



Bringing contextual reality to IUU fishing

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ABSTRACT

The illegal, unreported, and unregulated (IUU) fishing terminology, as presented in the International Plan of Action to Prevent, Deter, and Eliminate IUU Fishing (IPOA-IUU), is often scrutinised for its vague and conflated nature. As a result, although internationally recognised and widely used, it is often difficult to conceptualise and operationalise across scales. Through key informant semi-structured interviews, this study aimed to gain expert insights into the current usage of the term IUU fishing and the potential issues this may present. We found the interpretation and application of the term to vary, depending upon the context in which it is used. Moreover, four inherent misconceptions regarding IUU fishing emerged, which may hinder effective and equitable management towards ocean sustainability: 1) only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity; 2) the drivers and consequences of IUU fishing are restricted to stealing fish; 3) the applicability of IUU fishing as a clear-cut illegal activity is universal across scales; and 4) IUU fishing is the sole driver of unsustainable fisheries. Consequently, IUU fishing responses may become hampered by a high-level catch-all view that disregards intrinsic complexities and context-specificities. To move away from this reductionist perspective, we recommend that IUU be used sparingly, with a move towards focusing on its three discrete components - illegal fishing, unreported fishing, and unregulated fishing. By applying a problem-oriented approach, we may then be able to gain a contextualised understanding of nuanced problems, which can inform practical and tailored management across relevant spatiotemporal scales.

1. Introduction

1.1. Background

At a time when 713 - 757 million people face hunger [31], aquatic animal production provides approximately 15 % of global animal protein intake and upwards of 50 % in some regions of Africa and Asia [28]. Moreover, fisheries and aquaculture industries ensure the livelihood and economic stability of approximately 600 million people, with annual global capture fisheries production reaching over 90 million tonnes (US \$ 159 billion) in 2022 alone [28]. As such, the overexploitation of marine resources continues to be a cause for concern, jeopardising the Sustainable Development Goals set forth by the United Nations (UN), including “end poverty in all its forms”, “end hunger, achieve food security and improved nutrition”, and “conserve and sustainably use the oceans, seas and marine resources” [65]. Therefore, practical fisheries management approaches remain critical to the conservation and restoration of fish stocks and marine biodiversity, yet are undermined by

practices of illegal, unreported, and unregulated (IUU) fishing [64].

The past half-century has seen the development and adoption of several complex and interrelated measures designed to foster the sustainable use of our oceans. The 1982 UN Convention on the Law of the Sea (UNCLOS), a legally binding international treaty, is credited with developing the international legal framework that governs the marine environment, including jurisdictional maritime boundaries [60]. Following since, three legally binding implementing agreements have been put into place to support, build upon, and operationalise UNCLOS [36]: 1) the 1994 Agreement Relating to the Implementation of Part XI of the UNCLOS of 10 December 1982 (the 1994 Agreement) [61]; 2) the 1995 Agreement for the Implementation of the Provisions of the UNCLOS of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (the 1995 UN Fish Stock Agreement [UNFSA]) [62]; and 3) the 2023 Agreement Under the UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction (the Biodiversity Beyond National Jurisdiction [BBNJ] Agreement)

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[63]. While the 1994 Agreement concerns deep-sea mining, UNFSA is focused on regulating transboundary fisheries, and the BBNJ Agreement furthers these initiatives by providing a blueprint for managing marine biodiversity beyond national jurisdiction [61,62,63].

Since UNCLOS, the Food and Agriculture Organization of the UN (FAO) has developed various technical guidelines and standards to complement these instruments. These include the 1993 Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (the Compliance Agreement) [19] and the 1995 Code of Conduct for Responsible Fisheries (the Code of Conduct) [20]. The 1995 FAO Code of Conduct acts as a voluntary set of standards and principles guiding the sustainable use of our oceans through best management practices. Although voluntary, it is designed to reflect international regulations, and within this framework, International Plans of Action (IPOAs) are designed to support and tackle specific outlined concerns. Examples of IPOAs include the IPOA for Reducing Incidental Catch of Seabirds in Longline Fisheries, the IPOA for the Conservation and Management of Sharks, and the IPOA for the Management of Fishing Capacity [21].

1.2. The IPOA to Prevent, Deter, and Eliminate IUU Fishing

The concept of IUU fishing was first introduced by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in the 1990s in response to rising fisheries management concerns within the Southern Ocean [10,12]. At the time, CCAMLR - an international fisheries management body established to promote Antarctic marine resource conservation [13] - was alarmed at the decline in target (i.e., Patagonian toothfish) and non-target (i.e., seabirds) species within their Convention Area as a result of detrimental fishing activity [1,12]. Therefore, IUU fishing was coined in response to the need to address specific activities undermining the management efforts of transboundary fisheries within international waters - matters generally addressed by intergovernmental bodies that cooperatively manage shared fish stocks (regional fisheries management organisations [RFMOs]) [18,51].

While the three modes of fishing activity - illegal fishing, unreported fishing, and unregulated fishing - were not new, nor was the recognition of their impact on sustainable fisheries, the first use of IUU fishing is attributed to the 1997 Sixteenth Meeting of the CCAMLR [12,47]. The concept sought to improve and add coherence to international cooperative efforts and recognise some of the complexities inherent in high seas fisheries that had not previously been addressed within UNCLOS [58]. These included issues regarding “freedom of the high seas” (Article 87) [60], concerns related to flag state jurisdiction (Article 92) [60], and the principle of *pacta tertiis nec nocent nec prosunt*, under which non-parties to a treaty are not bound by the treaty, its provisions, or by regulation adopted under it (Article 34) [59] - whether directly by its parties or through an established RFMO [58]. In this context, illegal fishing concerned those activities undermining Patagonian toothfish management, unreported fishing referred to unreported catch that was detrimental to the management of sustainable stocks, and unregulated fishing focused on non-CCAMLR members operating within their Convention Area [12, 47,58]. In response to these concerns, the FAO’s Committee on Fisheries adopted the term in 1999 [22] and developed the IPOA to Prevent, Deter, and Eliminate IUU Fishing (IPOA-IUU), which was adopted in 2001 [23]. The goal of this IPOA was to expand upon the 1995 Code of Conduct and other international frameworks to act as a non-binding and voluntary “toolbox” that RFMOs and states could use to address regulatory gaps and issues of illegality [17,58]. These tools included international and national instruments (e.g., National Plans of Action [NPOAs]), monitoring, control and surveillance, as well as market-related measures [23].

1.3. Concerns related to the IPOA-IUU

Before the IPOA-IUU, there was no formal definition of IUU fishing, and the term had yet to be used precisely [17]. While similar instruments, such as the 1995 Code of Conduct, had generally avoided formal definitions due to the diverse legal systems in which countries operate, there was an increasing demand to define IUU fishing for the IPOA-IUU [17]. Therefore, paragraph 3 of the IPOA-IUU, which aims to define the term [23], was negotiated by FAO member states. During these negotiations, the “European Community” raised concerns about the determined definition’s appropriateness and suggested that a working group could help review the definition if time allowed. Canada expressed similar reservations [24]. Nevertheless, the definition provided in paragraph 3 was accepted, with the understanding that the “European Community” would not recognise it beyond the IPOA [17, 24]. As such, it was anticipated that the text of paragraph 3 would be fleshed out as appropriate in future relevant contexts [17].

An expansive list of legislation and implementation measures has since been designed to support the IPOA-IUU. These include, for example, the Voluntary Guidelines for Flag State Performance [26], the binding Agreement on Port State Measures to Prevent, Deter, and Eliminate IUU Fishing (the Port State Measures Agreement) [27], and many NPOAs (see the FAO’s FAOLEX database [29]). However, reflective of the concerns raised at the time of the IPOA-IUU’s inception [17, 24], many of these documents have since adopted paragraph 3 verbatim and without nuance [51,58]. Thus, while effectively drawing public attention to the issue, the ambiguity inherent in the term and its inappropriateness across scales have resulted in confusion, application inconsistencies, and difficulties in operationalisation on the ground [54, 58].

