Office of National Marine Sanctuaries
National Oceanic and Atmospheric Administration

Florida Keys National Marine Sanctuary: Restoration Blueprint

Final Environmental Impact Statement: Volume II

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U.S. Department of Commerce
Gina Raimondo, Secretary

National Oceanic and Atmospheric Administration
Richard W. Spinrad, Ph.D., Under Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator

National Ocean Service
Nicole LeBoeuf, Assistant Administrator

Office of National Marine Sanctuaries
John Armor, Director

Cover photos (left to right, from top): coral cover at Tortugas Ecological Reserve; recreational fishing; sand flats in the backcountry; American Shoal lighthouse; shipwreck of the City of Washington; recreational boating

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About This Document

Abstract

This document is the second volume of the Florida Keys National Marine Sanctuary Final Environmental Impact Statement and contains the appendices.

The National Oceanic and Atmospheric Administration's (NOAA) Office of National Marine Sanctuaries (ONMS) proposes to expand the Florida Keys National Marine Sanctuary (FKNMS) boundary, update sanctuary-wide regulations, modify and establish new marine zones, update marine zone-specific regulations, and revise the sanctuary's non-regulatory management plan. The purpose of this proposal is to meet the purposes and policies of the National Marine Sanctuaries Act (NMSA; 16 U.S.C. § 1434(a)(4)), to implement specific actions identified in the 2007 FKNMS management plan, and to act upon several recommendations of the FKNMS Sanctuary Advisory Council. These recommendations are based primarily on the 2011 FKNMS condition report. The need for this proposal is based on widespread, acute, chronic, and emerging threats to marine resources in the Florida Keys. The existing regulations, marine zones, and management plan activities designed and implemented by FKNMS in the mid-1990s are no longer sufficient to ensure long-term resource protection and ecosystem function integrity into the future considering those threats.

NOAA prepared this final environmental impact statement (EIS) in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. §§ 4321 et seq.) as implemented by the Council on Environmental Quality's regulations (40 C.F.R. Parts 1500-1508), and NOAA Administrative Order (NAO) 216-6A and Companion Manual, which describe NOAA policies, requirements, and procedures for implementing NEPA. This final EIS also fulfills the mandate of NMSA 16 U.S.C. § 1434(a)(4), which requires that "terms of designation may be modified only by the same procedures by which the original designation is made." This document also serves as a resource assessment that details the present and future uses of the area of the national marine sanctuary. No significant adverse impacts are expected under any action alternative. Long-term beneficial impacts are anticipated if the proposed action is implemented.

Lead agency: National Oceanic and Atmospheric Administration

Cooperating agency: U.S. Fish and Wildlife Service

For further information on the project, see the project website.

For further information contact: Beth Dieveney, policy advisor, Florida Keys National Marine Sanctuary, at (305) 797-6818 or beth.dieveney@noaa.gov

Table of Contents

About This Document i
Table of Contents ii
Glossary of Acronyms iv
Appendix A: Management Plan 1
Background 1
Management Plan Review and Development 2
Florida Keys National Marine Sanctuary Final Management Plan 2024 6
Appendix A.1: Implementation Factors: Funding, Capacity, and Level of Effort 23
Appendix A.2: Representative List of Sanctuary Partnership Agencies and Organizations 24
Appendix A.3: List of Acronyms 25
Appendix B: Maps – Proposed Modifications to Marine Zone Boundaries 26
Marine Zone Definitions 26
Final Preferred Alternatives 29
Alternatives Presented in the 2019 Draft EIS 102
Alternatives Presented in the 2022 Notice of Proposed Rulemaking Alternative 123
Appendix C: Response to Comments 129
General 129
Sanctuary Boundary 130
Sanctuary-Wide Regulations 132
Marine Zones and Associated Regulations 143
Management Plan 156
Miscellaneous 167
Appendix D: Minor or Technical Revisions and Updates 168
Introduction 168
Definitions and Terms 168
Regulations 169
Appendix E: Regulatory Framework 171
Regulatory Overview 171
Appendix F: Military Activities 181
Introduction 181
Exempted Military Activities 181
Environmental Effects of Military Exemption 182
Additional Requirement for Interagency Consultation under Section 304(d) of the NMSA 183
Description of Military Activities 185
Appendix G: Exempted Traditional Fishing Activities 209
Exempted Traditional Fishing Activities 209
Sanctuary and Fishery Management Overlay 210
Appendix H: Florida Keys National Marine Sanctuary Listed Species 220
USFWS ESA-listed Species & Critical Habitat Designations 220
USFWS Migratory Birds (56) 228
NMFS ESA-listed Species & Critical Habitat Designations 238
Essential Fish Habitat 244
State of Florida Species 247

Appendix I: Located Historical Resources and Historically Reported Vessel Losses 251
Located Historical Resources in Florida Keys National Marine Sanctuary 251
Historically-reported Vessel Losses in Florida Keys National Marine Sanctuary 260
Appendix J: Correspondence 280
Appendix K: Economic Cost-Benefit Analysis Prepared to Support the Final Regulations 282
Need for This Action 282
Description of Affected Entities 283
Baseline 283
Economic Effects of the Final Preferred Alternative 283
Determination of Significant Regulatory Action 290
Appendix L: Field Activities and Best Management Practices 296
Implementing Routine Sanctuary Field Activities 296
Impacts of Field Activities Across All Alternatives 306
ONMS Best Management Practices for Vessel Operations 350
Appendix M: Document Preparers 357

Glossary of Acronyms

APE – area of potential effects

ATBA – area to be avoided

BMP – best management practices

CFR – Code of Federal Regulations

DEP – Florida Department of Environmental Protection

DoD – Department of Defense

EFH – Essential Fish Habitat

EIS – environmental impact statement

E.O. – Executive Order

EPA – U.S. Environmental Protection Agency

ESA – Endangered Species Act

FKNMS – Florida Keys National Marine Sanctuary

FMP – fishery management plan

FNAI – Florida Natural Areas Site Inventory

FRRP – Florida Reef Resilience Program

FWC – Florida Fish and Wildlife Conservation Commission

GPS – Global Positioning System

HAPC – habitat area of particular concern

HMS – highly migratory species

MBTA – Migratory Bird Treaty Act of 1918

MMPA – Marine Mammal Protection Act

MSA – Magnuson-Stevens Fishery Conservation and Management Act

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act of 1966

NMFS – NOAA's National Marine Fisheries Service

NMSA – National Marine Sanctuaries Act

NOAA – National Oceanic and Atmospheric Administration

NOI – notice of intent

NOPR – Notice of Proposed Rulemaking

NOS – NOAA's National Ocean Service

NPS – National Park System

ONMS – NOAA's Office of National Marine Sanctuaries

PWC – personal watercraft

SAFMC – South Atlantic Fishery Management Council

SHPO – Florida State Historic Preservation Office; *also refers to* state historic preservation officer

SPA – sanctuary preservation area
THPO – tribal historic preservation officer
USCG – U.S. Coast Guard
USFWS – U.S. Fish and Wildlife Service
WMA – wildlife management area
WQPP – Water Quality Protection Program

Appendix A: Management Plan

Background

Since the designation of Florida Keys National Marine Sanctuary (FKNMS) in 1990, NOAA has worked to understand and conserve its resources, facilitate and manage human access and use, and address impacts from human influence. These advances have been accomplished through implementation of sanctuary regulations and marine zones, non-regulatory action, and collaborative partnerships.

This final management plan for FKNMS was developed as part of a larger Restoration Blueprint process that also includes a final rulemaking and final environmental impact statement. This management plan and final rule serve to update the original regulations, including marine zones, that went into effect in 1997, and the 2007 management plan, which directs the sanctuary's non-regulatory management activities.

This final management plan includes comments and edits based on the Restoration Blueprint draft management plan published in 2019 and the revised draft management plan published with the notice of proposed rulemaking in 2022. This management plan replaces the 2007 FKNMS Revised Management Plan.[1] The plan focuses on understanding and improving the condition of sanctuary resources through reducing threats and addressing emerging issues. Management activities focus on targeted research, updated and adaptive management efforts, regulatory compliance, community involvement, and stewardship. FKNMS regulations, including marine zones, are included in a separate final rulemaking and can be found at 15 CFR Part 922 Subpart P (Final Rule).

In managing national marine sanctuaries, the Office of National Marine Sanctuaries (ONMS) provides comprehensive and coordinated management in ways that complement existing regulatory authorities and partnerships. NOAA regularly coordinates management actions with other federal agencies such as the U.S. Fish and Wildlife Service (USFWS), National Park Service (NPS), Department of Defense/U.S. Navy, U.S. Coast Guard (USCG), U.S. Environmental Protection Agency (EPA), and U.S. Army Corps of Engineers, among others. FKNMS is also cooperatively managed with the state of Florida and has several issue-specific cooperative management agreements with the Florida Department of Environmental Protection (DEP), Florida Fish and Wildlife Conservation Commission (FWC), and State Historic Preservation Office. Many activities in this management plan are heavily dependent upon cross-agency coordination including research, habitat restoration, water quality, enforcement, stewardship and engagement, and managing high intensity and conflicting uses in the sanctuary.

ONMS also regularly collaborates with partners as we provide the services and activities necessary to manage the national marine sanctuaries. In addition to federal appropriations, ONMS relies on partnerships and outside funding sources, such as grants and in-kind services,

[1] https://floridakeys.noaa.gov/mgmtplans/2007.html

to assist in the implementation of the management plan. These partners include: federal, state, and local agencies; nonprofit organizations; and private institutions. Partnerships vary across the goals, objectives, and individual activities within this management plan. A representative list of partners is included in Appendix II.

Finally, while this 2024 final management plan represents the full suite of activities needed to advance FKNMS management goals and objectives, implementation is dependent upon the available resources including funding, staff capacity, and partnership contribution. These and other factors for determining implementation of this revised draft management plan are further described in Appendix I.

Management Plan Review and Development

The National Marine Sanctuaries Act requires NOAA to review the management plans for all national marine sanctuaries (16 U.S.C. §1434(e)) to ensure each site properly conserves and protects its living and cultural resources. Management plans present goals, strategies, and actions to guide the development and prioritization of future budgets and management activities.

From 2012 through 2023, NOAA conducted a review of FKNMS regulations, marine zones, and management plan through an extensive interagency and public process. The review examined current issues and threats to sanctuary resources and the extent to which the existing 1997 regulations and 2007 FKNMS Revised Management Plan provided adequate resource protections. The review specifically evaluated existing and potential new regulatory and management actions to address increased threats to sanctuary resources from local, regional, and global impacts, as well as changing visitor numbers, use patterns, types, and recreational interests.

The review included the release of the 2019 draft environmental impact statement (EIS) for the Florida Keys National Marine Sanctuary: A Restoration Blueprint (Restoration Blueprint draft EIS 2019)[2] which evaluated the environmental consequences of four regulatory alternatives and included an updated draft management plan. NOAA accepted public comments on the draft EIS over a five month period and within that time held six public hearings and two public comment-focused Sanctuary Advisory Council meetings. A revised draft management plan was released for a final round of public comment with the Notice of Proposed Rulemaking in 2022. NOAA accepted public comments for a 100-day period and hosted four public hearings, one Sanctuary Advisory Council focused on public comment, and a final Sanctuary Advisory Council meeting focused on receiving advisory council comments and recommendations. Finally, at each stage of the process, NOAA has received comments from state and federal agency partners.

Input on the draft management plan as part of the 2019 public comment on the Restoration Blueprint draft EIS and the 2022 revised draft management plan generally asserted that sanctuary resources are experiencing increased impacts from local, regional, and global threats (such as climate change), as well as from increased numbers of overall users. Public comments

[2] https://nmsfloridakeys.blob.core.windows.net/floridakeys-prod/media/blueprint/deis-fknms-restoration-blueprint.pdf

primarily focused on the need to improve sanctuary resource conditions and to monitor and address impacts from climate change and changes to water quality, to continue and expand living and non-living resource protection, and to advance efforts to restore habitats and ecosystem function. Public comments also called for increased issue- and audience-specific education and outreach efforts; enhanced enforcement capacity; greater support for mooring buoys; monitoring and evaluating effectiveness of management actions; increased capacity to administer sanctuary programs; and more responsive and adaptive management to address emerging threats and the increasing number of people in the sanctuary. Informed by these public comments, ONMS identified a suite of priority management themes to guide FKNMS management actions, resource allocation decisions, and partnership development.

Priority Management Themes

While the objectives and activities in this management plan comprise a comprehensive body of work, the following six priority management themes highlight the issues of greatest need and opportunity for FKNMS management. Throughout the management plan, the specific activities that advance these priorities are tagged with an asterisk (*).

Management Effectiveness/Adaptive Management

ONMS uses a variety of management measures to address resource threats within FKNMS. Understanding the effectiveness of those strategies is necessary to ascertain how well we are achieving our mission. ONMS will work with partners to conduct monitoring to evaluate management measures, and then shift or revise management approaches to address areas or issues where current resource protection efforts are not meeting the desired goals.

A diver works on a coral tree nursery where corals grow on lines tethered to the seafloor. Photo: XL Catlin Seaview Survey

Water Quality

Restoring and protecting water quality is essential for the overall recovery and sustainability of natural resources in the Florida Keys, and requires both local and regional action, and coordinated and individual effort. ONMS, working with the Water Quality Protection Program and the South Florida Ecosystem Restoration Task Force, will continue to build upon its three decades of work to address regional water quality issues, with an understanding that Florida Keys water quality is inextricably linked to the greater South Florida watershed. ONMS will prioritize continued work with our partners and the community to further analyze the sources of water quality decline and develop and implement tangible solutions. ONMS will demonstrate commitment, action, and progress towards improving water quality in the Florida Keys.

Restoration

Critical natural resources in the Florida Keys have experienced significant declines in recent decades. Without active restoration to rebuild degraded resources, recovery is in question. Therefore, ONMS will work with partners to undertake ambitious restoration efforts to promote species and habitat recovery. This may include active interventions to augment the natural coral reef structure, habitat enhancement to support species life cycle needs, re-establishment of critical species (e.g., Caribbean crab), and other active interventions to increase success of restoration activities. The ultimate goal of these efforts is to allow the ecosystem to recover to a point where natural processes and communities function at a self-sustaining state.

Visitor Use Management

Recognizing that the number of visitors to the Florida Keys continues to rise, and high levels of use are impacting both natural resources and the visitor experience, ONMS will work to understand these impacts and develop strategies to address them, including the strategic use of marker and mooring buoys. Mooring buoys are an important management tool in the sanctuary, providing boaters the ability to moor their vessels safely and avoid damaging coral reefs and other important ecosystems. ONMS now maintains about 500 mooring buoys as part of an overall network of almost 800 buoys, which also includes boundary buoys that mark marine zones, shoreline marker buoys, and information buoys. The current system of maintaining buoys in the sanctuary is under review to address aging infrastructure while adapting to increased demand for marking newly protected areas. Additionally, ONMS must creatively explore new technologies and partnerships to augment the current system.

Enforcement

Enforcement is a critical tool in achieving resource protection through compliance with sanctuary regulations and other federal and state laws. Successful enforcement requires a coordinated effort and is conducted through cooperative partnerships with other agencies. ONMS will work with partners to enhance enforcement capacity to achieve visible resource protection benefits. ONMS is also committed to enhancing public knowledge, understanding, and compliance through establishing consistent regulations, where feasible, and targeted education and interpretation of those regulations.

Stewardship and Engagement

Protecting sanctuary resources requires partnership and trust within the community. Effective communication is essential, and includes relaying information about sanctuary resources, regulations, and existing management measures, as well as gathering input and being responsive to community concerns. ONMS will work with partners to educate and engage with the community, including interpretation and wide dissemination of sanctuary regulations and marine zones, with the ultimate goal of fostering individual stewardship ethics and developing a populace that is informed, invested, and inspired to contribute to the responsible use and protection of Florida Keys' resources.

Florida Keys National Marine Sanctuary
Final Management Plan 2024

Vision

Florida Keys National Marine Sanctuary conserves the resources of the sanctuary while also managing uses that are compatible with the goal of resource protection.

Mission

Florida Keys National Marine Sanctuary is a living laboratory for scientific research, enhancing our understanding of the environment and improving management decisions for optimal resource conservation while allowing for sustainable public use and enjoyment. The public is engaged and involved with a desire to protect and restore the sanctuary's resources for current and future generations.

GOAL 1: Improve our understanding of sanctuary resources and ecosystem services, and their value to the Florida Keys economy.

GOAL 2: Improve the condition of sanctuary resources and, where possible, restore ecosystem structure and function.

GOAL 3: Reduce threats to sanctuary resources and manage human uses and associated impacts.

GOAL 4: Increase awareness and support for FKNMS and its resources.

GOAL 5: Advance and support collaborative and coordinated management.

Goal 1: Improve our understanding of sanctuary resources and ecosystem services, and their value to the Florida Keys economy.

Molasses Reef frames a picture-perfect image of the Florida Keys ecosystem. Photo: XL Catlin Seaview Survey

Goal 1 seeks to advance understanding of sanctuary resources and ecosystem services and ensure the best available science is used to inform conservation-based management decisions. Efforts to monitor changing conditions, the threats affecting ecosystems, and the role of ecological, environmental, and socioeconomic factors influencing these changes provide essential information needed to protect and conserve sanctuary resources.

There is a long history of research and monitoring programs in the Florida Keys. Information from these programs has been presented in the 2011 FKNMS Condition Report, the Draft National Coral Reef Monitoring Program Assessment Report, and numerous other publications and reports. There is a need to evaluate and synthesize the findings from these programs, update these datasets with new information on recent impacts and associated changes to sanctuary resources and habitats, and direct future activities toward the key management needs of today. The intent of this goal is to evaluate this body of knowledge to: (1) continue to inform management decisions, (2) identify gaps in knowledge needed to understand effectiveness of existing management measures, and (3) direct future monitoring and research priorities to further improve understanding of sanctuary resources and ecosystem services to develop adaptive resource management strategies.

The objectives and activities in this goal focus on better understanding sanctuary resource status and the factors contributing to their decline, identifying gaps in this understanding, and prioritizing research to fill these gaps. This work also includes an emphasis on understanding the science of ecosystem function and mechanisms that facilitate natural resource recovery and investigating the effects of climate change on sanctuary resources to inform future research and management action. Much of the work conducted within this priority area is driven by the final

updated regulations, marine zones, and management plan updated through the Restoration Blueprint process, as well as key needs and activities identified in the comprehensive science plan (Activity 1.1.4). The activities outlined in this goal are not insignificant and will require advanced planning, time, and funds. FKNMS will collaborate and coordinate with partners to support our collective conservation goals while also not duplicating efforts.

One of the FKNMS priority management themes falls within this goal: Management Effectiveness/Adaptive Management. The specific activities that advance this priority are noted by an asterisk (*).

Objective 1.1: Assess the state of the science/research of sanctuary natural resources and habitats and direct future research to inform priority resource protection and management needs.

Activity 1.1.1: Host a Florida Keys ecosystem science symposium to compile and share priority monitoring and research findings.

***Activity 1.1.2:** Identify gaps and additional targeted research and monitoring that is needed to determine the effectiveness of existing management strategies and new regulatory and marine zoning changes, implemented as part of the 2024 Restoration Blueprint rulemaking, and consider the potential effects of climate change. Update the FKNMS Science Needs Assessment[3] documents as needed.

***Activity 1.1.3**: Develop and implement appropriate strategies for a zone-specific monitoring and research program to provide comparative information on the status of marine species and habitats, and observe patterns within and outside managed areas to determine the effectiveness of those management measures.

Activity 1.1.4: Develop a comprehensive science plan (the last such plan was completed in 2002). This plan will identify priority research and monitoring needs (including consideration of the potential impacts of climate change), and associated partners and other responsible parties to fill those gaps (e.g., direct agency [federal/state] or permitted work, see also the Science Needs Assessment documents referenced in Activity 1.1.2).

Activity 1.1.5: Establish a Sanctuary Advisory Council Research Advisory Working Group to provide recommendations on priority research needs and application of available science to conservation-based management, including adaptive management needs and opportunities. (This is distinct from the Water Quality Protection Program (WQPP) Technical Advisory Committee.)

Activity 1.1.6: Contribute to the development and expansion of an online data portal where monitoring and research data and outcomes can be compiled, mapped, synthesized, and queried. Existing efforts to create a unified data portal include Marine Biological Observation Network, WQPP monitoring, and National Coral Reef Ecosystem Monitoring Program.

[3] https://sanctuaries.noaa.gov/science/assessment/florida-keys/

Activity 1.1.7: Prepare a sanctuary condition report that describes current status and trends of sanctuary resources, to update the 2011 FKNMS Condition Report.

Objective 1.2: Enhance our understanding, management, and interpretation of sanctuary historical resources.

Activity 1.2.1: Identify significant historical resources for additional research and work with partners, using innovative techniques, to advance historical resource characterization.

Activity 1.2.2: Continue building the sanctuary historical resource inventory, including biological characterization of historical resource sites.

Activity 1.2.3: Undertake a maritime cultural landscape assessment to identify broad cultural and environmental influences that shaped and continue to shape the Florida Keys' ecology and communities to achieve a deeper understanding of the sanctuary. Efforts will include seeking a better understanding of Indigenous Peoples and cultures in the Florida Keys, through engagement with Indigenous Peoples.

Activity 1.2.4: Implement archaeological research permitting standards to enhance protection of historical resources and streamline permitting (see 15 CFR § 922.166).

***Activity 1.2.5**: Evaluate visitor access/use and impacts to historical resources and identify interventions to reduce resource conflicts and potential damage from improper use while maximizing visitor access. Coordinate with other management partners and stakeholders as appropriate.

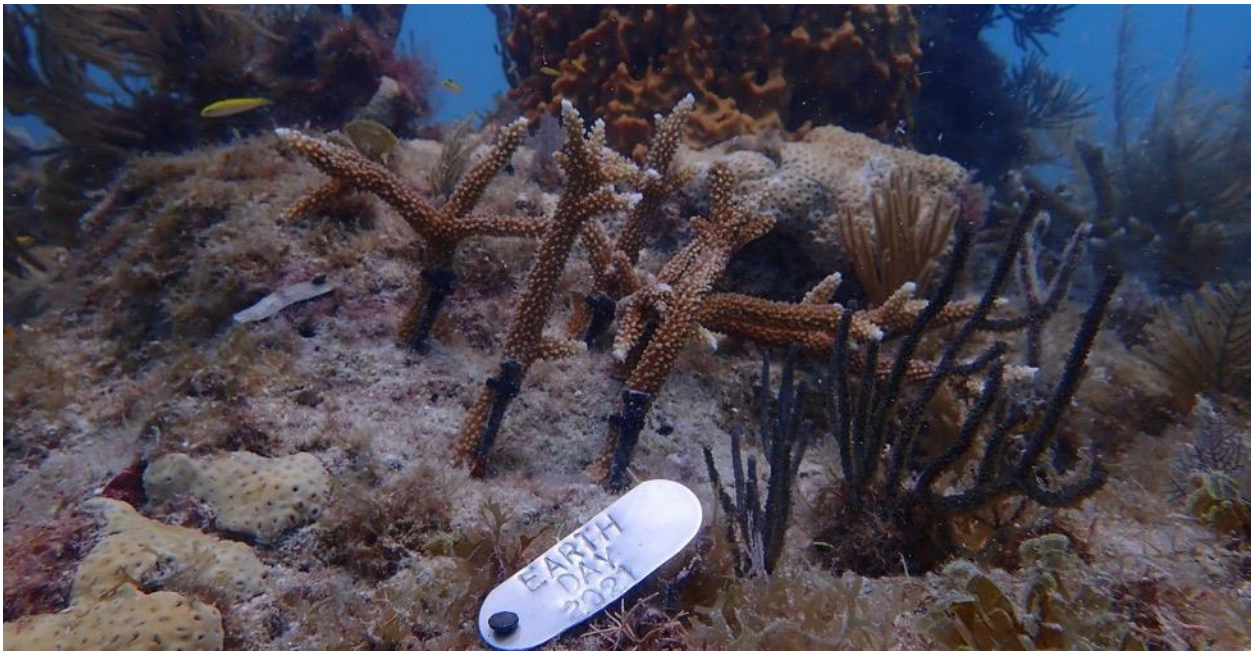
Activity 1.2.6: Pursue opportunities to disseminate historical resource information and interpret the sanctuary's maritime heritage through a variety of avenues to reach audiences locally, regionally, and nationally.

Objective 1.3: Identify and track socioeconomic value and ecosystem services provided by the sanctuary and its resources.

Activity 1.3.1: Update the socioeconomic valuation of the sanctuary and include a section on historical resources.

Activity 1.3.2: Use the updated socioeconomic valuation findings to communicate the value of the sanctuary and its resources to decision-makers and targeted user groups in the Florida Keys.

Goal 2: Improve the condition of sanctuary resources and, where possible, restore ecosystem structure and function.



Mote Marine Lab celebrated Earth Day 2021 by outplanting staghorn corals at Eastern Dry Rocks off Key West. A metal tag commemorates the occasion. Photo: Mote Marine Lab

Goal 2 focuses on the parameters assessed in the 2011 FKNMS Condition Report: water quality, habitat, and living marine resources. Activities related to the fourth parameter, historical resources, are included in Goal 1. In addition to the specific activities identified here, outputs from activities in other goals will also support action within this goal. For example, the development of a sanctuary science plan (see Goal 1, Objective 1.1, Activity 1.1.4) and actions in support of Goal 5: Collaborative and Coordinated Management, will directly support Goal 2.

The 2011 FKNMS Condition Report concluded that resources in the Florida Keys appear to be in fair to fair/poor condition, are generally either stable or in decline, and that emerging threats to sanctuary resources include invasive species, climate change, increasing coastal and visitor populations, and recreational use of the sanctuary. Since release of the 2011 condition report, sanctuary resources have been further impacted by Hurricane Irma, mass bleaching events, coral disease outbreak, seagrass die-off, the 2023 marine heat wave, and other localized and regional threats.

Building on the information gathered through Goal 1, the objectives and activities in this goal focus on partnership opportunities and new and innovative solutions to improve and restore sanctuary resource conditions. Activities in this goal also recognize the need to truly work in partnership with each entity bringing their expertise and respective authorities.

Two of the FKNMS priority management themes fall within this goal: Water Quality and Restoration. The specific activities that advance these priorities are noted by an asterisk (*).

Objective 2.1: Water quality: Demonstrate greater leadership in engaging with local and regional partners to collectively identify and address issues and implement solutions related to water quality.

***Activity 2.1.1**: Strengthen engagement with the WQPP, its partners, and the community to ensure that long-term water quality, associated habitat monitoring programs, and special studies are supported, maintained, and applied to management needs and decisions. This involves continued contribution to ongoing WQPP efforts to prioritize regional and local water quality issues and adapt to emerging needs, so that partnerships and resources can be more strategically leveraged to implement corrective actions at local and regional scales to achieve greater water quality improvements.

***Activity 2.1.2**: Strengthen engagement with the South Florida Ecosystem Restoration Task Force to ensure Florida Keys water quality, habitat, living marine resource conditions, and community interests are considered and integrated into regional restoration and management plans. Coordinate within NOAA to ensure appropriate representation in Task Force and Comprehensive Everglades Restoration Plan activities, including the South Florida Ecosystem Restoration Working Group and Science Coordination Group, Regional Coordination Teams and other advisory bodies, and Project Delivery Teams.

***Activity 2.1.3**: Identify additional water quality parameters that should be investigated (e.g., industrial discharge, metals, pesticides, endocrine disruptors, bacteria) to better understand enabling factors and stressors impacting sanctuary resources, identify and support implementation of cost-effective strategies to effectively mitigate these pollutants.

***Activity 2.1.4**: Work with the WQPP and relevant partners to evaluate existing water quality monitoring programs and recommend alterations to promote consistency with a unified coral reef water quality monitoring network, identify new or more cost-effective technologies and monitoring strategies, incorporate emerging monitoring needs, improve overall data analysis, and ensure data is effectively informing management decisions.

***Activity 2.1.5**: Evaluate and map recent and long-term water quality data sets to identify water quality improvements, hot spots, and spatial and temporal gaps in coverage.

***Activity 2.1.6**: Identify practical non-regulatory steps and solutions to improve water quality. Additional avenues for improving water quality include education and outreach, community engagement, partnerships, habitat restoration, and the use of emerging technologies.

***Activity 2.1.7**: Work with the WQPP and interested stakeholders to develop and implement a communication strategy to clearly and consistently communicate the importance of addressing water quality in the sanctuary, ecosystem and economic factors that are impacted, types of corrective actions that will be required to affect change in water quality, and highlights and accomplishments of the WQPP and its members/partners. This strategy would also include recommendations for new and creative funding streams for the WQPP and associated projects.

Objective 2.2: Develop habitat restoration or mitigation plans/activities where needed.

***Activity 2.2.1**: Participate in and facilitate recovery efforts for threatened coral species. Specifically, work with National Marine Fisheries Service (NMFS) Office of Protected Resources and other partners to implement actions identified in the Acropora Recovery Plan and identify options and best practices for restoration of other Endangered Species Act listed species.

***Activity 2.2.2**: Work with research and management partners to advance coral disease intervention research and implement activities at high priority sites to reduce impacts, address enabling conditions, reduce disease spread, enhance the survival of priority corals, and rehabilitate coral reefs and species damaged by coral disease.

Activity 2.2.3: Continue to support efforts led by the Florida Reef Resilience Program to implement monitoring, research, restoration, and outreach activities identified in the 2021-2026 Resilience Action Plan for Florida's Coral Reefs to address coral bleaching, disease, ocean acidification, and other climate-related stressors.

***Activity 2.2.4**: Work with partners to identify and assess factors that affect the vulnerability and resilience of seagrass habitats to chronic and acute impacts and emerging threats, and develop and implement recommendations for restoring degraded and damaged seagrass habitats. To support this activity, evaluate and update the FKNMS Damage Assessment and Restoration Program including methodologies, equipment, implementation, partnership opportunities, and effectiveness.

***Activity 2.2.5**: Expand efforts to monitor changes to hard-bottom habitats. Evaluate the ecological dynamics, functional significance, and economic importance of these habitats (e.g., WQPP Special Studies project to facilitate sponge restoration).

***Activity 2.2.6**: Support and facilitate the development, testing and scaling up of novel ecological restoration approaches to facilitate recovery and enhance resilience and sustainability of ecosystem components. Focal areas include improving habitat quality and condition; enhancing recruitment and survival of stony corals, sponges, anemones, and other ecologically relevant benthic invertebrates; rebuilding degraded populations of species; restoring ecosystem structure and function; and exploring ways to augment the natural habitat structure to further support natural recovery.

***Activity 2.2.7**: Use the newly created restoration permit category to facilitate restoration and associated requirements (e.g., monitoring and reporting) to further sanctuary management goals (see 15 CFR § 922.166).

***Activity 2.2.8**: Develop a sanctuary habitat restoration plan. The restoration plan would include restoration goals, priority restoration needs, nursery and restoration site selection criteria; species type and associated propagation and outplanting strategies; research and monitoring strategies; compilation, evaluation, and archiving of datasets and information; and expected outputs, potential midcourse corrections, and other adaptive management measures and access options, including the criteria for creating emergency or temporary restoration zones. This restoration plan would include the range of habitats and representative species

found within the sanctuary. Consider how the Resist-Accept-Direct framework[4] can be incorporated into sanctuary restoration approaches and the potential role habitat restoration site selection can play in protecting human communities from coastal flood risks. This sanctuary habitat restoration plan will be developed in coordination with other management and conservation partners.

***Activity 2.2.9**: Provide leadership for and support implementation of *Mission Iconic Reefs*. This involves engaging with partners to advance the science and practice of coral reef ecosystem restoration; increasing the scale and success of restoration; enhancing coordination between researchers, field practitioners, and managers; facilitating and encouraging the use of FKNMS as a field laboratory for research, testing of new methodologies and species, and demonstration projects; improving coordination and community and stakeholder involvement in maintenance, monitoring, and other stewardship activities; promoting a scaled-up production of corals, herbivores, and other organisms; and scaling up the outplanting of nursery-reared corals. This initiative, while focused in the Florida Keys, will be coordinated with and consider other regional activities including Florida's Coral Reef Restoration and Recovery Initiative.

Objective 2.3: Living marine resources: Improve the condition and diversity of natural biological communities.

***Activity 2.3.1**: Identify opportunities to further partner with NMFS, South Atlantic Fishery Management Council, Gulf of Mexico Fishery Management Council, and FWC on coordinated management and innovative research on fish and invertebrate populations, including ecosystem-based management approaches, within the sanctuary. Capitalize on each party's expertise, authorities, jurisdiction, and stakeholder engagement to advance this effort without duplicating effort.

Activity 2.3.2: Continue to work with fishery and research partners to advance understanding of fish aggregation sites, connectivity between sites and habitat types, and ecological and habitat features that support ecosystem productivity. As needed based on this evaluation, recommend and implement management measures that may better protect these unique and critical aggregations.

[4] The Resist-Accept-Direct framework provides options that decision makers can consider when responding to ecosystems facing the potential for rapid, irreversible ecological change, including from climate change. https://www.nps.gov/subjects/climatechange/resistacceptdirect.htm

Goal 3: Reduce threats to sanctuary resources and manage human uses and associated impacts.

Florida Keys National Marine Sanctuary features more than 500 mooring buoys that allow boaters to visit Keys coral reefs without dropping anchor. Photo: David Ruck/NOAA

ONMS uses a multi-faceted approach to comprehensively address the variety of impacts, pressures, and threats to the Florida Keys marine ecosystem. It is only through this inclusive approach that the complex problems facing the sanctuary can be adequately addressed. The objectives and activities in Goal 3 are focused on managing and facilitating human uses of the sanctuary that are consistent with the primary objective of sanctuary resource protection.

The tools used are wide ranging and include both regulatory and non-regulatory approaches. Updated regulatory approaches promulgated through the companion rulemaking to this management plan are codified in the regulations (15 CFR 922 Subpart P). These include sanctuary-wide regulations, marine zones and specific zone regulations, and permitting regulations to allow certain, otherwise prohibited activities that further sanctuary management goals to take place under carefully controlled circumstances. Enforcement of sanctuary regulations is critical to Goal 3. Non-regulatory approaches include: the use of mooring buoys; development and implementation of response plans; voluntary certification programs, including the Blue Star Dive Operators and Bluestar Fishing Guide Operators; and others highlighted below.

Two of the FKNMS priority management themes fall within this goal: Visitor Use Management and Enforcement. The specific activities that advance these priorities are noted by an asterisk (*).

Objective 3.1: Identify and monitor patterns of human uses and potential impacts of those uses, including existing and emerging threats.

***Activity 3.1.1**: Evaluate spatial patterns of different types of human uses within different habitats, characterize impacts associated with user groups, and evaluate effectiveness of existing measures to minimize those impacts. As needed, based on this evaluation and in collaboration with cooperative management partners and stakeholders, identify interventions to reduce and address concentrated uses and potential adverse impacts to sanctuary resources, including the potential to establish limited use areas.

***Activity 3.1.2:** Evaluate how the large vessel mooring buoy and no anchoring in SPA regulations work to address concentrated uses and reduce adverse impacts to sanctuary resources. Based on this evaluation, consider if changes are needed and/or where similar regulations and management approaches may be useful to further manage human uses and protect sensitive habitats (See Activity 3.3.2 for activities related to the mooring buoy evaluation and placement).

Objective 3.2: Reduce adverse impacts to key marine species and habitats.

***Activity 3.2.1**: As unforeseen threats arise and require action to manage the scope of or lessen their impact (e.g., storm damage, disease spread), implement immediate action to preserve sanctuary resources while examining a longer-term adaptive management approach. Any such action would follow the criteria and procedures of the temporary regulation for emergency and adaptive management (see 15 CFR § 922.165 for details).

***Activity 3.2.2**: Develop or update response plans for existing and/or emerging threats. ONMS staff will work with partner agencies to identify priority response plan needs, and collaboratively develop plans that articulate respective agency and partner authorities, roles, coordination, and funding mechanisms to support these efforts. Example topics include marine debris, derelict vessels, HAZMAT/pollution releases, invasive species, coral bleaching and disease events, fish kills, and others.

Activity 3.2.3: Assess the scope, scale, level of activity, and potential impact of live rock aquaculture activities. Develop agreements with NMFS and Florida Department of Agricultural Services to ensure permitted live rock aquaculture activities are aligned with sanctuary management goals and do not impact sanctuary resources, including examining agency responsibilities for permitting this activity in the sanctuary.

***Activity 3.2.4**: Work with partners to develop best management practices to mitigate habitat impacts, bycatch, and other stressors associated with fishing gear used within the sanctuary (e.g., evaluate recommendations from the Florida Marine Debris Reduction Plan to reduce the number of lost and derelict traps).

Activity 3.2.5: In coordination with NMFS, FWC, and the South Atlantic Fishery Management Council and Gulf of Mexico Fishery Management Council, review and evaluate fishing gear used within the sanctuary. Develop a transparent process by which new or modified fishing activities, such as those that reduce impacts to sanctuary resources, and other relevant changes to fisheries management will be evaluated prior to implementation within the sanctuary. This activity

directly relates to the definition and associated compiled list for traditional fishing within the sanctuary (see 15 CFR § 922.162 and the 2024 final EIS respectively).

Objective 3.3: Facilitate and manage human use, ensuring use is compatible with sanctuary resource protection goals.

***Activity 3.3.1:** In coordination with NMFS, USCG, USFWS, NPS, FWC, and DEP review and evaluate existing cooperative agreements and training programs to increase capacity and improve the effectiveness of enforcement activities in the sanctuary. Evaluate and support the implementation of technology (e.g., automatic identification system and remote surveillance) to enhance enforcement capabilities. Working with enforcement partners at NOAA and FWC, develop a strategy to identify and obtain additional investments for enforcement capacity and technologies.

***Activity 3.3.2**: Evaluate the effectiveness of and, as needed, update the placement and number of marker, mooring, channel, and information buoys, including large vessel mooring buoys. In particular, explore innovative partnerships and funding streams to install and maintain the marker and mooring buoy system and identify additional technological options instead of marker buoys (e.g., electronic charts integrated into GPS, virtual aids to navigation, and smart buoys) for alerting the public to marine zone locations and regulations. Engage management partners including USFWS, FWC, DEP, county, and municipalities, among others, to effectively and efficiently implement this activity.

Activity 3.3.3: Address the threat of derelict vessels by working with agency and local municipal partners to support ongoing efforts and contribute additional expertise, such as the Florida Marine Debris Reduction Guidance Plan, Monroe County derelict vessel removal and pilot vessel turn-in program, and others. This activity supports the regulations specific to at-risk vessels (see 15 CFR § 922.163(a)(5)).

Activity 3.3.4: Work with the towing and salvage industry to develop a suite of best practices to ensure vessel towing and salvage do not result in additional impacts to sanctuary resources. Assess and define which towing and salvage operations may require a sanctuary general permit, and communicate that to the industry and management partners who also contract for vessel removal services.

Activity 3.3.5: Strengthen interagency collaboration in permitting to reduce administrative duplication while avoiding and minimizing resource impacts to the greatest extent possible. This includes working with partner agencies to develop programmatic consultations to increase efficiency, evaluating cumulative impacts of certain permitted activities (e.g., fireworks, nearshore construction, and research) on sanctuary resources, and modifying permitting procedures as necessary to reduce those and other impacts.

***Activity 3.3.6**: Maintain, enhance, and, if applicable, expand FKNMS Blue Star programs to continue to promote responsible and sustainable use of the sanctuary and reduce impact of certain recreational activities (e.g., fishing and diving) on sanctuary resources.

***Activity 3.3.7**: Evaluate and monitor effects of artificial habitats and use patterns on sanctuary resources, including impacts artificial habitats may have on fish and invertebrate

populations, the extent to which the spread of invasive species has been facilitated by artificial habitats, and compliance with existing artificial habitat permits. This would apply to existing and any future proposed artificial habitat proposals.

Activity 3.3.8: Develop best practices for the use of artificial substrates in restoration. As applicable, based on the evaluation of these factors, develop ONMS specific criteria and requirements for the purposes, placement, monitoring, and evaluation of artificial habitats in the sanctuary. This activity is related to the habitat restoration activities in Goal 2 (see Activities 2.2.6, 2.2.7, 2.2.8, and 2.2.9).

Goal 4: Increase awareness and stewardship of FKNMS.

Many reefs in the Florida Keys are found in shallow waters that are accessible by snorkeling. Photo: Matt McIntosh/NOAA

Communication and education underpin all of the other goals and objectives and, as such, will be integrated across all FKNMS management. Communication and education areas of focus include media, outreach for education, informal education and interpretation, community/constituent engagement, and volunteer coordination as outlined below. Communication and education efforts must be strategic, coordinated, and focused. To that end, the overarching priority is to implement the sanctuary's Media Outreach Volunteer and Education Team Strategic Plan that will inform more specific priorities within each objective.

One of the FKNMS priority management themes falls within this goal: Stewardship and Engagement. The specific activities that advance this priority are noted by an asterisk (*).

Objective 4.1: Implement communication, interpretation, and education programming to achieve higher public awareness, understanding, sustainable use, and appreciation of FKNMS.

***Activity 4.1.1:** Develop new and adapt existing products and programs to incorporate sanctuary regulations into interpretive messaging, promote protection and responsible use, and address key threats to sanctuary resources. Work with partners to enhance the reach and distribution of these materials and messages.

***Activity 4.1.2**: Develop and implement an operations plan for Florida Keys Eco-Discovery Center that includes educational and interpretive programming and evaluation metrics.

***Activity 4.1.3**: Promote best practices for engaging with sanctuary resources to users of the sanctuary, such as wildlife viewing guidelines, diving/snorkeling/fishing etiquette, maritime heritage viewing, fish cleaning, and others.

***Activity 4.1.4**: Adapt programs and products to ensure they are accessible and to reach evolving demographics and diverse user groups.

Objective 4.2: Maintain and enhance community-based and partner engagement to improve collaborative and coordinated management in order to achieve the sanctuary's vision.

***Activity 4.2.1**: Continue support for the Sanctuary Advisory Council, including working with the chair and vice chair to develop an annual work plan that aligns with and supports the FKNMS management plan and ONMS strategic plan.

***Activity 4.2.2**: Enhance the volunteer program. Recruit volunteers to support existing operations and programs while developing additional opportunities for involvement to achieve the objectives and support the activities outlined in this management plan.

***Activity 4.2.3**: Strengthen existing and explore new partnership opportunities, including non-governmental conservation organizations, civic groups, and trade and business organizations, to further promote understanding and responsible use of sanctuary resources and to achieve objectives and support activities outlined in this management plan.

***Activity 4.2.4**: Promote local citizen science programs such as BleachWatch and SEAFAN, and work with partners to refine these programs to support resource protection needs.

***Activity 4.2.5:** Coordinate programs that invite community participation in stewardship (i.e., Goal: Clean Seas Florida Keys) and meet FKNMS resource protection needs by mitigating threats to sanctuary resources.

Goal 5: Advance and support collaborative and coordinated management.

Florida Keys National Marine Sanctuary has teams positioned in the Upper and Lower Keys to maintain the expansive network of buoys, which include zone marker and informational buoys, in addition to moorings. Photo: Benjamin D'Avanzo/NOAA

Florida Keys National Marine Sanctuary is managed in a partnership between NOAA, the state of Florida, and USFWS. Cooperative management and partnership has and continues to be at the core of how the sanctuary conducts its operations and programs. Active management becomes ever more essential given shifting environmental conditions and threats, enhanced research interest and effort, and increased user activity across all sectors, which is coupled with increased agency roles and responsibilities and shifts in available fiscal and human capital resources. A focus on strengthened and enhanced engagement with partners will be integrated in all aspects of operations as ONMS strives to most efficiently and effectively implement its management plan, regulations, and marine zoning scheme.

While the activities outlined in Goal 5 are largely internal to the sanctuary staff and/or in coordination with our cooperative management partners, they are included here to clearly articulate the focus and intent of this goal and associated objectives.

Objective 5.1: Improve operational capabilities, efficiency, and effectiveness including maintaining and acquiring the infrastructure required to accomplish the mission and goals specified in ONMS regulations and management plan.

Activity 5.1.1: Continually evaluate current staff and staff portfolios and restructure or hire as needed, as funding allows, to best address updated management plan activities and emerging sanctuary resource issues.

Activity 5.1.2: Assess the need for updated facilities and infrastructure, including potential partnership with other state and federal entities and develop an FKNMS infrastructure plan to meet current and future needs.

Objective 5.2: Annually develop operating plans that articulate how resources would be distributed to achieve goals and objectives, and conduct ongoing effectiveness evaluations toward meeting regulatory requirements and management plan objectives.

Activity 5.2.1: Formulate an annual operating plan to meet the objectives of ONMS regulations, management plan, and annual budget allocation specific to FKNMS. This could include evaluation of partner activities and associated resource capacity and funding streams (e.g., cooperative management partners, Water Quality Protection Program, research and non-governmental partners, among others).

Activity 5.2.2: Evaluate annual operating plan effectiveness toward meeting program objectives and seek engagement from the Sanctuary Advisory Council and the stakeholders they represent.

Objective 5.3: Maintain and strengthen cooperative management with our federal, state, and local partners to advance shared resource management priorities.

Activity 5.3.1: Conduct periodic reviews and evaluate the effectiveness of current cooperative management agreements and practices. Based on the results of that evaluation, work with agency partners to streamline and modernize existing agreements or create new agreements, if warranted, to best meet shared resource protection and management goals. Monitor and evaluate implementation of any revised/new agreements as defined in those protocols.

Activity 5.3.2: Develop a cooperative management annual operating plan and/or framework with federal and state management partners. This plan would facilitate:

- Coordination of cooperative management agency roles, activities, and contribution to shared sanctuary resource management priorities;
- Information and resource sharing to address priority research and threat reduction efforts (e.g., ongoing coral disease event and marine zone and living marine resources research and monitoring);
- Strategic efforts of the WQPP (with DEP and EPA);

- Enhancement of enforcement of sanctuary regulations (with FWC, NMFS, USCG, USFWS, and NPS);
- Coordination among other regional marine and natural resource management entities (e.g., NPS, state parks and aquatic preserves, and South Florida Water Management District); and
- Exploration of opportunities to further partner with NMFS, South Atlantic Fishery Management Council, Gulf of Mexico Fishery Management Council, and FWC on coordinated and innovative research and management of fish and invertebrate populations within the sanctuary (e.g., evaluation of the Joint Spiny Lobster Fishery Management Plan Amendment 11 areas closed to lobster trap fishing).

Activity 5.3.3: Work with Florida Division of Historical Resources to implement a National Historic Preservation Act (NHPA) Section 106 programmatic agreement[5] to meet NOAA's responsibilities under the NHPA for FKNMS operations, management, and permitting. Where needed, consult with interested federally-recognized tribes before issuance of archaeological research permits and on all undertakings with the potential to affect historic properties pursuant to Section 106 of the NHPA.

Activity 5.3.4: Continue to work with the Department of Defense through local partners at Naval Air Station Key West to facilitate mission-critical defense activities in the sanctuary, including reviewing and updating new or changing activities that may warrant exemption from FKNMS regulations (see Appendix F of Volume II of the final EIS).

Activity 5.3.5: Strengthen partnerships and coordination with Monroe County and the five individual Florida Keys municipalities to further sanctuary resource protection through the individual mandates and authorities of those jurisdictions.

[5] A draft programmatic agreement was released for public comment as part of the 2019 draft EIS process. NOAA and the Florida Division of Historical Resources anticipate releasing a final agreement with the final environmental impact statement and final management plan, forthcoming.

Appendix A.1: Implementation Factors: Funding, Capacity, and Level of Effort

In addition to federal appropriation, NOAA often receives support to complete our mission through external funding for collaborations with various agencies, partnerships with other organizations, and in-kind or volunteer-based labor and supplies. Most of the ONMS appropriation covers non-discretionary activities, such as labor, office rent, and utilities. The remainder is applied to discretionary activities, with vessel and facility maintenance representing the majority. Many of the activities within this management plan will depend on the availability of appropriate staff and resources for implementation, as well as external funding and partnerships. How discretionary funds and resources could be allocated is described below.

Prioritization and Implementation

While this revised management plan represents the full body of work needed to advance the sanctuary goals and objectives, prioritization of activities to implementation is necessary. The availability of funding and staff resources is limited, therefore ONMS is using the following factors to prioritize focus and effort.

Cost and level of effort determine the resources needed to execute a particular objective or activity and therefore are the first consideration for what the sanctuary can accomplish. Specifically, the following will be evaluated:

> **Cost:** The availability of agency appropriation, commitments of external funding sources, partnerships, and/or in-kind support.
>
> **Level of Effort**: The ability to implement, with existing staff capacity and partnerships, or if additional staff capacity and partnership support is needed.

Following consideration of the resources needed to implement a particular objective or activity, the sanctuary will use the following five factors to further discern which specific objective and activities to implement and over what time-frame:

> **Importance:** The level of urgency for each activity.
>
> **Impact:** The likelihood that the activity would positively impact the health of sanctuary resources and/or the well-being of sanctuary users.
>
> **Feasibility:** The ability to effectively implement the activity based on support from relevant agencies, public audiences, and ONMS.
>
> **Requirements:** Some activities are legal requirements for NOAA under a funded statute or regulation, or may be subject to court judgment or settlement agreement.

Priority Theme: Directly meets or is a prerequisite for, or enables an activity, of one of the six overarching ONMS priorities for FKNMS.

Appendix A.2: Representative List of Sanctuary Partnership Agencies and Organizations

State Agencies: Florida Department of Agricultural and Consumer Services, Florida Department of Economic Opportunity, Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission, Florida Department of State: particularly the Division of Historical Resources, and South Florida Water Management District

Federal Agencies: U.S. Army Corps of Engineers, U.S. Coast Guard, Department of Defense (U.S. Naval Air Station Key West), U.S. Department of the Interior (National Park Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey), and U.S. Environmental Protection Agency

Regional and Local Government: Monroe County, Florida Keys municipalities, and Tourism Development Council

Regional and Local Organizations and Associations: Blue Star dive operators and fishing guides, fishing associations and guiding organizations (e.g., American Sportfishing Association, Coastal Conservation Association, Bonefish Tarpon Trust, Key West Charter Boat Association, Florida Keys Commercial Fishermen's Association, Lower Keys Guides Association, Islamorada Fishing Guides Association, and others), marine towing and salvage operators, and National Marine Manufacturers Association

Non-Governmental: Coral Restoration Foundation, Fish and Wildlife Foundation of Florida, Florida Public Archaeological Network, I.CARE, National Audubon Society, National Fish and Wildlife Foundation, National Marine Sanctuary Foundation, National Parks Conservation Association, Plant A Million Corals, Reef Renewal, Reef Environmental Education Foundation, Reef Relief, Boy Scouts of America Seabase, and The Nature Conservancy,

Universities, Research Institutions, and Marine Laboratories: College of the Florida Keys, Florida Atlantic University Harbor Branch Oceanographic Institute, Florida International University, Florida Sea Grant, Indiana University, Keys Marine Laboratory, Mote Marine Laboratory, University of Miami Rosenstiel School of Marine and Atmospheric Science, and University of Florida

Key internal NOAA Partners: National Marine Fisheries Service, including the Southeast Regional Office and Southeast Fishery Science Center, Office of Law Enforcement, Office of Protected Resources, Office of Habitat Conservation, Restoration Center, and Integrated Ecosystem Assessment Program; the Gulf of Mexico Fishery Management Council and South Atlantic Fishery Management Council; Oceanic and Atmospheric Research particularly the Atlantic Oceanographic and Meteorological Laboratory; Coral Reef Conservation Program; National Weather Service; Office of Marine and Aviation Operations; and other National Ocean Service offices including National Centers for Coastal and Ocean Science and Integrated Ocean Observing System Program, Office of Coast Survey, and Office for Coastal Management

Appendix A.3: List of Acronyms

CFR	Code of Federal Regulations
DEP	Florida Department of Environmental Protection
DoD	Department of Defense
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FKNMS	Florida Keys National Marine Sanctuary
FWC	Florida Fish and Wildlife Conservation Commission
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
ONMS	Office of National Marine Sanctuaries
USC	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
WQQP	Water Quality Protection Program

Appendix B:
Maps – Proposed Modifications to Marine Zone Boundaries

The following series of maps included the regional and individual marine zone maps included in the Final Preferred Alternative. For more details, see Chapter 3 of this document. The following marine zones are included in the Final Preferred Alternative.

Marine Zone Definitions

Management Areas

The management areas have protections above and beyond sanctuary wide prohibitions. Management area regulations are at 15 CFR § 922.164(b) and Global Positioning System (GPS) coordinates are in Appendix III to 15 CFR 922 subpart P.

Prohibited activities include taking coral, marine invertebrates, plants, rocks, or other material (except lobstering and stone crab fishing are allowed); collecting tropical fish; fishing with wire fish traps or other bottom equipment; and fishing with or while carrying spearguns.

National Wildlife Refuges

FKNMS overlaps with the Florida Keys National Wildlife Refuge Complex, which includes four national wildlife refuges that are managed by the U.S. Department of Interior's U.S. Fish and Wildlife Service. Two of these national wildlife refuges, Key West and Great White Heron, have protections above and beyond sanctuary-wide prohibitions. Regulations for Key West and Great White Heron national wildlife refuges are at 15 CFR § 922.164(c) and GPS coordinates are in Appendix IV to 15 CFR 922 subpart P.

Prohibited activities include operating a personal watercraft; operating an airboat; water skiing; and landing recreational aircraft. However, there are some exceptions for personal watercraft operation in Key West National Wildlife Refuge.

Conservation Areas

These areas of the sanctuary provide natural spawning, nursery, and residence areas for sanctuary marine life, and seek to protect and preserve groups of habitats and species from certain activities through limited restrictions and prohibitions. These areas consist of contiguous, diverse habitats, protect a variety of sanctuary resources, and/or facilitate research that supports sanctuary management or recovery of sanctuary resources. The conservation areas proposed here are all existing marine zones, currently categorized as either a special use area or an ecological reserve. NOAA also proposes to eliminate one existing special use area. Conservation area regulations are at 15 CFR § 922.164(f) and GPS coordinates are in Appendix VII to 15 CFR 922 subpart P.

Prohibited activities include discharging any material except vessel cooling water; collecting, injuring, or possessing any living or dead organism; anchoring (except in Western Sambo where anchoring is allowed shoreward of the reef tract); and entering except for continuous transit without interruption (except in Western Sambo where entering is allowed). Western Sambo has

the same regulations as a SPA and is therefore depicted with the same zone boundary coloration as SPAs.

Sanctuary Preservation Areas (SPAs)

These areas of the sanctuary encompass discrete, biologically important areas, within which activities are subject to conditions and prohibitions to avoid concentrations of uses that could impact species populations or habitats, reduce conflicts between uses, protect areas of important marine species or habitats, or provide opportunities for scientific research. NOAA proposes to add two new, combine two existing, and eliminate two existing sanctuary preservation areas. Sanctuary preservation area regulations are at 15 CFR § 922.164(e) and GPS coordinates are in Appendix VI to 15 CFR 922 subpart P.

Prohibited activities include discharging any material except vessel cooling water; collecting, injuring, or possessing any living or dead organism; and anchoring.

Habitat Restoration Areas

Restoration areas are areas of the sanctuary that support species or habitat recovery, including protection for restoration sites (referred to as habitat restoration areas) and short and long-term propagation nurseries (referred to as nursery restoration areas), within which activities are subject to conditions, restrictions, and prohibitions to achieve these objectives. Restoration area regulations are at 15 CFR § 922.164(g) and (h) and GPS coordinates are in Appendix VIII and IX to 15 CFR 922 subpart P.

Prohibited activities include discharging any material except vessel cooling water; collecting, injuring, or possessing any living or dead organisms; and anchoring (habitat restoration areas have the same regulations as sanctuary preservation areas). Habitat restoration areas have the same regulations as SPAs and are therefore depicted with the same zone boundary coloration as SPAs.

Nursery Restoration Areas

Restoration areas are areas of the sanctuary that support species or habitat recovery, including protection for restoration sites (referred to as habitat restoration areas) and short and long-term propagation nurseries (referred to as nursery restoration areas), within which activities are subject to conditions, restrictions, and prohibitions to achieve these objectives. Restoration area regulations are at 15 CFR § 922.164(g) and (h) and GPS coordinates are in Appendix VIII and IX to 15 CFR 922 subpart P.

Prohibited activities include discharging any material except vessel cooling water; collecting, injuring, or possessing any living or dead organism; anchoring; and entering except for continuous transit without interruption (nursery restoration areas have the same regulations as conservation areas).

Wildlife Management Areas (WMAs)

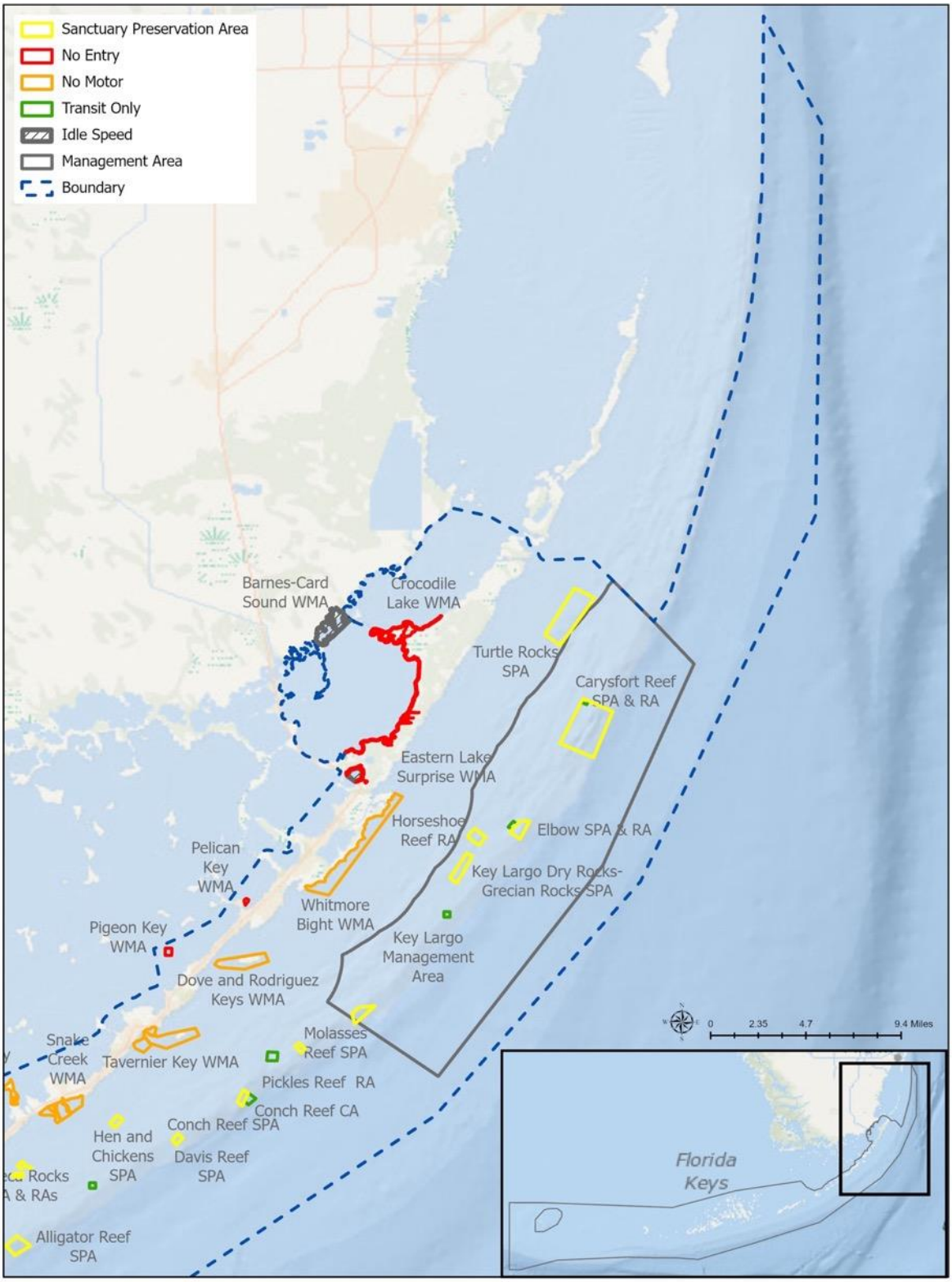
Wildlife management areas are areas of the sanctuary in which various access and use restrictions are applied to manage, protect, preserve, and minimize disturbance to sanctuary

wildlife resources, including, but not limited to, endangered or threatened species, or the habitats, special places, or conditions on which they rely. Wildlife management area regulations are at 15 CFR § 922.164(d) and GPS coordinates are in Appendix V to 15 CFR 922 subpart P. Each wildlife management area is established to meet location specific resource management or protection goals, and as such the access and use restrictions are zone specific. Prohibitions could include: idle speed no wake, no motor, no anchor, or no entry.

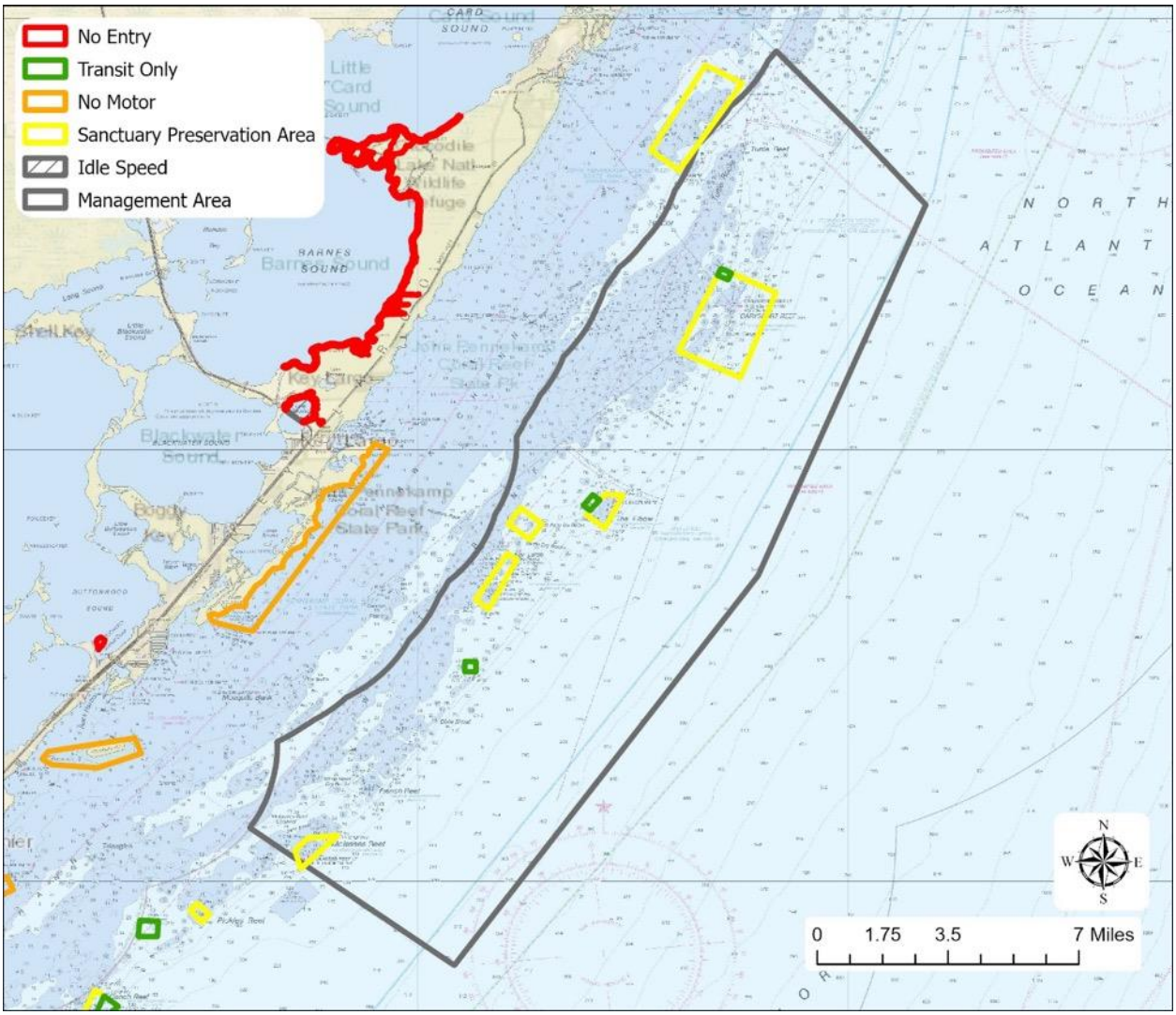
Each wildlife management area is established to meet location specific resource management or protection goals, and as such the access and use restrictions are zone specific. Prohibitions could include: idle speed no wake, no motor, no anchor, or no entry.

Final Preferred Alternatives

Upper Keys Region and Marine Zones



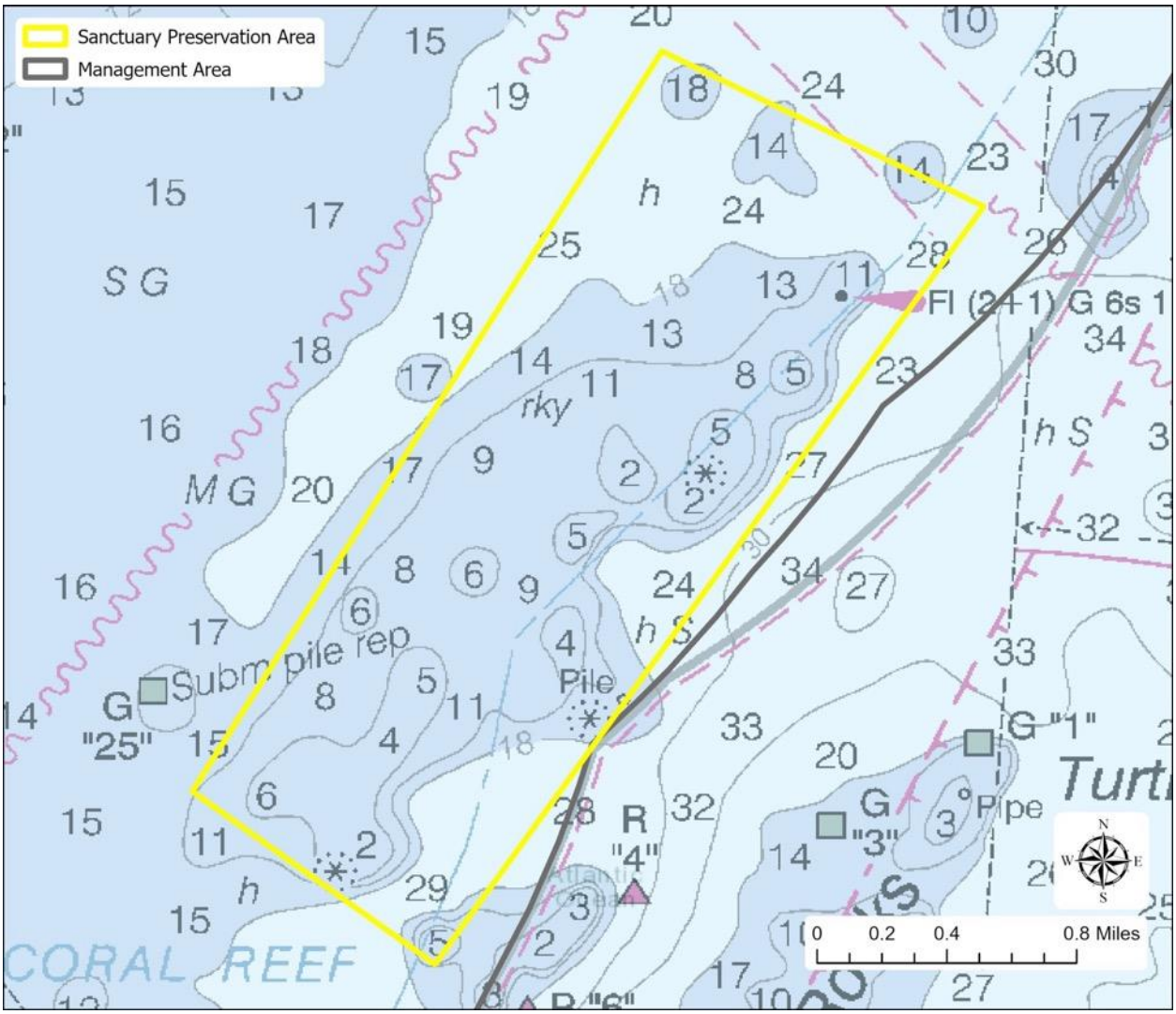
Key Largo Management Area



Designated as the first national marine sanctuary in the Keys, Key Largo Management Area encompasses an interconnected network of habitat types such as seagrass beds, shallow hardbottom, and coral reefs and is home to zones for protection and restoration.

Protections for this area include areas that prohibit spearfishing, marine life collecting, harvest of lobster, and recreational and commercial fishing. Key Largo Management Area is approximately 146.8 square miles (93,932 acres). The final preferred alternative proposes no change to this zone's area or regulations.

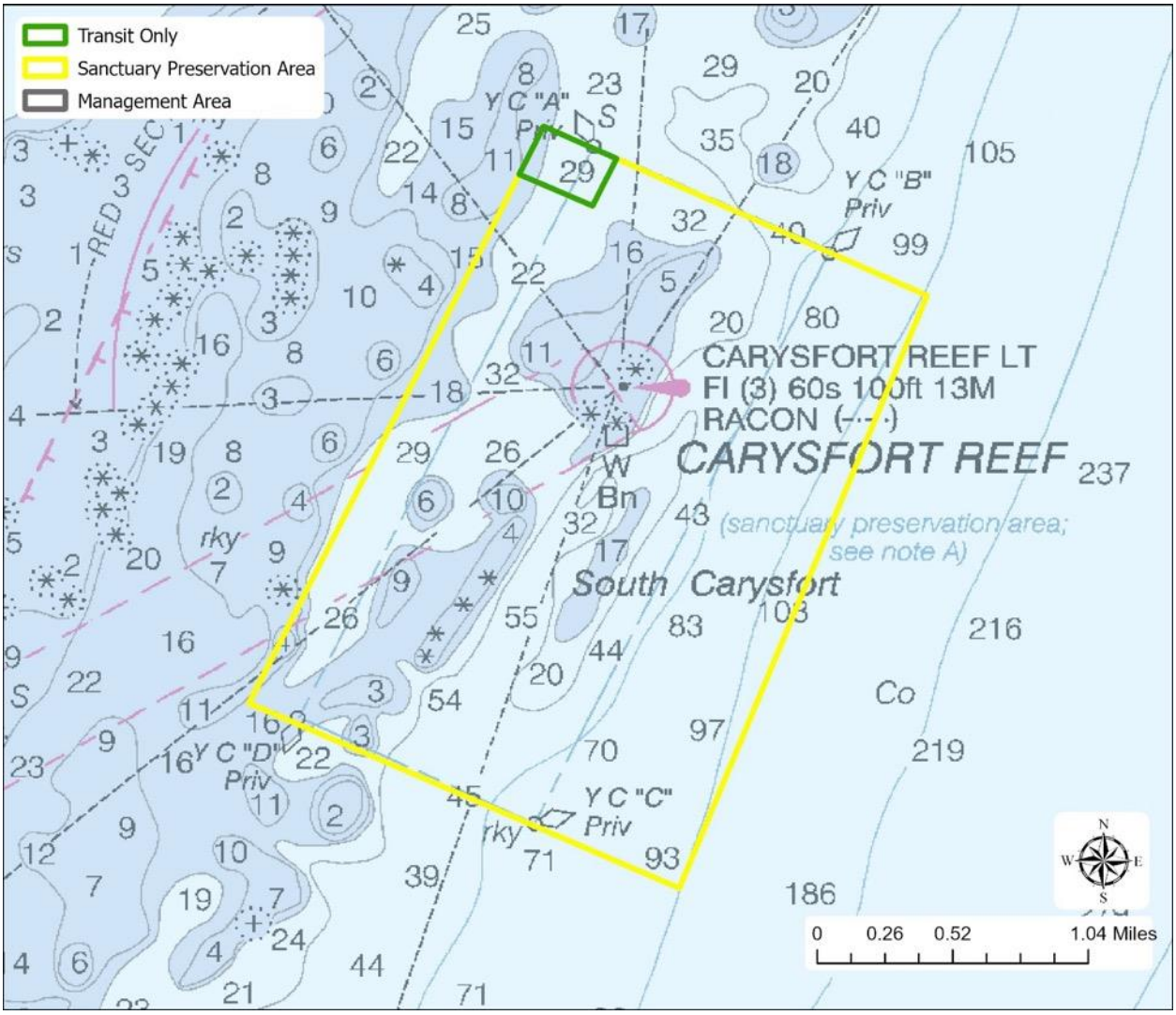
Turtle Rocks Sanctuary Preservation Area



This unique nearshore area historically contained populations of endangered staghorn, elkhorn, and star coral colonies, and is one of the only known reefs with fused staghorn colonies.

The final preferred alternative includes this area as a new SPA that is approximately 2.5 square miles (1612 acres).

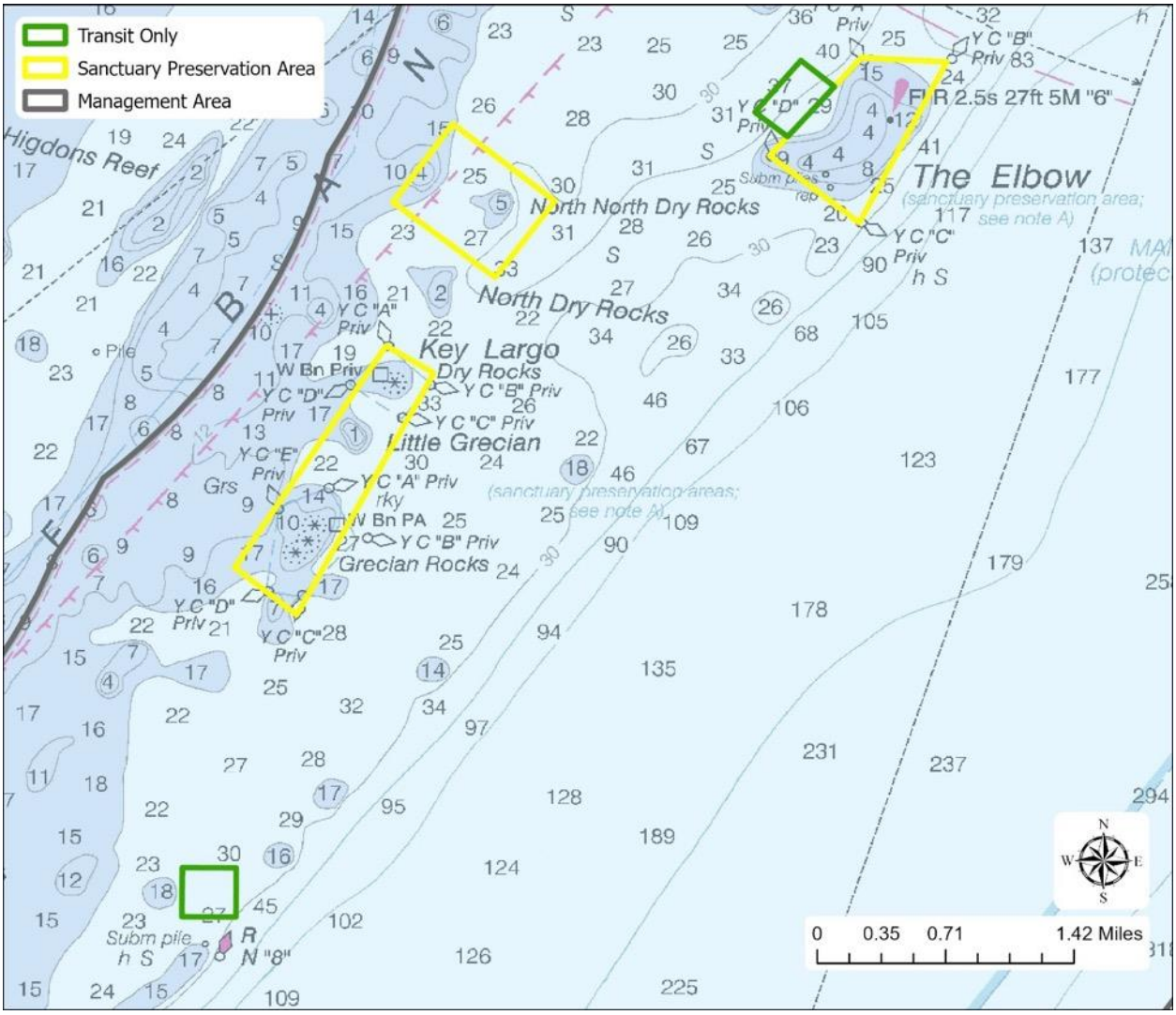
Carysfort Reef Sanctuary Preservation Area and Carysfort Reef Nursery Restoration Area



This SPA protects important cultural and natural resources like the Carysfort lighthouse and the largest demonstration site for restoration of elkhorn and staghorn corals. A Mission: Iconic Reefs restoration site, this reef historically supported extensive elkhorn and staghorn coral colonies.

Historically, this area supported a black grouper aggregation site. Carysfort Reef SPA has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone (all other existing regulations are maintained) and proposes to expand the zone by approximately 1.6 square miles (1,016 acres) for a total area of 3.8 square miles (2,421 acres).

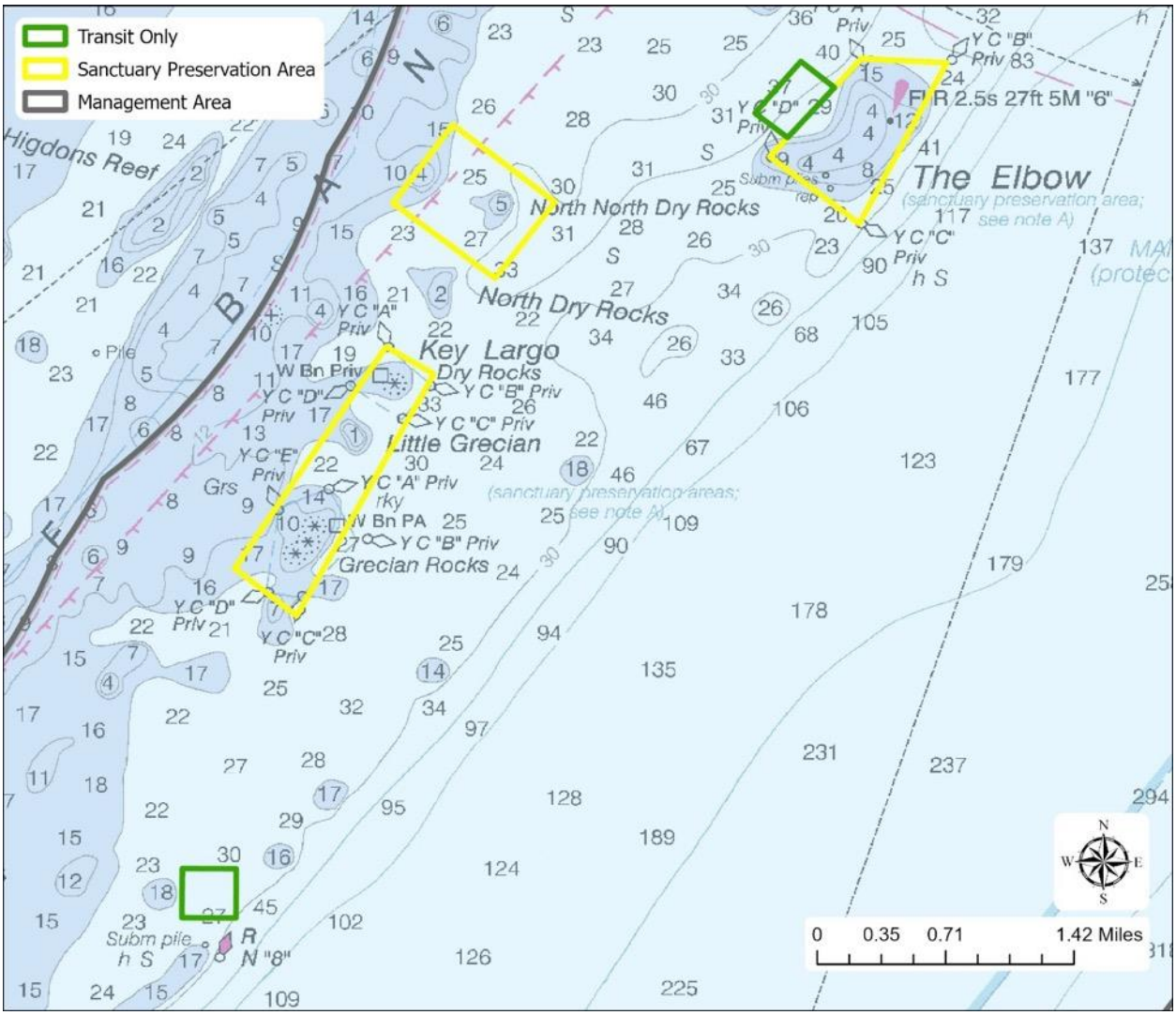
The Elbow Sanctuary Preservation Area and Elbow Nursery Restoration Area



Home to shipwrecks on the shipwreck trail, the Elbow is also an important reef community with a well-defined reef crest, spur-and-grove, and deeper multi-tiered linear reef system. Once home to historic large stands of staghorn and elkhorn coral. The Elbow SPA, approximately 0.4 square miles (256 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone, all other existing regulations are maintained.

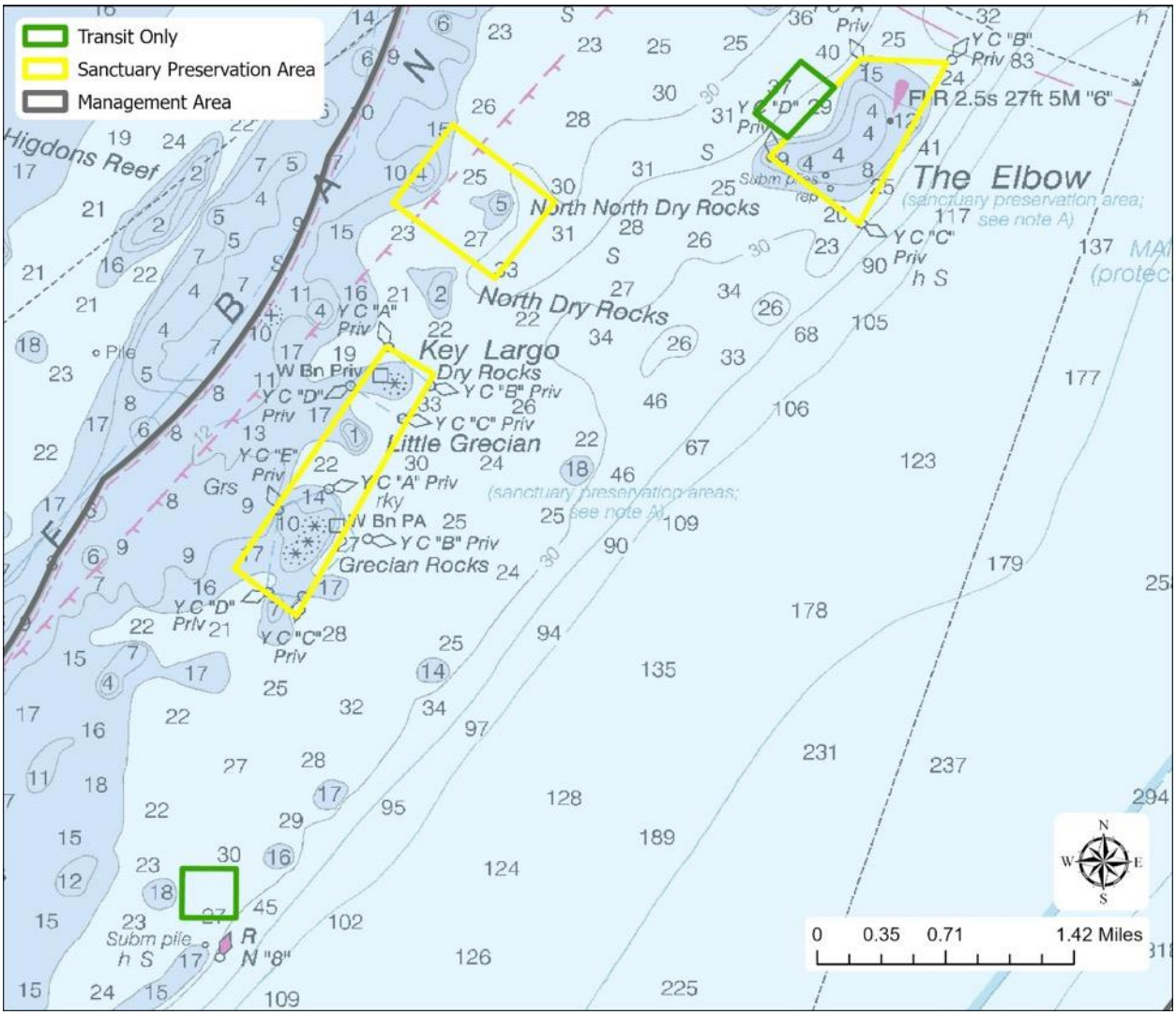
The Elbow Nursery Restoration Area is just inshore and adjacent to the Elbow SPA. The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.08 square miles (50 acres).

Horseshoe Reef Habitat Restoration Area



Horseshoe Reef Habitat Restoration Area is the zone nearest North North Dry Rocks and North Dry Rocks. It has the same regulations as a SPA and is therefore depicted with the same zone boundary coloration as SPAs. The final preferred alternative includes this area as a new habitat restoration area that is approximately 0.34 square miles (220 acres).

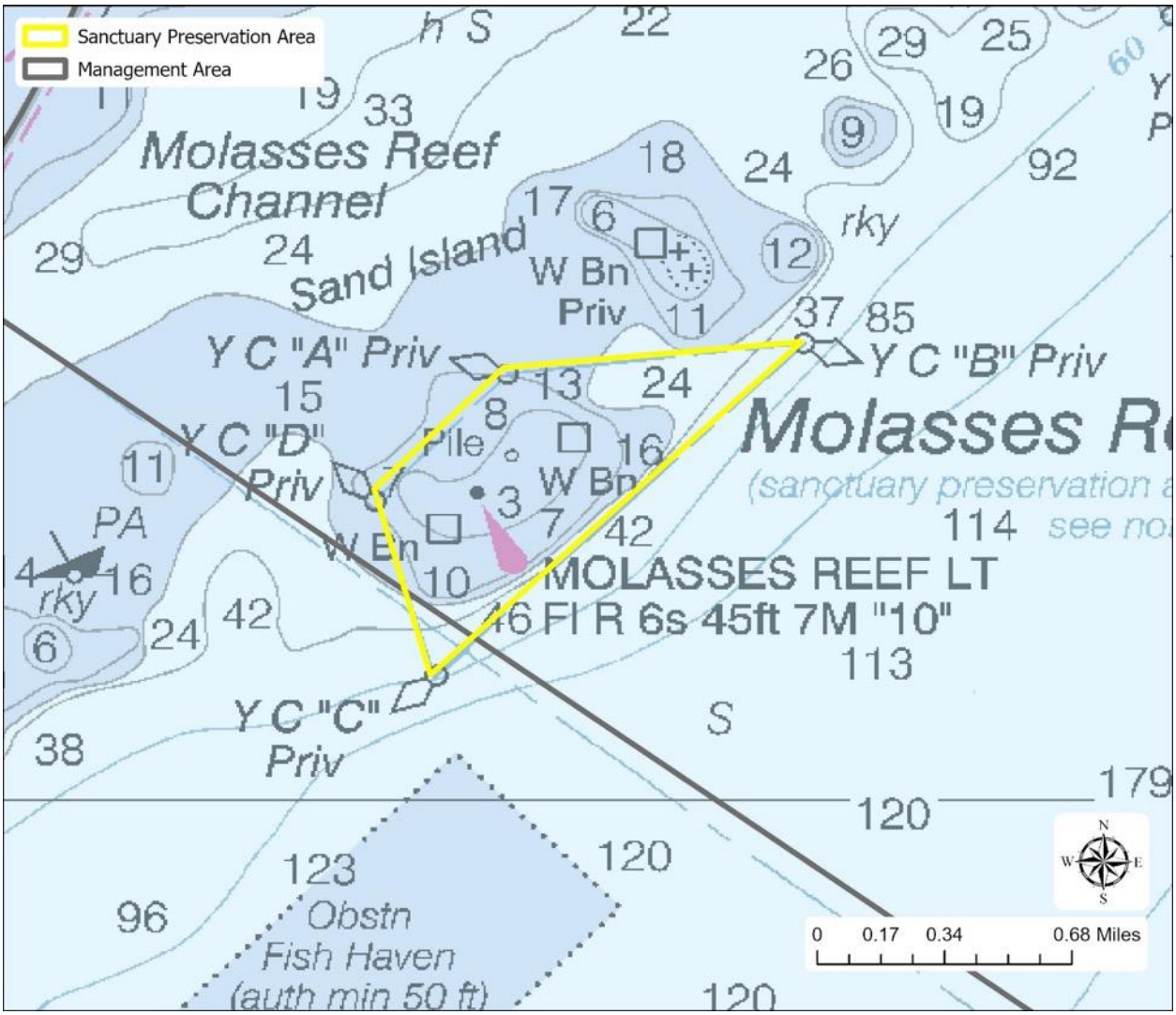
Key Largo Dry Rocks-Grecian Rocks Sanctuary Preservation Area



Home to one of the oldest elkhorn and staghorn coral restoration sites in the Florida Keys, this SPA is also home to one of the largest remaining healthy populations of endangered star coral populations. The connection of these SPAs protects seagrass meadows with large populations of herbivorous reef fish, queen conch, and lobster.

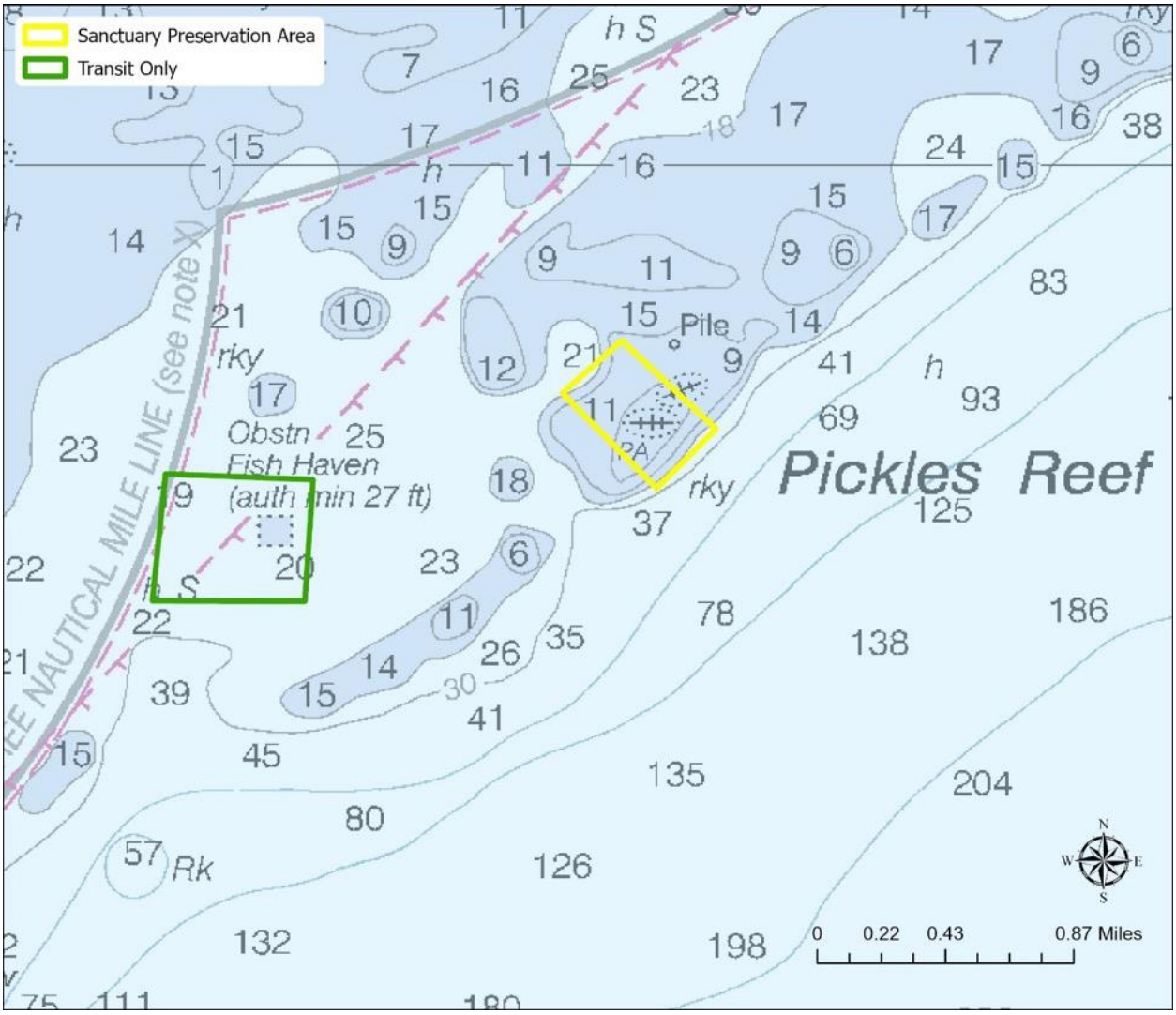
Key Largo Dry Rocks SPA (approximately 0.08 square miles; 51 acres) and Grecian Rocks SPA (approximately 0.17 square miles; 107 acres) have been sanctuary marine zones since 1997. The final preferred alternative proposes to combine these existing zones to create one zone of approximately 0.5 square miles; 314 acres) and include the addition of a no anchor regulation throughout this zone (all other existing regulations are maintained).

Molasses Reef Sanctuary Preservation Area



Molasses Reef Sanctuary Preservation Area is one of the most visited recreational diving sites in the Upper Keys. It is home to shipwrecks, the Molasses Reef light, and long-term temperature and coral monitoring stations. Historically, Molasses Reef was home to healthy populations of endangered elkhorn, staghorn, and star corals. Molasses Reef SPA, approximately 0.39 square miles (247 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone, all other existing regulations are maintained.

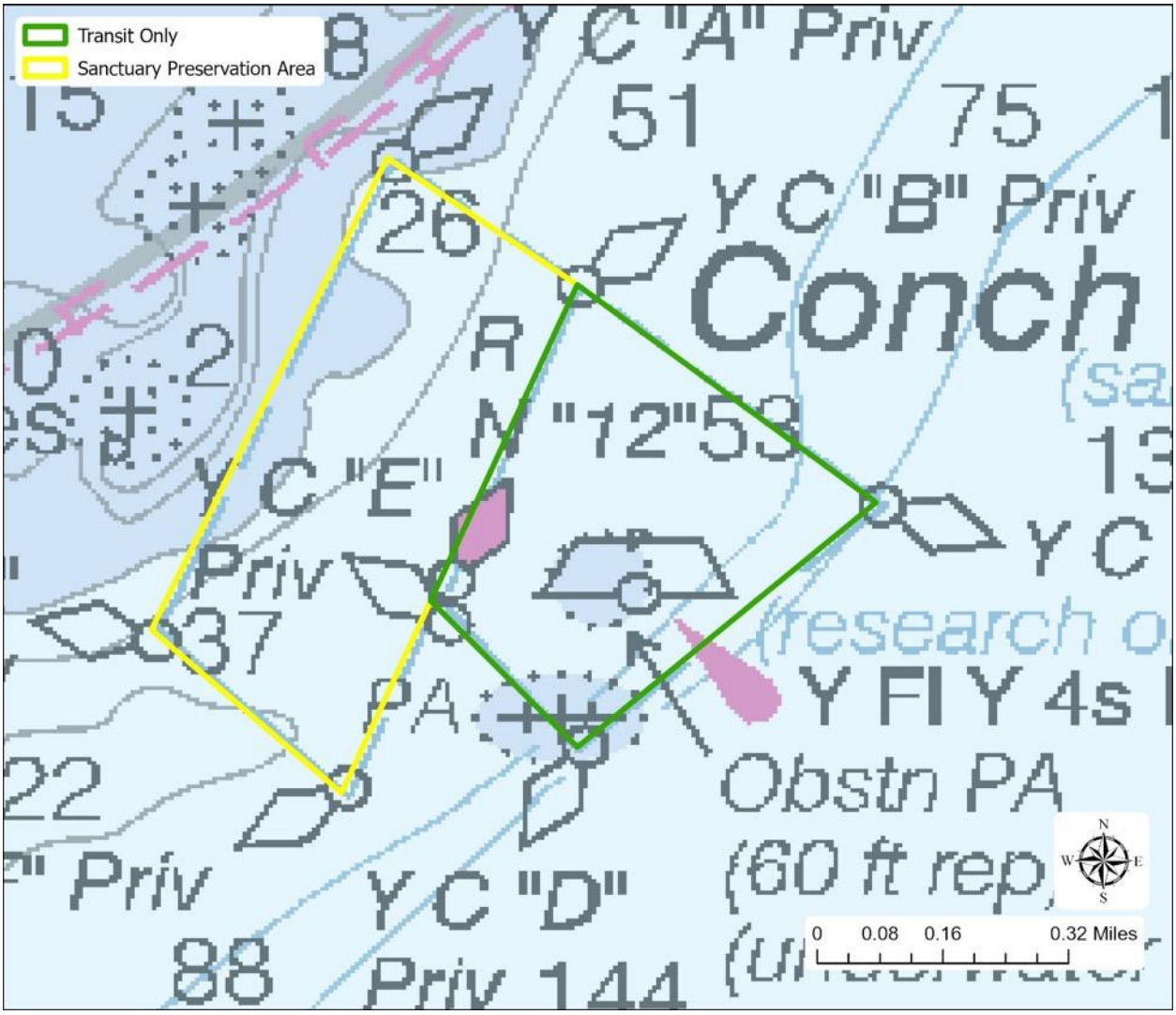
Pickles Reef Habitat Restoration Area and Tavernier Nursery Restoration Area



The final preferred alternative for Pickles Reef Habitat Restoration Area includes this area as a new habitat restoration area that is approximately 0.11 square miles (71 acres).

The final preferred alternative for the Tavernier Nursery Restoration Area is approximately 0.2 square miles (124 acres).

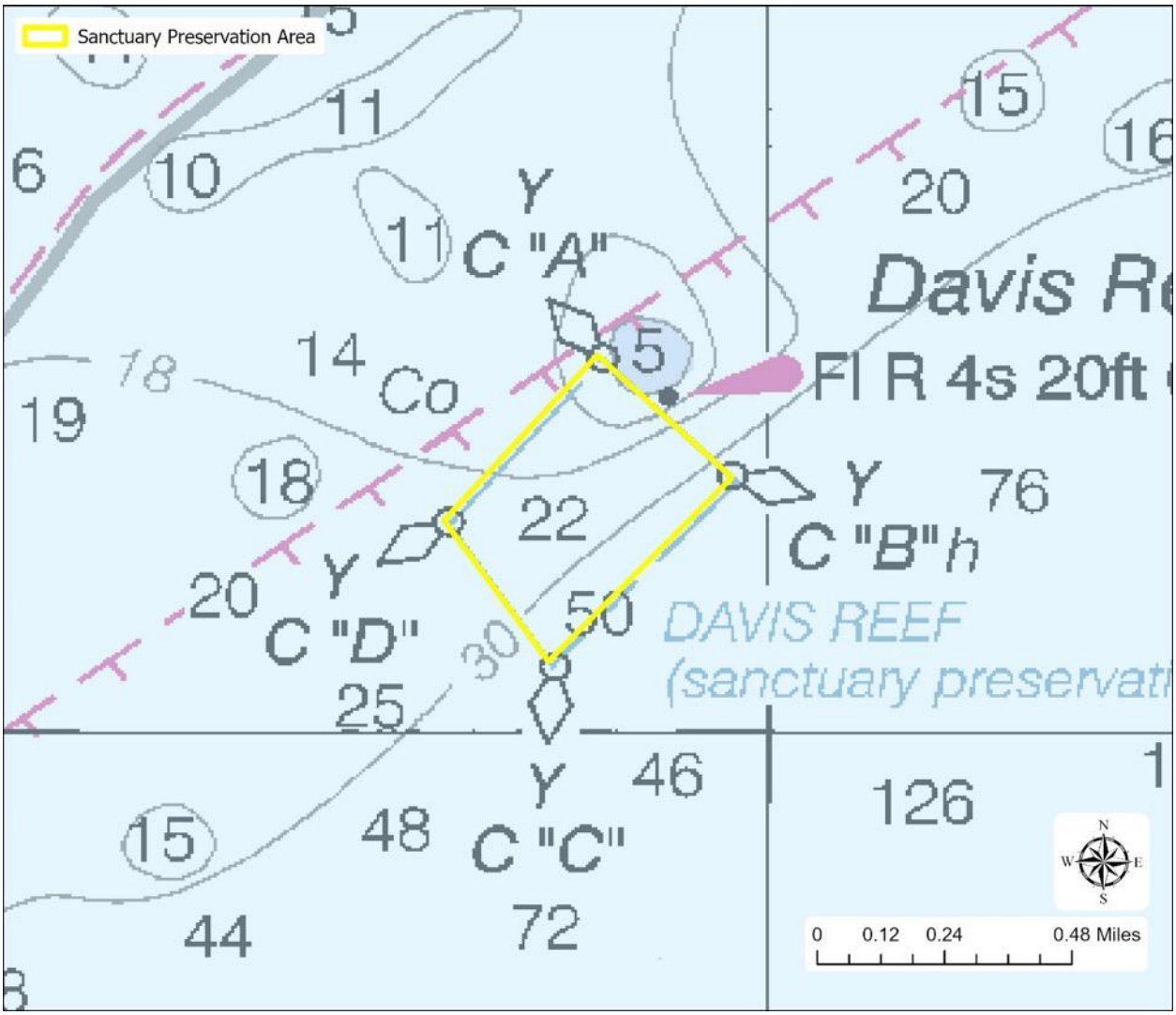
Conch Reef Sanctuary Preservation Area and Conch Reef Conservation Area



Conch Reef SPA is home to one of the best developed reef wall ecosystems in the Florida Keys. It historically contained well developed stands of pillar coral. Conch Reef SPA, approximately 0.19 square miles (119 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone and eliminates the current exception for catch and release fishing by trolling; all other existing regulations are maintained.

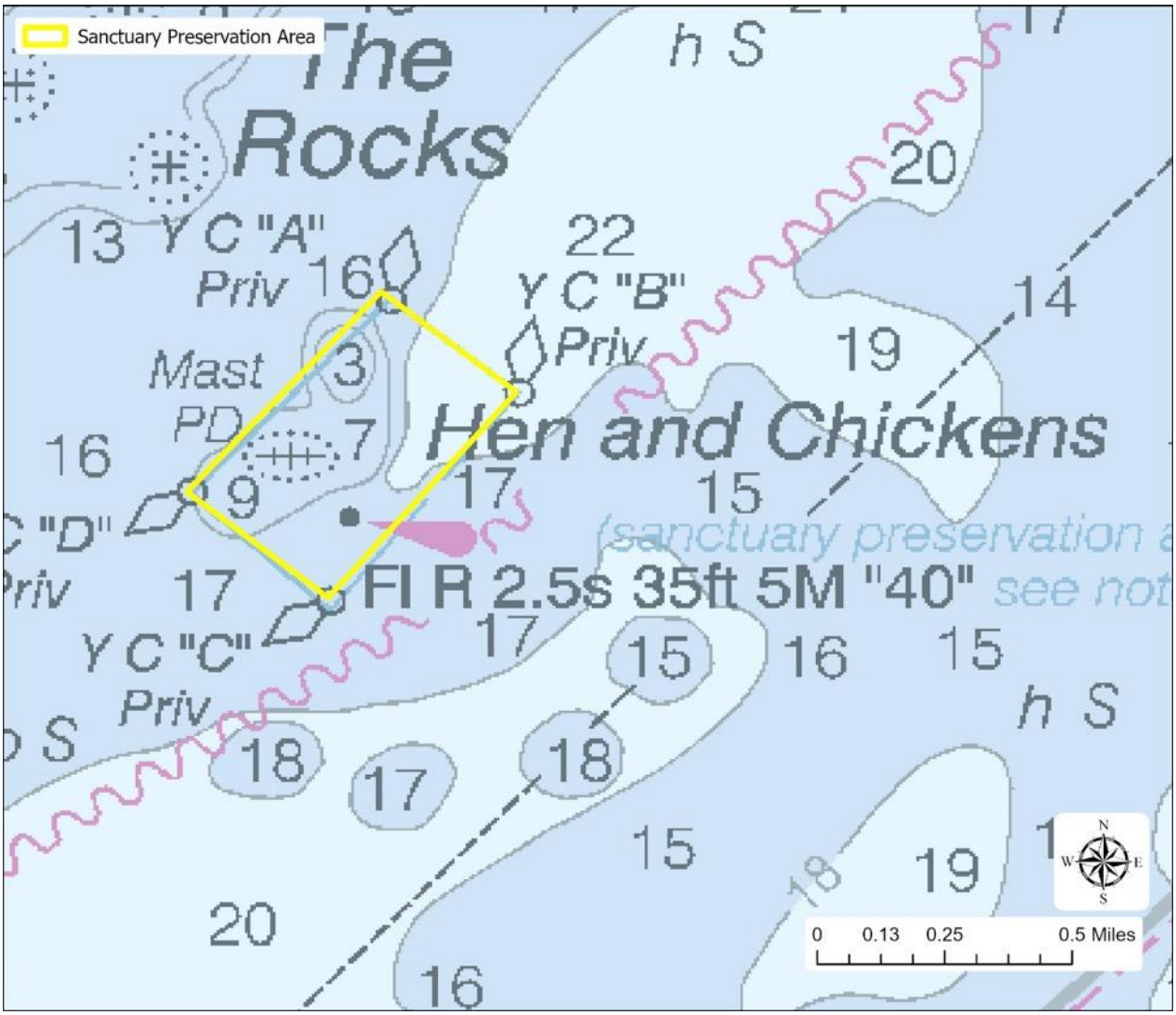
Conch Reef Conservation Area contains threatened species of corals and was established for scientists to examine the impacts caused by human use and environmental conditions. The area has been a sanctuary marine zone since 1997, the area formerly known as Conch Reef Research Only Area is now titled "Conservation Area." Conch Reef, approximately 0.15 square miles (96 acres) has been a marine zone since 1997. The final preferred alternative proposes no change to this zones area or regulations. The only change is the zone type from special use area to conservation area.

Davis Reef Sanctuary Preservation Area



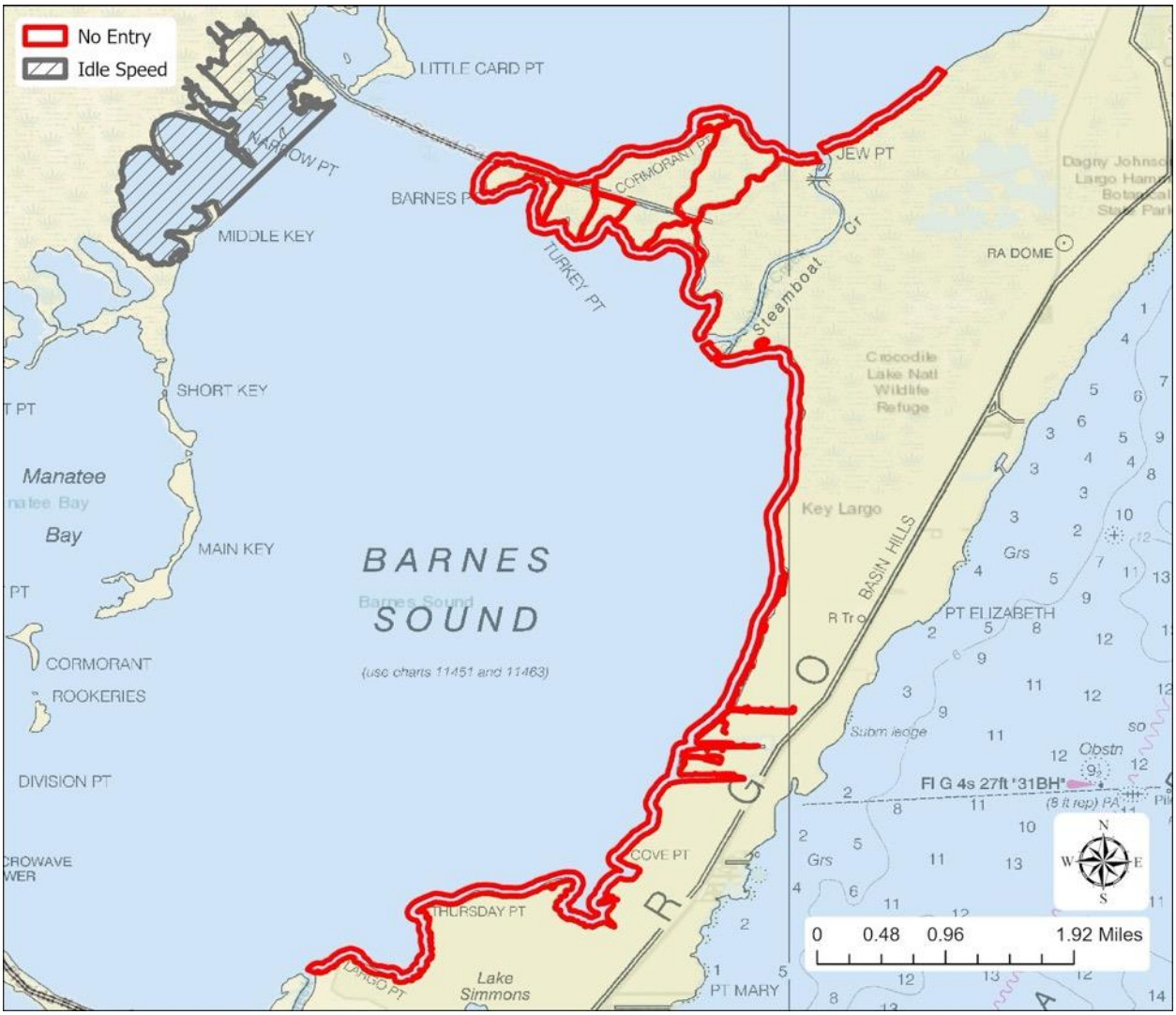
Davis Reef SPA protects a variety of reef ecosystem types, including a coral restoration project site. Davis Reef SPA, approximately 0.14 square miles (88 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

Hen and Chickens Sanctuary Preservation Area



Hen and Chickens is a unique mid-channel patch reef with populations of endangered star corals and staghorn corals. Hen and Chickens SPA, approximately 0.17 square miles (106 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

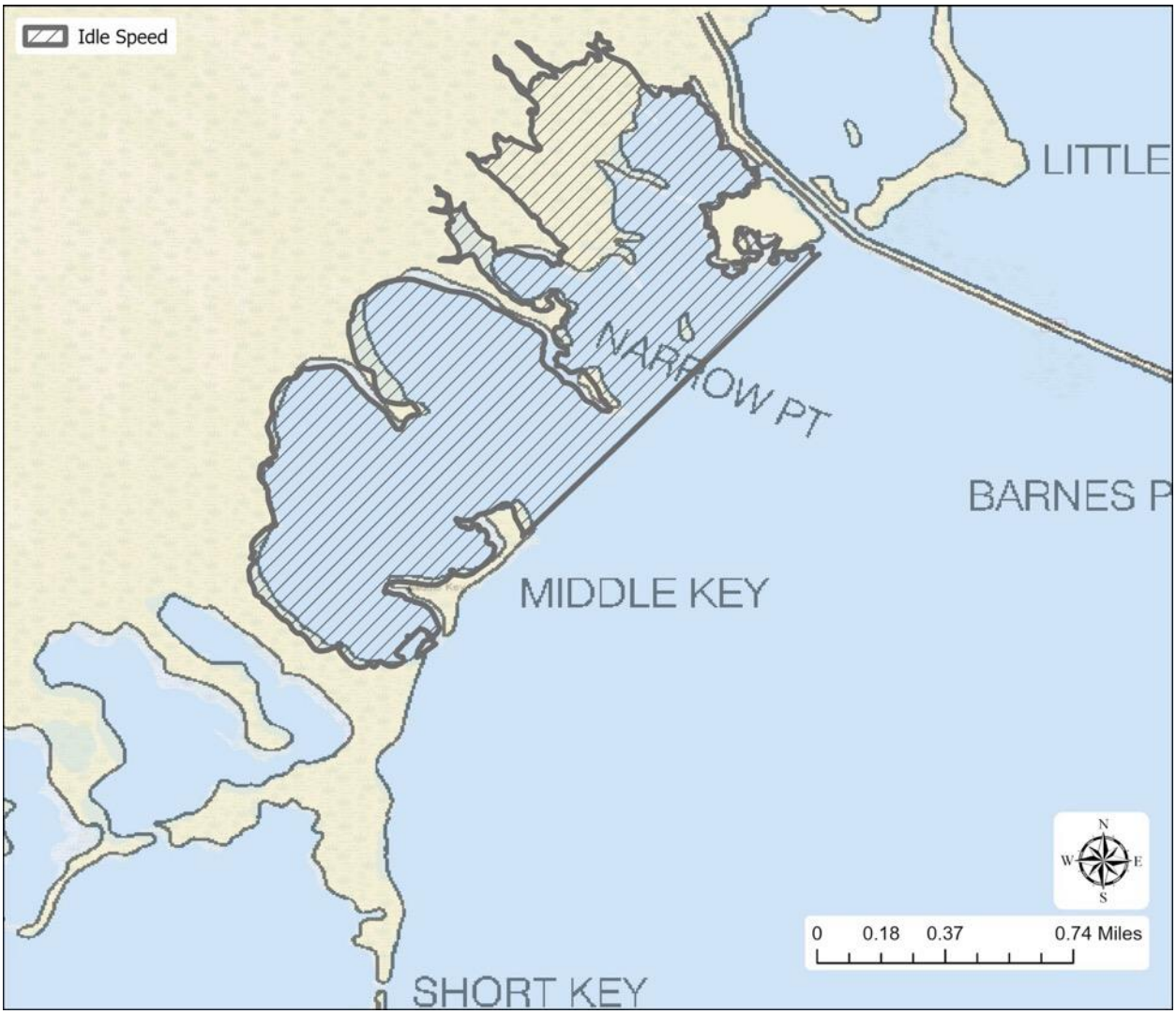
Crocodile Lake Wildlife Management Area



This minimum 100-yard distance no entry zone is to protect American crocodiles, West Indian manatee, and wading and migratory bird populations who may use this area to rest and nest. Studies on bird behavior demonstrate the need for this minimum distance to decrease disturbance of their activities.

