**DRAFT**

# Amendment X to the Fishery Ecosystem Plan for the Hawaii Archipelago
# Amendment X to the Fishery Ecosystem Plan for the American Samoa Archipelago
# Amendment X to the Fishery Ecosystem Plan for the Mariana Archipelago
# Amendment X to the Fishery Ecosystem Plan for the Pacific Remote Island Areas
# Amendment X to the Pacific Pelagics Fishery Ecosystem Plan

## Including a Programmatic Environmental Impact Statement as an Appendix

## Establishment of a Pacific Islands Aquaculture Management Framework

**Regulatory Identification Number (RIN) 0648-XXXX**

**September 2, 2022**

Prepared by:

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**Cover Page**

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**Including a Final Programmatic Environmental Impact Statement as Appendix**

**Establishment of a Pacific Islands Aquaculture Management Framework**

**Regulatory Identification Number (RIN) 0648-XXXX**

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|---|---|
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**Abstract**

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), authorize the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), and the Western Pacific Fishery Management Council (Council) to manage aquaculture in the United States (U.S.) Exclusive Economic Zone (EEZ) of the western Pacific.

Despite the growing interest in offshore aquaculture, there is no regulatory framework to manage commercial aquaculture production in the EEZ currently in place. NMFS and the Council manage fisheries through four archipelagic Fishery Ecosystem Plans (FEPs) and one pelagic FEP. The Council developed, and NMFS implemented, these FEPs. In recognition of the growing need and desire to develop aquaculture and the possibility of user conflicts and effects to the marine environment, the Council recommended amending these five FEPs to establish a federal management program for aquaculture fisheries in federal waters of the western Pacific under the MSA.

The features of the proposed aquaculture management program would ensure the program is consistent with the Council's policy to encourage environmentally responsible marine aquaculture. These features are intended to ensure that all offshore activities permitted in the

western Pacific are consistent with the MSA National Standards and are consistent with Council objectives for wild fisheries. Without such a management program, future operations for federally managed species may develop in an ad hoc manner without federal control of when, where, or how facilities could operate.

The Council at the 192nd meeting in September 2022 will consider taking final action on establishing an offshore aquaculture management framework in the Pacific Islands Region.

The amendment and the PIR Aquaculture PEIS evaluates the potential impacts of the following alternatives:

Alternative 1: No Action/Status Quo

Alternative 2: Establish an offshore aquaculture management program that would allow culture for current FEP MUS and ECS, limited gear types, and provide for longer permit durations (Commercial: 10 years, Research: 3 years)

Alternative 3: Establish an offshore aquaculture management program that would allow culture for all species native to the region of the proposed facility, a broader scope of allowable gear types, and provide for longer permit durations (Commercial: 20 years, Research: 10 years) (*preliminary preferred alternative)*

**How to Comment**

Instructions on how to comment on this document and the associated proposed rule can be found by searching on RIN 0648-XXXX at www.regulations.gov or by contacting the responsible official or Council at the above address. Comments are due on the date specified in the instructions.

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| % | percent |
| ACL | Annual Catch Limit |
| ALOHA | A Long-term Oligotrophic Habitat Assessment |
| AOA | Aquaculture Opportunity Area |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulation |
| CNMI | Commonwealth of the Northern Mariana Islands |
| CPUE | Catch per unit effort |
| CRECS | Coral reef ecosystem component species |
| DLNR | State of Hawaii Department of Land and Natural Resources |
| DO | Dissolved oxygen |
| DOD | United States Department of Defense |
| DPEIS | Draft Programmatic Environmental Impact Statement |
| DPS | Distinct Population Segment |
| EA | Environmental Assessment |
| ECS | Ecosystem Component Species |
| EEZ | U.S. Exclusive Economic Zone |
| EFH | Essential Fish Habitat |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| FAD | Fish Aggregating Device |
| FAO | Food and Agriculture Organization of the United Nations |
| FDA | U.S. Food and Drug Administration |
| FEP | Fishery Ecosystem Plan |
| FR | *Federal Register* |
| GDP | Gross domestic product |
| GHG | Greenhouse gas emissions |
| HAPC | Habitat Areas of Particular Concern |
| IRFA | Initial regulatory flexibility analysis |
| MHI | Main Hawaiian Islands |
| MMPA | Marine Mammal Protection Act |
| MNM | Marine National Monument |
| MPA | Marine protected area |
| MT | Million U.S. tons |
| t | metric tons |
| MUS | Management unit species |
| NAA | National Aquaculture Act |
| NADP | National Aquaculture Development Plan |
| NDSA | Naval Defense Seas Area |
| NEPA | National Environmental Policy Act |
| nm | nautical mile |
| NMFS | National Marine Fisheries Service |
| NMS | National Marine Sanctuary |

| | |
|---|---|
| NMSA | National Marine Sanctuaries Act |
| NOA | Notice of Availability |
| NOAA | National Oceanic and Atmospheric Administration |
| NOI | Notice of Intent |
| NPDES | National Pollutant Discharge Elimination System |
| NPTZ | North Pacific Transition Zone |
| NTU | Nephelometric Turbidity Units |
| NWHI | Northwestern Hawaiian Islands |
| NWR | National Wildlife Refuge |
| OIE | World Organization of Animal Health |
| ONMS | Office of National Marine Sanctuaries |
| PCBs | Polychlorinated biphenyls |
| PEIS | Programmatic Environmental Impact Statement |
| PIR | Pacific Islands Region |
| PIRO | Pacific Islands Regional Office |
| PPGFA | Pago Pago Sport Fishing Association |
| PRA | Paperwork Reduction Act |
| PRIA | Pacific Remote Island Areas |
| PSZ | Protected Species Zone |
| RFFA | Reasonably Foreseeable Future Action |
| ROD | Record of Decision |
| SAFE | Stock Assessment and Fishery Evaluation |
| SCREFP | Special Coral Reef Ecosystem Fishing Permit |
| tons | U.S. tons |
| U.S. | United States of America |
| U.S.C. | U.S. Code |
| USCG | U.S. Coast Guard |
| USDA | U.S. Department of Agriculture |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| WPFMC | Western Pacific Fishery Management Council |

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# 1 INTRODUCTION

## 1.1 Background Information

The National Marine Fisheries Service (NMFS) and the Western Pacific Fishery Management Council (Council) manage fishing for pelagic management unit species (PMUS) in the Exclusive Economic Zone (EEZ or federal waters, generally 3-200 nautical miles or nm from shore) around American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI) and Hawaii, and on the high seas through the Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region (Pelagic FEP) as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; 16 U.S.C. § 1801 *et seq.*).

## 1.2 Proposed Action

The Council at its 192nd meeting on September 20-22, 2022, will consider taking final action to amend its five FEPs to establish a Federal Aquaculture Permit Program in the Western Pacific region based on recommendations from the Western Pacific Fishery Management Council (Council). There is currently no comprehensive program for management of aquaculture in federal waters offshore in the region and this program would provide a means for the Council to monitor and manage aquaculture activity in the US EEZ.

## 1.3 Purpose and Need for Action

The purpose of this amendment is to identify elements of a management program so that any offshore aquaculture develops responsibly in the Pacific Islands Region (American Samoa, Guam, Hawaii, the Pacific Remote Islands, and the Northern Mariana Islands). While the PIR has historically hosted, and continues to host, aquaculture research and development facilities, there is no comprehensive and coordinated regime for managing the growing interest in offshore aquaculture development in the region. Further, the current NMFS permitting mechanism available to aquaculture operations is too limited to accommodate the interest level and the industry's desired scope and duration of aquaculture operations. Developing an aquaculture management program would allow sustainable development of offshore aquaculture while ensuring avenues for reasonable, coordinated processes for future permit applicants. Further, a management program would ensure that aquaculture contributes responsibly to the food and economic security of the Nation.

Any future management program would be necessary to prevent future aquaculture operations for most federally managed species from developing in an ad hoc manner, inhibiting sound planning, coordination, oversight, safety, and environmental protection in the PIR. Supplementing the harvest of domestic fisheries with well-managed and safe cultured product would help the U.S. meet consumer demand for seafood and may reduce the dependence on seafood imports.

## 1.4 Action Area

This proposed action area includes the US EEZ surrounding the Territory of American Samoa, Commonwealth of the Northern Mariana Islands, Territory of Guam, the State of Hawaii, and the

Pacific Remote Island Areas of Howland and Baker Islands, Johnston, Palmyra and Wake Atolls, and Kingman Reef.

### 1.5 Decision(s) to be Made

This amendment and the Final PIR Aquaculture PEIS will support a decision by the Regional Administrator (RA) of the NMFS Pacific Island Region, on behalf of the Secretary of Commerce, whether to approve, disapprove, or partially approve the Council's recommendation.

### 1.6 List of Preparers

(in alphabetical order by last name)

Joshua DeMello, Western Pacific Regional Fishery Management Council

Mark Fox, NOAA Fisheries Pacific Islands Regional Office

Tori Spence, NOAA Fisheries Pacific Islands Regional Office

Zach Yamada, Western Pacific Regional Fishery Management Council

### 1.7 Public Involvement

#### 1.7.1 Council and SSC Meetings

**Table 1. Chronology of Western Pacific Fishery Management Council Actions Related to Aquaculture Management in the Pacific Islands Region**

| Council Meeting Number | Date | Summary of WPFMC Actions |
|---|---|---|
| 146th | 2009 | WPFMC recommended an omnibus FEP amendment to address management and revised its Aquaculture Policy to encourage potential operations that adhere to WPFMC guidelines |
| 147th | 2010 | WPFMC staff hosted outreach meetings:<br>• Six public meetings across Hawaii, Guam, American Samoa, and CNMI.<br>• Ten meetings with State and Territory Advisory Panels, Plan Teams, and Regional Ecosystem Advisory Committees.<br>WPFMC reviewed draft FEP amendment with the following alternatives:<br>• Permitting and reporting for activities in Federal waters.<br>• Prohibited areas.<br>• Limiting the number of operations.<br>• Prohibiting aquaculture operations in Federal waters. |
| 148th | 2010 | WPFMC recommended developing permitting and reporting requirements, with further direction to develop a limited entry and environmental monitoring program |
| 151st | 2011 | WPFMC reviewed management options to: |

| Council Meeting Number | Date | Summary of WPFMC Actions |
|---|---|---|
| | | • Establishing a control date.<br>• Establishing a limited entry program.<br>• Recommend an environmental monitoring program.<br>WPFMC recommended:<br>• Conducting research to determine user capacity and conflicts, feed analysis, institutional capacity, etc. before considering a limited entry program.<br>• Limiting participation as a future precaution and evaluated through the permitting process.<br>• Incorporating environmental monitoring, inspection, and reporting requirements into the permitting amendment consistent with requirements already in place by the State of Hawaii or proposed through other regional/national organizations. |
| 172nd | 2018 | WPFMC reviewed proposed alternatives for an early draft of this PEIS and recommended Alternative 2 as a preliminarily preferred alternative. WPFMC directed staff to prepare an amendment for final action |
| 190th | 2022 | WPFMC reviewed Draft Management Framework PElS alternatives and:<br>• Supported NMFS publishing the Final PElS<br>• Supported PElS alternative 3 as its preliminarily preferred alternative<br>• Rescinded its previously supported preliminarily preferred alternative identified at the 172nd Meeting<br>WPFMC directed its staff to incorporate the PElS into an omnibus FEP amendment that includes management measures and procedures |

### 1.7.2 Coordination with Others and the Public

The proposed action was developed in coordination with the development of a PEIS for aquaculture management in the region. Public scoping meetings were held and comments were received on the Notice of Intent to prepare the PEIS. NMFS published the DPEIS on May 7, 2021 in the *Federal Register* with a 90-day public comment period that closed on August 5, 2021 (86 FR 24616). NMFS also held four virtual public meetings between June 15 and 24, 2021 (86 FR 27836), to record oral comments on the DPEIS. The draft PEIS was made available for public comment. Comments received reflected both opposition and support for the development of an aquaculture management program.

### 1.7.3 Summary of Public Comments Received

[Reserved]

# 2 DESCRIPTION OF THE ALTERNATIVES CONSIDERED

## 2.1 Development of the Alternatives

Alternatives were developed in conjunction with the development of the Final PEIS for this action and based on initial Council and public comments from initial meetings where aquaculture management was discussed. These alternatives served as a basis for discussion at public scoping meetings in the region where participants were provided the opportunity to provide insight on the potential effects of the alternatives as well as ideas for additional alternatives. The exact structure and components of the following alternatives were developed after completing the scoping process and a review by the Council at its 169th Meeting in Honolulu, Hawaii.

## 2.2 Description of the Alternatives

### 2.2.1 Alternative 1: No Action (Status Quo/Current Management)

The No Action Alternative provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives. Under Alternative 1, the Council would continue to require an Experimental Fishing Permit (EFP), as provided at 50 CFR 600.745, to conduct aquaculture in the EEZ, or a Special Coral Reef Ecosystem Fishing Permit (SCREFP), as described in 50 CFR §665.13 and subsequent archipelagic regulations for American Samoa, Hawaii, the Marianas, and the PRIA.

Alternative 1 describes the current conditions, the status quo, where NMFS only issues permits for the aquaculture of Coral Reef Ecosystem Management Unit Species (CREMUS). A SCREFP may include terms and conditions to control, monitor, and mitigate any potential environmental effects.

These special permits pursuant to the above regulations authorize fishing for a potentially harvested coral reef taxa using gear that is not specifically authorized. Potentially harvested coral reef taxa means coral reef associated species, families, or subfamilies, as defined in 50 CFR §665.121, 50 CFR §665.221, 50 CFR §665.421, and 50 CFR §665.621, for which little or no information is available beyond general taxonomic and distribution descriptions. These species have either not been caught in the past or have been harvested annually in amounts less than 1,000 lbs. (454.54 kg).

#### 2.2.1.1 Permits

***Permit Requirements***

Fishing permits are frequently required to identify participants, facilitate data gathering and scientific analysis, manage fishing activities and effort, and aid law enforcement. As described in Chapter 1 of the amendment, NMFS, Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) all have permitting responsibilities for offshore aquaculture operations.

NMFS would not require permits for operations raising any species, with limited exceptions for CRECS, which would require a SCREFP. Examples of potential species harvested under a SCREFP include, but are not limited to, jacks and snappers. Information regarding PIR species

classified as CRECS is located at 50 CFR 665 et seq. and in the respective FEPs available on the WPFMC website.[1] Additional information about permit requirements is on the NOAA NMFS permit webpage.[2]

#### 2.2.1.2 Eligibility and Transferability

Any U.S. citizen or partnership of U.S. citizens, U.S. national, permanent resident, or U.S. corporation or other entity organized under U.S. law is eligible to apply for an EFP or SCREFP. All permits issued would be transferable to other eligible persons or entities upon written notice to NMFS.

#### 2.2.1.3 Permit Duration and Renewal

Permit duration for an EFP or SCREFP would depend on an applicant's request and nature of operation, species, previous experience, and potential environmental effects. NMFS could revoke permits at any time if the applicant or operation does not meet permit conditions. Duration and timing would be coordinated with other corresponding permit durations. Applicants in good standing may renew their permits. There is no limit to the number of times a permit may be renewed. No species other than CRECS require a permit. For CRECS requiring a SCRFP, there are no term limits specified in the regulations.

#### 2.2.1.4 Dealer Permit

Alternative 1 would not require mandatory dealer permits

***Program Capacity***

Alternative 1 would have an unrestricted capacity. For all species other than CRECS, no permit is required. For CRECS, there is no limited entry system for a SCREFP.

#### 2.2.1.5 Applications

Applications for aquaculture of coral reef ecosystem component species, applicants must follow the SCREP procedures codified at 50 CFR 665.124 for American Samoa, 50 CFR 665.424 for the CNMI and Guam, 50 CFR 665.224 for Hawaii, and 50 CFR 665.624 for the PRIA.

Applications must include the following:

- Applicant contact information.
- Detailed description of the proposed aquaculture site.
- The objectives of the aquaculture activity, including:
    - Description of the species intended for culture, including anticipated annual production (e.g., number and weight).
    - Detailed description of the aquaculture systems and equipment employed, including support equipment.
    - Contact information and location of each feed supplier and hatchery that the applicant will use.

[1] www.wpcouncil.org/fishery-ecosystem-plans-amendments/

[2] https://www.fisheries.noaa.gov/pacific-islands/resources-fishing/pacific-islands-fishing-permits#coral-reef-fishing-and-precious-coral

- General description of the expected disposition of the resources harvested under the permit (e.g., stored live, fresh, frozen, preserved, sold for food, ornamental, research, or other use).
- An emergency response plan, including a contingency plan for escaped cultured fish.

#### 2.2.1.6 Permit Application and Review Process

No permit would be necessary to conduct aquaculture of MUS in the EEZ. However, for aquaculture of coral reef ecosystem component species, applicants must follow the SCREP procedures codified at 50 CFR 665.124 for American Samoa, 50 CFR 665.424 for the CNMI and Guam, 50 CFR 665.224 for Hawaii, and 50 CFR 665.624 for the PRIA.

#### 2.2.1.7 Siting Restrictions

Proper siting of an aquaculture facility is critical to both an operation's success and the protection of the surrounding physical, biological, and ecological environments. In considering potential sites, a number of factors are particularly relevant, and the applicant should be aware that these would be material considerations when assessing permit applications.[3]

Siting restrictions are limited to those outlined by NMFS and other agencies requiring coordination for protected species, essential fish habitat and other relevant laws. Otherwise, there are no explicit siting restrictions within the Western Pacific Fishery regulations as outlined in 50 CFR part 665.

#### 2.2.1.8 Allowable Marine Aquaculture Systems

Systems restrictions are limited to those outlined by NMFS and other agencies on an individual basis and requiring coordination for protected species, essential fish habitat and other relevant laws. Otherwise, there are no explicit prohibitions on aquaculture systems or gear types within the Western Pacific Fishery regulations as outlined in 50 CFR part 665.

#### 2.2.1.9 Allowable Species

With limited exceptions for CRECS, there is no restriction on any species for culture within the Western Pacific Fishery regulations as outlined in 50 CFR part 665. Culturing CRECS would require a SCREFP.

#### 2.2.1.10 Recordkeeping and Reporting Requirements

Under Alternative 1, there are no NMFS recordkeeping and reporting requirements. There may be such requirements for permits from other agencies. Recordkeeping and reporting may be included in the conditions for maintaining a SCREFP (50 CFR 665.13).

Expected Fishery Outcomes

Under the status quo, all other federal MUS or ECS would continue to be managed under existing regulations and other existing permitting by the US Army Corp of Engineers and the US

[3] In a completely separate action from this PEIS, NMFS may establish a limited number of marine aquaculture opportunity areas (AOAs) to provide a streamlined approach to permitting. AOAs would not be exclusive zones only for aquaculture, nor would an aquaculture facility be required to site within them. AOA establishment would follow a public process including environmental review. An AOA would provide a pre-assessment of these factors, which would assist advanced planning for operation density in a given area.

Coast Guard. FEPs would not be amended to include an aquaculture management program and regulations would not be changed. No aquaculture permit would be required.

### 2.2.2 Alternative 2: Establish an Aquaculture Management Program

Under Alternative 2, NMFS and the WPFMC would amend the FEPs and regulations to establish a new limited entry aquaculture management program. This program would include aquaculture-specific permit, application, and operational requirements for commercial and research/innovation activities. This alternative would also provide a streamlined avenue for navigating permitting processes with other relevant agencies. While this management program would be based on aquaculture activities and gear types currently or previously authorized in the PIR, it would also allow culture of current FEP MUS and provide for longer permit durations.

#### 2.2.2.1 Permits

**Permit Requirements**

Fishing permits are frequently required to identify participants, facilitate data gathering and scientific analysis, manage fishing activities and effort, and aid law enforcement. As described in Chapter 1, NMFS, Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) all have permitting responsibilities for offshore aquaculture operations.

**Aquaculture Permitting System**

Under alternative 2, the implementation of an aquaculture-specific permit would place NMFS as the lead agency in the management of aquaculture in PIR Federal waters. Note that each Federal agency that issues a permit is required to consult with other regulatory agencies. NMFS would endeavor to coordinate these processes amongst permitting agencies. One NMFS aquaculture permit would be required for conducting offshore marine aquaculture in Federal waters. NMFS permits would authorize deployment of approved gear; operation of the approved facility at the approved site; harvest, possession, transport, landing, and sale of allowable aquaculture species. Any vessel, aircraft, or vehicle authorized for use in aquaculture operations would be required to have a copy of the permit on board to assist law enforcement in determining compliance with aquaculture regulations.

