UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
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06/11/2026

F/SER31: HA
SERO-2024-00367

Taylor Parks
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Department of the Army
701 San Marcos Boulevard
Jacksonville, Florida 32207-8915

Ref.: SAJ-2020-01940, Mr. Brice Hall of Jack Rock B-A C LLC, Latitude 18 Marina Rebuild and Mooring Buoy Install, Red Hook Quarter, St. Thomas, U.S. Virgin Islands

Dear Taylor Parks,

The enclosed Conference Biological Opinion (Conference Opinion) responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.) for the above referenced action. The Opinion has been given the NMFS tracking number SERO-2024-00367. Please use the NMFS tracking number in all future correspondence related to this action.

The Conference Opinion considers the effects of the United States Army Corps of Engineers (USACE) proposal to authorize the Latitude 18 Marina Rebuild and Mooring Installation project by Mr. Brice Hall of Jack Rock B-A C LLC (the applicant) in Red Hook Quarter, St. Thomas, U.S. Virgin Islands, on the following listed species and critical habitat: green sea turtle (North Atlantic and South Atlantic Distinct Population Segments [DPS]), hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), giant manta ray, Nassau grouper, oceanic whitetip shark, scalloped hammerhead shark (Central and Southwest Atlantic DPS), queen conch, lobed star coral, mountainous star coral, sperm whale; critical habitat for the following species: elkhorn, staghorn, boulder star, lobed star, mountainous star, pillar, and rough cactus corals; proposed critical habitat for green sea turtle (South Atlantic DPS). The Conference Opinion is based on information provided by the USACE, the applicant, and the published literature cited within. NMFS concludes that the proposed action is not likely to adversely affect green sea turtle (North Atlantic and South Atlantic DPSs), hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), giant manta ray, Nassau grouper, oceanic whitetip shark, scalloped hammerhead shark (Central and Southwest Atlantic DPS), lobed star coral, mountainous star coral, sperm whale, critical habitat for elkhorn and staghorn corals, critical habitat for 5 Caribbean coral species, and proposed critical habitat for green sea turtle (South Atlantic DPS). NMFS concludes that the proposed action is likely to adversely affect, but is not likely to jeopardize the continued existence of, queen conch.

NMFS is providing an Incidental Take Statement with this Conference Opinion. The Incidental Take Statement describes Reasonable and Prudent Measures that NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action. The Incidental Take Statement also specifies Terms and Conditions, including monitoring and reporting requirements with which the USACE and the applicant must comply, to carry out the Reasonable and Prudent Measures.

USACE is conferring with NMFS under ESA section 7(a)(4) on effects to critical habitat proposed for designation for green sea turtle (South Atlantic DPS). The conference is being conducted following the procedures for formal consultation.

This conference opinion may be adopted as the biological opinion when the critical habitat is designated, but only if no significant new information is developed (including that developed during the rulemaking process on the critical habitat designation and no significant changes to the Federal action are made that would alter the content of the opinion.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and critical habitat. If you have any questions regarding this consultation, please contact Helena Antoun, Consultation Biologist, by phone at +1 (225) 536-3097, or by email at helena.antoun@noaa.gov

Sincerely,

AMENDOLA.KIMBERLY.BARBARA.1365830769 Digitally signed by AMENDOLA.KIMBERLY.BARBARA.1365830769 Date: 2026.06.11 16:56:12 -04'00'

for Andrew J. Strelcheck
Regional Administrator

Enclosures:
NMFS Biological Opinion SERO-2024-00367
Appendix 1: Water Quality and Sea Turtle Protection Plan
Appendix 2: Queen Conch Mitigation Measures and BMPs
cc: taylor.parks@usace.army.mil
nmfs.ser.esa.consultations@noaa.gov
File: 1514-22.f.10

Endangered Species Act - Section 7 Consultation
Conference Biological Opinion

Action Agency:	United States Army Corps of Engineers Permit number: SAJ-2020-01940
Applicant:	Mr. Brice Hall of Jack Rock B-A C LLC
Activity:	Latitude 18 Marina Rebuild and Mooring Buoy Install
Location:	Red Hook Quarter, St. Thomas, U.S. Virgin Islands
Consulting Agency:	National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, St. Petersburg, Florida NMFS Tracking Number: SERO-2024-00367
Approved by:	for AMENDOLA.KIMBERLY.BARBARA.1365830769 Digitally signed by AMENDOLA.KIMBERLY.BARBARA.1365830769 Date: 2026.06.11 16:57:04 -04'00' Andrew J. Strelcheck, Regional Administrator NMFS, Southeast Regional Office St. Petersburg, Florida
Date Issued:	06/11/2026

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4 ACRONYMS, ABBREVIATIONS, AND UNITS OF MEASURE

U.S.	United States of America
°C	degrees Celsius
°F	degrees Fahrenheit
ac	acre(s)
ADA	Americans with Disabilities Act
APC	Area of Particular Concern
ATON	Aid to Navigation
CCA	crustose coralline algae
CFMC	Caribbean Fishery Management Council
CFR	Code of Federal Regulations
CH	Critical Habitat
CITES	Convention on International Trade in Endangered Species
cm	centimeter(s)
CRCP	Coral Reef Conservation Program
CZM	Coastal Zone Management
CWA	Clean Water Act
DPNR	Department of Planning and Natural Resources
DPS	Distinct Population Segment
EAR	Environmental Assessment Report
ECO	Environmental Consultation Organizer
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 et seq.)
FAO	Food and Agriculture Organization
FR	Federal Register
ft	foot/feet
ft^2	square foot/feet
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Florida Fish and Wildlife Research Institute
IBFMP	Island Based Fishery Management Plan
in	inch(es)
IUU	Illegal, Unreported, and Unregulated
km	kilometer(s)
lin ft	linear foot/feet
m	meter(s)
MHW	Mean High Water
mi	mile(s)
mi^2	square mile(s)

MLLW	Mean Lower Low Water
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSL	Mean Sea Level
N/A	not applicable
NAD 83	North American Datum of 1983
nm	Nautical Miles
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NTUs	Nephelometric Turbidity Unit
Opinion	Biological Opinion, Conference Biological Opinion, or Draft Biological Opinion
PDC	Project Design Criteria
SAV	Submerged Aquatic Vegetation
SEFSC	South East Fisheries Science Center
SERO PRD	NMFS Southeast Regional Office, Protected Resources Division
STSSN	Sea Turtle Stranding and Salvage Network
TBT	Tributyltin
TCRMP	Territorial Coral Reef Monitoring Program
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USVI	United States Virgin Islands
WWTP	Waste Water Treatment Plant
yd^3	Cubic Yards

1 INTRODUCTION

1.1 Overview

Section 7(a)(2) of the ESA, requires that each federal agency ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. Section 7(a)(2) requires federal agencies to consult with the appropriate Secretary in carrying out these responsibilities. The NMFS and the USFWS share responsibilities for administering the ESA. Consultations on most ESA-listed marine species and their critical habitat are conducted between the federal action agency and NMFS (hereafter, may also be referred to as we, us, or our).

Consultation is required when a federal action agency determines that a proposed action "may affect" ESA-listed species or critical habitat and can be conducted informally or formally. Informal consultation is concluded after NMFS issues a Letter of Concurrence that concludes that the action is "not likely to adversely affect" ESA-listed species or critical habitat. Formal consultation is concluded after we issue a Biological Opinion (hereafter, referred to as an/the Opinion) that identifies whether a proposed action is "likely to jeopardize the continued existence of an ESA-listed species" or "destroy or adversely modify critical habitat," in which case Reasonable and Prudent Alternatives to the action as proposed must be identified to avoid these outcomes. An Opinion often states the amount or extent of anticipated incidental take of ESA-listed species that may occur, develops Reasonable and Prudent Measures necessary or appropriate to minimize such impact of incidental take on the species, and lists the Terms and Conditions to implement those measures. An Opinion may also develop Conservation Recommendations that help benefit ESA-listed species. For species and critical habitat proposed for listing, each federal agency shall confer on any agency action that is likely to jeopardize the continued existence of any species proposed for listing or result in the destruction or adverse modification of proposed critical habitat (ESA section 7(a)(4)). Federal agencies may also request a conference on any proposed action that may affect proposed species or proposed critical habitat. Federal action agencies may request that the conference be conducted following the procedures for formal consultation and, subject to our agreement, the conference may be conducted formally.

A formal conference results in a Conference Biological Opinion in the same format and with the same content as a Biological Opinion. The Conference Biological Opinion may be adopted as the biological opinion when the species is listed or critical habitat is designated, but only if no significant new information is developed (including that developed during the rulemaking process on the proposed listing or critical habitat designation) and no significant changes to the Federal action are made that would alter the content of the opinion. An Incidental Take Statement provided with a conference opinion does not become effective unless we adopt the Opinion once the listing is final (50 CFR 402.10(d)).

This document represents NMFS's Opinion based on our review of potential effects of the USACE's proposal to authorize the Latitude 18 Marina Rebuild and Mooring Installation project by Jack Rock B-A C LLC (the applicant) in Red Hook Quarter, St. Thomas, U.S. Virgin Islands on the following listed species and critical habitat: green sea turtle (North Atlantic and South Atlantic DPS), hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle (Northwest Atlantic DPS), giant manta ray, Nassau grouper, oceanic whitetip shark, scalloped hammerhead shark (Central and Southwest Atlantic DPS), queen conch, lobed star coral, mountainous star coral, sperm whale, proposed critical habitat for green sea turtle (South Atlantic DPS), and critical habitat for the following coral species: elkhorn, staghorn, boulder star, lobed star, mountainous star, pillar, and rough cactus corals. Our Opinion is based on information provided by the USACE, the applicant, and the published literature cited within.

This biological opinion was prepared by NMFS pursuant to section 7(a)(2) of the ESA and implementing regulations at 50 CFR 402. On March 30, 2026, in *Center for Biological Diversity v. Burgum*, No. 24-cv-04651 (N.D. Cal.), the U.S. District Court for the Northern District of California vacated aspects of four provisions from the 50 CFR part 402 regulations governing interagency consultation under section 7 of the Endangered Species Act and reinstated the provisions that were previously in effect. Consistent with the Court's ruling, these are the governing provisions for this consultation:

- "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features." 50 CFR 402.02 (2018).
- "Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration." 50 CFR §402.02 (2018). This definition includes the second sentence of the definition of "effects of the action." That sentence provided the definition of "environmental baseline" in effect as of 2018. In the 2019 rule amending the 50 CFR part 402 regulations, the Services established "environmental baseline" as a standalone definition. 84 Fed. Reg. 44976, 45016 (August 27, 2019). In the 2024 rule, the Services made minor revisions to the "environmental baseline" definition. 89 Fed. Reg. 24268, 24298 (April 5, 2024). The Court's ruling did not touch upon that definition of "environmental baseline," and it therefore remains valid. The definition is also fully consistent with the definition of "effects of the action" from 2018.
- 50 CFR §402.14(g)(8): "In formulating its biological opinion, any reasonable and prudent alternatives, and any reasonable and prudent measures, the Service will use the best scientific and commercial data available and will give appropriate consideration to any

beneficial actions taken by the Federal agency or applicant, including any actions taken prior to the initiation of consultation." 50 CFR §402.14(g)(8) (2018).

- 50 CFR §402.16(a): "(a) Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and . . . ." 50 CFR §402.16(a) (2023).

1.2 Consultation History

The following is the consultation history for the NMFS ECO tracking number SERO-2024-00367, Latitude 18 Marina Rebuild & Mooring Install.

On February 26, 2024, we received a request for informal consultation under Section 7 of the ESA from the USACE to permit the Latitude 18 Marina Rebuild and Mooring Installation project by Mr. Brice Hall of Jack Rock B-A C LLC (the applicant) in Red Hook Quarter, St. Thomas, USVI in a letter dated February 26, 2024.

On December 11, 2024, we requested additional information related to conferencing for proposed critical habitat for the South Atlantic DPS of green sea turtle, the number of maximum vessels for the project, the benthic resources within the dredging footprint, incorporating a turbidity monitoring plan, routes of effect for ESA-listed corals in action area, NOAA educational signs, and a marine debris removal plan. Subsequent requests for additional information were sent on February 24, 2024; April 24, 2024; June 26, 2024; and June 20, 2025.

On October 8, 2025, the applicant submitted a queen conch preconstruction survey that confirmed the presence of queen conch in the action area. On December 19, 2025, we sent an email to USACE confirming that a formal consultation is needed. On December 31, 2025 we requested additional information.

We received a final response from the USACE on January 6, 2026, and initiated formal consultation that day. Supplemental information was provided by the applicant on January 8, 2026.

2 PROPOSED ACTION

2.1 Project Details

2.1.1 Project Description

The USACE is proposing to authorize the reconstruction of Latitude 18 Marina, and the development of a managed mooring field. The original marina was damaged by several hurricanes over the past 30 years, and was never fully restored after Hurricane Marilyn in 1995. The viability of the property as a marina continually diminished over time, finally closing from damages because of the 2017 Hurricanes Irma and Maria. The proposed marina dock layout encompasses the area previously occupied by the original marina.

Existing damaged and derelict structures will be removed from the project footprint. The proposed marina redevelopment will then require pile driving to install docks and a bulkhead for shoreline stabilization, mechanical dredging, marine debris removal in the action area, and the installation of a wave attenuator, mooring buoys and ATONs. There are plans for a fuel yard, potable water storage, an electrical yard, and a wastewater treatment plant. Restrooms, showers, pump-out, and access to car parking and other supporting facilities would be available for the clients that lease moorings in the proposed mooring field.

Construction of the fixed docks for the marina would occur primarily from barges, including the installation of piles and construction of deck and other dock elements. Mooring buoy and floating dock attenuator installation would be done with light floating equipment and with the assistance of divers to install the helix anchors. Bulkhead construction would be completed using land-based equipment. Pile installation will take approximately 60 days, bulkhead construction is expected to take 31 days, dredging and fill operations are expected to take 30 days. All in water work is expected to be complete in 12 months.

The total proposed marina footprint, including maneuvering areas, is 6.73-ac. The total footprint of overwater structures is 28,499-ft^2 (0.65-ac) as shown in Table 1. The marina will result in the construction of 33 new wet slips. The proposed mooring field in Muller Bay will encompass 39.1-ac and will accommodate a total of 68 new moorings. Additionally, an upland drystack facility will be constructed to provide storage for up to 88 vessels.

Turbidity barriers will be deployed prior to any in-water work, including demolition and removal of the remains of the existing marina and surrounding scattered debris. Water quality monitoring will be implemented throughout all in-water activities (Appendix 1). Piles and superstructure would be pulled and lifted from the water and placed on the shoreline or on a barge.

Table 1. Square Footage of Overwater Structures

Structure	Area (ft^2)
Dock A-1	3,990
Dock A-2	11,893
Dock B	1,468
Dock C	3,302
Floating Dinghy Dock DD-E (Total)	902
Gangway	120
Floating Dinghy Dock DD-W	560
ADA Gangway	264
Total Surface Area	**22,499**
Less Not Over Water	**80**
Total Dock Over Water	**22,419**
Wave Attenuator	**6,080**
Total Marina Over Water	**28,499**

Marine Debris Removal

To compensate for unavoidable impacts that may occur due to construction, debris within the mooring field will be collected and disposed at an appropriate upland landfill. Typical types of marine debris include cups, plates, bottles, clothing, towels, hats, bags, batteries, broken fiberglass, boards, fans, chairs, and boat parts. Small pieces of debris will be picked up by hand by divers, and larger debris will be collected using lift bags.

There are at least 2 large, sunken sailboats within the footprints of the marina and mooring field. The 2 vessels were surveyed by divers in May 2025, and no ESA-listed coral species were identified on the vessels. One of the vessels is located very close to shore, and a land-based crane will be utilized for removal. The second vessel, located in the mooring field, will be lifted from the seafloor by divers using lift bags, then lifted onto a vessel using a crane. Prior to floating or lifting to the surface, the vessels will be surveyed for fuel and other hazardous material to ensure no releases occur. If fuel is found, it will be removed either by removing the container, or tank from the vessel, or by “hot-tapping”, which uses a pumping system that allows a diver to drill into the fuel tank, attach a valve, and pump the fuel to the surface without releasing it in to the water column. Any fuel or hazardous material removal operation will be conducted by a professional salvage company.

Debris cleanup will be conducted prior to beginning construction, and is planned to continue on a quarterly basis throughout the 5-year permit construction window. An inventory and photo log of the debris collected will be compiled, and an annual report will be provided to DPNR, USACE, and NMFS. The debris clean-up area is shown in Figure 1 below.

Figure 1. Debris Clean-up and Existing Structure Removal Area Shown outlined with a White Box (Image Provided by USACE).

Marina

The proposed marina will be comprised of 4 fixed main piers. Dock A-1 is a concrete dock overhanging the proposed bulkhead. Dock A-2 is a T-shaped fixed-pile dock. Dock B is an L-shaped fixed-pile dock, and Dock C is a concrete fuel dock as seen in Figure 2. The proposed marina will provide permanent and transient berthing for a mix of vessels ranging from 30- to 335-ft in length.

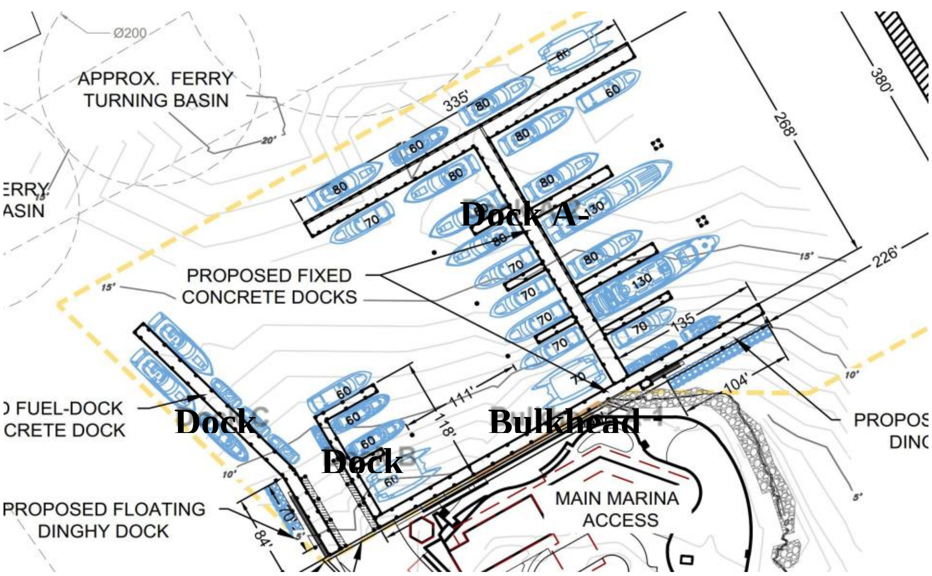
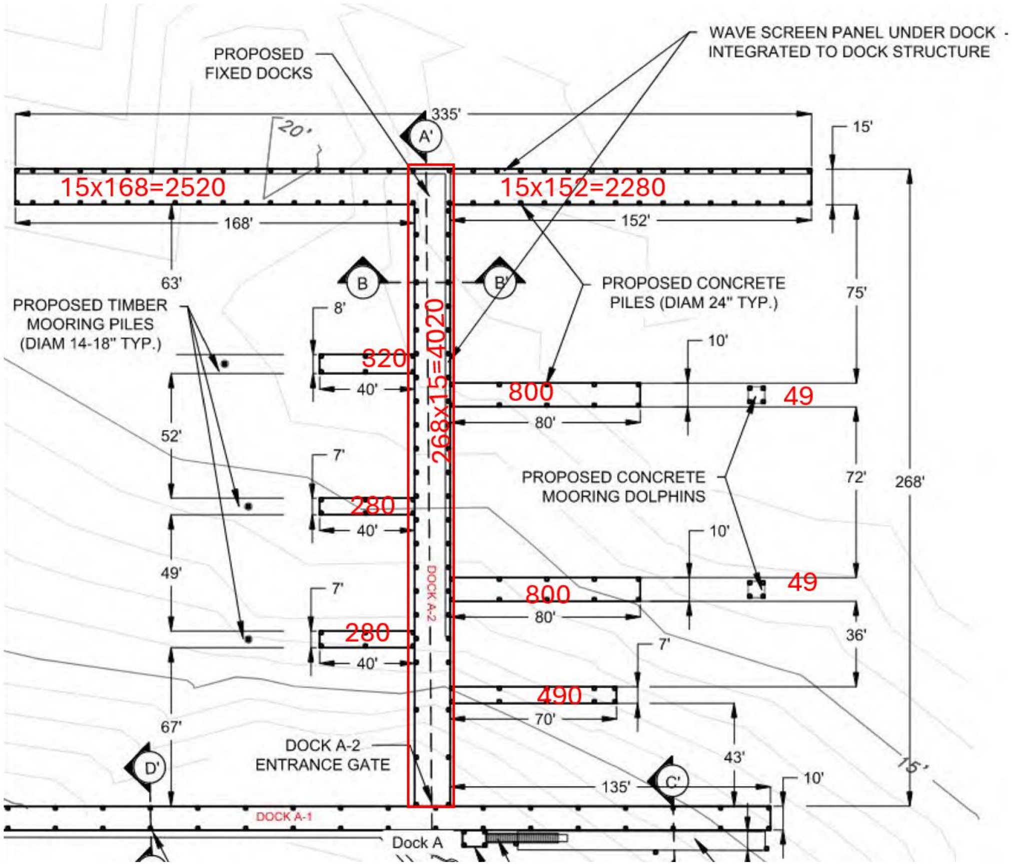


Figure 2. Project Drawing for Docks and Bulkhead (Image provided by USACE).



2520
2280
320
280
280
800
800
490
4020
49
49
1.5
1.5
1.5
11892.5

Figure 3. Dock dimensions for docks A, B, C and D.

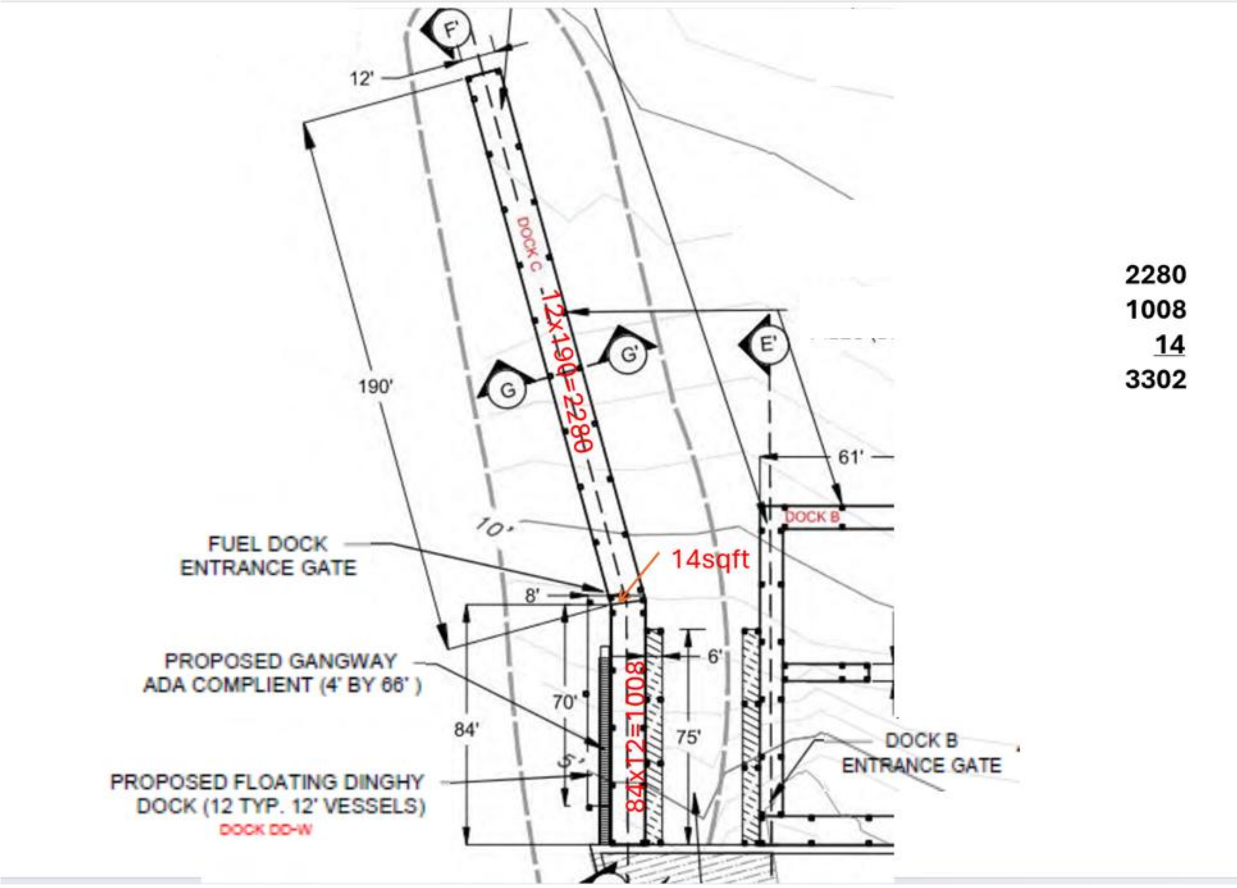


Figure 4. Dock dimensions for dock DD-E.

Dock A-1 is 3,990-ft^2, measuring 399-ft long by 10-ft wide. It is oriented parallel to the shoreline and will provide access to Dock A-2 and Dock B. The portion of Dock A-1 and bulkhead located east of Dock A-2 will provide 135 lin ft of alongside docking for up to 3 small vessels. The deck elevation is +5.0-ft MSL.

Dock A-2 is concrete fixed pile with an attached wave screen and a total overwater area of 11,893-ft^2. A-2 has a deck elevation of +5.0 ft MSL. Eleven dedicated slips for vessels ranging in length from 70-ft to 130-ft and alongside berthing for large yachts on both sides of the T-head are proposed. The perpendicular section of the concrete fixed dock is 268-ft long by 15-ft wide. The parallel T-head of the dock measures 335-ft long by 15-ft wide and would be able to accommodate large yachts. Dock A-2 will have 6 finger piers. The two 130-ft slip finger piers will be 80-ft long by 10-ft wide with a 7-ft by 7-ft mooring dolphin. One 70-ft slip will have a 7-ft-wide finger pier, and the other 3 finger piers are each 40-ft long by 7-ft wide. Dock utilities such as water, electricity, fuel, pump-out, and Wi-Fi are proposed.

Dock B is a concrete fixed pile dock with a total over-water surface area of 1,468-ft^2 with a deck elevation of +4.5-ft MSL. This dock will accommodate 4 slips for vessels up to 60-ft long. The perpendicular section of the concrete fixed dock is 100-ft long by 8-ft wide, and the L-head of the dock is 61-ft long by 8-ft wide. The partial finger pier is 30-ft long by 6-ft wide, plus a timber mooring pile.

Dock C is a concrete fixed pile dock totaling 3,302-ft^2 with a deck elevation of +4.5-ft MSL. This dock is for fueling and pump-out, as well as staging for the drop-well. The portion of the dock nearest to shore is 84-ft long by 12-ft wide, while the rest of the dock, angled 15° west from the shore (creating a 14-ft^2 section), is 190-ft long by 12-ft wide. Dock C will provide slips capable of accommodating up to 7 vessels.

Dock DD-E is a 902-ft^2 floating dinghy dock adjacent to Dock A-1. This dock will not provide permanent dockage for vessels Dock DD-E also has a 120-ft^2 gangway which is 4-ft by 30-ft and a 70-ft^2 access platform that is 7-ft by 10-ft, which overlaps dinghy dock DD-E.

Dock DD-W is a 560-ft^2 floating dinghy dock adjacent to Dock C. This dock does not have permanent dockage. It has a 264-ft^2 gangway that is ADA compliant and measures 4-ft by 66-ft.

In total, the surface area of the proposed docks is 22,499-ft^2 (see Figure 3 and Figure 4). The 2 gangways overlap by 80-ft^2; therefore, the total dock overwater area is 22,419-ft^2 (Table 1). The maximum number of vessels to be accommodated by the marina is 189 (33 wet slips, 88 dry slips, and moorings for 68 vessels). Table 2 shows the slip size and maximum numbers of vessels.

Table 2. Wet slips and vessels by dock component

Component	**Slip size (ft)**	**Max vessel length (ft)**	**Vessels per slip/mooring**	**No. of Slips/mooring**	**Max total vessels**
Dock A-1	135	60	1–3	1	3
Dock A-2	60–300	335	1–4	1	4
	60–80	168	2	1	2
	60–80	152	2	1	2
	80	80	1	2	2
	80–130	130	1	3	3
	70	70	1	6	6
Dock B	60	60	1	4	4
Dock C	Undefined	80	2–5	2	7
Dry slips				88	88
Moorings		60	1	68	68
Grand total				177	189

Piles

A total of 298 new 24-in diameter concrete piles, 156 new 24-in width iron rebar–reinforced concrete sheet piles, and 4 new 18-in diameter wood piles are proposed for installation in a confined space environment. Concrete piles and pile caps will be precast grouted together *in situ* with concrete after the piles are installed. The pile caps will be placed on the piles and wood framing will be placed around the edges prior to the concrete pour to ensure no spillage (Figure

5). The concrete will be poured using either a specialized bucket on a crane, or a pump truck located on a small platform.

Figure 5. Example of pouring concrete with a specialized bucket.