To date, substantial discourse exists related to the IPOA-IUU, including its broad yet limited scope and its vague nature that fails to recognise spatiotemporal heterogeneity in both threats to marine resources and the contexts in which they arise and are perpetuated. For example, questions have been raised concerning: 1) what RFMO “conservation and management measures” cover; 2) the contravention-focused language and the level of illegality of unreported and unregulated fishing; and 3) to what extent the IPOA-IUU applies [50,57,58]. The use of the word “may” (“certain unregulated fishing may take place in a manner which is not in violation of applicable international law, and may not require the application of measures envisaged under the International Plan of Action” [23]) leaves room for divergence in its application [50]. Moreover, with few exceptions, the IPOA-IUU conflates the three discrete issues - illegal fishing, unreported fishing, and unregulated fishing - into IUU fishing, obscuring three unique problems that require distinct management responses [53].

Therefore, to move towards a more practical approach to delivering healthy and thriving marine ecosystems, we sought to deconstruct the term IUU fishing and better understand how those on the ground interpret it. Through key informant (KI) semi-structured interviews and thematic analysis, this study builds upon the existing terminology discourse through expert insights to examine the current use of the term and the issues that this may present from their perspectives. An increased understanding of how the term is used and applied in today’s contemporary setting can provide insights towards operationalising the concept to drive more nuanced narratives and interventions.

2. Methods

Semi-structured interviews are a commonly used exploratory method for collecting qualitative data [15,4]. While they are based on a structured questionnaire to guide questions on critical topics, they also enable deviation in discussion to build a more comprehensive and well-rounded understanding of a topic [41]. This flexibility made semi-structured interviews particularly useful for exploring conceptions and uses of the IUU fishing terminology in today’s context. They enabled

data collection from various fisheries management experts across geographic locations, experience levels, and industries to gain a multi-faceted view.

2.1. Recruitment

Taking a purposive sampling approach, we used scientific literature, Google database searches, professional connections, and snowball sampling to identify KIs; defined here as individuals working within fisheries management for five or more years, with a focus on IUU fishing or an aspect of IUU fishing [40,46,9]. This enabled the selection of experts across diverse fields and backgrounds. All potential participants were contacted in English via e-mail and provided with an information sheet outlining the project details and an accompanying consent form. The snowball sampling method led to around 30 individuals being contacted, directly or indirectly, from which ten interviews were secured for the analysis. The interviewees were affiliated with non-governmental organisations (NGOs; n = 4), consultancies (n = 2), educational institutions (n = 2), and inter-governmental organisations (IGOs; n = 2; [Supplementary Material, Part B, Table 1](#)). Their experience in fisheries management and ocean governance ranged from over five years to over thirty years. They resided in North America (n = 4), Europe (n = 3), Oceania (n = 2), and Asia (n = 1).

2.2. Interviews

Interviews were conducted online through Microsoft Teams from April to June 2024 by the lead author and were designed to be flexible and adaptive. The interviews lasted approximately 30 to 60 minutes and were audio-recorded with permission. While guided by a list of previously developed questions ([Supplementary Material, Part A](#)), interviews often diverged to gain in-depth insight into a particular idea [41]. The audio was transcribed after each interview via Microsoft Word's transcription tool [42] and manually re-reviewed multiple times to ensure the accuracy and validity of key takeaways and quotes. These reviews also enabled a high level of data familiarisation, which helped conduct the thematic analysis [8]. When clarification regarding a comment was needed later, the appropriate participant was directly contacted. Four participants expanded upon conversations through follow-up email conversations and/or by providing additional resources. This enabled a more thorough understanding of concepts and themes of particular importance. Moreover, participants were also allowed to review the transcribed takeaways and quotes, if they wished, to ensure the reliability of the data transcription. Three participants built upon their comments during this review.

2.3. Ethics

All interviews were approved by the University of Oxford's Central University Research Ethics Committee (reference R91627/RE001, R91627/RE002).

2.4. Analysis

We used thematic analysis to explore the dataset using NVivo 14 Windows [48], a software program to assist in qualitative data analysis. Thematic analysis is a research method that seeks to categorise themes across data to understand persistent concepts, ideas, or experiences [8]. NVivo assists this process by enabling a structured and well-documented dataset. Coding and thematisation were ongoing and iterative throughout the data collection process, following an adaptation of the six-phase approach described by Braun & Clarke [8], which includes data familiarisation, initial coding, and refinement. The initial coding was a priori, derived from the semi-structured interview questions. This enabled a straightforward, focused, and unbiased approach to represent the transcription accurately and reduce preconceived biases. The second

coding phase sought to deductively refine these research questions into cross-cutting themes and sub-themes, such as conceptualisation and management. At the same time, misconceptions were inductively derived from explicit statements and reflections by interview participants regarding prevailing assumptions they had observed or encountered in their line of work. The third and final coding phase further refined these themes. This three-pronged, hybrid inductive and deductive approach enabled a comprehensive analysis and enhanced the reliability of the findings.

3. Results

3.1. Conceptualisation of IUU fishing

KIs provided a wide-ranging set of responses when discussing how they conceptualised IUU fishing, with some directly mentioning the FAO's IPOA-IUU and others providing more detailed or generalised responses. To KI-2, "IUU fishing is basically any activity that contravenes regulations". They noted that the definition most commonly used is that which is presented within the IPOA-IUU, which is then often incorporated directly into many NPOAs. To them, "the original basis for the unregulated component was vessels that are... operating without any sort of recourse to reporting or licensing on the high seas", noting that they feel that "there are very few of those vessels now operating". KI-5 highlighted the IPOA-IUU's debated contravention-focused language, stating that they personally only acknowledge two components (illegal and unregulated), with the unreported (and a portion of the unregulated) component falling under illegal fishing. Although KI-4 stated that they "would be very comfortable understanding... the three components of illegal, unregulated, and unreported aspects as defined by FAO", they recognised variability in the application, and KI-7 stated that their understanding of IUU fishing is that "it's a very broad-ranging concept" with "a whole spectrum of behaviours and actions and outcomes". KI-3 highlighted a newer concept of "IUU by necessity", referring to the fact that, in many instances, "there isn't a choice for a lot of people" as to whether to partake in IUU fishing. When asked if KI-1's usage of the term has changed over the years, they replied with, "I don't think that the way I use the term has changed, the way I understand the term has", mentioning that "it's not entirely literal, in-so-far as, I think, that in the IPOA-IUU, those are more of exemplars of what they mean by those terms".

In some instances, KIs recognised the importance of the terminology in bringing fisheries management issues to the forefront of the political agenda, with KI-9 stating, "I personally don't love the term IUU, but I understand the necessity of it in terms of the international dialogue" and KI-10 acknowledging that the term has "issue salience". KI-1 also alluded to the benefit of the "brand recognition". Additionally, informants acknowledged that changing the terminology at this point is "not realistic" (KI-3) and could be challenging in the "current environment" because IUU fishing covers "so many different things" (KI-1). We would need to "work that through the system" (KI-10) and, as K-2 mentioned, "nobody really has the appetite" for a "whole new round of international negotiations". Nonetheless, one commonality across the interviews was the term's "imperfect" (KI-10) nature, acknowledging its: 1) blurred, conflated, and overlapping text; 2) inaccessibility; and 3) narrow and limited coverage ([Supplementary Material, Part B, Table 2](#)).

3.2. Emergent misconceptions

From the semi-structured interviews, four primary misconceptions emerged, which were highlighted as inherent in the IUU fishing terminology with potential implications for effective and equitable management ([Table 1](#)). These include:

1. Only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity.

Table 1
Emergent misconceptions inherent in the IUU fishing terminology.