Crocodile Lake WMA has been a sanctuary marine zone since 1997. This WMA is part of the larger Crocodile Lake National Wildlife Refuge that has been in place since 1980. The final preferred alternative proposes to expand the no entry protections from 100 feet to 100 yards offshore for a total area of approximately 1.09 square miles (696 acres) and apply this regulation year-round rather than only March 1 to October 1. Access to Steamboat Creek for fishing and other recreational uses is allowed.

Barnes-Card Sound Wildlife Management Area



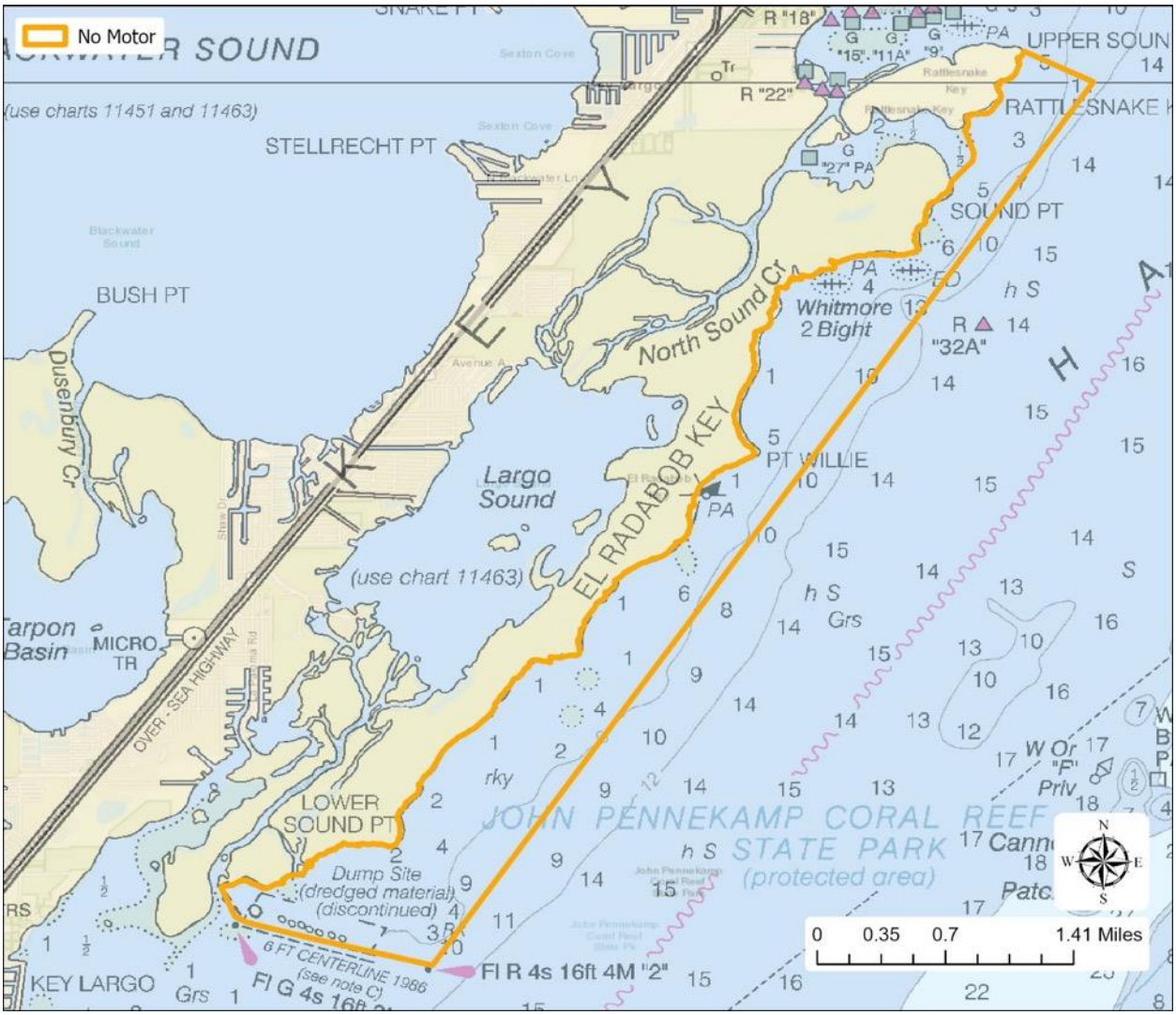
This new wildlife management area's purpose is to decrease disturbance to nesting and wading birds and shallow water gamefish. Idle speed no wake zones also decrease impacts to the benthic community, including seagrass and macroalgae. A seagrass and macroalgae monitoring program has existed in this area for more than 17 years. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 1.1 square miles (705 acres).

Eastern Lake Surprise Wildlife Management Area

This minimum 100-yard distance no entry addition to this existing zone is to protect American crocodiles, West Indian manatee, and wading and migratory bird populations who may use this area to rest and nest. Studies on bird behavior demonstrate the need for this minimum distance. The idle speed zone will remain in effect to protect wildlife like the West Indian manatee.

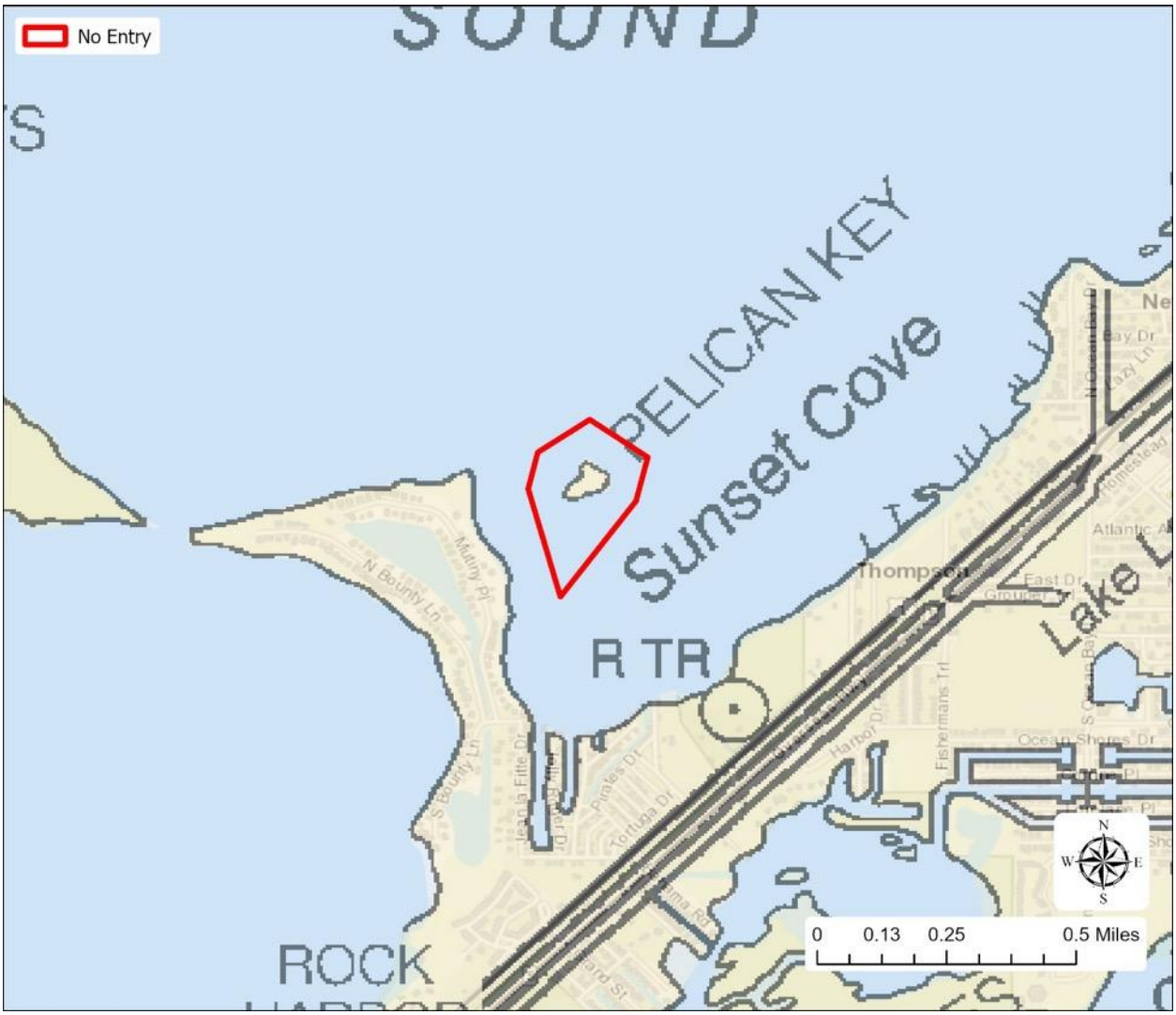
Eastern Lake Surprise WMA has been a sanctuary marine zone since 1997. The final preferred alternative maintains the existing idle speed no wake area north of Highway 1, changes the existing no access buffer zone to no entry (a terminology change that better aligns with Florida Critical Wildlife Area regulations), and extends no entry along the entire shoreline including the eastern basin. The total area zoned is approximately 0.44 square miles (285 acres).

Whitmore Bight Wildlife Management Area



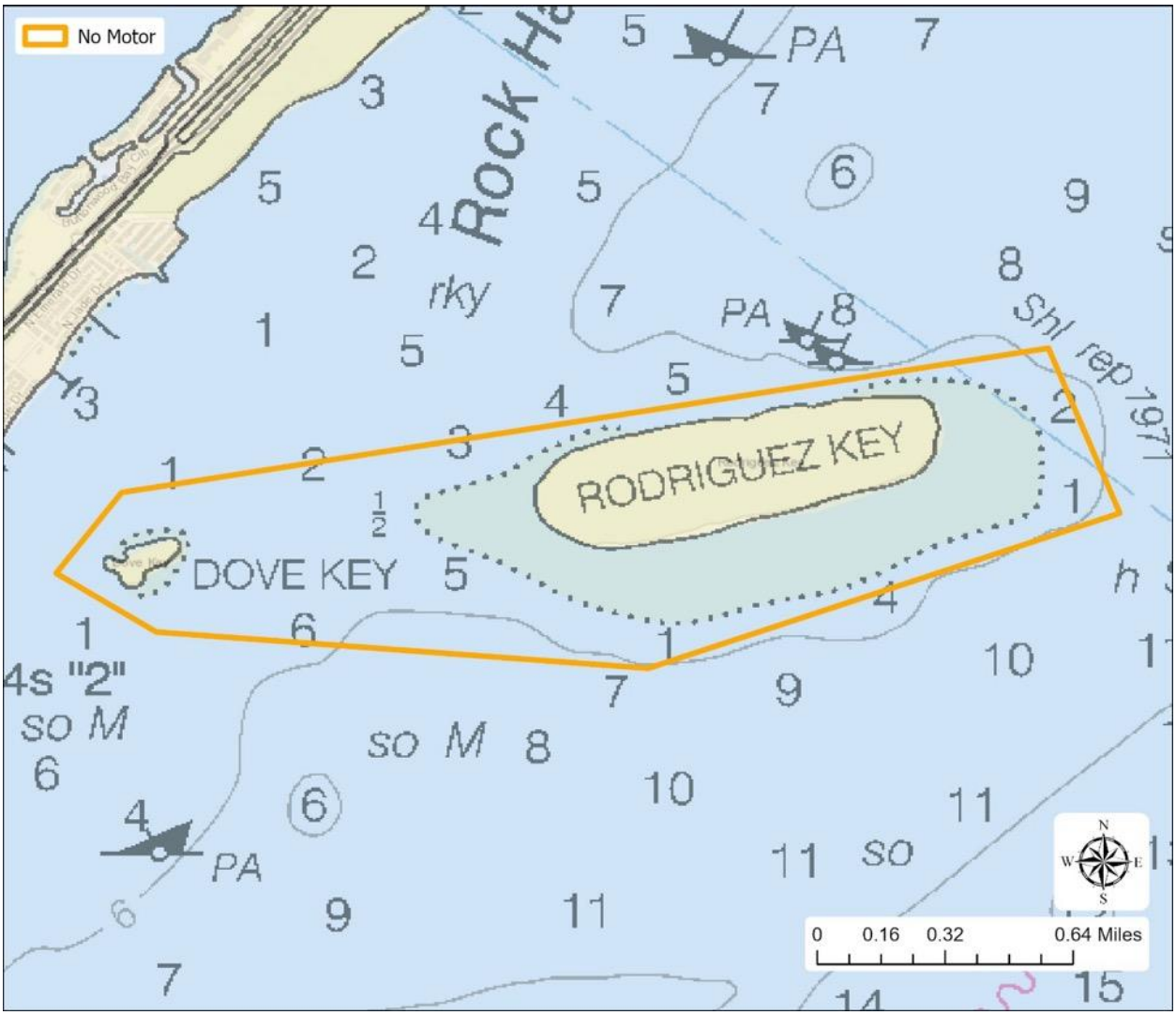
This WMA is a no motor zone to decrease disturbance to the hardbottom community that supports juvenile lobster and various fish. The final preferred alternative includes this area as a new no motor wildlife management area that is approximately 2.9 square miles (1,824 acres). A portion of this WMA overlaps with one of the John Pennekamp Coral Reef State Park no motor zones.

Pelican Key Wildlife Management Area



This minimum 100-yard distance no entry zone is to protect wading and migratory bird populations who may use this area to rest and nest. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.04 square miles (24 acres).

Dove and Rodriguez Keys Wildlife Management Areas



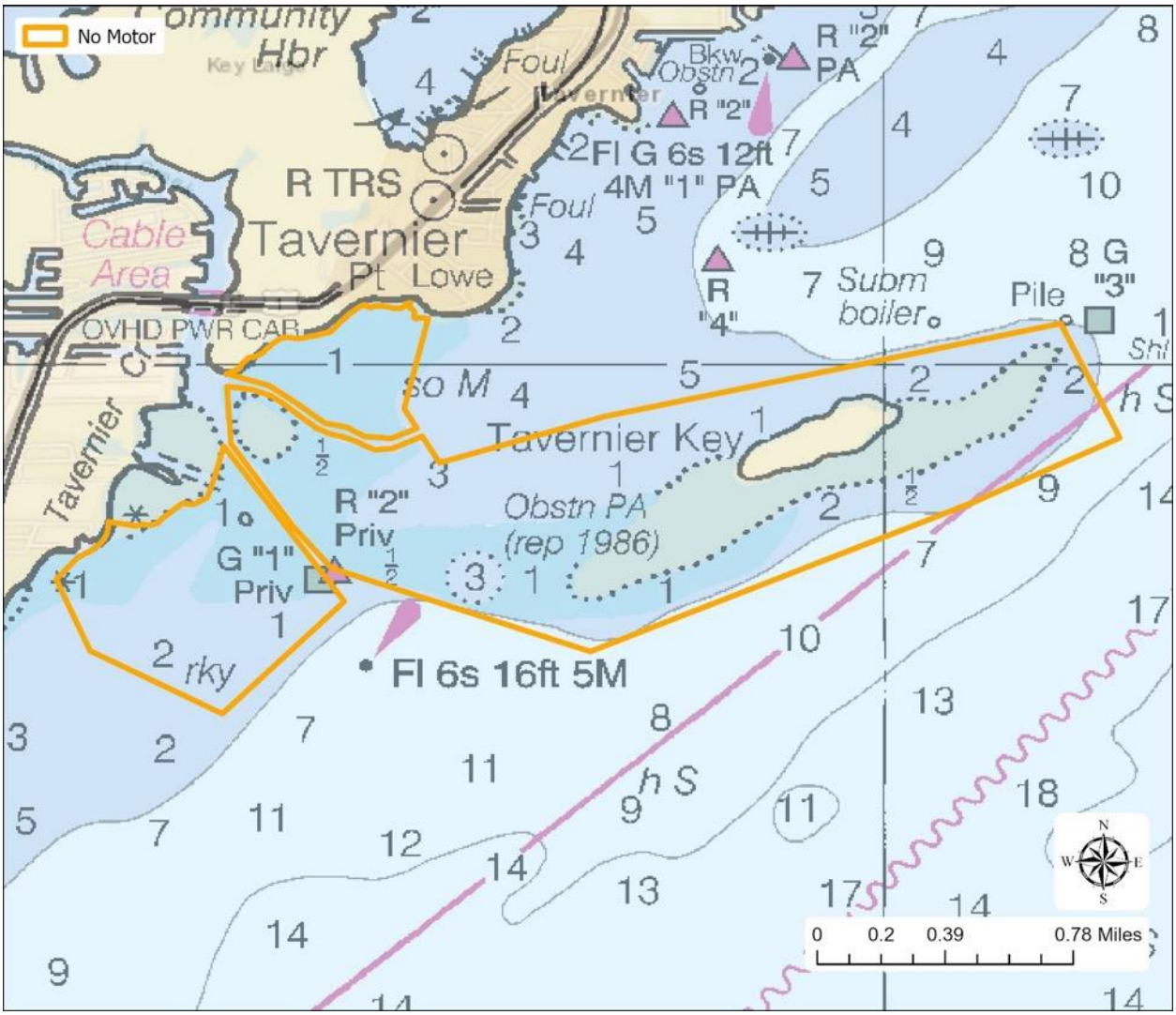
These seagrass and hardbottom habitats are impacted by vessel groundings and scarring. Connection of these existing zones will allow for continued recreation in this area and protection of the habitat.

Dove Key WMA (approximately 0.12 square miles; 78 acres) and Rodriguez Key WMA (approximately 0.6 square miles; 381 acres) have been sanctuary marine zones since 1997. The final preferred alternative proposes to combine these existing zones to create one zone of approximately 0.9 square miles (578 acres). The final preferred alternative applies a no motor regulation throughout this area and removes the existing no entry area around Dove Key.

Pigeon Key Wildlife Management Area

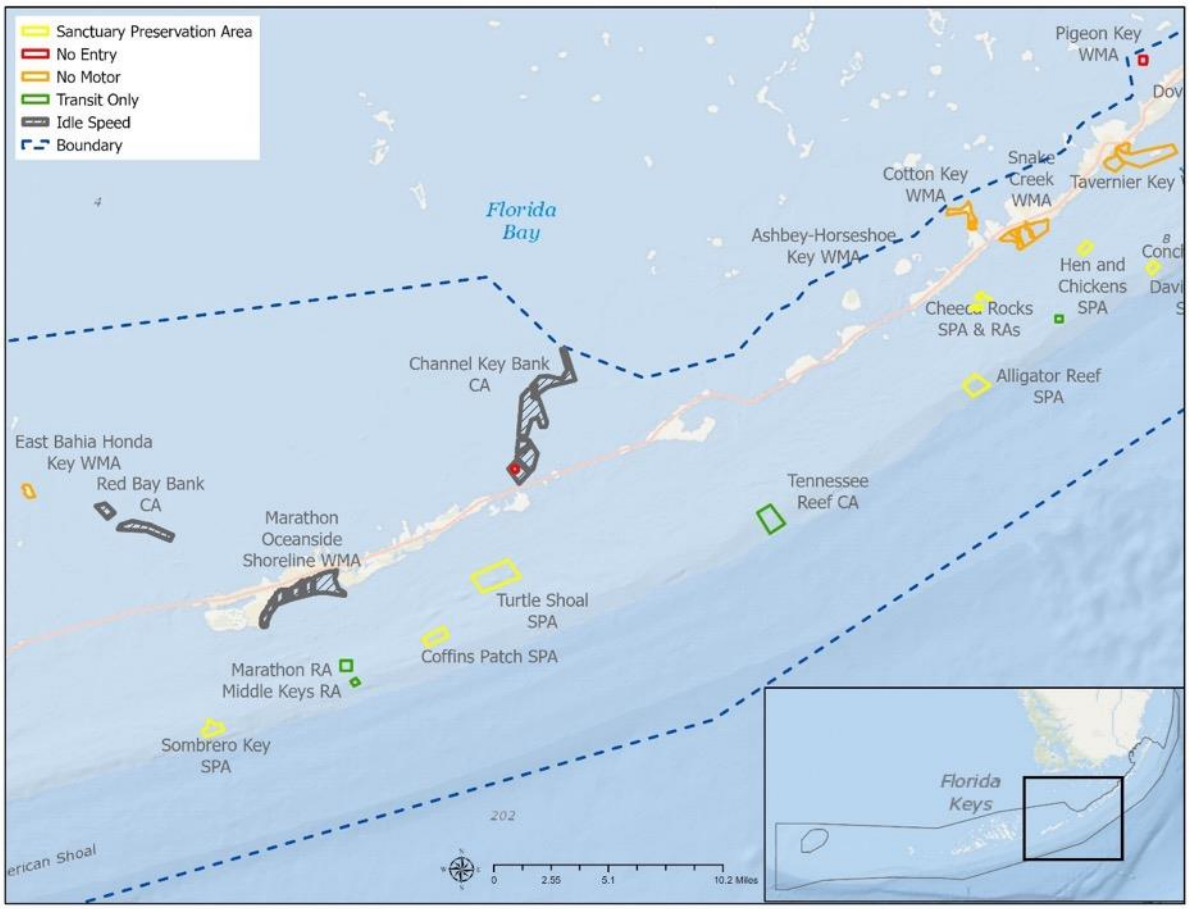
This minimum 100-yard distance no entry zone is to protect bird populations who may use this area to rest and nest, such as roseate spoonbills and magnificent frigatebirds. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.08 square miles (52 acres).

Tavernier Key Wildlife Management Area

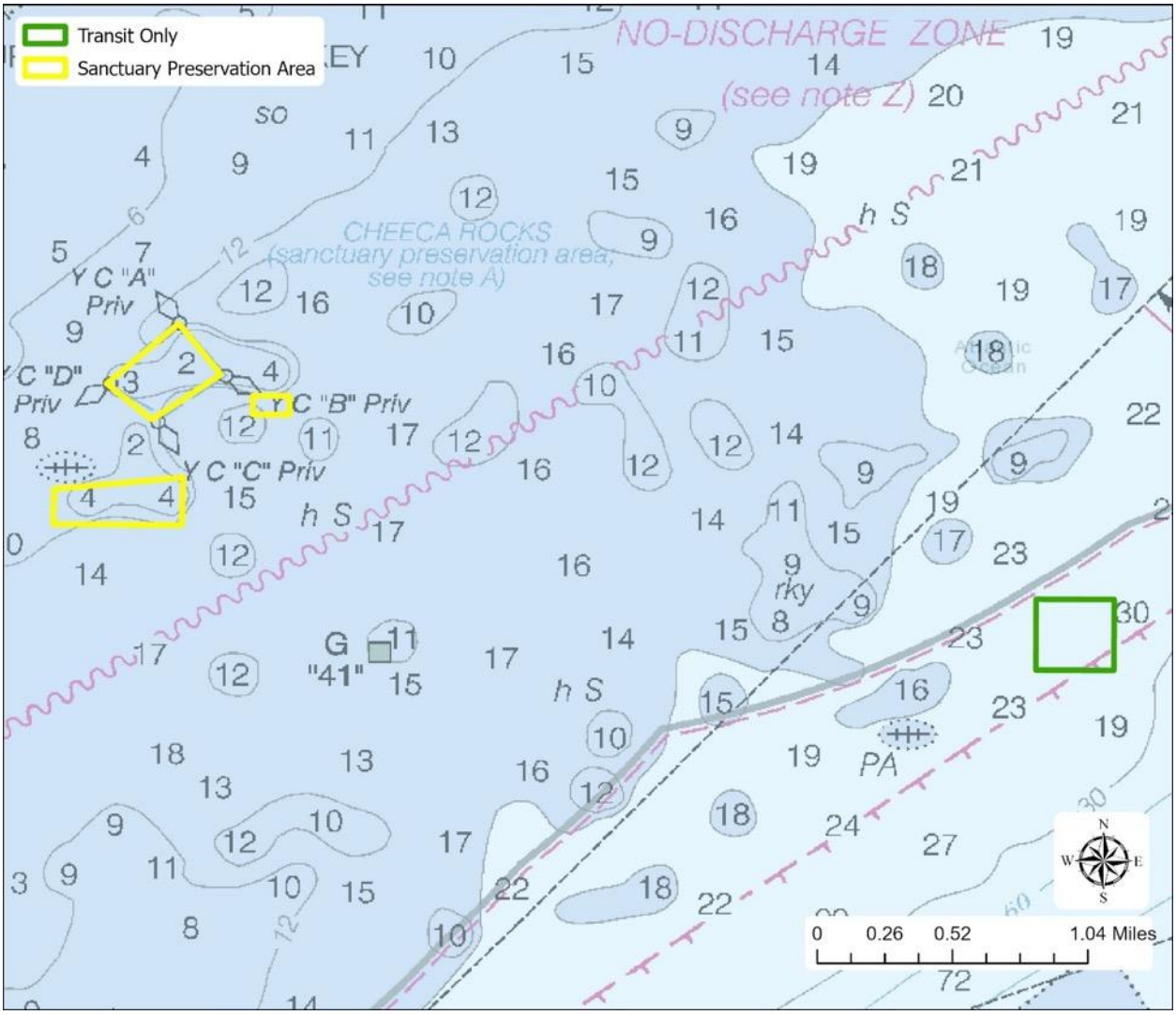


A no motor zone is in effect to reduce damage to seagrass and hardbottom habitats and to reduce disturbance to birds and fish. Tavernier Key WMA has been a sanctuary marine zone since 1997. The final preferred alternative maintains the existing no motor regulation and modifies the size slightly from approximately 1.57 square miles (1,003 acres) to 1.6 square miles (1,047 acres). Tavernier Creek and the unnamed channel to the northeast leading to Tavernier Creek are open for normal operation.

Middle Keys Region and Marine Zones



Cheeca Rocks Sanctuary Preservation Area and Cheeca Rocks East and Cheeca Rocks South Habitat Restoration Areas



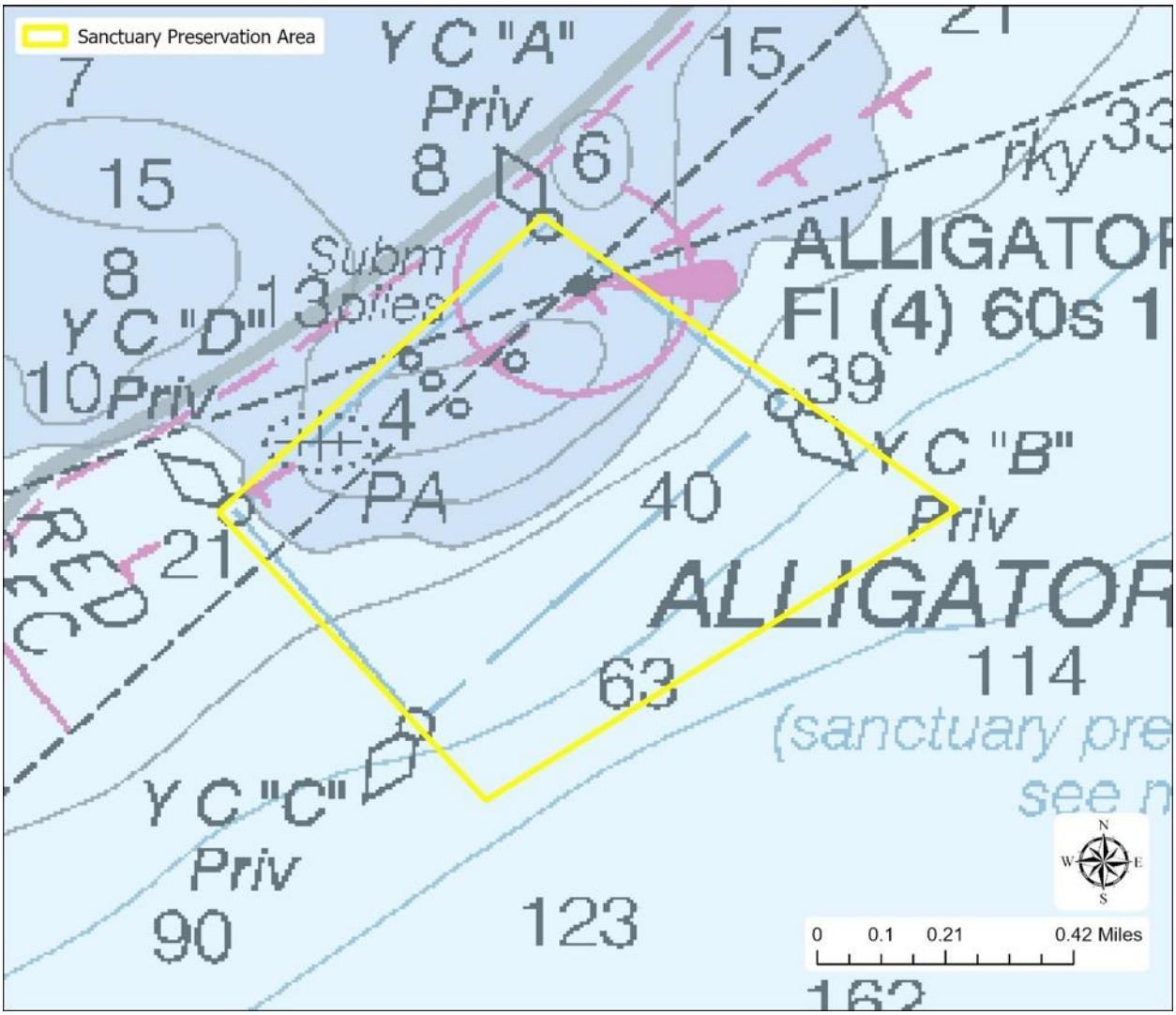
Cheeca Rocks SPA is home to endangered star corals and a high diversity of other boulder coral species. This isolated patch reef is an important site for climate change studies and other scientific research. Cheeca Rocks SPA, approximately 0.07 square miles (46 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

Cheeca Rocks Habitat Restoration East: The final preferred alternative includes this area as a new habitat restoration area that is approximately 0.01 square miles (5.9 acres).

Cheeca Rocks Habitat Restoration Area South: The final preferred alternative includes this area as a new habitat restoration area that is approximately 0.07 square miles (46 acres).

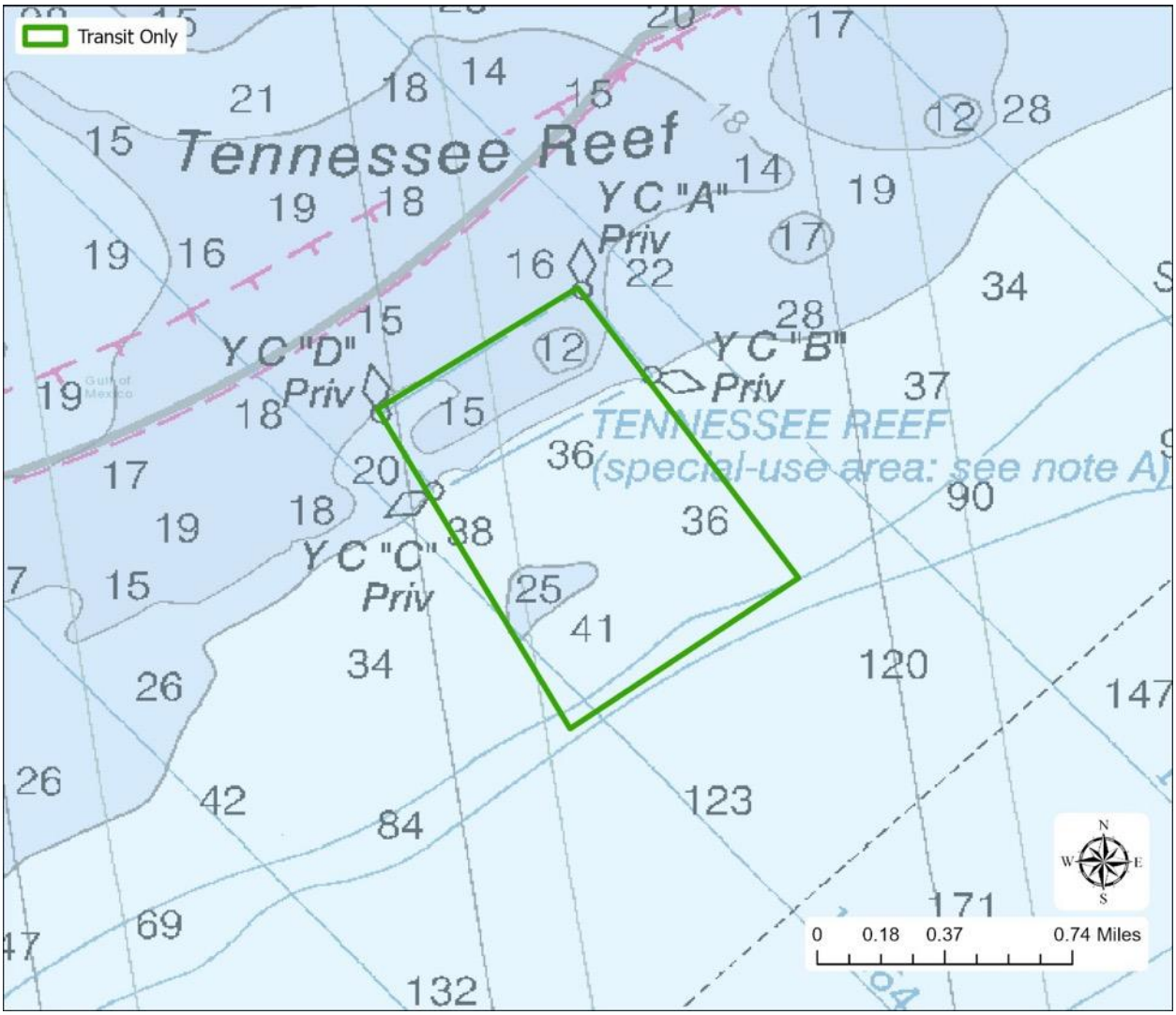
Islamorada Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.07 square miles (47 acres).

Alligator Reef Sanctuary Preservation Area



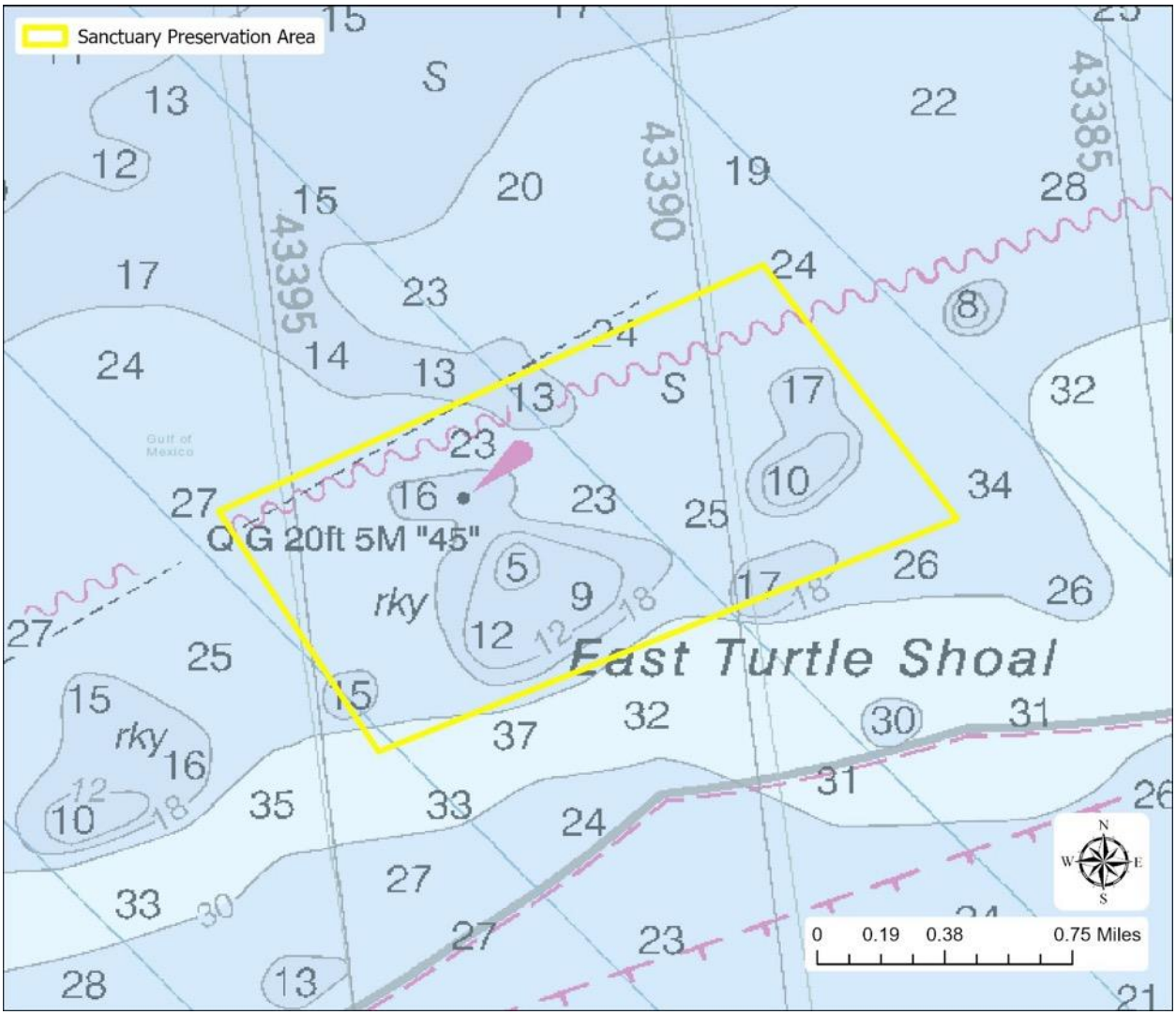
Alligator Reef SPA protects a coral reef ecosystem that marks a geological transition between shallow Upper and Middle Keys reefs. This area supports large aggregations of queen conch and historically contained extensive thickets of endangered staghorn corals. The historic Alligator Reef lighthouse is included in this SPA. This SPA is expanded to include deep reef coral assemblages. Alligator Reef SPA has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone, eliminates the current exception for catch and release fishing by trolling (all other existing regulations are maintained), and proposes to expand the zone by approximately 0.2 square miles (127 acres) for a total area of 0.52 square miles (334 acres).

Tennessee Reef Conservation Area



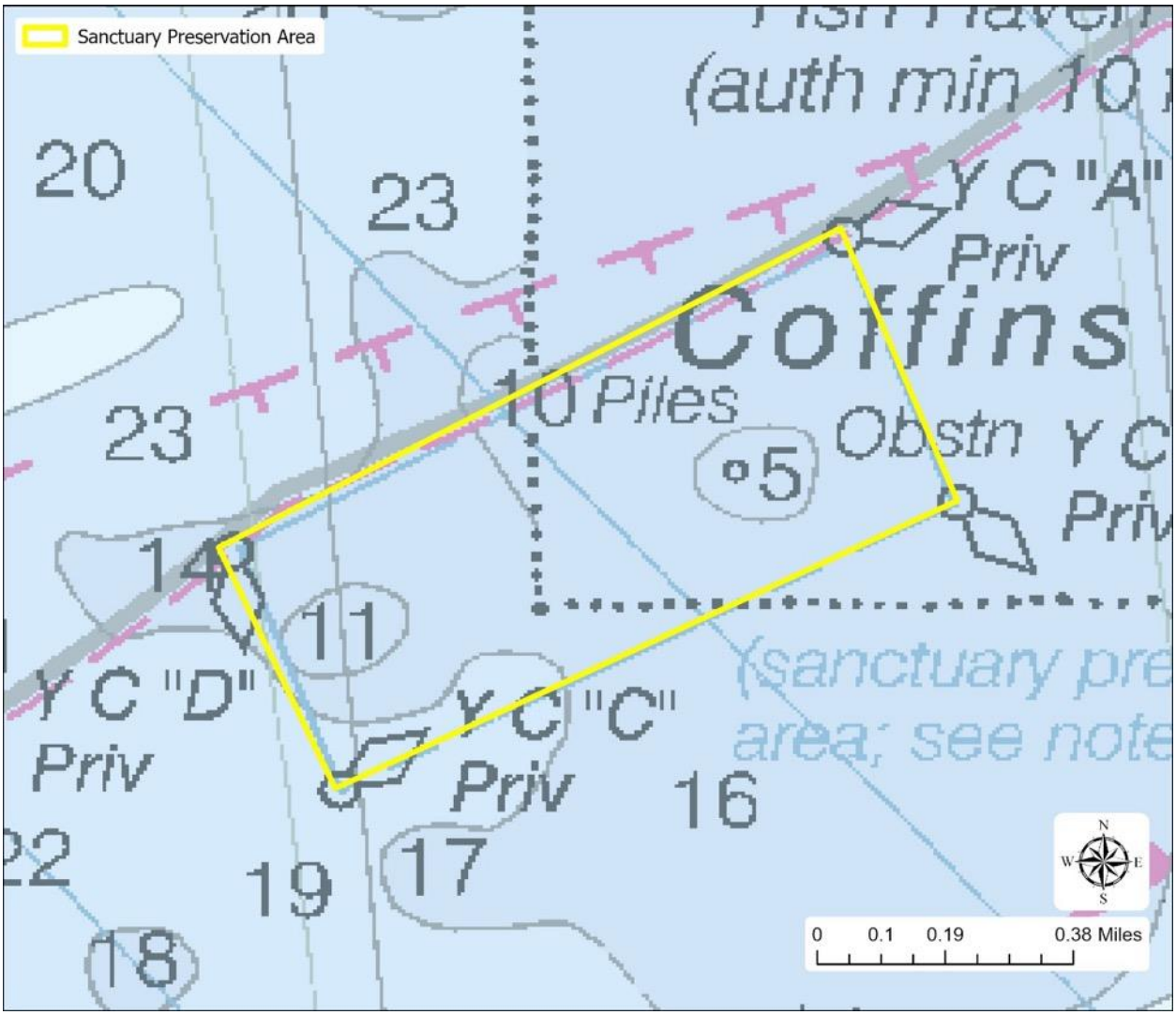
Tennessee Reef Conservation Area contains deep water assemblages of corals and sponges and was a historic site for endangered and threatened coral species. Tennessee Reef Conservation area is expanding to include deep water coral assemblages. Tennessee Reef has been a sanctuary marine zone since 1997. The final preferred alternative makes no change to regulations and proposes to expand this zone by approximately 0.53 square miles (336 acres) for a total area of 0.71 square miles (454 acres). Additionally, the zone type is changed from special use area to conservation area.

Turtle Shoal Sanctuary Preservation Area



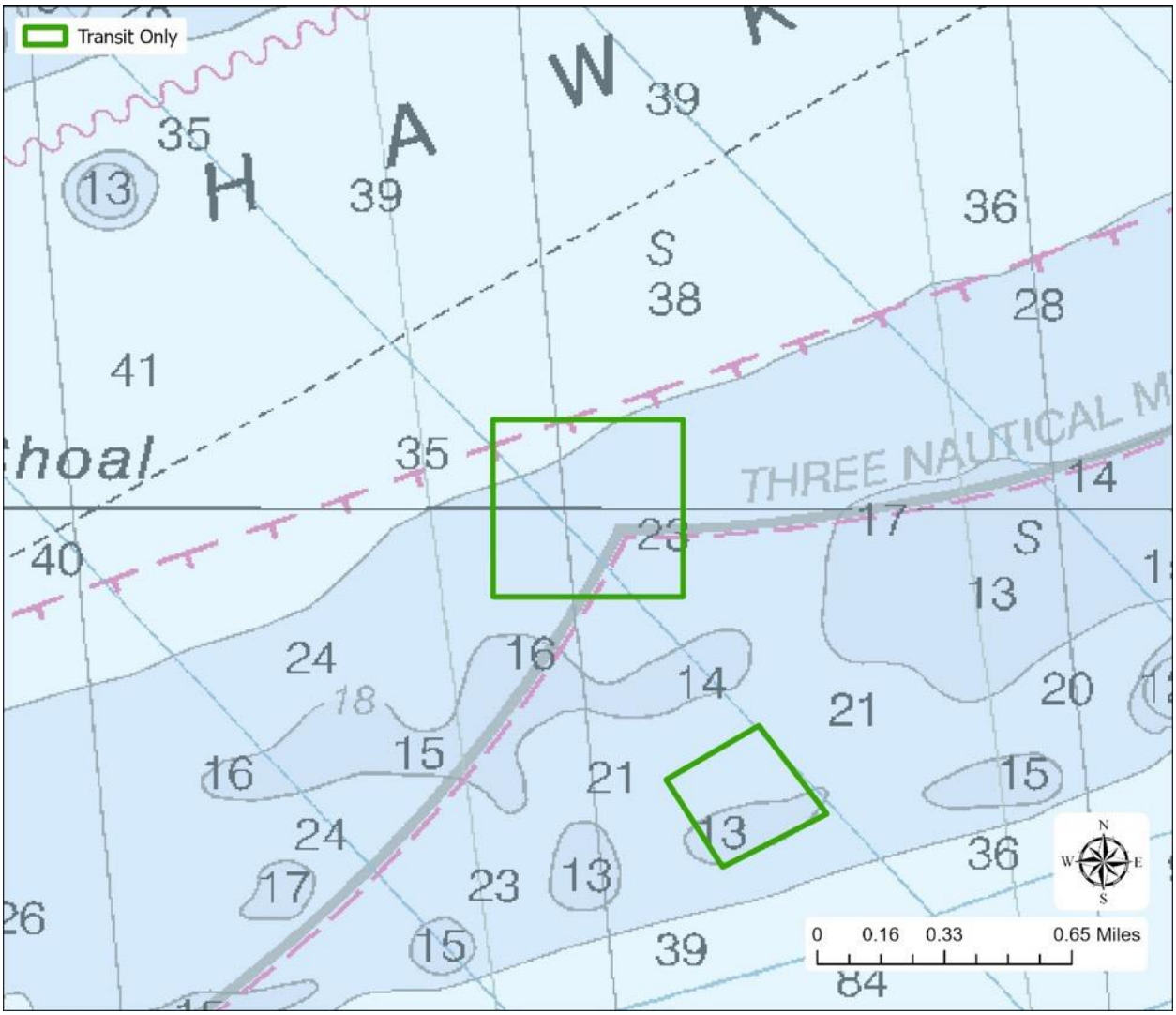
Turtle Shoal SPA protects an important complex of patch reefs surrounded by seagrass beds that historically supported populations of endangered staghorn and pillar corals. This area includes high stony coral cover, resilient reefs, and high fish diversity. The final preferred alternative includes this area as a new SPA that is approximately 1.4 square miles (904 acres).

Coffins Patch Sanctuary Preservation Area



This SPA protects a diverse coral reef ecosystem with one of the most prominent reef walls in the Florida Keys. This area historically protected one of the largest populations of endangered staghorn, elkhorn, and pillar corals. Coffins Patch SPA, approximately 0.39 square miles (248 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

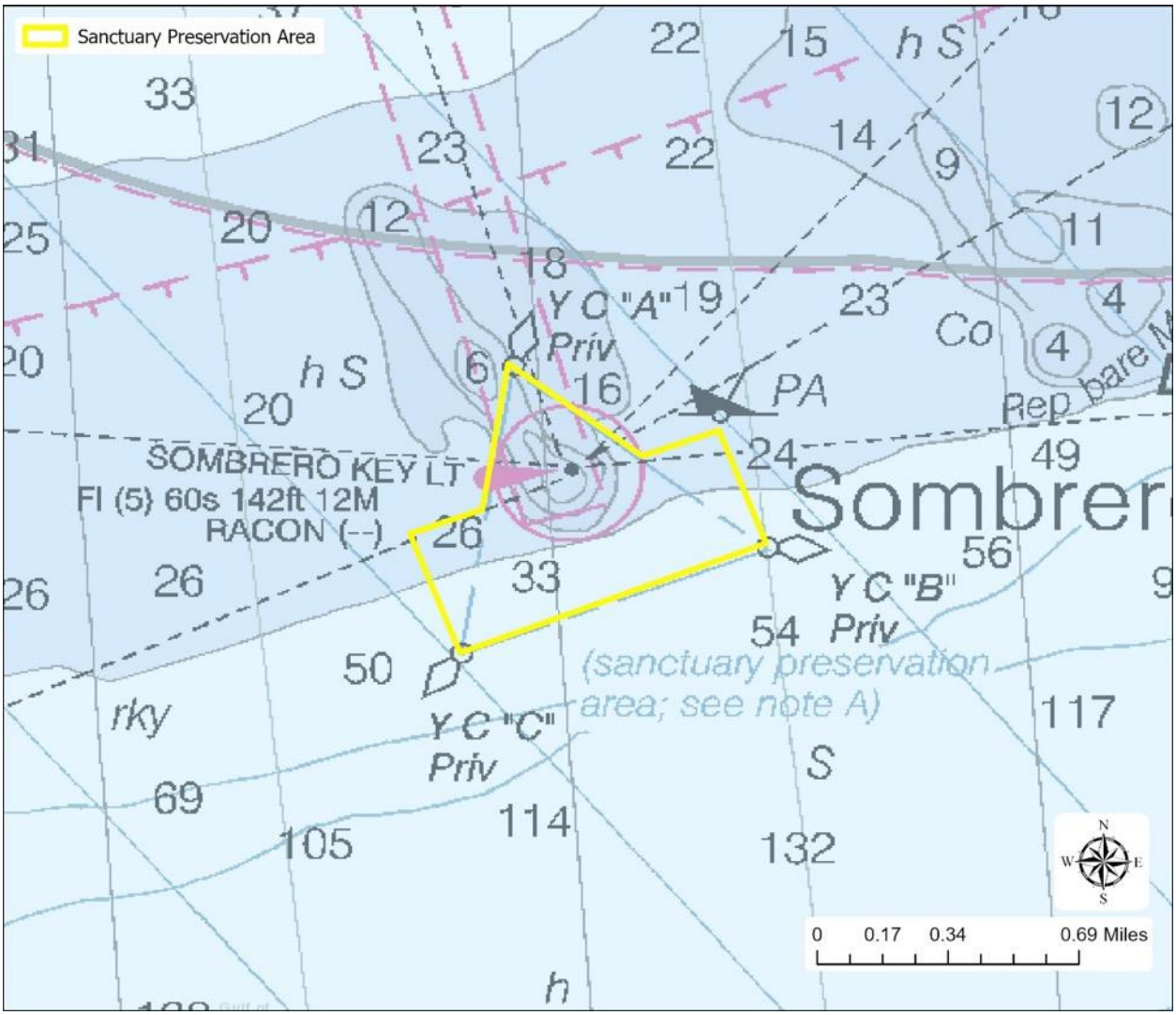
Marathon and Middle Keys Nursery Restoration Areas



Marathon Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.2 square miles (127 acres).

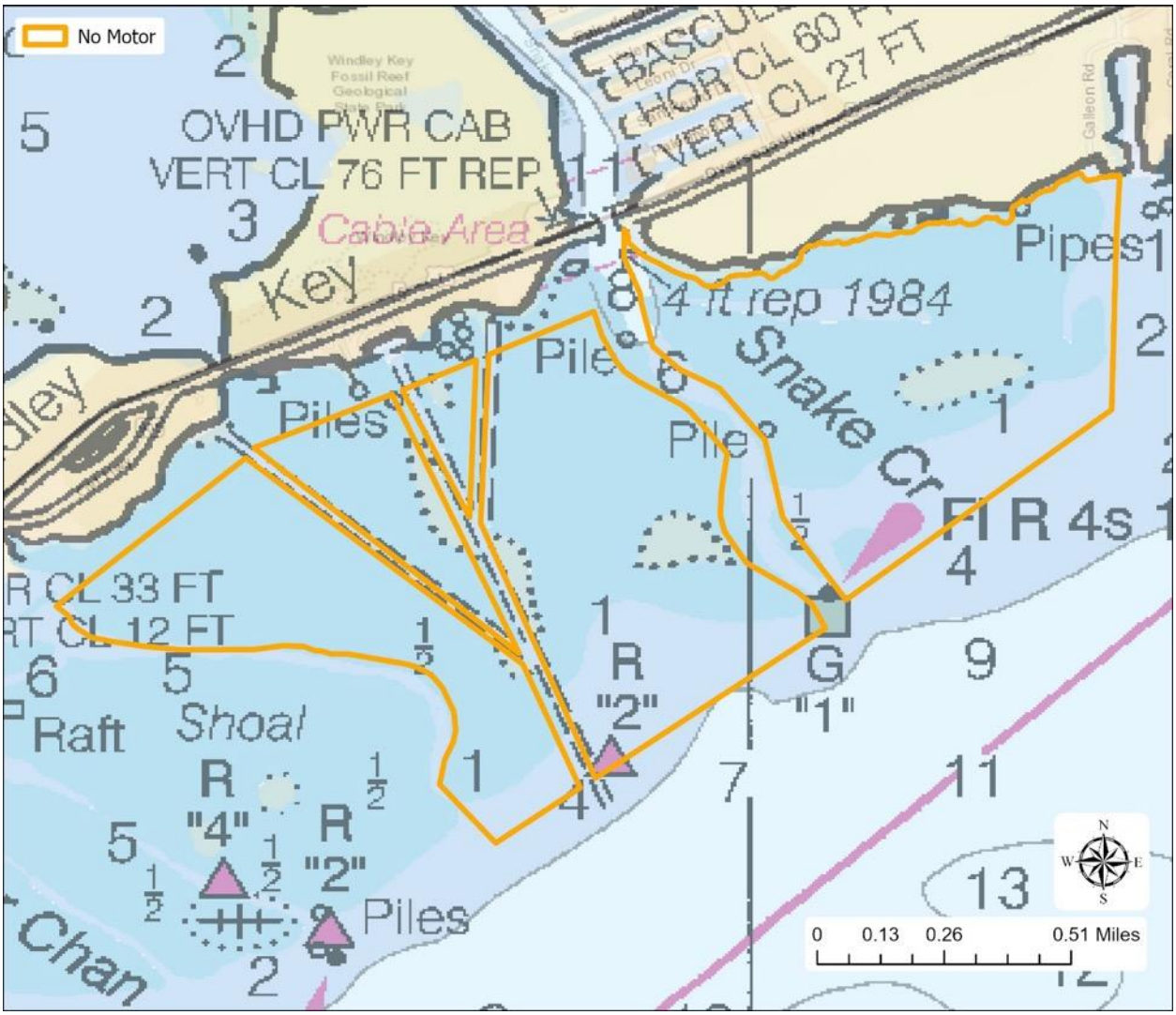
Middle Keys Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.07 square miles (45 acres).

Sombrero Key Sanctuary Preservation Area



Sombrero Key SPA is home to the most extensive spur and groove and deep fore reef community in the Middle Keys. Sombrero Reef is also home to endangered star coral and elkhorn coral populations, as well as brain corals and barrel sponges. The historic Sombrero Key lighthouse is included in this SPA. Sombrero Key SPA has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone, eliminates the current exception for catch and release fishing by trolling (all other existing regulations are maintained), and proposes to expand the zone by approximately 0.07 square miles (41 acres) for a total area of 0.33 square miles (208 acres).

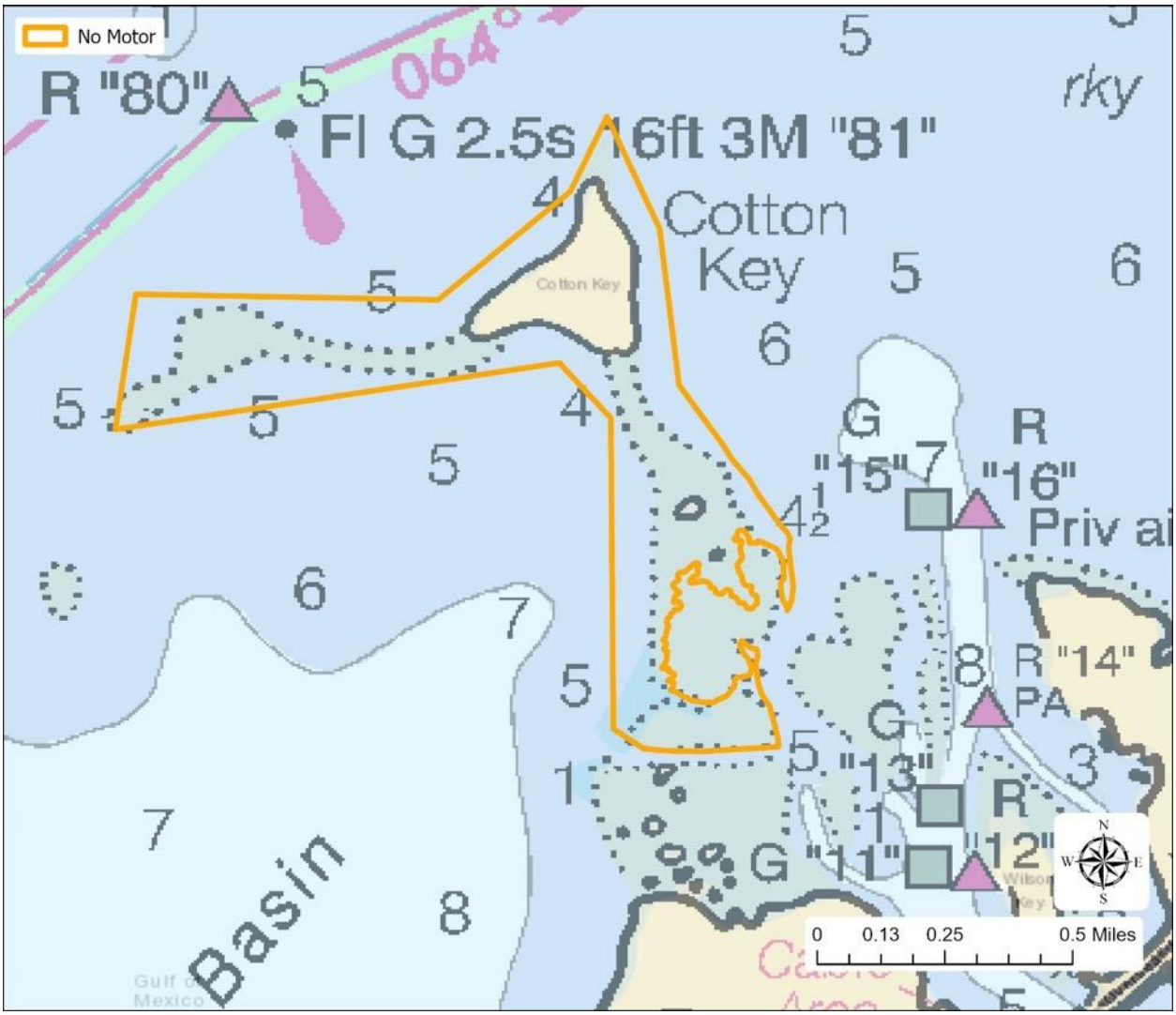
Snake Creek Wildlife Management Area



A no motor zone is in effect to reduce damage to seagrass and hardbottom habitats and to reduce disturbance to birds and fish. Snake Creek WMA has been a sanctuary marine zone since 1997.

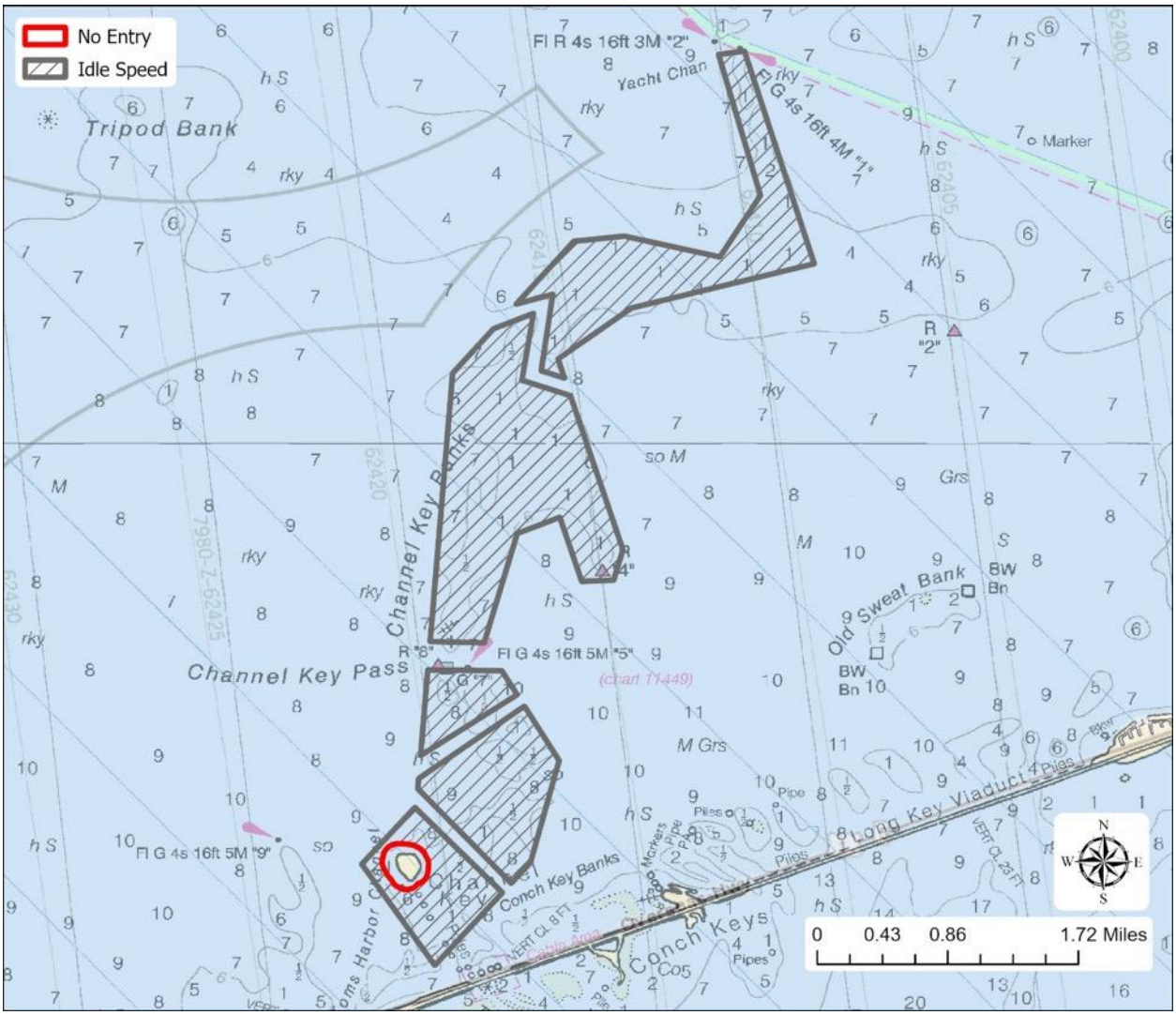
The final preferred alternative maintains the existing no motor regulation and modifies the size from approximately 0.42 square miles (271 acres) to 1.1 square miles (686 acres). Snake Creek and the three channels providing access to Windley Key are open for normal operation. This WMA is adjacent to existing Monroe County no motor zones.

Cotton Key Wildlife Management Area



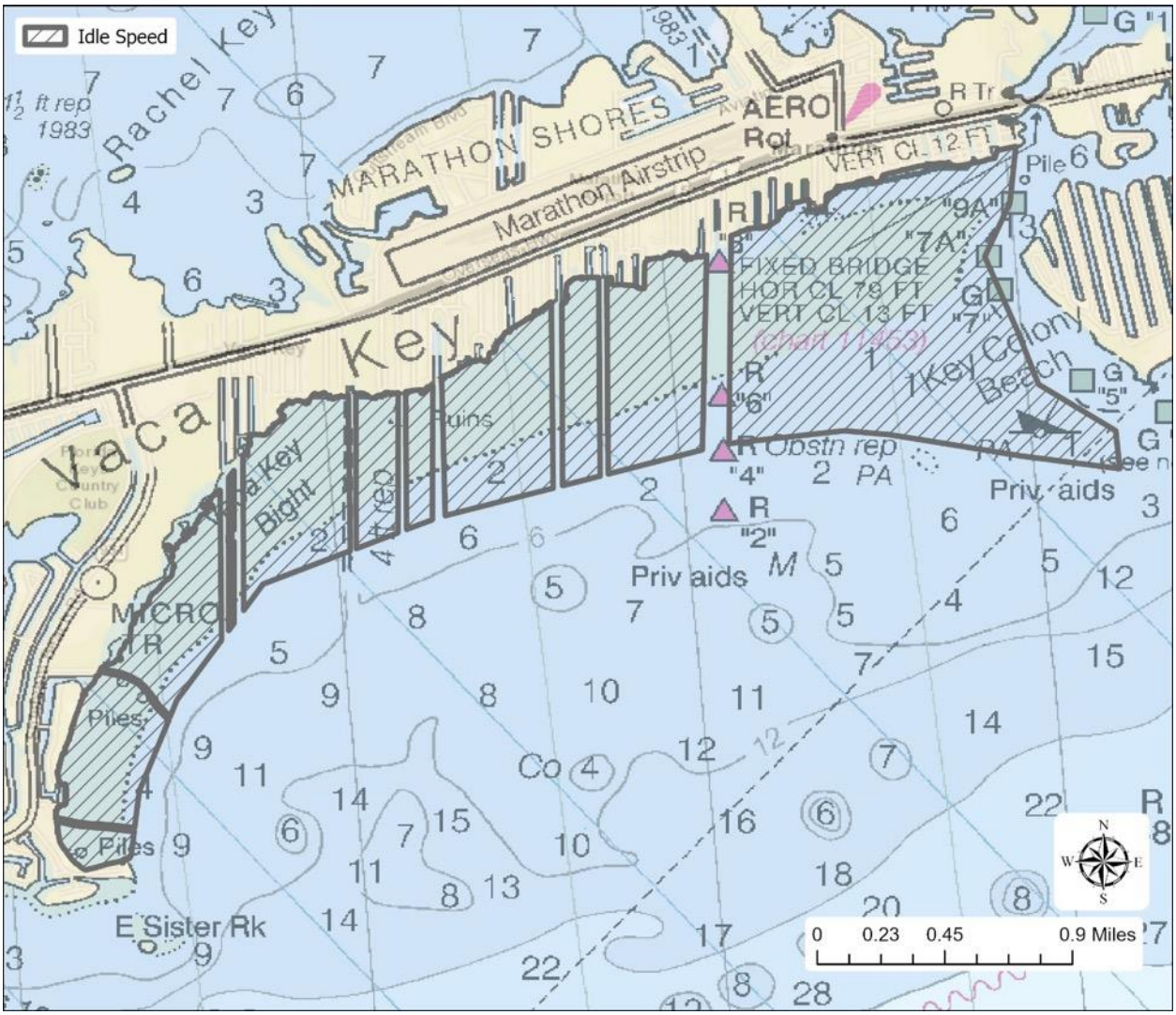
A no motor zone is in effect to reduce damage to seagrass and hardbottom habitats and to reduce disturbance to birds and fish. The existing no motor zone was expanded to protect additional area with heavy prop scarring. Cotton Key WMA has been a sanctuary marine zone since 1997. The final preferred alternative maintains the existing no motor regulation and modifies the size from approximately 0.19 square miles (124 acres) to 0.34 square miles (215 acres).

Channel Key Banks Wildlife Management Area



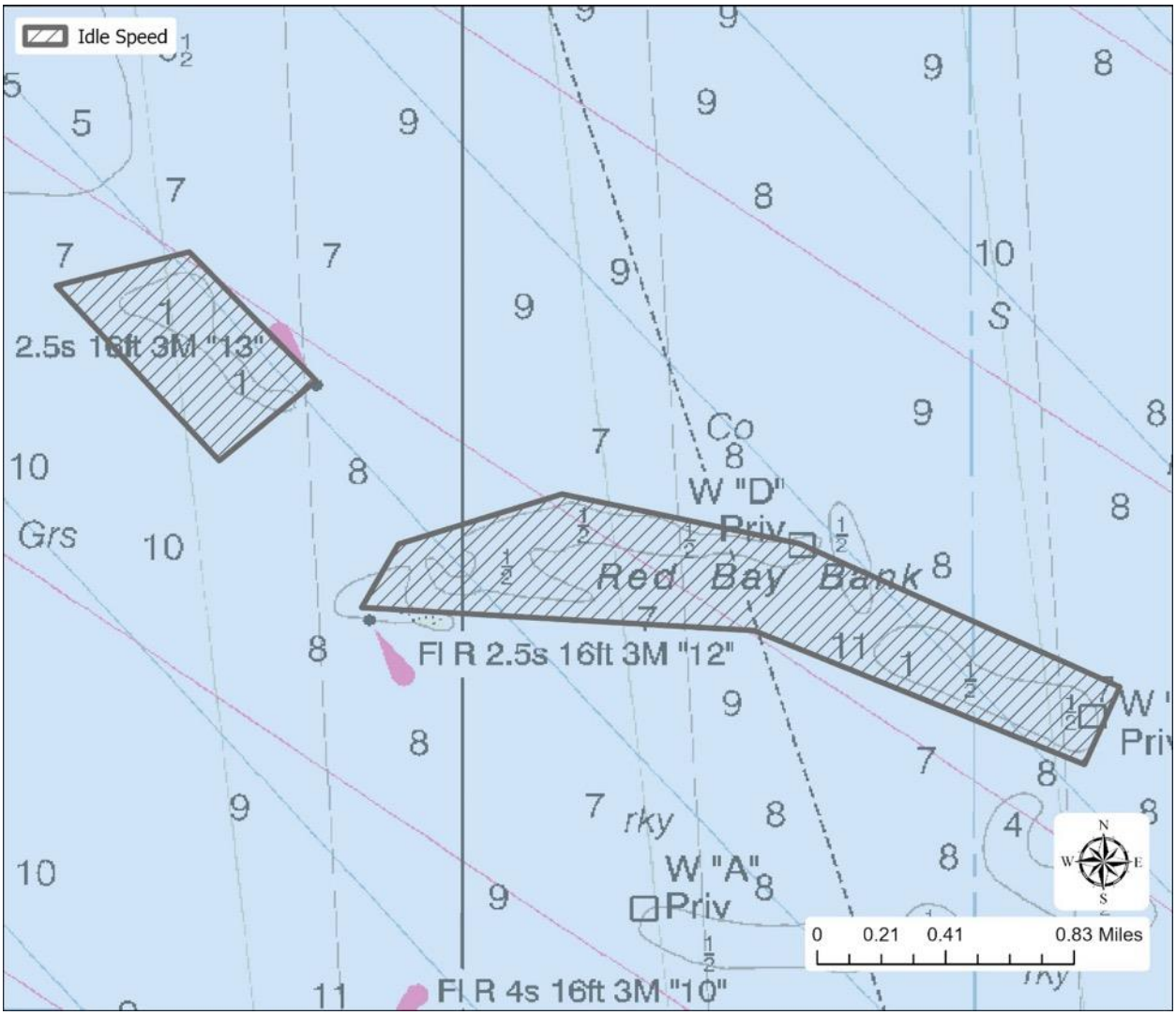
As an area that can be difficult to navigate, a no wake zone is in place to protect this area from boat groundings. In addition, the minimum 100-yard distance no entry zone around Channel Key is to protect wading and migratory bird populations who may use this area to rest and nest. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 3.3 square miles (2, 106 acres). This WMA also includes a 0.04 square mile (29 acres) no entry area around Channel Key. The total area zoned is approximately 3.34 square miles (2,135 acres).

Marathon Oceanside Shoreline Wildlife Management Area



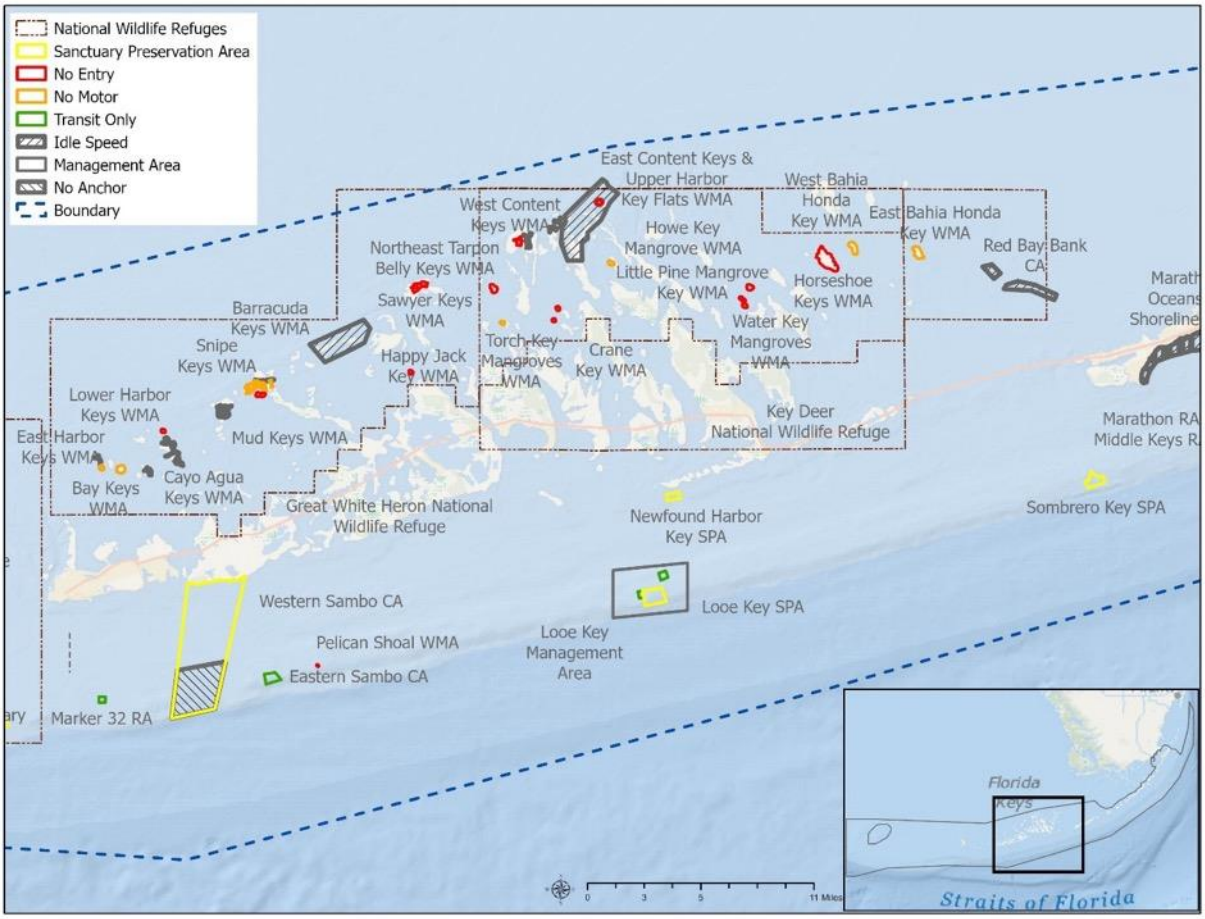
This idle speed no wake zone is in effect to reduce prop scars and vessel groundings, which have severely impacted this area. Established channels are open for normal operation. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 1.2 square miles (1,252 acres). Channels providing access to Marathon are open for normal operation.

Red Bay Bank Wildlife Management Area

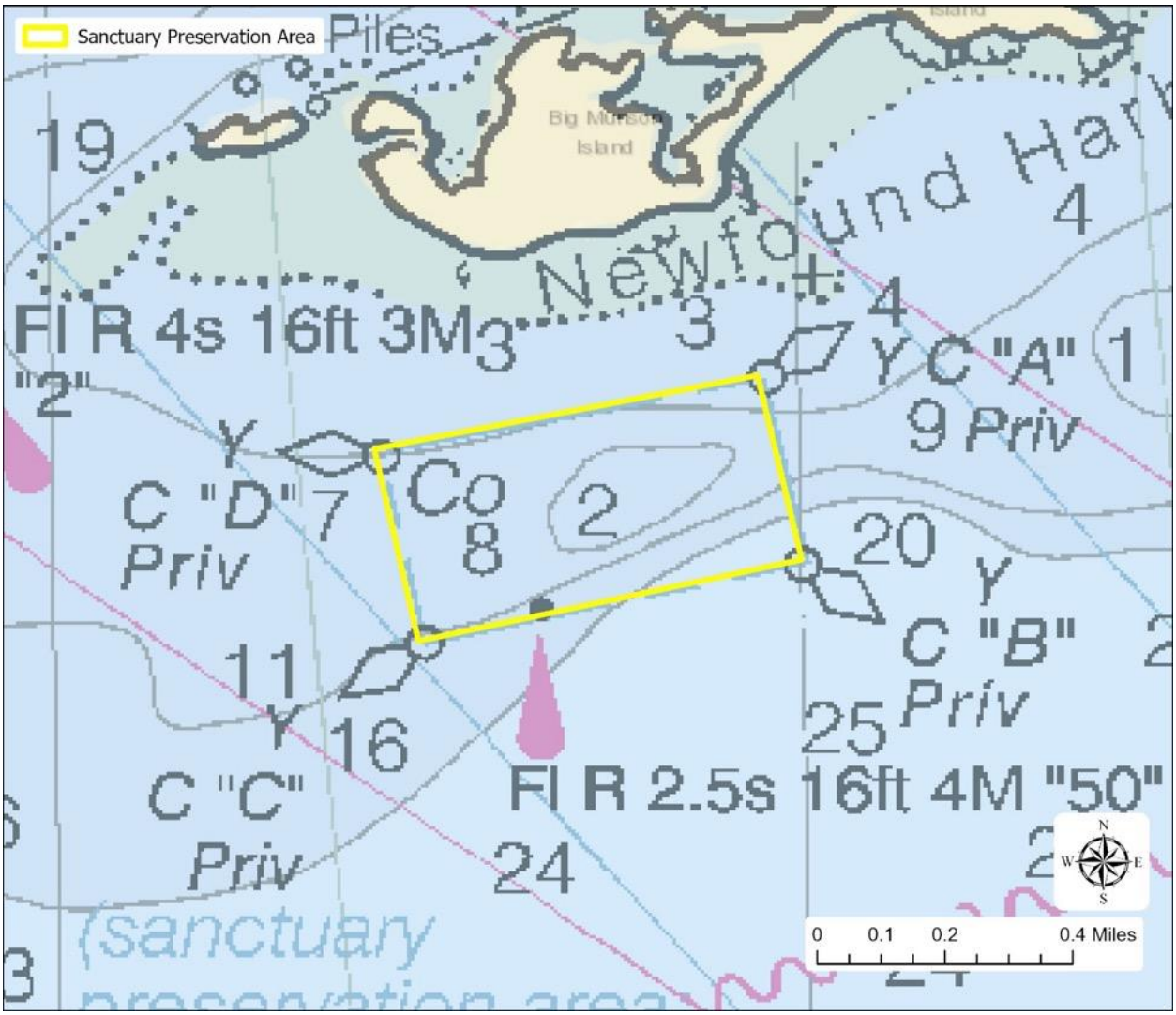


As an area that can be difficult to navigate, a no wake zone is in place to protect this area from boat groundings. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 0.93 square miles (593 acres).

Lower Keys Region and Marine Zones

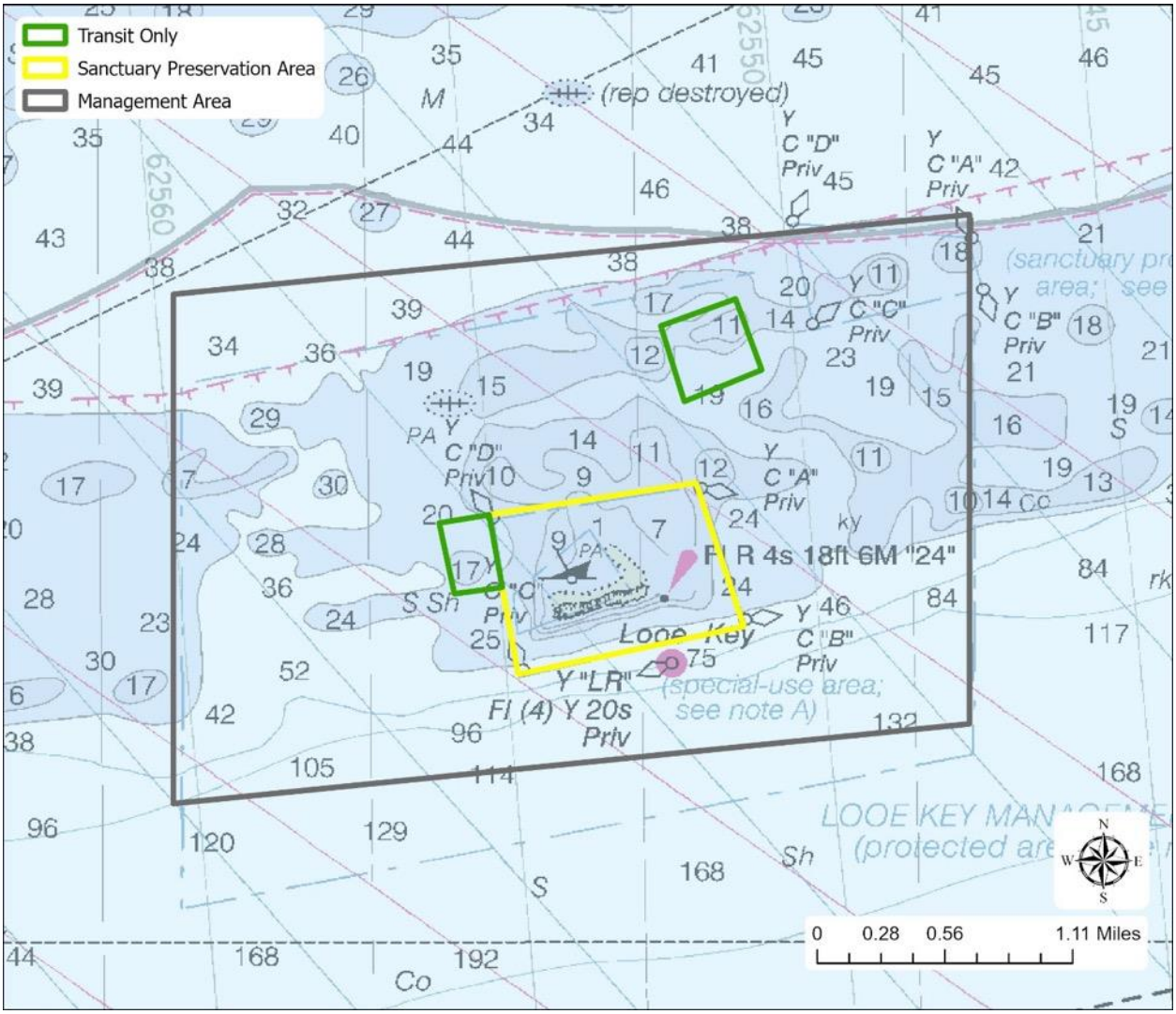


Newfound Harbor Key Sanctuary Preservation Area



Newfound Harbor SPA is an important nearshore patch reef in the Lower Keys that historically supports endangered staghorn and star corals. It is one of the seven Mission: Iconic Reefs Sites and serves as an important educational site. Newfound Harbor SPA, approximately 0.17 square miles (107 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

Looe Key Management Area, Looe Key Sanctuary Preservation Area, and Looe Key East and Looe Key West Nursery Restoration Areas



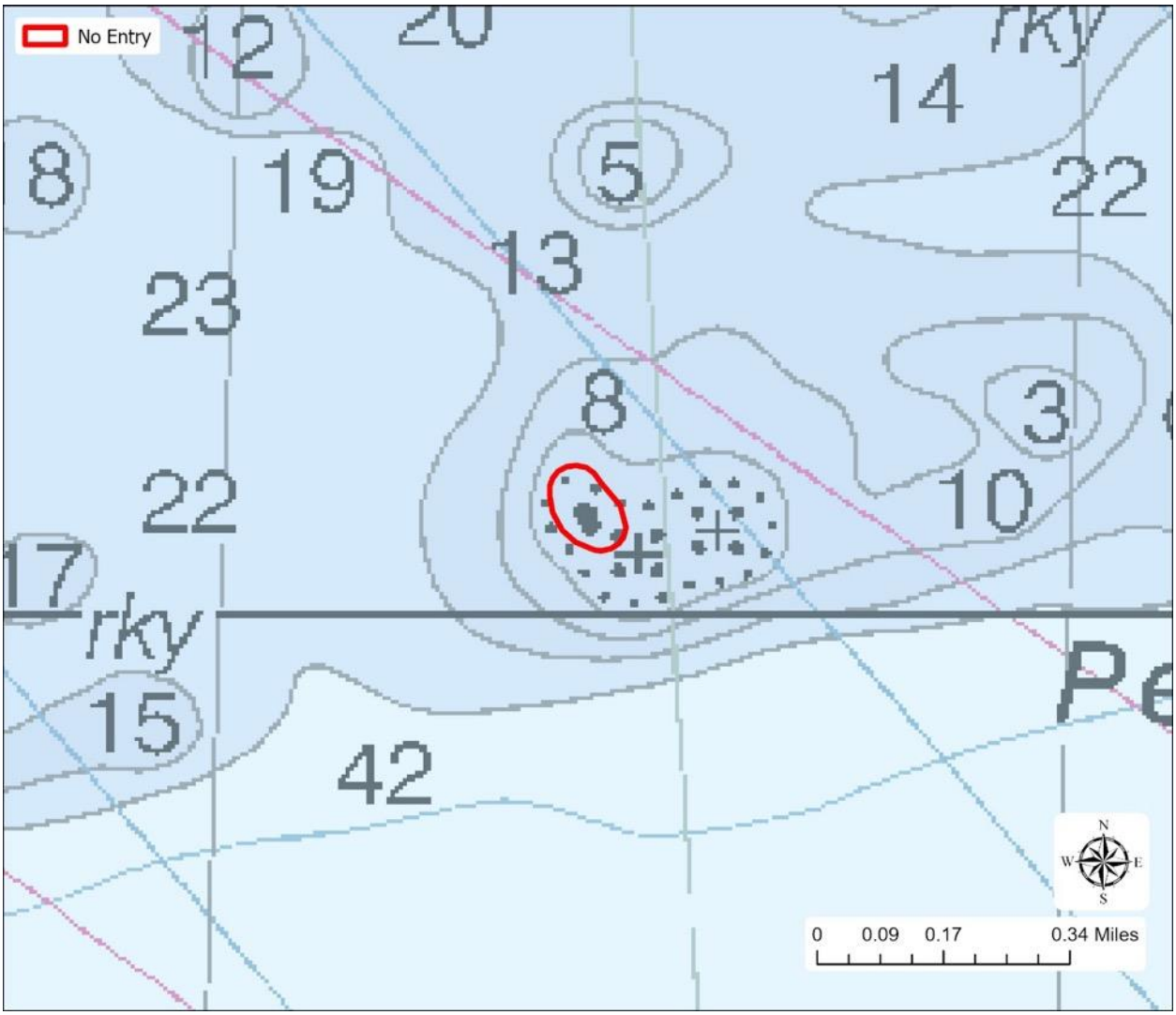
Looe Key Management Area: a premier snorkel and dive destination for its high relief spur and groove habitats. Historically, this area supported rare and endangered species of coral. It is also home to a sanctuary preservation area, three restoration areas, and populations of threatened and endangered coral species. Designated in 1981 as a national marine sanctuary, Looe Key Management Area is approximately 6.9 square miles (4,425 acres). The final preferred alternative proposes no change to this zone's area or regulations.

Looe Key SPA is one of the most visited sites in Florida Keys National Marine Sanctuary, and protects coral reef habitats and other important bottom communities like seagrass. Looe Key SPA, approximately 0.58 square miles (374 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

Looe Key East Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.12 square miles (69 acres).

Looe Key West Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.06 square miles (39 acres).

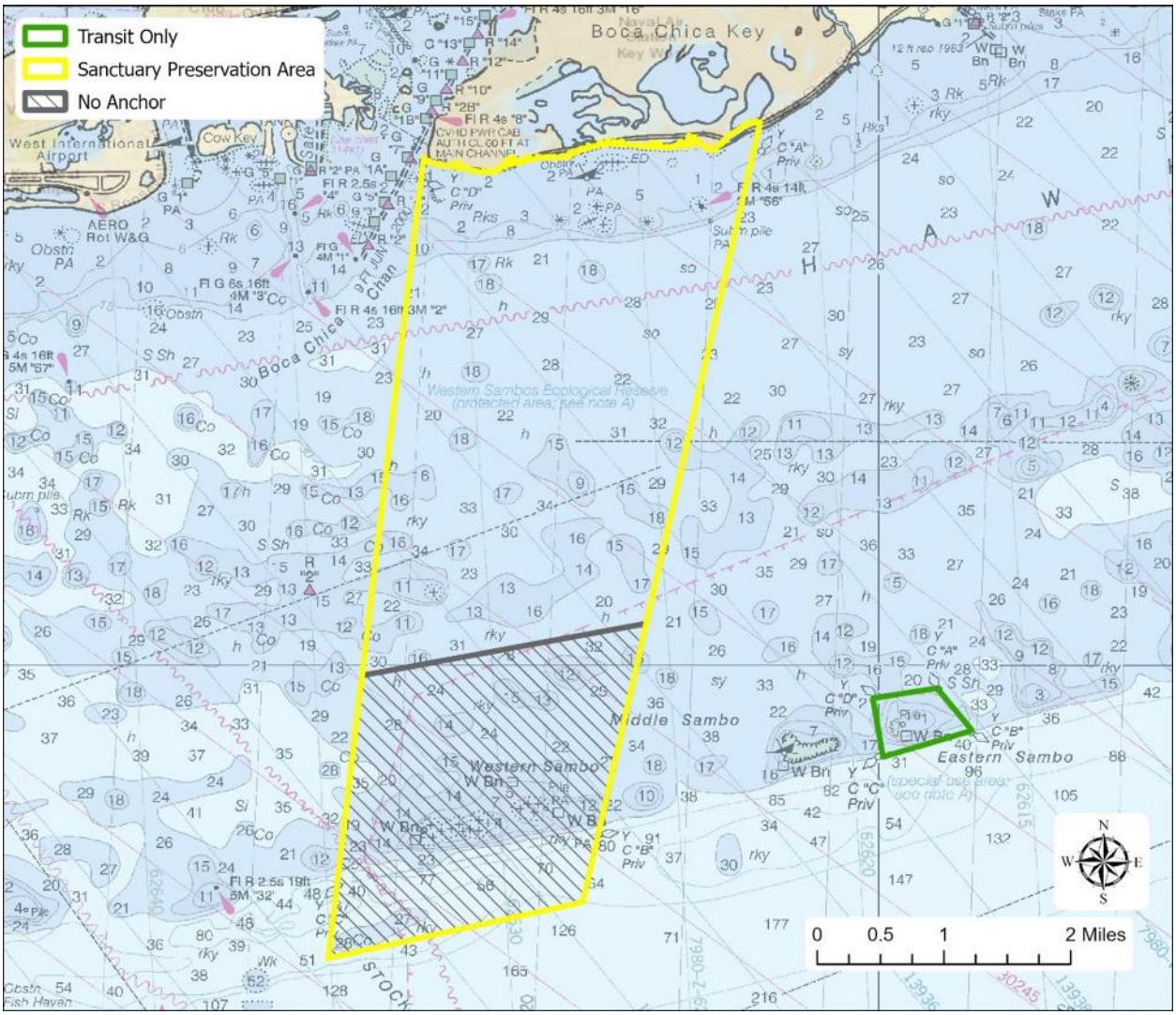
Pelican Shoal Wildlife Management Area



This existing wildlife management area maintains a minimum 100-yard distance no entry zone is to protect bird populations who may use this area to nest. This area is thought to be the last active ground-breeding location in Florida for roseate terns and endangered species.

This area is also managed as a state critical wildlife area. Pelican Shoal WMA (approximately 0.01 square miles; 4.5 acres) has been a sanctuary marine zone since 1997. The final preferred alternative changes the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. This area is also a FWC Critical Wildlife Area.

Eastern Sambo and Western Sambo Conservation Areas

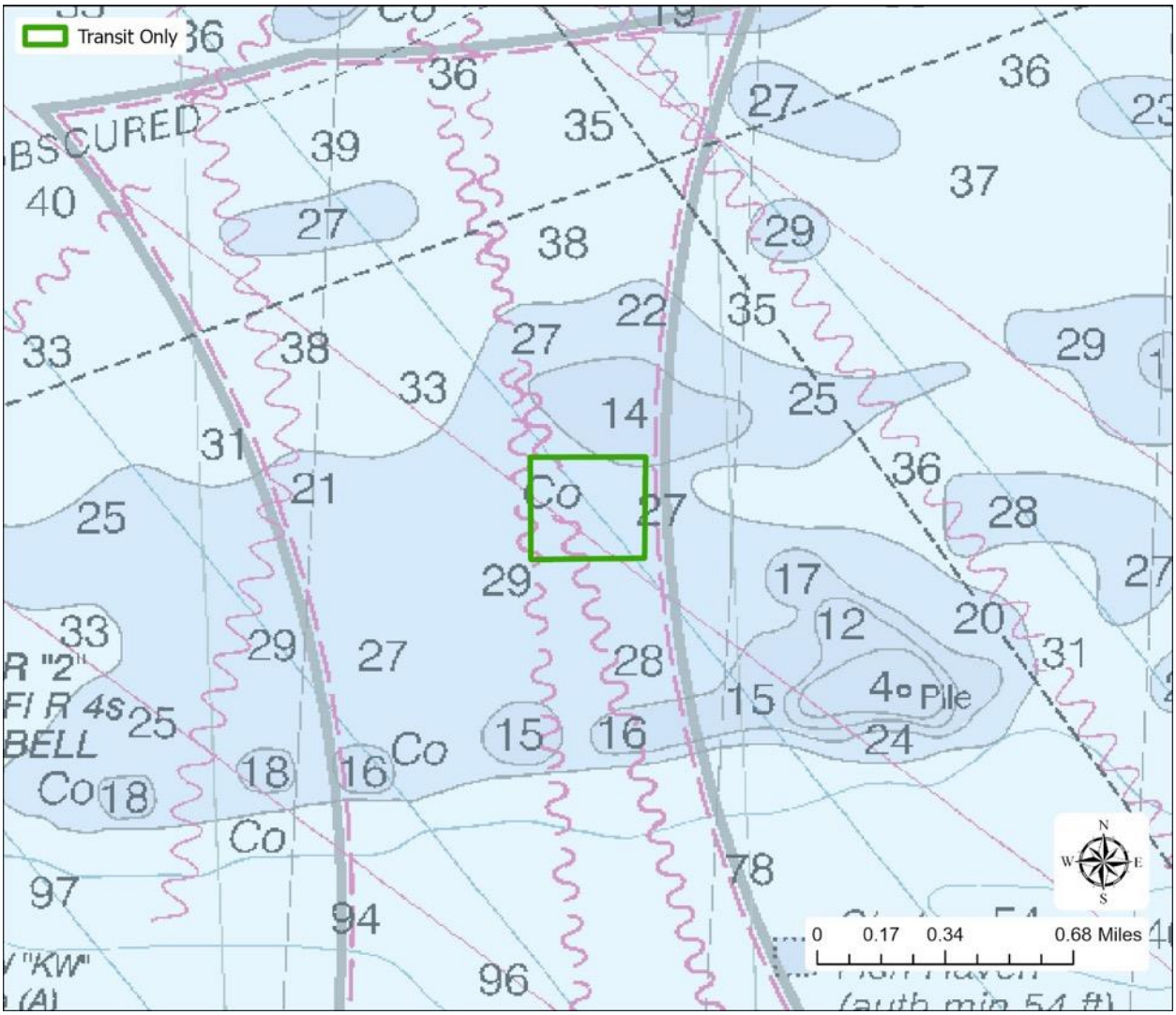


Eastern Sambo Conservation Area was historically home to threatened and endangered species of coral and is an important breeding site for queen conch. The area has been a sanctuary marine zone since 1997. Eastern Sambo, approximately 0.24 square miles (154 acres) has been a marine zone since 1997. The final preferred alternative proposes no change to this zone's area or regulations. The only change is the zone type from special use area to conservation area.

Western Sambo Conservation Area protects a large area of interconnected and diverse coral reefs, seagrass, and hardbottom communities. This zone provides a corridor for the migration of juvenile and adult fish and invertebrate populations as they move through their life cycle and protects a known lobster spawning area. This zone is expanding to include deep reef coral assemblages and a no anchor zone was added in the area of greatest high relief coral to protect these corals from anchor damage. Western Sambo has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation in the offshore high relief reef area, all other existing regulations are maintained. This zone is proposed to be expanded by approximately 5.1 square miles (3,248 acres) for a total area of 16.7 square miles

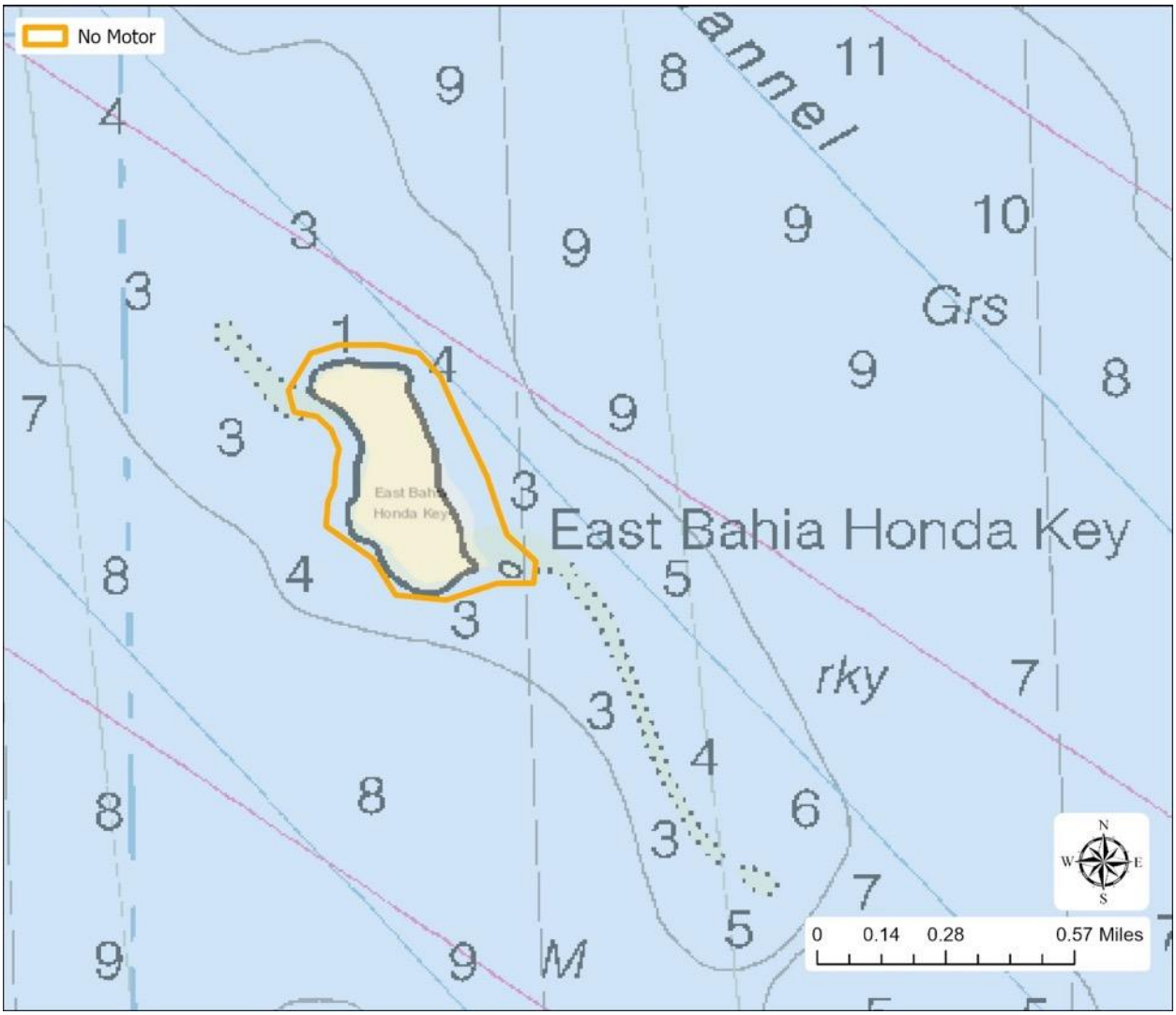
(10,679 acres); of this total area, the proposed no anchor regulation would apply in approximately 4.1 square miles (2631 acres). Additionally, the zone type is changed from ecological reserve to conservation area.

Marker 32 Nursery Restoration Area



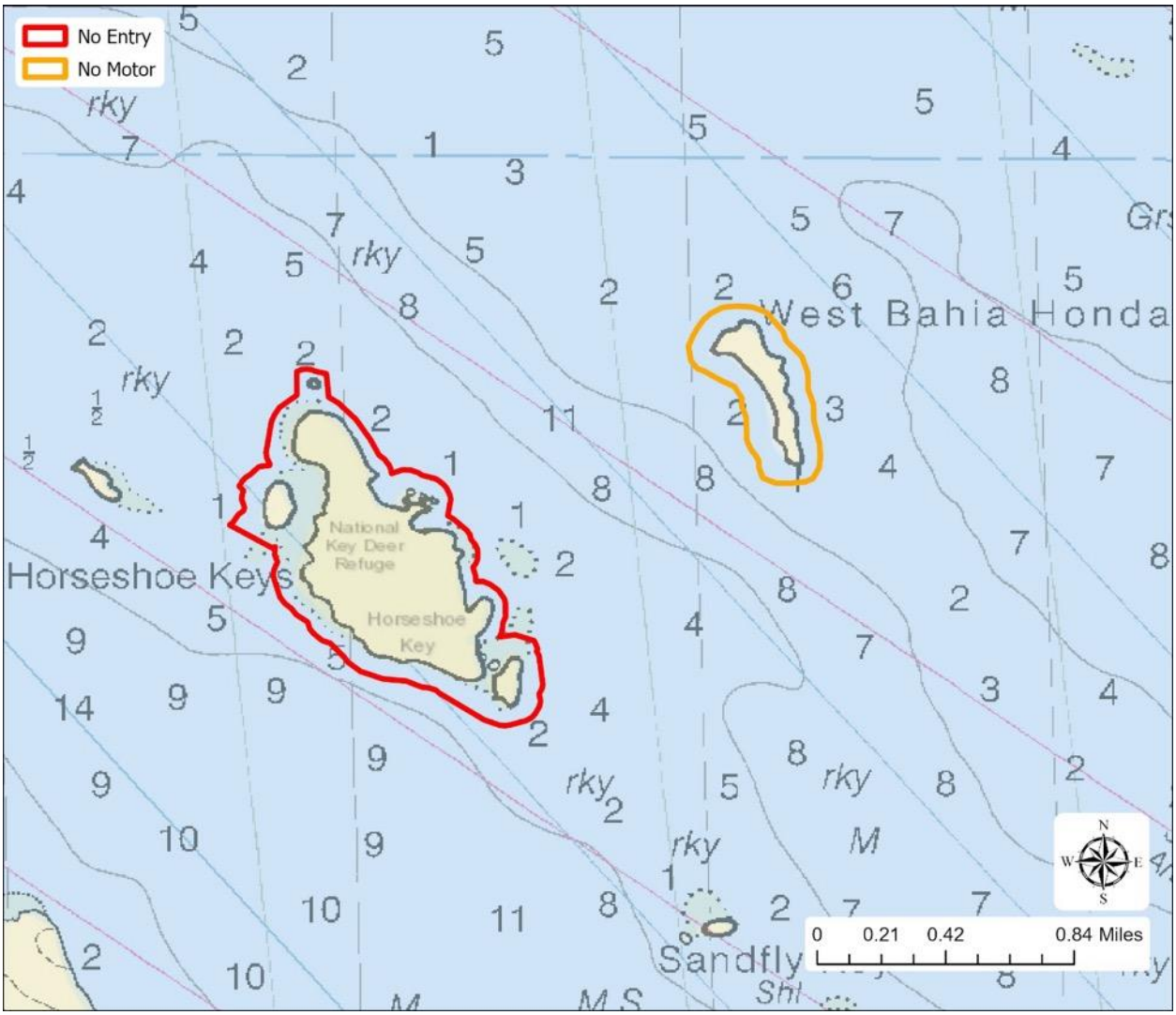
The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.07 square miles (48 acres).

East Bahia Honda Key Wildlife Management Area



This no motor zone is in effect to protect many birds who use this area to find food and nest. This area is an important nesting ground for white-crowned pigeons and great white herons. The final preferred alternative includes this area as a new no motor wildlife management area that is approximately 0.8 square miles (52 acres). This WMA is within the Great White Heron National Wildlife Refuge.

West Bahia Honda Key and Horseshoe Keys Wildlife Management Area

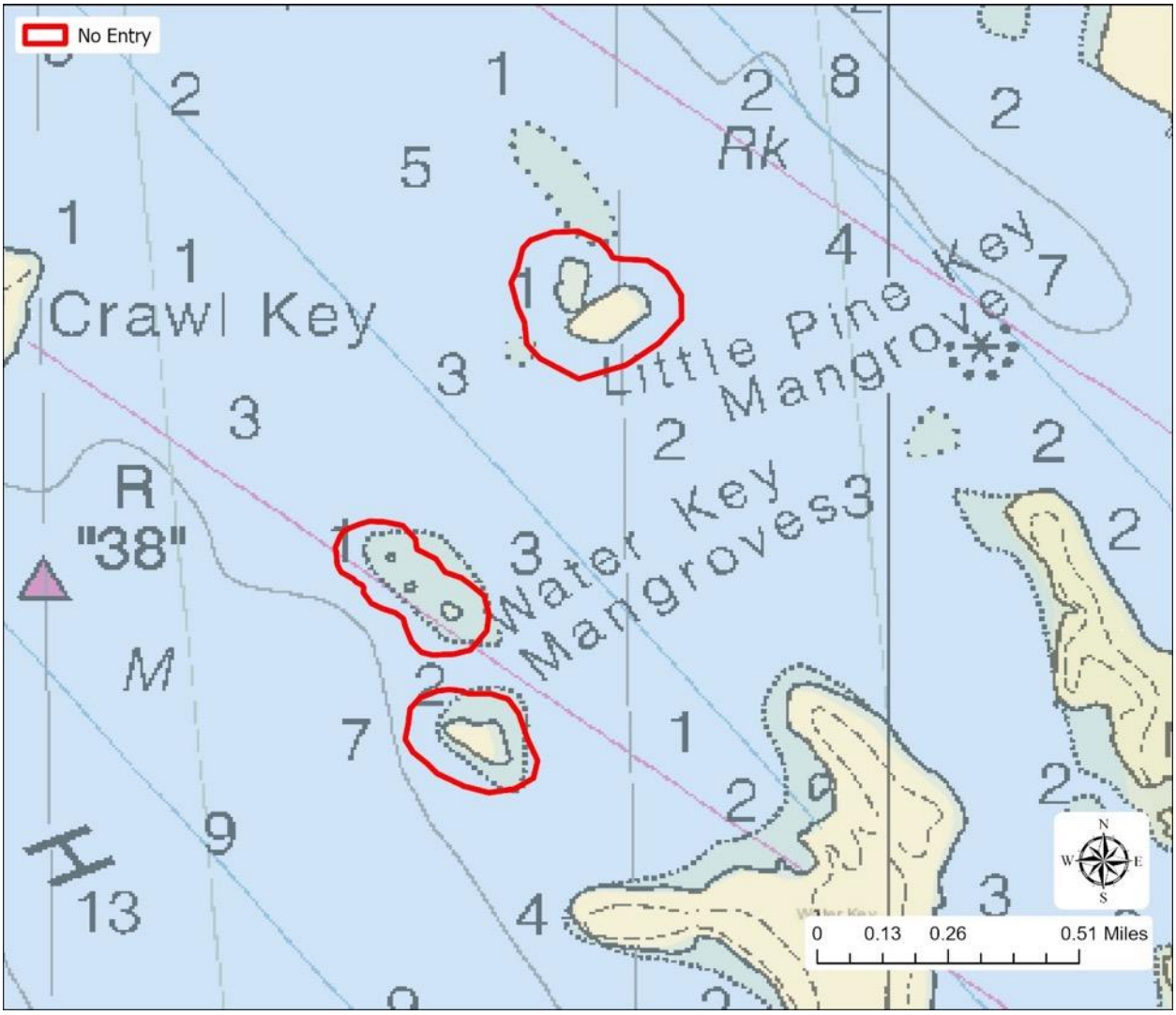


West Bahia Honda Key WMA: This no motor zone is in effect to protect wading birds, white-crowned pigeons, and bald eagles who use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no motor wildlife management area that is approximately 0.9 square miles (58 acres). This WMA is within the National Key Deer National Wildlife Refuge.

Horseshoe Keys WMA: This minimum 100-yard distance no entry zone is to protect birds like white-crowned pigeons, great white herons, and more who may use this area to nest, rest, and eat. Horseshoe Key WMA has been a sanctuary marine zone since 1997.

The final preferred alternative expands this zone slightly from approximately 0.17 square miles (107 acres) to approximately 0.22 square miles (134 acres) and changes the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. This WMA is within the National Key Deer National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

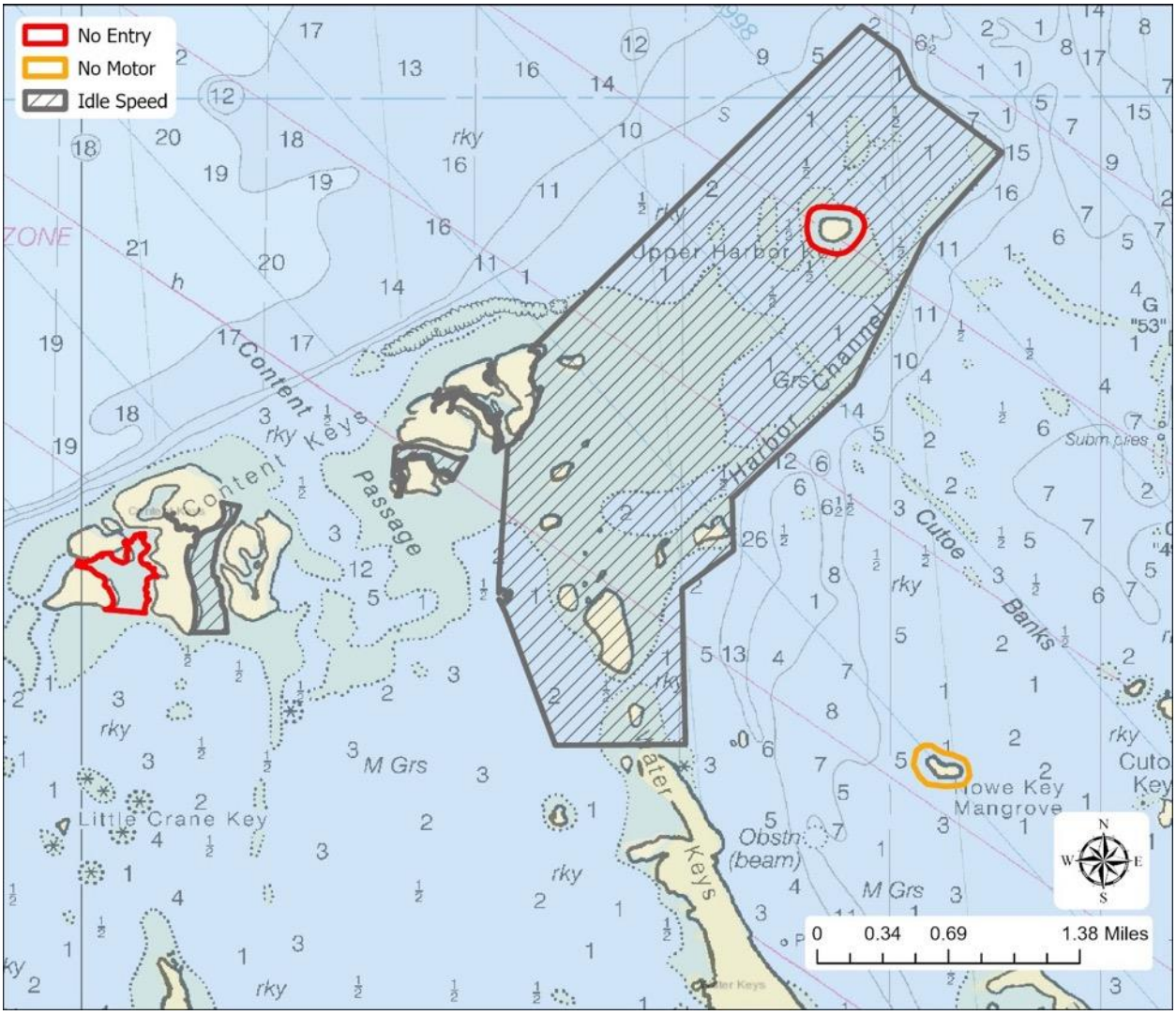
Little Pine Key Mangrove and Water Key Mangroves Wildlife Management Area



Little Pine Key Mangrove WMA: This minimum 100-yard distance no entry zone is to protect birds like reddish egrets, great white herons, and more who may use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.05 square miles (30 acres). This WMA is within the National Key Deer National Wildlife Refuge.

