

# Fisheries and aquaculture management in the United States

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**Fisheries**





RESEARCH FOR PECH COMMITTEE

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## **Abstract**

This in-depth analysis explores the complexities of fisheries and aquaculture management in the United States, focusing on the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA establishes ten national standards and eight Regional Fishery Management Councils to develop and enforce regulations. The research paper highlights the collaborative efforts between state and federal authorities in monitoring and regulating fisheries and aquaculture activities in the US. Finally, the analysis addresses US aquaculture regulation, environmental concerns, and initiatives to expand the sector despite existing challenges.

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## LIST OF ABBREVIATIONS

<b>ABC</b>	acceptable biological catch
<b>ACL</b>	annual catch limit
<b>ACT</b>	annual catch target
<b>AOA</b>	Aquaculture Opportunity Area
<b>CFP</b>	Common Fisheries Policy
<b>EEZ</b>	exclusive economic zone
<b>EPA</b>	Environmental Protection Agency
<b>EU</b>	European Union
<b>FMP</b>	fishery management plan
<b>IATTC</b>	Inter-American Tropical Tuna Commission
<b>ICCAT</b>	International Commission for the Conservation of Atlantic Tunas
<b>IPHC</b>	International Pacific Halibut Commission
<b>IUU</b>	illegal, unregulated and unreported (fishing)
<b>LAPP</b>	limited access privilege program
<b>MSA</b>	Magnuson-Stevens Fishery Conservation and Management Act
<b>MSY</b>	maximum sustainable yield
<b>NASCO</b>	North Atlantic Salmon Conservation Organisation
<b>NFH</b>	National Fish Hatchery
<b>NMFS</b>	National Marine Fisheries Service
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NPAFC</b>	North Pacific Anadromous Fish Commission
<b>OFL</b>	overfishing limit

<b>PECH</b>	European Parliament's Committee on Fisheries
<b>PSC</b>	Pacific Salmon Commission
<b>RFMCs</b>	Regional Fishery Management Councils
<b>SCA</b>	Sub Committee on Aquaculture
<b>SPTT</b>	South Pacific Tuna Treaty
<b>SSC</b>	Scientific and Statistical Committee
<b>TAC</b>	total allowable catch
<b>US</b>	United States (of America)
<b>USD</b>	US dollar
<b>USDA</b>	United States Department of Agriculture
<b>USFWS</b>	United States Fish and Wildlife Service
<b>VMS</b>	vessel monitoring system
<b>WCPFC</b>	Western and Central Fisheries Commission

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## EXECUTIVE SUMMARY

While both the United States (US) and the European Union (EU) are world leaders in fisheries production and trade, their respective fisheries management systems differ in several significant aspects. This paper provides an overview of fisheries and aquaculture management in the United States to help understand the management system of a country that has been successful in rebuilding fish stocks.

### Fisheries management

The main regulatory agency for fisheries in the United States is the **National Oceanic and Atmospheric Administration (NOAA)**. Within NOAA, the **National Marine Fisheries Service (NMFS)** is responsible for fisheries management. The US divides fisheries management responsibilities between the federal and state levels. All fishing within three nautical miles of shore falls under state jurisdiction, where individual states can decide on regulations. Federal jurisdiction begins at three nautical miles and extends to 200 nautical miles. To unify management of the vast US exclusive economic zone (EEZ), a national law known as the '**Magnuson-Stevens Fishery Conservation and Management Act**' (MSA) was created as the basis for all federal fisheries management. Under the MSA, eight **Regional Fishery Management Councils (RFMCs)** are responsible for developing and updating fishery management plans (FMPs) for their respective regions. The FMPs must follow the ten national standards that are outlined in the MSA.

The RFMCs base their **fisheries management plans** on the target species and their characteristics. A variety of management strategies are used, including catch shares, gear restrictions, size limits, and limited entry. The MSA encourages the RFMCs to minimise bycatch, through monitoring, research, and enforcement of bycatch regulations. Unlike the EU, the US does not have a mandatory landing requirement. **Fisheries control** in the US consists of vessel monitoring, cooperative enforcement and international enforcement. While there are requirements for an observer on board certain vessels, some vessels use electronic monitoring. State wildlife officers are also authorised to enforce fisheries management measures. Fisheries violations are enforced by the threat of a civil penalty, the amount of which depends on the severity of the violation.

**Subsidies** in the US focus on promoting sustainability or reducing the economic burden on fishers due to natural disasters. NOAA works with several other government agencies to provide subsidies to fishing communities and to improve the sustainability of fishing vessels. The US is a major player in **international fisheries relations** and participates in multilateral and bilateral agreements with several countries in an effort to promote international sustainable fisheries. Multilateral agreements in which the US participates focus on migratory and anadromous fish species. The US also has several bilateral agreements with Canada for Pacific halibut and salmon, as well as for fish species that inhabit the Great Lakes. Under these bilateral agreements, several commissions with members from both governments work together to develop FMPs. The US has also recently signed the World Trade Organization's agreement to combat illegal, unreported, and unregulated (IUU) fishing.

In the US, **recreational fisheries** are also managed at the federal level. Each RFMC creates separate regulations for any charter vessels or recreational fishers in federal waters. Each state's fish and wildlife department regulates recreational fishing in state waters. Regulations for recreational fishing generally include size and catch limits. For species that occur in both federal and state waters, and therefore have both federal and state management regulations, the stricter regulations must be followed.

## Aquaculture management

The *'National Aquaculture Act'* of 1980 established the Subcommittee on Aquaculture, which involves three departments of the US government to **regulate federal aquaculture**. The **United States Department of Agriculture** (USDA), **United States Fish and Wildlife Service** (USFWS) and the NMFS work together to manage aquaculture and the **National Fish Hatchery** (NFH) system. The hatchery system was originally used to support commercial and recreational fisheries, but has become a conservation tool. Species listed as threatened or endangered are now the focus of US hatcheries.

Aquaculture also requires several **environmental regulations** due to the waste products generated during production. The **Environmental Protection Agency** (EPA) is responsible for regulating the treatment and discharge of wastewater. Several federal laws work together to ensure that water is properly treated and kept clean and safe. In addition, the *'Federal Insecticide, Fungicide, and Rodenticide Act'*, regulates the pesticides and antibiotics used on farmed fish in accordance with specific government guidelines.

The majority of aquaculture in the US takes place in state waters or on land. Each **state is responsible for regulating aquaculture** in state waters or on land. Each state has its own department of fish and wildlife that is responsible for the legislation and regulation of aquaculture. This applies to both freshwater and marine species. Each state has its own requirements for aquaculture permits, depending on whether the species is a finfish, shellfish, or seaweed. There are currently only two commercial offshore aquaculture facilities operating in the US. However, the NMFS has identified areas for future development. Although US aquaculture production is currently low, the government is making efforts to expand the sector.