The dock structures, drop-well access lift, and mooring dolphins will require 274, 16, and 8 new 24-in diameter concrete piles, respectively. In addition, 4 new 18-in diameter wooden mooring piles will be installed. Table 3 provides the number of piles associated with each structure. Table 4 provides details regarding pile installation.

Table 3. Number of Piles Associated with Each Structure

Structure	**No. of piles**
Dock A-1	42
A-1 Bulkhead	156
Dock A-2	162
Dock B	27
Dock C	33
Dock DD-E	3
Dock DD-W	3
Platform access	4
Travel lift	16
Mooring dolphins	8
Mooring piles-slip	4
Total	**458**

Table 4. Pile Installation

Pile Type and Material	**Concrete, round**	**Concrete, sheetpile**	**Round, wood**
Pile Diameter or Sheet Pile width (in)	24	24	18
Number of Piles or Sheet Piles Total	298	156	4
Installation Method	Vibratory with Impact hammer seating	Vibratory with Impact hammer seating	Impact hammer
Number of Strikes per Pile/Sheet Pile	4 minutes vibration, 240 strikes	4 minutes vibration, 240 strikes	240 strikes, max
Number of Piles/Sheet Piles Installed per Day (if using impact or vibratory hammer)	5	5	Up to 4
Duration of pile driving activity (days)	60	32	1
Substrate and water depth in pile installation area	Sand/unconsolidated substrate	Unconsolidated hardbottom	Sand/unconsolidated substrate
Confined Space or Open Water?	Confined space	Confined space	Confined space
Noise abatement used	None	None	None

Bulkhead for Shoreline Stabilization

The proposed project includes the construction of a new 311.5-ft-long bulkhead, with 281.5-ft located along the waterfront and 30-ft serving as an inland return (Figure 6). The new bulkhead would replace 140-ft of damaged seawall and 232-ft of disturbed shoreline comprised of irregular masonry walls and a damaged pier structure. The new bulkhead will be installed within 24-in of the waterward face of the existing damaged shoreline structures. This is the maximum distance required to rectify the alignment of the irregular masonry wall and other disturbed shoreline segments while maintaining structural stability.

The seabed in the area adjacent to the new bulkhead will be excavated to achieve an elevation of -6.5-ft MSL to provide safe draft for the intended operation. Approximately 630-yd^3 of clean fill will be used. The bulkhead will require the installation of 156 concrete sheet piles (Table 3). Sheet pile will be vibratory installed, then seated with an impact hammer.

The proposed bulkhead construction will result in approximately 623-ft^2 of benthic impacts and will require the relocation of 12 colonies of 2 species of non-ESA-listed corals: common brain coral and starlet coral (*Pseudodiploria strigosa* and *Siderastrea siderea*). Only healthy corals will be relocated to the recipient site in Muller Bay. Corals showing any sign of disease will not be relocated to the recipient site or to any coral critical habitat.

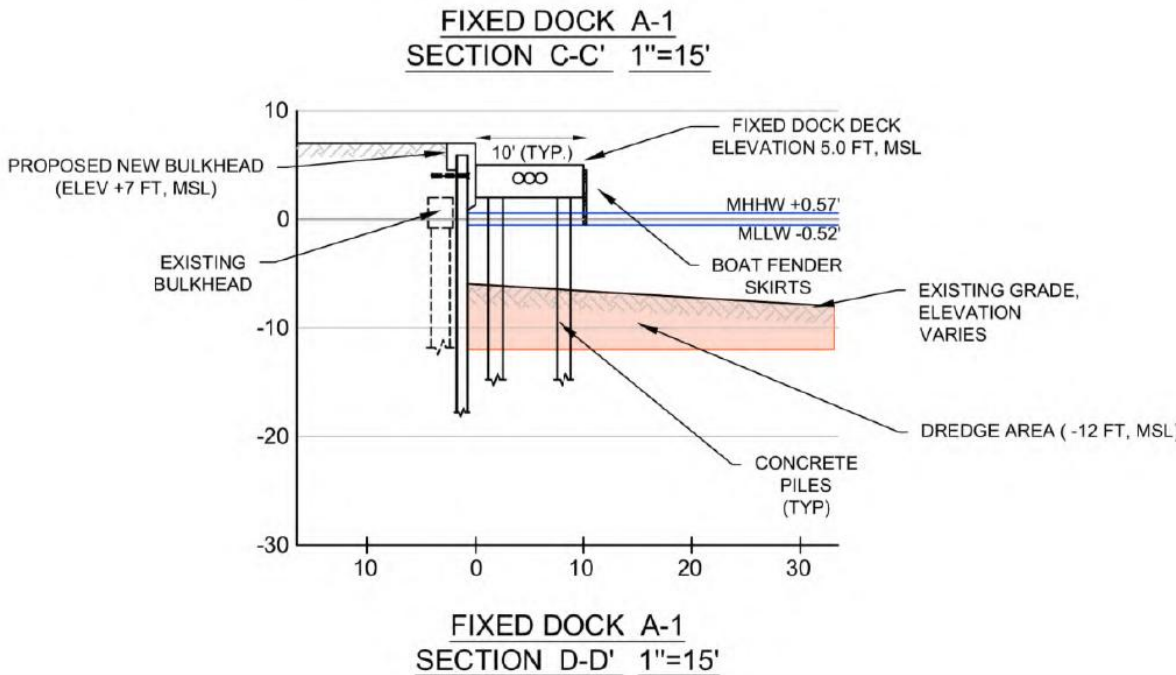


Figure 6. Project plans for Bulkhead installation. Image provided by USACE.

Floating Wave Attenuator

A 380-ft long by 16-ft wide (6,080 ft^2) floating wave attenuator oriented in a north-south direction is proposed to protect the marina slips facing Muller Bay, and to reduce the need for wave screens. The typical draft of the floating attenuator is 4.3 ft, and will be installed at a water depth between 18 and 28 ft. The wave attenuator will use an elastic anchorage system and connections to allow for emergency disconnect from the deck. In the event of a tropical storm or hurricane, marina operators would remove the floating wave attenuator. The floating units would be separated and detached from their anchor lines and replaced with a buoy on the line to prevent tangling or sinking. The sections will then get towed to the drop well area and forklifted for storage on land. Thirty-eight (38) helical anchors will be manually installed by divers to hold the wave attenuator in place.

Dredging

Adjacent to the proposed new bulkhead, 7,600-yd^3 of material will be dredged from an area of approximately 5.03 ac (219,106.8 ft^2) to a depth of 12-ft using mechanical clamshell dredge to provide safe draft for vessels (Figure 7). A maximum of 630-yd^3 of clean dredge spoils will be placed seaward of the MHW line to fill a small boat basin along the existing deteriorated bulkhead. The dredge footprint includes unconsolidated sediment, which is primarily a mix of open sand, macroalgae, and *Halophila stipulacea*. The sediment was tested against residential contaminant levels and was found not to contain hydrocarbons or elevated levels of heavy metals. Dredging is proposed to take place between October 17th and May 31st, outside of coral and queen conch spawning season (June 1-October 16th). .

Dredged material will be dewatered on shore in areas adjacent to the dredge area. A dewatering area will be created using dredged material to form dikes with a 1V:2H slope. Silt fencing and haybales and a sandbag barrier will be used as upland erosion control measures.

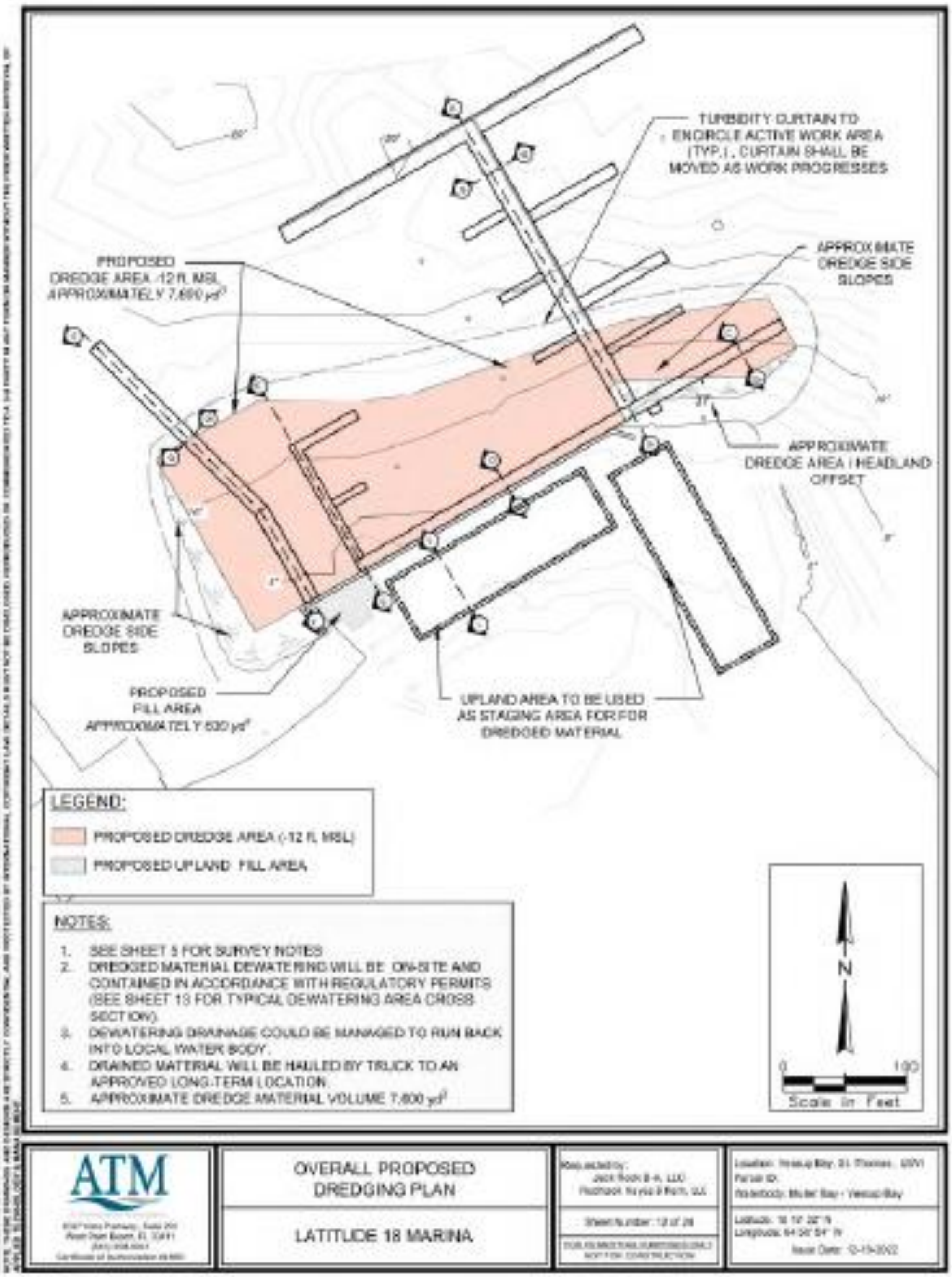


Figure 7. Proposed area for dredge and fill activities (Image provided by USACE).

All dredging will occur during daylight hours only, and be conducted using land-based or barge-mounted equipment. All construction personnel will be responsible for observing water-related activities to detect the presence of protected species and to avoid them. Double turbidity curtains will be deployed, as required, during in-water work to minimize potential temporary impacts on local water quality. A water quality monitoring and sediment testing plan will be followed as per the Water Quality Monitoring and Sea Turtle Protection Plan provided by the applicant (Appendix 1). Construction- and operation-related turbidity is limited to 3 NTUs outside of turbidity curtains. Should turbidity levels outside of the turbidity curtains exceed 3 NTUs, all in water work will cease and corrective action will be implemented. Prior to the removal of turbidity barriers, a dragline will be used to level material and any spud holes created by the barge.

Mooring Field

In order to provide safe moorage for vessels, a total of 68 new moorings will be installed in the Muller Bay Mooring Field (Figure 8), an area totaling 39.1 ac with water depths ranging from 10 to 40 ft, inclusive of vessel swing areas. Embedded helix-type anchors to secure the moorings will be hand-installed by divers up to a depth of 5 ft into the substrate. An underwater buoy will be attached to prevent contact of the anchor line with the seafloor, along with a pendant line and float, and a 24-in mooring buoy. All mooring buoys will be connected to the buoy bollard with elastic rods. This standard mooring buoy design helps to avoid seabed impacts. The proposed installation of 68 helical anchors will result in impacts to approximately 34-ft^2 of SAV. Manta deterrents will be affixed to the mooring downlines. Thirty-five mooring buoys will accommodate vessels up to 45-ft with a swing radius of 70-ft. Thirty-three buoys will accommodate vessels up to 65-ft with a swing radius of 90-ft. The swing radius will allow for vessel drift and minimize shading impacts to SAV and coral or hardbottom. There will be at least a 2-ft clearance from the seafloor to the keel of the vessel at the shallow mooring sites.

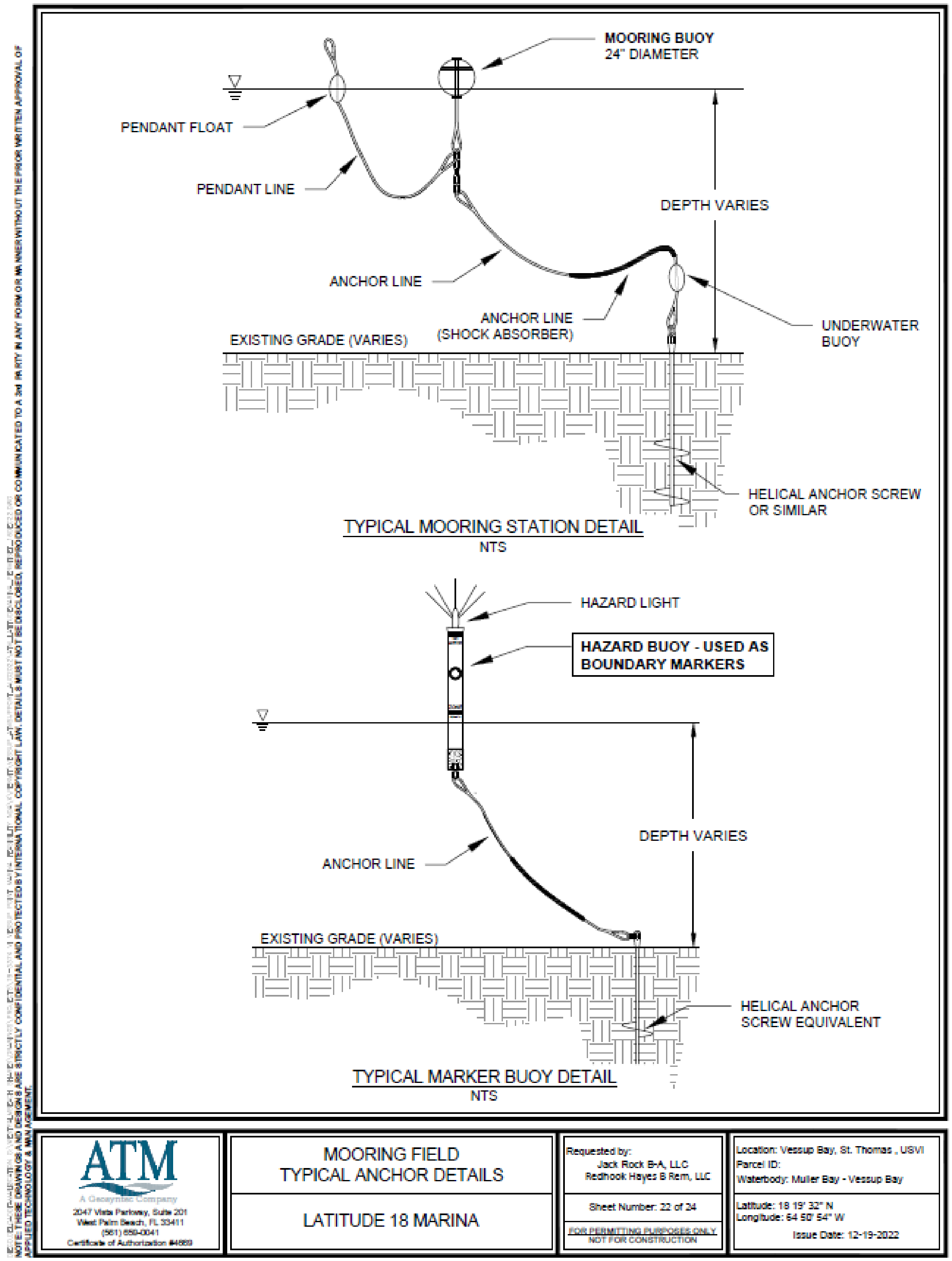


Figure 8. Typical Mooring and ATON Anchor Details. Image Provided by USACE.

Six new ATONS will demark the mooring field to help avoid encroachment into existing navigation channels and to maintain a 300-ft offset to beach swimming zones. Helix anchors will be placed by divers, and each mooring will temporarily impact a 6-in radius of primarily open sand, algae, or SAV (primarily *H. stipulacea*). The markers will be connected with elastic rods, and floating lines will ensure no lines drag on the seafloor or on nearby resources. Approximately 3-ft^2 of mixed aquatic vegetation will be temporarily impacted.

Work in uplands is proposed; however, the effects of land-based activities do not extend into the water or otherwise effect listed species under NMFS jurisdiction, Therefore, this aspect of the proposed action will not be considered further.

2.1.2 Mitigation Measures

To minimize potential impacts to ESA-listed species, the USACE will add the following conditions to the permit to be implemented by the applicant during construction.

- All work will be conducted during daylight hours only.
- Dredging will not take place during coral and queen conch spawning seasons (June 1 – October 16).
- The NMFS SERO *Protected Species Construction Conditions* will be implemented during construction, including the following:
  - An ESA-species pre-construction meeting will be held for all workers. Project construction and operations employees will be instructed not to approach, feed or water protected species. Employees will be provided materials, such as NMFS *Protected Marine Species Identification Guide*, to assist in identifying the species.
  - A 1,640-ft (500-m) safety zone will be established around the outer limits of the project area for all pile driving activities. Trained observers will be used to visually monitor for ESA-listed species in the safety zone for at least 30 minutes prior to pile driving. Protected species observers need to be able to confidently identify giant manta ray, scalloped hammerhead sharks, oceanic white tip sharks, Nassau grouper, and queen conch.
  - Buoys will be set at the edge of the safety zone as a reference for the observer. The observers will utilize binoculars from an optimal location in order to see the entire safety zone area. The area must be clear of any ESA-listed species 30 minutes prior to the start of all pile driving activities.
  - If an ESA-listed species is observed in the safety zone, the operation will be shut down until the animal has left of its own volition.
  - Observers for protected species will maintain watch for animals in the area during pile driving activities.
  - Any observed injuries to ESA-listed species will get reported to NOAA, USACE, and DPNR. A response effort will be coordinated with a local DPNR representative.
  - Records will be maintained of all ESA-listed species sightings in the area, including date and time, weather conditions, species identification, approximate distance from the project area, direction and heading in relation to the project area, and behavioral observations.

    - When animals are observed in the safety zone, reports will include shutdown time of pile driving, duration of the shut-down, behavior of the animal, and time spent in the safety zone. Reports will be provided to NOAA, USACE, DPNR/CZM monthly.
- *Vessel Strike Avoidance Measures* will be implemented during construction.
- All supporting equipment (barges and tow boats) will be shallow draft and will maintain a minimum of 1-ft of clearance above the existing bottom. Barges will be secured by spudding or mooring only.
- Turbidity Barriers:
    - Prior to the initiation of any work authorized by the USACE, the applicant will install floating turbidity barriers with weighted skirts that extend within 1-ft of the bottom around all work areas that are in, or adjacent to, surface waters.
    - Turbidity barriers shall remain in place and be maintained daily until the authorized work has been completed and turbidity within the construction area has returned to ambient levels. Turbidity barriers shall be removed upon stabilization of the work area.
    - These barriers will be anchored to the seafloor with screw anchors. These barriers must be installed during all work on the marina, associated with the bulkhead, or during the dredging of sediment adjacent to the bulkhead.
    - A double set of turbidity barriers may be installed if necessary to control turbidity, with a minimum of 2-m between them. The curtains would be attached to the bulkhead and held offshore by screw anchors. Divers would assist in the placement of all anchors to minimize impact.
    - The turbidity barriers would be monitored daily, and if at any time deficiencies or damage are noted it will be repaired immediately. Additionally, environmental monitors will observe the area daily to ensure animals are not entangled or entrapped.
- Pile Installation:
    - Turbidity barriers will be placed around areas designated for pile driving. All turbidity barriers will be removed promptly once construction is completed and turbidity levels return to baseline.
    - No more than 9 piles per day will be installed (i.e., no more than 5 concrete piles and 4 timber piles will be installed concurrently).
    - No more than 5 concrete sheet piles per day will be installed.
- Environmental Monitors will:
    - Ensure water quality conservation measures are implemented and standards are maintained,
    - Watch for and stop work if a listed species is located in the project area,
    - Regularly check the turbidity barriers for entangled or entrapped animals during project construction.
- Fill Material:
    - The applicant will only use clean fill material.
    - Fill material will be free of trash, debris, automotive parts, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic pollutants designated pursuant to Section 307(a)(1) of the Clean Water Act.
- Water Monitoring:
    - The applicant will incorporate a 5-year operational water quality and sediment monitoring plan provided in Appendix 1:
        - Experienced turbidity monitors will be utilized.

    - Monitors will sample water column conditions prior to, during, and post dredge disposal activities at the dredge site and at the edges of coral critical habitat. Samples will be taken at a 1-m depth and close to the benthos with a calibrated field nephelometer as NTU. Secchi disc readings will also be made as a measurement of water clarity.
    - In the event that turbidity exceeds the 3 NTUs, all dredging or disposal activity would cease immediately, the source of the excess turbidity would be identified, and corrective actions would be taken.
    - During-construction sampling will occur a minimum of twice a day with samples spaced at least 4 hours apart. The monitor will also sample anytime a plume is noted escaping the turbidity barriers. During-construction sampling will occur anytime in-water work is being undertaken, during all pile driving, all framing, dredging, all de-watering, all filling, and all concrete pours.
    - Weather and sea conditions will be recorded for each sampling time.
    - Dredging and disposal will not resume until turbidity has returned to acceptable levels as determined by turbidity monitoring protocols.
- During marine debris removal activities, care will be taken to ensure that any fish or invertebrates in the debris are not accidentally removed from the water.
- Queen Conch:
    - The applicant will implement survey protocols, construction conditions, and relocation protocols as described in Appendix 2.
    - A pre-construction survey of the project footprint (i.e. dredge, bulkhead, and pile installation footprint) and 12-m buffer area (area outside of the construction area and in-water activities) was received on October 8, 2025 (dated September 2025) and is valid for 3 years (see Appendix 2 for pre-construction survey protocol).
    - Divers conducting marine debris removal operations will visually survey for the presence of queen conch in accordance with Appendix 2.
    - The applicant will obtain a permit from USVI DPNR for the relocation of queen conch in the dredge, bulkhead, and pile installation footprints.
    - The applicant will relocate all queen conch individuals within the construction footprint prior to the placement of the turbidity curtains and within one week of the start of construction.
    - The applicant will use NMFS SERO's Queen Conch Reporting Form to report survey and relocation results.
- Signs will be placed at the marina to minimize the potential damage from groundings and prop wash. These signs will demarcate the location of the critical habitat, which is located 25-ft away from the nearest dock structure (Figure 9). Signs will be coordinated with the USVI Division of Coastal Zone Management (CZM) and NMFS before posting.

Figure 9. Example of sign to be placed at the marina demarking coral critical habitat. Sign developed by BioImpact.

- The applicant shall report any injury to any ESA-listed species occurring during the construction phase of the project immediately to both:
  - NMFS SERO PRD via the NMFS SERO Endangered Species Take Report Form. The applicant will include the SERO ECO tracking number in all correspondence, and
  - The local stranding and rescue organization at: (340) 690-0474.

2.1.3 Best Practices

To minimize potential impacts to ESA-listed species, the applicant has agreed to implement the following post-construction conditions:

- Upon completion of the marina, NMFS-approved educational signs will be posted in visible locations throughout the marina dock area, alerting boaters of listed species in the area. The applicant will post at the marina the following signs, which are available for download at the following website: https://www.fisheries.noaa.gov/southeast/consultations/protected-species-educational-signs.
  - *"Save Dolphins, Sea Turtles, and Manta Ray";*
  - *"No Fishing at the Marina"*
- Upon completion of the marina, copies of NMFS *Protected Marine Species Identification Guide* will be displayed and made available in a visible and accessible location within the Harbor Master's office.
- The applicant voluntarily agreed to affix giant manta ray deterrents to all mooring downlines.
- To minimize potential impacts to ESA-listed species, the USACE will add the following conditions to be followed by the applicant post-construction:

    - A marina management plan is in place, which requires regular maintenance at the facility, including waste removal.
    - Moorings will get inspected on an annual basis and after major storm events and repaired as necessary.
- Annual reports including ESA-listed species encounters, marine debris reports, water and sediment testing data will be sent to NOAA (nmfs.ser.esa.consultations@noaa.gov) with the referenced SERO number (SERO-2024-00367).
- The applicant will conduct quarterly marine debris removal efforts in the mooring field and surrounding areas following Project Design Criteria specific to Marine Debris Removal:
    - If an item cannot be removed without causing harm to surrounding coral (ESA-listed or non-listed), the item will be disassembled as much as practicable so that it no longer can accidentally harm or trap species.
    - Monofilament debris will be carefully cut loose from coral (ESA-listed or non-listed) so as not to cause further harm. Under no circumstance will line be pulled through coral since this could cause breakage of coral.
    - Marine debris shall be lifted straight up and not be dragged through seagrass beds, coral reefs, coral, or hard bottom habitats. Trawling also cannot be used as a means of marine debris removal. Debris shall be properly disposed of in appropriate facilities in accordance with applicable federal and state requirements.
    - An absorbent blanket or boom shall be immediately deployed on the surface of the water around any derelict vessel to be removed if fuel, oil, or other free-floating pollutants are observed during the work.
- The harbormaster office will promote safe boating practices and information on where to report marine mammal strikes and stranding's will be made available to vessel operators.
    - U.S. Virgin Islands Marine Mammal Stranding Hotline - Virgin Islands Division of Fish and Wildlife (Frederiksted, VI)
        - (340) 690-0474 (note: this is for Sea Turtle Assistance and Rescue (STAR) Stranding Hotline that forwards on reports)
        - Puerto Rico Marine Mammal Stranding Hotline (787) 538-4684 or (787) 645-5595
        - Images and videos are helpful when submitting a stranding report.

2.2 Action Area

The action area is defined by regulation as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area includes silt, sand, SAV, microalgae, macroalgea, consolidated hardbottom, non-ESA-listed coral species, mangrove shoreline, damaged armoring shoreline, and the surrounding coastal waters of Vessup Bay, Red Hook Bay, Muller Bay, and the South Atlantic Ocean; and, extends to the radius of anticipated effects.

The action area for marina construction is equivalent to the largest radius of effects on ESA-listed species based on the proposed installation of 24-in-diameter concrete piles by impact hammer, which is 706.8-ft from the proposed action, and the surrounding water accessible to vessels upon the completion of the proposed action (**Figure 10**). Additionally, the project will use vibratory installation; however, the estimated behavior radius for ESA-listed marine mammals is outside their range. The operational action area consists of water accessible to vessels upon completion of the marina. The action area is within the boundary of proposed critical habitat for green sea turtle (South Atlantic DPS) and of critical habitat for the following species: elkhorn, staghorn, boulder star, lobed star, mountainous star, pillar, and rough cactus corals.

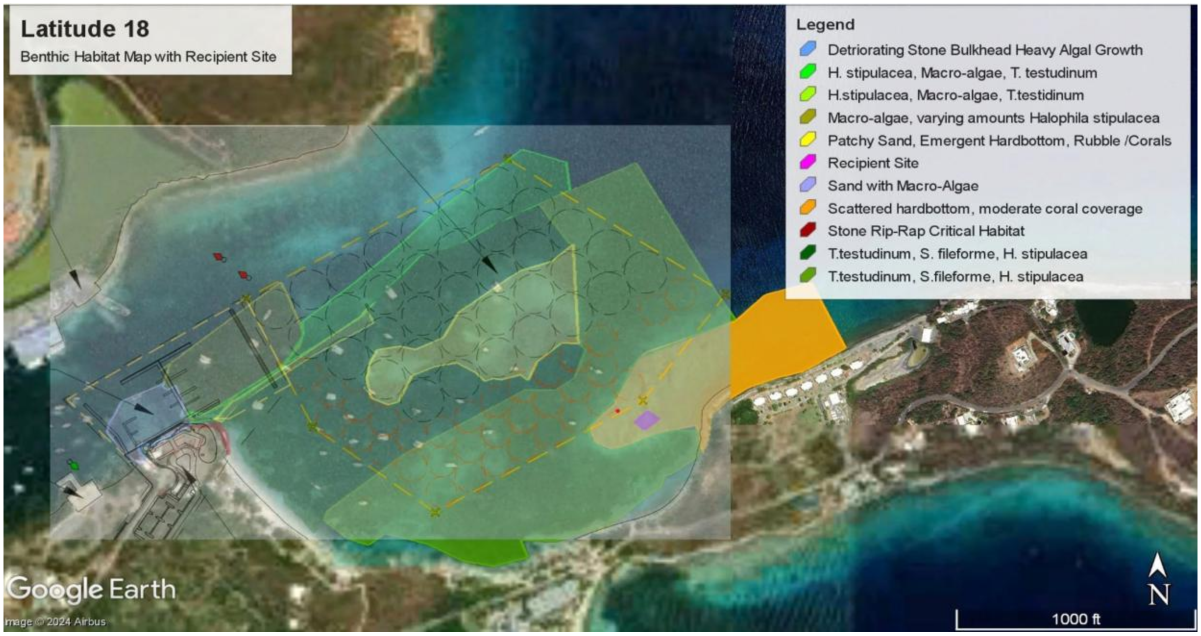


Figure 10. Benthic habitat map within the ESA Action Area. The nearest ESA-listed coral to the mooring field is depicted as a red point. Image Provided by USACE.