In addition to commercial permits, Alternatives 2 would allow for a research and innovation permit option. This could act as a stepping-stone to a full commercial permit. The subsequent sections discuss the restrictions for this permit.

#### 2.2.2.2 Eligibility and Transferability

Any U.S. citizen or partnership of U.S. citizens, U.S. national, permanent resident, or U.S. corporation or other entity organized under U.S. law is eligible to apply for an aquaculture permit(s). The program may consider eligibility for other entities consistent with Federal law. All permits issued would be transferable to other eligible persons or entities upon written notice to NMFS.

#### 2.2.2.3 Permit Duration and Renewal

Permit duration would depend on an applicant's request and nature of operation, species, previous experience, and potential environmental effects. NMFS could revoke permits at any time if the applicant or operation does not meet permit conditions. Duration and timing would be

coordinated with other corresponding permit durations. Applicants in good standing may renew their permits. There is no limit to the number of times a permit may be renewed.

Under Alternative 2 NMFS would issue and renew commercial permits for terms of up to 10 years each. NMFS would issue and renew research permits for terms of up to 3 years each.

A permittee seeking renewal would be required to submit a completed renewal application form and all required supporting documents to NMFS within a specified time prior to expiration of an existing permit. If the permittee is in good standing, the information required for a renewed permit would be streamlined. Depending on scope, a permit modification may require information and review similar to the initial permit application as described below.

#### 2.2.2.4 Dealer Permit

Non-transferable dealer permits and reporting would be required for anyone purchasing cultured organisms from a permitted facility for resale. Such requirements would be coordinated with any analogous regional and local (e.g., state and territorial) authorities to prevent duplication.

#### 2.2.2.5 Program Capacity

Under Alternatives 2, NMFS and the WPFMC could restrict the number of commercial and research permits issued. This could be done on a region-wide basis or by sub-regions (e.g., for each island area). As with other fisheries, NMFS and the WPFMC may modify the number of permits based on new information developed as aquaculture proceeds. This could include establishing limits on participation, harvest timing, annual production capacity (e.g., production cap or catch share), cultured species, location, or activity density (i.e., the number and size of facilities within a given area).

#### 2.2.2.6 Applications

**General Application Requirements**

Applications must include, but are not limited to, the following:

- Applicant contact information.
- Detailed description of the proposed aquaculture site.
- The objectives of the aquaculture activity, including:
    - Description of the species intended for culture, including anticipated annual production (e.g., number and weight).
    - Detailed description of the aquaculture systems and equipment employed, including support equipment.
    - Contact information and location of each feed supplier and hatchery that the applicant will use.
    - General description of the expected disposition of the resources harvested under the permit (e.g., stored live, fresh, frozen, preserved, sold for food, ornamental, research, or other use).
- For operations where broodstock will be collected from the wild:
    - A comprehensive description of the planned fishing operations, including duration, location of fishing, gear types and operations, species likely harvested, and anticipated total catch for the purposes of broodstock on an annual basis.

    - Certification that any broodstock collected for culture at the facility would be harvested from the same population or subpopulation (based on the best scientific information available) from Federal waters of the same region where the facility is located.
    - Documentation that broodstock would be marked or tagged at the hatchery.
    - For operations raising MUS: individuals captured for use as broodstock would count towards catch limits implemented by NMFS under the Magnuson-Stevens Act.
- Documentation of an assurance bond and decommissioning plan.
- Risk mitigation plans, including prevention and mitigation plans for disease transfer, escapes and protected species interactions.
- An emergency response plan, including a contingency plan for escaped cultured fish.
- An aquatic animal health plan with evidence of approval from an accredited veterinarian.
- Copy of a contractual arrangement with an accredited veterinarian, and a commitment that the following assurances will be made:
    - Certification that the applicant will not culture genetically engineered species.
    - Certification that juveniles are free from pathogens of concern (defined as any pathogens listed by the World Organisation for Animal Health (OIE) or in the National Aquatic Animal Health Plan) prior to stocking.
    - If therapeutants are used, the applicant will only administer thereapeutants approved by the Food and Drug Administration (FDA) for veterinary purposes.
- Any other information concerning the aquaculture facility or its operations or equipment, as specified on the application form.

#### 2.2.2.7 Permit Application and Review Process

Under Alternative 2, the process for obtaining permits to establish an offshore aquaculture operation in Federal waters would have six basic steps. Subsequent guidance documentation may include a process for appealing permit decisions.

1. Pre-Application Screening. Prospective applicants would provide general project information in a pre-application checklist to NMFS PIRO. Based on the proposed activity, and vested interest in ocean uses in the specific proposed site, NMFS PIRO would forward this information to other relevant agencies for review and comment. These agencies can include, but are not limited to, Federal, state, territory and/or local agencies with responsibility (e.g., permitting, authorizing, and management) or other expertise in natural area and/or cultural uses in the proposed area. This review would help identify requirements for other agencies early in the process to ensure a streamlined, coordinated process for permitting. NMFS will collect all agency comments and return them to the applicant. The agencies will determine whether additional consultation under ESA, MMPA, or other relevant law (e.g., NEPA) is necessary for the proposed project. The applicant may also request to schedule a pre-application meeting with NMFS and other applicable Federal, state or territorial agencies, during which time agencies and the applicant discuss any questions or concerns about the proposed project and guidance regarding application process. Following the pre-application step, the applicant may prepare and submit a permit application in the form provided by NMFS.
2. Application Review. A completed aquaculture permit application and required supporting documents submitted to NMFS would be reviewed and a preliminary determination that

is complete and warrants further consideration. NMFS PIRO will notify an applicant of an incomplete application within a specified time of application receipt, including a description of incomplete or additional information required. Based on permitting requirements of other Federal agencies, prospective applicants would submit other required information or agency-specific permit applications to those agencies in tandem (or sooner depending on other agency permit timelines) with the NMFS application process. Failure to submit required information to other agencies in a timely manner could result in a delay in NMFS's decision on the application and issuance of the NMFS permit.

3. WPFMC Consultation. NMFS would consult with the WPFMC concerning the application. NMFS would notify applicants in advance of any WPFMC meeting where the applicant will have the opportunity to appear in support of the application through public testimony. The WPFMC may also seek guidance from its advisory bodies on the proposed project prior to providing its recommendations to NMFS.
4. Determination of Permit Issuance. As soon as is practicable after consultation with WPFMC, NMFS will decide whether or not to issue the aquaculture permit. NMFS may recommend that the applicant revise the application in response to comments from the WPFMC or its advisory bodies before making a final decision. Upon reaching a final decision, NMFS will notify the applicant in writing, including reasons for approval or denial. The decision would be eligible for an appeal process. The decision to approve or deny the application could be based on, amongst others:
    a. Information provided by the applicant.
    b. Current harvest and stock status of the cultured species.
    c. Estimated impacts of the proposed activity on ecosystems, habitats, and protected species.
    d. Other biological and ecological information relevant to the proposal.
5. Permit Issuance and Operational Phase. If approved, NMFS will issue the permit simultaneously with its approval notice to the applicant. The permit will specify terms and conditions for the construction, deployment, operation, and maintenance of the project. Some permit requirements would be common to all aquaculture operations, such as adherence to protected species laws, while others may be tailored to an individual operation. Note that each Federal agency issues a permit is required to consult with other regulatory agencies and may solicit public input regarding the potential impacts of each proposed project. The permit terms and conditions may reflect these consultations. NMFS will endeavor to coordinate these processes amongst permitting agencies, including permit durations. All agencies must issue the required permits before operations may commence (i.e., before structures or animals may be placed in the water). The WPFMC will consider further details for the permit issuance and operational phase if it decides to develop a coordinated, comprehensive program.

#### 2.2.2.8 Siting Restrictions

Proper siting of an aquaculture facility is critical to both an operation's success and the protection of the surrounding physical, biological, and ecological environments. In considering

potential sites, a number of factors are particularly relevant, and the applicant should be aware that these would be material considerations when assessing permit applications.[4]

Placement and spacing between aquaculture facilities would be determined on a project-specific basis according to the facility details and best available science, and relative to other ocean users. Aquaculture facilities would be required to identify the boundaries of the facility.

Siting factors could include, but are not limited to:

- Environmental considerations such as:
    - Proximity to critical habitat, EFH, habitat areas of particular concern (HAPC)[5], artificial reefs, or special management areas.
    - Depth, current, bottom type.
    - Wildlife attraction or migratory pathways.
    - Potential algal blooms or hypoxia.
    - Climate change forecasting.
- Cumulative interactions with existing area activities:
    - Impact and proximity to navigation and fisheries (e.g., commercial shipping lanes or fishing grounds).
    - Impact and proximity to military activities or restricted areas (e.g., training ranges, defensive sea areas or transit areas).
    - Effects on recreation and tourism.
    - Scenarios regarding changes in boating, fishing or other constituent behavior.
    - Impact and proximity to other marine spatial planning frameworks.
- Impacts from methods of operation (e.g., lighting, noise, visual amenity, etc.).
- Proximity to markets and ports with particular demographic profiles.
- Implications for environmental justice (e.g., impacts on minority and low-income groups).
- Implications for cultural activities and culturally important areas.
- Availability of any access and necessary infrastructure.
- Proximity to marine protected areas.
- Proximity to DOD training, testing, or restricted zones.

To prevent impacts to the biological and physical environments, NMFS could consider other siting restriction criteria on an individual project basis. NMFS and partner agencies would establish siting guidance, requirements, and restrictions.

#### 2.2.2.9 Allowable Marine Aquaculture Systems

[4] In a completely separate action from this PEIS, NMFS may establish a limited number of marine aquaculture opportunity areas (AOAs) to provide a streamlined approach to permitting. AOAs would not be exclusive zones only for aquaculture, nor would an aquaculture facility be required to site within them. AOA establishment would follow a public process including environmental review. An AOA would provide a pre-assessment of these factors, which would assist advanced planning for operation density in a given area.

[5] Federal actions, in general, do not need to avoid HAPC but will receive greater scrutiny during the EFH consultation process when HAPC may be affected.

Management under this alternative would only allow cages and net pens of specific construction and size ranges. Floating or submerged net-pens or cages are the most commonly used offshore finfish aquaculture systems and have been utilized in the PIR previously. This alternative limits the allowable aquaculture systems to minimize the uncertainty associated with the potential effects of new systems. Using known systems may also help to expedite application review. Management under this alternative would not allow aquaculture system designs that do not meet the definition of a cage or net pen.

#### 2.2.2.10 Allowable Species

This alternative would only permit native species managed by the WPFMC. The relevant Archipelagic or Pelagic FEP must list these species as an MUS or ECS for culture. The permit application process would consider the stock status for each proposed cultured species. Stock enhancement would be considered on a case-by-case basis. This alternative would prohibit genetically engineered[6] species.

#### 2.2.2.11 Recordkeeping and Reporting Requirements

Alternatives 2 would require recordkeeping and reporting requirements as part of the conditions for maintaining an aquaculture permit and would allow NMFS to evaluate the impacts of a marine aquaculture operation. Requirements would be consistent among all permits issued and consultation requirements would be coordinated with other relevant permitting agencies. Permit validity and renewal would be contingent upon adherence to reporting requirements.

#### 2.2.2.12 Recordkeeping

Under Alternatives 2, required record would include:

- Valid paperwork for all required Federal, state and/or territorial permits or licenses.
- Number and pounds of harvested cultured species.
- Major escapes of the cultured species.
- Entanglements or other interactions with protected species.
- Detection or outbreak of reportable diseases or pathogens as required by OIE or in the National Aquatic Animal Health Plan.
- Dosage and frequency of any FDA-approved[7] antibiotics or other therapeutant[8] administration, if applicable.
- Human health and safety issues.
- Records relating to feed purchases, source fisheries used in feeds, juvenile and seed suppliers, sales records, transport records.
- Current documentation, registration and ownership information for project vessels and aircraft owned or contracted for the operation, along with names and contact information for employed or contracted captains and pilots.

[6] Genetic engineering, as defined by the USDA: “Manipulation of an organism's genes by introducing, eliminating or rearranging specific genes using the methods of modern molecular biology, particularly those techniques referred to as recombinant DNA techniques”

[7] https://www.fda.gov/animal-veterinary/aquaculture/approved-aquaculture-drugs

[8] A therapeutant can be any substance used to maintain the health of a cultured organism.

- Any other appropriate recordkeeping and reporting requirements necessary for evaluating and assessing the environmental impacts of an aquaculture operation and compliance with permit terms and conditions.

#### 2.2.2.13 Reporting

Under Alternative 2, permitees would be required to notify NMFS in writing of the following:

- Escapes. For major escapes, which will be defined in greater detail if a management program is developed, the following information shall be provided to NMFS within 24 hours of discovery of the event:
    - Permit number, contact person name and phone number.
    - Specific location and cause of the escape(s).
    - Number, species, size and percent of cultured organism that escaped.
    - Response and actions taken, including any recaptures, system repairs and further prevention measures.

If no major escape occurs during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

- Interactions with protected species (e.g., entanglement, entrapment, etc.). For any interactions with protected species (e.g., marine mammals, sea turtles, migratory birds) the following information shall be provided within 24 hours of discovery of the event:
    - Permit Number, contact person name and phone number.
    - Date and time of entanglement or interaction, if known.
    - Nature of entanglement or interaction, and species and numbers of individuals affected.
    - Number of mortalities and/or injuries observed.
    - Cause and resolution of the entanglement or interaction.
    - Actions to prevent future entanglements or interactions.

If no entanglement or interaction occurs during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

- Disease. Any findings or suspected findings of reportable diseases or pathogens as required by OIE or the National Aquatic Animal Health Plan shall be reported within 24 hours including the following information:
    - Permit number, contact person name and phone number.
    - Identification of the pathogen.
    - Percent of cultured species infected.
    - Findings of the aquatic animal health expert.
    - Plans for submission of specimens for confirmatory testing.
    - Testing results (where applicable).
    - Actions taken to address the episode, including administration of any FDA-approved antibiotics.

If there are no outbreaks during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

- Capture of broodstock. At least 30 days prior to collection activities, a permittee shall provide the following information:
    - Number of animals, species, and size.
    - Methods, gears, and vessels (including U.S. Coast Guard (USCG) documentation or state or territory registration) used for capturing, holding, and transporting.
    - Date and specific location of intended harvest.
    - Location to which broodstock will be delivered.

Expected Fishery Outcomes

Alternative 2 would result in a more precautionary management approach when faced with uncertainty while still meeting the requirements of the Magnuson-Stevens Act, MMPA, ESA, and other federal laws. Alternative 2 would provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities, minimize human-caused threats to protected species; and maintain a healthy marine resource habitat though its limited entry program. Alternative 2 recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management.

### 2.2.3 Alternative 3: Establish an Expanded Aquaculture Management Program (Preliminary Preferred Alternative)

Alternative 3 would provide the same basic management program outlined for Alternative 2, but expanded with longer permit durations of 20 years for commercial permits and 6 years for research permits. It would allow a broader scope of allowable species and gear types.

#### 2.2.3.1 Permits

***Permit Requirements***

Fishing permits are frequently required to identify participants, facilitate data gathering and scientific analysis, manage fishing activities and effort, and aid law enforcement. As described in Chapter 1, NMFS, Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE) all have permitting responsibilities for offshore aquaculture operations.

Preferred Alternative 3 would provide the same permit requirements outline for Alternative 2 in Section 2.2.2.1.

#### 2.2.3.2 Eligibility and Transferability

Any U.S. citizen or partnership of U.S. citizens, U.S. national, permanent resident, or U.S. corporation or other entity organized under U.S. law is eligible to apply for an aquaculture permit(s). The program may consider eligibility for other entities consistent with Federal law. All permits issued would be transferable to other eligible persons or entities upon written notice to NMFS.

#### 2.2.3.3 Permit Duration and Renewal

Permit duration would depend on an applicant's request and nature of operation, species, previous experience, and potential environmental effects. NMFS could revoke permits at any

time if the applicant or operation does not meet permit conditions. Duration and timing would be coordinated with other corresponding permit durations. Applicants in good standing may renew their permits. There is no limit to the number of times a permit may be renewed.

NMFS would issue and renew commercial permits for terms of up to 20 years each. NMFS would issue and renew research permits for terms of up to 10 years each.

The extended terms for the action alternatives are intended to help reduce the financial burden of establishing an offshore aquaculture operation by allowing a permittee the time to secure investment support, develop a proof of concept, obtain any other necessary permits, and establish a stable, productive operation.

A permittee seeking renewal would be required to submit a completed renewal application form and all required supporting documents to NMFS within a specified time prior to expiration of an existing permit. If the permittee is in good standing, the information required for a renewed permit would be streamlined. Depending on scope, a permit modification may require information and review similar to the initial permit application as described below.

#### 2.2.3.4 Dealer Permit

Non-transferable dealer permits and reporting would be required for anyone purchasing cultured organisms from a permitted facility for resale. Such requirements would be coordinated with any analogous regional and local (e.g., state and territorial) authorities to prevent duplication.

#### 2.2.3.5 Program Capacity

Under Preferred Alternatives 3, NMFS and the WPFMC could restrict the number of commercial and research permits issued. This could be done on a region-wide basis or by sub-regions (e.g., for each island area). As with other fisheries, NMFS and the WPFMC may modify the number of permits based on new information developed as aquaculture proceeds. This could include establishing limits on participation, harvest timing, annual production capacity (e.g., production cap or catch share), cultured species, location, or activity density (i.e., the number and size of facilities within a given area).

#### 2.2.3.6 Applications

Preferred Alternative 3 would provide the same application requirements outlines in Section 2.2.2.6.

#### 2.2.3.7 Permit Application and Review Process

Under Preferred Alternative 3, the process for obtaining permits to establish an offshore aquaculture operation in Federal waters would have the same six basic steps outlined in Section 2.2.2.7. Subsequent guidance documentation may include a process for appealing permit decisions.

#### 2.2.3.8 Siting Restrictions

Preferred Alternative 3 would provide the same siting restrictions outlined in Section 2.2.2.8.

#### 2.2.3.9 Allowable Marine Aquaculture Systems

This alternative proposes no specific prohibitions for marine aquaculture systems, so systems other than traditional cages and net pens (e.g., longline culture for bivalves) could be permissible. Applicants would be required to submit detailed information on the proposed system in their application, which would allow NMFS to conduct project-specific reviews. In addition, applicants must submit documentation sufficient to evaluate the structural integrity of the system, especially its ability to withstand physical stresses associated with the open ocean and storm events. NMFS may deny use of a proposed system or specify conditions for its use if it poses significant risks to essential fish habitat, endangered or threatened species, marine mammals, wild fish and invertebrate stocks, public health, or safety.

#### 2.2.3.10 Allowable Species

Preferred Alternative 3 would allow all species to be cultured provided they are native to the region of the proposed aquaculture facility, regardless of whether their management status under the WPFMC. The permit application process would consider the stock status for each proposed cultured species. Stock enhancement would be considered on a case-by-case basis. This alternative would prohibit genetically engineered species.

#### 2.2.3.11 Recordkeeping and Reporting Requirements

Preferred Alternatives 3 would require recordkeeping and reporting requirements as part of the conditions for maintaining an aquaculture permit and would allow NMFS to evaluate the impacts of a marine aquaculture operation. Requirements would be consistent among all permits issued and consultation requirements would be coordinated with other relevant permitting agencies. Permit validity and renewal would be contingent upon adherence to reporting requirements.

#### 2.2.3.12 Recordkeeping

Preferred Alternative 3 would provide the same reporting requirements outline in Section 2.2.2.12.

#### 2.2.3.13 Reporting

Preferred Alternative 3 would provide the same reporting requirements outline in Section 2.2.2.13.

Expected Fishery Outcomes

Alternative 3 represents a less restrictive approach to permitting aquaculture by providing some level of flexibility for both permittees and decision-makers. This alternative would provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities, minimize human-caused threats to protected species; and maintain a healthy marine resource habitat with longer permit durations for commercial and research permits. This alternative allows for more innovation based on criteria for the permittee.

This alternative would aid law enforcement and ensure that landings are reported and accounted for when determining compliance with the Magnuson-Stevens Act. These requirements intend to ensure the operations of all offshore aquaculture facilities permitted in the Western Pacific Region are consistent with the Magnuson-Stevens Act National Standards and do not compromise Council objectives for wild fisheries.

## 2.3 Comparison of Alternatives

Table 2 shows an overview of the key features for each alternative. Following that is a discussion of the details of Alternatives 2 and 3, with Alternative 1 included where relevant for comparison purposes.