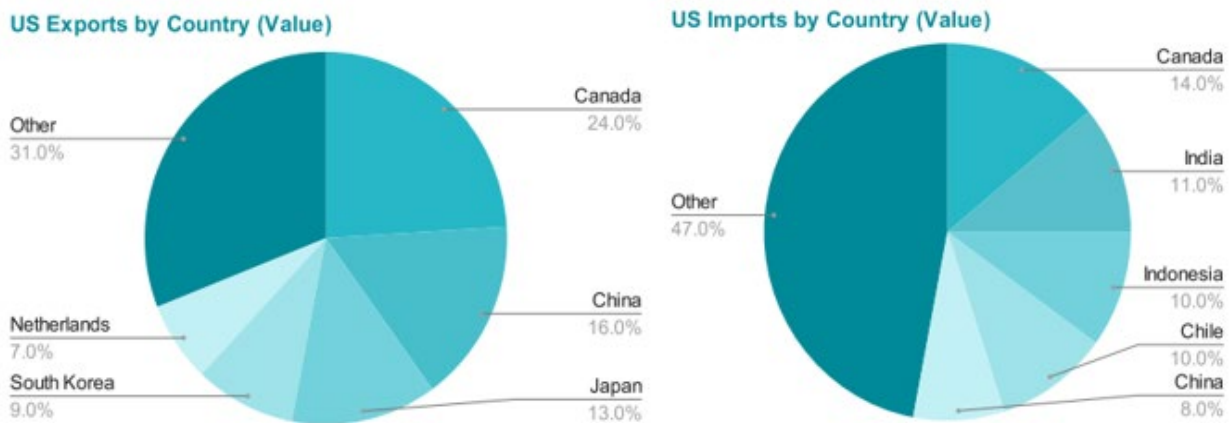
## 1. INTRODUCTION

Fisheries in the United States, as in the European Union, is a source of food, cultural, economic and recreational benefits for the general public. In 2022, the US **managed 506 fish stocks**, and the fishing sector supported more than **two million jobs**<sup>1</sup>. Based on the 2024 State of World Fisheries and Aquaculture report, the US ranks among the **top six of major producers** of marine aquatic animals, accounting for **5.3% of the total world production**<sup>2</sup>.

According to the 2020 annual report on fisheries, **finfish account for around 80% of commercial fishery landings** in the US, but **shellfish generate the most value** from commercial fisheries<sup>3</sup>. Shellfish, particularly crabs, lobsters and scallops bring in the most in terms of value. The highest value finfish in the commercial fishery is **salmon generating over USD 400 million** in 2020. Recreational fishers caught around 1 billion fish in 2020, of which catch and release fishing accounted for around 65%. The remainder, amounting to almost 300 million fish, were harvested<sup>4</sup>. According to the 2023 annual report on the status of stocks, 6% of US fish stocks in the US are subject to overfishing and 18% are still considered overfished<sup>5</sup>. By comparison, the 2022 data indicates that in the EU 30% of assessed stocks are considered overfished<sup>6</sup>.

Fishery and aquaculture products are a source of trade between the US and the EU. In 2020, the **US imported around 9% of the total fishery and aquaculture products produced by the EU**. In the same year, the US was responsible for almost **4% of the total fishery and aquaculture products imported to the EU**<sup>7</sup>. Trade between the two increased after 2022 because of an agreement between the European Commission and the United States<sup>8</sup>. With this agreement, the EU and the US resumed trade in bivalves and shellfish, in particular to the Netherlands (**Figure 1**).

**Figure 1: US trade of fishery and aquaculture products by country in terms of value, in %**



Source: [National Marine Fisheries Service \(2022a\)](#)

<sup>1</sup> National Marine Fisheries Service (2024), [Status of Stocks 2023: Annual report to Congress on the status of U.S. Fisheries](#).

<sup>2</sup> FAO (2024b), [The State of World Fisheries and Aquaculture 2024](#).

<sup>3</sup> National Marine Fisheries Service (2022a), [2020 Fisheries of the United States](#).

<sup>4</sup> National Marine Fisheries Service (2022a), [2020 Fisheries of the United States](#).

<sup>5</sup> National Marine Fisheries Service (2024), [Status of Stocks 2023: Annual report to Congress on the status of U.S. Fisheries](#).

<sup>6</sup> European Commission (2024), [Sustainable fishing in the EU: state of play and orientations for 2025](#).

<sup>7</sup> European Commission, Directorate-General for Maritime Affairs and Fisheries (2022), [Facts and figures on the common fisheries policy – Basic statistical data](#).

<sup>8</sup> Office of International Affairs, Trade, and Commerce (2024c), [Export Certification to the European Union](#).