The project site is located at latitude 18.325050° and longitude -64.848260° (NAD 83) in Red Hook Quarter, St. Thomas, USVI. The project site is located within the existing footprint of a hurricane-damaged marina in Vessup Bay and Muller Bay, approximately 0.50 nm from the South Atlantic Ocean. The depth of water within the construction area ranges between -10-ft MLW and -40-ft MLW. The site contains a peninsula that forms the southern entrance to Red Hook Bay. That peninsula is a rocky abutment that extends to the National Park Service property on the east side and the Vessup Beach area to the south.

The previously-existing Latitude 18 Marina was built originally in the early 1980s. This marina experienced significant damages due to multiple hurricanes over the past 30 years, most notably Hurricane Marilyn in 1995, and Hurricanes Irma and María in 2017. The original marina was never fully restored after Hurricane Marilyn, and finally closed from damages after the 2017 hurricanes. The entire development area for the proposed marina is zoned W-1-Waterfront Pleasure. The 2 primary upland structures are the restaurant and marina services building, and the warehouse buildings with the dry stack storage structure for a total of 88 vessels at capacity, vessel workstations, and a workshop (10,000-ft^2 total).

Benthic Resources in the Project Area
The EARin the USVI DPNR, Marine Resources and Habitat Assessment (Section 6.06 2021 Environmental Assessment Report~~1~~) characterizes habitats in the project area, including sandy bottom, mangrove shoreline, hardbottom, microalgae, and seagrass communities.

A benthic survey conducted in September 2025 showed an area of rip-rap and natural bedrock within the footprints of the marina and bulkhead. Consolidated hardbottom heavily colonized with macroalgae was found around the corner of Jack Rock Point, east of the bulkhead and along the riprap. A queen conch survey conducted in September 2025, found 11 adults, and 102 juvenile queen conch in the survey area.

In Vessup Bay, various species of macroalgae dominate areas shallower than 1-ft. At depths greater than 1-ft, the non-native seagrass *Halophila stipulacea* covers large areas. *Thalassia testudinum* is present near the fringing mangroves and the south project area. Vessup Bay is listed as Impaired Waters under CWA Section 303(d). Water exchange is very weak and highly dependent on wind conditions to force circulation and improve mixing, as tidal flows are extremely low. In addition to poor circulation, Vessup Bay receives pollutant discharges, including a public WWTP and has no enforceable management of discharges by many of the boats anchored in the bay.

In Muller Bay, seagrass beds are present and composed of *T. testudinum* intermixed with *Syringodium filiforme* and *Halodule wrightii* with varying composition and density with depth and disturbance. Within these beds, blowout areas are present and colonized by macroalgae. Coverage of seagrass in the inner bay ranges from 30% to 40%. Water circulation improves in Mueller Bay due to increased mixing and better circulation given the larger water body and positive influence of wind-driven mixing. The location on Vessup Point is in the transition between the poorly flushed Vessup Bay and the better-mixed waters of Muller Bay. The change in water quality is visible in the data collected overtime across the site. Turbidities are higher farther into Vessup Bay.

Within the marina footprint, algae, palythoas, sponges, and non-ESA-listed coral species (including *Siderastrea siderea, Pseudodiploria strigosa, S. radians,* and *Dichocoenia stokes*) colonize the bulkhead. Piles and other debris in the marina were surveyed previously, and only encrusting sponges and algae were documented as present. There is sparse colonization by non-ESA-listed coral species (*Siderastrea* spp. and *Psuedodiploria spp.)* in the proposed marina area. The largest of these corals are 10-in diameter with most being 4-in to 6-in. Hardbottom comprises less than 1% of the substrate within the project area. Along the eastern project boundary, a mixture of coral-colonized rubble and exposed broken pavement (a type of hardbottom) is present in the seagrass beds. ESA-listed corals (mountain star coral and lobed star coral) and non-ESA-listed corals (e.g. mustard hill coral: *Porites astreoides*) are present in the action area.

Since 2008, no ESA-listed coral species have been found on the shoreline revetment within the project footprint. The north-facing deteriorated masonry bulkhead in Vessup Bay has significant algal colonization on the manmade structure. Southeast of the marina, the riprap revetment extends around the point into Muller Bay, which has better water quality and coral critical habitat. No construction is proposed for this area.

There is a DPNR-designated mooring area located where the managed mooring field is proposed. Currently, standards are not enforced regarding mooring structures, and there are no pump-out facilities. There are many vessels that do not have DPNR mooring permits, and none of the moorings has USACE authorization. The seagrass beds in the current mooring field are badly damaged by anchoring, dragging lines, and debris.

There are emergent hardbottom areas to the east in Muller Bay, and there is sparse coral colonization on the emergent rock. Corals become abundant moving to the east of the proposed mooring field. Each mooring location proposed has been surveyed and positioned to avoid impacts to hardbottom habitat and corals. Two mooring buoy locations originally planned were removed in order to avoid potential impacts on corals. Helix anchors will be placed in sand pockets at a minimum depth of 12-ft. **Figure 10** (above) shows the benthic habitat types within the marina and mooring field.

There are 2 ESA-listed coral species, mountainous star coral and lobed star coral, located within and adjacent to the proposed mooring field. The closest ESA-listed coral species found within the mooring field, mountainous star coral, is located 25-ft away from a proposed mooring ball. The other ESA-listed coral species, lobed star, is located approximately 1,400-ft east of the proposed marina related activities. There are other ESA-listed corals located farther to the east, outside of the proposed action area. The recipient site for relocated non-ESA-listed coral species is located more than 1,600-ft east of the proposed dredge footprint and marina related activities.

A queen conch pre-construction survey was conducted in September, 2025, and followed the protocols outlined in Appendix 2. Surveys were conducted using belt transects and extended 12-m beyond the project footprint (i.e. dock construction area, dredging area, and mooring field). No queen conch were found within the dredge area or within the 12-m buffer around the dredge area. One adult queen conch was found within the dock footprint, and 1 adult queen conch was found in the outer edge of the dock 12-m buffer area (within the navigation channel). Nine adult queen conch were found in the mooring field and 102 juveniles were found within the 12-m buffer area of the mooring field. Figure 11 shows the survey area and location were the individuals were found.

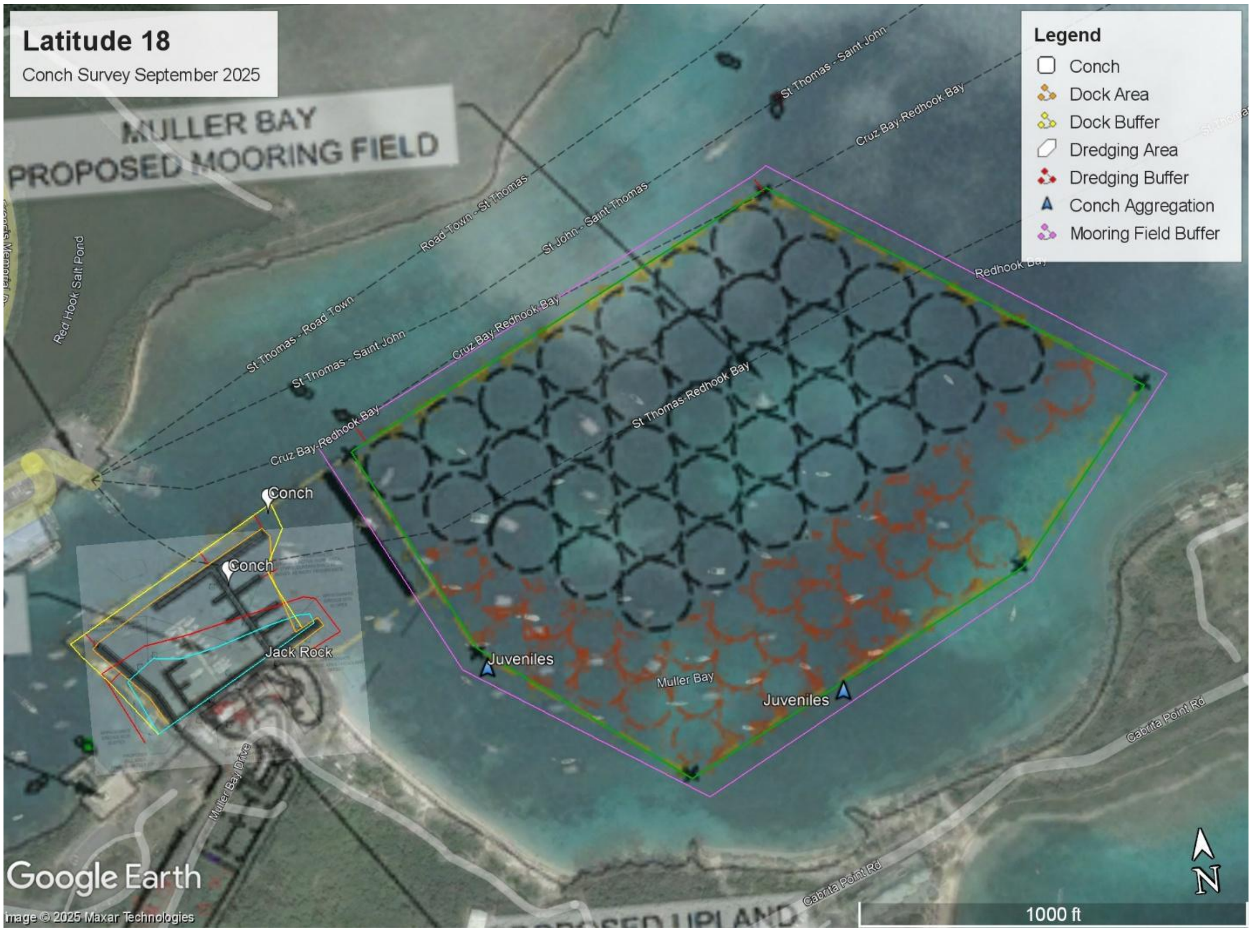


Figure 11. Queen conch survey map. Image provided by the applicant.

3 EFFECTS DETERMINATIONS

Please note the following abbreviations are only used in

Table 5 and are not, therefore, included in the list of acronyms: E = endangered; T = threatened; P = Proposed; LAA = likely to adversely affect; NLAA = may affect, not likely to adversely affect; NE = no effect.

3.2 Effects Determinations for ESA-Listed Species

3.2.1 Agency Effects Determinations

We have assessed the ESA-listed species that may be present in the action area and our determination of the project's potential effects is shown in

Table 5 below.

Table 5. ESA-listed Species in the Action Area and Effect Determinations

Species (DPS)	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan (or Outline) Date	USACE Effect Determination	NMFS Effect Determination
Sea Turtles					
Green sea turtle (North Atlantic DPS)	T	81 FR 20057/ April 6, 2016	October 1991	NLAA	NLAA
Green sea turtle (South Atlantic DPS)	T	81 FR 20057/ April 6, 2016	October 1991	NLAA	NLAA
Hawksbill sea turtle	E	35 FR 8491/ June 2, 1970	December 1993	NLAA	NLAA
Leatherback sea turtle	E	35 FR 8491/ June 2, 1970	April 1992	NLAA	NLAA
Loggerhead sea turtle (Northwest Atlantic DPS)	T	76 FR 58868/ September 22, 2011	December 2008	NLAA	NLAA
Fishes					
Giant manta ray	T	83 FR 2916/ January 22, 2018	2019 (Outline)	NLAA	NLAA
Nassau grouper	T	81 FR 42268/ June 29, 2016	2018 (Outline)	NLAA	NLAA
Oceanic whitetip shark	T	83 FR 4153/ January 30, 2018	2018 (Outline)	NLAA	NLAA
Scalloped hammerhead shark (Central and Southwest Atlantic DPS)	T	79 FR 38213/ July 3, 2014	N/A	NLAA	NLAA
Invertebrates and mollusks					
Queen conch	T	89 FR 11208; February 14, 2024	N/A	NLAA	LAA
Lobed star coral (*Orbicella annularis*)	T	79 FR 53852/ September 10, 2014	N/A	NE	NLAA
Mountainous star coral	T	79 FR 53852/	N/A	NLAA	NLAA

Species (DPS)	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan (or Outline) Date	USACE Effect Determination	NMFS Effect Determination
(*Orbicella faveolata*)		September 10, 2014			
Marine Mammals					
Sperm whale	E	35 FR 12222/ December 2, 1970	December 2010	NE	NLAA

3.2.2 Effects Analysis for ESA-Listed Species Not Likely to be Adversely Affected by the Proposed Action

We believe the proposed activity is not likely to adversely affect ESA-listed sea turtles, giant manta ray, Nassau grouper, oceanic whitetip shark, scalloped hammerhead shark, ESA-listed star corals and sperm whale. The following analyses include rationale to support NMFS's determinations that these effects are either insignificant or extremely unlikely to occur.

Physical Effects

ESA-listed species may be physically injured if struck by construction equipment, dredge equipment, vessels, or material. We believe this effect would be extremely unlikely to occur due to the ability of fish, sea turtles, and shark species to move away from the project site if disturbed. All supporting equipment will be shallow draft and will maintain a minimum of 1-ft of clearance above the existing bottom. Mobile species can avoid this type of slow-moving equipment and placement of material. In addition, the implementation of NMFS SERO's *Protected Species Construction Conditions* (May 2021) requires all construction workers to observe water-related activities for the presence of these species. Additionally, protected species observers will be continuously scanning the water from optimal viewpoints for the presence of ESA-listed species during construction hours. If a protected species is seen within 100-yds of the active daily construction operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. Operation of any mechanical construction equipment shall cease immediately if a protected species is seen within a 150-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition. Further, construction would be limited to daylight hours so construction workers would be more able to see protected species, if present, and avoid interactions with them.

ESA listed mountainous star coral may also be injured due to the use of the proposed mooring field. However, we believe effects to ESA-listed corals from injury to be extremely unlikely to occur. Moorings will be installed at a minimum distance of 25-ft away from any listed coral. Additionally, moorings will be inspected and repaired annually (at a minimum) to ensure all components are working appropriately, and that no part of the mooring has broken away or caused abrasions on the coral.

Vessel Strikes

The proposed action includes the reconstruction of a previously-existing, storm-damaged marina and the redevelopment of an existing vessel mooring field. The proposed project would increase the capacity of motorized vessels in the area by up to 189 additional vessels in the area and surrounding waters. Vessel sizes accommodated by the replacement marina and mooring field range from less than 30-ft to more than 300-ft.

Vessel traffic, both recreational and commercial, has been documented to adversely affect protected species such as sea turtles and giant manta ray. Sea turtles may spend a considerable amount of time on or near the surface of the water, which introduces the potential risk of collision from vessel traffic. The risk of vessel strike for ESA-listed sea turtles is spatially and temporally variable and is influenced by vessel type, vessel speed, vessel density, and environmental conditions such as sea state and visibility (Barnette 2018). For giant manta ray, vessel strikes are evident in every monitored manta ray population across the globe (Stewart et al. 2018a). Spending considerable time at the surface (e.g., while feeding and basking; Braun et al. 2014; Braun et al. 2015) manta rays are especially susceptible to vessel strikes (McGregor et al. 2019; Stevens and Froman 2019; Armstrong et al. 2020; Augliere 2020). Several studies have indicated that vessel strikes are significantly underestimated for manta rays. Documenting vessel strikes on manta rays is challenging because injuries are frequently misidentified and attributed to predation, fishing line, and entanglement injuries (McGregor et al. 2019). Vessel strikes are also underestimated due to the species ability to heal rapidly as the injury may not be recognizable in a quick underwater encounter (Marshall and Bennett 2010; McGregor et al., 2019; Pate and Marshall 2020). This misidentification of injuries and rapid wound healing indicates that vessel strikes are underestimated for manta ray populations (McGregor et al. 2019). It is also possible that manta rays are experiencing blunt force trauma from a vessel strike, yet are not exhibiting any obvious external injuries (Pate and Marshall 2020). In addition, any mortality caused by vessel strikes would likely be cryptic as manta rays are negatively buoyant and will sink after they die making documenting mortalities unlikely. While wound recovery is beneficial it likely requires significant energy cost and metabolic processes, which may shift energy allocation from reproductive effort, growth, and ability to feed, thereby reducing individual fitness (Archie 2013; Chin et al. 2015; Harvey-Carroll et al. 2021; Womersley et al. 2021).

The risk of vessel strike for giant manta rays is temporally and spatially variable (i.e., vessel strikes are more likely to occur where vessel density and manta ray density is high). In addition, when comparing the likelihood of vessel strikes on juveniles versus adults, the observed habitat use of juveniles may make them more prone to this threat. For example, in southeast Florida between Jupiter Inlet and Boynton Beach Inlet (i.e., Palm Beach County) vessel strikes were one of the most common sources of injuries to juvenile giant manta rays that frequent the shallow coastal waters there, where human activity and vessel traffic is heavily concentrated (Pate and Marshall 2020). Similarly, vessel strikes of elasmobranch species are generally considered extremely rare, though this could be a function of underreporting or the fact that several elasmobranchs, are negatively buoyant (Papastamatiou et al. 2022) and would thereby sink after a fatal collision.

We do not expect sperm whales to be present within the immediate area of the proposed construction activities in Red Hook Bay. However, these species are likely to be present in the greater action area that includes the Atlantic Ocean's continental slope and oceanic waters where this species may interact with the additional 189 vessels originating from the proposed marina rebuild. Sperm whales spend large periods of time at the water's surface "rafting" after they make deep dives, making them more susceptible to vessel traffic and collisions. Vessel traffic, both recreational and commercial, has been documented to adversely affect marine mammals including sperm whales.

We believe the potential effect on ESA-listed species resulting from increased vessel traffic associated with the proposed action is extremely unlikely to occur. Operation of the marina will not result in all 189 of the vessels moored and stored at the facility being in the water at the same time. We also do not have any data to support any assumption about where a majority of vessels originating from the new marina will travel – whether the majority of vessels will travel offshore, or travel to nearby inshore waters. The waters within and close to the new marina are subject to speed restrictions that would allow mobile species such as sea turtles and giant manta ray to swim out of the way of oncoming vessels and avoid collision. A NMFS Protected Resources Division analysis suggests that it would take an introduction of approximately 200 new vessels to an area to result in a take of 1 sea turtle in any single year (Barnette 2018). Giant manta rays are commonly found offshore, in oceanic waters, and near productive coastlines. The action area is not an area with known high occurrences of giant manta ray. Oceanic whitetip shark and scalloped hammerhead shark prefer oceanic waters farther from shore where the likelihood of vessel interactions is lower. While oceanic whitetip shark can be found near continental shelves, they generally use the near-surface mixed layer of offshore waters where they have access to deeper waters (Young and Carlson 2020). Scalloped hammerhead sharks could be nearshore migrating, foraging, or pupping and may encounter vessels traveling to and from the marina. Adult sperm whales are likely to be in deep waters offshore St. Thomas, UVSI for migrating, foraging, mating, and calving activities and juveniles could be in the area foraging and migrating. However, the Latitude 18 Marina rebuild is outside the core density area for Eastern Caribbean known sperm whale primary habitat, which is south of the project site, from St. Kitts to St. Vincent (Vachon et al. 2024). These islands quickly drop off to deep water, whereas St. Thomas is surrounded by shallow continental shelf depths. A vessel leaving the Latitude 18 Marina and Mooring Field site would need to travel 19.96-mi (32.12-km) to the north and 11.43-mi (18.39-km) to the south to reach the same isobaths inhabited by sperm whales.

In addition, the following measures will be put in place to alert mariners using the marina and mooring field of listed species in the area and actions to take to avoid harmful interactions. Signs will be placed at the marina to minimize the potential damage from groundings and prop wash. These signs will demarcate the location of the critical habitat, which is located 25-ft away from the nearest dock structure (Figure 7). Signs will be coordinated with the USVI Division of CZM and NMFS before posting. NMFS-approved educational signs will be posted in visible locations throughout the marina dock area, alerting boaters of listed species in the area. Copies of NMFS's *Protected Marine Species Identification Guide* will be displayed and made available in a visible and accessible location within the Harbor Master's office at the marina.

Entanglement
The installation and use of the proposed wave attenuator may pose an entanglement risk to ESA-listed species; however, we believe this effect is extremely unlikely to occur. The wave attenuator lines will remain taught when in use. It has an elastic anchorage system and connections to allow for emergency disconnect from the deck. In the event of a tropical storm or hurricane, marina operators will remove the floating wave attenuator. The floating units will be separated and detached from their anchor lines and replaced with a buoy on the line to prevent tangling or sinking.

The mooring field could potentially create an entanglement hazard for ESA-listed species; however, we believe this effect is extremely unlikely to occur. Incorporation of giant manta ray deterrents on the mooring buoy downlines will make the lines more visible to this particular species because they are unable to see directly in front of them. Furthermore, moorings will be regularly maintained and installed according to manufacturer's specifications, buoys will use rubber encased twisted nylon rope, and length of line will be adjusted so as to minimize, to the maximum extent possible, any slack and avoid looping. These measures are expected to reduce the potential for entanglement with ESA-listed species.

Habitat Effects
ESA-listed species may be adversely affected by their inability to access the project areas for foraging or movement due to their avoidance of construction activities, human presence, and related noise. We believe the temporary exclusion from a project area due to the project activities, including related noise and presence of turbidity curtains, will have an insignificant effect on ESA-listed species. Construction activities will occur during daylight hours only. Turbidity curtains will enclose the project site, or portions of the project site, at any given time and will be removed after project completion. Although ESA-listed species would be temporarily unable to access the marina, bulkhead, and dredge work areas during construction, these effects would be insignificant, given the project's limited footprint, the degraded quality of the existing habitat within these areas, and the abundance of higher quality habitats within the bay. ESA-listed species also can return to the project site when the activity is complete.

The proposed project may result in loss or alteration of the habitat used by ESA-listed species for foraging, resting, and nursery habitat. Dredging would directly impact 219,268-ft^2 (5.03-ac) of benthos, and result in the removal of approximately 51,590-ft^2 of non-native SAV and algae. The installation of the moorings and the wave attenuator would directly impact 34-ft^2 and 19-ft^2 of SAV and macroalgae, respectively. Approximately 80% of the seafloor below the floating wave attenuator contains *H. stipulacea* (invasive seagrass) and mixed macro-algae; 10% of the area contains a mix of *H. stipulacea*, macro-algae, and sparse *Thalassia testudinum;* the remaining 10% of the area contains a mix of *T. testudinum*, *Syringodium filiforme* and *H. stipulacea*. Installation of concrete and wood piles will impact a total of 943-ft^2 of seafloor, of which approximately 716-ft^2 is accounted for by dredging. Hence, installation of concrete and wood piles will impact approximately 227-ft^2 of benthic substrate (943-ft^2 – 716-ft^2 = 227-ft^2). Navigational and informational markers would impact 3-ft^2 of benthos. We believe these effects will be insignificant. The impact area is a relatively small area, the seagrass densities at the project sites are varied (~10% coverage), and there is abundant foraging and resting areas outside of the impacted area and in areas adjacent to the action area.

Shading from overwater structures and vessels may affect SAV habitat. Vessel shading at the marina from overwater structures is expected to impact 23,119-ft^2 of SAV habitat. At maximum capacity with maximum-sized vessels, shading from marina vessels may impact up to 41,400-ft^2 of SAV. At maximum capacity with maximum-sized vessels, shading from moored vessels in the mooring field may impact up to 68,400-ft^2 of SAV. Finally, approximately 6,080-ft^2 of SAV may be affected by shading from the floating wave attenuator. Hence, a total of 138,999-ft^2 (3.2-ac) of benthic habitat and SAV may be affected from vessel shading. We have determined that these effects would be insignificant. Although the action area contains native seagrass in the mooring field and near the floating wave attenuator, the project is not expected to result in the loss of native seagrass. Due to the water depth and the north-south orientation and narrow width of the attenuator, it should result in negligible shading of the SAV within its footprint. Vessel shading effects on SAV shifts as the vessels pivot around the mooring buoys and is therefore believed to be a temporary effect on SAV habitat. Due to current mooring practices in the proposed managed mooring field, it is expected that the project would result in long-term benefits to water quality and seagrass abundance due to the requirement for embedded anchors, floating lines, and the availability of a pump-out station.

Mountainous star coral may be also be affected by vessel shading and use of the proposed mooring field. We believe effects to ESA-listed corals from vessel shading to be insignificant. Vessels will have a swing radius up to 70-ft. Any shading from moored vessels will be temporary as the vessel shifts and pivots around the mooring buoy.

The proposed marine debris removal efforts may have a beneficial effect on habitat quality and availability for ESA-listed species. Debris removal efforts would focus on areas within sensitive habitats including coral reefs, seagrass beds, and hardbottom. Removal of debris, and particularly the sailboat, would allow for natural ecological processes to resume. Light would be able to reach benthic habitats, thus creating enhanced conditions for photosynthetic organisms which would consequently improve coral growth and seagrass recolonization. In addition, the removal of the debris would reduce risks to wildlife from ingesting foreign substances as well as entanglement risks.

Turbidity

ESA-listed corals may be affected by turbidity generated during construction of the proposed marina. We believe this effect will be insignificant. A strict water quality monitoring plan will implemented to ensure corals do not experience turbidity above natural levels. Turbidity curtains will be used, and distance of the dredging activity from ESA-listed corals makes the potential for turbidity impacts insignificant.

Noise Effects

Noise created by pile driving activities can physically injure animals or change animal behavior in the affected areas. Animals can be physically injured in two ways. First, immediate adverse effects can occur if a single noise event exceeds the threshold for direct physical injury. Second, adverse physical effects can result from prolonged exposure to noise levels that exceed the daily cumulative sound exposure level for the animals. Noise can also interfere with an animal's behavior, such as migrating, feeding, resting, or reproducing and such disturbances could constitute adverse behavioral effects.

When an impact hammer strikes a pile, a pulse is created that propagates through the pile and radiates sound into the water, the ground substrate, and the air. Pulsed sounds underwater are typically high-volume events that have the potential to cause hearing injury. Vibratory pile driving produces continuous, non-pulsed sounds that can be tonal or broadband. In terms of acoustics, the sound pressure wave is described by the peak sound pressure level (PK, which is the greatest value of the sound signal), the root-mean-square pressure level (RMS, which is the average intensity of the sound signal over time), and the sound exposure level (SEL, which is a measure of the energy that takes into account both received level and duration of exposure). Further, the cumulative sound exposure level (SEL_{24h}) is the measure of energy that considers the received sound pressure level over a 24-hour period. Please see the following website for more information related to measuring underwater sound and the NMFS-accepted pile driving sound measurement thresholds for species in the NMFS Southeast Region: https://www.fisheries.noaa.gov/southeast/consultations/section-7-consultation-guidance. Please note that for vibratory pile driving, only behavioral sound measurement thresholds exist for fishes; NMFS does not recognize any injurious sound thresholds for fishes when vibratory pile driving is used.

We use the NMFS Multi-species Pile Driving Tool (September 2025) to calculate the radii of physical injury and behavioral effects on ESA-listed species that may be located in the action area based on the NMFS-accepted pile driving sound measurement thresholds for species in the NMFS Southeast Region reference above. The applicant proposes to use an impact hammer to drive up to five 24-in concrete piles per day, and up to four 18-in timber piles per day during daylight hours only. Each pile will require approximately up to 240 strikes per pile to install. Pile driving will occur in a confined space. We define a confined space as any area that has a solid, vertical structure (e.g., jetty or seawall) or natural shoreline that would effectively serve as a barrier or otherwise prevent an animal from exiting the area. That is, for the animal to move away from the noise source, the animal would be forced to pass through the radius of noise effects. Because multiple pile-types (i.e., concrete and wood) and installation methods (i.e., impact hammer not using noise abatement measures and vibratory hammer) are proposed, the noise analysis in this consultation evaluates the pile-type and installation method with the greatest potential effects and largest potential effect radius (i.e., concrete piles with a noise radius of up to 706.8-ft). Any potential effects of pile driving noise from other proposed pile types and methods would not exceed those described below. Therefore, the potential pile driving noise effects from the other proposed pile types and methods, if any, are expected to occur within a radius of that size or smaller and would result in, at most, the potential effects described below.

