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DISSERTATION

**COMBATING ILLEGAL, UNREPORTED AND
UNREGULATED (IUU) FISHING IN ECUADOR:**

**THE MARITIME AUTHORITY APPROACH FOR THE
EXERCISE OF COASTAL STATE RIGHTS**

DANIELA ANDRADE TAMAYO


A dissertation submitted to the World Maritime University in partial fulfilment
of the requirements for the award of the degree of Master of Science in
Maritime Affairs

2023

Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): 

(Date): September 26, 2023

Supervised by:

Supervisor's affiliation:

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Abstract

Title of Dissertation: **Combating Illegal, Unreported and Unregulated (IUU) Fishing in Ecuador: The Maritime Authority approach for the exercise of Coastal State rights.**

Degree: **Master of Science**

This dissertation is a study of the enforcement actions and tools used by the Maritime Authority of Ecuador to exercise Coastal State rights in the combat of Illegal, unreported, and unregulated (IUU) fishing.

IUU fishing is one of the biggest threats to sustainability efforts, as it signifies a negative impact on the conservation and management of fisheries resources, the health of the marine ecosystems, and affects food security and the social and economic development of coastal communities. This issue represents a considerable loss of revenue for coastal States and a threat to maritime security.

Nowadays, mainly in Latin America, naval forces' mission focuses on protecting maritime interests and enhancing maritime security rather than fighting other naval forces. Ecuador's national legislation appoints the Navy as the Maritime Authority and entrusts the duties to exercise Flag, Coastal, and Port State rights.

This study revised the different dynamics of IUU fishing practices exhibited in Ecuador. The most relevant is the increasing presence of foreign fishing fleets within the EEZ, presumably engaged in fishing activities. Also, it underlined the international, regional, and national legislation governing fisheries and examined the Maritime Authority of Ecuador's approach to the exercise of its sovereign rights.

The results show that currently, the Ecuador Navy faces several challenges; nevertheless, it is committed to using the available tools, within the legal framework, to prevent, deter, and further eliminate IUU fishing. This effort aims to establish governance and enforce regulations in collaboration with other State agencies, international partners, and stakeholders.

KEYWORDS: IUU fishing, Ecuador, maritime security, coastal State, enforcement, capabilities.

Table of Contents

Declaration	ii
Acknowledgements	iii
Abstract	iv
Table of Contents	v
List of Tables	vii
List of Figures	viii
List of Abbreviations	ix
Chapter 1: Introduction	1
1.1 Background	1
1.2 Deterring IUU fishing in Ecuador: The problem	3
1.3 Research Objectives and Questions	3
1.4 Methodology	4
1.5 Structure	5
Chapter 2: Illegal, Unreported and Unregulated (IUU) Fishing	6
2.1 What is IUU fishing?	6
2.2 IUU fishing as a global threat	7
2.3 IUU Fishing in Latin America	10
2.4 Legal framework to combat IUU fishing	14
2.4.1 International instruments	15
2.4.2 Regional instruments	17
2.4.3 The European Union	20
2.5 Coastal States rights and responsibilities to combat IUU fishing	22
Chapter 3: The Situation of Ecuador	26
3.1 Country Background	26
3.2 Fisheries	27
3.3 Legal and Regulatory Framework	28
3.3.1 Constitution of Ecuador	28
3.3.2 Law on the Development of Aquaculture and Fisheries	29
3.3.3 Comprehensive Organic Criminal Code	30
3.3.4 The Navigation, Safety Management and Maritime Security Act	31
3.3.5 National Action Plan to Prevent, Discourage and Eliminate IUU Fishing (PAN INDNR)	32

3.4	Role of the Maritime Authority	32
	Chapter 4: Combating IUU Fishing in Ecuador	35
4.1	Evaluation of the current issues	35
4.2	Enforcing and implementation of Legal Instruments	38
4.2.1.	Exercise of Coastal State Rights	40
4.2.2.	Challenges and measures in place to overcome them	43
4.2.3.	Further actions	48
	Chapter 5: Summary, Conclusions and Recommendations	52
5.1	Summary and Conclusions	52
5.2	Recommendations	54
	References	58

List of Tables

Table 1: Top 5 Fish exporting countries to the EU	21
Table 2: Vessels apprehended during IUU fishing practices.	49

List of Figures

Figure 1: Chinese Fishing fleet in South America, 2020	11
Figure 2: Regional Fisheries Management Organizations	19
Figure 3: Countries involved in the EU IUU regulation procedures	21
Figure 4: Ecuador's jurisdictional waters	27
Figure 5: Control and surveillance screen from SIGMAR	42

List of Abbreviations

AIS	Automatic Identification System
CEAMAR	Maritime Information Analysis Centre
CPPS	Permanent Commission for the South Pacific
DFO	Fisheries and Oceans Canada
DVD	Dark Vessel Detector
EC	European Commission
EU	European Union
EEZ	Economic Exclusive Zone
FAO	Food and Agriculture Organization
GWF	Global Fishing Watch
IATCC	Inter-American Tropical Tuna Commission
IPOA-IUU	International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing
IUU	Illegal, Unreported and Unregulated
LONSEA	Navigation, Safety Management and Maritime Security Act
MCEIP	Ministry of Production, Foreign Trade and Fishing
MCS	Monitor, Control and Surveillance
MLE	Maritime Law Enforcement
NGO	Non-Governmental Organization
PAN INDNR	National Action Plan to Prevent, Discourage and Eliminate IUU Fishing
PSMA	Port State Measures Agreement
RFMO	Regional Fisheries Management Organizations
ROCRAM	Operative Network of Regional Cooperation of Maritime Authorities of the Americas
SPRFMO	South Pacific Regional Fisheries Management Organizations
SRFC	Sub-Regional Fisheries Commission
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
U.S.	United States
USCG	United States Coast Guard

Chapter 1: Introduction

1.1 Background

Illegal, unreported, and unregulated (IUU) fishing puts at risk sustainable fisheries and currently constitutes a threat to maritime security. The literature on IUU fishing discusses various challenges: economic, regulatory, environmental, and food security. Furthermore, several authors agree that the biggest of these challenges is that it threatens a nation's effort to conserve and manage fisheries resources.

Flag and port States play significant roles in deterring IUU fishing; nevertheless, coastal States have a critical duty to exercise their rights when combating these irregular practices. Part V of the United Nations Convention on the Law of the Sea (UNCLOS) establishes the regime for the Exclusive Economic Zone (EEZ); the provisions of Article 56(1) allow the coastal state to "exercise its sovereign rights to explore, exploit, conserve and manage the living resources in the exclusive economic zone"; at the same time, Article 73(1) grants the right to take all the necessary measures to "ensure compliance with the laws and regulations adopted" for the exercise of its sovereign rights. Also, article 58(3) of the *ibid* legal body refers to the obligation of other States to "comply with the laws and regulations adopted by the coastal State" when in the coastal state's EEZ.

The issue of IUU fishing could become a national security threat as well. Poling & Cronin (2017) mention that there are direct and indirect linkages between IUU fishing and illicit activities at sea; they also emphasize that IUU fishing "reduces revenues for governments in coastal states, reducing their ability to confront these and other challenges" (p.8).

In Ecuador, this issue affects the national and international levels. Bello (2021) mentioned that, lately, the waters of the Ecuadorian Exclusive Economic Zone “have become a hotspot for increased activity by foreign fleets, which operate freely throughout the Pacific, including on the high seas where there is no jurisdiction or enforcement to limit unsustainable fishing practices.” In 2019, Rentería et al. (2019) analyzed some data provided by the Non-Governmental Organization Global Fishing Watch to determine the fishing efforts and activities within its EEZ, trying to fill an existing information gap and, hence, aid the Maritime Authority in planning law enforcement operations. The analysis above concluded that several foreign-flagged vessels navigated inside the Ecuadorian EEZ surrounding the Galapagos Archipelago; also, the data show particular navigation patterns that could result as evidence of IUU fishing activities.

Developing legislative instruments for this purpose shows Ecuador’s effort to attain more sustainable practices. Bello (2021) highlights the passing of the Law on the Development of Aquaculture and Fisheries, which replaces old legislation and “integrated modern legal and environmental concepts and helped harmonize domestic regulations with international law” (p. 6). This law was a response to a European Commission “yellow card” issued due to the failure of Ecuador to address IUU within its territory.

The studies on IUU fishing indicate that it is a current issue that affects not only the sustainable development of a nation but also, directly and indirectly, supports national security threats. While there is enough information on the IUU fishing issue available through literature, and most of the authors refer to governance when addressing how to overcome its challenges, in Ecuador, there is a lack of academic information on the approaches of each of the stakeholders within this governance system.

1.2 Deterring IUU fishing in Ecuador: The problem

IUU fishing in Ecuador, whether from national or foreign vessels, raises concerns regarding the sustainability of the resources; it also calls for the Maritime Authority's attention as the coastal State rights and law enforcement institution. International law instruments such as the United Nations Convention on the Law of the Sea grant foreign vessels freedom of navigation in a State's Exclusive Economic Zone (Article 58[1]); nevertheless, the coastal States cannot exercise a right of visit freely unless there is reasonable doubt that these foreign vessels are fishing without authorization.

Also, regardless of the national fisheries law in place aiming for sustainable exploitation of the resources, the need for enforcement of these regulations seeks a coordinated effort of the Maritime and Fisheries Authorities and other actors within the Maritime Administration.

This research will focus on the implementation and enforcement of international and national laws governing fisheries, precisely the approach of the Maritime Authority, to ensure the sustainability of fishing activities and combat a threat to national maritime security.

1.3 Research Objectives and Questions

The research aims to analyze how the international legal framework to deter IUU fishing is implemented in Ecuador and, from the Maritime Authority's perspective, determine if appropriate policies and strategies are in place to ensure the exercise of sovereign rights to contribute to the sustainability of the fisheries activity.

To achieve this purpose, the objectives set for the study are as follows:

- To analyze the national legislation available to deter IUU fishing and compare it to the international legal framework.

- To review and evaluate the Maritime Authority procedures for fisheries law enforcement and coastal state rights exercise.
- To identify the main challenges for an adequate enforcement of these regulations.

A thorough analysis of the data collected to answer the following questions, will allow reaching the proposed objectives:

- i. How is Ecuador implementing international legislation to deter IUU fishing?
- ii. Does the Maritime Authority have the tools to enforce rules and exercise Coastal State rights properly?
- iii. How does the maritime administration address IUU fishing issues?

1.4 Methodology

This research design uses mixed methods. First, through legal document analysis, it revises all the available standards, regulations, and guidelines to deter IUU fishing and ensure the sustainability of the activity in Ecuador. Then, the research analyzed the available tools for the Maritime Authority to enforce the regulations and exercise the State's rights. It is important to mention that the study is limited to the available information on open sources since there is a lack of peer-reviewed academic papers that address the issue in Ecuador from the law enforcement perspective.

The researcher also interviewed experts from the field to determine the actions, available, tools, and challenges for exercising rights and responsibilities within the maritime administration. Having an understanding of the Navy's different roles in the country, these experts are naval officers whose duties are closely related to the exercise of the ones from the Maritime Authority.

Then, the researcher used qualitative observation of the most relevant content regarding the main research topic and contrasted these results to the analysis of the experts' interviews.

This comparison, added to the previous legal analysis, allow in determining the Maritime Authority's approach to enforce the law and contribute to fisheries' sustainability when fulfilling its obligations within the Ecuador Maritime Administration.