**Table 2: Overview of key features for each alternative**

| **Alternative 1. No Action** | **Alternative 2. Limited Aquaculture Management Program** | **Alternative 3. Expanded Aquaculture Management Program** (components that differ from Alt 2 are shown in **bold**) |
|---|---|---|
| No aquaculture management program.<br><br>NMFS permit not required for most species and gear types (with limited exceptions). | Comprehensive aquaculture management program that outlines requirements and processes for:<br>• Limited entry permit.<br>• Permit eligibility and transfer.<br>• Application requirements, review and approval/disapproval.<br>• Siting restrictions.<br>• Recordkeeping and reporting.<br><br>Allowable species limited to WPFMC-managed species:<br>• Management Unit Species (MUS).<br>• Coral Reef Ecosystem Component Species (CRECS).<br><br>Permit types:<br>• Commercial (up to 10 years).<br>• Research (up to 3 years).<br>• Dealer.<br><br>Allowable systems (gear types):<br>• Aquaculture systems and technologies previously approved for culture in the PIR. | Comprehensive aquaculture management program that outlines requirements and processes for:<br>• Limited entry permit.<br>• Permit eligibility and transfer.<br>• Application requirements, review and approval/disapproval.<br>• Siting restrictions.<br>• Recordkeeping and reporting.<br><br>Allowable species are limited to WPFMC -managed species:<br>• Management Unit Species (MUS).<br>• Coral Reef Ecosystem Component Species (CRECS).<br>• **Any native species.**<br><br>Permit types:<br>• Commercial (**up to 20 years**).<br>• Research (**up to 6 years**).<br>• Dealer.<br><br>Allowable systems (gear types):<br>• Any aquaculture systems and technologies **reviewed and approved during permit process**. |

## 2.4 Alternatives Considered, but Rejected from Further Analysis

The Council NMFS considered and rejected the following potential alternatives for analysis. The reasoning for each rejection is below.

*Aquaculture of Non-native, Non-Management Unit, or Genetically Engineered Species*

NMFS considered, but eliminated, an action alternative that would allow culture of species that are not native to the PIR or species not listed in an FEP. Evidence of the detrimental effects of non-native species on ecosystems supports the concern shared by NMFS that this type of alternative could pose significant risk to the health of PIR ecosystems. Only allowing native, non-genetically engineered and non-transgenic species for culture reduces and avoids these risks.

*Prohibiting Aquaculture Operations in Federal Waters*

Prohibiting aquaculture would not supplement the harvest of domestic fisheries with cultured product nor would it help the U.S. meet consumers' growing demand for seafood and reduce the Nation's dependence on seafood imports. This alternative would not meet the purpose and need of the action.

# 3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

## 3.1 Pacific Islands Region

The resources in this region are governed by one of five Fishery Ecosystem Plans (FEPs) developed by the WPFMC and NMFS. The FEPs include the American Samoa Archipelago FEP, the Hawaii Archipelago FEP, the Mariana Archipelago FEP (which covers EEZ waters around Guam and the CNMI), and the PRIA FEP. Lastly, the Pacific Pelagic FEP covers management of highly migratory pelagic fishery resources such as tunas and billfish, which play an important role in the biological and socioeconomic environment of the western Pacific region.

Because the action area is the EEZ, most of the natural resources and human activities align with pelagic habitat, as the ocean depths at 3 nm from nearly any shore in the PIR are considered the pelagic zone. As such, we present a full description of the pelagic resources common to all areas first. The following archipelagic sections outline characteristics unique to the specific respective FEP areas.

### 3.1.1 Affected Physical Environment

The Pacific Pelagic FEP describes the physical environment of the greater Western Pacific Ocean in detail (WPFMC 2009d). In addition to the pelagic habitat, this document includes descriptions of deep reef slopes, banks and seamounts, and the deep ocean floor. Each of the corresponding FEPs contains additional archipelagic-specific information.

### 3.1.2 Affected Biological Environment

The Final EIS for the Pelagic FEP describes the biological environment of the pelagic realm of the PIR, including the species addressed in this amendment, and is incorporated herein by reference (WPFMC 2009d).

### 3.1.3 Affected Social and Economic Environment

This description of the economic and social environment is largely focused on island areas (American Samoa, Hawaii, Marianas, and PRIA). Unless otherwise noted, the information provided in this section comes from the 2019 SAFE Reports for the Pelagic FEP, American Samoa FEP, Hawaii FEP, Marianas FEP, and Pacific Remote Island Area FEP. This section includes relevant information on the past and present aquaculture business operations and some discussion of economic implications. Description of aquaculture activities that occur only in American Samoa, Hawaii, Marianas (the CNMI and Guam), and PRIA can be found in their respective sub-regional sections later in this chapter.

It is likely that many species of interest for culture in the PIR would be high value species currently managed as wild fisheries, which could include albacore (*Thunnus alalunga*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*), dolphinfish (*Coryphaena hippurus*), and Pacific Bluefin tuna (*Thunnus orientalis*). In addition, forktail rabbitfish (*Siganus argenteus*) are a potential product in the CNMI and Guam due to their higher relative value in local markets. There is some potential mollusks, edible algae, and crustaceans to be cultured through aquaculture, although these are most likely to be cultured nearshore, rather than in Federal waters.

A primary motivation for further development of U.S. aquaculture production is to increase self-sufficiency, as the estimated import deficit required to meet U.S. demand for seafood products is $16.8 billion. U.S. per capita seafood consumption is comprised of a combination of domestic and imported products, with roughly 85% of the total consumption represented by imported products annually since 2010 (NMFS 2020). The U.S. is not a major aquaculture producer, ranking 17th globally in finfish and shellfish production, though nearly 50% of the seafood consumed within the U.S. is from both domestic and foreign aquaculture operations. By volume, U.S. aquaculture production comprises only 7% of the total seafood production, whereas it accounts for 21% of the sector's value, due to U.S. aquaculture's focus on producing high-value species.

**State of Industry and Science in Offshore Aquaculture**

The following sections describe past and ongoing offshore aquaculture research and commercial ventures globally. The discussion focuses on open ocean aquaculture, most relevant to any aquaculture management program. Information regarding each sub region is located in their respective sections later in this document.

Globally, offshore aquaculture is a nascent industry and a growing field. While nearshore and land-based aquaculture practices date back centuries, commercial-scale cage culture became prevalent in the mid-20th century and commercial offshore aquaculture operations only became active in the early 2010s. Commercial operations currently exist in at least seven countries, with

research efforts in at least an additional five. Although many of these operations are still relatively small, the sector is expected to grow in the future. In the US, there are several offshore aquaculture projects permitted or in process for permitting in Federal waters off the coast of California, in the Gulf of Mexico and off the coast of New England.

As with near-shore and land-based aquaculture, ideal candidate species for commercial offshore aquaculture are fast growing and successfully reproduced in hatcheries (i.e., there is complete control over the entire life cycle). Commercial and pilot offshore facilities are currently raising a variety of high-value finfish, mollusks, and seaweeds. These species could be raised in monoculture; however, there is also potential for integrated multitrophic aquaculture, which would involve raising finfish alongside mollusks and/or seaweeds, which extract nutrients from the environment, in an effort to increase efficiency, improve ecosystem functioning and provide alternate harvestable revenue streams. In the PIR, these species could include several species of shellfish, edible algae and crustaceans.

While there is great potential for culturing extractive species[9] in the offshore environment, there is limited information and experience for this in the PIR. In other regions, developing mussel, oyster, and kelp aquaculture in nearshore waters could be promising for offshore culture. Currently, there is one facility permitted for culturing an extractive species in the EEZ off the coast of California.

Reef fish and coastal migratory species are also potential aquaculture candidates, as exemplified by raising almaco jack culture offshore of Hawaii. Typically, ideal species for culture in an offshore system would be those commanding the highest value or exhibiting the highest growth rates.

Other potential candidates for aquaculture in the PIR include several tuna species and dolphinfish, and research on these species is ongoing. Many tunas are currently 'ranched,' where wild juveniles are caught and held in a netpen until they reach a marketable size, primarily in Australia, Mexico, and the Mediterranean. However, the alternatives listed in this action prohibit this form of aquaculture due to its heavy reliance on wild broodstock, as well as direct reliance on pelagic fisheries for feed. To successfully rear fish from hatchery to harvest, the life cycle of the fish must be fully under control of the producer. Currently, the only tuna species with consistent hatchery reproduction is the Pacific bluefin tuna, though research is ongoing for several other species.

Dolphinfish have been successfully reproduced under hatchery conditions and research into commercial rearing has been ongoing for more than 30 years. For dolphinfish and bluefin tuna, challenges to commercial production beyond closing the life cycle include addressing technical and physical specifications (e.g., precise water quality for larval rearing, collisions with tank walls), and disease (e.g., the 'puffy snout' syndrome experienced by tunas held in captivity). These constraints have hampered commercial efforts for these species but research is ongoing.

[9] In this context, extractive species do not require feed inputs during the growout phase. Common examples include mussels, oysters, clams, and seaweeds.

**Aquaculture in the Open Ocean: Gear Types and Technology**
Siting aquaculture facilities in an offshore environment brings a unique set of challenges. In addition to the optimal siting characteristics related to water quality for most nearshore aquaculture (e.g., temperature, dissolved oxygen, salinity, current direction and speed), offshore facilities also have to contend with extreme weather conditions. Offshore facilities require access to land-based services, including vessels and harbors, hatchery facilities, and facilities for staff. The respective section for each subregion of the PIR outlines these considerations.

This action focuses primarily on cage and net pen culture, with a general discussion of other gear types and technologies. Open ocean aquaculture could use a wide variety of nets and cages, some of which are established gear types while others are new to the industry.

### 3.1.4 Management Setting

**Federally Managed Sanctuaries, Monuments and Wildlife Refuges**
Federally managed sanctuaries, monuments and wildlife refuges are discussed in detail in their respective sub-regions; however, **Error! Reference source not found.** gives a broad overview f the Marine National Monuments throughout the PIR.

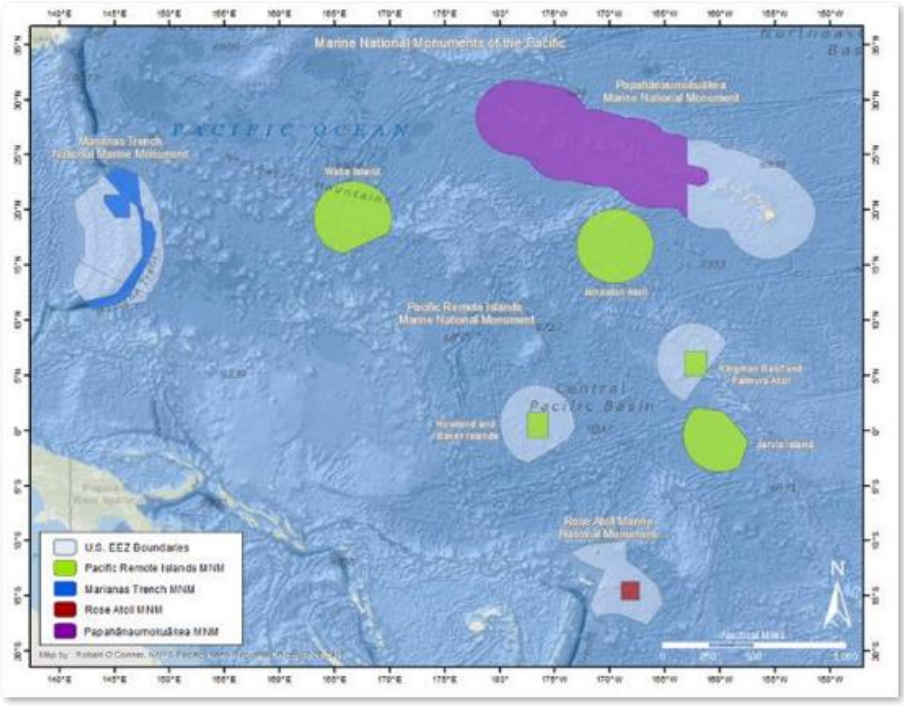


**Figure 1. Marine National Monuments of the Pacific Islands Region**

## 3.2 American Samoa

### 3.2.1 Physical Environment

The Samoa archipelago consists of seven major volcanic islands distributed between the Independent State of Samoa and American Samoa. The FEP for the American Samoa Archipelago (WPFMC 2009a) provides a complete description of the affected environment.

### 3.2.2 Biological Environment

The biological environment of American Samoa are described in detail in the American Samoa Archipelago FEP, which we incorporate here by reference (WPFMC 2009a).

### 3.2.3 Social and Economic Environment

**State of aquaculture industry**
There is no salt-water aquaculture currently conducted in American Samoa. Land-based freshwater operations culture tilapia, and previous operations included work with freshwater prawns, limu, giant clam, and mangrove crab. The effort to raise mangrove crabs was partly successful, but is currently not in operation. A few operators are conducting aquaponics (K. Tagarino, personal communication, April 8, 2020).

**Characteristics and Economic Feasibility of Aquaculture Operations**
Pago Pago harbor is a deep draft harbor important to the U.S. fishing industry, specifically purse seine vessels. The harbor is deep and wide enough to accommodate many of the largest class ships, including cruise ships and tankers, as well as personal yachts and sailboats (ASG Department of Port Administration 2017). The StarKist cannery is the primary business sited along the harbor's wharf.

The harbor infrastructure, presence of the cannery, a small longline fleet, and support for large distant-water fisheries could support aquaculture businesses and product development in American Samoa for both local and export markets.

**Scope of Fishing Industry - Wild Stocks**

**American Samoa Pelagic Fisheries**
The pelagic fishery in American Samoa is and has been an important component of the American Samoan culture and economy. American Samoan dependence on fishing undoubtedly goes back as far as the peopled history of the islands of the Samoan archipelago, about 3,500 years ago. Many aspects of the culture have changed in contemporary times, but American Samoans have retained a traditional social system that continues to strongly influence and depend upon the culture of fishing.

The American Samoa longline fishery is a limited access fishery with a maximum of 60 vessels under the Federal permit program. Vessels range in size from under 40 to over 70 ft long. Class A vessels are 40 ft long or smaller, Class B vessels are longer than 40 ft but no longer than 50 ft, Class C vessels are longer than 50 ft but no longer than 70 ft, and Class D vessels are longer than 70 ft. As of May 15, 2020, 43 vessels held American Samoa longline limited entry Class B, C,

and D permits. The fishery primarily targets albacore for landings at the local Pago Pago cannery, although the fishery also catches and retains other tunas (e.g., bigeye, yellowfin, and skipjack) and MUS (e.g., billfish, mahimahi, wahoo, oilfish, moonfish (opah), and sharks) for local sale and home consumption.

The number of permitted and active longline vessels in this sector increased from three in 1997 to 31 in 2003. Over time, most of the small longline vessels became inactive, and in 2019, there were 3 small (Class A) vessels, and 14 active Class C and D (large) vessels in the fishery. These vessels fish predominantly in the EEZ around American Samoa. Seventeen total vessels were active in 2019. (WPFMC 2020d).

As for non-longline vessels, in 2019, there were 5 troll vessels in American Samoa. Skipjack and yellowfin tuna dominated troll catch. The number of American Samoa boats landing pelagic species have generally declined overall for the longline boats, but almost every year, more participants used longline gear rather than troll to catch pelagic species.

**American Samoa bottomfish fisheries**

American Samoa's bottomfish industry was relatively large in the 1980s. Bottomfishing has been declining for years, but the 2009 tsunami dealt a devastating blow to the industry. The U.S. declared a fishery failure, and the U.S. Congress allocated $1 million to revive the fishery. The fishery used this fund to repair damaged boats, maintain the alia boats floating docks, and build a boat ramp. In 2013, the American Samoan government also implemented a subsidy program that provided financial relief associated with rising fuel prices; the fuel price has since become notably lower (WPFMC 2020a).

Fishermen generally target bottomfish in deep waters, but some catch bottomfish over reefs or at shallower depths. The eteline snappers (*Etelis* and *Pristipomoides* spp.) primarily inhabit high-relief, deep slopes ranging from 80 - 400 m deep. Fishermen catch bottomfish with a vertical handline. In addition to the deep-water eteline snappers, fishermen catch other species such as jacks, emperors, and lutjanid snappers at shallower depths. Fishermen also catch the gray jobfish (*Aprion virescens*) by vertical handline, but fishermen may use drifting or slowly moving vessels and trolling gear and fish over relatively flat-bottom areas for this species. Commercial and non-commercial fisheries for bottomfish occur primarily in nearshore waters from 0-3 nm, although some fishermen make longer trips to specific offshore bank areas (Brodziak et al. 2012).

**Commercial Fishery Suppliers and Markets**

The pelagic fishery in American Samoa is an important component of the American Samoan domestic economy. American Samoa is a landing and canning port for the U.S. purse seine fishery for skipjack and yellowfin tuna, with the largest catch of all U.S. pelagic fisheries in the region. The U.S. longline fishery for South Pacific albacore conducted primarily in the EEZ around American Samoa comprises the second largest of the U.S. longline fisheries in the FEP after Hawaii. Albacore is the primary longline species, with the bulk of the longline catch sold to the Pago Pago cannery. Fishermen sell the remaining catch to stores, restaurants and local residents or donate for customary trade or traditional functions.

Pago Pago Harbor on the island of Tutuila is a regional base for the trans-shipment and processing of tuna taken by domestic fleets from other South Pacific nations, the distant-waters

longline fleets, and purse seine fleets in part due to its exemption from the Nicholson Act, which prohibits foreign ships from landing their catches in U.S. ports (WPFMC 2020a). American Samoa is unique in the Western Pacific region in its development of domestic industrial-scale fisheries, including tuna processing, transshipment, and home port industries. Purse seine vessels land skipjack, yellowfin and other tunas, with little albacore.

The vast majority of American Samoans consume fish or seafood at least once a week, mostly purchased from stores or restaurants, but some obtained from roadside vendors or caught by family members.

**Non-commercial Fishing Considerations**

Fishing, for either subsistence or recreation, is an important activity throughout the Western Pacific Region, including American Samoa. Catch-and-release recreational fishing is virtually unknown in American Samoa, and providing fish to meet cultural obligations is very important (Tulafono 2001). Cultural, subsistence, and recreational fishing categories can be difficult to distinguish, as fishermen's trips might have more than one source of motivation. "Cultural fishing" is a relatively new term and it lacks a formal definition.[10] American Samoa culture is often framed in terms of Faa Samoa, or the "Samoan Way," which governs local social norms and practices. This includes core values and practices such as Tautua or "service" which involves the broad collective sharing of labor, resources, income, and social and political support to strengthen the Aiga (family groups), the village, and the role of chiefs in perpetuating Faa Samoa. In a fisheries context this may mean the distribution of catch within the Aiga, or the use of fish at specific ceremonial events. Cultural fishing would also encompass the day-to-day practices of subsistence. These values and practices endure in spite of significant technological change.

Boat-based recreational fishing revolves primarily around fishing clubs and fishing tournaments, with most participants operating 28-foot alia catamarans and small skiffs (Tulafono 2001). Typically, 7 to 14 local boats carrying 55 to 70 fishermen participated in each tournament, held two to five times per year (Craig et al. 1993). The Pago Pago Game Fishing Association (PPGFA) is the driving force for recreational fishing, with a membership that includes approximately 15 recreational fishing vessels ranging from 10-foot single engine dinghies to 35-foot twin diesel engine cabin cruisers. The PPGFA has annually hosted international tournaments with fishermen from neighboring Samoa and Cook Islands attending. The recreational vessels use anchored FAD extensively, and venture to the various outer banks during tournaments (Tulafono 2001).

### 3.2.4 Management Setting

**American Samoa Administrative Environment**

On April 2, 1900, chiefs of the islands of Tutuila and Anuu ceded and swore allegiance to the United States of America. On July 16, 1904, the chief of the island of Manua ceded the island to the United States. The islands now form American Samoa (Gurr n.d.). A Congressional act in 1929 accepted the Deeds of Cession of Tutuila and Aunuu and the Deed of Cession of Manua

[10] Kleiber and Leong (2018) found zero references to the term within the academic literature.

with special guarantees of protection of ceded waters and their marine resources for the American Samoan people (Sagapolutele 2016).

American Samoa is an unincorporated, unorganized, and self-governing territory of the U.S. Thus, it is excluded from some provisions of the U.S. Constitution and Congress has not provided it with an organic act, which would organize the government in the same manner as a constitution would. (Future Political Status Study Commission 2007). Instead, Congress gave plenary authority over the territory to the President of the U.S., who then delegated that authority to the Department of the Interior. The Secretary of the Interior enabled American Samoans to draft a constitution under which the American Samoa Government functions (Office of Insular Affairs 2017; USDOL 2017).