The installation of up to 5 concrete 24-in diameter piles per day by impact hammer not using noise abatement measures would cause PK injurious noise effects to ESA-listed fishes at a radius of up to 1.3-ft away (0.4-m away), and it is not expected to cause PK injury to sea turtles. We believe PK injurious noise effects to ESA-listed fish species are extremely unlikely to occur because this distance is within the 150-ft (46-m) “stop-work” radius defined in NMFS SERO’s *Protected Species Construction Conditions* (revised 2021). Additionally, the SEL_{24h} may cause injury to ESA-listed fishes at a radius of up to 152.3-ft away (46.4-m away) from the pile-driving operations, and to ESA-listed sea turtles at a radius of up to 147.1-ft away (44.8-m away) from the pile driving operations over a 24-hour period. We believe SEL_{24h} injurious noise effects are extremely unlikely to occur due to the mobility of these species, and the close proximity of these radii to the 150-ft (46-m) "stop-work" radius defined in NMFS SERO's *Protected Species Construction Conditions* (revised 2021). We expect these species to move away from the noise disturbances before the exposure to the noise causes physical injury. Movement away from the injurious sound radius is a behavioral response, which is discussed below.

The installation of up to 5 concrete 24-in diameter piles per day by impact hammer not using noise abatement measures could result in behavioral effects to ESA-listed fishes at a radius of up to 706.8-ft away (215.4-m away) from the pile driving operations, and to ESA-listed sea turtles at a radius of up to 15.2-ft away (4.6-m away) from the pile driving operations, and to ESA-listed marine mammals at a radius of up to 152.3-ft away (46.4-m away) from the pile driving operations. We believe behavioral noise effects to these species will be insignificant. Although we generally expect mobile species to move away from noise disturbances, the proposed action would occur in a confined space. However, trained protected species observers will establish a 1,640-ft (500-m) safety zone to be continuously visually monitored for ESA-listed species and will not allow pile installation if an animal is within the project area. Buoys would be set at the edge of the safety zone as a reference for the observer. The observers would position themselves to ensure they can view the entire safety zone. Wildlife observers would utilize binoculars to assist in the spotting of animals. The area must be clear for 30 minutes prior to any noise producing work commencing. If at any time a sea turtle is observed in the safety zone, the operation would be shut down until the animal has left the safety zone of its own volition. Additionally, because pile installations are limited to 10 piles per day, noise would occur intermittently during daylight hours only and these species would be able to resume normal activities during quiet periods between pile installations and at night.

3.2.3 ESA-Listed Species Likely to be Adversely Affected by the Proposed Action

We have determined that queen conch are likely to be adversely affected by the proposed action and thus requires further analysis. We provide greater detail on the potential effects to this species from the proposed action in the Effects of the Action (Section 6) and whether those effects, when considered in the context of the Status of the Species (Section 4.1), the Environmental Baseline (Section 5), and the Cumulative Effects (Section 7), are not likely to jeopardize the continued existence of this ESA-listed species in the wild.

3.3 Effects Determinations for Critical Habitat

3.3.1 Agency Effects Determinations

We have assessed the critical habitats that overlap with the action area and our determination of the project's potential effects is shown in Table 6 below.

Table 6. Critical Habitat in the Action Area and Effect Determinations

Species (DPS)	Critical Habitat Unit in the Action Area	Critical Habitat Rule/Date	USACE Effect Determination	NMFS Effect Determination
Invertebrates			NLAA	NLAA
Elkhorn coral	St. John/St. Thomas Area	73 FR 72210/ November 26, 2008	NLAA	NLAA
Staghorn coral	St. John/St. Thomas Area	73 FR 72210/ November 26, 2008	NLAA	NLAA
Boulder star coral	St. John/St. Thomas Area	88 FR 54026/ August 9, 2023	NLAA	NLAA
Lobed star coral	St. John/St. Thomas Area	88 FR 54026/ August 9, 2023	NLAA	NLAA
Mountainous star coral	St. John/St. Thomas Area	88 FR 54026/ August 9, 2023	NLAA	NLAA
Pillar coral	St. John/St. Thomas Area	88 FR 54026/ August 9, 2023	NLAA	NLAA
Rough cactus coral	St. John/St. Thomas Area	88 FR 54026/ August 9, 2023	NLAA	NLAA
Proposed				
Sea Turtle				
Green sea turtle (South Atlantic DPS)	St. Thomas Area	88 FR 46572, July 19, 2023	NLAA	NLAA

3.3.2 Effects Analysis for Critical Habitat Not Likely to be Adversely Affected by the Proposed Action

3.3.2.1 Coral Critical Habitat

The project is located within the boundary of the following units of critical habitat for the elkhorn, staghorn, boulder star, lobed star, mountainous star, pillar, and rough cactus corals:

- Area 3: St. Thomas/St. John for elkhorn and staghorn corals.
- Unit OFRA-3 (All islands of St. Thomas and St. John) for boulder star coral.
- Unit OANN-3 (All islands of St. Thomas and St. John) for lobed star coral.
- Unit OFAV-3 (All islands of St. Thomas and St. John) for mountain star coral.
- Unit MFER-3 (All islands of St. Thomas and St. John) for rough cactus coral.
- Unit DCYL-3 (All islands of St. Thomas and St. John) for pillar coral.

The essential feature for elkhorn and staghorn coral critical habitat (Area 3: St. Thomas/St. John Unit) includes sites that support the normal function of all life stages of the corals including reproduction, recruitment, and maturation. Within the action area, the following essential features are present.

1. Substrate of suitable quality and availability to support larval settlement and recruitment, and reattachment and recruitment of asexual fragments. "Substrate of suitable quality and availability" is defined as natural consolidated hard substrate or dead coral skeleton that is free from fleshy or turf macroalgae cover and sediment cover.
2. additionally water that is relatively clear, well-circulated and within 21° to 29° C water temperature range (73 FR 6895).

The essential feature for non-*Acropora* coral critical habitat (Units OFRA-3, OANN-3, OFAV-3, MFER-3, and DCYL-3 (All islands of St. Thomas and St. John)) includes sites that support the normal function of all life stages of the corals, including reproduction, recruitment, and maturation; these sites are natural, consolidated hard substrate or dead coral skeleton, which is free of algae and sediment at the appropriate scale at the point of larval settlement or fragment reattachment, and the associated water column.

The essential feature of natural, consolidated hard substrate or dead coral skeleton, which is free of algae and sediment, can be found scattered in patch areas farther east within the mooring field. Coral critical habitat may be affected by turbidity generated during dredging and construction activities. We believe these effects will be temporary and insignificant. Dredging activities will occur approximately 1,600-ft away from the nearest coral critical habitat hardbottom patch. Turbidity curtains will be used during all in-water construction activities. A robust turbidity monitoring protocol will be implemented, and should turbidity levels rise above 3 NTUs from background, all in-water work shall stop, mitigation measures shall be implemented, and work will not resume till turbidity levels have returned to below 3 NTUs above background. The essential feature may be affected by vessel shading from vessels moored in the mooring field. However, vessels will have a swing radius of approximately 70-ft, and any shading is expected to be intermittent and temporary. We do not expect the essential feature to be affected by the installation of mooring buoys in the mooring field. Installation of mooring buoys will avoid all hardbottom and will be done manually by divers. Therefore, we believe coral critical habitat is not likely to be adversely affected by the proposed action.

3.3.2.2 Proposed Critical Habitat for Green Sea Turtle

The project is located within the geographic boundary of proposed critical habitat for the green sea turtle (South Atlantic DPS; Unit VI02: St. Thomas). The following physical or biological features essential for the conservation of the species ("essential features") are present within the action area:

- *Migratory essential feature*: From the mean high water line to 20 m depth, sufficiently unobstructed corridors that allow for unrestricted transit of reproductive individuals between benthic foraging/resting areas and reproductive areas.
- *Benthic foraging/resting essential features*: From the mean high water line to 20-m depth, underwater refugia and food resources (i.e., seagrasses, macroalgae, and/or invertebrates) of sufficient condition, distribution, diversity, abundance, and density necessary to support survival, development, growth, and/or reproduction.

We believe the proposed action may affect only the benthic foraging/resting essential features. The proposed benthic foraging/resting essential feature is present within the immediate vicinity of the marina and the proposed mooring field, and may be removed, or temporarily affected by construction activities (i.e., pile installation, installation of mooring buoys, and elevated turbidity) and shading. Below we outline the direct and indirect impacts to this essential feature within the action area.

Construction Activities

Construction of the marina will result in a total of 52,409-ft^2 of direct impacts to seagrass and macroalgae as a result of dredging (51,590-ft^2); installation of piles in areas that are not dredged (763-ft^2); helix anchor installation for the wave attenuator (19-ft^2) and the mooring field (34-ft^2); and, installation of ATONs (3-ft^2). Additionally, seagrass and macroalgae may be temporarily affected by increased turbidity levels during construction. We believe these effects will be insignificant. The permanent removal of seagrass and macroalgae will not appreciably reduce the benthic foraging/resting essential feature within Unit VI02: St. Thomas. The impact area is a relatively small area, the seagrass densities at the project site are varied (~10% coverage), and there is abundant foraging and resting areas outside of the impacted area and in areas adjacent to the action area. Turbidity will be temporary and turbidity curtains will be used and will remain in place until conditions return to preconstruction conditions.

Shading

The benthic foraging/resting essential feature may be affected by shading due to moored vessels and overwater structures. At maximum capacity, and with the maximum-sized vessels in each slip, stationary vessels would shade approximately 41,400-ft^2 of SAV within the marina. Overwater structures (see Table 1) would shade approximately 28,499-ft^2 of benthic habitat, of which approximately 23,119-ft^2 will have SAV. We believe these effects to the benthic foraging/resting essential feature will be insignificant.

Currently, the 39.1-ac area proposed for a managed mooring field is currently an unregulated mooring field where existing mooring practices, anchoring, dragging lines, and debris continue to damage the seagrass beds. Once rebuilt, mooring buoy lines will be floated and encased to minimize any impact to the seafloor and the benthic community. All moorings within the managed mooring field will be inspected and maintained on an annual basis and after all major storm events. In addition, the marine debris mitigation plan and mooring field management plan would result in regular marine debris removal for the 5-year term of the permit construction activity period. Last, vessel shading effects on SAV shifts as the vessels pivot around the mooring buoys, thus making shading effects ephemeral and temporary depending on sea and wind conditions.

A benthic survey conducted in September 2025 showed an area of riprap and natural bedrock within the footprints of the marina and bulkhead. Consolidated hardbottom heavily-colonized with macroalgae was found around the corner of Jack Rock Point, east of the bulkhead and along the riprap. The seagrass densities at the project site are varied (~10% coverage). Subsequently, we do not anticipate that the entire area affected by shading of vessels or overwater structures contain the benthic foraging/resting essential feature, nor do we anticipate that the marina will be at full capacity with vessels docked at the facility 24 hours per day, 7 days per week.

For the reasons discussed above, we believe green sea turtle (South Atlantic DPS; Unit VI02: St. Thomas) proposed critical habitat is not likely to be affected by the proposed action.

4 STATUS OF ESA-LISTED SPECIES CONSIDERED FOR FURTHER ANALYSIS

4.2 Rangewide Status of the Species Considered for Further Analysis

4.2.1 Queen Conch

NMFS listed queen conch as a threatened species, effective March 15, 2024 (89 FR 11208, February 14, 2024). At the time of listing, critical habitat was not determinable because data sufficient to perform the required analysis were lacking.

4.2.2 Species Description

*Aliger gigas (*Linnaeus 1758), commonly known as the queen conch, is a large, slow-moving sea snail, a marine gastropod mollusk in the family of true conches (*Strombidae*), in the phylum Mollusca (Figure 12). Queen conch are characterized by a large, heavy, whorl-shaped shell with multiple short spines at the apex, a brown and horny operculum (a plate that closes the opening of the shell when the animal is retracted), and a pink interior of the shell lip. Adult queen conch shells can grow to 12 in in length and weigh up to 5 lbs.

Figure 12. Conch have long eye stalks that move independently and a tube like mouth called a proboscis that it can pull into its shell if threatened (Photo: Jennifer Doerr, NOAA-SEFSC).

General Habitat
Queen conch occur in different habitat types including seagrass and algae beds, sand flats, and rubble areas from a few cm deep to depths generally less than 61-m. Adult distributions are heavily influenced by food availability and fishing pressure. In unexploited areas, they are most commonly found in shallow marine waters less than 30-m. Adult queen conch prefer sandy algal flats, but are also found on gravel, coral rubble, smooth hard coral, and beach rock bottom, while juveniles are primarily associated with seagrass beds (Doerr and Hill 2018; Glazer and Kidney 2004; Stoner 2003).

General Diet
Larval conch feed on phytoplankton (Davis 2005). The primary diet of juvenile conch consists of native seagrass detritus and red and green macro algae, primarily *Laurencia* spp. and *Batophora oerstedii (Randall 1964; Serviere-Zaragosa et al. 2009; Stoner and Sandt 1992; Stoner and Waite 1991)*. Juveniles are thought to feed on organic material in the sediment, such as benthic diatoms and particulate organic matter and cyanobacteria (Serviere-Zaragosa et al. 2009; Stoner et al. 1995; Stoner and Waite 1991), macro algae in seagrass beds, and epiphytes that live on the seagrass (Stoner 1989b; Stoner and Waite 1991). Adult conch feed on different types of filamentous algae (Creswell 1994; Ray and Stoner 1995). The presence of the green algae, *B. oerstedii*, in The Bahamas is correlated to areas of higher conch densities (Stoner and Lally 1994) and even caused an aggregation to shift orientation (Stoner and Ray 1993).

4.2.3 Life History Information

Reproduction
Queen conch reproduce through internal fertilization, meaning individuals must be in contact to mate. Seasonal movements are usually associated with the initiation of the reproductive season. Adult conch can move from offshore feeding areas in the winter to summer spawning grounds in shallow, inshore sand habitats; and from seagrass to sand-algal flats with the onset of winter (Hesse 1979). In locations where adult conch are abundant, migrations culminate in the

formation of reproductive aggregations. These aggregations generally form in the same locations each year (Glazer and Kidney 2004; Marshak et al. 2006; Posada et al. 1997) and are dominated by older individuals that produce large, viable egg masses (Berg Jr. et al. 1992).

Queen conch have a protracted spawning season of 4 to 9 months, with peak spawning during warmer months (Figure 13). Generally, queen conch located in waters within NMFS's Southeast Region have the ability to spawn year round, but peak spawning occurs during a narrower window (Stoner and Appeldoorn 2022), as presented below in Figure 13. The duration and intensity of the spawning season are mediated by temperature, photoperiod, and weather events, and vary extensively throughout the queen conch's range (Figure 13). Generally, reproductive activity begins earlier and extends later into the year with decreasing latitude; extending primarily from May through September in Florida (although spawning has been recorded as early as March and as late as October) (D'Asaro 1965; Davis et al. 1984; Delgado and Glazer 2020), May to November in Puerto Rico (Appeldoorn 1985; Appeldoorn 1988a; Appeldoorn 1993), and February through November in the USVI (Coulston et al. 1987; Randall 1964).

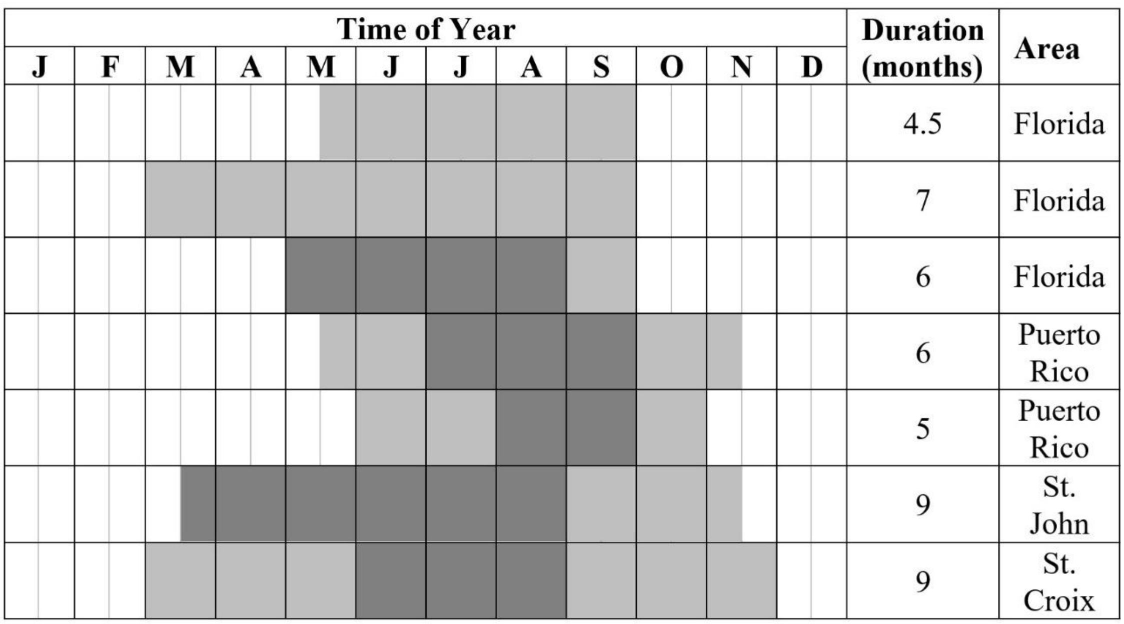


Figure 13. Reproductive/spawning cycle of queen conch, from visual surveys. Colors indicate relative level of reproductive activity (white=none, light gray = spawning activity, dark gray = peak spawning activity). Figure modified from Horn et al. (2022).

Differences in spawning rates have been attributed to spawning site selection, population densities, and food selection and availability, among other factors. However, it is widely suspected that adult breeding population density is the most important factor to promote reproduction (Farmer and Doerr 2022; Stoner and Appeldoorn 2022). Conch in low-density environments produce more abundant (i.e., more batches) and larger egg masses and demonstrate a longer spawning season than conch in high-density environments (Appeldoorn 1993; Appeldoorn 2020). Variability in spawning activity may also be correlated to water temperature and weather conditions. Reproductive activity can decrease with increasing water turbulence and reproduction can peak with longer days (Davis 1994).

Connectivity among queen conch populations is essential as the flow of larvae among different populations impacts the species' ability to reproduce, find mates, and maintain genetic diversity. Effective connectivity helps populations of queen conch to replenish themselves and support overall species health. There are a limited number of reproductively viable aggregation sites within the U.S. and U.S. territories (Figure 14), which play a significant role in the recovery potential of the species. For example, Puerto Rico's spawning site at the Abrir La Sierra reef, located in the southeast of the Mona Passage (García-Sais et al. 2012), connects populations in Puerto Rico and the Dominican Republic (Vaz et al. 2022). There are only two known reproductively active shallow-water aggregations in Florida. While neither aggregation is mapped completely, one aggregation exists at Port Everglades, directly to the south of the shipping channel, and the second aggregation is located next to the St. Lucie Inlet, primarily in the Intracoastal Waterway. The Port Everglades aggregation is comprised of at least 8,000 individuals, and potentially up to 40,000 individuals, corresponding to densities averaging 173 adult conch/ha and up to 700 adult conch/ha (J. Doerr, SEFSC, unpublished data). SEFSC monitoring of the Port Everglades aggregation documented active spawning of individuals as well as egg masses (J. Doerr, SEFSC, unpublished data). The aggregation at Port Everglades may play a major role in sustaining nearshore Florida populations, and may also have important seeding potential for both the Florida Keys and the nearby Bahamas archipelago (A. Vaz SEFSC pers. comm. NMFS, to O. Tzadik, June 9, 2024). The Port Everglades aggregation is the second most northern documented spawning aggregations of queen conch in the world and, therefore, may represent a population that is more robust than others to changing environmental conditions. The other documented aggregation is farther north adjacent to the St. Lucie Inlet within the Intracoastal Waterway, where spawning is presumed to occur but has not been observed.

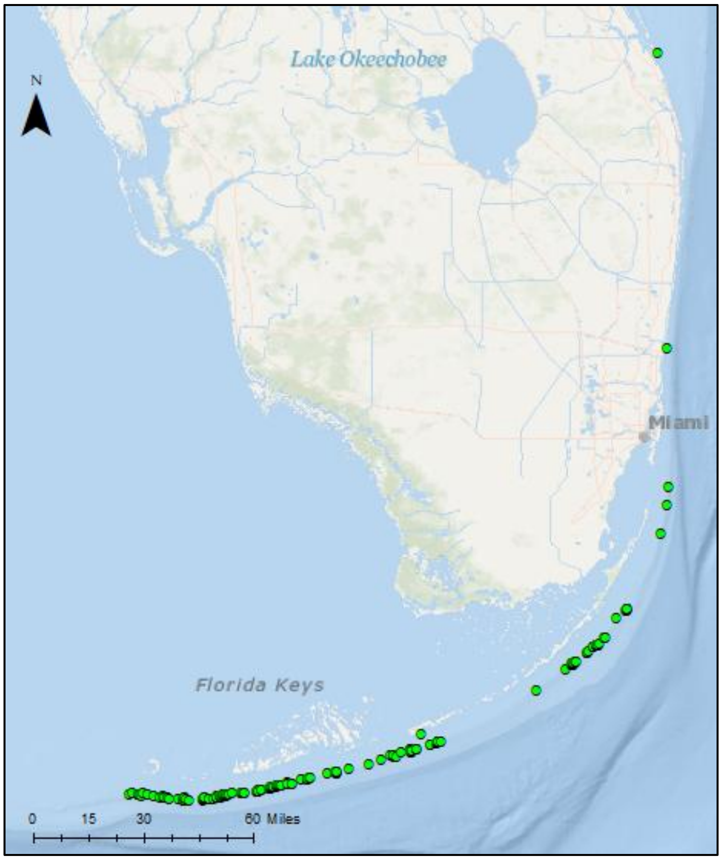


Figure 14. Aggregation locations (green dots) for queen conch in the Florida Keys. Aggregations were defined as FWC survey sites with 10 or more adult queen conch monitored (corresponding to 50 or more adult conch per hectare), and limited to locations surveyed by FWC.

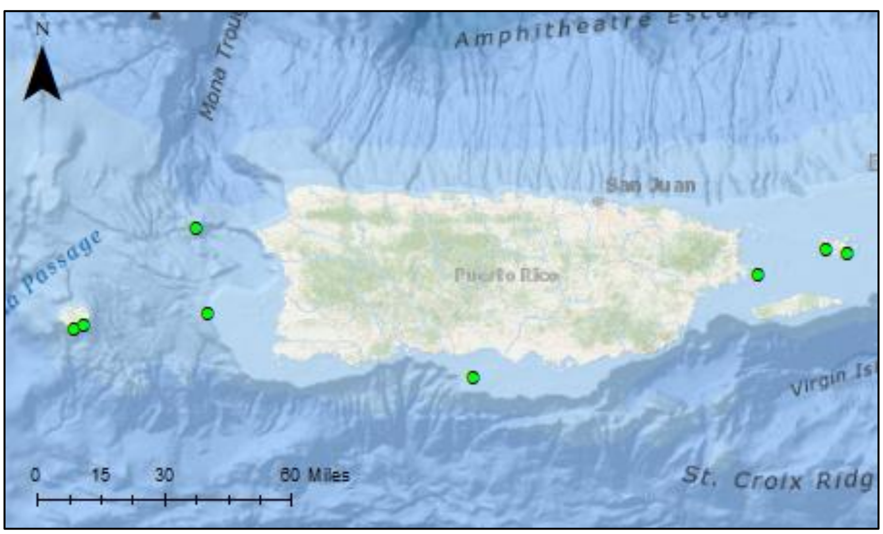


Figure 15. Known aggregation locations for queen conch in Puerto Rico, as determined by survey locations with densities of over 100 adult conch per hectare.

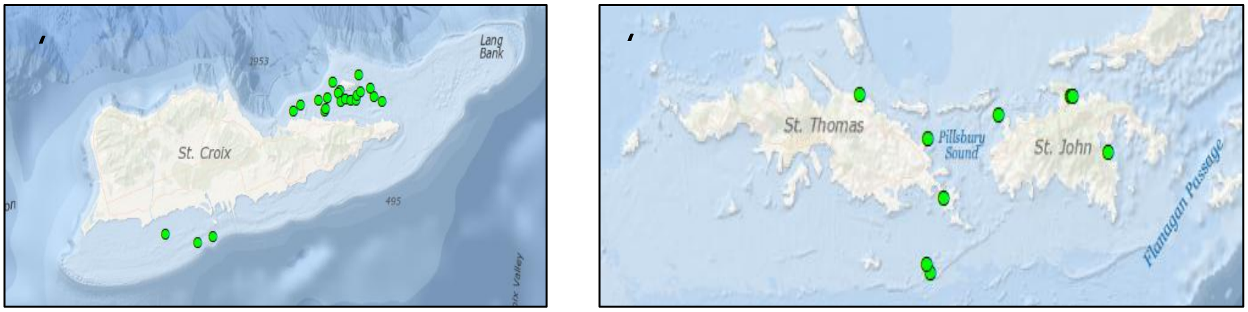


Figure 16. Known aggregation locations for queen conch in the USVI, as determined by survey locations with densities of over 100 adult conch per hectare.

Growth Rates

Queen conch size at maturity can vary depending on environmental conditions. The growth rate and shell morphology of queen conch can vary depending on sex, depth, latitude, food availability, age class, and habitat type. In addition, several different locations have reported up to four individual “morphs” that all exhibit different growth rates (Beltrán 2019). On average, females grow more quickly than males, to a larger size, and have greater weight than males (Appeldoorn 1988a). Queen conch exhibit periods of seasonal growth associated with water temperature and food availability. Summer growth rates are greater than winter growth rates (Stoner and Ray 1993).

Age at Maturity

Queen conch are a long-lived species, reaching 25–30 years in age, and are believed to reach sexual maturity around 3.5-years to 4-years of age. They reach maximum shell length before sexual maturation. Following sexual maturation, the shell continues to grow in thickness only.

Habitat Use by Different Life Stages

Egg laying takes 24 to 36 hours, with females producing a continuous, crescent-shaped egg mass containing from 150,000–1,649,000 eggs (Appeldoorn 1993; Appeldoorn 2020; Berg Jr. and Olsen 1989; D'Asaro 1965; Delgado and Glazer 2020; Mianmanus 1988; Randall 1964; Robertson 1959; Weil and Laughlin 1984). The number of egg masses produced per female is highly variable, ranging between 1 and 25 egg masses per season (Appeldoorn 1993; Berg Jr. and Olsen 1989; Davis and Hesse 1983; Davis et al. 1984; Weil and Laughlin 1984). Upon hatching, the veligers (larvae) drift in the upper water column for up to 30 days (Paris et al. 2008; Posada and Appeldoorn 1994; Stoner 2003; Stoner and Davis 1997), then metamorphose into benthic infaunal (i.e., living in the substrate) juveniles, where they bury in sediments, typically adjacent to seagrass habitats in response to trophic cues (Davis 2005). Juveniles emerge from the sediment about a year later (Stoner 1989a) at around 60-mm shell length. When these epifaunal (e.g., above the substrate) juvenile conch first emerge, they move into nearby seagrass beds, where densities can be as high as 200 to 2,000 conch/ha.

Conch nursery areas primarily occur in back reef areas (i.e., shallow sheltered areas, lagoons, behind emergent reefs or cays) of medium seagrass density, in depths between 2-m to 4-m (6-ft to 13-ft) (Jones and Stoner 1997), with strong tidal currents at least 50 cm/s (Stoner 1989b), and frequent tidal water exchanges (Stoner et al. 1996; Stoner and Waite 1991). Seagrass is thought to provide both nutrition and shelter from predators (Ray and Stoner 1995; Stoner and Davis

2010). The structure of the seagrass beds decreases the risk of predation (Ray and Stoner 1995), which is very high for juveniles (Appeldoorn 1988b; Posada et al. 1997; Stoner et al. 2019; Stoner and Glazer 1998).

Although juvenile queen conch are primarily associated with native seagrass, such as *Thalassia testudinum*, they can occur in a variety of habitat types (Boman et al. 2019). In the USVI, juvenile queen conch were more abundant in shallow coral-rubble environments than on bare sand and seagrass beds (Randall 1964). In Puerto Rico, Torres Rosado (1987) reported higher numbers of conch in coral rubble compared with sand, seagrass, and hard bottom. In Florida, juveniles are found in reef rubble, algae-covered hard bottom, and secondarily in mixed beds of algae and seagrass, depending upon general location (Glazer and Berg Jr. 1994). In St. Croix, USVI, densities of juvenile were the highest in seagrass habitats characterized as 50–90% coverage (Doerr and Hill 2013; Doerr and Hill 2018; Stoner and Waite 1991).

Adult distributions are heavily influenced by food availability and fishing pressure. They prefer sandy algal flats but are also found on gravel, coral rubble, smooth hard coral, patchy seagrass, and beach rock bottom (Acosta 2001; Doerr and Hill 2018; Glazer and Kidney 2004; Stoner 2003; Stoner and Davis 2010). In St. Croix, USVI, densities of adult queen conch were the highest in habitats characterized as 10–50% patchy seagrass (Doerr and Hill 2013; Doerr and Hill 2018; Stoner and Waite 1991). Adult queen conch are rarely, if ever, found on soft bottoms composed of silt and/or mud, or in areas with high coral cover (Acosta 2006). Adult conch are found in shallow, clear water of oceanic or near-oceanic salinities at depths generally less than 61-m, and, in less exploited areas, are most often found in waters less than 30-m (McCarthy 2007).