1.5 Structure

This dissertation is divided in five chapters. Chapter one is the introduction of the research, it includes the background of the issue that is later described, the research objectives, methodology and its limitations. Chapter two introduces IUU fishing at a global and regional level; it includes the legal framework which regulate the issue and general description of the exercise of coastal state rights. Chapter three focusses in the situation of Ecuador, it revises the institutional and regulatory framework that governs fisheries and the maritime authority in the country, and describes the issue that is object of the study. Chapter four analyses the efforts of the maritime authority of Ecuador to combat IUU fishing, the challenges that it faces, how to overcome those challenges and further actions to fulfil its role. Chapter five summarizes and concludes the research, and includes recommendations.

Chapter 2: Illegal, Unreported and Unregulated (IUU) Fishing

2.1 What is IUU fishing?

Fishing is an activity that has developed over time, and it represents an important food and economic source for some countries around the globe; nevertheless, “illegal, unreported and unregulated (IUU) fishing remains one of the greatest threats to aquatic ecosystems and to fishers and communities who rely on their resources for nutrition and livelihoods” (FAO, 2022, p. 163). Reports indicate that these illegal practices generate approximately \$23 billion annually, ranking it as one of the three largest illicit “businesses” worldwide (Cook, 2023).

IUU fishing raises alarms for the international communities since the 1990s, as they were activities conducted without authorization or breaching the measures imposed by the Regional Fisheries Management Organizations (RFMOs). The FAO adopted the term ‘IUU fishing’ in its agenda in 1999 and it is clearly defined in the scope of the *International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing* (IPAO-IUU).

The IPAO-IUU (2001) refers to IUU fishing as follows:

Illegal fishing, contravenes laws and regulations of a State in which jurisdictional waters, national or foreign flagged, vessels carry out fishing activities without the permission of such State; or, when they are conducted by vessels of States that are parties to an RFMO, in this RFMO jurisdictional area and in contravention with the conservation and management measures adopted by the organization. It also refers to

the activities that violate existing national laws or international obligations, including those that govern the areas managed by RFMOs.

Unreported fishing, refers to the activities that have not been reported or have been misreported to the relevant national authorities or the RFMOs, according to the pertaining laws, regulations, and reporting procedures.

Unregulated fishing are the activities that occur in the area of application of an RFMO conducted by vessels of a State not party of the organization or vessels without flag. Also, it refers to those activities in areas or for fish stocks when there are no conservation or management measures, in a manner which are not consistent with the responsibility for the conservation of marine resources under international law.

Furthermore, it is essential to mention the definition of *fishing related activities* established in Article 1 (d) of the *Agreement on Port State Measures* (PSMA, 2009), as they support the previous ones:

“fishing related activities” means any operation in support of, or in preparation for, fishing, including landing, packaging, processing, transshipping or transporting fish that have not been previously landed at a port, as well as the provisioning of personnel, fuel, gear and other supplies at sea.

Therefore, IUU fishing constitutes a severe and negative impact on the conservation and management of fish stocks. These activities hinder progress toward the achievement of long-term sustainability goals.

2.2 IUU fishing as a global threat

IUU fishing activities bring along a series of economic, environmental, and social impacts; moreover, it is a non-traditional security threat for all coastal state nations. For a while, IUU fishing activities focused on the high seas, yet recent reports found that the “bulk” of these practices occur within coastal States’ EEZs (Schatz, 2016).

Temple et al. (2022) found in their review that IUU fishing practices are common in areas with lower governance strength and weak, or lack, of enforcement capabilities; however, exclusive economic zones (EEZs) of high-income nations are not immune to such activities.

The United Nations Sustainable Development Goals (SDG) set a target to end IUU fishing practices by 2020, to restore fish stocks and produce maximum sustainable yield. However, the destructive trends continue, and fishery resources are still exposed to these practices. Bethel et al. (2022) emphasize on the need to combat IUU fishing, since fishing zones are close to losing all of their resources and report that IUU fishing “accounts for nearly one-third of fish stocks caught worldwide” (p.2).

In the same way, the European Union (2022), one of the largest consumers of fishing products, calls for a global integrated effort to combat illegal fishing, which will include sovereign nations in their capacity as flag, coastal, port, and market states.

The impacts of IUU fishing are not mutually exclusive. The harm these practices cause affects nations’ economic, social, and environmental aspects. In countries where the fisheries sector represents one of the most important economic activities, IUU fishing “could disrupt the development agenda” (Stefanus & Vervaele, 2021, p. 585). Also, legitimate fishers are disadvantaged since the cost of operations for illegal activities is lower; thus, their efforts to responsibly adhere to rules and regulations are undermined (FAO, 2001; Stefanus & Vervaele, 2021). These reasons motivate a culture of non-compliance due to the disruption of the social status of fishing communities.

When explaining the environmental impacts of IUU fishing, Puspoayu & Setyowati, (2018) mention that it is not only about the depletion of fish stocks but the “uncommon methods and procedures utilized by the perpetrators” and “conservation and management measures being disregarded,” which impact marine biodiversity and ecosystems’ structure, impairing its function and health.

The FAO (2020) reports that fisheries capture was about 84,4 million tons, and regardless, it employed about 60 million people directly and indirectly; these numbers show that marine resources are closer to overexploiting. This report also indicates that some fishing stocks do not have an evaluation method, mainly due to the lack of data due to IUU fishing practices prevalent in many parts of the world.

When exploring the root causes of overexploitation, one could be the increased demand and consumption of aquatic food. The FAO (2022) reports the growth of aquaculture production by 250 percent since 1995 and predicts that it will continue growing; nowadays, fisheries and aquaculture net trade value is more significant than other products, especially in countries that rely on these activities. An increased demand for resources is also a cause for engaging in practices that evade regulations to obtain larger profits.

Furthermore, the literature suggests that IUU fishing must be considered a transnational organized crime. Some IUU practices involve large-scale operations and target high-value fishing products; thus, these groups' financial benefits cause significant harm to society (Puspoayu & Setyowati, 2018; Stefanus & Vervaele, 2021). The operations involve individuals from different nationalities and impact coastal state nations and the international community; this mode of operating, also allow a comparison with other crimes, such as drug or human trafficking.

The impacts caused by IUU fishing allow to consider this issue as an increasing risk for security; Auld et al. (2023) report that IUU fishing "surpassed maritime piracy as the leading global maritime security threat" (p.1). Whereas literature does not define Maritime Security, it describes several scopes to which the concept is linked; among them, there are national security, maritime safety and the marine environment, economic development, and human security, and its issues go beyond governmental responsibilities (Bueger, 2015; Bueger & Edmunds, 2017). The FAO's most considerable maritime security effort is combating IUU practices.

National security comprises understanding the importance of the development of naval power, and that of seapower, which underlines the action of the naval power when protecting sea lines of communication, the marine resources or engaging with other actors to enforce maritime legislation (Bueger & Edmunds, 2017). Naval forces are the MLE institutions which seek to establish an order on the maritime domain, and contribute to enhance cooperation with other states to combat global common threats, such as IUU fishing.

2.3 IUU Fishing in Latin America

Fishing is an important economic activity for the Latin American coastal states; only in the southeast Pacific captures fluctuate between 900.000 and 1'000.000 tons annually (CPPS, 2022). During the last years, Latin American coastal States claimed IUU fishing practices near or within their EEZs, threatening their social and economic well-being and the diversity of their ecosystems.

South America is one of the most affected regions due to IUU fishing activities; research estimates the economic losses sum up to \$2.3 billion, without considering income and tax revenue losses or the impact on local food security (CLALS, 2022; Sumaila et al., 2020). In the limits of the EEZs of coastal states in the southeast Pacific, it is common to locate several foreign fleets, mostly Chinese, throughout the year; these fleets navigate along the coasts from north to south, following the paths of the giant squids. (CPPS, 2022). Figure 1, illustrates a report of the Chinese fishing fleet activities in 2020, within the region.

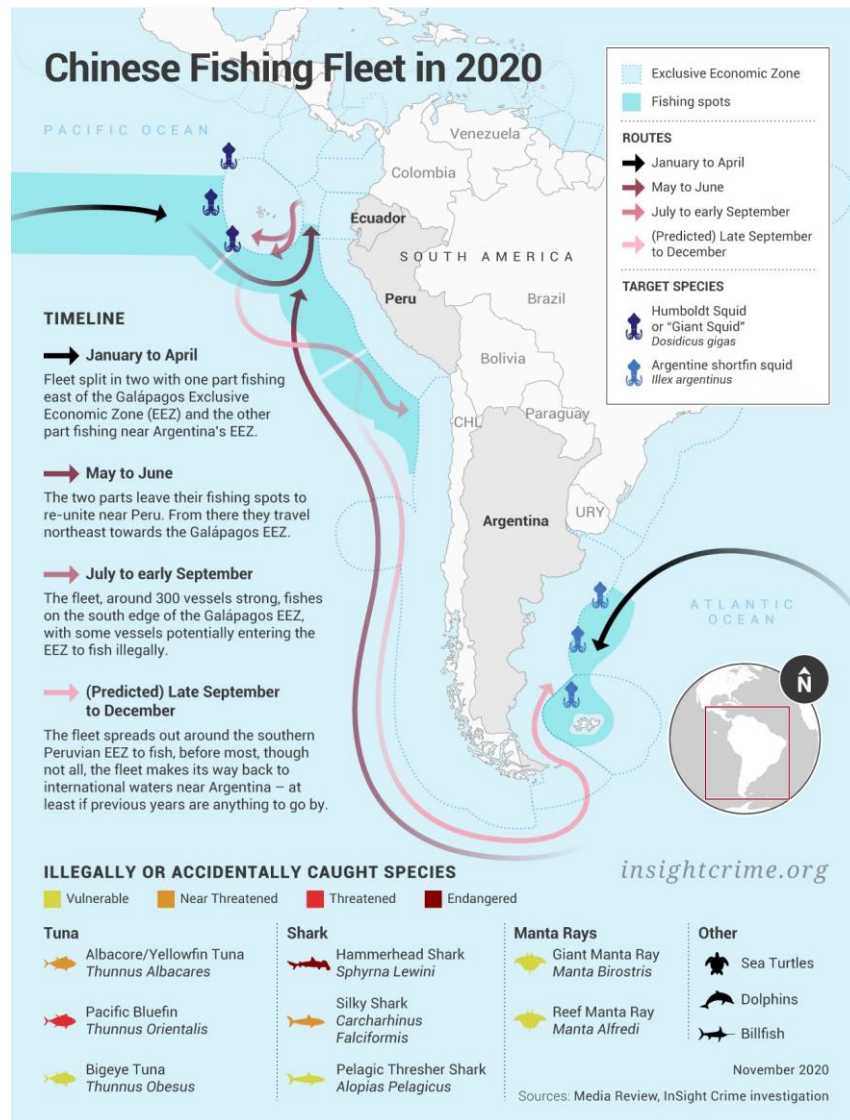


Figure 1: Chinese Fishing fleet in South America, 2020

Note. From “Chinese Fishing Fleet leaves Ecuador, Chile and Peru Scrambling to Respond,” by A. Ford, 2020, *InSight Crime*, (<https://insightcrime.org/news/analysis/china-fishing-fleet-response/>). Copyright 2020 by InSight Crime.

The following paragraphs will briefly explore some of the issues within the region.