Water Key Mangroves WMA: This minimum 100-yard distance no entry zone is to protect birds like reddish egrets, great white herons, and more who may use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.07 square miles (44 acres). This WMA is within the National Key Deer National Wildlife Refuge.

East Content Keys and Upper Harbor Key Flats Wildlife Management Area, West Content Keys, and Howe Key Mangrove Wildlife Management Area



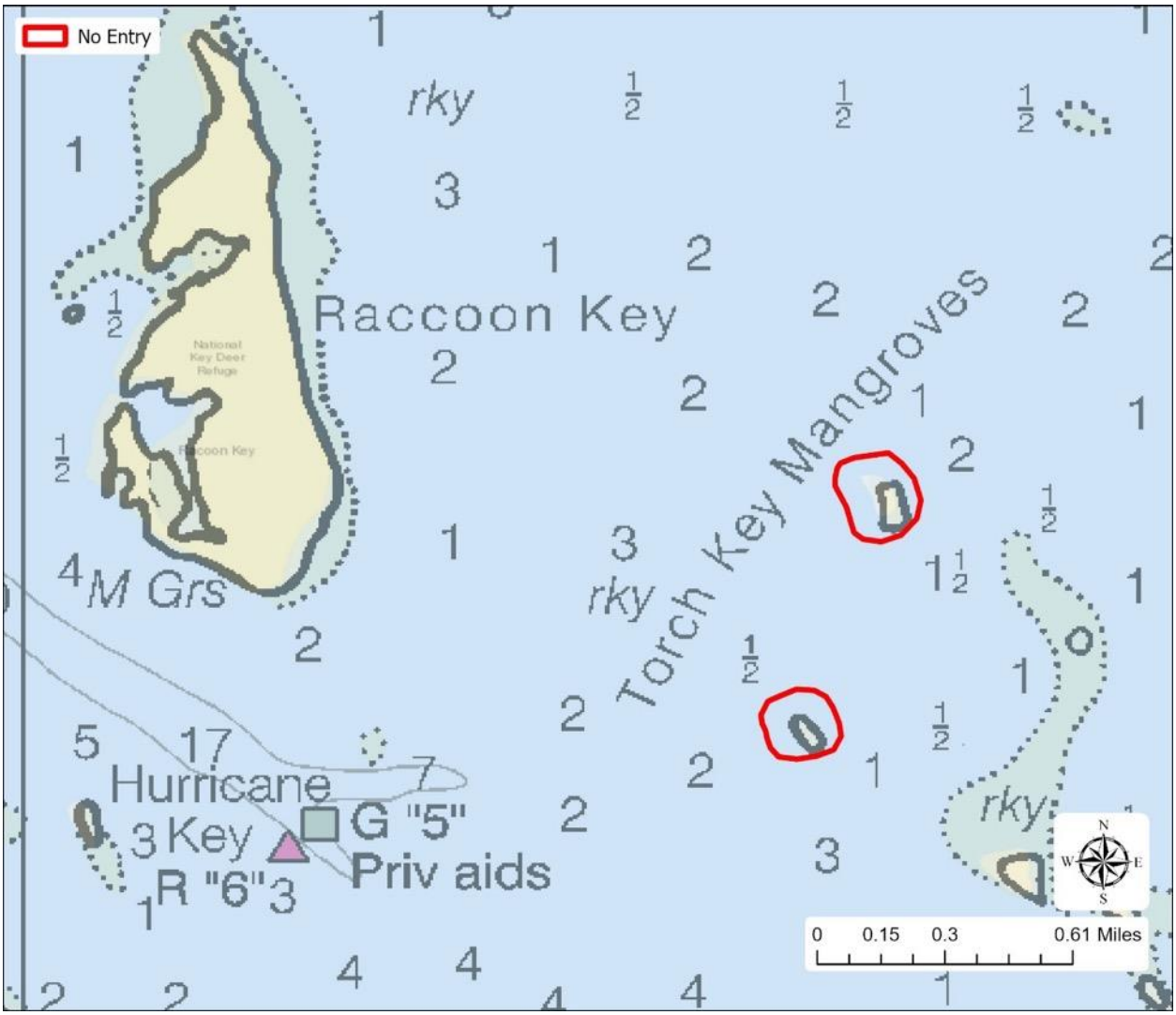
East Content and Upper Harbor Key Flats Wildlife Management Area: This minimum 100-yard distance no entry zone around Upper Harbor Key is to protect birds like reddish egrets, great white herons, little blue herons, and more who may use this area to nest, rest, and eat. The idle speed no wake for the surrounding flats is in effect to reduce prop scars and vessel groundings, which have impacted this area that is used by foraging birds.

Upper Harbor Key WMA (approximately 0.04 square miles; 24 acres) and East Content Keys WMA (approximately 0.03 square miles; 19 acres) have been sanctuary marine zones since 1997. At Upper Harbor Key, the final preferred alternative changes the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. The existing idle speed no wake area is expanded to encompass approximately 3.9 square miles (2, 468 acres). This WMA is within the National Key Deer National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

West Content Keys: The idle speed and no wake regulations are in effect to reduce disturbance to shorebirds and wading birds who use this area to eat and rest. West Content Key WMA has been a sanctuary marine zone since 1997 and includes areas of idle speed no wake (approximately 0.08 square miles; 51 acres) and no entry (0.07 square miles; 44 acres). The final preferred alternative makes no change to this zone other than changing the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. This WMA is within the National Key Deer National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

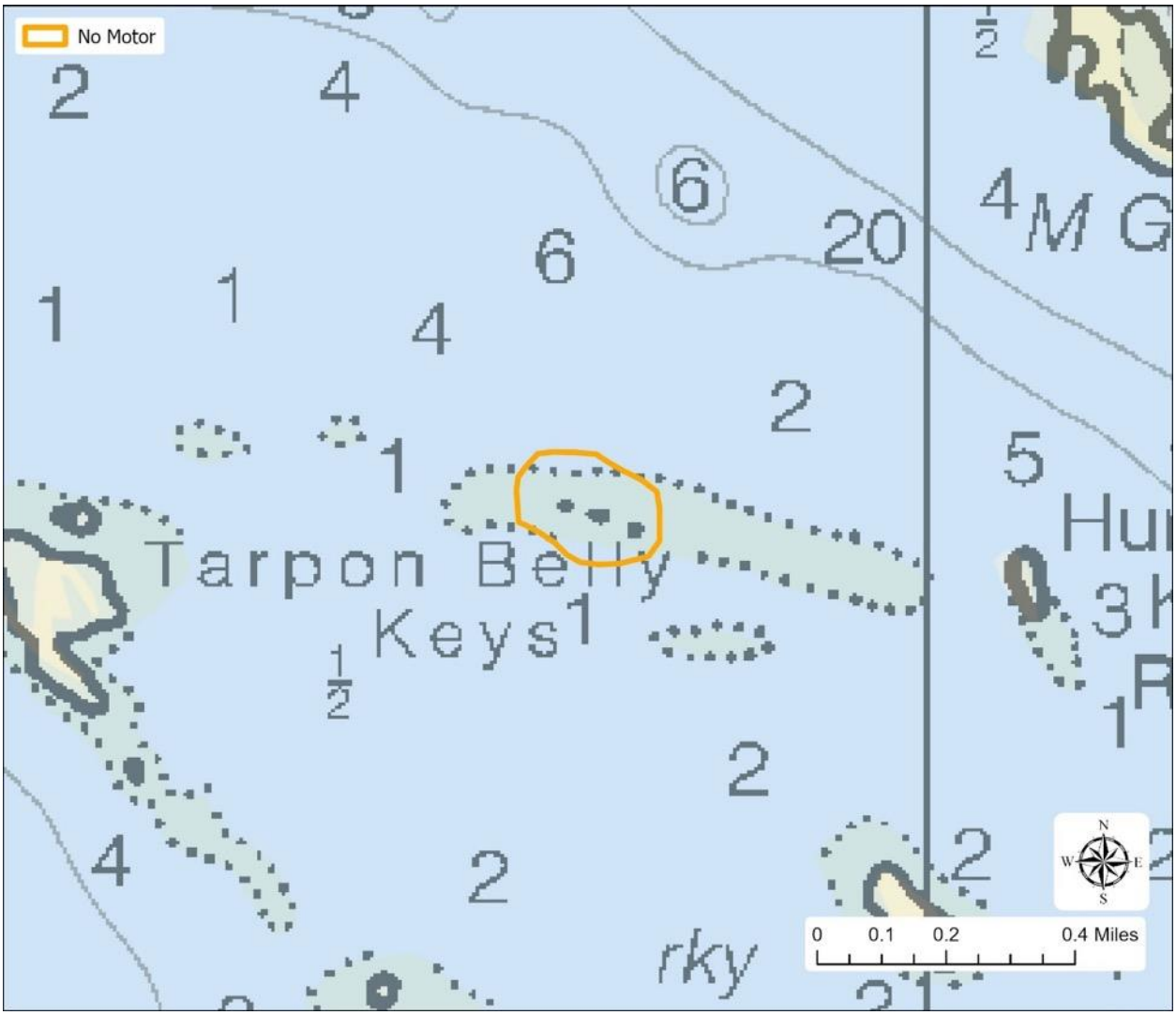
Howe Key Mangrove: This minimum 100-yard distance no motor zone is to protect birds like reddish egrets, great white herons, and more who may use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no motor wildlife management area that is approximately 0.04 square miles (23 acres). This WMA is within the National Key Deer National Wildlife Refuge.

Torch Key Mangroves Wildlife Management Area



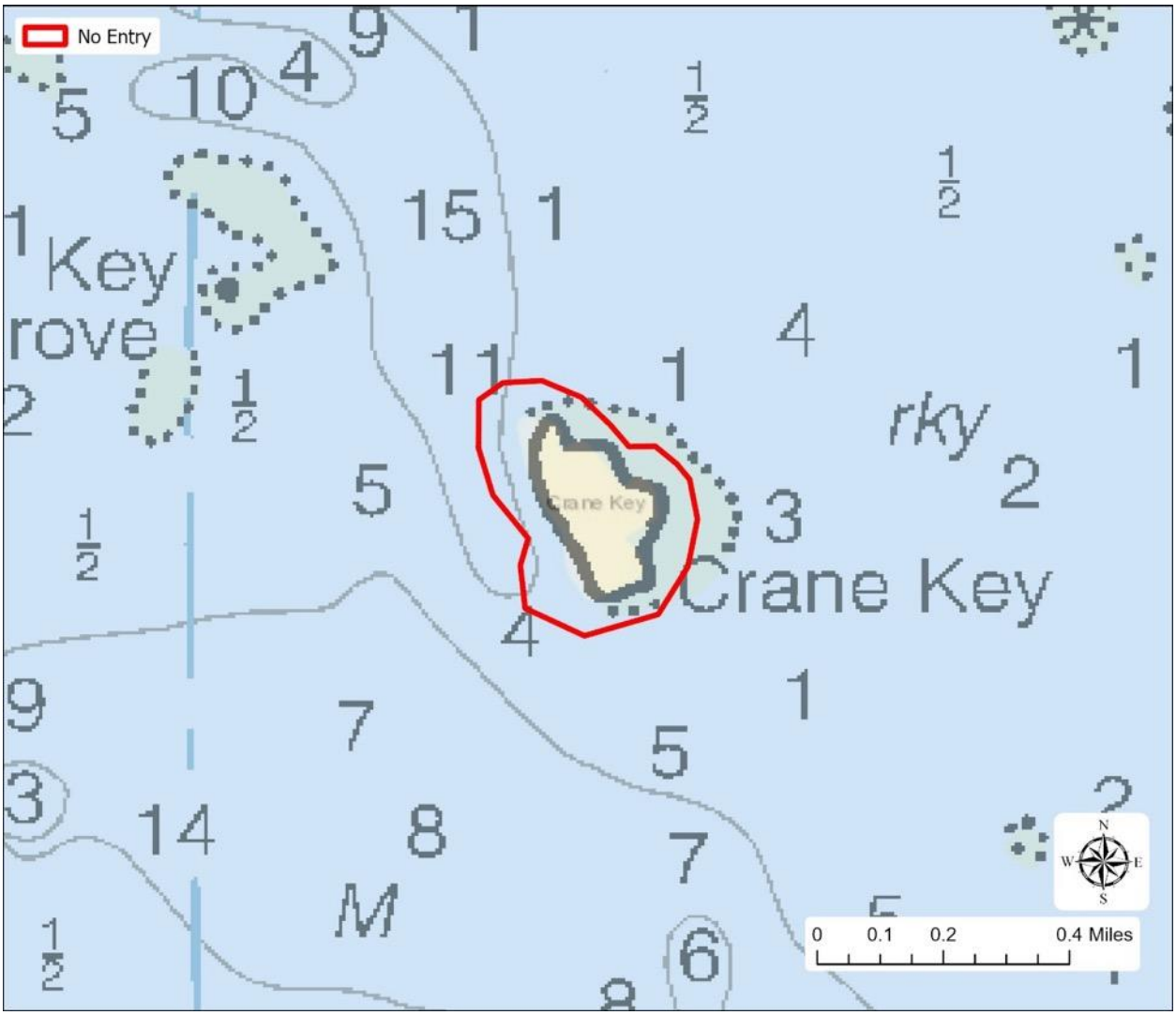
This minimum 100-yard distance no motor zone is to protect birds like reddish egrets, great white herons, and more who may use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.05 square miles (29 acres). This WMA is within the National Key Deer National Wildlife Refuge.

Northeast Tarpon Belly Keys Wildlife Management Area



A minimum 100-yard distance (i.e., 100-yard No Entry Zone) is needed to minimize disturbance to wading and migratory birds. This minimum 100-yard distance no motor zone is to protect birds like reddish egrets, great white herons, and more who may use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.03 square miles (16 acres). This WMA is within the National Key Deer National Wildlife Refuge.

Crane Key Wildlife Management Area

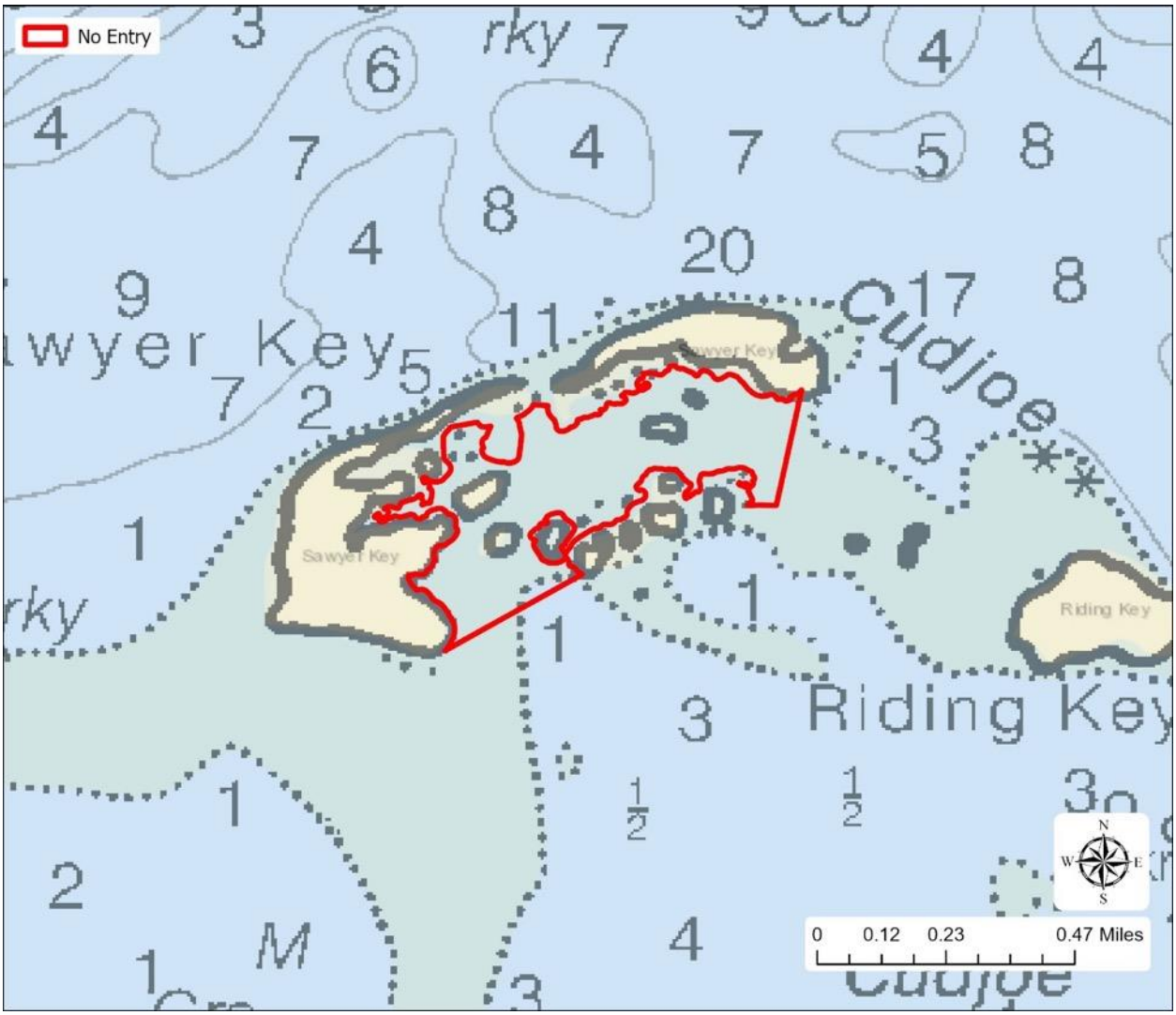


This minimum 100-yard distance no motor zone is to protect birds like magnificent frigatebirds, great white herons, and more who may use this area to nest, rest, and eat.

Crane Key has the highest post Hurricane Irma annual count of nesting great white herons in the backcountry. This additional no entry protection reduces flushing of birds from their nesting and roosting sites. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.05 square miles (34 acres). This WMA is within the National Key Deer National Wildlife Refuge.

The final preferred alternative eliminated Little Crane Key from analysis.

Sawyer Key Wildlife Management Area

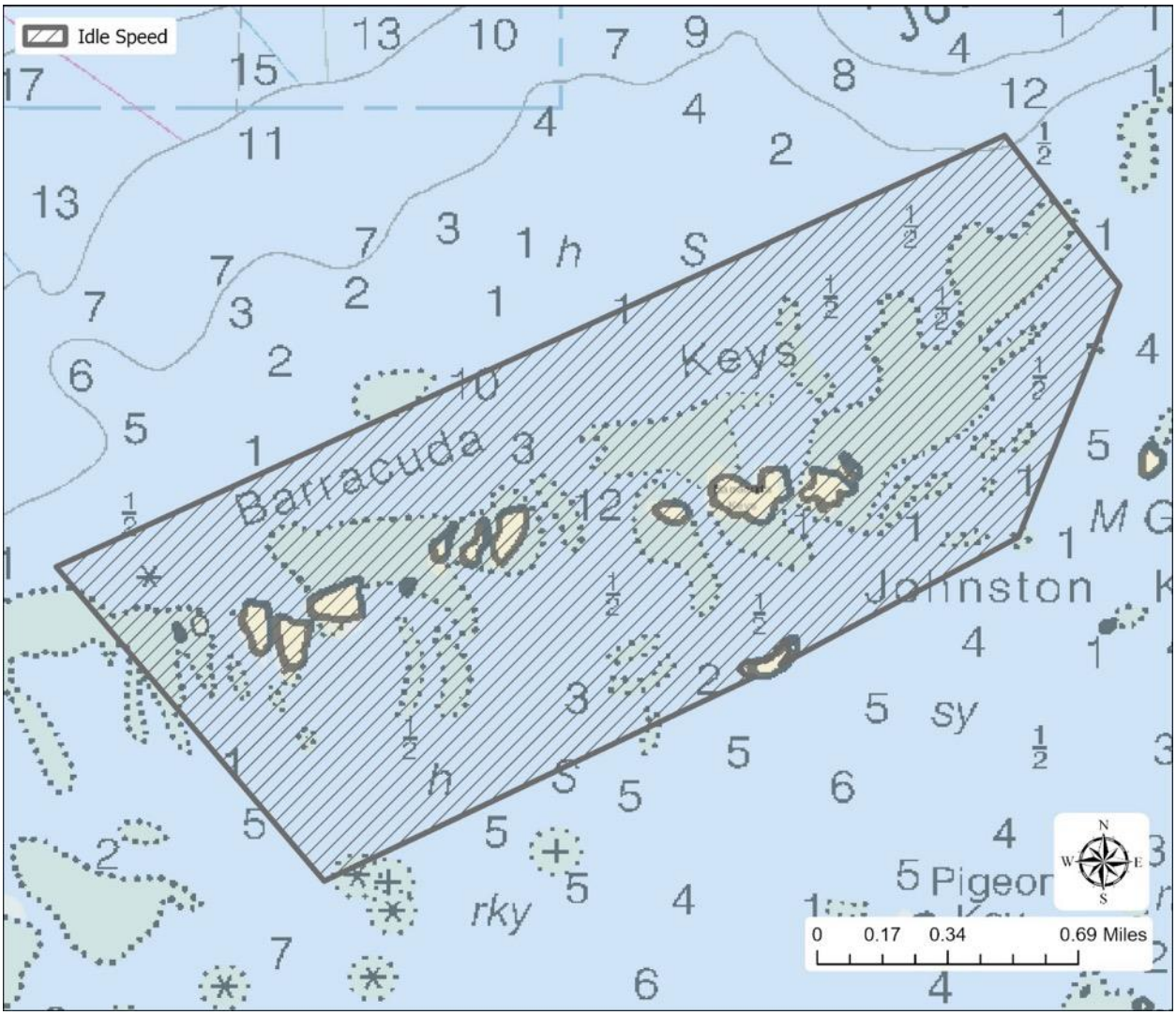


This existing no entry zone is designed to protect birds like osprey, shorebirds, and other bird populations who use this area to nest, rest, and eat. Sawyer Keys WMA (0.12 square miles; 77 acres) has been a sanctuary marine zone since 1997. The final preferred alternative makes no change to this zone. This WMA is within the National Key Deer National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Happy Jack Key Wildlife Management Area

This minimum 100-yard distance no entry zone is needed to protect wading birds, like reddish egrets, who use this area to nest, rest, and eat. The final preferred alternative includes this area as a new no entry wildlife management area that is approximately 0.02 square miles (15 acres). This WMA is within the Great White Heron National Wildlife Refuge.

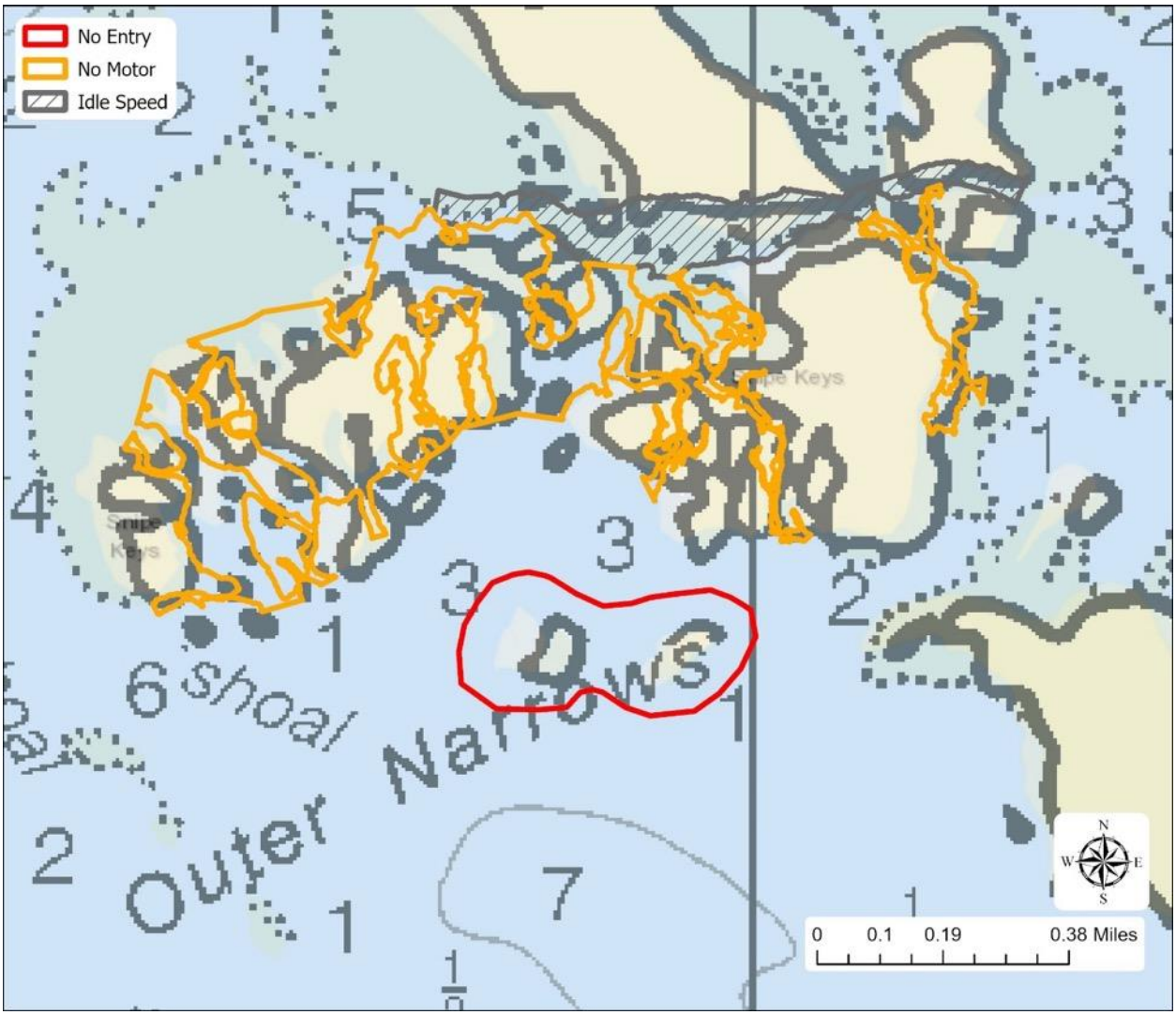
Barracuda Keys Wildlife Management Area



This idle speed no wake is needed to protect the shallow bottom habitat and places for birds to forage for food. This will also reduce conflict between different recreational users. The final preferred alternative includes this area as a new no idle speed no wake wildlife management area that is approximately 2.2 square miles (1,434 acres). This WMA is within the Great White Heron National Wildlife Refuge.

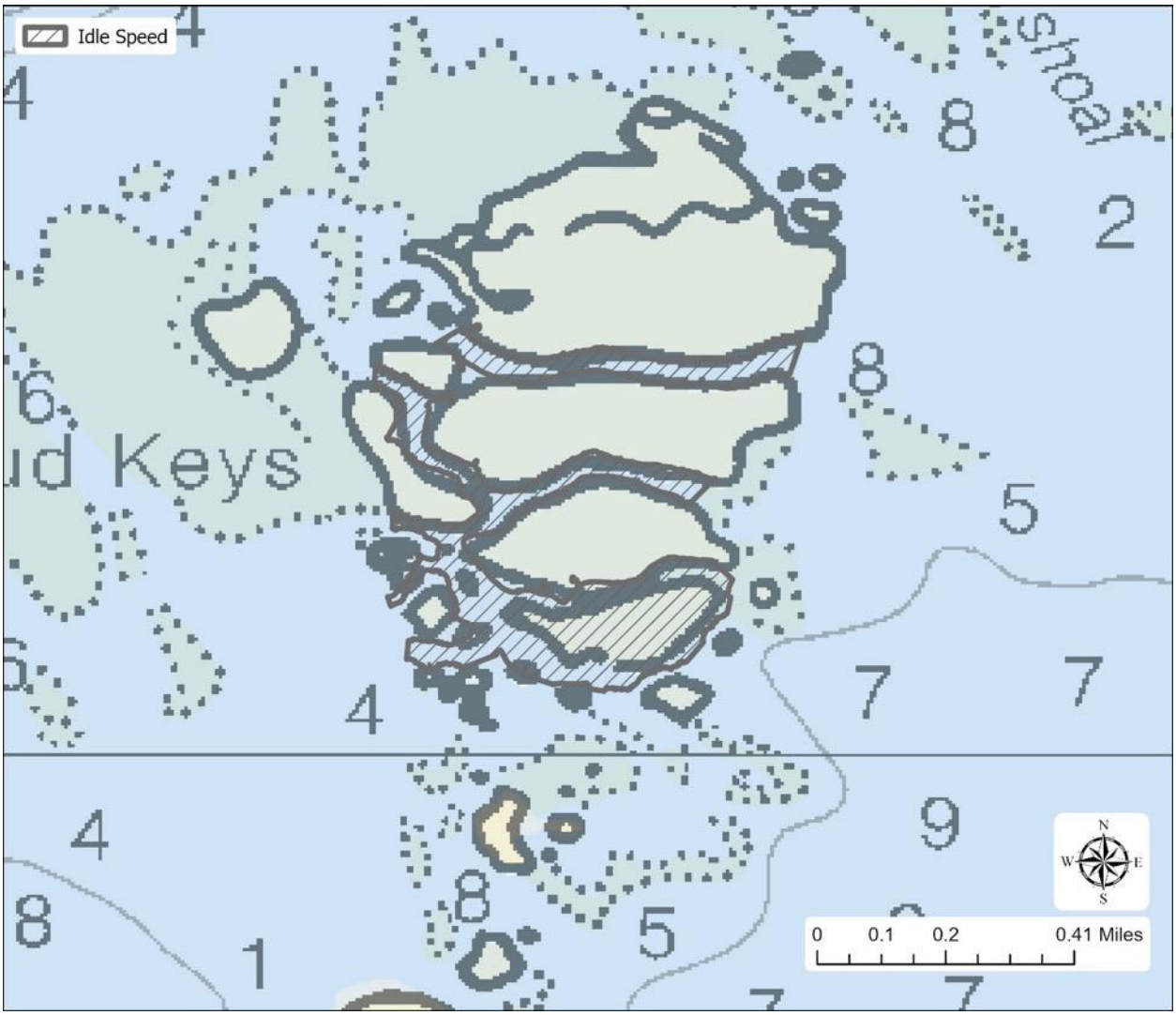
Tidal Flat South of Marvin Key Wildlife Management Area was eliminated from consideration at the draft rule stage.

Snipe Keys Wildlife Management Area



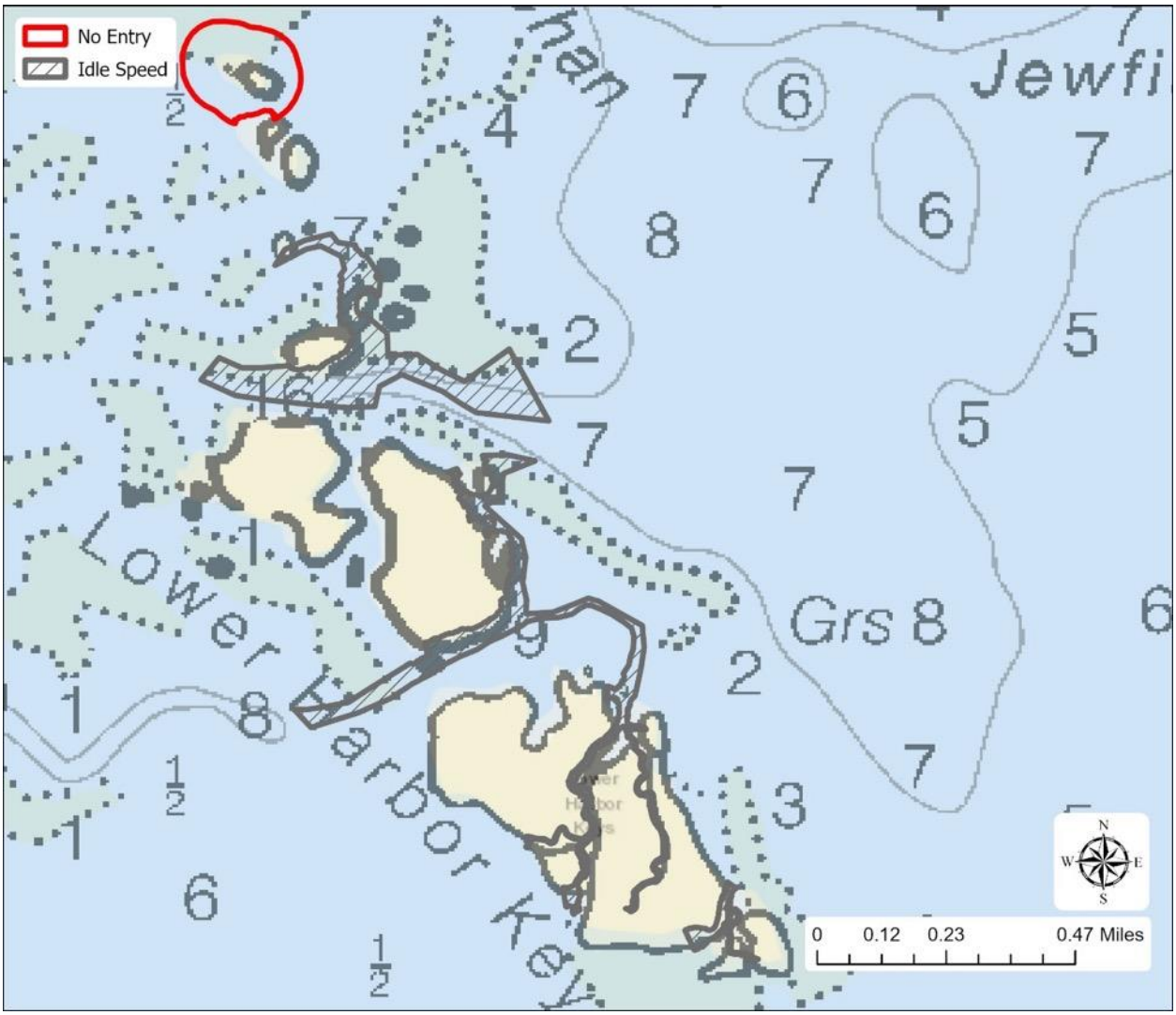
The addition of the minimum 100-yard distance no entry zone for the two small southern islands is needed to protect birds, like magnificent frigatebirds and great white herons, who use this area to nest, rest, and eat. There is no change to the existing idle speed no wake and no motor areas that have been in place since 1997. These regulations would not impact sandbar use on the northern side of Snipe Keys. Snipe Keys WMA has been a sanctuary marine zone since 1997 and includes areas of idle speed no wake (approximately 0.04 square miles; 26 acres) and no motor (0.11 square miles; 72 acres). The final preferred alternative includes an additional no entry area that is approximately 0.06 square miles (36 acres). This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Mud Keys Wildlife Management Area



An idle speed no wake zone is designed to provide options for transit while reducing disturbance to birds, like great white herons and magnificent frigatebirds, who use this area to rest, nest, and eat. Mud Keys WMA has been a sanctuary marine zone since 1997. The final preferred alternative modifies this zone to shift a closed area to idle speed no wake, for a total idle speed no wake area of approximately 0.08 square miles (53 acres). This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

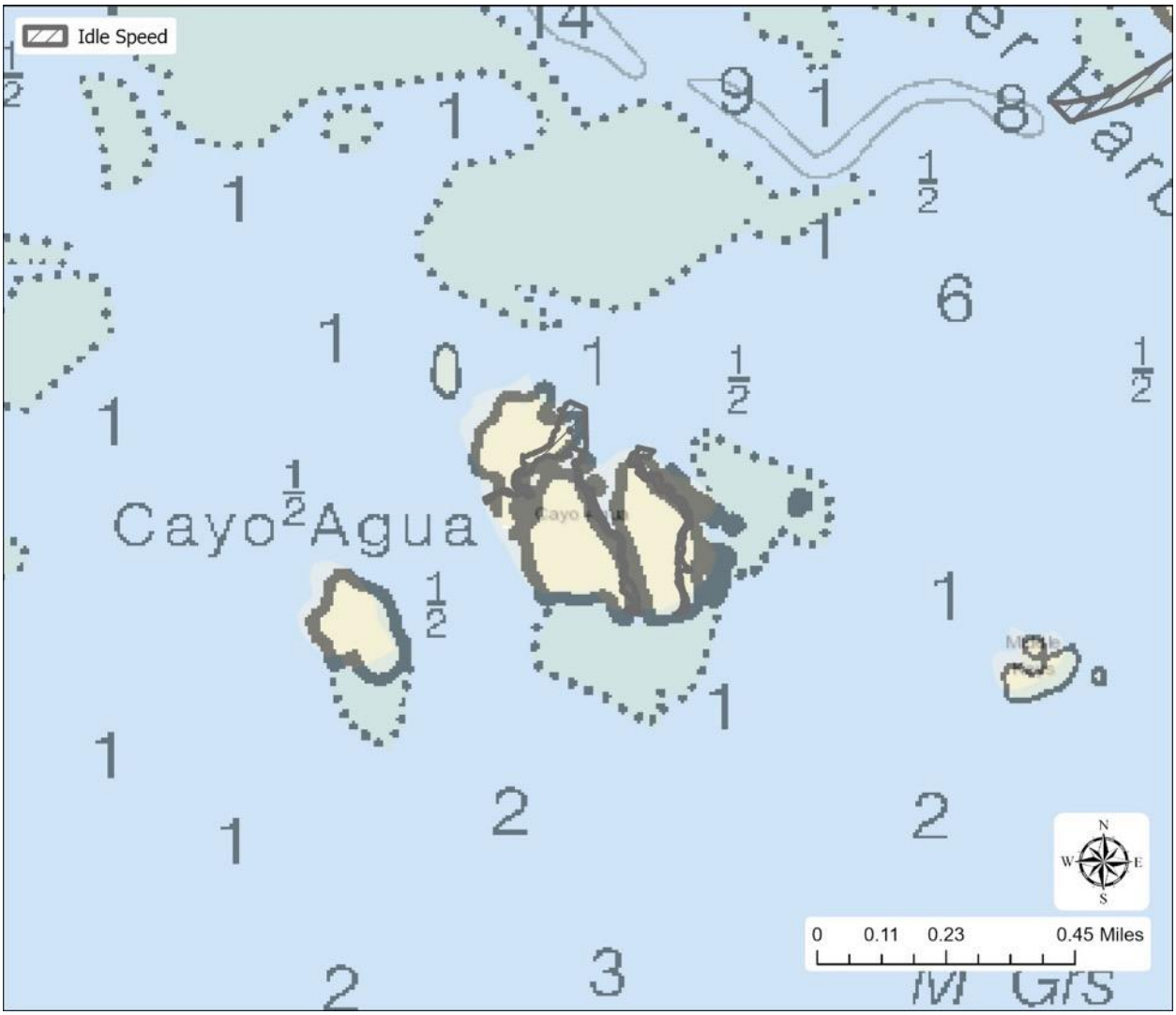
East Harbor Key and Lower Harbor Keys Wildlife Management Areas



East Harbor Key: This minimum 100-yard distance no entry zone is needed to protect wading birds, like great white herons, who use this area to nest, rest, and eat. No entry regulations were updated to align with regulations in place by the state of Florida. East Harbor Key WMA (0.02 square miles; 16 acres) has been a sanctuary marine zone since 1997. The final preferred alternative makes no change to this zone other than changing the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

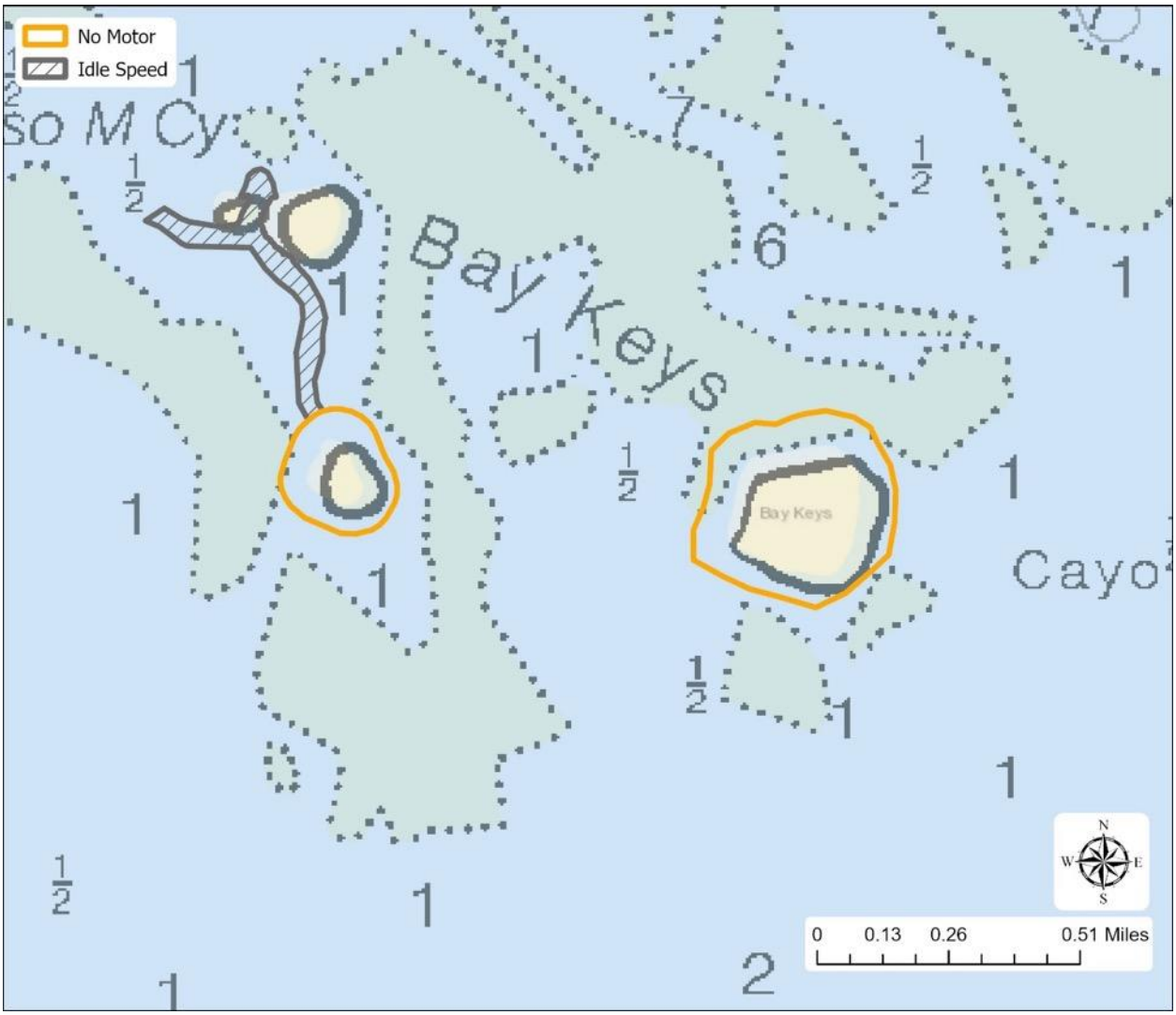
Lower Harbor Key: This minimum 100-yard distance no entry zone is needed to protect wading birds, like great white herons, who use this area to nest, rest, and eat. Lower Harbor Keys WMA has been a sanctuary marine zone since 1997. The final preferred alternative expands this existing idle speed no wake zone slightly from approximately 0.07 square miles (42 acres) to 0.09 square miles (56 acres). This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Cayo Agua Keys Wildlife Management Area



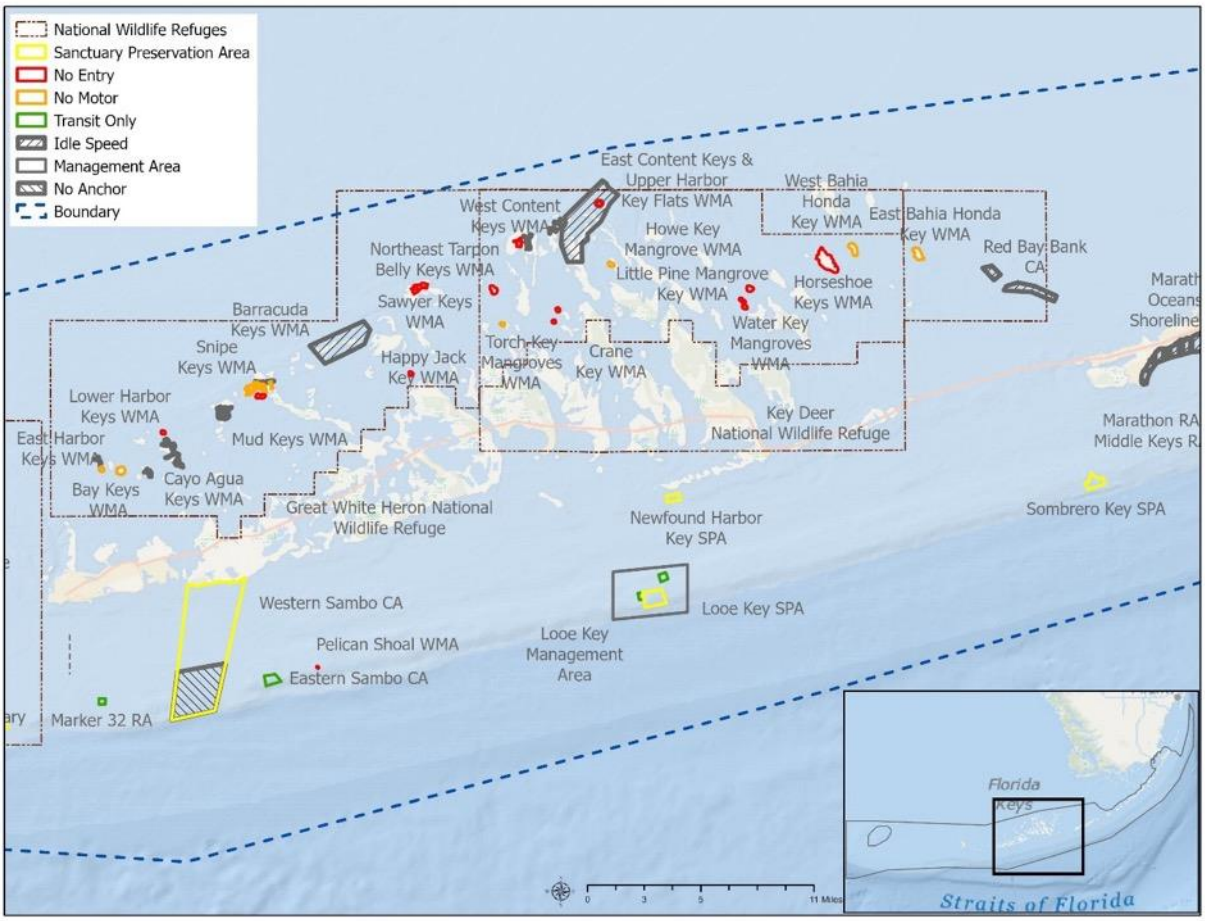
An idle speed no wake zone is in effect to reduce disturbance to birds, like the great white heron, who find food and rest in this area. Cayo Agua Keys WMA (0.01 square miles; 7.0 acres) has been a sanctuary marine zone since 1997. This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Bay Keys Wildlife Management Area



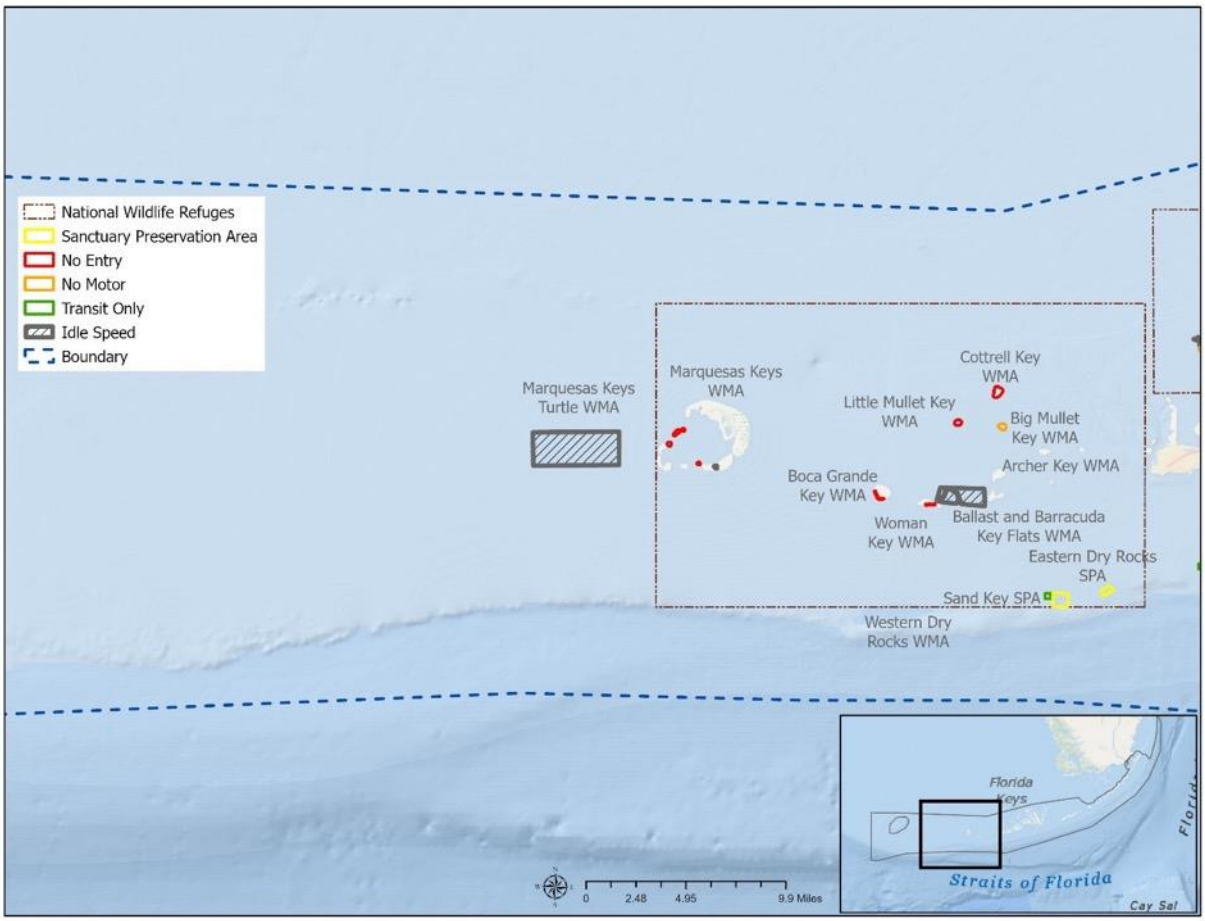
To protect magnificent frigatebirds and great white herons, a minimum 100-yard distance no motor zone around Southwest and Southeast Bay Keys is needed to minimize disturbance to these birds when they rest and nest in this area. An existing idle speed no wake zone leading up to Southwest Bay Keys is expanded to protect the habitat from vessel damage. Bay Keys WMA has been a sanctuary marine zone since 1997. The final preferred alternative expands the existing idle speed no wake area by approximately 0.02 square miles (8.7 acres) and adds an additional island with no motor regulations expanding the area with no motor regulations from approximately 0.03 square miles (18 acres) to approximately 0.08 square miles (56 acres). This WMA is within the Great White Heron National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Great White Heron National Wildlife Refuge



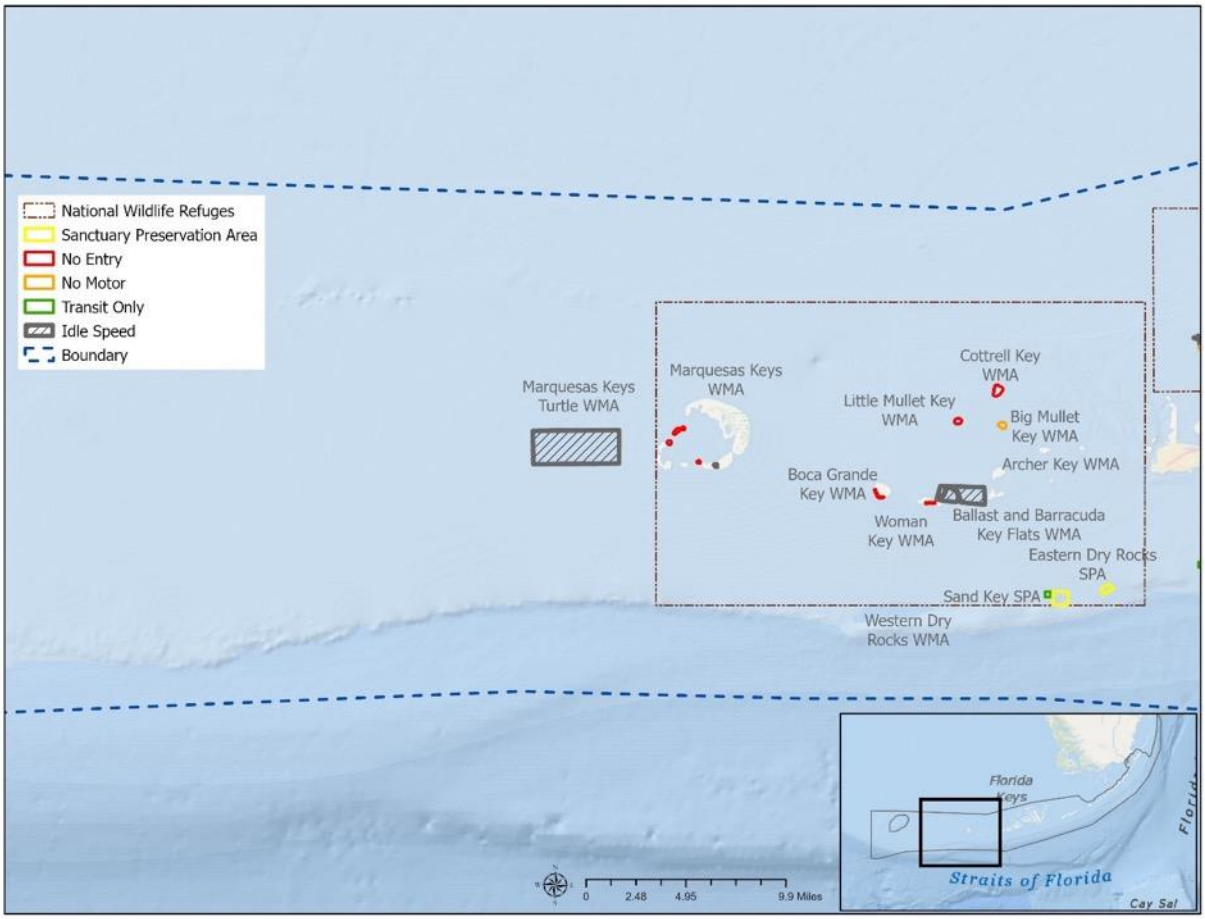
This national wildlife refuge is a haven for hundreds of species of birds, including the great white heron, this refuge's namesake. Protected since the 1930s, this refuge provides a place where birds and other wildlife like sea turtles can nest, feed, and rest. This national wildlife refuge encompasses approximately 309 square miles. The final preferred alternative proposes no change to the area or regulations that apply within this area.

Key West National Wildlife Refuge

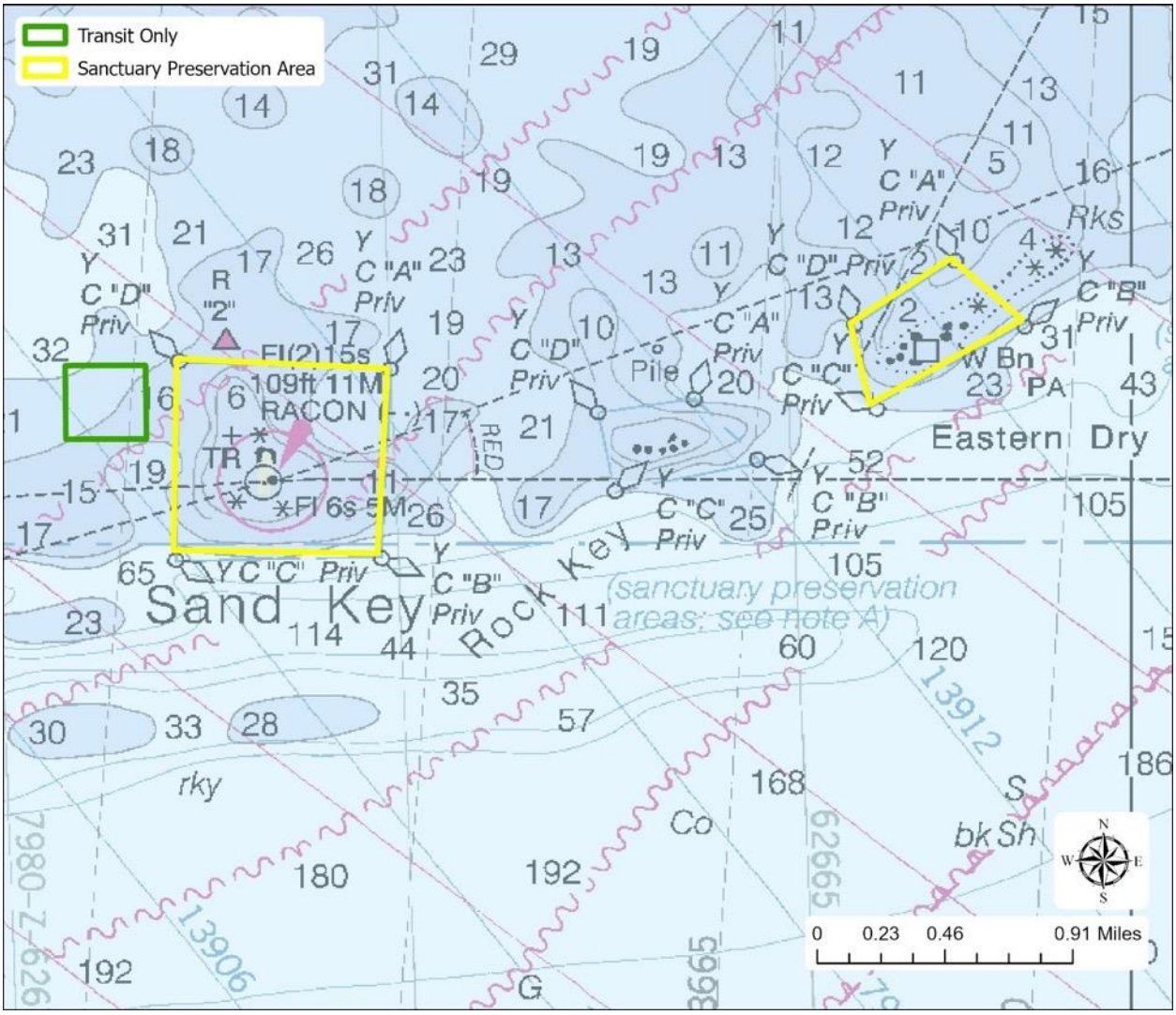


Designated in 1908 to protect birds and other wildlife, this wildlife refuge now is home to the largest wintering population of piping plover, the largest colony of white crowned pigeon, and is home for over 250 other species of birds. Other threatened species that call this refuge home include the Miami blue butterfly and sea turtles, with more loggerhead and green sea turtle nests found each year than any area of the Florida Keys except the Dry Tortugas. This national wildlife refuge encompasses approximately 333 square miles. The final preferred alternative includes a modification to the prohibition of personal watercraft to allow passage of around marker G13 but on the inside of GWR5.

Marquesas Region and Marine Zones



Sand Key and Eastern Dry Rocks Sanctuary Preservation Areas, and Sand Key Nursery Restoration Area



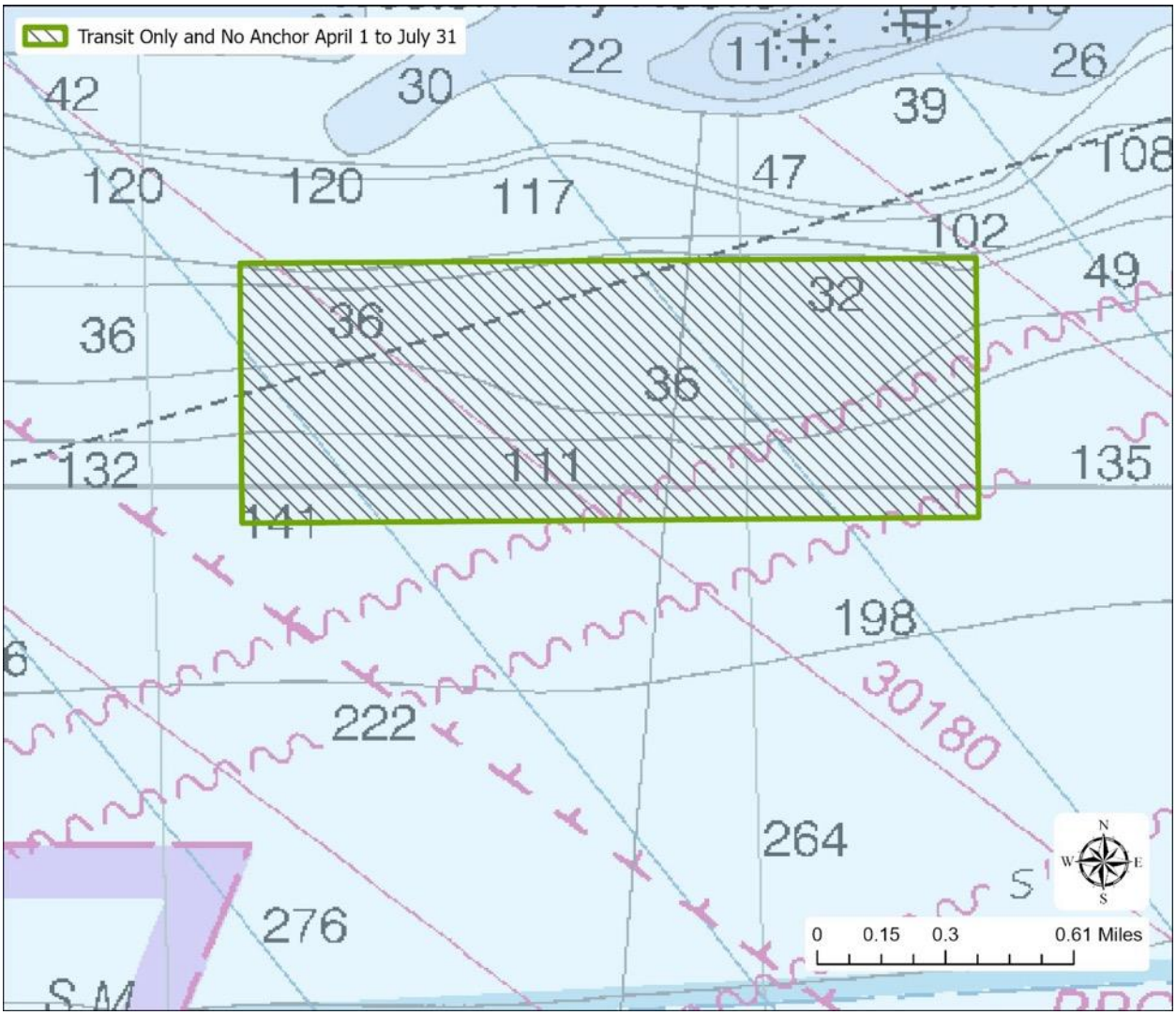
Sand Key SPA is an active restoration site for endangered elkhorn and staghorn corals. This area historically supported endangered elkhorn, staghorn, pillar, and star corals. Sand Key SPA, approximately 0.45 square miles (286 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone and eliminates the current exception for catch and release fishing by trolling; all other existing regulations are maintained.

Eastern Dry Rocks SPA is one of the seven Mission: Iconic Reefs restoration sites, and coral restoration is actively occurring here. This area historically supported thickets of endangered elkhorn and star corals. Eastern Dry Rocks SPA, approximately 0.14 square miles (91 acres), has been a sanctuary marine zone since 1997. The final preferred alternative proposes the addition of a no anchor regulation throughout this zone; all other existing regulations are maintained.

Sand Key Nursery Restoration Area: The final preferred alternative includes this area as a new nursery restoration area that is approximately 0.07 square miles (43 acres).

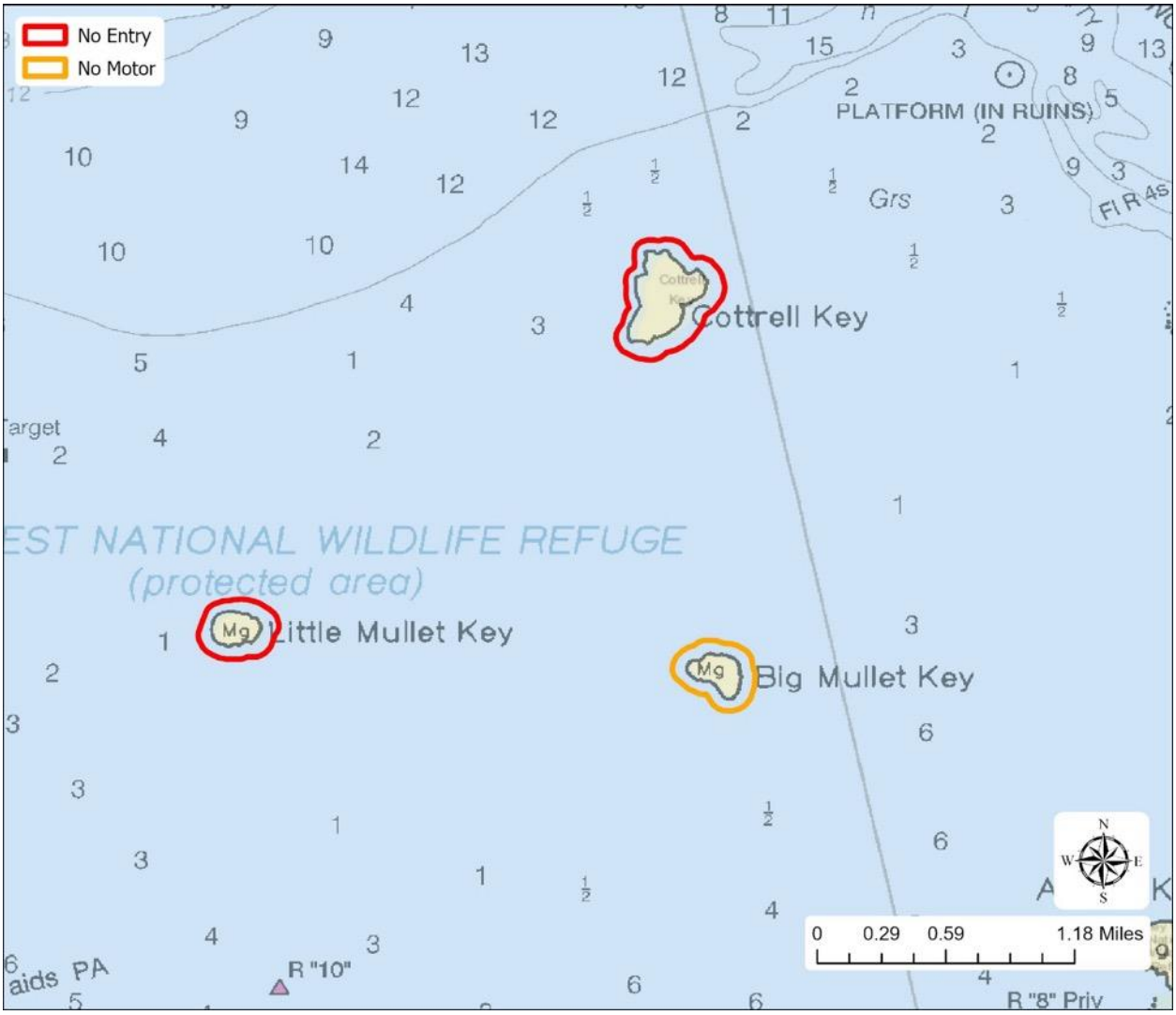
Rock Key SPA was eliminated from consideration during the draft and final EIS.

Western Dry Rocks Wildlife Management Area



This zone protects a reef that supports multi-fish spawning aggregations. Sanctuary regulations align with and complement FWC regulations that established a seasonal closure at Western Dry Rocks that prohibits fishing from April 1 through July 31 annually. Sanctuary regulations also include a no anchor regulation during this same time period to provide further protections for this important fish aggregation and spawning site. The final preferred alternative includes this area as a new wildlife management area that is approximately 1.0 square miles (626 acres).

Big Mullet Key, Little Mullet Key and Cottrell Key Wildlife Management Areas



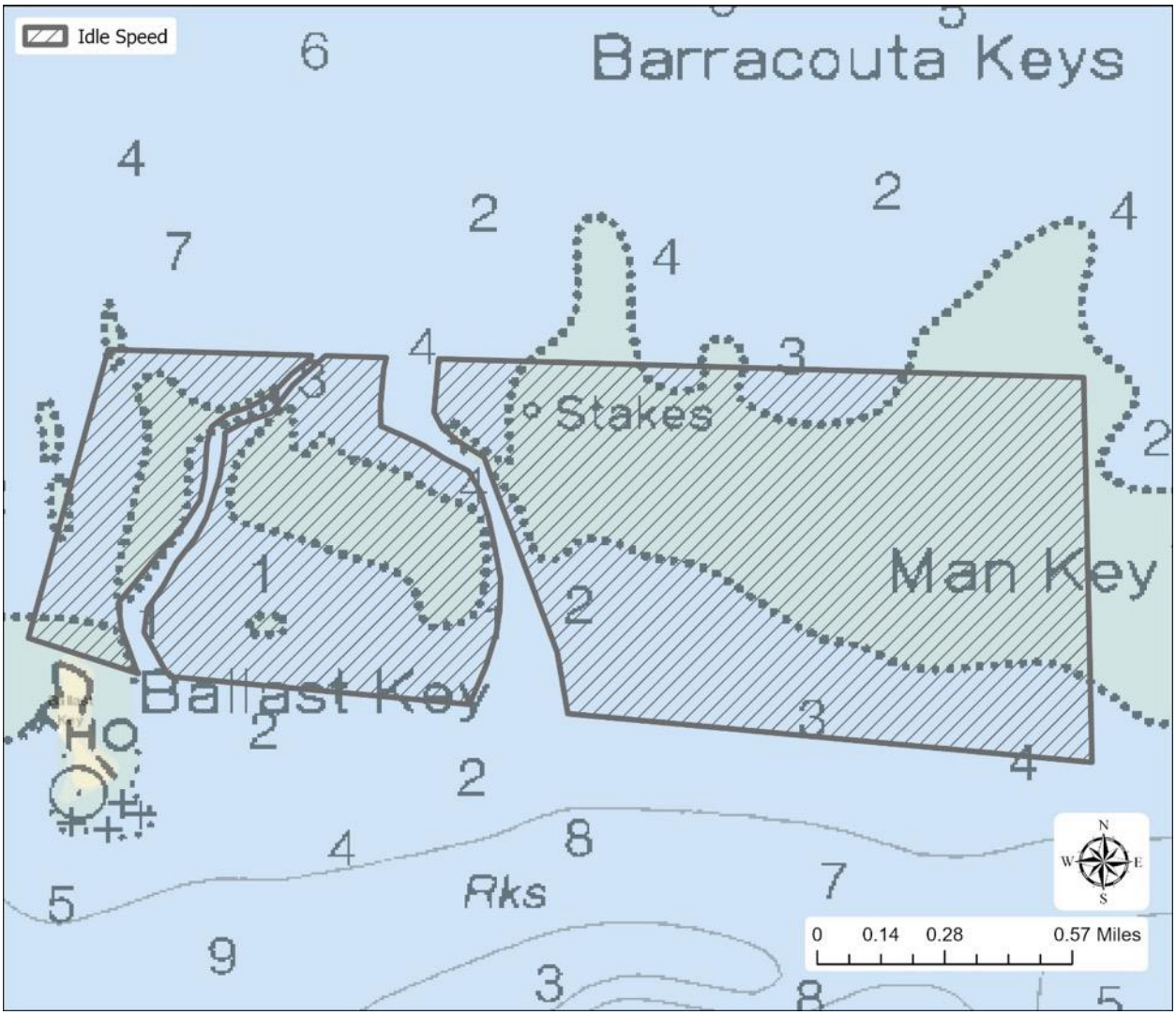
Big Mullet Key: This existing minimum 100-yard distance is needed to minimize disturbance to wading and migratory birds, like great white herons, who use this area to rest, nest, and eat. Big Mullet Key WMA (approximately 0.05 square miles; 33 acres) has been a sanctuary marine zone since 1997. The final preferred alternative makes no changes to this existing marine zone. This WMA is within the Key West National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Little Mullet Key: This minimum 100-yard distance no entry zone is needed to minimize disturbance to wading and migratory birds, like great white herons, who use this area to rest, nest, and eat. Little Mullet Key WMA (approximately 0.05 square miles; 31 acres) has been a sanctuary marine zone since 1997. The final preferred alternative makes no change to this zone other than changing the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. This WMA is within the Key West

National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

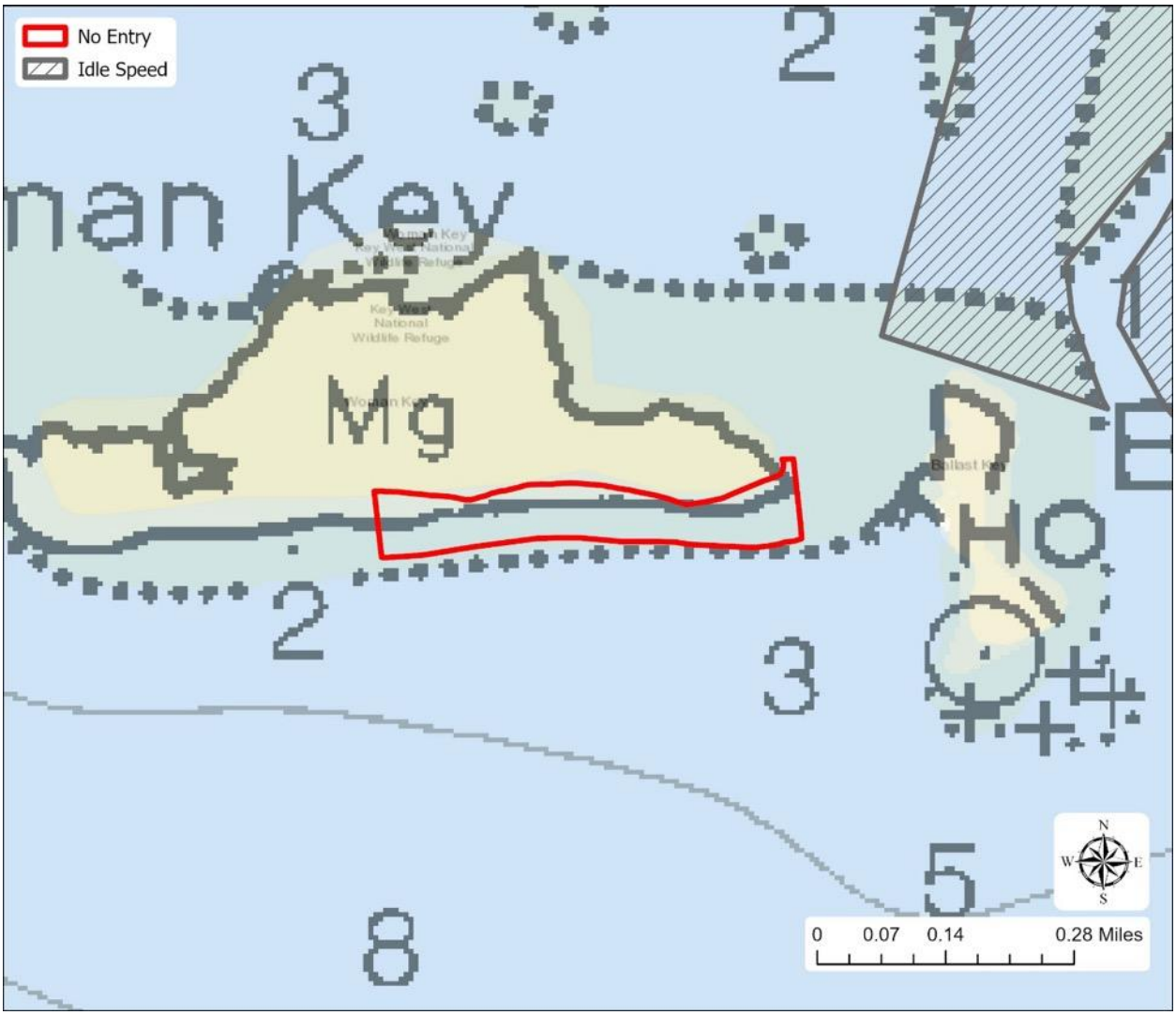
Cottrell Key: This minimum 100-yard distance no entry zone is needed to protect wading birds, like great white herons, who use this area to nest, rest, and eat. Cottrell Key has one of the highest annual counts of nesting great white herons in the lower Florida Keys. Cottrell Key WMA (approximately 0.08 square miles; 57 acres) has been a sanctuary marine zone since 1997. The final preferred alternative changes the existing no motor regulations to no entry. This WMA is within the Key West National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Ballast and Man Key Flats Wildlife Management Area



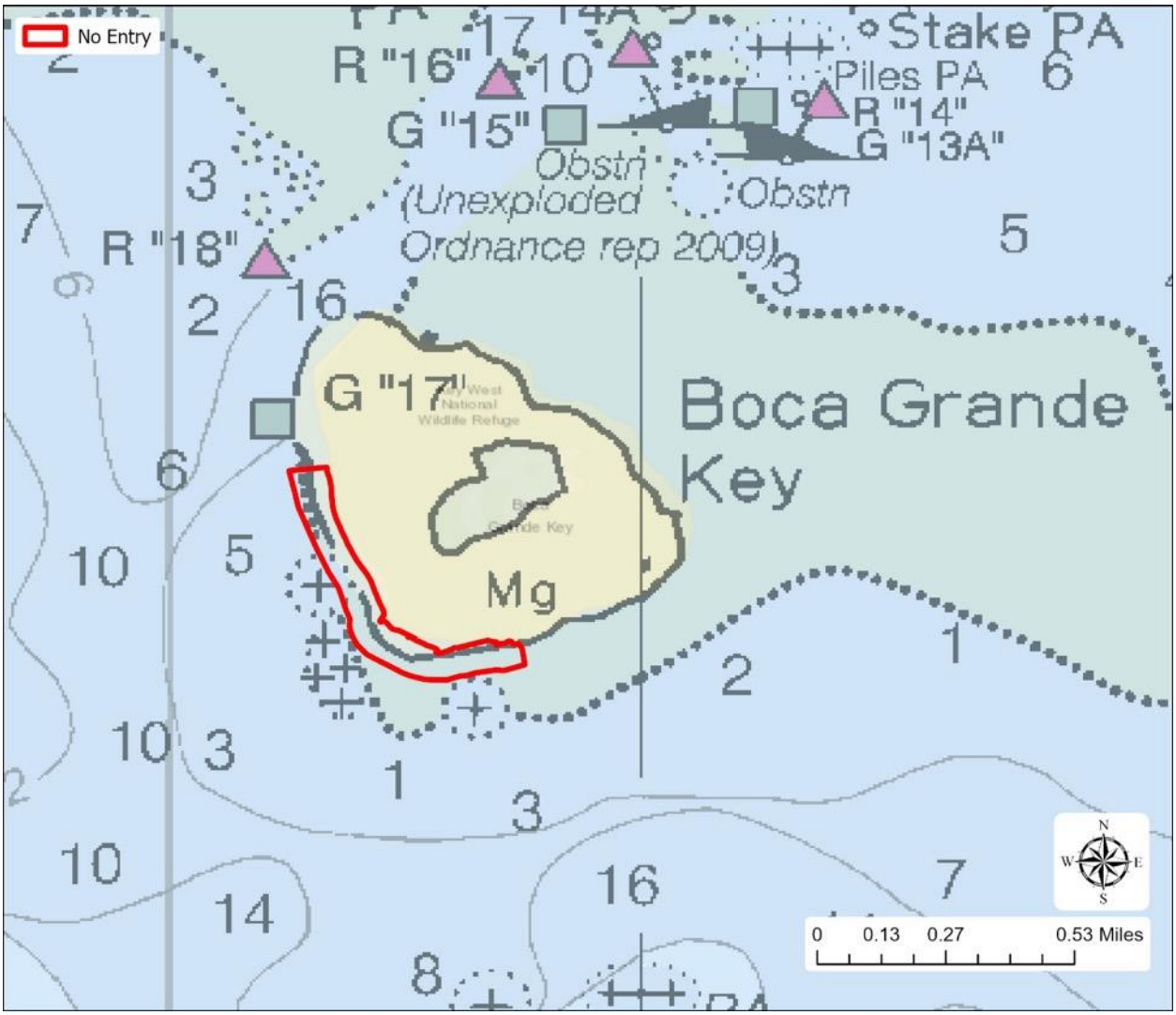
This idle speed no wake zone is in effect to protect sea turtles and the shallow habitats in the area as well as reduce used conflict between different recreational user groups. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 1.5 square miles (970 acres) except the two channels between the Keys are open for normal operation. This WMA is within the Key West National Wildlife Refuge.

Woman Key Wildlife Management Area



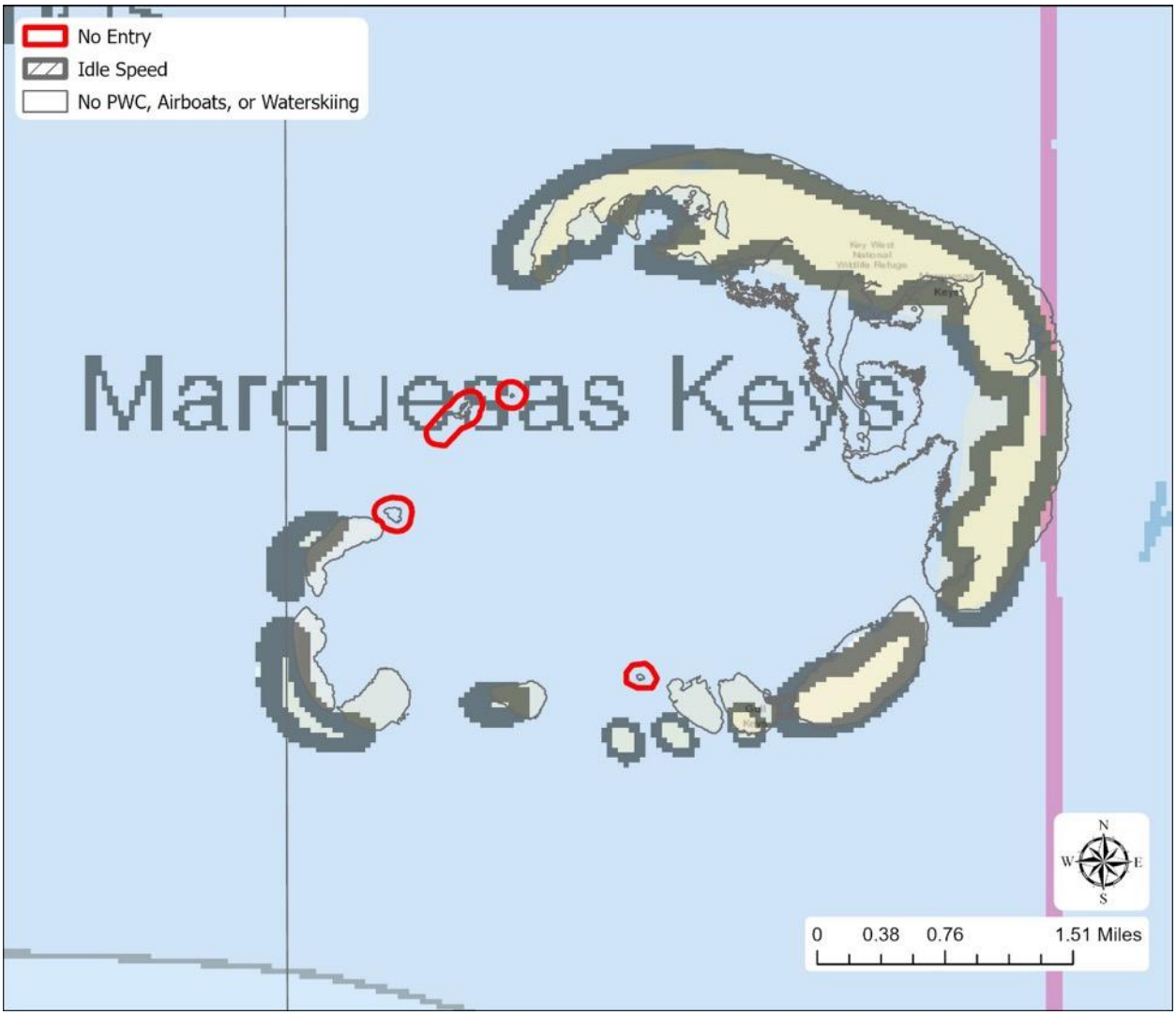
This minimum 100-yard distance no entry zone around Upper Harbor Key is to protect birds, like reddish egrets, great white herons, little blue herons and more, who may use this area to nest, rest, and eat. The idle speed no wake for the surrounding flats is in effect to reduce prop scars and vessel groundings, which have impacted this area that is used by birds looking for food. Woman Key WMA has been a sanctuary marine zone since 1997. The final preferred alternative expands the existing no entry area by approximately 0.01 square miles (8.6 acres) for a total of 0.02 square miles (16 acres). This WMA is within the Key West National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Boca Grande Key Wildlife Management Area



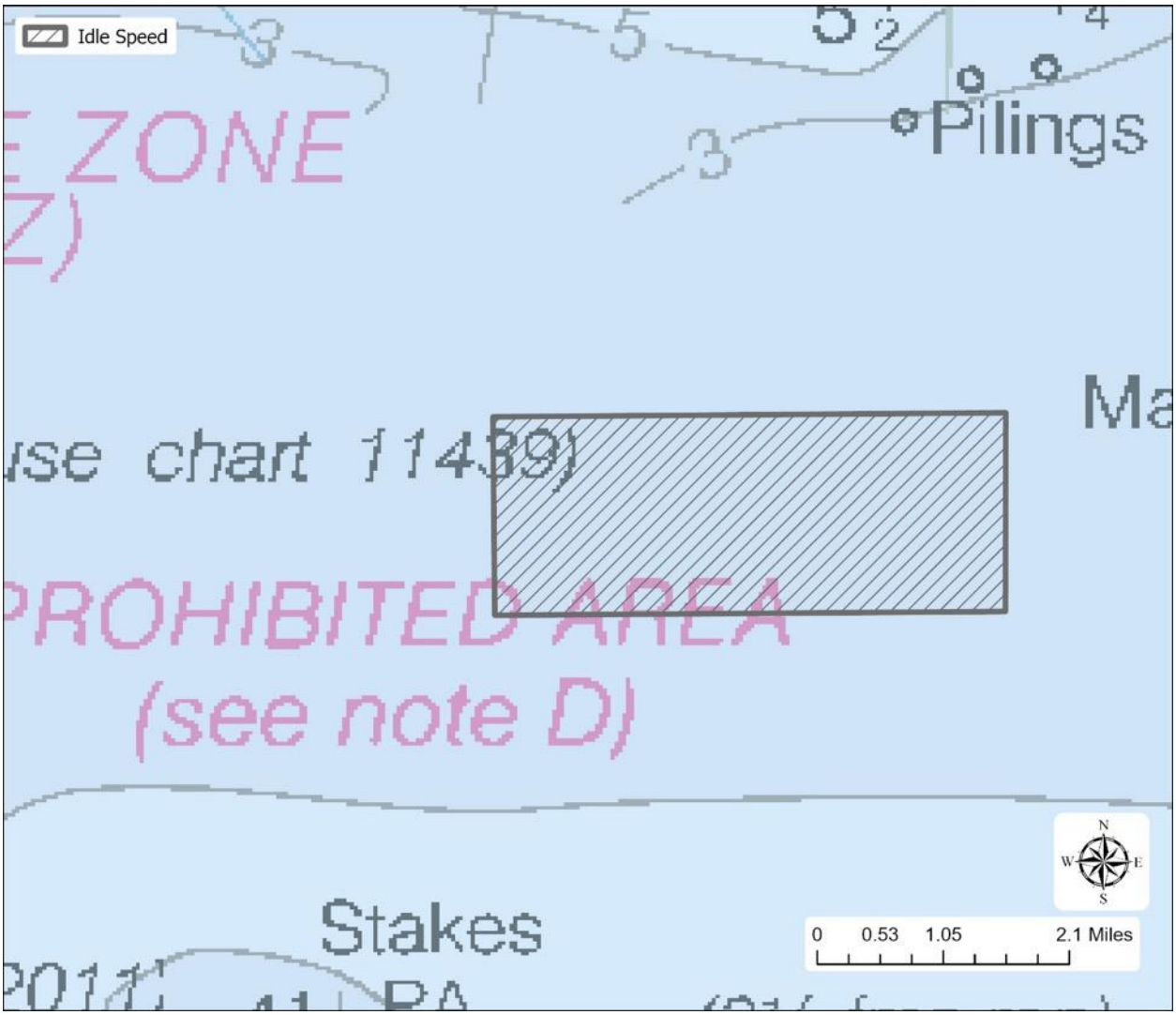
This minimum 100-yard distance no entry zone is needed to minimize disturbance to wading and migratory birds, like great white herons, who use this area to rest, nest, and eat, and sea turtles who use these islands as nesting areas. This area is also home to sensitive habitat for the Miami blue butterfly. This is an important biodiversity hotspot in the National Wildlife Refuge and the sanctuary. Boca Grande Key WMA has been a sanctuary marine zone since 1997. The final preferred alternative expands the existing no entry area by approximately 0.01 square miles (8.0 acres) for a total of 0.04 square miles (26 acres). This WMA is within the Key West National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Marquesas Key Wildlife Management Area



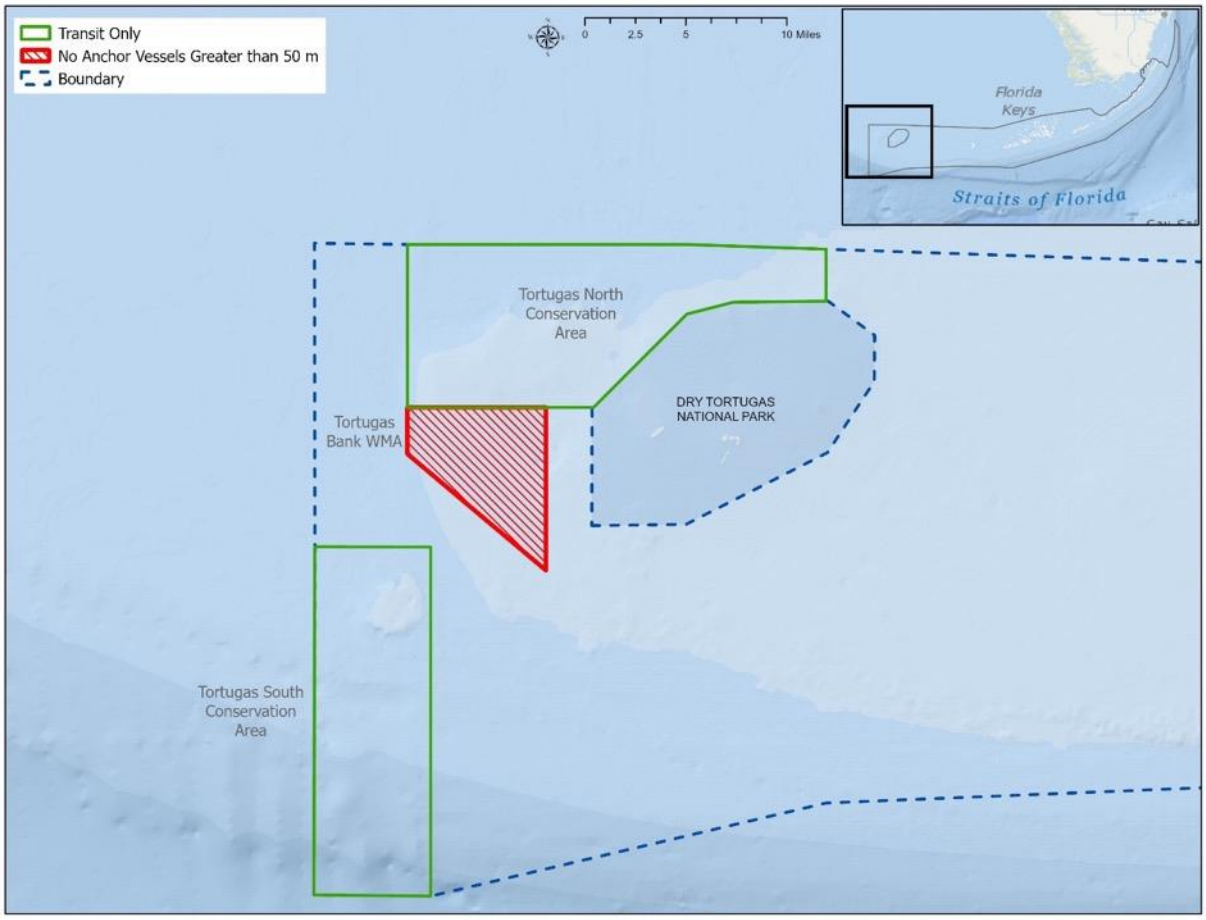
This minimum 100-yard distance no entry zone is needed around some of the islands to minimize disturbance to wading and migratory birds, like great white herons, who use this area to rest, nest, and eat, and sea turtles who use these islands as nesting areas. Marquesas Keys WMA has been a sanctuary marine zone since 1997. The final preferred alternative maintains an idle speed no wake area in one southern channel; changes two no motor areas to no entry and slightly expanding the area included as no entry (islands in the northwest); adds a no entry area around an island in the southern portion of the Keys; and finally for the western most island that is currently zoned, changes the regulatory terminology of no access buffer to no entry to better align with regulatory terminology used by the state of Florida. The total area included in the preferred alternative is approximately 0.12 square miles (76.4 acres). This WMA is within the Key West National Wildlife Refuge with access restrictions outlined in their 1992 backcountry management plan.

Marquesas Keys Turtle Wildlife Management Area

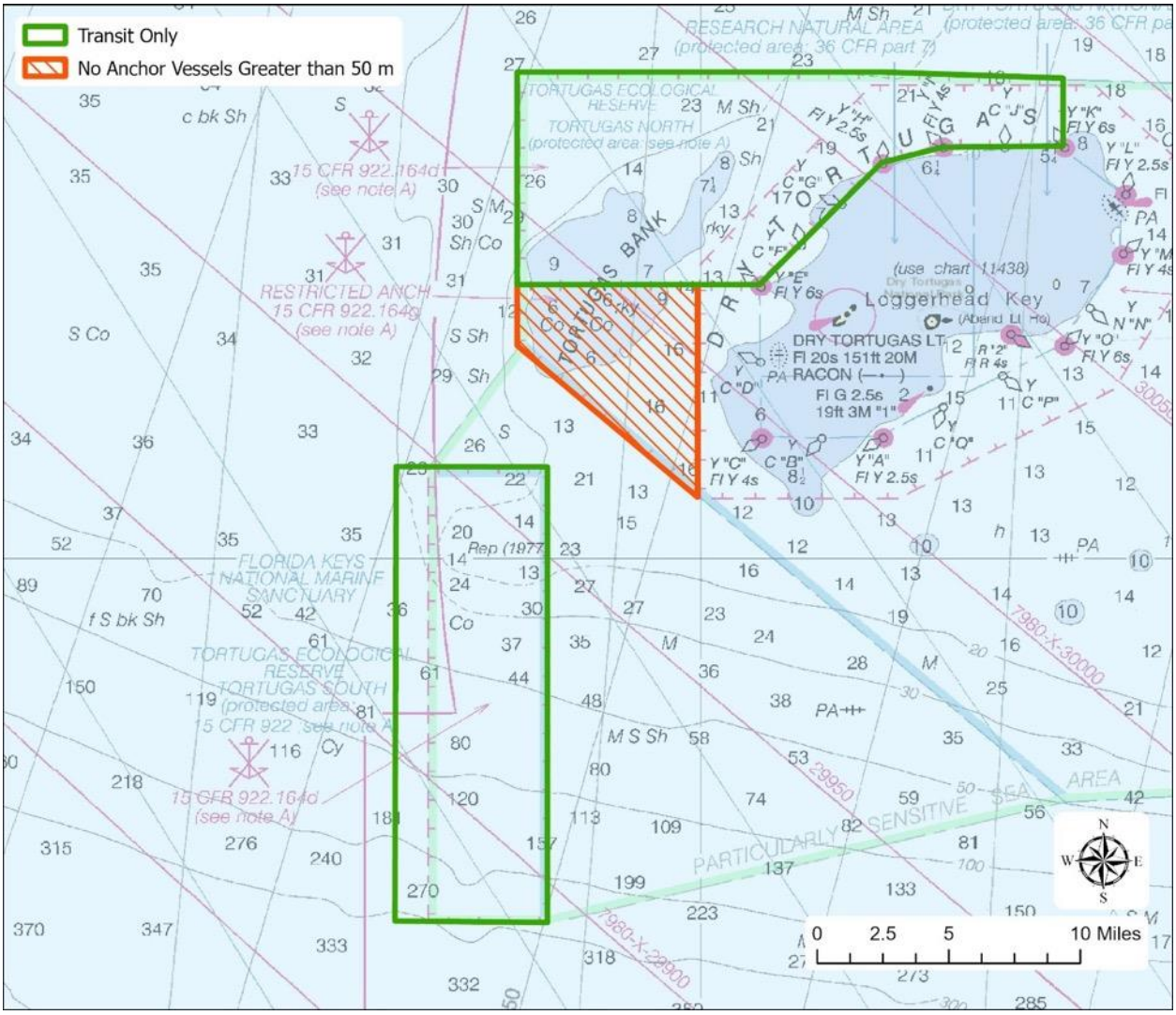


This area is idle speed no wake to protect sensitive habitats in a rare, internationally important foraging ground for green sea turtles that travel throughout the Caribbean basin. The final preferred alternative includes this area as a new idle speed no wake wildlife management area that is approximately 6.4 square miles (4,079 acres).

Tortugas Region and Marine Zones



Tortugas North and Tortugas South Conservation Areas and Tortugas Bank Wildlife Management Area



Tortugas North Conservation Area: This site, with the Dry Tortugas National Park Research Natural Area, protects an ecologically-diverse seascape that contains seagrass beds, shallow coral reef habitats, hardbottom areas, deep reef areas, and pinnacles that connect inshore juvenile fish habitats to offshore adult spawning areas. The Dry Tortugas region supports the largest remaining thickets of ESA-listed elkhorn coral and staghorn coral as well as high cover of deep-water star corals. Tortugas North, approximately 109 square miles (69,789 acres) has been a marine zone since 2000. The final preferred alternative proposes no change to this zones area or regulations. The only change is the zone type from ecological reserve to conservation area.

Tortugas South Conservation Area: Tortugas South Conservation Area is expanding to protect fish and coral life. This area protects high species and habitat diversity and abundance, and a known multi-fish spawning aggregation site. It also protects unique deep water pinnacles, ledges, and ridges including Riley's Hump and deep reef habitats and supports deep water snapper and grouper populations, including high numbers of snowy groupers. Tortugas South

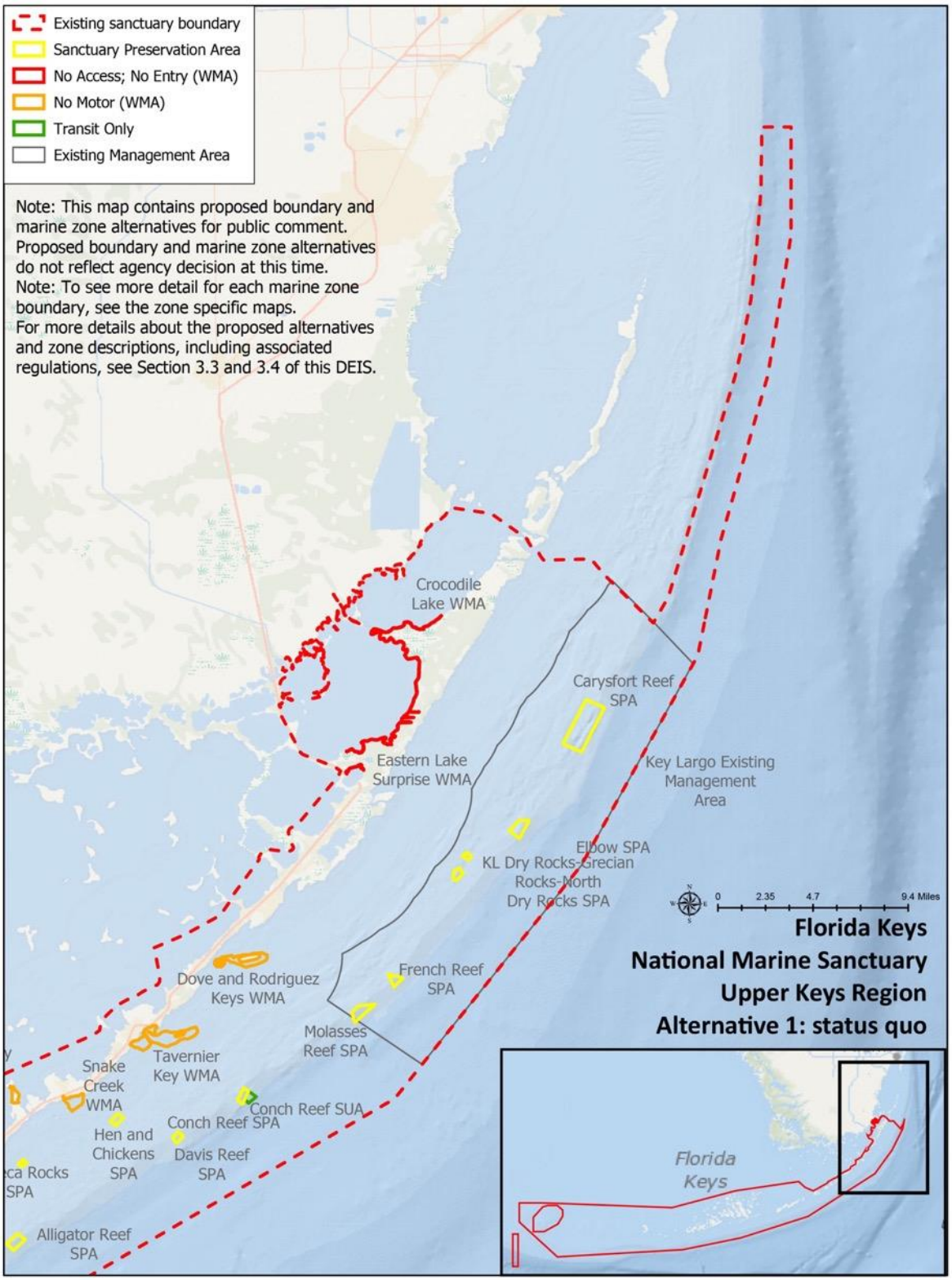
has been a sanctuary marine zone since 2000. The final preferred alternative makes no change to regulations and proposes to expand this zone by approximately 18.1 square miles (11,568 acres) for a total area of 90.4 square miles (57,846 acres). Additionally, the zone type is changed from ecological reserve to conservation area.

Tortugas Bank Wildlife Management Area: To protect this area from damaging boat anchors, this existing area has a no anchoring for vessels larger than 50-meter regulation in effect. Tortugas Bank (approximately 32 square miles; 20,626 acres) has been a sanctuary marine zone since 1997.

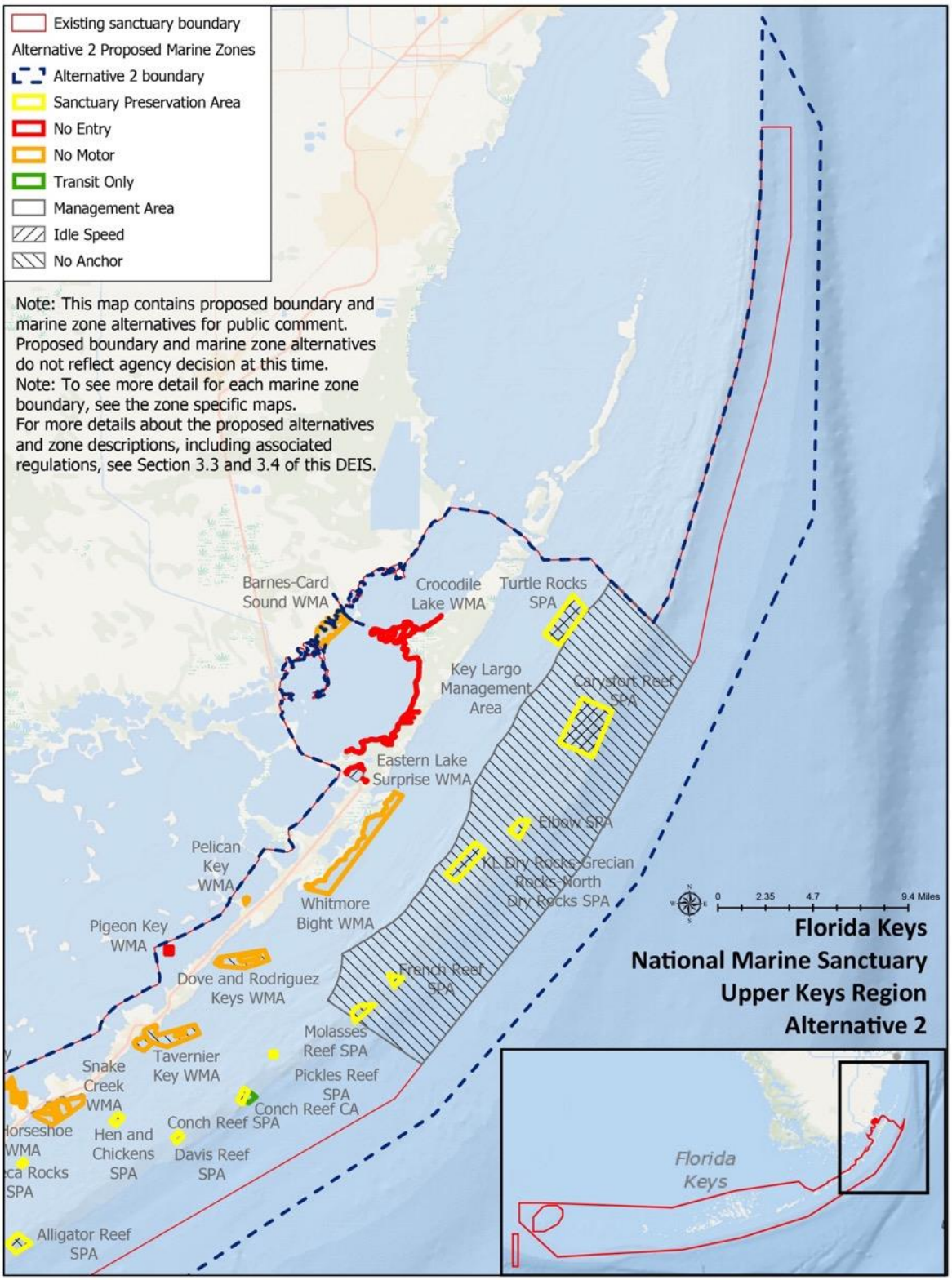
Alternatives Presented in the 2019 Draft EIS

The following series of maps were included in the 2019 draft environmental impact statement. These maps depict alternatives 1 through 4, which are described in Chapter 3 of this document. See the 2019 draft EIS for more information.