Misconception	Reality	Selected Quotations (KI Code)
(1) Only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity.	Illegal, unreported, and unregulated fishing activity, in one form or another, occurs within fisheries of all sizes and scales.	<p>“I think this is one of the big misconceptions - not just in public consciousness, but also from many practitioners - MCS practitioners - who are trying to combat IUU fishing. There’s still a tendency to think of IUU fishing as being more predominant in the industrial space than in small-scale fisheries, and I think that’s a big mistake.” (KI-2)</p> <p>“But one of the things that came out of the Hidden Harvest study was that small-scale fisheries could arguably be catching something like 43 % of the global catch. Suddenly, it’s not that small.” (KI-4)</p> <p>“I’ll also say that in my world of work, I think that the term is predominantly used to refer to foreign fishing... and I think that’s interesting because... we do still have illegal fishing here locally - and unregulated and unreported.” (KI-10)</p> <p>“The other thing which I find slightly negative is that because it’s, you know, IUU fishing, it tends to make people think it’s just fish. And as I’ve said before, I think that it impacts so much more than fish.” (KI-1)</p> <p>“The implication with IUU fishing is mostly from a sustainability, environmental impacts... these newer concepts... I think my gut instinct is that they are... linked.” (KI-7)</p> <p>“Part of the reason that we have this sort of separation of fisheries and then other crimes and so on is because the international structures - the UN structures around them. They, themselves, are set up around these different issues. So, FAO is set up very much to see fishes in the context of food and just fisheries law... IMO comes in in terms of vessel safety and so on. ILO comes in in terms of labour conditions. And while that is improving between the different UN agencies, ultimately, what it creates is an international framework that trickles down to a national framework of ‘no, that’s our mandate, not</p>
(2) The drivers and consequences of IUU fishing are restricted to stealing fish.	In the present context, IUU fishing has emerged as a complex, interconnected issue with variable socio-economic linkages that require consideration.	<p>“It’s, I think, unhelpful, if everybody suggests that the only time that exploitative practises happen are on board IUU fishing vessels, where my assessment and I think that the actual body of knowledge would suggest that the same practises occur on a lot of other fishing vessels, not just the IUU ones. And so, you know, some of the practises which are legal are absolutely awful.” (KI-1)</p> <p>“But everybody should be generally aware that things are not great with the oceans for a number of reasons. And one of those major reasons is that we’re taking too much fish out of the sea - whether that’s because of illegal reasons or whether that’s because of legal overfishing - which is as big or a bigger issue than IUU fishing these days.” (KI-9)</p>

Table 1 (continued)

Misconception	Reality	Selected Quotations (KI Code)
(3) The applicability of IUU fishing as a clear-cut illegal activity is universal across scales.	Illegal fishing is not a catch-all for IUU fishing activity, and there are nuances in definition and application across scales.	<p>yours. Yours is this. And so on.’ And that is not helpful.” (KI-9)</p> <p>“Quite often people use illegal as the shorthand for IUU fishing... they don’t necessarily understand the interconnectivity between the unreported and the illegal activities.” (KI-1)</p> <p>“And, in general terms, I think most people, when they talk about IUU fishing, they mean illegal fishing... ‘there’s a lot of IUU fishing there’. That doesn’t mean there’s a lot of fisheries that have not been regulated by the states. When somebody says that, 99.99 % of the time they mean there’s a lot of hanky-panky going on.” (KI-5)</p> <p>“And the most annoying conflation is they often tend to conflate the whole thing as illegal and then focus on illegal fishing as the big headline issue without understanding the distinctions and nuances between all the various different types.” (KI-8)</p> <p>“A lot of people say ‘IUU’ when they mean ‘illegal.’” (KI-9)</p>
(4) IUU fishing is the sole driver of unsustainable fisheries.	Problems of unsustainable and inequitable fisheries go beyond IUU fishing.	<p>“It’s, I think, unhelpful, if everybody suggests that the only time that exploitative practises happen are on board IUU fishing vessels, where my assessment and I think that the actual body of knowledge would suggest that the same practises occur on a lot of other fishing vessels, not just the IUU ones. And so, you know, some of the practises which are legal are absolutely awful.” (KI-1)</p> <p>“But everybody should be generally aware that things are not great with the oceans for a number of reasons. And one of those major reasons is that we’re taking too much fish out of the sea - whether that’s because of illegal reasons or whether that’s because of legal overfishing - which is as big or a bigger issue than IUU fishing these days.” (KI-9)</p>

FAO = Food and Agriculture Organization; ILO = International Labor Organization; IMO = International Maritime Organization; IUU = illegal, unreported, and unregulated; KI = key informant; MCS = monitoring, control and surveillance; UN = United Nations

2. The drivers and consequences of IUU fishing are restricted to stealing fish.
3. The applicability of IUU fishing as a clear-cut illegal activity is universal across scales.
4. IUU fishing is the sole driver of unsustainable fisheries.

3.2.1. Only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity

KIs highlighted that within the general public, as well as within their line of work, there appears to be a general tendency to overemphasise large-scale, distant-water fishing fleets as the only entity partaking in IUU fishing and driving down fish stocks (Table 1, Misconception 1, K2, K4, K10). As a result, the conception of the problem is limited by a narrow interpretation of the perpetrator (Table 2, Implication 1, K4, K10). In reality, small-scale fisheries (SSFs) are responsible for almost half of the global capture fisheries production (Table 1, Misconception 1, KI-4). Thus, while large-scale fisheries (LSFs) are a predominant contributor to stock decline, they are not the sole contributor. Additionally, it is essential to highlight that these fisheries do not operate in a vacuum. Not only is it necessary to recognise SSFs and LSFs as distinct and separate entities, but it is also essential to recognise their interactions, with KI-4 noting the potential impact that illegal fishing activities by industrial vessels (e.g., encroachment) can have on artisanal fishing grounds (Supplementary Material, Part B, Table 3).

However, while SSFs do partake in illegal fishing, unreported fishing, and unregulated fishing, it often occurs within a different context than that of their LSF counterparts. KI-4 noted that this acknowledgement does exist within the IPOA-IUU; however, it is rarely highlighted in practice (Table 2, Implication 2). As a result, SSFs often get grouped with LSFs through the homogenisation of Westernised management approaches, which fail to acknowledge the diverse socio-ecological and socio-economic contexts in which they operate. Traditional fisheries management, the basis for many international agreements, is often embedded in a conception of large offshore commercial vessels operating in single-gear, single-species fisheries with technological advancements. SSFs are not as straightforward - they are diverse and are characterised by many smaller vessels operating in multi-gear, multi-species fisheries, often with limited technology (Table 2, Implication 2, K-4, K-5, K-9). However, the conflation of the term and concept across fisheries neglects these nuances, and SSFs are often subject to the same measures as LSFs despite their differing motivations (Table 2, Implication 3, KI-1, KI-4, KI-8, KI-10). One prominent example highlighted by KI-4 concerns the European Union - IUU trade regulation, which implements a prohibition on all fishery products originating from a fishery assumed to have partaken in IUU fishing activity. While SSFs may not report their catch, this may have resulted from a lack of capacity, framework, or mechanism to report, instead of a deliberate and purposeful act. Nonetheless, they are labelled as committing acts of IUU fishing and can still be excluded from high-value markets.

3.2.2. The drivers and consequences of IUU fishing are restricted to stealing fish

Historically, the IPOA-IUU was developed predominantly from an environmental and sustainability standpoint (Table 1, Misconception 2, KI-7). The FAO was responsible for food and fisheries law, while other institutions focused on their distinct mandates. For example, the International Maritime Organization was developed to address vessel safety, while the International Labour Organization was designed to focus on labour issues (Table 1, Misconception 2, KI-9). As a result, "because it's, you know, IUU fishing, it tends to make people think it's just fish. And, as I've said before, I think that it impacts so much more than fish" (Table 1, Misconception 2, KI-1). KI-9 highlighted how this "is a very good example of where IUU is limiting", noting that "the illegal in the context of IUU is around illegalities to do with fisheries legislation - whether that's national or international", yet, within the context of their work, they are "dealing

Table 2

Implications of Misconception 1: Only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity.