In Chile, the stocks of one of its most delectable resources are being overfished and sold to an illegal market, worth about \$60 million a year (Segura, 2022). Here, small-scale fishermen are affected by intermediaries who provide them with fishing

instruments to keep them loyal to the activity but avoid the regulations by allowing much of the catch to go undeclared, affecting the income of artisanal fishermen by selling the excessive cargo indiscriminately.

Also, research shows that industrial fishing boats engage in “undeclared transfer of catch on the high seas” (CLALS, 2022). While Chile is not affected by foreign fleets like most of the region, IUU fishing practices of its domestic fleet still substantially affect this sector’s revenue.

Peru is a fisheries country, yet 70% of the artisanal activities are conducted illegally or out of regulation; studies show that the actual catch in Peruvian waters is 25% more than the quantity officially reported to the authorities (Ganoza et al., 2021). Despite foreign fleets along the South Pacific coasts, the issue in Peru focuses on the domestic fishing fleet, which catches more than the permitted quota or outside the permitted age and size range for the species.

Also, there are several activities related to IUU fishing conducted by Peruvian fishermen. Among these activities, Ganoza et al. (2021) highlight the use of fishing instruments that harm the seabed and increase the bycatch of non-commercial species, which die and are later thrown back into the ocean. These practices threaten the health of the marine environment, significantly affecting its biodiversity.

Colombia faces increasing activity of IUU fishing by domestic and foreign fleets, especially around the Malpelo Reserve and the San Andrés Archipelago. There are weaknesses in the enforcement capabilities of the Colombian authorities, primarily due to the continuous battle over fishing rights and policing with Nicaragua (Mistler-Ferguson, 2021). The dynamics of the IUU fishing activities in Colombian waters include crews working with small motorboats to “quickly move their catches...away from authorities if the need arises” (Olaya, 2019).

In Colombian jurisdiction, the issue of irregular fishing practices worsens because it crosses paths with drug trafficking; drug exchanges happen at sea disguised among

fishing boats carrying its activities (Olaya, 2019). InSight Crime (2019) reports that Colombian Authorities respond faster to this issue than IUU fishing. Argentina's coast is filled with hundreds of foreign fleets, primarily Chinese, every year from November to April. The nutritious condition of its sea shelf serves as a feeding ground for several species along its jurisdictional waters; however, when reaching the limit of high seas and due to its shallow depth, trawlers take advantage of the spillover of fish from this shelf, and most of the times the vessels go dark¹ to fish along or into the Argentine EEZ. Although China claims its fleet to be fishing squid, the fleet is located on the coast before the opening of squid season and engaged in transshipment (Ramírez & Ford, 2022).

Foreign vessels show aggressive behavior against Argentine fishers who try to go into the high seas from Argentina's EEZ; they also disregard life and respect for authority when the Argentine Coast Guard (Prefectura Naval Argentina) tries to pursue them (CLALS, 2022; Ramírez & Ford, 2022). In 2016, one vessel engaged in IUU fishing in Argentina's EEZ was shot and sunk due to its hostile response to law enforcement agents; a similar situation occurred in 2019 (Sanchez, 2016; Bhatt, 2020).

Argentina also faces constraints in enforcing its legislation due to a lack of regional agreements; Schaeffer (2021) reports that foreign fleets go dark and fish within the Argentinian EEZ and then move into the port of Montevideo (Uruguay) to evade the jurisdiction of law enforcement.

In Uruguay, studies show that the issue relies on the lack of fisheries regulations and mostly low control and oversight of the fishing industry at the port of Montevideo. Here, distant fishing fleets suspected of transshipment arrive for resupply, repair, and, sometimes, offload the IUU catch (CLALS, 2022). Robbins (2022) reports that in 2021, the port unloaded more than 70000 tons of fish; some of this cargo came from ships that were previously identified to be fishing with their AIS turned off in the outer edge of Argentina. The abovementioned report also entails the connection between

¹ Switch their AIS off for longer periods of time to avoid detection

IUU fishing activities and labour abuse. Crewmembers of most of the fishing ships that dock at the Montevideo port reported labor abuses such as forced work, passports or identifications taken away, and attacks with different harmful tools, among others.

In Ecuador, there are different dynamics of IUU fishing, and it is a concern because it is affecting its national security; during recent years, the presence of foreign fleets near the Galapagos archipelago shocked national and international communities due to the environmental importance of this area. Chapter four focuses on the issue of Ecuador and the challenges that the MLE institutions are facing.

Latin America relies on its MLE agencies, the Navy or Coast Guard, to counter maritime security threats; Schaeffer (2021) highlights that the “perspective that naval forces primarily exists to fight other naval forces...is outdated” (p.14). These institutions give time, resources, and cooperative efforts to increase their capabilities to control and protect their vast jurisdictional waters and overcome the challenge IUU fishing represents; through this mission, it is possible to achieve other maritime security objectives further (Sánchez, 2016; Sánchez, 2020; Schaeffer, 2021).

The interest of Navies and Coast Guards in Latin America in obtaining new systems and engaging in partnerships to strengthen the regional combat of IUU fishing shows that IUU fishing is increasingly becoming a threat to these coastal states' sovereignty, which calls for the same attention as other common threats in the region such as drug trafficking.

2.4 Legal framework to combat IUU fishing

Since the early 1990s, the international community adopted a legal framework that aims to manage living resources and tackle IUU fishing while adopting more sustainable practices; this framework recognizes “the sector’s important role for food security and nutrition, economic development, protection of the environment and the well-being of people” (Bethel et al., 2021, p. 128). These instruments allow states to

design policies, formulate legislation, and develop enforcement measures at a national level.

The FAO (2022) reports that in 2022, there was an improvement on the average degree of implementation of the international instruments to combat IUU fishing compared to 2018.

The following paragraphs will briefly describe some of the most relevant legal instruments available to prevent, avoid, and deter IUU fishing at an international and regional level.

2.4.1 International instruments

a. United Nations Convention on the Law of the Sea

The United Nations Convention on the Law of the Sea (UNCLOS) 1982 constitutes the legal basis for the exercise of sovereignty and jurisdiction within the ocean space. Article 56 of the UNCLOS establishes sovereign rights for States “for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living and non-living” on its EEZ; hence, it is a key instrument for fisheries management and conservation, since it establishes rights and obligations for the use and protection of the ocean’s resources. This instrument also provide other rules regarding all ocean uses.

b. Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas

Also known as The Compliance Agreement, it was approved by the FAO Conference in 1993 and entered into force ten years after, when the twenty fifth instrument of acceptance was deposited (FAO, 2023b). It enhances flag States' responsibility to control their vessels' compliance with fisheries management and conservation measures, as well as exercise jurisdiction on the high seas when non-authorized fishing activities are being carried out.

c. United Nations Fish Stocks Agreement

The UN Fish Stocks Agreement is an UNCLOS implementation instrument which addresses the issues on long term conservation of straddling and highly migratory fish stocks. It also describes means of international cooperation as well as, regional and subregional enforcement, along with promoting sustainable use of resources.

d. Code of Conduct for Responsible Fisheries

Adopted in 1995, it is a voluntary instrument and probably “the most cited, high-profile, and widely diffused global fisheries instrument in the world after the 1982 UN Convention” (FAO, 2022, p. 156). It establishes standards of responsible behaviour in the fisheries sector, aiming to manage and conserve living resources effectively.

e. International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing

The International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) is the first “soft law” agreement on an international basis conceived as a “toolbox” to use in distinct situations to combat IUU fishing (FAO, 2023b). It comprises an integrated approach for all stakeholders in the fisheries sector, to ensure each one executes its responsibilities in due diligence to minimize and further eliminate IUU fishing.

f. Agreement on Port State Measures

The Agreement on Port State Measures aims to reduce the incentive of vessels to engage on IUU. It blocks the products from reaching markets at national and international levels (FAO, 2023a). It is the first binding agreement addressing

specifically IUU fishing. Given the statistics of IUU fishing activities, the FAO assures that “implementing the PSMA is one of the most cost-effective means to curb IUU fishing”; hence the importance of this instrument.

g. The 2030 Agenda for Sustainable Development

During its seventieth session, the United Nations General Assembly adopted the *2030 Agenda for Sustainable Development to take* “the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path” (UNGA, 2015). Among the goals set is “14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development,” which aims for adequate management of resources by addressing the IUU fishing issue within targets 14.4 (Sustainability of global fishing resources) and 14.6 (End subsidies which contribute to IUU fishing).

2.4.2 Regional instruments

In addition to the international regulatory instruments, there are a series of regional measures and organizations that have among their objectives the elimination of IUU fishing. This section will explore the more relevant for Ecuador.

a. Regional Fisheries Management Organizations (RFMOs)

These organizations provide binding measures to ensure that fishing activities, particularly of highly migratory or straddling fish species, guarantee their sustainable management and conservation (European Commission, 2023). Most of the international instruments address the importance of the RFMOs for their implementation and international cooperation; their management tools complement conservation and management measures established at a global level (FAO, 2023b). The RFMOs are divided among those that manage migratory species, mainly tuna and fish stocks, by geographical areas, as shown in Figure 2.

i) South Pacific Regional Fisheries Management Organization:

It is an intergovernmental organization established in 2012 that covers 25% of the Earth's high seas and aims to the conservation of species of the South Pacific Ocean; the main species fished in this area are jack mackerel and jumbo squid (SPRFMO, 2023). Ecuador joined the SPRFMO in 2015.

ii) Inter-American Tropical Tuna Commission:

This organization was born with the objective of “the gathering and interpretation of factual information” in 1949 (IATTC, 2023); through time and given the adoption of several international instruments seeking for the conservation of marine environment and fisheries, it became an RFMO responsible for the management of tuna and tuna-like species in the Eastern Pacific, with the adoption of the Antigua Convention. Ecuador signed the Antigua Convention in 2004 and ratified it in May 2021.

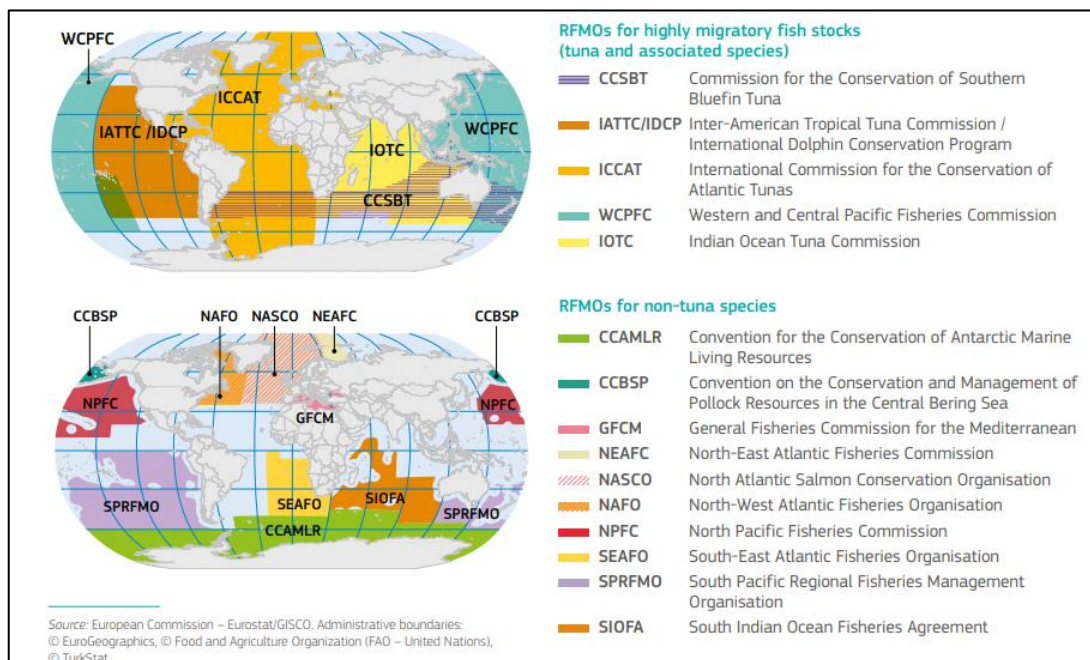


Figure 2: Regional Fisheries Management Organizations

Note. From “Facts and Figures on the Common Fisheries Policy: basic statistical data 2022”, by Directorate-General for Maritime Affairs and Fisheries (European Commission), 2022

(<https://data.europa.eu/doi/10.2771/737237>). Copyright 2022 by European Union.

b. Permanent Commission for the South Pacific

The Permanent Commission for the South Pacific (CPPS) is a regional fishery advisory body that coordinates regional maritime policies to adopt determined and consistent arguments for its Member States (Chile, Colombia, Ecuador, and Perú) in international forums (FAO, 2023c).