American Samoans are U.S. nationals rather than U.S. citizens. They cannot vote in national elections, but have freedom of entry into the United States. American Samoa has had an elected, nonvoting Member of Congress in the U.S. House of Representatives since 1981 (USDOL 2017).

The American Samoa Department of Marine Wildlife Resources provides marine resource management within territorial waters. Activities include conducting creel surveys, enforcing territorial fishing regulations, conducting water quality surveys, and participating in various marine wildlife and habitat research and monitoring projects.

**Federally Managed Sanctuaries, Monuments and Wildlife Refuges**
The National Marine Sanctuary (NMS) of American Samoa was originally designated in 1986 as the Fagatele Bay NMS. The NMS was expanded from its 0.25 $mi^2$ (0.65 square $km^2$) site at Fagatele Bay to five additional discrete units: Fagalua/Fogamaa, Swains Island, Tau, Aunuu and Muliāva (Rose Atoll), totaling 13,581 $mi^2$ (35,175 $km^2$) with the Rose Atoll unit accounting for 99% of the expansion (77 FR 43942).

Later, President George W. Bush designated the Rose Atoll Marine National Monument in 2009, which encompasses 13,436 $mi^2$ (34,800 $km^2$) of pelagic habitat surrounding the 0.08 $mi^2$ (0.214 $km^2$) Rose Atoll. This designation prohibits all extraction within 12 nm of the atoll and all commercial fishing within the boundaries of the Monument. The Monument also encompasses the Rose Atoll National Wildlife Refuge and is part of the NMS of American Samoa.

**Department of Defense Jurisdictions**
There are no Department of Defense (DOD) installations or known active DOD jurisdictions in the EEZ surrounding American Samoa.

## 3.3 Mariana Archipelago (Commonwealth of the Northern Mariana Islands and Guam)

### 3.3.1 Physical Environment

The Mariana Archipelago composed of 15 volcanic islands with a total land area of 396 $mi^2$ (1,026 $km^2$) that are part of a submerged mountain chain that stretches nearly 1,500 mi (2,414 km) from Guam to Japan. Politically, the Mariana Archipelago contains the Territory of Guam and the CNMI (WPFMC 2009b).

The CNMI stretches over 400 nm (741 km) between 14-21°N latitude and 144-146°E longitude. The total land area of the CNMI is approximately 179 $mi^2$ (453 $km^2$). The CNMI is comprised of fourteen islands in the Archipelago. The southern islands are limestone and the northern islands are volcanic with several active volcanoes (WPFMC 2009b). The vast majority of the population resides on the islands of Saipan, Tinian, and Rota, with the center of government on Saipan.

Guam is located at 13°28'N latitude and 144°45'E longitude and has a total land area of 216 $mi^2$ (560 $km^2$). It is the southernmost and largest island in the Mariana Archipelago. Guam is the closest island to the Mariana Trench that lies east of the island chain (WPFMC 2009b).

The following is information relevant to any aquaculture management program; the Mariana Archipelago FEP contains a full description of the affected physical environment.

### 3.3.2 Biological Environment

The Final PIR Aquaculture PEIS describes the biological environment of the Mariana Archipelago, including the species addressed in this amendment, which we incorporate here by reference (0648-XA867). This document describes specific resources of concern identified during scoping and interagency informal consultations to the level necessary for appropriate analysis.

### 3.3.3 Social and Economic Environment

Species most likely to be cultured in the Mariana Archipelago under this action include yellowfin tuna, bigeye tuna, dolphinfish, almaco jack, giant trevally, bluefin trevally, pacific threadfin, and rabbitfish. Section 3.2 describes the life history characteristics of these species. The focus of the discussion with regard to the economic and social environment potentially affected by this action would be fisheries that catch these species, supporting industries and surrounding fishing communities. The potential for rabbitfish as an aquaculture species is specific to the CNMI due to strong local demand for rabbitfish, which is only available seasonally.

**State of Aquaculture Industry**

Both Guam and the CNMI have an academic and government support structure for aquaculture, including the CNMI Aquaculture Strategic Plan, the Northern Marianas College Aquaculture Development Center, and the Guam Aquaculture Development Training Center. Guam has developed more aquaculture, producing 122 tons (111 mt) of eel, carp, catfish, marine shrimp and tilapia in 2012.

Until 2011, most aquaculture activity in the CNMI focused on tilapia and marine shrimp aquaculture (SPC Aquaculture Portal, 2011). Currently there is active tilapia aquaculture, albeit in a limited commercial capacity and some tentative future plans to start operating mud crab facilities. In an effort to promote aquaculture in the region, specifically finfish aquaculture, the CNMI launched an Aquaculture Strategic Plan (2011-2015), which identified potential and emerging commodities for further development in the CNMI. Funding from the USDA provided finfish aquaculture training at the Oceanic Institute in Hawaii where individuals from Saipan came and studied finfish aquaculture techniques (Ogo, 2015). This launched the Saipan rabbitfish aquaculture project (2015-2018) with the goal to establish a commercially available rabbitfish product to the markets of the CNMI (Ogo, 2015). In February of 2017, the Northern

Marianas College Cooperative Research, Extension, and Education Service program (CREES) officially opened a new aquaculture development center. This center is currently the second in the world to perform rabbitfish aquaculture research, having completed successful larval rearing and offers training services (Encinares, 2017).

There is one aquaculture facility on Guam, located at the University of Guam in Mangilao. The Guam Aquaculture Development and Training Center currently cultures tilapia, marine shrimp and catfish, though in the past it has also cultured eel, freshwater prawn, carp, milkfish, mangrove crab, mullet and ornamental carp (CTSA 2012; Jiang n.d.). As with the facility in the CNMI, the Guam Aquaculture Development and Training Center is also associated with extension activities and can provide training services.

**Characteristics and Economic Feasibility of Aquaculture Operations**

While there have been no offshore aquaculture projects in the Mariana Archipelago, important support structure for development currently exists. Guam has a relatively large, part-time fishing fleet that could provide services to offshore cages, including deployment, facility maintenance, stocking and harvesting, feeding, and cage retrieval. The University of Guam and local environmental consulting operations may be able to provide environmental services, including surveys and monitoring, as well as facilitate hatchery technology and the development of a dependable source of broodstock. As described above, both the University of Guam and the Northern Marianas College have aquaculture training services. While some of these services are in early development, they are likely to grow with the growing interest in aquaculture.

The area should be well situated to accommodate both local and export demand for aquaculture products, with a relatively high annual seafood consumption rate of 56 lbs. (25 kg) per capita in Guam and 51 lbs. (23 kg) per capita in the CNMI, (WPFMC 2009b and Rhodes et al. 2011, respectively) and proximity to Japanese and other Asian markets. Guam's status as a major regional fish transshipment center is also useful for developing and meeting export demand.

**Scope of Fishing Industry - Wild Stocks**

**Pelagic Fisheries**

*The CNMI*

Commercial fishing in the Mariana Archipelago is primarily trolling with small boats in nearshore waters. The CNMI pelagic troll fishery occurs primarily from the island of Farallon de Medinilla south to the island of Rota, mostly by vessels less than 24 feet in length, that generally take day trips within 30 nm (56 km) to primarily target skipjack tuna (WPFMC 2020d). The number of boats involved in the CNMI pelagic fishery has been steadily decreasing since 2001, when there were 113 reporting commercial pelagic landings. In 2016, a decade-high 73 boats reported landings, a significant increase from 12 in the previous year. In 2019, 49 boats reported landing pelagic species, a decrease of 12.5% from the 56 boats in 2018 (WPFMC 2020d).

*Guam*

Guam's pelagic fishery consists of approximately 400 small, primarily recreational, trolling boats that fish within the local waters of the EEZ around Guam or the adjacent EEZ around the

CNMI. The majority of the fishing boats are less than 30 ft in length and are usually owner-operated by fishermen who earn a living outside of fishing. The number of boats involved in Guam's pelagic fishery gradually increased from 193 in 1983 to a high of 496 in 2013. There were 472 boats involved in Guam's pelagic fishery in 2019, an increase of 18.6% from 2018. The majority of the fishing boats are less than 10 m (33 ft) in length. Most fishermen sell a portion of their catch, and it is difficult to make a distinction between recreational, subsistence, and commercial fishers. A small but economically significant segment of the pelagic group (approximately 5-10%) is comprised of marina-berthed charter boats with full-time captains and crews (WPFMC 2020d).

**Bottomfish Fisheries**

*The CNMI*

The two distinct types of bottomfish fisheries in the CNMI are shallow-water bottom fishing, which targets fish at depths down to 150 m, and deepwater bottom fishing, which targets fish at depths greater than 150 m. Relatively small (<25ft) fishing vessels are used to access bottom fishing grounds around Saipan and Tinian, while the larger (>25ft) vessels are used to access bottomfish resources in the Northern Islands. Only a handful of these larger bottom fishing vessels are operating within the CNMI. Vendors own most of the small bottomfishing vessels. However, a few subsistence bottomfishers participate in the fishery intermittently. More recently, improved technologies, such as sophisticated electronics to locate fish and various types of reels replacing handlines, have entered the CNMI bottomfish fishery (WPFMC 2020b).

The number of boats participating in the CNMI bottomfish fishery peaked in 2010 at 6,300 fishers, saw a marked decrease to roughly 600-800 fishers from 2012-2017, and in 2018 increased to 1,195 fishers. The coral reef boat-based troll fisheries have remained steady in the same timeframe, with roughly 600-800 fishers between 2010 and 2018 (WPFMC 2019a).

*Guam*

Bottomfishing in Guam is a combination of recreational, subsistence, and small-scale commercial fishing. Bottomfishing consists of two distinct fisheries separated by depth and species composition. The shallow water complex (< 500 feet) comprises the largest portion of the total bottomfish harvest and effort, though in recent years, deep water species (>500 feet) have made up a significant portion of the total expanded bottomfishing catch. The majority of bottomfishing around Guam takes place on offshore banks, though practically no information exists on the condition of the reefs on offshore banks (WPFMC 2020b). Based on anecdotal information, most of the offshore banks are in good condition due to their isolation. The banks are fished using hook and line, and jigging at night for bigeye scad (*Selar crumenophthalmus*; Myers 1997).

The number of participants in Guam's bottomfish fishery peaked in 2010 at 6,300 fishers, saw a marked decrease to roughly 600-800 fishers from 2012-2017, and in 2018 increased to 1,195 fishers.

**Commercial Catch and Landings of Species with Aquaculture Potential**
*The CNMI*

Skipjack tuna is the principal species landed in the CNMI, comprising over 74% of the entire pelagic landings in 2019 based on creel survey data (**Error! Reference source not found.** bove). Dolphinfish (mahi mahi) and Yellowfin tuna ranked second and third, respectively, by weight of landings in 2019.

Amberjack and rabbitfish are also potential aquaculture species in the CNMI. Though total commercial landings volume are not available,[11] the "Revenue from Commercial Fisheries" section below outlines commercial value and volume sold.

*Guam*

The 2019 total expanded pelagic landings were 840,332 lbs., a slight decrease of 5.77% when compared to 2018. Tuna PMUS landings were 564,886 lbs., while non-tuna PMUS were 252,702 lbs. Landings consisted primarily of five major species: mahimahi, wahoo, bonito or skipjack tuna, yellowfin tuna, and Pacific blue marlin, with skipjack comprising over 57% of total landings (WPFMC 2020d). For more information on landings in the Guam pelagic fishery, refer to the most recent Annual SAFE Report.

Amberjack and rabbitfish are also potential aquaculture species in Guam. Though total commercial landings volume are not available,[12] the "Revenue from Commercial Fisheries" section below outlines commercial value and volume sold.

**Revenue from Commercial Fisheries**
*The CNMI*

The primary target and most marketable species for the pelagic fleet in the CNMI is skipjack. Schools of skipjack tuna have historically been common in near shore waters, providing an opportunity to catch numerous fish with a minimum of travel time and fuel costs. CNMI residents readily consume skipjack and serve it in restaurants, primarily as sashimi. Yellowfin tuna and dolphinfish are also easily marketable species, but are seasonal. During their seasonal runs, these fish are usually found close to shore and provide easy targets for local fishermen.

**Commercial Fishery Suppliers and Markets**
The CNMI government's volunteer database collection system records 36 fish vendors in Saipan in 2019. Fisheries managers report that the system of seafood distribution has undergone significant changes in the past decade because of the establishment of large seafood vendors. In contrast to individual fishermen/vendors who only market their own catch, large vendors typically own and operate a number of vessels and purchase catch from independent fishermen.

The Guam Fishermen's Cooperative Association (GFCA) is a central component of the Guam offshore fishing industry that continues to pursue and broaden its original mission of providing marketing services, fuel, and ice for its small-boat fishermen members. A primary GFCA service is the retailing and wholesaling of ocean-caught fish and aquaculture products of local origin to the general public (cash sales), local restaurants, and government institutions (credit sales). GFCA's influence has become pervasive, providing a variety of benefits not just to its members,

[11] https://apps-pifsc.fisheries.noaa.gov/wpacfin/home.php
[12] https://apps-pifsc.fisheries.noaa.gov/wpacfin/home.php

but also for fisheries conservation, marine education, and the greater Guam community. Prior to the GFCA establishment, which formed in 1976 and incorporated in 1977 to assist its small-scale fishermen members in marketing their catch, commercial fishermen sold catch at farmer's markets and roadside locations.

**Non-commercial Fishing Considerations**
The CNMI has few fishing clubs. The Saipan Fishermen's Association, established in 1985, is the sponsor of the annual Saipan International Fishing Tournament which is usually held in August or September. Charter fishing in the CNMI is limited, with about ten boats operating on Saipan, and a few vessels on Tinian conducting occasional fishing charters. (WPFMC 2020b).

In both the CNMI and Guam, small boat fisheries are a complex mix of subsistence, cultural, recreational, and quasi-commercial fishermen whose fishing behaviors provide evidence of the importance of fishing to the island of the Guam. For nearly all fishery participants, the social and cultural motivations for fishing far outweigh any economic prospects. Nearly all fishermen supplement their income with other jobs and are predominantly subsistence fishermen, selling occasionally to recover trip expenses (WPFMC 2020b).

**Relevant Socio-economic profile**
In both Guam and the CNMI, fish and marine resources have played a central role in shaping the social, cultural, and economic fabric that continues today. Residents fish for both reef and pelagic species, collect mollusks and other invertebrates, and historically have caught sea turtles.

Additional information about the role of fishing and marine resources across the Marianas Archipelago, as well as information about the people who engage in fishing or use fishing can be found through the Marianas FEP 2019 SAFE Report (WPFMC 2020b), Pelagic FEP 2019 SAFE Report (WPFMC 2020d), Allen and Bartram (2008) and Allen and Amesbury (2012).

### 3.3.4 Management Setting

**CNMI and Guam Administrative Environment**
Politically, the Mariana Islands contain the Territory of Guam and the Commonwealth of Northern Mariana Islands, both of which are U.S. possessions. The CNMI was part of the U.S. Pacific Trust Territory since 1947, and has been a U.S. commonwealth since 1986. The island of Guam has been an unincorporated U.S. territory since 1949.

The CNMI Department of Land and Natural Resources, Division of Fish and Wildlife is tasked with conserving, protecting and enhancing the fish, game and wildlife resources of the islands for the benefit of the citizens of the CNMI. In Guam, the Department of Agriculture, Division of Aquatic and Wildlife Resources is comprised of three sections, Wildlife, Fisheries, and Law Enforcement that together undertake management actions to sustain and recover fish and wildlife resources.

**Federally managed sanctuaries, monuments and wildlife refuges**
The CNMI management subarea includes all Federal waters of the EEZ from 3 to 200 nm (6 to 370 km) around the CNMI, except for the three northernmost islands of Uracus, Maug, and Asuncion, and the island of Farallon de Medinilla, where Federal jurisdiction extends to the shoreline. In these areas, waters within 3 nm of the shoreline are restricted from public access at

all times due to safety reasons based on military activities. At Tinian, Federal waters also extend to the shoreline around certain lands leased by the U.S. government.

There are two National Wildlife Refuges (NWR) in the Mariana Archipelago - the Mariana Arc of Fire NWR and the Mariana Trench NWR. These designations followed the establishment of the MNM, per Secretarial Order 3284. The NWR boundaries and regulations are identical to the MNM.

In January 2009, President George W. Bush created the Marianas Trench Marine National Monument., encompassing three units: the Islands, Trench, and Volcanic Units. The Islands Unit includes the waters and submerged lands of the three northernmost Mariana Islands of Farallon de Pajaros (also known as Uracus), Maug, and Asuncion.

The Trench Unit/Refuge encompasses the submerged lands extending from the northern limit of the EEZ around the CNMI to the southern limit of the EEZ around Guam. The Volcanic Unit/Arc of Fire Refuge includes the submerged lands within 1 nm (1.9 km) of 21 designated volcanic sites. The waters above the seafloor in the Volcanic and Trench Units are not included in the Monument and the CNMI Government maintains all authority for managing the terrestrial environment of the three islands within the Islands Unit.

The total Monument area consists of approximately 96,714 $mi^2$ (250,487 $km^2$) of submerged lands and waters of the Mariana Archipelago. NOAA and the U.S. Fish and Wildlife Service (USFWS) manage the Monument, in cooperation with the U.S. Department of Defense (DOD) and the CNMI Government. The Monument prohibits commercial fishing, including commercial aquaculture. Regulations allow for non-commercial fishing by permit and customary exchange in non-commercial fisheries in the Islands Unit.

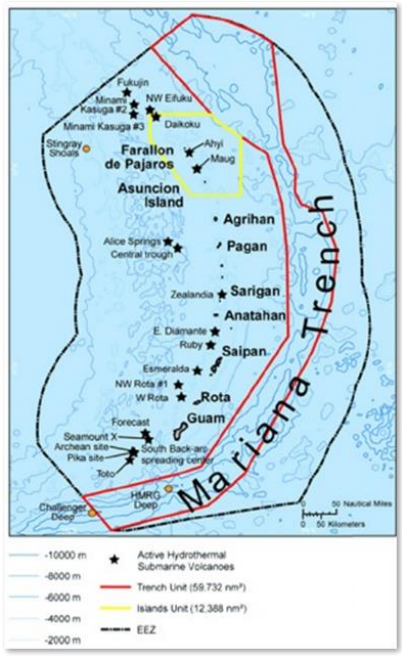


**Figure 2. Marianas Trench Marine National Monument**

**Department of Defense Jurisdictions**
With the large military presence in Guam, there are numerous restricted areas and other training zones, all of which would be incompatible with aquaculture. In particular, the Mariana Archipelago hosts a long-term training and testing area for the U.S. Navy (U.S. Navy 2020). The DOD operates a year-round 3 nm restricted zone around the Farallon de Medinilla (R-7201). During military range operations involving live fire or other hazardous training, this restricted zone temporarily extends to 12 nm for the duration of the exercise (R-7201A).

## 3.4 Hawaii

### 3.4.1 Physical Environment

The Hawaii Archipelago is comprised of 137 islands, islets, and coral atolls that are part of a great undersea mountain range known as the Hawaiian-Emperor Seamount Chain. The Hawaiian Islands extend for nearly 1,500 mi (2,414 km) from Kure Atoll in the northwest to Hawaii Island in the southeast. The islands are often grouped into the Northwestern Hawaiian Islands (NWHI; Nihoa to Kure) and the MHI (MHI; Hawaii to Niihau). The total land area of the 19 primary islands and atolls is approximately 6,423 $mi^2$ (16,600 $km^2$) and over 75% of the 1.42 million population resides on the island of Oahu.

### 3.4.2 Biological Environment

The biological environment of Hawaii, including the species addressed in this PEIS, are described in detail in the Hawaii Archipelago FEP, which we incorporate here by reference (WPFMC 2009c).

### 3.4.3 Social and Economic Environment

**State of aquaculture industry**
Within the PIR, Hawaii has the longest history, largest industry, and most extensive technical capacity for both marine and freshwater aquaculture ventures. The value of Hawaii's aquaculture industry has held steady since a peak of roughly $78 million in 2014. In 2017, aquaculture sales reached $76.4 million, of which algae contributed $35.2 million (46%). Currently, the aquaculture industry in Hawaii produces a wide variety of crustaceans, finfish, mollusks, and algae for food (USDA 2018).