Seasonal Distribution Patterns and Movement

The movements of adult conch are associated with factors like changes in temperature, food availability, and predation. The average home range size for an individual queen conch is variable and has been measured at 5.98 ha in Florida (Glazer et al. 2003). Glazer et al. (2003) found that there were no significant differences in movement rate, site fidelity, or size of home range between adult males and females. However, home range in queen conch is highly variable throughout its range, and movement patterns and speeds may differ as well (Farmer and Doerr 2022). Few studies have been conducted to definitively demonstrate differences in movement patterns and speeds throughout the range of the queen conch, but the studies that have been conducted show different movement patterns and speeds in Florida as compared with St. Croix, USVI (Doerr and Hill 2013; Doerr and Hill 2018; Glazer et al. 2003). The factors that affect these differences are unclear, but may be a result of low sample size, differences in conch size, or different environmental cues that initiate movements, such as temperature or spawning migrations.

Queen conch may undertake seasonal movements, usually associated with the initiation of the reproductive season. Increasing water temperature and day length are believed to trigger large-scale migrations and the subsequent initiation of mating. Adults move at varying speeds throughout the year with movement rates increasing during seasonal migrations and slowing during foraging activities or upon reaching mating aggregations. Queen conch typically move slowly (i.e., <5 m/d) (Doerr and Hill 2018; Glazer et al. 2003) but can move faster (e.g., 11.36±0.24 m/d (mean±sd), with a maximum observed speed of 21.24 m/d (Doerr and Hill 2018) when traveling to aggregations. Queen conch move at a greater speed during the summer, which may be due to the increased metabolic activity associated with warmer waters and increased movement related to their reproductive season (i.e., males searching for mates and females moving into egg-laying habitat) (Glazer et al. 2003).

Predation and Competition
The only known predator of adult queen conch is the nurse shark (Marshall 1992). Other organisms predate on juveniles, but the effects are not considered as limits on population structure (Ray and Stoner 1994). Competition threats to queen conch, likely from other conch species and other grazers with similar feeding styles such as urchins, are likely related to food availability, and may be directly associated with the survival and resilience of seagrass meadows and presence of invasive vegetation (Horn et al. 2022).

4.2.4 Population Dynamics

Current Population Size
Queen conch are distributed throughout the Caribbean. Horn et al. (2022) estimated the total adult queen conch abundance (i.e., the sum of median estimated abundance across all jurisdictions) at 743 million individuals; this estimate is highly uncertain and based on data of varying quantity and quality by jurisdiction. Numerous lines of evidence suggest that the vast majority of conch populations have declined and are suffering recruitment failure or Allee effects, with evidence of ongoing declines in many populations (Horn et al. 2022). U.S. waters are estimated to contain 0.61% of the total contemporary adult conch population abundance (approximately 4.5 million individuals) and 6.94% of the available conch habitat (Horn et al. 2022). These estimates were derived from extrapolating representative densities across known viable habitats, and are therefore very broad and highly uncertain. Populations of queen conch exhibit clumped and patchy distributions and cross shelf densities are difficult to extrapolate. We are currently evaluating population levels in the U.S. and abroad in an effort to improve understanding of small-scale and local population information.

Population Variability (Abundance Trends over Time)
Consistent long-term monitoring abundance trends is exceptionally sparse throughout the region. Range-wide density and abundance trends are discussed below.

Population Stability (Ability of the Population to Resist Change from Dramatic Events)
Depensatory mechanisms, or factors that can accelerate the decrease in the reproductive population, are a major factor limiting the recovery of overharvested queen conch populations (Appeldoorn 1995; Stoner et al. 2012a). Reproductive potential is primarily reduced by the removal of spawning conch from the population (Appeldoorn 1995). Observations suggest mating and egg-laying in queen conch are directly related to the density of mature adults (Stoner et al. 2011; Stoner et al. 2012b; Stoner and Ray-Culp 2000). In animals that aggregate to reproduce, particularly where physical contact is required, low population densities can make it difficult or impossible to find a mate (Appeldoorn 1995; Stephens and Sutherland 1999; Stoner and Ray-Culp 2000). Challenges associated with mate finding are likely exacerbated for slow-moving animals such as conch (Doerr and Hill 2013; Farmer and Doerr 2022). This limitation

translates directly into limited recovery because increased “search time” depletes energy and time resources, reducing the rate of gametogenesis and the overall reproductive potential of the population. Although delayed mate finding appears to be the primary driver behind reproductive failure, experiments (Gascoigne and Lipcius 2004) and simulations (Farmer and Doerr 2022) suggest other factors, including delayed functional maturity at low-density sites, contribute to declines in reproductive activity.

Due to the importance of adult spawning aggregation density, Horn et al. (2022) defined the following thresholds to determine the reproductive viability of queen conch populations throughout the greater Caribbean:

- Populations with densities above 100 adult conch/ha are considered to be at a density that support reproductive activity resulting in population growth.
- Populations with densities between 50–99 adult conch/ha are considered to have reduced reproductive activity resulting in minimal population growth.
- Populations with densities below the 50 adult conch/ha threshold are considered to be not reproductively viable.

Based on the above thresholds, Horn et al. (2022) determined the majority (i.e., 69%) of jurisdictions within the queen conch’s range are characterized by populations with adult densities below the reproductively viable threshold (Figure 17). While these are general guidelines, density thresholds are location-specific and may differ among project areas. Conch densities are often measured as either “cross-shelf” or “aggregation” densities; however, these terms are poorly defined and heavily influenced by the total area surveyed, which can lead to high variance in reported data. Thus, although density is the single most important factor in determining conch reproductive success, it is difficult to make comparisons across jurisdictions.

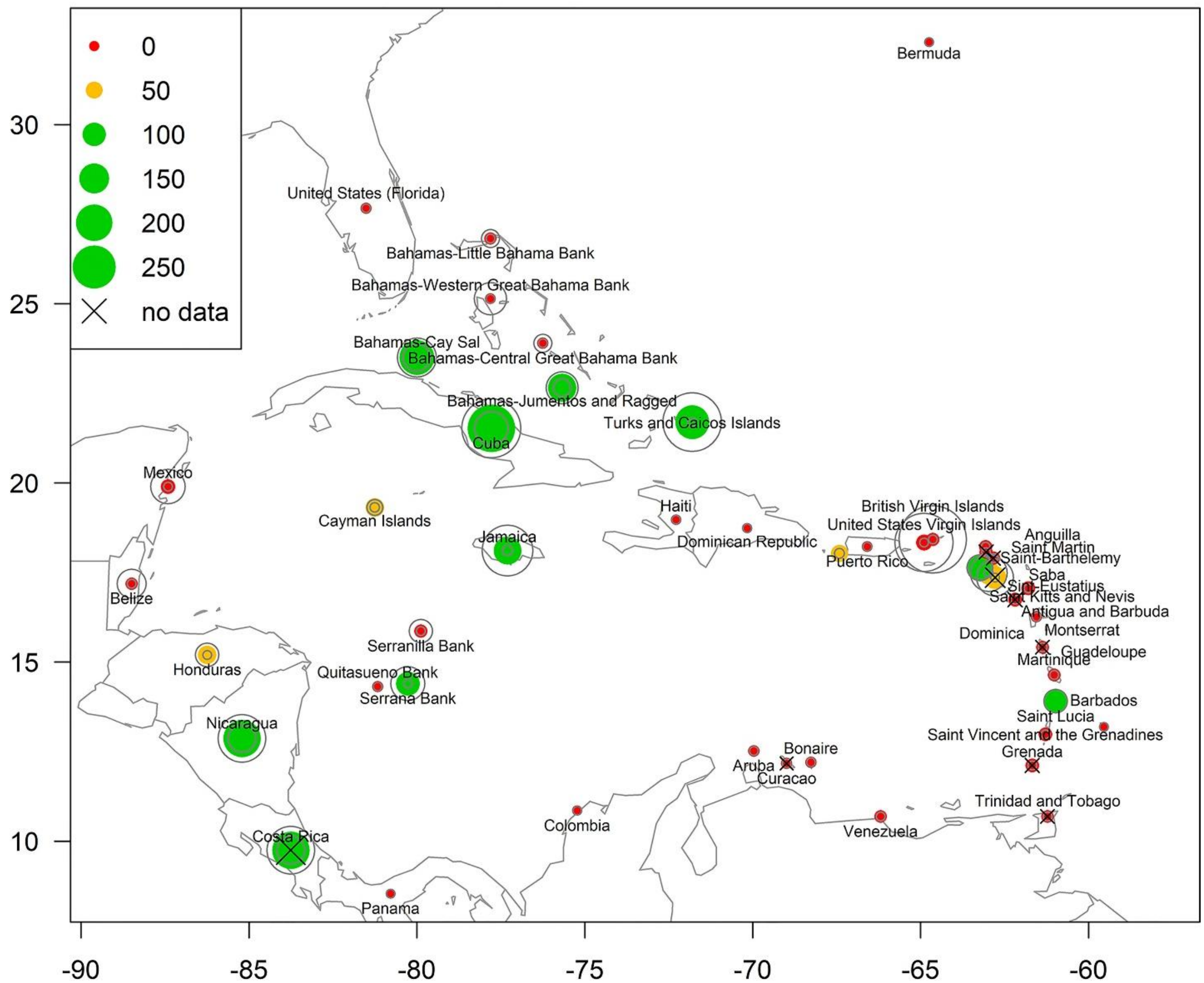


Figure 17. Adult conch densities per ha. Countries without density data (X) were interpolated from the nearest neighbor. Gray circles represent the 95% confidence interval (2.5 - 97.5% bounds) of density estimates for each jurisdiction. Where densities are summarized on a jurisdiction level, the points appear at the approximate center point of the jurisdiction; where densities are summarized on a subregional level the points appear at the location of fishing banks or subregions (i.e., The Bahamas and Puerto Rico). Figure from Vaz et al. (2022).

In Florida, thresholds for reproductive viability are likely variable; however, aggregation densities of greater than 204 conch/ha appear necessary in certain locations for successful reproduction (Delgado and Glazer 2020). Extrapolated average values of adult densities in U.S. jurisdictions, as per Horn et al. (2022), are presented in Table 7 below. It should be noted that different studies done within these regions often result in highly variable adult density values. For example, the FWRI developed a monitoring program that weights surveys based on the likelihood of encountering queen conch. The sampling design focused efforts in areas with a higher probability of queen conch presence, from Key Biscayne south to the Marquesas, including both inshore and offshore zones. Although queen conch migrate and larval dispersal varies annually, aggregations generally remain relatively stable over time and space. As a result, mapping high-density areas remains one of the most effective strategies for supporting the species' recovery. The extrapolated density of queen conch per hectare in the high density areas of the FWRI study was 150 individuals (adults and juveniles) per hectare. This extreme variability across single jurisdictions makes large area quantifications challenging.

Table 7. Adult conch density and habitat area estimates calculated by the Status Review Team; reproduced from Horn et al. (2022)

Jurisdiction	Lat	Long	Habitat (km^2)	Adult Density (Individuals/ha)	Sources Used to Support the Estimate
Florida	27.7	-81.5	2372.3	7.0	Average from studies of non-aggregation sites from 2012-2019; cross-shelf densities from Glazer and Delgado (2020) were derived by dividing total abundance estimates by statistical sampling domain
Puerto Rico	18.2	-66.6	2372.3	6.1	Derived distribution from sites in east, west, and south from 2001-2013; excluded unfished mesophotic site with higher density (reported separately)
Puerto Rico mesophotic reef	18	-67.4	NA	54.6	Unfished mesophotic site is only location where densities are over 20 conch/ha; reported separately
USVI	18.3	-64.9	323.5	44.5	Derived from all estimates from 3 islands; surveys done 2001-2011; most data are from St. Croix

In 2023, the SEFSC began a standardized and intensive sampling effort for queen conch in the U.S. Caribbean. In 2023 and 2024, the shelf areas of St. Thomas/St. John, and St. Croix were sampled using a random stratified design of available habitats. The estimated densities for the U.S. Virgin Islands were similar to those presented above. Sampling in Puerto Rico has yet to occur and future efforts will depend on available funding.

4.2.5 Status and Distribution

Historical Range and Status

Queen conch has been fished in the western tropical Atlantic since prehistoric times, but in the last four decades, pressure has increased and industrial scale fishing has developed (CITES 2003). In many range states, export fisheries have closed but artisanal subsistence fisheries and fisheries for local consumption continue. In other locations, industrial scale fishing continues despite populations with densities insufficient to support reproductive activity. Efforts to assess the condition of queen conch across its range are hampered by the lack of uniform data collection for all fishing sectors. While many jurisdictions make an effort to collect data on the main commercial fisheries, including both industrial and artisanal, data collection is difficult for small-scale fisheries. These fisheries typically land conch at a wide variety of locations, lack adequate centralized marketing outlets that can be monitored as a check on landings, and lack enforcement resources to ensure compliance with minimum size or weight requirements, quotas, and other regulations. Indirect evidence, however, strongly suggests that overfishing is affecting abundances, densities, spatial distributions, and reproductive outputs (FAO 2007; Horn et al. 2022).

Spatial distributions have been affected by fishing. Adult conch populations in shallow (<60 ft) waters tend to be reduced or eliminated first. Many jurisdictions report the loss of queen conch from shallow waters and the need for their fisheries to pursue conch with SCUBA or hookah in deeper waters (versus freediving in shallow waters). Regulations in a few jurisdictions prohibit the use of SCUBA to control fishing and subsequent depletion of deep-water stocks.

Current Range and Status

There has been no known contraction in the range of the species. The queen conch occurs throughout the Caribbean Sea and the Gulf, as well as in the Atlantic Ocean around southern Florida and around Bermuda (Figure 18).

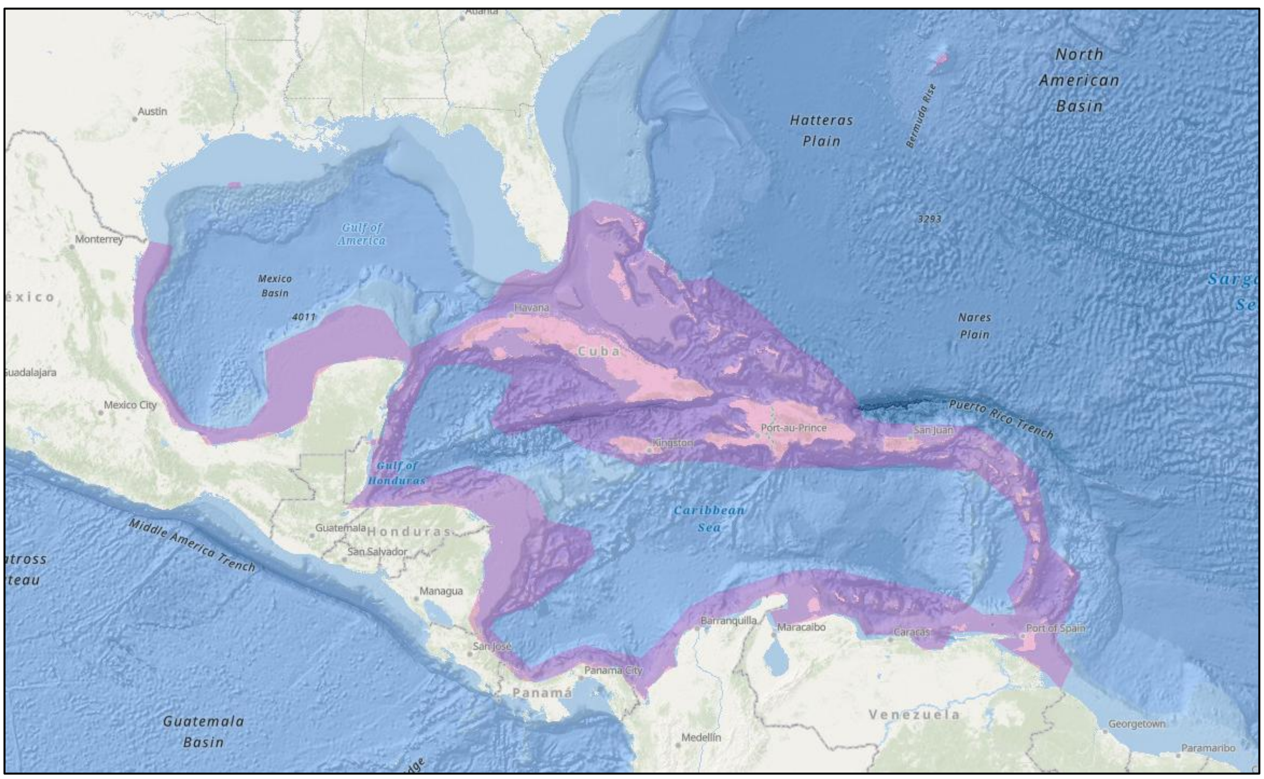


Figure 18. Map of the geographic distribution of queen conch.

Queen conch are found in marine waters at depths up to 200-ft (61-m), though they primarily occur in waters less than 100 ft (30 m) deep. U.S. waters are estimated to contain 0.61% (Puerto Rico: 0.19%, Florida: 0.22%, USVI: 0.19%) of the total contemporary adult conch population abundance and 6.94% (Puerto Rico: 3.25%, Florida: 3.25%, USVI: 0.44%) of the available conch habitat (Horn et al. 2022). Within the Southeast Region of the U.S., queen conch are most likely to occur in the following consultation areas:

- Within the 61 m (200 ft) isobaths: (1) Southeast Florida and the Atlantic Ocean side of the Florida Keys from St. Lucie Inlet south to Key West; (2) Marquesas Keys; (3) Dry Tortugas; (4) Puerto Rico; (5) USVI; (6) Navassa Island; and (7) Flower Garden Banks National Marine Sanctuary.
- Areas of the intracoastal waterway that are within 3 miles of any marine inlet from St. Lucie Inlet south to Palm Beach Inlet.
- Areas of the intracoastal waterway that are within 1.5 miles of any marine inlet from Boynton Inlet south to Haulover Inlet.
- The intracoastal waterway from Haulover Inlet south to Card Sound Bridge. Note that no surveys are required on the northern side of the Florida Keys from Card Sound Bridge south to Lignum Vitae key.
- Within 1.5 mi to the north of U.S. Highway 1 (US-1) from Lignum Vitae key south to the Seven Mile Bridge.
- Within the 10 m (33 ft) isobaths on the Gulf side of the Florida Keys from the Seven Mile Bridge (west end of Marathon) south to Key West.

The available data suggest that queen conch has been significantly depleted throughout its range with only a few exceptions. The best available information from the status review (Horn et al. 2022) indicates that only Saba, St. Lucia, Colombia’s Serrana Bank, Nicaragua, Jamaica’s Pedro Bank, Costa Rica, Cuba, and portions of the Bahamas and Turks and Caicos still have cross-shelf densities above the 100 conch/ha threshold recommended by UNEP (2012). In most areas, surveys are not performed comprehensively, and some show evidence of local overutilization. However, it appears likely that these locations have conch populations residing in difficult to fish areas that support mating success and associated recruitment.

Biotic or Abiotic Factors Dictating Range and Distribution

Most population trends have been strongly influenced by fishing pressure, both legal and illegal, unreported, and unregulated (IUU) fishing. However, reproductive shutdown in viable aggregations has been linked with warming waters, and may further contribute to population declines (O. Tzadik, NMFS and B. Glazer, FWRI, pers. comm., November 8, 2022). Warming waters can also lead to ocean acidification, which can affect the strength and functionality of shell production. Distribution shifts may result due to these factors, but have not been observed on a detectable level.

Because queen conch require certain densities to effectively reproduce, management strategies for queen conch should aim to protect high-density reproductive aggregations and breeding habitats. Populations with densities above 100 adult conch/ha are considered to support reproductive activity resulting in population growth. Reproductively viable populations in the U.S. jurisdiction are limited, but serve as an important node for connectivity and the broader recovery of the species, particularly in Puerto Rico and the USVI. Models suggest the islands in the U.S. Caribbean (i.e., St. Thomas, St. John, St. Croix, and Puerto Rico) receive larval supply from the lesser Antilles, and potentially provide larvae to downstream sources further west and north (i.e., Dominican Republic, Turks and Caicos). The deep water populations of Puerto Rico and potentially St. Croix seem to be particularly important to maintain connectivity in the region. The unique geography of the U.S. Caribbean may therefore act as a central node to the larval connectivity of queen conch throughout the range of the species. Connectivity modelling further suggests that Florida populations are the product of upstream larval supply and self-recruitment (Vaz et al. 2022). The population at Port Everglades is likely a large contributor to the recovery of conch populations throughout Florida, including the Florida Keys (Vaz, unpublished data).

Range-Wide Trends
Queen conch fisheries and documented densities have generally declined across the range, with fishing pressure (legal and IUU) as the primary driver for declines (Horn et al. 2022). Adult densities in areas protected from fishing have been documented to be higher than those on the fishing grounds. Queen conch population recovery and stability has been noted in areas that are closed to fishing as a result of conservation measures such as marine reserves or protective fisheries regulations (Doerr and Hill 2018). Continued recruitment in many areas is attributed to locations where reproductive activity is likely occurring in no-take reserves, deep-water populations, or larval supply from distant populations.

Currently, the only fishery for queen conch in U.S. federal waters is in St. Croix. This fishery is conducted almost exclusively near Lang Bank off the eastern tip of the island. Regulations allow fishing in the U.S. EEZ around St. Croix, with the exception of a seasonal closure from November 1 through May 31 in the area east of 64° 34’ W longitude (50 CFR 622.479(b)(4)). Both the USVI and Puerto Rico have fisheries in their territorial waters. Fishing for queen conch is allowed in territorial waters of the USVI from November 1 through May 31, or until the queen conch annual quota is reached. Of note, the annual quota of 50,000 lbs has not been reached in St. Croix since the implantation of the quota. Annual harvest averages roughly 25,000 lbs per year. In Florida, fishing for queen conch is prohibited and a special activity license is required to handle queen conch. These measures have been in place since the mid-1980s and the population has since shown initial signs of recovery. Long term monitoring by the FWRI has recorded increasing abundances and densities at long-term monitoring locations (Glazer and Delgado 2020).

4.2.6 Threats

Past Threats That Resulted in Population Declines
Queen conch have been harvested for centuries throughout their range and they have traditionally been an important resource for many nations in the Caribbean and Central America. Increased fishing pressure, industrialized fishing practices, and ineffective regulations/enforcement has led to the overutilization of the species. Throughout the wider Caribbean region, queen conch production has shown a negative trend over time and the decrease can largely be attributed to overfishing. Some stocks have collapsed and are yet to recover (Theile 2001). Overfishing and collapsing stocks have disrupted larval connectivity in queen conch populations. Historically, the southeastern part of the species’ range served as a key source of larvae and genetic exchange for the Western Caribbean (Vaz et al. 2022). Although some connectivity remains among populations in the central and southwestern Caribbean, it likely persists due to a few high-density areas, such as the deep-water population off Puerto Rico

and Saba Bank. Ongoing fishing pressure, illegal harvest, and weak enforcement of regulations continue to threaten these populations, increasing their risk of extinction in the near future.

Queen conch populations in Florida experienced large declines since the 1950s due to fisheries harvest and habitat degradation, despite protective regulations implemented in the 1980s and 1990s, and have recently shown initial signs of recovery. As previously discussed, the best available data indicate the density of large adults is still too low and/or compromised (i.e. non-reproductive adults in nearshore areas) to restore healthy populations across the three distribution zones in South Florida: nearshore, back reef, and deepwater (Horn et al. 2022).

Queen conch populations in Puerto Rico showed signs of steady decline beginning in the 1980s (CITES 2012). Estimated fishing mortality exceeded estimates of natural mortality and catch continued to decline while effort increased through 2011 (CITES 2012). This resulted in the catch increasingly skewed to smaller sizes, all suggesting that Puerto Rican populations have been overfished for decades (Appeldoorn 1993; SEDAR 2007). Recently, however, studies have suggested that some of the downward demographic trends may be reversing (Baker et al. 2016; Jiménez 2007). Larger size distributions, higher adult queen conch densities, an increase in the proportion of older adults, and evidence of sustained recruitment suggest that populations are recovering to some extent (Baker et al. 2016).

Queen conch populations in the USVI are depleted compared to historical values due to fishing (Horn et al. 2022). Preliminary scientific monitoring occurred in the 1980s when population densities were well below reproductive viability (< 20 adults per hectare). However, recent studies suggest that density values are currently higher than those recorded in the 1980s (Horn et al. 2022) and nearing cross shelf densities of 50 adults per hectare. The implementation of conservation strategies that include a 5 month seasonal closure, along with area closures, is likely responsible for the increasing densities. While an annual catch limit of 50,000 lbs was agreed to by both federal and state agencies, annual catch rarely exceeds half that value, likely due to market constraints.

Current Threats That May Be Affecting Recovery

<u>Overutilization</u>

Queen conch are highly sought after for their meat, shell, and pearls in the Caribbean, although the meat is the most common product in trade. The species has been harvested for centuries and they are an important fishery resource for many nations in the Caribbean and Central America. As a result, the most significant threat to queen conch is overutilization (through commercial; artisanal; and IUU fishing), and current regulatory mechanisms (e.g., regulations and enforcement) are considered inadequate to reverse this trend in the foreseeable future. The majority of the queen conch meat is landed in Belize, The Bahamas, Honduras, Jamaica, Nicaragua, and Turks and Caicos. In the artisanal fishery, queen conch are sometimes landed with the shell, but mostly as unclean meat with the majority of organs still attached. Additionally, local markets and subsistence fishing of queen conch is often not monitored or not included in catch data. In some jurisdictions, the subsistence and locally marketed catches are small, but they can be high in some jurisdictions (Prada et al. 2017). Furthermore, the best estimates of unreported catch and illegal harvest is most likely an underestimate, yet accounts for about 15 percent of total annual catch (Horn et al. 2022). Furthermore, queen conch meat production shows a negative trend over time and the decrease can largely be attributed to overfishing (Prada et al. 2017).

Inadequate Regulatory Mechanisms

The best available information indicates that existing regulatory mechanisms are inadequate to control the harvest and overutilization of queen conch throughout most of its range due to: (1) the ongoing demand for queen conch; (2) issues with compliance; (3) appropriateness of certain morphometric regulations; and (4) issues with enforcement and poaching. Currently, relatively few jurisdictions (e.g., Belize, Jamaica, Nicaragua, Colombia, and the Bahamas) are conducting assessments and periodic surveys to gather relevant information on the status of their queen conch populations to inform their national management regimes (Queen Conch Population Assessment Workshop, Belize, 2019). Despite fishery management regulations aimed at controlling commercial harvest, ineffective management measures, along with poor enforcement and significant IUU fishing, demonstrate the existing regulatory mechanisms throughout much of the range of the species are inadequate to achieve their purpose of protecting the queen conch from unsustainable harvest and continued population decline.

Ocean warming and acidification

Well-documented increases in average and extreme ocean temperatures and acidification represent significant threats to queen conch reproduction and shell calcification in the foreseeable future. Queen conch reproduction is dependent on water temperature and, therefore, any changes may disrupt reproduction. Specifically, increasing ocean temperatures may have direct effects on the timing and length of the reproductive season and ultimately decrease reproductive output during peak spawning periods (Appeldoorn et al. 2011). Early life history stages of queen conch are particularly sensitive to ocean temperature and rising water temperatures may have a direct impact on larval and egg development (Aldana-Aranda and Manzano 2017; Boettcher et al. 2003; Chávez Villegas et al. 2017; Harley et al. 2006). Warming oceans may also adversely affect the Caribbean region through ocean acidification, which impacts the calcification process of organisms with calcareous structures, such as queen conch. Ocean acidification impedes calcareous shell formation and, thereby, impacts shell development (Aldana-Aranda and Manzano 2017; Parker et al. 2013). Reduced shell strength may increase vulnerability to predation (Horn et al. 2022).

While seasonal temperature changes likely initiate spawning cues in queen conch, recent extreme warming events in Southern Florida are likely causing reproductive failure at shallow water aggregation locations in the Florida Keys (FWC, Public Comment, November 7, 2022). These shallow-water aggregations are isolated from the deep-water aggregations by Hawk Channel, which runs parallel to the reef throughout the entire reef tract of the Florida Keys. Most nearshore populations in Florida show a complete lack of reproductive activity with reduced gonadal development (Delgado et al. 2004; Glazer and Quintero 1998). The shallow-water queen conch resume spawning activity if they are relocated to deep-water aggregation locations (Delgado et al. 2004).

Pollution

Reproductive inhibition has been described for individuals that are exposed to contaminants (Spade et al. 2010). In particular, high concentrations of Tributyltin (TBT), a biocide previously used in antifouling paint and commonly found in water and sediment samples near marinas and shipping lanes (Chau et al. 1997), is known to cause imposex in conch (Titley-O'Neal et al. 2011). Imposex is a condition in which male external genitalia are present in the female conch, and female reproductive capacity is greatly reduced.

Other Threats

Beyond the major factors identified in the listing and described above, one of the largest contributors to queen conch mortalities from anthropogenic activities is likely sedimentation. Deposition of fine sediment particles onto queen conch and their associated benthic habitats will initiate a multitude of detrimental effects on the species. Developing embryos, hatching veliger larvae, and metamorphic post-settlement larvae are intolerant of fine sediments. These early life stages may experience severe mortality in sediment accumulation as little as 0.1-mm (Doerr et al. *in prep*).

Sedimentation may also have indirect effects on queen conch. Juvenile and adult queen conch rely heavily on hard bottom or pavement substrates colonized by diatomaceous films and epiphytic macroalgae for their primary food resource. Juvenile and adult queen conch are mostly likely to be impacted by increased sedimentation through the smothering of their primary food resource and the subsequent reduced food availability, potentially resulting in reduced assimilation of nutrients and poor physical condition, reduced growth rates contributing to increased predation, and potentially starvation (Stoner and Appeldoorn 2022).