The CPPS promotes the implementation of international instruments to deter IUU fishing, it also coordinates activities to tackle this issue in the region. In 2022, the Regional Plan of Action to Discourage IUU fishing was approved.

c. Regional Plan to deter IUU Fishing in the Southeast Pacific

On November 2nd, 2022, the CPPS approved this plan, which is the result of a systemic work and seeks the short, medium, and long-term

commitment of the CPPS members to reduce the IUU fishing practices impacts and better the countries' capabilities to prevent, combat and deter this activity within the region.

The Plan contains five strategic axes; each axis develops goals and targets to meet until 2030. The axes include Surveillance and Control, Monitoring and Information systems, Port State Control, Training and Capacity Building, and Coordination with other International Organizations.

Ecuador participates actively within these regional organizations; reports show that between 2020 and 2021, its initiatives to deter IUU fishing and to preserve marine biodiversity have had full support. Ecuador was a key participant on the elaboration of the Regional Plan within the CPPS framework.

2.4.3 The European Union

The European Union (EU) is the world's leader in fighting IUU fishing; in 2010, the Council Regulation (EC) 1005/2008, also known as the *IUU Regulation*, entered into force. This regulation integrates several provisions of international legal instruments, especially the IPOA-IUU.

The relevance of the regulation in this research is that its purpose is to achieve and enforce cooperation to tackle IUU fishing by establishing communication procedures with the flag States of the vessels that harvest the resources intended for EU markets and finally remove commercial opportunities when there are not adequate measures or regulations to avoid the illegal practices (Rosello, 2017). The EU is a global seafood market, and, according to the FAO (2022), Ecuador is one of its large suppliers. Sumaila (2019) reports Ecuador as one of the top 5 exporting countries to the EU; table 1 summarizes this data.

Table 1: Top 5 Fish exporting countries to the EU

Exporting countries	Export value (million USD)
Norway	5.800
China	2.100
Iceland	1.290
Ecuador	1.230
Morocco	1.180

Note. Adapted from “A Carding System as an Approach to Increasing the Economic Risk of Engaging in IUU Fishing?”, by R. Sumaila, 2019, *Frontiers in Marine Science*, 6, Article 34 (doi: 10.3389/fmars.2019.00034).

The *IUU Regulation* introduces a system that takes action against the States with poor or lack of measures to control their fishing activities and enforce international regulations. This instrument allows the issue of a warning or pre-identification “yellow card” first. If the IUU practices continues, an identification “red card” is issued, and the State is considered non-cooperating country and banned from the EU markets; if the country concretely resolves the issues the status of the country changes to delisted or “green card” (Popescu, 2022; Rosello, 2017; Sumaila, 2019). Figure 3 shows the countries involved in the EU carding system procedures.

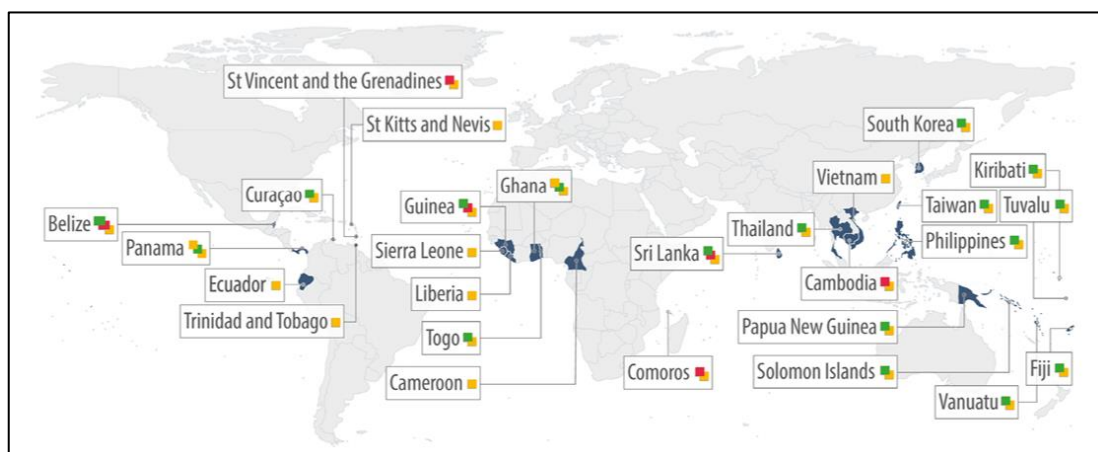


Figure 3: Countries involved in the EU IUU regulation procedures

Note. From “Illegal, unreported and unregulated (IUU) fishing,” by I. Popescu, 2022, European Parliament (https://www.europarl.europa.eu/RegData/etudes/ATAG/2017/614599/EPRS_ATA%282017%29614599_EN.pdf). Copyright 2022 by European Union.

2.5 Coastal States rights and responsibilities to combat IUU fishing

The legal framework that governs fisheries emphasizes on the role of Flag and Port States in controlling these activities. Nevertheless, there are implicit roles for coastal States among these provisions since 90% of world fisheries happen in the EEZs (FAO, 2020); hence, their communities suffer the losses caused by illegal practices. To exercise its sovereign rights, UNCLOS Articles 62 and 63 call for coastal States to regulate the EEZ fisheries; and, pursuant to Article 73, there is an obligation thereof to enforce its national laws and regulations.

Part of the economic profit of coastal States relies on fisheries activities; therefore, when “not landing, reporting, and processing fish in the host country in whose waters the fish was caught, before exporting them, substantial economic and food and nutritional security losses are incurred by the countries whose waters are being exploited” (Sumaila et al., 2020, p. 1). Even when the fishing fleets are located just outside a coastal state EEZ, their gear allows catches from the state's jurisdictional waters. Schaeffer (2021) recognizes that the fight against IUU fishing has a broader context than preserving fish stocks but is “safeguarding a valuable renewable resource that has national security implications” (p.5).

On the environmental side, Part XII of the UNCLOS provides the general obligation for States “to protect and preserve the marine environment”; Puspoayu & Setyowati (2018) concur with this provision when describe how IUU fishing practices “are very detrimental to the coastal States which have the obligation to maintain and take care for the marine environment” (p.5). Similar to provisions related to the exploitation of resources, coastal States are responsible for taking measures to protect the marine environment, and Article 220, asserts jurisdiction to enforce these measures.

The International Tribunal for the Law of the Sea (ITLOS) received a request for an Advisory Opinion² from the Secretary of the Sub-Regional Fisheries Commission (SRFC). Among the request, the SRFC asked the following matters:

1. What are the obligations of the flag State in cases where illegal, unreported and unregulated (IUU) fishing activities are conducted within the Exclusive Economic Zone of third party States?
4. What are the rights and obligation of the coastal State in ensuring the sustainable management of shared stocks and stocks of common interest, especially the small pelagic species and tuna?

Although this case specifically addressed the claim of the countries that are part of the SRFC, this matter analyses the exercise of rights and duties of coastal States in due regard to other states.

The ITLOS unanimously determined that:

The flag State has the obligation to take necessary measures, including those of enforcement, to ensure compliance by vessels flying its flag with the laws and regulations enacted by the SRFC Member States concerning marine living resources within their exclusive economic zones for purposes of conservation and management of these resources.

...

The flag State, in fulfilment of its obligation to effectively exercise jurisdiction and control in administrative matters under article 94 of the Convention, has the obligation to adopt the necessary administrative measures to ensure that fishing vessels flying its flag are not involved in activities in the exclusive economic zones of the SRFC Member States...

² *Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission, Advisory Opinion, 2 April 2015, ITLOS Reports 2015, p.4*

(Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission, Advisory Opinion, 2 April 2015, ITLOS Reports 2015, p.4, at p.63)

Also, in regard to the rights and obligation of coastal States, it replied:

...The conservation and development of shared stocks in the exclusive economic zone of an SRFC Member State require from that State effective measures aimed at preventing over-exploitation of such stocks that could undermine their sustainable exploitation and the interests of neighbouring Member States.

...

In exercising their rights and performing their duties under the Convention in their respective exclusive economic zones, the SRFC Member States and other States Parties to the Convention must have due regard to the rights and duties of one another...

(Request for Advisory Opinion submitted by the Sub-Regional Fisheries Commission, Advisory Opinion, 2 April 2015, ITLOS Reports 2015, p.4, at p.67-68)

Henceforth, the primary responsibility of the coastal states is to control the activities of vessels that enter its waters, establish measures for the conservation of living resources, and ensure and enforce compliance with regulations; in matters of IUU fishing, the flag states maintain their obligation of due diligence to prevent and ensure that vessels flying their flag are not engaged in IUU fishing practices.

Every coastal State has different approaches to combat the IUU fishing issue within its jurisdiction; the study on *IUU Fishing and Indian National Security* (2020) remarks the responses of Asian coastal States and mentions that “the responses range from the adoption of destructive practices, such as the shooting and sinking of foreign ships in

their EEZs by coast guards and navies, to capacity building efforts, such as strengthening domestic regulatory mechanisms and maritime infrastructure” (p.447).

Taking India as example, its government amended the *Coast Guard Act* and provided every Coast Guard member with authority to:

...visit, board, search and seize any vessel, or arrest any person or seize any artificial island or any floating or moored object or any underwater object including any maritime property involved or suspected to be used in the commission of any offence...within the maritime zone[s] of India (Bhatt, 2020).

This amendment to the national legislation allows the Coast Guard to enforce its regulations under the provisions of UNCLOS Article 73, which allows to include “boarding, inspection, arrest and judicial proceedings, as may be necessary to ensure compliance with laws and regulations adopted by it [coastal State].”

Chapter 3: The Situation of Ecuador

3.1 Country Background

The Republic of Ecuador is located in the northwest of South America, latitude 0° 00'; its land territory is about 256.370 km² and it shares borders with Colombia and Perú. Its coastline extends along the Pacific Ocean, and its jurisdictional waters correspond to 1'092.140 km² measured from the baselines³, plus internal waters, which are all the rivers and straits where some commercial and no commercial activities take place; this area represents five times the size of its land. Figure 4 shows the extension of Ecuador jurisdictional waters.