Implication	Selected Quotations (KI Code)
(1). A lack of attention to small-scale fisheries results in a limited understanding and assessment of the issue.	<p>"There is still then a very serious issue, which is that if you don't have a handle on what your small-scale fishery is catching, and it is so numerous and so dispersed throughout your country, how can you say that you have an idea about the total catch and the total impact on the fishery resource that that component, the small-scale fisheries, is having. You can't just say, 'Oh, it's irrelevant. They're not catching anything worth talking about. We only focus on the medium and large-scale fishery because they're the ones that catch all the fish'. When you have so many small-scale fishers, it actually becomes a problem." (KI-4)</p> <p>"I sometimes feel that when we use the term to connote foreign activities, particularly, you know, Chinese distant-water fishing fleets, that we are actually really limiting our understanding of what's happening out there." (KI-10)</p>
(2) Western-derived large-scale fisheries management approaches are often incompatible with small-scale fisheries.	<p>"[There is a caveat in the IPOA-IUU in which] small-scale fisheries can be essentially excluded because these definitions are inapplicable or inappropriate to be applied to such a fishery. So, there is a kind of an escape clause or a get out of jail free in Article 3.4 for small-scale fisheries, but interestingly, you don't hear it referred to that often." (KI-4)</p> <p>"Stock-focused fisheries management, which has been the sort of norm, and a lot of the international agreements are built out of this idea that you've managed single stocks. It all completely falls apart in a multi-species, multi-gear, multi-scale context that you have in a developing country." (KI-4)</p> <p>"So, some of these control mechanisms are not fit for purpose when you're dealing with aggregations of catches from a large number of small operators, and they do fall through the cracks then, and they become victims of the system that are designed essentially with much larger vessels and larger volumes in mind. Which, in turn, you can argue becomes a deterrent then for using smaller vessels." (KI-4)</p> <p>"Yet you're really saying, 'because of the way we want to manage fisheries and our reporting, all these things, we're going to favour the destructive, large single vessel,' which has, you know, all sorts of issues with equity and who gets the benefit." (KI-4)</p> <p>"And then legitimacy of rules. That's another one. If a rule is not perceived as being legitimate... if the regulator goes and asks for something that the fishermen have absolutely no way to relate to, then non-compliance will be a lot higher. And it has nothing to do with 'Oh, we want to make quick money or something.' It just has something to do with the fact that they do not accept the rule as being reasonable." (KI-5)</p> <p>"The challenge is that the way we work in terms of information sources and looking at global networks and so on doesn't apply in the same way to small-scale." (KI-9)</p>

(continued on next page)

Table 2 (continued)

Implication	Selected Quotations (KI Code)
(3) Variable fishing motivations between fishery scales require variable mitigations.	<p>“So, you perhaps have the systematic organised, industrial, distant-water IUU exploitation... And so, you’ve got that IUU. On the other end of the scale, you’ve got impoverished people... and so, we’ve got different scales, and we’ve got to be thinking about things differently.” (KI-1)</p> <p>“Most or many small-scale fisheries are essentially unreported - there is not even a mechanism by which those fishers could report even if they wanted to. So, by definition or defacto, many small-scale fisheries are IUU simply by virtue of the fact that they’re unreported... then that brings you very rapidly into a position... where you have, for example, EU regulations on IUU, which means that the EU cannot import any product that is coming from such a fishery. So, then you immediately start excluding or preventing those fishers from marketing a product into a higher value market or value chain.” (KI-4)</p> <p>“And for artisans, you know, there’s gargantuan amounts of unreported catch, but it’s not unreported in any kind of IUU sense. It’s non-reported because there’s no capacity to report it, or it’s not a priority, or there’s no framework that requires it, or whatever it might be.” (KI-8)</p> <p>“So, what I was talking about there is sort of, like, more the large-scale industrial fishing which gets more, has gotten more, press in recent years... sort of more attention. But there is also IUU, the illegal side again that is small-scale, relatively small-scale, and in those cases I don’t think it’s people with malicious intent. I believe that the driver there is people trying to, like, subsistence fish, fish for their family, fish for their community in that small-scale economy. And again, the driver is to survive - to keep their small-scale business going, to keep their community going.” (KI-10)</p>

EU = European Union; IUU = illegal, unreported, and unregulated; IPOA-IUU = International Plan of Action to Prevent, Deter, and Eliminate IUU Fishing; KI = key informant.

with a lot of other crimes that are taking place within the fisheries space... so, things like document forgery or labour issues or vessel safety”. And, as KI-10 pointed out, “you have to have poorly paid or slave labour... really poor conditions... to make it all work. So, I feel like there’s a set of incentives that drives illegal behaviour”. Additionally, KI-10 highlighted that, in some cases, “the sustainability framing has sort of fallen by the wayside”, and now “it’s really about security, maritime crime economics, great power competition”. Thus, based on many of the semi-structured interview discussions, in today’s context, IUU fishing has emerged beyond stealing fish to encompass a complex, interconnected and multidisciplinary issue with variable socio-economic and political linkages that require consideration.

3.2.3. The applicability of IUU fishing as a clear-cut illegal activity is universal across scales

Throughout the semi-structured interviews, there was a focus on the interchangeable use and conflation of illegal fishing and IUU fishing by the public, practitioners, government, and academics, which often neglects the interconnectivity and nuances inherent in IUU fishing activity (Table 1, Misconception 3, KI-1, KI-5, KI-8, KI-9). As described within 1.3, much discourse exists regarding the illegality of the unreported and unregulated fishing components. However, regardless, KIs highlighted

that the blanket use of the term and overemphasis on illegal fishing activity could result in a limited focus on other, potentially more detrimental management issues. “This focus on illegal... if we continue to do that, we will not effectively manage fisheries because... we won’t get at the other parts of the definition, we won’t get at the root causes of the problem, and we won’t even effectively address other stressors on fisheries that are part of this big picture” (KI-10). Notably, in certain instances throughout the interviews, the unreported and unregulated fishing components were also often recognised as potentially more harmful and detrimental than their illegal fishing counterpart (Supplementary Material, Part B, Table 3).

As a result, KIs noted the importance of distinguishing among the three components, with K-5 stating that “what I’m advocating is that people should be clear about what they mean when they use IUU fishing” and KI-7 noting that they think it is a matter of “being precise” about “which part of it you’re talking about”, acknowledging that it can result in a “whole suite of responses”. KI-6 also recognised the importance of this precision, while KI-9 stated that “I think the usage is important”, mentioning that “people in the space... need to be much more aware of and judicious with the term or the definitions of each of the components of it than they are right now” and noting that “that would help in terms of some of the dialogues and understanding where to go on it”.

Additionally, it was highlighted that the overemphasis on the binary nature of legality/illegality disregards the diversity of fisheries, the communities in which they operate, and the variable motivations of fishers (similar to 3.1, Table 2, Implication 3, KI-1, KI-4, KI-8, KI-10). This results in legal consequences (administrative or criminal; [37]) and regulatory enforcement that neglect the underlying drivers of certain activities. In such instances, KI-3 recognised the importance of acknowledging that “there isn’t a choice for a lot of people in the small-scale sector”, highlighting the concept of “IUU by necessity”.

3.2.4. IUU fishing is the sole driver of unsustainable fisheries

While IUU fishing is undoubtedly a pressing problem requiring management response, KIs highlighted that it is not the sole issue facing our fisheries (Table 1, Misconception 4, KI-1, KI-9). Problems of unsustainable and inequitable fisheries go beyond IUU fishing. While KI-8 noted they believe that overfishing is understood to be a problem, they emphasised that “again, overfishing is not illegal. There’s a whole bunch... bearing on fully regulated fisheries. It’s just because they haven’t been managed effectively”. Moreover, KI-8 also highlighted that, to them, “it’s a fisheries management design problem and a cooperation problem, accountability, transparency problem - none of which are IUU”. Aside from environmental sustainability, KI-1 also recognised the flaws in legal and regulated fisheries in human exploitation, highlighting that “normal fishing can exploit people quite badly”. As such, KI-9 highlighted the importance of “building connectivity” and “understanding that these things - whether it’s, you know, climate change and illegal fishing and other things - are not sitting there as isolated issues - that they have real connectivity and impact on each other, both positive and...negative”.