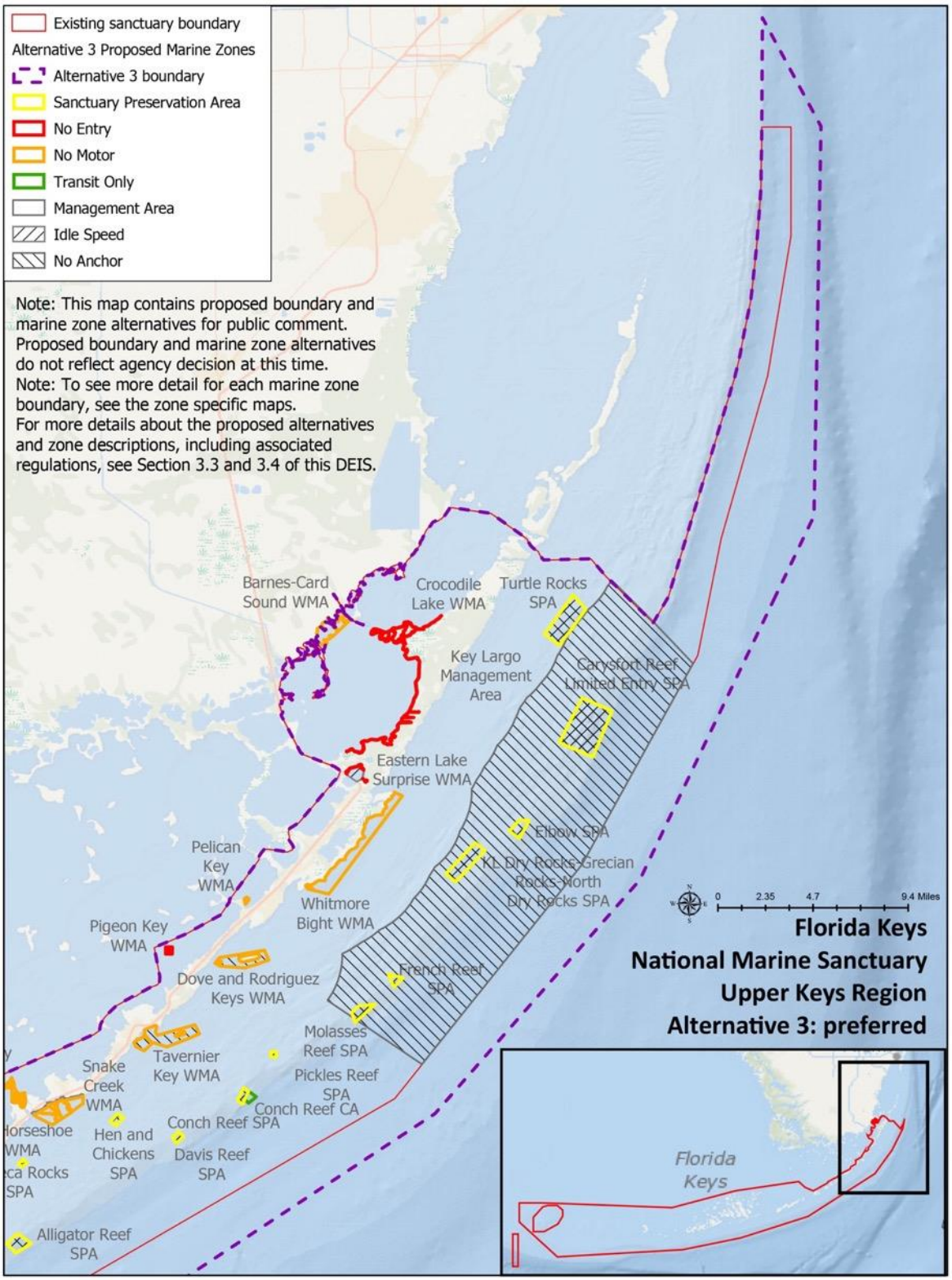
Upper Keys Region Alternative 1



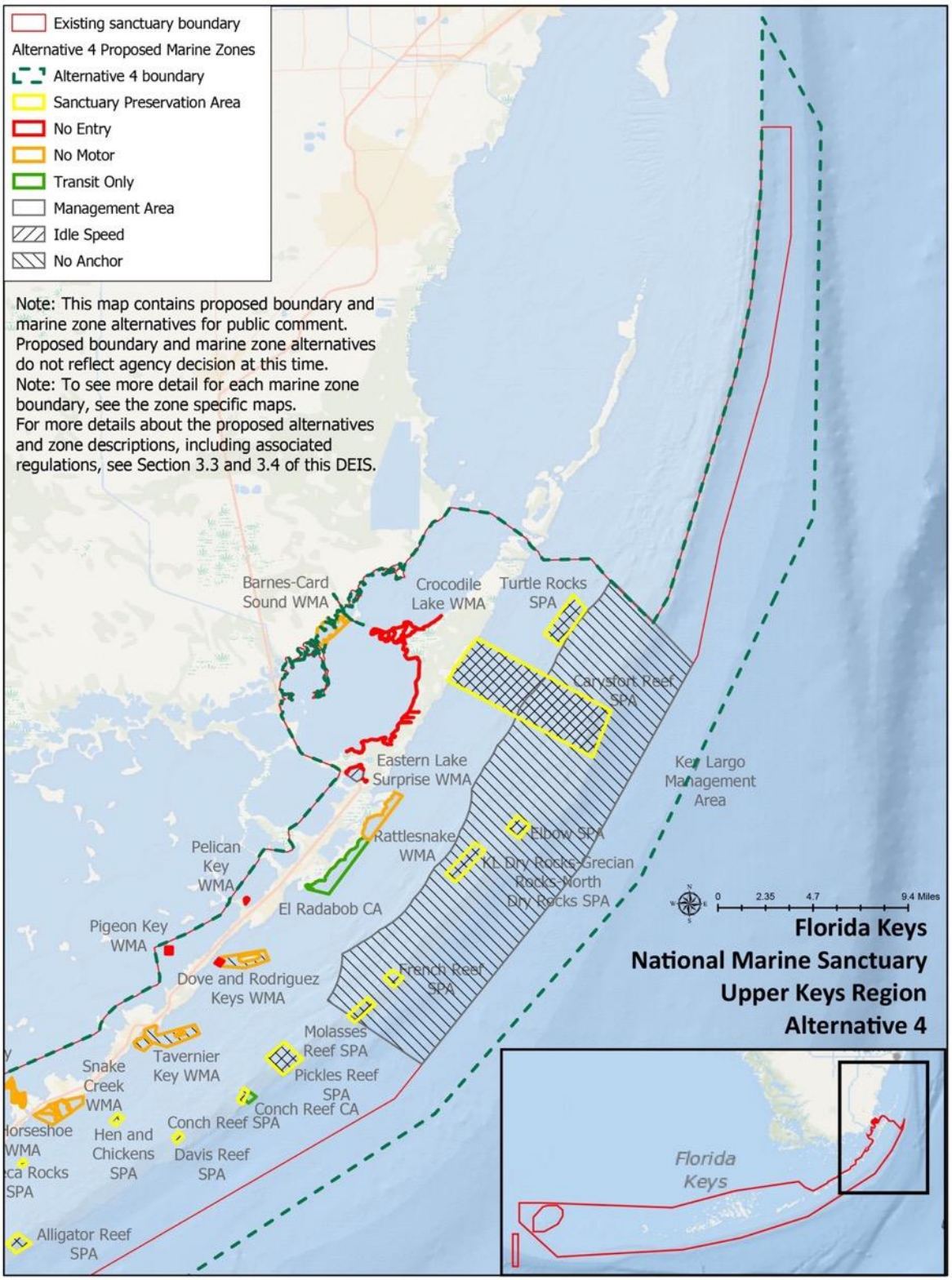
Upper Keys Region Alternative 2



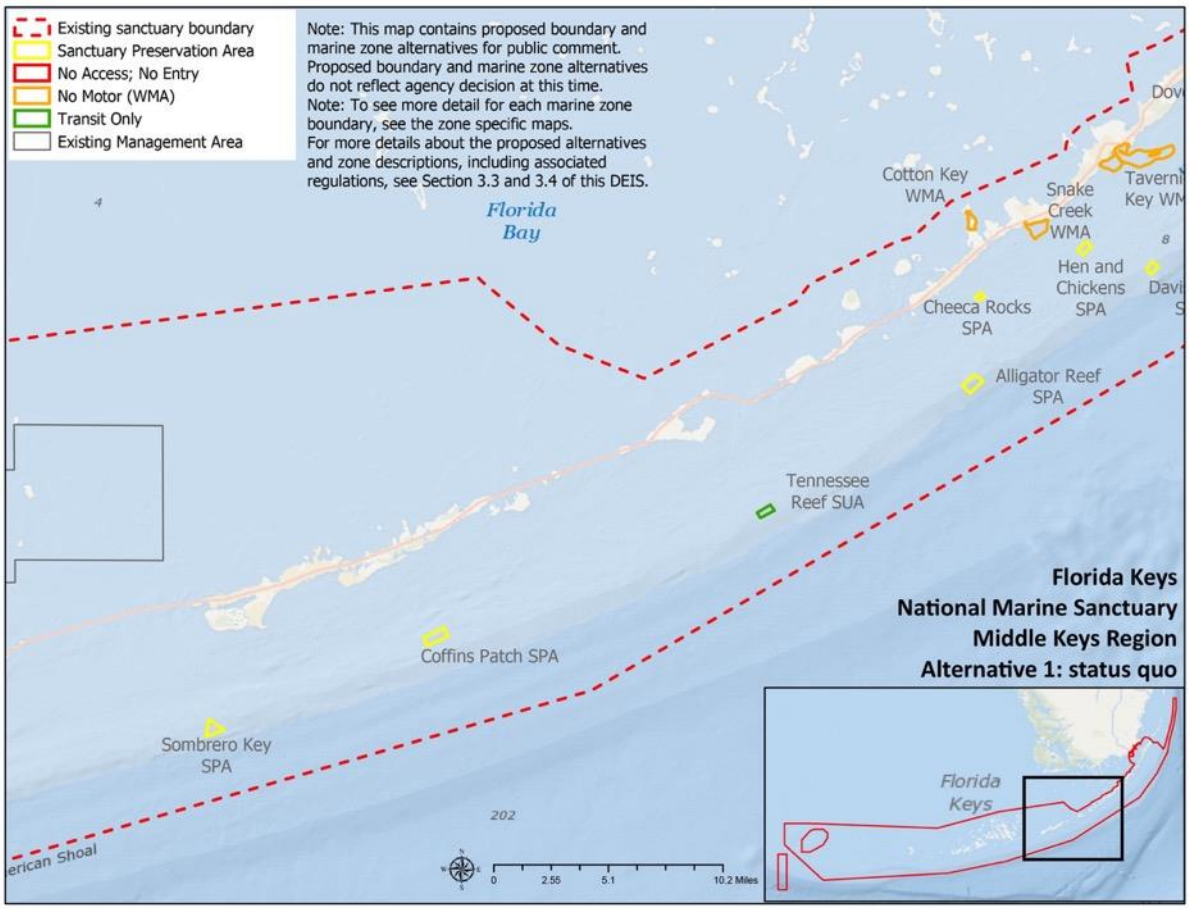
Upper Keys Region Alternative 3



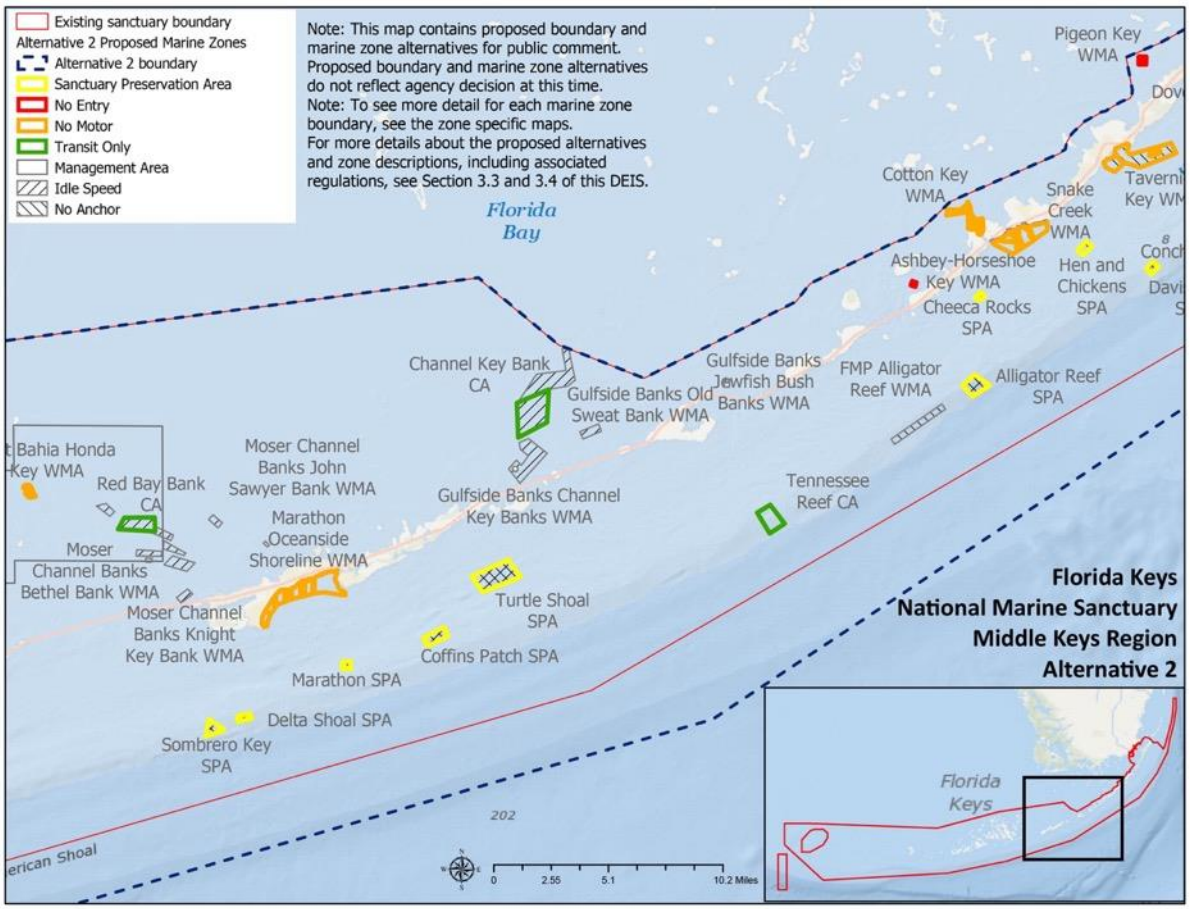
Upper Keys Region Alternative 4



Middle Keys Region Alternative 1



Middle Keys Region Alternative 2



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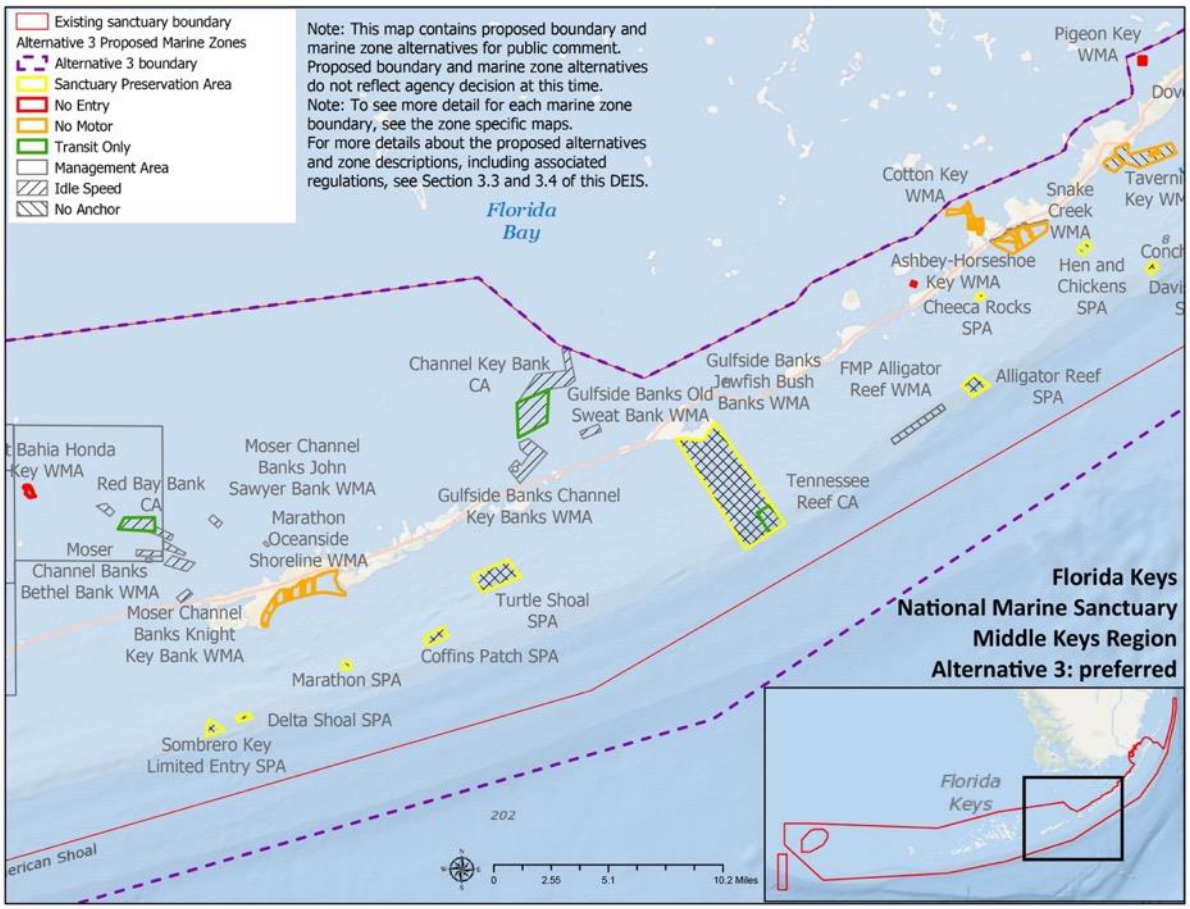

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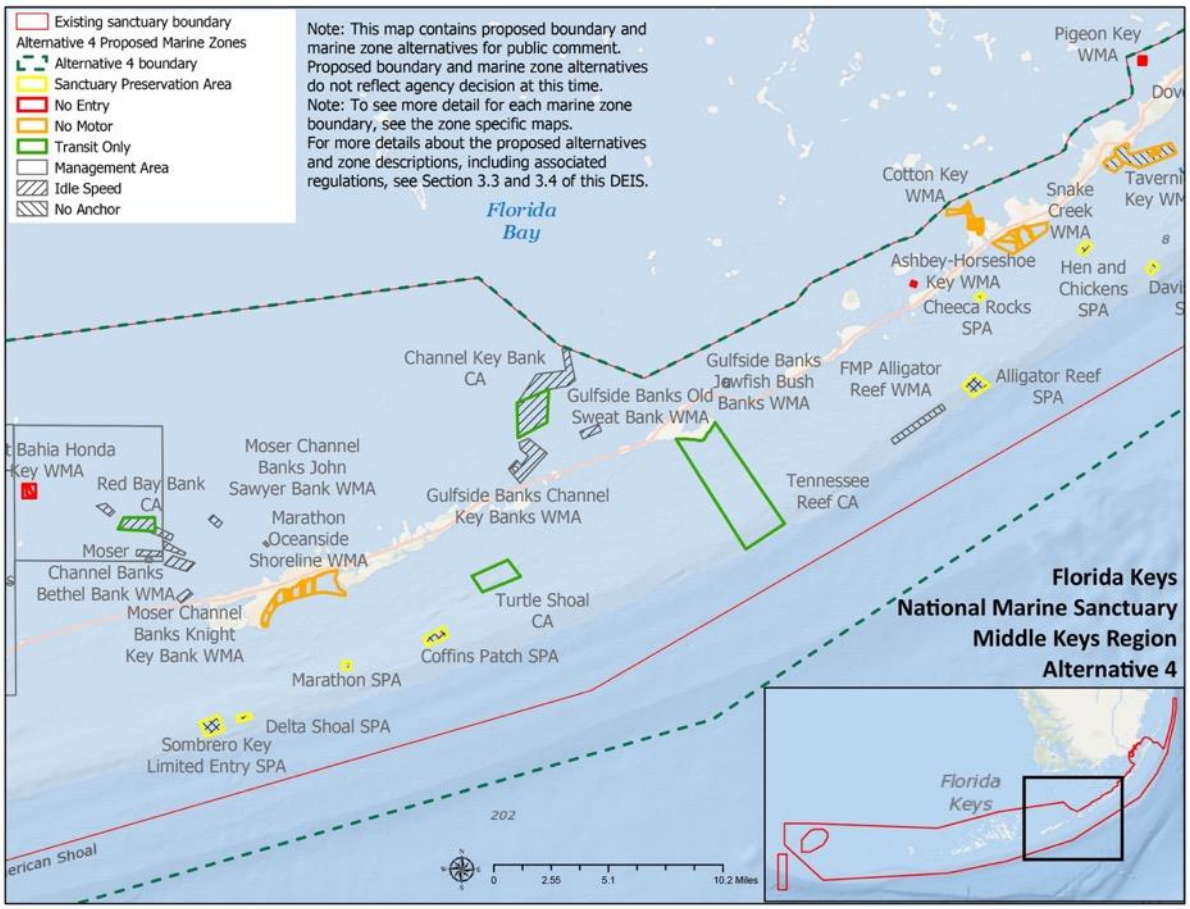
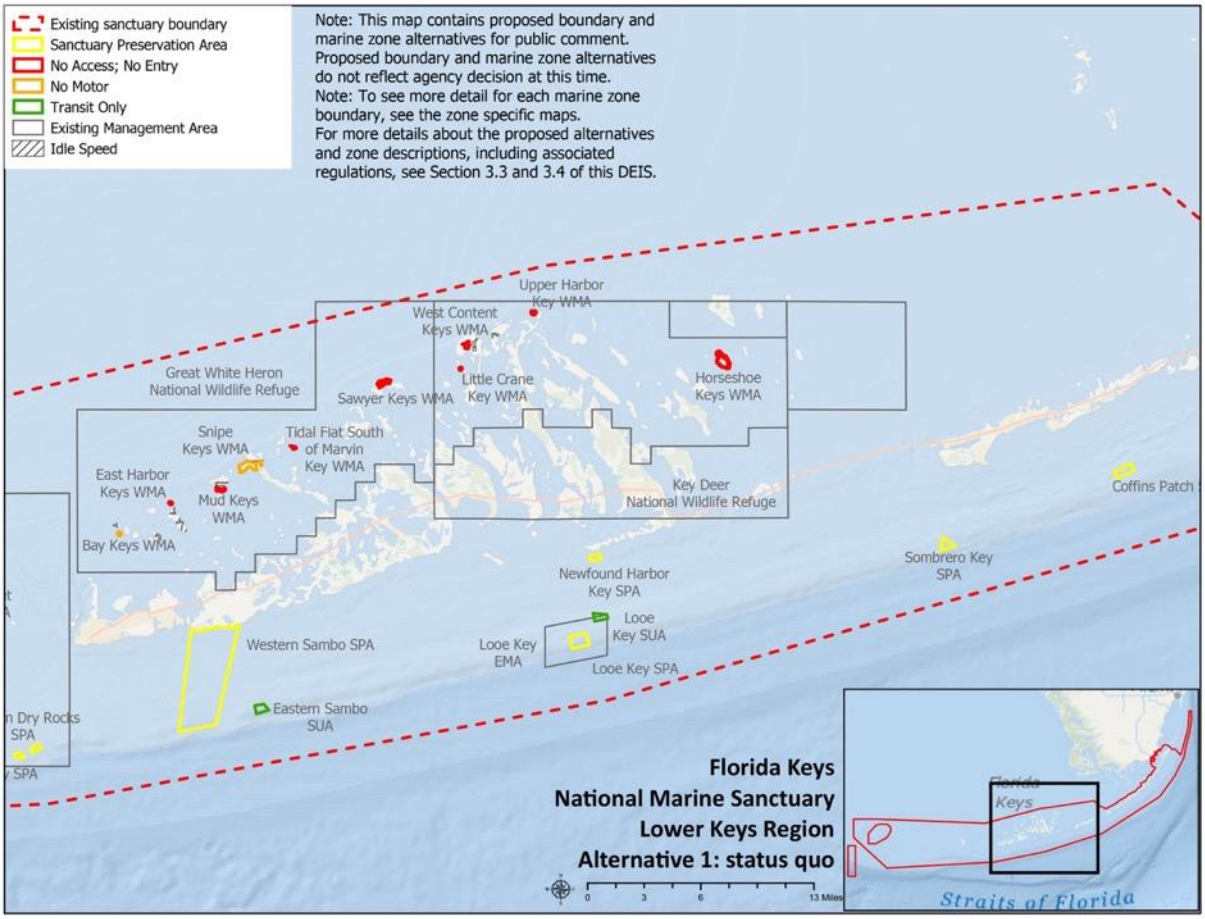
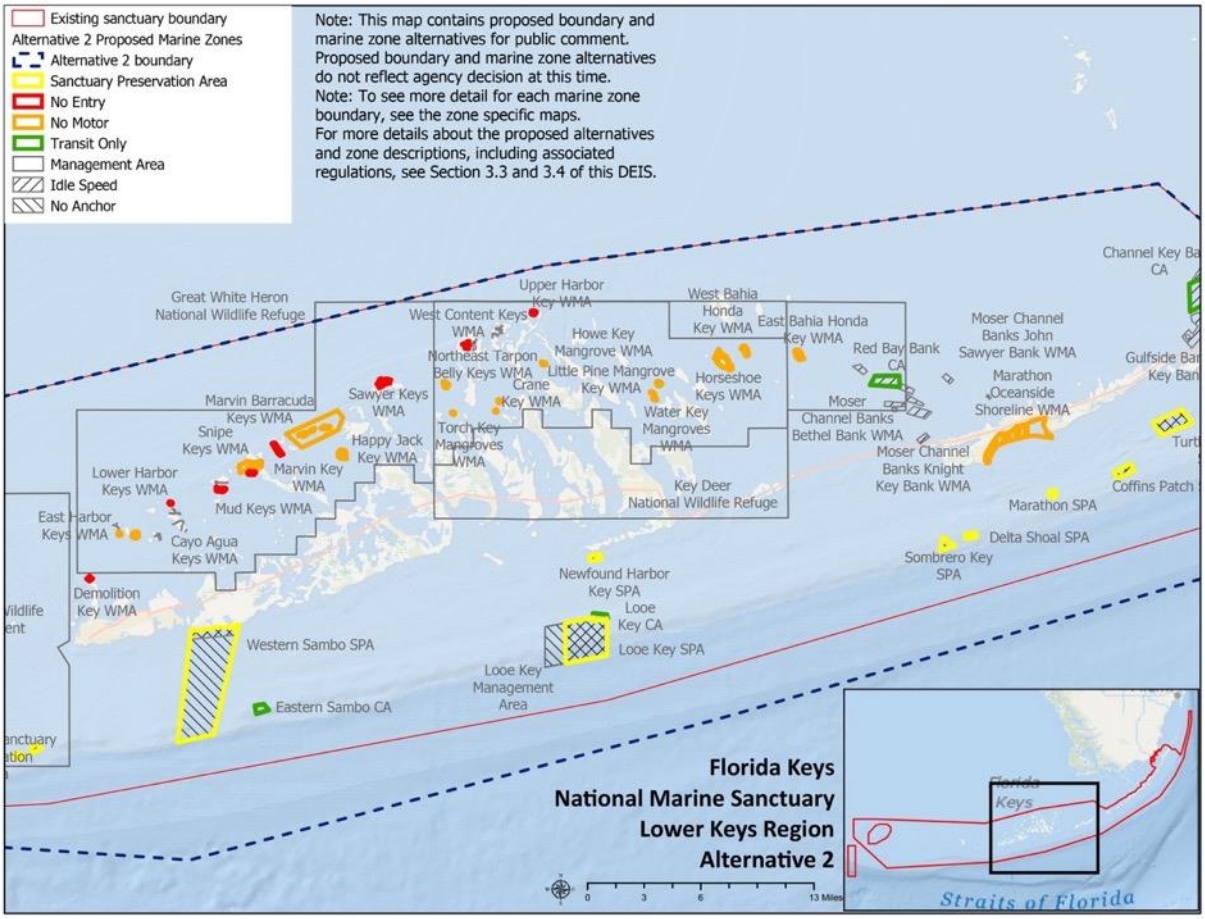


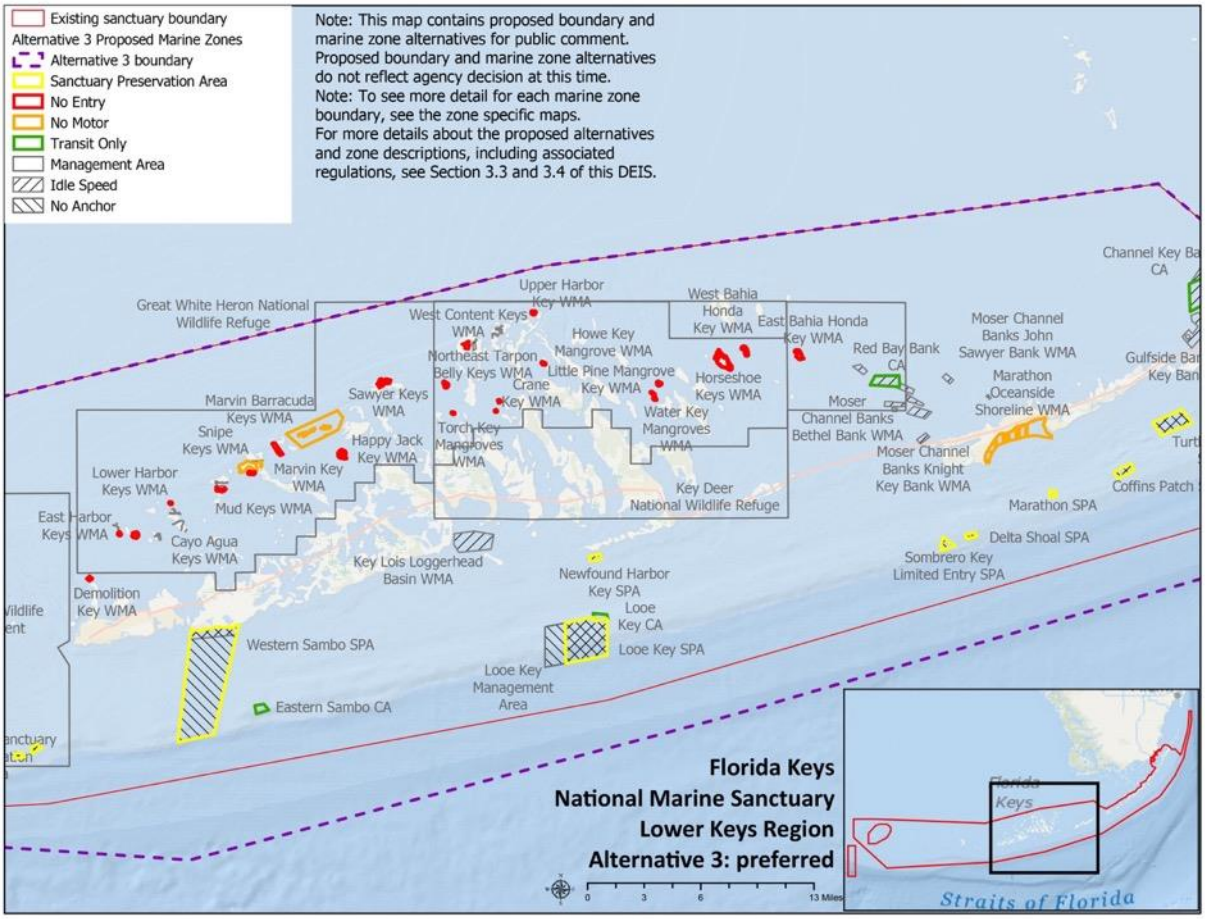
Lower Keys Region Alternative 1



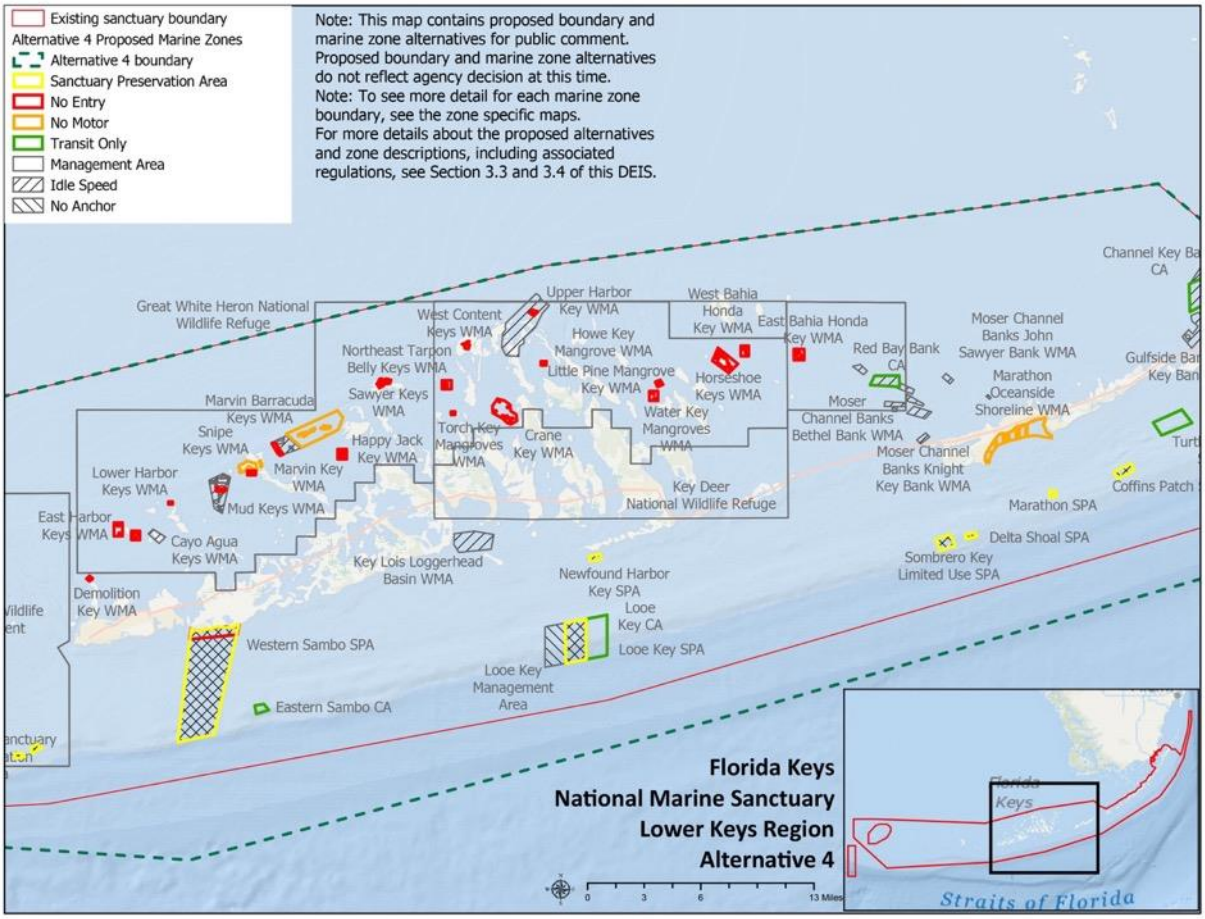
Lower Keys Region Alternative 2



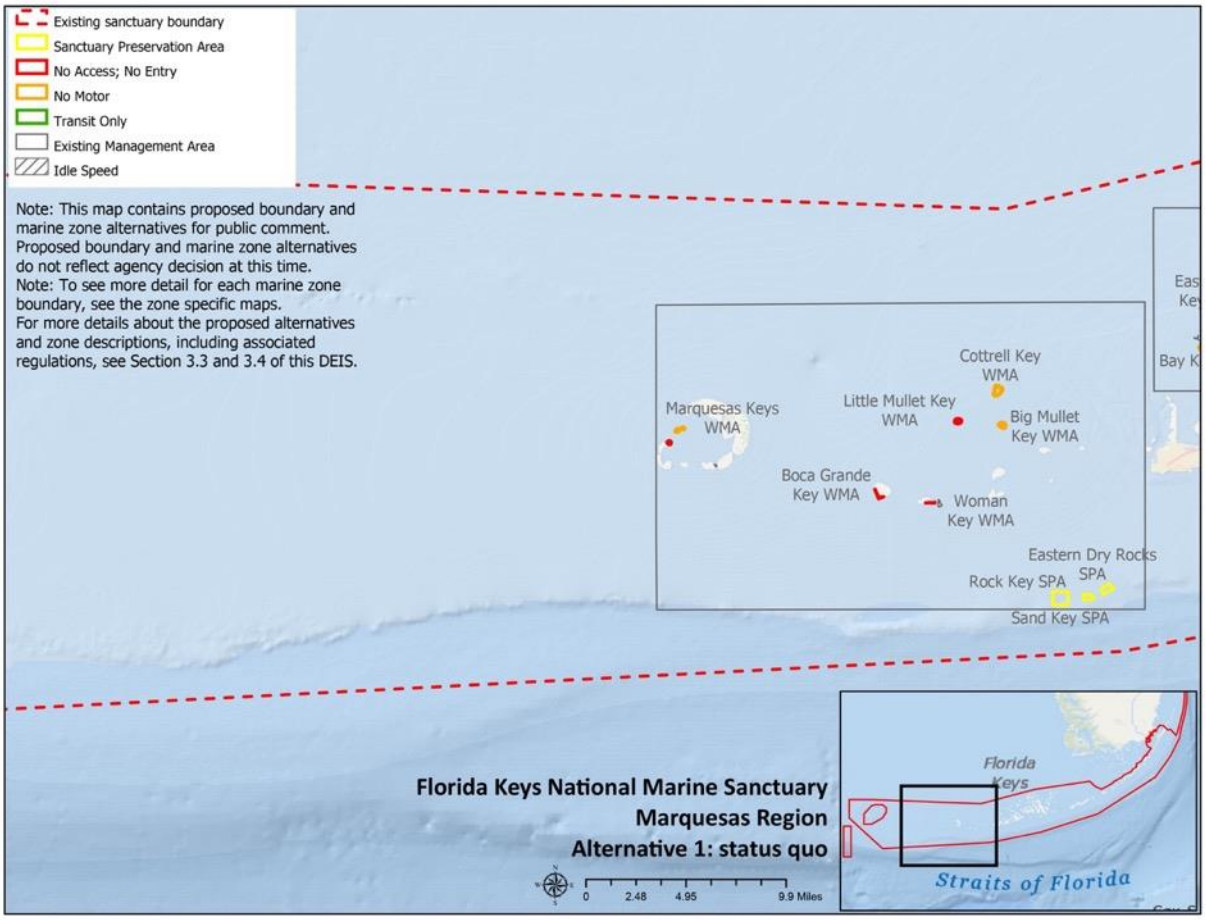
Lower Keys Region Alternative 3



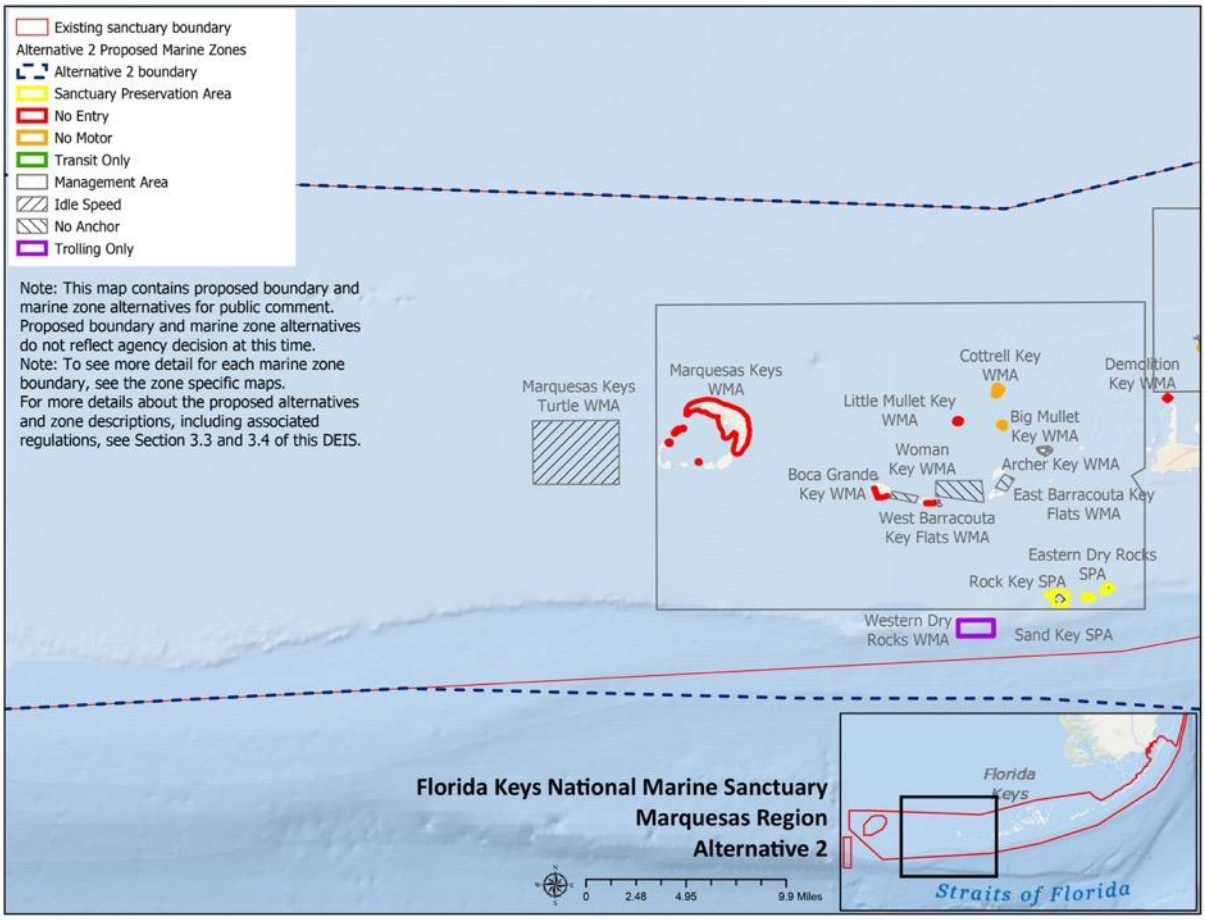
Lower Keys Region Alternative 4



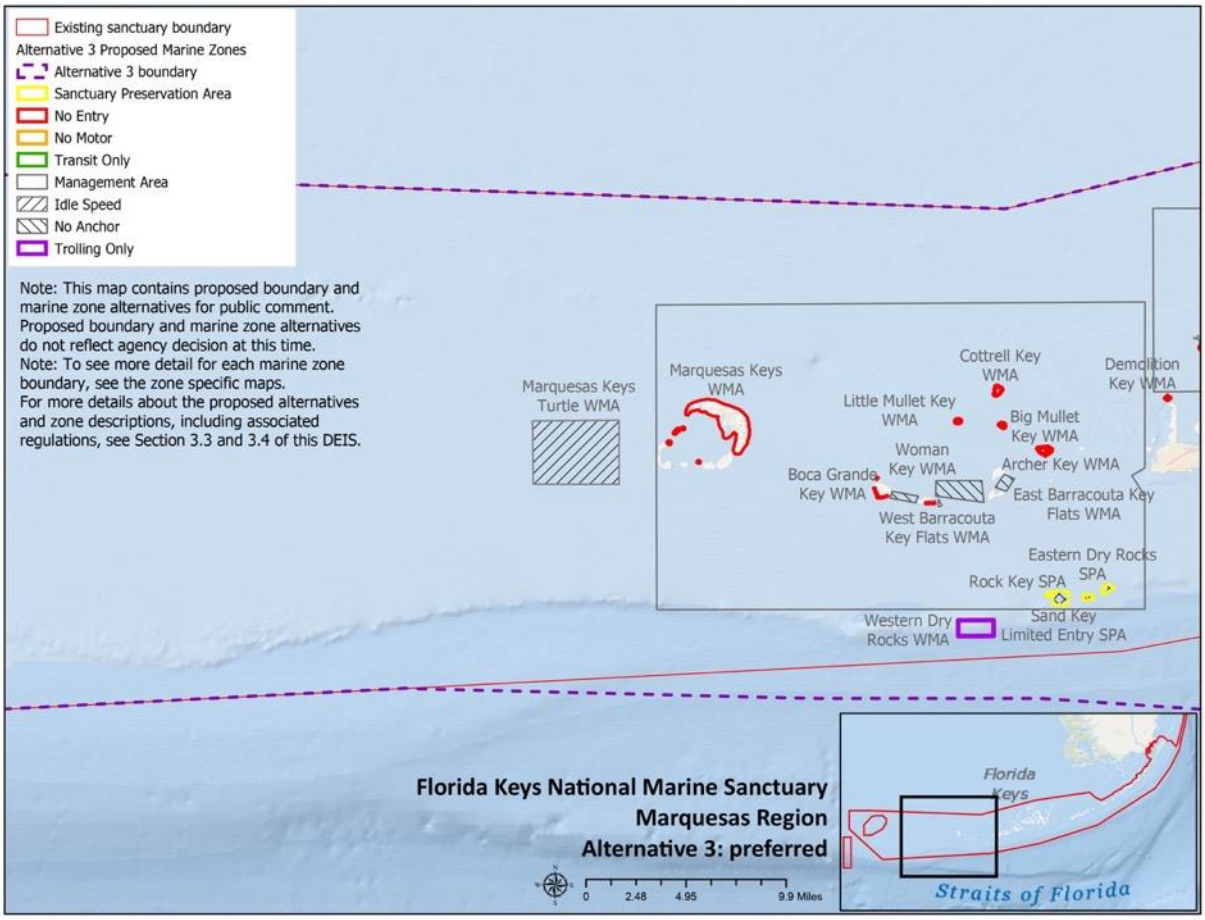
Marquesas Region Alternative 1



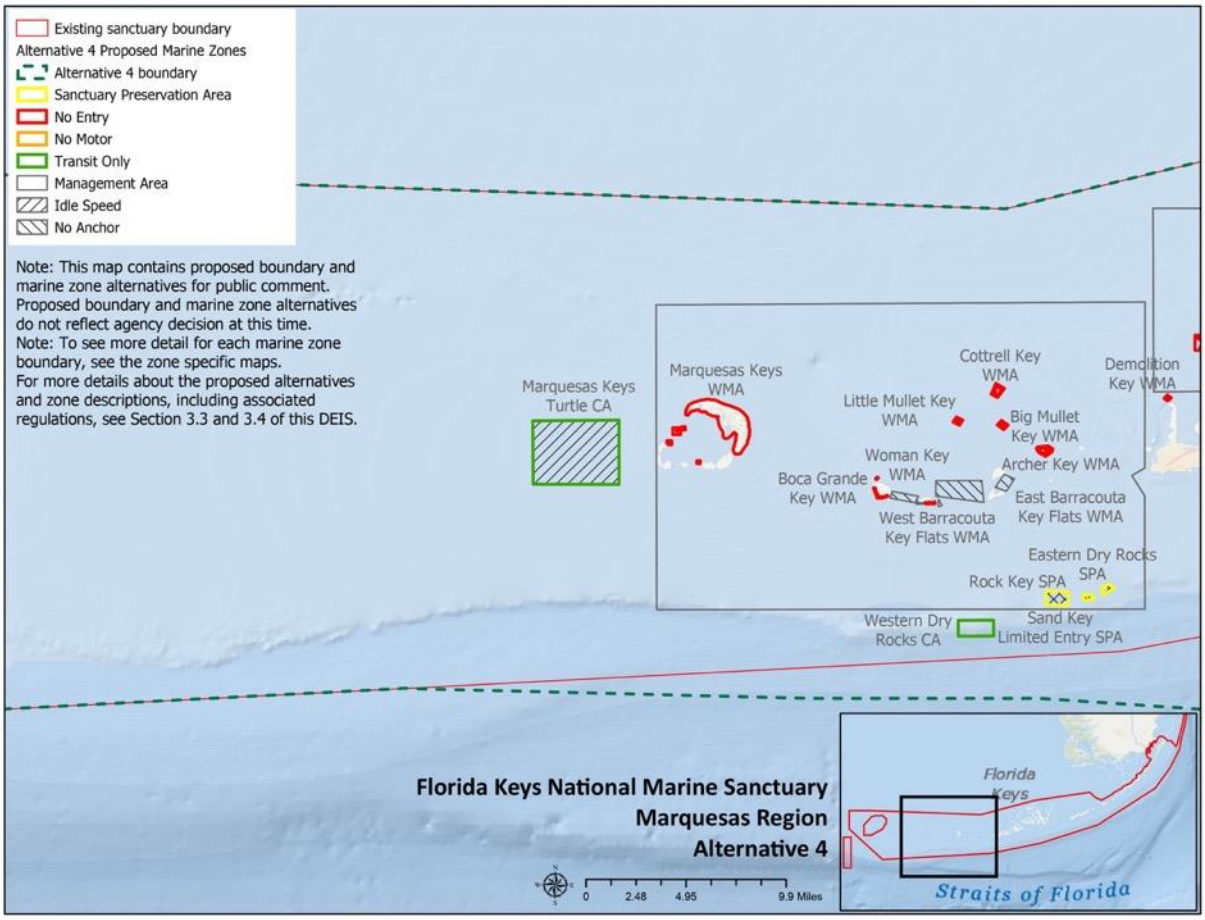
Marquesas Region Alternative 2



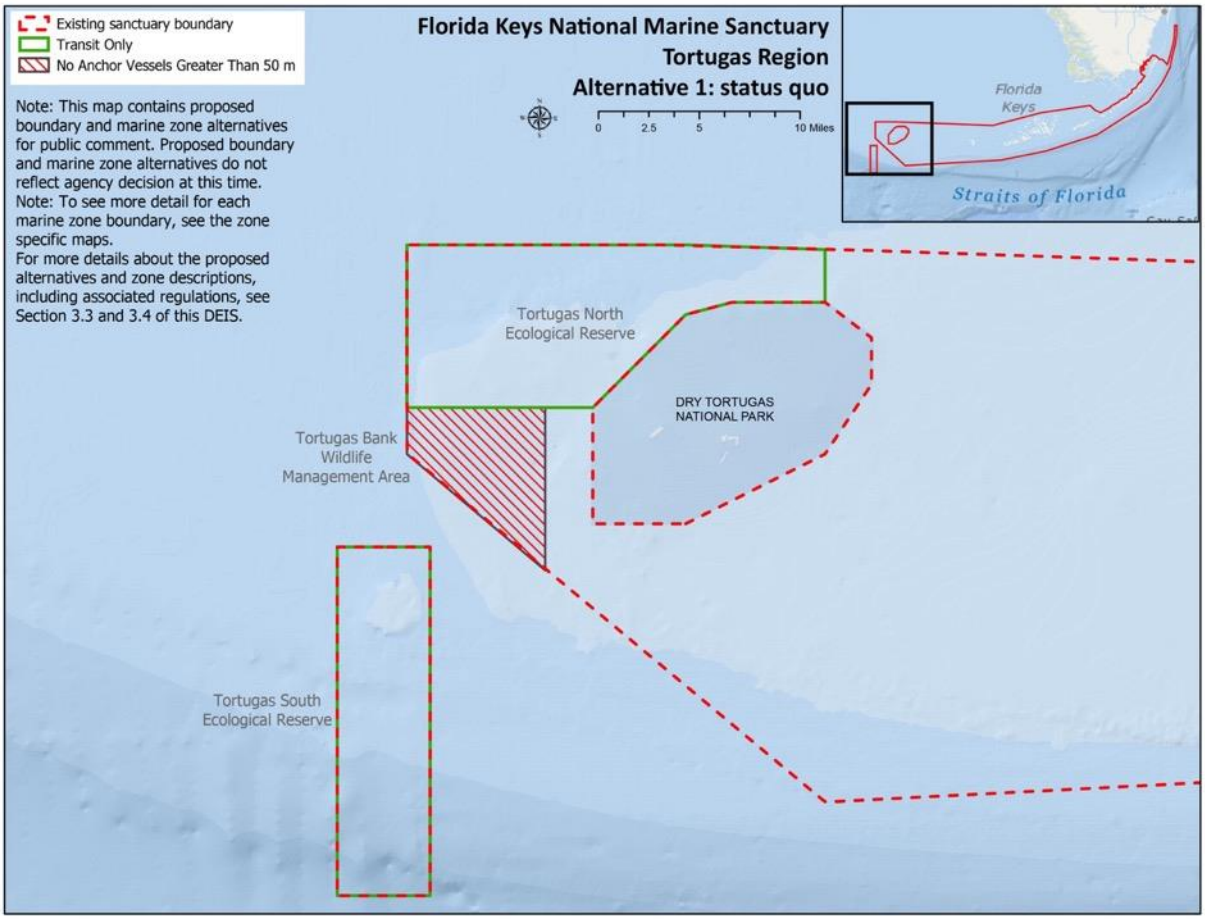
Marquesas Region Alternative 3



Marquesas Region Alternative 4



Tortugas Region Alternative 1



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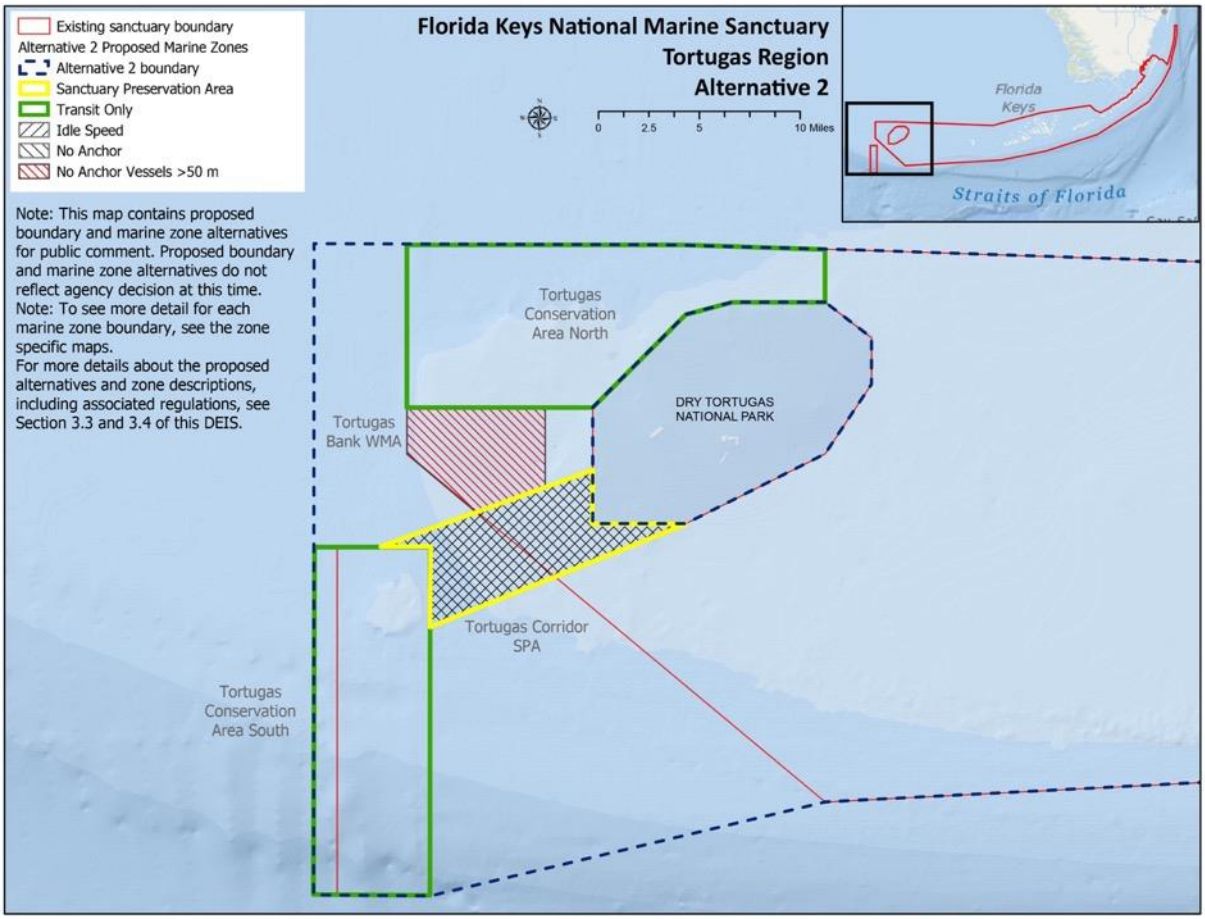

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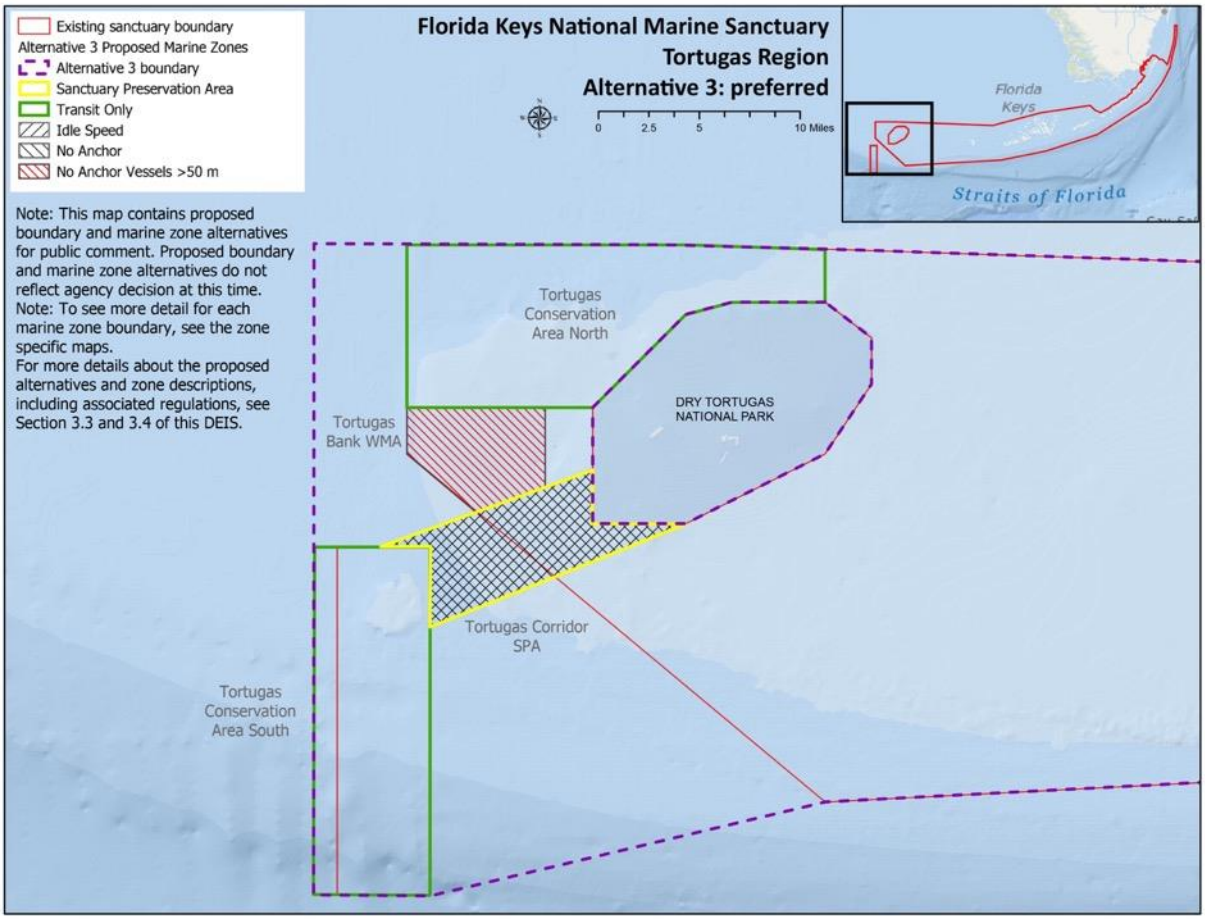

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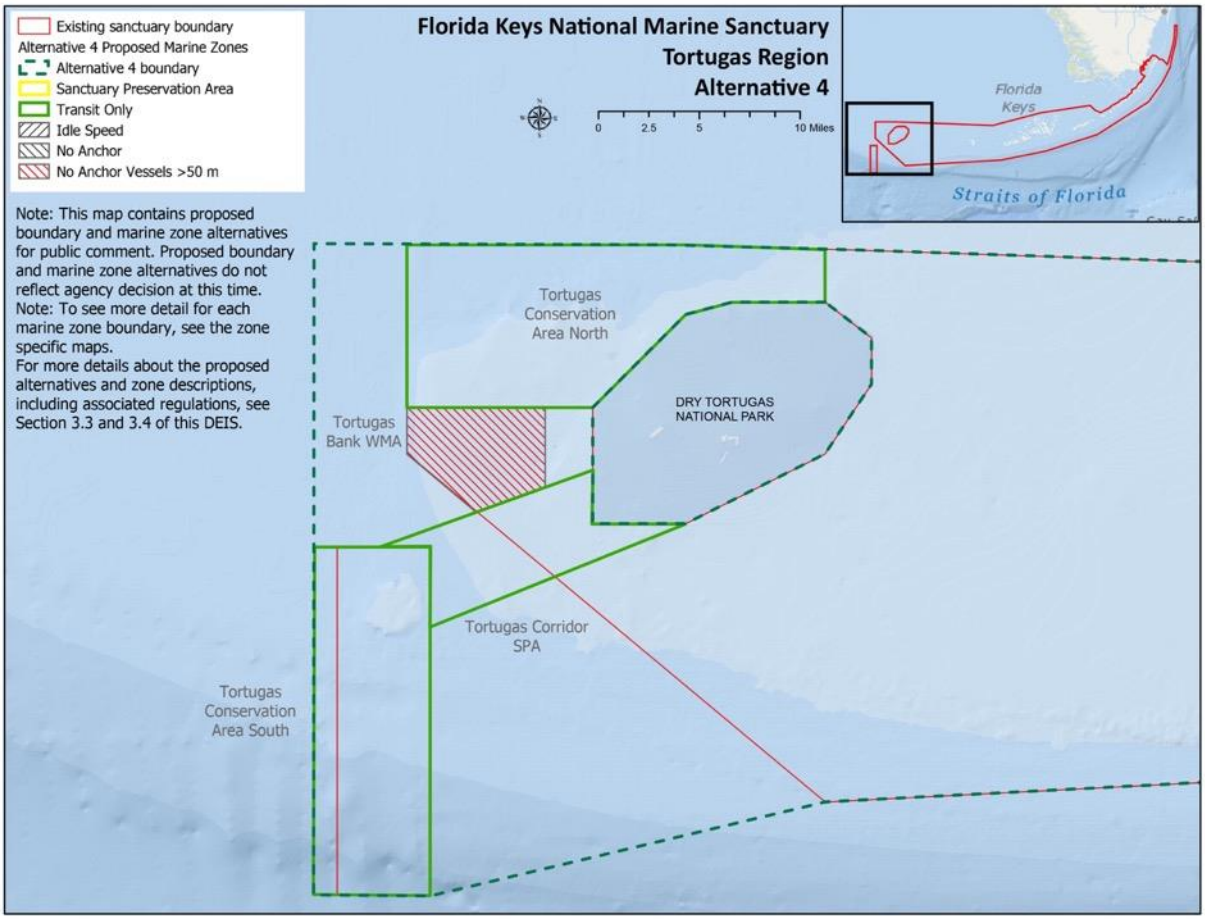
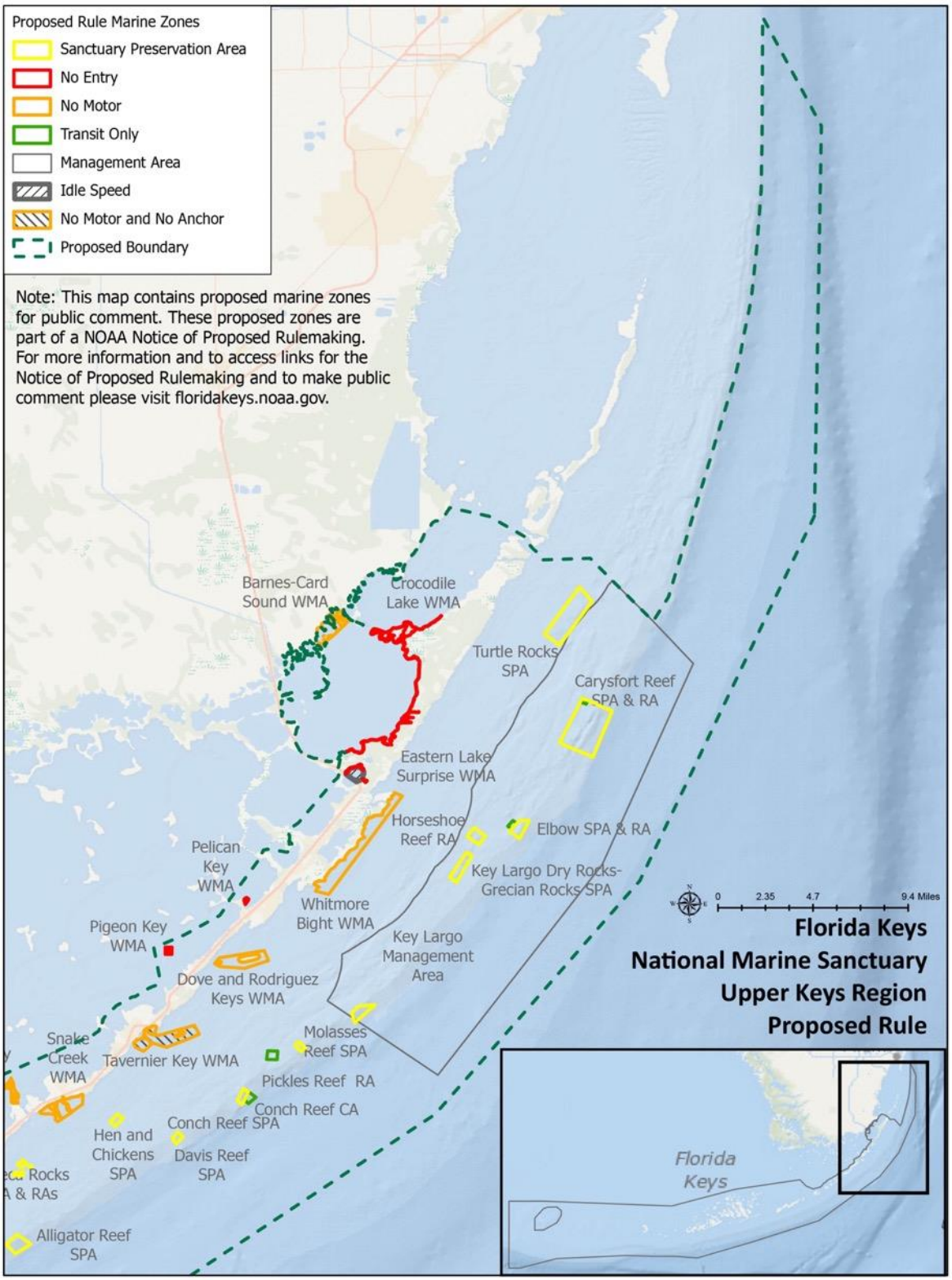


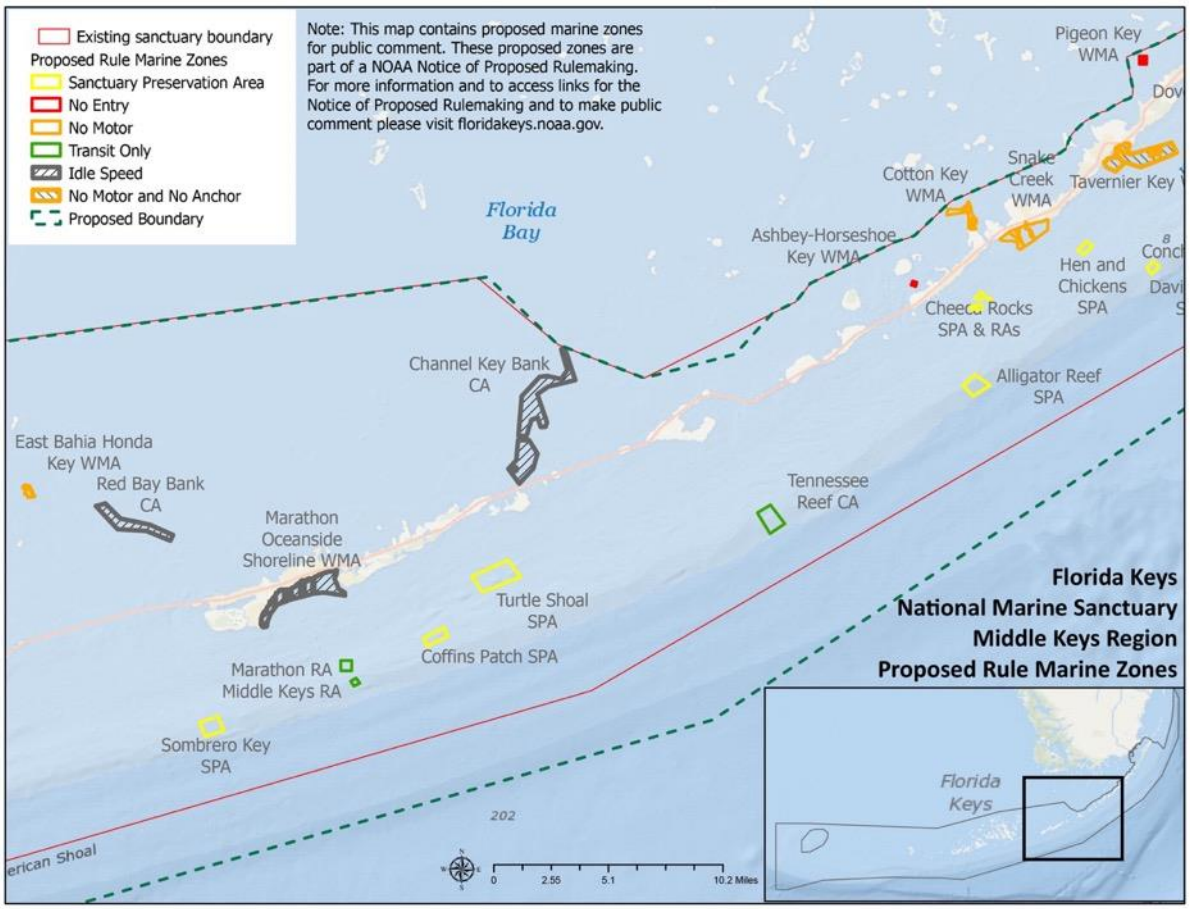
Alternatives Presented in the 2022 Notice of Proposed Rulemaking Alternative

The following series of maps were included in the 2022 notice of proposed rulemaking supplementary material. These maps depict the alternative presented in the 2022 notice of proposed rulemaking and is described in Chapter 3 of this document. See the 2022 notice of proposed rulemaking and supplementary materials for more information.

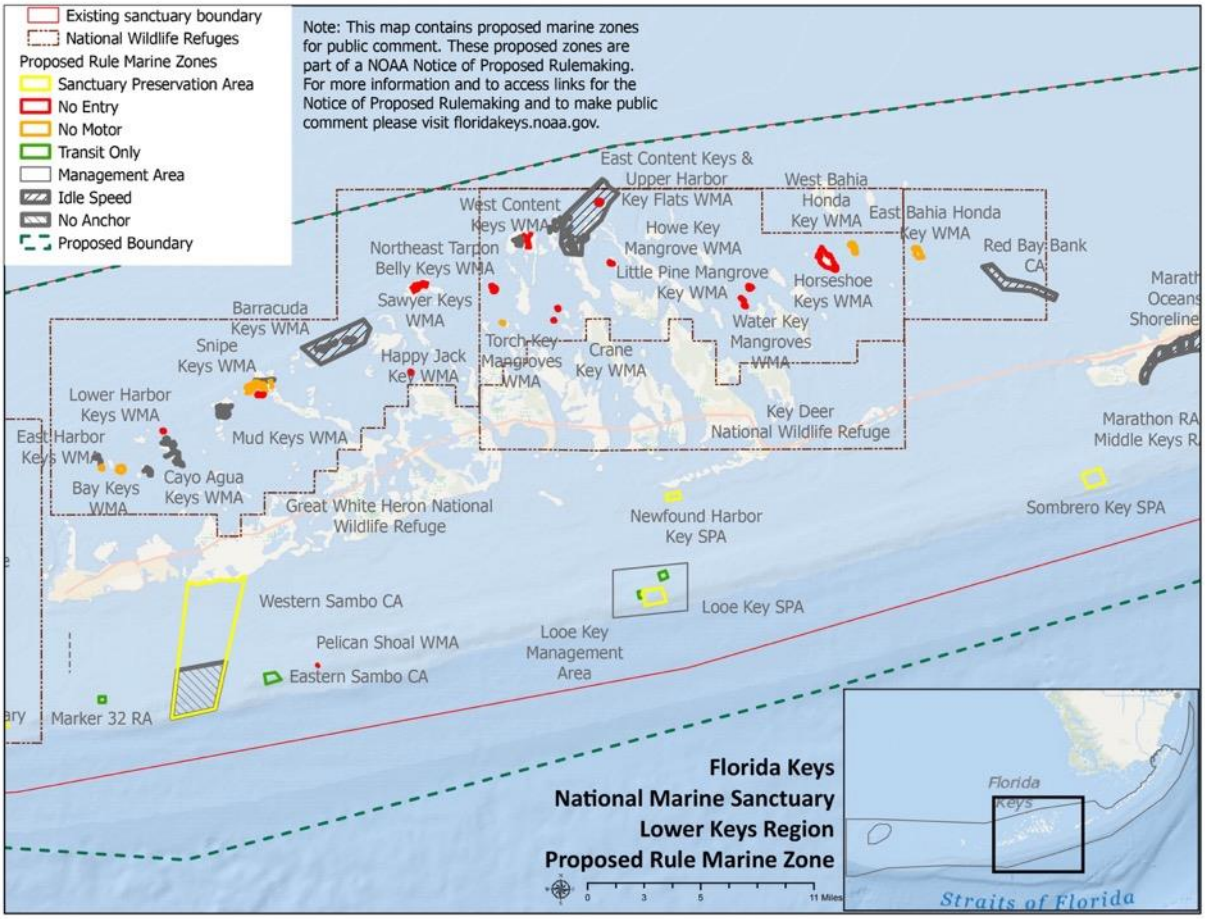
Upper Keys Region NOPR Alternative



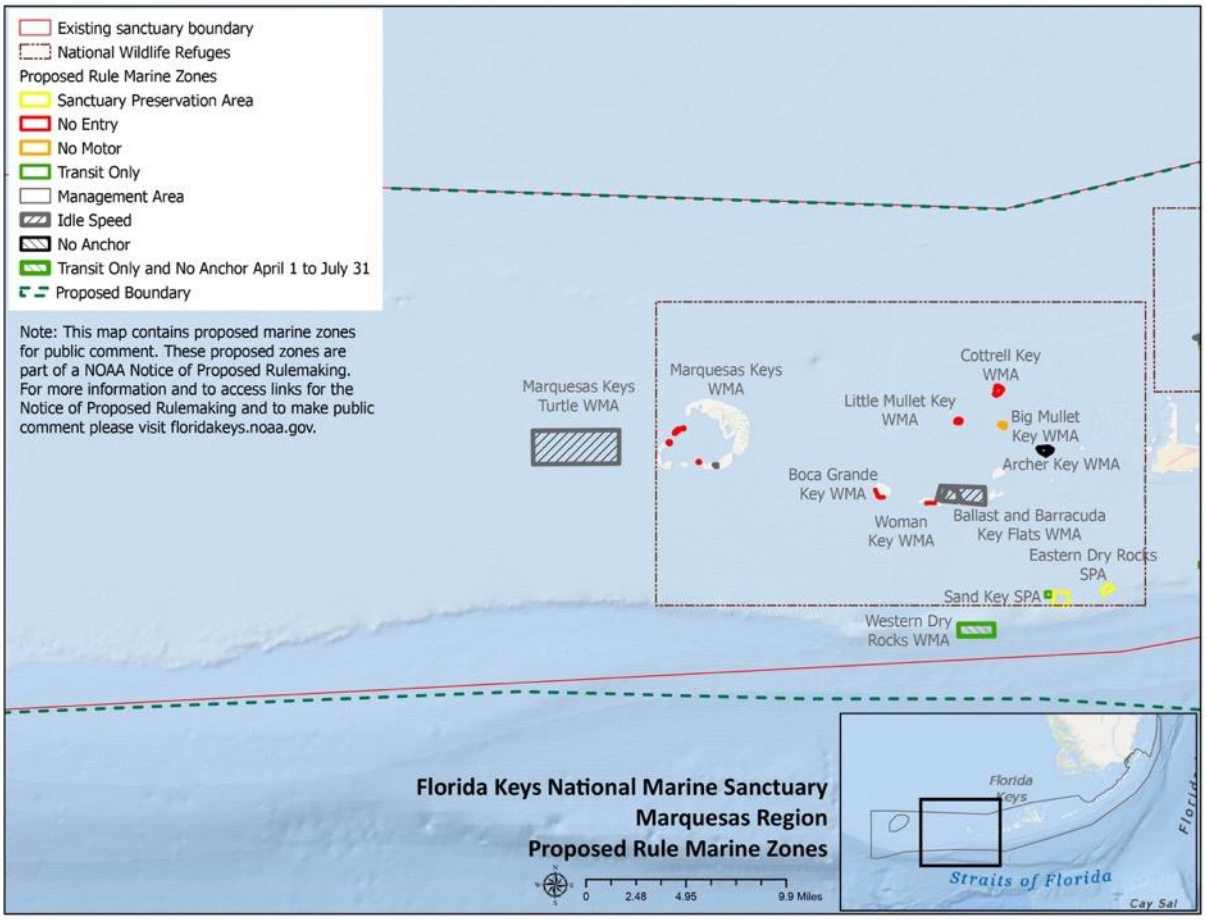
Middle Keys Region NOPR Alternative



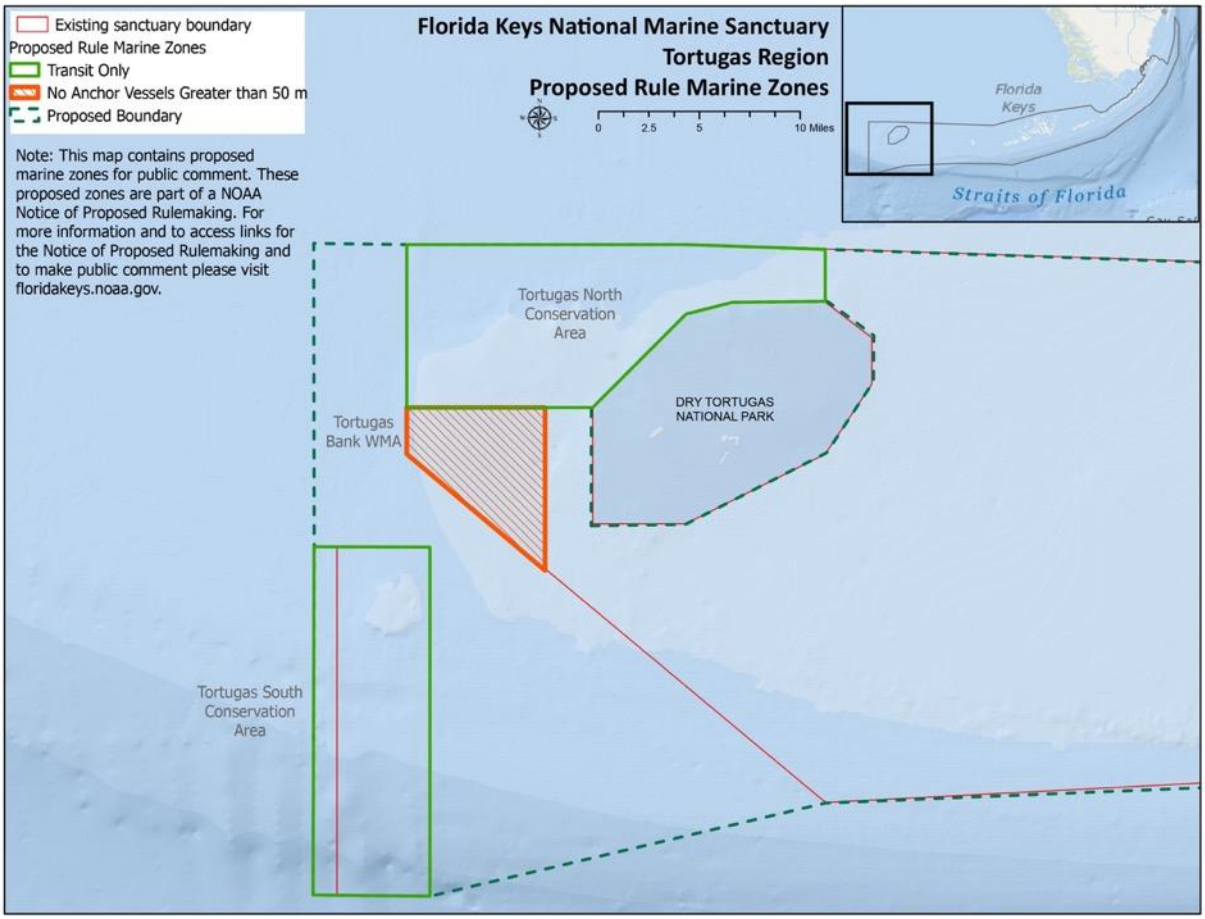
Lower Keys Region NOPR Alternative



Marquesas Region NOPR Alternative



Tortugas Region NOPR Alternative



Appendix C: Response to Comments

Response to Comments on Restoration Blueprint Draft EIS, Management Plan, and Proposed Rule

NOAA received 1,213 distinct comments (letters and oral testimony) on the draft environmental impact statement (EIS) and draft management plan during the August 2019 through January 2020 public review period. NOAA received 426 distinct comments (letters and oral testimony) on the notice of proposed rulemaking and updated draft management plan during the August 2022 through October 2022 public review period. During both public comment periods, there were several letter campaigns and petitions, each with multiple signatories, for a total of well over 70,000 submissions. In total, across both of these public review periods, NOAA hosted 13 public meetings and received written comments from members of the public submitted at regulations.gov, written comments from the Sanctuary Advisory Council, and oral and written comments provided during in-person and virtual public meetings.

All comments are available for viewing at regulations.gov (Docket #NOAA-NOS-2019-0094). In accordance with the Council on Environmental Quality regulations, 15 CFR 1503.4 (1978), NOAA has carefully considered all substantive public comments, including all opposing viewpoints, in order to determine whether to modify or consider new alternatives, and improve or correct our analysis in the EIS. All substantive issues raised in the comments are summarized and addressed in this section. NOAA organized and summarized the comments according to the topic, theme, or subject area. In our responses, NOAA notes when we made changes to the EIS, rule, and management plan in response to these comments. For other comments, NOAA also explains why NOAA did not make certain changes or why certain comments do not warrant further agency response. Minor technical or editorial (such as proofreading) comments on any of the draft documents are incorporated in the final documents, and are not described in further detail here.

The subject matter of each comment category is first summarized, followed by NOAA's response. Responses may refer to portions of the regulations, management plan, or EIS that NOAA modified as a result of comments it received. Comments and responses are organized primarily by applicable regulation or management plan goal or priority, in addition to a few cross-cutting categories of comments.

General

Comment: NOAA received comments that opposed any additional regulatory action, beyond the status quo, and called for no change to the current regulations and management plan.

Response: Maintaining only current marine zones and regulations without change would not address the longstanding concerns that led to this action, as identified in the 2007 Florida Keys National Marine Sanctuary management plan and 2011 condition report, and therefore, would not meet the purpose of the proposed action. Alternative 1 in this final EIS assesses the effects of taking no action, which would include no changes to the current regulations and management plan.

Sanctuary Boundary

For more details on the sanctuary boundary proposals and impact analysis see Section 3.1 and Chapter 5 respectively.

Comment: NOAA received comments supporting the sanctuary boundary expansion alternative to include the Florida Keys Area to Be Avoided (ATBA), the Tortugas region, and Pulley Ridge. Comments noted support for sanctuary-wide boundary expansion to reduce confusion and create consistency, particularly through the ATBA boundary expansion. Comments acknowledged the need for greater ecological protection in the Florida Keys that could be achieved through boundary expansion, particularly by including the entire Tortugas region and Pulley Ridge. NOAA received comments opposing the sanctuary boundary expansion alternatives, largely due to concern about loss of access for traditional fishing activities.

Response: NOAA's proposed action including the Final Preferred Alternative aligns the sanctuary boundary with the ATBA boundary to create a consistent geographic and regulatory boundary. In addition, including the ATBA and the Tortugas region would provide additional protections for the resources that are present in the expanded area including those that are ecologically connected. In response to concerns about sanctuary boundary expansion resulting in loss of fishing access, existing and proposed new or modified sanctuary-wide regulations would apply. Specific to fishing activity, the boundary expansion does not affect activities that are considered traditional fishing as defined at 15 CFR 922.162 and described in Appendix G of this final EIS.

Comment: NOAA received comments supporting and opposing expanding the sanctuary boundary to include a distinct unit at Pulley Ridge. Comments in support noted its value as the deepest known photosynthesizing coral reef off the continental U.S. with physical and biological connections to the Florida Keys. Comments on opposition noted this area is already regulated as the Pulley Ridge Habitat Area of Particular Concern (HAPC) with associated Gulf of Mexico Fishery Management Council regulations and requested that NOAA pursue other avenues to protect the area from all vessel anchoring.

Response: The existing Pulley Ridge HAPC, with associated Gulf of Mexico Fishery Management Council regulations, prohibits anchoring by fishing vessels. NOAA's purpose for proposing to designate a new unit in Pulley Ridge is to protect important mesophotic reef habitat from anchoring by all vessels. Concurrent with considering boundary expansion to include Pulley Ridge, as noted in the proposed rule, the United States proposed the International Maritime Organization designate a Pulley Ridge No Anchoring Area in the southern portion of Pulley Ridge, which was approved and implemented starting June 1, 2023 (IMO SN.1/Circ.342). The International Maritime Organization designation prohibits all anchoring on Pulley Ridge and, therefore, the need for additional regulation by NOAA is greatly reduced. NOAA has updated its Final Preferred Alternative in the final EIS because the new Pulley Ridge No Anchoring Area designation provides sufficient protection for these important resources. Finally, given that this area of Pulley Ridge is managed as a HAPC with associated fishing regulations under the Magnuson-Stevens Fisheries Conservation and Management Act, NOAA did not propose an alternative that restricts fishing in this area.

Comment: NOAA received comments that opposed any change to the sanctuary boundary citing reasons including: 1) the lack of sufficient enforcement; 2) concern of restricting use/access for the public, particularly for commercial fishing and most notably shrimp fishing; 3) budget and management limitations; and 4) socioeconomic consequences to certain industries.

Response: NOAA considered all of these concerns throughout the Restoration Blueprint process, including at the draft EIS and draft management phase, the notice of proposed rulemaking, and the final EIS and final management plan. Specifically:

1. Enforcement is identified as one of six management priorities in the final management plan (see sections 3.3.1 and 5.3.2). NOAA/Office of National Marine Sanctuaries would work with partners to enhance enforcement capacity to achieve visible resource protection benefits. The Office of National Marine Sanctuaries is also committed to enhancing public knowledge, understanding, and compliance through establishing consistent regulations, where feasible, and targeted education and interpretation of those regulations. These efforts will strengthen enforcement of the final regulations.
2. Public access, including fishing access, is not affected by expanding the sanctuary boundary. Sanctuary-wide regulations would apply, which may affect how someone operates (e.g., prohibition on impact to the seabed) but do not affect access. Regarding fishing activity, exemptions from specific sanctuary-wide regulations exist for traditional fishing activities—the definition for which is updated in the Final Preferred Alternative.
3. NOAA will address resource limitations by identifying priorities towards which resources will be directed. NOAA's final management plan includes a suite of six management priorities and Appendix I outlines a prioritization framework that initially evaluated cost and level of effort needed followed by consideration of the following five factors: importance, impact, feasibility, requirements, and connection to one of the six priority themes. In addition, NOAA will continue to work with partners that play an essential role in how the sanctuary conducts its operations and programs. Appendix II includes a list of representative partners.
4. As summarized in the 2022 Socioeconomic Report (2022 Schwarzmann et.al.,), the estimated economic effects of the 2022 Notice of Proposed Rulemaking (NOPR) Alternative are not considered significant under Section 3(f)(1) of Executive Order 12866. This means that the proposed action will not adversely affect in a material way the economy; a sector of the economy; productivity; competition; jobs; the environment; public health or safety; or state, local, or tribal governments or communities. Estimated losses to commercial fishing operations and recreational for-hire fishing operations resulting from proposed boundary changes are expected to be less than 1% of average revenue with the exception of the lobster fishery, which may experience a loss of roughly 2%. The Final Preferred Alternative is expected to have less adverse socioeconomic effects because it has a smaller sanctuary boundary expansion than the 2022 NOPR Alternative; therefore, socioeconomic impacts are expected to be less than what was estimated in the 2022 Socioeconomic Report.

Sanctuary-Wide Regulations

For more details on the sanctuary-wide regulation proposals and impact analysis see Chapter 3: Section 3.2, and Chapter 5, respectively.

Comment: Commenters requested NOAA consider adding an exception to the proposed anchoring definition to include an exemption for push poles and power poles.

Response: NOAA's Final Preferred Alternative prohibits anchoring in all sanctuary preservation areas (SPAs), habitat restoration areas, and the offshore area of high relief coral reef in Western Sambo Conservation Area. Given that these areas prohibit take (i.e., fishing) and the use of push poles and power poles is not commonplace, the Final Preferred Alternative does not modify the anchoring definition to allow exceptions. The Final Preferred Alternative would not regulate anchoring for nearshore wildlife management areas (WMAs), where push poles and power poles are more commonplace. See the response to comments in the WMA section.

Comment: NOAA received comments requesting a definition for trolling given the existing exception for catch and release fishing by trolling in four SPAs and the proposal to include a "trolling only" zone at the proposed Western Dry Rocks (alternatives 2 and 3).

Response: Alternative 1, status quo, includes the exception for catch and release fishing by trolling in four existing SPAs. That exception has been in place since 1997 with no specific definition for trolling. This existing exception for catch and release fishing by trolling in four SPAs is proposed to be eliminated in all action alternatives, including the Final Preferred Alternative. The 2019 draft EIS alternative for a trolling only zone at Western Dry Rocks is not included in the Final Preferred Alternative. While NOAA's Final Preferred Alternative does not include trolling as a regulation or exception, for the purposes of the other alternatives that use this term, NOAA relies upon the National Marine Fisheries definition for troll fishing gear, which is defined as: *one or more lines that drag hooks with bait or lures behind a moving fishing vessel* (50 CFR § 300.91).

Comment: NOAA received comments opposing the proposed update to the traditional fishing definition. Commenters requested that the definition more fully captures existing fishing regulations promulgated by state and federal authorities and allows for the future development and use of innovative gear types intended to reduce impacts on Florida Keys National Marine Sanctuary resources. Commenters also recommended that the final rule includes the complete definition of traditional fishing, instead of being included as a reference to another section or document.

Response: After further consideration and close coordination with the Florida Fish and Wildlife Conservation Commission (FWC), the Gulf of Mexico Fishery Management Council, and the South Atlantic Fishery Management Council, NOAA agrees with the recommendation to capture existing fishing regulations in the definition of traditional fishing rather than limiting the definition to activities that were in existence as of 1997. NOAA has included an updated definition for "traditional fishing" in the final EIS that includes fishing activities taking place as of the effective date of the final rule.

NOAA provides further guidance in final EIS Appendix G that includes an updated description of the current fisheries managed by the FWC in state waters and by NMFS in the EEZ. The traditional fishing activities described in Appendix G are currently occurring in this sanctuary subject to FWC/NMFS regulation and will remain subject to the sanctuary's marine zone regulations where additional protections are needed to address impacts of traditional fishing activities on sanctuary resources.

NOAA has updated the preferred alternative to reflect this comment, but NOAA does not anticipate any environmental impacts from this alternative because these fishing activities are currently ongoing in Florida Keys National Marine Sanctuary.

NOAA agrees that it may be appropriate to update the traditional fishing definition in the future, particularly to recognize new or innovative gear types that become widely used and are demonstrated to reduce impacts to sanctuary resources. Under the Final Preferred Alternative, any update to the definition and the fishing activities that are considered traditional fishing would be done through a separate rulemaking in order to consider public comment and to conduct an environmental analysis under National Environmental Policy Act of the potential impacts of new or innovative gear types or fisheries activities on sanctuary resources. New or innovative gear types, along with other new or modified fishing activities, would continue to require sanctuary permits or authorization while they are being tested. NOAA would collaborate closely with, and rely on the expertise of, FWC and the Fishery Management Councils (FMCs) when considering any updates to the definition of traditional fishing activities.

Discharge and Deposit Regulation Exception

*NOAA received many comments specifically related to water quality, both locally within the sanctuary, and regionally within South Florida and the Gulf of Mexico. For the comments related to water quality concerns more generally, see the management plan comments section below.

Comment: NOAA received comments strongly supporting a specific regulation to limit discharges from cruise ships and asserting that cruise ship discharges are a significant cause of water quality problems in Florida Keys National Marine Sanctuary. Specific comments requested clarification about exceptions from the discharge prohibitions for certain discharges (e.g., rainwater, ballast water) from cruise ships. Commenters also requested that NOAA continually review this provision to see if technology advances warrant additional or modified discharge regulations. Commenters also stated that discharges from cruise ships are sufficiently regulated by the U.S. Environmental Protection Agency (EPA) including through the Clean Water Act and the Vessel Incidental Discharge Act. Finally, commenters claimed that there is no scientific support for prohibiting exhaust gas cleaning system discharges and no need to rely on the precautionary principle.

Response: NOAA has updated and clarified the cruise ship discharge and deposit prohibition between the 2019 draft EIS to the Final Preferred Alternative to more clearly prohibit discharging or depositing of any material or other matter from a cruise ship except cooling water. NOAA determined that other alternatives, which proposed instead to specify certain discharges that would be allowed by cruise ships (e.g., "clean wash water") would be extremely

difficult to define based on changing industry standards. The use of such terms could be interpreted differently among stakeholders, which could create compliance and enforcement challenges. Further, NOAA is concerned about new and emerging technologies and activities on cruise ships that may result in harmful discharges into ocean waters, such as the increased use of exhaust gas cleaning systems, the impacts of which indicate releases of PAH's, higher pH water, and heavy metals. EPA's national standards for discharge of EGCS wash water is based largely on the International Maritime Organization 2015 Guidelines for Exhaust Gas Cleaning Systems (Resolution MEPC.259(68)), but these standards may not be sufficiently protective for the sanctuary. Although the degree of harm of these releases depends on the local environmental conditions, scientific studies indicate a cause for concern of impacts to sensitive ecosystems such as FKNMS (Teuchies et al., 2020). NOAA does not require scientific certainty to prohibit EGCS wash water discharges. EPA has declined requests from commenters to ban EGCS wash water discharges as a uniform national standard (i.e., in all waters governed by VIDA) due to concerns of technological feasibility of such a broad ban, a ban narrowly tailored to cruise ships in FKNMS is feasible. The Final Preferred Alternative meets the express purpose of the NMSA to facilitate uses in the sanctuary to the extent compatible with the primary objective of resource protection by, in this case, balancing the feasibility of cruise ships to refrain from discharging with the risk of harm to sanctuary resources (16 U.S.C. 1431(b)(6)).

EPA has recently issued a final rule setting national standards of performance for commercial vessel incidental discharges, but these standards will not be effective until the United States Coast Guard has promulgated implementing regulations. Additionally, the sanctuary was designated by Congress in part for the purpose of protecting water quality, and sanctuary regulations have long imposed more stringent vessel discharge standards than the Clean Water Act. For instance, the sanctuary's current discharge and deposit prohibition, which provides a limited exception for certain routine vessel discharges, was promulgated almost 10 years before EPA began regulating incidental vessel discharges in 2007.

Cruise ships spend a small proportion of operating time in the sanctuary, and NOAA has not received information pointing to meaningful technical issues associated with prohibiting exhaust gas cleaning systems discharges during that short period. As NOAA stated in the proposed rule, the scientific literature reflects a risk to the environment from exhaust gas cleaning systems discharges, and taking action to minimize risks to sanctuary resources is appropriate.

Comment: NOAA received comments raising concerns about compliance with the prohibition of discharges from cruise ships and enforcement of violations. Specifically, commenters noted that this regulation lacks the appropriate enforcement mechanism and mandatory penalty consequences.

Response: Cruise ships are part of a comprehensive system of regulation and oversight. State and federal agencies may conduct announced and unannounced inspections and enforce compliance with state and federal laws and regulations. A ship found to be in violation of the sanctuary's discharge and deposit prohibition could be subject to civil penalties under the National Marine Sanctuaries Act (NMSA)(16 U.S.C. 1437(d)), or in some cases, criminal prosecutions. If a discharge and deposit results in destruction, loss of, or injury to sanctuary

resources, violators may also be liable for resulting response costs and damages under 16 U.S.C. 1443.

Comment: NOAA received public comments requesting that proposed discharge prohibition for cruise ships be extended to all commercial vessels over 79 feet.

Response: NOAA appreciates these comments and considered them carefully. Cruise ships are a unique source of a considerable volume of greywater discharges generated by carrying passengers (i.e., showers, laundry, sinks, kitchens), and have the ability to refrain from discharging during their short time in the sanctuary. NOAA may consider extending this discharge prohibition to other large vessels in a future rulemaking after evaluating water quality monitoring data and assessing the types, numbers, and sizes of vessels present in FKNMS.

Comment: NOAA received comments recommending that a regulation be added to specifically address turbidity (e.g., suspended sediments in the water column) generated from cruise ships and other large vessels.

Response: NOAA's purpose and need for the proposed action includes alternatives designed to limit discharges of greywater and runoff from cruise ships because these discharges are well studied as having potential adverse effects on water quality. Cruise ships are capable of reducing these discharges while in the sanctuary. More study is needed to weigh the costs and benefits of any regulation aimed at reducing turbidity from cruise ship transit. Ship-caused turbidity could have localized impacts to sanctuary resources in the vicinity of the transit channel. It is unclear if measures to address those impacts could be taken other than reducing the size or frequency of cruise ships entering Key West, which could have measurable economic impacts.

Additionally, the Florida Department of Environmental Protection (DEP) is responsible for reviewing, establishing, and revising water quality standards, including turbidity. Pursuant to the Federal Clean Water Act, DEP conducts a comprehensive review of water quality standards every three years. The Water Quality Protection Program (WQPP) may invite additional review, discussion, and recommendations about proposed or adopted revisions to water quality standards that impact waters of the Florida Keys.

Comment: NOAA received comments acknowledging that in some cases, vessels provide affordable housing options. These commenters were concerned about the use of these vessels as homes, the use of vessels as overnight rentals, and the potential environmental impact of discharge from such vessels if they aren't regulated specifically.

Response: NOAA acknowledges the reality of vessels serving as affordable housing and the use of vessels as short-term rentals could potentially cause harm to the environment from discharges from residential uses. However, NOAA already regulates vessel discharges, regardless of the duration of a visit. State waters of the Florida Keys have been designated as a no discharge zone since 2002. This designation was extended into federal waters in 2010 and current sanctuary regulations prohibit the discharge or deposit of any material or other matter into the sanctuary, with limited exceptions. NOAA continues to work with the FKNMS Water Quality Protection Program (WQPP) (established through the NMSA and administered by the U.S. EPA and the State of Florida's DEP in cooperation with NOAA), its partners, and the community to support outreach to vessel owners about sanctuary discharge regulations and

options for marine sanitation device pump out. NOAA also continues to support NOAA OLE, FWC, and USCG enforcement efforts related to discharge. See also the comments and responses to Overnight Mooring Buoys.

Temporary Regulation for Emergency and Adaptive Management

Comment: NOAA received comments supporting an expanded time frame for the existing emergency regulation to allow increased responsiveness to emergencies and emerging issues that would benefit from immediate management action. NOAA also received comments expressing concerns that an increased time-frame could subvert the public comment process required for rulemaking. Commenters also suggested that the sanctuary consider different time-frames for sanctuary-wide versus marine zone-specific emergencies. Finally, NOAA received comments that “emergency” was not clearly defined which raised uncertainty about the drivers that would potentially allow for "greater flexibility in modifying zones to address changing resource management needs."

Response: In response to these comments on the draft EIS, NOAA proposed a new regulatory framework for temporary, emergency rules in the proposed rule, which is considered in the NOPR Alternative and Final Preferred Alternative of the final EIS. NOAA proposes to update the regulations to have an increased time frame for the Temporary Regulation for Emergency and Adaptive Management in order to provide the greatest level of flexibility to NOAA for responding to emergency management needs in the sanctuary. While NOAA’s alternative has a maximum time frame (six months with one six-month extension), NOAA would consider shorter time frames where appropriate to meet management needs. In addition, this extended time frame provides sufficient time for NOAA to go through a full rulemaking process if the situation warranted. An increased time frame also aligns with the emergency time frames as outlined in section 305(c) of the Magnuson-Stevens Fishery Conservation and Management Act. This increased time-frame is also consistent with other national marine sanctuaries that have emergency regulations.

In addition, the emergency framework in the NOPR Alternative and Final Preferred Alternative addresses public comments received on the draft EIS alternatives in a number of ways. Specifically:

1. To address concerns about subverting the public notice and comment process, NOAA has incorporated the existing requirements from the Administrative Procedure Act to demonstrate good cause;
2. To respond to questions regarding what NOAA would consider an emergency, the agency has identified categories for which temporary regulations may be promulgated. NOAA believes it would be clearer and more efficient to establish well-defined categories, criteria, and processes for temporary regulations to respond to time-sensitive needs to manage sanctuary resources, rather than attempt to define “emergency;” and
3. With respect to concerns raised about application of emergency action in state waters, NOAA explicitly acknowledges that temporary regulations shall be subject to the governor’s review pursuant to section 304(b)(1) of the NMSA.

In the final EIS, NOAA has assessed an overall benefit to the environment in taking rapid action to respond to time-sensitive needs to manage sanctuary resources, and the potential for a negligible and short-term impact to socioeconomic resources, such as restrictions on fishing and boating in certain areas, due to the short-time frame of a temporary or emergency response action.

Historical Resources Permitting

Comment: NOAA received comments in support of updating historical resource permits to align with the state process, noting that historic resources are nonrenewable resources and NOAA has an obligation to manage them as such. Comments specifically acknowledged that aligning NOAA's historical resource permits with Florida's archaeological research permit standards should make the permitting process more efficient for researchers working in the state waters of the sanctuary. Some commenters noted that this alignment would in turn serve to increase protection of Florida Keys National Marine Sanctuary historical resources.

Response: NOAA agrees, and has proposed updating the historical resource permits for these reasons. The current permitting system is unnecessarily complicated and confusing to applicants as it artificially bisects the archaeological research process into either survey/inventory or research/recovery, often resulting in insufficient research plans to meet project goals. The proposed archaeological research permit category included in all action alternatives, including the Final Preferred Alternative, would require that applicants commit to following an explicit statement of objectives and that project methods be chosen to gather the information required to meet the stated objectives. The quality of the research, both proposed and conducted, would be improved by these proposed changes, and the reporting of research results will also be of higher quality when directed by a professional archaeologist with the required education and experience. Finally, the archaeological research permit category with associated application and review criteria would increase the protection of historical resources throughout the sanctuary. These proposed changes support the agency's efforts to meet National Historic Preservation Act (NHPA) responsibilities in combination with the new management plan and the proposed NHPA Programmatic Agreement for Florida Keys National Marine Sanctuary Operations, Management, and Permitting. NOAA concludes minor socioeconomic impacts for increasing regulation of historic resource permitting.

Comment: NOAA received comments both supporting and opposing historic shipwreck salvage and the resulting removal of historical resources from the sanctuary for private gain. Commenters in support of the status-quo indicated a belief that private sector salvage was a better way to preserve historical resources. Comments opposing historic shipwreck salvage were supportive of NOAA's proposal to remove current permitting provisions allowing for the deaccession/transfer of sanctuary artifacts. More specifically, NOAA received comments opposing changes to the historical resource permit categories due to the potential impact to private property rights for those involved in salvage of historic shipwrecks. NOAA also received comments that organizations holding Federal Admiralty Court rights of access should not be exempt from updated historical resource permitting regulations.

Response: Holders of pre-existing, valid admiralty rights are not required to obtain a deaccession/transfer permit under the current sanctuary policies, and, as such, will not be

affected by the proposed elimination of this permit category. In the 1996 Florida Keys National Marine Sanctuary final management plan and final environmental impact statement (Vol. 2, pg. 99), NOAA recognized that admiralty rights of access to specific historic shipwrecks had been granted by federal courts to certain organizations and individuals prior to congressional designation of the sanctuary. NOAA continues to recognize such rights of access for those organizations and individuals that have continued to maintain the underlying admiralty rights and will recognize any right to seek adjudication of title to articles of salvage in accordance with the entities' admiralty rights.

The proposed removal of a deaccession/transfer permit category for those without Federal Admiralty rights is consistent with federal archaeological preservation laws, collectively referred to as the Federal Archaeology Program, which promote the "in place" conservation of archaeological sites on public lands, rather than private salvage/recovery. Furthermore, archaeological excavation and artifact recovery from public lands should be undertaken for public benefit to answer specific research questions. The resulting artifact collections should be maintained intact for future study. NOAA's proposed changes to Florida Keys National Marine Sanctuary historical resource permitting categories in the proposed action aligns sanctuary regulations with these national historic preservation standards.

Those holding pre-existing, valid admiralty rights are not exempt from other historic resource permitting requirements. In accordance with section 304(c) of the NMSA and Office of National Marine Sanctuaries regulations at 15 CFR § 922.10 and § 922.167 (proposed), these rights of access are subject to sanctuary regulation, and must be carried out in a manner consistent with other applicable laws such as the Abandoned Shipwreck Act, Abandoned Shipwreck Act guidelines, NHPA, NMSA, and Florida Keys National Sanctuary and Protection Act (FKNMSPA).

Comment: NOAA received comments specifically related to the Draft NHPA Programmatic Agreement for Florida Keys National Marine Sanctuary Operations, Management, and Permitting, which was included in Appendix C of the 2019 draft EIS. Commenters expressed frustration that the previous NHPA Programmatic Agreement had expired prior to the development and implementation of an updated version. Commenters expressed concern that this updated draft was not fairly publicly vetted and approved with full consultation of the relevant Florida state offices. Some commenters indicated a desire to have the draft agreement made available through a separate public review process.

Response: NOAA has been working with the state of Florida and the Advisory Council on Historic Preservation since 2015 to develop a NHPA Programmatic Agreement for Florida Keys National Marine Sanctuary Operations, Management, and Permitting. NHPA implementing regulations under 36 CFR 800.14 (b)(2)(ii) requires the agency official to arrange for public participation appropriate to the subject matter and the scope of the proposed agreement. NOAA determined that the 2019 draft EIS process would be a suitable way to notify the public of the draft programmatic agreement and receive public comment. In addition to public meetings during which NOAA presented information about its management update, including the draft programmatic agreement, NOAA also held a meeting with Florida Keys National Marine Sanctuary historical resource permittees and former permittees to make them aware of the 2019

draft EIS/draft programmatic agreement and associated public comment period. NOAA believes that the five-month public comment period offered for the 2019 draft EIS/draft programmatic agreement, was sufficient. NOAA, with the Florida Keys National Marine Sanctuary, Sanctuary Advisory Council Submerged Cultural Resources members, hosted a special meeting just following release of the draft EIS in 2019 to further engage the interested public on issues related to the programmatic agreement. Since that time, NOAA, the state of Florida and the Advisory Council on Historic Preservation have been finalizing the agreement. While that process proceeds, NOAA has been conducting separate Section 106 consultations for individual undertakings, per the NHPA regulations.

Fish Feeding

Comment: NOAA received comments that generally supported the proposal to prohibit the feeding and attracting of fish, including sharks, or other marine species, from any vessel or while diving in the sanctuary, consistently in state and federal waters. Specifically, comments opposed shark feeding for entertainment purposes, citing safety concerns of mixing feeding sharks with fishing, swimming, and snorkeling activities. Commenters also noted concern about habituating sharks to feeding and how that affects their behavior. NOAA also received comments that opposed this proposed regulation because of the potential loss of eco-tourism and educational opportunities, and that questioned the impacts of fish and shark feeding on the environment, human safety, and fish and shark behavior.

Response: NOAA determined the benefits of prohibiting fish feeding outweigh the potential costs to eco-tourism or educational opportunities. NOAA considered impacts to sharks and shark depredation, human safety concerns, and compliance and enforcement. In order to minimize the impacts to current eco-tourism and educational businesses that utilize fish feeding, NOAA would consider issuing general permits to pre-existing eco-tour operators. However, in order to minimize the negative impacts of fish feeding, this exception would only apply to pre-existing companies with the goal of phasing out the practice, and permit applicants must satisfy all general permit application requirements. Any permits would contain specific terms and conditions to protect sanctuary resources.

Comment: NOAA received comments questioning the difference between the prohibition of feeding fish for attracting and viewing purposes but allowing the use of bait in traditional fishing activities and the impact these activities have on the environment and fish behavior.

Response: This regulation was developed due to concerns about the safety of divers, swimmers, and the effects of concentrating and training predatory fish to associate humans with food. Moray eels, sharks, barracuda, groupers, and a host of other species can pose an increased danger to divers as a result of hand-feeding. In addition, marine species conditioned to being fed by humans begin anticipating meals, which interrupts natural feeding cycles and can result in negative behavior and health impacts; including that hand-fed fish are especially vulnerable to predators. In addition, hand feeding, which generally occurs in the same locations, days, and time schedules, creates a habitual feeding station for marine life. This is in contrast to fishing activity that is generally less regular and consistent in locations, times, and schedule. The existing exemption for the discharge or deposit of fish, fish parts, chumming materials, or bait

used or generated incidental to and while conducting traditional fishing activities would be maintained. A description of activities considered traditional fishing is included in Appendix G.

Comment: NOAA received comments requesting that shore-based fish feeding be regulated, including that all business-scale feeding of tarpon and other species should be fully prohibited, noting the habituation of a wild animal.

Response: NOAA is not proposing to regulate shore-based activity at this time due to the large number of shore-based fish feeding venues. These venues are mostly small-scale, coin operated operations with a handful of larger-scale operations at points throughout the sanctuary, which would be difficult to control and manage and ensure compliance.

Grounded and Deserted Vessels, and Harmful Matter

Comment: NOAA received comments supporting the proposal providing the sanctuary greater authority to address grounded and deserted vessels. Commenters noted that NOAA should ensure that definitions and application of any proposed regulations are consistent with state of Florida regulations and enforcement authorities. NOAA also received comments acknowledging that enforcement of a new regulation could prove challenging given the number of deserted vessels in the sanctuary and broad geographic area where they are found. NOAA received comments supporting additional coordination with the towing and salvage operators to develop best practices for vessel removal recognizing that sometimes additional damage can occur during the removal process.

Response: NOAA agrees with the need for the sanctuary to have its own specific regulations to respond to the threat of deserted vessels and harmful matter. The proposed action is consistent with state regulations. NOAA would continue to work in partnership with the state of Florida, Monroe County, the USCG and others due to the challenging scope of this issue. Finally, the management plan includes additional details for how NOAA would engage with towing and salvage operators to develop best management practices and a permitting process for removing grounded and deserted vessels (see Appendix A, Activity 3.3.4).

Large Vessels Mooring Buoys

Comment: NOAA received comments that support delineating large and small vessel mooring buoys. Commenters requested clarification about the size delineation including length, combined length of rafted vessels, and vessel tonnage. Some comments supported this regulation and the potential application to limit access to sensitive areas that have been damaged by overcrowding and intensive use. Commenters also recommended boater education courses to increase boater knowledge regarding proper use of and regulations associated with mooring buoys. Commenters did raise concern about the number of large vessel mooring buoys and if that would be sufficient to meet demand.

Response: NOAA agrees with comments about delineating mooring buoys based on vessel sizes, and provides further clarification in the definition for “large vessel” in the preferred alternative. In addition, large vessel mooring buoys include a sticker indicating the vessel length that can use such buoys. The management plan includes activities related to review and update of the sanctuary mooring buoy program including plans to engage user groups to help identify

areas of use, numbers of users, and placement of mooring buoys. Finally, the sanctuary website includes information and tutorials about the proper use of mooring buoys, information is included in the Blue Star Operator Program education materials, and the sanctuary has a voluntary boater education course and participates in and provides sanctuary specific content for boater training courses hosted by the USCG Auxiliary and others.

Live Rock Aquaculture

Comment: NOAA received comments that supported the development of a Memorandum of Agreement with the Florida Department of Agricultural Services and NOAA's NMFS for better coordination of this activity. Commenters opposed the requirement of an additional sanctuary permit for live rock aquaculture operations.

Response: NOAA agrees and the Final Preferred Alternative does not include an additional sanctuary permit for live rock aquaculture. The final management plan includes Activity 3.2.3 calling for the development of a Memorandum of Agreement with the Florida Department of Agricultural Services and NOAA's NMFS for better coordination of this activity.

Comment: NOAA received specific comments requesting that existing live rock aquaculture sites be considered when evaluating the final marine zone locations, regulations, and continued access for existing permitted live rock aquaculture operators.

Response: NOAA has evaluated the existing live rock aquaculture site locations in relation to the proposed new or modified marine zones. Currently, there is only one marine zone where live rock aquaculture occurs (in the vicinity of the proposed new Tavernier Nursery Restoration Area). Due to the fact that the Tavernier Nursery Restoration Area is proposed transit only under the NOPR and final preferred alternatives, the live rock aquaculturist would need to obtain a sanctuary permit to enter and operate in this zone. In addition, for this site and more generally, live rock aquaculture practitioners must have a valid state license or federal permit to operate, and as long as they have a copy of this documentation and a sanctuary permit on their vessel if and when operating in the sanctuary marine zone, enforcement action would not be taken with respect to lawful and authorized live rock aquaculture operations within this marine zone. NOAA and FWC will ensure that their enforcement officers are aware that valid state license or federal permit holders may continue to conduct this activity as licensed or permitted.

Overnight Use of Mooring Buoys

Comment: NOAA received comments that were generally not supportive of prohibiting overnight use of mooring buoys, largely due to issues of public safety (e.g., safe harbor during storms), public access, and enforcement. Some public comments, however, highlighted concern about new and increasing practice of anchored and moored vessels being used for overnight accommodation (e.g., vacation rental by owner) and possible impacts from such use, including prohibited discharges. Comments also include alternative proposals including limiting visitors to a maximum 14-day stay to prevent long-term use of moorings.

Response: Mooring buoys are intended to increase boating accessibility while reducing impact to critical and sensitive natural resources caused by anchoring. In the EIS, NOAA considers an alternative that would prohibit use of mooring buoys overnight, in response to concerns about

impacts of longer term uses, such as increased discharges and increased impacts on sanctuary resources like harvesting of fish. In response to safety concerns, this alternative also considers an exception to this regulation for vessels seeking safe harbor. The benefits of this alternative would be to facilitate equitable access to the mooring buoys and to ensure compliance with sanctuary rules while at mooring buoys, while continuing to allow overnight use for safety. However, NOAA does not propose to restrict overnight use in the Final Preferred Alternative, in response to public and agency comments that were generally not supportive of prohibiting overnight use of mooring buoys largely due to issues of public safety, limiting public access, and enforcement.