Ecuador's marine and coastal spaces constitute very diverse ecosystems and support various economic activities; the traditional uses are navigation and fisheries, which intensify as the fishing and aquaculture sectors grow. Commerce also grows with the increase in fishing activities. About 32,3% of Ecuador's population inhabits along the coast and relies primarily on maritime activities as a source of income.

³ Proclaimed by Supreme Decree No. 959 – A, June 28th of 1979, published on Official Registry No. 265, July 13th of 1971.



Figure 4: Ecuador's jurisdictional waters

Note. From Ministry of Foreign Affairs of Ecuador. (https://www.cancilleria.gob.ec/wp-content/uploads/2017/02/carta_didactica_1.pdf)

Ecuadorian policies recognize that the State has vital and strategic interests for its development and the well-being of its nationals; these interests are priorities for the defense sector. Therefore, fisheries are a crucial part of this group since it is considered one of Ecuador's maritime interests.

3.2 Fisheries

Fisheries is one of Ecuador's most relevant economic activities, and it is continuously growing. It also has an historical, social and cultural role in the development of coastal communities (Barragan-Paladines et al., 2023). The FAO (2020) reports that Ecuador's fisheries' annual growth rate was 12% in 2018. Despite the slow growth worldwide, Ecuador's growth rate is among the highest.

In Ecuador, there are two fisheries groups: artisanal and industrial fisheries. The first one is the leading supplier of the national market, and it constitutes the basis of an important export sector; until 1950, this sector's practices were small-scale for subsistence purposes and later developed commercially (Barragan-Paladines et al., 2023). On the other hand, industrial fisheries allow to catch larger quantities and various fishing resources; it is a developing industry that significantly contributes to the annual GDP. Bello (2021) reports that "fisheries and aquaculture represent the second-largest export sector" in Ecuador and that the value of the export market (all fisheries and aquaculture products) ranges between \$3 million and \$4 million annually.

Ecuador EEZ is a highly productive zone because of the influence of the Humboldt current; besides the distinction of fishing activities according to the size of the fleet, Ecuador fisheries are focused on two sources: the fishing of tuna for exports and pelagic species. Ecuador is one of the 25 biggest fisheries producers around the world. Pazmiño (2017) reports that tuna represents approximately 120.000 jobs and more than a million of dollars a year on exports. According to the National Chamber of Fisheries, in 2023 (as of May 31st), tuna exports represented about 68% of all fisheries exports. The data shows that fisheries are essential to Ecuadorian economic and social development.

3.3 Legal and Regulatory Framework

This section examines the main legal instruments related to fisheries management and conservation, and the control of the maritime activities.

3.3.1 Constitution of Ecuador

Ecuador's Constitution (2008) recognizes rights for nature and the intrinsic connection between species and ecosystems. It gives a framework to develop policies that include an adequate environmental management.

The constitutional provisions under Article 73 lead to establishing any measure to avoid the extinction of species or the obliteration of ecosystems; it also entrusts the national communities to demand regulations for a suitable exploitation of resources and natural services while avoiding negative impacts and assuring conservation and sustainable management.

Whereas it does not address the IUU fishing issue specifically, the Constitution establishes principles that allow the development of plans and further regulations that will prevent and tackle issue's effects while driving all citizens' efforts toward sustainability.

3.3.2 Law on the Development of Aquaculture and Fisheries

The Law on the Development of Aquaculture and Fisheries was approved in February and entered into force in April 2020. It marks a significant achievement for the management of the fishing activities, as it replaced the legislation from 1974.

This law is a comprehensive instrument that describes the procedure for the fisheries and aquaculture activities, the management of the areas designated for these activities and the resources, the institutional framework that governs the fisheries sector, and the guidelines for investigation and research. The law harmonizes the national legislation with international regulations and aims to the sustainability of the national fisheries resources by addressing measures to deter IUU fishing activities.

Among the principles that guide this regulatory instrument are achieving maritime governance, sustainability of marine resources, and several social and economic benefits with an ecosystem-based approach.

Under its provisions, it creates the National System of Aquaculture and Fisheries. This System brings together public and private entities for the coordination, cooperation, supervision, enforcement and follow-up of public policies and regulations necessary to manage the fisheries sector.

Article 13 of this law nominates the Ministry of Production, Foreign Trade and Fishing (MCEIP, acronym in Spanish) through the Undersecretariat of Fishing Resources as the authority with the competency to regulate fisheries activities in Ecuador. The MCEIP is responsible for regulating, controlling, and evaluating the System mentioned above.

This legal instrument underlines the activities permitted and prohibited for the management of resources during the off-season, Articles 98 to 100; it establishes specific areas for artisanal fisheries that are within eight nautical miles measured from low tide line, Article 104, and specifies the fishing tools and instruments permitted, Article 105.

The Law on the Development of Aquaculture and Fisheries also takes into consideration important norms regarding environmental management and food security from other domestic legislation instruments.

3.3.3 Comprehensive Organic Criminal Code

The Comprehensive Organic Criminal Code is a legal instrument that outlines what constitutes a crime under national legislation and allows for its prosecution. This instrument is a permanent measure that complements any other action taken by Ecuador to combat IUU fishing.

The Code comprises a chapter that focuses on crimes against nature, divided further into sections: against biodiversity, against natural resources, against environmental management, against non-renewable resources, and general provisions. Considering crimes against nature on a primary legal source aims to raise awareness among society about the consequences, either imprisonment or monetary fines, when practices do not adhere to proper management measures for the resources or when there are indiscriminate actions against the ecosystems.

Besides the aforementioned instruments, there are also complementary legal bodies that do not specifically relate to the issue of IUU fishing yet regulate the environmental impact of all the activities and pursue a healthy and sound environment, guaranteeing the protection of all living resources; the most important of these instruments is the Environmental Code.

3.3.4 The Navigation, Safety Management and Maritime Security Act

In June 2021, Ecuador approved the Navigation, Safety Management and Maritime Security Act (LONSEA); it came to replace the Code of Maritime Police (1960) and consequently to harmonize international maritime legal instruments into domestic legislation.

This legal body provides a framework to regulate the navigation in jurisdictional waters while promoting the safety of life, marine environmental protection, and proper management of resources for the effective development of maritime activities.

The main objective of the LONSEA is described under the provisions of Article 1, as follows:

to regulate and guarantee the defence of the sovereignty and territorial integrity in national waters, to protect the rights that safeguard human life at sea, the safety of navigation and maritime security, and prevent and control illicit acts in coordination with the competent institutions for the preservation of marine resources.⁴

The LONSEA establishes the institutional framework for the Maritime Administration by creating the National Maritime Organization System (Articles 6 and 7), which brings together all the Institutions that exercise sovereignty and sovereign rights on behalf of the State and recognizes the Ministry of Defence as the governing body for public policy in maritime related matters. The System's primary function is to

⁴ Original text in Spanish, translated by the author.

harmonize the different sectors' strategies to enact a coordinated effort of various authorities on all the issues related to maritime safety and security

Article 9 of the Act appoints the Ecuadorian Navy as the competent body to exercise the duties of the National Maritime Authority; amidst these duties is to exercise Flag Coastal, Flag, and Port State rights and responsibilities in accordance to national and international legislation.

3.3.5 National Action Plan to Prevent, Discourage and Eliminate IUU Fishing (PAN INDNR)

The PAN INDNR was adopted in September 2015, and continuous reviews take place to reach its primary goal of adopting a national policy for the development and sustainable use of resources while taking care of the social and economic well-being of all the personnel involved in fisheries activities.

This plan is a tool that seeks to strengthen cooperation among public, private, national, regional, and international stakeholders to combat IUU fishing; it emphasizes exchanging information and using joint technological systems to build adequate management, control, and traceability of fisheries activities.

3.4 Role of the Maritime Authority

The development of a coastal State such as Ecuador is closely related to the adequate management and protection of its maritime interests; IUU fishing and all other illicit activities within jurisdictional waters threaten the productivity sector and generate a need for the State to exercise its rights effectively.

Article 158 of the Constitution of Ecuador establishes that the fundamental mission of the Armed Forces is to defend the sovereignty and territorial integrity of Ecuador; the Ecuadorian Navy, then, has to take part in protecting the rights of the country and its citizens in accordance with this provision.

Henceforth, the constitutional mandate and the competencies assigned in the LONSEA allow the Navy to engage its actions within a legal, social, economic, and technical scope to provide maritime safety and security to the community.

The Maritime Authority will preside over the meetings of the National Maritime Organization System; thus, it plays a role in enabling the coordination for exercising sovereignty and sovereign rights in the maritime jurisdiction, which, in the end, is an essential tool to contribute with the efforts to combat IUU fishing.

The Ecuadorian Navy developed the *Maritime Safety and Security Plan (2022)* to comply with its responsibilities. The time frame for this instrument corresponds to December 2033 and aims to guarantee safety and security to the activities in jurisdictional waters; this goal will contribute to the National Security efforts already in place. One of the principles that drives this plan is *Cooperation*. The Maritime Authority believes that unified efforts from all the actors of the National Maritime Organization System will contribute to its role.

The Ecuador Navy Doctrine (2020) provides the elements for developing its operations. The Doctrine emphasizes that these operations are not limited to naval warfare; they also encompass controlling and protecting natural resources in Ecuador's national waters. Consequently, the Navy's role as a Maritime Authority includes working with other state agencies to exchange information, coordinate enforcement activities, or review policies to reach maritime governance.

In Ecuador, IUU fishing is considered a high-risk threat; hence, policies and procedures that will increase national security and tackle this issue have significance on the national agendas. These days, the Ecuadorian Navy is the MLE institution and aims to establish the country's maritime development as a priority; therefore, it is building a National Maritime Policy to enhance safety and security. For this purpose, the Navy (2022) asserts that it is essential to attain maritime domain awareness; therefore, its role includes raising awareness among the State and society about the

activities that take place in jurisdictional waters and interest areas and how these activities influence the country's economy, safety, security and environment.

Chapter 4: Combating IUU Fishing in Ecuador

4.1 Evaluation of the current issues

Ecuador's EEZ waters have been lately becoming of greater interest to foreign fleets, which "operate freely throughout the Pacific, including on the high seas where there is no jurisdiction or enforcement to limit unsustainable fishing practices" (Bello, 2021). However, given the country's privileged position filled with marine resources and the profit that these resources could lead to, national fleets have also been participating in the growing IUU activities.

Also, research claims that the increase in IUU fishing activities is linked to national security threats such as trafficking wildlife, narcotics, and several other illegal practices; therefore, a coordinated effort for the protection of national maritime interests is crucial.

The report on *IUU Fishing Crimes in Latin America and the Caribbean* (2022) describes three dynamics of IUU fishing and the related crimes. The first group corresponds to artisanal fishers who avoid compliance with national fishing regulations and engage in crimes such as narcotics, contraband, or fuel smuggling near the coast. Second, the industrial fishing fleets which expand their activities into the EEZ boundaries and engage in practices such as misreporting of catches or fishing in some unauthorized areas. They also take part in other crimes, such as narcotics smuggling.

The last group corresponds to foreign fleets operating within or close to the EEZ limits, mainly without the supervision of their flag States and continuously turning off their identification systems; they misreport their catches, overfish, do not abide by international or coastal State regulations, and several other security threats.