Increased amounts of fine sediments may also compromise the gill function of juvenile and adult queen conch, leading to respiratory and physiological effects. Increased water column turbidity from fine suspended particles could interfere with visual perception of adult queen conch and disrupt mate finding for successful reproduction. The direct impact of sediment-associated chemical contaminants is largely unknown, though pesticides, heavy metals, and persistent pollutants (e.g., butyltins) that have been pervasive in the shipping industry for decades have also been shown to inhibit larval development, cause physiological abnormalities, and contribute to reproductive failure (Titley-O'Neal et al. 2011).

Predation and competition are not currently considered significant threats influencing the status of queen conch.

5 ENVIRONMENTAL BASELINE

5.1 Overview

This section describes the effects of past and ongoing human and natural factors contributing to the current status of the species, their habitats (including critical habitat), and ecosystem within the action area without the additional effects of the proposed action. In the case of ongoing actions, this section includes the effects that may contribute to the projected future status of the species, their habitats, and ecosystem. The environmental baseline describes the species' and critical habitat's health based on information available at the time of the consultation.

By regulation, the environmental baseline for an Opinion refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The impacts to listed species or designated critical habitat from Federal agency activities or existing Federal facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR 402.02).

Focusing on the impacts of the activities in the action area specifically, allows us to assess the prior experience and state (or condition) of the endangered and threatened individuals, and areas of critical habitat that occur in an action area, that will be exposed to effects from the action under consultation. This focus is important because, in some states or life history stages, or areas of their ranges, listed individuals or critical habitat features will commonly exhibit, or be more susceptible to, adverse responses to stressors than they would be in other states, stages, or areas within their distributions. These localized stress responses or stressed baseline conditions may increase the severity of the adverse effects expected from the proposed action.

5.2 Baseline Status of ESA-Listed Species Considered for Further Analysis

The status of queen conch in the action area, as well as the threats to this species, is supported by the species account in Section 4 (Status of the Species).

As stated in Section 2.2 (Action Area), the proposed project site is located at latitude 18.325050° and longitude -64.848260° (NAD 83) in Red Hook Quarter, St. Thomas, USVI. The project site is located within the existing footprint of a hurricane-damaged marina in Vessup Bay and Muller Bay, approximately 0.50 nm from the South Atlantic Ocean. The depth of water within the construction area ranges between -10-ft MLW and -40-ft MLW. Substrate in the nearshore project area consists of sand and silt with coral reef and hardbottom habitats (colonized pavement, rubble/colonized pavement), degraded wall, and unconsolidated sediments, non ESA-listed and ESA-listed corals, mangroves, seagrasses, sponges, and macroalgae. The site contains a peninsula that forms the southern entrance to Red Hook Bay. That peninsula is a rocky abutment that extends to the National Park Service property on the east side and the Vessup Beach area to the south. The action area around Jack Rock Point, including portions of Vessup Bay and Muller Bay, documented 11 adult and 102 juvenile queen conch in the action area in a queen conch survey conducted by BioImpact dated September 2025 (see Appendix 2 for survey protocol).

5.3 Additional Factors Affecting the Baseline Status of ESA-Listed Species Considered for Further Analysis

5.3.1 Federal Actions

Activities funded, authorized, or carried out by federal agencies have been identified as threats and may affect queen conch within the action area.

Environmental Protection Agency (EPA)
The EPA regulates discharge of pollutants, such as oil, toxic chemicals, radioactivity, carcinogens, mutagens, teratogens, or organic nutrient-laden water, including sewage water, into the waters of the U.S. Elevated nutrients in the water column typically lead to increased algal growth. The EPA has been involved in ongoing litigation over the sufficiency of standards promulgated by the USVI to regulate discharges of nutrients into state waters, including habitats occupied by queen conch.

Managed Fisheries
Within the action area, both recreational and commercial fisheries occur in territorial and federal waters. The Caribbean Fishery Management Council (CFMC) develops fishery management plans (FMP), implemented by NMFS-approved fishery regulations, that govern fishing activities that may affect ESA-listed species. For all fisheries for which there is a FMP or for which any federal action is taken to manage that fishery, impacts are evaluated under Section 7 of the ESA.

On April 14, 2020, the CFMC requested formal consultation for three new independent island-based FMPs (Puerto Rico FMP, St. Thomas/St. John FMP, and St. Croix FMP), collectively known as the Island Based Fishery Management Plan (IBFMP). NMFS completed a Biological Opinion for all three island-based FMPS on September 21, 2020.

Current federal fishing regulations for queen conch under the IBFMP continue to implement the fishing regulations previously established under the prior FMP. For the USVI, harvest and possession of queen conch is prohibited in the EEZ, with the exception of Lang Bank, St. Croix, where fishing for queen conch is only allowed from November 1 through May 31.

Vessel Operations
The Department of the Interior, including NPS, along with NOAA and the U.S. EPA, also conduct research activities using federal research vessels as part of coral reef monitoring activities within the territorial waters of the USVI.

Federal vessel operations traveling through the action area are likely. Through the Section 7 process, where applicable, NMFS will continue to establish conservation measures for federal agency vessel operations to avoid or minimize adverse effects to listed species and critical habitat.

Federal Dredging Activity
The USACE authorizes and carries out construction and dredge-and-fill activities that may result in adverse effects to queen conch through physical injury if struck by dredge

equipment or during pumping, excavating and dumping of dredge material. Queen conch may also be adversely effected by turbidity associated with dredging activities.

5.3.2 State and Private Actions

The Territorial Government regulates activities that occur in terrestrial and marine habitats of USVI. The V.I. Code prohibits the taking, possession, injury, harassment, sale, offering for sale, etc. of any indigenous species, unless a person holds a valid fishing or hunting license, scientific or aquarium collecting permits, or indigenous species retention permits (V.I. Code Title 12 and the Indigenous and Endangered Species Act of 1990). Additionally, USVI has a comprehensive, state regulatory program that regulates most land, including upland and wetland, and surface water alterations throughout the Territory, including in partnership with NOAA under the Coastal Zone Management Act, and EPA under the Clean Water Act.

In accordance with federal and territorial regulations (50 CFR 622.491; V.I.C. Title 12, Chapter 9A §316; VI.R.R. Title 12, Chapter 9A §316-1) fishing for queen conch in U.S. Caribbean federal waters is allowed only in waters east of 64°34′ W longitude, from November 1 through May 31st. These seasonal restrictions protect queen conch populations during critical reproductive periods, ensuring sustainable fisheries and preserving USVI marine resources for future generations. Possession of queen conch in USVI jurisdictional waters (0-3 nm) is otherwise prohibited from June 1 through October 31.

5.3.3 Natural Disturbance and Changing Environmental Conditions

There is a large and growing body of literature on past, present, and future impacts creating changes in sea temperatures and salinity (due to melting ice and increased rainfall), ocean currents, storm frequency and weather patterns, and ocean acidification. These changes have the potential to affect species behavior and ecology including migration, foraging, reproduction (e.g., success), and distribution. Ocean surface warming and ocean acidification may also affect marine forage species, either negatively or positively. It may also affect migratory behavior (e.g., timing, length of stay at certain locations).

Hurricanes can be beneficial in areas outside of heavy storm surge, as they lower water temperatures providing fast relief to corals during periods of high thermal stress (Heron et al. 2016). Low-energy hurricanes may also act to scour competing macroalgae off patches of reef, which also may be beneficial to reef health. However, hurricanes and large coastal storms may also significantly change benthic habitat and cause the displacement of queen conch. Post Hurricane Maria, local fishermen in Naguabo, Puerto Rico, reported seagrass beds being severely damaged and queen conch disappearing from areas where queen conch were locally known to be abundant (Naguabo fisherman, personal communication with Helena Antoun, 2017).

With regard to the action area, ocean surface warming and ocean acidification may affect the timing and extent of queen conch population movements and their range, distribution, composition of prey or foraging habitat, and the range and abundance of competitors and predators. Changes in distribution including displacement from ideal habitats, decline in fitness of individuals, population size due to the potential loss of foraging opportunities, abundance, migration, community structure, susceptibility to disease and contaminants, and reproductive success are all possible impacts that may occur as the result of changing environmental conditions. Still, more information is needed to better determine the full and entire suite of impacts of ocean surface warming and ocean acidification on queen conch and specific predictions regarding impacts in the action area are not currently possible.

5.3.4 Conservation and Recovery Actions Shaping the Environmental Baseline

In 1996, the CFMC published the first queen conch fishery management plan for Puerto Rico and the USVI (CFMC 1996). The management plan established size limits, catch limits, seasonal closures, gear restrictions, and the prohibition of sale of undersized individuals. The rule also required that all queen conch be landed in the shell.

On April 28, 2005, NMFS published a final rule prohibiting commercial and recreational catch and possession of queen conch in federal waters of the U.S. Caribbean, with the exception of Lang Bank, St. Croix, in federal waters east of 64°34′ W (FR: 70 FR 62073).

On May 31, 2011, NMFS published a final rule prohibiting fishing and possession of queen conch in or from the Caribbean EEZ east of 64°34′ W, which includes Lang Bank, when harvest and possession of queen conch is prohibited in St. Croix territorial waters as a result of territorial quota closures. The intended effects of this final rule was to prevent additional fishing pressure on queen conch in the U.S. Caribbean, and to improve enforcement of regulations affecting the queen conch resource by improving compatibility among Federal and territorial regulations.

On September 13, 2022, NMFS published a final rule establishing 3 new island specific fishery management plans for Puerto Rico, St. Thomas/St. John, and St. Croix, collectively known as the Island Based Fishery Management Plans. This final rule restructures prior fishery management regulations corresponding to the U.S. Caribbean-wide FMPs (Reef Fish, Spiny Lobster, Corals and Reef Associated Plants and Invertebrates, and Queen Conch) to three subparts corresponding to island-based FMPs (Puerto Rico, St. Thomas and St. John, and St. Croix). Additionally, the new IBFMPs incorporate U.S. Caribbean-wide management measures, as appropriate, into the appropriate island-specific subpart. Spiny lobster, queen conch, 47 species of fish, and all species of corals, sea urchins, and sea cucumbers that occur within the St. Thomas and St. John management area were included for management in the St. Thomas and St. John FMP.

On February 14, 2024, NMFS published a final rule to list the queen conch (*Aliger gigas*, previously known as *Strombus gigas*) as a threatened species under the Endangered Species Act (ESA) (89 FR 11208, February 14, 2024).

At present, queen conch continues to be managed in state and federal waters under state/territory regulations and the St. Thomas/St. John IBFMP. Possession and harvesting of queen conch is allowed in state waters with a special fishing permit. Fishing is allowed only during open season, cannot exceed commercial or recreational catch quotas, and must meet size restrictions. Possession and harvesting of queen conch continues to be prohibited in federal waters with the exception of Lang Bank, St. Croix, as mentioned above.

6 EFFECTS OF THE ACTION

6.1 Overview

Effects of the action refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action that will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. 50 CFR 402.02 (2018).

In this section of our Opinion, we assess the effects of the action on listed species and critical habitat that are likely to be adversely affected. The analysis in this section forms the foundation for our jeopardy analysis and destruction or adverse modification analysis in Section 8. The quantitative and qualitative analyses in this section are based upon the best available commercial and scientific data on species biology and the effects of the action. Where data are limited or equivocal, we have occasionally needed to make reasonable determinations based upon our best professional judgment to bridge the gap in the available data. Sometimes, the best available information may include a range of values for the number of queen conch needing relocation within the action area. In all instances the approach to our analysis is explained, including how uncertainty, causation, and the choice among a range of values are evaluated and addressed.

6.2 Effects of the Proposed Action on ESA-Listed Species Considered for Further Analysis

6.2.1 Routes of Effect That Are Not Likely to Adversely Affect ESA-Listed Species

Physical Impacts

Queen conch may be physically injured if struck by construction equipment and materials, or by direct impact during pile installation or dredging if found within the action area during construction. However, we believe the risk of physical injury due to construction activity is extremely unlikely to occur. The applicant will implement and adhere to NMFS SERO's *Protected Species Construction Conditions* (NMFS 2021). Additionally, because of previous observations of queen conch in the action area, the applicant will implement and adhere to the guidelines in Appendix 2. Due to the repeated surveys and permanent relocation of queen conch it is unlikely this species will be found in the action area behind the turbidity curtains. For all areas of the project that require helix anchor installation or small marine debris removal, trained divers will be able to visually survey for and avoid queen conch. Work will not resume until the mitigation measures outlined in Section 2.1.2 have been met. Additionally, construction would be limited to daylight hours only, and dredge and fill activities should be complete in approximately 30 days and 60 days for pile driving activities.

Turbidity

Queen conch may be adversely affected by turbidity due to construction activities. However, we believe adverse effects to queen conch due to turbidity is extremely unlikely to occur. Benthic surveys found queen conch concentrated mostly within the mooring field were they would be away from the effects of turbidity as a result of marina construction activities. Turbidity curtains will be placed where construction activities will take place, and will remain in place until dock construction activities have been completed and conditions return to preconstruction conditions. Installation of mooring buoys in the mooring field will be done manually and will result in minimal sediment disturbance. Additionally, the benthic substrate within the mooring field is composed of sand, which is heavy and settles quickly. Finally, should any queen conch be found within the perimeter of the marina footprint where they may be exposed to turbidity associated with construction activities, they will be relocated to the mooring field per the guidelines outlined in Appendix 2.

Habitat alteration
Adult queen conch prefer sandy algal flats but are also found on gravel, coral rubble, smooth hard coral, and beach rock bottom, while juveniles are primarily associated with seagrass beds (Doerr and Hill 2018; Glazer and Kidney 2004; Stoner 2003). The proposed project will result in the removal of dredged material from an area measuring about 219,268-ft^2 (5.03-ac), and in the removal of approximately 51,590-ft^2 non-native SAV and algae from the action area. The installation of the moorings and the wave attenuator would directly impact 34-ft^2 and 19-ft^2 of SAV and macroalgae, respectively; pilings outside the dredging footprint would impact 763-ft^2 of SAV; and navigational and information markers would impact 3-ft^2 of SAV. Vessel shading at the marina is expected to impact 41,400-ft^2 of SAV. The total direct impact to benthic substrate, which is primarily a mix of open sand, macroalgae, and *H. stipulacea*, would be 220,087-ft^2 (5.05-ac). The proposed project may temporarily disturb potential foraging and resting habitat for queen conch within the construction footprint. We believe these effects to foraging and resting habitat for queen conch will be insignificant. The habitat within the project footprint is already degraded and there is an abundance of higher quality habitats present within the bay. Water quality and seagrass abundance within the proposed mooring field is expected to improve following the completion of the proposed project due to the requirement for embedded anchors, floating lines, and the availability of a pump-out station. While the proposed project will result in the loss of non-native SAV, the project is not expected to result in a significant loss of native seagrass.

Due to the water depth and the north-south orientation and narrow width of the attenuator, it should have a negligible impact on the SAV within its footprint. When individually and cumulatively viewing the areal scale of the proposed project, we believe this loss of habitat will not appreciably reduce the abundance of habitat available to queen conch and suitable for foraging and resting.

6.2.2 Routes of Effect That Are Likely to Adversely Affect ESA-Listed Species

Queen Conch Relocation
The proposed action includes the construction of a marina and the installation of a managed mooring field. Within the footprints of the marina and mooring field, 11 queen conch adults and 102 juveniles were documented during a queen conch survey conducted in September 2025. Two of the adults were found within the outer 12-m buffer perimeter of the marina construction footprint, and the remaining 9 adults were found within the footprint of the proposed mooring field. All documented juveniles were found within the mooring field buffer area in Muller Bay. Any queen conch found present in the marina construction footprint where construction and

dredging will take place (Figure 2 and 7) will need to be relocated prior to the start of construction (see Section 2.1.2).

Relocation may adversely affect queen conch due to the stressors of capturing, tagging, transporting, and placing queen conch in the relocation site. These stressors may cause queen conch to experience harassment and disruption of normal behavioral patterns. In January 2025, the FWC and FKNMS received interim reporting on a 2024 translocation (relocation) experiment with tagged queen conch among three locations in the Upper Keys and a smaller scale 1-km translocation near Port Everglades (Interim Report to FWC and FKNMS, Gutzler and Kough, 2025). Individual queen conch were relocated to queen conch aggregations outside of their natal placement, in-line with the relocation work as described in the proposed action. Within 6 months, 7 of the 25 relocated individuals died, and no control (non-relocated) animals died. It is possible that differences in shell algal coloration patterns or some other factors result in increased predation rates on relocated individuals. Based on these observations, NMFS assumes a 28% (7 ÷ 25 = 0.28) mortality rate for conch relocated during the proposed action.

Based on the queen conch pre-construction survey, we do not expect to find juvenile queen conch within the marina footprint where construction and dredging will take place. To estimate the number of queen conch that may be relocated as part of the proposed marina construction and to account for seasonable movement of queen conch within the action area, we use the (a) the area of the marina construction footprint (i.e., 22,499-ft^2; 0.209 ha), and (b) the density estimates of adult queen conch per hectare for USVI, as determined by Horn et al. (2022) (i.e., 44.51 queen conch/ha).

0.209 ha × 44.51 queen conch/ha = 9.30 queen conch

We round 9.30 up to 10 to account for whole animals that may be relocated for the duration of the project. Of these 10 relocated queen conch, up to 3 queen conch (10 x 0.28 = 2.8) may experience mortality post-relocation. Mortality of queen conch post-relocation constitutes the death of the animal. NMFS believes that if queen conch are relocated to nearby areas (e.g. far eastern area of the mooring field), this mortality rate is lower than the mortality rate that would result if the individuals were left in place throughout the project.

Relocation of queen conch will be coordinated between the applicant and the USVI DPNR. An appropriate relocation site will be determined by USVI DPNR and specified in the Special Activity License, which is required for queen conch relocation in USVI.

7 CUMULATIVE EFFECTS

ESA Section 7 regulations require NMFS to consider cumulative effects in formulating its Opinions (50 CFR 402.14). Cumulative effects include the effects of future state or private actions, not involving federal activities, that are reasonably certain to occur within the action area considered in this Opinion (50 CFR 402.02). NMFS is not aware of any future projects that may contribute to cumulative effects. Within the action area, the ongoing activities and processes described in the environmental baseline are expected to continue and NMFS did not identify any additional sources of potential cumulative effect. Although the present human uses of the action area are expected to continue, some may occur at increased levels, frequency, or intensity in the near future as described in the environmental baseline.

8 JEOPARDY ANALYSIS

To "jeopardize the continued existence of" a species means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and the recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Thus, in making this determination for each species, we must look at whether the proposed action directly or indirectly reduces the reproduction, numbers, or distribution of a listed species. If there is a reduction in 1 or more of these elements, we evaluate whether the action would be expected to cause an appreciable reduction in the likelihood of both the survival and the recovery of the species.

The NMFS and USFWS's ESA Section 7 Handbook (USFWS and NMFS 1998) defines survival and recovery, as these terms apply to the ESA's jeopardy standard. Survival means "the species' persistence…beyond the conditions leading to its endangerment, with sufficient resilience to allow recovery from endangerment." The Handbook further explains that survival is the condition in which a species continues to exist into the future while retaining the potential for recovery. This condition is characterized by a sufficiently large population, represented by all necessary age classes, genetic heterogeneity, and number of sexually mature individuals producing viable offspring, which exists in an environment providing all requirements for completion of the species' entire life cycle, including reproduction, sustenance, and shelter. Per the Handbook and the ESA regulations at 50 CFR 402.02, recovery means "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in Section 4(a)(1) of the Act." Recovery is the process by which species' ecosystems are restored or threats to the species are removed or both so that self-sustaining and self-regulating populations of listed species can be supported as persistent members of native biotic communities.

The analyses conducted in the previous sections of this Opinion serve to provide a basis to determine whether the proposed action would be likely to jeopardize the continued existence of queen conch. In Section 6.2, we outlined how the proposed action can adversely affect this species. Now we turn to an assessment of the species' response to these impacts, in terms of overall population effects, and whether those effects of the proposed action, when considered in the context of the Status of the Species (Section 4.0), the Environmental Baseline (Section 5.0), and the Cumulative Effects (Section 7.0), will jeopardize the continued existence of the affected species. For any species listed globally, our jeopardy determination must evaluate whether the proposed action will appreciably reduce the likelihood of survival and recovery at the species' global range. For any species listed as DPSs, a jeopardy determination must evaluate whether the proposed action will appreciably reduce the likelihood of survival and recovery of that DPS.

8.1 Queen Conch

8.1.1 Survival

The proposed action involves the relocation of up to 10 adult queen conch which is expected to occur over the duration of the project. Of the estimated 10 individuals to be relocated, we expect up to 3 relocated individuals to potentially experience mortality events post-relocation. The remaining 7 relocated individuals are expected to survive relocation. The potential survival of any relocated individuals is not expected to have a measurable impact on the reproduction, numbers, or distribution of the species. These survivors are expected to fully recover over time, although the process is expected to stress the animals. Individuals suffering non-lethal injuries or stresses are expected to fully recover such that no reductions in reproduction or numbers of queen conch are anticipated. The relocation of any animals also would not result in a change in the distribution queen conch.

The proposed action could result in the potential mortality of up to 3 adult queen conch post-relocation. These potential mortalities would reduce the number of queen conch, compared to their numbers in the absence of the proposed action, assuming all other variables remained the same. Post-relocation mortalities would also result in reduction in future reproduction, assuming that some of the relocated individuals are females and would have survived otherwise to reproduce. Assuming that all relocated individuals are female, and 3 of these individuals experience mortality (n = 3 individuals), and each female produces 3-4 clutches per season with a clutch size of 250,000–750,000 eggs, reproductive output could diminish by approximately 9,000,000 eggs (= 4 clutches x 750,000 eggs x 3 females) (Stoner and Appeldoorn 2022). Although specific survival rates for queen conch have not been determined, gastropods typically exhibit significant variability in survival. If we assume a 1% survival rate for eggs under normal conditions, this translates to a decrease of approximately 90,000 individuals per season due to the mortality events resulting from the proposed action.

Whether the reductions in queen conch numbers and reproduction attributed to the proposed action would appreciably reduce the likelihood of survival depends on the changes relative to current population sizes and trends. Queen conch are distributed throughout the Caribbean. Horn et al. (2022) estimated the total adult queen conch abundance (i.e., the sum of median estimated abundance across all jurisdictions) at 743 million individuals; this estimate is highly uncertain and based on data of varying quantity and quality by jurisdiction. Numerous lines of evidence suggest that the vast majority of conch populations have declined and are suffering recruitment failure or Allee effects, with evidence of ongoing declines in many populations (Horn et al. 2022). U.S. waters are estimated to contain 0.61% of the total contemporary adult conch population abundance (approximately 4.5 million individuals) and 6.94% of the available conch habitat (Horn et al. 2022). These estimates were derived from extrapolating representative densities across known viable habitats, and are therefore very broad and highly uncertain. Populations of queen conch exhibit clumped and patchy distributions and cross shelf densities are difficult to extrapolate.

Surveys between 2008 and 2010 estimated the median population for the combined area of St. Thomas, St. John, and St. Croix at 44.5 adult conch per hectare (Table 7). The USVI does manage a queen conch fishery in territorial waters that implements seasonal closures, size restrictions, and catch limits. Based on NOAA's 2022 queen conch catch data they are not subject to overfishing. The loss of up to 3 queen conch post-relocation will not significantly decrease the population of queen conch as this is a limited amount of loss relative to the estimated population size, nor will it change the distribution queen conch.

After analyzing the magnitude of the effects of the proposed action, alongside the past, present, and future expected impacts to the species discussed in this Opinion, we believe that the proposed action is not expected to appreciably reduce the likelihood of queen conch survival in the wild.

8.1.2 Recovery

The queen conch currently lacks an official recovery plan or outline. However, the primary threats identified in the status review (Horn et al. 2022) are overutilization (including commercial, artisanal, illegal, unreported, or unregulated fishing), inadequate existing regulations, and changing ocean conditions across the species' range. Therefore, recovery efforts are anticipated to focus on international collaboration to address these major threats, including encouragement of sustainable fishing practices and improved enforcement of regulations. There is a managed queen conch fishery in federal waters. The proposed action is not expected to exacerbate or contribute to the major threats affecting the species' status. The proposed action also is not expected to hinder the potential recovery strategies or the overall recovery of the queen conch throughout its range.

Relocation will reduce harm to queen conch relative to leaving them in place during the proposed action, but is anticipated to result in behavioral disruption of all relocated conch and the potential lethal take of approximately 28% of relocated individuals. In an ideal scenario, the relocation of up to 10 individuals will augment existing sub-populations and individuals will continue to be reproductively successful.

As outlined above, the potential capture, collection, harassment, behavioral disruption, and death associated with this action will result in a reduction in population abundance; however, the action is unlikely to influence the recovery objectives and trends noted above, when considered in the context of the Status of the Species, and the Environmental Baseline discussed in this Opinion. Thus, the proposed action will not result in an appreciable reduction in the likelihood of queen conch recovery in the wild.

8.1.3 Conclusion

The potential relocation of up to 10 queen conch (3 lethal, 7 non-lethal) associated with the proposed action is not expected to cause an appreciable reduction in the likelihood of either the survival or recovery of queen conch in the wild.

9 CONCLUSION

We reviewed the Status of the Species, the Environmental Baseline, the Effects of the Action, and the Cumulative Effects using the best available data.

The proposed action will result in the take of up to 10 queen conch (3 lethal and 7 non-lethal). Given the nature of the proposed action and the information provided above, we conclude that the action, as proposed, is not likely to jeopardize the continued existence of queen conch.

10 INCIDENTAL TAKE STATEMENT

10.1 Overview

Section 9 of the ESA and protective regulations issued pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. *Take* is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct (ESA Section 2(19)). *Incidental take* refers to takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that would otherwise be considered prohibited under Section 9 or Section 4(d) but which is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA, provided that such taking is in compliance with the Reasonable and Prudent Measures and the Terms and Conditions of the Incidental Take Statement of the Opinion.

The take of queen conch by the proposed action is not prohibited under ESA Section 9, as no Section 4(d) Rules for the species have been promulgated. However, a circuit court case held that non-prohibited incidental take must be included in the Incidental Take Statement (*CBD v. Salazar*, 695 F.3d 893 [9th Circuit 2012]). Though the *Salazar* case is not a binding precedent for this action, which occurs outside of the 9th Circuit, NMFS finds the reasoning persuasive and is following the case out of an abundance of caution and because we anticipate that the ruling will be more broadly followed in future cases. Providing an exemption from Section 9 liability is not the only important purpose of specifying take in an Incidental Take Statement. Specifying incidental take ensures we have a metric against which we can measure whether or not reinitiation of consultation is required. Including these species in the Incidental Take Statement also ensures that we identify Reasonable and Prudent Measures that we believe are necessary or appropriate to minimize the impact of the incidental take on the species.

Section 7(b)(4)(c) of the ESA specifies that to provide an Incidental Take Statement for an endangered or threatened species of marine mammal, the taking must be authorized under Section 101(a)(5) of the MMPA. Since no incidental take of listed marine mammals is anticipated as a result of the proposed action, no statement on incidental take of protected marine mammals is provided and no take is authorized. Nevertheless, the applicant must immediately notify (within 24 hours, if communication is possible) our Office of Protected Resources if a take of a listed marine mammal occurs.

As soon as the applicant or the USACE becomes aware of any take of an ESA-listed species under NMFS's purview that occurs during the proposed action, the applicant or the USACE shall report the take to NMFS SERO PRD via the NMFS SERO Endangered Species Take Report Form. This form shall be completed for each individual known reported capture, entanglement, stranding, or other take incident. Information provided via this form shall include the title, Latitude 18 Marina and Mooring, the issuance date, and ECO tracking number, SERO-2024-00367, for this Opinion; the species name; the date and time of the incident; the general location and activity resulting in capture; condition of the species (i.e., alive, dead, sent to rehabilitation); size of the individual, behavior, identifying features (i.e., presence of tags, scars, or distinguishing marks), and any photos that may have been taken. At that time, consultation may need to be reinitiated.

10.2 Amount or Extent of Anticipated Incidental Take

Based on the above information and analyses, NMFS believes that the proposed action is likely to adversely affect queen conch. These effects will result from conch relocation activities and includes potential mortality events as a result of relocation. NMFS anticipates the following incidental take may occur as a result of the the initial queen conch relocations conducted prior to the marina construction. (Table 8).

Table 8. Anticipated Incidental Take Related to construction of Latitude 18 Marina

Queen Conch	Total Anticipated to be Relocated	Potential Mortality
Adult	10	3

10.3 Effect of Take

NMFS has determined that the anticipated incidental take specified in Section 10.2 is not likely to jeopardize the continued existence of queen conch if the project is developed as proposed.

10.4 Reasonable and Prudent Measures

Section 7(b)(4) of the ESA requires NMFS to issue to any federal agency whose proposed action is found to comply with Section 7(a)(2) of the ESA, but may incidentally take individuals of listed species, a statement specifying the impact of that taking. The Incidental Take Statement must specify the Reasonable and Prudent Measures necessary or appropriate to minimize the impacts of the incidental taking from the proposed action on the species, and Terms and Conditions to implement those measures. "Reasonable and prudent measures" refer to those actions the Director considers necessary or appropriate to minimize the impact of the incidental take on the species" (50 CFR 402.02). Per Section 7(o)(2), any incidental taking that complies with the specified terms and conditions is not considered to be a prohibited taking of the species concerned.