3.3. Management insights

When discussing ways to tackle IUU fishing and broader fisheries management issues, KIs provided recommendations, including capacity building, co-management and stakeholder engagement, framework improvement, cooperation, information sharing, transparency, and technology (Supplementary Material, Part B, Table 4). However, one consistent theme was the need to understand and combat the problem(s) on a relevant spatiotemporal scale and case-by-case basis, depending on the context in which one works. “There was a study of studies conducted by the FAO... basically said you can’t do a global study... because the assumptions were heroic” (KI-1). KI-8 mentioned that while they do not think the “terminology is irrelevant”, they believe it is more “at that sort of abstract level - where the applied practical, how do we respond to this problem and what is actually the problem, is a regional level discussion”. This

aligned with the perception of KI-4, who, although recognising the text of the FAO's IPOA-IUU, stated that on a practical level, "you have to start looking at what makes sense in the context of management or the context of the fishery that you're working". KI-9 remarked that they think "it's very important that solutions, you know, while learning from other regions and so on, are tailored to the national, the regional and the very local context", noting that there is "no silver bullet". KI-6 reaffirmed this idea by stating, "I think it's probably the fisher has a more accurate representation of what the issues actually are because, they're, you know, they see it... I think as you get farther away... it becomes this, sort of, more amorphous type of thing".

Root cause analysis and risk assessment were two approaches that were highlighted as ways to achieve clarity and precision within the appropriate context. Root cause analysis would help us "stop playing whack-a-mole at sea" (KI-10), while risk assessment could fine-tune responses. Therefore, "once you have figured out what the main forms and big issues are, then you go for those" (KI-5). "You need to do the risk assessment to understand the main fleet types that you think are most problematic", the "main types of regulations" that are being broken, the "seasonal issues", and once you "understand who the players are, what they're doing... where it's taking place, and when it's taking place" (KI-2), then you can begin to target problematic fishing with the available resources.

4. Discussion

In this study, we have attempted to contribute to the discourse on IUU fishing by gaining expert insights into its application and the potential consequences of any misconceptions. Through KI semi-structured interviews, we have identified variability in use across the geographic and institutional contexts in which the term's user sits. Overall, we identified four broad misconceptions that emerged from the interviews: 1) only large-scale industrial fishing fleets partake in illegal, unreported, and unregulated fishing activity; 2) the drivers and consequences of IUU fishing are restricted to stealing fish; 3) the applicability of IUU fishing as a clear-cut illegal activity is universal across scales; and 4) IUU fishing is the sole driver of unsustainable fisheries.

In the 1990s, persistent legal and regulatory gaps existed on the high seas. For example, longline fisheries operating within the Southern Ocean caught four times the regulated catch [1]. As a product of its time, the conception of IUU fishing emerged from within a large-scale RFMO-focused context [12,47,51]. Although it is challenging to operationalise the term beyond this context [54,55], it has arguably been stretched to apply to many fisheries for which it is not appropriate or useful. This application across diverse spatiotemporal scales often results in non-nuanced management approaches, which are often ineffective and inequitable. Nevertheless, while the definition presented within the IPOA-IUU may be inappropriate in various contexts, IUU fishing, in whatever form it takes, does require attention, as do the socio-economic and socio-ecological interdependencies that may lead to and result from such activities.

Today, SSFs are responsible for approximately 40 % of total global capture fisheries production and employ an estimated 60.2 million people globally (90 % of the world's capture fishing industry), with approximately 492 million people depending on them for their livelihood to some degree [30]. They, therefore, play a prominent role in the global fisheries industry. Approximately 97 % of SSFs are in developing countries [35]. These fisheries are based on diverse values, face unique challenges, and operate in various regulatory frameworks [44,52,54]. While global fisheries data regarding SSFs have limitations, overfishing (legal and illegal) and the direct or incidental take of vulnerable species in (regulated and unregulated) fisheries have been well documented in different parts of the world (e.g., [6,16,34]). Concerns with unreported fishing have also been highlighted, with, for example, Temple et al. [56] estimating that in 2016, SSFs within the Southwest Indian Ocean were responsible for catching approximately 2.48 million sharks annually - 72.6 % more than what was reported. Therefore, the implications of SSFs for fish stocks and marine biodiversity are significant, yet they are

often inappropriately managed, and the unique socio-ecological systems in which they operate are often neglected [11,43,68].

Moreover, recognition of the interconnected socio-economic implications of IUU fishing (as well as legal and regulated fishing) has been growing (e.g., [2,69,72]). In recent years, there has been more awareness of the links to other sectors, such as human, drug, and arms trafficking, and poor labour conditions, and the broader concept of fisheries crime has been coined. This raises awareness of the various crimes related to IUU fishing across the fisheries value chain. Integrating IUU fishing into fisheries crime is not ideal, however, as it eclipses distinct issues with varying degrees of severity. For example, fishing in a protected area or with prohibited gear is very different to issues of slave labour and drug trafficking. Moreover, it obscures appropriate management approaches and reinforces the predominant focus on illegal fishing [45]. Recognition of the benefits of regulatory pluralism could prove helpful [39]. Thus, Urbina [66] has suggested it would be beneficial to recognise discrete yet interrelated activities: 1) "illegal fishing" (e.g., the act of fishing in contravention of fishing regulations); 2) "illicit fisheries-related crime" (e.g., fraud, corruption, labour exploitation); and 3) "crimes committed in the context of the fisheries sector" (e.g., transnational organised crime).

The IPOA-IUU was designed to address a specific set of gaps in high seas fisheries at the turn of the century [12,23]. Its limitations, therefore, require recognition and acknowledgement. In particular, over the last twenty-five years, there has been increased attention to balancing social, economic, and environmental considerations in fisheries management (e.g., [3,14]). Therefore, adaptive interventions could use the flexible elements presented in the IPOA-IUU and broader fisheries management frameworks to address these additional concerns - for example, the FAO's 2003 Technical Guidelines on the Ecosystem Approach to Fisheries [32] and the more recent 2015 Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries [25]. These documents aim to guide how best to balance diverse interests and address the interrelated human elements of fisheries management, including IUU fishing.

4.1. Reconceptualising IUU fishing: A way forward

Our results correspond to previous studies highlighting gaps related to the socio-complexities of marine species management (e.g., [7]). As such, the deconstruction, reconceptualisation and reframing of terminology and concepts have been frequently documented in the social and natural sciences to move away from preconceived notions and stereotypes (e.g., [67,70,71]). A change in perception can enable a more comprehensive understanding of the issue(s) and potentially prompt more holistic conservation interventions [49]. Therefore, we support moving away from the current high-level interpretation of IUU fishing and recommend caution when implementing an overarching international, regional, and national policy to address IUU fishing in a catch-all or silver-bullet way.

To overcome the drawbacks that emerge from a reductionist interpretation of the IPOA-IUU, we suggest the term IUU fishing be used sparingly, instead focusing on understanding and defining the specific problem - illegal fishing, unreported fishing, or unregulated fishing - independently and in a context-specific way [58]. A problem-oriented approach ([33]; Fig. 1) could help develop a targeted and holistic understanding, which can inform practical and nuanced management approaches across relevant spatiotemporal scales. Because the specific issues become a "more amorphous type of thing" as you "get farther away" (KI-6), this "judicious" (KI-9) approach could foster a more appropriate conceptualisation of the issue(s) at hand and enable locally relevant interventions that recognise the unique ecological, economic, political, and social drivers at play. In line with root cause analysis and risk assessment, a problem-oriented approach involves identifying and targeting the underlying drivers that foster behaviour based on an appropriate contextual understanding [5]. It seeks to move from a macro-level to a micro-level conception, promoting stakeholder engagement