A review of various literature made it possible to conclude that Ecuador is affected by the three dynamics described before. Thus, the issue of IUU fishing in Ecuador combines a series of scenarios, which involves artisanal fishers harvesting off-season or endangered species, industrial fishers exceeding their quota or fishing in unauthorized areas, and foreign fleets engaging in practices that affect the marine environment or violating sovereign rights of the country; meanwhile, some of these also take part on associated crimes such as drug trafficking due to its geographical location (CLALS, 2022). Legitimate fishers often decide to move to irregular practices since it offers short term benefits, and because they feel at disadvantage next to IUU fishing offenders.

The Captain of the Port of Manta, the biggest fishing port in Ecuador, reported during the interview conducted for this research that there are several irregularities in the artisanal fishing activities; most of them justify the behavior on their social and economic condition and in the disparities with industrial fishing fleets who exceed their quota or engage in practices in artisanal areas. Also, the ignorance of regulations and standards in the artisanal sector due to a perception of the State ignoring the small-scale historical activity and imposing rules that benefit industries (Barragan-Paladines et al., 2023) hinders control and enforcement of policies.

The issue worsens as the country faces an economic crisis because it facilitates the emergence of several criminal activities as “alternative sources of employment” (Bueger & Edmunds, 2017); when jobs are lost, and there are difficulties in providing for their families, fishers “turn to illicit activities that enable them to survive and earn a living” (Schaeffer, 2021, p. 6). Therefore, the likelihood of coastal communities

engaging in other illegal practices increases if there is unsustainability in fisheries, as their main economic activity is affected.

About distant water fleets, the detection of foreign vessels near the Ecuadorian EEZ has increased since 2017; and its behaviour leads to suspicion of its engagement in IUU fishing or other illegal or related activity. Every year, around June, July, and August, the Ecuadorian Navy detects foreign vessels just outside of the EEZ; reports indicate that “the fleet continued to operate for several weeks and, for periods over eight hours, the ships turned off their legally required localization systems” (Previde, 2021). In August 2020, 340 vessels were reported along the Galapagos EEZ’s southern limit, although they provided faux coordinates that located them in New Zealand (Bonaccorso, et al., 2021). IUU fishing practices put Ecuador’s fisheries at risk, which affects its national income and international trade, and there are also affections to all the related the ecosystems due to the loss of species and acceleration of climate change.

Although there is no constructive evidence of IUU fishing activities carried by these foreign fleets, in August 2017, the Chinese flagged reefer *Fu Yuan Yu Leng 999* was seized when crossing the Galapagos Marine Reserve, and transporting 7639 sharks and 537 bags of shark fins among its 572 tons of fish (Bonaccorso, et al., 2021). This seizure is the largest made by Ecuadorian authorities; despite it being challenging to establish the origin of the species, analysis of the vessel’s AIS data showed anomalies that suggested the transshipment of the cargo without authorization:

...6 days before crossing into the Galapagos EZZ the *Fu Yuan Yu Leng 999* rendezvoused with four Chinese flagged tuna longliners in the equatorial eastern Pacific, 1700 miles from the Galapagos. Each longliner spent about 12 hours moving along with the reefer at a distance of about 30 meters... as the vessel approached and entered the Galapagos EEZ some AIS transmission error prevented the vessel’s location coming through... (Global Fishing Watch, 2017).

The reefer was not part of the registered and authorized vessels under the applicable RFMO, then any transshipment of cargo was not legal (Alava et al., 2017; Global Fishing Watch, 2017; Bonaccorso et al., 2021). The *Fu Yuan Yu Leng 999* seizure corresponds to prosecuting an IUU fishing-related activity. Even though it was difficult to establish whether the species capture happened within the Ecuadorian EEZ, the national legal framework which punishes the transshipment and transporting of endangered living resources and the cooperation achieved with NGOs such as Global Fishing Watch allowed the prosecution of the event.

4.2 Enforcing and implementation of Legal Instruments

Protecting living marine resources against threatening foreign fleets has been one of Ecuador's policy priorities since the 1960s, with the breaking of the so-called "Tuna War⁵." To protect resources and consequently the country's economic interests, which was the main draw for the Tuna War, Sumaila et al. (2020) mention that it is essential to create policies that encourage accountability and transparency but mostly to ratify and enforce the international conventions. To achieve the policies' goals, Ecuador relies on a solid legal and institutional framework harmonizing international instruments into national legislation.

Ecuador published the ratification of UNCLOS on the 2nd of August 2012 and deposited the instrument of accession on the 24th of September 2012. Since then, the national legislation has continuously been updated to harmonize it with international regulations to allow the exercise of flag, coastal, and port state duties.

⁵ Chile, Perú, and Ecuador signed the Declaration of Santiago in 1952; this agreement reserved fishing privileges within 200 nautical miles of territorial waters for its nationals and licensed foreign fleets. The U.S. did not recognize these limits, so its fishing fleet refused to get the licenses and engaged in activities outside the 12 nautical mile limit. Ecuadorian patrol boats seized these vessels, and in retaliation, the U.S. imposed sanctions, which included a cut off of military sales and credits (Maidenberg, 1972; Ecuador: The Tuna War Continues, 1972).

The PSMA entered into force in Ecuador on the 7th of March 2019, thirty days after the deposit of its instrument of accession in accordance to Article 29 (3) of the agreement.

Ecuador is committed to discouraging illegal fisheries practices and makes great efforts to implement the PSMA fully; it also participates actively in the agreement's forum. Recently, during the meeting of the parties, the Deputy Minister of Aquaculture and Fisheries was elected unanimously to preside the International Board of Fisheries Transparency Initiative. Also, during this meeting, Ecuador emphasized the importance of information exchange and reported the interconnection of the Ecuador fisheries authority system with the one from FAO (Cook, 2023). These efforts locate Ecuador as the regional leader of IUU fishing fighting.

Concerning enforcing the PSMA, Bethel et al. (2021) describe that the reasons for a state to be considered non-compliant include,

a shortage of manpower required to inspect vessels, a lack of adequate training for inspection officers, a lack of accountability to ensure that information is shared once data is collected regarding a vessel suspected of IUU fishing, a lack of empowerment by national laws to exercise jurisdiction against foreign-flagged and stateless IUU fishing vessels in port, and a lack of technical resources to ensure that accurate information is quickly disseminated (p.3).

Although Ecuador's approach to tackling the IUU fishing issue encounters all of the obstacles described above, national legislation has started to show efforts to comply with international legislation. For instance, Article 160 of the Law on the Development of Aquaculture and Fisheries explains that the MCEIP will establish protocols for inspections of all fishing activities and also gives the Ecuadorian Navy competencies to enforce fisheries policies by boarding and inspecting national fishing vessels during its day-to-day activities.

Failure to adequately address IUU fishing caused the European Commission to issue Ecuador a yellow card in 2019. These days, Ecuador's decision makers are committed to more sustainable practices; they are actively engaged and proposing measures against IUU fishing and species conservation within critical international forums.

4.2.1. Exercise of Coastal State Rights

UNCLOS is the governing legal body for the maritime spaces, under the provisions related to the EEZs, Article 73(1) describes the obligation of enforcing the laws and regulations of the coastal State, which may

in exercise of its sovereign rights to explore, exploit, conserve and manage the living resources in the exclusive economic zone, take such measures, including boarding, inspection, arrest and judicial proceedings, as may be necessary to ensure compliance with laws and regulations adopted by it in conformity with this Convention.

Furthermore, section 2.5 described that ITLOS already has concluded that it is the coastal states' duty to combat IUU in its jurisdictional waters. Also, the European Union Court of Auditors committed to achieving goal target 14.4 and ending IUU fishing, examined the legal framework in the EU and concluded that regardless of the effectiveness of the measures to avoid commercialization of IUU fishing products, there is a need for coastal states to exercise jurisdiction in their EEZs as they are primarily responsible for the adoption and enforcement of conservation and management measures (European Union Court of Auditors, 2022).

In Ecuador, Article 9 (5) of the LONSEA grants the Navy, appointed as Maritime Authority, competence for the exercise of coastal state rights; it is designated as the law enforcement institution and tasked with the duties of controlling, monitoring, and demanding compliance of laws, regulations, and provisions related to the maritime activities. This provision is concordant with Articles 10(2), 10(3) and 10(5) of the same legal body, which grants the Ecuador Navy the right to visit, inspect and apprehend, if necessary, any vessel which is not abiding by rules and regulations specified in the

national legal framework; and, which task all the operational assets of the institution with taking the necessary measures to impede the performance of illicit activities, such as IUU fishing among others.

The PAN INDNR recognizes the Ecuadorian Navy as the responsible authority for exercising flag, coastal, and port state rights and appoints it as the leading agency with which the fisheries authorities will coordinate control operations. This plan also contemplates developing an integrated MCS system among the fisheries and maritime authorities.

When asked⁶ about the Navy's approach to enforcing fisheries legislation and preventing IUU fishing, experts from the Maritime Authority identified surveillance as the primary enforcement activity, this activity is complemented with patrols. For instance, in the Operational Control Centers (Guayaquil and San Cristobal) there is personnel monitoring constantly Ecuador's jurisdictional waters using platforms such as Global Fishing Watch, Dark Vessel Detection, and SIGMAR⁷. The last one is part of the maritime data management system developed by the Navy, which combines information with the fisheries authority's database and also allows to report a summary of the results of the inspections. Figure 5 shows the activity on the SIGMAR screen on the 5th of September 2023.

⁶ Interview conducted for this research.

⁷ Sistema Integral de Gestión Marítima

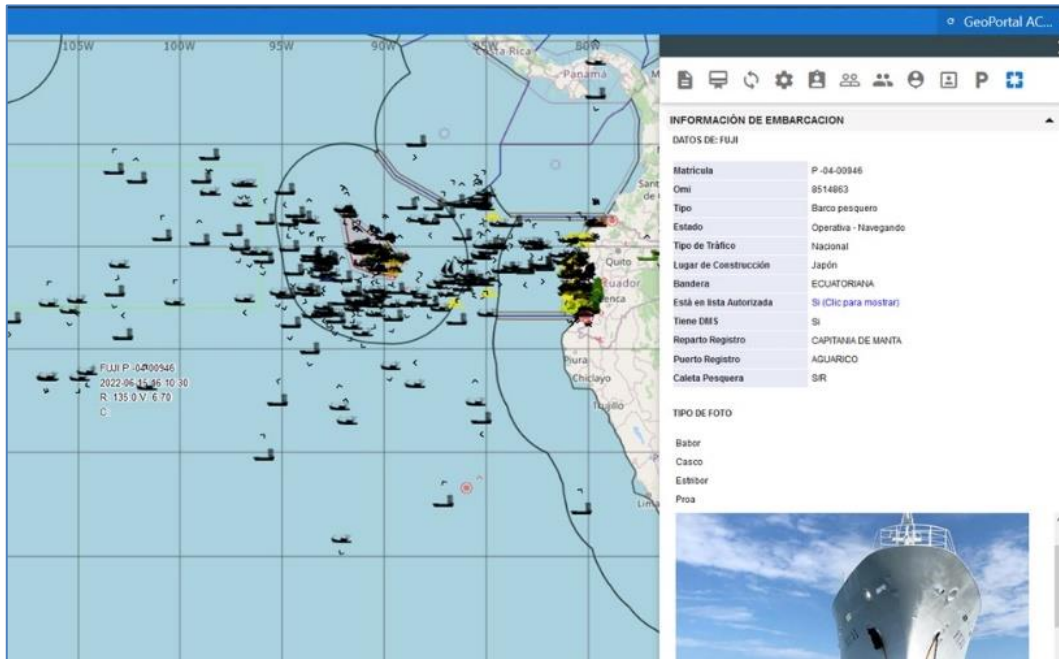


Figure 5: Control and surveillance screen from SIGMAR

Note. Photo courtesy of the National Directorate of Aquatic Spaces (DIRNEA)

The Maritime Authority liaison officer to the Ministry of Foreign Affairs highlighted⁸ the importance of monitoring and surveillance as it is the primary source to compile information for the decision-making process prior to patrolling,

Through constant monitoring, it is possible to detect when there are high interest contacts or suspicion of illegal activities; then, navy vessels can be deployed to patrol specific areas or to conduct maritime surveillance flights to obtain a better situational picture (Valladares, 2023)⁹.