In 1999, with assistance from NOAA's National Marine Aquaculture Initiative (NMAI), Hawaii became the first place in the world with a commercially operating ocean-lease and offshore cage system. This began as a public-private partnership known as the Hawaii Offshore Aquaculture Research Project, which conducted environmental research and commercial production of moi (Pacific threadfin, *Polydactylus sexfilis*) off Ewa Beach, Oahu. By 2006, the private venture partner, Cates International, Inc. (CII), produced as much as 8,000 lbs. (3,630 kg) of moi per week. After it sold to Grove Farm Fish & Poi, LLC, operating as Hukilau Foods, the company declared bankruptcy in 2010. CII's founder later began a new venture, Mamala Bay Seafood, and intended to produce moi in a 10-cage facility over 75 acres in the nearshore waters of south

Oahu. The final Environmental Assessment for this proposed project was completed in 2014 and the construction permit was extended in 2018;[13] however, this facility was never constructed.

In addition to Mamala Bay Seafood, Kona Blue Water Farms began harvesting commercial quantities of the amberjack, also known as "kampachi" or "kanpachi," in September 2005 in state waters off the Kona coast of the island of Hawaii. A year later, the company produced up to 10,000 lbs. (4,536 kg) per week of hatchery-produced sashimi-grade fish (Toth 2014). In 2012, Blue Ocean Mariculture acquired the hatchery and offshore assets of Kona Blue Water Farms and is currently the only active commercial aquaculture venture utilizing submersible sea cages in Hawaii. Blue Ocean Mariculture continues to culture amberjack and in 2014 they applied to the State of Hawaii for permission to increase production capacity from 550 U.S. tons (tons) (500 metric tons [t]) to 1,212 tons (1,100 t) of fish annually (Blue Ocean Mariculture 2014). The approved permit allows Blue Ocean Mariculture to culture almaco jack/kahala, Pacific threadfin/moi, dolphinfish/mahi mahi, and giant trevally/giant ulua.

In 2011, the founders of Kona Blue Water Farms founded Kampachi Farms, LLC, primarily a research venture to investigate and address the challenges of open ocean aquaculture. That year, NMFS issued a permit to Kampachi Farms to test the potential for untethered cages drifting in large-scale eddies that persist in the lee of the island of Hawaii, known as the Velella Project. The goal was to raise fish as sustainably as possible by moving cages offshore to reduce many of the environmental impacts of aquaculture. As such, the system was the first project to raise fish in cages untethered from the ocean bottom in U.S. waters.

In July 2016, NMFS issued a SCREFP to Kampachi Farms, LLC for a net pen system to culture and harvest of *S. rivoliana*. The permit for this project describes a net pen tethered to an existing mooring located in Federal waters approximately 5.5 nm (9.3 km) west of Keauhou Bay Hawaii Island. NMFS transferred this initial two-year permit to Forever Oceans Corporation in March 2017. It authorized the culture and harvest of a maximum amount of 30,000 kampachi or approximately 120,000 lbs. (54,431 kg) during the permit's two-year duration (NOAA 2015). Because of the delay in beginning culture activities, NMFS extended the permit through the end of 2021 with the same operations and processes for the permitted activity (30,000 kampachi, same location, gear, etc.).

There are examples of at least three other offshore aquaculture ventures in Hawaii over the past decade, although none expanded beyond the proposal stage. One of these, Hawaii Oceanic Technology, under the name King Kona Ahi, received a 35-year lease in 2011 from the State of Hawaii, and a required Army Corps of Engineers permit in 2013, to develop and operate a geostatic, untethered offshore cage system to raise bigeye and yellowfin tuna. This venture intended to investigate technology that would allow open ocean aquaculture siting in waters of limitless depth. This technology, in collaboration with technology for automated feeding systems and other remotely operated systems, could provide for expansion of the aquaculture. However, Hawaii Oceanic Technology has since withdrawn from this lease, citing difficulties in raising money for a prototype cage and delays in obtaining permits. The company dissolved in January 2017 (Gomes 2017).

[13] https://dlnr.hawaii.gov/wp-content/uploads/2018/01/K-2.pdf

The Oceanic Institute, a research facility of Hawaii Pacific University, provides research for aquaculture from their land-based aquaculture facility in Waimanalo, Oahu. Over the last 20 years, their facility has housed a stock enhancement program for Pacific threadfin, as well as developed breeding technologies for commercial shrimp. The researchers have provided technical support to numerous ventures in open ocean aquaculture technology, but currently focus on marine ornamentals, shrimp and feed technology.

**Characteristics and Economic Feasibility of Aquaculture Operations**

As noted previously, within the PIR, Hawaii has the longest history, largest industry, and most extensive technical capacity for both marine and freshwater aquaculture ventures. Additionally, with a long history of supporting aquaculture innovation, the state is poised to support and develop a growing aquaculture industry.

Currently the state-run Hawaii Ocean Science and Technology Park, administered by the Natural Energy Laboratory of Hawaii Authority, houses many aquaculture innovation projects (NELHA). This facility offers a pre-permitted demonstration site to support emerging science and technology in renewable and ocean-based technologies. The mission of the facility is "to develop and diversify the Hawaii economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner."[14] This facility has a track record of supporting the development of technologies related to aquaculture and is planning to increase its capacity for offshore technologies.

As noted above, the Oceanic Institute, run by Hawaii Pacific University, also has a long history of supporting and developing research essential to the aquaculture industry. Additionally, it co-administers the Center for Tropical and Subtropical Aquaculture (CTSA), one of five regional USDA aquaculture centers, with the University of Hawaii.

The University of Hawaii at Manoa Sea Grant Program is currently developing an aquaculture hub, with the aid of a $1.2 million NOAA grant to "revitalize, solidify, and expand an aquaculture-focused, collaborative program that would be socially, geographically, and economically inclusive." [15] This hub would provide integration between research, extension and education services, all aimed at supporting the development of the aquaculture industry. The University of Hawaii at Hilo has offered an aquaculture specialty since 1988 and houses the Pacific Aquaculture and Coastal Resources Center (PACRC).[16] This facility encompasses a variety of aquaculture research and supports a long-term goal of providing infrastructure aquaculture programs at both University of Hawaii campuses, as well as supporting commercial aquaculture, fisheries, and conservation.

**Scope of Fishing Industry - Wild Stocks**

Of the wild-caught species in Hawaii, yellowfin tuna, bigeye tuna, dolphinfish, almaco jack, giant trevally, bluefin trevally, and pacific threadfin are the most likely candidates for culture under this action. Fisheries that catch these species, supporting industries and surrounding fishing communities, are the focus of the following subsections.

[14] http://nelha.hawaii.gov/about/
[15] https://www.hawaii.edu/news/2019/09/20/noaa-aquaculture-funding/
[16] https://hilo.hawaii.edu/pacrc/

The Hawaii FEP characterizes each of the inhabited MHI (Kauai, Niihau, Oahu, Maui, Molokai, Lanai, Hawaii) as a separate fishing community (WPFMC 2009c). Shore-side activities associated with the large-vessel fisheries are mostly concentrated near Honolulu. Activities associated with the small vessel fisheries, in contrast, are widely dispersed within and among islands (WPFMC 2009c).

**Hawaii Pelagic Fisheries**

Compared to the other regions, Hawaii has a diverse fishery sector that includes shallow- and deep-set longline, Main Hawaiian Islands (MHI) troll and handline, offshore handline, and the aku boat (pole and line) fisheries. The Hawaii longline fishery is by far the most important economically, accounting for 90% of estimated ex-vessel value of the total commercial fish landings in the State. The MHI troll was the second largest fishery in Hawaii with 7% of the total value, followed by MHI handline, aku boat, offshore handline fisheries, and other gear types comprising the remainder (WPFMC 2020d).

Longline vessels are prohibited from fishing within 50 mi (80 km) of the islands of Hawaii, Maui, Kahoolawe, Lanai and Molokai, and within 75 mi (121 km) of the islands of Oahu, Kauai and Niihau (57 FR 7661).

Hawaii-based U.S. longline vessels operate under a limited entry program, with 164 total permits, 146 of which are active (https://www.fisheries.noaa.gov/pacific-islands/resources-fishing/pacific-islands-permit-holders#hawaii-longline-limited-entry, accessed October 14, 2020). Hawaii longline vessels set shallow longlines to target swordfish or deep to target bigeye tuna. See WPFMC (2019d) for more information.

The State of Hawaii licensed 3,124 fishermen in 2019, including 1,929 (62%) who listed pelagic fishing gear as their primary fishing method and gear. This is a 6% decrease in fishing licenses from the previous year. Most licenses that indicated pelagic fishing as their primary method were issued to longline fishermen (46%) and trollers (40%). Ika shibi and palu ahi (handline) make up the remaining licenses (14%) (WPFMC 2020d).

**Hawaii Bottomfish fisheries**

Bottomfish fishing was a part of the culture of the indigenous people of Hawaii long before European explorers first visited the islands. Descriptions of traditional fishing practices indicate that Native Hawaiians harvested the same deep-sea bottomfish species as the modern fishery and used similar specialized gear and techniques to those employed today. The State of Hawaii, Department of Land and Natural Resources, Division of Aquatic Resources, manages the deep-sea bottomfish fishery in the MHI (MHI) under a joint management arrangement with NMFS and the WPFMC (WPFMC 2020c).

Decreasing catch and effort trends relative to measured averages characterized the 2018 MHI Deep 7 bottomfish fishery. This decline is attributed to trends in the portion of the fishery that harvests using deep-sea handline, which is responsible for a majority of Deep 7 bottomfish catch in the main MHI. Though the effort, participation, and the pounds landed all decreased, effort and participation decreased to the extent that CPUE for the fishery increased relative to short- and long-term averages for the gear type. Uku (*Aprion virescens*) and white ulua (*Caranx ignobilis*) dominated the non-Deep 7 bottomfish fishery. The total number of non-Deep 7 fish

caught was higher than the short- and long-term averages, though the pounds caught was lower than the decadal average. Each of the major gear types used in the fishery (i.e., deep-sea handling, inshore handline, and trolling) all showed notable decreases in effort and participation relative to their short-term averages. However, all gears had increasing trends for CPUE. Trolling with bait showed increases for participation, effort, number of fish caught, and pounds landed relative to both ten- and twenty-year trends (WPFMC 2020c).

**Hawaii Crustacean fisheries**

Ula (lobster) was a traditional food source for Native Hawaiians and they sometimes used it in early religious ceremonies (Titcomb 1978). After Europeans arrived in Hawaii, the lobster fishery became by far the most productive commercial shellfish fishery. Crustacean fisheries in the MHI are comprised of the Heterocarpus deep water shrimps (*H. laevigatus* and *H. ensifer*), spiny lobsters (*Panulirus marginatus* and *P. penicillatus*), slipper lobsters (*Scyllaridae haanii* and *S. squammosus*), kona crab (*Ranina ranina*), kuahonu crab (*Portunus sanguinolentus*), Hawaiian crab (*Podophthalmus vigil*), opaelolo prawn (*Penaeus marginatus*), and aama crab (*Grapsus tenuicrustatus*). The main gear types used are shrimp traps, loop nets, miscellaneous traps, and crab traps.

In 2019, the MHI crustacean fishery, now comprised of only deepwater shrimp and kona crab, had an overall decline in catch relative to available short- and long-term trends. In general, there was a greater number of fishing trips taken for these species than recorded in their historical trends, but total catch (18,296 lbs.) decreased by 17% from its 10-year trend and 30% from its 20-year trend. Effort, participation, and catch values for shrimp species harvested by shrimp trap were not disclosed due to data confidentiality (i.e., less than three licenses reporting). Kona crab harvested by loop net had increases in catch (5,650 lbs.) and CPUE (80.71 lbs./trip) compared to its 10-year average despite having fewer associated licenses (23) and fishing trips (70); catch increased over 7% from its 10-year average while CPUE increased over 39%. Data for other gear types were unavailable to report due to data confidentiality (WPFMC 2020c). For more information on the Hawaii crustacean fisheries, refer to the most recent Annual SAFE report.

**Commercial Catch and Landings of Species with Aquaculture Potential**

Hawaii commercial fisheries caught and landed 36.5 million pounds of pelagic species in 2019, a decrease of 3% from the previous year. Although each fishery targets or intends to catch a particular pelagic species, the fisheries capture a variety of other species. The deep-set longline fishery targeted bigeye and yellowfin tuna. This was the largest of all pelagic fisheries and its total catch comprised 8% (32.0 million pounds) of all pelagic fisheries. The shallow-set longline fishery targeted swordfish and its catch was 837,000 pounds, or 2% of the total catch. The Main Hawaiian Islands troll fishery targeted tunas, marlins and other PMUS, and caught 2.5 million pounds or 7% of the total. The MHI handline fishery targeted yellowfin tuna while the offshore handline fishery targeted bigeye tuna. The MHI handline fishery accounted for 675,000 pounds (2% of the total). The offshore handline fishery was responsible for 477,000 pounds or 1% of the total catch (WPFMC 2020d).

**Revenue from Commercial Fisheries**

The total revenue from Hawaii's pelagic fisheries was $105.6 million in 2019, a decrease of 11% from the previous year. Bigeye tuna and yellowfin tuna represented 60% and 20% of the total

pelagic revenue, respectively in 2019. The deep-set longline revenue was $92.9 million in 2019. This fishery represented 88% of the total revenue for pelagic fish in Hawaii. The shallow-set longline fishery decreased to $2.0 million and accounted for 2% of the revenue (WPFMC 2020d).

The MHI troll revenue was $7.2 million or 7% of the total in 2019, followed by the MHI handline fishery at $2.2 million (2%). The offshore handline fishery was worth $1.0 million in 2019. The trend for revenue from the deep-set longline was increasing, although it dropped 11% in 2019. Revenue for the shallow-set longline fishery was decreasing. The revenue from the MHI troll, MHI handline, and offshore handline fishery showed some variability and had no clear trend over the past ten years (WPFMC 2020d).

The total revenue from all fish in the bottomfish fishery (Deep-7 and non-Deep-7) in 2019 was $1.79 million, which is steady with the previous four years. There is currently no socioeconomic information for the crustacean fishery (WPFMC 2020c).

The following figures below provide additional data and trends for revenue, number of fishermen, and days fished for Hawaii's pelagic and bottomfish fisheries. Additionally, the annual catch and revenue data for amberjack and threadfin are included.

**Commercial Fishery Suppliers and Markets**

The United Fishing Agency auction in Honolulu sells most of the pelagic longline catch, which represents more than 86% of annual commercial landings and revenue. Other commercial fishermen have multiple options for selling their catch including the Honolulu auction, directly to dealers/wholesalers, markets/stores, restaurants, roadside, or even selling or giving fish to friends and others. Much like other Pacific Island communities, a majority of this latter group of fishermen report selling their fish simply to recover costs, rather than as a primary source of income. Many also place importance on sharing fish as a part of maintaining relationships within their network of friends and family.

Hawaii residents' average seafood consumption is about two to three times more than other U.S. residents (WPFMC 2020c). In 2010, Hawaii imported 75% of all seafood consumed in the State from either the U.S. mainland or foreign markets, as local supply is not sufficient to meet the high seafood demand in the state.

**Non-commercial Fishing Considerations**

Non-commercial fishing for recreational, subsistence and cultural purpose are an important part of life and lifestyle in Hawaii. There are roughly 30 fishing clubs in Hawaii and the state hosts between 150 and 200 boat-based fishing tournaments. In 2018, the recreational catch was an estimated 43.7 million lbs. (19.8 million kg), which accounts for approximately 15% of the total catch (WPFMC 2020c).

Non-commercial fisheries are also extremely important in Hawaii economically, socially, and culturally. The total estimated pelagic recreational fisheries production in 2019 was nearly 12.8 million lbs. The number of small vessels in Hawaii declined to approximately 11,000 in 2018 since a peak of over 16,000 vessels in 2008. Boat-based anglers took 632,088 fishing trips in 2019, with only 7,744 designated charter vessel trips. Although unsold or not entering the typical

commercial channels for fish sales, the total estimated value of the recreational catch was approximately $20 million in 2018 based on an average of $3.00/lb (WPFMC 2020d).

**Socio-Economic Profile**

As of July 2019, the estimated population of the state of Hawaii was 1,415,872, composed of about 37.6% Asian alone, 25.6% Caucasian alone, 24% mixed, 10.2% Native Hawaiian and other Pacific Islanders. While the primary language spoken is English, roughly 25% of residents speak another language at home.[17] The median age of Hawaii residents is 39.3 years old.[18]

In 2018, nominal GDP for the state of Hawaii was an estimated $97,282,000.[19] The top five sectors in the 2018 GDP accounted for 62% of the GDP and were real estate/rental/leasing (20.9%), government (19.5%), accommodation and food services (8.7%), health care and social assistance (6.8%) and retail trade (6.6%). The agriculture, forestry, fishing and hunting category by comparison directly contributed $406 million (0.4%) to the GDP.

With regard to the role of fishing in Hawaii, historically, Native Hawaiian subsistence relied heavily on fishing, trapping crustaceans, and collecting seaweed to supplement land-based diets. Native Hawaiians also maintained fishponds, some of which date back thousands of years and are still in use today. Fishing continues to play a central role in local Hawaii culture, diet, and economy. In 2015, with total revenue from commercial fishing of $110.9 million, the commercial fishing and seafood industry in Hawaii generated additional impacts to seafood processors and dealers, seafood wholesalers, seafood distributors, and retail. These total impacts, which exclude impacts from imports, were estimated to be $411.13 million in sales impacts, $162.7 million in income impacts, and 6,802 full- and part-time jobs in 2015 (NMFS 2017). In Hawaii, consumers prefer fresh seafood, and while most consumers purchase seafood at markets or restaurants, friends, neighbors, or extended family members catch much of the seafood consumed in Hawaii.

Hawaii residents consume fresh bigeye tuna and yellowfin tuna, often as sashimi or poke (cubed and seasoned raw tuna) daily, especially during celebrations. Tuna wholesale prices increase dramatically at the end of the year because of the concentrated demand for fresh fish for the holiday season.

Additional information about the role of fishing and marine resources across Hawaii, as well as information about the people who engage in fishing or use fishing can be found through the Hawaii FEP 2019 SAFE Report (WPFMC 2020c) and Pelagic FEP 2019 SAFE Report (WPFMC 2020d). An interactive online tool created by NMFS- Pacific Islands Fisheries Science Center depicts snapshots of Hawaii communities with information on fisheries involvement and demographics.[20]

[17] https://www.census.gov/quickfacts/fact/table/HI/PST045216, accessed 06/24/2020
[18] https://data.census.gov/, accessed 06/24/2020
[19] http://files.hawaii.gov/dbedt/economic/reports/GDP_Report_Final.pdf
[20] https://www.pifsc.noaa.gov/socioeconomics/hawaii-community-snapshots.php

### 3.4.4 Management Setting

**Hawaii Administrative Environment**
The Hawaii Department of Land and Natural Resources (DLNR) is responsible for managing public lands, water resources, ocean waters, navigable streams, and coastal areas. The DLNR Division of Aquatic Resources manages the State's marine and freshwater resources including commercial and non-commercial fisheries and aquaculture, aquatic resources protection and enhancement, and related education and enforcement programs. The DLNR operates in conjunction with Federal fisheries management concerning dealer reporting, fishing permits required for individuals in federally managed fisheries that cross into state waters, size limits for landings, and enforcing federally banned practices such as shark finning.

In 1978, the State developed the first formal aquaculture development plan in the U.S. In 1999, the Hawaii legislature approved ocean leasing for aquaculture (Buttner and Karr 2009). These efforts have led to a growing aquaculture industry in state waters.

**Federally Managed Sanctuaries, Monuments and Wildlife Refuges**
The Hawaiian Islands Humpback Whale National Marine Sanctuary, authorized by Congress in 1992, is located from the shoreline to the 100-fathom isobath (600-ft depth [183 m]), as shown in **Error! Reference source not found.**. The sanctuary encompasses approximately 1,218 $nm^2$ 4780 $km^2$) and is managed via a cooperative Federal-state partnership between NOAA's Office of National Marine Sanctuaries (ONMS) and the Department of Land and Natural Resources.