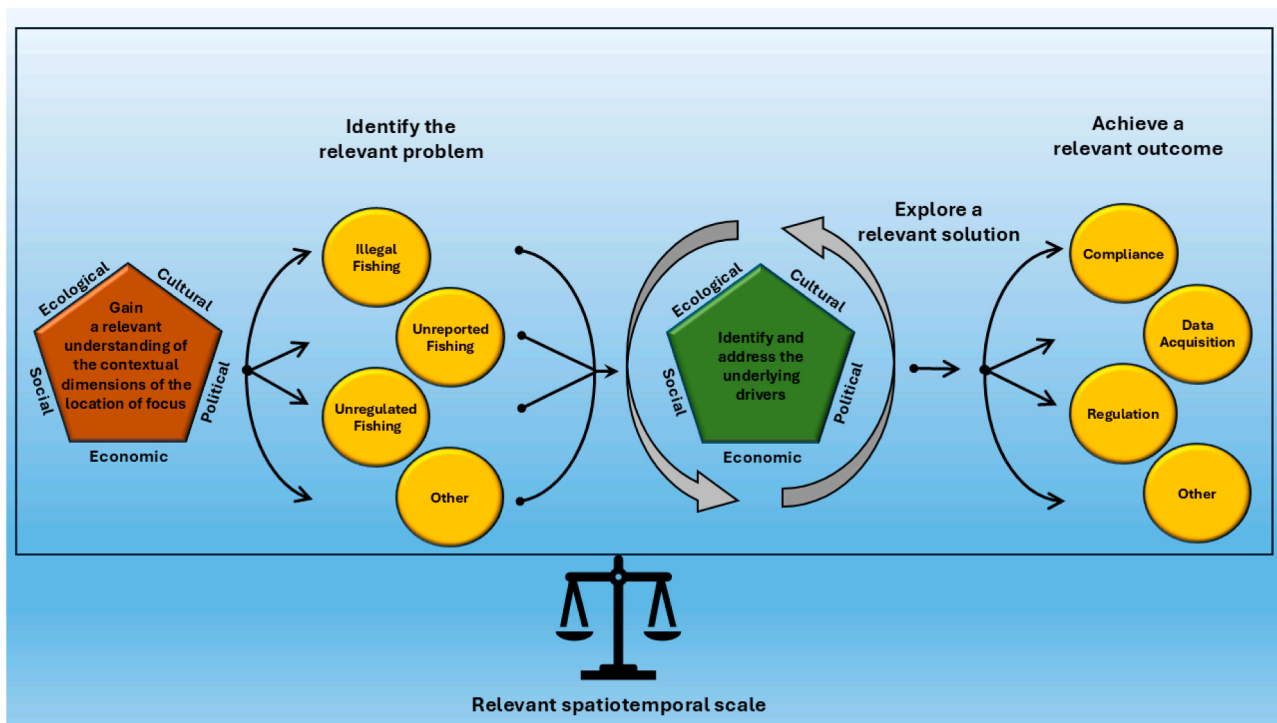


Fig. 1. A problem-oriented approach to IUU fishing and broader fisheries management concerns.

through context-specific grassroots initiatives and interventions beyond law enforcement and the penal system. As such, it focuses on understanding and eliminating the driving forces influencing behaviour [38]. This approach could, therefore, refute the four previously identified misconceptions by: 1) enabling a proper identification of the specific fishery of concern; 2) recognising the external contexts in which the fishery of concern is operating; 3) pinpointing the specific fishing activity or interconnected activities of concern; and 4) acknowledging other socio-ecological and socio-economic implications that require adaptive solutions. This would allow for the exploration of distinct interventions that address the underlying drivers of fisheries decline and enable a more engaged approach to fostering compliance, acquiring data, implementing regulation, or developing any other measure required to achieve sustainable and equitable fisheries.

4.2. Study limitations

We acknowledge several limitations within the methodology. The small sample size and recruitment technique (snowball sampling) may have resulted in selection bias and a sample that may not fully reflect the broader population. While our participants worked in various regions globally, we had no representation from individuals residing in Africa or Central and South America. Moreover, most of our participants were of a Caucasian background, with English as their first language. To minimise these biases, we ensured that initial recruitment strategies cross-cut diverse groups and backgrounds encompassing a wide range of industry outlooks and opinions. Moreover, while our participants did not represent the full range of stakeholder groups, multiple participants cross-cut groups throughout their careers.

It is also essential to highlight the inherent subjectivity in qualitative research approaches, such as thematic analysis. The initial coding was informed directly from the semi-structured interview questions to reduce this subjectivity. Highlighted misconceptions were drawn from direct statements and evidence-based analysis, while the iterative coding process enabled refinement of the supporting text. These limitations should be considered when interpreting the presented findings. We hope that future research will continue triangulating the themes drawn from

this study through scholarly literature and on-the-ground fieldwork.

5. Conclusion

Through semi-structured interviews, this study sought to identify the implications of an abstract and macro-level conceptualisation of IUU fishing and its impact on sustainable fisheries. Illegal, unreported, and unregulated fishing are three distinct and dynamic components, dependent upon time and space and the socio-complex contexts in which they occur, with implications well beyond fishing. Therefore, there is a need to understand these distinct issues independently through a problem-oriented approach and reconceptualise the term on a relevant spatiotemporal scale. Reframing the narrative from this perspective may enable the integration of previously overlooked nuances, encouraging a more holistic approach that recognises fisheries management's dynamic and interdisciplinary nature.

CRediT authorship contribution statement

Rodrigo Oyanedel: Writing – review & editing, Supervision, Conceptualization. **Brittany Anne Bartlett:** Writing – original draft, Methodology, Formal analysis, Conceptualization. **E.J. Milner-Gulland:** Writing – review & editing, Supervision, Conceptualization. **Hollie Booth:** Writing – review & editing, Supervision, Conceptualization.

Ethics statement

All interviews were approved by the University of Oxford's Central University Research Ethics Committee (reference R91627/RE001, R91627/RE002).

Author contributions

Guided by all co-authors, BB conceptualised, designed, and conducted data collection and analysis. BB drafted the manuscript with substantial input and revisions from all co-authors.

Declaration of Competing Interest

The authors have no competing interests to declare.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.marpol.2025.106784.

Data availability

The data that has been used is confidential.