The Chief of Staff of the Navy, former National Directorate of Aquatic Spaces, mentioned in the interview for this research that these patrols and control activities take part in a coordinated effort of the Fisheries and Maritime Authorities; also, the most critical tool for an adequate exercise of Coastal State rights is the synchronized

⁸ During the interview conducted for this research.

⁹ Maritime Authority liaison officer to the Ministry of Foreign Affairs, personal interview.

legal framework that governs the duties and responsibilities of both Authorities, which takes into consideration the regulations given in international legal bodies.

International cooperation plays a role in combating IUU fishing through MLE joint operations and capacity building programs. In August 2020, the Ecuador Navy coordinated a patrol that combined the efforts of the USCG Cutter Bertholf and the Ecuadorian Coast Guard vessel LAE Isla San Cristobal; also, Ecuadorian personnel embarked onboard the USCG Cutter Mohawk to participate in counter-illicit activities operations in the Galapagos (U.S. Department of State, 2022). These operations are an opportunity of gathering information to support future efforts and increase awareness.

The United States (U.S.) Department of State (2022) also reports funding Ecuador's Navy (Coast Guard) capacity-building initiatives and equipment to collaborate in counter IUU fishing and expand Ecuador's maritime domain awareness. Also, USCG Mobile Training Teams offer various programs to enhance MLE agents' capabilities.

Nevertheless, despite the effort and commitment of the Maritime Authority to enforce rules while exercising coastal state rights, there are some challenges to face.

4.2.2. Challenges and measures in place to overcome them

The dynamics of IUU fishing activities in Ecuador vary, as described in section 4.1; then, the law enforcement body must have proper capabilities to address the issue. The CLALS (2022) report identifies three components that are important to analyse: physical capacity, surveillance capabilities, and prosecutorial-judicial capacity.

The physical capacity refers to personnel and equipment. This capacity considers factors such as the size, condition, and age of the fleets. In Ecuador, physical capacity is limited; while some of its naval vessels are undergoing a modernization campaign and offshore patrol vessels were added in the last decade to its fleet, Ecuador's vast jurisdictional waters imply more extended operational periods, hence costs. Alava et al. (2017) acknowledge the continuous deployment of naval units as efforts of the

Maritime Authority to overcome IUU fishing practices; yet, there is not “sufficient and long-term funding to cover all the associated costs derived by the economic and logistic resources” (p.3). The Chief of Staff of the Navy recognized¹⁰ that the budget allocation for the Navy is limited, henceforth operational periods are limited too, and information analysis is crucial to prioritize the fleet missions.

Another challenge identified within the physical capabilities is lack of knowledge on the available legislation and tools which contribute to the sanctioning process. Experts coincide on the need of capacity building for MLE personnel, which will allow the personnel working within the authority to fully comprehend the importance of properly enforcing rules and regulations. Physical capacity constraints are what make IUU fishing a “highly lucrative business”. Since enforcement at sea is difficult, the “risk of losing capital investment [in IUU practices] is limited” (Auld et al., 2023).

The next component is surveillance; this is an element of the fishery management measures of *Monitoring, Control, and Surveillance* (MCS). According to Bergh & Davies (2002), the FAO defined surveillance as “the degree and types of observations required to maintain compliance with the regulatory controls imposed on fishing activities,” and it is the focus of the law enforcement bodies. The aim of MCS is to develop a strategy for the adequate exploitation of resources while maximizing economic opportunities; moreover, it is a tool to exercise sovereign rights over the EEZs.

Law enforcement with solid and effective surveillance capabilities increases the probability of apprehending IUU fishing actors. As a result of these detentions, there will be a reduction in the fishers' engagement in illegal practices due to increased costs (Sumaila, 2019). Currently, especially in developing countries, there is a lack of surveillance capabilities, thus the high level of IUU fishing in the world's oceans.

¹⁰ During the interview conducted for this research.

As it was mentioned in subsection 4.2.1, Ecuador’s Maritime Authority relies on surveillance as the primary approach for enforcement. The systems used for satellite surveillance include those from governmental and non-governmental organizations such as Global Fishing Watching and Wild Aid. Also, since 2021, the Ecuadorian Navy has been working with Canada’s Department of Fisheries and Oceans (DFO), as part of the program Dark Vessel Detection (DVD) for the use of satellites to detect, and track ships whose location transponders are turned off. Canada owns technology that is able to analyse satellite images using artificial intelligence and identify “dark vessels”¹¹ (United Nations, 2023). This project is worth about \$7 million and the objective is to synthesize data, including information about ownership and past offenses, and then alert the Ecuadorian Navy to execute patrols and operations and determine whether these vessels are engaged in IUU fishing or any related activities.

The aforementioned platforms, together with the Operational Centres constitute the land component of MCS; this component allows the revision of information and coordinates the authority’s efforts prior deployment of resources (FAO, 1994) to address each situation accordingly.

At the General Directorate of Maritime Interests, a department within the Ecuadorian Navy whose main goal is to support the development as a maritime nation, experts assure¹² that surveillance will always face challenges due to the rapid development of technologies; therefore, they highlighted the importance of cooperation agreements for the use of different systems (the case of DVD, GWF and Wild Aid).

Nonetheless, one of the experts interviewed for this research mentioned that physical and surveillance capacity need to go together,

there is necessary for the Navy to acquire modern patrol vessels that are able to rapidly intercept the ships engaged in IUU fishing, and to be able to collect

¹¹ Those whose Automatic Identification System (AIS) has been turned off over long periods to avoid its detection.

¹² During the interview for this research

actual evidence of the wrongdoing. The systems alone cannot collect evidence, and foreign fleets are quite far from the coast (Valladares, 2023)¹³.

The FAO (1994) defines the integration of these capabilities as the sea component of MCS, since it includes the technology and vessel platforms that are used, and their ability to apprehend the offenders and, identify and collect evidence. On this topic, the Ecuadorian Navy reported to CBC news (2022) that some of its patrol vessels have on board “special image recognition software” which allows them to identify endangered species on board fishing vessels; in 2021, this software helped to stop industrial fishing vessels which were harvesting in unauthorized areas and to identify flag vessels that were not compliant with the restrictive measures in place to avoid supplying of stores and fuels to any foreign flagged vessel that might be engaged in IUU fishing activities.

Furthermore, there is also an air component of MCS; the FAO (1994) indicates that air surveillance constitutes the first responders and, most of the time, the easiest way of detecting illegal activities in the areas of overflight. Since the budget is limited to enhance the Navy’s capabilities, international partners cooperate with the Navy. The CLALS (2022) reports the partnership established to counteract IUU fishing and the related activities between the U.S. and Ecuador, where a U.S. Orion P-3 aircraft carries out maritime aerial surveillance and exploration; a Boeing 707 aircraft “carrying an airborne warning and control system to periodically conduct operations and gather information on illicit activities” (U.S. Department of State, 2022) also is part of this cooperation agreement.

Although the described capabilities seem to concentrate on the issue of the foreign fleet IUU fishing dynamic, it does not greatly differ for artisanal fisheries. Article 113 of the Law on the Development of Aquaculture and Fisheries, mandates for shipowners to install satellite monitoring devices to keep track of their location at all times and which has to be operative from the beginning to the end of their journeys.

¹³ Maritime Authority liaison officer to the Ministry of Foreign Affairs, personal interview.

While this article was developed with the goal of guaranteeing the safety of fishers, it is a tool that Navy uses to identify if they engage in their activities in permitted areas.

The next component is prosecutorial and judicial capacity, which is measured by the effectiveness of prosecuting crimes. Within this component, it is crucial to mention that “one of the challenges that the Maritime Authority faces is that the legal body allowing crime prosecution does not explicitly refer to IUU fishing; this diminishes the possibility of sanctioning the activities” (Rubio, 2023)¹⁴.

Although the Ecuadorian maritime authority is not competent for prosecuting crimes, as the law enforcement body, it plays a significant role within the system by providing and delivering timely reports and supporting the evidence found, as appropriate. Moreover, Schaeffer (2021) describes another challenge that Naval units face: prosecutors and those operating ashore are unaware of operational limitations.

The different dynamics of the IUU issue in Ecuador demand the Maritime Authority to ensure fair and equitable actions for all stakeholders when enforcing the law; the experts interviewed concur when making remarks about the fairness of the actions taken. They assure that the main legal bodies which govern fisheries and the maritime activities are comprehensive, and give a clear understanding of the due process to follow in the event of contraventions and crimes. Also, the secondary legal sources which are developed within the National System of Aquaculture and Fisheries and the National Maritime Organization System serve as tools to guarantee equity in the procedures, especially for legitimate fishing communities.

At a different level, Ecuador seeks international support to guarantee due process during prosecutions related to IUU fishing issues; for instance, the U.S. Department of State (2021) reports that prosecutors from Ecuador “trained with U.S. officials on enforcing against and deterring IUU fishing”, this training was part of the USAID and

¹⁴ Director of Oceanopolitics and projection of the Maritime Interests (General Directorate of Maritime Interests), personal interview.

State Department fund trainings to prosecute crimes such as IUU fishing and wildlife trafficking (U.S. Department of State, 2022).

4.2.3. Further actions

At a national level, it is notable that fishers from small communities engage in irregular fishing practices and, additionally, engage in other illegal activities because of the influence of larger criminal groups. To overcome this situation, the Ecuador Navy started an education and awareness campaign to fill coastal communities with knowledge and understanding of the importance of abiding by regulations.

The Maritime Authority reports that the number of national vessels apprehended for IUU fishing practices has slightly diminished over the years; this data is shown in Table 2. Yet, fewer vessels caught while engaging in these practices are part of the national fleet and do not reflect a decrease in the issue but the need to increase capabilities for MLE because foreign fleets located near Ecuador EEZ continue to increase.

The previous section described the challenges to overcome to better the Navy's capabilities; however, the efforts to combat practices such as IUU fishing to reach maritime security is a joint efforts battle (Bueger & Edmunds, 2017). It involves policy and enforcement actions, engagement with IGOs and NGOs, and awareness from all national, regional, and international stakeholders. Sumaila et al. (2020), on the issue of IUU fishing, agree with augmenting collaborative enforcement activities among countries and suggest that stakeholders commit to "full accountability and public transparency" of their actions and behaviour to ensure its legality and sustainability.

Table 2: Vessels apprehended during IUU fishing practices.

Year	Vessels apprehended
2018	16
2019	39
2020	16
2021	37
2022	16
2023	3

Note. Elaborated by Author, data published on an internal report prepared by the National Directorate of Aquatic Spaces (DIRNEA).