## 2. FISHERIES MANAGEMENT IN THE US

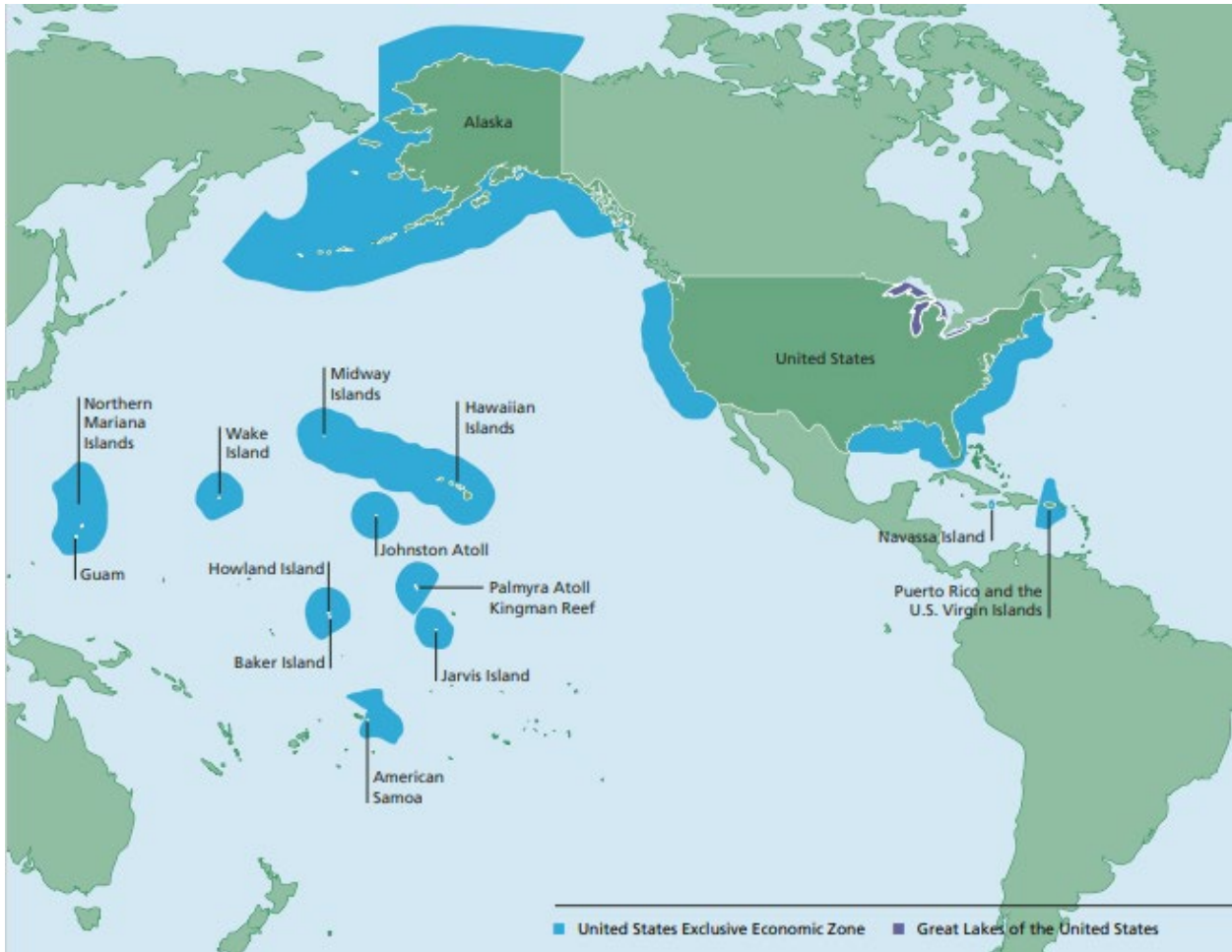
### KEY FINDINGS

- The '*Magnuson-Stevens Fishery Conservation and Management Act*' (**MSA**) is the law that organises the structure of fisheries management in the US by outlining ten national standards.
- **Regional Fishery Management Councils** (RFMCs) are responsible for establishing and enforcing fishery management plans (FMPs) for the species in their designated regions.
- **RFMCs set the annual catch limit** (ACL) for each fishery, which is then managed through catch shares, gear restrictions, size limits, or limited entry.
- The **US enforces fisheries regulations** through a combination of vessel monitoring systems, cooperative and international enforcement efforts, with a strong **focus on combating illegal, unreported, and unregulated (IUU) fishing**.
- The **US provides fisheries subsidies** primarily for sustainability and disaster relief, with significant funding to support innovative **sustainable fishing practices**.
- The **US engages in international and regional fisheries management agreements**, focusing on **tuna and anadromous species** such as salmon, through multilateral cooperation and bilateral treaties, particularly with Canada and the EU.
- The **National Marine Fisheries Service** (NMFS) regulates **marine recreational fisheries** through federal-state collaboration, requiring permits, catch and size limits, and reporting systems, while the '*Marine Recreational Information Program*' collects and integrates data from various sources to enhance fishery management and conservation efforts.

Fisheries management in the US is the combined effort of several organisations. While Congress creates and passes laws that affect fisheries, government agencies enforce the laws with authority and jurisdiction. The US divides the ocean along the coast into **federal and state jurisdictions (Map 1)**. As outlined in the '*Submerged Lands Act*' of 1953, from the baseline of the US coastline out to three nautical miles, the **state is responsible for managing fisheries**<sup>9</sup>. In Texas, the Gulf of Florida, and Puerto Rico, the state boundaries extend to 9 nautical miles. The federal government is responsible for managing fisheries in the exclusive economic zone (EEZ) from three to 200 nautical miles<sup>10</sup>. The United States has one of the largest EEZs in the world, covering 11.4 million square kilometres.

<sup>9</sup> Bureau of Ocean and Energy Management (2002), [Submerged Lands Act of 1953](#).

<sup>10</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

**Map 1: US federal fisheries jurisdiction**

Source: [National Oceanic and Atmospheric Administration \(2011\)](#)

Note: Regions in dark blue indicate the EEZ (3-200 nautical miles). States are responsible for the 0-3 nautical miles zone. The Great Lakes, indicated in purple, are managed federally.

## 2.1. Legal framework

The US regulates fisheries through the '*Magnuson-Stevens Fishery Conservation and Management Act*' (**MSA**), similar to the EU, which regulates fisheries through the Common Fisheries Policy (CFP). While both systems manage a wide range of fisheries, there are differences in their approaches. The MSA began in 1976 as the '*Fishery Conservation and Management Act*'. Congress amended the MSA to include the '*Sustainable Fisheries Act*' in 1996 after a decline in fishery productivity was observed. The addition of the '*Sustainable Fisheries Act*' underscored the importance of **ending overfishing and rebuilding fish stocks**<sup>11</sup>. Finally, in 2006, Congress reauthorised the MSA to include clearer guidelines for ending overfishing<sup>12</sup>. Ten national standards (**Box 1**) ensure that FMPs meet the overall goals of the MSA<sup>13</sup>:

<sup>11</sup> National Research Council (2014), [Evaluating the Effectiveness of Fish Stock Rebuilding Plans in the United States](#).

<sup>12</sup> Dell'Apa, A., Schiavinato, L., Rulifson, R. A. (2012), [The Magnuson-Stevens act \(1976\) and its reauthorizations: Failure or success for the implementation of fishery sustainability and management in the US?](#)

<sup>13</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

**Box 1: National standards in the Magnuson-Stevens Fishery Conservation and Management Act**

1. Conservation and management measures shall **prevent overfishing** while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.
2. Conservation and management measures shall be **based upon the best scientific information available**.
3. To the extent practicable, an **individual stock** of fish shall be **managed as a unit throughout its range**, and interrelated stocks of fish shall be managed as a unit or in close coordination.
4. Conservation and management measures shall **not discriminate between residents of different states**. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.
5. Conservation and management measures shall, where practicable, **consider efficiency** in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
6. Conservation and management measures shall take into account and **allow for variations** among, and contingencies in, fisheries, fishery resources, and catches.
7. Conservation and management measures shall, where practicable, **minimize costs and avoid unnecessary duplication**.
8. Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the **importance of fishery resources to fishing communities** in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.
9. Conservation and management measures shall, to the extent practicable, (A) **minimize bycatch** and (B) to the extent bycatch cannot be avoided, **minimize the mortality** of such bycatch.
10. Conservation and management measures shall, to the extent practicable, **promote the safety of human life at sea**.