The Reasonable and Prudent Measures and terms and conditions are required to document the incidental take by the proposed action and to minimize the impact of that take on ESA-listed species (50 CFR 402.14(i)(1)(ii) and (iv)). These measures and terms and conditions must be implemented by the USACE for the protection of Section 7(o)(2) to apply. The USACE has a continuing duty to ensure compliance with the reasonable and prudent measures and terms and conditions included in this Incidental Take Statement. If USACE fails to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms, or fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of the incidental take, the USACE must report the progress of the action and its impact on the species to SERO PRD as specified in the Incidental Take Statement [50 CFR 402.14(i)(4)].

NMFS has determined that the following Reasonable and Prudent Measures are necessary or appropriate to minimize impacts of the incidental take of ESA-listed species related to the proposed action. The following Reasonable and Prudent Measures and associated terms and conditions are established to implement these measures, and to document incidental takes. Only incidental takes that occur while these measures are in full implementation are not considered to be a prohibited taking of the species. These restrictions remain valid until reinitiation and conclusion of any subsequent Section 7 consultation.

1. The USACE must ensure the applicant minimizes the likelihood of injury or mortality to queen conch resulting from relocation.
2. The USACE must ensure that the applicant monitors and reports the impacts of its activities on queen conch.

10.5 Terms and Conditions

In order to be exempt from the prohibitions established by Section 9 of the ESA, the USACE must comply (or must ensure that any applicant complies) with the following Terms and Conditions.

The following Terms and Conditions implement Reasonable and Prudent Measure #1:

- The USACE shall include permit condition requiring the permittee to implement the relocation protocol specified in the large scale Queen Conch Survey Construction Conditions and Relocation Guidelines specified on NMFS's website here: (https://www.fisheries.noaa.gov/s3/2024-09/Queen-Conch-Survey-Construction-Conditions-and-Relocation-Guidelines.pdf).
- The USACE shall coordinate with the DPNR in identifying relocation sites for queen conch so as to minimize

The following Terms and Conditions implement Reasonable and Prudent Measure #2:

- The USACE shall include a special permit condition that directs the permittee to submit all project-related monitoring reports completed in accordance with this Opinion to NMFS SERO PRD by email (takereport.nmfsser@noaa.gov) with the NMFS tracking number for this Opinion (SERO-2024-00367, Latitude 18 Marina and Mooring) and date of issuance.

- The USACE shall include a special permit condition that directs the permittee to transmit the notice of relocation activities and results to the NMFS Queen Conch Survey and Relocation Form (https://forms.gle/Xg74LA3dx4sZsVPP6).

11 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authority to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation Recommendations identified in Opinions can assist action agencies in implementing their responsibilities under Section 7(a)(1). Conservation recommendations are discretionary activities designed to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to help implement recovery plans, or to develop information. The following conservation recommendations are discretionary measures that NMFS believes are consistent with this obligation and therefore should be carried out by the federal action agency:

1. Work with NMFS and DPNR to develop and implement a Before-After Gradient Monitoring Plan for Queen Conch.
2. Fund and support restoration efforts that rehabilitate coral reefs. Implement ecosystem-level actions to improve habitat quality and restore keystone species and functional processes to maintain adult colonies and promote successful natural recruitment.
3. Reduce locally manageable environmental stress and pollution from marina (e.g., acute sedimentation, nutrients, contaminants, or overfishing of reef grazers).
4. Support efforts in the forthcoming Queen Conch Recovery Plan.

12 REINITIATION OF CONSULTATION

This concludes formal consultation on the proposed action. As provided in 50 CFR 402.16, reinitiation of formal consultation is required and shall be requested by USACE or by the Service, where discretionary federal action agency involvement or control over the action has been retained, or is authorized by law, and if: (a) the amount or extent of incidental take specified in the Incidental Take Statement is exceeded, (b) new information reveals effects of the action on listed species or critical habitat in a manner or to an extent not considered in this Opinion, (c) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion, or (d) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the USACE must immediately request reinitiation of formal consultation and project activities may only resume if the USACE establishes that such continuation will not violate Sections 7(a)(2) and 7(d) of the ESA.

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APPENDIX 1

WATER QUALITY MONITORING AND SEA TURTLE PROTECTION PLAN

FOR THE
LATITUDE 18 VESSUP BAY MARINA
ST. THOMAS, U.S. VIRGIN ISLANDS

INTRODUCTION

Jack Rock B-AC LLC and Redhook Hayes B Rem LLC purchased parcels 9C and 9B-Consolidated, Estate Nazareth with the intention of developing a World Class Marina with an upland mixed use commercial development. Parcels 9-C and 9B-Consolidated comprise a total of 17.83 acres. The entire area is zoned W-1-Waterfront Pleasure. The Proposed Development is permitted by the Virgin Islands Code as a matter of right. The project site contains a peninsula that forms the southern entrance to Red Hook Bay. That peninsula is a rocky abutment that extends to the National Park Service property on the East side and abuts the Vessup Beach area to the south.

The project area was the site of the Latitude 18 Marina. This Marina has been through significant damage because of the Hurricanes over the past 25 years, specifically Hurricane Marilyn in 1995 and Hurricanes Irma and Maria in 2017. The original Marina was never fully restored after Hurricane Marilyn in 1995. The viability of the property as a Marina has continually diminished over time, finally closing from damage because of the 2017 Hurricanes. The Development Plan intends to take advantage of this unique promontory at the entrance to Red Hook Bay. The Development Plan is supported by environmental studies that are the basis for the location and development of upland, shoreline and overwater structures. The inclusion of a wave attenuator in the Marina Development Plan is intended to create calmer water under operational conditions. The Marina dock layout encompasses the area occupied by the previous Marina. The upland Development Plan includes significant areas reserved for natural drainage courses and preserved vegetation to address endangered species such the Tree Boa. A total of 45% of the lot areas are devoted to undisturbed vegetation, drainage areas, and landscaping.

The applicant is proposing reconstruction of the Latitude 18 Marina and development of a managed mooring field as shown in the enclosed drawings (Enclosure 1). The proposed marina dock layout encompasses the area occupied by the previous marina. The entire development area is zoned W-1-Waterfront Pleasure. The two primary upland structures are the restaurant and marina services building (total of 10,000 square feet (sq ft)) and the warehouse buildings with the drystack storage structure for a total of 88 vessels at capacity, vessel workstations, and a workshop (total of 10,000 sq ft). There would also be a fuel yard, potable water storage, an electrical yard, and a wastewater treatment plant. Restrooms, showers, pump-out, and access to car parking and other supporting facilities would be available for the clients that lease moorings in the proposed mooring field. All in-water work is expected to take a total of 12 months inclusive of dredging and upland work is expected to take 18 months.

The total proposed marina footprint, including maneuvering areas, is 6.73 acres. The total footprint of overwater structures is 28,499 sq ft. (0.65425 ac). The Muller Bay Mooring Field would occupy 39.1 acres (1,703,196 sq ft). The scope of work includes removing existing structures and marine debris from the project footprint to rebuild the marina, pile installation for overwater structures, installation of a floating wave attenuator, moorings, and aids to navigation (ATONs), dredging, and shoreline stabilization. The project would provide moorage for a maximum of 101 vessels (68 moorings in Muller Bay and a maximum of 33 marina slips). In addition, a maximum of 88 vessels could be stored in the upland dry-stack storage. The proposed dry-stack storage layout has 8 bays of 4 levels, with capacity for 72 to 88 boats, depending on the arrangement of the racks in the bays.

Figure 1. Project Location

PROJECT SETTING

The subject parcels are within the Vessup Bay/ East End Red Hook Area of Particular Concern (APC) (Figure 2). The Vessup Bay/Red Hook APC is located on the eastern end of St. Thomas and includes Nazareth, Muller, Vessup, Red Hook, Great Bay, Cowpet Bay, Cabrita, Beck and Water Point, Great St. James, Little St, James, and Dog Island.

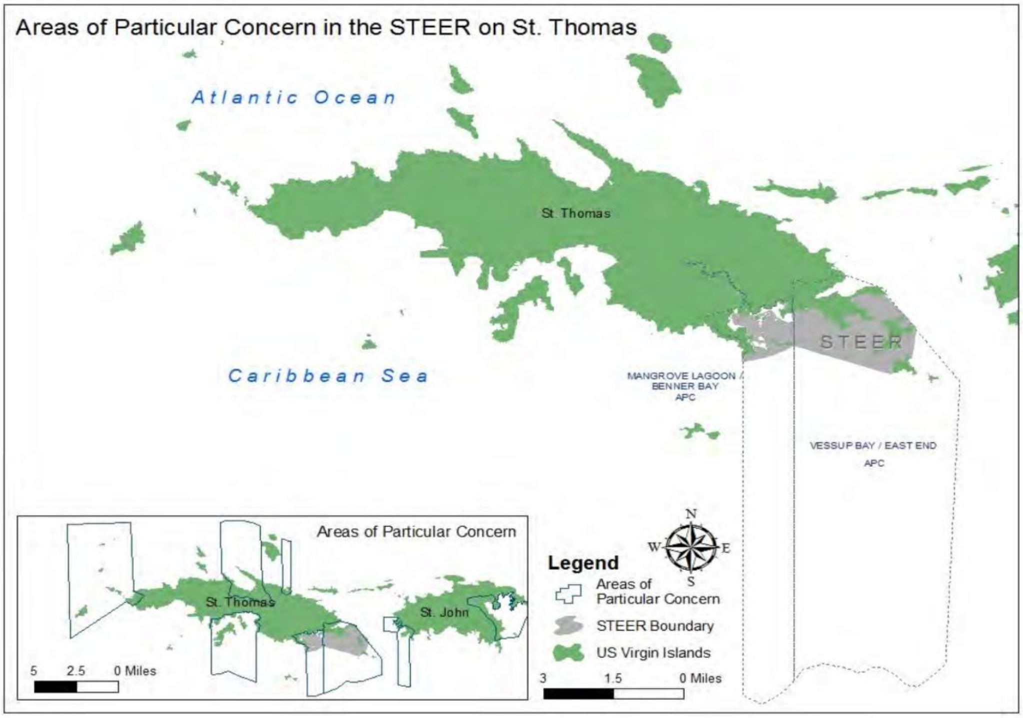


Figure 2. Areas of Particular Concern (STEER (2011) St. Thomas East End Reserve Management Plan. St. Thomas, USVI.

The Latitude 18 marina has been developed since the 1980s. The docks were severely damaged by hurricane Hugo (1979), were repaired, and then damaged again by hurricane Marilyn (1995), and only a portion would be rebuilt (CZT-7-95W). The rebuilt marina was destroyed by hurricanes Irma and Maria 2017.

At one time dense seagrass, *Thalassia testudinum* was found in the eastern portion of the marina, however over time it has become less abundant, and the area is now fully mixed with the invasive seavine *Halophila stipulacea*. In early 2000 there was a *Dendrogyra cylindrus*, a coral which is now listed on the endangered species list, found on the riprap which raps around the point at the northeastern end of the property. Surveys in 2008 did not find this coral and no other ESA corals have been found on the shoreline revetment since that time. The piles and the shoreline revetment which faces north and is in Vessup Bay proper, is degraded habitat with significant algal colonization. These hard structures would not be considered critical habitat due to the amount of algal colonization. A few *Siderastrea spp*. and *Psuedodiploria spp.* are found in this area.

The riprap revetment which extends around the point into Muller Bay enjoys much better water quality and can be considered critical habitat. No construction is proposed for this area. There were scattered corals on the hardbottom although many of the corals were damaged due to a sailboat grounding on the riprap. The sailboat is still aground against the riprap, because the owner has never agreed to remove the vessel Latitude 18 will be removing the vessel as part of the development plan. The vessel will be removed utilizing a land based crane to remove the vessel.

There are emergent hard bottom areas to the east in Muller Bay, and there is sparse coral colonization on the emergent rock including *Orbicella faveolata* and *O. annularis,* ESA listed coral species. The coral colonization increases to the east, and corals become abundant to the east of the proposed Managed Mooring Field. Each mooring location proposed has been surveyed and positioned to avoid hard-bottom impact and impact on corals. Two buoy locations originally planned were removed from the proposed plan due to potential impacts on corals, while three remain in an area generally classified as hardbottom habitat but will not impact corals or hardbottom as they have been located in large sand pockets. All lines and tackle will be floated so as not to damage the seafloor, or the corals and special manta deterrents are being added to minimize risk to the giant manta ray.

While the invasive seavine is found throughout Vessup, Muller and Red Hook Bay, there are still expanses of *Thalassia testudinum* and *Syringodium filiforme*. These sea grass beds are damaged by existing mooring practices, anchoring, dragging lines and debris.

The managed mooring field should help to alleviate these impacts and should facilitate recolonization by these species.

The area is habitat to protected sea turtles and marine mammals and as such NOAA's Sea Turtle and Smalltooth Sawfish Construction Conditions will be followed as well as NOAA's Vessel Strike Avoidance Measures and Reporting for Mariners during the construction of the dock and installation of the moorings.

While most of the site has gentle gradients, the existing paved roadway onto the site has excessive slopes that have been taken into consideration from a construction standpoint. Access to the site will be carefully planned to allow for construction activities to occur with minimal disruption to the local roadways and neighboring properties.

Vessup Bay and Muller Bay are directly downstream of the proposed construction site. Erosion control BMP's will be implemented to ensure the turbidity remains under the acceptable levels throughout construction. Also, constant attention will be required to ensure that erosion control measures are in place and maintained to protect the water quality of the bay below.

The offshore waters are classified as Class B and the best usage of the water is listed as the propagation of desirable species of marine life and for primary contact recreation (swimming, water skiing, etc.). The quality criteria include dissolved oxygen not less than 5.5mg/l from other than natural conditions. The pH must not vary by more than 0.1 pH unit from ambient; at no time, shall the pH be less than 7.0 or greater than 8.3. Bacteria (fecal coliform) cannot exceed 70 per ml, and turbidity should not exceed a maximum nephelometric turbidity unit of three (3) NTU.

Water sampling has occurred on the site over the last several years in order to establish a baseline of water quality conditions. Samples were taken with a calibrated YSI EXO multi-meter and were taken at a depth of 1 meter. The samples from 2019 and the beginning of 2020 were focused within the marina. As the idea of a managed mooring field was considered additional sampling locations were added (Table 1). Samples were also taken during the current study which are provided in Table 2. The map below shows the location of the samples.

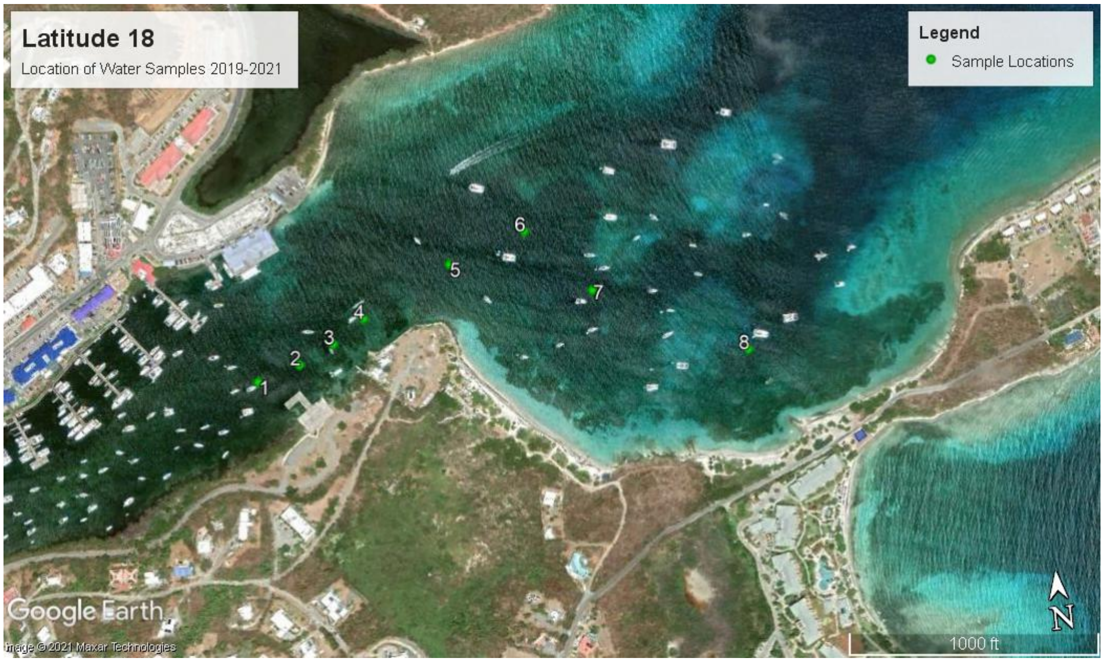


Figure 3 Location of samples taken between 2019 and 2021

		Turbidity NTU														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	2.11	3.26	5.6	2.99	1.77	2.16	2.76	6.78	3.32	0.98	1.23	2.09	1.12	2.14	0.78
2	18.324904°-64.849217°	1.12	0.87	2.13	1.23	1.18	1.43	1.09	2.76	2.14	0.47	0.98	1.34	0.87	1.16	0.87
3	18.325089°-64.848813°	1.08	0.67	1.78	1.01	0.97	0.88	1.25	2.34	2.03	0.46	0.99	0.86	0.78	1.43	0.67
4	18.325330°-64.848435°	0.86	0.56	2.08	0.94	0.89	1.1	0.98	0.88	2.09	0.68	1.02	0.67	0.78	1.34	0.87
5	18.325815°-64.847384°	0.82	0.65	1.59	0.96	1.11	0.92	0.65	0.67	1.34	0.73	0.78	0.56	0.67	85	0.81
6	18.326089°-64.846486°												0.77	0.62	0.54	0.76
7	18.325368°-64.845776°												0.81	0.31	0.56	0.81
8	18.324541°-64.844065°												0.65	0.78	0.45	0.51
		Dissolve Oxygen mg/l														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	4.66	3.31	4.13	5.12	3.54	4.41	5.11	4.98	4.63	5.56	5.37	4.61	3.21	4.11	4.89
2	18.324904°-64.849217°	6.49	5.26	5.26	4.63	6.43	6.66	6.38	6.18	5.99	6.09	6.06	6.06	4.79	3.60	5.18
3	18.325089°-64.848813°	6.46	6.06	6.06	4.56	6.45	6.70	6.29	6.05	6.11	6.21	6.32	6.32	2.32	5.46	5.97
4	18.325330°-64.848435°	4.31	6.32	6.32	5.33	5.67	5.20	6.55	6.00	6.12	6.19	6.85	6.85	6.59	4.84	5.74
5	18.325815°-64.847384°	4.10	6.85	6.85	5.26	5.78	5.29	6.51	5.86	6.14	6.06	6.45	7.11	6.72	4.58	5.68
6	18.326089°-64.846486°												6.11	6.21	6.12	5.78
7	18.325368°-64.845776°												6.04	6.09	6.23	6.01
8	18.324541°-64.844065°												5.99	6.07	6.00	6.03
		pH														
Station	Location	5/13/2019	6/15/2019	8/22/2019	9/19/2019	10/22/2019	12/5/2019	3/17/2020	5/15/2020	8/20/2020	11/1/2020	12/3/2020	1/14/2021	2/20/2021	3/17/2021	4/19/2021
1	18.324763°-64.849718°	8.34	8.20	8.39	8.31	8.38	8.37	8.11	8.37	8.33	8.40	8.38	8.36	8.33	8.29	8.37
2	18.324904°-64.849217°	8.20	8.33	8.39	8.31	8.35	8.40	8.29	8.34	8.31	8.36	8.38	8.31	8.31	8.26	8.37
3	18.325089°-64.848813°	8.39	8.34	8.30	8.35	8.35	8.37	8.26	8.33	8.34	8.31	8.38	8.33	8.34	8.23	8.40
4	18.325330°-64.848435°	8.38	8.33	8.30	8.35	8.28	8.40	8.23	8.25	8.38	8.33	8.40	8.33	8.38	8.33	8.37
5	18.325815°-64.847384°	8.25	8.33	8.40	8.38	8.26	8.40	8.33	8.25	8.40	8.33	8.37	8.38	8.40	8.37	8.40
6	18.326089°-64.846486°												8.38	8.40	8.34	8.40
7	18.325368°-64.845776°												8.38	8.36	8.33	8.11
8	18.324541°-64.844065°												8.40	8.31	8.25	8.29

Table 1. Results of water samples taken in the vicinity of the dock and mooring field between 2019 and 2021.

Location	Date	Turbidity	Dissolve Oxygen
18.324225°-64.837556°	8/15/2020	0.91 NTU	6.21mg/l
18.324225°-64.837556°	9/5/2020	0.76 NTU	5.99mg/l
18.324225°-64.837556°	9/12/2020	0.49 NTU	6.18mg/l
18.324225°-64.837556°	10/1/2020	0.68 NTU	6.32mg/l
18.324225°-64.837556°	11/3/2020	0.71 NTU	6.43mg/l
18.324225°-64.837556°	11/22/2020	0.47 NTU	6.17mg/l

Table 2 Water samples taken in dock footprint in 2020.

Existing conditions

Existing water quality in Vessup Bay is poor and it is listed as Impaired Waters under CWA Section 303(d).

Water exchange is very weak and highly dependent on wind conditions to force circulation and improve mixing, as tidal flows are extremely low.

Based on the calibrated circulation model implemented by ATM for Vessup Bay, water exchange under average wind conditions is less than 75% in 10 days. Exchange improves to 90% in 9 days for the high wind conditions but decreases to 40% in 10 days for low wind conditions.

In addition to poor circulation, Vessup Bay receives pollutant discharges, including a public WWTP and has no enforceable management of discharges by many of the boats anchored in the bay.

Water circulation improves in Mueller Bay due to increased mixing and better circulation given the larger water body and positive influence of wind-driven mixing.

The location on Vessup Point is in the transition between the poorly flushed Vessup Bay and the better-mixed waters of Muller Bay.

The change in water quality is visible in the data collected overtime across the site. Turbidities are higher farther into Vessup Bay and dissolved oxygen is lower. Water quality shifts across the site with the changing tides.

The 2024 baseline study yielded the following results.

Baseline	Start Time	Control/ East		Control / West		Station 1		Station 2		Station 3		Station 4		Station 5		Station 6		Station 7		Station 8		Note
		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		NTU/Secchi		
12/27/2024	13:23	1.92	3	3.42	1	2.06	3	1.93	3	2.59	3	1.98	3	2.10	3	2.13	3	2.00	3	1.92	3	
1/10/2025	10:53	2.01	2	4.22	1	1.96	2	2.21	2	2.39	2	1.83	2	2.28	2	2.82	2	2.24	2	1.81	2	North Swell
1/17/2025	11:00	1.79	3	2.75	2	2.05	3	1.98	3	1.79	3	1.87	3	2.15	3	2.1	3	1.83	3	1.81	3	
1/22/2025	10:45	1.65	3	2.11	2	1.79	3	1.77	3	1.93	3	2.00	3	1.98	3	1.97	3	2.09	3	2.01	3	
1/29/2025	10:45	1.78	3	1.99	2	1.47	3	2.04	3	2.00	3	1.74	3	2.06	3	1.78	3	1.93	3	1.94	3	
2/15/2025	10:00	1.93	3	3.11	2	1.98	3	2.06	3	2.13	3	2.13	3	2.04	3	1.92	3	1.97	3	1.88	3	
2/13/2025	13:00	1.47	3	2.13	2	2.24	3	2.39	3	1.81	3	1.96	3	1.95	3	1.87	3	1.83	3	2.03	3	
2/23/2025	12:45	1.52	3	2.79	1	2.17	3	1.67	3	1.63	3	1.78	3	1.92	3	1.69	3	1.75	3	2.06	3	
Average		1.7588	2.9	2.815	2	1.965	3	2.00625	3	2.03375	3	1.91125	3	2.06	3	2.035	3	1.955	2.9	1.9325	3	
STD		0.1844	0.3	0.71404	0	0.22633	0	0.21453	0	0.30207	0	0.12129	0	0.1098863	0	0.32753	0	0.14816	0.3	0.08997	0	

POTENTIAL IMPACTS

During construction, the seafloor will be disturbed through the cleanup of debris, removal of existing pilings, and then by dredging, de-watering and pile driving. This water quality plan will be implemented monitor control devices, and water quality and to ensure control features remain in good repair and that additional measures are added or implemented as necessary to maintain ambient water quality.

If properly executed there should be minimal impact to marine water quality during construction. To ensure that water quality is maintained throughout the operation of the marina a five year operational monitoring plan will be implemented that will look at turbidity impacts as well as changes in water quality and sediment due to the presence of the marina.

A specific flushing study was conducted to determine the project design that will cause no negative impact to circulation in Vessup Bay. In addition to showing no negative impact, the proposed mooring field management includes the installation of a sewage pump out station and the enforcement of no-discharge requirements within the mooring field, which should improve water quality in Vessup Bay.

In any marine construction or long-term marine use the potential for negative impacts to marine life and degradation of water quality exists. When sediments are suspended in the water column through dredging or deposition of fill, propwash and these suspended sediments add to the turbidity of the water. The lowering of the transparency of seawater can greatly affect sessile marine organisms that rely on the transmission of light for their existence. Settling sediments can also smother coral colonies and prevent larval sediment of reef organisms. There are coral colonized hardbottom areas and seagrass beds close to the project area which contain federally listed threatened species. Through careful planning and monitoring, potential impacts can be minimized and abated. The purpose of this monitoring plan is to ensure that impacts are minimized to the greatest extent possible.

Best Management Practices

To ensure that water quality is maintained this water quality monitoring program will be implemented during all in-water work pile driving, pre-drilling, filling and concrete pours. This plan will monitor turbidity and look at the effectiveness of the sedimentation control. If any degradation of water quality is detected immediate corrective measures will be taken to abate the impact.

Proper length (1 ft. from seafloor) turbidity barriers will be installed around all areas of in-water. A double set of curtains will be installed, if necessary, with a minimum of 2 meters between them. The curtains will be attached to the bulkhead and held offshore by carefully placed traditional anchors or screw anchors. Divers will assist in the placement of all anchors to minimize impact. The curtains will be monitored daily and if at any time deficiencies or damage is noted it will be repaired immediately. A small workboat will be kept at the bulkhead so the curtains can be serviced quickly in the event of need. Because the ESA listed Queen Conch species is present the project will follow the January 2025 NMFS Queen Conch Survey Construction Conditions and Relocation Guidelines. For manual in-water work such as helix anchor installation and marine debris removal done by hand, the applicant would be able to visually ensure the activities have no effect on queen conch.

On land silt fencing will be placed around all areas of earth disturbance to prevent sediment laden runoff from being carried into the sea. Silt fencing will be monitored daily and repaired when and if damage or deficiencies are noted.

WATER QUALITY MONITORING

Monitoring Plan Design

The monitoring plan has been designed to help ensure that existing water quality is maintained and not degraded by the renovation of the marina. The plan has been designed to address all potential construction activities which effect water quality or create bottom disturbances which will in turn affect water quality.

Monitoring Objectives

The objective of the monitoring plan is to ensure that turbidity control is properly implemented and to assess where the implemented methods are effectively controlling water quality. If the implemented control is not adequately controlling turbidity, the monitoring plan lays out additional steps that will be taken to minimize water quality degradation.

Monitoring Parameters

The proposed bulkhead reconstruction has the potential to impact water quality through the suspension of bottom sediments during dredging and dewatering, pile driving, offshore vessel movement, and anchoring or spudding, and installation of moorings. The project has the potential to impact water quality through de-watering, filling, and concrete pouring. These activities will affect the turbidity within the water column. Therefore, turbidity and water clarity are the parameters which will potentially be affected and will be monitored throughout construction of the project. Total suspended solid may also be impacted however this parameter requires laboratory analysis and cannot provide real-time monitoring. Turbidity will be measured with an EPA approved calibrated field nephelometer as Nephelometric Turbidity Units (NTU). Secchi disc readings will also be made as a measurement of water clarity.

The long-term operation of the marina could result in chemical changes to the water column and changes to marine sediments in the footprint of the marina and mooring field. A baseline of inorganic criteria pollutant metals, tributyltin and petroleum range organics (TPH) will be collected from the water column and from the sediments within the marina and more field footprint. In addition water quality parameters, turbidity, dissolved oxygen and pH will be assessed during all long-term sample collection.

Monitoring Sites

Water quality samples will be taken 5m outside the turbidity barriers immediately offshore of where the current work is ongoing. Three sites will be taken approximately 10m apart from the central point immediately off the area of work. The monitor will also take samples in any plume that is noted coming through the turbidity barriers. The monitoring samples will be placed in the areas most likely to be impacted by the project. Control sites will be established in areas which should be exposed to the same ambient conditions but should not be impacted by the project's activities. Two control sites will be established, one to the east and one to the west. These will be taken at Stations 1 and 8 shown in Figure 3.

Samples will be taken 1 meter below the surface and one meter from the seafloor will be analyzed by either a Hach 2100 Turbidity meter or a YSI Multi-meter or other equivalent approved EPA meter. The meter must be calibrated daily prior to sampling.

A baseline of water quality conditions has been established at the site prior to any work, eight samples were taken evenly spread along the length to the project area (Figure 3). This data will be used to compare construction water quality.

Water chemistry (ICP Metals, TPH and tributyltin) will be taken immediately before the start of the construction and/or installation of the first mooring. Three stations will be established one within the marina footprint and two within the mooring field as shown below.