Bilateral, regional and international cooperation play a significant role for the Maritime Authority efforts to combat IUU fishing. For instance, Peru and Ecuador signed a convention of cooperation in which they agree on join their efforts to achieve sustainable fisheries and aquaculture, and to encourage research and development activities for the first purpose.

Also, Maritime Authorities representatives actively participate in regional forums and workshops, motivating the development of plans or permanent working groups to evaluate periodically the issue within the region. At the General Directorate of Maritime Interests and the National Directorate of Aquatic Spaces, head of the Coast Guard in Ecuador, experts emphasized¹⁵ that even though cooperation does not include financial aid, the participation in actions developed within CPPS, ROCRAM, or the RFMOs is constant and committed. These organizations also provide capacity building to support enforcing fisheries legislation.

Furthermore, a multinational MLE exercise called GALAPEX 2023 will take place in Ecuador at the end of September; this exercise is an initiative of the Ecuadorian Navy presented during the InterAmerican Naval Conference in 2018; during his interview,

¹⁵ During interview conducted for this research

the Navy's Chief of Staff mentioned that the upcoming international event primary goal is to strengthen the interoperability of a multinational task force to exercise coastal state rights.

The issue on which the practice will focus is IUU fishing; Vanegas (2023) reports that navies from Argentina, Brazil, Colombia, Costa Rica, United States, France, England, Italy, Panama, Mexico, and Peru, representatives from the Ministry of Foreign Affairs, the MCEIP and CPPS participate on this exercise, which will develop strategies to deter IUU fishing and its related activities. Ecuador hosting this event shows commitment to enhancing maritime security throughout the region.

The *Maritime Safety and Security Plan* (2022) establishes some axes to take action on to enhance control of the maritime domain while deterring illegal practices such as IUU fishing. These actions include reaching situational awareness in the country's maritime domain by integrating the information available through surveillance and databases of all the maritime administration agencies in a single information analysis center.

Currently, the exchange of information among Authorities (Maritime and Fisheries) is crucial for effectively combating IUU activities; hence, the importance of Operational Control Centers, which have access to a general database containing the most critical information to allow decision-making during ongoing operations. Integrating vessel's surveillance and fisheries information allow navies and coast guards to “take a more holistic approach to maritime security and help nations...establish governance of their waters” (Borg, 2022). The Maritime Authority relies on the Maritime Information Analysis Centre (CEAMAR) to combine this information into integrated operational pictures.

Another action suggests strengthening naval presence. The Navy highlights the close relationship between naval presence and control of the maritime domain because it generates a reaction from the community, discouraging engaging in illegal practice due to the MLE agency activity and enhancing trust in the legitimate actors.

Strengthening naval presence implies increasing the physical capabilities of the Maritime Authority; Pazmiño (2019) suggests taking advantage of the Galapagos archipelago geographical location and maintaining the Navy fleet operating within this area. This proposal derives from research that combines experts' opinions and the MLE institution capabilities analyses. It concludes that building adequate infrastructure and means to provide logistics to the naval fleet, and improve physical and surveillance capabilities is essential. Also, it emphasizes the importance of building a National Maritime Policy focusing on Maritime Safety and Security, which will reinforce the integrated efforts of all the institutions that take part in the maritime administration.

The efforts of the Maritime Authority to enhance its capabilities are tangible; their actions match continuous work toward reaching the goals set in plans and initiatives raised in meetings. However, there is a need for State intervention in revising existing legal framework and policies to prioritize the issue of IUU fishing. Also, the budget allocation to the Navy is crucial to improve capabilities and ensure permanent naval presence in jurisdictional waters, especially in critical areas. Additionally, build capacities among the Maritime Authority's personnel will improve enforcement; Borg (2022) recognizes that most nations do not have the "capability to take action" when IUU fishing practices are detected.

The competencies of the Navy as Maritime Authority go beyond the exercise of coastal state rights; even though the authority's approach to the exercise of coastal state rights remains the focus of the research, it is important to mention that fulfilling responsibilities and exercising rights as Flag and Port State will also contribute to the effort of combating IUU fishing.

Chapter 5: Summary, Conclusions and Recommendations

5.1 Summary and Conclusions

The issue of IUU fishing has been affecting the globe for over two decades and threatens the sustainability of fisheries resources. The impacts it causes allow for an address from different scopes: environmental, economic, social, and national security. These impacts affect almost every country, especially coastal states; thus, they need to strongly exercise their rights and fulfill the obligations given by international conventions.

The Latin American region is one of the most affected by the IUU fishing practices; the annual economic losses surpass \$2 billion, and this estimation does not account for the impacts it creates in the local communities, among them moving toward other illegal practices as an easy way to overcome their needs.

For Ecuador, the fishing and aquaculture sector is relevant in its economy as it represents over a hundred thousand employment opportunities and millions of dollars in exports annually. Also, these activities are closely related to the Ecuadorian coastal communities' historical, cultural, and social development. Here, the issue of IUU fishing encounters three dimensions: illegal, unreported, and unregulated, highlighting the importance of enforcing flag, coastal, and port State duties.

The biggest concern is the constant presence of foreign fishing fleets within the Ecuadorian EEZ and similar situations around the region; hence, the scope of this study, which identified whether the approach of the Maritime Authority for the exercise of coastal state rights is adequate to assure the country's sustainable fisheries.

The research highlights some of the international legal framework and regional initiatives that contribute to tackling IUU fishing and which provisions contribute to the National authorities' action to combat these practices if adequately implemented.

The study includes the European Union as one of the largest consumers of fishing products and its approach to the issue by calling for a global integrated effort when adopting the *IUU Regulation*. For instance, the carding system addressed in this regulation triggered the Ecuadorian legislative efforts when a yellow card was issued in 2019.

Ecuador shows a solid commitment to the sustainable management of its fisheries resources; a vital aspect of this effort is integrating the available international legal framework to deter IUU fishing into national legislation. In the study context, the Law of Development of Aquaculture and Fisheries and the LONSEA are the key instruments that allow Ecuador to develop effective measures to combat an issue currently affecting its biodiversity, food security, and economy while threatening its maritime security.

The provisions of these legal bodies establish a governance framework and outlines the roles of the institutions, which serve as the most significant tool for enforcing national and international regulations when addressing IUU fishing issues.

The Ecuadorian Navy fulfills its constitutional mandate to provide maritime safety and security to its nationals and protect the nation's maritime interests; since 2021, it has been appointed Ecuador's Maritime Authority. It uses its capabilities to compel compliance with the provisions given by UNCLOS and other national legislation for the exercise of coastal state rights. The technologies for monitoring and surveillance are a key tool that the Authority has for exercising its rights; analysis of this information allows for deterring illicit activities within the jurisdiction.

The jurisdictional waters extension is vast; thus, continuous patrolling with the available naval assets and personnel is inconvenient. The Institution faces physical and

logistic challenges to combat illicit activities occurring within the maritime domain; this is similar throughout the region, hence the importance of cooperation.

Moreover, cooperation at regional and international levels is crucial in the efforts to combat the current issues. The GALAPEX 2023 operation is an excellent example of joint efforts of MLE agencies; also, countries such as the U.S. and Canada support the Authority's efforts by engaging in projects that enhance surveillance capabilities.

Nevertheless, it's becoming clear that regardless of the effort and commitment of the Maritime Authority, more planning and prioritization are necessary. While the existing legal framework allows governance to address current IUU fishing, it's not solely the Navy's responsibility to exercise Coastal state rights. Also, enhancing physical capabilities is an ideal approach, yet budget allocation from the State is necessary.

5.2 Recommendations

Based on the findings of the present study, the following recommendations seek to contribute to the efforts of the Ecuador Navy, for an adequate exercise of coastal State rights and tackle the issue of IUU fishing, among others.

1. Operationalize the Systems created within the national legal instruments and develop intersectoral strategies to address the current issue

The national legal framework creates the National System of Aquaculture and Fisheries and the National Maritime Organization System, and grants them competencies to engage in coordinated work through meetings and working groups to enforce the provisions of the legal bodies (Law of Development of Aquaculture and Fisheries and LONSEA).

While this outlines an institutional framework to address issues such as IUU fishing, there is not information available about enforcement measures or results analyzed within these forums. It is important to operationalize the Systems, by actively engage

in meetings, assigning roles and responsibilities to each Institution and setting goals for better governance.

These Systems are tools in which the Maritime Authority could rely for developing strategies to face the ongoing issues. For instance, the National Maritime Policy that is being developed will find a solid forum that will support its reaching to the national policy agenda.

2. Strengthen Bilateral, Regional and International Cooperation

IUU Fishing impacts are global; thus, the response requires a global coordinated effort. The Maritime Authority has established partnerships with which share crucial surveillance tools to tackle the issue.

Enhancing these partnerships and creating more will contribute to the fight against the IUU Fishing and related activities. The cooperation must include capacity building, considering the specific needs of the country, and enhancing capabilities for monitoring, control, and response.

Also, establish agreements to facilitate joint enforcement actions, which should include a process of information sharing. These partnerships will address situations where offenders move to a different jurisdiction to avoid the coastal State's MLE.

3. Review of the Maritime Authority plans and procedures

The Maritime Authority uses various software for surveillance; it is crucial to analyze the information gathered on these platforms and create statistical reports that include a spatiotemporal context of the fishing fleets' activities and their flag of registry.

These reports could include data from MCEIP, RFMOs, and other partners; then, they will allow the review of the existing plans and prioritize the areas and periods on which there is a need to intensify controls. Hence, the approach is preventive rather than respondent.

Moreover, Article 73 of the UNCLOS allows the coastal State to include “boarding, inspection, arrest and judicial proceedings” within the measures to exercise sovereign rights within the EEZ. Therefore, developing an adequate procedure to engage in boarding and inspections of any vessel suspected of fishing in the EEZ and implementing it through national legislation rather than keep it as an internal procedure will contribute to combating IUU activities. Schaeffer (2021) states that “legal restrictions present barriers to effective enforcement” (p.9); hence, any existing plan must have been adequately implemented and policymakers should address how to overcome any operational challenge (use of force and judiciary procedure, among others).

To implement these procedures, it is essential to build capacities and to educate personnel on the specifics of the IUU fishing issue, including the regulatory framework for fisheries and rights and responsibilities in the EEZ for the Coastal and other states.

4. Raise awareness among the communities and the stakeholders

It is important to get all stakeholders involved, as the problem has far-reaching implications. The Maritime Authority started an educational program to aware the fishing communities of the importance to comply with the regulations.

A holistic and collaborative approach is needed to build awareness on the issue. By engaging local communities and legitimate fishers in an effort to enforce fisheries legislation and combat IUU fishing, the Authority can obtain valuable insight and identify more areas of concern; this approach will also tackle other maritime security threats.

5. Fill the knowledge gap

Personnel on board operational units and taking MLE actions need to fully understand the legal procedure that follows; also, prosecutors need to understand the challenges and limitations of operational units. Conducting joint trainings with all stakeholders

will allow to gain a better understanding of the issue from different scopes, rather than focus solely in one institution's roles.

Also, by involving the academic community, research will contribute to identify the roots and underlying causes of the issues, as well as develop solutions. This research identified a gap of academic knowledge from the MLE agency approach. National and Regional institutions could focus on the issue from a maritime security threat perspective, and provide knowledge as support for decision-makers

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