Source: Own elaboration based on the national standards outlined in the '*Magnuson-Stevens Fishery Conservation and Management Act*'

## 2.2. Governance

Under the MSA, the **National Oceanic and Atmospheric Administration** (NOAA), within the Department of Commerce, sets federal fisheries standards and establishes regulatory agencies throughout the United States. In particular, the **National Marine Fisheries Service** (NMFS) is the agency within NOAA that focuses on fisheries. The management of federal fisheries and aquaculture in the US is unique, starting with the division between **commercial** and **recreational** fisheries management. Federal regulations within the US focus primarily on **marine** and **anadromous species**<sup>14</sup>. Freshwater fish are managed by the individual states unless the '*Endangered Species Act*' also

<sup>14</sup> Anadromous species are species that migrate up freshwater rivers for the purpose of spawning, for example salmon (see e.g. Schiewe and Kareiva, 2001: [Anadromous Fish](#)).

applies to the species<sup>15</sup>. The government regulates aquaculture separately from both commercial and recreational fisheries (see Section 3).

The MSA established eight **Regional Fishery Management Councils** (RFMCs), which are responsible for developing **fishery management plans** (FMPs) for their designated regions in accordance with the national standards (**Map 2**). Councils submit their FMPs to the NMFS for review, approval, and implementation<sup>16</sup>. Councils conduct meetings throughout the year to discuss any new FMPs or proposed amendments to current FMPs. During these Council meetings, interested members of the public are able to attend and share opinions and suggestions on the developments in the FMPs<sup>17</sup>.

Each RFMC is responsible for different species, depending on the species in that region. The eight **Councils all have the same basic four components**: voting members, nonvoting members, an executive director and staff, and several committees. The **voting members** are responsible for establishing rules and making decisions. When voting, a majority is representative of a final decision<sup>18</sup>. **Nonvoting members** are representatives from outside federal agencies, such as the United States Fish and Wildlife Service (USFWS). The **executive director** and **staff** are responsible for supporting the Council through research, analysis, outreach, and communication within the Council<sup>19</sup>. Some Councils have staff responsible for drafting FMPs and amendments for a specific fish population. The **Scientific and Statistical Committee** (SSC) focuses on scientifically relevant information used in the development of FMPs. Members of the SSC collect and analyse data and peer review any information that may be relevant to FMPs. The SSC also works with their RFMC to develop research and fisheries management plans every five years. The **Council Coordination Committee** addresses any issues within the different Fishery Management Council by setting up working groups. The Councils consider any information provided by the committees as advice<sup>20</sup>. Despite having the same core components, each of the **eight RFMCs** differ in the species they manage and in their management style (**Figure 2**).

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<sup>15</sup> Office of Protected Resources (2023), [Endangered Species Act of 1973](#).

<sup>16</sup> U.S. Regional Fishery Management Councils (n.d.), [About the Councils](#).

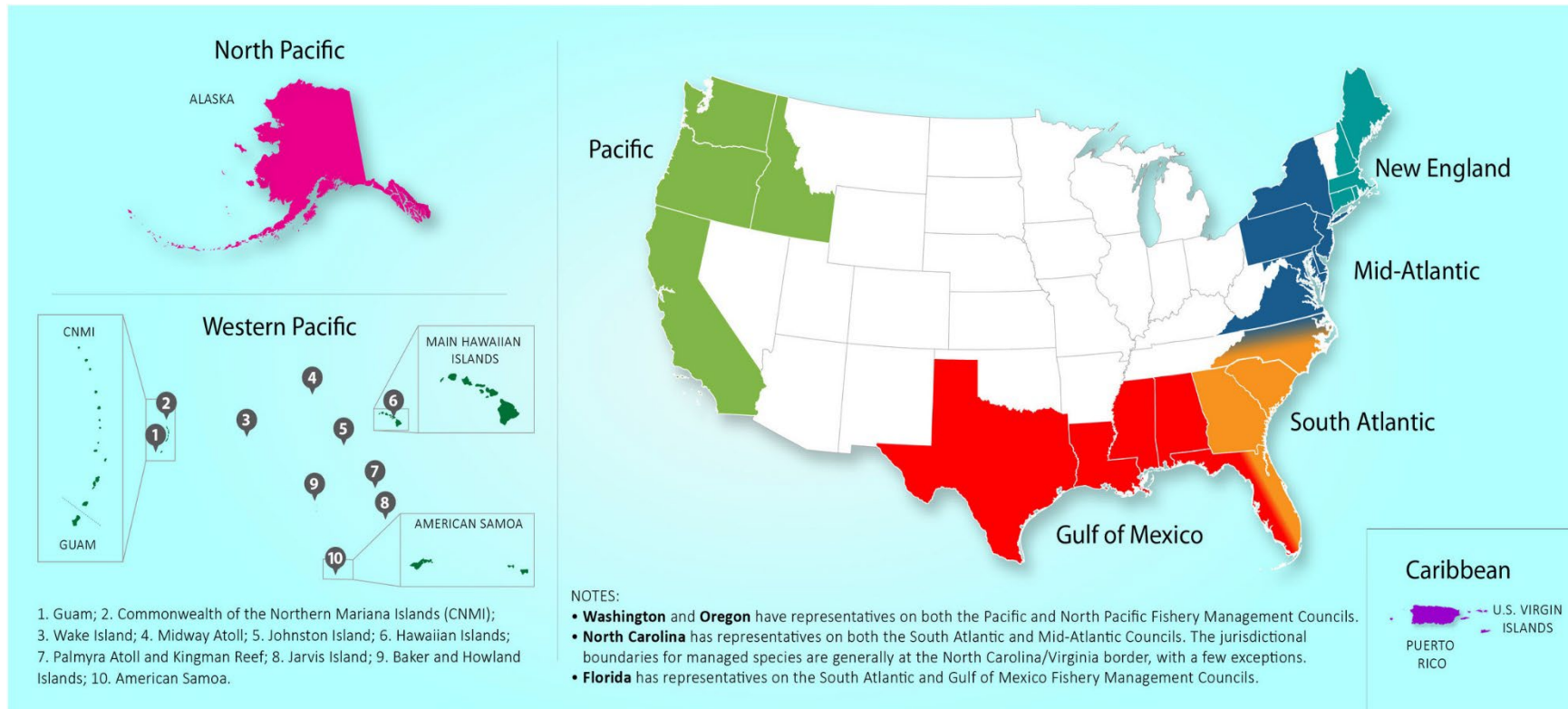
<sup>17</sup> Congressional Research Service (2023a), [U.S. Regional Fishery Management Councils](#).

<sup>18</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

<sup>19</sup> North Pacific Fishery Management Council (n.d.), [Council Staff](#).

<sup>20</sup> Congressional Research Service (2023a), [U.S. Regional Fishery Management Councils](#).