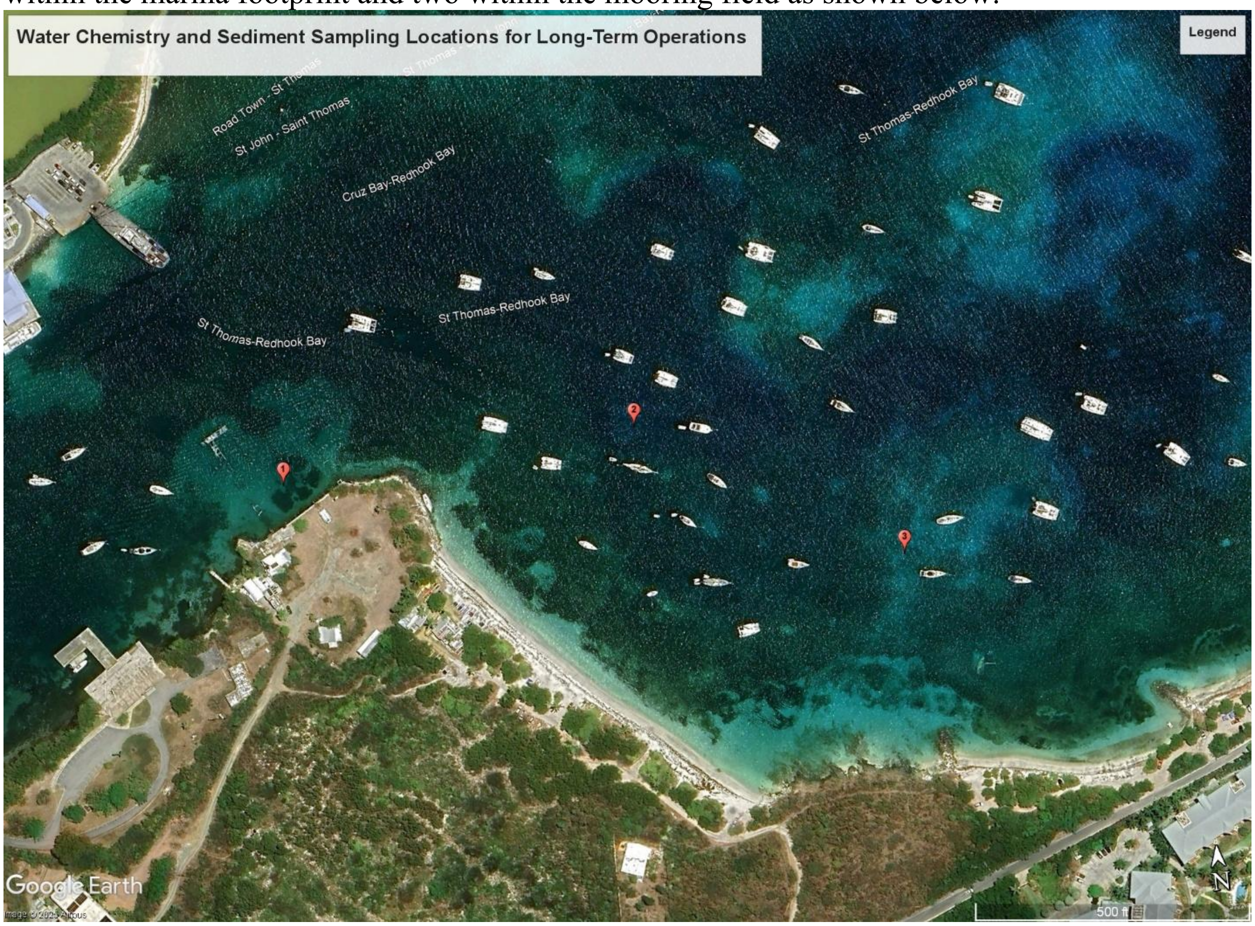


Figure 4. Location of long-term sampling points

During Construction

During construction sampling a minimum of twice a day will occur with samples spaced at least 4 hours apart. The monitor will also sample anytime a plume is noted escaping the turbidity barriers. During construction sampling will occur anytime in-water work is being undertaken, during all pile driving, all framing, dredging, all de-watering, all filling and all concrete pours, anytime work is occurring in or over the water. Weather and sea conditions will be recorded for each sampling time. The data from the baseline used to compare with data collected during the construction project to help assess whether readings are a result of the construction project or are due to ambient conditions.

As per the Virgin Islands Code, visual depth visibility readings (Secchi disk measurements) should not fall below 1 meter and turbidity may not exceed 3 NTU in Class C waters which is what the harbor is designated as.

All results will be recorded on field sheets. Wind speed and direction, wave height and direction, and rainfall will be recorded on the field at the time of sampling. GPS of the sampling points will be included on the field sheets. The monitor will take pictures as necessary as a part of the monitoring to document activities at the site and to document any incidents which may occur.

Turbidity Control

During all in-water work, which includes pile driving, dredging, filling, framing and concrete pouring, a set of proper length (1ft from seafloor) turbidity barriers must be installed. The curtains must be maintained throughout all work. The contractor must have additional barriers so that they are available for deployment if the barriers become damaged or if additional barriers are necessary to control turbidity. Silt fencing must be properly installed in all areas of upland soil disturbance and maintained until such time that the area has become revegetated or paved.

CORRECTIVE ACTIONS

During construction, if the water samples show NTU readings more than the allowable limits and if it is determined that the elevated turbidity is the result of the project, the source of the problem will be identified, and methods worked out to reduce the turbidity. If elevated readings are encountered the construction will stop and any deficiencies in the deployed turbidity controls will need to be corrected. Work may resume once turbidity has fallen to allowable levels. If there are no deficiencies in the deployed turbidity control, additional curtains will need to be deployed around the area of work. If additional barriers are not effective the work may need to be slowed (i.e. – dewatering or fill behind the bulkhead slowed, dredging slowed, etc.) In-water work will have to stop until turbidities reach allowable levels before resuming. If the additional measures cannot be deployed which are adequate to control turbidity, then work will have to be shut down every time readings become elevated over acceptable ranges and will only be able to resume once they have fallen back into acceptable ranges.

REPORTING

Elevated Readings

During construction if the water samples show NTU readings more than the allowable limits, DPNR, DEP, USACE and NMFS will be notified by email. The baseline samples will be utilized to determine if an increase in turbidity is a result of natural phenomena or if the monitoring sample is elevated above the ambient background because of the project. If it is determined that the elevated turbidity is the result of the project, the source of the problem will be identified, and methods worked out to reduce the turbidity. The construction contractor must always have someone at the construction site who has the authority to implement sediment control devices, so that the monitor can work with them to stop construction and implement additional turbidity control.

If elevated readings are encountered, the construction will stop and if any deficiencies in the deployed turbidity controls are encountered, they will need to be corrected. Work may resume once turbidity has fallen to allowable levels. If there are no deficiencies in the deployed turbidity control, additional curtains will need to be deployed, or work may need to be slowed. In-water work will have to stop until turbidities reach allowable levels before resuming. If the additional measures cannot be deployed which are adequate to control turbidity, then work will have to be shut down every time readings become elevated over acceptable ranges and will only be able to resume once they have fallen back into acceptable ranges.

Weekly Reports

A weekly report will be provided to DPNR, DEP, NPS, USACE and NMFS by email detailing the week's events and the results of all monitoring activities. The reports will include a summary of all actions taken and the results of those actions. The reports will include photographs of the activities which were undertaken during the week as well as photographs of any incidents which occurred.

SEA TURTLE AND MARINE MAMMAL PROTECTION PLAN

INCLUDING ACOUSTIC IMPACTS DURING PILE DRIVING ACTIVITIES

The dock structures would have a total of 274 24-inch diameter, concrete piles, the travel lift would require 16 piles, the mooring dolphins 8 and the bulkhead 156 concrete sheet piles. In addition, four 18-inch diameter wooden mooring piles would be installed within proper length turbidity barriers. Concrete piles would be installed using an impact hammer and may be set in position via jetting. The maximum number of concrete piles to be driven with an impact hammer per day is five. Pile driving is expected to take 60 days

All work will occur during daylight hours only and be conducted with land-based or barge-mounted equipment. All construction personnel will be responsible for observing water-related activities to detect the presence of protected species and avoid them. Turbidity curtains will be deployed, as required, during in-water work to minimize potential temporary impacts on local water quality.

Methods to Protect Sea Turtles and Marine Mammals

The following measures will be implemented to minimize impacts to protected species of sea turtles, and marine mammals.

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS (*smalltooth sawfish do not occur in USVI waters)

The permittee shall comply with the following protected species construction conditions:

a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.

b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.

c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.

d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.

e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.

f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824- 5312) and the local authorized sea turtle stranding/rescue organization.

g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

In order to avoid and minimize an injury or death to marine mammals and sea turtles the following NMFS measures form the Vessel Strike Avoidance Measures and Reporting for Mariners will be taken by all vessels associated with the project:

1. Vessel operators and crews should maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.

2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.

3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.

4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary

measures should always be exercised. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

Esonification of the Water Column

Underwater sound in the marine environment is generated by a broad range of sources, both natural and human (anthropogenic). Open ocean ambient sound has been recorded between 74 and 100 dB off the coast of central California (Heathershaw et al. 2001). Ambient noise levels for other water bodies based on surveys generally follows in this range. Based on deep-water studies in the Northeastern Pacific, low-frequency background sound has doubled each decade for the past forty years as a result of increased commercial shipping (Andrew et al. 2002, McDonald et al. 2006) resulting in a 15 to 20 dB increase in ambient conditions compared to preindustrial levels. Table 1 identifies ambient underwater sound levels at various open water and coastal water locations.

Environment	Location	Ambient Noise Levels (dB_{PEAK} unless noted)	Source
Open ocean	Central coast, CA	74 – 100	Heathershaw et al. 2001
Open ocean	Beaufort Sea, AK	80 – 83	Roth 2012
Coastal water	Prudoe Bay, AK	80 – 87	Roth et al. 2012
Marine surf	Fort Ord Beach, CA	138	Wilson et al. 1997
Large marine bay, heavy industrial use, and boat traffic	San Francisco Bay, CA	120 – 155 or 133 dB_{RMS}	Strategic Environmental Consulting, Inc. 2004
Large marine bay, heavy commercial boat traffic	Elliot Bay, WA	147 – 156 or 132 – 143_{RMS}	Laughlin 2006
Large marine bay, nearshore, heavy commercial, recreational boat traffic	Monterey Bay, CA	113	O'Neil 1998

Table 1: Ambient Noise Levels (RMS refers to rate-mean-square)

US Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service (NMFS), have developed threshold values, values that elicit some response from a target species, for making effect determinations for Endangered Species Act (ESA) listed species as follows:

- Detectability threshold (where the noise is detectable, but reactions are not observable).
- Alert and disturbance threshold (alert is where the noise has been identified by the target species, interest is shown; disturbance is where the target species shows avoidance of the noise by hiding, moving, or postponing feeding).
- Harassment/injury threshold (where the target species is actually injured).

NMFS's current thresholds for impulse noises (ex. impact pile driving or in our case rock breaking) and non-impulse noises (ex. vibratory pile driving, dredging, etc.) for marine mammals are listed in the table below.

Criterion	Criterion Definition	Threshold
Level A	PTS (injury) conservatively based on TTS	190 dB_{rms} for pinnipeds 180 dB_{rms} for cetaceans
Level B	Behavioral disruption for impulsive noise (e.g., impact pile driving)	160 dB_{rms}
Level B	Behavioral disruption for non-pulse noise (e.g., vibratory pile driving, drilling)	120* dB_{rms}
All decibels referenced to 1 micro Pascal (re: 1µPa). Note all thresholds are based off root mean square (rms) levels. * The 120 dB threshold may be slightly adjusted if background noise levels are at or above this level.		

Based on recommendations of the Fisheries Hydroacoustic Work Group (FHWG) in June of 2008, the current sound thresholds from impulse noises (such as pile driving) that cause injury to fish are:
- 206 dBPEAK
- 187 dB cSELfor fish > 2 grams
- 183 dB cSEL for fish < 2 grams

The threshold for behavioral impacts for all fish is 150 dBRMS (FHWG 2008).

Cumulative SEL (cSEL): the energy accumulated over multiple strikes or continuous vibration over a period of time; the cSEL value is not a measure of the instantaneous or maximum noise.

The following measures will be implemented to minimize impacts to protected species of sea turtles, and marine mammal.

When a pile driving (impact) hammer strikes a pile, a pulse is created that propagates through the pile and radiates sound into the water, the ground substrate, and the air. Sound pressure pulse as a function of time is referred to as the waveform. In terms of acoustics, these sounds are described by the peak pressure, the root-mean-square pressure (RMS), and the sound exposure level (SEL).

Transmission Loss Calculations and NMFS Disturbance and Injury Thresholds

Type of Equipment	Peak sound level at 10 m (dB/1 µPa)	In-water sound level (RMS) at 10 m (dB/1 µPa)	Sound exposure level (SEL) at 10 m (dB/1 $\mu Pa^2 \cdot s$)	Distance to 150 dB sSEL fish injury threshold*	Distance to 150 dB RMS fish disturbance threshold*
Vibratory Hammer; 50-inch wide steel sheet pile	175	160	160	54 meters (177 feet)	80 meters (262 feet)

*Values for distances to fish injury and disturbance thresholds are based on use of impact hammer with nylon cushion blocks

The esonification could impact could result in behavioral disruption to sea turtles and marine mammals therefore a 500m safety zone shall be established around the outer limits of the project area for sea turtles and marine mammals. Trained observers will be used to visually monitor the safety zone for at least 30 minutes prior to beginning all noise creating in-water activities (pile driving). Buoys will be set at the edge of the safety zone as a reference for the observer. The observers will position them self in a position where the entire zone can be seen and will utilize binoculars from an optimal location to assist in the spotting of animals. The area must be clear for 30 minutes prior to any noise producing work commencing.

If at any time a sea turtle or marine mammal is observed in the safety zone the operation will be shut down until the animal has left the safety zone of its own volition.

Observations for protected species will occur at least twice a day during work to maintain watch for animals in the area. If at any time an animal is observed in the safety zone during the noise creating in-water activity, work shall cease until the animal has left the area of its own volition, or coordination with a DPNR representative has occurred, if the animal is injured.

Records will be maintained of all sea turtle and marine mammal sightings in the area, including date and time, weather conditions, species identification (if possible), approximate distance from the project area, direction and heading in relation to the project area, and behavioral observations. When animals are observed in the safety zone, additional information and corrective actions taken such as a shutdown of pile driving, duration of the shut-down, behavior of the animal, and time spent in the safety zone will be recorded. Reports will be provided to NMFS, COE, and CZM monthly.

OPERATIONAL MONITORING

Once construction is complete, water quality monitoring for turbidity will ensue on a biweekly basis to look for long term trends in water quality at the sample locations shown in Figure 4.

Samples will also be taken for ICP Metals, TPH and BTEX on a yearly basis.

If at any time any of the monitoring sites show significant deterioration whether project related or natural phenomena, Latitude 18 management, CZM, USACE, NMFS, and DEP will be immediately notified in order that remedial measures can be implemented to prevent future negative impacts in situations that are project related.

SEDIMENT SAMPLING

Three sediment collection locations have been identified within the bay (Figure 4). A set of samples will be collected prior to the beginning of construction and analyzed for grainsize, Total Petroleum Hydrocarbons (TPH), and heavy metals including lead and mercury. These will serve as a baseline for the current conditions. Samples will then be taken on a yearly basis to look at long-term changes. Every 5 years samples will also be tested for Tributyltin (TBT) which can be found in bottom paints. Bottom paints containing TBT are no longer used in the US, but area available in the BVI and a majority of the boats within the VI are hauled out and worked on in the BVI.

This information will be provided to the agencies on a yearly basis documenting the change. If degradation is found a meeting with the agencies should be held to determine steps that can abate or slow this impact.

References

Water Quality Standards for Waters of the Virgin Islands, Title 12, Chapter 7, Amendments to

Subchapter 186, August 28, 2015 p26.

APPENDIX 2

1. QUEEN CONCH SURVEY PROTOCOL

1.1 Definition of Terms

Action Area – All areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.

Project Footprint – The minimum convex polygon covering all physical in water project activities, including all in-water and over-water aspects of the project, including areas that do not directly contact the benthos. This is smaller than the survey area and the action area.

Survey Area – The project footprint plus any necessary buffers to account for conch movement between surveys, as described below. The survey area is larger than the project footprint, but is smaller than the action area.

1.2 Pre-Construction Survey Protocol

To determine whether the action area is in suitable queen conch habitat and to provide a statistically robust estimate of the abundance of queen conch that may be affected by the project, a pre-consultation survey will be conducted. The pre-construction survey area shall include the project footprint as well as a 12-m buffer area to account for any potential queen conch movement (see Figure 1 and 2 below detailing Pre-Construction Survey Area and Queen Conch Survey Methods).

In habitats where queen conch are expected to be present, a pre-construction survey will be conducted within 90 days prior to commencing any in-water work to determine the presence of queen conch The pre-construction survey will include the entire project area including a 12m (39ft)[1] buffer around the limits of construction.

If no queen conch are found in the pre-construction survey area, it is extremely unlikely they will move into the area within 90 days. If the project extends beyond the 90 day timeframe, then another survey will be conducted to provide consultation coverage for an additional 90 days.
If queen conch are found present in the survey area during the pre-construction survey, and at risk of being adversely affected by in-water activities (e.g., within the marina footprint where they may be exposed to turbidity), the individuals will be relocated (see Figures 3 and 4 for relocation protocol).

Daily movement speeds of queen conch vary throughout the year, and queen conch distribution can vary seasonally and annually (Doerr & Hill 2018). However, queen conch generally do not travel far from habitats that provide forage and shelter (e.g., seagrass and algae beds). Therefore, survey results are expected to be valid for 3 years.

[1]Based on the upper 95% confidence interval of “high” movement speed from Doerr & Hill (2018).

1.3 During-Construction Survey Protocol

A during-construction survey will be conducted if one of the following occurs:

1. No pre-construction surveys were conducted.
2. More than 90 days have elapsed since the most recent pre-construction survey. Hence, a new pre-construction survey is required.
3. If a pre-construction survey was conducted and queen conch were reported within the survey area.

1.3.1 During Construction Survey Area and Frequency

Projects with full-depth turbidity curtains – If a turbidity curtain completely enclosing the project footprint and extending from the surface to the seafloor will be used throughout construction, a single survey before the beginning of in-water work will be conducted. This survey will only cover the area to be contained within the turbidity curtain either immediately prior (within 12 hours) to curtain installation or any time after curtain installation but prior to the start of in-water work, under the assumption that conch beyond the project footprint will be unable to move past the turbidity curtain.

Projects with no turbidity curtain or floating turbidity curtains – Depending on the frequency of the survey, the following queen conch survey will be conducted:

i. Initial Survey: Will be conducted prior to the start of in-water work and cover the project footprint plus a buffer of 12m (39ft) around the entire project footprint.

ii. Repeated Surveys:
   - Daily surveys: Will cover the project footprint and buffer area [i.e., from the project footprint perimeter plus 12m (39ft)]; or
   - Every other day: Will cover the project footprint and buffer area, with the buffer area extending 24m (78ft) in each direction around the project footprint perimeter; or
   - Every third day: Will cover the project footprint and buffer area, with the buffer area extending 36m (118ft) in each direction around the project footprint perimeter.
   - Surveys will not be conducted less frequently than every third work day, but may be discontinued during breaks in in-water work. If surveys are discontinued, a new Initial Survey will be conducted, followed by Repeated Surveys according to the schedule above.

Pre-Construction Survey Area – Marine waters covered by the project footprint (i.e., the immediate area directly impacted by the project, not including broader areas indirectly affected by noise or vessel transit routes) with a buffer of 12m (39ft) around the perimeter in all directions (see Figure 1).

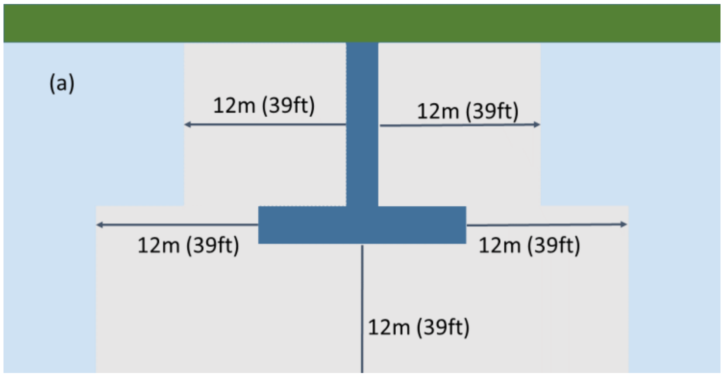
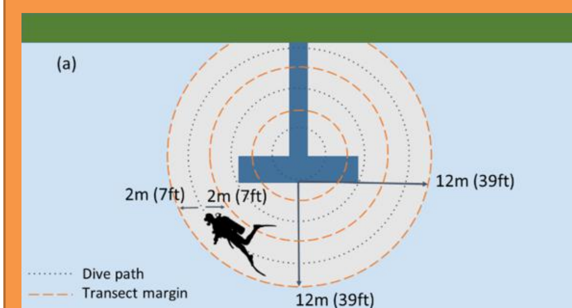


Figure 1. Queen conch pre-construction survey of project footprint and buffer area.

Queen Conch Survey Methods – Surveys may be conducted using **radial** or **belt transect** survey methods, providing 100% coverage of survey area. Presence of queen conch (juveniles and adults) should be recorded and reported to NOAA Fisheries (see **Reporting Guidelines**, below).

- For projects in waters less than 100ft deep, a survey shall be done by qualified individuals able to identify queen conch.
- For deeper projects or in areas where dive safety may be of concern (e.g. areas of high vessel traffic), a camera may be used to survey for queen conch. Camera and video footage must be of high resolution with an HD format of 1920 x 1080 or above.

Radial surveys may be done for in-water projects provided the project footprint does not follow a linear trajectory along the coastline. Radial surveys are done following the roving dive survey method, expanding out in concentric circles. The transect width between concentric circles will be subject to visibility conditions; however, the width shall not exceed 2m (7ft) left and right of the surveyor.



Belt transect surveys may be done for any project layout, including shoreline projects that follow a linear trajectory along the coastline (e.g. seawalls, revetments). Belt transect surveys shall follow the same protocol outlined for the radial survey, with divers surveying a maximum distance of 2m (7ft) left and right of the belt transect.

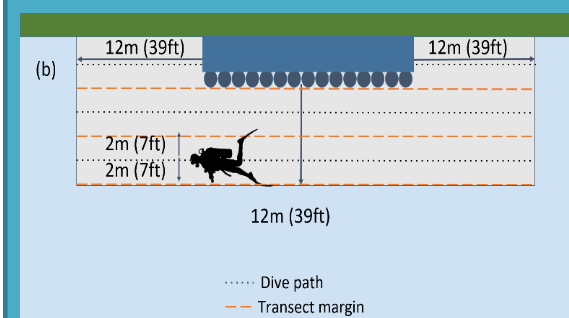


Figure 2. Queen conch survey methods

2 QUEEN CONCH CONSTRUCTION CONDITIONS AND MITIGATION MEASURES

The primary threats to queen conch during construction activities include direct impacts from equipment, direct sedimentation, and resuspension of fine particles in the water column. If queen conch are located during a survey, turbidity is anticipated, and the benthos contains silt, clay, very fine, and fine sands (≤ 0.25mm grain size), of turbidity curtains will be used.

Any holes created in benthic environments during construction, such as spud holes, will be backfilled or leveled with the appropriate substrate type after the completion of in-water work.

3 RELOCATION PROTOCOL

Temporary Relocation Protocol: will only be used for projects of short duration (≤ 72 hours of in-water work) AND those that are unlikely to alter the benthic habitat (i.e., no fine grain sedimentation anticipated from construction activity, and no deposition of materials on the habitats used by queen conch in the survey).
Permanent Relocation Protocol: use for projects of longer duration OR projects where benthic habitat alteration is anticipated**.**

Temporary Relocation Protocol

i. Obtain necessary permits for temporary holding pen from USACE, FWC, DNER, and/or DPNR.
ii. Create a holding crate that is located outside the survey area. Holding crates should have a non-permeable bottom and should allow for the flow of water throughout the crate with walls at least 1ft tall.
iii. Relocate queen conch by hand. Queen conch should be kept underwater and out of direct sunlight during relocation (e.g., by snorkelers or divers) or placed in buckets of aerated seawater, while being transported to the holding crate. Holding and transport should be completed within 3 hours.
iv. Place individuals into holding crate with shell opening facing down. Do not stack individuals. The holding crate must be large enough to provide $\geq 1ft^2$ per conch. Use multiple crates if necessary.
v. Individuals can remain in holding pens for up to 72 hours, with daily monitoring to ensure survival.
vi. Upon completion of construction, individual queen conch can be moved back to their original location using the same relocation procedures outlined in step (iii).

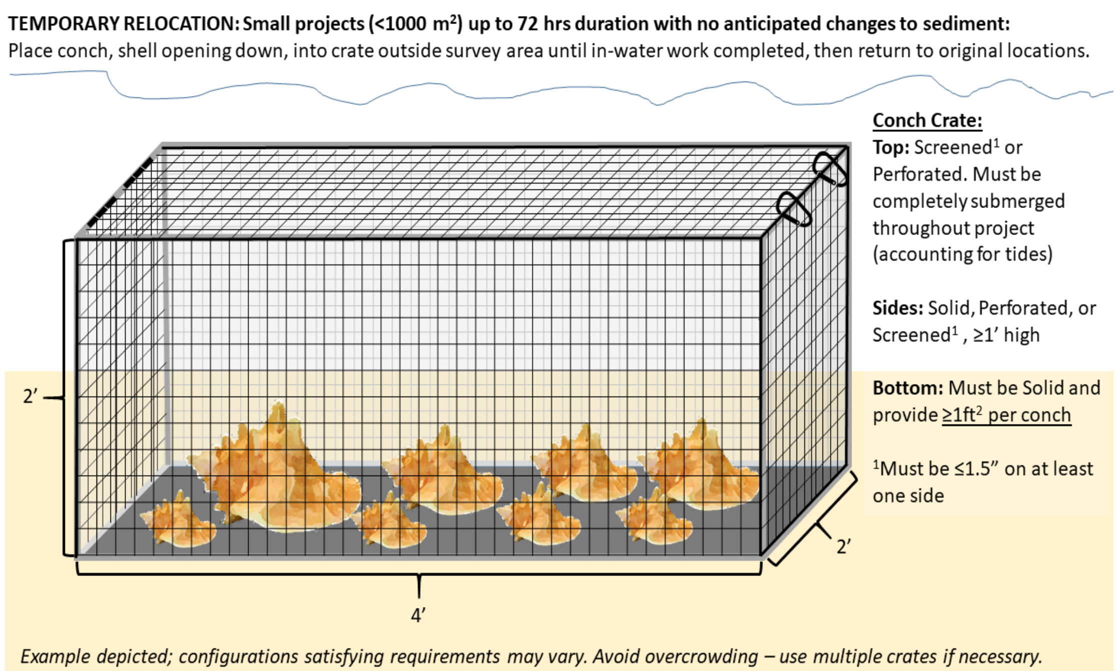


Figure 3. Queen conch temporary relocation protocol.

Permanent Relocation Protocol

1. Gather all queen conch in the survey area (up to 10 juveniles and 10 adults) by hand.
2. Carefully place queen conch in containers of aerated seawater, and keep containers out of direct sunlight during transport. Queen conch should not be stacked one on top of the other. Transport duration should not exceed 3 hours.
3. In Florida, relocate conch to areas identified by FWC during the SAL process. In other locations, relocate conch to areas identified in this relocation site guide, in a manner consistent with permit requirements from USVI-DPNR and Puerto Rico DNER.
4. Individuals should be carefully released at relocation sites by hand-placing them on the bottom, or by slowly lowering them to the bottom using crates or sacks, so as to avoid any potential damage to their shells. Care must be taken to ensure that no air is trapped inside the shell. If possible, individuals should be placed in sand or seagrass rather than directly atop coral or other hardbottom.
5. Once placed on the bottom, snorkelers or divers should ensure that each individual is placed right side up with shell opening facing downward so as to reduce potential risk from predators.

Figure 4. Queen conch permanent relocation protocol.

4 STATE AND TERRITORIAL COMPLIANCE REQUIREMENTS

Prior to relocating queen conch, all applicable state or territory permits will be acquired. Relocation of queen conch in Florida may require a Special Activities License (SAL) from the Florida Fish and Wildlife Conservation Commission (FWC). Similarly, relocation of queen conch in USVI may require the applicant to obtain a permit from USVI Department of Planning and Natural Resources (DPNR). In Puerto Rico, relocation may require special permits from Puerto Rico Department of Natural and Environmental Resources (DNER).

5 REPORTING GUIDELINES

In addition to any reporting requirements associated with federal, state, or territorial permits, the NMFS Queen Conch Survey and Relocation Form will be used to report any queen conch found and relocated during project activities. The project name, consultation number, survey coordinates, survey area, date, surveyor identification, number of queen conch encountered, and number taken will be provided. If conch are relocated, the number of queen conch relocated, relocation method, and any injury or mortality observed will be included.

6 LITERATURE CITED

Doerr, J. C., and R. L. Hill. 2018. Spatial distribution, density, and habitat associations of queen conch *Strombus gigas* in St. Croix, US Virgin Islands. Marine Ecology Progress Series 594:119-133.