Shoreline Slow Speed

Comment: NOAA received comments that were generally supportive of modifying the existing idle speed, no wake regulation along all residential shoreline regulation (922.163(a)(5)(iii)(D) (1997)) to a more general shoreline slow speed regulation and applying it to all shorelines within the sanctuary. Commenters noted the benefits of such a regulation including: 1) potentially decreasing the number of individual WMAs (where speed is regulated); 2) reducing the need for, or at least the number of, marker buoys and signage; and 3) providing additional protections for nearshore habitats and species. Commenters also noted concern regarding the feasibility of enforcing a shoreline slow speed regulation and the number of exceptions that may be required for channels, passes, and ability to access deeper areas nearshore.

Response: The sanctuary's existing regulations prohibit operating a vessel at a speed greater than 4 knots (4.6 mph) or in a manner which creates a wake within 100 yards of residential shorelines. In Alternative 4, NOAA considered modifying this regulation so that it applies to 100 yards of all shorelines (not just residential) and simplifying the speed restriction by prohibiting "creating an extensive wake." NOAA acknowledges the value of expanding slow speed regulations for the reasons identified by the commenters, as well as the value that additional shoreline protections could provide in light of potential impacts from climate change and sea level rise. However, in the Final Preferred Alternative, NOAA proposes to retain the existing 1997 regulatory language due to the number of exceptions that may be required for channels and passes and the potential loss of access to deeper areas nearshore. In the preferred final alternative, NOAA carefully considered all of the proposed existing, modified, and new WMAs to ensure that the WMAs would provide additional protections for nearshore habitats and species in the areas of greatest need without a slow speed restriction.

Military Activities

Comment: NOAA received comments questioning the adequacy of NOAA's analysis of the effects that military activities have on marine mammals—particularly the effects on marine mammal vocalization and communication.

Response: NOAA relied on the U.S. Navy's evaluation of impacts for military training and texting as described and analyzed in the Navy's 2018 Atlantic Fleet Testing and Training EIS and Navy and NMFS's 2018 interagency consultation under section 304(d) of the NMSA (see Appendix F). NOAA considered this information qualitatively as part of the baseline and cumulative impacts. NOAA also reviewed these documents to assess the potential environmental

effects of NOAA's proposal to add one additional Navy activity to the military exemption at 15 CFR 922.163(d). NOAA independently reviewed these 2018 documents for sufficiency and considers them to be accurate and valid. NOAA specifically reviewed these documents for impacts to marine mammals. In the 304(d) consultation, NOAA found that acoustic exposures for Navy training and testing are predominantly associated with explosive use outside the sanctuary's boundaries, resulting in modeled instances of behavioral harassment, and temporary and permanent hearing impacts to marine mammals inside the sanctuary's boundaries. Impact levels, relative to the greater stock area, are moderate for a few dolphin stocks and otherwise are low for marine mammals. Navy and NOAA must reinitiate consultation under NMSA if changes to these activities or new information reveals that the effects to sanctuary resources are different in a manner or to an extent that they are not previously considered in the consultation.

Marine Zones and Associated Regulations

For more details on the marine zones and associated regulation proposals and impact analysis see Chapter 3: Sections 3.3 and 3.4, and Chapter 5, respectively.

Comment: NOAA received comments that opposed any additional regulatory action, beyond the status quo, and called for no change to the current regulations and management plan.

Response: Maintaining only current marine zones and regulations without change does not meet the purpose and need of the proposed action. Alternative 1 in this final EIS assesses the effects of taking no action, which would include no changes to the current regulations and management plan.

Comment: NOAA received numerous suggestions for new or different areas to be designated marine zones.

Response: NOAA carefully assessed all suggestions for new or modified marine zones throughout the Restoration Blueprint process. NOAA's assessment was based on the resources present in the areas, the condition of those resources, risks to the resources, and the nature and extent of the public's use of those areas. NOAA carried forward new or modified marine zones for additional analysis in the proposed rule and final EIS where NOAA identified a potential need for protection that would outweigh potential negative effects on the public's use. The suggested new marine zones include either SPAs or WMAs at the following locations: South Islamorada Coral Gardens, Cannon Patch, Sister Creek, Hurricane Key, Don Quixote Key, Howell Key, South Picnic Island, Pine Channel Island, Upper Sugarloaf Sound, Little Saddlebunch, Coconut Key, Bill Finds Key, Veterans Key, Upper Matacumbe Key, Cheeca Rocks Flat, Lower Matacumbe Key, Ocean Reef, and Plantation Key Colony.

Comment: NOAA received comments expressing concern that NOAA is establishing new marine zones with access restrictions, particularly impacting fishing access, but NOAA does not subsequently re-open areas for fishing once the marine zone has either achieved its purpose or resource conditions have shifted.

Response: NOAA's NOPR Alternative and Final Preferred Alternative consider eliminating five existing marine zones: 1) Looe Key Special Use Area, 2) Rock Key Sanctuary Preservation Area,

3) French Reef Sanctuary Preservation Area, 4) Little Crane Wildlife Management Area, 5) Tidal Flat South of Marvin Key (WMA). These existing marine zones are proposed to be eliminated due to resource condition changes and an opportunity to evaluate different management regimes. The proposed elimination of these zones would remove restrictions on fishing in these areas.

In addition, NOAA proposed 13 new marine zones in the 2019 draft EIS that are not included in the Final Preferred Alternative. These proposed marine zones are not being considered in the Final Preferred Alternative for a range of reasons including the need for additional scientific and user data, and concerns about fishing access and other recreational uses within these areas.

Management Areas

Comment: NOAA received comments supporting the proposal to change the existing management area zone type to management area.

Response: In all action alternatives including the Final Preferred Alternative, NOAA proposes changing the zone type from existing management area to simply Management Area. This change is common sense given that all marine zones within Florida Keys National Marine Sanctuary would now be considered existing Key Largo and Looe Key areas (which predated and were encompassed in the designation of the sanctuary) would now be referred to as management areas with all existing regulations maintained. Great White Heron National Wildlife Refuge and Key West National Wildlife Refuge, which are referred to as existing management areas, would now simply be referred to as national wildlife refuges. Existing sanctuary regulations in the Key West and Great White Heron national wildlife refuges would be maintained with the exception of a minor change to a particular area where personal watercraft would be allowed to operate in Key West National Wildlife Refuge where they are otherwise prohibited.

Comment: NOAA received comments opposing the proposed no anchor regulations in the Key Largo Management Area and Looe Key Management Area. Specific to the Key Largo Management Area, comments noted that a no anchor regulation would impact the multi-use activities there, including fishing, and the area includes sandy bottom habitats, where a no anchor regulation is not needed. Comments did, however, support the use of no anchor regulations in smaller, targeted areas with sensitive habitats that would benefit from protection from anchor damage.

Response: NOAA agrees the area includes sandy bottom habitat and a no anchor regulation is not needed, which was proposed in alternatives 2, 3, and 4 to protect the benthic habitat in these marine zones from anchor damage. Informed by public comment, NOAA's NOPR Alternative and Final Preferred Alternative do not include a no anchor regulation in Key Largo or Looe Key management areas. NOAA does, however, include a no anchor regulation in all (SPAs) and restoration areas, which is described below in those respective sections.

Comment: NOAA received comments opposing the proposal in the 2019 draft EIS to change the Looe Key Management Area boundary by expanding the Looe Key SPA and Looe Key Special Use Area boundaries, because this change would have reduced the extent of the areas where certain fishing activities are currently allowed.

Response: NOAA's 2022 NOPR and Final Preferred Alternatives maintain the greatest amount of area in the Looe Key Management Area available for fishing. The areas of the Looe Key Management Area, Looe Key SPA, and Looe Key Special Use Area were modified in different configurations in each of the draft EIS alternatives for a few reasons including to provide additional protections for habitats and species in those areas and in an attempt to simplify the zoning scheme in this area. As in the proposed rule, the Final Preferred Alternative does not change the Looe Key SPA boundary, and the Looe Key Special Use Area would be eliminated, thereby opening the area up for fishing that has been closed since 1997. The Final Preferred Alternative also includes two small nursery restoration areas within the Looe Key Management Area where fishing is prohibited.

Exception for Motorized Personal Watercraft

Comment: NOAA received comments related to the operation of motorized personal watercraft (PWC) in the sanctuary that ranged from banning PWC throughout the sanctuary to opposing any restrictions on where PWC could operate, with the majority of comments supporting some level of continued use of PWC within the sanctuary. Specific to the proposal to provide a small area open for PWC operation in the Key West National Wildlife Refuge, comments included: 1) support, 2) recommendations to allow PWC use in areas parallel to the entire length of the Key West ship channel to further public safety, 3) additional licensing requirements for PWC tour operators, and 4) the state of Florida should take the lead for regulating PWC under Chapter 327.60 Florida Statutes.

Response: The current sanctuary regulatory prohibition on the operation of PWC, and airboats within the Great White Heron and Key West national wildlife refuges prevents the disruption of roosting, foraging, and nesting birds over a widespread area. At this time, NOAA has concluded that the risk of disturbance to sanctuary resources such as birds does not warrant banning PWC throughout the sanctuary. NOAA finds that it is appropriate to maintain and refine the existing regulation for PWC operations in the areas where the resources of greatest sensitivity are found including the national wildlife refuges and the network of islands. The Final Preferred Alternative provides a small area for PWC operation in the Key West National Wildlife Refuge that is adjacent to the shipping channel to allow for the separation of users engaged in different and conflicting activities while continuing to meet the resource protection goals over the broader area. The Lower Keys Guides Association and the PWC Cooperative requested NOAA allow PWCs in this small area in a presentation to the Florida Keys National Marine Sanctuary Advisory Council to address concerns about conflict between the operation of PWC and fishing activities in this area including on the eastern side of the shipping channel. NOAA and the Florida Keys National Wildlife Refuge support this change to avoid this conflicting use in this very congested shipping channel. All vessel operators have a responsibility to observe the navigation rules and practice good seamanship while transiting this area.

Regarding additional licensing requirements for PWC tour operators, business and livery licensing for PWC tour operators falls under the purview of state, county, and municipal entities, which provide adequate training and screening. Regarding comments asserting that the state of Florida should take the lead for regulating PWC, the state has not enacted regulations to protect sanctuary resources from PWC. Comments also asserted that the current prohibition on PWC

does not comply with Florida Statute 327.60. Florida Statute 327.60, but that provision applies to a county or municipality, not the federal government. Therefore, NOAA is establishing additional regulations on PWC in order to prevent the disturbance of sanctuary wildlife.

Comment: NOAA received comments that additional regulation and enforcement of existing regulations regarding the use of thrill craft (e.g., PWC, airboats, parasails) in the national wildlife refuges are needed.

Response: Existing NOAA regulations prohibit the operation of PWC and airboats within the Great White Heron and Key West national wildlife refuges. The Federal Aviation Administration regulates parasail activities and the USCG regulates small passenger vessels that conduct parasail operations. Therefore, at this time, additional regulation and enforcement of existing regulations regarding the use of thrill craft (e.g., PWC, airboats, parasails) in the national wildlife refuges are not proposed.

Conservation Areas

Comment: NOAA received comments supportive of combining the existing ecological reserve zone type and existing special use zone type into one new conservation area zone type and maintaining the existing regulations (e.g., continuous transit only).

Response: NOAA agrees, and in an attempt to simplify zone terminology, proposes creating one conservation area zone type that includes the zones with the most restrictive regulations. Please see Section 3.3 of the final EIS.

Tortugas North Conservation Area Access Permits

Comment: NOAA received comments that were supportive of the proposed administrative changes to these permits.

Response: Thank you for your comment.

Comment: NOAA received comments both supporting and opposing establishing three large, contiguous conservation areas in each region of the sanctuary (Carysfort Reef, Long Key Tennessee Reef, and Tortugas Corridor). Comments in support were numerous, and they generally noted the value of providing additional ecosystem-level management and protection. Opposing comments were also numerous and provided specific impacts related to loss of access and opportunity for recreational use in all the proposed areas, particularly related to fishing access.

Response: NOAA considered including large contiguous marine zones in alternatives 2, 3, and 4 with more area and restrictive regulations in each subsequent alternative to better meet a Sanctuary Advisory Council goal for this review: Protect large, contiguous, diverse, and interconnected habitats that provide natural spawning, nursery, and permanent residence areas for the replenishment and genetic protection of marine life and protect and preserve all habitats and species. While NOAA believes there is great value in a system of marine zones that includes large contiguous marine zones in each region of the Florida Keys, public sentiment from local Florida Keys residents, location specific impact to users (e.g., in some cases a large portion of recreational access would be lost for specific communities), and in some cases (Tortugas Region)

additional data is needed. NOAA is committed to working with the community, user groups, agency partners, and researchers to evaluate possibilities to further refine the existing marine zones and advance a network of marine reserves in the future.

Comment: NOAA received comments both supporting and opposing expanding existing marine zones to include deep reef habitat (Tennessee Reef and Western Sambo). Supporting comments noted that expansions would provide additional protections to deep reef habitats that show potential resilience to the stony coral tissue loss disease, could serve as a source for coral reef seed stock, and would provide greater ecosystem level protection. Opposing comments were related to a general opposition towards limiting any access for fishing activity. Some comments specifically requested for hook and line trolling or drift fishing to be allowed in the deep reef expansion areas, noting their desire to allow as much user access as possible while still protecting coral reef habitat from physical damage.

Response: NOAA's proposed action, including the Final Preferred Alternative, includes the expansion of these two existing zones to include deep reef habitat. Expanding these zones would support ecological resilience in this area and potentially serve as seed stock for shallow coral reefs. Conservation areas are designed to protect interconnected habitat types, facilitate research, and protect the full range of habitats and species life cycle needs. Due to the overarching purpose and intent of this zone, NOAA determined that allowing an exception for fishing in these expansion areas would not be compatible with the goals of conservation areas as the marine zone type that affords the greatest protections. The expansion area for Western Sambo is 0.97 square miles, and the expansion area for Tennessee Reef is 0.53 square miles. Additionally, NOAA determined that consistent regulations across all conservation areas and within specific zones would improve public understanding of and compliance with zone-specific regulations.

Comment: NOAA received comments both supporting and opposing expanding Tortugas South westward to include additional habitat and an area shown to support multi-fish aggregation activity. Comments also requested that, if NOAA extends this zone to the west, that NOAA also consider removing 34 square miles from the southern portion of this zone to allow for fishing opportunities in an area that has been closed to fishing since 2001. Opposing comments expressed general opposition to limiting access for fishing activities. Specific concerns were raised about the loss of access for the commercial shrimp fishery.

Response: NOAA's action alternatives, including the Final Preferred Alternative, includes expansion of Tortugas South to provide additional protection for habitats shown to support multi-species fish spawning aggregation activity. NOAA evaluated recently collected and compiled mapping coverage data and remotely operated vehicle imagery showing unique habitat features in this area, including rock escarpment formations and a well-defined ledge. The data also showed a diversity of fish species are present. NOAA determined that maintaining protection in the southern portion of Tortugas South is warranted.

Comment: NOAA received comments both supporting and opposing the proposal to establish two new conservation areas (Channel Key Banks and Red Bay Bank) to protect shallow, mixed hard-bottom habitat that is not currently well represented in sanctuary marine zones. Comments generally supported additional protections for these areas due to the impacts from

vessel prop scarring, however most commenters did not support applying conservation area regulations (i.e., transit only) due to the level of reported fishing use in the area (i.e., lobster). In addition, NOAA received comments requesting that regulations be applied to restrict entry at Channel Key within the Channel Key Banks proposed marine zone, given the presence of a high number of nesting and roosting birds.

Response: Alternatives in the draft EIS included a range of different options for establishing marine zones to protect shallow mixed habitat in the bayside Florida Keys. Given the amount of habitat damage in these areas, new protections through marine zoning are warranted; however, informed by public comment about the level of reported use in these areas, the Final Preferred Alternative regulations would require idle speed no wake rather than transit only. The Final Preferred Alternative also includes much smaller, more targeted areas than initially proposed and allows normal operation through established channels. It includes additional protections at Channel Key due to the high number of roosting and nesting birds; some reports indicate the highest numbers congregating in the Middle Keys region. Under the Final Preferred Alternative, these marine zones are considered WMAs rather than conservation areas.

Restoration Areas

Comment: NOAA received comments supporting the establishment of new marine zones to facilitate habitat restoration and protect coral reef nursery sites. Public comment also specifically requested that these new zones be considered restoration areas through the creation of a new general restoration area zone category.

Response: NOAA's Final Preferred Alternative includes two types of restoration areas: nursery restoration areas and habitat restoration areas. NOAA included four coral reef nursery sites as SPAs in alternatives 2, 3, and 4. In addition, several existing coral nursery sites and coral restoration sites (where nursery corals are being outplanted to restore coral reef habitat) are included in existing SPAs, therefore they are afforded the same protections as SPA marine zones. Informed by public comment, the 2022 NOPR Alternative and Final Preferred Alternative include a new restoration area zone category, which would include two distinct designations: habitat restoration areas where active restoration is taking place and nursery restoration areas where nursery species are propagated. The Final Preferred Alternative includes all existing permitted coral reef nursery sites (11 total) as nursery restoration areas and existing permitted coral reef restoration sites (four total) as habitat restoration areas. NOAA proposes this action to recognize the increase in important habitat restoration activities in the sanctuary over the past two decades. Finally, while the Final Preferred Alternative restoration area zones are all coral reef sites, this zone type could be used for other habitat areas (e.g., seagrass, sponge, hard bottom). New zones would need to be established in future rulemaking processes.

Comment: NOAA received comments requesting two additional coral nursery sites be established as nursery restoration areas. These two nursery sites were installed by restoration practitioners after the 2022 NOPR Alternative was released, so were therefore not included in the 2022 NOPR Alternative.

Response: NOAA has added these two areas to the Final Preferred Alternative because the value of including these two additional coral nursery sites is consistent with the goals of this

zone type. These proposed new zones, included in the Final Preferred Alternative, are Key Largo Nursery Restoration Area (0.07 square miles; 46.8 acres) and Islamorada Nursery Restoration Area (0.07 square miles; 47.2 acres).

Sanctuary Preservation Areas

Comment: NOAA received comments opposing the application of an idle speed no wake regulation in all SPAs due to several factors, including the size of many zones and the inclusion of portions of Hawk Channel in some SPAs.

Response: The final preferred alternative does not include an idle speed no wake regulation, in response to concerns about the practicability or the necessity of this regulation in SPAs, including those that overlap with Hawk's channel.

Comment: NOAA received comments supporting the application of a no anchoring regulation in all SPAs to provide greater protections to coral and other sensitive habitats from anchor damage. Commenters also expressed the need for additional, well placed and maintained mooring buoys, particularly if additional no anchor restrictions would be applied. Commenters requested that updates to the mooring buoy program include input from user groups.

Response: The Final Preferred Alternative includes a no anchor regulation for all SPAs in order to provide greater protections from anchor damage for areas with sensitive habitats. The management plan also includes activities related to review and update of the sanctuary mooring buoy program, including plans to engage user groups to help identify areas of use, numbers of users, and placement of mooring buoys (see management plan comments and responses below).

Comment: NOAA received comments both supporting and opposing the proposal to establish two new SPAs to protect patch reef habitat (Turtle Rocks and Turtle Shoals). The majority of commenters supported establishing these new zones. Some commenters also supported establishing these areas as conservation areas to provide the greatest level of protection for these sensitive habitats. Opposing comments expressed concerns about limiting access for fishing activity due to the fact that SPA regulations prohibit fishing.

Response: The draft EIS alternatives included a range of options for establishing marine zones at these two sites, including designating these areas as conservation areas (the marine zone type that affords the greatest protections) and SPAs (allowing access but no take). Informed by public comment, the Final Preferred Alternative includes these two sites as new SPAs to protect important patch reef habitat. Establishing these areas as SPAs would allow access for responsible diving and snorkeling and would prohibit fishing in these areas.

Comment: NOAA received comments supporting the proposal to combine two existing SPAs (Key Largo Dry Rocks and Grecian Rocks) into one larger SPA zone. Commenters in support noted the value of larger SPA zones for greater protection to habitats and species. The majority of commenters supporting combining these two zones requested that the expanded zone target the core area of coral reef habitat. NOAA also received comments that opposed combining these two zones, most noting that the expansion includes large areas of sand bottom rather than coral reef and opposing limiting any access for fishing.

Response: Informed by public comment, NOAA modified the size of this zone for the 2022 NOPR Alternative and Final Preferred Alternative to focus the zone on the high relief reef areas to balance protection with greater access in the surrounding waters (alternatives 2, 3, and 4 includes a proposed 1.2 square-mile zone and the 2022 NOPR Alternative and Final Preferred Alternative includes a 0.5 square-mile zone). Through the Final Preferred Alternative, NOAA would more fully protect the habitats and species present at this site, because data shows that the larger zone size more adequately captures the area necessary to support different life cycle stages of some fish species.

Comment: NOAA received comments both supporting and opposing the expansion of existing marine zones to include deep reef habitat (e.g., at Carysfort Reef and Alligator Reef). Supporting comments noted that expansions would provide additional protections to deep reef habitats that show potential resilience to stony coral tissue loss disease, could serve as a source for coral reef seed stock, and would provide greater ecosystem-level protection. Opposing commenters expressed concern about limiting access for fishing activity. Some comments specifically requested that hook and line trolling or drift fishing be allowed in the deep reef expansion areas, noting their desire to allow as much user access as possible while still protecting coral reef habitat from physical damage.

Response: The final EIS action alternatives, including the Final Preferred Alternative, expands these two existing zones to include deep reef habitat. Including deep reef habitat in the marine zone would further support ecological resilience in this area and potentially serve as seed stock for shallow coral reefs. SPAs are established, in part, to separate conflicting uses (e.g., diving, snorkeling, and fishing). Therefore, allowing an exception for fishing in these expansion areas would not be compatible with the purpose and intent of SPAs to separate conflicting uses. Additionally, consistent regulations across all SPAs and within specific zones would better facilitate public understanding of what is allowed and result in greater compliance with associated regulations. The expansion area for Carysfort Reef is 1.6 square miles, and the expansion area for Alligator Reef is 0.20 square miles.

Catch and Release Fishing by Trolling in Four Sanctuary Preservation Areas

Comment: NOAA received comments in support of eliminating the exception in four SPAs for catch and release fishing by trolling. Commenters noted the benefit of consistent regulations within all SPAs and that SPAs should be fully no-take zones, as the current area in the sanctuary that is truly no-take is very small. NOAA received comments that opposed eliminating this exception due to concerns about the loss of fishing access in these SPAs, noting that this exception was part of a trade-off with fishermen to gain their support for the establishment of SPAs in 1997, and that this agreement should continue to be upheld and that trolling is not likely to impact the benthic habitats in these areas.

Response: NOAA's action alternatives, including the Final Preferred Alternative, proposes to eliminate catch and release trolling in SPAs in order to standardize all regulations for SPAs. NOAA acknowledges that catch and release trolling may not impact the benthic habitats in these areas, but NOAA's analysis suggests that having consistent regulations in all SPAs may outweigh maintaining this exception that was instituted over 26 years ago. Through this and other

proposals in the Final Preferred Alternative, NOAA attempts to create consistent regulations to aid in user understanding of what is and is not allowed, in order to facilitate increased compliance with marine zone-specific regulations. Eliminating this exception would also facilitate enforcement against unlawful fishing. Given that an overarching purpose of SPA zones is to reduce user conflict, fully separating fishing and diving and snorkeling activity more fully realizes the purpose of this zone type. Through this proposed change, a total of 1.22 square miles (779 acres) that once allowed an exception for catch and release fishing by trolling would no longer allow such fishing.

Bait Fish Permits in Sanctuary Preservation Areas

Comment: NOAA received comments supporting the proposal to stop issuing permits for bait fishing in SPAs, noting that allowing this activity in these zones creates 1) confusion for the public regarding what is and is not allowed; 2) provides an incentive to fish in no-fishing zones, and 3) creates enforcement challenges given public confusion. Commenters also supported NOAA's intent to create consistent regulations in all SPAs. NOAA also received comments opposing the elimination of bait fishing permits in SPAs. These commenters generally noted that allowing bait fishing in SPAs was part of a trade-off with fishermen that took place 26 years ago to gain their support for the establishment of SPAs, and that this agreement should continue to be upheld. Commenters also more specifically stated that the gear type used does not impact the benthic habitat, and that this activity is generally undertaken early in the morning, thereby limiting the potential overlap of fishing activity with diving and snorkeling.

Response: Under the proposed action, NOAA would begin phasing out the practice of issuing bait fishing permits for SPAs over a three-year period to create no-take SPAs. NOAA's proposal to eliminate the practice of issuing bait fish permits does not require a change to the regulations, and would be implemented via changes to Florida Keys National Marine Sanctuary's permitting policies. When final Florida Keys National Marine Sanctuary regulations become effective, existing bait fishing permit holders would have the option to renew their permit annually for three years, but NOAA would not issue bait fishing permits to any additional persons. After the third year, NOAA would no longer issue permits for this activity. This change, while not requiring a change to the regulations, contributes to creating consistent regulations of all SPAs, will aid in user understanding and compliance, and will facilitate enforcement. Consistency of regulations and practices in SPAs outweighs issuing baitfish permits as initiated over 26 years ago. This proposed decision is based on over 25 years of management of the network of marine zones within the sanctuary, including a review of catch log data submitted by permit holders over the past five years. These reports indicate that there is a limited number of recreational and commercial fishermen using the permits to catch bait fish, with over half of the permitted fishermen reporting annually they are not using the permit (i.e., not catching bait fish within the SPAs). Those fishermen that do state they are harvesting bait fish within the SPAs report very low catch numbers, leading NOAA to believe that very few users will be adversely affected by this change, and that most fishermen are already catching bait fish outside of the SPAs. Given that an overarching purpose of SPA zones is to reduce user conflict, fully separating fishing and diving and snorkeling activity more fully realizes the purpose of this zone type.

Restricted Access in Select Sanctuary Preservation Areas

Comment: NOAA received comments regarding the proposal to limit access in select SPAs. The majority of comments oppose any proposal that would restrict local boater access. While not supporting this specific proposal, commenters noted concern about increasing numbers and intensity of use, and expressed support for considering ways to manage the number of users in the sanctuary in both coral reef and the waters and islands on the Gulf side of the Florida Keys (i.e., backcountry areas). Many commenters acknowledged that other resource protection entities (e.g., U.S. Forest Service, National Park Service, and international marine parks, among others) manage use, access, and the overall number of users through various regulatory and non-regulatory mechanisms, and some commenters provided ideas and recommendations for consideration. While public comment generally supported the concept of limiting access, there was little support for the specific locations selected for closure to the public by NOAA in the draft EIS. In addition, the public did not support the proposal to limit access by only allowing certain commercial operators (i.e., Blue Star Program participants), because commercial operators bring more visitors to a site than individual boaters.

Response: Draft EIS alternatives 3 and 4 would limit commercial access in three SPAs to Blue Star credentialed operators. In the Final Preferred Alternative, NOAA does not include this regulation or any regulation that specifically restricts access by setting a limit on the number of users allowed to access specific sanctuary marine zones. Informed by public comment, NOAA determined that more information, additional public input, and evaluation of additional management tools would be needed prior to implementing a limited access regulation. Part of this evaluation would include consideration of how NOAA would manage and enforce a limited access regulation in some SPAs. Finally, in response to comments acknowledging the need to address the increasing numbers of users and visitors, the final management plan includes additional information about NOAA's intent to better assess sanctuary carrying capacity, evaluate regulatory and non-regulatory tools to manage use and the number of users of the sanctuary, and consider how existing regulations and management activities can be more strategically applied to better manage use and impacts from use (e.g., boater education, mooring buoys, proposed no anchor regulation in SPAs). Under the Final Preferred Alternative, with this additional evaluation and further public and agency engagement, NOAA may consider regulatory action to manage the number of users and impacts of this use on sanctuary resources in the future.

Wildlife Management Areas

Comment: NOAA received comments that both supported no change to existing zones (e.g., status quo) and other comments that supported creating additional WMAs and/or expanding existing WMAs. Even those comments that supported no change to the zones, generally supported taking some action to protect sanctuary resources, while also allowing the greatest level of access and use. Most public comments included some mention of the importance and challenge of marking the physical location of WMAs and educating the public (particularly the visiting, non-resident public) about the nature of navigating in the backcountry and shallow waters of Florida Keys National Marine Sanctuary. NOAA received comments specific to every

WMA, including comments regarding the size and shape of zones and the regulations applied within the zones. WMA comments are summarized below.

Response: WMAs are proposed for location-specific resource management needs and issue-specific regulations are proposed (e.g., idle speed no wake vs. no entry), NOAA used two criteria when developing WMAs: 1) favor resource protection goals over access when data demonstrates the need and 2) implement the least restrictive access regulations and zone size to achieve resource protection goals. Additional considerations include simplifying zones and associated regulations to enhance user understanding of the zone area and associated regulations to facilitate greater compliance. Finally, with respect to those zones focused on shallow water habitat/seagrass protection, NOAA considers the success of existing no motor zones (e.g., Tavernier Key WMA) and utilizes recent prop scar mapping data to determine where additional zoning was necessary. The selection of the WMAs in the proposed action and alternatives reflect a careful consideration and balancing of these factors.

Contour of 300 Feet Around Islands vs. Straight Line Zones in Wildlife Management Areas

Comment: NOAA received comments supporting the use of straight lines to mark the boundaries of WMAs for easier marking, compliance, and enforcement. NOAA received comments opposing the use of straight lines to mark the boundaries of WMAs, noting that more area than needed for the resource protection goals would be included in the marine zone, thereby affecting the area accessible by various user groups.

Response: NOAA's action alternatives, including the Final Preferred Alternative, generally uses a 300-foot (100-yard) buffer zone around sensitive islands, and create zone boundaries that align with the habitats intended for protection within the marine zone rather than straight line boundaries. Alternative 4 considers straight line WMA boundaries, which have an advantage because they further simplify the zone shape, improve the ability to mark the zone boundaries, and improve enforcement. Despite these benefits, the Final Preferred Alternative defines boundaries that follow the contours around islands and other natural features (e.g., seagrass beds, bank habitats) in order to provide the least restrictive access regulations and zone size to achieve resource protection goals. This type of boundary is more difficult and expensive to mark, maintain, and enforce.

Recommendation of a 50-Foot Entry Zone Surrounded by a 300 Foot No Motor Zone in Wildlife Management Areas

Comment: NOAA received comments recommending a modified regulatory scheme for several WMAs of a 50-foot no entry area closest to shore (e.g., about two-boat lengths) surrounded by an outer additional 300-foot no motor area. The intent of these recommendations is to allow the greatest user access while still maintaining protections for sensitive habitat, bird nesting and roosting sites, and turtle nesting beaches.

Response: NOAA evaluated these recommendations and for several reasons did not carry them into any of the action alternatives. Primarily, NOAA's decision criteria favors resource protection over access when data demonstrates the need. The Final Preferred Alternative was further informed by comments and data submitted by the U.S. Fish and Wildlife Service that a

minimum 100-yard distance (i.e., 100-yard no entry zone) is needed to minimize disturbance to wading and migratory birds. Bird species will be disturbed and negatively impacted where no entry zones are less than 100 yards and boater traffic of any kind (including kayaks and other paddle craft) is allowed. Aside from sea-level rise, the number one threat to the long-term persistence of these bird species in the national wildlife refuges is human disturbance. Secondarily, the proposed scheme is complicated, and an overarching goal for the marine zoning component of this rulemaking is to simplify and create consistent regulations where possible to facilitate compliance and enforcement.

Idle Speed No Wake and Channel Access in Wildlife Management Areas

Comment: NOAA received comments specific to several proposed idle speed no wake zones that, while supporting the zone, requested maintaining normal operation in channels.

Response: NOAA agrees, and in the Final Preferred Alternative has clarified where channels are open for normal operation (e.g., Marathon WMA) and in some cases has added additional channels based on user feedback (e.g., Channel Key WMA).

No Anchor in Wildlife Management Areas

Comment: NOAA received comments specific to the proposed no anchor WMAs, including comments stating that they are not necessary (e.g., Archer Key), and that safe harbor anchoring and anchoring for educational purposes should be excluded (e.g., Tavernier Key).

Response: The Final Preferred Alternative does not include a new no anchor zone at Archer Key (as proposed in draft EIS Alternative 2 and the 2022 NOPR Alternative). The purpose and intent of this zone—to protect seagrass and hard-bottom habitat—is sufficiently addressed through the three existing Florida Keys National Marine Sanctuary mooring buoys installed in that area. The Final Preferred Alternative also does not include a no anchor regulation at Tavernier WMA and Dove Key and Rodriguez Key WMA because of public use of these areas for recreation and specific to the sailing community: for safe harbor and for sailing and anchoring education. Both of these high-use marine zones would still include the no motor regulation aimed at protecting habitat from vessel damage. For all of these WMAs, if impacts to the habitat increase, NOAA could reevaluate regulations at these locations.

Clarification of No Motor Regulation in Wildlife Management Areas

Comment: NOAA received comments seeking clarification about the proposed no motor WMAs, specifically whether vessels could have motors and/or what types of motors may be allowed in these WMAs.

Response: The Final Preferred Alternative maintains the existing “no motor” definition, which applies to all modified or no motor WMAs (12 WMAs) and means the use of internal combustion motors is prohibited. NOAA would provide information in outreach and educational products to help boaters understand and comply with this regulation. A vessel with an internal combustion motor on board may still access a no motor zone, but only through the use of a push pole, paddle, sail, electric motor, or similar means of operation. It would be prohibited from using its internal combustion motor.

Change of "No Access Buffer" and "Closed" Regulation to "No Entry" in Wildlife Management Areas

Comment: NOAA received comments both supporting and opposing the proposed change of the existing no access buffer and closed regulation to no entry. The majority of commenters supported the proposed change, noting that it made sense to simplify the language and be consistent with state zone types and associated regulations. Those who opposed the proposed change asserted that the existing regulation was sufficient for the resource protection goals.

Response: The action alternatives, including the Final Preferred Alternative, changes the no access buffer and closed regulations to no entry to be consistent with the intent of the regulation and with complimentary state regulations. The existing no access buffer zone identifies a portion of the sanctuary where vessels are prohibited from entering regardless of the method of propulsion. In general practice, the no access buffer, closed, and no entry regulations have similar intent. This change applies to nine of the existing WMAs.

No Entry and Access for Education and Eco-Tour Operators in Wildlife Management Areas

Comment: NOAA received comments specific to certain proposed no entry WMAs related to continued educational and eco-tour operation (e.g., Pelican Key). Comments included: 1) opposition to no entry due to the loss of access, and 2) support for no entry if access for educational and eco-tour operators would be allowed.

Response: The resources present at many of these locations need the greatest level of protection and therefore, these zones are proposed as no entry in the Final Preferred Alternative. In addition, given the educational opportunities some of these sites provide to advance understanding and stewardship ethic of these resources, NOAA would consider using its existing permit categories to permit educational and eco-tour operators. Permits would be issued on a case-by-case basis and would help sanctuary staff gather important information about the numbers, types, and frequency of use in these areas. NOAA would also work with partners to evaluate the potential impacts of use in these areas to determine if continued access should be allowed and permitted.

Other Zone-Specific Comments in Wildlife Management Areas

Comment: NOAA received comments both supporting and opposing protections for a multi-species fish spawning aggregation site at Western Dry Rocks. Comments included support for year-round closure, seasonal closure, no action, and deferring to FWC to take action as this area is in state waters and is deemed a fisheries action.

Response: NOAA's Final Preferred Alternative includes a WMA at Western Dry Rocks with regulations align with existing FWC regulations (as of February 2021) with a seasonal no fishing prohibition from April 1 to July 31, and include a no anchor regulation during that same time period. In this alternative, NOAA includes additional anchoring restrictions because the ecological features present at this site contribute to the establishment and maintenance of a fish spawning aggregation site.

Comment: NOAA received comments both supporting and opposing a proposed new marine zone protecting an internationally important sea turtle foraging habitat area. Comments included: 1) support for the greatest level of protection (e.g., transit only) in the largest area where sea turtles are shown to be present in high numbers; 2) support for a smaller targeted area; 3) support for less restrictive regulations (e.g., idle speed no wake); 4) questioning the need of such a zone given the perceived increase in turtle numbers and lack of data for turtle strikes that can be attributed to vessel traffic in this specific area; 5) opposition to this zone due to the need to transit through this area to take safe harbor in the Marquesas Keys; and 6) opposition to this zone due to the potential loss of fishing access, depending on the regulation applied.

Response: NOAA determined that protecting this internationally important sea turtle foraging habitat area is needed and would apply idle speed no wake regulations in this area to protect this habitat from vessel impacts. In developing the Final Preferred Alternative, NOAA reviewed updated data for this site and proposes to modify the size of the marine zone and include the area of greatest habitat variability and highest numbers of turtle sightings. This size modification removes the southern portion, which would allow safe transit to the Marquesas Keys. In addition, by applying an idle speed no wake regulation instead of a no entry or transit only regulation, this area is still accessible for fishing activities and other uses.

Comment: NOAA received comments suggesting numerous areas to include as additional new WMAs (e.g., Hurricane Key, Don Quixote, Bill Finds Key).

Response: NOAA used the two criteria for considering new WMA marine zones (resource protection need and public access/use) and evaluated these additional marine zones proposed by the public and other agencies under these criteria. However, NOAA is not proposing any additional WMAs beyond those included and analyzed in the 2019 Draft EIS and 2022 NOPR Alternative. Through the updated proposed WMA zones, NOAA prioritized modifying or creating new WMAs where resources demonstrated the greatest need for additional protections while balancing user access. In response to changing resource conditions or levels, types, and intensity of use, NOAA will continue to work with sanctuary users, agency partners, and research partners to evaluate existing zones and the need to consider modified or new protections.

Management Plan

For more details on the sanctuary-wide regulation proposals and impact analysis see Chapter 3 Section 3.5 and Chapter 5, respectively.

General

Comment: NOAA received comments suggesting that the order of the goals be changed to demonstrate greater emphasis on improving the condition of sanctuary resources (Goal 2) and reducing threats (Goal 3). Commenters also requested that the management plan include greater specificity, including accountability metrics and target dates for completion of specific activities.

Response: These management plan goals are not intended to be completed in a sequential order, so the order in the document does not indicate sequencing of effort or prioritization. Regarding including greater specificity, this management plan serves as the overall strategic plan and direction for the sanctuary and partners for the next five to 10 years. The more detailed plan that some commenters requested, which includes timelines, accountability metrics, and agency or partner leads, would be included in the annual operating plan and the cooperative management annual operating plan with federal and state management partners as outlined in Goal 5.

Comment: NOAA received comments that highlighted the need to improve sanctuary resource conditions and to monitor and address impacts from climate change and changes to water quality, to continue and expand living and non-living resource protection, and to advance efforts to restore habitats and ecosystem function. Comments also called for targeted efforts to evaluate the effectiveness of management actions; more responsive and adaptive management to address emerging threats and the increasing number of people in the sanctuary; greater support for mooring buoys; the need for enhanced enforcement capacity; increased issue- and audience-specific education and outreach efforts; and increased capacity to administer sanctuary programs.

Response: NOAA agrees that while the objectives and activities in the management plan comprise a comprehensive body of work, there are priority issues that need greater attention and emphasis. In the final management plan, NOAA identified a suite of six priority management themes to guide Florida Keys National Marine Sanctuary management actions, resource allocation decisions, and partnership development. These are: 1) management effectiveness/adaptive management; 2) water quality; 3) restoration; 4) visitor use management; 5) enforcement; and 6) stewardship and engagement. These are outlined in more detail in the final management plan and specific activities that support these priorities are highlighted throughout the plan. Specific comments related to these themes are included below.

Management Effectiveness/Adaptive Management

Comment: NOAA received comments calling on NOAA to update the sanctuary's condition report, regulations, and management plan at least every five years to allow for a comprehensive understanding of and response to changing conditions, and to adopt rules to allow for adaptive management that can meet immediate threats facing ecosystems and ocean life. Comments specifically noted future regulatory reviews should be more targeted and responsive to specific issues, rather than the time consuming and large-scale (like the Restoration Blueprint process).

Response: NOAA is committed to evaluating sanctuary conditions, regulations, and management actions on a more regular and iterative basis, including conducting a management plan review every five years, as directed by the NMSA. NOAA believes the lengthy and comprehensive nature of this Restoration Blueprint review process was necessary and should provide a solid baseline for future management reviews and targeted adaptive management.

Comment: NOAA received comments supporting the use of adaptive management and the establishment of a mechanism in addition to the proposed temporary regulations. Commenters noted that adaptive management should include strong coordination with the Sanctuary

Advisory Council through the establishment of a dedicated advisory council working group and should engage various user groups.

Response: NOAA agrees, and as part of the implementation of the final management plan, NOAA plans to develop specific monitoring programs to support adaptive management (e.g., evaluating changes in SPAs due to application of a no anchor regulation). NOAA is committed to working with the myriad partners (e.g., agency, research, NGO, constituent groups, etc.) to understand the needs, evaluate options, and ultimately execute an adaptive management approach as sanctuary resources, levels of use, and impact demand.

Water Quality

Comment: NOAA received comments calling for more specific management plan activities to address water quality both locally and regionally. Specific localized issues included shallow well injections; stormwater runoff; turbidity caused by large vessels, particularly cruise ships; support for vessel pump-out stations; support for more "clean marinas" throughout the Florida Keys; banning sunscreens that contain chemicals known to impact coral reefs; and enhanced water quality monitoring to address point source pollution. Specific regional issues noted the need to address South Florida agricultural runoff; Lake Okeechobee releases; funding and implementation of Everglades restoration; and better engagement with the South Florida Ecosystem Restoration Task Force and the South Florida Water Management District.

Response: NOAA is committed to working with partners to address water quality issues resulting from both localized and regional impacts in the final management plan. Working with the WQPP and the South Florida Ecosystem Restoration Task Force, NOAA would continue to build upon its three decades of work to address regional water quality issues, with an understanding that Florida Keys water quality is inextricably linked to the greater South Florida watershed. NOAA would prioritize continued work with our partners and the community to further analyze the sources of water quality decline, develop and implement tangible solutions, and adapt to emerging needs.

The WQPP regularly evaluates localized and regional water quality issues and provides recommendations for a variety of corrective actions, education and outreach, monitoring and research activities to help understand and address those concerns. NOAA representatives sit on the South Florida Ecosystem Restoration Task Force, including the South Florida Ecosystem Restoration Working Group and Science Coordination Group, through which a variety of regional issues affecting South Florida ecosystems, including water quality, are addressed (See Goal 2, Objective 2.1).

Using sunscreen is very important to prevent skin cancer, however, NOAA agrees that certain sunscreen chemicals may harm the environment, particularly corals. NOAA's approach to addressing this issue is focused on public education and outreach campaigns, as banning the use of sunscreen chemicals during in-water activities (such as diving, snorkeling, or swimming) would be very difficult to enforce under the National Marine Sanctuaries Act.

Comment: NOAA received comments noting the need to improve regulations that prevent further deterioration of water quality from overdevelopment on land, including potential impacts to both groundwater and run-off.

Response: NOAA already has the authority at 15 CFR sections 922.163(a)(2), (3), and (4)(ii) to prohibit impacts to coral, alteration of the seabed, and discharges of materials into the sanctuary. NOAA uses this authority to review nearshore construction projects and can require specific conditions be applied to the permits for those projects to minimize and/or mitigate impacts to sanctuary habitats, species, and water quality. However, it would be infeasible for NOAA to attempt to use its authority to regulate the numerous inland use activities that contribute to coastal nonpoint pollution. NOAA will continue to work with Florida DEP, the U.S. Army Corps of Engineers, Monroe County, and public and private landowners to evaluate and minimize impacts to the marine environment from these land based and nearshore impacts. NOAA also regularly engages with the Florida Department of Commerce through the WQPP. Florida Department of Economic Opportunity oversees the Areas of Critical State Concern Program which is intended to protect natural resources from substantial deterioration caused by uncontrolled development. The WQPP provides a forum to cultivate a collective understanding of the variety of factors that contribute to water quality degradation and coordinate preventive measures and corrective actions to address those.

Comment: NOAA received comments requesting periodic silt removal in the Key West ship channel. Other comments requested a study to determine whether a deeper channel would reduce any harmful effects of large ships.

Response: The responsibility for maintaining the navigability of shipping channels falls under the Clean Water Act and the Rivers and Harbors Act, which are administered by the EPA and the U.S. Army Corps of Engineers. If silt removal and/or channel dredging are proposed by these agencies, NOAA would use its existing authorities to review and consider issuance of a sanctuary permit for any such activity, and through that process would have the opportunity to evaluate impacts and require various conditions to minimize and/or mitigate any potential impacts.

Comment: NOAA received comments noting there is little focus on monitoring for cruise ship generated turbidity in the waters around Key West.

Response: While turbidity from cruise ship propellers could adversely affect sanctuary resources, NOAA has prioritized addressing discharges from cruise ships, such as greywater and runoff in the proposed action because these discharges have a greater potential impact on water quality and it is practical for the cruise ships to refrain from these discharges for the short period they are in port in the sanctuary. In addition, the sanctuary's WQPP is charged with establishing a comprehensive water quality monitoring program to determine the sources of pollution that cause or contribute to marine resource degradation and evaluate the effectiveness of efforts to reduce those sources of pollution. NOAA will continue to collaborate with the WQPP and other partners to address evolving water quality priorities and adapt monitoring programs to meet emerging needs. This includes the city of Key West and College of the Florida Keys who are working together to enhance monitoring in this vicinity.

Restoration

Comment: NOAA received comments calling for increased emphasis on restoration activities throughout the Florida Keys and to include the full range of habitat types (e.g., coral, seagrass,

sponge), and specific keystone species (e.g., long spined sea urchins, queen conch), fish, and apex predators.

Response: NOAA agrees with the comments. The Final Preferred Alternative includes a new restoration area zone type, a new restoration permit category, and several management plan activities specifically related to advancing the science and implementation of restoration (see primarily Objective 2.2). The Final Preferred Alternative includes 13 specific restoration areas, and while these are all specific to coral reef nursery and outplanting sites, this zone type is intended for application for other habitat types as needed. If future circumstances suggest a need for additional restoration areas, NOAA could establish new zones through future rulemaking.

Visitor Use Management

Comment: NOAA received comments supporting and noting the need to enhance the mooring buoy program. Comments emphasized the importance of ensuring there are sufficient and well-placed mooring buoys, particularly if the proposed regulation prohibiting anchoring in SPAs is implemented.

Response: NOAA agrees and has already solicited input from a Sanctuary Advisory Council working group (recommendations provided at the August 2023 Sanctuary Advisory Council meeting) to address this issue. In addition, as part of the implementation of the management plan, NOAA is evaluating the need for new buoys and/or relocating existing mooring buoys, the associated short- and long-term costs (e.g., staff, contracts, materials), and mechanisms for execution. Continued engagement with the Sanctuary Advisory Council, user groups, and agency partners is essential.

Comment: NOAA received comments noting that the proposed regulations and management plan have not gone far enough in limiting the number of users and potential detrimental impacts to sanctuary resources and the user experience (tourists, locals, commercial fishing, and other activities that use the sanctuary). Many commenters suggested various models and methods to limit access, including user fees and/or a medallion system that could be required of commercial diving and sport fishing charters to limit the number of individuals in the sanctuary at once. Commenters noted that such programs could provide funds to support education and enforcement activities. NOAA also received comments opposing limiting access and the application of a user fee.

Response: NOAA included a proposal in alternatives 3 and 4 to limit commercial access in three SPAs to Blue Star designated operators. In the Final Preferred Alternative, NOAA does not propose restricting access by setting a limit on the number of users allowed to access specific sanctuary marine zones, in recognition that additional information may be useful before NOAA imposes access restrictions. The Final Preferred Alternative includes a proposed no anchor regulation in SPAs and habitat nursery areas, which may serve to manage overall numbers of users in these zones. In addition, the management plan includes visitor use management as a priority for action. Several activities are included to help NOAA, partner agencies, and the community to better understand the scope and scale of use throughout the sanctuary and, where needed, identify interventions to reduce and address concentrated uses and potential adverse

impacts (see Activity 3.3.1). Finally, NOAA has extensive experience in crafting regulations and management plans that carefully balance the various and competing priorities for the site.

Enforcement

Comment: NOAA received comments noting the need for more enforcement capacity (funding and officers), particularly if the sanctuary expands and increases the number of regulations and marine zones. Commenters shared the sentiment "what is the use of having regulations if lawbreakers feel they will not be caught?" Commenters also identified specific hotspots (e.g., Alligator Reef Light) and times of year (e.g., lobster mini season) that additional enforcement capacity is needed.

Response: NOAA agrees that enforcement is an essential component of sanctuary management. While additional enforcement capacity and presence is always useful, this is not a reason to take no action to put additional regulatory protections in place. NOAA relies heavily on "interpretive enforcement" seeking voluntary compliance through education. NOAA believes that the majority of users want to protect sanctuary resources and honor the regulations that are in place, much like drivers on the highway honoring speed limits.

NOAA's NMFS Office of Law Enforcement is the lead entity within NOAA for enforcing all of NOAA laws and regulations, and partners with FWC, USCG, U.S. Fish and Wildlife Service, National Park Service, and the Monroe County Sheriff's Office. NOAA Office of Law Enforcement's Cooperative Enforcement Program is the primary means by which enforcement is conducted in the sanctuary. This program utilizes two main tools to increase federal enforcement capacity within the sanctuary. The Cooperative Enforcement Agreement between NOAA Office of Law Enforcement and FWC authorizes state law enforcement officers to enforce federal laws and the Joint Enforcement Agreement facilitates the operations, administration, and funding for FWC to enforce those federal laws. Under the Joint Enforcement Agreement, the Division Enforcement Plan identifies specific, directed, and targeted federal enforcement priorities for FWC to focus their enforcement effort on.

Comment: NOAA received comments requesting that the fines for violations be increased, noting that if there is a minimal penalty, people are not as likely to comply with regulations.

Response: Section 307(d)(1) of the NMSA sets a statutory cap for civil penalties for up to $100,000 per violation, which may be adjusted for inflation. The maximum civil monetary penalty authorized under the National Marine Sanctuaries Act (NMSA) has been adjusted for inflation over time and is currently $216,972 per violation per day. *See* 15 CFR 6.3(f)(13). Furthermore, NMSA also authorizes an action in rem against any vessel used in violation of this proposed regulation. *See* 16 U.S.C. 1437(d)(3).

Comment: NOAA received comments inquiring about a mechanism, such as a telephone or marine radio for the USCG watch-standers, for the public to report occurrences of discharge in the sanctuary including marine sanitation devices and waste oil, among other violations.

Response: NOAA notes that such mechanisms currently exist for reporting violations. NOAA recently redid the Florida Keys National Marine Sanctuary website and has created a "Report a

Violation" webpage with a list of contacts and instructions on how to report various wildlife issues, environmental hazards, and sanctuary violations.

Stewardship and Engagement

Comment: NOAA received comments requesting additional educational and outreach materials that target specific issues (habitat damage, no anchoring regulations, discharge, etc.) and audiences (e.g., translating and placement of materials for other languages/cultures).

Response: NOAA agrees and as part of the management activities, Florida Keys National Marine Sanctuary staff have developed a Media, Outreach, Volunteer, and Education Strategic Plan that outlines specific communication, interpretation, and programming activities and goals which sanctuary staff will carry out through the implementation of the proposed management plan.

Comment: NOAA received comments about the need to increase equitable access to the sanctuary including physical access; language and cultural access; educational and job opportunity access. Commenters noted the importance of developing partnerships with environmental justice groups, community-based organizations, and others that work directly with low-income and Black, Indigenous, and People of Color (BIPOC) communities to best inform and advance this work.

Response: The Media, Outreach, Volunteer, and Education Strategic Plan of the proposed management plan includes activities to determine the baseline of how existing sanctuary products, programs, facilities, etc. meet the needs of diverse audiences. This baseline would inform recommendations for accessibility and diversity enhancements across the sanctuary site. This includes working with various organizations, nonprofits, government entities, and sovereign Tribes and Nations in South Florida to expand access and opportunities to engage with the sanctuary. In addition, universal design, accessibility, and diversity enhancements were included as part of the Eco Discovery Center remodel.

Comment: NOAA received comments calling for increased signage and maps at visitor centers, public boat ramps, hotels, and local liveries to help inform boaters and deter violators. Commenters pointed out that recreational boaters do not see boundaries on the water and transit among different areas frequently. Therefore, on water signage, when appropriate, to indicate zones, no anchoring, speed limits, and transient corridors should be utilized. Additionally, commenters suggested the use of innovative technology such as "smart buoys" and QR codes to help to ensure dissemination about the regulations and the environment.

Response: NOAA agrees and as part of the management activities, the sanctuary worked with mobile application developers to release the Marine Sanctuary Explorer app. The Marine Sanctuary Explorer app uses GPS location to alert users when they are entering special marine zones, as well as provides interpretive stories about natural and cultural resources. Partner agency boundaries and special use areas are also marked on the app and staff have the ability to rapidly update app information to address emerging situations and alert visitors. Additionally, the MOVE team developed, and will refresh as needed, updated signage for boat ramps and marinas that contains interpretive information relative to the location of the sign as well as information on downloading the Marine Sanctuary Explorer mobile app for on-the-water use.

The sanctuary staff in collaboration with other partners will continue to explore innovative methods of communicating with visitors to Florida Keys National Marine Sanctuary.

Comment: NOAA received comments in support of the Blue Star fishing guide and diving operator programs noting that they must be strengthened and reevaluated. Commenters noted that the Blue Star programs should exist as an exemplary program with rigorous and environmentally conscious requirements including, at a minimum, more in-depth, quality education to passengers and a requirement that operators use environmentally friendly products including cleaning supplies, food and beverage products, and sunscreens. NOAA also received comments questioning the value of the Blue Star programs.

Response: The Blue Star programs require participating operators to provide education to participants that include environmentally conscious fishing or diving practices and regulations. The Blue Star program operators undergo annual reviews of program requirements (referred to as the program "framework") for content and relevance to existing and emerging threats to sanctuary resources. Participants are required to identify areas of growth and improvement, in addition to meeting the baseline requirements, showing a commitment to being environmentally conscious and sharing sanctuary messaging with guests and passengers. Operators are required to use environmentally friendly products in some instances, and this requirement is also subject to annual review and updating as appropriate (see Activity 3.3.6). Visit the Florida Keys National Marine Sanctuary website for more information on the Blue Star programs.

Comment: NOAA received comments that both supported and opposed a mandatory boater education program. Those that supported boater education also requested that recreational boaters be considered in some fashion in the Blue Star programs such as using an online education program in conjunction with the Blue Star program for boat operators to use before entering the sanctuary. Commenters specifically noted that boating and navigation experience should be a prerequisite for boat rentals. Some commenters that opposed mandatory boater education did support statewide education.

Response: NOAA considered proposing a mandatory boater education requirement but ultimately eliminated it from further review for a variety of reasons. As discussed in Chapter 3 Section 3.7, the sanctuary, unlike Everglades National Park, has a high number of access points (individual homes, boat ramps, marinas, etc.) and does not require permits for access, making it more challenging to ensure user compliance with and enforcement of a mandatory boater education requirement. However, NOAA acknowledges that enhanced boater education is needed, and is committed to working with other agency partners, the state, and the advisory council to develop and implement a more robust boater education program within the sanctuary, including developing specific boat rental outreach. In April 2019, Florida Keys National Marine Sanctuary developed and launched a voluntary online boater education course in partnership with Indiana University's Eppley Institute for Parks and Public Lands and with funding through an Florida Keys National Marine Sanctuary WQPP special studies grant administered by the EPA. The new Florida Keys National Marine Sanctuary website also has a section dedicated to providing information for boaters, including a list of tips for responsible boating and links to additional boater education resources.

Comment: NOAA received comments that Florida Keys National Marine Sanctuary should work with GPS manufacturers to make sure that the sanctuary boundary and marine zones are on all new chart plotters and electronic charts for the public and law enforcement's benefit.

Response: NOAA agrees and will provide the final sanctuary and individual marine zone boundaries selected to NOAA's Office of Coast Survey for updates to navigational charts. The Office of Coast Survey prioritizes chart updates that have a nexus with marine navigation; however, the Office of National Marine Sanctuaries will work to have all individual marine zones included on official charts. When updates to charts are made, there is an announcement in the Coast Pilot alerting users that new information is available. Many commercially available GPS units include sanctuary zone boundaries in their software products, but NOAA cannot mandate the content of commercially available GPS software products. Ultimately, the coordinates of each zone are provided in the sanctuary regulations, and users are responsible for knowing and complying with all regulations.

Other Management Plan Topics

Climate

Comment: NOAA received comments noting that while the effects of climate change are identified as a threat to Florida Keys National Marine Sanctuary, understanding those effects and building considerations for climate change into planning efforts should be more explicitly stated throughout the management plan.

Response: NOAA agrees, and while climate change is a consideration for much of the work NOAA's Office of National Marine Sanctuaries has outlined within the management plan, NOAA has updated the draft management plan to more specifically call out where greater emphasis on climate change activities should be applied (e.g., see Activities 1.1.4 and 2.2.8).

Research

Comment: NOAA received comments supporting activities outlined in Goal 1 emphasizing interdisciplinary research. Some commenters offered support to take a leading role in that effort to bring scientists, policymakers, and stakeholders together for the ecosystem science symposium as outlined in Activity 1.1.1. Commenters also recommended that such a symposium include scientific partners and stakeholders throughout the Caribbean as the sanctuary is inherently part of a wider Caribbean ecosystem.

Response: NOAA agrees and as part of the management activities, the sanctuary Science Team has developed a comprehensive strategic plan that informs sanctuary staff work priorities and research priorities to inform academic and partner research. The Science Team has also updated the Florida Keys National Marine Sanctuary science needs documents that outline the research needs for several topics including climate change, marine zone effectiveness, human use, water quality, restoration, among others. NOAA appreciates the offer of assistance in planning and executing a Science Symposium.

Comment: NOAA received comments requesting that research efforts prioritize:

- Investigating the potential predator-prey imbalance occurring in the sanctuary with respect to sharks
- All facets of human dimensions sciences, including, but beyond, economics; and the science of natural resource recovery, in addition to the existing emphasis on causes of decline
- Greater emphasis on management activities that consider ecological connectivity given that the Florida Keys are hydrologically linked to and influenced by waters from the West Florida Shelf, Florida Bay, Biscayne Bay, the greater Everglades ecosystem, and the wider Caribbean basin.

Response: NOAA develops site-specific and issue-specific science needs assessments that are updated periodically and will continue to be updated as shifts occur in research needs. NOAA does not have the resources and capacity to do all of the research requested, which is why prioritization (such as the science needs assessment) and partnerships are essential. NOAA will consider these comments when updating future science needs assessments.

Artificial Habitat

Comment: NOAA received comments supporting and opposing the use of artificial structures in the sanctuary.

Response: NOAA agrees that the use of artificial habitat can be a management tool to support and facilitate ecosystem restoration. The final management plan includes activities specific to active habitat restoration (see Objective 2.2) and evaluating impacts of existing artificial habitats and developing best practices for potential future use of artificial substrates (see Activities 3.3.7 and 3.3.8). The final management plan specifically calls for the development of a habitat restoration plan, which includes consideration of artificial substrates. NOAA is committed to working with the state, county, and local governments, and other partners to evaluate the potential application of and develop a framework for artificial habitat use in the sanctuary. Such a framework would include guidance for identifying priority needs and clear goals for considering when and where artificial habitat use is acceptable. This framework would identify best management practices including site selection criteria; material components and suitability for use in the sanctuary (e.g., prohibiting the use of plastic), design factors (including the environmental footprint and stability); research and monitoring strategies; compilation, evaluation, and archiving of datasets and information; and expected outputs, potential midcourse corrections, and other adaptive management measures.

NOAA's intent for the use of artificial habitat within sanctuary waters is to facilitate habitat enhancement to support a range of species life cycle needs, re-establishment of critical species, and ultimately support the ecosystem function. NOAA will also consider the potential role habitat restoration site selection can play in protecting human communities from coastal flood risks. The ultimate goal of these efforts is to allow the ecosystem to recover to a point where natural processes and communities function at a self-sustaining state.

Other Uses: Emerging, Concentrated, and Conflicting

Comment: NOAA received comments about noise pollution at sandbars (e.g., loud and often vulgar music). Concerns include: 1) wildlife disturbance; 2) loss of the tranquility that many

seek; and 3) corruption of the beauty of these wild areas. Commenters requested that the sanctuary work jointly with U.S. Fish and Wildlife Service to develop regulations in regard to noise pollution that will uphold the purpose of the National Wildlife Refuges as wilderness and to create standards that can be applied throughout the sanctuary. Commenters noted that solutions should seek to maintain the freedom to enjoy these beautiful places while still being compatible with resource protection.

Response: NOAA agrees that anthropogenic noise pollution can cause wildlife disturbance, loss of tranquility, and corrupt the beauty of areas in the sanctuary. Existing sanctuary regulations prohibit the taking of any marine mammal, sea turtle, or bird, which includes conducting any act that results in the disturbance of these animals. Local governments and many of the municipalities have existing ordinances that prohibit causing disturbances (e.g., loud and vulgar music).

NOAA worked with U.S. Fish and Wildlife Service to evaluate areas within the National Wildlife Refuges that are in need of additional protection and created new WMAs that regulate certain uses to meet the goal of resource protection. One objective of the Florida Keys National Marine Sanctuary final management plan is to identify and monitor patterns of human uses and potential impacts of those uses. In collaboration with management partners and stakeholders, Florida Keys National Marine Sanctuary would work to identify interventions to reduce and address concentrated uses that may lead to noise pollution and other adverse impacts to sanctuary resources.

Comment: NOAA received comments highlighting the increased use of mothership activities (large vessels, usually a yacht, that are owned and run as de facto hotels on the water) throughout Florida Keys National Marine Sanctuary. Commenters noted issues specific to user conflicts, loss of traditional etiquette among users, and the potential violation of sanctuary regulations (e.g., discharge) and other concerns about valid business licenses and vessel inspection status.

Response: NOAA understands and acknowledges this concern. NOAA proposed an alternative to restrict overnight use of mooring buoys in order to address these types of concerns, but NOAA's preferred alternative is to not restrict mooring buoy use in response to the numerous public comments opposing the measure. Any vessel operating within the sanctuary is required to follow all sanctuary regulations, regardless of the duration of their visit. Business licensing falls under the purview of state, county, and municipal entities. Vessel inspections fall under the purview of the FWC and USCG.

Comment: NOAA received comments about the use of uncrewed aircraft systems (UAS) and in the sanctuary and the national wildlife refuges, noting that the use of these UASs disturbs wildlife.

Response: NOAA agrees that the use of UASs has the potential to disturb wildlife. Existing Florida Keys National Marine Sanctuary regulations already prohibit "take" of any marine mammal, sea turtle, or bird within or above the sanctuary. "Take" includes harassment or to attempt to engage in any such conduct and includes operation of an aircraft, including UAVs, that results in the disturbance or molestation of any marine mammal, sea turtle or seabird. A

sanctuary permit, such as a research permit, is required for any operation of UASs that would result in the "take" of any marine mammal, sea turtle, or bird.

Cooperative Management

Comment: NOAA received comments highlighting the importance of engaging with local county and municipal governments whose leaders and their constituents have the capacity to augment sanctuary and other federal and state-led efforts. Similarly, NOAA received comments recommending that sanctuary staff consider how to best engage NGO stakeholders to support funding of the annual operating plan. NOAA received comments recommending continued partnership with other marine management entities to develop consistent management regulations across jurisdictional boundaries. Noting that such a consistent approach increases efficiency and reduces costs while improving overall user understanding and compliance.

Response: NOAA agrees, and throughout the management plan acknowledges the essential role partners do and will play in sanctuary research, management, and operations activities. Goal 5: "Advance and Support Collaborative and Coordinated Management" is completely devoted to how Florida Keys National Marine Sanctuary will engage with existing and new partners to support implementation of the sanctuary management plan.

Miscellaneous

Environmental and Socioeconomic Data and Analysis

Comment: NOAA received comments raising concern that NOAA was using outdated data given that the Florida Keys National Marine Sanctuary Condition Report was completed in 2011 and has not yet been updated, and the fisheries-related data used in the draft EIS were outdated.

Response: NOAA understands and acknowledges this concern. While the last formal Florida Keys National Marine Sanctuary Condition Report was completed in 2011, at every stage of the Restoration Blueprint process, the best available and up-to-date environmental data was used to evaluate and inform agency decisions. Specific to the socioeconomic data, NOAA compiled updated data and conducted an updated analysis of all the draft EIS alternatives and the proposed rule alternative (see the 2022 Socioeconomic Report). NOAA has incorporated this 2022 analysis in the final EIS as it represents the best available information and NOAA has made only nominal changes to the proposed action since the 2022 proposed rule. The updated information did not result in any changes to the impact determinations for any alternative analyzed in the draft EIS.

Appendix D:
Minor or Technical Revisions and Updates

Introduction

This appendix identifies minor or technical revisions and updates to regulatory definitions, terms, and provisions that FKNMS is proposing to update. The proposed updates would not result in direct, indirect, or cumulative impacts on any sanctuary resources in the existing sanctuary or proposed expansion area. Therefore, these proposed regulatory changes are not discussed in Chapter 5, Environmental consequences. The proposed changes described below would be implemented for all of the alternatives considered in this draft EIS, except for the No Action Alternative.

Definitions and Terms

The following existing definitions and terms would be updated for greater consistency with the state of Florida Administrative Code (F.A.C.), National Marine Sanctuary System-wide regulations, other sanctuary-specific regulations, and the updated FKNMS management plan.

Definitions:

1. *Idle speed only/no wake* would be updated to be consistent with state law at 68D-23.103(3)(b), (d)-(f), F.A.C., for boating restricted areas. All other references to *idle speed only/no wake* in FKNMS regulations would be updated (e.g., officially marked channel).
2. *Idle speed only/no-wake zone* would be updated to be consistent with state law at 68D-23.103(3)(b), (d)-(f), F.A.C., for boating restricted areas. All other references to this zone type in FKNMS regulations would be updated.
3. *Marine life species* would be updated to correct the state code citation.
4. *No-access buffer zone* would be replaced with the term "*no entry*." All other references to this zone type in the FKNMS regulations would be updated to reflect the new term.
5. *Tropical fish* would be updated to correct the state code citation.

Terms:

1. All references to the term *seabed* would be replaced by the term *submerged lands*.
2. Terms used to describe the types of activities and projects that are exempt from the *alteration of, or construction on, the seabed* regulation would be updated. The updated terms would expressly exempt a number of small-scale construction projects that are minor in scope and would not result in adverse impacts to sanctuary resources. In addition, the term "breakwater" would be removed from the list of currently exempt activities, as breakwaters are not commonly built in the Florida Keys and tend to require more extensive review and coordination with other local, state, and federal agencies.
3. The term littering would be added to the discharge or deposit of material or other matter regulation.

Regulations

The following regulations would be updated for greater consistency with the state of Florida F.A.C., National Marine Sanctuary System-wide regulations, other sanctuary-specific regulations, ONMS policies and practices, and the updated FKNMS management plan.

1. *Boundary coordinates* would be added to more clearly delineate the existing sanctuary boundary for the areas adjacent to Everglades National Park and Card Sound.
2. *Vessel operations around divers down flags* would be changed to incorporate the updated definition for idle speed no wake areas as noted above and would be updated to be consistent with Chapter 327.331, Florida Statutes.
3. *Conduct of diving/snorkeling without a flag* would be updated to be consistent with Chapter 327.331, Florida Statutes, which addresses both vessel behavior around divers and diver behavior.
4. *Take or possession of protected wildlife* would be updated to more accurately capture the listed wildlife species present in sanctuary waters (e.g., in addition to marine mammals and turtles, this updated terminology would include corals and crocodiles), and a definition for *protected wildlife* would be added. The species that would be added are already protected by existing state or federal laws, such as stony corals listed under the Endangered Species Act.
5. *Exemption for Military Activities:* NOAA has removed from the military exemption regulation reference to NMSA 304(d) Interagency Cooperation. The regulation previously referenced 304(d) as the mechanism for exempting new DoD activities from the prohibitions. However, NOAA has removed the reference to the 304(d) Interagency Cooperation process because 304(d) applies to all federal agency actions that are likely to destroy, cause the loss of, or injure sanctuary resources, including those conducted by DoD, regardless of whether the specific actions are prohibited by sanctuary regulations. NOAA commits to working with DoD to consider exempting new activities from the prohibitions. NOAA would use the same standard to exempt new activities as used to update the list of DoD exemptions in the 2024 final EIS. In other words, NOAA would exempt a new activity from the prohibitions if NOAA determines such activity is not likely to injure sanctuary resources or will be carried out in a manner that avoids, to the maximum extent practical, any adverse impact on sanctuary resources and qualities. Any changes to this list of exempted military activities would only occur after compliance with all applicable laws, such as the Administrative Procedure Act and NEPA, as necessary, and after public notice and comment, as applicable.
6. *Exemptions for law enforcement* would be updated and consolidated to more accurately reflect the types of prohibited activities that officers may need to undertake during routine operations.
7. Prohibitions on permits for mineral or hydrocarbon development, disposal of dredged spoil, or discharge of sewage would be updated to correct regulatory citations and provide clearer language.
8. *Great White Heron and Key West National Wildlife Refuge Management Areas* would be updated with geographic coordinates versus township information to explain where

personal watercraft, waterskiing, or airboat use is allowed. The term *Management Areas* will be removed and *National Wildlife Refuge* will be defined.

9. *Restoration permit* would be added as a category of general permit that may be issued by the director to further restoration of natural resources and advance sanctuary management goals. These types of activities are currently addressed through the general permit category, "Further the natural or historical resource value of the sanctuary." Adding a restoration permit category would more accurately describe the activities currently being permitted and help facilitate tracking of such projects.
10. *Changes required for consistency with the NMSA* – NOAA is updating one and eliminating another regulatory provision to eliminate redundancy or confusion pertaining to the authority granted to state governors under the NMSA. Under section 304(b)(1) of the NMSA, at the time of sanctuary designation or modification to the sanctuary's boundary or regulations, the governor of any state in which a federal national marine sanctuary is located partially or entirely within the seaward boundary may certify that the designation or changed regulations/boundaries are unacceptable and the designation or changed regulation/boundaries will not take effect in state waters. With this action, NOAA is eliminating the provisions at 922.163(g) and 922.164(f) because the provisions grant an authority to object to new sanctuary regulations to state entities (the Board of Trustees of the Internal Improvement Trust Fund and the Florida Marine Fisheries Commission), instead of the governor.
11. *Certification of pre-existing leases, permits, approvals, other authorizations, or rights to conduct a prohibited activity* would be added to address any pre-existing activity conducted in a sanctuary expansion area pursuant to a valid federal, state, or local lease, permit, license, approval, or other authorization in existence prior to the effective date of sanctuary expansion. A similar provision was included in the original FKNMS regulations for activities that pre-dated sanctuary designation, but was later removed because it was no longer applicable.
12. *ONMS permitting regulations* – Editorial changes to permitting regulations were made to reduce redundancy with National Marine Sanctuary System-wide permitting regulations, which were published for consolidation and updating to 15 CFR subpart D (88 FR 993; January 6, 2023). These changes are solely editorial, and no new requirements are established by these changes.
13. *Permit application guidelines* – Since the 1997 FKNMS regulations, ONMS has published application guidelines to aid potential applicants for ONMS permits. The application guidelines explain the necessary parts of an application and how to submit it. Updated National Marine Sanctuary System-wide regulations (15 CFR subpart D) codify these requirements. As such, in the final rule, NOAA would remove redundant application instructions.
14. *Sunken Military Craft Act* – ONMS has added a provision regarding collaboration with other federal agencies charged with implementing the Sunken Military Craft Act (Pub. L. 108-375, Title XIV, sections 1401 to 1408; 10 U.S.C. 113 note).

Appendix E: Regulatory Framework

Regulatory Overview

This section presents the existing statutory and regulatory consultation requirements and compliance for the proposed action. Section E.1 presents the federal statutes that require NOAA/ONMS to coordinate or consult with another agency, or with NOAA's National Marine Fisheries Service. Section E.2 incorporates by reference Appendix C from the FKNMS 1996 final environmental impact statement (EIS), which describes the statutory or legal framework that was in place in the Florida Keys at the time of sanctuary designation. Section E.2 also notes a number of updates and additions to the federal and state laws included in Appendix C of the 1996 final EIS. Section E.3 presents a summary of the memoranda of agreement and understanding between NOAA and the state of Florida.

E.1 Statutory Requirements and Consultations

E.1.1 Endangered Species Act (16 U.S.C. §§ 1531 et seq.)

The Endangered Species Act (ESA) of 1973, as amended, provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend. The ESA directs all federal agencies to work to conserve endangered and threatened species and to use their authorities to further the purposes of the act. NMFS works with USFWS to manage ESA listed species. Generally, NMFS manages marine species, while USFWS manages land and freshwater species.

A species is considered endangered if it is in danger of extinction throughout all or a significant portion of its range. A species is considered threatened if it is likely to become an endangered species within the foreseeable future. When listing a species as threatened or endangered, NMFS or USFWS also designates critical habitat for the species to the maximum extent prudent and determinable (16 U.S.C. § 1533(a)(3)).

Section 7(a)(2) of the ESA states that each federal agency shall, in consultation with the Secretary of Commerce and/or Interior, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. In fulfilling these requirements, each agency must use the best scientific and commercial data available. The consultation process is further developed in regulations promulgated at 50 CFR part 402.

The ESA requires action agencies to consult or confer with the USFWS and/or NMFS when there is discretionary federal involvement or control over the action. When a federal agency's action "may affect" a protected species, that agency is required to consult formally with NMFS or USFWS, depending upon the endangered species, threatened species, or designated critical habitat that may be affected by the action (50 CFR § 402.14 (a)). Federal agencies are exempt from this general requirement if they have concluded that an action "may affect, but is not likely to adversely affect" endangered species, threatened species, or designated critical habitat and NMFS or the USFWS concurs with that conclusion (50 CFR § 402.14 (b)). This is commonly

referred to as "informal consultation." This finding can be made only if *all* of the reasonably expected effects of the proposed action will be beneficial, insignificant, or discountable. An action agency shall confer with USFWS and/or NMSF if the action is likely to jeopardize the continued existence of a proposed species or result in the destruction or adverse modification of proposed critical habitat.

In chapter 5 of this final EIS, NOAA evaluates the potential impacts of the proposed action (i.e., expanding the boundary of the sanctuary, updating sanctuary-wide regulations, updating the individual marine zones and their associated regulations, and revising the sanctuary management plan) on federally listed species and critical habitats. During its review of the proposed expansion, NOAA/ONMS staff considered whether any federally listed, proposed, or candidate species or proposed or designated critical habitats may be present in the action area (as defined at 50 CFR § 402.02, "Definitions") for the proposed action.

On June 3, 2019, USFWS identified 55 ESA-listed species and nine critical habitats that could be located in the action area. Following discussions with USFWS, NOAA/ONMS determined that the proposed action may affect, but is not likely to adversely affect, 13 of the identified ESA-listed species and five of the identified critical habitats. USFWS concurred with these determinations on June 22, 2020. (NOAA/ONMS concluded that the other species and habitats would not be affected by the action.)

In February 2024, NOAA/ONMS updated USFWS on the Final Preferred Alternative and considered impacts to four ESA-listed species that were not previously considered (the eastern indigo snake, Florida Keys mole skink, green sea turtle, and eastern black rail), concluding that the proposed action may affect, but is not likely to adversely affect, these species.

In response, USFWS concurred with these updated findings and noted that two additional snake species (key-ringed neck and rim rock crowned snakes) had been proposed for listing in the action area since the original consultation in 2020. USFWS concluded that the proposed action may affect, but is not likely to adversely affect, these two proposed species. Finally, USFWS concurred that the changes in the Final Preferred Alternative for the final EIS did not alter its analysis and previous concurrence in 2020, concluding the ESA section 7 consultation process for this action for species under USFWS jurisdiction.

With respect to ESA-listed species under NMFS' jurisdiction, NOAA/ONMS identified 26 federally listed species and 10 critical habitat areas on NMFS' consultation lists for Florida's Atlantic and Gulf coasts that have the potential to occur within the action area. NMFS concurred with the list of species with the potential to occur within the action area during a technical assistance meeting on November 9, 2023. Since that time the list has been updated to remove Johnson's seagrass (which has been de-listed) and to add the queen conch (which has been listed as threatened).

Via letter dated May 17, 2024, NOAA/ONMS initiated informal section 7 ESA consultation with NMFS, relying in part on analysis in the draft EIS and providing a summary effects analysis. NOAA/ONMS described the majority of the species in Section 4.2.3.1.1 of the draft EIS and evaluated the potential impacts to these species in Section 5.2.2.1.2 of the draft EIS. In the May 17, 2024 letter, NOAA/ONMS concluded that the proposed action may affect, but is not likely to

adversely affect, these 23 species and would have no effect on three species (Gulf, shortnose, and Atlantic sturgeon). NOAA/ONMS concluded that the action would not adversely modify critical habitat areas. On July 23, 2024, NOAA/ONMS received a response from NMFS concurring that the proposed action is not likely to adversely affect NMFS ESA-listed species and designated critical habitat.

Correspondence between NOAA/ONMS and both USFWS and NMFS is included in Appendix J.

E.1.2 Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.) – Essential Fish Habitat

In 1976, Congress passed the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA fosters long-term biological and economic sustainability of the nation's marine fisheries out to 200 nautical miles from shore. Key objectives of the MSA are to prevent overfishing, rebuild overfished stocks, increase long-term economic and social benefits, and ensure a safe and sustainable supply of seafood. The MSA promotes domestic commercial and recreational fishing under sound conservation and management principles and provides for the preparation and implementation, in accordance with national standards, of fishery management plans (FMPs).

Essential Fish Habitat (EFH) describes all waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity. The consultation requirements of Section 305(b) of the MSA provide that:

- Federal agencies must consult with the Secretary on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- the Secretary shall provide recommendations (which may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH) to conserve EFH to federal or state agencies for activities that would adversely affect EFH; and
- the federal action agency must provide a detailed response in writing to NMFS and to any regional fishery management council commenting under Section 305(b)(3) of the MSA within 30 days after receiving an EFH conservation recommendation.

"Adverse effect" is defined in the regulations as: "any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions" (50 CFR § 600.910).

The trigger for EFH consultation is a federal action agency's determination that an action or proposed action, funded, authorized, or undertaken by that agency may adversely affect EFH. If a federal agency makes such a determination, then EFH consultation is required. If a federal action agency determines that an action does not meet the may adversely affect EFH test (i.e., the action will not adversely affect EFH), no consultation is required.

The Department of Commerce's guidelines for implementing the EFH coordination and consultation provisions of the MSA are at 50 CFR §§ 600.905-930. These guidelines provide definitions and procedures for satisfying the EFH consultation requirements, which include the use of existing environmental review processes, general concurrences, programmatic consultations, or individual EFH consultations (i.e., abbreviated, expanded) when an existing process is not available. The EFH guidelines also address coordination with the councils, NMFS EFH conservation recommendations to federal and state agencies, and council comments and recommendations to federal and state agencies.

On August 20, 2019, NOAA/ONMS initiated consultation on EFH. Based on its EFH included in Section 5.2.2.2 of the draft EIS, NOAA/ONMS determined that the proposed action could result in minimal adverse impacts to designated EFH. In addition, the implementation of mitigation measures would ensure any adverse impacts remain below the minimum threshold. NMFS responded on February 5, 2020 that NMFS believes each of the three alternatives examined in the draft EIS would provide greater protection and conservation of EFH than the No Action Alternative, which already provides significant benefits to EFH conservation, and consequently, NMFS offers no EFH conservation recommendations. On November 15, 2023, NMFS sent NOAA/ONMS an email confirming that the updates to the Final Preferred Alternative are within the scope of what NMFS analyzed in 2020, and no further EFH consultation was needed.

Correspondence between NOAA/ONMS and NMFS is included in Appendix J.

E.1.3 Marine Mammal Protection Act of 1972 (16 U.S.C. §§ 1361 et seq.)

The Marine Mammal Protection Act (MMPA), as amended, prohibits, with certain exceptions, the "take" of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. The MMPA defines "take" as: "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal" (16 U.S.C. § 1362). Harassment means any act of pursuit, torment, or annoyance that has the *potential to injure* a marine mammal or marine mammal stock in the wild (Level A harassment); or that has the *potential to disturb* a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering, but does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment) (16 U.S.C. § 1362).

Section 101(a)(5)(A-D) of the MMPA provides a mechanism for allowing, upon request, the "incidental," but not intentional, taking, of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing or directed research on marine mammals) within a specified geographic region. The NMFS Office of Protected Resources processes applications for incidental takes of small numbers of marine mammals. Authorization for incidental takes may be granted if NMFS finds that the taking would be of small numbers, have no more than a "negligible impact" on those marine mammal species or stocks, and not have an "unmitigable adverse impact" on the availability of the species or stock for "subsistence" uses. NMFS issuance of an incidental take authorization also requires NMFS to make determinations under NEPA and Section 7 of the ESA.

With the exception of use of multibeam sonars during field activities (see Appendix L), NOAA/ONMS determined that the proposed action would not cause the take of any marine mammal protected under the MMPA. Section 4.2.3.1 describes the marine mammals protected under the Endangered Species Act (ESA) and Section 5.2.2.1 evaluates the impacts to marine mammals protected under the ESA. Should NOAA/ONMS conduct, permit, or authorize any future activities that would cause the take of any marine mammal protected under the MMPA, NOAA/ONMS would evaluate the environmental impacts from such activities on a case-by-case basis.

ONMS' multibeam and other active acoustic activities have been assessed programmatically pursuant to NEPA with those of other National Ocean Service (NOS) programs, including the Office of Coast Survey, which conducts the majority of echo sounder surveys for the NOS (NOS Surveying programmatic EIS). As part of that programmatic review, the National Ocean Service has completed informal section 7 ESA consultations with NMFS and USFWS. NOS has also requested authorization for incidental take of marine mammals under the MMPA from both USFWS and NMFS. On April 1, 2024, USFWS determined that the proposed field activities are not likely to result in the incidental take of the West Indian manatee, the only marine mammal species under USFWS' jurisdiction in the study area. On August 20, 2024, NMFS notified NOAA that the proposed activities are not likely to result in the incidental take of marine mammals under NMFS' jurisdiction (i.e., cetaceans and pinnipeds other than walrus), and no MMPA authorization is required.

ONMS would comply with all required mitigation when conducting activities under this NOS Surveying programmatic EIS within FKNMS.

E.1.4 Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.)

The Coastal Zone Management Act (CZMA) was enacted in 1972 to encourage coastal states to preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone. The federal consistency provision of CZMA requires federal actions (inside or outside a state's coastal zone) that affect any land or water use or natural resource of a state's coastal zone to be consistent with the enforceable policies of the state coastal management program. The term "effect on any coastal use or resource" means any reasonably foreseeable effect on any coastal use or resource resulting from the activity, including direct and indirect (cumulative and secondary) effects. The federal consistency regulations at 15 CFR part 930 set forth detailed timeframes and procedures that must be followed carefully.

Part 930 subpart C of the federal consistency regulations applies to federal agency activities and requires a federal agency to submit a consistency determination to the state coastal management program if the federal agency determines that its activity may have reasonably foreseeable effects—including direct, indirect, cumulative, adverse, or beneficial effects—on the state's coastal uses or resources. Federal agency activities must be consistent to the maximum practicable with the enforceable policies of the state's coastal management program.

NOAA/ONMS submitted a consistency determination to the Florida Coastal Management Program on May 21, 2024. On August 6, 2024 the state of Florida issued a letter of conditional concurrence to NOAA. See Appendix J for related correspondence.

E.1.5 National Historic Preservation Act of 1966 (54 U.S.C. §§ 100101 et seq.)

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties in accordance with regulations issued by the Advisory Council on Historic Preservation (ACHP) at 36 CFR part 800. The regulations require that federal agencies consult with the ACHP, states, tribes, and other interested parties (consulting parties) for undertakings that have the potential to affect historic properties.

The regulations establish four basic steps in the NHPA 106 process: (1) determine if the undertaking is the type of activity that could affect historic properties; (2) identify historic properties in the area of potential effects (APE); (3) assess potential effects; and (4) avoid, mitigate, or minimize adverse effects. Historic properties are properties that are included in the National Register of Historic Places or that are eligible for listing. The agency must identify the appropriate state historic preservation officer/tribal historic preservation officer(s) (SHPO/THPO) to consult with during the process.

After determining that the proposed action is a type of activity that could potentially affect historic properties, NOAA/ONMS identified historic properties within the APE (i.e., the sanctuary boundary including the FKNMS boundary expansion area) (see Appendix I). NOAA/ONMS determined that the proposed action will have no adverse effects on the historic properties within the APE. Upon publication of the draft EIS, NOAA/ONMS consulted with the Florida SHPO and Tribes that may attach religious and cultural significance to historic properties in the APE to seek the SHPO's and THPO's concurrence with NOAA/ONMS' determination. NOAA received comment from the SHPO that the draft EIS Alternative 3 (the NOAA-preferred alternative at the time of consultation) sufficiently addressed the sanctuary's NHPA Section 106 responsibilities through implementation of the new management plan and through the development of an updated Section 106 Programmatic Agreement. On October 13, 2022, NOAA sent a follow-up letter to the SHPO notifying the SHPO of the publication of the NOPR and an updated management plan, and providing a finding of no adverse effects to historic properties. In the letter, NOAA explained that, while the SHPO provided concurrence based on Alternative 3 in the draft EIS, the proposed regulations adopt elements of several of the regulatory alternatives described and analyzed in the draft EIS. Because the draft EIS already analyzes the effects of each of the regulatory alternatives, the draft EIS continues to contain an accurate assessment of the potential effects of the proposed regulations on historic properties, and supports NOAA's finding. The SHPO did not offer comment on this letter.

In addition, ONMS initiated consultation with the Seminole Tribe of Florida and the Miccosukee Tribe of Indians of Florida following publication of the draft EIS. NOAA received comments from the Seminole Tribe of Florida requesting that NOAA specifically include reference to its Section 106 responsibility to consult with interested federally recognized Tribes before issuing permits for archaeological research and on all undertakings with the potential to affect historic properties. NOAA has incorporated these comments into the final EIS. NOAA sent a follow-up letter to the Tribes notifying the Tribes of the publication of the NOPR and an updated

management plan, and provided a finding of no adverse effects to listed properties. No response was received from the Tribes. For associated correspondence, see Appendix J.

Finally, NOAA continues to work closely with the Florida SHPO and the Advisory Council on Historic Preservation to develop an updated NHPA Section 106 Programmatic Agreement that sets forth an alternate process by which ONMS intends to comply with Section 106 and its implementing regulations (36 CFR part 800). NOAA has considered and incorporated comments received during the draft EIS public process when drafting the updated Section 106 Programmatic Agreement.

E.1.6 Migratory Bird Treaty Act (16 U.S.C. §§ 703 et seq.)

The Migratory Bird Treaty Act of 1918 (MBTA) implements the United States' commitment to bilateral treaties, or conventions, with Great Britain, Canada, Japan, Russia, and Mexico for the protection of shared migratory bird resources. The MBTA establishes that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird, unless authorized under a permit issued by the Secretary of the Interior. Take is defined in regulations as: "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." The MBTA protects over 1,000 species of birds that occur in the United States, and the list of migratory bird species protected by the MBTA is set forth in 50 CFR § 10.13. USFWS issues permits for scientific collecting, banding and marking, falconry, raptor propagation, depredation, import, export, taxidermy, waterfowl sale and disposal, and special purposes. USFWS has also developed, and continues to develop, voluntary guidance that helps project proponents reduce incidental take of migratory birds.

No part of the proposed action is expected to cause the "take" of migratory birds, as defined by the MBTA. Appendix H includes a description of the migratory birds that may occur within the proposed action area. See Chapter 5, Section 5.2.3.1.2.

E.2 Updates to the Legal Framework Included in Appendix C of the FKNMS 1996 Final Environmental Impact Statement

As noted above, this final EIS incorporates by reference Appendix C from the FKNMS 1996 final environmental impact statement, which describes the statutory or legal framework that was in place in the Florida Keys at the time of sanctuary designation. Below are a number of updates and additions to the federal and state laws that were included in Appendix C of the 1996 final EIS.

E.2.1 Updates to Federal Authorities

In addition to the federal authorities described in Appendix C of the 1996 final EIS, the following federal statutes make up the statutory framework for FKNMS:

- Archaeological Resources Protection Act of 1979, 16 U.S.C. §§ 470aa *et seq*.
- Antiquities Act of 1906, 54 U.S.C. §§ 320301 *et seq*.
- Native American Graves Protection and Repatriation Act, 25 U.S.C. §§ 3001 *et seq*.

- Sunken Military Craft Act of 2004, Title XIV of the Ronald W. Reagan National Defense Authorization Act for FY2005 (Pub. L. No. 108-375)
- Energy Policy Act of 2005, 42 U.S.C. §§ 15801 *et seq*.
- Marine Debris Act, 33 U.S.C. §§ 1951 *et seq*.
- National Historic Lighthouse Preservation Act, 54 U.S.C. §§ 305101-305106 (this statute amends the National Historic Preservation Act of 1966, 54 U.S.C. §§ 300101 *et seq*.)

Further, the updated or corrected citations below apply to the following federal statutes that were included in Appendix C of the 1996 final EIS:

- Endangered Species Act, 16 U.S.C. §§ 1531 *et seq*.
- Ports and Waterways Safety Act, 46 U.S.C. Subtitle VII, Ch. 700
- Act to Prevent Pollution from Ships, as amended by the Marine Plastic Pollution Research and Control Act of 1987 (33 U.S.C. §§ 1901 *et seq*.)
- Federal Aviation Act of 1958, 49 U.S.C. §§ 40101 *et seq*.

E.2.2 Updates to State Authorities

In addition to the state of Florida authorities described in Appendix C of the 1996 final EIS, the following additional state statutory sections are particularly relevant to the management of FKNMS, as discussed in Chapter 3 of this final EIS:

- Florida Statute 327.395 (Boating safety identification cards)
- Florida Statute 403.93345 (Florida Coral Reef Protection Act)
- Florida Statute 823.11 (Derelict vessels; relocation or removal; penalty)
- Florida Administrative Code 68B-5.005 (Divers: Fish Feeding Prohibited; Prohibition of Fish Feeding for Hire; Definitions)

Further, the updated information below applies to the following state statutes that were included in Appendix C of the 1996 final EIS:

- Florida ACSC Restoration Trust Fund Act, sections 380.0558 *et seq*. (REPEALED)
- Florida Wetlands Protection Act, Title 29, Public Health, Chapter 403, Environmental Control, sections 403.91 - 403.929 (known as the Warren S. Henderson Wetlands Protection Act of 1984). (REPEALED, except 403.927). Wetlands protection is addressed in Florida Statute Title XXVIII, Ch. 373.403-468 (Management and Storage of Surface Waters).
- A number of Florida Administrative Code sections cited in Appendix C of the 1996 final EIS have been relocated from Chapter 17 to Chapter 62 of the Florida Administrative Code.

E.3 Regulatory Overview: Memoranda of Agreement and Understanding Pertaining to Sanctuary Management

Florida Keys National Marine Sanctuary has entered into a number of memoranda of agreement and understanding with partner state and federal agencies to facilitate cooperative management

and enforcement within the sanctuary. The sanctuary is currently in the process of working with partners to revise these agreements as needed.

E.3.1 Co-Trustees Agreement for Cooperative Management

This agreement clarifies the relative jurisdiction, authority, and conditions of the state of Florida and NOAA in the co-trustee management of FKNMS. In 1992, NOAA and the governor and cabinet of Florida (the "Co-Trustees") entered into a cooperative agreement concerning the development of the sanctuary's comprehensive management plan. Following development of the management plan, the agreement was updated in 1997. The agreement clarifies the state's continuing authority and jurisdiction over submerged lands and other state resources within the sanctuary and outlines provisions for how NOAA and the state will cooperatively manage the sanctuary and sanctuary resources consistent with the management plan on specific issues such as regulatory amendments, permits, and civil claims, among other issues.

E.3.2 Cooperative Enforcement Agreement

This agreement establishes an enforcement regime for FKNMS between NOAA and the Florida Fish and Wildlife Conservation Commission. Implemented in 1999, this agreement establishes the procedures and mechanisms for coordinating state and federal law enforcement operations within the sanctuary. State law enforcement officers designated as federal law enforcement agents are authorized to enforce the authorities and regulations established under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), Lacey Act, National Marine Sanctuaries Act (NMSA), and the Florida Keys National Marine Sanctuary and Protection Act (FKNMSPA). Actions taken (in conjunction with NMFS special agents) include warnings, seizure of domestic vessels and cargo, and arrests for violations of the acts. No arrests or seizures of foreign vessels can be made by FWC without the knowledge and consent of the U.S. Coast Guard and/or NMFS special agents.

E.3.3 Agreement for the Coordination of Civil Claims

This agreement outlines cooperation and coordination among NOAA and the state of Florida with respect to civil claims for response costs or damages based on injury to sanctuary resources. The procedures and mechanisms established for state and federal civil claims for damages to sanctuary resources, include: (a) initial notification and response, (b) incident screening, (c) coordination of joint and other civil claims, (d) coordination of policy, and (e) the use of recovered sums.

E.3.4 Protocol for Cooperative Fisheries Management

This agreement describes management and regulation of fishing activities within FKNMS between NOAA and the state of Florida. This agreement recognizes fisheries management authorities' continuation of management of fisheries under state law, the Magnuson-Stevens Fishery Conservation and Management Act, and other federal laws. The protocol is intended to address the recognized problem of inconsistent regulations within South Florida waters. Specifically, the protocol allows for fishing regulations to occur under FKNMS regulations and/or under Magnuson-Stevens Fishery Conservation and Management Act authority. The protocol also notes that if there is consensus, federal and state fishery management authorities

may agree to develop uniform fishing regulations for South Florida species in state and federal waters of both the Gulf of Mexico and South Atlantic, including within FKNMS. Originally implemented in 1997, the protocol was signed by Florida Marine Fisheries Commission, NMFS, and the National Ocean Service.

E.3.5 Certification/Authorization of Permits Agreement

This agreement establishes the procedures and mechanisms for addressing state authorization of activities prohibited by sanctuary regulations. The purpose of this agreement is to streamline the process of issuing permits related to the collection of all coral species, sea fans (*Gorgonia* spp.), live rock, and live sand in FKNMS.

E.3.6 Memorandum of Agreement for Recreational Fishing and Boating

The purpose of this memorandum of agreement is to develop and expand a framework of cooperation among the participating parties, which comprise: NOAA ONMS and NMFS, the Association of Fish and Wildlife Agencies, the American Sportfishing Association, the National Marine Manufacturers Association, and the Recreational Boating and Fishing Foundation, for planning and implementing mutually beneficial projects and activities to promote sustainable fishing and boating conducted within federal marine waters, including national marine sanctuaries. These activities and projects will complement the respective missions of the parties and serve the mutual interests of these groups and the public.

E.3.7 Management Agreement for Submerged Lands Within Boundaries of the Key West and Great White Heron National Wildlife Refuges

This agreement provides USFWS the right to manage for public purposes all lands titled in the Trustees of the Internal Improvement Trust Fund of the State of Florida (including islands, tidal lands, and sovereignty submerged lands) which are located within the boundaries of Key West National Wildlife Refuge and Great White Heron National Wildlife Refuge.

Appendix F: Military Activities

Introduction

This appendix provides the list of the list of military activities that are exempted from NOAA regulations. This appendix also provides a more in-depth description of Department of Defense (DoD)/U.S. Navy activities in and around Florida Keys National Marine Sanctuary (FKNMS).

This appendix also describes where the environmental effects of military activities in the vicinity of FKNMS have been analyzed. In addition, the appendix briefly describes the separate statutory requirement for interagency consultation under section 304(d) of the National Marine Sanctuaries Act as it relates to activities conducted by the Department of Defense.

Exempted Military Activities

NOAA regulations provide exemptions from prohibited activities for certain classes of military activities that were conducted in the sanctuary at the time of sanctuary designation and original implementing regulations, and those exempt activities are described in the 1996 final environmental impact statement for the sanctuary.

Many other activities DoD conducts in and around the sanctuary are not subject to NOAA sanctuary prohibitions and therefore do not require exemption. In addition, many activities the Navy undertakes within and adjacent to FKNMS are described and analyzed in the Navy's Atlantic Fleet Testing and Training Final Environmental Impact Statement.[6]

As part of this FKNMS Restoration Blueprint process, NOAA has worked closely with DoD to understand the suite of activities historically and currently conducted at Navy facilities in the Florida Keys. With this action, NOAA would update and explicitly define the list of exempt military activities. Table F.1 (below) provides an updated description of military activities that would be subject to, but are otherwise exempt from, NOAA regulations. NOAA commits to working with DoD to consider exempting new activities from the sanctuary prohibitions in the future. NOAA would use the same standard to exempt new activities as used to update the list of DoD exemptions in this final EIS. In other words, NOAA would exempt a new activity from the prohibitions if NOAA determines such activity is not likely to injure sanctuary resources or will be carried out in a manner that avoids to the maximum extent practical any adverse impact on sanctuary resources and qualities. Any changes to this list of exempted military activities (see Table F.1 below) would only occur after compliance with all applicable laws, such as the Administrative Procedure Act and NEPA, as necessary, and after public notice and comment, as applicable.

[6] https://www.nepa.navy.mil/AFTT-Phase-III/

Table F.1. Revised list of exempted military activities in FKNMS.

DoD Category	Activity	Description
Special Warfare	Demolition Training at Demolition Key	Special Warfare, using limpet mines within the sanctuary. Limpet mine charges up to 5.5 pounds of TNT equivalent would be placed on a steel structure in the water adjacent to Demolition Key and detonated.
Navy Systems Commands Research and Test Events	Sonobuoy Lot Acceptance Testing	Sonobuoys are deployed from surface vessels and aircraft to verify integrity and performance of a lot or group in advance of delivery to the fleet for operational use.
Research	Acoustic Research	Shipboard acoustic research on Naval vessels operating out of Key West Harbor historically occurred within the sanctuary and may occur in the future. Additionally, active and passive acoustic research may occur using listening devices and acoustic profilers, typically deployed on the seabed, to passively monitor natural and human soundscapes or gather oceanographic data. Dummy targets, sonobuoys, and autonomous underwater vehicles may also be used in testing. Any items placed on the seabed are located in areas of bottom substrate without attached marine plants or animals (e.g., sand habitats), are in place for brief duration (hours to weeks) and are removed at the conclusion of each research project or test.
Infrastructure	Fuel Deliveries	Fuel supplies for Naval Air Station (NAS) Key West come by sea by way of the Straits of Florida. One Military Sealift Command tanker per month delivers aviation jet fuel. The Key West Pipeline Company owns three bulk fuel storage tanks for receipt and storage of aviation jet fuel and a transmission pipeline that runs between Trumbo Point Annex and NAS Key West, Boca Chica Field. The pipeline is four inches in diameter and about seven and one-half miles in length, approximately four miles of which is in the sanctuary. Pipeline maintenance and repairs occur as needed, which typically include removing substrate from around the pipeline to expose sections needing repair, performing necessary repair, and re-filling the area with appropriate fill to support the pipeline.

Environmental Effects of Military Exemption

The activities in Table F.1 were either conducted in the sanctuary at the time of sanctuary designation, and their associated impacts were analyzed in the 1996 FKNMS final environmental impact statement (EIS), or these activities were analyzed in the 2018 Atlantic Fleet Training and Testing final EIS.

The Department of the Navy (Navy) issued a record of decision for the *Atlantic Fleet Training and Testing Final Environmental Impact Statement/Overseas Environmental Impact Statement* (AFTT EIS/OEIS) on October 26, 2018. The AFTT EIS/OEIS evaluated potential impacts of conducting training and testing activities within the in-water areas of the western

Atlantic Ocean along the eastern coast of North America, in portions of the Caribbean Sea and the Gulf of Mexico, at select Navy pier-side locations, within port transit channels, near select civilian ports, and in bays, harbors, and inshore waterways. The Navy also prepared the *Sanctuary Resource Statement for the U.S. Navy's Atlantic Fleet Training and Testing Activities* (SRS), April 3, 2018. The SRS served as the basis for the Navy's interagency consultation with ONMS under a separate requirement, section 304(d) of the NMSA, described in more detail in the following section. This document describes the frequency and intensity of Navy training and testing activities in or near the sanctuary, and includes an effects analysis of all AFTT activities conducted in or near FKNMS. NOAA relies on the combined analysis in the AFTT EIS/OEIS and the Navy's SRS to assess the environmental impacts for exempting one new DoD activity from the sanctuary prohibitions.

Demolition Training at Demolition Key

As described in AFTT EIS, Appendix A, at Table A.2.8.8, demolition training involves Navy divers, typically explosive ordnance disposal personnel, placing limpet mine charges on a steel structure in the water and detonating an explosive charge of up to 5.5 pounds of TNT equivalent in Demolition Key.

Demolition Key is comprised of two land masses [Demolition Key North West (NW) and Demolition Key South East (SE)], separated by a narrow channel. Originally, the key consisted of approximately 24 acres of dredge spoil from the clearing of navigable waterways around Key West. The channel between the two keys was formed by historic military training and testing activities involving ordnance detonation compounded by storm and sea erosion and subsequent encroachment of the Florida Bay. Large craters throughout the channel were reported to be the result of World War II-era sea-mines being towed into the area and detonated in the water. The narrow channel still harbors several craters, but the swift and vigorous current has diminished their dimensions by scouring and redepositing bottom sediments. The benthic habitat of the area where the steel structure would be placed is a barren area composed of sand and soft sediments lacking a developed benthic community, macroalgae communities ranging from sparse to dense in cover, and seagrass communities ranging from sparse to dense in cover.

Based on how the limpet mine event is conducted, with a small charge fully encased on the sides with steel plates and I-beams, and on the bottom with concrete, the sound energy will be attenuated to such an extent it is not expected that these explosive sources would result in adverse impacts to these sanctuary resources. Impacts from unconsumed explosives and constituent chemical compounds would be minimal and limited to the area adjacent to the munition.

Additional Requirement for Interagency Consultation under Section 304(d) of the NMSA

Section 304(d) of the NMSA requires federal agencies to consult with the ONMS whenever their proposed actions are likely to destroy, cause the loss of, or injure a sanctuary resource. The purpose of NMSA consultation is to protect sanctuary resources by requiring federal agencies to

consider alternatives to proposed actions that might otherwise destroy, cause the loss of, or injure these resources.

Section 304(d) applies to all federal agency actions that are likely to destroy, cause the loss of, or injure sanctuary resources, including those conducted by DoD, regardless of whether the specific actions are prohibited by sanctuary regulations. In the regulatory action supported by this EIS analysis, NOAA has removed from the military exemption regulation reference to NMSA 304(d) Interagency Cooperation (see Appendix D: Minor or Technical Revisions and Updates). The regulation previously referenced 304(d) as the mechanism for exempting new DoD activities from the prohibitions. NOAA commits to working with DoD to consider exempting new activities from the sanctuary prohibitions in the future in a manner as stated above in this Appendix F.

As described above, the Navy's 2018 SRS analyzed activities that would be conducted in or near the sanctuary, and assessed those activities' potential to injure sanctuary resources. See SRS Table 4 for the list of activities assessed. On May 15, 2018, NOAA submitted its injury determination and description of recommended alternatives to minimize injury to sanctuary resources. As stated in this letter, and in a follow-up communication on August 1, 2018, NOAA concluded consultation for these activities, and emphasized that if the activities described in the 2018 SRS are modified, or new information becomes available, such that the activity is likely to destroy, cause the loss of, or injure a sanctuary resource or quality in a manner greater than considered here, Navy must reinitiate 304(d) consultation.

References

FKNMS Management Plan/Environmental Impact Statement, 1996, pp 93–96.

Correspondence from Navy re: Restoration Blueprint EIS, 2014-2021.

Navy Sanctuary Resource Statement for AFTT EIS, final December 15 2017, Addendum April 3, 2018.

FKNMS Letters to Navy, Injury Determination and Recommended Alternatives for AFTT EIS, May 2018 and August 2018 (supplemental).

Description of Military Activities

Department of Defense Activities

The U.S. Department of Defense has played an important role in Monroe County since the early 1800s, when the federal government established a small Naval operation in Key West to control piracy in nearby waters.

The DoD currently maintains several sites in the Florida Keys, including the largest unencumbered airspace available for training on the East Coast. Although all of the military DoD Services (Navy, Marine Corp., Air Force, and Army) are represented in the region, the Navy's presence is the most significant.

Naval Air Station Key West

The Navy's presence in Key West dates back to 1822 with a Naval base established in 1823 to stop piracy in the area. This base was expanded during the Mexican War (1845–1848) and the Spanish-American War (1898) when the battleship *Maine* sailed from Key West to Havana, Cuba, where it experienced an explosion and sank in Havana harbor. The sinking of *Maine* precipitated the United States declaration of war on Spain; the entire U.S. Atlantic Fleet moved to Key West for the duration of the war.

During World War I (1914–1918), Naval facilities in Key West were enlarged (to include piers, barracks, communication facilities, submarine basin, and other buildings) as Key West served as a strategic defense center to shipping lanes throughout the war. When the United States entered the war in 1917, a Naval Air Station (NAS) was constructed near the northwest end of Key West, in an area now known as Trumbo Point; the seaplane base consisted of a seaplane training center, a dirigible hangar, barracks, and administration buildings.

NAS Key West was established at its present location on Boca Chica Key during World War II (1941–1945). Boca Chica Field originated as a civilian airfield. It was leased to the Army in 1942 when three paved runways were built and was transferred to the Navy in December 1942. During the war, the Air Station was used to train carrier pilots and housed 4,000 personnel; nearby Saddlebunch Key was used as a practice bombing range. During the Cuban missile crisis (1962), operational and reconnaissance flights were flown from the Air Station in support of the Naval quarantine around Cuba. After the Cuban missile crisis, permanent missile sites were constructed at various locations around the Air Station and alert aircraft were maintained at the airfield. Although much of the military presence in the Lower Keys was disestablished in March 1979, a decision was made to keep NAS Key West as a fully operational Naval Air Station. Airfield operations at NAS Key West in the late 1970s were estimated at 85,000 per year, with approximately 400 airfield operations per day estimated on a busy day. Since then, NAS Key West has been a training location for many types of DoD aircraft and a variety of airfield training operations have been conducted at the airfield, including touch and go, Field Carrier Landing Practice (FCLPs), and other pattern operations. As with other Navy airfields, the volume of annual airfield operations at NAS Key West fluctuates from year-to-year based on factors such as training needs, national defense missions, relief/humanitarian efforts, surge requirements, and airfield construction/repair projects.

Throughout the decades, the southernmost Naval Air Station in the continental U.S. has proven to be an ideal year-round training facility with rapid access to unencumbered offshore training areas and overlying airspace. NAS Key West has been a home base to various squadrons and squadron detachments flying antisubmarine warfare, tactical electronic warfare, reconnaissance, attack, combat adversary, and strike fighter aircraft. Most recently, in January 2006, Fighter Squadron Composite (VFC) - 111 was home based at NAS Key West. Military units have routinely used detachments at NAS Key West for aviation training at the airfield and offshore range complex and the Air Station has served important roles in support of operations in South America and for disaster assistance and other world events.

These roles continue at NAS Key West. Currently, the Air Station employs approximately 3,000 military, DoD civilian, and contractor personnel, is home base to 20 aircraft, and can support up to approximately 80 visiting aircraft and 1,200 visiting personnel at one time, as well as provide port operations for home ported and visiting ships.

NAS Key West comprises 6,433 acres of land distributed in numerous properties located in the Florida Keys. Most of NAS Key West lies in the vicinity of Boca Chica which encompasses 4,700 acres and consists of an airfield, administrative and industrial facilities, and recreational areas. NAS Key West also provides and maintains facilities and services for other Navy tenants as well as other DoD Services and the United States Coast Guard (USCG).

Trumbo Point Annex includes a helicopter landing area, a large multi-use hangar, visitors quarters, a fuel tank farm, vacation rentals, and family housing. A Naval Air Warfare Detachment (NAWCAD Det) Atlantic Targets & Marine Operations (ATMO) is also located at Trumbo Point. The NAWCAD Det conducts research projects involving sonobuoys, lasers, navigational systems, ordnance, and various other land and sea-based research.

Fleming Key, accessible by a bridge from Trumbo Annex, is the site of the U.S. Army Special Forces Underwater Operations School (USASFUOS), Naval Research Lab, a munitions magazine area, and a closed U.S. Department of Agriculture, Animal & Plant Health Inspection Service (APHIS) Quarantine Station. The city of Key West Wastewater Treatment Plant also sits on Fleming Key property leased to the city of Key West. The Army school trains combat divers, dive supervisors, and dive medical technicians. The Naval Research Lab coordinates with research projects to address problems in corrosion and marine fouling as well as natural seawater exposure testing and marine related materials evaluation.

Truman Annex consists of multi-use buildings on about 80 acres of land, plus a 50-acre harbor separated from open water by a 7.6-acre Mole Pier. Truman Annex is home to Joint Interagency Task Force South (JIATFS) and its mission as the lead interagency command responsible for the detection and monitoring operations throughout their Joint Operating Area to facilitate the interdiction of illicit trafficking in support of national and partner nation security. The annex supports U.S. Navy and allied nation war ships with berthing, freshwater, and occasionally fuel and other support services. In addition, past agreements with the city of Key West, have allowed cruise ships to berth at Truman Annex. Truman Annex also houses the Department of Commerce Florida Keys National Marine Sanctuary (FKNMS), and NOAA assets are located on land excessed as a result of Defense Base Closure and Realignment (BRAC) 95.

NAS Key West Range Complex

The Key West Range Complex lies between the Florida mainland and Cuba, an area that has a mild climate and a high percentage of visual flight rules (VFR) conditions, which is ideal for Navy training. The location is of particular importance because of its supporting infrastructure and unobstructed airspace with favorable weather that allows for all levels of training and the efficient use of resources.

Training must be as realistic as possible to provide the initial experience and confidence necessary to ensure success and survival in combat. The Navy often employs simulators and synthetic training to provide early skill repetition and to enhance teamwork, but live training in a realistic environment is vital to success. A range complex, such as the Key West Range Complex, is a set of co-located or nearly co-located areas, which may include sea space, subsurface space, land ranges, and overlying airspace designated for military training and testing operations (see Figure 1- 1).

The Key West Range Complex consists of the following components:

- Offshore operating area (OPAREA) (surface and subsurface waters);
- Offshore special use airspace (SUA) divided into warning areas; and
- A submerged surface target (Patricia Target) and a visual landmark land area (Demolition Key).

Together these components encompass 25,000 square miles of special use airspace (SUA) and 8,288 nm^2 of ocean within the NAS Key West area of responsibility (AOR). The Key West OPAREA is located south of Key West, Florida within the Straits of Florida between the United States and Cuba. The undersea space includes depths that range from shallower than 17 fathoms (100 feet) in near shore areas, to over 1,830 fathoms (11,000 feet) in offshore areas.

Range complexes provide a controlled and safe environment with threat-representative targets where military ships and aircraft can train in realistic, combat-like conditions throughout the graduated buildup needed for combat ready deployment. The integration of subsurface ranges and OPAREAS with land training ranges, safe landing fields, and amphibious landing sites are critical to this realism, allowing execution of multidimensional exercises in complex scenarios. Also, range instrumentation captures data on the effectiveness of tactics and equipment and provides feedback for constructive critiques. Live-fire training ensures the ability to place ordnance on target with the required level of precision in a stressful environment. Live training, most of it accomplished in the waters off the nation's east and west coasts and the Caribbean Sea, will remain the cornerstone of readiness as the Navy transforms its military forces for a security environment characterized by uncertainty and surprise.

The mission of the Key West Range Complex is to provide sustainable and modernized ocean operating areas, airspace, ranges, range infrastructure, training facilities, and resources to fully support Navy training requirements. The Key West Range Complex also provides critical support for Navy operational readiness training.

Training at the Key West Range Complex historically has been diverse, including ship and aircraft maneuvers, gunnery and bombing exercises, and joint training exercises. Numerous

commands and their subordinate units across multiple Naval warfare areas use the Key West Range Complex. Now, and in the foreseeable future, the typical range users include Navy fighter squadrons and aggressor squadron aircraft. Less frequent users include other DoD and federal entities, as well as foreign nation partners. The primary operation conducted in the Key West Range Complex is Air Warfare (AW), specifically, Air Combat Maneuvers (ACM). However, surface and subsurface water-based training continues to play an increasing role in the Navy's mission.

The Tortugas Military Operating Area

The Tortugas Military Operating Area (MOA) is a unique block of special use airspace (SUA) located above the Dry Tortugas National Park. The Tortugas MOA extends from 5,000 feet mean sea level (MSL) to 18,000 feet MSL (FL180). ACM training occurs regularly in the SUA above and beside the MOA. Tactical maneuvers resulting in supersonic flight are not conducted in the Tortugas MOA above Fort Jefferson and Dry Tortugas National Park between 5,000 feet and 18,000 feet. No chaff or flare exercises occur within the MOA. The MOA is the airspace within an area bounded by a line 12 nautical miles from and parallel to the shoreline of the Dry Tortugas Islands.