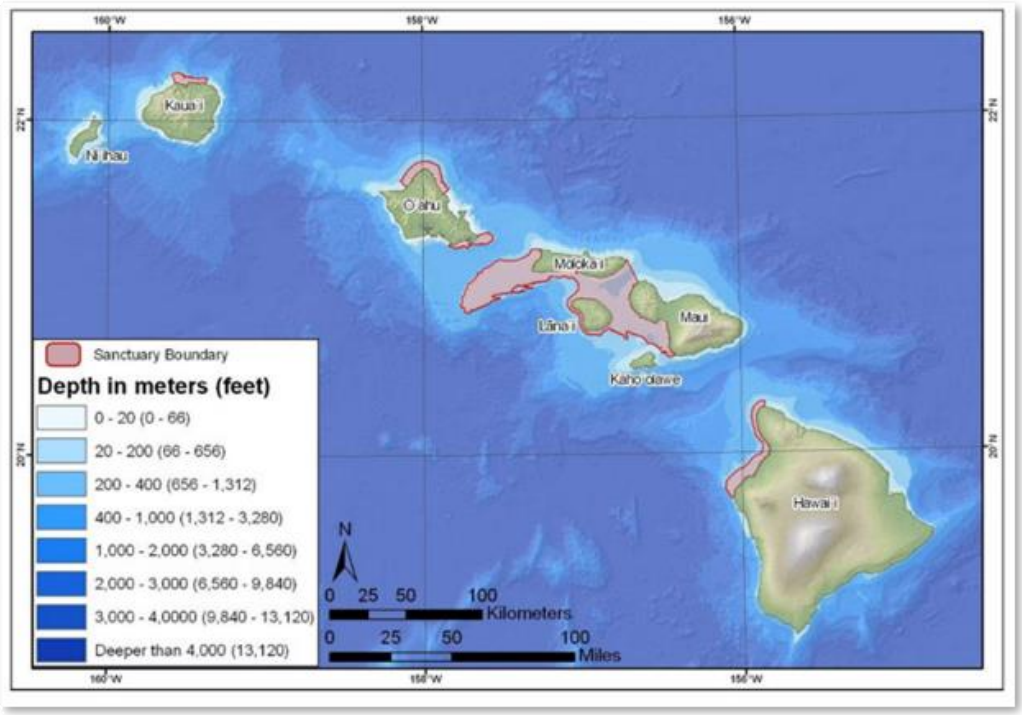


**Figure 3. Hawaiian Islands Humpback Whale National Marine Sanctury. Source HIHWNMS Website.**

The sanctuary's advisory council prepared an *Offshore Development and Aquaculture Report* (SAC 2012). In this report, the advisory council did not recommend banning aquaculture in the sanctuary, but if considered, the sanctuary must take an active role in its development. They also listed five concerns related to aquaculture development: aversion, attraction, entanglement, habitat degradation, and habitat loss, and measures to address and study these concerns.

The NWHI are subject to a series of management measures and jurisdictional authorities, including:

- A 1909 bird reserve, which converted into the Hawaiian Islands National Wildlife Refuge.
- A protected species zone (PSZ) that has prohibited longlining within 50 nm (93 km) of the islands since 1991.
- A coral reef ecosystem reserve in 2000 that mirrors the boundaries of the PSZ and prohibits all commercial fishing.
- A marine national monument that is the largest marine wildlife reserve in the world.

On June 15, 2006, President G.W. Bush created the Papahanaumokuakea Marine National Monument under the Antiquities Act of 1906. The Monument spans the entire NWHI, encompassing the islands and 139,797 $mi^2$ (362,073 $km^2$) of surrounding ocean waters. On August 26, 2016, President Obama expanded the Monument to 582,578 $mi^2$ (1,508,870 $km^2$), nearly the size of the Gulf of Mexico (**Error! Reference source not found.**). The Monument rohibits all commercial fishing, including commercial aquaculture, within its boundaries. The Monument allows for certain armed forces' activities.

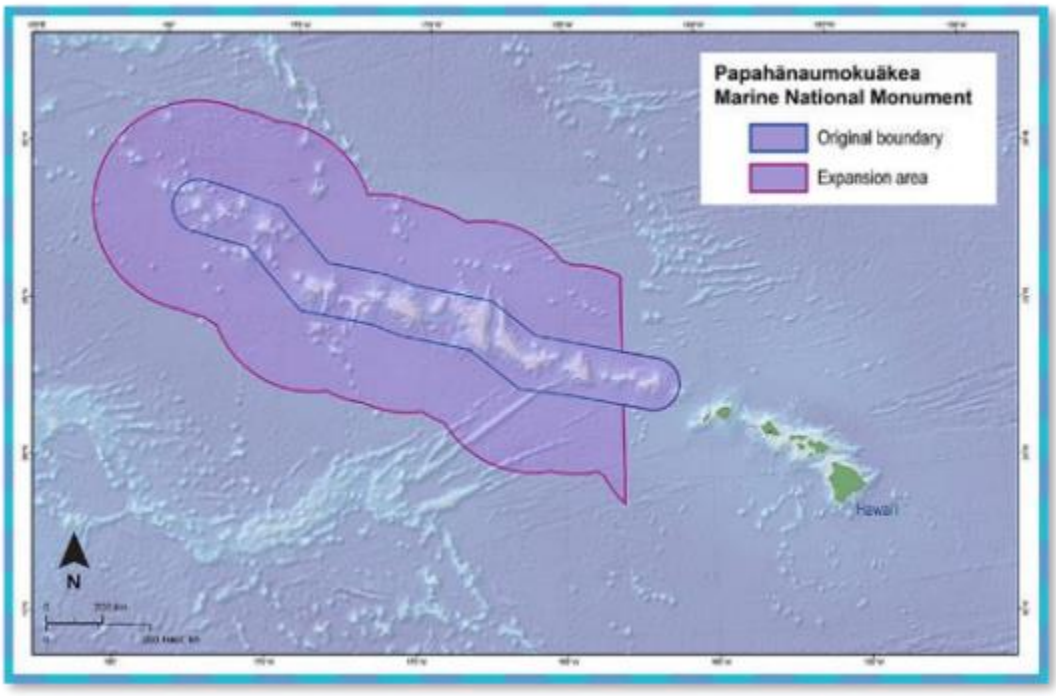


**Figure 4. Papahanaumokuakea Marine National Monument. Source: ONMS Website.**

**Department of Defense Jurisdictions**
With the large military presence in Hawaii, there are numerous restricted areas and other training zones, most of which would be incompatible with aquaculture. Hawaii waters are also part of a long term training and testing study area for the U.S. Navy (U.S. Navy 2018). The figures below provide the broader Hawaii-Southern California Training and Testing Study Area, as well as the detailed Hawaii Training and Testing map, showing restricted zones in State waters, and warning and operating areas across the EEZ and beyond into international waters (U.S. Navy 2018). DOD and Department of Homeland Security activities could occur throughout the broader study area.

## 3.5 Pacific Remote Island Areas (PRIA)

### 3.5.1 Physical Environment

The PRIA is an unorganized group of seven islands and atolls throughout the Central Pacific that are under U.S. jurisdiction. Baker, Howland, and Jarvis Islands, Johnston Atoll, Palmyra Atoll and Kingman Reef lie between Hawaii and American Samoa. Wake Island is located between the NWHI and Guam. The Pacific Remote Islands Marine National Monument (PRIMNM) includes much of the PRIA and prohibits commercial fishing, including commercial aquaculture, within its limits. Commercial fishing and aquaculture are also prohibited within the EEZ surrounding Jarvis Island, Johnston Atoll and Wake Island, but are allowed outside the seaward boundary of the Monument at Baker Island, Howland Island, Palmyra Atoll and Kingman Reef.

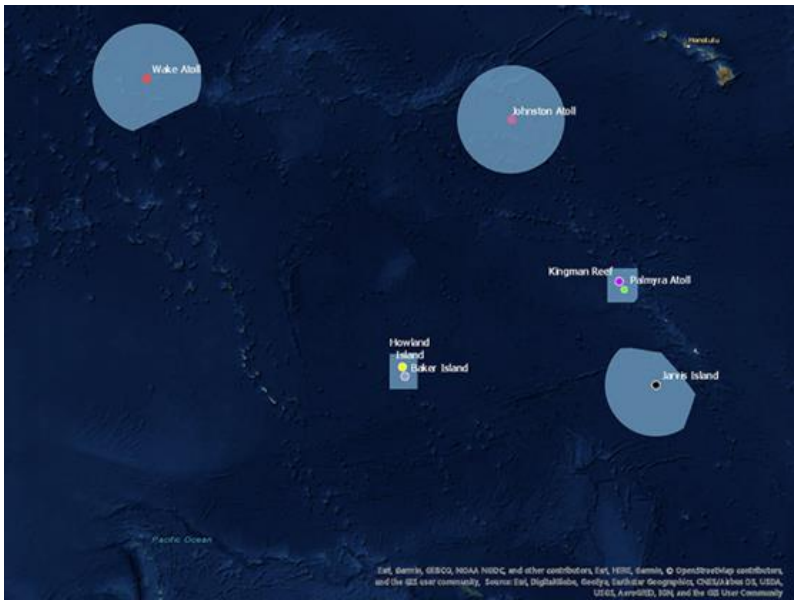


**Figure 5. Map of the Islands Included in the PRIA.**

The PRIA FEP (WPFMC 2009e) contains a detailed description of the physical and biological habitat. This section summarizes important information relevant to the analysis of the alternatives for Baker, Howland, Palmyra, and Kingman. Because commercial aquaculture has been prohibited throughout the EEZ around Jarvis, Johnston and Wake, this section does not describe these areas.

### 3.5.2 Biological Environment

The PRIA FEP describes the biological environment of the PRIA in detail, including the species addressed in this PEIS, which we incorporate here by reference (WPFMC 2009e). This document describes specific resources of concern, identified during scoping and interagency informal consultations to the level necessary for appropriate analysis.

### 3.5.3 Social and Economic Environment

Past and Present Commercial Offshore Aquaculture Operations

**State of Aquaculture Industry**
There have been no commercial aquaculture operations in the PRIA.

**Characteristics and Economic Feasibility of Aquaculture Operations**
The PRIA are unlikely locations for aquaculture operations. There are virtually no services at any of the locations, access to the islands and even within the monument waters is restricted, and grow-out facilities could not be sited inside of the Monument that surrounds all of the islands. In addition, these islands are among the most remote locations on the planet, 1,000 mi (1610 km) from the nearest commercial harbor or airport. Prior to and during WWII, the U.S. military constructed runways on Baker, Howland and Johnston Islands. These runways are no longer serviceable. Palmyra Atoll has one 6056 ft (1,846 m) unpaved runway that is privately owned.[21] Baker, Howland, and Kingman Reef do not have harbors, and vessels must anchor offshore. Palmyra Atoll does have an accessible sheltered lagoon for anchorage and a small wharf.[22] However, there is no admittance or access without a USFWS permit consistent with the conservation purposes of the Atoll.

**Scope of Fishing Activity - Wild Stocks**
Howland and Baker Islands and Kingman Reef are uninhabited. Since 2000, a group of four to twenty USFWS staff, Nature Conservancy staff, and researchers temporarily reside at Palmyra Atoll.[23] Fishing at Palmyra is for research and on-island consumption only.

**Description of Commercial Fisheries**
As many tropical pelagic species are highly migratory, the fishing fleets targeting them often travel great distances. Although the EEZ waters around Johnston Atoll and Palmyra Atoll are over 750 nm and 1000 nm (respectively) away from Honolulu, the Hawaii longline fleet does seasonally fish in those areas. For example, Hawaii-based longline vessels targeting yellowfin tuna visit the EEZ around Palmyra, whereas albacore is the main target species around Johnston Atoll. Similarly, the U.S. purse seine fleet also targets pelagic species (primarily skipjack tuna) in the EEZs around some PRIAs, specifically, the equatorial areas of Howland, Baker, and Jarvis Islands. The combined amount of fish harvested from these areas from the U.S. purse seine on average is less than 5% of their total annual harvest (WPFMC 2020d).

[21] CIA https://www.cia.gov/library/publications/the-world-factbook/geos/lq.html, accessed April 10, 2020
[22] CIA https://www.cia.gov/library/publications/the-world-factbook/geos/hq.html, accessed April 10, 2020
[23] CIA https://www.cia.gov/library/publications/the-world-factbook/geos/lq.html, accessed April 10, 2020

The record of fishing at the PRIA is somewhat limited. Hawaii-based vessels previously made sporadic commercial fishing trips to Palmyra Atoll and Kingman Reef. State of Hawaii commercial data between the years 1988-2007 indicates that landings of 51,740 lb (23,500 kg) non-longline caught pelagic fish, and 19,095 lbs. (8,660 kg) of bottomfish and reef fish at Palmyra Atoll, Kingman Reef and Johnston Island. This is equivalent to 1,293 lb/year (586 kg/yr) non-longline pelagic fish and 477 lb/year (216 kg/yr) of bottomfish and reef fish. However, currently there are no bottomfish, crustacean, coral reef, or precious coral fisheries operating in the PRIA, and no historical observer data are available for fisheries under the PRIA FEP (WPFMC 2020e).[24]

**Non-Commercial Fishing Consideration**
There are no permanent residents on any of these islands and no recreational fishing. Fishing at Palmyra Atoll is strictly for research and on-island consumption.

**Relevant Socio-Economic Profile**
Additional information about the role of fishing and marine resources across PRIA can be found through the PRIA FEP 2019 SAFE Report (WPFMC 2020e) and Pacific FEP 2019 SAFE Report (WPFMC 2020d).

### 3.5.4 Management Setting

#### 3.5.4.1 Pacific Remote Islands Areas Administrative Environment

All of the PRIA are under Federal management, and are not associated with any state or territory. All of the areas have been designated National Wildlife Refuges, including all land, reef and waters out to 12 nm (3.7 km), administered either solely or jointly by the USFWS. In 2000, The Nature Conservancy (TNC) acquired Palmyra Atoll from its previous private owner and, in 2001, TNC conveyed 439 acres of the property to the USFWS. The entire atoll, including the main Cooper islet retained by TNC, is included within the Palmyra Atoll National Wildlife Refuge.

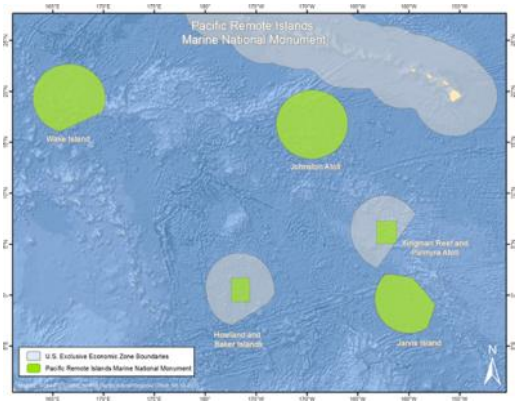


**Figure 6. Map of the Pacific Remote Islands Marine National Monument.**

[24] NMFS maintains a list of current permit holders, available at the following website: https://www.fisheries.noaa.gov/pacific-islands/resources-fishing/pacific-islands-permit-holders#pacific-remote-island-areas-bottomfish

**Table 3. Marine Resource Management Boundaries within the PRIA. Source: WPFMC 2009e.**

| Island or Area | Dept. of Commerce | Dept. of the Interior and Dept. of Defense ( as noted) |
|---|---|---|
| Howland I. | WPFMC/NMFS 0-200 nm | FWS: 0-3 nm |
| Baker I. | WPFMC/NMFS 0-200 nm | FWS: 0-3 nm |
| Jarvis I. | WPFMC/NMFS 0-200 nm | FWS: 0-3 nm |
| Johnston A. | WPFMC/NMFS 0-200 nm | FWS/U.S. Navy: 0-3 nm |
| Kingman R. | WPFMC/NMFS 0-200 nm | FWS: 0-12 nm[1] |
| Palmyra A. | WPFMC/NMFS 0-200 nm | FWS: 0-12 nm[2] |
| Wake I.[3] | WPFMC/NMFS 0-200 nm | DOI/U.S. Army: 0-3 nm |

[1] Boundary formerly 0-3 miles under the jurisdiction of the U.S. Navy. Secretarial Order 3223 extended Department of the Interior's jurisdiction to 12 nm.
[2] Secretarial Order 3224 (Palmyra Atoll) extended the USFWS administrative authority from 3 to 12 nm.
[3]As of 1962, the jurisdiction over Wake Island is vested with the Department of the Interior. Since 1994, the Department of the Army has maintained administrative use of Wake Island.

**Federally managed sanctuaries, monuments and wildlife refuges**
The PRIA fishery management area is the EEZ seaward of Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, and Wake Island, PRIA. The inner boundary is a line coterminous with the seaward boundaries of the above atolls, reefs and islands PRIA and the outer boundary a line drawn in such a manner that each point on it is 200 nm from the baseline from which the territorial sea is measured, or is coterminous with adjacent international maritime boundaries. All of the islands and atolls are designated National Wildlife Refuges (NWRs), with primary management of the lands and waters to 12 nm by the USFWS. NMFS has primary responsibility for fishing related activities seaward of 12 nm from the islands and atolls.

On June 27, 1974, the Secretary of the Interior created Jarvis Island, Howland Island, and Baker Island National Wildlife Refuges (NWR). These refuges were expanded in 2009 to add submerged lands within 12 nm (22 km) of the island. The Jarvis refuge includes 1,273 acres (5.15 $km^2$) of land and 428,580 acres (1,734.4 $km^2$) of water. Howland Island includes 648 acres (2.62 $km^2$) of land and 410,351 acres (1,660.6 $km^2$) of water. The Baker refuge includes 531 acres (2.15 $km^2$) of land and 409,653 acres (1,654 $km^2$) of water (CIA 2017).

The Wake Island NWR includes 495,515 acres (2,005 $km^2$) of submerged lands and waters surrounding Wake Atoll out to 12 nm. The atoll was designated a National Historic Landmark in 1985 in recognition of its role in World War II. The Secretary of Defense continues to manage the emergent lands of Wake Atoll under an existing agreement between the Secretary of the Interior and the Secretary of the Air Force.

In 1926, President Calvin Coolidge established Johnston Atoll as a Federal bird refuge. In 1934, President Roosevelt placed the atoll under U.S. Navy control, but retained its status as a refuge. The Johnston Atoll NWR includes 660 acres (267 $km^2$) of land, of which 90% was artificially created by the military through coral dredging as well as the associated reef and nearshore waters.

In January 2001, the Secretary of the Interior designated the Palmyra Atoll and Kingman Reef NWR. The Palmyra Atoll NWR includes 4.6 $mi^2$ (12 $km^2$) of land and nearly 500,000 acres (2,000 $km^2$) of water of water out to 12 nm. The Kingman Reef NWR includes 3 acres (0.01 $km^2$) of emergent reef 483,754 acres (1,958 $km^2$) of submerged reefs and associated waters, out to 12 nm (USFWS).

In 2009, President George W. Bush created the Pacific Remote Island Marine National Monument (PRIMNM) incorporating 86,888 $mi^2$ (225,000 $km^2$) within its boundaries, which extended 50 nm (93 km) from the mean low water line (Proclamation 8336). In 2014 President Barack Obama extended the monument to the extent of the EEZ (200 nm) at Jarvis, Johnston and Wake, increasing the size of the monument by 408,299 $mi^2$ (1,057,000 $km^2$) to a total size of 495,187 $mi^2$ (1,283,000 $km^2$) (Proclamation 9173). The Department of the Interior and Department of Commerce, through USFWS and NOAA, respectively, jointly administer the PRIMNM. The PRIMNM includes 33 seamounts across the seven areas. There are approximately 132 additional seamounts within the EEZ and outside of the monument boundaries (Proclamation 9173).

The following EEZ waters are no-take MPAs: Landward of the 50-fathom (91-m) curve at Jarvis, Howland, and Baker Islands, and Kingman Reef, as depicted on National Ocean Survey Chart Numbers 83116 and 83153. In addition, regulations prohibit all fishing for CRECS within 12 nm of the islands in the PRIMNM, subject to USFWS authority to allow non-commercial fishing in consultation with NMFS and the WPFMC. The PRIMNM prohibits all commercial fishing within its boundaries.

**Department of Defense Jurisdictions**

The DOD has administrative authority in the PRIA for use as military airfields and for weapons testing through a number of historic Executive Orders. Executive Order 8682 of 1941 authorizes the Secretary of the Navy to control entry into Naval Defensive Seas Areas (NDSAs) around Johnston Atoll, Wake Island, and Kingman Reef, which include “territorial waters between the extreme high-water marks and the three-mile marine boundaries surrounding.” In addition, the Navy has joint administrative authority with the USFWS of Johnston Atoll and has transferred administrative authority over Kingman Reef to the USFWS. DOD has suspended the Wake Island NDSA until further notice.

### 3.6 Resources Eliminated from Detailed Study

[reserved]

## 4 ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES (SFD FROM PEIS)

This section describes the potential effects of each alternative on the components of the affected environment or other socio-economic elements identified in Section 3.0 above. The Final PEIS for PIR Aquaculture describes the environmental effects of the alternatives and is incorporated herein by reference (0648-XA867).