**Map 2: US Regional Fishery Management Councils**



Source: [Regional Fishery Management Councils \(n.d.\)](#)



**Figure 2: Portfolios of US Regional Fishery Management Councils (RFMCs)**



Source: Adaptation from [US Regional Fishery Management Council Overview \(2022\)](#)

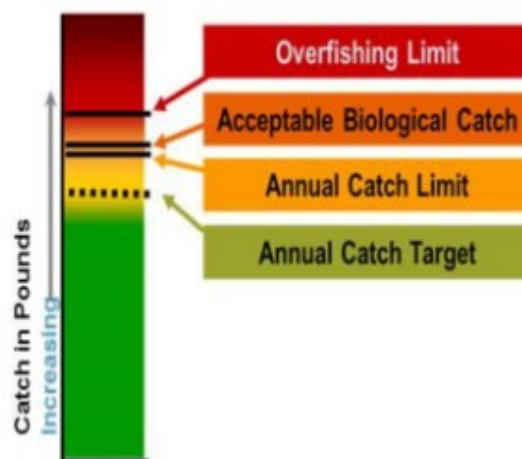
### 2.3. Management system

Each Council sets an **annual catch limit** (ACL) measured in pounds, similar to the EU total allowable catch (TAC), for each FMP based on the recommendation of its SSC. According to NOAA, overfishing occurs when the fishing mortality rate is greater than that produced by the **maximum sustainable yield** (MSY), implying that the US considers MSY as a limit<sup>21</sup>. Councils set ACLs using the **overfishing limit** (OFL) and the **acceptable biological catch** (ABC). The SSCs calculate the OFL using the annual maximum level of fishing mortality before overfishing occurs<sup>22</sup>. Councils are required to set an ACL and an **annual catch target** (ACT) that is below or equal to the SCC's ABC to account for any uncertainty and bycatch (**Figure 3**)<sup>23</sup>.

<sup>21</sup> National Marine Fisheries Service (2022b), [Additional Stock Status Information](#).

<sup>22</sup> Southeast Regional Office (2024), [Frequent Questions: Annual Catch Limit Monitoring](#).

<sup>23</sup> Southeast Regional Office (2024), [Frequent Questions: Annual Catch Limit Monitoring](#).

**Figure 3: Technical terms used for US fisheries management**

Source: [Southeast Regional Office Annual Catch Limit Monitoring \(2024\)](#)

The US uses several **types of management strategies**, including catch shares, gear restrictions, size limits, and limited entry<sup>24</sup>. The type of catch share ranges from a **limited access privilege program** (LAPP) to an individual fishing quota or a territorial use right for the fishery<sup>25</sup>. The reauthorisation of the MSA allowed Councils to implement LAPPs, if the plan established the fishery as a market-based limited access system<sup>26</sup>. Another type of limited access is community development quotas that allow certain villages or communities an amount of fish they can catch from the total allowable catch<sup>27</sup>. The RFMCs are also required to work with a governmental committee to address the issue of illegal, unreported, and unregulated (IUU) fishing<sup>28</sup>. The NMFS created a national policy for Councils to refer to when creating a catch share system for a fishery. Councils are **not required to set up a catch share system** but are rather encouraged to determine if it is the best management strategy for the specific fishery. Councils are also **free to decide on the transferability of the quotas**. Transferability is a management tool that allows fishers to harvest efficiently<sup>29</sup>. The MSA prohibits uninterested entities from purchasing catch shares simply to reduce the total amount of fish caught by not using those shares. Other than this MSA restriction, Councils are free to decide to what extent quotas and shares are transferable<sup>30</sup>.

Each RFMC is responsible for developing measures to reduce bycatch or mortality of bycatch, in accordance with national standard number nine. The NMFS has developed a **National Bycatch Reduction Plan** to guide the RFMCs. The plan focuses on monitoring, research, conservation, and enforcement. **Monitoring** is carried out through observer coverage and data collection through the National Bycatch Report. The NMFS encourages information sharing to and from both state and international agencies. **Research** strategies focus on using marine closures and monitoring of the environment. Enforcement is achieved by researching areas for improvement in gear or monitoring technologies and working collaboratively with state, federal, and international enforcement agencies.<sup>31</sup>

<sup>24</sup> Pacific Fishery Management Council (2022), [Fishery Management Plan, For U.S. West Coast Fisheries For Highly Migratory Species](#).

<sup>25</sup> Office of Sustainable Fisheries (2023a), [Catch Shares](#).

<sup>26</sup> Lee G. Anderson and Mark C. Holliday (eds.), NOAA, NMFS (2007), [The Design and Use of Limited Access Privilege Programs](#).

<sup>27</sup> Congressional Research Service (2023a), [U.S. Regional Fishery Management Councils](#).

<sup>28</sup> Office of International Affairs, Trade, and Commerce (2024d), [U.S. Interagency Working Group on IUU Fishing](#).

<sup>29</sup> Wendy Morrison (2017), [National Marine Fisheries Service's Catch Share Policy](#).

<sup>30</sup> Wendy Morrison (2017), [National Marine Fisheries Service's Catch Share Policy](#).

<sup>31</sup> Office of Sustainable Fisheries (2024b), [National Bycatch Reduction Strategy](#).

## 2.4. Control

The US controls and enforces fisheries regulations through **vessel monitoring, cooperative enforcement, and international enforcement**<sup>32</sup>. Some vessels are required to have an observer on board, while others use electronic monitoring. Vessel Monitoring Systems (VMS) use satellite transmission to record information about the vessel. VMS records data for seven days a week, 24 hours each day. Depending on the region, certain fishing vessels are required to always carry a VMS transceiver<sup>33</sup>. VMS data includes information on the identification of the vessel, the vessel's position, the date and time, and landing and departure harbours. The frequency of VMS signals depends on the vessel's location. When a vessel approaches an area of concern, such as a marine protected area, the signal frequency increases to ensure that the vessel is complying with location requirements. Each RFMC determines for which vessels the VMS is required<sup>34</sup>.

In the United States, individual state natural resource officers are authorised to enforce federal regulations. At the strictly federal level, the **United States Coast Guard, USFWS, and Customs and Border Protection** all work together to enforce regulations. A Joint Enforcement Agreement involves the coastal states and allows their state law enforcement officers to enforce the federal fisheries laws<sup>35</sup>. The Coast Guard focuses on IUU fishing<sup>36</sup>. The US has a five-year plan to reduce IUU fishing and strengthen enforcement measures at an international level. Furthermore, NOAA has an Office of Law Enforcement that focuses on the enforcement of regulations. Five federal divisions focus on patrolling, outreach, and investigating violations. Alaska has its own division because it is the largest single supplier of seafood in the United States. Then there is the Northeast division, which covers 20 states on the East coast. The Pacific Islands division covers the Hawaiian Islands and US territories. The Southeast division monitors the Gulf of Mexico and US territories in the Caribbean. Finally, the West coast division oversees the continental West coast states except Alaska<sup>37</sup>. Federal fishery violations under the MSA, 'Marine Mammal Protection Act', and 'Endangered Species Act' are treated as a civil violation with fines<sup>38</sup>.

