fla. Admin. Code R. 62-302.700(9).

⁵ Fla. Admin. Code 62-302.700(6)(b).

⁶ Fla. Admin. Code R. 62-302.700(6)(a).

⁷ See § 380.0552, Fla. Stat. (2016).

⁸ § 403.93345, Fla. Stat. (2015).

⁹ See MARK SPALDING ET AL., WORLD ATLAS OF CORAL REEFS 97-98 (2001)[hereafter SPALDING ET AL].

¹⁰ See 16 U.S.C § 1531.

¹¹ *Id.*

¹² See MARTIN F. J. TAYLOR, KIERAN F. SUCKLING, AND JEFFREY J. RACHLINSKI, *The Effectiveness of the Endangered Species Act: A Quantitative Analysis* (April 5, 2005), <https://www.biologicaldiversity.org/publications/papers/bioscience2005.pdf>.

¹³ See <https://ecos.fws.gov/ecp0/pub/SpeciesReport.do>.

¹⁴ 33 U.S.C. § 1251(a)(1)-(3) (1972).

¹⁵ 33 U.S.C. § 1251(c)(1)(A).

¹⁶ 33 U.S.C. § 1251(b)(1).

¹⁷ See Constantine G. Papavizas & Lawrence I. Kiern, *2013-2014 U.S. Maritime Legislative Developments*, 46 J. Mar. L. & Com. 261, 266–67 (2015).

¹⁸ *Id.*

¹⁹ 33 USC §1401.

²⁰ *Id.*

²¹ See S.B. 172, 2020 Leg., Reg. Sess. (Fl. 2020); see also Downs, C.A., Kramarsky-Winter, E., Segal, R. et al. *Toxicopathological Effects of the Sunscreen UV Filter, Oxybenzone (Benzophenone-3), on Coral Planulae and Cultured Primary Cells and Its Environmental Contamination in Hawaii and the U.S. Virgin Islands*. Arch Environ Contam Toxicol 70, 265–288 (2016).

²² See <https://oceanservice.noaa.gov/news/sunscreen-coral.html>, https://cdhc.noaa.gov/docs/Site%20Bulletin_Sunscreen_final.pdf.

²³ See U.S. EPA, Threats to Coral Reefs (May 4, 2018), <https://www.epa.gov/coral-reefs/threats-coral-reefs>.

²⁴ See SPALDING ET AL., *supra* note 9 at 97-98.

²⁵ See COLIN WOODARD, OCEAN'S END, 104-06 (2000); see also Reef Relief, What is the Biggest Threat to the Health of Florida's Coral Reef?, at http://www.reefrelief.org/coral_reef_florida.html.

²⁶ See David A. Ring, *Sustainability Dynamics: Land-Based Marine Pollution and Development Priorities in the Island States of the Commonwealth Caribbean*, 22 Colum. J. Envtl. L. 65, 73 (1997).

²⁷ *Id.*

²⁸ *Id.*

²⁹ See Peter C. Underwood, The Marine Environment and Ocean Development in the Eastern Caribbean, in *A New Law of the Sea for the Caribbean: An Examination of Marine Law and Policy Issues in the Lesser Antilles* 126 (Lecture Notes on Coastal and Estuarine Studies no. 27) (Edgar Gold ed., 1988).

³⁰ See David L. McKee & Clem Tisdell, *Developmental Issues in Small Island Economies* 134 (1990).

³¹ See LAST STAND (PROTECT KEY WEST AND THE FLORIDA KEYS, d/b/a LAST STAND), AND GEORGE HALLORAN, Petitioners v. KW RESORT UTILITIES CORP. AND STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION, Respondents, (2016).

³² Florida Department of Environmental Protection Division of Environmental Assessment and Restoration Water Quality Assessment Program, *2018 Update to the Florida Keys Reasonable Assurance Document* (June 2018).

³³ *Id.*

³⁴ See SPALDING ET AL., *supra* note 9 at 97-98.

³⁵ *Id.*

³⁶ See NOAA. What is a marine protected area? National Ocean Service website (June 25, 2018), <https://oceanservice.noaa.gov/facts/mpa.html>.

³⁷ See Clyde McGrady, Washington Energy Briefing, *CBD urges FDA to ban two chemicals found in sunscreen to protect coral*, (2018).

³⁸ *See id.*

³⁹ See NOAA, Coral Disease and Health Consortium, National Park Service U.S. Dept. of the Interior, *Protect Yourself, Protect the Reef*, [https://cdhc.noaa.gov/docs/Site%20Bulletin Sunscreen final.pdf](https://cdhc.noaa.gov/docs/Site%20Bulletin%20Sunscreen%20final.pdf).

⁴⁰ See S.B. 2571, 29th Leg., (Haw. 2020).

⁴¹ *See id.*

⁴² See National Marine Fisheries Service, NOAA, Coral Reefs: Critical Biodiversity and Fisheries Resources, (Mar. 12, 2002), http://www.nmfs.noaa.gov/prot_res/PR/coralhome.html.

⁴³ E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo, *IPBES: Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, IPBES secretariat, Bonn, Germany, 41 (2019) [here after IPBES: Global Assessment Report].

⁴⁴ See Kuffner, I.B., 2020, *Underwater temperature on off-shore coral reefs of the Florida Keys*, U.S. Geological Survey data release (April 2020), <https://doi.org/10.5066/F71C1TZK>.

⁴⁵ *Id.*

⁴⁶ *See id.*; see also https://www.ncei.noaa.gov/access/data/coastal-water-temperature-guide/all_meanT.html.

⁴⁷ See *id.*

⁴⁸ Ilsa B. Kuffner, Vic Hines, Dept. of the Interior, U.S. Geological Survey, *Ocean Warming Affecting Florida Reefs* (Sept. 9, 2014), <https://www.usgs.gov/news/ocean-warming-affecting-florida-reefs>.

⁴⁹ *Id.*

⁵⁰ See Fl. Dept. of Env. Protection, *Stony Coral Tissue Loss Disease Response* (last updated Mar. 31, 2020, 10.36am), <https://floridadep.gov/rcp/coral/content/stony-coral-tissue-loss-disease-response>.

⁵¹ *Id.*

⁵² See Erin Brown, Environmental and Energy Study Institute, *Florida's Dying Reefs Could Devastate Keys' Economy* (July 13, 2017), <https://www.eesi.org/articles/view/floridas-dying-reefs-could-kill-the-florida-keys-economy>.

⁵³ See H.B. 5001 (line item 1906A), 26th Leg., (Fla. 2020).

⁵⁴ See Joe Guudry, The Fla. Aquarium, *Project Coral: A New Hope to Save an Endangered Species* (Aug. 18, 2019), <https://www.flaquarium.org/blog/posts/project-coral-a-new-hope-to-save-an-endangered-species>.

⁵⁵ See The Fla. Aquarium, *The Florida Aquarium Becomes First Organization in History to Induce Spawning of Atlantic Coral; A New Hope to Save Florida's Reefs* (Aug. 21, 2019), <https://www.flaquarium.org/pressroom/posts/the-florida-aquarium-becomes-first-organization-in-history-to-induce-spawning-of-atlantic-coral-a-ne>.

⁵⁶ *Id.*

⁵⁷ See Fl. Dept. of Env. Protection, Coral Reef Conservation Program, <https://floridadep.gov/rcp/coral>.

⁵⁸ *Id.*