Economic Significance

In 2020, the total contribution of NAS Key West to the Monroe County economy was $885 million.[7] The on-site military, civilian, and contractor employment population at NAS Key West is approximately 820 personnel. In addition to NAS Key West personnel, approximately 2,219 persons are employed by NAS Key West tenants. Including dependents, the military population makes up approximately 5,500 people. As such, the DoD needs to ensure the continued capability of NAS Key West to support mission requirements while promoting the compatible growth and development of the surrounding community.

The Navy spends approximately $38 million annually to operate and maintain Air Station facilities. Additional spending occurs on a case-by-case basis for military construction projects and tenant activity spending. In recent years, spending for major military construction has included projects for harbor maintenance dredging, airfield lighting, restoration of clear zones and drainage at Boca Chica Field, and utility privatization. A $15.7 million fire station project also planned for the Air Station was completed around 2020. Additional infrastructure improvements have included a new fire station on Sigsbee Annex, and a new Navy Gateway Inns and Suites to replace existing aging structures. Future infrastructure and mission improvements are planned for the Joint Inter-Agency Task Force, Naval Special Warfare facilities, and potential shoreline resiliency and restoration efforts to protect infrastructure. Additional socioeconomic benefit is realized from mutual aid agreements for law enforcement, fire, and emergency services; continuing education support; environmental stewardship; and large-scale contingency capabilities such as hurricane recovery.

[7] Florida Military & Defense Economic Impact Study (Enterprise Florida; January 2022)

Current Department of Defense Activities

Existing classes of DoD military activities conducted prior to the effective date of sanctuary regulations and identified in the 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary (National Marine Sanctuary Program 1996) included:

- Research on radar and missile systems and test missile operations and evaluation
- Underwater explosives testing (including weapon systems testing and shock testing of ship hull designs) in "Site A"
- Mine countermeasure research
- Corrosion and coatings tests
- Acoustic research
- General air operations
- Air combat maneuvering
- Air-to-surface ordnance (inert ordnance and smoke markers) at Patricia Range
- Submarine activities (including firing and recovery of non-explosive torpedoes outside sanctuary)
- Sonobuoy testing and diver training (typically includes recovery of sonobuoys)
- Special warfare activities at Fleming Key
- Search and rescue
- General transits, anchoring in designated areas, moorings, and pierside maintenance at Naval Air Station Key West piers
- Harbor management
- Fuel deliveries

Research and Development

DoD conducts research and development activities in the Florida Keys, both on and offshore, including research on radar and missile systems and test missile operations and evaluation. Other research, testing, development, and evaluation (RTD&E) activities include the following:

- Underwater Explosives Testing: The Navy formerly conducted small explosives testing in the shallow waters (12 to 120 m) of the Keys. The Navy now tests explosives in an area Site A/E-1 (Site A). Geographically, Site A/E-1 is in the central Florida Straits just to the north of the Gulf Stream axis with coordinates of 23° 55' N to 24° 15' N between 81° 49' W and 82° 15' W, as shown in Key West Offshore Detonation Areas figure. The upper boundary of which is located 18 miles southwest of Key West and about 10 miles from the current sanctuary boundary.

  Many of these tests are in connection with weapon systems testing or the shock testing of ship hull designs.

  Two additional test sites, Sites D & H, were identified and used in the 1990s (see Key West Offshore Detonation Areas figure).

  - Site D is an L shaped test site approximately 3.5 sq. miles in area located about 38 miles west of Key West centered at 24° 32' North and 82° 30' West.
  - Site H is a 1 mile by 3 mile test area located 75 miles northwest of Key West centered at 24° 50.5' North and 83° 5.5' West.
- Mine Countermeasure Research: The Office of Naval Research occasionally sponsors research, in which allied forces participate, pertinent to mine operations in the shallow-water carbonate environment of the sanctuary, using vessels greater than 50 meters in length in the Area To Be Avoided, and uses this environment to test the next generation of environmental monitoring and prediction systems for the next generation of mine countermeasure class ships.
- Corrosion and Coatings Tests: The Naval Research Laboratory/Marine Corrosion Facility at Fleming Key conducts a wide variety of corrosion and coatings tests utilizing sea water from the sanctuary.
- Acoustic Research. Naval acoustic research vessels occasionally operate out of Key West harbor and conduct research activities in the sanctuary.

Onshore Operations

Naval Air Station Key West consists of a number of land-based annexes in the Lower Keys, accounting for about 6,433 acres. Boca Chica Field, located on Boca Chica Key, and one former communications site on Saddlebunch Key account for a majority of all lands.

There are also a number of annexes in Key West, including storage and supply sites, military housing, port operations, the Navy commissary, recreational areas, and a medical clinic.

Boca Chica Field contains facilities for airfield operations, aircraft storage and maintenance, administration, supply, housing, recreation, and facility maintenance. An Air Installation Compatible-Use Zone (AICUZ) surrounds the Air Station. Compatible use in future development around the airfield is a primary goal of the AICUZ program at NAS Key West.

NAS Key West serves transient flight units from around the country and partnering foreign nations and has one squadron permanently based on board. Over 20 types of fixed wing and rotary wing aircraft typically deployed to NAS Key West for various durations. Typical aircraft include F-5s, F-15s, F-16s, F/A-18s, T-45s, E-2/C-2s, SH-3 and H-60s.

Aircraft currently home based at NAS Key West consist of 18 F-5N aircraft assigned to Fighter Composite Squadron 111 (VFC-111) and 3 MH-60S Search and Rescue helicopters assigned to NAS Key West.

In addition, the Department of Homeland Security owns 35 acres on Cudjoe Key commonly referred to as the blimp site. This site has historically supported two aerostats, one as a radar platform and another for television broadcasting.

Port Operations

Truman Annex is home to NAS Key West's Port Operations Department. NAS Key West's support of warfighting readiness includes a strategically-located port and harbor. Port Operations supports a myriad of maritime customers, including U.S. Navy and international

navy warships, and vessels from United States Naval Ships (USNS), NOAA, and Army Corps of Engineers, special operations and diver training.

Port facilities include:

- The Mole Pier: refers to the breakwater pier at the western portion of Truman Annex, which separates Truman Harbor from the ship channel. This pier contains three primary ship berths: the Outer Mole, North Inner Mole, and South Inner Mole.
    - The Outer Mole Berth refers to the large 650-foot single berth on the channel side of the Mole Pier and can support up to a 1000 foot vessel.
    - The Inner Mole refers to the two berths on the Truman Harbor side of the Mole Pier. The North Inner Mole Berth and the South Inner Mole berth are each 600 feet long.
- The Ramp: refers to the boat ramp located in the southeast corner of the harbor bordered on the north by the East Quay and on the west by the South Quay. This ramp is owned by the city of Key West excessed as a result of BRAC 95. The Navy has a perpetual right of ingress, egress, and use of the ramp.
- The East Quay: refers to the 1511-foot wharf on the eastern border of Truman Harbor.
- Truman Harbor: refers to all of the berths comprising the Mole Pier, South Quay, Ramps, East Quay, and the body of water enclosed in this Perimeter.
- Pier 8: refers to the 367-foot finger pier extending north from the South Quay.
- The South Quay: refers to the 1149-foot bulkhead on the southern border of Truman Harbor. It extends from the eastern base of the Mole Pier to the western opening of the large boat ramp. NOAA owns 260 feet of the South Quay structure starting 60 feet west of the western ramp face. There is a small boat ramp located along the southern side of the South Quay, west of Pier 8.

A variety of small surface craft are used in support of harbor management, including training, water transportation, pollution control, search and rescue, and other similar management functions. These small craft include security boats, oil boom deployment boats, work boats, crew boats, utility boats, personal watercraft, and other similar vessels.

In-water structures (i.e., bulkheads, mooring piles, bollards) in Truman Harbor require continuous maintenance and repair. Construction projects that have the potential to impact FKNMS trust resources require consultation under sanctuary regulations.

Offshore Operations

- Air Operations: Various fixed wing and rotary wing aircraft operate from and around NAS Key West. For all such aircraft, normal approaches, transits, and holding patterns occur regularly per applicable Navy and Federal Aviation Administration (FAA) guidance. During normal flight operations for fixed wing aircraft, transit through FKNMS and U.S. Fish and Wildlife Service (USFWS) wildlife refuges will be at 3,000 feet or above with the following exception. Departure and landing patterns that take aircraft over FKNMS and USFWS wildlife refuges at altitudes below 1000 feet.
- Search and Rescue (SAR) operations and any military operations using NAS Key West as a staging base can occur with little or no notice. Much of the airspace over and close to

the station is designated as restricted. Air operations on the station are conducted per a consultation between the Navy and USFWS, undertaken pursuant to the Endangered Species Act for the protection of the Lower Keys marsh rabbit.

NAS Key West's SAR area of responsibility is one of the busiest in the Navy and extends 150 nautical miles from landing facilities in the Keys. During real world missions, SAR flights will go wherever they are needed and will entail hovering over, landing on, and insertion of swimmers and small boats (including personal watercraft) into the water.

Navy SAR training is conducted per Naval Instructions and Naval Air Training and Operating Procedures Standardization (NATOPS) flight manuals. Navy SAR pilots and co-pilots are briefed on local area familiarization during course rules briefings, including:

- No flying below 500 feet (vertical) or within 500 feet (horizontally) of any backcountry island within FKNMS or USFWS wildlife refuge while training.
- No landing of aircraft within FKNMS or USFWS wildlife refuge while training.

- Air Combat Maneuvering (ACM): The reserved airspace around NAS Key West is of critical importance to the Atlantic Fleet's aviation training. This area represents one of the largest areas available for overwater and littoral aviation warfare training. Marine Corps and Navy fighter and attached aircraft squadrons visit the Station and conduct basic and advanced ACM training and carrier qualification training in the designated air-space. This training at times entails super-sonic flight and low-level flight, which can result in short periods of high noise levels. One training fighter squadron, VFC-111, operates out of the Station most of the year as an "adversary" squadron to provide an "enemy" for aircrews undergoing training. Air Force fighter squadrons also use this airspace for the same purposes. Live gunnery exercises are conducted from time to time in designated areas with towed sleeves as targets.
- Air to Surface Ordnance: Military aircraft periodically use a designated bombing range located just west of Marquesas Key, west of the Station, and east of the Dry Tortugas. This range, known as Patricia Target, consists of a World War II vintage hulk that is aground just west of Marquesas Key. Aircraft make runs on this hulk in order to perfect at-sea delivery of ordnance. It is currently unattended and non-instrumented. The target is currently available for "cold" runs. Demolition Key, located north of Fleming Key, is used as a visual landmark for training. No live or inert ordnance is dropped on Demolition Key. Demolition Key is reserved to train with a maximum limit of Class I Division I net explosive weight of 5 pounds or less.
- Submarine Operations: Submarines engage in operations and training, including training in conjunction with Research, Development, Testing and Evaluation (RDT&E) in the sanctuary. Occasionally, submarines fire exercise torpedoes. These firings take place outside the sanctuary.
- Sonobuoys: The Naval Air Warfare Center tests sonobuoys and conducts diver training operations. Typically, buoys are gravity launched from an aircraft into shallow water and then recovered by divers in scuba equipment.

- Special Warfare Operations: Enclosure (1) *"U.S. Navy Training and Testing Activities In the Vicinity of the Florida Keys National Marine Sanctuary"* provides additional descriptions of these activities and maps illustrating where these activities take place.

Other Department of Defense Activities

Fuel Deliveries

NAS Key West's fuel supplies come by sea by way of the Hawk Channel Cut. Approximately one Military Sealift Command (MSC) tanker per month delivers aviation fuel to Key West Pipeline Company (KWPC). KWPC receives jet fuel from tankers that moor and off-load at Pier D-2 (USCG Sector Key West) located approximately 1,000 feet west of their Trumbo Point tank farm. KWPC bulk storage facility is located on the Navy's Trumbo Point Annex, Key West, Florida. KWPC facility includes fuel storage and transfer infrastructure, which consists of a fuel offloading system, storage tanks, pump station, and pipeline system to supply jet fuel to the storage tanks at the NAS Key West tank farm on Boca Chica Key. The jet fuel is transferred from the KWPC tanks to the NAS Key West tanks on Boca Chica Key via an underground/underwater pipeline owned by KWPC. Portions of the pipeline are within FKNMS.

Shipboard Operations.

Protection of the marine environment is mission essential. Navy ships conduct operations, in port and at sea, minimizing or eliminating any adverse impact on the marine environment and its resources. While transiting, the FKNMS ships and submarines avoid adverse impacts on sanctuary resources and qualities. Ships and submarines minimize, to the maximum extent practicable, any solid waste, sewage, bilge water, or ballast water discharges.

Unexploded Ordnance (UXO) and Mine Detonation

Navy response is per the Office of the Chief of Naval Operations (OPNAV) Instruction 8027.6F (Naval Responsibilities for Explosive Ordnance Disposal).

Non-emergency Mine Exploitation. If UXO or a mine is found and it is not considered an immediate threat to human life or the environment, it may be moved to one of the three deep offshore underwater detonation areas (identified in the 1996 FKNMS EIS) or to a shallow water location for detonation. In 1997, three shallow water sites were identified in coordination with FKNMS and USFWS:

- West/Southwest of the Marquesas Keys (24° 33' N; 82 ° 25'W)
- Northeast of Turtle Crawl Bank (24° 50' N; 81° 11'W)
- Maryland Shoal Area (24° 30' N; 81° 34'W)

U.S. Navy Training and Testing Activities

In the Vicinity of the Florida Keys National Marine Sanctuary & Key West and Great White Heron National Wildlife Refuges

NAS Key West is one of the premier Navy tactical aviation training installations in the United States. Due to the year round flying weather and direct access to outstanding military airspace, operating areas, and tactical support facilities, NAS Key West hosts tactical air squadrons from

units stationed both on the east and west coast of the United States. For the same reasons, NAS Key West is in demand as a venue for aviation training and support; it is also a valued installation that supports Navy surface ships, expeditionary forces, special warfare units, and tenants from various other commands within the Department of Defense. This includes Navy Systems commands that conduct research and testing of potential future Navy platforms.

The types of Navy activities that occur within the vicinity of FKNMS and the Key West and Great White Heron National Wildlife Refuges (Refuge) are broken down into summary tables below by Navy warfare training areas. The primary warfare training activities being conducted in the NAS Key West area of responsibility include Air Warfare, Electronic Warfare, Surface Warfare, Expeditionary Warfare, and Special Warfare. There is also a table to illustrate the Navy Systems command research and development activities. These activities may include the use of Unmanned Aerial Systems (UAS).

The majority of these activities are conducted outside of the current FKNMS and Refuge boundary and the proposed expanded boundaries. This includes the training and testing activities analyzed in the Atlantic Fleet Testing and Training (AFTT) Environmental Impact Statement completed in 2013 as well as other previously completed National Environmental Policy Act (NEPA) documents by various Navy commands. The individual NAS Key West activity maps illustrate the training and testing activities conducted within the littoral areas of the Florida Keys.

Table F.2. Air Warfare

Activity	Activity Description	NEPA
Air Combat Maneuver (ACM)	• Air crews engage in flight maneuvers designed to gain a tactical advantage during aerial combat. • These events may be supported by ground controllers for ground-controlled intercepts.	FKNMS EIS[1] AFTT[2]
Air to Air Gunnery (GUNEX)	• Air Crews defend against threat aircraft with cannons (machine guns). • Air Gunnery events are conducted with either organic aircraft or support aircraft towing a banner target. • These events are usually conducted or combined with other training, such as with ACM events.	FKNMS EIS AFTT
Air to Air Missile (MISSILEX)	• Air crews defend against threat with missiles. • Training operations include air to air missiles fired from tactical aircraft against unmanned aerial targets.	AFTT
Search & Rescue (SAR)	• Rotary wing air crews train to search and rescue down pilots, persons overboard, or civilians potentially lost at sea. • Includes combat search and rescue training. • Aviation rescue swimming training is conducted within the certified drop zones in the NASKW area of responsibility.	FKNMS EIS AFTT

Activity	Activity Description	NEPA
Air to Surface Ordnance Release (BOMBEX)	• Air to surface ordnance release involving training of strike fighter aircraft in delivery of bombs against surface maritime targets. • Authorized ordnance for training at the Patricia (Target) Range is limited to inert ordnance with smoke markers. • Training is limited to unit level training only.	FKNMS EIS AFTT

1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary
2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS)

Table F.3. Electronic Warfare

Activity	Activity Description	NEPA
Chaff Exercise	• Fixed wing aircraft deploy chaff to disrupt threat targeting and missile guidance radars and to defend against attack. • These events are usually conducted or combined with other training, such as with ACM events.	FKNMS EIS[1] AFTT[2]
Flare Exercise	• Fixed wing aircraft and helicopters deploy flares to disrupt threat targeting and to defend against an infrared missile attack. • These events are usually conducted or combined with other training, such as with ACM events.	FKNMS EIS AFTT

1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary
2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS)

Table F.4. Surface Warfare

Activity	Activity Description	NEPA
Gunnery Exercise	• Ship crews engage surface targets with small and large caliber guns. • Small caliber training is designed to provide close range support against small boat attacks. • Large caliber training is designed to provide defense against other surface ships or longer range targets.	AFTT[2]
Submarine Tracking and/or Torpedo Exercise	• Surface ship crews search for, track, and detect submarines to determine a firing position to launch a torpedo and attack the submarine. • Generally a single ship unit level training event. • Tracking exercises do not require a submarine as a target; a simulated target is often used. • Tracking exercise becomes a torpedo exercise when the ship launches an exercise torpedo.	FKNMS EIS[1] AFTT

Activity	Activity Description	NEPA
Maritime Intercept Operations	• Surface ship crews train on how to conduct visit, board, search and seizure (VBSS) on vessels of interest. • Target vessels vary depending upon vessel availability. • Training includes compliant and non-compliant boarding procedures. • Training may include helicopters.	AFTT
Maritime Security Operations	• Surface ship and helicopter crews conduct a suite of maritime security operations. • Training includes counter piracy, ship force protection, warning/disabling fire, and oil platform defense.	AFTT
Miscellaneous Shipboard Training	• Man overboard drills • Damage Control exercises and training. • Shipboard navigation. • Organic helicopter flight and vertical lift training	AFTT

1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary
2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS)

TABLE F.5. EXPEDITIONARY WARFARE

Activity	Activity Description	NEPA
Mobile Dive and Salvage Operations	• Advanced diving skills training conducted to a maximum of 240 feet. • Includes surface supplied dives, underwater breathing apparatus dives, and recompression chamber operations. • Remotely operated vehicle operations to support salvage training, includes recovery of small objects on the ocean floor.	AFTT[2]
Explosive Ordnance Disposal (EOD) Dive Training	• Underwater breathing apparatus dive supervisor initial training at a maximum depth of 160 feet. • Training includes floating decompression and recompression chamber operations.	AFTT
Mine Neutralization	• Mine Countermeasures training with the use of underwater explosives charges to destroy or neutralize simulated mines. • Training is conducted only in approved sites and the maximum explosive charge is 20 pounds (Net Explosive Weight) • Training can be conducted off of surface ships, small boats, or helicopters.	AFTT
Parachute Operations	• Static line and military free fall parachute insertion operations from rotary or fixed wing aircraft into a water or land drop zone.	FKNMS EIS[1] NSW dEA[3]

1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary

2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS)
3. 2018 Draft Environmental Assessment (dEA) for Naval Special Warfare (NSW) Training in the Vicinity of Key West, Florida.

Table F.6. Special Warfare

Activity	Activity Description	NEPA
Combat Swimmer Training	• Special Warfare units will conduct combat swimming training, to include advance combat swimmer. • Conduct long underwater swims with simulated weapons package to ensure proper ballasting and water proofing. • Training includes underwater navigation, stealth swim technics, water survival training, and deployment of simulated weapons packages against target vessels.	FKNMS EIS[1] NSW dEA[3]
Maritime Intercept Operations (Level III)	• Advanced training to conduct visit, board, search and seizure (VBSS) on vessels of interest. (Level III) • Target vessels vary depending upon vessel availability. Training includes compliant and non-compliant boarding procedures. • Training may include helicopters.	AFTT[2]
Underwater Vehicle Training	• Training with the use of delivery and dry combat submersibles. • Training may include long range navigation, surveillance, harbor penetration and combat swimming. • Interoperability training with Submarine Forces.	FKNMS EIS NSW dEA
Parachute Operations	• Static line and military free fall parachute insertion operations from rotary or fixed wing aircraft into a water or land drop zone.	FKNMS EIS NSW dEA
Naval Special Warfare Small Boat and Boat Coxswain Training	• Training is for both Special warfare combatant-craft crewmen and basic crewman training and qualification. • Routine high speed defensive tactical boat maneuvers while deploying forces during insertion (unloading crew on land) and extraction (loading crew from land to boat)	FKNMS EIS NSW dEA
Beach Assault	• Special Warfare unit training to conduct over the beach assaults from the sea. • Training can be conducted with the support of helicopters, small boat units, and inflatable crafts in the near shore waters.	FKNMS EIS NSW dEA
Proposed: Unmanned Aerial System (UAS) Activities	• Nighttime launch and recover Special Operation Forces (SOF)-unique UAS simultaneously while conducting SOF combat swimmer, special reconnaissance and direct action mission training.	NSW dEA
Proposed: Demolition Training	• Personnel place limpet mines or disable threat mines using explosive charges.	AFTT[2]

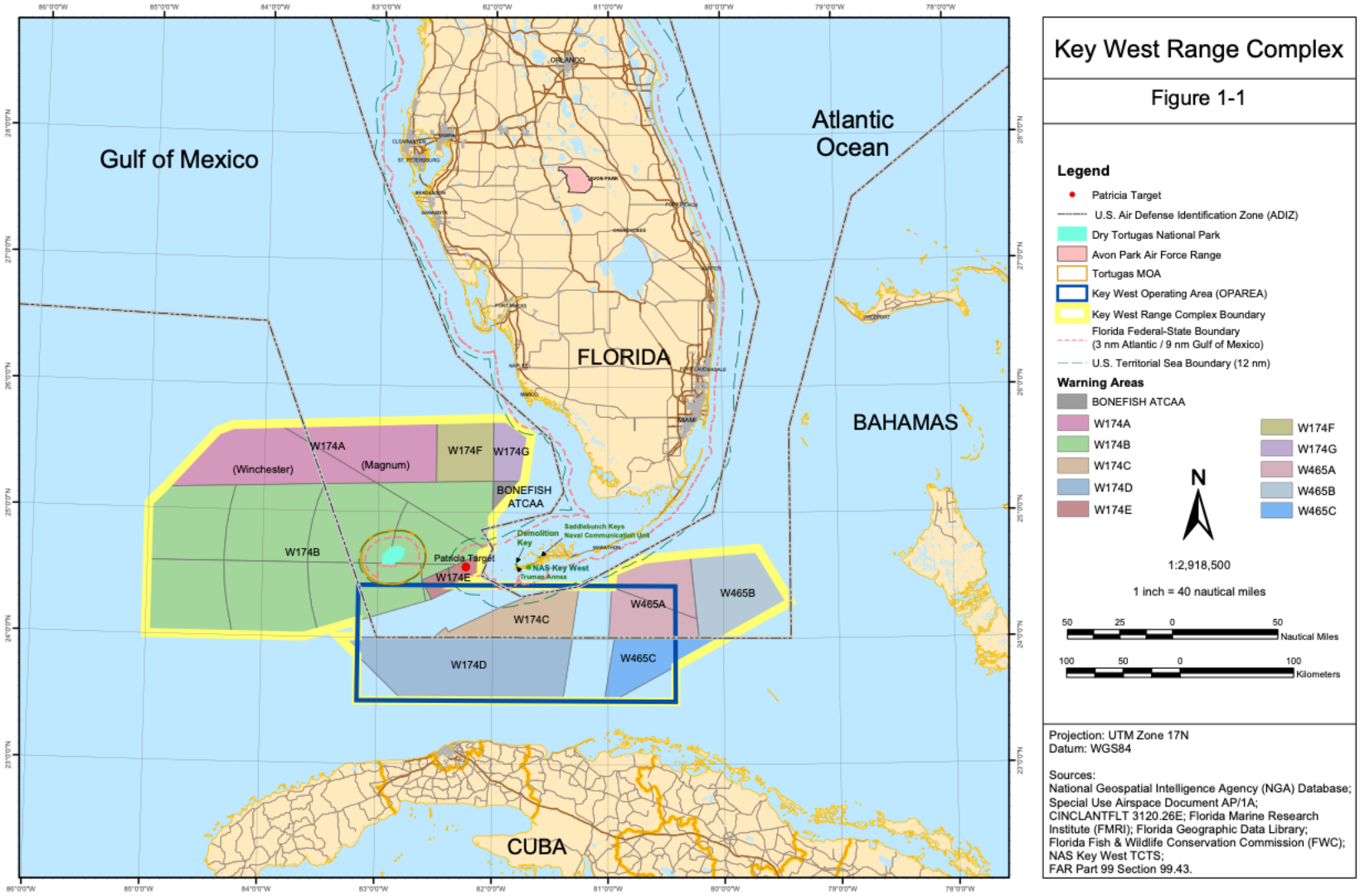
1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary

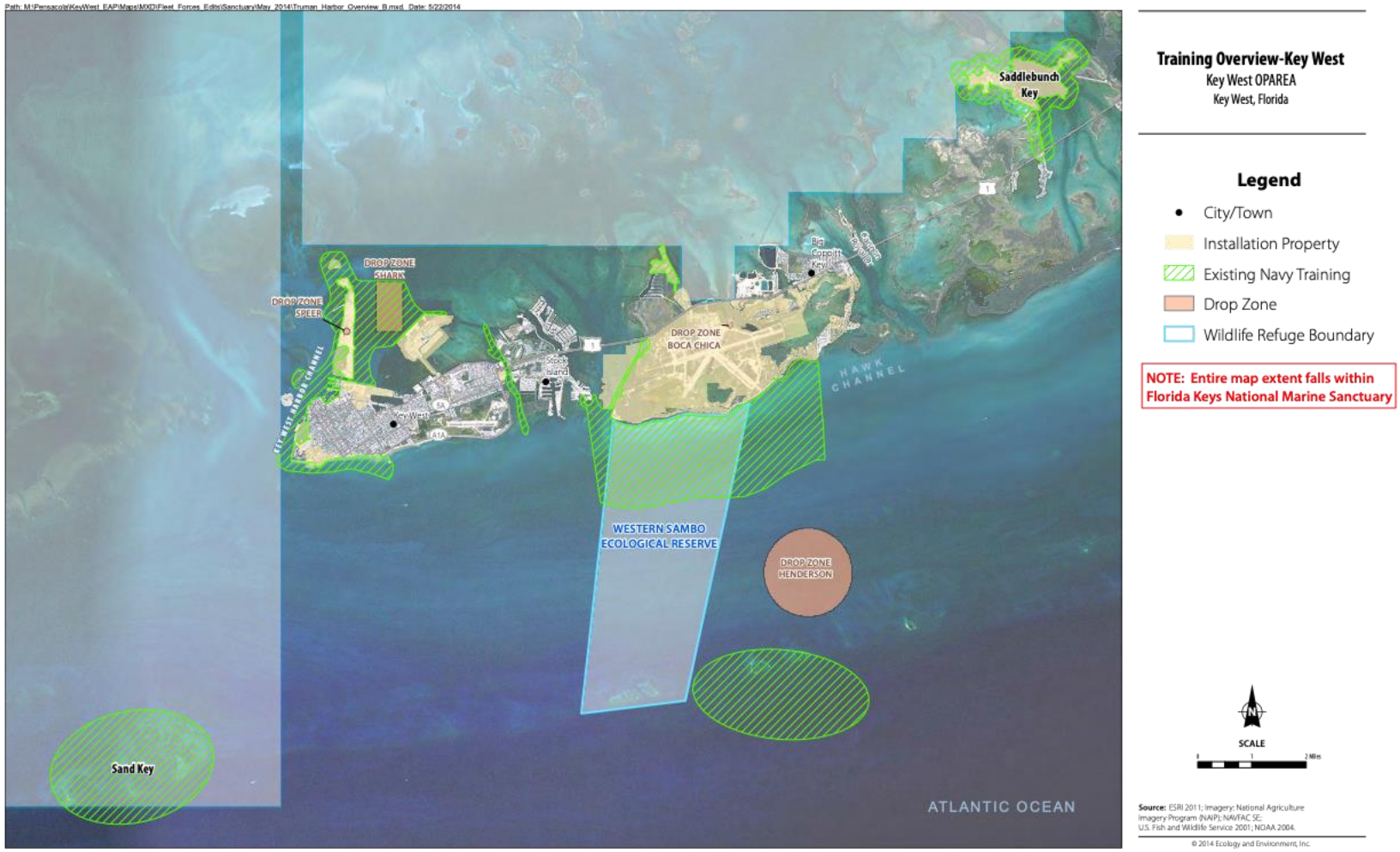
2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/ Overseas Environmental Impact Statement (OEIS)
3. 2018 Draft Environmental Assessment (dEA) for Naval Special Warfare (NSW) Training in the Vicinity of Key West, Florida.

Table F.7. Navy Systems Commands Research and Test Events

Activity	**Activity Description**	**NEPA**
Air Platform/ Vehicle Testing	• Testing to quantify the flying qualities, handling, airworthiness, stability, controllability, and integrity of air platforms or vehicles. • No weapons releases included in the testing.	AFTT[2]
Sonobuoy Lot Acceptance Testing	• Sonobuoys are deployed from surface vessels and aircraft to verify integrity and performance of a lot or group in advance of delivery to the fleet for operational use.	FKNMS EIS[1] AFTT
Submarine Land Attack Missile Testing	• Testing of a submarine launch of a land attack missile from the Key West Operating Area into Eglin Air Force Base. • Missile test includes fixed wing aircraft tracking the flight into Eglin as a safety precaution.	AFTT
Combat System Ship Qualification Trail	• Test of shipboard sensor capabilities to detect and track surface targets and then relay the data to the weapon system and engage the target.	AFTT
Submersible Testing	• Testing of Navy submersibles and the capability to support personnel and payload insertion and extraction from strategic distances.	AFTT
Surface/ Subsurface Platform/Ship Testing	• In water testing to quantify the qualities, handling, seaworthiness, stability, controllability, and integrity of surface/subsurface platforms or ships.	AFTT

1. 1996 Final Management Plan/Environmental Impact Statement for the Florida Keys National Sanctuary
2. 2018 Atlantic Fleet Training and Testing (AFTT) Final Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS)


Key West Range Complex
Figure 1-1
Gulf of Mexico
Atlantic Ocean
FLORIDA
BAHAMAS
CUBA
ORLANDO
W174A
(Winchester)
(Magnum)
W174F
W174G
BONEFISH ATCAA
W174B
Patricia Target
W174E
Demolition Key
Saddlebunch Keys Naval Communication Unit
NAS Key West
Truman Annex
W465A
W465B
W174C
W174D
W465C
Legend
Patricia Target
U.S. Air Defense Identification Zone (ADIZ)
Dry Tortugas National Park
Avon Park Air Force Range
Tortugas MOA
Key West Operating Area (OPAREA)
Key West Range Complex Boundary
Florida Federal-State Boundary (3 nm Atlantic / 9 nm Gulf of Mexico)
U.S. Territorial Sea Boundary (12 nm)
Warning Areas
BONEFISH ATCAA
W174A
W174B
W174C
W174D
W174E
W174F
W174G
W465A
W465B
W465C
N
1:2,918,500
1 inch = 40 nautical miles
50 25 0 50 Nautical Miles
100 50 0 100 Kilometers
Projection: UTM Zone 17N
Datum: WGS84
Sources:
National Geospatial Intelligence Agency (NGA) Database;
Special Use Airspace Document AP/1A;
CINCLANTFLT 3120.26E; Florida Marine Research Institute (FMRI); Florida Geographic Data Library;
Florida Fish & Wildlife Conservation Commission (FWC);
NAS Key West TCTS;
FAR Part 99 Section 99.43.



Enclosure (1) Map 1

Enclosure (1) Map 2

Fleming Key, Trumbo Point Annex, Demolition Key, and Shark Drop Zone
Key West OPAREA
Key West, Florida

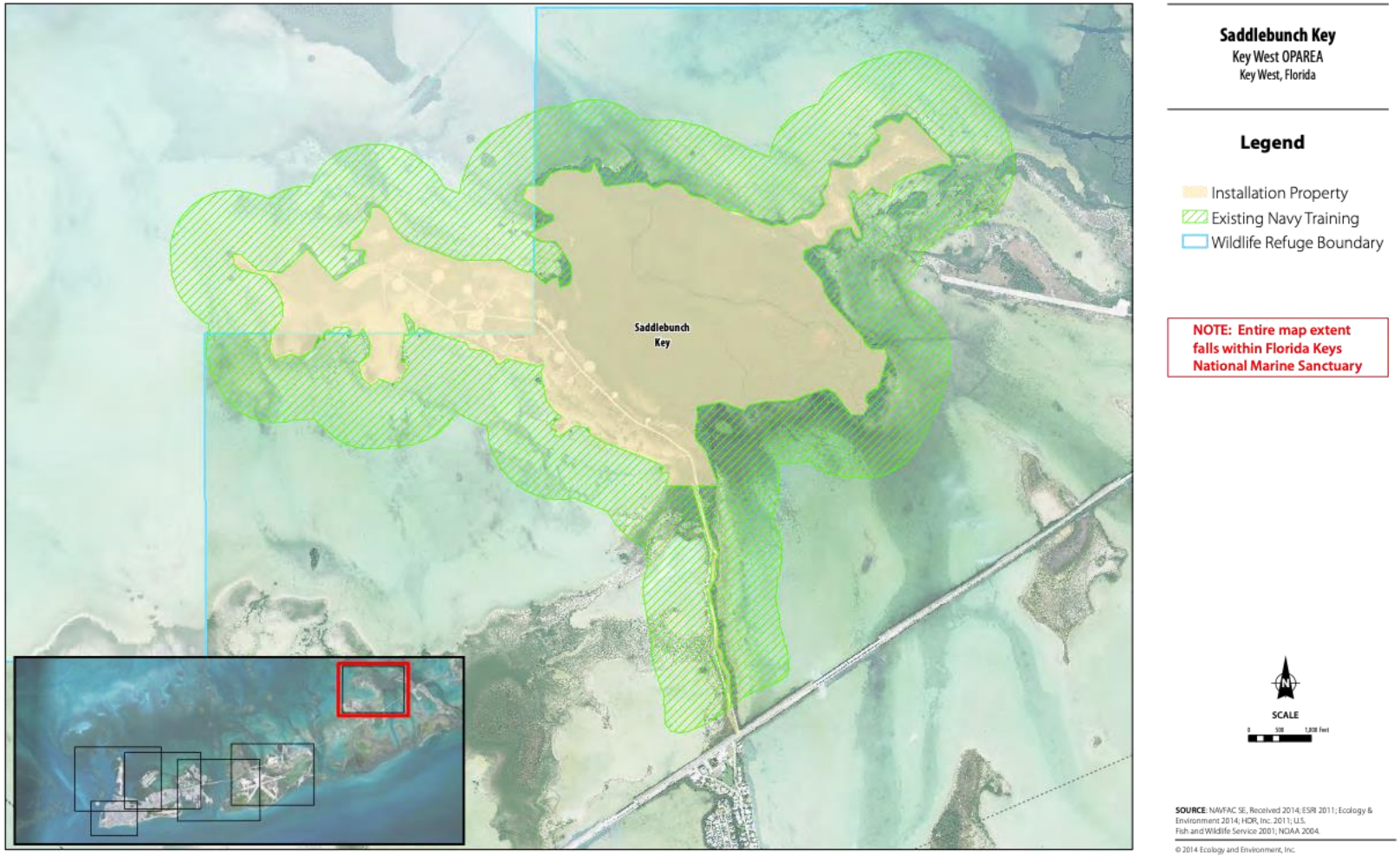
Legend

Enclosure (1) Map 3

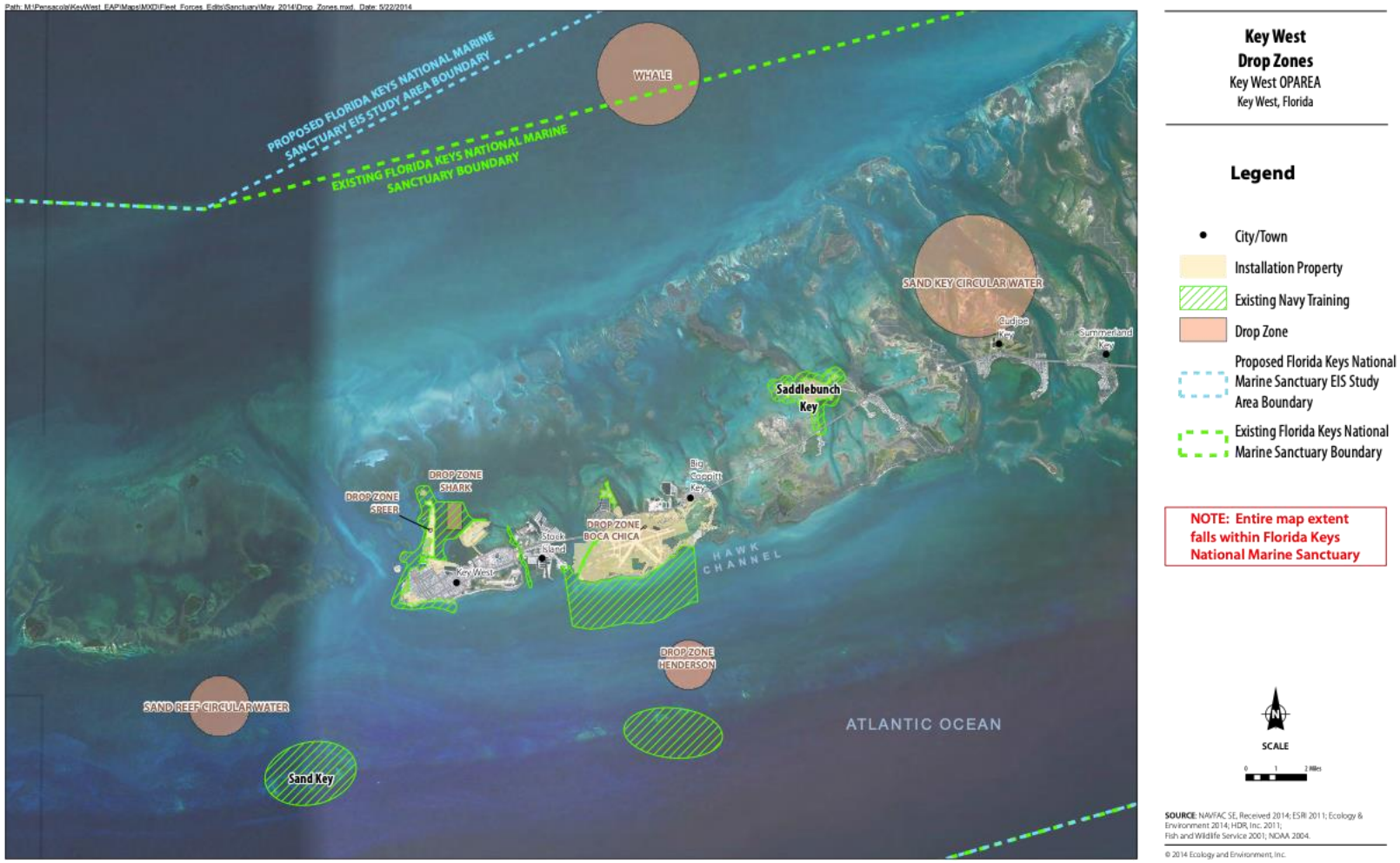
Enclosure (1) Map 4

Enclosure (1) Map 5

Enclosure (1) Map 6

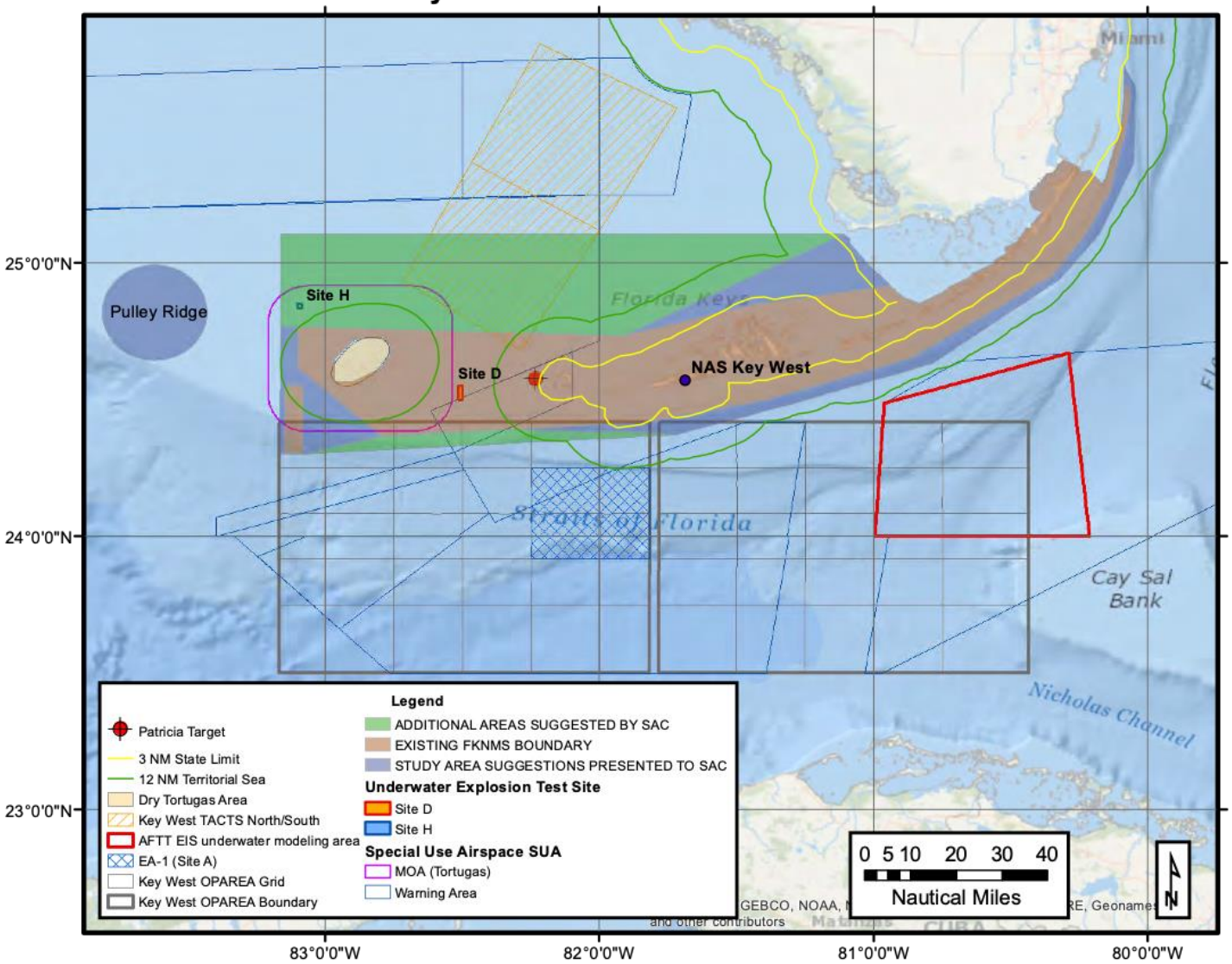


Enclosure (1) Map 7



Enclosure (1) Map 8

Key West Offshore Detonation Areas



Enclosure (1) Map 9

Appendix G: Exempted Traditional Fishing Activities

Exempted Traditional Fishing Activities

Traditional fishing means those commercial or recreational fishing activities customarily conducted within the sanctuary as of the effective date of the final 2025 sanctuary regulations[8] (15 CFR § 922.162). NOAA regulations for Florida Keys National Marine Sanctuary (FKNMS) provide exemptions for traditional fishing activities from the following regulatory prohibitions:

- Alteration of, or construction on, the seabed (15 CFR § 922.163(a)(3));
- Discharge or deposit of materials or other matter (15 CFR § 922.163(a)(4)); and
- Attracting or feeding fish, including sharks, or other marine species from any vessel and/or while diving.(15 CFR § 922.163(a)(14))

The 1997 regulations define traditional fishing activities as "commercial or recreational fishing activities that were customarily conducted within the sanctuary prior to the time of sanctuary designation, as identified in the Environmental Impact Statement and Management Plan for this Sanctuary"(15 CFR § 922.162).

In the 2022 Florida Keys National Marine Sanctuary Notice of Proposed Rulemaking/Restoration Blueprint process, NOAA proposed amending the 1997 definition of traditional fishing to clarify that the exemption applied only to those activities identified in the 1996 environmental impact statement (EIS):

> "those commercial or recreational fishing activities that were customarily conducted within the sanctuary prior to its designation as identified in the 1996 FL Keys NMS FMP/EIS (Vol. II) and Management Plan, pages 84–91" (incorporated by reference, see § 922.179).

NOAA received comments, most notably from fishery management partners at the Florida Fish and Wildlife Conservation Commission (FWC), the Gulf of Mexico Fishery Management Council (GMFMC), and the South Atlantic Fishery Management Council (SAFMC) that did not support this proposed definition. Comments indicated that the definition should be updated to fully capture all current, existing fishing regulations promulgated by state and federal authorities, rather than refer to fishing activities conducted at the time of sanctuary designation. In addition, comments noted that the definition should allow for the future development and use of innovative gear types, including those intended to reduce impacts on FKNMS resources. Finally, comments also recommended that the regulatory definition contain the complete definition of traditional fishing, instead of cross-referencing another section or document.

NOAA recognizes that decades of fishery management in the sanctuary has promoted gear innovations to reduce bycatch and other unintended effects of fishing on sanctuary resources. NOAA also recognizes that an updated description of the managed fisheries that comprise "traditional fishing" would assist fishery management partners and the regulated public in

[8] NOAA intends to include the effective date of the final 2025 sanctuary regulations for FKNMS in the regulatory text of the definition "traditional fishing" in 15 CFR § 922.162.

understanding which activities are exempt from certain FKNMS prohibitions. Such a description would also provide a clear baseline for the sanctuary and fisheries managers to analyze future potential fishing regulation modifications.

Therefore, NOAA worked closely with FWC, GMFMC, SAFMC, and the National Marine Fisheries Service (NMFS) to review the suite of fishing activities historically and currently conducted within the Florida Keys and the potential effects on sanctuary resources if exempted. NOAA is providing additional background and an updated description of exempted traditional fishing activities.

The below sections provide an updated description of the fisheries and fishing activities as currently managed in 2024 by FWC in state waters and in the Exclusive Economic Zone (EEZ) for species over which FWC has extended its management authority, and by NMFS in the EEZ. This information provides guidance for those fisheries and fishing activities that would be considered "traditional fishing" for the purposes of the FKNMS definition and regulations.

Fishing regulations change, and by defining traditional fishing as those activities customarily conducted as of the effective date of the final 2025 sanctuary regulations, NOAA does not intend to exclude fishing activities subject to routine changes to state and federal fishery management regulations. Routine changes include changes to size limits, bag limits, vessel limits, trip limits, possession limits, retention limits, quotas, catch limits, or catch targets; and routine season modifications including in season adjustments or quota closures. On the other hand, substantial changes to state and federal fishery management regulations for a fishing activity would not be considered "traditional fishing" and the changes to that fishing activity would make that activity no longer considered traditional fishing and the changes to that fishing activity would not be exempted from the corresponding sanctuary prohibition. Substantial changes include new or modified regulations that allow use of new gear types or methods, or that modify allowable or authorized gear types or methods that alter the seabed.

To support coordination, a memorandum of agreement between the Office of National Marine Sanctuaries, FWC, NMFS, GMFMC, and SAFMC guides interagency communication and consultation of fishing regulations in the sanctuary, including the potential review and modification of the description of traditional fishing activities. Any changes to this description of what qualifies as traditional fishing must be made in accordance with the requirements of the Administrative Procedure Act (5 U.S.C. 553), National Environmental Policy Act (42 U.S.C. §§ 4321 *et seq*.), and any other applicable law.

Sanctuary and Fishery Management Overlay

FKNMS encompasses approximately 4,539 square miles of coastal and ocean waters. The sanctuary overlaps with state of Florida waters (2,223 square miles, 49%), GMFMC EEZ waters (505 square miles, 11%), and SAFMC EEZ waters (1,809 square miles, 40%), as shown in image G.1.

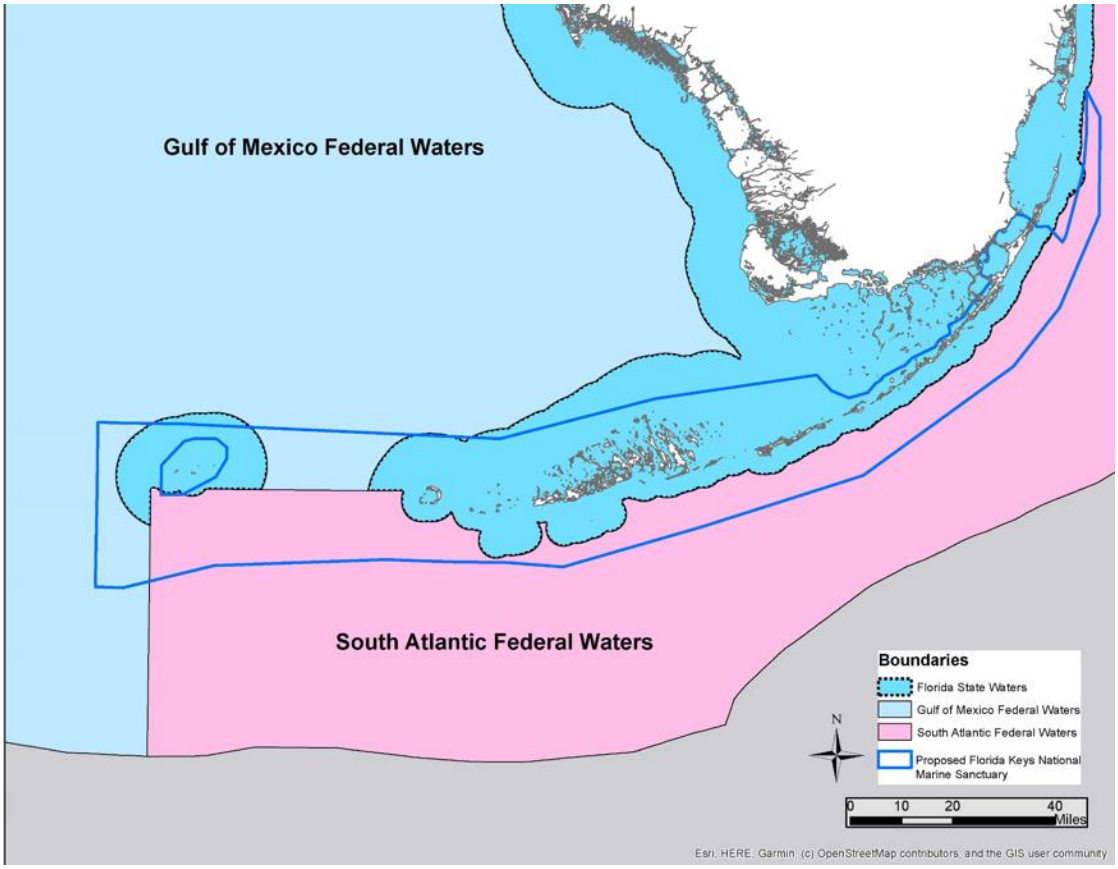


Figure G.1. Map of FKNMS showing respective fishery agency jurisdictions including the state of Florida, the GMFMC, and the SAFMC. Map: NOAA

Florida State Waters

The FWC derives its authority from Section 9 of Article IV of the Florida Constitution and further promulgated in Title 68 of the Florida Administrative Code (F.A.C.) and Chapter 379 of the Florida Statutes. The FWC exercises the regulatory and executive powers of the state with respect to wild animal life, freshwater aquatic life, and marine life, which includes corals and coral reef associated species, and exercises regulatory authority for vessel speed and operations and vessel safety upon waters of this state within the sanctuary boundary, pursuant to delegated authority from the Florida Legislature pursuant to Chapter 327 of the Florida Statutes, with associated rules in Title 68 of the F.A.C. FWC's authority falls within Florida state waters of the Gulf of Mexico and Atlantic Ocean and within adjacent federal waters for fisheries over which FWC has extended its authority, pursuant to 16 U.S.C. 1856(a).

FWC promulgates both recreational and commercial fishing regulations in Florida state waters and in adjacent federal waters for fisheries over which FWC has extended its authority, pursuant to 16 U.S.C. 1856(a). Recreational regulations include location-specific regulations and species-specific regulations for over 500 species, including numerous species of finfish and invertebrates. FWC also prohibits the recreational take of certain species. Commercial regulations include similar categories as outlined above for recreational fishing regulations as well as marine life regulations.

It is NOAA's intent that the definition for traditional fishing in FKNMS incorporates all allowable commercial and recreational fishing activities as regulated in 68B-1 through 68B-64, F.A.C., as of the effective date of the final 2025 sanctuary regulations for FKNMS, for species found in the state waters, and, as applicable, adjacent federal waters of FKNMS. Additionally, the definition for traditional fishing incorporates all allowable commercial and recreational fishing activities regulated under Chapter 379 of the Florida Statutes, as listed below:

379.2401 Marine fisheries; policy and standards.

379.2402 Marine information system.

379.2411 Saltwater fish; regulations.

379.2412 State preemption of power to regulate.

379.2413 Catching food fish for the purposes of making oil.

379.2421 Fishers and equipment; regulation.

379.2422 Illegal use of nets.

379.2423 Carriage of proscribed nets across Florida waters.

379.2424 Retrieval of spiny lobster, stone crab, blue crab, and black sea bass traps during closed season; commission authority.

379.2425 Spearfishing; definition; limitations; penalty.

379.2426 Regulation of shark fins; penalties.

379.2431 Marine animals; regulation.

379.244 Crustacea, marine animals, fish; regulations; general provisions.

379.245 Spiny lobster reports by dealers during closed season required.

379.246 Tortugas shrimp beds; gifted and loan property.

379.248 Sponges; regulation.

379.2521 Rulemaking authority with respect to marine life.

379.353 Recreational licenses and permits; exemptions from fees and requirements.

379.357 Fish and Wildlife Conservation Commission license program for tarpon; fees; penalties.

379.365 Stone crab; regulation.

379.366 Blue crab; regulation.

379.367 Spiny lobster; regulation.

379.3671 Spiny lobster trap certificate program.

Gulf of Mexico EEZ Waters

GMFMC is one of eight regional fishery management councils. The councils are advisory bodies that assist in federal fisheries management, each with responsibilities over a specific geographic region within the EEZ. The GMFMC is responsible for the EEZ of the Gulf of Mexico. The GMFMC prepares and submits a Fishery Management Plan (FMP) to NMFS for each fishery under its authority that requires conservation and management, as well as proposed regulations

that the council deems necessary or appropriate to implement the FMP.

The GMFMC has developed and NMFS has approved FMPs as follows:

- Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region
- Coral and Coral Reefs of the Gulf of Mexico
- Red Drum Fishery of the Gulf of Mexico
- Reef Fish Resources of the Gulf of Mexico
- Shrimp Fishery of the Gulf of Mexico
- Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic

It is NOAA's intent that the definition for traditional fishing in FKNMS incorporates all allowable commercial and recreational fishing activities under the jurisdiction of the GMFMC, as regulated in 50 CFR Part 622 and included in the list of fisheries and authorized gear in 50 CFR 600.725(v), as of the effective date of the final 2025 sanctuary regulations. Additional information may be found in the above listed FMPs, as well as any amendments, approved as of the effective date of the final 2025 sanctuary regulations for FKNMS.

Table G.1 is provided as a reference for the approved gear for usage in each of the GMFMC fisheries included in 50 CFR 600.725(v) (2024).

Table G.1. Gulf of Mexico Fishery Management Council Authorized Gear Types

Fishery	Authorized gear types
Gulf of Mexico Reef Fish Fishery (FMP)	
Commercial sector	Longline, handline, bandit gear, rod and reel, buoy gear, spear, powerhead, cast net, trawl.
Recreational sector	Spear, powerhead, bandit gear, handline, rod reel, cast net.
Gulf of Mexico Shrimp Fishery (FMP)	
Commercial sector	Trawl butterfly net, skimmer, cast net.
Recreational sector	Trawl.
Gulf of Mexico Coastal Migratory Pelagics Fishery (FMP)	
Large pelagics longline fishery	Longline.
King/Spanish mackerel gillnet fishery	Gillnet.
Pelagic hook and line fishery	Bandit gear, handline, rod and reel.
Pelagic species purse seine fishery	Purse seine.
Recreational fishery	Bandit gear, handline, rod and reel, spear.

Fishery	Authorized gear types
Gulf of Mexico Spiny Lobster Fishery (FMP)	
Commercial sector	Trap, pot, dip net, bully net, hoop net, trawl, snare, hand harvest.
Recreational sector	Dip net, bully net, pot, trap, snare, hand harvest.

South Atlantic EEZ Waters

SAFMC is one of eight regional fishery management councils. The councils are advisory bodies that assist in federal fisheries management, each with responsibilities over a specific geographic region within the EEZ. The SAFMC is responsible for the EEZ off the coasts of North Carolina, South Carolina, Georgia, and east Florida to Key West. The SAFMC prepares and submits an FMP to NMFS for each fishery under its authority that requires conservation and management, as well as proposed regulations that the council deems necessary or appropriate to implement the FMP.

The SAFMC has developed and NMFS has approved FMPs as follows:

- Coastal Migratory Pelagic Resources in the Gulf of Mexico and Atlantic Region
- Coral, Coral Reefs, and Live/Hard Bottom Habitats of the South Atlantic Region
- Dolphin and Wahoo Fishery of the Atlantic
- Golden Crab Fishery of the South Atlantic Region
- Pelagic Sargassum Habitat of the South Atlantic Region
- Shrimp Fishery of the South Atlantic Region
- Snapper-Grouper Fishery of the South Atlantic Region
- Spiny Lobster Fishery of the Gulf of Mexico and South Atlantic

It is NOAA's intent that the definition for traditional fishing in FKNMS incorporates all allowable commercial and recreational fishing activities under the jurisdiction of the SAFMC, as regulated in 50 CFR Part 622 and included in the list of fisheries and authorized gear in 50 CFR Part 600.725(v) for species found in the EEZ of FKNMS, as of the effective date of the final 2025 sanctuary regulations. Additional information may be found in the above listed FMPs, as well as any amendments, approved as of the effective date of the final 2025 sanctuary regulations for FKNMS.

Table G.2 is provided as a reference for the approved gear for usage in the SAFMC fisheries included in 50 CFR Part 600.725(v) (2024).

Table G.2. South Atlantic Fishery Management Council Authorized Gear Types

Fishery	Authorized gear types
South Atlantic Shrimp Fishery (FMP)	Trawl.
South Atlantic Snapper-Grouper Fishery (FMP)	
Commercial sector	Bandit gear, bottom longline (except for wreckfish; except south of St. Lucie Inlet, FL, and inside 50 fathoms north of St. Lucie Inlet, FL), buoy gear, handline, rod and reel, sea bass pot, and spearfishing gear.
Recreational sector	Handline, rod and reel, bandit gear, spear, powerhead.
Commercial and recreational fishery	Non-offset, non-stainless steel circle hooks Required when fishing for South Atlantic snapper-grouper with hook-and-line gear and natural baits north of 28° N lat. Non-stainless steel hooks required when fishing for South Atlantic snapper-grouper with hook-and-line gear and natural baits south of 28° N lat. Possession of a dehooking device and descending device required.
South Atlantic Spiny Lobster Fishery (FMP)	
Commercial sector	Trap, pot, dip net, bully net, snare, hand harvest.
Recreational sector	Dip net, bully net, snare, hand harvest.
South Atlantic Coastal Migratory Pelagics Fishery (FMP)	
Spanish mackerel fishery, Atlantic Group	Automatic reel, bandit gear, handline, rod and reel, cast net, run-around gillnet, and stab net.
King mackerel fishery, Atlantic Group	North of 34°37.3′ N. lat. (Cape Lookout Light, NC): all gear except drift net and long gillnet South of 34°37.3′ N. lat.: automatic reel, bandit gear, handline, and rod and reel.
Cobia, Gulf Migratory Group	All gear except drift gillnet and long gillnet
Sargassum Fishery (Non-FMP)	Net; The minimum allowable mesh size for a net used to fish for pelagic sargassum in the South Atlantic EEZ is 4.0 inches (10.2 cm), stretched mesh, and such net must be attached to a frame no larger than 4 ft by 6 ft (1.2 m by 1.8 m).
Dolphin/wahoo fishery (FMP)	Automatic reel, bandit gear, handline, pelagic longline, rod and reel, spear (including powerheads).

Highly Migratory Species

NOAA's NMFS manages Highly Migratory Species (HMS) fisheries—tunas, sharks, swordfish, and billfish—in the U.S. Atlantic Ocean, Gulf of Mexico, and Caribbean waters. Most HMS travel long distances and often cross domestic and international boundaries. Many are found in and pass through the waters of FKNMS, and HMS fishing activities are therefore included in the list of traditional fishing activities for the sanctuary.

All HMS are managed under the 2006 Consolidated Atlantic HMS FMP and its amendments. Any person engaged in fishing activities, whether recreational or commercial, within FKNMS is expected to comply with all relevant state or federal fishery regulations

It is NOAA's intent that the definition for traditional fishing in FKNMS incorporates all allowable commercial and recreational fishing activities of HMS fisheries, as regulated in 50 CFR Part 635 and included in the list of fisheries and authorized gear in 50 CFR Part 600.725(v) for species found in the EEZ of FKNMS, approved as of the effective date of the final 2025 sanctuary regulations for FKNMS.

Table G.3 includes the list of HMS species managed by NMFS as identified in the 2022 Stock Assessment and Fishery Evaluation Report.[9]

Table G.3. Species Managed under the 2006 Consolidated HMS FMP and Amendments

Common Name	Scientific Name
Skipjack tuna	*Katsuwonus pelamis*
Albacore tuna	*Thunnus alalunga*
Yellowfin tuna	*Thunnus albacares*
Bigeye tuna	*Thunnus obesus*
Bluefin tuna	*Thunnus thynnus*
Swordfish	*Xiphias gladius*
Sailfish	*Istiophorus platypterus*
White marlin	*Kajikia albida*
Blue marlin	*Makaira nigricans*
Roundscale spearfish	*Tetrapturus georgii*
Longbill spearfish	*Tetrapturus pfluegeri*
Bigeye thresher shark	*Alopias superciliosus*
Thresher shark	*Alopias vulpinus*

[9] https://www.fisheries.noaa.gov/s3/2023-06/SAFE-Report-062223.pdf

Common Name	Scientific Name
Blacknose shark	*Carcharhinus acronotus*
Bignose shark	*Carcharhinus altimus*
Narrowtooth shark	*Carcharhinus brachyurus*
Spinner shark	*Carcharhinus brevipinna*
Silky shark	*Carcharhinus falciformis*
Galapagos shark	*Carcharhinus galapagensis*
Finetooth shark	*Carcharhinus isodon*
Bull shark	*Carcharhinus leucas*
Blacktip shark	*Carcharhinus limbatus*
Oceanic whitetip shark	*Carcharhinus longimanu*
Dusky shark	*Carcharhinus obscurus*
Caribbean reef shark	*Carcharhinus perezii*
Sandbar shark	*Carcharhinus plumbeus*
Smalltail shark	*Carcharhinus porosus*
Night shark	*Carcharhinus signatus*
Sand tiger shark	*Carcharias taurus*
White shark	*Carcharodon carcharias*
Basking shark	*Cetorhinus maximus*
Tiger shark	*Galeocerdo cuvier*
Nurse shark	*Ginglymostoma cirratum*
Sevengill shark	*Heptranchias perlo*
Sixgill shark	*Hexanchus griseus*
Bigeye sixgill shark	*Hexanchus nakamurai*
Shortfin mako shark	*Isurus oxyrinchus*
Longfin mako shark	*Isurus paucus*
Porbeagle shark	*Lamna nasus*
Smooth dogfish	*Mustelus canis*

Common Name	Scientific Name
Florida smoothhound shark	*Mustelus norrisi*
Gulf smoothhound shark	*Mustelus sinusmexicanus*
Lemon shark	*Negaprion brevirostris*
Bigeye sand tiger shark	*Odontaspis noronhai*
Blue shark	*Prionace glauca*
Whale shark	*Rhincodon typus*
Caribbean sharpnose shark	*Rhizoprionodon porosus*
Atlantic sharpnose shark	*Rhizoprionodon terraenovae*
Scalloped hammerhead shark	*Sphyrna lewini*
Great hammerhead shark	*Sphyrna mokarran*
Bonnethead shark	*Sphyrna tiburo*
Smooth hammerhead shark	*Sphyrna zygaena*
Atlantic angel shark	*Squatina dumer*

Table G.4 is provided as a reference for the approved gear for usage in the HMS fisheries included in 50 Part 600.725(v) (2024).

Table G.4. Highly Migratory Species Fishery Authorized Gear Types

Fishery	Authorized gear types
Swordfish handgear fishery	Rod and reel, harpoon, handline, bandit gear, buoy gear, green-stick gear.
Swordfish recreational fishery	Rod and reel, handline.
Pelagic longline fishery	Longline.
Shark gillnet fishery	Gillnet.
Shark bottom longline fishery	Longline.
Shark handgear fishery	Rod and reel, handline, bandit gear.
Shark recreational fishery	Rod and reel, handline.
Tuna recreational fishery	Speargun gear (for bigeye, albacore, yellowfin, and skipjack tunas only); Rod and reel, handline (all tunas); green-stick gear (HMS Charter/Headboat Category only).
Tuna handgear fishery	Rod and reel, harpoon, handline, bandit gear.

Fishery	Authorized gear types
Tuna harpoon fishery	Harpoon.
Atlantic billfish recreational fishery	Rod and reel.
Tuna green-stick fishery	Green-stick gear.

Appendix H:
Florida Keys National Marine Sanctuary Listed Species

USFWS ESA-listed Species & Critical Habitat Designations

Table H.1. USFWS ESA-listed mammal species and critical habitat designations

Common name	**Species**	**Status**	**Life history**	**Conclusion**
Florida bonneted bat	*Eumops floridanus*	Endangered	Unlikely to occur in the Action Area	No effect
Florida panther	*Puma concolor coryi*	Endangered	Unlikely to occur in the Action Area	No effect
Key deer	*Odocoileus virginianus clavium*	Endangered	- Area with the most likely probability of occurrence would be the Lower Keys and in transit in open water between islands. - Actions would be beneficial. - Protect shorelines from disturbance.	May affect, not likely to adversely affect
Key Largo cotton mouse	*Peromyscus gossypinus allapaticola*	Endangered	Unlikely to occur in the Action Area	No effect
Key Largo woodrat	*Neotoma floridana smalli*	Endangered	Unlikely to occur in the Action Area	No effect
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	Endangered	Unlikely to occur in the Action Area	No effect
Puma (mountain lion)	*Felis concolor* (all subsp. except coryi)	SAT "threatened due to similarity of appearance"	N/A	N/A
Silver rice rat	*Oryzomys palustris natator*	Endangered; Critical Habitat Designated	- Potentially found on shorelines. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect

Common name	Species	Status	Life history	Conclusion
West Indian manatee	*Trichechus manatus*	Threatened; Critical Habitat Designated	- May be found throughout aquatic parts of the Action Area. Agency actions would protect shorelines and shallow seagrass flat areas from disturbance, and limit vessel access and speeds to reduce strikes and damage to seagrass feeding habitats. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities. Small vessel operations would be at slow speeds unlikely to endanger.	May affect, not likely to adversely affect

Table H.2. USFWS ESA-listed bird species and critical habitat designations

Common name	Species	Status	Life history	Conclusion
Bachman's warbler	*Vermivora bachmanii*	Endangered	Unlikely to occur in the Action Area	No effect
Eastern black rail	*Laterallus jameaicensis*	Threatened	- Potentially found on land near coastlines and nearshore marsh or swamp areas intermittently covered with water. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect
Everglade snail kite	*Rostrhamus sociabilis plumbeus*	Endangered	- Potentially found on forested shorelines. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect
Piping plover	*Charadrius melodus*	Threatened; Critical Habitat Designated	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect

Common name	Species	Status	Life history	Conclusion
Roseate tern	*Sterna dougallii dougallii*	Threatened	- May be found on shorelines and may occur in transit over open water between coastal islands. Potentially nesting on beaches and flat ground or rooftops. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect
Wood stork	*Mycteria americana*	Threatened	- Potentially found foraging and nesting on shorelines and coastal wetlands and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	- May affect, not likely to adversely affect. - This species prefers deeper freshwater estuarine habitats than are found in most of the action area, other than the mainland shorelines of Barnes and Card Sounds.

Table H.3. USFWS ESA-listed reptile species and critical habitat designations

Common name	Species	Status	Life history	Conclusion
American alligator	*Alligator mississippiensis*	SAT - "threatened due to similarity of appearance."	- Potentially found on shorelines and coastal wetlands near the mainland and may occur in transit in open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	N/A
American crocodile	*Crocodylus acutus*	Threatened; Critical Habitat Designated	- May be found throughout Upper Keys and Card and Barnes Sounds parts of the Action Area. - Agency actions would protect shorelines and shallow water from disturbance, and limit vessel access and speeds to reduce strikes and damage to seagrass and mangrove feeding habitats.	May affect, not likely to adversely affect

Common name	Species	Status	Life history	Conclusion
Eastern indigo snake	*Drymarchon corais couperi*	Threatened	- Potentially found on shorelines. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect
Florida Keys mole skink	*Plestiodon egregius egregius*	Proposed Threatened	- Endemic to the Florida Keys, documented on 23 islands from Key Largo to Loggerhead Key. Most current detection within the Lower Keys from Bahia Honda to Key West. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	May affect, not likely to adversely affect
Green Sea Turtle	*Chelonia mydas*	Threatened; Critical Habitat Designated	- May be found on beaches nesting or hatching, or transiting and foraging in open water. - Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes	May affect, not likely to adversely affect
Key ring-necked snake	*Diadophis punctatus acricus*	Proposed endangered	-Sea level rise projections show a complete loss of its habitat in the lower Florida Keys in 20 to 40 years without intervention. -Majority of suitable habitat has been lost due to residential and commercial development.	May affect, not likely to adversely affect

Common name	Species	Status	Life history	Conclusion
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	- May be found on beaches nesting or hatching or transiting and foraging in open water. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes and damage to seagrass feeding habitats.	May affect, not likely to adversely affect
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	- May be found on beaches nesting or hatching, or transiting and foraging in open water. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Loggerhead sea turtle	*Caretta caretta*	Threatened; Critical Habitat Designated	- May be found on beaches nesting or hatching, or transiting and foraging in open water. - Ten reproductive habitat areas on beaches in the Dry Tortugas and Lower and Middle Keys; one open water breeding and migratory area on the Atlantic side of the Keys from Key West National Wildlife Refuge to north of Jupiter Inlet; one open water sargassum habitat area on the Atlantic side of FKNMS and Pulley Ridge. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes and damage to seagrass feeding habitats.	May affect, not likely to adversely affect

Common name	Species	Status	Life history	Conclusion
Rim rock crowned snake	*Tantilla oolitica*	Proposed endangered	- Effects associated with climate change, particularly sea level rise and saltwater intrusion, could make the entire range of the rim rock crowned snake vulnerable to effects from severe storms that contribute to increased flooding in low-lying areas. -In the Florida Keys, up to half of available habitat in the Upper Keys and nearly all habitat in the Lower Keys could be lost by 2040	May affect, not likely to adversely affect

Table H.4. USFWS ESA-listed fish species and critical habitat designations

Common name	Species	Status	Life history	Conclusion
Atlantic sturgeon (gulf subspecies)	*Acipenser oxyrinchus (oxyrhynchus) desotoi*	Threatened	- Known or believed to occur in Monroe County, but limited estuarine habitat for juveniles or spawning adults. - Actions would be mostly beneficial to reduce disturbance, minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect

Table H.5. USFWS ESA-listed invertebrate species and critical habitat designations

Type	Common name	Species	Status	Life history	Conclusion
Snails	Stock Island tree snail	*Orthalicus reses* (not incl. *nesodryas*)	Threatened	Unlikely to occur in the Action Area	No effect
Insects	Bartram's hairstreak butterfly	*Strymon acis bartrami*	Endangered; Critical Habitat Designated	Unlikely to occur in the Action Area	No effect
Insects	Florida leafwing butterfly	*Anaea troglodyta floridalis*	Endangered; Critical Habitat Designated	Unlikely to occur in the Action Area	No effect
Insects	Miami blue butterfly	*Cyclargus (Hemiargus) thomasi bethunebakeri*	Endangered	Unlikely to occur in the Action Area	No effect
Insects	Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	Endangered	Unlikely to occur in the Action Area	No effect

Table H.6. USFWS ESA-listed flowering plant species and critical habitat designations

Common name	Species	Status	Life history	Conclusion
Beach jacquemontia	*Jacquemontia reclinata*	Endangered	- Potentially found on shorelines.	No effect
Big Pine partridge pea	*Chamaecrista lineata keyensis*	Endangered	- Potentially found on shorelines.	No effect
Blodgett's silverbush	*Argythamnia blodgettii*	Threatened	- Potentially found on shorelines in low, moist limestone areas near margins of pine rocklands, sunny edges, and gaps in pine rocklands, rockland hammocks, and coastal berm.	No effect
Cape Sable thoroughwort	*Chromolaena frustrata*	Endangered; Critical Habitat Designated	- Potentially found on shorelines in buttonwood hammocks and coastal hardwood hammocks.	No effect
Carter's mustard	*Warea carteri*	Endangered	- Potentially found on shorelines.	No effect
Carter's small-flowered flax	*Linum carteri carteri*	Endangered	- Potentially found on shorelines.	No effect
Crenulate lead-plant	*Amorpha crenulata*	Endangered	- Potentially found on shorelines.	No effect
Deltoid spurge	*Chamaesyce deltoidea* ssp. *deltoidea*	Endangered	- Potentially found on shorelines.	No effect
Everglades bully	*Sideroxylon reclinatum* ssp. *austrofloridense*	Threatened	- Potentially found on shorelines.	No effect
Florida Brickell-bush	*Brickellia mosieri*	Endangered	- Potentially found on shorelines.	No effect
Florida pineland crabgrass	*Digitaria pauciflora*	Threatened	- Potentially found on shorelines.	No effect
Florida prairie-clover	*Dalea carthagenensis floridana*	Endangered	- Potentially found on shorelines.	No effect
Florida semaphore cactus	*Consolea corallicola*	Endangered; Critical Habitat Designated	- Potentially found on shorelines of Big Pine Key and Upper Keys	No effect
Garber's spurge	*Chamaesyce garberi*	Threatened	- Potentially found on shorelines.	No effect
Key tree cactus	*Pilosocereus robinii*	Endangered	- Potentially found on shorelines.	No effect
Pineland sandmat	*Chamaesyce deltoidea pinetorum*	Threatened	- Potentially found on shorelines.	No effect
Sand flax	*Linum arenicola*	Endangered	- Potentially found on shorelines.	No effect

Common name	Species	Status	Life history	Conclusion
Small's milkpea	*Galactia smallii*	Endangered	- Potentially found on shorelines.	No effect
Tiny polygala	*Polygala smallii*	Endangered	- Potentially found on shorelines.	No effect
Wedge spurge	*Chamaesyce deltoidea serpyllum*	Endangered	- Potentially found on shorelines.	No effect

USFWS Migratory Birds (56)

Key: BCC: USFWS Birds of Conservation Concern

BCR: BCC only in Bird Conservation Region

CON: BCC throughout range

Non-BCC Vulnerable: not BCC but warrants attention due to Eagle Act or from potential offshore activities

Table H.7. USFWS migratory birds

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
American kestrel	*Falco sparverius paulus*	BCC - BCR	Breeds Apr 1 to Aug 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
American oystercatcher	*Haematopus palliatus*	BCC Rangewide (CON)	Breeds Apr 15 to Aug 31	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Arctic tern	*Sterna paradisaea*	Non-BCC Vulnerable	Breeds May 20 to Aug 15	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Rarely	
Audubon's shearwater	*Puffinus lherminieri*	BCC Rangewide (CON)	Breeds Mar 1 to Aug 5	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Rarely	

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Bald eagle	*Haliaeetus leucocephalus*	Non-BCC Vulnerable	Breeds Sep 1 to Jul 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Band-rumped storm-petrel	*Oceanodroma castro*	BCC Rangewide (CON)	Breeds elsewhere	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Rarely	
Black scoter	*Melanitta nigra*	Non-BCC Vulnerable	Breeds elsewhere	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging
Black skimmer	*Rynchops niger*	BCC Rangewide (CON)	Breeds May 20 to Sep 15	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Black-legged kittiwake	*Rissa tridactyla*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Black-whiskered vireo	*Vireo altiloquus*	BCC - BCR	Breeds May 1 to Aug 15	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Bonaparte's gull	*Chroicocephalus philadelphia*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Bridled tern	*Onychoprion anaethetus*	Non-BCC Vulnerable	Breeds Apr 15 to Sep 20	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Brown pelican	*Pelecanus occidentalis*	Non-BCC Vulnerable	Breeds Jan 15 to Sep 30	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging, breeding
Clapper rail	*Rallus crepitans*	BCC - BCR	Breeds Apr 10 to Oct 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Common ground-dove	*Columbina passerina exigua*	BCC - BCR	Breeds Feb 1 to Dec 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Common loon	*Gavia immer*	Non-BCC Vulnerable	Breeds Apr 15 to Oct 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Common tern	*Sterna hirundo*	Non-BCC Vulnerable	Breeds May 10 to Sep 10	- May be found on shorelines and over open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Cory's shearwater	*Calonectris diomedea*	Non-BCC Vulnerable	Breeds elsewhere	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging
Double-crested cormorant	*Phalacrocorax auritus*	Non-BCC Vulnerable	Breeds Apr 20 to Aug 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging, breeding
Dunlin	*Calidris alpina arcticola*	BCC - BCR	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Great black-backed gull	*Larus marinus*	Non-BCC Vulnerable	Breeds Apr 15 to Aug 20	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging
Great shearwater	*Puffinus gravis*	Non-BCC Vulnerable	Breeds elsewhere	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging
Herring gull	*Larus argentatus*	Non-BCC Vulnerable	Breeds Apr 20 to Aug 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging
Least tern	*Sterna antillarum*	BCC - BCR	Breeds Apr 20 to Sep 10	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Lesser yellowlegs	*Tringa flavipes*	BCC Rangewide (CON)	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Limpkin	*Aramus guarauna*	BCC Rangewide (CON)	Breeds Jan 15 to Aug 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Magnificent frigatebird	*Fregata magnificens*	BCC Rangewide (CON)	Breeds Oct 1 to Apr 30	- May be found on shorelines and over open water in the sanctuary. - Minimal disturbance from management activities.	Frequently	Resting, foraging, breeding
Mangrove cuckoo	*Coccyzus minor*	BCC Rangewide (CON)	Breeds Apr 20 to Aug 20	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Manx shearwater	*Puffinus puffinus*	Non-BCC Vulnerable	Breeds Apr 15 to Oct 31	- May be found over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging
Nelson's sparrow	*Ammodramus nelsoni*	BCC Rangewide (CON)	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Northern gannet	*Morus bassanus*	Non-BCC Vulnerable	Breeds elsewhere	- May be found in and over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging
Parasitic jaeger	*Stercorarius parasiticus*	Non-BCC Vulnerable	Breeds elsewhere	- May be found in and over open water in the sanctuary. - Minimal disturbance from management activities.	Rarely	
Pomarine jaeger	*Stercorarius pomarinus*	Non-BCC Vulnerable	Breeds elsewhere	- May be found in and over open water in the sanctuary. - Minimal disturbance from management activities.	Rarely	
Prairie warbler	*Dendroica discolor*	BCC Rangewide (CON)	Breeds May 1 to Jul 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Rarely	
Prothonotary warbler	*Protonotaria citrea*	BCC Rangewide (CON)	Breeds Apr 1 to Jul 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Rarely	
Razorbill	*Alca torda*	Non-BCC Vulnerable	Breeds Jun 15 to Sep 10	- May be found in and over open water in the sanctuary. - Minimal disturbance from management activities.	Rarely	
Red-breasted merganser	*Mergus serrator*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Rarely	

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Red-necked phalarope	*Phalaropus lobatus*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Rarely	
Reddish egret	*Egretta rufescens*	BCC Rangewide (CON)	Breeds Mar 1 to Sep 15	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Ring-billed gull	*Larus delawarensis*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging
Roseate tern	*Sterna dougallii*	Non-BCC Vulnerable	Breeds May 10 to Aug 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging
Royal tern	*Thalasseus maximus*	Non-BCC Vulnerable	Breeds Apr 15 to Aug 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging
Ruddy turnstone	*Arenaria interpres morinella*	BCC - BCR	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Semipalmated sandpiper	*Calidris pusilla*	BCC Rangewide (CON)	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Short-billed dowitcher	*Limnodromus griseus*	BCC Rangewide (CON)	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Short-tailed hawk	*Buteo brachyurus*	BCC - BCR	Breeds Mar 1 to Jun 30	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Smooth-billed ani	*Crotophaga ani*	BCC - BCR	Breeds Jan 1 to Dec 31	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Sooty tern	*Onychoprion fuscatus*	Non-BCC Vulnerable	Breeds Mar 10 to Jul 31	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Surf scoter	*Melanitta perspicillata*	Non-BCC Vulnerable	Breeds elsewhere	- May be found on shorelines and in open water in the sanctuary. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Swallow-tailed kite	*Elanoides forficatus*	BCC Rangewide (CON)	Breeds Mar 10 to Jun 30	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Whimbrel	*Numenius phaeopus*	BCC Rangewide (CON)	Breeds elsewhere	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
White-crowned pigeon	*Patagioenas leucocephala*	BCC Rangewide (CON)	Breeds May 1 to Sep 30	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Frequently	Resting, foraging, breeding
Willet	*Tringa semipalmata*	BCC Rangewide (CON)	Breeds Apr 20 to Aug 5	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Wilson's plover	*Charadrius wilsonia*	BCC Rangewide (CON)	Breeds Apr 1 to Aug 20	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging
Wilson's storm-petrel	*Oceanites oceanicus*	Non-BCC Vulnerable	Breeds elsewhere	- May be found in and over open water in the sanctuary. - Minimal disturbance from management activities.	Occasionally	Resting, foraging

Common name	Species	Status	Notes on range and effects	Probability of effect	Frequency of onsite observations	Onsite habitat use
Yellow warbler	*Dendroica petechia gundlachi*	BCC - BCR	Breeds May 20 to Aug 10	- May be found on shorelines and may occur in transit over open water between coastal islands. - Actions would be mostly beneficial to reduce disturbance; minimal disturbance from management activities.	Occasionally	Resting, foraging

NMFS ESA-listed Species & Critical Habitat Designations

Threatened, endangered, and imperiled species

https://www.fisheries.noaa.gov/southeast/consultations/florida-atlantic-coast

https://www.fisheries.noaa.gov/southeast/consultations/florida-gulf-coast

Critical Habitat

https://sero.nmfs.noaa.gov/maps_gis_data/protected_resources/critical_habitat/index.html

Table H.8. NMFS ESA-listed marine mammal species and critical habitat designations

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Blue whale	*Balaenoptera musculus*	Endangered	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect
Fin whale	*Balaenoptera physalus*	Endangered	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect
North Atlantic right whale	*Eubalaena glacialis*	Endangered	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect
Sei whale	*Balaenoptera borealis*	Endangered	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Sperm whale	*Physeter macrocephalus*	Endangered	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect

Table H.9. NMFS ESA-listed sea turtle species and critical habitat designations

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Green sea turtle	*Chelonia mydas*	Threatened: Critical Habitat Designated	May be found on beaches nesting or hatching or transiting and foraging in open water.	- Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	May be found on beaches nesting or hatching or transiting and foraging in open water.	- Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	May be found on beaches nesting or hatching or transiting and foraging in open water.	- Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	May be found on beaches nesting or hatching or transiting and foraging in open water.	- Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Loggerhead sea turtle	*Caretta caretta*	Threatened; Critical Habitat Designated	May be found on beaches nesting or hatching, or transiting and foraging in open water. FKNMS contains critical habitat for this species.	- Actions would be mostly beneficial to reduce negative effects from commercial activities and disturbance of nesting beaches; minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect

Table H.10. NMFS ESA-listed fish species and critical habitat designations

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	Endangered	This species is known or believed to occur in Monroe County, but there is limited estuarine habitat for juveniles or spawning adults in FKNMS.	- FKNMS actions would be mostly beneficial to reduce disturbance. There would be minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered	This species is commonly found in rivers and estuaries of the East Coast, but is uncommon in South Florida.	- FKNMS actions would not affect this species.	No effect
Atlantic sturgeon	*Acipenser oxyrinchus oxyrinchus*	Endangered	This species is commonly found in rivers and estuaries of the East Coast, but is uncommon in South Florida.	- FKNMS actions would not affect this species.	No effect

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Smalltooth sawfish	*Pristis pectinata*	Endangered	May be found in nearshore mangrove and seagrass habitats. FKNMS contains critical habitat for this species.	- FKNMS actions would be mostly beneficial to reduce disturbance. There would be minimal disturbance from management activities. - Management activities by vessel would be conducted to reduce strikes.	May affect, not likely to adversely affect
Nassau grouper	*Epinephelus striatus*	Threatened; Critical Habitat Proposed	May be found in coral reef and seagrass habitats.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Oceanic whitetip shark	*Carcharhinus longimanus*	Threatened	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect
Giant manta ray	*Manta birostris*	Threatened	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect
Scalloped hammerhead shark	*Sphyrna lewini*	Threatened	May be found transiting and foraging in open water.	- Actions would be mostly beneficial to reduce disturbance from commercial activities and to protect water quality; minimal disturbance and risk of adverse impacts from vessel strikes from management activities.	May affect, not likely to adversely affect

Table H.11. NMFS ESA-listed invertebrate species and critical habitat designations

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Pillar coral	*Dendrogyra cylindrus*	Threatened; Proposed Endangered; Critical Habitat Designated	This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Rough cactus coral	*Mycetophyllia ferox*	Threatened; Critical Habitat Designated	This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Lobed star coral	*Orbicella annularis*	Threatened; Critical Habitat Designated	This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Mountainous star coral	*Orbicella faveolata*	Threatened; Critical Habitat Designated	This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Boulder star coral	*Orbicella franksi*	Threatened; Critical Habitat Designated	This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect

Common name	Species	Status	Life history and habitat requirements	Potential Effects	Conclusion
Elkhorn coral	*Acropora palmata*	Threatened; Critical Habitat Designated	- This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current. - Critical Habitat: One area in the Dry Tortugas; two areas on the Atlantic side of the Keys: one from Key West National Wildlife Refuge to Dania Beach and one from Port Everglades to Boynton Inlet.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Staghorn coral	*Acropora cervicornis*	Threatened; Critical Habitat Designated	- This species may be found on reef and hardbottom habitats within FKNMS, mostly on the Atlantic side of the Florida Keys in proximity to the warm, low nutrient waters of the Florida Current. - Critical Habitat: One area in the Dry Tortugas; two areas on the Atlantic side of the Keys: one from Key West National Wildlife Refuge to Dania Beach and one from Port Everglades to Boynton Inlet.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect
Queen conch	*Strombus gigas*	Threatened	Queen conch use different habitat types including seagrass beds, sand flats, algal beds, and rubble areas from a few centimeters deep to approximately 30 meters.	- FKNMS actions would be mostly beneficial to protect habitat and water quality. - There would be minimal disturbance from management activities.	May affect, not likely to adversely affect

Essential Fish Habitat

AHMS: Atlantic Highly Migratory Species

GMFMC: Gulf of Mexico Fishery Management Council

SAFMC: South Atlantic Fishery Management Council

MAFMC: Mid-Atlantic Fishery Management Council

Table H.12. Essential fish habitat

Species: Common name	Lifestage	Region
Atlantic sharpnose shark (Gulf of Mexico stock)	Juvenile/Adult	AHMS
Atlantic sharpnose shark (Gulf of Mexico stock)	ALL	AHMS
Bigeye thresher shark	ALL	AHMS
Bigeye tuna	ALL	AHMS
Bigeye tuna	Juvenile	AHMS
Blacknose shark (Gulf of Mexico stock)	ALL	AHMS
Blacknose shark (Gulf of Mexico stock)	Juvenile/Adult	AHMS
Blacknose shark (Gulf of Mexico stock)	Neonate	AHMS
Blacktip shark (Atlantic stock)	Juvenile/Adult	AHMS
Blacktip shark (Atlantic stock)	ALL	AHMS
Blacktip shark (Gulf of Mexico stock)	Juvenile/Adult	AHMS
Blacktip shark (Gulf of Mexico stock)	Neonate	AHMS
Blacktip shark (Gulf of Mexico stock)	ALL	AHMS
Blue marlin	Adult	AHMS
Blue marlin	ALL	AHMS
Blue marlin	Spawning adults	AHMS
Blue marlin	Juvenile	AHMS
Bluefin tuna	ALL	AHMS
Bluefin tuna	Spawning adults, eggs, larvae	AHMS
Bluefish	Juvenile	MAFMC
Bluefish	Eggs	MAFMC
Bluefish	Adult	MAFMC
Bluefish	ALL	MAFMC
Bluefish	Larvae	MAFMC
Bonnethead shark (Gulf of Mexico stock)	Juvenile	AHMS
Bonnethead shark (Gulf of Mexico stock)	ALL	AHMS

Species: Common name	Lifestage	Region
Bonnethead shark (Gulf of Mexico stock)	Adult	AHMS
Bonnethead shark (Gulf of Mexico stock)	Neonate	AHMS
Bull shark	Juvenile/Adult	AHMS
Bull shark	ALL	AHMS
Bull shark	Neonate	AHMS
Caribbean reef shark	ALL	AHMS
Coastal migratory pelagics	ALL	SAFMC
Coastal migratory pelagics	ALL	GMFMC
Corals	ALL	SAFMC
Corals	ALL	GMFMC
Great hammerhead shark	ALL	AHMS
Lemon shark	Adult	AHMS
Lemon shark	ALL	AHMS
Lemon shark	Juvenile	AHMS
Lemon shark	Neonate	AHMS
Longbill spearfish	ALL	AHMS
Longfin mako shark	ALL	AHMS
Night shark	ALL	AHMS
ALL	ALL	AHMS
AHMS	ALL	AHMS
Nurse shark	Juvenile/Adult	AHMS
Nurse shark	ALL	AHMS
Red drum	ALL	GMFMC
Reef fish	ALL	GMFMC
Sailfish	Juvenile	AHMS
Sailfish	ALL	AHMS
Sailfish	Spawning adults, eggs, larvae	AHMS
Sailfish	Adult	AHMS
Sandbar shark	ALL	AHMS
Sandbar shark	Adult	AHMS
Scalloped hammerhead shark	ALL	AHMS
Scalloped hammerhead shark	Juvenile/Adult	AHMS

Species: Common name	Lifestage	Region
Shortfin mako shark	ALL	AHMS
Shrimp	ALL	GMFMC
Silky shark	ALL	AHMS
Skipjack tuna	Juvenile	AHMS
Skipjack tuna	ALL	AHMS
Skipjack tuna	Spawning adults, eggs, larvae	AHMS
Skipjack tuna	Adult	AHMS
Smoothhound shark complex (Gulf of Mexico stock)	ALL	AHMS
Snapper grouper	ALL	SAFMC
Spinner shark	Neonate	AHMS
Spinner shark	ALL	AHMS
Spiny lobster	ALL	SAFMC
Spiny lobster	ALL	GMFMC
Swordfish	ALL	AHMS
Swordfish	Adult	AHMS
Swordfish	Spawning adults, eggs, larvae	AHMS
Swordfish	Juvenile	AHMS
Tiger shark	ALL	AHMS
Tiger shark	Juvenile/Adult	AHMS
Tiger shark	Neonate	AHMS
Whale shark	ALL	AHMS
White marlin	ALL	AHMS
White marlin	Adult	AHMS
White marlin	Juvenile	AHMS
Yellowfin tuna	ALL	AHMS
Yellowfin tuna	Spawning adults, eggs, larvae	AHMS

State of Florida Species

Table H.13. State-designated threatened or endangered fish species

Common name	Species	Status	Range	Occurrence
Blackmouth shiner	*Notropis melanostomus*	State-designated Threatened	Yellow, Shoal, and Blackwater rivers, and Pond Creek	Not expected to occur in FKNMS
Bluenose shiner	*Pteronotropis welaka*	State-designated Threatened	St. Johns River basin and the western panhandle	Not expected to occur in FKNMS
Crystal darter	*Crystallaria asprella*	State-designated Threatened	Inhabits rivers with modest current, sandy riffles, and a sand/gravel bottom of medium to large size streams (Escambia River)	Not expected to occur in FKNMS
Key silverside	*Menidia conchorum*	State-designated Threatened	- Inhabits protected saline lagoons and ponds with restricted tidal exchange - Endemic to the Lower and Middle Keys, documented in lagoons on Long, Grassy, Big Pine, No Name, Little Torch, Cudjoe, Sugarloaf, Saddle Bunch, and Rockland keys; Boca Chica, and Key West.	
Saltmarsh topminnow	*Fundulus jenkinsi*	State-designated Threatened	Extreme western portion of the Florida panhandle	Not expected to occur in FKNMS
Southern tessellated darter	*Etheostoma olmstedi maculaticeps*	State-designated Threatened	St. Johns River	Not expected to occur in FKNMS

Table H.14. State-designated threatened or endangered amphibian species

Common name	Species	Status	Range	Occurrence
Florida bog frog	*Lithobates okaloosae*	State-designated Threatened	Walton, Okaloosa, and Santa Rosa counties	Not expected to occur in FKNMS
Georgia blind salamander	*Eurycea wallacei*	State-designated Threatened	Jackson, Washington, and Calhoun counties	Not expected to occur in FKNMS
Striped newt	*Notophthalmus perstriatus*	State-designated Threatened	North Central Florida	Not expected to occur in FKNMS

Table H.15. State-designated threatened or endangered reptile species

Common name	Species	Status	Range	Occurrence
Barbour's map turtle	*Graptemys barbouri*	State-designated Threatened	Aucilla, Ochlockonee, Apalachicola, Chipola, and Choctawhatchee rivers	Not expected to occur in FKNMS

Common name	Species	Status	Range	Occurrence
Florida brown snake	*Storeria victa*	State-designated Threatened	- Only the Lower Keys population is state-designated Threatened - Inhabit hardwood hammocks in the Lower Keys on Big Pine, Little Torch, Middle Torch, No Name, and Sugarloaf keys.	
Florida Keys mole skink	*Plestiodon egregius egregius*	State-designated Threatened	Inhabits sandy areas under rocks, leaf litter, and tidal wracks (line of washed-up vegetation on the beach that consists of dead seaweed and marsh grass). This species can be found in the Florida Keys in Dry Tortugas, Key West, Stock Island, Middle Torch Key, Big Pine Key, Key Vaca, Grassy Key, Upper Matecumbe Key, Indian Key, and Key Largo.	
Florida pine snake	*Pituophis melanoleucus mugitus*	State-designated Threatened	Inhabits dry upland habitats with well-drained sandy soils. They use burrows of other animals, most notably those of pocket gophers.	Not expected to occur in FKNMS
Gopher tortoise	*Gopherus polyphemus*	State-designated Threatened	Prefer well-drained, sandy soils found in habitats such as longleaf pine sandhills, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes.	
Key ringneck snake	*Diadophis punctatus acricus*	State-designated Threatened	Inhabits tropical hardwood hammocks and scrub. This species is restricted to the Lower Keys and has been found on Key West and Big Pine, Little Torch, Middle Torch, and No Name keys.	
Rim rock crowned snake	*Tantilla oolitica*	State-designated Threatened	- Inhabits pine rockland and tropical hardwood hammocks near fresh water. They can be found in holes and depressions in the oolitic limestone, but they can also be found periodically in rotten logs, under rocks and trash - Various localities in Miami - Also occurs in the Upper, Middle, and Lower keys.	
Short-tailed snake	*Lampropeltis extenuate*	State-designated Threatened	- In sandy soils, particularly longleaf pine and xeric oak sandhills, scrub, and xeric hammock habitats - Only from the Suwannee River south to Highlands County	Not expected to occur in FKNMS
Suwannee alligator snapping turtle	*Marcochelys suwanniensis*	State-designated Threatened	Can be found in the Panhandle and Big Bend regions, from the Escambia River east to the Suwannee River	Not expected to occur in FKNMS

Table H.16. State-designated threatened or endangered bird species

Common name	Species	Status	Range	Occurrence
American oystercatcher	*Haematopus palliatus*	State-designated Threatened	Inhabits beaches, sandbars, spoil islands, shell rakes, salt marsh, and oyster reefs	
Black skimmer	*Rynchops niger*	State-designated Threatened	Inhabits coastal areas in Florida such as estuaries, beaches, and sandbars	
Florida burrowing owl	*Athene cunicularia floridana*	State-designated Threatened	Inhabits open prairies in Florida that have very little understory vegetation	
Florida sandhill crane	*Antigone canadensis pratensis*	State-designated Threatened	Inhabits freshwater marshes, prairies, and pastures	Not expected to occur in FKNMS
Least tern	*Sternula antillarum*	State-designated Threatened	Inhabits estuaries and bays	
Little blue heron	*Egretta caerulea*	State-designated Threatened	Inhabits fresh, salt, and brackish water environments, including swamps, estuaries, ponds, lakes, and rivers	
Marian's marsh wren	*Cistothorus palustris marianae*	State-designated Threatened	Inhabits marshes dominated by black needle rush (*Juncus roemarianus*) and cordgrass (*Spartina alterniflora*) from Pasco to Escambia County	Not expected to occur in FKNMS
Reddish egret	*Egretta rufescens*	State-designated Threatened	Inhabits estuaries near mangroves and lagoons	
Roseate spoonbill	*Platalea ajaja*	State-designated Threatened	Florida Bay	
Scott's seaside sparrow	*Ammodramus maritimus peninsulae*	State-designated Threatened	Inhabits tidal marshes in Florida. Scott's seaside sparrow can be found from Pasco County to Pepperfish Keys in Dixie County.	Not expected to occur in FKNMS
Snowy plover	*Charadrius nivosus*	State-designated Threatened	Inhabits sandy beaches	
Southeastern American kestrel	*Falco sparverius paulus*	State-designated Threatened	Found in open pine savannahs, sandhills, prairies, and pastures	
Tricolored heron	*Egretta tricolor*	State-designated Threatened	Inhabits fresh and saltwater marshes, estuaries, mangrove swamps, lagoons, and river deltas	
Wakulla seaside sparrow	*Ammodramus maritimus juncicola*	State-designated Threatened	Can be found in tidal marshes from Taylor County to St. Andrews Bay	Not expected to occur in FKNMS

Common name	Species	Status	Range	Occurrence
White-crowned pigeon	*Patagioenas leucocephala*	State-designated Threatened	Inhabits low-lying forest habitats with ample fruiting trees, including Florida Bay, Biscayne Bay, and Florida Keys	
Worthington's marsh wren	*Cistothorus palustris griseus*	State-designated Threatened	Inhabit tidal marshes dominated by cordgrass (*Spartina alterniflora*) and are found from the St. Mary's/Cumberland Island Sound, to the northern edge of the St. Johns River	Not expected to occur in FKNMS

Table H.17. State-designated threatened or endangered mammal species

Common name	Species	Status	Range	Occurrence
Big Cypress fox squirrel	*Sciurus niger avicennia*	State-designated Threatened	Found in open woods, pine and cypress stands, and mangrove swamps in Lee County to the southern part of Dade	
Everglades mink	*Neovison vison evergladensis*	State-designated Threatened	Can be found in both fresh and salt water marsh habitats in the Everglades and Big Cypress	
Sanibel Island rice rat	*Oryzomys palustris sanibeli*	State-designated Threatened	Can be found in coastal marshes, hydric hammocks, swamps, and freshwater marshes and meadows; found only on Sanibel Island	Not expected to occur in FKNMS
Sherman's short-tailed shrew	*Blarina shermani*	State-designated Threatened	Inhabits dense, herbaceous habitats and moist forests, including mixed wetland forests, mixed hardwood-pine forests, ditches, and disturbed/transitional habitat; found in Collier and Lee counties	Not expected to occur in FKNMS

Table H.18. State-designated threatened or endangered invertebrate species

Common name	Species	Status	Range	Occurrence
Black Creek crayfish	*Procambarus pictus*	State-designated Threatened	Inhabits tannic stained streams where they can be found taking refuge under tree roots and in vegetation; found in St. Johns, Duval, Clay, and Putnam counties	Not expected to occur in FKNMS
Santa Fe cave crayfish	*Procambarus erythrops*	State-designated Threatened	Inhabits groundwater areas in caves and sinkholes in southern Suwannee and southwestern Columbia counties	Not expected to occur in FKNMS

Appendix I:
Located Historical Resources and Historically Reported Vessel Losses

Located Historical Resources in Florida Keys National Marine Sanctuary

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	140' Depth Barge	Pickles Reef			No
Located Site	1800s Wreck	Quicksands, West of Marquesas Keys		MO06700	No
Located Site	7-Mile Bridge Barge Wreck	Moser Channel			Yes
Located Site	7-Mile Bridge Moser Channel Swing Bridge (Artificial Reef)	SW of Sombrero Key			No
Located Site	*Acorn*	Elbow Reef	1885		No
Located Site	*Adelaide Baker*	Coffins Patch, 4 miles SSE of Duck Key	1889	MO02536	No
Located Site	Alexander Barge	Between Crocker Reef and Alligator Reef		MO01305	No
Historic Structure	Alligator Reef Lighthouse	Alligator Reef	1873	MO01259	No
Located Site	*Alligator*, USS (potential)	SE of Alligator Reef Light	1822	MO00173	No
Located Site	*Almiranta/El Gallo Indiano*	Off Long Key	1733	MO00178	Yes
Historic Structure	American Shoal Lighthouse	American Shoal	1880	MO01295	No
Located Site	American Shoal Schooner Wreck	American Shoal		MO01132	Yes
Located Site	*Amesbury*, USS	5 miles west of Key West, Gulf side	1962	MO06611	Yes
Located Site	*Arbutus*, USLHT	Quicksands, West of Marquesas Keys		MO06705	Yes
Located Site	Bahia Honda Ballast Stone Pile	Bahia Honda Key		MO01887	Yes
Located Site	Bahia Honda Wreck	Bahia Honda Key		MO01196	Yes
Located Site	Barbara	North End of Key Largo		MO02050	Yes
Located Site	Barrel Wreck	Lower Matecumbe Key			Yes
Located Site	Benny's Wreck	Dixie Shoal			No
Located Site	*Benwood*	Between French Reef and Dixie Shoals	1942	MO02662	No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	*Bibb*, USCGC (Artificial Reef)	Off Molasses Reef	1987	MO01311	No
Located Site	Bittner's Wreck	Rodriguez Key			Yes
Located Site	Boca Chica Ballast Pile	South of Boca Chica Key		MO02349	Yes
Located Site	Boca Chica PV-1 Aircraft	South of Boca Chica Key		MO02348	Yes
Located Site	Boca Grande Wreck - Small	Boca Grande		MO06708	Yes
Located Site	Boiler Patch Steam Freighter	South of Duck Key			No
Located Site	BonVont Wreck	Quicksands			No
Located Site	Brass Wreck	Molasses Reef		MO01331	No
Located Site	Brick Barge	Hen and Chickens Reef		MO01308	Yes
Located Site	Brick Wreck	Tavernier		MO01323	Yes
Located Site	Bridge Rubble	Upper Matecumbe Key		MO01340	No
Located Site	Bronze Cannon Wreck	American Shoal			Yes
Located Site	Bronze Pin Wreck	Molasses Reef		MO01328	No
Located Site	Bronze Wreck	Turtle Shoal			Yes
Located Site	Bunn Cannon Patch	Carysfort Reef		MO03228	No
Located Site	Buried Ballast Wreck	Whale Harbor Bridge			Yes
Located Site	Button Wreck	Carysfort Reef			No
Located Site	Cable Wreck	Dixie Shoal			No
Located Site	Cannabis Trawler	South of Alligator Reef		MO01303	No
Located Site	*Capitana/El Rubí Segundo*	Off Key Largo, near Davis Reef	1733	MO00146	No
Historic Structure	Carysfort Reef Lighthouse	Carysfort Reef	1852	MO01980	No
Located Site	Carysfort Lighthouse Materials	Carysfort Reef			No
Located Site	*Cayman Salvage Master* (Artificial Reef)	Offshore Key West Shipping Channel	1985		No
Located Site	C-D Wreck	Carysfort Reef			No
Located Site	Cement Barrel Wreck/Unidentified Shipwreck D	Pickles Reef		MO01316	No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	*Charles W. Baird*	Inshore of Carysfort Reef	1930		No
Located Site	*Chaves*	Off Islamorada, at the intersection of Snake Creek and Hawk Channel	1733	MO00102	Yes
Located Site	*City of Washington*	Elbow Reef	1917	MO02663	No
Located Site	Coin Wreck	Plantation Key		MO00253	Yes
Located Site	*Columbus Iselin* Grounding Wreck Site	Looe Key Reef			No
Located Site	Copper Clad Wreck	Quicksands		MO06706	No
Located Site	Copper Wreck	Carysfort Reef			No
Located Site	*Coral*, USS	Boca Grande	1948	MO06709	Yes
Historic Structure	Cosgrove Shoal Light	Cosgrove Shoal. SW of Marquesas Keys	1935	MO01443	No
Located Site	CR Wreck	Crocker Reef			No
Located Site	*Curb*, USS (Artificial Reef)	South of Key West	1983		No
Located Site	D & B Barge Wreck	Between Crocker Reef and Alligator Reef		MO01306	No
Located Site	Delta A Wreck	Delta Shoal			No
Located Site	Delta B Wreck	Delta Shoal			No
Located Site	Delta Shoal Barge	Delta Shoal			Yes
Located Site	Delta Shoal Steel Wreck	Southwest Delta Shoal			No
Located Site	Gudgeon Wreck	Vicinity of Rodriquez Key		MO01321	Yes
Located Site	Dixie Shoals Cannon Wreck	Dixie Shoals		MO03274	No
Located Site	Dominguez Wreck	Quicksands		MO06701	No
Located Site	*Duane*, USCGC (Artificial Reef)	Off Molasses Reef	1987	MO01310	No
Located Site	Eagle (Artificial Reef)	3 miles northeast of Alligator Reef Light	1985	MO01304	No
Located Site	Eagle-Class PE-19, USS	North of Marquesas Keys	1946	MO06699	Yes
Located Site	*El Infante/N. S. de Balvenada*	Little Conch Reef	1733	MO00092	No
Located Site	*El Sueco de Arizon*	Off Conch Key	1733	MO00132	Yes
Located Site	*El Terri/San Felipe*	Off Lower Matecumbe Key	1733	MO00133	Yes

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Elbow Ballast Wreck	Elbow Reef			No
Located Site	Eurisco Wreck	Off Alligator Reef			No
Located Site	*Excelsior*	French Reef	1879		No
Located Site	F.H.S.T. Wreck	French Reef			No
Located Site	Fishing Camp Foundation	Upper Matecumbe Key		MO01309	Yes
Located Site	French Reef Wreck 2	French Reef		MO03398	No
Located Site	Flagler Shipping Docks	Marathon End of 7 Mile Bridge	1906		Yes
Located Site	Fleming Key Wreck	Fleming Key		MO02158	Yes
Located Site	*Fly*, HMS	Shoreward side of Little Conch Reef	1805	MO01326	No
Located Site	Gear Wreck/ Scattered Pickles Reef Wreckage	Pickles Reef		MO01333	No
Located Site	Granite Block Wreck	Conch Reef			No
Located Site	Granite Block Barge	French Reef			No
Located Site	Granite Wreck	Conch Reef		MO00148	Yes
Located Site	Grassy Key Bronze Pin Wreck	Grassy Key		MO01879	Yes
Located Site	Grassy Key Canoe	Grassy Key		MO03448	Yes
Located Site	*Guerrero* (Potential)	Turtle Reef/Ocean Reef	1827	MO02343	Yes
Located Site	Halas Ballast	Carysfort Reef			No
Located Site	*Hannah M. Bell*	Elbow Reef	1911	MO02353	No
Located Site	Hawk Channel Schooner Wreck	South of Rodriquez Key		MO01320	Yes
Historic Structure	Hen and Chickens Light	Hen and Chickens Reef	1935		Yes
Located Site	*Henrietta Marie*	New Ground Reef north of the Marquesas Keys	1700	MO00130	No
Located Site	*Herrera/N. S. de Belem y San Antonio de Padua*	East of Matecumbe Key	1733	MO00090	Yes
Located Site	Honey Dipper Wreckage	Pickles Reef			No
Located Site	Horseshoe Reef Wreck	Horseshoe Reef			No
Located Site	*Hoyt S. Vandenberg*, USNS (Artificial Reef)				No
Located Site	Indian Key Anchorage	Indian Key		MO01335	Yes

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Indian Key Wreck	Indian Key		MO01327	Yes
Located Site	Iron Ballast Wreck 1	Near Pickles Reef		MO00151	No
Located Site	Iron Bar Wreck	Watson's Reef			No
Located Site	Iron Masted Schooner	Between Alligator Reef and Crocker Reef		MO01324	No
Located Site	Iron Slab Wreckage	French Reef			No
Located Site	Ivory Wreck	Delta Shoal		MO00136	No
Located Site	Kearns Wreck	Conch Reef		MO01334	Yes
Located Site	Key Colony Beach Brick Wreck	Off Marathon		MO01881	Yes
Located Site	Kimbel's Wreck	Tavernier Harbor			Yes
Located Site	Knight Key Pier	Knight Key		MO00140	Yes
Located Site	Knob Wreck	Alligator Reef			No
Located Site	Laddy's Wreck	White Bank			No
Located Site	Landing Craft Infantry, Target Ship	West of Marquesas Keys	1970	MO06702	Yes
Located Site	Landing Craft Infantry, Target Ship	West of Marquesas Keys	1970	MO06703	Yes
Located Site	*Laramie River*, USS	Offshore of Key West Ship Channel	1983		No
Located Site	Little Conch Reef Wreck	Tavernier Key			Yes
Located Site	Liz's Wreck	White Bank Dry Rocks			No
Located Site	Long Key Dock Piers	Long Key		MO01472	Yes
Located Site	*Loo*, HMS	Looe Key	1744	MO00199	No
Located Site	M-13 Wreckage/*Slobodna*	Molasses Reef	1887		No
Located Site	Maitland Wreck I/A	Carysfort Reef			No
Located Site	Maitland Wreck II/B	Carysfort Reef			No
Located Site	*Major Archibald Butt*	Entrance to Garden Cove			Yes
Located Site	*Marie J. Thompson*	Key West Harbor	1935		Yes
Located Site	Marker 39 Shipwreck	Tavernier, Rodrigues Key		MO01931	Yes
Located Site	MAST	Dixie Shoal			No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Mast Wreck	French Reef			No
Located Site	*Menemon Sanford*	3 miles from Carysfort Reef Light	1862	MO02342	No
Located Site	Metal Wreck	Little Conch Reef			No
Historic Structure	Molasses Reef Light	Molasses Reef			No
Located Site	Muir Wreck/Boca Chica Channel Wreck	Boca Chica Key		MO01448	Yes
Located Site	Mystery Wreck	Key Colony Beach		MO00143	Yes
Located Site	North French Reef Wreck Site	French Reef			No
Located Site	Nickerson Wreck	Grecian Rocks			No
Located Site	*Nimble*, HMS, Anchor (Potential)	Turtle Reef/Ocean Reef	1827	MO02345	Yes
Located Site	*Nimble*, HMS, Ballast (Potential)	Turtle Reef/Ocean Reef	1827	MO02344	Yes
Located Site	Cannon Patch	Cannon Patch Reef, JPCRSP		MO00144	Yes
Located Site	NN Wreck	Little Conch Reef		MO00150	No
Located Site	NN Wreck	Indian Key		MO00149	Yes
Located Site	NN Wreck	Sombrero Key		MO00138	No
Located Site	NN Wreck	East of Looe Key		MO00174	No
Located Site	NN Wreck	Man Key		MO00145	Yes
Located Site	NN Wreck	Mooney Harbor Key, Marquesas Keys		MO00256	Yes
Located Site	*North America*	Delta Shoal, just east of Sombrero Light	1842	MO06610	Yes
Located Site	Northeast Ballast Wreck	Molasses Reef			No
Located Site	*Northern Light*	Off Elbow Reef	1930		No
Located Site	*Nuestra Señora de Atocha*	Quicksands, West of Marquesas Keys	1622	MO00141	No
Located Site	NW Turtle Wreck	Turtle Reef			Yes
Located Site	Ore Ballast Wreck	Pickles Reef		MO01332	No
Located Site	Penny's Wreck	Conch Reef			Yes
Located Site	Pickles Bar Wreck	Pickles Reef			No
Located Site	Pickles Rib Wreck	Pickles Reef			No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Pigeon Key Railroad Wreck	Narrow Channel, Northeast side of Pigeon Key	1906	MO01195	Yes
Located Site	Pillar Coral Wreck	Pickles Reef			No
Located Site	Pinder Rigging Site	Watsons Reef			No
Located Site	Porter Anchor Wreck	Dixie Shoal			No
Located Site	Pyramid Wreck	Carysfort Reef			No
Located Site	*Queen of Nassau*	Off Alligator Reef	1926	MO03620	No
Located Site	Real Kearns Wreck	Conch Reef			Yes
Located Site	Rebecca Shoal Barge Wreck	Rebecca Shoal			No
Located Site	Rebecca Shoal Iron Wreckage	Rebecca Shoal			No
Located Site	Rib Wreck	Vaca Key		MO01880	Yes
Located Site	Ribs Bare Wreck	Fleming Key			Yes
Located Site	Ridge Wreck	Carysfort Reef			No
Located Site	R-J Wreck	Carysfort Reef			No
Located Site	Rodriguez Key/Rock Harbor Anchorage	Rodriguez Key		MO01338	Yes
Located Site	*Rosalee*	Plantation Key	1964	MO01312	Yes
Located Site	Ruiz Wreckage	Alligator Reef			Yes
Located Site	Rum Runner Wreck	Vicinity of Rodriquez Key		MO01322	Yes
Located Site	S-*16*, USS Submarine	14 Miles South Southwest of Key West	1945		No
Located Site	*San Fernando*	Coffins Patch	1733	MO00137	Yes
Located Site	*San Francisco*	Off Long and Craig Keys	1733	MO00091	Yes
Located Site	*San José y Las Animas*	Off Tavernier Key	1733	MO00101	Yes
Located Site	*San Pedro*	Off Lower Matecumbe Key	1733	MO00104	Yes
Located Site	*San Rafael/N. S. de las Angustias*	Long Key Channel	1733	MO00131	Yes
Historic Structure	Sand Key Lighthouse	Sand Key	1853	MO00221	Yes
Located Site	*Santa Margarita*	Quicksands	1622	MO03397	No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Schooner Wreck	Molasses Reef		MO01329	No
Located Site	Seal's Wreck	French Reef			No
Located Site	Seaquarium	Grecian Reef			No
Located Site	Shallow Wreck	Pickles Reef			No
Located Site	Sheen Wreck	Tavernier Harbor			Yes
Located Site	Sheen Wreck	Alligator Reef			Yes
Located Site	Shot Wreck	East Delta Shoal		MO00135	No
Located Site	Shrimp Boat Wreck	Dry Tortugas		MO00172	Yes
Located Site	Shrimp Boat Wreck	Delta Shoal			No
Located Site	Small Reef Wreck	Carysfort Reef			No
Located Site	Snake Creek Anchor	Snake Creek, Plantation Key		MO01902	Yes
Historic Structure	Sombrero Key Lighthouse	Sombrero Key	1858	MO02153	No
Located Site	South Carysfort Wreck	Carysfort Reef			No
Located Site	South Turtle Wreck	Turtle Reef			No
Located Site	Southwest Channel Wreck	Inshore Carysfort Reef			No
Located Site	Southwest Wreckage	Molasses Reef			No
Located Site	*Spiegel Grove*, USS (Artificial Reef)	Off Dixie Shoal	2002		No
Located Site	Spiney Oyster Barge	Crocker Reef		MO01307	No
Located Site	Tavernier Key/Planter Anchorage	Tavernier Key		MO01337	Yes
Located Site	Tea Table Anchorage	Tea Table Key		MO01336	Yes
Historic Structure	Tennessee Reef Light	Tennessee Reef	1935		
Located Site	Tennessee Wreck	Tennessee Reef			No
Located Site	*Thiorva*	Turtle Reef	1894		No
Historic Structure	Thompson Turtle Kraals and Cannery	Key West		MO01467 A	Yes
Located Site	Three Sisters Wreck	Inshore of Molasses Reef			No
Located Site	*Thunderbolt* (Artificial Reef)	4 miles south of Key Colony Beach	1986	MO02516	No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Tile Wreck	Rock Key			Yes
Located Site	*Tonawanda*	Elbow Reef	1866		No
Located Site	Totten Beacon “A”	Eastern Sambo	1855		Yes
Located Site	Totten Beacon “B”	American Shoal	1855		No
Located Site	Totten Beacon “C”	Coffins Patch	1873		No
Located Site	Totten Beacon “D”	Crocker Reef	1855		No
Located Site	Totten Beacon “E”	Conch Reef	1855		No
Located Site	Totten Beacon “F”	Pickles Reef	1855		No
Located Site	Totten Beacon “G”	French Reef	1855		No
Located Site	Totten Beacon “I”	Elbow Reef	1855		No
Located Site	Totten Beacon “K”	Turtle Reef	1855		No
Located Site	Totten Beacon “N”	Western Sambo			Yes
Located Site	Totten Beacon “7”	Tennessee Reef	1873		No
Located Site	Totten Beacon	Molasses Reef			No
Located Site	*Tres Puentes/N. S. de Belem y San Juan Bautista*	Off Upper Matecumbe Key	1733	MO00177	Yes
Located Site	Twin Diesel Wreck	Basin Hill Shoals			Yes
Located Site	Unidentified Shipwreck A	Conch Reef		MO01313	No
Located Site	Unidentified Shipwreck B	Tavernier Key		MO01314	Yes
Located Site	Unidentified Shipwreck C	Pickles Reef		MO01315	No
Located Site	Unidentified Shipwreck E	Alligator Reef		MO01317	No
Located Site	Unidentified Shipwreck F	Upper Matecumbe Key		MO01318	Yes
Located Site	Unidentified Shipwreck G	Windley Key		MO01319	Yes
Located Site	Unidentified Wreck	Ocean side of Grassy Key			Yes
Located Site	Vaca Key Ballast Mound	Vaca Key			Yes
Located Site	*Valbanera*	Quicksands	1919	MO06707	No

Type	Site Name	General Location	Date	Florida Master Site File #	On Florida Submerged Lands
Located Site	Vertical Pin Wreck	Molasses Reef			No
Located Site	*Vitric*	Southeast of Molasses Reef	1944		No
Located Site	Wall Ballast	White Bank			No
Located Site	Watson's Wreck	Watson's Reef			No
Located Site	*Weber*, USS DE-675	Quicksands	1962	MO06704	No
Located Site	Welberry Wreck	Windley Key		MO01325	Yes
Located Site	Wellwood Ballast Wreck	Molasses Reef			No
Located Site	West Turtle Shoals Wreck	Coffins Patch area, on West Turtle Shoals		MO00142	Yes
Located Site	White Bank Dry Rocks Wreck	White Bank			No
Located Site	*Wilkes-Barre*, USS	Offshore Saddlebunch Key	1972		No
Located Site	*Wisteria*, USPHS	Key West Harbor, west of Wisteria Island			Yes
Located Site	Winch Hole/*Slobodna*	Molasses Reef	1887		No
Located Site	*Winchester*, HMS	Carysfort Reef	1695		No
Located Site	Windlass Wreck	Molasses Reef		MO01330	No
Located Site	Windlass Wreck	Off Key Colony Beach			Yes
Located Site	Wreck 12	Delta Shoal		MO00134	No

Historically-reported Vessel Losses in Florida Keys National Marine Sanctuary

The following list of historically-reported vessel losses is limited to those vessels believed to have been a total loss or resulted in the likely deposition of archaeological material. Information to compile this list is derived from primary source materials including historical newspapers and Key West Admiralty Court records. Secondary sources consulted include Robert F. Marx's *Shipwrecks in the Americas* and *Shipwrecks in Florida Waters*, and Thomas Hambright's Shipwreck Index available from the Monroe County Public Library's Florida Keys History Center. Information from Appendix I: Historically Recorded and Document Submerged Cultural Resources of Monroe County, Florida in the 1996 *FKNMS Final Management Plan/Environmental Impact Statement* also contributed to this list.