## 2.5. Subsidies

Fisheries subsidies often allow fishers to **expand their fishing operations** and capacity to catch fish. The US focuses fisheries subsidies on helping fishers for **sustainability reasons** or because of **natural disasters**<sup>39</sup>. NOAA and the USFWS work together to provide funding to promote sustainable fishing. In 2024, the two agencies awarded USD 4 million in grants through the 'Electronic Monitoring and Reporting Program'<sup>40</sup>. The aim is to encourage innovative gear developments that increase the sustainability of fisheries. The Secretary of Commerce is responsible for determining the need for disaster assistance under the 'Fishery Resource Disasters Improvement Act'<sup>41</sup>. The NMFS provides the necessary financial support to fishers or communities affected by a natural disaster. The US created this distribution of funds to provide support to fishing communities and decrease the economic burden that results from an unexpected natural disaster<sup>42</sup>. According to a report on global fisheries subsidies,

<sup>32</sup> Pacific Fishery Management Council (2023), [Pacific Coast Groundfish Fishery Management Plan](#).

<sup>33</sup> Office of Law Enforcement (2024), [Regional Vessel Monitoring Information](#).

<sup>34</sup> National Marine Fishery Service (n.d. c), [Enforcement: Vessel Monitoring](#).

<sup>35</sup> National Marine Fishery Service (n.d. b), [Enforcement: Cooperative Enforcement](#).

<sup>36</sup> United States Coast Guard (n.d.), [ILLEGAL, UNREPORTED, AND UNREGULATED FISHING](#).

<sup>37</sup> NOAA Office of Law Enforcement (2023), [Enforcement Priorities 2023-2027](#).

<sup>38</sup> National Oceanic and Atmospheric Administration (2024), [Enforcement Charging Information](#).

<sup>39</sup> Office of Sustainable Fisheries (2024a), [Fishery Resource Disaster Assistance](#).

<sup>40</sup> Rob Blumenthal (2024), [NFWF Announces \\$4 Million in Grants to Support Sustainable Fisheries](#).

<sup>41</sup> US Congress (2007), Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

<sup>42</sup> US Congress (2021), Fishery Resource Disasters Improvement Act, [16 U.S.C. § 1864a](#).

the US provided **USD 3.4 billion in fisheries subsidies** in 2018. For comparison, the EU provided USD 3.8 billion in fisheries subsidies in the same year<sup>43</sup>. The potential for fisheries subsidies to encourage overfishing led the United States to sign the World Trade Organization's 2022 Agreement on Fisheries Subsidies in April 2023<sup>44</sup>. The purpose of this agreement is to restrict fisheries subsidies that may contribute to IUU fishing or overfishing. As one of the main objectives of fisheries management in the United States is to prevent overfishing, the US was keen to sign the agreement<sup>45</sup>.

## 2.6. International relations

The United States recognises the value of international management of certain fisheries because target species do not follow national jurisdictional boundaries. As such, the US acknowledges the importance of cooperative management of these species to prevent overfishing and depletion of marine resources. The US is a member of numerous **Regional Fisheries Management Organisations** (RFMOs), particularly for **tuna and salmon**, including the Inter-American Tropical Tuna Commission (IATTC), the Western and Central Fisheries Commission (WCPFC), the International Commission for the Conservation of Atlantic Tunas (ICCAT), the North Atlantic Salmon Conservation Organisation (NASCO), and the North Pacific Anadromous Fish Commission (NPAFC)<sup>46</sup>. Other multilateral agreements focus on protecting vulnerable marine ecosystems and maintaining catch limits to promote sustainable fisheries<sup>47</sup>.

There are also several **regional and bilateral agreements** in which the US participates. The South Pacific Tuna Treaty (SPTT) is an agreement between the US and several Pacific Islands that allows US vessels to fish in their waters<sup>48</sup>. In July 2015, the US signed an agreement in the Arctic region that aims to prevent fishing and promote research in the Arctic region, with a similar outcome to the EU's precautionary approach<sup>49</sup>. Bilateral agreements are most common between the US and Canada, as they share resources from three oceans. Both countries have used formal agreements to manage the Pacific halibut, the Pacific salmon, and Great Lakes fisheries. The International Pacific Halibut Commission (IPHC) makes fishery management decisions including setting TACs and allocating individual quotas for Pacific halibut in the West coast states and British Columbia<sup>50</sup>. The commission works in collaboration with the RFMCs in the US and fishery managers in Canada. The Pacific Salmon Commission (PSC) works under the authority of the Pacific Salmon Treaty to advise the RFMCs in the US and the fishery managers in Canada. The PSC uses panels and committees with representatives from each country to provide scientific advice to fishery managers in both countries<sup>51</sup>. Finally, the **Great Lakes Fishery Commission** works with local and tribal authorities in both countries to make management decisions for the fisheries in the Great Lakes<sup>52</sup>. All three commissions set regulations for commercial, recreational and subsistence fisheries.

IUU fishing is a global problem that the US is actively working to combat through international cooperation. Within its borders, the US has an **interagency working group on IUU fishing** that combines the efforts of state and federal agencies to combat the issue. This working group uses a five-

<sup>43</sup> Congressional Research Service (2023b), [World Trade Organization Fisheries Subsidies Negotiations](#).

<sup>44</sup> Congressional Research Service (2023b), [World Trade Organization Fisheries Subsidies Negotiations](#).

<sup>45</sup> Congressional Research Service (2023b), [World Trade Organization Fisheries Subsidies Negotiations](#).

<sup>46</sup> Office of International Affairs, Trade, and Commerce (2023), [International and Regional Fisheries Management Organizations](#).

<sup>47</sup> Office of International Affairs, Trade, and Commerce (2023), [International and Regional Fisheries Management Organizations](#).

<sup>48</sup> U.S. Department of State (n.d.), [International Fisheries Management](#).

<sup>49</sup> Office of International Affairs, Trade, and Commerce (2024a), [Bilateral Agreements](#).

<sup>50</sup> Great Lakes Fishery Commission (n.d), [Fisheries Management: Working to sustain the resource](#).

<sup>51</sup> Pacific Salmon Commission (n.d), [Organizational Structure](#).

<sup>52</sup> International Pacific Halibut Commission (n.d.), [Commercial Fisheries](#).

year plan to allocate tasks among the agencies<sup>53</sup>. Internationally, the US works with the EU and many other countries to monitor and combat IUU fishing<sup>54</sup>. In 2011, the US and the EU signed a declaration to prevent the import of IUU seafood. Both the US and the EU share information and use Regional Fishery Management Organisations (RFMOs) to improve fisheries monitoring and the enforcement of IUU fishing rules<sup>55</sup>.