References

- D.J. Agnew, The illegal and unregulated fishery for toothfish in the Southern Ocean, and the CCAMLR catch documentation scheme, *Mar. Policy* 24 (5) (2000) 361–374, [https://doi.org/10.1016/S0308-597X\(00\)0012-9](https://doi.org/10.1016/S0308-597X(00)0012-9).
- V. Becker-Weinberg, Time to get serious about combating forced labour and human trafficking in fisheries, *Int. J. Mar. Coast. Law* 36 (1) (2021) 88–113, <https://doi.org/10.1163/15718085-BJA10040>.
- N.J. Bennett, Mainstreaming equity and justice in the ocean, *Article 873572*, *Front. Mar. Sci.* 9 (2022), <https://doi.org/10.3389/fmars.2022.873572>.
- H.R. Bernard. *Social research methods: Qualitative and quantitative approaches*, Second ed., SAGE Publications, 2012.
- H. Booth, U. Mardhiah, H. Siregar, J. Hunter, Giyanto, M.I.H. Putra, J. Marlow, A. Cahyana, Boysandi, A.Y.L. Demoor, S. Lewis, D. Adhiasto, L. Adrianto, I. Yulianto, An integrated approach to tackling wildlife crime: impact and lessons learned from the world's largest targeted manta ray fishery, *Conserv. Sci. Pract.* 3 (2) (2021) e314, <https://doi.org/10.1111/csp.2314>.
- H. Booth, G. Powell, I. Yulianto, B. Simeon, Muhsin, L. Adrianto, E.J. Milner-Gulland, Exploring cost-effective management measures for reducing risks to threatened sharks in a problematic longline fishery, *Ocean Coast. Manag.* 225 (2022) 106197, <https://doi.org/10.1016/j.ocecoaman.2022.106197>.
- H. Booth, D. Squires, E. Milner-Gulland, The neglected complexities of shark fisheries, and priorities for holistic risk-based management, *Ocean Coast. Manag.* 182 (2019) 104994, <https://doi.org/10.1016/j.ocecoaman.2019.104994>.
- Braun, V., & Clarke, V. (2012). Thematic analysis. In H. Cooper, P.M. Camic, D.L. Long, A.T. Panter, D. Rindskopf, & K.J. Sher (Eds.), *APA handbook of research methods in psychology: Vol. 2. Research designs: Quantitative, qualitative, neuropsychological, and biological* (pp. 57–71). American Psychological Association. <https://doi.org/10.1037/13620-004>.
- S. Campbell, M. Greenwood, S. Prior, T. Shearer, K. Walkem, S. Young, D. Bywaters, K. Walker, Purposive sampling: complex or simple? Research case examples, *J. Res. Nurs.* 25 (8) (2020) 652–661, <https://doi.org/10.1177/1744987120927206>.
- J. Christensen, Illegal, unreported and unregulated fishing in historical perspective, in: K. Schwerdtner Mániz, B. Poulsen (Eds.), *Perspectives on Oceans Past*, Springer, 2016, pp. 133–153, https://doi.org/10.1007/978-94-017-7496-3_8.
- P.J. Cohen, E.H. Allison, N.L. Andrew, J. Cinner, L.S. Evans, M. Fabinyi, L. R. Garces, S.J. Hall, C.C. Hicks, T.P. Hughes, S. Jentoft, D.J. Mills, R. Masu, E. K. Mbaru, B.D. Ratner, Securing a just space for small-scale fisheries in the blue economy, *Front. Mar. Sci.* 6 (2019) 434657, <https://doi.org/10.3389/fmars.2019.00171>.
- Commission for the Conservation of Antarctic Marine Living Resources, Report of the Sixteenth Meeting of the Scientific Committee (CCAMLR-XVI), CCAMLR, Hobart, Australia, 1997. Retrieved from, (https://www.ccamlr.org/en/system/files/e-sc-xvi_1.pdf).
- Commission for the Conservation of Antarctic Marine Living Resources. 2022. About CCAMLR. Retrieved February 8, 2025, from (<https://www.ccamlr.org/en/or-organisation>).
- K.M. Crosman, E.H. Allison, Y. Ota, A.M. Cisneros-Montemayor, G.G. Singh, W. Swartz, M. Bailey, K.M. Barclay, G. Blume, M. Colléter, M. Fabinyi, E. M. Faustman, R. Fielding, P.J. Griffin, Q. Hanich, H. Harden-Davies, R.P. Kelly, T. A. Kenny, T. Klinger, A.K. Spalding, Social equity is key to sustainable ocean governance, *Npj Ocean Sustain.* 1 (4) (2022), <https://doi.org/10.1038/s44183-022-00001-7>.
- E. de Lange, E. Woodhouse, E.J. Milner-Gulland, Approaches used to evaluate the social impacts of protected areas, *Conserv. Lett.* 9 (5) (2016) 327–333, <https://doi.org/10.1111/conl.12223>.
- P.D. Doherty, J. Alfaro-Shigueto, D.J. Hodgson, J.C. Mangel, M.J. Witt, B. J. Godley, Big catch, little sharks: insight into Peruvian small-scale longline fisheries, *Ecol. Evol.* 4 (12) (2014) 2375–2383, <https://doi.org/10.1002/eec3.1104>.
- W. Edeson, The International plan of action on illegal, unreported and unregulated fishing: the legal context of a non-legally binding instrument, *Int. J. Mar. Coast. Law* 16 (4) (2001) 603–623, <https://doi.org/10.1163/157180801X00243>.
- European Commission. n.d. Regional fisheries management organisations (RFMOs). Retrieved February 8, 2025, from (https://oceans-and-fisheries.ec.europa.eu/fisheries/international-agreements/regional-fisheries-management-organisations-rfmos_en).
- Food and Agriculture Organization of the United Nations, Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, FAO, 1993. <https://faolex.fao.org/treaty/docs/tre00023E.pdf>.
- Food and Agriculture Organization of the United Nations, Code of Conduct for Responsible Fisheries, FAO, 1995. <https://www.fao.org/4/v9878e/v9878e00.htm>.
- Food and Agriculture Organization of the United Nations. (1999a). International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries; International Plan of Action for the Conservation and Management of Sharks; International Plan of Action for the Management of Fishing Capacity. FAO. (<http://openknowledge.fao.org/server/api/core/bitstreams/3972a5a1-cd13-409f-b90f-d06d11b96697/content>).
- Food and Agriculture Organization of the United Nations. (1999b). Report of the Twenty-third Session of the Committee on Fisheries: Rome, Italy, 15 – 19 February 1999 (FAO Fisheries Report. No. 595). FAO. (<https://openknowledge.fao.org/server/api/core/bitstreams/dc887d53-e99b-4c46-a052-6561dbf9391f/content/x2930e.htm>).
- Food and Agriculture Organization of the United Nations. (2001a). International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing. FAO. (<https://openknowledge.fao.org/server/api/core/bitstreams/a80c3bfb-1d5b-4ee6-9c85-54b7e83986a2/content>).
- Food and Agriculture Organization of the United Nations. (2001b). *Report of the Second Technical Consultation on Illegal, Unreported and Unregulated Fishing: Rome, Italy, 22 – 23 February 2001* (FAO Fisheries Report No. 646). FAO. (<https://www.fao.org/4/Y0772E/Y0772E.htm#:~:text=The%20Second%20Technical%20Consultation%20on%20Illegal%2C%20Unreported%20and,one%20non-Member%20Nation%20of%20FAO%20attended%20the%20Consultation>).
- Food and Agriculture Organization of the United Nations, Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication, FAO, 2015. (<https://openknowledge.fao.org/handle/20.500.14283/14356en>).
- Food and Agriculture Organization of the United Nations, Voluntary Guidelines for Flag State Performance, FAO, 2015. (<https://openknowledge.fao.org/items/73719804-5e8b-4e55-afaf-f769eef01f9e>).
- Food and Agriculture Organization of the United Nations, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. Food and Agriculture Organisation of the United Nations, FAO, 2016. (<http://openknowledge.fao.org/server/api/core/bitstreams/515b81dc-ad65-41c9-a-b02-6ff081103cc3/content>).
- Food and Agriculture Organization of the United Nations. (2024). The state of world fisheries and aquaculture 2024 - Blue transformation in action. Rome. <https://doi.org/10.4060/cd0683en>.
- Food and Agriculture Organization of the United Nations. (2025). FAOLEX database. Retrieved February 21, 2025, from (<https://www.fao.org/faolex>).
- Food and Agriculture Organization of the United Nations, Duke University, & WorldFish. (2023). Illuminating hidden harvests: The contributions of small-scale fisheries to sustainable development - Executive summary. Rome. <https://doi.org/10.4060/cc6062en>.
- Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, & World Health Organization. (2024). The state of food security and nutrition in the world 2024 - Financing to end hunger, food insecurity and malnutrition in all its forms. Rome. <https://doi.org/10.4060/cd1254en>.
- S.M. Garcia, A. Zerbi, C. Aliaume, T. Do Chi, G. Lasserre, The ecosystem approach to fisheries: Issues, terminology, principles, institutional foundations, implementation and outlook, FAO Fisheries Technical Paper No. 443, Food and Agriculture Organizations of the United Nations (FAO), 2003, (<https://www.fao.org/4/Y4773E/y4773e00.htm>). FAO Fisheries Technical Paper No. 443.
- H. Goldstein, Improving policing: a problem-oriented approach, *Crime. Delinquency* 25 (2) (1979) 236–258, <https://doi.org/10.1177/001112877902500207>.
- A.B. Haque, R.D. Cavanagh, N. Seddon, Evaluating artisanal fishing of globally threatened sharks and rays in the Bay of Bengal, Bangladesh, *PLOS ONE* 16 (9) (2021) e0256146, <https://doi.org/10.1371/journal.pone.0256146>.
- International Bank for Reconstruction and Development. (2012). Hidden harvest: The global contribution of capture fisheries (Report No. 66469-GLB). (<http://hdl.handle.net/10986/11873>).
- C. Keating-Bitonti, M.C. Weed, Implementing agreements under the United Nations Convention on the Law of the Sea (UNCLOS) (CRS Report No. IF12578), Congressional Research Service, 2024, (<https://crsreports.congress.gov/product/pdf/IF/IF12578>) (CRS Report No. IF12578).
- B. Kuemlangan, E.-R. Amidjogbe, J. Nakamura, A. Tomassi, R. Hupperts, B. Bojang, T. Amador, Enforcement approaches against illegal fishing in national fisheries legislation, *Mar. Policy* 149 (2023) 105514, <https://doi.org/10.1016/j.marpol.2023.105514>.
- A.M. Lemieux, R.S.A. Pickles, Problem-oriented wildlife protection, Center for Problem-Oriented Policing, Arizona State University, 2020. (https://popcenter.asu.edu/sites/default/files/problem-oriented_wildlife_protection_lemieux_pickles_2020.pdf).