Name	Vessel Type	Nationality	Location	Year Lost
San Anton	Merchant Nao	Spanish	Florida Keys	1521
Unnamed Vessel	Unknown		Key Largo	1530
Unnamed Vessel	Unknown		Plantation Key	1533
Three Spanish Vessels	Unknown	Spanish	Florida Keys, Key Largo	1549
Unnamed Vessel	Unknown		Vaca Key	1550
Unnamed Vessel	Unknown		Upper Matecumbe Key	1550
Visitacion	Nao	Spanish	Florida Keys	1550
Spanish Vessel	Unknown	Spanish	Key Largo, Florida Keys	1551
Unnamed Vessel	Unknown		Saddlebunch Keys	1554
Two Spanish Vessels	Unknown	Spanish	Head of the Florida Keys, Key Largo	1577
Spanish Nao	Nao	Spanish	Head of the Florida Keys, Key Largo	1579
Unnamed Vessel	Unknown		Florida Keys	1590
Spanish Galleon	Galleon	Spanish	Florida Keys	1600
Spanish Nao	Ship		Florida Keys	1619
N. S. de Atocha	Galleon		Quicksands	1622
Santa Margarita	Galleon	Spanish	Quicksands	1622
Capitana	Galleon	Spanish	4 Leagues to Windward of the *Atocha*, Quicksands	1623
Two Spanish Galleons	Galleon	Spanish	Head of the Florida Keys	1630
Three Spanish Ships	Almirante and two vessels	Spanish	Matecumbe Key	1634
Unnamed Vessel	Unknown		Crawl Key	1656
Santa Anna Maria	Nao	Spanish	Key Largo	1665
Dutch Ship	Unknown	Dutch	Key West	1676
Spanish Nao	Nao	Spanish	Florida Keys	1688
N. S. de Concepción y San Josefe	Galleon, Frigate	Spanish	Key Largo	1689
San Juan	Unknown		Off North end of Key Largo	1689
San Vincent Ferrer	Unknown		1/2 mile off North End of Key Largo	1689
Winchester, HMS	Frigate	British	Carysfort Reef	1695
Henrietta Marie	Slave Ship	British	New Ground Shoal	1700
Almiranta-*El Gallo Indiano*	Galleon	Spanish	Offshore Long Key	1733
Ana Agustina - El Gran Poder de Dios y Santa Ana	Unknown	Spanish	Vacas Key	1733
Chaves - N.S. del Carmen, San Antonio de Padua y las Animas	Nao	Spanish	Off Windley Key; Offshore Upper Matecumbe Key	1733
El Infante - N. S. de Balvaneda	Galleon	Spanish	Little Conch Reef	1733
El Sueco de Arizon	Galleon	Spanish	Conch Reef	1733
Herrera	Nao	Spanish	Upper Matacumbe Key	1733
La Capitana - *El Rubí Segundo*	Galleon	Spanish	Davis/Crocker Reef	1733
La Floridana - La Fragata de la Florida	Frigate		Offshore Key Vaca	1733

Name	Vessel Type	Nationality	Location	Year Lost
Ledieque	Ship	Spanish	Cayo de Tavanos	1733
N. S. de las Angustias y San Rafael	Nao	Spanish	Long Key Channel	1733
San Felipe	Nao	Spanish	Florida Keys	1733
San Fernando	Unknown	Spanish	Coffins Patch	1733
San Francisco Asis	Nao	Spanish	Craig/Long Key	1733
San Ignacio	Unknown	Spanish	Cayo de Bocas, Vaca Key	1733
San José y las Animas	Nao	Spanish	Cayo Tabamos	1733
San Pedro	Nao	Spanish	Lower Matacumbe	1733
Tres Puentes	Galleon	Spanish	Alligator Reef	1733
Unnamed Vessel	Unknown		Florida Keys	1740
Naffaw	Ship	British	Florida Keys	1741
Ann and Elizabeth	Unknown		Florida Keys	1744
Billander Betty	Merchant Ship	English	Looe Key	1744
Loo, HMS	44-gun Warship	British	Looe Key	1744
Alexander	Merchantman	British	Gulf of Florida	1752
Dolphin	Merchantman	British	Gulf of Florida	1752
Kingston	Merchantman	British	Gulf of Florida	1752
Lancaster	Merchantman	British	Gulf of Florida	1752
Mary and Priscilla	Merchantman	British	Gulf of Florida	1752
May	Merchantman	British	Gulf of Florida	1752
Phillis	Merchantman	British	Gulf of Florida	1752
Queen Anne	Merchantman	British	Gulf of Florida	1752
Rhode Island	Merchantman	American Colonial	Gulf of Florida	1752
Statea	Merchantman	American Colonial	Gulf of Florida	1752
Alexander	Merchantman	British	Florida Keys	1763
Alexandria	Ship		Florida Keys	1763
Unnamed Vessel	Unknown		Key Largo	1767
Anna Theresa	Ship		Florida Keys	1768
San Antonio	Unknown	Spanish	Key West	1768
Unnamed Vessel	Unknown		Florida Keys	1768
Unnamed Vessel	Unknown		Florida Keys	1769
Unnamed Vessel	Unknown		Florida Keys	1770
Unnamed Vessel	Unknown		Florida Keys	1770
El Nauva Victoriosa	Nao	Spanish	Key Largo	1771
Unnamed Vessel	Unknown		Florida Keys	1771
Rhee Galley	Ship	British	Florida Keys	1774
Cay	Unknown		Matacumbe Key	1775
Unnamed Vessel	Unknown		Matacumbe Key	1775
Floridana	Unknown		Long Key	1777
Mary	Brig	British	Cape Florida	1778
Unnamed Vessel	Unknown		Florida Keys	1781
English Country	Unknown		Florida Keys	1782

Name	Vessel Type	Nationality	Location	Year Lost
Unnamed English Ship	Ship	English	Florida Keys	1782
Unnamed Ship	Ship		Florida Keys	1785
Unnamed Vessel	Unknown		Florida Keys	1785
Evenly	Merchantman	British	Florida Keys	1788
Unnamed Vessel	Unknown		Pigeon Key	1788
Flora	Unknown		Florida Keys	1789
Fly	Ship	British	Florida Keys	1789
Unnamed Vessel	Unknown		Florida Keys	1790
Unnamed Vessel	Unknown		Florida Keys	1790
Lively	Brig	British	Florida Keys	1791
Lovely Ann	Ship	American	Florida Keys	1792
Unnamed Ship	Ship		Carysfort Reef	1792
Unnamed Ship	Ship		Florida Keys	1792
Unnamed Vessel	Unknown		Florida Keys	1792
Unnamed Vessel	Unknown		Florida Keys	1792
Unnamed Vessel	Unknown		Florida Keys	1792
General Clark	Ship	British	Florida Reef	1793
Catherine Green	Ship	British	Florida Keys	1794
Noah's Ark	Brig	American	Martyr's Reef	1795
Speedwell	Ship	British	Carisford Reef	1796
Flora	Ship		Florida Keys	1798
Lora	Ship	British	Florida Keys	1798
Unnamed Vessel	Unknown		Florida Keys	1799
Hector	Ship		Florida Reef	1800
Unnamed Schooner	Schooner		Sandy Point, offshore point on Coco Plum Key	1800
Eagle	Ship	American	Matanzies Reef, Florida Keys Reef	1801
Britannia	Ship/Merchantman	British	Florida Keys	1803
Evenly	Ship/Merchantman	British	Florida Keys	1803
Calliope	Ship	American	Carysfort Reef	1804
Andromache	Ship		Florida Keys, Matacumbe Reef	1805
Fly, HMS	Sloop-of-War	British	Little Conch Reef	1805
Julian	Brig	American	Florida Reefs	1805
Princess Charlotte, HMS	Frigate	British	Martyr's Reef	1805
Providence	Ship		Florida Reef	1805
Rattler	Ship	British	Carysfort Reef	1805
Vanguard, HMS	74-gun Warship	British	Florida Reefs	1805
Merchant	Schooner		Carysfort Reef	1808
Ohio	Ship		40 miles south of Cape Florida	1808
Cabinet	Merchantman	British	Florida Reef	1811
Highlander	Ship		Carysfort Reef	1812
Juno	Ship	American	Carysfort Reef	1812
Orion	Ship	American	Florida Keys	1812

Name	Vessel Type	Nationality	Location	Year Lost
Americano	Ship/Merchantman	Spanish	Florida Keys	1814
Jerusalem	Ship	Spanish	Florida Keys	1815
Unnamed Ship	Ship		Carysfort Reef	1815
Unnamed Vessel	Unknown		Key Largo	1815
Watt	Ship		Florida Reef, Carysfort Reef	1815
Atlas	Ship		Florida Keys	1816
Cossack	Brig	American	Florida Keys	1816
Magdalen	Ship	British	Florida Keys	1816
Three Sisters	Ship	American	Carrysford's Reef	1816
Despatch	Schooner		Carysfort Reef	1817
Europa	Ship		Florida Reef	1817
Marquis De Pombal	Ship	Portuguese	Florida Keys	1817
Merrimack	Brig	American	Florida Keys	1817
Unity	Ship		Carysfort Reef	1817
Unnamed Ship	Ship		Carysfort Reef	1817
Betsey	Ship		Florida Reef	1818
Eliza	Ship		Carysfort Reef	1818
Quebec	Ship	British	Florida Keys	1818
Sally	Brig	American	Florida Reef	1818
Solway	Merchantman	British	Florida Keys	1818
Unnamed Ship	Ship		Carysfort Reef	1818
Anie of Scarbro (sic) (*Annie of Scarborough*)	Ship		Florida Keys	1819
Barilla	Brig	American	Inshore of the Florida Reef	1819
Lively	Schooner	American	Florida Keys	1819
Modeste	Ship	French	Key Largo	1819
Sandwich	Ship	British	Florida Keys	1819
Unnamed Brig	Brig		Florida Keys	1819
Unnamed Vessel	Unknown		Carysfort Reef	1819
Cosmopolite	Ship	American	Florida Keys; Salt Bunch Keys	1821
Unnamed Ship	Ship		Carysfort Reef	1821
Alligator, USS	Schooner	American	Alligator Reef	1822
Ann of London	Ship		Florida Keys (east)	1822
Francis/Frances and Lucy	Merchantman	British	Florida Keys	1822
Unnamed Brig	Brig		Carysfort Reef	1822
Unnamed Ship	Ship		Carysfort Reef	1822
Unnamed Vessel	Unknown		Florida Keys	1822
Andromache	Ship		Florida Keys	1823
Franklin	Merchant Ship	American	Florida Keys	1823
Leopard	Sloop	American	Florida Keys	1823
George III	Merchant Ship	British	Carysfort Reef	1824
Swift	Ship		Wrecked on Long Island	1824
Unnamed Brig	Brig	American	South West end of Carysfort Reef	1824

Name	Vessel Type	Nationality	Location	Year Lost
Unnamed Brig	Brig		Florida Keys	1824
Unnamed British Brig	Brig	British	Florida Keys	1824
Adeline	Schooner	American	Looe Key	1825
Brutus	Brig		Duck Key	1825
Johan Carl/Carl John	Ship		Florida Keys	1825
Point-A-Petre	Ship	French	Florida Keys	1825
Orleans	Ship		Carysfort Reef	1826
Guerrero	Brig, Slave Ship	Spanish	North Carysfort Reef, Turtle Reef	1827
Spermo	Ship	American	Alligator Reef	1827
Curreo No. 1	Brigantine	Spanish	Carysfort Reef	1829
Mississippi	Unknown		Looe Key	1829
President	Schooner		Pickles Reef	1829
Unnamed Schooner	Schooner		Carysfort Reef	1829
Unnamed British Ship	Ship	British	Alligator Reef	1830
Unnamed Vessel	Unknown		Looe Key	1830
Vineyard	Brig		East Side of Long Key	1830
Amulet	Ship		Pickles Reef	1831
Florida	Unknown		Florida Keys	1831
Henry	Schooner		Florida Reef	1831
Maria	Ship		Carysfort Reef	1831
Sylvia	Ship	British	Quicksands, Outer Shoals of Tortugas	1831
Eliza Plummer	Ship	British	In Sight of Key West	1832
Favorite	Schooner		Off Duck Key	1832
Glasgow	Bark	British	Coffins Patch	1832
Mary Jane	Brig		Coffins Patch off Duck Key	1833
Unnamed Ship	Ship		Carysfort Reef	1833
Unnamed Brig	Brig		Carysfort Reef	1834
William	Brig		Carysfort Reef	1834
Blakely	Brigantine		Carysfort Reef Light, Carysfort Reef	1835
Isabella	Brigantine/Brig		Alligator Reef, 5 Miles from Indian Key	1835
Jean Key	Barque		East End of Conch Reef	1835
John Britton	Brigantine/Brig		Key Tavernier	1835
Laura	Schooner		Carysfort Reef	1835
Lion/Lyon	Brig		Pickles Reef	1835
Majestic	Ship		Carysfort Reef	1835
Maria	Unknown		Carysfort Reef	1835
Mary	Brig	American	Reef Offshore Key Vacas	1835
Olive Branch	Schooner		Carysfort Reef	1835
Philadelphia	Brigantine		Western Part of Conch Reef	1835
Pizarro	Schooner		Carysfort Reef	1835
Sea Drift	Brigantine/Brig	American	Carysfort Reef	1835
Thomas	Brig/Brigantine	British	Indian Key	1835

Name	Vessel Type	Nationality	Location	Year Lost
United States	Schooner		Marquesas	1835
Agenora	Brig		Carysfort Reef	1836
Belle	Brig		Sugarloaf Key	1836
Courier	Brig		Knights Key	1836
Dorothy Foster	Ship		Pickles Reef; b/t Pickles and Conch Reef	1836
Franklin	Brigantine/Brig		Pickles Reef	1836
Louisiana	Brig/Brigantine		Western End of Carysfort Reef	1836
Mary	Unknown		Tavernier Creek	1836
Natchez	Brigantine		Pickles Reef	1836
Norman	Unknown		Conch Reef	1836
Alfred	Unknown	American	Carysfort Reef/Basin Shoal	1837
Hiram	Schooner		Looe Key	1837
Mary	Brig	British	Dry Rocks or French Shoals	1837
Orleans	Brig		Coffins Patch	1837
Rosalina	Brigantine/Bark		Pickles Reef	1837
Sarah Ann	Schooner		Sombrero Reef	1837
Unnamed Bark	Bark		Carysfort Reef	1837
Unnamed Barque	Barque		Sombrero Key	1837
Unnamed Ship	Ship		Florida Keys	1837
Forrest	Schooner		1 Day Sailing East from Key West	1838
Hebrus	Brig/Brigantine	British	Pickles Reef	1838
Hyder Alley	Schooner		Marquesas	1838
Julia	Ship		40 miles W of Key West	1838
Triumph	Ship		Off Caesar's Creek	1838
Mary Howland	Ship		Delta Shoal, near Key Vacas	1839
Orion	Schooner (wrecking)		Sand Key	1839
Unnamed American Schooner	Schooner	American	Looe Key	1839
Unnamed American Ship	Ship	American	Looe Key	1839
Unnamed Ship	Ship		Carysfort Reef	1839
Unnamed Ship	Ship		Looe Key	1839
Cora Nelly	Ship	French	Possibly Carysfort	1840
Emery	Brig	American	Carysfort Reef	1840
Financier	Schooner	American	Sombrero Key	1840
Unnamed Brig	Brig		Carysfort Reef	1840
Unnamed Brig	Brig		15 miles W of Carysfort Reef	1840
Unnamed Ship	Ship		Carysfort Reef	1840
Claudine	Barque		Florida Reef	1841
Unnamed Bark	Bark		Carysfort Reef	1841
Unnamed Ship	Ship		Carysfort Reef	1841
Unnamed Ship	Ship		Sombrero Reef	1841
Unnamed Ship	Ship		Alligator Reef	1841
Unnamed Vessel	Unknown		Key West	1841

Name	Vessel Type	Nationality	Location	Year Lost
Unnamed Vessel	Unknown		Key West	1841
Unnamed Vessel	Unknown		Key West	1841
Caroline	Schooner		Mule Key, Key West	1842
Charles the Fifth	Brig	Belgium	Carysfort Reef	1842
North America	Ship	American	Delta Shoal	1842
Unnamed Schooner	Schooner		Carysfort Reef	1842
Unnamed Ship	Ship		Carysfort Reef	1842
Ada	Brig		Pickles Reef	1843
Col. T. Sheppard	Schooner		Key West	1843
Magnet	Brig		Conch Reef	1843
Marion	Ship	American	American Shoal	1843
Opelousas	Brig		Little Pickles Reef	1843
Register	Schooner		Carysfort Reef	1843
Sirius	Brig		Pickles Reef	1843
Unnamed Brig	Brig		Old Matacumbo Reef, SW of Carysfort Reef	1843
Unnamed Ship	Ship		Sombrero Key	1843
Unnamed Ship	Ship		Carysfort Reef	1843
Aluida/Alwida/Alwilda	Brig	American	Alligator Reef/Carysfort Reef	1844
Challenge	Ship	British	Carysfort Reef	1844
Conservative	Brig	British	Long Key Shoal	1844
Mary Averill	Brig		Carysfort Reef	1844
Mount Vernon	Sloop (wrecking)	American	Carysfort Reef	1844
Statira/Staters	Brig	American?	Dry Rocks, Outside Key West Key West Harbor	1844
Unnamed Ship	Ship		Alligator Reef	1844
Unnamed Vessel	Unknown		Key West	1844
Feronia	Barque	British	Windward side of Conch Reef	1845
Newark	Ship		Pickles Reef, off Rodriguez Key	1845
Rienzi/Rienri	Ship		Pickles Reef	1845
Telumah	Ship	American	Carysfort Reef	1845
Tevonia	Barque	British	Carysfort Reef	1845
Yeluman	Ship		Carysfort Reef	1845
Ann Flood	Ship		Alligator Reef	1846
Commissary	Brig		Key West	1846
Eben Preble/Ebber Prebelle	Ship		High and dry on banks of Key West Harbor	1846
Exchange	Unknown		Key West	1846
H.W. Stafford/Henry W. Safford	Schooner	American	High and Dry in Key West Harbor	1846
Iris	Barque	American	Florida Reef	1846
JNV (?) Parker	Bark		Carysfort Reef	1846
Key West	Unknown		Key West	1846
La Reunion	Ship	French	On Reef near Key West	1846
Lafayette	Bark/Pilot Boat	American	Key West Harbor	1846

Name	Vessel Type	Nationality	Location	Year Lost
Linedora	Unknown	Spanish	Carysfort Reef	1846
Mandarin	Bark	British	NE end Alligator Reef	1846
Marion	Ship	American	Looe Key	1846
Melemora	Unknown		Key West	1846
Morris, USRC	Schooner-topsail	American	Key West area, about 3 mi from KW	1846
Navigator	Unknown	American	Navigator	1846
Nelson	Brig	British	French Reef	1846
New England	Bark	American	American Shoal	1846
Olive and Eliza	Ship		Key West	1846
Perry, USS, (guns and anchors)	Brig	American	Sombrero Shoal, inside the reef	1846
Platinia	Ship		Carysfort Reef	1846
St. Mark	Ship		Carysfort Reef	1846
Unnamed Ship	Ship		Sombrero Key	1846
Unnamed Vessel	Unknown		Looe Key	1846
Villa Nueva	Schooner	Spanish	Lower Florida Keys	1846
Warsaw	Ship	American	Ashore in 9 feet of water in Key West Harbor	1846
York	Ship	British	Carysfort Reef	1846
Elizabeth	Schooner	British	Unclear, Near lightShip, Florida Reef	1847
General Jackson	Ship	American	American Shoal	1847
Gilbert	Brig		Carysfort Reef	1847
Minerva	Schooner		Near Carysfort Reef LightShip	1847
St. Mary's	Schooner		Sambos	1847
Unnamed British Ship	Ship	British	Washerwoman Shoal	1847
Waccamaw	Schooner	American	Carysfort Reef, Vicinity of Cape Florida	1847
Yucatan	Barque		French Reef	1847
Henry	Bark		Marquesas	1848
Mortoun	Ship		Key Vaca	1848
Petrus	Brigantine		Sombrero Reef	1848
Quebec	Ship		Carysfort Reef	1848
Taglioni	Ship		Carysfort Reef	1848
Yagliona	Ship		Carysfort Reef	1848
Maryland	Ship	American	Washerwoman Shoal/Looe Key	1849
Princeton	Schooner		Carysfort Reef	1849
Unnamed Vessel	Unknown		Dry Rocks, east of Key West	1849
Damascus	Brig	American	Looe Key, Spanish Harbor, Pine Key	1850
Ganymede	Brig	British	Matacumbe Bar	1850
General Taylor	Schooner		Carysfort Reef	1850
Isabella Reed	Brig/Barge		Conch Reef	1850
Unnamed Brig	Brig		Carysfort Reef	1850
Williams	Schooner	American	Washerwoman Shoal	1851
Fairmount/Fairmont	Barque	American	off Looe Key, Gulf of Mexico	1852

Name	Vessel Type	Nationality	Location	Year Lost
Matthew Van/Von Bree	Barque	Belgium	Western End, Yucatan Reef, Crocus Reef	1852
Sarah	Brig	British	Looe Key Reef/Newfound Harbor	1852
Telamon	Ship		Delta Shoal	1852
Unnamed Ship	Ship		15 miles S of Carysfort Reef Light	1852
Colony	Bark		Coffins Patch	1853
Cymbrus	Brig	American	Western Dry Rocks Near Sand Key	1853
E.G. Willard	Schooner		Long Key Bar	1853
Fannie A. Everett	Bark	American	American Shoal	1853
Jeune France	Brig	French	Pickles Reef	1853
Nathaniel Kimball	Ship	American	Eastern Dry Rocks Near Sand Key	1853
Robert Morris	Bark	American	Pelican Shoals (6 miles SE of Boca Chica)	1853
S.G./E.G. Willard	Schooner	American	Long Key Bar	1853
Scotchman	Brig		Rienzi Reef/Pickles Reef	1853
Unnamed Barque	Barque		Alligator Reef	1853
Unnamed Ship	Ship		20 Miles W of Carysfort Reef	1853
Athalia	Schooner	American	Western Dry Rocks, est of Sand Key	1854
Elizabeth Bruce	Ship	American	Near Elbow Reef, 7-10 ft of water	1854
L.W. Maxwell	Brig	American	Eastern Dry Rocks, 18 ft water	1854
Linden	Bark		Carysfort Reef	1854
Meteor	Brig		Pickles Reef	1854
Pauline	Schooner		Pickles Reef	1854
R.M. Charlton	Brig		Carysfort Reef	1854
Robert M. Charlton	Brig		French Reef	1854
Snow Drop	Barque	British	Pickles Reef	1854
Sterling	Brig		Conch Reef	1854
Unnamed Brig	Brig		Carysfort Reef	1854
William	Ship		Hen and Chickens Reef	1854
Concordia	Ship		Key Vacas	1855
Nacoochee	Bark		Straits of Florida, Offshore Middle Keys	1855
Rainbow	Bark		Florida Reef	1855
Tovano/Il Tovano	Brig	Sardinian	Alligator Reef	1855
Unnamed Bark	Bark		Coffins Patch	1855
Frances/Francis	Ship	American	Dry Rocks, Dog Rocks	1856
Gardner Pike	Ship	American	Sugarloaf Key	1856
Isaac Allerton	Ship	American	Washerwoman Shoal, American Shoal	1856
James W. Laurance	Schooner		Middle Sand Bores	1856
Katahdin	Unknown		Long Reef	1856
Marie	Bark	French	Looe Key	1856
Mariner	Brig/clipper	American	On Pickles Reef/French Reef	1856
Octavia	Bark		Tavernier Key	1856
Unnamed Bark	Bark		Pickles Reef	1856

Name	Vessel Type	Nationality	Location	Year Lost
Unnamed Brig	Brig		Conch Reef	1856
Unnamed Ship	Ship		Sombrero Reef	1856
Belle	Brig	British	French Reef	1857
Helen E. Booker	Ship	American	Elbow Reef / Grecian Shoal	1857
Kelvin	Ship	British	Pickles Reef	1857
Phoenix (US Coast Survey)	Schooner	American	Key Vaccos	1857
Trinity	Bark		Pickles Reef	1857
Unnamed Vessel	Unknown		Sand Key	1857
William T. Dugan	Brig		Sand Key	1857
Brilliant	Schooner		Carysfort Reef	1858
Caraquena	Bark	French	Sanbornes	1858
Lizzie Sturgis	Schooner	British	French Reef	1858
Malcom	Barque	British	French Reef	1858
Milton	Ship		Carysfort Reef	1858
Ostean	Ship		Key West	1858
River Smith/Riversmith	Ship		6 miles N of Carysfort Reef Light	1858
Sea Ranger	Schooner		Tavernier	1858
Sierra Nevada	Barque/Ship	American	Crocker Reef	1858
Whalton	Barque	British	Carysfort Reef	1858
Admiral Pleville	Barque	French	French Reef	1859
Indian Hunter	Clipper Ship		French Reef/Pickles Reef	1859
Martha Regan	Hermaphrodite Brig		Marquesas	1859
Miami	Ship		on Pickles Reef	1859
Mimi/Mini	Bark	French	Pickles Reef	1859
Mulhouse	Ship		Marquesas, near Tortugas	1859
Ney	Schooner		Pickles Reef	1859
Tchernayia/Tchernia	Brig	French	French Reef	1859
William Chestnut	Unknown		Florida Keys	1859
Cordelia	Bark	American	Looe Key	1860
Horace	Bark	American	Mosquito Bank,15 Miles S of Carysfort Light	1860
J.W. Roland/Rowland	Brig		Pickles Reef	1860
Las Mulas	Unknown		Man Key	1860
Tiger	Brigantine/Brig		Mouth of Key West Harbor, Eastern side of the Sambos, in sight of the city	1860
William Jarvis	Ship		Marquesas Key	1860
Brunette	Schooner	British	Long Key Bar	1861
Franklin	Brig	British	Conch Reef	1861
George Leslie	Bark	American	Upper End Alligator Reef	1861
Phoenix	Barque	British	Alligator Reef	1861
Ben Cushing	Brig/barge	British	French Reef	1862
Director	Bark	British	Elbow Reef	1862

Name	Vessel Type	Nationality	Location	Year Lost
Lady Franklin	Bark	British	French Reef	1862
Menemon Sanford	Steamship	American	3 Miles from Carysfort Lighthouse	1862
Unnamed Ship	Ship		Sombrero Reef	1862
Adelayda	Schooner	Spanish	Elbow Reef (outside of reef)	1863
N. M. Terry	Brig	American	Eastern French Reef	1864
Sebra Crooker	Bark	American	Looe Key	1864
Annie Baldwin	Bark		Conch Reef	1865
Caroline Nesmith	Ship	American	Western Dry Rocks, Near French Reef	1865
Dahlia	Bark		Pickles Reef	1865
Dwight	Schooner	American	Eastern Dry Rocks off Key West	1865
J. Brickmore	Brig		Carysfort Light	1865
Margaret Kerr	Ship		Crocker Reef	1865
Morga	Brig	Spanish	Sombrero Key	1865
Oswingo	Ship		3/4 mile off Key West	1865
Queen Mob	Bark		Conch Reef	1865
Ringold	Schooner		Northwest Channel	1865
Sea Lark	Brigantine		Spanish Harbor Key	1865
Sea Side	Brigantine		Off Key West	1865
Unnamed Ship	Ship		Grecian Shoal	1865
Angela	Brig	Mexican	Agamemnon Shoal, SW of Key West	1866
Joseph A. Davis	Bark	American	Grecian Shoal	1866
Rebecca Barton	Steamship (propeller)	American	Key West	1866
Tonawanda	Steamship	American	Elbow Reef	1866
Unnamed Brig	Brig (hermaphrodite)		Grecian Shoal	1866
Unnamed Vessel	Unknown		Key West	1866
Unnamed Vessel	Unknown		Key West	1866
Unnamed Vessel	Unknown		Key West	1866
Oracle	Brig	British	Conch Reef	1867
Scandinavia	Brig	Norwegian	Conch Reef	1867
Mutter Schultz	Barque	German	Sugarloaf Reef/American Shoal	1869
Honduras	Unknown		Key West	1870
Key West	Unknown		Key West	1870
Moonlight	Brig	American	Mosquito Shoals (5 miles west of Elbow Reef)	1870
Patriarca San Jose	Brigantine/Brig	Spanish	Pickles Reef	1870
Star	Bark	British	Little Conch Reef	1870
Tomas/Thomas de Resa	Bark	Spanish	Turtle Reef	1870
Unnamed Ship	Ship		Alligator Reef	1870
Unnamed Vessel	Unknown		Key West	1870
Aguilla/Aguila	Brig/Schooner		Pickles Reef	1871
Grace Redpath	Bark	British	Davis Reef	1871
St. James	Ship	American	Conch Reef	1871

Name	Vessel Type	Nationality	Location	Year Lost
Amazon	Bark	Norwegian	Carysfort Reef, Dragus Reef, Dry Rocks, SW Part of Reef, 7 miles from Key Largo	1872
Amisia/Amisa	Brig	German	Conch Reef	1872
Hermanas/Hermanos	Brig	Spanish	Carysfort Reef	1872
Matawa	Ship	British	Key West	1872
Restless	Bark		Florida Keys	1872
Spar	Unknown		Key Largo	1872
Unnamed Vessel	Unknown		Key West	1872
Unnamed Vessel	Unknown		Key West	1872
Unnamed Vessel	Unknown		Key West	1872
Virginia	Ship	American	Tennessee Reef	1872
Nor'wester	Ship		Key West	1873
Eveline	Schooner		Key West	1874
Governor Troupe or Troup	Bark	American	Davis Reef	1874
Mississippi	Brig	Italian	Basin Hill Banks	1874
Thomas P. Barklow	Schooner	American	Florida Bay	1874
Evandale	Ship	British	Carysfort Reef	1875
Mountain Home	Schooner		North of Key West	1875
Nordkyn	Bark	Norwegian	Coffins Patch, Eastern End of Vaca Key	1875
Prairie Bird	Bark		Key West	1875
Unnamed Vessel	Unknown		Key West	1875
Unnamed Vessel	Unknown		Key West	1875
Western Empire	Unknown	British	Florida Reef	1875
Abbie Carson	Schooner	American	Key West	1876
Athenais	Ship		Marquesas/Quicksands	1876
Galveston	Bark		Duck Key	1876
Georges	Brig	French	Molasses Reef	1876
Godfrey Keebler	steam tug	American	Reef Near Key West	1876
Jalapo	Brig	German	5 Miles East of Marquesas	1876
Unnamed Schooner	Schooner		Channel near Western Dry Rocks	1876
Unnamed Vessel	vessel		Channel near Western Dry Rocks, Key West	1876
WM. B. R. Knighton	Schooner	American	Florida Reef	1876
Yole/Yolo	Brig	Austrian/Russian	Looe Key	1876
Edith	Schooner		Key West	1877
Emilie	Steamship		8 Miles SSW of NW Light, in 6 fathoms	1877
Energia	Bark	Italian	Western End Heading N.E. 1/2 N.	1877
Henry J. May	Schooner	American	Florida Reef	1877
Memphis	Brig/Ship	British	Conch Reef	1877
Merrie/Merri England	Bark	British	Just SW of Lighthouse on Pickles Reef	1877

Name	Vessel Type	Nationality	Location	Year Lost
Muzzie	Brig	British	Florida Reef	1877
Ocean Queen	Schooner	American	Florida Reef	1877
R.E. Lee	Schooner	American	Florida Reef	1877
Sverige, Suerige	Bark	Swedish	Pickles Reef	1877
Vengern	Bark		on Pickles Reef	1877
Veto	Unknown	American	Conch Reef	1877
Henry R. Tilton	Schooner	American	Florida Straits	1878
Hope of London	Bark	British	Pickles Reef	1878
Jane H. Crawford	Schooner	American	Conch Reef	1878
Lewis J. Stocker	Bark		Key West	1878
Mary E. Riggs	Ship	American	Inside French Reef	1879
Excelsior	Barque	American	Between Grecian Shoal and Eastern Dry Rocks	1880
Unnamed Vessel	Unknown		Key West	1881
Unnamed Vessel	Unknown		Key West	1881
Island Home	Bark		Marquesas	1882
Northampton	Ship	American	Outer Side of Molasses Reef	1883
Marcia Reynolds	Schooner	American	20 NW of Sombrero light	1884
Acorn	Steamship	British	Elbow Reef	1885
Tom	Smack	American	Looe Key	1885
E.J. Watte/Waite	Schooner		Little Pelican Shoals	1886
Rask	Brig	Norwegian	Quicksands	1886
Slobodna	Ship	Austrian	Outer Side of Molasses Reef	1887
Petrie	Schooner		Washerwoman Shoal	1888
Prince Umberto	Bark	British	Duck Key Straights, Coffins Patch	1888
Cavaliere Ivanissiveck	Bark	Austrian	Marquesas/Quicksands	1889
True Briton	Ship	British	Marquesas, Rebecca Shoal/Quicksands	1889
Lone Star	Schooner	American	North Dry Rocks	1891
Ardell	Schooner	American	Long Key, 9 ft water	1892
Kate	Schooner	American	Elbow Reef	1892
London	Bark		Marquesas	1892
Adelaide	Schooner	American	Pickles Reef	1894
Curler	Bark	British	Marquesas, Southwest Key	1894
Nada	Barkentine	German	Tennessee Reef	1894
Thiorva	Bark	Norwegian	North End of Turtle Rocks, Turtle Harbor	1894
Unnamed 4-masted Schooner	Schooner (4m)		Half Moon Shoal, Marquesas	1894
Wandering Chief	Bark	British	Elbow Reef	1894
Romina	Schooner	Austrian	11-12 miles from Carysfort Reef Light	1895
Cyrus Hall	Schooner (3m)	American	Off American Shoal Light and Boot Key Bank	1896
Ishuria	Tug	Mexican	Mosquito Bank	1896

Name	Vessel Type	Nationality	Location	Year Lost
Saturn	Bark	Norwegian	Offshore Florida Keys	1896
Shelter Island	steamboat	American	Inshore of American Shoal, by Loggerhead Key	1896
Unnamed Vessel	Unknown		Jetty at NW entrance of Key West Harbor	1896
Apphia and Amelia	Schooner (3m)	American	Off American Shoal near Key West	1897
Clyde	Steamship/tug	American	Tavernier Key, Hawks Channel	1897
Unnamed Vessel	Unknown		Key West	1897
Unnamed Vessel	Unknown		Key West	1897
Darlington	Steamship	British	Marquesas Shoals	1898
Dash	Schooner - auxiliary	American	Harbor Reef, 20 miles north	1898
Salve Marie	Schooner (2m)	Spanish	Western Dry Rocks, 9 mi SW Key West	1898
Unnamed Ship	Ship		Marquesas, Rebecca Shoal	1898
George Asher	Schooner	American	Key West (25 mi northeast)	1899
Julia	Schooner	Cuban	NE of Rebecca Shoal, Quicksands	1899
Unnamed Schooner	Schooner		Coffins Patch	1899
Unnamed Spanish Steamship	Steamship	Spanish	Near Alligator Reef lighthouse	1899
Ambrosio Bolivar	Steamship	American	Key West at Wharf	1900
Heartease	Schooner	American	Key West Harbor	1900
South American	Bark	British	French Reef	1900
Venezuela	Bark	Norwegian	French Reef, Turtle Harbor	1900
L.F. Munson	Brig	American	Off Key West	1901
Gladiator	Schooner	American	15 Miles NE of Harbor Key	1902
Monhegan	Schooner (4m)	American	Molasses Reef	1902
Unnamed Steamship	Steamship		Marquesas/Rebecca Shoal	1903
Unnamed Vessel	Unknown		NW passage lighthouse, Key West	1903
Veteran	Schooner	American	Largo Sound	1903
Sweetheart	Schooner (aux fishing)		Long Key	1904
Unnamed Steamship	Steamship (3m)		Coffins Patch	1904
Glama/Glamo	Bark	Portuguese	Marquesas (near)	1905
Mount Pleasant	Schooner (aux)	American	Long Key	1905
Volunteer	Schooner	American	18 mi NW by W from Sand Key Light	1905
Columbia	Motor Vessel	American	Long Key (beach)	1906
Moccasin	Schooner	American	Knights Key	1906
Palm	Gas Screw	American	Long Key	1906
Race	Schooner	American	Knights Key Dock	1906
Sidney	Schooner	American	Matacumbe Key	1906
Thistle	Gas Screw	American	Key Largo	1906
Unnamed Vessel	Unknown		Spanish Harbor Bridge	1906
Unnamed Vessel	Unknown		End Seven Mile Bridge	1906
Dash	Schooner	American	Women Key	1907

Name	Vessel Type	Nationality	Location	Year Lost
Manatee	Schooner	American	Key West Harbor	1907
Quinnipiac	Motor Vessel	American	Between Key West and Miami	1907
Flora	Schooner	American	Key Largo	1908
Maggie	Schooner	American	3 Miles from Key West	1908
Ada	Sloop	American	Key West	1909
Addie and Norman	Schooner	American	Key West Harbor	1909
Amy	Schooner	American	Key West Harbor	1909
Annie	Schooner	American	Key West	1909
Biscayne	Sternwheel Steamboat	American	Boot Key Harbor	1909
Braganza	Schooner	American	Key West Harbor	1909
Carmen	Sloop	American	Key West Harbor	1909
Elizabeth Ann	Schooner	American	Key West	1909
Emma Eliza	Schooner	American	off Cudjoe Key	1909
Empire	Motor Vessel	American	Key West	1909
Ethel	Schooner	American	Key West Harbor	1909
Florida	Schooner - auxiliary	American	Southwest Channel, Key West	1909
Freddie W. Alton	Schooner	American	Dock in Key West Harbor	1909
Gertrude	Schooner	American	Key West	1909
Glance	Schooner	American	Offshore of Key West	1909
Havana	Sloop	American	Key West Harbor	1909
Impulse	Schooner	American	Key West Harbor	1909
Juniata	Schooner	American	Key West Harbor	1909
Kate	Schooner	American	harbor	1909
Kate Davis	Schooner	American	Key West Harbor	1909
Liberty	Schooner	American	Key West Harbor	1909
Magnolia	Schooner	American	William Curry's dock, Key West Harbor	1909
Managua	Schooner	American	Reef Off Cudjoe Key	1909
Medford	Schooner	American	SW channel, Sand Key, SSW from KW Light	1909
Newport	Schooner	American	Key West Harbor	1909
Noal	Schooner	American	Key West Harbor	1909
Peerless	Sternwheel Towboat	American	Boot Key	1909
Reaper	Sloop	American	Key West Harbor	1909
Rosebud	Schooner	American	Key West Harbor	1909
S.H. Woodbury	Schooner	American	On the Ways, Key West Harbor	1909
S.R. Mallory	Schooner	American	Key West Harbor	1909
Sadie	Steamship/tug	American	West Side of Bahia Honda Harbor	1909
Sybil	Steamship (towboat/tug)	American	Bahia Honda	1909
Thomas Franklin	Schooner	American	Key West Harbor	1909
Triton	Schooner	American	Key West Harbor	1909

Name	Vessel Type	Nationality	Location	Year Lost
Undine	Schooner - auxiliary gas	American	Key West Harbor	1909
Unnamed Steamship	Steamship		Elbow Reef	1909
Unnamed Vessel	Unknown		Key West	1909
Unnamed Vessel	Unknown		Key West	1909
Unnamed Vessel	Unknown		Key West	1909
Victor	Schooner	American	Key West Harbor	1909
Adeline	Schooner	American	Key West Harbor	1910
Edward T. Stotesbury	Schooner (4m)	American	Pigeon Key, Sombrero Light (6 mi. away from)	1910
Nettle J.	Steamship	American	Key West	1910
Pelton	Steam Tug	American	Key West	1910
Standard	Schooner	American	Lower End of Marquesas	1910
Unnamed Pump Barge	Pump Barge	American	Boca Chica	1910
Virginia	Sternwheel steamboat	American	Boca Chica Bridge	1910
Hannah M. Bell	Steamship	British	Elbow Reef	1911
Star of the Sea	Schooner (4m)	American	NE end of French Reef	1911
Willie Wallace	Schooner	American	Southwest Channel, Key West	1911
Winfield S. Schuster	Schooner	American	Marquesas	1911
William R. Wilson	Schooner	American	On Pickles Reef	1912
Clifford N. Carver	Schooner (4m)	American	Tennessee Reef, 2.5 Fathoms Water	1913
Unnamed Vessel	Unknown		Tennessee Reef	1913
Amelia	Schooner	American	3 miles from Key West	1914
Edna Louise	Schooner	American	Near Key West	1914
Irene Albury	Motor Fishing Vessel	American	Long Key/Jewfish Creek	1914
Markab	Schooner	American	Railroad Trestle, Pigeon Key	1914
Balmes	Steamship	Spanish	Marquesas Keys	1915
Dilia	Schooner	Dominican Republic	Florida Keys	1915
Fanny Breslauer	Barkentine/Bark	British	Delta Shoal, Sombrero Reef	1915
Limit	Schooner (ex yacht)	American	Hen and Chickens Reef	1916
Melba	Schooner - tern	British	Pickles Reef	1916
City of Washington	Barge	American	Elbow Reef	1917
F.A. Kilburn	Steamship	American	American Shoal	1918
Lake City	Steamship	American	3 mi E by 1/2 S of American Shoal Light	1918
Lake Winoa	Unknown		Marquesas, Half Moon Shoals (South)	1918
Cleo	Sloop	American	Key West	1919
Louis H.	Barge	American	Sombrero Key Light	1919
Magnolia	Schooner	American	Key West	1919
Robert	Barge	American	Key West	1919
Santa Cristina	Gas Screw	American	25 Miles off Key West	1919

Name	Vessel Type	Nationality	Location	Year Lost
Trojan	Gas Screw	American	Key West	1919
Unnamed Vessel	Unknown		Delta Shoal	1919
Valbanera	Steamship	Spanish	Half Moon Shoal	1919
White Squadron	Schooner barge	American	Key West Harbor	1919
Albert W. Robinson	Schooner (4m)	American	Conch Reef, Key West	1920
J. Frank Seavey	Schooner (3m)	American	Florida Straits, off Carysfort Reef	1920
Priscilla L. Ray	Schooner (4m)	American	Northwest Passage, Key West	1920
Quoque	Steamship	American	Elbow Reef	1920
Bobbie	Gas Screw	American	Key West	1921
Lewis H. Goward	Schooner	American	near Key West	1921
Pauline G.	Gas Screw	American	Key West	1921
Pilot	Motor Vessel	American	Sand Key	1921
Planter	Schooner (3m)	American	30 Miles East of Key West	1921
Unnamed Vessel	Unknown		Key West	1921
Unnamed Vessel	Unknown		Boca Chica	1921
Herbert May	Schooner (3m)	American	Marquesas (near)	1922
Carrie S. Allen	Schooner	American	Key West	1923
Casa Marina	Motor Vessel	American	Key West	1923
Robin Hood	Schooner (5m)	American	between Key West and Tortugas	1923
Lilla	Gas Screw	American	Key West	1924
Wisteria/Wistaria, USPHS	Steamship	American	Wisteria Island, Key West Harbor	1924
Eola	Gas Screw	American	Key West	1925
Carmelita	Bark		Mangrove Key, Fleming Key	1926
Island Belle	Steamship	American	Key West	1926
Liberty	Gas Screw	American	Key West	1926
Queen of Nassau/ex-CGS *Canada*	Steamship	American	Offshore Alligator Reef	1926
Serafina C.	Schooner		Key West	1926
Shiawasse	cabin cruiser/yacht		American Shoal	1926
Thendara	Steam Yacht	American	Key West	1926
Unnamed Vessel	Unknown		Key West	1926
William G. Vance	Schooner	American	Key West Harbor	1926
Albert Meyer	Schooner	American	Marquesas Keys	1927
Cynthiana	Yacht		Key West	1927
D.A. Drake	Gas Screw	American	Key West	1927
Marie J. Thompson	4m Schooner	American	Key West Harbor	1927
Rose Murphy	Steamship	American	8 miles S of Key West Ship Channel	1927
Arago	Tug	American	West/East Sambo Reef	1928
Massachusetts	Dredge		Offshore Fowey Rocks Light	1928
Monroe County	Motor Vessel		Key West	1928
Unnamed Vessel	Unknown		Key West	1928
Unnamed MV Rum Runner	Motor Vessel (rum runner)		Eastern Dry Rocks	1929
Amos Watchilt	Unknown		Key West	1930

Name	Vessel Type	Nationality	Location	Year Lost
Charles W. Baird	Schooner Barge		Inshore of Carysfort Reef	1930
Erickson	Fishing Smack		Key West	1930
Northern Light	Barge (ex Steamship)		Off Elbow Reef	1930
Rosemary	Schooner (4m)	American	Key West	1930
Nepenthe	Gas Screw		Tavernier Key	1932
Hilton	Gas Screw		Carysfort Light	1937
Nor Wester	Ship		Key West	1938
Benwood	Freighter	Norwegian	North French Reef	1942
Coot	Freighter		Off Rebecca Shoal	1942
Norman H. Davis	Dredge		Key West	1942
Unnamed Vessel	Unknown		Sambo Key	1942
YC-898	Lighter	American	Off Key West	1942
YC-899	Lighter	American	Off Key West	1942
Athene	Trawler		Off Fowey Rocks	1943
Evenly	Unknown		Florida Keys	1943
Majestic	Motor Vessel		Key West	1943
Sylva	Fishing vessel		Florida Keys	1943
YC-891	Lighter	American	Off Key West	1943
YCK-8	Lighter	American	Off Key West	1943
H.H. Conway	Fishing Vessel - Trawler		Washerwoman Shoal	1944
Lockheed PV-1 Ventura Aircraft	Medium Bomber	American	Hawk Channel off Boca Chica	1944
Maria	Unknown		Straits of Florida	1944
Spindrift	Freighter		6.3 Nautical Miles North of Key West	1944
Vitric	Schooner Barge		Off Molasses Reef	1944
S-16, USS	Submarine	American	South of Boca Grande Key	1945
PE-19 Eagle Patrol Craft, USS	Patrol Craft	American	North of Marquesas Keys	1946
Old River	Oil Screw		Matacumbe Key	1947
Coral, USS	Patrol Vessel	American	Boca Grande	1948
Sunshine	restaurant (ex yacht)		50 miles south of Miami	1949
Unnamed Barge	Barge	American	Hen and Chickens Reef	1949
Merry Sea	Motor Vessel		Marquesas, b/t Rebecca Sh./Pulaski	1952
Sa-La	Motor Vessel		Marquesas/New Ground	1952
Unnamed Yawl	Yawl		Looe Key	1953
Goloenk	Unknown		entrance to SE Channel, Key West	1956
Revonoc	Yawl	American	Washerwoman Shoal	1958
Amesbury, USS	Destroyer Escort	American	North of Boca Grande Key	1962
Weber, USS	Destroyer Escort	American	Quicksands	1962
Rosalie	Salvage Boat	American	Off Islamorada near Treasure Harbor	1964
Kendrick, USS	Destroyer	American	Offshore Boca Chica Key	1966

Name	Vessel Type	Nationality	Location	Year Lost
Saufley, USS	Destroyer	American	Offshore Boca Chica Key	1968
Unnamed Landing Craft	Infantry Landing Craft	American	Quicksands	1970
Fred T. Berry, USS	Destroyer		Offshore Boca Chica Key	1972
Wilkes-Barre, USS	Light Cruiser	American	Offshore of Boca Chica Key	1972
Lola	Motor Vessel		Looe Key	1976
Robby Dale	drug runner/shrimp boat	American	Looe Key	1977
Miss Alissa	Unknown		Looe Key	1982
Noah Smith	fishing vessel (shrimp)	American	Looe Key	1982
Arbutus, USLHT	Lighthouse Tender/Salvage Vessel	American	Quicksands	1983
Cleo	fishing vessel (shrimp)	American	Looe Key	1983
Curb, USS	Cable Laying Vessel	American	Offshore Key West	1983
Laramie River, USS	Landing Ship	American	Offshore Key West	1983
Marylin	Unknown		Looe Key	1983
Pacific Bell	Unknown		Looe Key	1983
Papillion	Unknown		Looe Key	1984
Cayman Salvage Master/ex- *Lt. Col. Ellery W. Niles*	Buoy Tender	American	South of Key West	1985
Eagle Tire Company	Freighter		Offshore, Between Alligator Reef and Crocker Reef	1985
Thunderbolt/ex-*M.G. Wallace F. Randolph*, USAMT	Minefield Tender	American	Offshore Coffins Patch	1986
Bibb, USCGC	Cutter	American	Offshore of Molasses Reef	1987
Duane, USCGC	Cutter	American	Offshore of Molasses Reef	1987
Adolphus Busch Sr.	Freighter		Offshore Big Pine Key	1998
Spiegel Grove, USS	Landing Ship Dock	American	Off Dixie Shoal, Key Largo	2002
Gen. Hoyt S. Vandenberg, USNS	Missile Tracking Ship	American	Off Key West	2009

Appendix J: Correspondence

Below is a list of correspondence letters sent and received. The full versions of all correspondence can be found on the Florida Keys National Marine Sanctuary Restoration Blueprint webpage.

Cooperating Agency

- National Oceanic and Atmospheric Administration (NOAA) Office of National Marine Sanctuaries (ONMS) letter to U.S. Fish and Wildlife Service (USFWS) Florida Keys National Wildlife Refuge Complex requesting they serve as a cooperating agency for preparation of the draft Environmental Impact Statement (EIS)
- USFWS Florida Keys National Wildlife Refuge Complex response acknowledging and accepting the request to serve as cooperating agency
- USFWS Florida Keys National Wildlife Refuge Complex supporting NOAA's release of the draft EIS for public comment

Endangered Species Act (16 U.S.C. §§ 1531 et seq.)

- NOAA ONMS letter to NOAA National Marine Fisheries Service (NMFS) regarding informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) for the draft EIS
- NOAA ONMS letter to NOAA National Marine Fisheries Service (NMFS) regarding informal consultation under Section 7(a)(2) of the Endangered Species Act (ESA) for the final EIS
- NOAA ONMS letter to the USFWS Ecological Services regarding informal consultation under Section 7(a)(2) of the ESA for the draft EIS
- USFWS Ecological Services letter to NOAA ONMS regarding informal consultation under Section 7(a)(2) of the ESA for the draft EIS
- NOAA ONMS letter to the USFWS Ecological Services regarding informal consultation under Section 7(a)(2) of the ESA for the final EIS
- USFWS Ecological Services email exchange regarding informal consultation under Section 7(a)(2) of the ESA for the final EIS
- NMFS Section 7(a)(2) ESA letter informing of concurrence on informal consultation

Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §§ 1801 et seq.) – Essential Fish Habitat

- NOAA ONMS letter to NOAA NMFS regarding consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) 304(b) for Essential Fish Habitat (EFH) for the draft EIS
- NOAA NMFS letter to NOAA ONMS acknowledging and responding to consultation request for MSA 304(b) for EFH
- NOAA NMFS email exchange consultation request for MSA 304(b) for EFH for the final EIS

National Marine Sanctuaries Act 304(a)(5)

- NOAA ONMS letter to the Gulf of Mexico Fishery Management Council (GMFMC) regarding consultation under Section 304(a)(5) of the National Marine Sanctuaries Act (NMSA)
- GMFMC letter to NOAA ONMS acknowledging and responding to consultation request under Section 304(a)(5) of the National Marine Sanctuaries Act (NMSA)
- NOAA ONMS letter to the South Atlantic Fishery Management Council (SAFMC) regarding consultation under Section 304(a)(5) of the NMSA
- SAFMC letter to NOAA ONMS acknowledging and responding to consultation request under Section 304(a)(5) of the NMSA

Coastal Zone Management Act (16 U.S.C. §§ 1451 et seq.)

- NOAA ONMS letter to the Florida State Clearinghouse requesting assistance to identify the relevant enforceable policies pursuant to Section 930.34(d) of NOAA's Coastal Zone Management Act (CZMA) federal consistency regulations
- NOAA ONMS letter to the Florida State Clearinghouse regarding CZMA federal consistency review

National Historic Preservation Act of 1966 (54 U.S.C. §§ 100101 et seq.)

- NOAA ONMS letter to Florida State Historic Preservation Officer (SHPO) regarding consultation under Section 106 of the National Historic Preservation Act (NHPA) for the draft EIS
- Florida SHPO letter to NOAA ONMS acknowledging and responding to NHPA Section 106 consultation request
- NOAA ONMS letter to Florida SHPO regarding consultation under Section 106 of the National Historic Preservation Act (NHPA) for the final EIS
- NOAA ONMS letter to Tribal Historic Preservation Officer Seminole Tribe of Florida regarding consultation under Section 106 of the National Historic Preservation Act (NHPA)
- NOAA ONMS letter to Miccosukee Tribe of Indians of Florida regarding consultation under Section 106 of the National Historic Preservation Act (NHPA)
- NOAA ONMS letter to Tribal Historic Preservation Officer Seminole Tribe of Florida regarding consultation under Section 106 of the National Historic Preservation Act (NHPA) for the Notice of Proposed Rulemaking
- Tribal Historic Preservation Officer Seminole Tribe of Florida letter to NOAA ONMS acknowledging and responding to the request for consultation under Section 106 of the National Historic Preservation Act (NHPA)

Executive Order 13795 (April 28, 2017), Implementing an America-First Offshore Energy Strategy

- NOAA letter to U.S. Department of the Interior regarding Section 4(a) of Executive Order 13795
- U.S. Department of the Interior to NOAA acknowledging and responding to the request for evaluation under Section 4(a) of Executive Order 13795

Appendix K: Economic Cost-Benefit Analysis Prepared to Support the Final Regulations

This appendix provides a Regulatory Impact Review analysis to satisfy NOAA's obligations under Executive Order 12866. The White House Office of Management and Budget's Office of Information and Regulatory Affairs determined that the proposed action is a significant regulatory action. Therefore, in accordance with Executive Order 12866, this appendix provides a detailed description of the need for the action and an explanation of how the final preferred alternative will meet that need. In addition, this appendix provides an assessment of the potential costs and benefits of the final preferred alternative. The analysis provided here considers the effects of the final preferred alternative on commercial fishing, recreational fishing, non-consumptive recreation, and other relevant sectors. Table K.1 provides a summary overview of the qualitative benefits, costs, and net economic benefits of the final preferred alternative. The information and analysis in this appendix incorporates the corresponding chapter of the "Florida Keys National Marine Sanctuary Restoration Blueprint: Updated Socioeconomic Supporting Documentation for the 2019 Draft Environmental Impact Statement and 2022 Proposed Rule"[10] also referred to the 2022 socioeconomic report (Schwarzmann, 2022).

Need for This Action

The Restoration Blueprint is required to respond to threats to marine resources of the Florida Keys, consistent with the purposes and policies of both the NMSA and the Florida Keys National Marine Sanctuary and Protection Act. FKNMS currently operates under its original regulations (including marine zone regulations), which became effective in 1997, and a 2007 revised management plan, which directs the sanctuary's non-regulatory management activities. To ensure long-term resource viability and ecosystem function, this management framework must be updated to address current and foreseeable future threats. Generally, the marine resources within FKNMS face increased threats from local, regional, and global impacts, as well as changes in visitor numbers, use patterns, use types, and recreational interests. Specifically, these threats include water quality impacts originating from both within and outside the sanctuary; significant decreases in coral cover; and habitat degradation from vessel impacts, including anchor damage, prop scarring, and groundings, among others. Each of these threats has major implications for FKNMS.

Additionally, regulatory updates are needed to respond to the 2011 FKNMS condition report, which concluded that resources in the Florida Keys appeared to be in fair to fair/poor condition, and were generally either stable or in decline (ONMS, 2011). Since the release of the condition report, sanctuary resources have been further impacted by Hurricane Irma (2017); a serious, widespread coral disease outbreak; and a seagrass die-off, among other threats.

[10] https://floridakeys.noaa.gov/media/blueprint/2022-florida-keys-national-marine-sanctuary-socioeconomic-report.pdf

Florida Keys National Marine Sanctuary is a public good. The regulatory changes would address the failure of the private markets to comprehensively manage this marine environment for public benefit, including for the purposes of protecting underwater historical and cultural resources, environmental resources, regulating human use of these resources, and conducting research and monitoring, education, and enforcement. To address the market failure and natural and human threats to marine and cultural resources in the Final Preferred Alternative, NOAA is proposing a series of changes to protect and conserve natural and cultural resources within FKNMS.

Description of Affected Entities

Chapter 4.6 of the final EIS provides descriptions of the affected industries (commercial fishing, recreational fishing, non-consumptive recreation, and travel and tourism), and recreational users. Further, Chapter 3 of the final EIS provides a summary of the sanctuary-wide and marine zone regulations. To the extent available, data on the industries likely to be impacted by the updated regulations are presented in Chapter 5 of the final EIS. Chapter 5 of the final EIS also provides an analysis of the maximum potential effects of marine zone boundary changes to commercial and recreational fishing in addition to private/rental boat users and non-consumptive recreations. The three primary industries considered in this section are commercial fishing, recreational for-hire fishing, and dive/snorkeling for-hire operations in addition to recreational users.

Baseline

If NOAA does not change the regulations within FKNMS under this action, NOAA would not promulgate regulations under the National Marine Sanctuaries Act that would increase conservation and protection of natural and cultural resources; implement a management plan to strengthen the protect and manage marine resources and historical resources in the area; provide changes to resources for research and monitoring, enforcement, education, or outreach; or otherwise improve the long-term management and outcomes of this sanctuary. The No Action Alternative, Alternative 1, would maintain the existing sanctuary boundary, sanctuary-wide regulations, marine zones and associated regulations, and management plan. NOAA would make no changes in the way the sanctuary would be managed. The existing activities occurring in the sanctuary are described in the final EIS by resource area under the No Action Alternative subsections in Chapter 4: Affected Environment.

Economic Effects of the Final Preferred Alternative

Boundary Expansion to Include Existing Areas to be Avoided

This section only analyzes the cost and benefits of the expansion of the FKNMS boundary to encompass existing Areas to be Avoided (ATBAs). The final preferred alternative includes expansion of the FKNMS boundary by approximately 1,000 square miles (2,590 square km), which comprises 472 square miles (1,229 square km) of ATBAs; 271 square miles (702 square km) of Tortugas Ecological Reserve; and 259 square miles (670 square km) of Pulley Ridge. The ATBAs are areas, originally proposed by the U.S. Coast Guard (55 Fed. Reg. 19418 [May 9, 1990]) and codified through the Florida Keys National Marine Sanctuary and Protection Act,

where operating any tank vessel or vessel over 50 meters in length is prohibited. However, the current FKNMS boundary is not inclusive of all ATBAs. The final preferred alternative extends the sanctuary boundary to align with the existing ATBA boundary.

Benefits: This provision of the final preferred alternative would result in an alignment of existing ATBAs with the FKNMS boundary, which may provide *de minimis* administrative benefits.

Costs: There would not be any additional incremental costs, since the ATBA already exists.

Sanctuary-Wide Regulations

Live Rock Aquaculture

NOAA is proposing that no substantive change be made to the existing live rock prohibition. Accordingly, there is no anticipated impact of this action.

Discharge Regulation Exception

Benefits: Water quality is fundamental to all water-based recreation-tourism uses in FKNMS, as well as commercial fishing (and the quality of food supplied by this industry). Chapter 4 of the final EIS provides information on the importance of the recreation and tourism industry to Monroe County. Protecting water quality in FKNMS has enormous potential to provide both short-term and long-term ecosystem service benefits, such as recreation, by improving and sustaining the resources on which users rely.

Costs: The costs to the cruise ship industry are minimal to non-existent since ships can discharge once outside sanctuary boundaries.

Temporary Regulation for Emergency and Adaptive Management

Benefits: Temporary regulations allow FKNMS to respond to emergencies and unforeseen events to prevent or minimize the destruction of, loss of, or injury to sanctuary resources or their quality. In the short term, some activities might be displaced. However, it is expected that there would be short-term benefits in terms of public safety and long-term gains in resource protection to ensure the future flow of benefits. Existing emergency regulations have been used three times in FKNMS. For example, an area was closed to facilitate large-scale coral reef restoration, which used large barges and other heavy equipment. Closing this area protected the public from interacting with these vessels and equipment. Future temporary regulations could improve recovery of resources following anchor damage, protect nesting birds, and facilitate response to natural disturbances.

Costs: Potential costs include temporary displacement of activities due to temporary regulations. In the short term, substitution or relocation of activities would likely be possible, minimizing disruption to activity. There would be no long-term costs associated with each temporary regulation, but future temporary regulations would incur the same short-term costs. Additionally, depending on the temporary regulation, there may be increased costs associated with enforcement.

Historical Resources Permitting

Benefits: Improvements to the research permitting process would yield benefits to both users and non-users via increased protection of resources, knowledge, research, and educational opportunities. Many of the goods and services provided by cultural and heritage resources do not require market transactions to derive benefit. These benefits are split into two types: use value and non-use value. Use value may be impacted by the number of shipwrecks protected and the level of investments in museum exhibits, maritime heritage trails (including virtual trails that use video and mobile phone technology), educational workshops on maritime heritage, and training in maritime archaeology.

While use value comes from the direct use of resources, non-use value is derived from those who may never use the resource and is comprised of option value (the value people place on the option to use the resource in the future), existence value (the value of knowing a resource or place exists), and bequest value (the value of knowing that the resource will be available to future generations). Non-use value is typically estimated using stated preference surveys that measure non-users' willingness to pay. Although no studies have been conducted specific to the use or non-use value of shipwrecks in FKNMS, there is evidence that both users and non-users are willing to pay for the protection of these resources (Whitehead & Finney, 2003; Mires, 2014). A more recent study that evaluated the total economic value of national parks to the American public found that nearly 95% of responding households indicated it was important to protect national parks, including historic sites, for current and future generations (Haefele et al., 2016). The same study also found that households placed a marginal value of $3.87 (2014$) on each history-focused national park. Although this estimate may seem small, extrapolating across all households in the U.S. yields a value in the millions.

Costs: Reducing the number of permit categories and aligning the permit with existing state of Florida requirements is expected to reduce the burden of the permit application and, consequently, the cost of compliance.

Fish Feeding

Benefits: There are very few operations that engage in this activity within the Florida Keys. Provided these existing operations can verify they have been engaged in fish feeding, they will be able to obtain an ONMS certification permit. This will allow them to continue this practice; however, new businesses or existing businesses that do not currently engage in fish feeding will not be able to initiate this practice. Consequently, the benefits are expected to be small in the short and long term.

Costs: The costs are minimal in the short term, since few operations are known to engage in this practice and, if they meet all permit requirements, those that do would be able to apply for a permit to continue the practice. If these operators are issued a permit, diver/snorkeler experiences are not expected to decline since the recreational opportunity will not change, resulting in no loss of benefits to users.

Grounded and Deserted Vessels and Harmful Matter

Benefits: The potential for harm to sanctuary resources from derelict and/or abandoned vessels is very high. Multiple vessel groundings have occurred in the Florida Keys; these

incidents were, in part, what led to the designation of FKNMS. Damage assessment and restoration costs due to vessel groundings have totaled multiple millions of dollars. The additional regulations would minimize future damage to sanctuary resources and protect a multi-billion-dollar economy dependent on those resources. There is potential for both substantial short- and long-term benefits from these protections.

Costs: The cost of vessel removal would vary greatly depending on many factors including the size of the vessel, its distance from shore, and the circumstances and condition of a particular vessel. For instance, the fee for an operator to tow a vessel away from shore before the vessel grounds may be minimal, whereas, the cost to recover a severely damaged, abandoned vessel could be substantial. Cost of vessel removal would also vary depending on whether or not the operator is insured and, if insured, the cost would likely be much lower than for an uninsured boater. In addition, the cost of vessel removal for an operator is minimal compared to the cost of liability should a vessel be abandoned, cause damages to sanctuary resources, and lead to a damage assessment case brought to recover damages from responsible parties. Derelict and abandoned vessels also present costs to the county, state, or federal government if a responsible party cannot be identified, in addition to the cost of damage and resulting restoration as required.

Marine Zone Regulations

Large Vessel Mooring Buoys

Benefits: Benefits of large vessel mooring buoys include the avoidance of smaller mooring buoy repair costs and damage to habitat caused by large vessels pulling smaller mooring buoys loose. Large vessel owners would also benefit by avoiding fines for damaging FKNMS resources. Further, this final preferred alternative provision will help to mitigate and reduce crowding, thus improving visitor use experience.

Costs: There would be no cost to vessel operators as a result of this regulation. Costs to the federal government would include those associated with supplying enough mooring buoys to accommodate existing and future use by large vessels (or rafting of vessels that would be the equivalent of a large vessel). Additionally, with the assistance of its advisory council, FKNMS would collect information from different user groups to determine appropriate numbers and locations for the installation of buoys of various sizes.

Prohibition of Catch and Release Fishing by Trolling in Four Sanctuary Preservation Areas

Benefits: The main benefit of SPAs has been the reduction in conflicts between fishing and other consumptive activities with non-consumptive activities, such as snorkeling and scuba diving. During initial public scoping and after the release of the draft EIS, public comments indicated the existence of conflicts between trolling activity and diving/snorkeling. Reducing such conflicts is likely to improve visitor experience and satisfaction. Consequently, this regulatory alternative has both short- and long-term benefits to non-consumptive user groups.

Costs: Fishers who troll in SPAs would potentially suffer both short- and long-term costs from displacement. However, there are abundant locations outside of SPAs available to relocate this activity; therefore, the likelihood of either short- or long-term costs is very low.

Bait Fishing Permits

Benefits: Reducing exemptions such as bait fishing within SPAs (i.e., no-take areas) could potentially lower enforcement costs. Consistent regulations could also help to resolve any potential user conflicts with non-consumptive recreation users, particularly divers and snorkelers, thereby enhancing the value of the non-consumptive recreation experience.[11] Elimination of the bait fishing permit system would also reduce administrative costs.

Costs: Fishers who catch their own bait might have to shift to either buying bait or catching bait outside SPAs. If fishers must pay for bait, the replacement cost could be between $20,859 and $33,375 for all cast net permit holders per year ($815–1,304 per active permit holder annually). Lampara net fishers may lose a total of $1,916 in harvest revenue. If costs incurred can be transferred to customers, profits would not be affected; however, transferring losses to customers would reduce consumer surplus. If permit holders catch bait outside SPAs (lampara and cast net fishers currently catch close to 20.0% and 37.8% of baitfish outside SPAs, respectively), their costs would be reduced to zero or the additional time and effort needed to replace the catch.

Tortugas Ecological Reserve North Permits

Benefits: The benefits of this change would be relatively minor. The permit process would become less burdensome, which might lead to expanded economic opportunities for diving operations or private households that want to visit Tortugas Ecological Reserve North for diving.

Costs: Costs may be expected to decrease by a trivial amount due to decreased permit requirements.

Marine Zone Boundary Changes

A detailed quantitative analysis and discussion of the expected economic effects of the final preferred alternative to commercial and recreational fishing is provided in Chapter 4 of the 2022 socioeconomic report. The following section summarizes the expected economic effects of this action.

Commercial Fishing

This action would establish new zone types, expand existing zone types, and update the regulations specific to each zone type, with the goal of improved conservation, management, and preservation of each zone. The economic effects on individual commercial harvesters would depend on each vessel owner's profit maximization strategy, their dependence on reef-

[11] Johns et al. (2001) found that reef users in Monroe County are willing to pay $72.2 million per year to maintain artificial and natural reefs in their current condition, which includes preventing overuse of the reefs.

associated species caught within each spatial management zone, and their ability to adapt to changing regulations.

Benefits: NOAA expects the rule to have positive outcomes on the conservation, protection, and health of key habitats. Long-term fish populations will be supported and potentially increase both within the protected areas and outside the protected areas, providing sustained and possibly improved benefits to commercial fishers.

Costs: The expected change in average harvest revenues across the species of interest for the period 2015–2019 were used to approximate the anticipated change in net economic benefits. Across each of the nine reef species, the average annual loss of harvest revenue across all fishers who landed each species from Monroe-County-associated statistical areas is less than 1%. Caribbean spiny lobster harvest revenue is estimated to decrease by an average of $966,000 annually, equating to 2.3% of total Caribbean lobster harvest revenue within Monroe County statistical areas. Stone crab harvest revenue is expected to decrease by 0.2%, and shrimp harvest revenue is not expected to change.

These estimated changes in harvest revenue do not reflect changes in profit or producer surplus,[12] since any changes in costs (i.e., fuel, time, labor) due to the final preferred alternative were not estimated. If the maximum potential effects occur and fishers do not substitute species or locations, then fishers may reduce effort, thereby reducing costs (i.e., fuel, time, labor). These estimates also do not account for the potential impact to seafood dealers; indirect economic effects (net costs or benefits) for this group cannot be estimated due to a lack of data on net revenue and profit. However, dealers are generally indirectly affected whenever gross revenues to commercial fishing vessels are expected to change. As discussed in Chapter 4 of the 2022 socioeconomic report, previous studies demonstrate that estimated maximum potential losses do not occur in the long run (five years). Ultimately, it is possible that some commercial harvesters may benefit from the regulatory changes via reduced effort and cost required to land the same catch as a result of enhanced habitat and larger fish populations.

Recreational Fishing

The action would establish new zone types, expand existing zone types, and update the regulations specific to each zone type, with the goal of improved conservation, management, and preservation of each zone. A separate analysis is provided for charter boat operations and private/rental boats.

For-hire Charter Operations

The economic effects on individual for-hire charter operations would depend on each vessel owner's profit maximization strategy, their dependence on the reef-associated species caught within each spatial management zone, and their ability to adapt to changing regulations.

Benefits: NOAA expects the rule to have positive outcomes on the conservation, protection, and health of key habitats. Long-term fish populations will be supported and potentially

[12] Producer surplus is the difference between how much a business is willing to accept for a good or service and the market price.

increase both within the protected areas and outside the protected areas, providing sustained and possibly improved benefits to recreational fishers.

Costs: Based upon the analysis provided in Chapter 4 of the final EIS, the total maximum potential loss in terms of average annual charter boat angler-days is 424, equivalent to a loss of 0.36% angler-days from the baseline (117,119 angler-days). Individual angler-days do not represent the number of potential charter vessel trips lost. (For example, a vessel may take three trips in a week, with six people on each trip. This would yield three charter vessel trips and 18 angler-days.) The net cash flow per angler is $113 for charter operations in the South Atlantic; this value should be considered an upper bound for producer surplus. This amounts to a maximum average potential loss of $47,912 per year across all charter operations in the Florida Keys that target reef-associated species. However, the areas that would be closed to fishing are small, and it is likely that charter operations will be able to fish in other locations. In the long run, it is possible that some for-hire operations may benefit from the regulatory changes via reduced effort and cost required to land the same catch as a result of enhanced habitat and larger fish populations.

Private/Rental Boat Fishing

Benefits: NOAA expects the rule to have positive outcomes on the conservation, protection, and health of key habitats. Long-term fish populations will be supported and potentially increase both within the protected areas and outside the protected areas, providing sustained and possibly improved benefits to recreational fishers.

Costs: A potential reduction of nearly 4,200 (0.38%) annual angler-days was estimated. Reduced angler-days could result in less satisfaction and a reduction in benefits that recreational fishers derive from FKNMS. Ultimately, the level of reduced benefits will depend on fishers' ability and willingness to fish other locations and even target other fish species. However, the final preferred alternative is intended to aid in conservation management and stewardship and support reef-associated species for sustainable future use.

Non-Consumptive Recreation

This action would establish new zone types, expand existing zone types, and update the regulations specific to each zone type, with the goal of improved conservation, management, and preservation of each zone. The primary non-consumptive recreation activities considered here are scuba diving, snorkeling, and wildlife viewing.

The economic effects on non-consumptive recreation for-hire charter operations would depend on each vessel owner's profit maximization strategy, their dependence on the use of the reefs in each spatial management zone, and their ability to adapt to changing regulations.

Benefits: There are limited cost and earnings data available for non-consumptive recreation businesses. From a qualitative perspective, potential costs to operators and private boaters may exist related to no-entry and no anchoring zones (e.g., if operators are unable to locate a buoy within their desired dive/snorkeling location). FKNMS plans to minimize such costs through thorough stakeholder engagement to identify the optimal size and number of buoys to install. Ultimately, the use of buoys will help reduce damage to habitats and improve user experience. In addition, user satisfaction is expected to increase as a result of reduced user conflict and

expansion of the buoy program. Additionally, the intent of the final preferred alternative is to improve resource quality, which may yield increased demand for non-consumptive users regardless of method of access.

Indirect benefits are likely to exist, as measured by scuba divers and snorkelers' willingness to pay for the conservation and restoration of coral habitats (Johns et al., 2001). Additionally, if users substitute non-consumptive recreation activities for other activities not directly affected by the regulations (i.e., culture or arts), this may lead to a transfer of economic activity to other businesses and industries within Monroe County.

Costs: Costs are expected to be de minimis to non-consumptive recreational users.

Non-Users

Benefits: Non-users of FKNMS are also expected to benefit. As stated throughout this document and the final EIS, the marine zones are intended to improve habitat, natural resource conditions, and species health. Cavasos & Bhat, 2020, found that respondents to a study asking about the preferences for restoration and protection of staghorn corals and Florida's coral reef ecosystems had substantial non-market benefits to both users and non-users.

Determination of Significant Regulatory Action

As stated in Executive Order 12866, "Regulatory Planning and Review," 58 FR 190 (Oct 4, 1993), as supplemented and reaffirmed by E.O. 14094, "Modernizing Regulatory Review," 88 FR 21879 (April 11, 2023)., a regulation is considered a "significant regulatory action" if it is likely to: (1) have an annual effect on the economy of $200 million or more (adjusted every 3 years by the Administrator of OIRA for changes in gross domestic product) or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, territorial, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise legal or policy issues for which centralized review would meaningfully further the President's priorities or the principles set forth in this Executive order [14094], as specifically authorized in a timely manner by the Administrator of OIRA in each case."

The Office of Management and Budget (OMB) has determined this final rule is significant action under Executive Order 12866, as supplemented and reaffirmed E.O. 14094. However, based upon the information provided in this analysis, this final rule would not meet the criteria for a significant regulatory action as defined in section 3(f)(1) of E.O. 12866, as supplemented and reaffirmed by E.O. 14094.

Table K.1. Qualitative summary of costs, benefits, and net economic benefits of the action. For more details regarding the costs and benefits of this action, refer to the regulation-specific information above and the analysis provided in Chapter 5 of this final EIS.

Component	**Regulation**	**Benefits**	**Costs**	**Net Benefits**
Boundary expansion	Boundary expansion to include existing ATBAs	*De minimis:* This provision will result in an alignment of existing ATBAs with the FKNMS boundary, which may provide *de minimis* administrative benefits.	No costs because the ATBA already exists.	No change
Sanctuary-wide regulations	Discharge regulation exception	Positive: Prohibiting cruise ship discharges would result in increased benefits for recreational users and commercial entities that rely on good water quality.	*De minimis* because cruise ships can discharge materials other than cooling water once outside FKNMS boundaries.	Based on the benefits and de minimums costs, positive short- and long-term net benefits are expected as a result of this regulation. The potential net benefits are expected to be higher in the long term than the short term. Benefits are expected to increase over time as a result of environmental conditions improving.
	Temporary regulation for emergency and adaptive management	Positive: This regulation will benefit public safety in the short-term and sanctuary resources in the long-term. Emergency actions may preserve sanctuary resources in the long run.	Loss of access or use would be temporary, but may interfere with commercial or recreational activities in the short run. There will be no long-term costs since these regulations are temporary.	By increasing the agency's ability to respond to emergencies, FKNMS will be able to more effectively manage emergencies, reducing long-term effects to sanctuary resources while minimizing costs. It is unknown what the net economic benefits will be, given that it is not possible to predict the types or extent of emergencies.

Component	Regulation	Benefits	Costs	Net Benefits
	Historical resources permitting	Positive: Users will benefit from the expansion of the number of shipwrecks protected, educational workshops on maritime heritage and training in maritime archaeology, etc. Non-users may derive option, bequest, and existence value from the preservation of additional shipwrecks in the FKNMS.	Reduction in costs due to the more streamlined and efficient nature of the permitting process.	Based on the benefits and reduction of costs, positive short- and long-term net benefits are expected as a result of this regulation.
	Fish feeding	Positive: Reduces negative effects associated with fish feeding on wildlife behavior and health, and human safety.	Minimal: Existing operators may seek an ONMS permit to continue fish feeding.	The net benefits are likely to be low in the short term but potentially greater in the long term by restricting fish feeding and thus reducing impacts on the behavior of various marine species.

Component	Regulation	Benefits	Costs	Net Benefits
	Grounded and deserted vessels and harmful matter	Positive: These regulations will reduce the likelihood of future damage to resources.	Reduction in costs and damages. The cost of vessel removal will vary greatly depending on factors including the size of the vessel, its distance from shore and/or distance from sensitive resources, and the condition of a particular vessel. However, the cost of vessel removal to industry or individuals is minimal compared to the liability associated with damage to sanctuary resources caused by derelict or abandoned vessels.	By minimizing potential damage to resources, there is potential for net benefits in both the short and long term from this set of regulations.
Marine zone regulations	Large vessel mooring buoys	Positive: Reduced damage of coral reef, hard bottom, and other habitats caused by large vessels pulling mooring buoys loose.	Costs of infrastructure to site for buoy installation and maintenance.	It is expected there will be both short- and long-term net benefits for this regulatory action, as NOAA expects the benefits to coral reefs and other habits in the sanctuary to outweigh the costs of buoy installation and maintenance.

Component	Regulation	Benefits	Costs	Net Benefits
	Prohibition of catch and release fishing by trolling in four SPAs	Positive: Benefits to non-consumptive recreational user experiences and human safety, by separating conflicting uses within the SPAs.	Costs to trolling fishers due to displacement to areas outside of these SPAs.	It is expected that there will be both short- and long-term net benefits for this regulatory action, including reduced potential user conflicts and improved non-consumptive user experience.
	Bait fishing permits	Positive: Benefits to non-consumptive recreational user experiences by separating conflicting uses within the SPAs.	Costs to bait fishers would be minimal as this activity is not restricted outside of marine zones.	Given the value of non-consumptive recreation uses, primarily scuba diving and snorkeling, the enhanced value of the recreation experience is expected to more than offset the potential costs to baitfish permit holders. A phase-out of the baitfish permit program is also expected to reduce administrative and enforcement costs. Net benefits from this action provision are expected.
	Tortugas Ecological Reserve North permits	None.	Reduction in administrative burden for permit applicants.	A small net economic benefit is expected from this action alternative provision due to reducing the regulatory burden and slight decrease in costs due to reduced permit requirements.

Component	Regulation	Benefits	Costs	Net Benefits
Marine zone boundary changes	Designation of marine zone boundaries and associated regulations	Positive benefits to the environment through the conservation, protection, and health of key wildlife habitats. Improved resource quality results in improved fishing and non-consumptive recreational experiences.	Potential loss in revenue to commercial and recreational for-hire operations.	Net benefits are expected as a result of these provisions regarding marine zone boundaries. The benefits from conservation and protection are likely to improve the quality of experiences and condition of the environment for all user groups. Although some costs may occur, as shown in existing studies cited throughout this analysis, the maximum potential losses to fishers are unlikely to occur, especially over time as user behavior adapts to changes in regulations. In the long term, it is likely that net benefits will increase.

Appendix L:
Field Activities and Best Management Practices

Implementing Routine Sanctuary Field Activities

As part of NOAA's management responsibilities for FKNMS, NOAA conducts routine field activities in sanctuary waters and in vessel transit routes to the sanctuary. Field activities aim to further resource protection goals, promote stewardship among local stakeholders, and educate the public and research community on the sanctuary. The field activities and impact analyses in this appendix are derived from the 2018 ONMS Draft Programmatic Environmental Assessment for the Southeast and Gulf of Mexico.[13] The typical activities conducted at FKNMS are: operating and maintaining sanctuary vessels; undertaking scuba operations; deployment of equipment on the seafloor; and deployment of remotely operated vehicles (ROVs) and other uncrewed systems. Deployment of equipment on the seafloor includes the installation and maintenance of mooring buoy systems. As part of applying the existing sanctuary regulations and management actions to the expansion areas, under all action alternatives NOAA would place mooring buoys at certain banks to facilitate access and to provide alternatives to anchoring.

NOAA expects the type and intensity of activities that would be conducted in the sanctuary would be the same under all alternatives, including the No Action Alternative. The estimated annual activity level of field operations at FKNMS in a given year can be reviewed below. When conducting field activities, NOAA operates all small boats in accordance with all NOAA Small Boats Policy (NOAA Administrative Order 209-125)[14] and complies with all NOAA Fisheries regulations regarding interactions with protected species and habitats. NOAA also implements self-imposed best management practices and standing orders to minimize impacts on sanctuary resources, including living marine resources, seafloor habitat, and cultural and historical resources.

Field operations at FKNMS include several activities that support the mission to protect the sanctuary's natural and cultural resources through responsible stewardship; to conduct and apply research to preserve the area's ecological integrity and maritime heritage; and to promote understanding through public outreach and education. Activities include vessel operations, vessel maintenance and crew training, crewed and uncrewed aircraft operations, natural resource damage assessment, habitat restoration, restoration monitoring, benthic habitat characterization, fish and wildlife surveys, coral spawning observation and sampling, invasive/exotic species management, maritime heritage resource management, emergency response, marine debris management, waterway management, water quality monitoring, and education, outreach, and volunteer programs. Note that the specific location, timing, and extent of individual field projects are not known at this time. For this reason, NOAA would complete any environmental compliance requirements (e.g., NEPA, ESA, NHPA) for individual projects at a later time, once the specifics of the project are known. Unless otherwise noted, FKNMS vessel operations are conducted on one or more of approximately 20 small vessels (23–53 ft.) or two

[13] https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20180807-pea-of-field-opsse-gom-nms.pdf
[14] https://www.noaa.gov/organization/administration/nao-209-125-noaa-small-boat-safety-program

smaller skiffs (22 vessels in total) that would be available to FKNMS staff under any of the alternatives.

Table L.1. FKNMS Field Operations

Categories of Field Operations	Definition
Vessel Operations	Vessel operations include all activities conducted on the water from an ONMS small boat or sponsored mission such as, but not limited to, research, education, outreach, resource and habitat assessments, marine mammal disentanglement, and law enforcement. All ONMS vessels must comply with the operational protocols and procedures in the NOAA Small Boats Policy (NAO 209-125) and the best management practices identified below in this appendix. This category applies to all personnel, including crew, staff, visitors, volunteers, and students who may use or work upon any ONMS vessel, regardless of mission sponsor whether directly or indirectly involved. It includes vessel transiting to/from port, where to go, how long to stay there, and what is needed to accomplish cruise purpose.
Vessel Maintenance	Regular activities are determined by the program engineer, vessel's crew, and operations staff and performed on each vessel to ensure safety, compliance, and reduced risk. Includes vessel maintenance, disposal of waste, general ship operations, and any standing orders that improve safety or reduce the potential for resource impacts.
Aircraft Operations	Activities include the use of motorized aircraft including uncrewed aerial systems (UAS) for research and surveillance purposes.
Non-Motorized Craft	Activities include the use of any non-motorized craft, such as kayaks and canoes.
Scuba or Snorkel Operations	Activities include any field work where personnel will be in the water. Includes numbers of divers, time underwater, and location of dives.
Onshore Fieldwork	Activities include onshore or intertidal field work where personnel will be walking on shoreline. May include emergency response activities to address marine mammal strandings, vessel groundings, oil or chemical spill response, Shoreline Cleanup Assessment Team protocols, cultural resource assessments, or natural resource damage assessments.
Deployment of AUVs/ROVs/gliders/drifters	Activities include equipment deployed from a vessel such as autonomous underwater vehicles, remotely operated vehicles, tow-boards, drifters, and gliders.
Deployment of Remote Sensing Equipment	Activities include the deployment from a vessel of towed and hull mounted sensor arrays and the use of acoustic survey systems, including use of scientific fish finders and multibeam mapping sonars. These activities may be done on contracted vessels, if not on an ONMS small boat, such as the NOAA Fisheries vessel, R/V *Pisces*.

Categories of Field Operations	Definition
Deployment of Equipment on Seafloor	Activities include the deployment and maintenance of stationary buoys, moorings, anchored or weighted instrumentation, buoyed sensor arrays, and small marker buoys that are used for safe and efficient dive operations.
Other Sampling Activities	Activities include extractive sampling, placement and retrieval of sampling devices (e.g., constructed arrays, equipment, and traps), capturing, tagging and collection of animals, and other sampling protocols such as those associated with injury assessments.

Note: Where these operations require vessel support, those vessels may be ONMS owned or contracted (except as noted). Vessel maintenance includes only ONMS vessels. Aircraft operations include ONMS-contracted aircraft. Deployment of equipment includes ONMS-owned and -contracted equipment.

Table L.2. FKNMS Project Types

Activity Title	Project Purpose	Relevant Field Operations (from Table L-1)
Natural Resource Damage Assessment	Determine the severity and extent of the injury and make procedural recommendations[15] to ONMS and the NOAA Office of General Counsel Natural Resources and Enforcement Sections.	Vessel operations Aircraft operations Non-motorized craft Scuba or Snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Habitat Restoration	Implement habitat restoration projects in FKNMS by creating the site conditions necessary for the injured areas to recover to pre-incident conditions, and compensate the public and environment for the services lost from the time of injury until full recovery.	Vessel operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Habitat Restoration Monitoring	Monitor habitat restoration projects to evaluate restoration success by assessing the progress of restoration and identifying, as necessary, timely corrective action to shorten the injury recovery period.	Vessel operations Scuba or snorkel operations Deployment of equipment on the seafloor

[15] "Procedural recommendations" refer to staff recommendations on the best course of action to respond to an injury, which may entail a judicial action under Section 307 or 312 of the National Marine Sanctuaries Act or under other federal or state statutes.

Activity Title	Project Purpose	Relevant Field Operations (from Table L-1)
Benthic Habitat Characterization	Survey and monitor the condition and spatial distribution of seagrass, coral, and hard-bottom habitats to inform and develop management strategies.	Vessel operations Aircraft operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Fish and Wildlife Surveys	Survey and monitor fish and wildlife to track changes in abundance, diversity, spatial distributions, behavior, and other metrics to inform and develop management strategies.	Vessel operations Aircraft operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Coral Spawning Observation and Sampling	Continue observation of and support of science activities studying mass coral spawning events. This includes sampling of coral and gametes for a variety of studies including coral reproduction, genetics, symbiotic algal communities, and climate change.	Vessel operations Scuba or snorkel operations Deployment of equipment on the seafloor Other sampling activities
Invasive/Exotic Species Management	Develop and implement a lionfish invasion response and management plan. Response involves delineating removal and non-removal zones and fish surveys.	Vessel operations Scuba or snorkel operations Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Other sampling activities
Maritime Heritage Resource Management	Survey and monitor historical and cultural resources to inform and develop management strategies.	Vessel Operations Non-Motorized Craft Scuba or Snorkel Operations Onshore Fieldwork Deployment of Equipment on the Seafloor Deployment of AUVs/ROVs/Gliders Deployment of Remote Sensing Equipment Other Sampling Activities

Activity Title	Project Purpose	Relevant Field Operations (from Table L-1)
Emergency Response	Provide coordination, support, and resource trustee information during emergency incidents that injure or threaten injury to sanctuary resources.	Vessel operations Aircraft operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Marine Debris Management	Identify, determine sources of, assess, prevent, reduce, remove, dispose, or recycle marine debris, including but not limited to construction materials, derelict fishing gear, and derelict vessels.	Vessel operations Aircraft operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Deployment of equipment on the seafloor Deployment of AUVs/ROVs/gliders Deployment of remote sensing equipment Other sampling activities
Waterway Management	Install and maintain aids to navigation to prevent damage to biological and historical/cultural resources from vessel operation, anchor damage, and delineate sanctuary regulatory zones that protect sanctuary resources.	Vessel operations Scuba or snorkel operations Deployment of equipment on the seafloor
Water Quality Monitoring	Conduct and/or support activities to collect, measure, and analyze data on temperature, salinity, light, currents, chemicals (nutrient) data, and other water quality factors.	Vessel operations Scuba or snorkel operations Onshore fieldwork Deploy equipment on seafloor Other sampling activities
Education, Outreach, and Volunteer Programs	Develop and maintain programs for public involvement to support sanctuary management in order to build a stewardship ethic in the community and accomplish management objectives.	Vessel operations Non-motorized craft Scuba or snorkel operations Onshore fieldwork Other sampling activities

Natural Resource Damage Assessment

This project type uses vessels, aircraft, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. The vessels used are small boats for approximately 20 trips per year. Aircraft operations are conducted one to three times each year. The vessel trips are typically less than 20 miles round trip. Flight length/duration is variable based on the location of injury. Kayaks or inflatable boats may also be used during an assessment to gather information. Between two and five staff utilize scuba/snorkel and may be deployed for less than four hours per trip to document resource

injury. During dives or snorkeling trips, survey-grade GPS, commercially-available off-the-shelf depth-sounders are used (similar to those used by thousands of recreational vessels operating in FKNMS). FKNMS depth-sounder systems are dual frequency 50/200 kHz single beam sonars and used approximately 20 times per year. During dives or snorkeling trips, survey-grade GPS, PVC stakes, quadrats, stainless steel pins, flagging tape, and measuring tapes may be used, with all equipment removed at the end of each trip. The quadrats are 0.25 to 1.0 square meters and are deployed a minimum of 10 times in each injury and the control/reference area. Divers also take photos and record video. In addition to small vessel trips, staff trailer a small vessel 8–10 times per year between 50–100 miles roundtrip to access grounding sites that are greater than 20 miles from our Upper and Lower Region duty stations.

Habitat Restoration

Seagrass, coral, and hard-bottom restoration projects in FKNMS prevent injuries from expanding in size or increasing in severity; create the site conditions necessary for the injured areas to recover to pre-incident conditions; and compensate the public and the environment for the services lost from the time of injury until full recovery. FKNMS works with partners to maintain coral nurseries to help replenish wild populations of corals in areas where coral populations have declined due to major environmental events such as coral bleaching and winter cold-water events. These nursery corals originate as small colonies rescued from seawall and nearshore construction projects. Other times small corals are salvaged from a vessel grounding. In the nursery, corals are typically attached to pedestals on blocks on the seafloor, hung on line nurseries, or placed in baskets suspended off the seafloor.

This activity uses vessels, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. For vessel operations, the vessels are used on approximately 10 trips per year. The vessel trips are typically less than 20 miles round trip. For scuba/snorkel operations, between two and five snorkel/scuba-certified biologists are deployed to conduct seagrass restoration, provide oversight for contractors, and document restoration activities. Scuba/snorkel trips are typically less than eight hours each.

Restoration Monitoring

Monitoring is the primary means for determining whether habitat restoration projects provide services in a manner consistent with restoration goals. Monitoring also allows sanctuary scientists to assess the progress of restoration and to identify, as necessary, timely corrective action to shorten the seagrass injury recovery period.

Coral and hard-bottom restoration monitoring activities are implemented following protocols described in Final Programmatic Environmental Impact Statement for Coral Restoration in the Florida Keys National Marine Sanctuary and Flower Gardens Banks National Marine Sanctuaries (NOAA, 2010).

Seagrass restoration monitoring activities are implemented following protocols described in Final Programmatic Environmental Impact Statement for Seagrass Restoration in the Florida Keys National Marine Sanctuary (NOAA, 2004).

The activity uses vessels, scuba/snorkel operations, and other sampling activities. This activity uses small vessels for approximately 20 trips per year. The trips are less than 20 miles round trip. Between two and five snorkeling or scuba diving biologists may be deployed for less than four hours per trip to document restoration projects. During dives or snorkeling trips, PVC stakes, quadrats, brass chains, and measuring tapes may be used. Divers also take photos and record video.

Benthic Habitat Characterization

FKNMS staff provide support for or participate in a number of habitat surveys and monitoring projects designed to detect status and trends of various ecological parameters in order to discern local and system-wide effects of human and natural disturbances on natural resources and to assess the overall health of the ecosystem. These activities use vessels, aircraft, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. Hydroacoustic and bathymetric survey activities may be conducted by FKNMS or by partners on behalf of ONMS, such as NOAA's Office of Coast Survey,[16] and may occur on FKNMS vessels, or on NOAA ships or aircraft, including but not limited to NOAA ships *Thomas Jefferson, Nancy Foster, Pisces, Okeanos*, and others.

Fish and Wildlife Surveys

FKNMS staff provide support for or participate in a number of fish and wildlife surveys designed to track changes in abundance, diversity, spatial distributions, behavior, and other metrics to inform and develop management strategies. Surveys involve collecting data on fish, marine mammals, birds, sea turtles, and other wildlife to evaluate diversity, distribution, abundance, and size. This activity uses vessels, aircraft, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. These activities use vessels for approximately 70 trips per year and aircraft for one to three trips per year. The vessel trips are typically less than 20 miles round trip, however some may be hundreds of miles when conducting surveys in remote areas of the sanctuary. Between two and five scuba diving biologists may be deployed for less than four hours per trip. During dives or snorkeling trips, PVC stakes, quadrats, brass chains, and measuring tapes may be used. Divers also take photos and record video.

Coral Spawning Observation and Sampling

Annually in the late summer, coral colonies release their gametes simultaneously. FKNMS staff participate in and/or support observation and sampling activities during the spawn.

This activity uses vessels, scuba/snorkel operations, deployment of equipment on the seafloor, and other sampling activities. This activity uses small vessels for approximately 12 trips per year. The trips are typically less than 20 miles round trip. Between two and five snorkeling or scuba diving biologists may be deployed for less than four hours per trip to document, observe, and

[16] The mission of NOAA's Office of Coast Survey is to survey all navigationally significant waters of the U.S., including national marine sanctuaries, in order to produce navigational charts for the public.

sample coral spawn. During dives or snorkeling trips, PVC stakes, quadrats, brass chains, and measuring tapes may be used. Divers also take photos and record video.

Invasive/Exotic Species Management

FKNMS encourages the safe removal of invasive lionfish from its waters and issues lionfish removal permits to divers for the collection of lionfish from sanctuary preservation areas, which are otherwise no-take zones. No permits are necessary for removing lionfish from areas of the sanctuary where fishing is normally allowed. FKNMS staff remove lionfish as they are encountered during various project dives and other field operations.

FKNMS and NOAA Fisheries also permit the testing of traps to capture lionfish. The effects of testing of traps has been analyzed in *Programmatic Environmental Assessment-Testing Traps to Target Lionfish in the Gulf of Mexico and South Atlantic, Including within the Florida Keys National Marine Sanctuary* (NOAA, 2018).

This activity uses vessels, scuba/snorkel operations, deployment of equipment on the seafloor, and other sampling activities. This activity uses small vessels for approximately 10 trips per year. The trips are less than 20 miles round trip. Between two and five snorkeling or scuba diving biologists may be deployed for less than four hours per trip to remove lionfish. This activity may be conducted on an opportunistic basis during other dives or snorkeling trips.

Maritime Heritage Resource Management

Maritime heritage research activities seek to locate and characterize historical and cultural resources. Study of these now-renewable sites and artifacts is critical to understanding the history of the Florida Keys. Historical and cultural resources include shipwrecks (the predominant variety), plane wrecks, historic navigation aids and other structures placed on the seafloor, and submerged Native American archaeological sites.

Sanctuary researchers and archaeologists employ remote sensing equipment such as side scan sonar and AUVs to map the seafloor and locate targets for further investigation. Remote sensing surveys are conducted from the sanctuary's small vessels and from larger vessels operated by partner organizations, such as the University of Miami. Follow up investigations by divers and ROVs capture imagery of the resources. Archaeological sites selected for further investigation may be mapped by larger dive teams of up to 40 persons who utilize analog measuring equipment and drawings to create detailed site maps. These efforts may require the placement of temporary measuring apparatus on the seafloor. Staff archaeologists may collect threatened or diagnostic artifacts to ensure that the information they possess is available to the public. Artifacts are conserved and archived to the Secretary of the Interior's standards.[17] Archaeological sites of high research interest that are buried in sediment may be excavated to reveal important information. Excavation techniques are appropriately scaled to the research questions and designed to minimally impact the surrounding environment. Monitoring of the

[17] Department of Interior 1983 and 36 CFR Part 79 (https://www.gpo.gov/fdsys/pkg/CFR-1999-title36-vol1/pdf/CFR-1999-title36-vol1-part79.pdf)

sanctuary's historical and cultural resources is also conducted to evaluate changes to the resources from environmental and anthropogenic sources for adaptive management.

These activities use vessels, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. Maritime heritage research conducts approximately 50 mission days a year with research vessel transits of 20 nm each mission. Between two and five scuba diving biologists may be deployed for less than four hours per trip. During dives or snorkeling trips, PVC stakes, quadrats, brass chains, and measuring tapes may be used. Divers also take photos and record video. The research takes place throughout FKNMS, but is predominantly located in sharply shoaling waters, where the majority of shipwrecks have occurred.

Emergency Response

FKNMS staff respond to or support response efforts for approximately 25 incidents per year. These incidents include, but are not limited to, vessel groundings, marine casualties, marine mammal strandings, aircraft crashes, and pollution/hazardous materials releases.

FKNMS emergency response activities follow guidance and utilize response measures and alternatives from National Response Framework, National Incident Management System, National and Regional Response Teams, and Southeast Florida and Florida Keys Area Contingency Plans, Geographic Response Plans, Environmental Sensitivity Index Maps, and Tidal Inlet Protection Strategies. During recovery and removal operations in connection with an air or marine casualty, FKNMS also implements BMPs developed in conjunction with NOAA Fisheries, USFWS, United States Army Corps of Engineers, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Florida Department of State, Seminole Tribe of Florida, and the Seminole Nation of Oklahoma. These BMPs are designed to minimize and/or avoid adverse effects to wildlife and habitat during response activities.

This activity uses vessels, aircraft, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. Response activities may require the use of small boats and barges up to approximately 250 ft. in length. This activity uses vessels for approximately 30 trips per year. Between two and 10 sanctuary staff typically assist in incident response by planning and assisting in operations and logistics.

Marine Debris Management

FKNMS conducts and/or supports the removal and disposal of marine debris to eliminate physical, biological, and chemical threats to coastal and marine resources and habitat. This debris may include derelict or illegal fishing gear, derelict or illegal structures, solid waste, and abandoned or derelict vessels. Many forms of debris can negatively impact riverine, riparian, associated upland, coastal, intertidal, or subtidal habitat and compromise the ecosystem by limiting access to habitat, degrading the quality of habitat, or directly harming a living marine resource. Derelict fishing gear can entangle and kill fish, birds, sea turtles, and marine mammals and can snag on or drag across sensitive subtidal habitats such as coral reefs and seagrass.

Debris removal projects typically involve, but are not limited to:

- Identifying, assessing, and removing debris.
- Entry of personnel and/or heavy equipment into upland and marine environments.
- The use of machinery, trucks, and/or heavy equipment to access and remove debris.
- Manual removal by volunteers and/or professionals.

This activity uses vessels, aircraft, non-motorized craft, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, deployment of AUVs/ROVs/gliders, deployment of remote sensing equipment, and other sampling activities. The vessels used are small boats for approximately 20 trips per year. Aircraft operations are conducted one to three times each year. The vessel trips are less than 20 miles round trip. Flight length is variable based on the location of debris. Kayaks or inflatable boats may also be used during an assessment to gather information. Between two and five staff utilize scuba/snorkel and may be deployed for less than four hours per trip to document resource injury.

During debris removal operations, FKNMS implements BMPs developed in conjunction with NOAA Fisheries, USFWS, United States Army Corps of Engineers, Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Florida Department of State, Seminole Tribe of Florida, and the Seminole Nation of Oklahoma. These BMPs are designed to minimize and/or avoid adverse effects to wildlife and habitat during removal activities.

This activity has also been analyzed in the Final Programmatic Environmental Impact Statement for Habitat Restoration Activities Implemented throughout the Coastal United States (NOAA, 2015).

Waterway Management

Waterway management activities assist FKNMS in minimizing impacts to maritime heritage resources and sensitive marine habitats, specifically coral reef formations, to provide reasonable access to sanctuary resources, consistent resource protection, and to manage or restrict activities that have a detrimental impact on resources. FKNMS uses mooring buoys throughout the sanctuary to provide alternatives to anchoring in high-use and sensitive areas. FKNMS also uses buoys to delineate sanctuary regulatory zones that protect sanctuary resources (sanctuary preservation areas (SPA), special use areas, wildlife management areas (WMA), and ecological reserves (ER)). FKNMS is also responsible for maintaining 12 Private Aids to Navigation (PATON) near Carysfort Reef, South Carysfort Reef, Grecian Rocks, Key Largo Dry Rocks, White Bank Dry Rocks, French Reef, Molasses Reef, and Sand Island.

This activity uses vessels, scuba/snorkel operations, and deployment of equipment on the seafloor to monitor over 820 buoys with over 28,000 feet of down line. Maintenance involves hydraulic drilling to install new anchor points and PATONs on the seafloor and re-establishing anchor points on artificial reefs (shipwrecks). The activity uses two 39-foot vessels and two smaller vessels to install and maintain moorings throughout the sanctuary. The activity involves approximately 250 vessel trips of 25–50 miles roundtrip per year. Additionally, ONMS staff run one trip per year to the Dry Tortugas Ecological Reserve for a roundtrip of 160 miles. The teams

average 35–40 dives each month to conduct routine inspections and down-line cleanings. Down-lines are changed out based on a maintenance timeline and anchors are replaced when necessary.

Water Quality Monitoring Program

FKNMS staff conduct and/or support activities to collect, measure, and analyze data on temperature, salinity, light, currents, chemicals (nutrient) data, chlorophyll-a and pigment concentrations, environmental DNA (eDNA), bio-optical measurements, phytoplankton and zooplankton samples for taxonomy and primary productivity, in situ bio-optical measurements including surface remote sensing reflectance (Rrs), chlorophyll-a and colored dissolved organic matter (CDOM) fluorescence, and specific absorption spectra of phytoplankton and detritus. This activity uses vessels, scuba/snorkel operations, onshore fieldwork, deployment of equipment on the seafloor, and other sampling activities. The vessels used are small boats for approximately 20 trips per year. Between two and five snorkeling or scuba diving staff may be deployed for less than four hours per trip to obtain samples.

Education, Outreach, and Volunteer Programs

Successful sanctuary management relies on a well-informed public who understand their role in the overall management of the sanctuary. Education and outreach programs develop opportunities and tools to reach key audiences, such as students or first-time visitors, with critical messages that enlist their support in protecting sanctuary resources.

Volunteers are a vital mechanism for involving the community and a valuable resource for accomplishing a variety of tasks, including research and monitoring, education and outreach programs, underwater projects, representation at certain events and functions, and administrative tasks. Volunteers support many activities that would otherwise not be accomplished as efficiently or cost effectively.

This activity uses vessels, scuba/snorkel operations, non-motorized craft, and onshore fieldwork. Team OCEAN utilizes three small vessels for approximately 80 trips per year. The trips are less than 20 miles round trip. Team OCEAN also conducts 8–10 shoreline/mangrove cleanups per year using up to 16 kayaks.

Impacts of Field Activities Across All Alternatives

Physical Environment

Geology

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Onshore fieldwork consisting of the removal or relocation of large items such as grounded vessels or large amounts of marine debris is expected to have less than significant beneficial impacts to the physical environment by preventing large and potentially damaging items from no longer threatening the marine and nearshore environment.

Onshore fieldwork that consists of the removal or relocation of large items such as grounded vessels or large amounts of marine debris may have less than significant adverse impacts to the physical environment when removing or moving large items from a shoreline area. For example, the removal of grounded vessels may require motorized equipment that may alter the surrounding environment and the relocation of large items may adversely impact the substrate upon which the vessel or marine debris was originally found during the removal or relocation process. However, adverse impacts to the physical environment of the area are expected to be less than significant, because they are conducted within a localized area, for a short duration, amounting to a low impact and short-term effect on the physical geological surrounding environment.

Onshore fieldwork that is limited to beach-walk and intertidal surveys through the movement of personnel engaged in collection and identification studies will have negligible impacts on the physical environment. Short-term and insignificant disturbance to the physical environment may occur during fieldwork sampling activities through incidental and unavoidable contact by feet and hand-operated equipment with physical resources. However, the effects of this contact are expected to be negligible as any contact with the physical environment is localized and short term (activities likely to occur a few days per year in any one area).

Activities with both less than significant beneficial and less than significant adverse impacts

Deployment of Equipment on the Seafloor

The scientific data generated through the seafloor deployment of equipment helps create a better characterization of the biological, geological, and oceanographic processes within a sanctuary, thus increasing our understanding of sanctuary resources and their associated relationship to the physical environment (e.g., the physical habitat use by fish) and aiding the development of education and outreach materials. This aids protection and management of these resources, and the sanctuary as a whole.