### 4.1 Potential Effects of Alternative 1: No Action (Status Quo)

#### 4.1.1 Effects on Physical Resources

Under Alternative 1, current regulations do not restrict the number of facilities. Without limitation, there would be minimal consideration of the direct and indirect impacts. The potential effects of habitat creation from anchors or moorings is considered permanent for Alternative 1 particularly since it is assumed that they would be left in place permanently.

A project-specific EA or EIS could address the potential impacts of gear failure, but the regulations do not currently require an emergency action plan that incorporates gear failure. Without catastrophic mitigation plans, the potential impacts to the geophysical features and physical habitat could range from moderate to significant.

For non-CRECS, no NMFS permit would be required and, thus, EFH and HAPC would not be considered unless required by other agency permits for the operation. The impacts for this would depend upon the chosen location and cultured species. The permitting process for CRECS would consider the potential impacts to EFH and HAPC.

Permit applications would not require consideration for sensitive habitats that do not have EFH and HAPC designations. The effects of this would range from minor to major. This alternative does not require consideration for habitat creation due to the presence of the culture system structures. A project EA or EIS could consider the potential impact on lightscapes; however, this would not be required for non-CRECS. The net effects of Alternative 1 are likely moderate to major adverse.

#### 4.1.2 Effects on Biological Resources

For non-CRECS, there is currently no limitation on the species cultured in offshore facilities and NMFS does not have a regulatory mechanism to address this. Thus, this alternative has the potential for introducing non-native species, as well as genetically engineered species as a culture species. The permits under Alternative 1 consider the genetic and competitive impacts of potential escapes as well as the risks of pathogens and parasites on a case-by-case basis rather than within the context of a comprehensive program. The net effects of Alternative 1 are likely moderate to major adverse.

An EA or EIS for CRECS would consider protected species. For non-CRECS and non-MUS protected species, impacts would be considered on a case-by-case basis.
Under Alternative 1, the number of facilities is not restricted, regardless of whether the species is a CRECS. Without limitation on the number of facilities in an area, there would be a potential for larger impacts on protected species with regards to injury from facility-associated structures or equipment, as well as potential increases in noise impacts. The net effects of Alternative 1 are likely moderate to major adverse.

### 4.1.3 Effects on Socio-economic Setting

Alternative 1 does not provide a streamlined approach to ensuring aquaculture activities do not impede activities and access of other ocean users. The net effects of Alternative 1 are likely moderate adverse.

### 4.1.4 Effects on Management Setting

Under Alternative 1, regulations do not restrict the number of facilities, regardless of whether the species falls within the CRECS. Without regulatory limitation on the number of facilities in an area, existing regulations require minimal consideration of the direct and indirect impacts. The net effects of Alternative 1 are likely minor to moderate adverse.

For non-CRECS, applicants would need to work through the review and permitting processes with other Federal, state, or local agencies as appropriate to ensure the proposed activities meet agency stipulations and mandates. Though they would not have any NMFS siting restrictions within the EEZ, their setup and activities are still subject to other agency regulations.

Currently under Alternative 1, applying for and obtaining a special use permit to culture CRECS species under the SCREFP process is both lengthy and costly, as the current status quo reviews SCREFP on a case-by-case basis. Moreover, once issued, the permit is typically only valid for one to two years with renewal options, but overall is not designed for long-term operations and activities.

Under Alternative 1, non-CRECS facilities would not undergo any site evaluation by NMFS. Proposed CRECS operations would undergo a site evaluation by NMFS as part of the SCREFP process.

### 4.1.5 Other Effects

*[Reserved]*

## 4.2 Potential Effects of Alternative 2

### 4.2.1 Effects on Physical Resources

Alternatives 2 require a decommissioning plan. This would determine whether moorings are permanent structures or whether the operation must remove them. Thus, under these alternatives the potential effects of habitat creation from anchors or moorings is either permanent or

reversible, depending upon the types of moorings used, the ease of removal, and the cost of removal.

The number of facilities would be restricted based on comprehensive siting analyses, thus preventing operation beyond the carrying capacity of a given area. These siting analyses would likely include the potential impacts from multiple facilities in a given area, potential for habitat creation or loss, impacts on lightscapes, as well as impacts to sensitive habitats beyond EFH and HAPC. This would reduce the potential impacts on near and far-field habitats, as it would be more inclusive.

Both alternatives would require systems that have demonstrated effectiveness, redundancies and regular inspections to prevent gear failure along with an emergency action plan that addresses the response to and mitigation for gear failure. Safeguards in place would likely prevent a catastrophic failure, resulting in impacts range from minor to moderate in the event of a gear failure. Under Alternative 2, the limited entry system would likely limit the potential habitat impacts.

Under Alternative 2, the permit duration (10 years) could reduce long term impacts or offer a quicker return to baseline conditions if the permit is not renewed. The net effects of Alternative 2 are likely moderate adverse to minor beneficial.

### 4.2.2 Effects on Biological Resources

Under Alternatives 2, the number of facilities would be restricted based on comprehensive siting analyses, thus preventing operation beyond the carrying capacity of a given area. These siting analyses would include the potential impacts from multiple facilities in a given area with regard to disease transfer and would require escape prevention and mitigation plans and measures as well as reporting. The limited entry system for both alternatives could reduce the risk for impacts of pathogen or parasite transfer between wild and cultured fish.

Under Alternative 2, allowable species would be restricted to native species, which would prevent the risk of introducing potentially invasive non-native species. This alternative would prohibit the possession or use of genetically engineered species, thereby reducing the potential risks associated with culturing these species. The application process for a permit under alternative 2 would consider impacts to source fisheries, including pathogen and parasite transfer. Under Alternative 2, operations could use a research and development permit to test new diets that are less dependent upon wild fisheries. The net effects of Alternatives 2 are likely moderate adverse the minor beneficial.

Under Alternatives 2, the number of facilities would be restricted based on comprehensive siting analyses, thus preventing operation beyond the carrying capacity of a given area. These siting analyses would likely include the potential impacts from multiple facilities in a given area, as well as consideration for protected species. The limited entry system would likely limit the potential impacts from development of an aquaculture industry. For Alternatives 2, BMPs and identification of appropriate mitigation measures would be required for any permit application. BMPs would ensure operations use appropriate methods for preventing interactions with protected species. NMFS and the WPFMC would review mitigation measures to ensure they are

appropriate for the system design and for the stated purpose of mitigating interactions with protected species. The best available science, including any outcomes and knowledge gained from current and previous aquaculture facilities in the PIR, would inform both BMPs and mitigation measures development. The net effects of Alternatives 2 are likely minor adverse to neutral.

### 4.2.3 Effects on Socio-economic Setting

Permits under Alternative 2 would be limited to 10 years and might not be of sufficient duration to allow the facility to become operational or allow enough time for the production of a marketable product. Alternative 2 would be restricted to certain gear types, which could expedite the process. However, this restriction could hamper efforts for innovation. The net effects of Alternative 2 are likely minor adverse to minor beneficial.

### 4.2.4 Effects on Management Setting

Under Alternatives 2, the number of facilities would be restricted based on comprehensive siting analyses, thus preventing operation beyond the carrying capacity of a given area. These siting analyses would likely include the potential impacts from multiple facilities in a given area. Under Alternatives 2, the limited entry system would likely limit the potential effluent impacts.

Under Alternative 2, the permit duration (10 years) could reduce long term impacts or offer a quicker return to baseline conditions if the permit is not renewed. The net effects of Alternative 2 are likely negligible to minor adverse.

Alternatives 2, to varying degrees, aim to streamline the process of obtaining a permit to proceed with developing an offshore aquaculture operation. Developing a stable and predictable aquaculture regulatory regime under either Alternatives 2 would result in greater investment in offshore aquaculture and lower the financial burden of establishing and operating an aquaculture facility. Furthermore, an aquaculture program would establish application requirements, operational requirements, and restrictions for proposed aquaculture operations. The permitting process would likely be faster and simpler for both the applicant and NMFS.

Thus, under Alternatives 2, the more streamlined process through a coordinated interagency review with NMFS would offset any additional burdens associated with undergoing a NMFS review to obtain a NMFS aquaculture permit for non-CRECS.

### 4.2.5 Other Effects

[Reserved]

## 4.3 Potential Effects of Alternative 3

### 4.3.1 Effects on Physical Resources

Alternatives 3 would have the same potential effects of Alternative 2 outlined in Section 4.2.2.

Under Preferred Alternative 3, the permit duration (20 years) would increase the length of time needed for the area to return to baseline conditions if the permit is not renewed. The net effects of Preferred Alternative 3 are likely moderate adverse to neutral.

### 4.3.2 Effects on Biological Resources

Alternatives 3 would have the same potential effects of Alternative 2 outlined in Section 4.2.2. The net effects of Alternatives 3 are likely moderate adverse the minor beneficial on local wild fish stocks. The net effects on other marine wildlife and protected species are likely minor adverse to neutral

### 4.3.3 Effects on Socio-economic Setting

Alternatives 3 would have the same potential effects of Alternative 2 outlined in Section 4.2.4.

Proper location of aquaculture facilities would ensure they do not disproportionately affect significant cultural resources, historic properties, or archaeological resources. Proper siting requirements would ensure ocean access for affected users and consideration for cultural sites.

Permits under Preferred Alternative 3 would be limited to 20 years, which would provide permittees greater revenue over time and greater stability to aquaculture operations, as well as sufficient time to become fully operational. Furthermore, the flexibility to potentially culture a wider range of native species already listed in FEPs would allow greater marketing and business opportunities, which in turn could increase revenues for the aquaculture sector. If the program offers permits on a first come, first serve basis, this may require additional analysis. As in Alternative 1, all fishermen targeting wild-caught species that are also cultured could face direct competition in the market with cultured fish from PIR offshore facilities. The net effects of Alternative 3 are likely minor beneficial.

### 4.3.4 Effects on Management Setting

Under Alternatives 3, the number of facilities would be restricted based on comprehensive siting analyses, thus preventing operation beyond the carrying capacity of a given area. These siting analyses would likely include the potential impacts from multiple facilities in a given area.

Under Alternatives 3, the limited entry system would likely limit the potential effluent impacts.

Under Preferred Alternative 3, the permit duration (20 years) would increase the length of time needed for the area to return to baseline conditions if the permit is not renewed. The net effects of Preferred Alternative 3 are likely negligible to minor adverse.

### 4.3.5 Other Effects

[Reserved]

## 4.4 Potential Cumulative Effects of the Alternatives

Cumulative effects refer to the combined effects on the human environment that result from the incremental impact of the proposed action, and its alternatives, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. Further, cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative effects analysis examines whether the direct and indirect effects of the alternatives considered on a given resource interacts with the direct and indirect effects of other past, present and reasonably foreseeable actions on that same resource to determine the overall, or cumulative effects on that resource.

### 4.4.1 Cumulative Effects Related to Effects on the Physical Environment

Cumulative effects on water quality within the EEZ from aquaculture would be minor due to the small spatial scale at which effects may occur and, with the exception of plastics (Eriksen et al. 2014), the negligible influx of pollutants from other sources in the offshore environment. Vessels and permanent structures in the water would always have a potential to release contaminants into the ocean, but large-scale releases are unlikely. The nutrient addition associated with feed inputs and the associated waste products may be detected as indirect impacts; however, they are unlikely to result in major effects due to currents at deepwater sites that are adequate to dilute the effects of excess nutrients or pollutants. Physical parameters (e.g., turbidity, dissolved oxygen) are not a concern for offshore facilities of any size (Price and Morris 2013, Gentry et al. 2017).

Military activities in the region are expected to deposit various equipment and supplies, including flares, chaff, munitions, and personal gear. Various EISs on these military activities describe the level of impact and the mitigation measures to minimize these impacts.

The proposed action would take place in an open ocean environment that is dynamic and subject to the long-term impacts of global climate change. Marine resource managers expect substantial changes to the marine environment from climate change, regardless of whether NMFS and WPFMC implement one of the action alternatives. Climate change would play a role in water quality in the future, given parameters like increasing ocean temperature, changes in circulation and changes in salinity and dissolved oxygen levels. Increased levels of $CO_2$[25], resulting in ocean acidification, would also impact water quality (Hoegh-Guldberg 2010). Changes in rainfall and increases in frequency of extreme weather events could also impact water quality (Maulu et al. 2021).

#### 4.4.1.1 Geologic Features

Overall, the cumulative effects of any aquaculture management program, when combined with other past, present and future actions in the EEZ, would likely result in negligible cumulative effects on geologic features. Aquaculture could alter habitat that is directly under anchors, anchor chains, cables, or pipes. Large objects deposited on the seabed would also have an impact, although these items are new habitat in a relatively homogenous, flat environment.

[25] http://hahana.soest.hawaii.edu/hot/hot_jgofs.html, accessed 16 June 2020

Nevertheless, the spatial extent of these impacts would involve a small, localized area. While these effects could be long-term, the magnitude of these effects would not likely alter habitat function or cause widespread changes to the geologic structure of the area or region.

#### 4.4.1.2 Aquatic Plants

Direct and indirect effects on aquatic plants is negligible. Facilities sited in waters shallower than 200 m may impact aquatic plants during construction, but would most likely impart a minor beneficial long-term impact as they would provide a surface on which plants could attach.

#### 4.4.1.3 Benthic Organisms

Other activities in the action area that may affect benthic organisms include undersea cables, FAD, seawater air conditioning, and windfarms. Cumulative impacts on benthic organisms from aquaculture and these past, present and future actions are likely minor. The contribution of aquaculture on cumulative effects to benthic organisms would be negligible.

#### 4.4.1.4 Sensitive Areas

Coral reefs are among the world's most sensitive and endangered marine ecosystems (Wilkinson 2004). The potential impacts of aquaculture operations to sensitive reefs in U.S. waters has been identified as a concern, especially for nearshore reefs which already experience considerable stress from anthropogenic sources including terrigenous sediments and nutrients (Torres 2001, Smith et al. 2008, Otero 2009), and sewage outfall (Kaczmarsky et al. 2005, Nagelkerken 2006, Sutherland et al. 2011). Climate change has led to massive coral bleaching events with permanent consequences for local habitats (Donner et al. 2005; NMFS 2014b). Climate change will likely impact these marine habitats by increasing mortality from heat stress and frequency and severity of storms, severely reducing or redistributing existing habitats due to changes to water depth and tides (Harley et al. 2006). Nearshore reefs in the PIR are not located within Federal waters and aquaculture activities in any aquaculture management program would not likely impact these reefs. Deep sea corals have not experienced the same severity of impacts from climate change, however, since some of the beds lie within the EEZ aquaculture activities could impact them.

Based on the characteristics of the action area, aquaculture is not likely to contribute anything but negligible or minor cumulative effects on coral reefs or other sensitive areas for any of the proposed alternatives.

#### 4.4.1.5 Ecosystem Function

The ecosystem of the tropical pelagic environment is primarily low biomass and relatively homogenous in the surface layer. For any of the past, present and RFFAs to cause cumulative effects, the action would need to be spatially connected to aquaculture facilities. Because of the vast, relatively undifferentiated environment of the action area, the contribution of aquaculture to cumulative effects on the ecosystem are likely minor.

### 4.4.2 Cumulative Effects Related to Effects on the Biological Environment

#### 4.4.2.1 Local Wild Fish Stocks

Climate change may have effects on weather patterns and sea surface temperature, which may shift the distribution of fish populations around the PIR. Climate change may also impact disease transmission and virulence, while rising temperatures could impact immune systems for wild species (Maulu et al. 2021). Changes in oceanographic conditions may alter rates of direct and incidental harvests or interactions with marine resources in commercial fisheries. Ocean climate fluctuations that change the habitat quality or the prey availability of ocean resources have the potential to affect a species short- or long-term distribution and abundance. The magnitude of potential effects is uncertain, but these impacts would show as variability in stock size, recruitment, growth rates, or other factors for marine species in stock assessment reviews. Aquaculture's contribution to the effects on fish relative to other external actions in the area are likely negligible to minor adverse depending on site-specific conditions described above.

#### 4.4.2.2 Other Marine Wildlife and Protected Species

***Sea Turtles Cumulative Effects***

All proposed aquaculture alternatives would have a negligible contribution to the potential cumulative effects of climate change, warming waters, acidification, and rising sea level on sea turtle populations and their habitat.

Potential beneficial effects (e.g., increased food availability from cages or pens) and or adverse effects (e.g., potential bycatch due to increased commercial or non-commercial fishing in the area due to the FAD effect) could occur for sea turtles in the action area. Relative to the other risks described here, the contribution of any aquaculture management program would likely be negligible or minor under all alternatives.

***Marine Mammals Cumulative Effects***

The combined effects of climate change and any aquaculture management program on marine mammals potentially affected by aquaculture activities is considered negligible to minor adverse.

***Seabirds Cumulative Effects***

Any aquaculture program under any of the proposed alternatives would contribute adverse effects on seabirds due to the very low likelihood that mooring lines or cages could entangle seabirds. Minor beneficial effects could also occur as a result of seabird prey aggregating around cages. Relative to other more notable stressors for seabirds in the PIR, aquaculture is not likely to contribute to overall adverse cumulative effects on seabirds.

### 4.4.3 Cumulative Effects Related to Effects on the Socio-economic Setting

Because of their greater distance from shore, offshore facilities are likely to experience fewer conflicts with other economic, cultural and recreational uses of the environment (Knapp 2008a). Climate change impacts to fishing communities can include secondary effects from impacts on habitat and water quality (e.g., loss of stock, shifting migration patterns, shifting disease patterns,

increased risk for zoonotic transfer[26]), and these could result in lost revenue (Sony et al. 2021). Extreme weather events could also impact not only fishery participants but also fishery supply chains (Suh and Pomeroy 2020, de Souza Valente and Wan 2021).

### 4.4.4 Cumulative Effects Related to Effects on the Management Setting

[Reserved]

### 4.4.5 Other Planning Considerations

[Reserved]

## 5 APPLICABLE LAWS (COUNCIL AND SFD)

Section 303 of the Magnuson Stevens Act requires that any fishery management plan prepared by any Council or by the Secretary of Commerce contain conservation and management measures that are consistent with the National Standards of the Act, other provisions of the Act, regulations implementing recommendations by international fishery management organizations and any other applicable law. This section identifies provisions of the Magnuson Stevens Act, and other applicable laws that the Council has identified the proposed action must comply with, and rational for why the Council believes this action is consistent with each applicable law.

### 5.1 Magnuson Stevens Fishery Conservation and Management

### 5.1.1 Section 303(a) Required Provisions

Conservation and Management Measures
Fishery Descriptions
MSY and OY Estimates
Domestic Capacity to Harvest and Process OY
Fishery Data Requirements
Temporary Adjustments to Fishery Access
Description of EFH
Scientific Data Needs
Fishery Impact Statement
Status Determination Criteria
Bycatch Reporting
Recreational Catch and Release
Description of Fishing Sectors
Allocation Considerations
Annual Catch Limits and Accountability Measures

### 5.1.2 National Standards for Fishery Conservation and Management

National Standard 1 – Optimum Yield

[26] Zoonotic transfer is disease transmission from an animal host to a human.

National Standard 2 – Scientific Information
National Standard 3 – Management Units
National Standard 4 – Allocations
National Standard 5 – Efficiency
National Standard 6 – Variations and Contingencies
National Standard 7 – Costs and Benefits
National Standard 8 – Communities
National Standard 9 – Bycatch
National Standard 10 – Safety of Live at Sea

## 5.2 National Environmental Policy Act

In accordance with NEPA, CEQ implementing regulations, and NOAA Administrative Order (NAO) 216-6A - *Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands*, NMFS must consider the effects of proposed agency actions and alternatives on the human environment. As part of this process, NMFS and the WPFMC provide opportunities for interested and affected members of the public to be involved before making a decision. NMFS and the WPFMC prepared this PEIS in accordance with NEPA and its implementing regulations, at 40 CFR 1500-1508, and in coordination with various Federal and local government agencies represented by the WPFMC. NMFS would use this EIS to consider the effects of the proposed action on the human environment, taking into consideration public comments on the proposed action presented in this document, and to determine whether the proposed action would have a significant environmental impact requiring the preparation of an environmental impact statement.

This amendment is prepared using the 1978 CEQ NEPA Regulations (40 CFR Parts 1500-1508). The CEQ published new NEPA regulations on July 16, 2020 that entered into effect on September 14, 2020 (85 FR 43304). This PEIS was under development prior to September 14, 2020, and, thus, has been prepared in accordance with the 1978 CEQ NEPA regulations that applied prior to the new regulations entering into effect.