## 2.7. Recreational fisheries

In the United States, the NMFS regulates and manages marine **recreational fisheries**<sup>56</sup>. Recreational fishing is defined as fishing for pleasure rather than for subsistence or commercial purposes. To fish recreationally in federal waters, a vessel must be beyond three nautical miles (state waters). Both individual fishing using one's own vessel and chartering a fishing vessel are popular pastimes in the United States. State waters are generally more accessible, resulting in more recreational fishing in state waters than in federal waters<sup>57</sup>. In accordance with national standard number three, the NMFS manages federal stocks as a unit and therefore a portion of the **annual catch limit** (ACL) is allocated to recreational fisheries. Recreational management generally takes the form of catch and size limits as well as season lengths. All eight RFMCs have their own measures for recreational fishing within the different FMPs. The RFMCs work with state agencies to share information on fisheries in their region.

All recreational fishing in state waters (0-3 nautical miles) is the responsibility of the state to enforce regulations and provide licenses<sup>58</sup>. Each state has its own department of fish and wildlife or similar department that regulates the recreational fishing in that state. These agencies are **independent state agencies** but they **work with the federal agencies**. In particular, the NOAA '*Fisheries' Marine Recreational Information Program*'<sup>59</sup> is a collaborative program that involves individual states, the RFMCs, and the federal government to collect data on the recreational fishing in the United States. Using catch and effort surveys, the program **aims to provide a comprehensive estimate of the recreational fish caught each year**. Fisheries managers from RFMCs combine recreational data from these surveys with commercial fishery and biological data to improve their ability to evaluate management plans<sup>60</sup>. In 2018, the '*Modernising Recreational Fisheries Management Act*' required an evaluation of the recreational information program<sup>61</sup>. This act established the definition of a "mixed-use fishery", which is any fishery in federal waters that has two or all types of fishing – commercial, recreational, and charter<sup>62</sup>. The Act also addressed conservation measures and the development of recreational fisheries. It required a study of the biological and socio-economic impacts of LAPPs within mixed-use fisheries. The Department of Commerce was authorised to emphasise the incorporation of the information provided by state agencies into the FMPs.

Since 2011, the NMFS has required all marine recreational fishers to register with the **National Saltwater Angler Registry**<sup>63</sup>. Obtaining a recreational fishing permit from nearly every state automatically registers the fisher with the national registry; however, recreational fishers must take the

<sup>53</sup> Office of International Affairs, Trade, and Commerce (2024d), [U.S. Interagency Working Group on IUU Fishing](#).

<sup>54</sup> Office of International Affairs, Trade, and Commerce (2024b), [Bilateral Engagement with the European Union](#).

<sup>55</sup> European Commission (2011), [Fisheries: European Union and United States agree to strengthen cooperation to combat illegal fishing](#).

<sup>56</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

<sup>57</sup> Congressional Research Service (2018), [Federal Management of Saltwater Recreational Fisheries](#).

<sup>58</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

<sup>59</sup> NOAA Fisheries: [Marine Recreational Information Program](#).

<sup>60</sup> Office of Sustainable Fisheries (2023b), [National Saltwater Recreational Fisheries Policy](#).

<sup>61</sup> Congressional Research Service (2023a), [U.S. Regional Fishery Management Councils](#).

<sup>62</sup> Oliver, C. and Jacobs, N.A. (2018), [Report to Congress Section 102 of the Modernizing Recreational Fisheries Management Act of 2018](#)

<sup>63</sup> Office of Science and Technology (2024), [National Saltwater Angler Registry](#).

additional step of registering if they are in Hawaii, Puerto Rico, or the US Virgin Islands<sup>64</sup>. The registry provides information on stocks and surveys to the NMFS for overall stock assessments. Separate permits are required for fishers targeting Atlantic highly migratory species or bottomfish in Hawaii. For Atlantic highly migratory species, charter boats or fishers with an angling permit are required to report all landings of swordfish, billfish, and bluefin tuna within 24 hours<sup>65</sup>. For bottomfish fishers in Hawaii, recreational fishers must report all landings to the NMFS within 72 hours<sup>66</sup>.

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<sup>64</sup> National Marine Fisheries Service (n.d. a), [Resources for Fishing: Recreational](#).

<sup>65</sup> Office of Sustainable Fisheries (2022), [Atlantic Highly Migratory Species Reporting](#).

<sup>66</sup> Pacific Islands Regional Office (2022), [Main Hawaiian Islands Non-Commercial Bottomfish Permit](#).

### 3. AQUACULTURE MANAGEMENT IN THE US

#### KEY FINDINGS

- The **Environmental Protection Agency (EPA)** regulates aquaculture by ensuring proper treatment of **wastewater and discharge**, controlling **pesticide use**, and monitoring **chemicals** to protect environmental and human health.
- Federal marine **aquaculture in the US remains underdeveloped** due to regulatory costs, technological constraints, and knowledge gaps, with federal and state agencies overseeing operations through various permits and environmental assessments.

Similar to fisheries management, federal aquaculture management in the United States is carried out by several organisations. Three US departments work together in the **Subcommittee on Aquaculture (SCA)**, established by the '*National Aquaculture Act*' of 1980<sup>67</sup>. The **United States Department of Agriculture (USDA)** conducts research and development for freshwater aquaculture. Within the Department of the Interior, the **USFWS** focuses on the development of freshwater aquaculture<sup>68</sup>. The USFWS is also responsible for the **National Fish Hatchery (NFH)** system. Under this system, the US breeds certain species in captivity and then releases them into the wild. At its inception, the NFH system supported **commercial and recreational fisheries**, but it has since evolved into a **conservation tool**. The system now aims to raise federally recognised threatened or endangered species to rebuild their populations<sup>69</sup>. Finally, within the Department of Commerce, the NMFS is the authority that oversees the development of marine aquaculture, providing support through permitting, research, and regulation<sup>70</sup>.

For the majority of aquaculture in the United States, the state is responsible for regulating aquaculture, as it takes place on land or in state waters. Each state has its own Department of Fish and Wildlife that is responsible for the legislation and regulation of aquaculture<sup>71</sup>. This applies to both freshwater and marine species. Each state has their own requirements for aquaculture permits, depending on whether the species is a finfish, shellfish, or seaweed<sup>72 73 74</sup>.

#### 3.1. Aquaculture-related environmental protection

Environmental protection is an important part of the regulations governing the waste products produced and the treatment required. The **Environmental Protection Agency (EPA)** is responsible for issuing water quality permits and ensuring that any wastewater or discharge from aquaculture facilities is properly treated<sup>75</sup>. The EPA has authority under four laws in the United States that affect aquaculture<sup>76</sup>. The '*Clean Water Act*' regulates aquaculture facilities that produce more than

<sup>67</sup> US Congress (1980), National Aquaculture Act of 1980, [16 U.S.C. § 2801](#).