For example, vessel moorings prevent anchor damage to the seafloor, and the use of weighted marker buoys for dive operations supports science and education projects that help managers take action to protect sanctuary physical resources. Also, incident response operations that may occasionally require use of marker buoys benefit physical resources through the removal of hazardous material and pollution threats.

Thus, deployment of equipment on the seafloor and other seabed deployed instruments in sanctuaries is expected to provide less than significant, indirect, short-term and long-term beneficial effects to the physical environment.

Thus, fixed buoy deployments are expected to have less than significant adverse effects on a sanctuary's physical resources because of the nature of ground-secured buoys. Although efforts are made to secure buoys on open bottoms, storms and other physical events can move anchors into coral and other sensitive areas.

The deployment of some scientific, safety, and monitoring equipment attached to the seafloor via weights or embedded anchors poses a chance of adversely affecting the physical environment through its direct contact with the bottom. Anchors are placed in soft sediment, non-coral

locations whenever possible. Usually, the temporary nature of these devices (although some are placed on the seabed for a long period of time), their limited local effects, and the narrow scope of each study with regards to the size of the area keep these adverse effects minor. For example, the deployment of buoys on the seafloor may have a short-term, direct but slightly adverse effect on a small area (<3m^2) and any associated resources of the seafloor. Therefore, the adverse effects are expected to be less than significant.

Deployment of Remote Sensing Equipment

The scientific data generated through remote sensing efforts help create a better characterization of the geologic and oceanographic processes within a sanctuary, thus increasing our understanding of sanctuary resources and their associated relationship to the physical environment (e.g., the physical habitat used by fish), and aiding the development of education and outreach materials. This aids protection and management of these resources, even if indirectly. For example, the development of bathymetric maps is beneficial in developing better strategies for managing physical resources found on the seabed, which could result in indirect and less than significant beneficial conditions for such resources.

The deployment of some remote sensing arrays pose a slight chance of directly affecting the physical environment through direct contact with the bottom, either planned or unplanned, although normal operations usually preclude this possibility. Equipment is placed in soft sediment, non-coral locations whenever possible. Usually, the temporary nature of these devices (although some are placed on the seabed for a long period of time), their limited local effects, and the limited scope of each study with regards to the size of the region are expected to keep these adverse effects less than significant.

Other Sampling Activities

The scientific and monitoring data generated through other sampling activities help create a better characterization of the geologic and oceanographic processes within a sanctuary, thus increasing our understanding of sanctuary resources and their associated relationship to the physical environment. Sampling activities in the Florida Keys include, but are not limited to, placement of recruitment tiles, sediment and water quality sampling, placement of transect lines and tape, and other markers. These activities are localized and of small scale, and they are located in areas and performed in manners that minimize impact to the environment. This also raises public awareness of the nature and importance of the physical environment and the need to protect it; helps reduce potential impacts from human and natural sources; and aids protection and management of these resources and the sanctuary as a whole. For example, disentanglement activities in sanctuaries serve to remove foreign objects such as lines and boys from the physical environment, which reduces the risks of wildlife entanglement. The benefits are expected to be indirect, long-term, and less than significant.

The deployment of some other sampling activities poses a slight chance of directly affecting the physical environment through direct contact with the bottom, either planned or unplanned. For example, research projects that require sampling devices such as small PVC pipe quadrats placed on the seafloor to document species diversity, or sediment sampling procedures, may affect the physical habitat of a sanctuary and its resources, but due to the small area impacted

and the brief time frame for the operation these direct adverse effects are expected to less than significant, because they are localized and short term.

Activities with only less than significant adverse impacts

Vessel Operations

The operation of vessels, although episodic and of low intensity (average 230 vessel days per year for FKNMS), has the potential to have adverse but less than significant direct impacts to geological resources from anchoring and from unintentional striking or groundings. Fixed moorings, drifting, or live boating (maintaining a stationary location using the vessel engine) are used whenever possible to avoid impacts from anchoring. Vessel operators are highly trained and will employ ONMS best management practices and apply the NOAA Small Boat Program and sanctuary standing orders and procedures to avoid direct impacts to physical resources. In addition, the NOAA Small Boat program mandates that all sanctuary vessels longer than 40 feet be operated by personnel with an appropriate tonnage U.S. Coast Guard (USCG) license or equivalent NOAA Corps experience for the vessel size. In general, operators of sanctuary vessels employ ONMS best management practices to minimize impacts. And, because they are operating assets that are very visible to the public, they serve as models of best practices to avoid harm to geological resources.

Activities with negligible impacts or less than significant adverse impacts

Aircraft Operations

Under typical circumstances, operation (less than 20 ops days/year) of uncrewed aircraft systems (UAS) and other remote aerial systems at FKNMS is expected to have negligible impacts to the physical environment due to their small size and remote aerial operation. UAS and other remote aerial systems are used for research activities in FKNMS only. In the unlikely event a remotely operated aerial system requires an unintentional or emergency landing, trained operators would use care during landing operations and utilize the surrounding environment and coast to a soft landing, targeting an unpopulated area, and all efforts would be taken to ensure minimal impact to the surrounding physical environment. In compliance with FAA regulations and NOAA standing orders, all remote aerial system operators are required to successfully complete training certifications specific to the UAS system being used and a health screening and must be licensed to operate such systems within sanctuary boundaries. Therefore, aircraft (UAS) operations conducted by ONMS staff are expected to have negligible effects on the sanctuary's physical environment.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters is considered a discharge and most national marine sanctuaries have regulations restricting certain discharges. In those cases, a permit from the sanctuary superintendent will be required. Deployment of AUV/ROV/gliders/drifters are expected to result in negligible effects on geological and oceanographic resources due to the unlikely disturbance of the water column or submerged lands in each sanctuary. Fewer than 20 AUV ops days are conducted in the sanctuary and ROVs are deployed on about 32 days per year. While intentional or accidental improper operator techniques are possible, trained operators are utilizing assets that are very visible to the public and operators serve as models of best practices. Thus, these activities are expected to result in negligible effects.

Drifter buoys, though only 30–40 cm in diameter, remain at sea in the physical environment as a long-term effect. However, the low number of drifting buoys per year and the short-term nature of anchored buoys are expected to result in less than significant impacts.

Dive marker weights are deployed with a buoy at the surface to temporarily mark dive locations to ensure diver safety. Marker buoys are removed at the termination of dive operations at each site visited and at the end of each diving day. These direct adverse effects on the physical environment are expected to be less than significant, because they are localized and short term. Additionally, the weight is light (10 pounds or less) and is designed to quickly release to prevent damage to ledge habitat if the current carries the line attached to the weight.

Non-Motorized Craft

Non-motorized craft are expected to have negligible effects on the geology of an area because they are small, lightweight, slow, and maneuverable, and, therefore, are generally not capable of inflicting damage on geological features or altering oceanography features.

Scuba/Snorkel Operations

Scuba/snorkel operations, while frequently used in the southeast region for research in the sanctuaries, are expected to result in negligible effects on geological/oceanographic resources due to very limited disturbance of sediments and other submerged lands of each sanctuary. Although over 1400 dives are performed annually in the sanctuaries of the southeast, all are done by highly-trained divers, and most divers are conducting visual census or other non-removal sampling of the habitats and organisms. While intentional or accidental improper techniques and overuse of specific locations can result in damage to these physical resources, sanctuary dive sites vary according to the different projects throughout each sanctuary tending to prevent overuse of any specific location. In addition, both divers and snorkelers are highly trained and will employ ONMS best management practices. Furthermore, they are briefed on proper protocols and supervised during in-water activities to avoid improper actions that can cause harm to the physical environment. Thus, these operations are expected to result in negligible effects.

Vessel Maintenance

The routine maintenance of sanctuary owned vessels is episodic, low intensity (24 total vessels) and accomplished by trained NOAA personnel and contractors to avoid impacts to the physical environment. Routine maintenance includes cleaning, fluid changes, and some repairs. It is highly unlikely that routine vessel maintenance will have any detectable effect on geological resources. Because sanctuary vessels are relatively small, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance by local, state, and other federal entities. Therefore, the effects of vessel maintenance on geological resources are expected to be negligible.

Water Quality

Activities with only less than significant adverse impacts

Onshore Fieldwork

Onshore fieldwork activities are conducted by experienced ONMS staff. Such work involves responding to vessel groundings which often may involve fuel spills. Care is taken to avoid additional spills during grounding response operations to ensure any adverse effect to water quality in connection with such operations is minimized. Accordingly, the adverse impacts to water quality associated with vessel operations are expected to be less than significant.

Vessel Operations

The general operation of vessels has the potential to have adverse but less than significant direct impacts on water quality from unintended fuel, lubricant, sewage, and garbage spills from sanctuary vessels. Because there are existing state, federal, and sanctuary regulations prohibiting most discharges, impacts to water quality is highly unlikely. As stated above, sanctuary vessel operators are highly trained and will employ ONMS best management practices and apply the NOAA Small Boat Program mandates and sanctuary standing orders to avoid impacts to water quality.

Activities with negligible impacts

Aircraft Operations

Many remote aerial systems are capable of landing on both land and water and are designed to float when landing on the water. The operation of UAS and other remote aerial systems may require a water landing, in which the operator lands and retrieves the aerial system in the ocean. In such instances, negligible effects to water quality are anticipated due to the fact that the systems are battery operated and sealed to ensure water does not enter the system, even when submerged, thereby minimizing the threat of a discharge during retrieval. In the unlikely event a remote aerial system unintentionally lands in the ocean and sustains damage, the damage to the surrounding environment is expected to be minimal because, per NOAA standing orders, the systems must be within eyesight of the remote operator resulting in an immediate retrieval following an emergency landing. The infrequency in which overflights occur further reduces potential threat to water quality.

Deployment of AUV/ROV/Gliders/Drifters

Although deployment of AUV/ROV/gliders/drifters is considered a discharge under FKNMS regulations, their use is expected to result in negligible effects on water quality due to the lack of discharges from these instruments. Thus, these operations are expected to result in negligible effects on water quality.

Deployment of Equipment on the Seafloor

The normal deployment and use of equipment on the seafloor generally causes no discharge of harmful waste material into the water column and thus is expected to have a negligible impact on a sanctuary's water quality.

Deployment of Remote Sensing Equipment

Normal remote sensing operations generally cause no discharge of harmful waste material into the water column and thus are expected to have a negligible impact on a sanctuary's water quality.

Non-Motorized Craft

Non-motorized craft are expected to have negligible effects on water quality because they do not generally discharge any substance in the water.

Other Sampling Activities

The use of other sampling technologies and operations, such as deploying instruments to measure oceanographic and water quality conditions, or tagging marine mammals to better understand their behavior, or placement of temporary transect lines or quadrats for visual census of biota, generally has no or a negligible effect on the physical environment. Normal operations cause no discharge of harmful substances into the water column, atmosphere, or onto the seafloor.

Scuba/Snorkel Operations

Scuba/snorkel operations are expected to result in negligible effects on water quality due to the lack of discharge generally involved in scuba diving or snorkeling activities. Thus, these operations are expected to result in negligible effects.

Vessel Maintenance

The routine maintenance of sanctuary owned vessels is episodic, low intensity, and accomplished by trained NOAA personnel and contractors to avoid impacts to the physical environment. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, further reducing the threat to water quality resources in the unlikely event of a spill. Because these vessels are small and limited in total number at any location, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance including spill prevention by local, state, and other federal entities. Therefore, the effects of vessel maintenance on water quality resources are expected to be negligible.

Summary of the Effects on Physical Resources

The effects on physical resources from the preferred alternative are expected to be negligible or less than significant (beneficial and adverse, depending on the type of operations), resulting in improved characterization of geology and oceanography, which would enhance conservation and management of resources, while preventing anchor damage. The adverse effects are expected to be short term and of low intensity, and would result from minor seabed disturbance from buoy deployment, emissions from vessel operations, and noise disturbance from vessel operations and deployment of active acoustic instruments.

Biological Environment

Habitat

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Programs that involve monitoring biological resources from shore benefit the resource directly and indirectly. Removal, disentanglement, and monitoring efforts provide a direct, short-term benefit to biological resources as immediate attention and action is employed when necessary to ensure the safety and health of marine and nearshore habitat and species (birds, invertebrates, fish, marine mammals, sea turtles, and cetaceans). Indirect effects are expected from the education and outreach materials generated by these studies to educate the public about the resources. Public awareness and education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. These benefits remain less than significant effects due to the limited nature of the studies of the entire region. In the event of a vessel grounding or the presence of marine debris, necessitating the removal of large or bulky items, the prompt removal of such items would result in indirect, short- and long-term benefits to the entire ecosystem by eliminating the threat of further damage to the marine and nearshore environment. Similarly, large congregations of marine debris create entanglement and entrapment hazards, and prompt removal eliminates threats to both habitat and species. By the immediate attention to known threats and the elimination of threats caused by foreign objects, such as marine debris, response efforts will reduce wildlife entanglements.

Inherent in any effort to remove large or bulky foreign items from the nearshore or marine environment is the potential for impact to the surrounding biological environment. Grounded vessels may be dragged along shoreline areas to eliminate threat to the environment. Similarly, large aggregation of marine debris creates entanglement and entrapment hazards; however, removal efforts may require the use of cranes or other equipment that could cause incidental damage to the surrounding area. In addition, while the physical presence of staff conducting monitoring and removal or mitigation efforts may displace or disturb nearshore and marine species, staff are highly trained and will employ ONMS best management practices to ensure disturbance to the surrounding environment is minimized as much as possible. Further, removal of marine debris often results in overall positive impacts by eliminating immediate physical, biological, and/or chemical threats to the survival of living coastal and marine resources and their habitats. As such, field work activities that require the removal and relocation of large foreign objects, such as marine debris or grounded vessels, are expected to have a less than significant adverse impact on the surrounding biological environment.

Beach-walk and intertidal surveys, through the movement of personnel engaged in collection and identification studies, are expected to have negligible impacts to the surrounding ecosystem (including habitat, fish, invertebrates, birds, and protected species). Short-term and insignificant disturbance to the surrounding area may, but is unlikely to, occur during fieldwork activities through necessary, incidental, and unavoidable contact within the surrounding area.

However, the effects of this contact are expected to be negligible as any contact with the environment is localized and short term (activities likely to occur a few days per year in any one area) and care would be taken to avoid unnecessary or potentially harmful contact.

Activities with both less than significant beneficial and less than significant adverse impacts

Aircraft Operations

Monitoring efforts conducted via crewed and uncrewed aerial operations can lead to better characterization of habitat and species in remote areas and reduce the need for a physical presence in remote areas, which may cause a disturbance to the areas physical and biological surroundings. As such, while infrequent in occurrence, the use of aircraft for research activities are expected to result in the further characterization and protection of sanctuary resources, resulting in less than significant beneficial, indirect, long-term effects to the general biological environment.

While aircraft operations are infrequent (less than 10 UAS flights each year, all of which occur in FKNMS), some adverse direct effects are anticipated on biological resources associated with potential seabird strikes and behavioral disturbance from UAS noise. UAS operating at low altitudes conducting remote sensing surveys may have indirect effects on biological resources via seabird disturbances (i.e., low overflights could result in seabird flushing). In order to minimize the likelihood of interactions with birds, aircraft operations do not generally occur below 200 feet in elevation and generally operate at elevations of 500 feet or more. Aircraft operations are also very limited in number, scope, and duration. Therefore, they are expected to result in less than significant adverse effects on biological resources, because these effects are short term and localized.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters, used for scientific or educational purposes, increases the understanding and appreciation of the biological environment, thus enhancing management strategies to protect habitat, invertebrates, fish, birds, and protected species. The scientific and education results also serve to improve public stewardship. Thus, these activities are expected to result in less than significant beneficial, indirect, long-term effects.

Deployment of AUV/ROV/gliders/drifters is expected to result in less than significant adverse effects on biological habitat due to the small potential for disturbance of the water column or submerged lands in each sanctuary. While intentional or accidental improper operator techniques are possible, trained operators are utilizing assets that are very visible to the public, and operators serve as models of best practices. In addition, the high mobility of these tools prevents overuse of any specific location. Thus, these operations are expected to result in less than significant adverse, short-term effects.

Deployment of Equipment on the Seafloor

Seafloor deployed equipment, such as instrumentation placed on data buoys that focuses on biological data collection (such as contaminant sampling or lionfish traps) and monitoring (as opposed to measuring oceanographic conditions as described above), can improve the conservation and management of species and habitats, and allow sanctuary managers to better

understand certain oceanographic conditions such as sea temperature, pH, and carbon dioxide fluctuations that affect species and biological communities. This gives managers better information to use when developing future habitat characterizations and research and management plans that address environmental changes. The beneficial impacts of this information gathering, usually derived from routine research and monitoring projects, are expected to remain less than significant due to the limited nature of the studies of the entire region.

Further, mooring buoys used by visiting boaters prevent anchor damage to the seafloor. They are expected to yield direct, less than significant beneficial effects to the biological environment, because these effects are short term and long term and localized.

Because virtually all seafloor substrates in sanctuaries host some organisms, disturbing the seafloor with buoy deployments can adversely affect habitats. Seafloor disturbance occurs in projects that involve buoy weights or moorings, often small buoys used for diving safety. However, every effort is made to place buoy anchors in areas with no biological cover to limit any possible adverse disturbances. These buoys are removed at the termination of dive operations at each site visited. Temporary buoys and markers are also used to establish safety zones during response operations. These direct adverse effects on the physical environment are expected to be less than significant, because they are localized and short term. Additionally, the buoys are lightweight and designed for quick release to prevent damage to bottom habitats and organisms.

Further, deploying moored instruments on the seafloor is expected to have short-term, temporary effects, including mortality only on the benthos directly impacted by the instrument or mooring, and the small footprint of the instruments means that direct impacts would be minimal.

The long-term effects from the permanent placement of buoys and moorings may adversely affect surface or subsurface organisms that may either be crushed or blocked from accessing overlying waters. However, the affected area on the bottom is very small and the placement is intentionally selected to minimize impacts. Therefore, the adverse effects for long-term buoys and moorings are less than significant, long term, direct, and localized.

Deployment of Remote Sensing Equipment

Most remote sensors measure parameters (e.g., temperature, wave height, oxygen) in the water. Multibeam and single beam sonars used to map habitat from autonomous or tethered vehicles, or shipboard mounts, penetrate the water column and seafloor with high frequency sound waves that are the lowest estimated sensation levels of active acoustic sources (MacGillivray et al., 2013). Remote sensing can have several indirect beneficial impacts on biological resources, including increased understanding of individual species, biodiversity, and habitats; better education and outreach materials for public education, which can lead to indirect benefits to living marine resources; and the use of hydrographic mapping as a means to improve habitat characterization and protection of seabed living resources. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant.

Deployment of remote sensing equipment, such as instrumentation on data buoys, is beneficial as it allows sanctuary managers to better understand oceanographic conditions, such as sea temperature, pH, and carbon dioxide fluctuations that affect species and biological communities. This gives managers better information to use when developing future research and management plans that address environmental changes (e.g., ocean acidification), resulting in what are expected to be long-term, less than significant beneficial impacts. As another example, the development of sanctuary maps is beneficial as they lead to more precise habitat characterization, including the water column and other specific ecosystems, by the sanctuary and its partners. The limited nature of deployments of remote sensing equipment per year indicates that the benefits are likely to be less than significant.

Possible adverse effects on habitat from remote sensing operations may occur if the equipment impacts or causes changes to habitat. Normal operations are designed to preclude this possibility, and any effects would be short term and less than significant. Also see analysis of acoustics above.

Other Sampling Activities

The use of other sampling techniques and instrumentation is beneficial to habitats as it allows sanctuary managers to better understand certain oceanographic conditions, such as sea temperature, pH, and carbon dioxide fluctuations that affect species and biological communities; can result in improved characterization of habitats and protection of seabed living resources; and improves the monitoring of habitat conditions and changes. This gives managers better information to use when developing future research and management plans. One example is coral disease mitigation and reversal studies that allow divers to directly remove diseased portions of coral colonies to test their recovery abilities. The amount of coral removed is quite small, but it provides valuable information to researchers and coral managers which then results in indirect, less than significant beneficial effects on coral habitats.

Other sampling activities can have several indirect beneficial impacts on biological resources, including data collection for future study; increased understanding of individual species, biodiversity, and habitats, which leads to improved conservation and management of resources. These indirect beneficial effects are expected to be less than significant, because they are long term.

The use of other sampling technology and operations, particularly those involving collecting, capturing, and tagging individual animals, may have some adverse impacts to marine species and habitats. For example, because virtually all seafloor substrates host some organisms, disturbing the seafloor with equipment and/or collecting samples can adversely affect these biological resources. Similar disturbances also occur in projects that involve injury assessment and restoration activities. While there may be some adverse impacts, the effects are less than significant, because most monitoring and sampling devices deployed on the seafloor are relatively small in size and few in number, and are generally temporary or stay in place for a long time (i.e., undisturbed). Therefore, only a very small part of the sanctuary's habitats are affected. While those organisms that are collected do not, of course, survive, the overall population of these organisms and the habitat itself are not likely to be significantly affected. Recommended minimization, avoidance, and mitigation measures provided by NOAA Fisheries

will be employed to the maximum extent practical. Therefore, the overall direct impacts are expected to be less than significant, because they are short term and localized.

Scuba/Snorkel Operations

The results of scuba/snorkel operations—that are predominantly for scientific or educational purposes—increase the understanding and appreciation of biological resources, enhancing management strategies to protect biological habitat, invertebrates, fish, birds, and protected species. The scientific and educational results also serve to improve public stewardship. Thus this activity is expected to result in less than significant beneficial, indirect, long-term effects.

Scuba/snorkel operations are expected to result in less than significant adverse effects on biological habitat and sessile invertebrates due to the minor and limited disturbance of the water column and bottom habitats (live bottom, coral, etc.) of each sanctuary. While intentional or accidental improper techniques and overuse of specific locations can result in damage to these resources, sanctuary dive sites vary according to the different projects throughout each sanctuary preventing overuse of any specific location. In addition, sanctuary divers and snorkelers are highly trained and will employ ONMS best management practices to avoid improper actions that can cause harm to living marine resources. Thus, these operations are expected to result in less than significant adverse effects, because these effects are short term and localized.

Activities with only less than significant beneficial impacts

Non-Motorized Craft

In FKNMS, the Team Ocean program trained teams aboard sanctuary non-motorized craft stationed at heavily-visited reef sites during peak recreational boating seasons inform boaters about the sanctuary's zones and regulations, and encourage proper use of resources and moorings. This can result in beneficial, but not significant impacts to sanctuary habitats by preventing improper and damaging behavior by the public. In addition, for example, non-motorized craft are sometimes used to assess resource injuries and develop restoration plans (when appropriate) which will prevent the injuries from expanding in size or increasing in severity, and create the site conditions necessary for the injured areas to recover to pre-incident conditions.

Activities with only less than significant adverse impacts

Vessel Operations

The operation of vessels has the potential to have adverse but less than significant direct impacts to habitat resources from anchoring and from unintentional striking or groundings. Fixed moorings are used whenever possible to minimize impacts from anchoring. Vessel operations are episodic and low intensity. Vessel operators are highly trained and will employ ONMS best management practices and apply the NOAA Small Boat Program and best management practices and procedures to avoid direct impacts to habitat resources. In addition, the NOAA Small Boat program mandates that all sanctuary vessels longer than 40 feet be operated by personnel with an appropriate tonnage USCG license or equivalent NOAA Corps experience for the vessel size. In general, operators of sanctuary vessels will employ ONMS best management

practices to minimize impacts. And, because they are operating assets that are very visible to the public, they serve as models of best practices to avoid harm to habitat.

Invertebrates

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Programs that involve monitoring biological resources from shore benefit the resource directly and indirectly. Removal, disentanglement, and monitoring efforts provide a direct, short-term benefit to biological resources, as immediate attention and action is employed when necessary to ensure the safety and health of marine and nearshore habitat and species (birds, invertebrates, fish, marine mammals, sea turtles, and cetaceans). Indirect effects are expected from the education and outreach materials generated by these studies to educate the public about the resources. Public awareness and education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. These benefits remain less than significant effects due to the limited nature of the studies of the entire region. Because these studies need to be repeated over time, impacts are short term for each particular effect. In the event of a vessel grounding or the presence of marine debris, necessitating the removal of large or bulky items, the prompt removal of such items would result in indirect, short- and long-term benefits to the entire ecosystem by eliminating the threat of further damage to the marine and nearshore environment. Similarly, large congregations of marine debris create entanglement and entrapment hazards and prompt removal eliminates threats to both habitat and species. By the immediate attention to known threats and the elimination of threats caused by foreign objects, such as marine debris, response efforts will reduce the risk of wildlife entanglement.

Inherent in any effort to remove large or bulky foreign items from the nearshore or marine environment is the potential for impact to the surrounding biological environment. Grounded vessels may be dragged along shoreline areas to eliminate threat to the environment. Similarly, large aggregation of marine debris creates entanglement and entrapment hazards; however, removal efforts may require the use of cranes or other equipment that could cause incidental damage to the surrounding area. Staff (ONMS and specialized contract staff) conducting such mitigation efforts are highly skilled and trained with ONMS best management practices, and will ensure work is done carefully so as not to unnecessarily harm the surrounding environment. In addition, while the physical presence of staff conducting monitoring and removal or mitigation efforts may displace or disturb nearshore and marine species, staff are highly trained and will employ ONMS best management practices to ensure disturbance is minimized as much as possible. As such, field work activities that require the removal and relocation of large foreign objects, such as marine debris or grounded vessels, are expected to have a less than significant adverse impact on the surrounding biological environment.

Beach-walk and intertidal surveys through the movement of personnel engaged in collection and identification studies are expected to have negligible impacts to the surrounding ecosystem

(including habitat, fish, invertebrates, birds, and protected species). Short term and insignificant disturbance to the surrounding area may, but is unlikely to, occur during fieldwork activities through necessary, incidental, and unavoidable contact within the surrounding area. However, the effects of this contact are expected to be negligible as any contact with the environment is localized and short term (activities likely to occur a few days per year in any one area) and care would be taken to avoid unnecessary or potentially harmful contact.

Activities with both less than significant beneficial and less than significant adverse impacts

Aircraft Operations

Monitoring efforts conducted via crewed and uncrewed operations can lead to better characterization of habitat and species in remote areas and reduce the need for a physical presence in remote areas, which may cause a disturbance to the areas physical and biological surroundings. As such, while infrequent in occurrence, the use of aircraft for research activities are expected to result in the further characterization and protection of sanctuary resources, resulting in less than significant beneficial, indirect, long-term effects to the general biological environment.

While aircraft operations are infrequent (less than 20 UAS flights each year across the Southeast and Gulf of Mexico national marine sanctuaries, all of which occur in FKNMS), no adverse effects are anticipated on invertebrates from UAS noise.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters, used for scientific or educational purposes, increases the understanding and appreciation of the biological environment, thus enhancing management strategies to protect habitat, invertebrates, fish, birds, and protected species. The scientific and education results also serve to improve public stewardship. Thus, these activities are expected to result in less than significant beneficial, indirect, long-term effects.

Deployment of AUV/ROV/gliders/drifters is expected to result in less than significant adverse effects on the behavior of mobile invertebrates, fish, protected species, and birds due to the generally minor, limited, and short-term impact caused by these tools. While intentional or accidental improper operator techniques are possible, such occurrences are unlikely given that operators are required to complete training courses specific to the craft that would be operated. In addition, operators utilize highly visible assets and, accordingly, serve as models of best practices. In addition, the high mobility of these tools prevents overuse of any specific location. As a result of the low number of annual deployments and the care in which the devices are operated, these activities are expected to result in less than significant adverse, short-term effects.

Deployment of Equipment on the Seafloor

The use of seafloor deployed equipment has several indirect beneficial impacts on biological resources including data collection; increased understanding of individual species, biodiversity, and habitats; monitoring; boating and transit safety; and the indirect benefits of developing education and outreach materials. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in

ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

The physical placement of equipment on the seafloor, the direct contact with sessile benthic organisms by the gear itself, and the possible deterioration of buoy material that subsequently lands on the bottom may lead to the smothering and mortality of some invertebrates, but the transitory nature of most of these devices, as well as the limited scope of each study with regards to the size of the region, is expected to keep these effects less than significant.

Deployment of Remote Sensing Equipment

Most remote sensors measure parameters (e.g., temperature, wave height, oxygen) in the water. Multibeam and side-scan sonars used to map habitat from autonomous or tethered vehicles, or shipboard mounts, penetrate the water column and seafloor with high frequency sound waves that are the lowest estimated sensation levels of active acoustic sources (MacGillivray et al., 2013). Remote sensing can have several indirect beneficial impacts on biological resources, including increased understanding of individual species, biodiversity, and habitats; better education and outreach materials for public education, which can lead to indirect benefits to living marine resources; and the use of hydrographic mapping as a means to improve habitat characterization and protection of seabed living resources. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

The possible adverse or beneficial effects of remote sensing operations on invertebrates have not been well studied or documented, and are therefore not well known. However, it's possible that remote sensing equipment may indirectly adversely affect invertebrates through behavioral disturbances caused by the instruments themselves; or more directly through direct contact of sessile (i.e., attached) benthic organisms by the gear itself. The transitory nature of these devices, as well as the limited scope of each study with regards to the size of the region, is expected to keep these effects less than significant.

Current scientific understanding of the acoustic sensitivity and sound-production by invertebrate species remains limited. However, many species such as crabs, lobsters, urchins, and corals are known to either produce sounds in intraspecific interactions and/or use acoustic cues in settlement phases. For these species, and these documented acoustic use contexts, the highest risk associated with human-induced impacts would be associated with more continuous and prevalent source types that could, in conditions of high or biologically vulnerable co-occurrence, lead to reduced ability to detect important cues ("masking"). The highly localized, relatively rare, and impulsive nature of echo-sounder and multibeam sonar use suggests that impacts on settlement cueing and communication by species such as crabs, lobsters, urchins, and other known acoustically-active species are likely to be negligible.

Other Sampling Activities

Other sampling activities can have several indirect beneficial impacts on invertebrates including data collection for future study; increased understanding of individual species, biodiversity, and habitats, which leads to improved conservation and management of resources. These indirect beneficial effects are expected to be less than significant, because they are long term.

It is possible that other sampling activities may indirectly adversely affect invertebrates through behavioral disturbances caused by the instruments themselves; or more directly through contact of sessile benthic organisms (including some invertebrates) by the gear itself. The transitory nature of these devices, as well as the limited scope of each study with regards to the size of the region, is expected to keep these effects less than significant.

Scuba/Snorkel Operations

The results of scuba/snorkel operations—that are predominantly for scientific or educational purposes—increase the understanding and appreciation of biological resources, enhancing management strategies to protect biological habitat, invertebrates, fish, birds, and protected species. The scientific and educational results also serve to improve public stewardship. Thus, this activity is expected to result in less than significant beneficial, indirect, long-term effects.

Scuba/snorkel operations are expected to result in less than significant adverse effects on mobile invertebrates due to the minor and limited, short-term impact on animal behavior in each sanctuary. While intentional or accidental improper techniques and overuse of specific locations can result in increased disturbance of animals, sanctuary dive sites vary according to the different projects throughout each sanctuary preventing increased disturbance of animals in any one location. In addition, sanctuary divers and snorkelers are highly trained and will employ ONMS best management practices to avoid improper actions that can cause undue harm to sanctuary living marine resources. Thus, these operations are expected to result in less than significant adverse effects, because these effects are short term and localized.

Vessel Operations

In general, conducting vessel operations allows sanctuary personnel to be on the water, providing direct and indirect less than significant beneficial impacts to habitat, invertebrates, fish, birds, and protected species through enforcing compliance and by providing education to users so that they may avoid impacts to biological resources. In addition, conducting vessel operations allows sanctuary personnel to respond to emergency incidents involving other users and wildlife.

The operation of vessels has the potential to have adverse, but less than significant direct and indirect impacts to invertebrates from anchoring and from temporary displacement due to vessel movement. The effects of anchoring are short term and whenever possible are conducted in locations (i.e., sand) where concentrations of invertebrates are low.

Activities with negligible impacts

Non-Motorized Craft

Due to their non-motorized nature, low speed, light weight, and high maneuverability, non-motorized craft are likely to have only negligible impacts on invertebrates, fish, birds, and protected species.

Vessel Maintenance

The routine maintenance of sanctuary-owned vessels is episodic, low intensity, and accomplished by trained NOAA personnel and contractors to avoid impacts to the biological environment. Where possible, bio-based lubricants and fluids (and in some cases bio-based

fuels) are used, further reducing the threat to invertebrates, fish, birds, and protected species in the unlikely event of an unintentional spill. Because these vessels are small and limited in total number at any location, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance, including spill prevention by local, state, and other federal entities. Therefore, the effects of vessel maintenance on these biological resources are expected to be negligible.

Fish

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Programs that involve monitoring biological resources from shore benefit the resource directly and indirectly. Removal, disentanglement, and monitoring efforts provide a direct, short-term benefit to biological resources as immediate attention, and action is employed when necessary to ensure the safety and health of marine and nearshore habitat and species (birds, invertebrates, fish, marine mammals, sea turtles, and cetaceans). Indirect effects are expected from the education and outreach materials generated by these studies to educate the public about the resources. Public awareness and education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. These benefits remain less than significant effects due to the limited nature of the studies of the entire region. Because these studies need to be repeated over time, impacts are short term for each particular effect. In the event of a vessel grounding or the presence of marine debris, necessitating the removal of large or bulky items, the prompt removal of such items would result in indirect, short- and long-term benefits to the entire ecosystem by eliminating the threat of further damage to the marine and nearshore environment. Similarly, large congregations of marine debris create entanglement and entrapment hazards and prompt removal eliminates threats to both habitat and species. By the immediate attention to known threats and the elimination of threats caused by foreign objects, such as marine debris, response efforts will reduce the risk of wildlife entanglements.

Inherent in any effort to remove large or bulky foreign items from the nearshore or marine environment is the potential for impact to the surrounding biological environment. Grounded vessels may be dragged along shoreline areas to eliminate threat to the environment. Similarly, large aggregation of marine debris creates entanglement and entrapment hazards; however, removal efforts may require the use of cranes or other equipment that could cause incidental damage to the surrounding area. In addition, while the physical presence of staff conducting monitoring and removal or mitigation efforts may displace or disturb nearshore and marine species, staff are highly trained and will employ ONMS best management practices to ensure disturbance to the surrounding environment is minimized as much as possible. As such, field work activities that require the removal and relocation of large foreign objects, such as marine debris or grounded vessels, are expected to have a less than significant adverse impact on the surrounding biological environment.

Beach-walk and intertidal surveys through the movement of personnel engaged in collection and identification studies are expected to have negligible impacts to the surrounding ecosystem (including habitat, fish, invertebrates, birds, and protected species). Short-term and insignificant disturbance to the surrounding area may, but is unlikely to, occur during fieldwork activities through necessary, incidental, and unavoidable contact within the surrounding area. However, the effects of this contact are expected to be negligible as any contact with the environment is localized and short term (activities likely to occur a few days per year in any one area), and care would be taken to avoid unnecessary or potentially harmful contact.

Activities with both less than significant beneficial and less than significant adverse impacts

Aircraft Operations

Monitoring efforts conducted via crewed and uncrewed operations can lead to better characterization of habitat and species in remote areas and reduce the need for a physical presence in remote areas, which may cause a disturbance to the areas physical and biological surroundings. As such, while infrequent in occurrence, the use of aircraft for research activities are expected to result in the further characterization and protection of sanctuary resources, resulting in less than significant beneficial, indirect, long-term effects to the general biological environment.

While crewed and uncrewed aircraft operations are infrequent (e.g., less than 10 UAS flights each year in FKNMS), no adverse effects are anticipated on fish from crewed and uncrewed operations. The transitory nature of these devices, as well as the limited scope of each study with regards to the size of the region, is expected to keep these effects less than significant.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters, used for scientific or educational purposes, increases the understanding and appreciation of the biological environment, thus enhancing management strategies to protect habitat, invertebrates, fish, birds, and protected species. The scientific and education results also serve to improve public stewardship. Thus, these activities are expected to result in less than significant beneficial, indirect, long-term effects.

Deployment of AUV/ROV/gliders/drifters is expected to result in less than significant adverse effects on the behavior of mobile invertebrates, fish, protected species, and birds due to the generally minor, limited, and short-term impact caused by these tools. While intentional or accidental improper operator techniques are possible, such occurrences are unlikely given that operators are required to complete training courses specific to the craft that would be operated. In addition, operators utilize highly visible assets and, accordingly, serve as models of best practices. In addition, the high mobility of these tools prevents overuse of any specific location. As a result of the low number of annual deployments and the care in which the devices are operated, these activities are expected to result in less than significant adverse, short-term effects.

Deployment of Equipment on the Seafloor

The use of seafloor deployed equipment has several indirect beneficial impacts on fish including data collection; increased understanding of individual species, biodiversity, and habitats;

monitoring; boating and transit safety; and the indirect benefits of developing education and outreach materials. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

The normal use of equipment anchored to the seafloor causes no or negligible disturbance to fish through the emission of noise unless the device emits sound as part of its operation. Then, less than significant impacts to certain organisms may occur.

Deployment of Remote Sensing Equipment

Most remote sensors measure parameters (e.g., temperature, wave height, oxygen) in the water. Multibeam and side-scan sonars used to map habitat from autonomous or tethered vehicles, or shipboard mounts, penetrate the water column and seafloor with high frequency sound waves that are the lowest estimated sensation levels of active acoustic sources (MacGillivray et al., 2013).

Remote sensing can have several indirect beneficial impacts on fish, including increased understanding of individual species, biodiversity, and habitats; better education and outreach materials for public education, which can lead to indirect benefits to living marine resources; and the use of hydrographic mapping as a means to improve habitat characterization and protection of seabed living resources. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

Information on the movements of commercially and recreationally important fish species gained from remote sensing operations and tagging could be used to better manage species and protect fish habitat, which could result in potential long-term, indirect, less than significant beneficial impacts on fish. Also see related analysis in the NOS Surveying and Mapping Programmatic EIS for more information.[18]

Other Sampling Activities

Other sampling activities can have several indirect beneficial impacts on biological resources, including data collection for future study; increased understanding of individual species, biodiversity, and habitats, which leads to improved conservation and management of resources. These indirect beneficial effects are expected to be less than significant, because they are long term.

Information gleaned from other sampling operations may be helpful in determining the movements of commercially and recreationally important fish species (e.g., tagging of fish can

[18] https://aambpublicoceanservice.blob.core.windows.net/oceanserviceprod/about/environmental-compliance/final-peis/Appendix%20D%20Mitigation%20Measures%20During%20NOS%20Mapping%20and%20Surveying%20Activities.pdf

be used to better manage species and protect their habitat), which could result in potential long-term, indirect, less than significant beneficial impacts on fish.

Other sampling activities may indirectly adversely affect fish through behavioral disturbances caused by the instruments themselves; or more directly through contact of fish by the gear itself. The transitory nature of these devices, as well as the limited scope of each study with regards to the size of the region, is expected to keep these effects less than significant.

Activities with only less than significant beneficial impacts

Scuba/Snorkel Operations

The results of scuba/snorkel operations—that are predominantly for scientific or educational purposes—increase the understanding and appreciation of biological resources, enhancing management strategies to protect biological habitat, invertebrates, fish, birds, and protected species. The scientific and educational results also serve to improve public stewardship. However, benefits, such as increased protection of fish species, are expected to result in less than significant beneficial, indirect, long-term effects.

Vessel Operations

In general, conducting vessel operations allows sanctuary personnel to be on the water providing direct and indirect less than significant beneficial impacts to habitat, invertebrates, fish, birds, and protected species, through enforcing compliance and by providing education to users so that they may avoid impacts to biological resources. In addition, conducting vessel operations allows sanctuary personnel to respond to emergency incidents involving other users and wildlife.

Activities with negligible impacts

Non-Motorized Craft

Due to their non-motorized nature, low speed, light weight, and high maneuverability, non-motorized craft are likely to have only negligible impacts on invertebrates, fish, birds, and protected species.

Vessel Maintenance

The routine maintenance of sanctuary-owned vessels is episodic, low intensity, and accomplished by trained NOAA personnel and contractors to avoid impacts to the biological environment. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, further reducing the threat to invertebrates, fish, birds, and protected species in the unlikely event of an unintentional spill. Because these vessels are small and limited in total number at any location, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance, including spill prevention by local, state, and other federal entities. Therefore, the effects of vessel maintenance on these biological resources are expected to be negligible.

Birds

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Programs that involve monitoring biological resources from shore benefit the resource directly and indirectly. Removal, disentanglement, and monitoring efforts provide a direct, short-term benefit to biological resources as immediate attention and action is employed when necessary to ensure the safety and health of marine and nearshore habitat and species (birds, invertebrates, fish, marine mammals, sea turtles, and cetaceans). Indirect effects are expected from the education and outreach materials generated by these studies to educate the public about the resources. Public awareness and education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. These benefits remain less than significant effects, due to the limited nature of the studies of the entire region. Because these studies need to be repeated over time, impacts are short term for each particular effect. In the event of a vessel grounding or the presence of marine debris, necessitating the removal of large or bulky items, the prompt removal of such items would result in indirect, short- and long-term benefits to the entire ecosystem by eliminating the threat of further damage to the marine and nearshore environment. Similarly, large congregations of marine debris create entanglement and entrapment hazards and prompt removal eliminates threats to both habitat and species. By the immediate attention to known threats and the elimination of threats caused by foreign objects, such as marine debris, response efforts will reduce the risk of wildlife entanglements.

Inherent in any effort to remove large or bulky foreign items from the nearshore or marine environment is the potential for impact to the surrounding biological environment. Grounded vessels may be dragged along shoreline areas to eliminate threat to the environment. Similarly, large aggregation of marine debris creates entanglement and entrapment hazards; however, removal efforts may require the use of cranes or other equipment that could cause incidental damage to the surrounding area. In addition, while the physical presence of staff conducting monitoring and removal or mitigation efforts may displace or disturb nearshore and marine species, staff are highly trained and will employ ONMS best management practices to ensure disturbance to the surrounding environment is minimized as much as possible. Further, removal of marine debris often results in overall positive impacts by eliminating immediate physical, biological, and/or chemical threats to the survival of living coastal and marine resources and their habitats. As such, field work activities that require the removal and relocation of large foreign objects, such as marine debris or grounded vessels, are expected to have a less than significant adverse impact on the surrounding biological environment.

Beach-walk and intertidal surveys through the movement of personnel engaged in collection and identification studies are expected to have negligible impacts to the surrounding ecosystem (including habitat, fish, invertebrates, birds, and protected species). Short-term and insignificant disturbance to the surrounding area may, but is unlikely to, occur during fieldwork activities through necessary, incidental, and unavoidable contact within the surrounding area.

However, the effects of this contact are expected to be negligible as any contact with the environment is localized and short term (activities likely to occur a few days per year in any one area), and care would be taken to avoid unnecessary or potentially harmful contact.

Activities with both less than significant beneficial and less than significant adverse impacts

Aircraft Operations

Monitoring efforts conducted via crewed and uncrewed operations can lead to better characterization of habitat and species in remote areas and reduce the need for a physical presence in remote areas, which may cause a disturbance to the areas physical and biological surroundings. As such, while infrequent in occurrence, the use of aircraft for research activities are expected to result in the further characterization and protection of sanctuary resources, resulting in less than significant beneficial, indirect, long-term effects to the general biological environment.

While aircraft operations are infrequent (less than 10 UAS flights each year across FKNMS), some adverse direct effects are anticipated on biological resources associated with potential seabird strikes and behavioral disturbance from UAS noise. UAS operating at low altitudes conducting remote sensing surveys may have indirect effects on biological resources via seabird disturbances (i.e., low overflights could result in seabird flushing). In order to minimize the likelihood of interactions with birds, crewed aircraft operations do not generally occur below 200 feet in elevation and generally operate at elevations of 500 feet or more. Crewed aircraft operations are also very limited in number, scope, and duration. Therefore, they are expected to result in less than significant adverse effects on biological resources, because these effects are short term and localized.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters, used for scientific or educational purposes, increases the understanding and appreciation of the biological environment, thus enhancing management strategies to protect habitat, invertebrates, fish, birds, and protected species. The scientific and education results also serve to improve public stewardship. Thus, these activities are expected to result in less than significant beneficial, indirect, long-term effects.

Deployment of AUV/ROV/gliders/drifters is expected to result in less than significant adverse effects on the behavior of birds due to the generally minor, limited, and short-term impact caused by these tools. While intentional or accidental improper operator techniques are possible, such occurrences are unlikely given that operators are required to complete training courses specific to the craft that would be operated. In addition, operators utilize highly visible assets and, accordingly, serve as models of best practices. In addition, the high mobility of these tools prevents overuse of any specific location. As a result of the low number of annual deployments and the care in which the devices are operated, these activities are expected to result in less than significant, short-term, adverse effects.

Deployment of Equipment on the Seafloor

The use of seafloor deployed equipment has several indirect beneficial impacts on biological resources, including data collection; increased understanding of individual species, biodiversity,

and habitats; monitoring; boating and transit safety; and the indirect benefits of developing education and outreach materials. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

The normal use of equipment anchored to the seafloor causes no or negligible disturbance to the biological environment through the emission of noise unless the device emits sound as part of its operation. Then, less than significant impacts to certain organisms, particularly marine mammals, may occur. The use of seafloor deployed equipment will have no impact on bird resources.

Other Sampling Activities

Other sampling activities can have several indirect beneficial impacts on biological resources, including data collection for future study; increased understanding of individual species, biodiversity, and habitats, which leads to improved conservation and management of resources. These indirect beneficial effects are expected to be less than significant, because they are long term.

Sampling activities that focus on learning more about birds that reside in or visit a sanctuary, such as surveys, applying satellite tags for tracking, and studying tissue samples, aid the management and protection of these animals, which could result in potential long-term, indirect, less than significant beneficial impacts on birds.

Some other sampling operations may adversely impact birds in a sanctuary, although their effects are expected to be short term and less than significant. These include conducting standardized transects with a research vessel to count seabirds, which may temporarily affect their behavior; and applying micro-satellite tracking tags and obtaining tissue samples from seabirds which will result in short-term, temporary injury.

Vessel Operations

In general, conducting vessel operations allows sanctuary personnel to be on the water providing direct and indirect less than significant beneficial impacts to habitat, invertebrates, fish, birds, and protected species, through enforcing compliance and by providing education to users so that they may avoid impacts to biological resources. In addition, conducting vessel operations allows sanctuary personnel to respond to emergency incidents involving other users and wildlife.

The operation of vessels has the potential to have adverse, but less than significant, short-term, direct and indirect impacts to birds due to temporary displacement or changes in behavior, due to presence of vessel or from vessel movement. While highly unlikely, because birds are able to fly away at the sound or sight of an incoming vessel, floating and diving birds have the potential to be struck by a moving vessel.

Activities with only less than significant beneficial impacts

Deployment of Remote Sensing Equipment

Remote sensing can have several indirect beneficial impacts on biological resources, including increased understanding of individual species, biodiversity, and habitats; better education and outreach materials for public education, which can lead to indirect benefits to living marine resources; and the use of hydrographic mapping as a means to improve habitat characterization and protection of seabed living resources. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

Scuba/Snorkel Operations

The results of scuba/snorkel operations—that are predominantly for scientific or educational purposes—increase the understanding and appreciation of biological resources, enhancing management strategies to protect biological habitat, invertebrates, fish, birds, and protected species. The scientific and educational results also serve to improve public stewardship. Thus, this activity is expected to result in less than significant beneficial, indirect, long-term effects.

Activities with negligible impacts

Non-Motorized Craft

Due to their non-motorized nature, low speed, light weight, and high maneuverability, non-motorized craft are likely to have only negligible impacts on invertebrates, fish, birds, and protected species.

Vessel Maintenance

The routine maintenance of sanctuary owned vessels is episodic, low intensity, and accomplished by trained NOAA personnel and contractors to avoid impacts to the biological environment. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, further reducing the threat to invertebrates, fish, birds, and protected species in the unlikely event of an unintentional spill. Because these vessels are small and limited in total number at any location, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance, including spill prevention by local, state, and other federal entities. Therefore, the effects of vessel maintenance on these biological resources are expected to be negligible.

Protected Species

Activities with less than significant beneficial, less than significant adverse, and negligible impacts

Onshore Fieldwork

Programs that involve monitoring biological resources from shore benefit the resource directly and indirectly. Removal, disentanglement, and monitoring efforts provide a direct, short-term benefit to biological resources as immediate attention, and action is employed when necessary to ensure the safety and health of marine and nearshore habitat and species (birds,

invertebrates, fish, marine mammals, sea turtles, and cetaceans). Indirect effects are expected from the education and outreach materials generated by these studies to educate the public about the resources. Public awareness and education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. These benefits remain less than significant effects due to the limited nature of the studies of the entire region. Because these studies need to be repeated over time, impacts are short term for each particular effect. In the event of a vessel grounding or the presence of marine debris, necessitating the removal of large or bulky items, the prompt removal of such items would result in indirect, short- and long-term benefits to the entire ecosystem by eliminating the threat of further damage to the marine and nearshore environment. Similarly, large congregations of marine debris create entanglement and entrapment hazards and prompt removal eliminates threats to both habitat and species. By the immediate attention to known threats and the elimination of threats caused by foreign objects, such as marine debris, response efforts will reduce the risk of wildlife entanglements.

Inherent in any effort to remove large or bulky foreign items from the nearshore or marine environment is the potential for impact to the surrounding biological environment. Grounded vessels may be dragged along shoreline areas to eliminate threat to the environment. Similarly, large aggregation of marine debris creates entanglement and entrapment hazards; however, removal efforts may require the use of cranes or other equipment that could cause incidental damage to the surrounding area. In addition, while the physical presence of staff conducting monitoring and removal or mitigation efforts may displace or disturb nearshore and marine species, staff are highly trained and will employ ONMS best management practices to ensure disturbance to the surrounding environment is minimized as much as possible. As such, field work activities that require the removal and relocation of large foreign objects, such as marine debris or grounded vessels, are expected to have a less than significant adverse impact on the surrounding biological environment.

Beach-walk and intertidal surveys through the movement of personnel engaged in collection and identification studies are expected to have negligible impacts to the surrounding ecosystem (including habitat, fish, invertebrates, birds, and protected species). Short-term and insignificant disturbance to the surrounding area may, but is unlikely to, occur during fieldwork activities through necessary, incidental, and unavoidable contact within the surrounding area. However, the effects of this contact are expected to be negligible as any contact with the environment is localized and short term (activities likely to occur a few days per year in any one area), and care would be taken to avoid unnecessary or potentially harmful contact.

Activities with both less than significant beneficial and less than significant adverse impacts

Aircraft Operations

Monitoring efforts conducted via crewed and uncrewed aerial operations can lead to better characterization of habitat and species in remote areas and reduce the need for a physical presence in remote areas, which may cause a disturbance to the areas physical and biological

surroundings. As such, while infrequent in occurrence, the use of aircraft for research activities are expected to result in the further characterization and protection of sanctuary resources, resulting in less than significant beneficial, indirect, long-term effects to the general biological environment.

While crewed and uncrewed aircraft operations are infrequent (e.g., less than 10 UAS flights each year across FKNMS), some adverse direct effects are anticipated on biological resources associated with potential seabird strikes and behavioral disturbance from UAS noise. UAS operating at low altitudes conducting remote sensing surveys may have indirect effects on biological resources via seabird disturbances (i.e., low overflights could result in seabird flushing). In order to minimize the likelihood of interactions with birds, aircraft operations do not generally occur below 200 feet in elevation and generally operate at elevations of 500 feet or more. Aircraft operations are also very limited in number, scope, and duration. In addition, ONMS will follow all minimization and mitigation measures offered by NOAA Fisheries to reduce effects on marine mammals and sea turtles. Therefore, they are expected to result in less than significant adverse effects on biological resources, because they are short term and localized.

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters, used for scientific or educational purposes, increases the understanding and appreciation of the biological environment, thus enhancing management strategies to protect habitat and protected species, particularly marine mammals and sea turtles. The scientific and education results also serve to improve public stewardship. Thus, these activities are expected to result in less than significant beneficial, indirect, long-term effects.

Deployment of AUV/ROV/gliders/drifters is expected to result in less than significant adverse effects on the behavior of mobile invertebrates and protected species, particularly marine mammals and sea turtles, due to the generally minor, limited, and short-term impact caused by these tools. While intentional or accidental improper operator techniques are possible, such occurrences are unlikely given that operators are required to complete training courses specific to the craft that would be operated. In addition, operators utilize highly visible assets and, accordingly, serve as models of best practices. In addition, the high mobility of these tools prevents overuse of any specific location. As a result of the low number of annual deployments and the care in which the devices are operated, these activities are expected to result in less than significant adverse, short-term effects.

Entanglement of protected resources, primarily marine mammals, in ROV cable is possible, but unlikely because the duration of operations is very limited and the operation is attended at all times. Should an animal be observed in the vicinity, the ROV can be quickly retrieved. Thus, these operations are expected to result in less than significant adverse, direct, short-term effects.

Deployment of Equipment on the Seafloor

The use of seafloor deployed equipment has several indirect beneficial impacts on biological resources, including data collection; increased understanding of individual species, biodiversity, and habitats; monitoring; and boating and transit safety. It also has the indirect benefits of developing education and outreach materials. Increased public education, awareness, and understanding of resource protection may inspire users to cause fewer negative effects on

resources, and to act in ways that benefit resources in the long term. These indirect beneficial effects are expected to be less than significant, because they are long term.

Seafloor deployed equipment can be used for monitoring marine mammal behavior, thus providing information that may be useful in reducing the possible deleterious impacts of human interactions with these animals by alerting vessel operators of marine mammal presence, and thereby giving them the chance to take precautions to avoid harassing or injuring the animals. These activities would result in both short-term and long-term (avoiding impact to individual marine mammals), indirect, and less than significant beneficial effects.

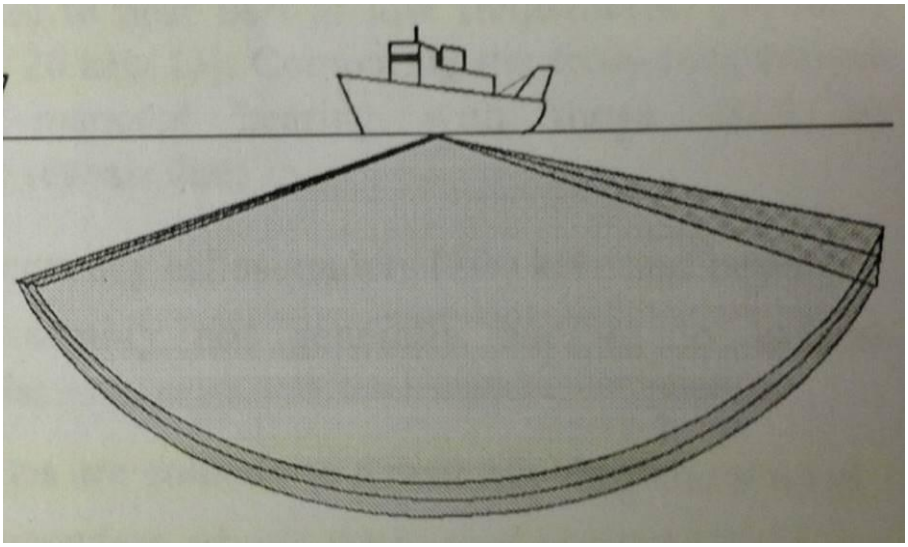
If the seafloor-deployed equipment uses active sonar or other noise-generating technology as part of its normal operations, there is a possibility that marine mammals may be adversely affected, perhaps causing behavioral changes such as altering their foraging, diving, or vocalization patterns. Another possible adverse impact to marine mammals may be the slight chance of entanglement with a mooring cable. These adverse impacts are expected to be short term and localized, and therefore considered to be less than significant.

Deployment of Remote Sensing Equipment

Remote sensing included in the proposed action refers to the use of active sonar, typically either hull-mounted multibeam or towed side-scan sonar systems. Active sonar devices emit pulses of sound waves that travel through the water, reflect off objects, and return to a receiver on the ship. Echo sounders transmit a repeated series of short sound signals (on the order of milliseconds) into the water column. These signals continue until they reach an object of a different acoustic impedance (typically the seafloor, but also potentially objects in the water column) and reflect back to the echo sounder's receiver; echo sounders do not transmit while listening for an echo. By measuring the amount of time for the sound to return from the seafloor or object, the depth of the water (or the distance to the object) can be determined. Echo sounders used for mapping can generally be divided into three categories: single beam systems, multibeam systems, and side-scan sonars. Single beam echo sounders transmit one focused acoustic beam, typically directly below the vessel. Multibeam echo sounders transmit a fan of acoustic energy and can resolve individual depths across the return beam (see Figure 1). Side-scan sonars (sometimes referred to as "imaging sonars") are a specialized system for detecting objects on the seafloor that typically use fans of acoustic energy to look down and to the side of the sensor platform.

Under any of the alternatives, NOAA would operate sonars for a variety of projects, including seafloor mapping and habitat characterization. Based on the available sonar sources and the depth regimes present in the study area, NOAA expects to use sonars that operate at frequencies of 50 kiloHertz (kHz) or higher.

a)



b)

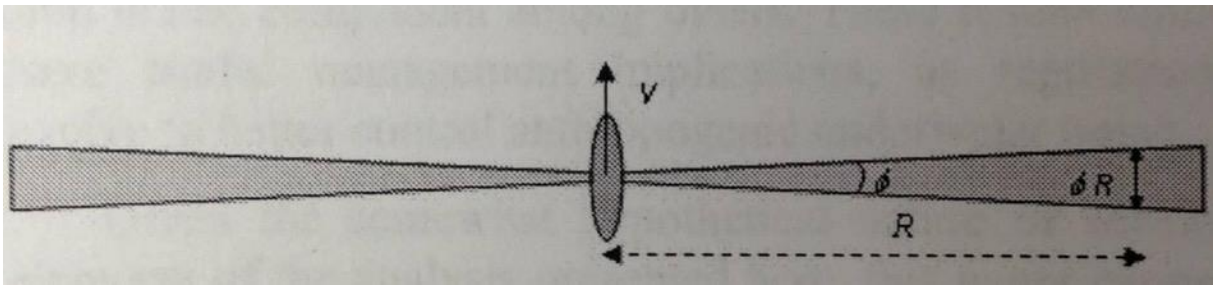


Figure 1. Diagrams showing a typical multibeam ensonification volume from (a) the horizontal and (b) the overhead perspective. Source: Lurton & DeRuiter, 2011

The National Ocean Service (NOS), of which the Office of National Marine Sanctuaries is a part, completed the Final Programmatic Environmental Impact Statement for Surveying and Mapping Projects in U.S. Waters for Coastal and Marine Data Acquisition (the "NOS Survey EIS") in December 2022,[19] which is incorporated here by reference. The NOS Survey EIS analyzes the environmental impact of operating a wide variety of sonars in use throughout NOS, which includes all types of sonar sources that are expected to be used at FKNMS, under any of the alternatives. NOS analyzed the impact of these sonars on environments and marine species present throughout the United States Exclusive Economic Zone (U.S. EEZ), which includes the entire study area considered for the proposed action.

The use of sonar may adversely affect marine animals, particularly marine mammals, through the sound that sonars emit into the marine environment. Depending on the sonar source, the distance to the animal, and the specific acoustic sensitivities of the species, these effects can range from behavioral changes (such as altering their foraging, diving or vocalization patterns), to temporary hearing damage (referred to as temporary threshold shift (TTS)), and permanent hearing damage (permanent threshold shift (PTS)). Direct physical injury, which may result in death, may occur from exposure to high levels of impulsive sound such as shock waves associated with in-water explosions. Finally, also over a broad range of distances, exposure to cumulative acoustic energy from a variety of sound sources leading to higher "background"

[19] https://oceanservice.noaa.gov/about/environmental-compliance/surveying-mapping.html

noise levels can result in masked communications and/or degraded ability for animals to hear acoustic environmental cues used to support biologically important activities.

NOS assessed effects on marine mammals, sea turtles, fish, and aquatic macroinvertebrates from impact causing factors including sound, presence and movement, and water column disruption from vessel traffic; vessel strikes; accidental spills; underwater activities and equipment; and onshore activities. NOS determined that these impacts would be adverse and insignificant.

Effects on Marine Mammals from Remote Sensing

Through quantitative acoustic impacts modeling, NOS determined that impacts on marine mammals by these sonars would be largely limited to temporary or short-term behavioral disturbances that would not be outside the natural range of variability of species' populations, their habitats, or the natural processes sustaining them. NOS concluded that potential impacts of underwater sound from active acoustic sources include injury exposures in the form of hearing loss, but such injury would be rare and confined to a few individuals of cetacean species with high-frequency hearing ranges. While more individual animals comprising cetaceans, pinnipeds, sirenians, and fissipeds are expected to be exposed to sound levels that could lead to behavioral disruption, the amount of time individuals would be exposed would last only a few minutes. Similarly, the potential for masking would continue to be minimal during sonar use because animals would not spend much time in ensonified zones. Overall, the potential impacts would likely continue to be limited to short-term disruption of acoustic habitat and behavioral patterns.

Effects on Sea Turtles from Remote Sensing

Sea turtles are low frequency specialists with a generalized hearing range of 30 to 2,000 Hz (0.03 to 2 kHz) and are most sensitive to sound between 200 and 400 Hz (0.2 and 0.4 kHz) (BOEM, 2014b; NMFS, 2018b; NOAA, 2016; Piniak et al., 2012; and Southwood et al., 2008). Hearing below 80 Hz is less sensitive but still possible (Lenhardt, 1994). These low frequency sources are used in deeper water that are not found in the study area. Underwater sound produced by remote sensing equipment used under the proposed action would be at frequencies orders of magnitude above the documented sea turtle hearing range and would therefore be imperceptible to sea turtles and unlikely to cause direct injury, hearing threshold shifts, auditory masking, or behavioral changes.

Effects on Fish from Remote Sensing

The hearing frequency range of most fish is below approximately 1.5 kHz with the most sensitive range below 0.8 kHz. Thus, most fish may be able to hear low frequency sources that go down to 0.5 kHz, and which are used in deeper water, but remain outside of the primary energy band. The hearing range of pressure sensing fish is typically extended to a few kHz (up to about 4 kHz). However, at least three species of herring-like fishes detect sounds above 20 kHz (Mann et al., 1997). Generally, underwater acoustic sources have not been known to cause direct injury or mortality to fish under conditions that would be found in the wild (Halvorsen et al., 2012; Kane et al., 2010; Popper et al., 2007). Potential direct injuries (e.g., barotrauma, hemorrhage or rupture of organs or tissue) from such sound sources are unlikely because of slow rise times (the amount of time for a signal to change from static pressure [the ambient pressure without the

added sound] to high pressure), lack of strong shock waves, and relatively low peak pressures (Navy, 2018a).

Effects on Aquatic Macroinvertebrates from Remote Sensing

Research into the effects of underwater sound waves on aquatic macroinvertebrates has barely begun and there are still many unknowns. While they lack ears and related structures associated with hearing, certain aquatic macroinvertebrates do possess morphological structures (external cilia sensory hairs and internal statocysts), and at close range to a sound source, they are believed to be capable of detecting low-frequency vibrations and particle motion in water. However, unlike aquatic vertebrates, aquatic macroinvertebrates, lacking ears with which to hear, would not be vulnerable to potential hearing loss from loud underwater sounds. Furthermore, virtually all of the high frequency underwater acoustic sources used during NOS projects should be above the detection range of aquatic macroinvertebrates.

Non-Motorized Craft

In the sanctuaries which promote the Team Ocean program, trained teams aboard sanctuary non-motorized craft stationed at heavily-visited reef sites during peak recreational boating seasons inform boaters about the sanctuary's zones and regulations and encourage proper use of resources and mooring, which results in beneficial but not significant impacts to ESA-listed species and marine mammals by preventing improper and damaging behavior by the public. These activities would result in both short-term and long-term (avoiding impact to individual marine mammals and ESA-listed species), indirect, and less than significant beneficial effects.

Non-motorized craft are likely to have adverse, but not significant effects on protected species or marine mammals due to some temporary disturbance resulting in displacing some marine mammals or altering their behavior if they are close. One of the ways in which NOAA avoids the risk of disturbance to protected species or marine mammals is by always attempting to maintain a safe distance between them and NOAA-operated craft. Non-motorized craft are only used only in FKNMS in the southeast and Gulf of Mexico region at a rate of about 300 trips/year.

Other Sampling Activities

Other sampling activities can have several indirect beneficial impacts on biological resources including data collection for future study; increased understanding of individual species, biodiversity, and habitats, which leads to improved conservation and management of resources. These indirect beneficial effects are expected to be less than significant, because they are long term.

Various sampling operations aimed at better protection and management of marine mammals include applying tags to record and study whale behavior, and deploying instruments into the water column to measure internal waves as a means of understanding their effects on whale foraging. These long-term scientific studies that aid sanctuary managers with resource protection are expected to yield less than significant beneficial impacts.

Vessel Operations

In general, conducting vessel operations allows sanctuary personnel to be on the water providing direct and indirect less than significant beneficial impacts to habitat, invertebrates, fish, birds, and protected species, through enforcing compliance and by providing education to

users so that they may avoid impacts to biological resources. In addition, conducting vessel operations allows sanctuary personnel to respond to emergency incidents involving other users and wildlife.

The operation of vessels has the potential to have adverse, but less than significant short-term, direct and indirect impacts to ESA-listed species and marine mammals, due to temporary displacement or changes in behavior due to presence of vessel or from vessel movement. While unlikely, protected species have the potential to be struck by a moving vessel. Smaller vessels are typically faster, but have higher maneuverability and shallow draft compared to larger vessels. Therefore, the small vessels primarily used by ONMS are even less likely to collide with and injure protected species because they can change direction to avoid collisions and do not ride as low in the water. Except for law enforcement vessels, larger, hard-bottom hull vessels tend to move slower and have increased crew requirements per the NOAA Small Boat Program and ONMS standing orders to make up for their lesser maneuverability compared to small vessels.

Operating a research vessel in close proximity to protected species during the course of other sampling activities can have short-term temporary effects on their behavior, and presents a remote risk of the vessel striking the animal.

Regardless of boat size, operators of sanctuary vessels have heightened awareness of sanctuary, ESA, and MMPA regulations. And, because they are highly trained and will employ ONMS best management practices and are operating assets that are very visible to the public, they serve as models of best practices to avoid harm to protected species and sanctuary resources. Examples of best practices include maintaining lookouts for protected species; interacting with other vessel operators (e.g., whale watch boats); receiving real time survey information on the locations and concentration of marine mammals; reducing speeds; and maintaining safe distances.

The combination of a limited number of days at sea, the corridors used by vessels to travel from port to the sanctuaries, and the small number of vessels operated by ONMS further decreases the likelihood of impacts to protected species residing in the sanctuaries and other areas where ONMS vessels are operating. Because of partial recovery of sea turtle populations, and the fact that they are submerged, partially submerged, and regularly coming up for air, sea turtle strikes such as those that have happened rarely in the past can happen again, particularly in light of increased conservation and population sizes. Because of due diligence by vessel crews, the likelihood of collision with a sea turtle is likely much lower than it is for the thousands of recreational vessels operating in the sanctuaries. Due to all of these factors, it is very unlikely that sanctuary vessel operations would have significant impacts on protected species.

Activities with only less than significant beneficial impacts

Scuba/Snorkel Operations

The results of scuba/snorkel operations—that are predominantly for scientific or educational purposes—increase the understanding and appreciation of biological resources, enhancing management strategies to protect biological habitat, invertebrates, fish, birds, and protected species. The scientific and educational results also serve to improve public stewardship. Thus, this activity is expected to result in less than significant beneficial, indirect, long-term effects.

Activities with negligible impacts

Vessel Maintenance

The routine maintenance of sanctuary owned vessels is episodic, low intensity, and accomplished by trained NOAA personnel and contractors to avoid impacts to the biological environment. Where possible, bio-based lubricants and fluids (and in some cases bio-based fuels) are used, further reducing the threat to invertebrates, fish, birds, and protected species in the unlikely event of an unintentional spill. Because these vessels are small and limited in total number at any location, heavy maintenance (e.g., welding, grinding, and painting) is typically accomplished on land in self-contained contractor facilities which are highly regulated for industrial safety and environmental compliance, including spill prevention by local, state, and other federal entities. Therefore, the effects of vessel maintenance on these biological resources are expected to be negligible.

Summary of Effects on Biological Resources

The effects on biological resources from the preferred alternative would generally be negligible or less than significant (beneficial and adverse, depending on the type of operations). The beneficial effects can be summarized as: improved compliance with sanctuary regulations; increased characterization of biological resources enhancing conservation and management of living resources; data collection for future study and long-term monitoring of changes; and increased awareness and educational opportunities.

The adverse effects on biological resources are expected to be short term and temporary from all field operations, including those that physically alter or cause a reaction in a biological resource. They would result from protected species disturbance or, very infrequently strike, as a result of vessel operations; seabird disturbance from aircraft operations; behavior modification for mobile invertebrates, fish, protected species, and birds by AUV/ROV/gliders/drifters; habitat modification as well as invertebrate, fish, bird, and protected species disturbance due to removal of debris during fieldwork; anchoring or unintentionally grounding vessels; and diving. Small, temporary changes to habitat or behavior of protected species could also result from remote sensing equipment or equipment deployed on the seafloor. ONMS has determined that active acoustic activities would result in very little risk of injury to marine mammals and other endangered species. Risk is minimized due to source characteristics (higher frequency highly directional sources) and their use context (during time periods and within regions of the sanctuary with less overlap with protected and endangered species).

Socioeconomic Environment

Maritime Transportation

Activities with both less than significant beneficial and less than significant adverse impacts

Other Sampling Activities

The information gleaned from the use of other sampling operations is expected to advance scientific study and inquiry, create greater awareness and appreciation of sanctuary resources, and promote public and commercial uses. The socioeconomic environment stands to indirectly

benefit since trade, tourism, recreation, research, and commercial ventures depend on the vitality of the sanctuary. Given the long-term nature of scientific study and sanctuary resource management, these beneficial effects are expected to be less than significant. A less than significant long-term benefit to many users, however, would be the increased knowledge of sanctuary resources that leads to better resource management, more public education and outreach, and improved partnerships between sanctuary managers, users, and constituents.

Occasionally, other sampling operations conducted by sanctuary staff and partners may temporarily interfere with the conduct of commercial or recreational activities, but these effects are expected to be less than significant if not negligible because they are short term and localized.

Activities with less than significant beneficial and negligible impacts

Deployment of Equipment on the Seafloor

The use of buoys to aid navigation is beneficial to marine transport as they assist in preventing groundings in shallow areas; however, these benefits are negligible because they only incrementally add to the already extensive network of navigation buoys from other agencies used to aid in marine navigation.

The data generated by seabed deployed equipment can increase knowledge of sanctuary resources, leading to better resource management; more public awareness and appreciation; increased safety; improved partnerships between sanctuary managers, users, and constituents; and the promotion of public and commercial uses. Thus, the socioeconomic environment stands to indirectly benefit since trade, tourism, recreation, research, and commercial ventures depend on the vitality of the sanctuary. Given the long-term nature of scientific study and sanctuary management these beneficial effects are expected to be less than significant.

Occasionally, buoys, mooring lines, and other equipment may temporarily interfere with the conduct of commercial or recreational activities (such as fishing or transit), but the effect is expected to be short term and negligible as most of the operations are limited in scope and time.

Deployment of Remote Sensing Equipment

The use of remote sensing to develop bathymetric maps is beneficial to marine navigation as they assist in preventing groundings; however, these benefits are negligible because they only incrementally add to the already large body of bathymetry knowledge used to aid in marine navigation. The data generated by remote sensing operations can increase knowledge of sanctuary resources, and better characterizations of habitats may lead to better resource management, more public education and outreach, and improved partnerships between sanctuary managers, users, and constituents. Given the long-term nature of scientific study and sanctuary management these beneficial effects are considered less than significant.

Occasionally, scientific activities conducted by sanctuaries such as transect surveys may temporarily interfere with the conduct of commercial or recreational activities, but the effect is expected to be short term and negligible.

Activities with only less than significant beneficial impacts

Aircraft Operations

In general, aircraft operations, whether primarily used for species and habitat surveys within sanctuary boundaries, are expected to have a less than significant beneficial effect on the socioeconomic environment, resulting in both long-term and short-term benefits. Additional research can lead to better characterization of habitats and species aiding in education and outreach efforts, which aim to increase informed management decisions and policy. Thus, less than significant beneficial, indirect, short-term and long-term effects are expected to result from aircraft operations.

Activities with negligible impacts

Vessel Maintenance

It is estimated that approximately 24 days of vessel maintenance will be required each year to support the ONMS vessels which operate in the sanctuaries in the southeast and Gulf of Mexico. Vessel maintenance activities are highly unlikely to have detectable effect on marine transport because they are low intensity, episodic, and typically conducted at piers or on land, and therefore would not overlap with areas where marine transportation takes place.

Research and Education

Activities with both less than significant beneficial and less than significant adverse impacts

Other Sampling Activities

Sanctuary research and education that derives from other sampling operations include such activities as reef assessment and monitoring programs; video and photographic documentation of whales; maritime heritage field activities; and the development of public outreach materials, which are all designed to both better protect and manage sanctuary resources and offer related socioeconomic opportunities to users and constituents. These activities can result in benefits to the socioeconomic environment that are short or long term, direct or indirect, and less than significant.

Occasionally, other sampling operations conducted by sanctuary staff and partners may temporarily interfere with the conduct of commercial or recreational activities, but these effects are expected to be less than significant if not negligible because they are short term and localized.

Activities with less than significant beneficial and negligible impacts

Deployment of Equipment on the Seafloor

Research and educational materials developed from data gathered from buoys and other seabed-deployed instrumentation foster a greater awareness and appreciation for sanctuary resources, which in turn promotes public use of the sanctuary (e.g., diving, kayaking, snorkeling, glass bottom boat excursions). Local businesses benefit from this dynamic. For example, small, weighted buoys temporarily deployed for dive operations provide safety for divers, and thus are expected to exhibit less than significant beneficial, short-term, direct effects.

Occasionally, buoys, mooring lines, and other equipment may temporarily interfere with the conduct of commercial or recreational activities (such as fishing or transit), but the effect is expected to be short term and negligible as most of the operations are limited in scope and time.

Deployment of Remote Sensing Equipment

The data generated by remote sensing operations can increase knowledge of sanctuary resources and better characterizations of habitats may lead to better resource management, more public education and outreach, and improved partnerships between sanctuary managers, users, and constituents. Given the long-term nature of scientific study and sanctuary management, these beneficial effects are considered less than significant. Nevertheless, these benefits are negligible because they only incrementally add to opportunities for research and education in the sanctuaries.

Occasionally, scientific activities conducted by sanctuaries such as transect surveys may temporarily interfere with the conduct of commercial or recreational activities, but the effect is expected to be short term and negligible.

Activities with only less than significant beneficial impacts

Aircraft Operations

In general, aircraft operations, whether primarily used for species and habitat surveys within sanctuary boundaries, are expected to have a less than significant beneficial effect on the socioeconomic environment resulting in both long-term and short-term benefits. Additional research can lead to better characterization of habitats and species aiding in education and outreach efforts, which aim to increase informed management decisions and policy. Thus, less than significant beneficial, indirect, short-term and long-term effects are expected to result from aircraft operations.

Deployment of AUV/ROV/Gliders/Drifters

Deployments of AUV/ROV/gliders/drifters in sanctuaries are expected to have a less than significant beneficial, long-term effect on sanctuary research and education resources. This is because all projects are designed to gain information about each sanctuary so that managers can better protect all of its resources. By undertaking these projects, resources will be better protected, restored, or preserved. Because of this, the socioeconomic environment stands to gain a benefit since many research and education ventures depend on the vitality of the sanctuaries.

Onshore Fieldwork

ONMS projects associated with onshore fieldwork activities are intended to enhance awareness and understanding of sanctuary natural and cultural resources. This heightened awareness can have a direct and indirect beneficial effect on socioeconomic resources. Research and monitoring efforts lead to a better understanding of interactions of species with each other and their surrounding environment, which in turn aids in better and more informed management of resources. For example, an understanding of seabird foraging habits can help fishermen employ measures and techniques to reduce the risk of interacting and harming seabirds. In addition, the presence of staff conducting onshore survey and monitoring efforts can afford an opportunity for public interaction and education. Public education is vital to helping public stakeholders understand the resources throughout the region. Improved public awareness and understanding

of resources may inspire the public to cause fewer negative effects on resources, and to act to improve resource protection, both of which would benefit the resources in the long term. Thus, these indirect effects are expected to be beneficial but less than significant, because they are short term and long term and localized.

Scuba/Snorkel Operations

Scuba/snorkel operations are expected to have a less than significant beneficial, long-term effect on sanctuary research and education resources. This is because all projects are designed to gain information about each sanctuary so that managers can better protect sanctuary resources. By undertaking these projects, resources will be better protected, restored, or preserved. Because of this, the socioeconomic environment stands to gain a benefit since many research and education ventures depend on the vitality of the sanctuaries.

Vessel Operations

Vessel operations are expected to have a less than significant beneficial, long-term effect on sanctuary research and education resources. Beneficial impacts include educational opportunities, and at sea research, all of which are activities dependent on vessel operations. However, vessel operations are episodic and of low intensity, and few vessels are used to operate in a large area, so the beneficial impact to education and research would not be concentrated in a small area, resulting in expected less than significant beneficial impacts overall. Vessel operations allow sanctuary personnel to be on the water, providing direct and indirect less than significant beneficial impact to human uses through education, research, and general awareness, so that users may avoid impacts to sanctuary resources and learn more about sanctuary resources through science.

Activities with negligible impacts

Vessel Maintenance

It is estimated that approximately 24 days of vessel maintenance will be required each year to support the ONMS vessels which operate in the sanctuaries in the southeast and Gulf of Mexico. Vessel maintenance activities are highly unlikely to have detectable effect on research and education because they are low intensity, episodic, and typically conducted at piers or on land, and therefore would not overlap with areas where research and education activities take place.

Human Use (Fishing, Recreation, Tourism)

Activities with both less than significant beneficial and less than significant adverse impacts

Deployment of Equipment on the Seafloor

The data generated by seabed deployed equipment can increase knowledge of sanctuary resources; leading to better resource management; more public awareness and appreciation; increased safety; improved partnerships between sanctuary managers, users, and constituents; and the promotion of public and commercial uses. Thus, the socioeconomic environment stands to indirectly benefit since trade, tourism, recreation, research, and commercial ventures depend on the vitality of the sanctuary. Given the long-term nature of scientific study and sanctuary management, these beneficial effects are expected to be less than significant.

Information on the movements of commercially and recreationally important fish species from seabed deployed instrumentation can be used to better manage species and protect their habitat. This may represent a less than significant benefit to fishermen and those associated with the fishing industry as sanctuary partners.

The only possible adverse impact to human uses from seabed deployed instrumentation is the slight possibility of contact with or entanglement in mooring lines. This is expected to be a less than significant effect, because it is very localized and short-term.

Other Sampling

The information gleaned from the use of other sampling operations is expected to advance scientific study and inquiry, create greater awareness and appreciation of sanctuary resources, and promote public and commercial uses. The socioeconomic environment stands to indirectly benefit since trade, tourism, recreation, research, and commercial ventures depend on the vitality of the sanctuary. For example, applying digital tags to whales benefits whale watching activities by providing additional information for the on-board naturalists to discuss with their passengers thus enhancing their experience and appreciation for whales, and promoting the whale-watching industry. Given the long-term nature of scientific study and sanctuary resource management, these beneficial effects are expected to be less than significant. A less than significant long-term benefit to many users, however, would be the increased knowledge of sanctuary resources that leads to better resource management, more public education and outreach, and improved partnerships between sanctuary managers, users, and constituents.

Further, information on the movements of commercially and recreationally important fish species from sampling techniques and tagging can be used to better manage species, protect their habitat, and streamline fishing effort. This may represent a less than significant, but measurable benefit to fishermen and those associated with the fishing industry as sanctuary partners.

Occasionally, other sampling operations conducted by sanctuary staff and partners may temporarily interfere with the conduct of commercial or recreational activities, but these effects are expected to be less than significant if not negligible, because they are short term and localized.

Extractive sampling efforts would result in take of less than a fraction of a percent of the total population of species and plants being studied and would not be expected to interfere with other users' ability to legally harvest and/or collect marine species for subsistence or commercial purposes. In addition, much of the material being studied is invasive species, of which, abundance is great.

Activities with less than significant beneficial and negligible impacts

Aircraft Operations

In general, crewed and uncrewed aircraft operations, whether primarily used for species and habitat surveys within sanctuary boundaries, are expected to have a less than significant beneficial effect on the socioeconomic environment, resulting in both long-term and short-term benefits. Additional research can lead to better characterization of habitats and species aiding in education and outreach efforts, which aim to increase informed management decisions and

policy. Thus, less than significant beneficial, indirect, short-term and long-term effects are expected to result from aircraft operations.

Aircraft operations are not expected to impact maritime users as no crewed aircraft operations occur on or near the ocean. Because most uncrewed aerial systems are operated from a vessel and the system remains within eyesight and under the control of the operator at all times, adverse impacts to interactions with human use activities such as fishing (recreational or commercial) and tourism are expected to be negligible.

Deployment of Remote Sensing Equipment

The data generated by remote sensing operations can increase knowledge of sanctuary resources and better characterizations of habitats may lead to better resource management, more public education and outreach, and improved partnerships between sanctuary managers, users, and constituents. Given the long-term nature of scientific study and sanctuary management, these beneficial effects are considered less than significant.

Further, information on the movements of commercially and recreationally important fish species from remote sensing operations and tagging can be used to better manage species and protect their habitat. This may represent a less than significant benefit to fishermen and those associated with the fishing industry as sanctuary partners.

Occasionally, scientific activities conducted by sanctuaries such as transect surveys may temporarily interfere with the conduct of commercial or recreational activities, but the effect is expected to be short term and negligible.

Activities with only less than significant beneficial impacts

Non-Motorized Craft

Trained teams aboard sanctuary non-motorized craft stationed at heavily-visited reef sites during peak recreational boating seasons inform recreational boaters about the sanctuary's zones and regulations, encourage proper use of resources and mooring buoys, promote dive flag safety, and promote safe and responsible boating behavior, which is expected to result in better and safer visitor experience. These activities would result in less than significant beneficial impacts.

Vessel Operations

Conducting vessel operations allows sanctuary personnel to be on the water providing direct and indirect less than significant beneficial impact to human uses through enforcing compliance with sanctuary and other regulations, and by providing education and general awareness, so that users may avoid impacts to sanctuary resources. In addition, conducting vessel operations allows sanctuary personnel to respond to emergency incidents involving other users.

Activities with only less than significant adverse impacts

Scuba/Snorkel Operations

Scuba/snorkel operations are expected to have a less than significant adverse effect on sanctuary users due to the potential for temporary displacement of fishing activity when divers or

snorkelers are present conducting sanctuary operations. These effects are less than significant, because they are short term and localized.

Activities with negligible impacts

Vessel Maintenance

Vessel maintenance activities are highly unlikely to have detectable effect on other human uses, because they are low intensity, episodic, and typically conducted at piers or on land.

Summary of Effects on Socioeconomic Resources

The effects on socioeconomic resources would be predominantly positive and beneficial. The information gained from scientific study and inquiry would create greater awareness and appreciation of sanctuary resources, and promote public and some commercial uses. These advantages would outweigh the short-term adverse effects on socioeconomic activities.

Maritime Heritage and Cultural Environment

Maritime Heritage Resources

Activities with both less than significant beneficial and less than significant adverse impacts

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters in sanctuaries is expected to have a less than significant beneficial, long-term effect on maritime heritage resources, cultural resources, and historic properties. All projects are designed to learn more about each sanctuary so that managers can better protect sanctuary resources. By undertaking these projects, the historical environment will be better protected, restored, or preserved. Thus, these resources stand to gain a benefit from these activities.

Deployment of AUV/ROV/gliders/drifters in sanctuaries is expected to have a less than significant adverse effect on maritime heritage resources, cultural resources, and historic properties. While intentional or accidental improper operator techniques are possible, trained operators are utilizing assets that are very visible to the public and operators serve as models of best practices. Thus, these operations are expected to result in less than significant adverse effects.

Deployment of Equipment on the Seafloor

The use of seabed deployed equipment is expected to have an overall positive and beneficial effect on maritime heritage resources in a sanctuary because it helps sanctuary managers locate and document new archaeological sites, and better characterize and monitor these resources.

These operations locate and document new archaeological sites; lead to enhanced resource characterization, protection, and management; raise public awareness; prevents anchoring on historic resources; and allow researchers and all interested people to gain a better understanding and appreciation of a sanctuary's maritime archaeological history. Further, the measurement of oceanographic and water quality conditions at an archaeological site aids researchers in developing more efficient field work protocols. Thus, given the nature of

archaeological research and documentation, these impacts are expected to be less than significant, because they are long term and localized.

The National Historic Preservation Act mandates that a sanctuary inventory and document historic resources. Consequently, every effort is made to survey areas prior to sampling and to use all available technologies to contribute to the inventory of historic resources. Precautionary measures are taken to avoid disturbance of known historic resources.

A possible adverse impact to maritime heritage resources from seabed deployment of instrumentation is the highly improbable physical impact of the equipment on a heritage resource such as a shipwreck. Maritime archaeological operations are performed by highly skilled and experienced researchers and divers with complete knowledge of National Historic Preservation Act protocols, so the possibility of any serious harm to historic artifacts is quite small. Therefore, the effects of these operations are expected to be less than significant, because they are long term and localized.

Some other benthic sampling activities could potentially occur in the vicinity of historic and cultural resources and may, thus, adversely affect these resources, but as these operations are evaluated in advance for proximity to historic resources on the seafloor, the chance of adverse impacts is remote.

There is also a slight risk in studying and identifying historic and culturally-significant sites, as this may lead to looters and memento-seekers carrying off important historic resources, but again the possibility of this is quite small as the great majority of divers respect the historic and cultural significance of these artifacts. Moreover, great care is given to how and when information is made public for newly discovered sites, resulting in less than significant adverse impacts.

Deployment of Remote Sensing Equipment

The effects on historic and cultural resources are expected to be predominantly positive and beneficial. These operations locate and document new archaeological sites; lead to enhanced resource characterization, protection, and management; raise public awareness; and allow researchers and all interested people to gain a better understanding and appreciation of a sanctuary's maritime archaeological history. These would be less than significant beneficial impacts.

The use of remote sensing helps sanctuary managers locate and document new archaeological sites, and better characterize and monitor these resources. For example, hydrographic mapping can be used to locate and protect maritime heritage resources, improve understanding of these resources, and allow researchers to better assess the significance of these resources to develop more refined management approaches. Further, the measurement of oceanographic and water quality conditions at an archaeological site aids researchers in developing more efficient field work protocols.

The National Historic Preservation Act mandates that a sanctuary inventory and document historic resources. Consequently, every effort is made to survey areas prior to sampling and to use all available technologies to contribute to the inventory of historic resources. Precautionary measures are taken to avoid disturbance of known historic resources.

Onshore Fieldwork

Onshore fieldwork that involves resource documentation and monitoring has a less than significant beneficial effect on the study and preservation of historic and maritime heritage sanctuary resources, as well as the practice of cultural activities within sanctuary sites. Such activities promote improved understanding and protection of these resources that can lead to enhanced environmental stewardship. All projects are of a short duration and limited scope and are not expected to interfere with cultural resources; instead, they serve to characterize better what is in the region. Additionally, these projects are not expected to interfere with historical artifacts that may be found in the region.

During routine fieldwork, great care is taken to avoid historic and cultural resources, therefore during incident response efforts, there is a small likelihood to disturb maritime heritage, historical, and/or cultural resources. Staff (ONMS and specialized contract staff) conducting incident response efforts are highly skilled and trained with ONMS best management practices to ensure work is done carefully so as not to unnecessarily harm the surrounding environment. In addition, if these activities are conducted in areas near historic or cultural resources, appropriate experts (e.g., cultural or archeological) are consulted prior to extraction. As a result, less than significant adverse impacts are expected on maritime heritage and cultural resources.

Other Sampling Activities

The use of other sampling activities in a sanctuary has many positive and beneficial effects on maritime heritage resources, because they may help sanctuary managers locate and document new archaeological sites; lead to enhanced resource characterization, protection, and management; raise public awareness; and allow researchers and all interested people to gain a better understanding and appreciation of a sanctuary's maritime archaeological history. Further, the measurement of oceanographic and water quality conditions at an archaeological site aids researchers in developing more efficient field work protocols.

This process of discovery, documentation, collection, and sometimes extraction of artifacts for educational and research purposes are designed to gain knowledge about these sanctuary resources, so that managers and partners can work together to better protect and preserve our history. Given the nature of maritime archaeological operations, the impacts from these activities are expected to be long-term, localized, and therefore, less than significant.

Some sampling activities could potentially occur in the vicinity of historic and cultural resources and may, thus, adversely affect these resources, but, as these operations are evaluated in advance for proximity to historic resources on the seafloor, and are conducted by personnel with experience and knowledge of the protocols laid out in the National Historic Preservation Act, the possibility of any serious harm is expected to be remote.

However, possible but highly unlikely adverse impacts to maritime heritage resources from other sampling operations do exist and include physical impact of the equipment on a shipwreck, anchoring by research vessels, and destruction of historic resources by damaging extraction techniques such as using grabs or corers on the seafloor in close proximity to an artifact. All of these scenarios would be unintentional as every effort would be made to scan the area for historic properties prior to sampling, resulting in less than significant impact.

Scuba/Snorkel Operations

Scuba/snorkel operations are expected to have a less than significant beneficial effect on maritime heritage resources, cultural resources, and historic properties, because these effects are long term. All projects are designed to learn more about each sanctuary so that managers can better protect all these resources. By undertaking these projects, historical resources will be better protected, restored, or preserved, thus gaining benefit from these activities. While intentional or accidental improper diving or snorkeling techniques and overuse of specific locations can result in damage to these resources, sanctuary divers and snorkelers are highly trained and will employ ONMS best management practices to avoid improper actions that can cause harm to historical resources. Thus, these operations are expected to result in less than significant adverse effects.

Activities with less than significant beneficial and negligible impacts

Non-Motorized Craft

Non-motorized craft are sometimes used to inform boaters about the sanctuary's zones and regulations, and encourage proper use of resources and mooring buoys, which can result in beneficial but not significant impacts to maritime heritage and cultural resources by preventing improper and damaging behavior by the public.

Non-motorized craft are expected to have negligible effects on any maritime heritage resources, cultural resources, or historic properties because they are lightweight, slow, and maneuverable, and therefore able to avoid contact with sensitive historic and cultural resources. Therefore, non-motorized crafts are generally unlikely to have an impact on such resources.

Activities with negligible impacts

Aircraft Operations

Aircraft operations, while infrequent, can aid in the identification of historic and cultural sites within sanctuary boundaries. However, due to the infrequency of flights (less than 10 flights per year), the fact that most sanctuary resources are underwater, and the need for specialized equipment to survey marine resources from aircrafts, effects on historic and cultural resources are expected to be negligible.

Vessel Maintenance

Vessel maintenance activities are highly unlikely to have detectable effect on historical or cultural resource uses, because they are low intensity, episodic, and typically conducted at piers or on land.

Vessel Operations

Vessel operations are highly unlikely to have a detectable effect on maritime heritage resources, cultural resources, or historical properties. Anchoring and unintentional striking or groundings are rare, but may occur. Vessel operations are episodic and of low intensity, and few vessels are used to operate in a large area, so the risk of impact would not be concentrated in a small area. To mitigate potential impacts from anchoring a vessel, fixed moorings are used whenever possible. Vessel operators are highly trained and will employ ONMS best management practices and apply the NOAA Small Boat Program, and follow sanctuary standing orders and procedures

to avoid direct impacts to physical resources, as well as maritime heritage or cultural resources. This would result in negligible impacts from vessel operations.

Cultural Resources

Activities with both less than significant beneficial and less than significant adverse impacts

Deployment of AUV/ROV/Gliders/Drifters

Deployment of AUV/ROV/gliders/drifters in sanctuaries is expected to have a less than significant beneficial, long-term effect on maritime heritage resources, cultural resources, and historic properties. All projects are designed to learn more about each sanctuary so that managers can better protect sanctuary resources. By undertaking these projects, the historical environment will be better protected, restored, or preserved. Thus, these resources stand to gain a benefit from these activities.

Deployment of AUV/ROV/gliders/drifters in sanctuaries is expected to have a less than significant adverse effect on maritime heritage resources, cultural resources, and historic properties. While intentional or accidental improper operator techniques are possible, trained operators are utilizing assets that are very visible to the public and operators serve as models of best practices. Thus, these operations are expected to result in less than significant adverse effects.

Onshore Fieldwork

Onshore fieldwork that involves resource documentation and monitoring has a less than significant beneficial effect on the study and preservation of historic and maritime heritage sanctuary resources, as well as the practice of cultural activities within sanctuary sites. Such activities promote improved understanding and protection of these resources that can lead to enhanced environmental stewardship. All projects are of a short duration and limited scope and are not expected to interfere with cultural resources; instead, they serve to characterize better what is in the region. Additionally, these projects are not expected to interfere with historical artifacts that may be found in the region.

In addition, in many locations, cultural beliefs, traditions, and practices provide a foundational context in which sanctuary activities function. As a result, local and traditional knowledge is utilized to further protect cultural sanctuary resources, which leads to more culturally sensitive management of cultural resources and practices, and therefore is expected to provide a less than significant beneficial impact to cultural resources.

During routine fieldwork, great care is taken to avoid historic and cultural resources, therefore during incident response efforts, there is a small likelihood to disturb maritime heritage, historical, and/or cultural resources. Staff (ONMS and specialized contract staff) conducting incident response efforts are highly skilled and trained with ONMS best management practices to ensure work is done carefully so as not to unnecessarily harm the surrounding environment. In addition, if these activities are conducted in areas near historic or cultural resources, appropriate experts (e.g., cultural or archeological) experts are consulted prior to extraction. As a result, less than significant adverse impacts are expected on maritime heritage and cultural resources.

Scuba/Snorkel Operations

Scuba/snorkel operations are expected to have a less than significant beneficial effect on maritime heritage resources, cultural resources, and historic properties, because these effects are long term. All projects are designed to learn more about each sanctuary so that managers can better protect all these resources. By undertaking these projects, historical resources will be better protected, restored, or preserved; thus, gaining benefit from these activities. While intentional or accidental improper diving or snorkeling techniques and overuse of specific locations can result in damage to these resources, sanctuary divers and snorkelers are highly trained and will employ ONMS best management practices to avoid improper actions that can cause harm to historical resources. Thus, these operations are expected to result in less than significant adverse effects.

Activities with less than significant beneficial and negligible impacts

Non-Motorized Craft

Non-motorized craft are sometimes used to inform boaters about the sanctuary's zones and regulations and encourage proper use of resources and mooring buoys, which can result in beneficial but not significant impacts to maritime heritage and cultural resources by preventing improper and damaging behavior by the public.

Non-motorized craft are expected to have negligible effects on any maritime heritage resources, cultural resources, or historic properties because they are lightweight, slow, and maneuverable, and therefore able to avoid contact with sensitive historic and cultural resources. Therefore, non-motorized crafts are generally unlikely to have an impact on such resources.

Activities with negligible impacts

Aircraft Operations

Aircraft operations, while infrequent, can aid in the identification of historic and cultural sites within sanctuary boundaries. However, due to the infrequency of flights (less than 10 flights per year), the fact that most sanctuary resources are underwater, and the need for specialized equipment to survey marine resources from aircrafts, effects on historic and cultural resources are expected to be negligible.

Deployment of Remote Sensing Equipment

Some remote sensing operations will have no or negligible effect on maritime heritage and cultural resources, as they usually will not come in contact with these resources at all.

Vessel Maintenance

Vessel maintenance activities are highly unlikely to have detectable effect on historical or cultural resource uses because they are low intensity, episodic, and typically conducted at piers or on land.

Vessel Operations

Vessel operations are highly unlikely to have a detectable effect on maritime heritage resources, cultural resources, or historical properties. Anchoring and unintentional striking or groundings are rare, but may occur. Vessel operations are episodic and of low intensity, and few vessels are used to operate in a large area, so the risk of impact would not be concentrated in a small area.

To mitigate potential impacts from anchoring a vessel, fixed moorings are used whenever possible. Vessel operators are highly trained and will employ ONMS best management practices and apply the NOAA Small Boat Program, and follow sanctuary standing orders and procedures to avoid direct impacts to physical resources as well as maritime heritage or cultural resources.

Summary of Effects on Maritime Heritage and Cultural Resources

The effects on maritime heritage and cultural resources would be predominantly less than significant and beneficial. These field operations locate and document new archaeological sites; lead to enhanced resource characterization, protection, and management; raise public awareness; and allow researchers and all interested people to gain a better understanding and appreciation of a sanctuary's maritime archaeological history, all of which are beneficial effects to historic and cultural resources. Precautionary measures are taken to avoid disturbance of known historic resources.

ONMS Best Management Practices for Vessel Operations

Vessel Operations

All ONMS vessels must comply with the operational protocols and procedures in the NOAA Small Boats Policy (NOAA Administrative Order 209-125)[20] and mitigation measures in the NOS Surveying and Mapping programmatic environmental impact statement.[21] To minimize impacts on sanctuary resources during field activities, sanctuary vessels would adhere to the following standing orders and practices, which includes applicable mitigation measures from the NOS Surveying and Mapping programmatic EIS.

Lookouts/Staying at the Helm

- While underway, vessel operators should always stay alert for marine mammals, sea turtles, and other collision hazards.
- While transiting in areas where marine mammals and sea turtles are likely to occur, vessel operators should post a minimum of one dedicated lookout, and operators should remain vigilant at the helm controls (keeping hands on the wheel and throttle at all times), and be ready to take action immediately to avoid an animal in their path.
- When operating in areas where marine mammals and sea turtles are present, a dedicated lookout is required in addition to the operator. A second lookout may be posted in circumstances where visibility is restricted.
- When marine mammals are riding the bow wake, or porpoising nearby, operators should exercise caution and take actions that avoid possible contact or collisions.

[20] https://www.noaa.gov/organization/administration/nao-209-125-noaa-small-boat-safety-program
[21] https://aambpublicoceanservice.blob.core.windows.net/oceanserviceprod/about/environmental-compliance/final-peis/Appendix%20D%20Mitigation%20Measures%20During%20NOS%20Mapping%20and%20Surveying%20Activities.pdf

- When operating within visual range of whales, vessel operators should follow NOAA Fisheries Whale Watching guidelines[22] unless otherwise covered by a NOAA Fisheries permit, and only then with extreme caution.

Vessel Speed and Maintaining Distance

- An ESA-listed whale is identified within 457 meters (500 yards) of the forward path of the vessel: All vessels must steer a course that increases the distance from the whale at a speed of 10 knots or less until the 457 meters (500 yards) minimum separation distance has been established.
- An ESA-listed whale is sighted within 91 meters (100 yards) of the forward path of a vessel: The vessel operator must reduce speed and shift the engine to neutral. Engines must not be engaged until the whale has moved outside the vessel's path and beyond 457 meters (500 yards). If stationary, the vessel must not engage engines until the large whale has moved beyond 457 meters (500 yards). A single cetacean at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised.
- One or more cetaceans (whales, dolphins, or porpoises) are sighted while a vessel is underway: Attempt to remain parallel to the animal's course if feasible. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.
- One or more sea turtles are sighted while the vessel is underway: Attempt to maintain a distance of 45 meters (50 yards) or greater whenever possible.
- Vessel operators on project vessels operating at night will use the appropriate lighting to comply with navigation rules and best safety practices. All project areas will be continually monitored for protected species by posted crewmembers during vessel operations.

Operation of Vessels

- Due to the increased risk of collision at night, vessel operations, whenever possible, should be planned for daylight hours (i.e., between one half hour before sunrise and one half hour after sunset when possible).
- Restricted visibility can hinder an operator's ability to see and respond to marine mammals and sea turtles. Prudent seamanship should be applied, including posting an additional lookout when there is the potential for marine animals in the vicinity.
- Standing order for nighttime operations: If nighttime operations are essential and integral to the mission, the principal investigator must discuss mitigations for avoiding whales and other objects within the vessel operation corridor and incorporate them into the cruise plan. Mitigation measures could include speed restrictions, additional lookouts, use of navigation lights, use of sound signals, etc.
- Implement mandatory invasive species prevention procedures including, but not limited to, vessel and equipment washdown (including diving equipment), cleaning, and de-ballasting (exchange of ballast water in open ocean waters for those vessels used by NOS that have ballast tanks).

[22] https://www.fisheries.noaa.gov/topic/marine-life-viewing-guidelines

- Do not attempt to feed, touch, ride, or otherwise intentionally interact with any marine protected species.
- Vessel crew must maintain at least one protected species observer (PSO) at all times. This individual may perform other duties simultaneously. PSOs should use all means necessary to enhance visibility (e.g., spotlights, night vision, Forward Looking Infrared), and will be trained according to NOS Standard Operating Procedures.
- NOS would internally coordinate the location and timing of a given project, wherever possible, to ensure that areas are not repeatedly surveyed, except as needed to achieve research or monitoring goals.
- NOS would not perform surveys on or near ongoing Navy exercises.
- Sighting of any injured, dead, or entangled right whales: Report sighting immediately to the U.S. Coast Guard (USCG) via VHF Channel 16.
- Sighting of any injured, dead, or entangled ESA-listed species: Immediately report to NOAA Fisheries using the contact information on the NOAA Fisheries website. NOAA Fisheries also has created a Dolphin & Whale 911 telephone app that can be used to direct calls to the nearest stranding response helpline.
- Sightings of critically endangered cetaceans including North Atlantic right whale, North Pacific right whale, Southern Resident killer whale, Main Hawaiian Island insular false killer whale, and Rice's whale: Report sighting within two hours of occurrence when practicable and no later than 24 hours after occurrence to NOAA Fisheries. Right whale sightings in any location may also be reported to the USCG via VHF channel 16 and through the WhaleAlert App.
- Sighting of any protected marine species within 91 m (100 yd) of the vessel: Do not discharge.
- Additional discharge restrictions when operating a vessel:
    - Follow the International Convention for the Prevention of Pollution from Ships (MARPOL) discharge protocols.
    - Meet all U.S. Environmental Protection Agency (USEPA) Vessel General Permits and USCG requirements.
    - Use anti-fouling coatings.
    - Clean hull regularly to remove aquatic nuisance species.
    - Avoid cleaning of hull in critical habitat. Avoid cleaners with nonylphenols.

Anchoring and Deployment of Instruments

- Ensure that all instruments placed in contact with the seafloor are properly secured to minimize bottom disturbance. Use retrievable instruments, when possible, to avoid abandoning deployed equipment on the seafloor.
- Deployment of instruments would occur slowly and under constant supervision to minimize risk and mitigate impacts should a collision or entanglement occur. Deployment operations would be postponed if species at risk of entanglement are observed.
- While vehicles or personnel are deployed, spotters would monitor activities at all times.
- Where possible NOAA staff will avoid leaving weights behind through use of an anchor retrieval system for sanctuary research gear.

- Do not anchor in coral critical habitat or other known areas of coral.
- Avoid anchoring in seagrass.
- Vessel operators would not drag anchor chains.
- Vessel operators would select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types are sticky mud or sand, as those characteristics allow the flukes of the anchor to dig into the bottom and hold the chain in place. When working in an un-surveyed area or in an area that has not been surveyed in many years, the ship would try to anchor in bays where data have already been collected, providing the ship with better information on where to drop the anchor.
- For instruments required to be left in the marine environment for long periods of time (i.e., a few months or more), staff would deploy subsurface floats that keep the mooring lines vertically tight at all times in order to significantly reduce any entanglement risk.
- Stiffer line materials should be used for towing and kept taut during operations to reduce the potential for entanglement in bottom features, such as coral habitats and shipwrecks.
- Sighting of any protected marine species within 91 m (100 yd) of the work area: Suspend deployment of all instruments, divers, and autonomous systems. Work already in progress may continue if that activity is not expected to adversely affect the animal(s).
- Autonomous underwater vehicle (AUV) operation: Equipment such as AUVs would be programmed and operated to avoid seafloor disturbance.

Scuba Diving

- NOAA divers are required to be certified by the NOAA Diving Program.[23]
- Annual training requirements assure that NOAA divers are versed in NOAA diving standards, policies, and procedures that minimize impacts on sanctuary resources.
- When using a boat or platform to conduct scuba or snorkeling operations: At least one person should maintain a visual watch for mobile protected species to ensure none are sighted within the working area. If a listed species moves into the area of work, cessation of operation of any moving equipment within 15 m (50 ft) of the animal should occur. Activities may resume once the species has departed the project area of its own volition.
- Diving on or near coral: Divers/snorkelers/swimmers should not stand or rest on live corals/coral reefs. Bottom contact should only be in unconsolidated areas or non-living hard bottom.
- At all times during scuba or snorkel operations: scuba divers/snorkelers involved in in-water activities should have proper training and be capable of responsible dive/snorkel practices (e.g., proper buoyancy), such that they minimize injury to organisms, avoid unnecessary habitat impacts, and avoid injury to sensitive archaeological materials. It is the responsibility of NOAA or grantees/contractors to ensure that divers/snorkelers are trained to a level commensurate with the type and conditions of the diving activity being undertaken. Divers shall use appropriate diving equipment and tools, expert boat anchoring (e.g., hand placement by divers/snorkelers on verified non-living bottom habitat before deployment), and have diver awareness. The organization must have the capacity (appropriate insurance, safety policies, etc.) to oversee all proposed

[23] https://www.omao.noaa.gov/learn/diving-program/diving/training

diving/snorkeling activities. Scuba divers will avoid inadvertent disturbance to the seafloor.

Seafloor Protection

- To avoid potential disturbance of submerged cultural resources and artifacts, and to protect seafloor habitats and benthic species, sanctuary staff would continue to comply with NOAA regulations prohibiting unauthorized disturbance of the seafloor (15 CFR § 922.232(a)(3)) and removal or disturbance of historical resources (15 CFR § 922.232(a)(4)).
- When considering issuance of an ONMS research permit to authorize any coring of the sanctuary seafloor or other use of equipment that could impact seafloor habitats or benthic species, NOAA would exercise caution and, upon permitting any activities, require protective conditions to reduce impacts.
- When securing research and monitoring equipment to the seafloor, NOAA staff will select areas with sandy substrate for vessel anchoring and gear deployment.
- Anchoring of sanctuary vessels will be limited to sandy-bottom substrates to avoid damage to seagrasses and coral habitat.
- Whenever possible, NOAA staff will avoid leaving weights behind through use of an anchor retrieval system with sanctuary research gear.

Uncrewed Aircraft Systems

NOAA recognizes that even though responsibly operated UAS can be less disturbing to sanctuary wildlife than larger and noisier fixed wing aircraft and helicopters, these craft still hold the potential to create disturbance to wildlife and, in particular, seabirds.

- NOAA requires that special permitting, authorization, and environmental compliance work must be addressed when flights will occur over sensitive areas or in the vicinity of protected species or marine mammals. Such operations "may require a permit, authorization, or inter-agency consultation to meet environmental compliance requirements. Sensitive areas may include, but are not limited to, national parks, national wildlife refuges, waterfowl production areas, wilderness areas, and national marine sanctuaries. For flights over animals, applicable statutes may include but are not limited to the ESA, 16 United States Code (U.S.C.) § 1531 *et seq*., Marine Mammal Protection Act (MMPA), 16 U.S.C. § 1361 *et seq*., and Migratory Bird Treaty Act (MBTA), 16 U.S.C. § 703 *et seq*. These permits may contain specific mitigation measures, or other terms and conditions that will need to be met. All flights must comply with the National Environmental Policy Act, 42 U.S.C. § 4321 *et seq*.; NOAA Administrative Order 216-6A. The principal investigator is responsible for all environmental compliance."
- In accordance with this agency policy, NOAA's National Ocean Service (NOS) requires that an Unmanned Aircraft Systems Operations Checklist be followed prior to the initiation of the operational phase of any UAS activity, including within national marine sanctuaries. The checklist includes requirements for assuring environmental compliance. This includes:
    - Completion of all applicable environmental compliance reviews, consultations, and permitting requirements, including, but not limited to the:

        - National Environmental Policy Act (42 U.S.C. § 4321 *et seq.*);
        - NOAA Administrative Order 216-6A;
        - ESA (16 U.S.C. § 1531 *et seq.*); and
        - MMPA (16 U.S.C. § 1361 *et seq.*)
    - Any required mitigation measures, best management practices, monitoring, terms and conditions, or other environmental compliance requirements.
- More specifically, UAS operations within the sanctuary are planned and executed in a manner that follows best practices designed to minimize or avoid disturbance to seabirds. These practices include:
    - Conduct a pre-flight check for birds in the flight area prior to UAS take-off. If birds are detected in the flight airspace, wait until they depart before initiating takeoff.
    - Provide a 50–100 foot buffer from areas where birds are present. This includes on land, nearshore, or on the water.
    - If one or more migratory birds or non-migratory birds is suspected of being disturbed in the air during airborne operations, wait until the bird(s) clear the flight area. Attempt operations again using more conservative parameters such as a different approach angle, different time of day, etc. If a second incident occurs, conduct no further UAS operations for this day.
    - If one or more threatened or endangered bird(s) is suspected of being disturbed in/around its nest, and/or if disturbance occurs during nesting season, conduct no further UAS operations. Contact the environmental compliance coordinator.
    - Maintain a log of each day's UAS operations to account for any disturbances to migratory or other birds and review this information with the site coordinator and the environmental compliance coordinator.

Aircraft Operations

- NOAA recognizes and requests pilots of charter and NOAA aircraft to comply with applicable Federal Aviation Administration-recommended practices relevant to flights above the sanctuary. In addition, the Federal Aviation Administration's Advisory Circular 91-36D[24] "encourages pilots making visual flight rule flights near any noise-sensitive areas to fly at altitudes higher than the minimum permitted by regulation and on flight paths, which will reduce aircraft noise in such areas."

Tagging Fish

- Researchers would follow all local and federal laws, and secure proper permits.
- Where directed take is involved, such as in whale-tagging operations, sanctuary staff would ensure that appropriate permits are obtained from NOAA Fisheries pursuant to ESA and MMPA.

[24] https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentid/23156

- To reduce stress on the fish (e.g., sharks, giant sea bass), NOAA researchers would minimize physical handling, keep the fish in the water for tagging, and use proper fishing gear.
- Fishes would not be tagged with tags greater than 2% of their body weight, and prohibited species will be released immediately.
- NOAA staff would follow additional best practices for tagging, as identified by NOAA Fisheries.[25]

[25] https://www.fisheries.noaa.gov/new-england-mid-atlantic/atlantic-highly-migratory-species/tagging-instructions-and-resources-volunteers

Appendix M: Document Preparers

This document was prepared by several staff members at NOAA's Florida Keys National Marine Sanctuary with significant assistance from NOAA's Office of National Marine Sanctuaries and NOAA's National Centers for Coastal Ocean Science. Cooperating agency support was provided by the U.S. Fish and Wildlife Florida Keys National Wildlife Refuge Complex staff. This proposal for updates to Florida Keys National Marine Sanctuary was informed by many years of input from the Florida Keys National Marine Sanctuary Advisory Council and their working groups. This dedicated group consists of community representatives of fishing, diving, cultural resources, conservation, education, research, and governmental interests.

Preparers

Name	Title	Affiliation
Bohnsack, Karen	Associate Director | Water Quality and Ecosystem Restoration	FKNMS
Brown, Caroline	Policy Analyst	ONMS, affiliate
Bruckner, Andy	Research Coordinator	FKNMS
Delaney, Joanne	Resource Protection and Permit Coordinator	FKNMS, affiliate
Dieveney, Beth	Policy Analyst	ONMS
Freitag, Amy	Social Scientist	NCCOS, affiliate
Harback, Wilamena	Environmental Compliance Coordinator	ONMS
Lawrence, Matthew	Maritime Archaeologist	FKNMS
Lindelof, Edward	Senior Policy Advisor	ONMS, retired
Nunenkamp, Jay	Environmental Compliance Coordinator	NOS
Reyer, Tony	GIS Specialist	ONMS
Schwarzmann, Danielle	Economist	ONMS
Stein, Sarah	Policy Analyst	ONMS
Werndli, Steve	Enforcement Coordinator	FKNMS

Cooperating Agency

Name	Title	Affiliation
Demarest, Dean	Senior Wildlife Biologist	USFWS Division of Migratory Birds
Eggleston, Chris	Manager	USFWS Florida Keys National Wildlife Refuge Complex
Feltner, Jennifer	Wildlife Biologist	USFWS
Guerena Watts, Kate	Wildlife Biologist	USFWS, Region 1
Hunter, Chuck	Chief, Division of Strategic Resource Management Regional Refuge Biologist	USFWS Southeast Region

NATIONAL MARINE
SANCTUARIES

AMERICA'S UNDERWATER TREASURES