## 5.3 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable coastal zone management program. The CZMA also requires that any applicant for a required Federal license or permit to conduct an activity affecting any land or water use or natural resource of the coastal zone of a state or territory shall provide a certification to the permitting agency that the proposed activity complies with the enforceable policies of the state or territorial approved coastal zone management program.

## 5.4 Endangered Species Act

The ESA provides for the protection and conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action authorized,

funded, or carried out by such agencies is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species.

### 5.5 Marine Mammal Protection Act

The MMPA prohibits, with certain exceptions, the take of marine mammals in the U.S. and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. The MMPA gives NMFS as delegated by the Secretary of Commerce, the authority and duties for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses). With this responsibility, NMFS required to prepare and periodically review stock assessments of marine mammal stocks.

The MMPA works in concert with the provisions of the ESA. The Secretary of Commerce is required to consider all factors regarding regulations applicable to the "take"[27] of marine mammals such as the conservation, development, and utilization of fishery resources, and the economic and technological feasibility of implementing the regulations.

### 5.6 Executive Order 12866 (Regulatory Impact Review)

A "significant regulatory action" means any regulatory action that is likely to result in a rule that may -

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal government or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Should an aquaculture permitting program be enacted, NMFS will determine whether the action is significant for the purpose of E.O. 12866

### 5.7 Executive Order 13132 (Federalism)

The objective of E.O. 13132 is to guarantee the Constitution's division of governmental responsibilities between the Federal government and the states. Federalism implications are defined as having substantial direct effects on states or local governments (individually or collectively), on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. NMFS and the WPFMC do not expect that this action would impact or alter the relationship between the

[27] The MMPA defines "take" broadly to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal."

Federal government and the government of the State of Hawaii or the territories of American Samoa, the CNMI or Guam.

### 5.8 Information Quality Act

The IQA and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) recognize information quality is composed of three elements: utility, integrity, and objectivity. National Standard 2 of the Magnuson-Stevens Act states that an FMP's (FEP's) conservation and management measures shall be based upon the best scientific information available.

### 5.9 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden on the public resulting from the collection of information by or for the Federal government. It is intended to ensure the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501(1)).

### 5.10 Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires government agencies to assess and present the impact of their regulatory actions on small entities, including small businesses, small organizations, and small governmental jurisdictions. The agency would prepare an Initial Regulatory Flexibility Analysis (IRFA) and Final Regulatory Flexibility Analysis (FRFA) for each proposed and final rule, respectively. Under the Regulatory Flexibility Act, an agency does not need to conduct an IRFA or FRFA if they can certify that the proposed rule, if adopted, will not have a significant adverse economic impact on a substantial number of small entities. NMFS may request that the Department of Commerce Chief Counsel for Regulation certify to the Small Business Administration that the proposed permitting system and specifications would not have a significant economic impact on a substantial number of small entities.

### 5.11 Executive Order 12898 (Environmental Justice)

E.O. 12898 requires Federal agencies to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. E.O. 12898 also provides for agencies to collect, maintain, and analyze information on patterns of subsistence consumption of fish, vegetation, or wildlife. That agency action may also affect subsistence patterns of consumption and indicate the potential for disproportionately high and adverse human health or environmental effects on low-income populations, and minority populations. Agencies should also consider environmental justice when conducting NEPA analyses.ch programs related to the development of marine resources.

### 5.12 American Samoa Deeds of Cession

[reserved]

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# 7 DRAFT PROPOSED REGULATIONS (SFD)

This section contains the DRAFT proposed regulations to implement the conservation and management measures described in the FEP amendment document, based on the preliminary preferred alternative selected by the Council at the 190th meeting in March 2022.

This subpart provides the regulatory structure for enabling environmentally sound and economically sustainable aquaculture in the Western Pacific EEZ. Offshore marine aquaculture activities are authorized by a Western Pacific aquaculture permit or Western Pacific aquaculture dealer permit issued under § ###### and are conducted in compliance with the provisions of this subpart.

Pacific Islands Marine Offshore Aquaculture Program
§ 665.### General.
This subpart provides the regulatory structure for enabling environmentally sound and economically sustainable aquaculture in the Pacific Islands Region EEZ. Offshore marine aquaculture activities are authorized by a Western Pacific aquaculture commercial permit or Western Pacific aquaculture research/innovation permit issued under § 6##.### and are conducted in compliance with the provisions of this subpart. NMFS permits would authorize deployment of approved gear; operation of the approved facility at the approved site; harvest, possession, transport, landing, and sale of allowable aquaculture species. Any vessel, aircraft, or vehicle authorized for use in aquaculture operations would be required to have a copy of the permit on board to assist law enforcement in determining compliance with aquaculture regulations.

§ 622.101 Permits.

(a) ***Western Pacific aquaculture permit.*** One NMFS aquaculture permit would be required for conducting offshore marine aquaculture in Federal waters. NMFS permits would authorize deployment of approved gear; operation of the approved facility at the approved site; harvest, possession, transport, landing, and sale of allowable aquaculture species. Any vessel, aircraft, or vehicle authorized for use in aquaculture operations would be required to have a copy of the permit on board to assist law enforcement in determining compliance with aquaculture regulations.

(1) ***Eligibility requirement for a Western Pacific aquaculture permit.*** Eligibility for a Western Pacific aquaculture permit is limited to any U.S. citizen or partnership of U.S. citizens, U.S. national, permanent resident, or U.S. corporation or other entity organized under U.S. law is eligible to apply for an aquaculture permit(s). The program may consider eligibility for other entities consistent with Federal law. All permits issued would be transferable to other eligible persons or entities upon written notice to NMFS.

(2) ***Application for a Western Pacific aquaculture permit.*** Application forms are available from the RA. A completed application form and all required supporting documents must be submitted by the applicant (in the case of a corporation, an officer; in the case of a partnership, a general partner) to the RA at least 180 days prior to the date the applicant

desires the permit to be effective. An applicant must provide all information indicated on the application form including:

- Applicant contact information.
- Detailed description of the proposed aquaculture site.
- The objectives of the aquaculture activity, including:
    - Description of the species intended for culture, including anticipated annual production (e.g., number and weight).
    - Detailed description of the aquaculture systems and equipment employed, including support equipment.
    - Contact information and location of each feed supplier and hatchery that the applicant will use.
    - General description of the expected disposition of the resources harvested under the permit (e.g., stored live, fresh, frozen, preserved, sold for food, ornamental, research, or other use).
- For operations where broodstock will be collected from the wild:
    - A comprehensive description of the planned fishing operations, including duration, location of fishing, gear types and operations, species likely harvested, and anticipated total catch for the purposes of broodstock on an annual basis.
    - Certification that any broodstock collected for culture at the facility would be harvested from the same population or subpopulation (based on the best scientific information available) from Federal waters of the same region where the facility is located.
    - Documentation that broodstock would be marked or tagged at the hatchery.
    - For operations raising MUS: individuals captured for use as broodstock would count towards catch limits implemented by NMFS under the Magnuson-Stevens Act.
- Documentation of an assurance bond and decommissioning plan.
- Risk mitigation plans, including prevention and mitigation plans for disease transfer, escapes and protected species interactions.
- An emergency response plan, including a contingency plan for escaped cultured fish.
- An aquatic animal health plan with evidence of approval from an accredited veterinarian.
- Copy of a contractual arrangement with an accredited veterinarian, and a commitment that the following assurances will be made:
    - Certification that the applicant will not culture genetically engineered species.
    - Certification that juveniles are free from pathogens of concern (defined as any pathogens listed by the World Organisation for Animal Health (OIE) or in the National Aquatic Animal Health Plan) prior to stocking.
    - If therapeutants are used, the applicant will only administer thereapeutants approved by the Food and Drug Administration (FDA) for veterinary purposes.
- Any other information concerning the aquaculture facility or its operations or equipment, as specified on the application form.

(b) ***Western Pacific aquaculture dealer permit.*** For a dealer to receive fish cultured by an aquaculture facility in the Western Pacific EEZ, that dealer must first obtain a Western Pacific aquaculture dealer permit. Non-transferable dealer permits and reporting would be required for

anyone purchasing cultured organisms from a permitted facility for resale. Such requirements would be coordinated with any analogous regional and local (e.g., state and territorial) authorities to prevent duplication.

(c) ***Program capacity.*** NMFS and the WPFMC could restrict the number of commercial and research permits issued. This could be done on a region-wide basis or by sub-regions (e.g., for each island area). As with wild capture fisheries, NMFS and the WPFMC may modify and/or limit the number of permits issued based on new information gathered as offshore aquaculture develops. This could include establishing limits on participation, harvest timing, annual production capacity (e.g., production cap or catch share), cultured species, location, or activity density (i.e., the number and size of facilities within a given area).

(d) ***Permit-related procedures*** -

(1) ***Fees.*** [Reserved]

(2) ***Review and notifications regarding a Western Pacific aquaculture permit.***

1. Pre-Application Screening. Prospective applicants would provide general project information in a pre-application checklist to NMFS PIRO. Based on the proposed activity, and vested interest in ocean uses in the specific proposed site, NMFS PIRO would forward this information to other relevant agencies for review and comment. These agencies can include, but are not limited to, Federal, state, territory and/or local agencies with responsibility (e.g., permitting, authorizing, and management) or other expertise in natural area and/or cultural uses in the proposed area. This review would help identify requirements for other agencies early in the process to ensure a streamlined, coordinated process for permitting. NMFS will collect all agency comments and provide them to the applicant. The agencies will determine whether additional consultation under ESA, MMPA, or other relevant law (e.g., NEPA) is necessary for the proposed project. The applicant may also request to schedule a pre-application meeting with NMFS and other applicable Federal, state or territorial agencies, during which time agencies and the applicant discuss any questions or concerns about the proposed project and guidance regarding application process. Following the pre-application step, the applicant may prepare and submit a permit application in the form provided by NMFS.
2. Application Review. A completed aquaculture permit application and required supporting documents submitted to NMFS would be reviewed and a preliminary determination that is complete and warrants further consideration. NMFS PIRO will notify an applicant of an incomplete application within a specified time of application receipt, including a description of incomplete or additional information required. Based on permitting requirements of other Federal agencies, prospective applicants would submit other required information or agency-specific permit applications to those agencies in tandem (or sooner depending on other agency permit timelines) with the NMFS application process. Failure to submit required information to other agencies in a timely manner could result in a delay in NMFS's decision on the application and issuance of the NMFS permit.

3. WPFMC Consultation. NMFS would consult with the WPFMC on the application. NMFS would notify applicants in advance of any WPFMC meeting where the application may be considered. The applicant will have the opportunity to speak in support of the application through public testimony. The WPFMC may also seek guidance from its advisory bodies on the proposed project prior to providing its recommendations to NMFS.
4. Determination of Permit Issuance. As soon as practicable after consultation with WPFMC, NMFS will decide whether or not to issue the aquaculture permit. NMFS may recommend that the applicant revise the application in response to comments from the WPFMC or its advisory bodies before making a final decision. NMFS will notify the applicant in writing, including reasons for approval or denial. The decision would be eligible for an appeal process. The decision to approve or deny the application could be based on, amongst others:
    a. Information provided by the applicant.
    b. Current harvest and stock status of the cultured species.
    c. Estimated impacts of the proposed activity on ecosystems, habitats, and protected species.
    d. Other biological and ecological information relevant to the proposal.
5. Permit Issuance and Operational Phase. If approved, NMFS will issue the written permit simultaneously with its approval notice to the applicant. The permit will specify terms and conditions into the construction, deployment, operation, and maintenance of the project. Some permit requirements would be common to all aquaculture operations, such as adherence to protected species laws, while others may be tailored to an individual operation. Note that each Federal agency issuing a permit is required to consult with other regulatory agencies and may solicit public input regarding the potential impacts of each proposed project. The permit terms and conditions may reflect these consultations. NMFS will endeavor to coordinate these processes amongst permitting agencies, including permit durations. All agencies must issue the required permits before operations may commence (i.e., before structures or animals may be placed in the water). The WPFMC will consider further details for the permit issuance and operational phase if it decides to develop a coordinated, comprehensive program.

(4) ***Duration.*** NMFS would issue and renew commercial permits for terms of up to 20 years each. NMFS would issue and renew research permits for terms of up to 10 years each.

(5) ***Transfer.***

(i) A Western Pacific aquaculture permit is transferable to any U.S. citizen or partnership of U.S. citizens, U.S. national, permanent resident, or U.S. corporation or other entity organized under U.S. law is eligible to apply for an aquaculture permit(s). The program may consider eligibility for other entities consistent with Federal law. All permits issued would be transferable to other eligible persons or entities upon written notice to NMFS.

(ii) An aquaculture dealer permit is not transferable.

**(6)** ***Renewal.*** A permittee seeking renewal would be required to submit a complete renewal application form with required supporting documents to NMFS within a specified time prior to expiration of an existing permit. If the permittee is in good standing, the information required for a renewed permit would be streamlined. Depending on scope, a permit modification may require information and review similar to the initial permit application as described below.

(7) ***Display.*** A Western Pacific aquaculture permit issued under this section must be prominently displayed and available for inspection at the aquaculture facility. The permit number should also be included on the buoys or other floating devices used to mark the restricted access zone of the operation as specified in § 622.104(c). An aquaculture dealer permit issued under this section, or a copy thereof, must be prominently displayed and available on the dealer's premises. In addition, a copy of the dealer's permit, or the aquaculture facility's permit (if the fish have not yet been purchased by a dealer), must accompany each vehicle that is used to receive fish harvested from an aquaculture facility in the Western Pacific EEZ. A vehicle operator must present the permit or a copy for inspection upon the request of an authorized officer.

(8) ***Sanctions and denials.*** A Western Pacific aquaculture permit or aquaculture dealer permit issued pursuant to this section may be revoked, suspended, or modified, and such permit applications may be denied, in accordance with the procedures governing enforcement-related permit sanctions and denials found at subpart ####.

(9) ***Alteration.*** A Western Pacific aquaculture permit or aquaculture dealer permit that is altered, erased, or mutilated is invalid.

(10) ***Replacement.*** A replacement Western Pacific aquaculture permit or aquaculture dealer permit may be issued. An application for a replacement permit is not considered a new application.

(11) ***Change in application information.*** An aquaculture facility owner or aquaculture dealer who has been issued a permit under this subpart must notify the RA within 30 days after any change in the applicable application information specified in paragraphs (a) or (b) of this section. If any change in the information is not reported within 30 days aquaculture operations may no longer be conducted under the permit.

The process for obtaining permits to establish an offshore aquaculture operation in Federal waters would have six basic steps. Subsequent guidance documentation may include a process for appealing permit decisions.

§ 622.102 Recordkeeping and reporting.

(a) Participants in Western Pacific aquaculture activities addressed in this subpart must keep records and report as specified in this section. Unless otherwise specified, required reporting must be accomplished electronically via the Web site. See § ###### regarding provisions for paper-based reporting in lieu of electronic reporting during catastrophic conditions as

determined by the RA. Recordkeeping (*i.e.*, maintaining records versus submitting reports) may, to the extent feasible, be maintained electronically; however, paper-based recordkeeping also is acceptable.

(1) ***Aquaculture facility owners or operators.*** An aquaculture facility owner or operator must comply with the following requirements:

(i) ***Reporting requirements*** -

(A) Permitees must notify NMFS in writing of the following:

- Escapes. For major escapes, which will be defined in greater detail if a management program is developed, the following information shall be provided to NMFS within 24 hours of discovery of the event:
- Permit number, contact person name and phone number.
- Specific location and cause of the escape(s).
- Number, species, size and percent of cultured organism that escaped.
- Response and actions taken, including any recaptures, system repairs and further prevention measures.

(B) If no major escape occurs during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

(C) Interactions with protected species (e.g., entanglement, entrapment, etc.). For any interactions with protected species (e.g., marine mammals, sea turtles, migratory birds) the following information shall be provided within 24 hours of discovery of the event:

- Permit Number, contact person name and phone number.
- Date and time of entanglement or interaction, if known.
- Nature of entanglement or interaction, and species and numbers of individuals affected.
- Number of mortalities and/or injuries observed.
- Cause and resolution of the entanglement or interaction.
- Actions to prevent future entanglements or interactions.

(D)If no entanglement or interaction occurs during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

(E)Disease. Any findings or suspected findings of reportable diseases or pathogens as required by OIE or the National Aquatic Animal Health Plan shall be reported within 24 hours including the following information:

- Permit number, contact person name and phone number.
- Identification of the pathogen.
- Percent of cultured species infected.
- Findings of the aquatic animal health expert.
- Plans for submission of specimens for confirmatory testing.
- Testing results (where applicable).

- Actions taken to address the episode, including administration of any FDA-approved antibiotics.

(F)If there are no outbreaks during a given year, then the permittee shall provide NMFS with an annual report on or before January 31 each year indicating this.

- Capture of broodstock. At least 30 days prior to collection activities, a permittee shall provide the following information:
  - Number of animals, species, and size.
  - Methods, gears, and vessels (including U.S. Coast Guard (USCG) documentation or state or territory registration) used for capturing, holding, and transporting.
  - Date and specific location of intended harvest.
  - Location to which broodstock will be delivered.

(iii) ***Recordkeeping requirements.*** An aquaculture facility owner or operator must comply with the following recordkeeping requirements:

- Valid paperwork for all required Federal, state and/or territorial permits or licenses.
- Number and pounds of harvested cultured species.
- Major escapes of the cultured species.
- Entanglements or other interactions with protected species.
- Detection or outbreak of reportable diseases or pathogens as required by OIE or in the National Aquatic Animal Health Plan.
- Dosage and frequency of any FDA-approved[28] antibiotics or other therapeutant[29] administration, if applicable.
- Human health and safety issues.
- Records relating to feed purchases, source fisheries used in feeds, juvenile and seed suppliers, sales records, transport records.
- Current documentation, registration and ownership information for project vessels and aircraft owned or contracted for the operation, along with names and contact information for employed or contracted captains and pilots.
- Any other appropriate recordkeeping and reporting requirements necessary for evaluating and assessing the environmental impacts of an aquaculture operation and compliance with permit terms and conditions.

(2) ***Aquaculture dealer recordkeeping and reporting requirements.*** A dealer who purchases fish from an aquaculture facility in the Western Pacific EEZ must:

(i) [Reserved]

(b) [Reserved]

[28] https://www.fda.gov/animal-veterinary/aquaculture/approved-aquaculture-drugs

[29] A therapeutant can be any substance used to maintain the health of a cultured organism.

§ 622.103 Aquaculture facilities.

(a) ***[Reserved]***

(b) [Reserved]

§ 622.104 Restricted access zones.

(a) ***[Reserved]***

§ 622.105 Allowable aquaculture systems and species.

(a) ***Allowable aquaculture systems.*** The RA will evaluate each proposed aquaculture system on a case-by-case basis and approve or deny use of the proposed system for offshore marine aquaculture in the Western Pacific EEZ. The RA will evaluate the structural integrity of a proposed aquaculture system based, in part, on the required documentation (*e.g.*, engineering analyses, computer and physical oceanographic model results) submitted by the applicant to assess the ability of the aquaculture system(s) (including moorings) to withstand physical stresses associated with major storm events, *e.g.* hurricanes, storm surge. The RA also will evaluate the proposed aquaculture system and its operations based on the potential to pose significant risks to essential fish habitat, endangered or threatened species, marine mammals, wild fish stocks, public health, or safety. The RA may deny use of a proposed aquaculture system or specify conditions for using an aquaculture system based on a determination of such significant risks. The RA's evaluation will be based on information provided by the applicant as well as consultations with appropriate NMFS and NOAA offices and programs. If the RA denies use of a proposed aquaculture system or specifies conditions for its use, the RA will deny the Western Pacific Aquaculture Permit and provide this determination as required by § 6########.

(b) ***Allowable aquaculture species.*** All species native to the region of the proposed aquaculture facility and are not genetically engineered or transgenic, may be cultured in an aquaculture facility in the Western Pacific EEZ.

§ 622.106 Aquaculture operations.

(a) ***[Reserved]***

(b) [Reserved]

§ 622.107 Limitation on aquaculture production.
[Reserved]

# 8 DRAFT PROPOSED FEP AMENDATORY LANGUAGE (COUNCIL AND SFD)

This section contains the proposed amendatory language the Council deems necessary and appropriate to amend and update the applicable FEP.

1. The _____FEP shall be amended by replacing Section X.X.X with the following text:

[RESERVED]

## APPENDIX A. PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR PIR AQUACULTURE

[Reserved]