<sup>68</sup> Congressional Research Service (2019), [U.S. Offshore Aquaculture Regulation and Development](#).

<sup>69</sup> U.S. Fish and Wildlife Service (n.d.), [The National Fish Hatchery System Supports Aquatic Conservation](#).

<sup>70</sup> US Congress (2007) Magnuson-Stevens Fishery Conservation and Management Act, [16 U.S.C. §§ 1801 et seq.](#)

<sup>71</sup> FAO (2024a), [United States of America: Fisheries and Aquaculture](#).

<sup>72</sup> NOAA Fisheries (2021a), [State-by-State Summary of Finfish Aquaculture Leasing and Permitting Requirements](#).

<sup>73</sup> NOAA Fisheries (2021b), [State-by-State Summary of Seaweed Aquaculture Leasing and Permitting Requirements](#).

<sup>74</sup> NOAA Fisheries (2021c), [State-by-State Summary of Shellfish Aquaculture Leasing and Permitting Requirements](#).

<sup>75</sup> Environmental Protection Agency (2024), [Managing Aquaculture to Protect Water Quality](#).

<sup>76</sup> United States Environmental Protection Agency (2018), [Federal Agency Aquaculture Profile Series](#).

45 000 kilogrammes of fish per year by setting wastewater quality limits<sup>77</sup>. The ‘*Safe Drinking Water Act*’ ensures that any discharge or wastewater from an aquaculture facility does not affect drinking water, or any water used for human consumption. This is primarily a concern for any closed system aquaculture facility that needs to dispose of the wastewater after the tanks have been filled<sup>78</sup>. The ‘*Federal Insecticide, Fungicide, and Rodenticide Act*’ regulates aquaculture using pesticides for pest control. This law ensures that all pesticides that are used follow specific guidelines set forth by the EPA. Through this act, the EPA works closely with the Food and Drug Administration<sup>79</sup>. Finally, the ‘*Toxic Substances Control Act*’ authorises the EPA to maintain a registration of any chemical used in an aquaculture facility<sup>80</sup>.

### 3.2. Production

**Marine aquaculture** in the United States is currently relatively small for the resources that a country of its size has. The sector is underdeveloped for several reasons, including the lack of a coherent policy for aquaculture in federal waters, technological constraints, and knowledge gaps<sup>81</sup>. It is believed that regulatory costs and unknown environmental impacts have played a large role in preventing the expansion of the sector over the past two decades<sup>82</sup>. Although federal law defines aquaculture, federal legislation does not explicitly address its regulations<sup>83</sup>. Authorisation to operate a federal aquaculture facility is the responsibility of the SCA, the NMFS, and the EPA together. Each agency has its own required permits, with mandatory consultation due to potential interactions resulting from the implementation of a commercial offshore aquaculture farm<sup>84</sup>. Under the MSA, all aquaculture in federal waters is treated as a fishery in the region in which it is located, making it the **responsibility of the RFMCs** to regulate and manage it<sup>85</sup>. The ‘*Endangered Species Act*’ and ‘*Marine Mammal Protection Act*’ require the NMFS and the USFWS to collaborate on aquaculture species that interact with wild species and their habitats<sup>86</sup>.

There are currently two operational commercial offshore aquaculture facilities in the United States. One cultures blue mussels in California and the other cultures albacore jack in Hawaii<sup>87 88</sup>. The NMFS is currently reviewing areas called **Aquaculture Opportunity Areas** (AOAs) for future development of federal aquaculture. Before an AOA is designated, scientific analysis is required, starting with an environmental impact assessment of the AOA<sup>89</sup>. For the majority of aquaculture in the United States, the state is responsible for regulating aquaculture as it occurs on land or in state waters. Each state has its own Department of Fish and Wildlife, which is responsible for the legislation and regulation of

<sup>77</sup> Environmental Protection Agency (1972), Clean Water Act, [33 U.S.C §§ 1251 et seq.](#)

<sup>78</sup> US Congress (1974), Safe Drinking Water Act, [42 U.S.C. §300f et seq.](#)

<sup>79</sup> US Congress (1947), Federal Insecticide, Fungicide, and Rodenticide Act, [7 U.S.C. §§ 136 et seq.](#)

<sup>80</sup> US Congress (1970), Toxic Substance Control Act, [15 U.S.C. §§ 2601 et seq.](#)

<sup>81</sup> Fujita, R., Brittingham, P., Cao, L., Froehlich, H., Thompson, M., Voorhees, T. (2023), [Toward an environmentally responsible offshore aquaculture industry in the United States: ecological risks, remedies, and knowledge gaps.](#)

<sup>82</sup> Rubino, M.C. (2022), [Policy Considerations for Marine Aquaculture in the United States.](#)

<sup>83</sup> FAO (2024a), [United States of America: Fisheries and Aquaculture.](#)

<sup>84</sup> Congressional Research Service (2019), [U.S. Offshore Aquaculture Regulation and Development.](#)

<sup>85</sup> 16 U.S.C. §§ 1801 et seq. (2007), [Magnuson-Stevens Fishery Conservation and Management Act.](#)

<sup>86</sup> Congressional Research Service (2019), [U.S. Offshore Aquaculture Regulation and Development.](#)

<sup>87</sup> J. McDaniel (n.d.), [Farming the open ocean—is offshore aquaculture in Hawai'i the future of seafood?.](#)

<sup>88</sup> Rubino, M. C. (2022), [Policy Considerations for Marine Aquaculture in the United States.](#)

<sup>89</sup> Office of Aquaculture (2023), [Aquaculture Opportunity Areas.](#)



aquaculture<sup>90</sup>. This applies to both freshwater and marine species. Each state has its own requirements for aquaculture permits, depending on whether the species is finfish, shellfish, or seaweed<sup>91 92 93</sup>.

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<sup>90</sup> FAO (2024a), [United States of America: Fisheries and Aquaculture](#).

<sup>91</sup> NOAA Fisheries (2021a), [State-by-State Summary of Finfish Aquaculture Leasing and Permitting Requirements](#).

<sup>92</sup> NOAA Fisheries (2021b), [State-by-State Summary of Seaweed Aquaculture Leasing and Permitting Requirements](#).

<sup>93</sup> NOAA Fisheries (2021c), [State-by-State Summary of Shellfish Aquaculture Leasing and Permitting Requirements](#).

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This in-depth analysis explores the complexities of fisheries and aquaculture management in the United States, focusing on the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA establishes ten national standards and eight Regional Fishery Management Councils to develop and enforce regulations. The research paper highlights the collaborative efforts between state and federal authorities in monitoring and regulating fisheries and aquaculture activities in the US. Finally, the analysis addresses US aquaculture regulation, environmental concerns, and initiatives to expand the sector despite existing challenges.

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