- [39] J. Lindley, E.J. Techera, Overcoming complexity in illegal, unregulated and unreported fishing to achieve effective regulatory pluralism, *Mar. Policy* 81 (2017) 71–79, <https://doi.org/10.1016/j.marpol.2017.03.010>.
- [40] J. Lyons-White, A.T. Knight, Palm oil supply chain complexity impedes implementation of corporate no-deforestation commitments, *Glob. Environ. Change* 50 (2018) 303–313, <https://doi.org/10.1016/j.gloenvcha.2018.04.012>.
- [41] D. Magaldi, M. Berler, Semi-structured interviews, in: V. Zeigler-Hill, T. K. Shackelford (Eds.), *Encyclopedia of personality and individual differences*, Springer, 2020, pp. 4825–4830, https://doi.org/10.1007/978-3-319-24612-3_857.
- [42] Microsoft Corporation. (2024). Transcribe. Microsoft 365 MSO (Version 2501 Build 16.0.18429.20132) [Computer software]. (<https://www.microsoft.com>).
- [43] L. Nahuelhual, T. Vallejos, G. Campos, X. Vergara, S. Gelcich, R. Estévez, Reframing illegal fishing in small-scale fisheries as a wicked problem, *Fish Fish* 24 (3) (2023) 504–521, <https://doi.org/10.1111/faf.12741>.
- [44] R. Oyanedel, S. Gelcich, E.J. Milner-Gulland, Motivations for (non-)compliance with conservation rules by small-scale resource users, *Conserv. Lett.* 13 (5) (2020) e12725, <https://doi.org/10.1111/conl.12725>.
- [45] K.Y. Page, A.J. Ortiz, What's in a name: the importance of distinguishing between "fisheries crime" and IUU Fishing, in: M.H. Nordquist, J.N. Moore, R. Long (Eds.), *Cooperation and engagement in the Asia-Pacific region*, 23, Brill Nijhoff, 2020, pp. 433–440, https://doi.org/10.1163/9789004412026_023.
- [46] L.A. Palinkas, S.M. Horwitz, C.A. Green, J.P. Wisdom, N. Duan, K. Hoagwood, Purposeful sampling for qualitative data collection and analysis in mixed method implementation research, *Adm. Policy Ment. Health Ment. Health Serv. Res.* 42 (5) (2015) 533–544, <https://doi.org/10.1007/s10488-013-0528-y>.
- [47] M.A. Palma, M. Tsamenyi, W.R. Edeson, *History and scope of IUU Fishing. Promoting sustainable fisheries: The international legal and policy framework to combat illegal, unreported and unregulated fishing*, Martinus Nijhoff Publishers, 2010, pp. 25–53.
- [48] QSR International Pty Ltd. (2023). NVivo (Version 14) [Computer software]. (<https://lumivero.com/products/nvivo/>).
- [49] C. Roberts, C. Béné, N. Bennett, J.S. Boon, W.W.L. Cheung, P. Cury, O. Defeo, G. De Jong Cleynndert, R. Froese, D. Gascuel, C.D. Golden, J. Hawkins, A.J. Hobday, J. Jacquet, P. Kemp, M.E. Lam, F. Le Manach, J.J. Meeuwig, F. Micheli, B. C. O'Leary, Rethinking sustainability of marine fisheries for a fast-changing planet, *Npj Ocean Sustain.* 3 (41) (2024), <https://doi.org/10.1038/s44183-024-00078-2>.
- [50] M. Rosello, Cooperation and unregulated fishing: interactions between customary international law, and the European Union IUU fishing regulation, *Mar. Policy* 84 (2017) 306–312, <https://doi.org/10.1016/j.marpol.2017.06.030>.
- [51] M. Rosello, Origins and meaning of IUU fishing. IUU fishing as a flag state accountability paradigm: Between effectiveness and legitimacy, *Brill Nijhoff*, 2021, pp. 9–28, https://doi.org/10.1163/9789004463219_003.
- [52] Ruddle, K., & Satria, A. (Eds.). (2010). *Managing coastal and inland waters: Pre-existing aquatic management systems in Southeast Asia*. Springer. <https://doi.org/10.1007/978-90-481-9555-8>.
- [53] A. Serdy, Simplistic or surreptitious? Beyond the flawed concept(s) of IUU fishing, in: In: W.W. Taylor, A.J. Lynch, M.G. Schechter (Eds.), *Sustainable fisheries: Multi-level approaches to a global problem*, American Fisheries Society, 2011, pp. 253–279. (<https://fisheries.org/docs/books/55064P/11.pdf>).
- [54] A.M. Song, J. Scholtens, K. Barclay, S.R. Bush, M. Fabinyi, D.S. Adhuri, M. Houghton, Collateral damage? Small-scale fisheries in the global fight against IUU fishing, *Fish Fish* 21 (4) (2020) 831–843, <https://doi.org/10.1111/faf.12462>.
- [55] A.J. Temple, D.J. Skerritt, P.E.C. Howarth, J. Pearce, S.C. Mangi, Illegal, unregulated and unreported fishing impacts: a systematic review of evidence and proposed future agenda, *Mar. Policy* 139 (2022) 105033, <https://doi.org/10.1016/j.marpol.2022.105033>.
- [56] A.J. Temple, N. Wambiji, C.N. Poonian, N. Jiddawi, S.M. Stead, J.J. Kiszka, P. Berggren, Marine megafauna catch in southwestern Indian Ocean small-scale fisheries from landings data, *Biol. Conserv.* 230 (2019) 113–121, <https://doi.org/10.1016/j.biocon.2018.12.024>.
- [57] J.T. Theilen, What's in a name? The illegality of illegal, unreported and unregulated fishing, *Int. J. Mar. Coast. Law* 28 (3) (2013) 533–550, <https://doi.org/10.1163/15718085-12341284>.
- [58] Tsamenyi, M., Kuemlangan, B., & Camilleri, M. (2015). Defining illegal, unreported and unregulated (IUU) Fishing. In Report of the Expert Workshop to Estimate the Magnitude of Illegal, Unreported and Unregulated Fishing Globally, 2 – 4 February 2015, Rome, Italy (FAO Fisheries and Aquaculture Report No. 1106, pp. 24 – 35). Food and Agriculture Organization of the United Nations. <https://openknowledge.fao.org/server/api/core/bitstreams/d4db21d4-9b3a-4d7c-bbaf-b21e4b1d4dae/content>.
- [59] United Nations, Vienna Convention on the Law of Treaties, 1155, United Nations Treaty Series, 1969. (<https://treaties.un.org/doc/Publication/UNTS/Volume%201155/v1155.pdf>).
- [60] United Nations, United Nations Convention on the Law of the Sea, 1833, United Nations Treaty Series, 1982. (<https://treaties.un.org/doc/Publication/UNTS/Volume%201833/v1833.pdf>).
- [61] United Nations, Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, United Nations Treaty Series, 1994, p. 1836. (<https://treaties.un.org/doc/Publication/UNTS/Volume%201836/volume-1836-I-31364-English.pdf>).
- [62] United Nations, Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 2167, United Nations Treaty Series, 1995. (<https://treaties.un.org/doc/PuBlication/UNTS/Volume%202167/v2167.pdf>).
- [63] United Nations, Agreement Under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, 2023. (<https://www.un.org/bbnjagreement/sites/default/files/2024-08/Text%20of%20the%20Agreement%20in%20English.pdf>).
- [64] United Nations General Assembly. (1999). Oceans and the law of the sea: Report of the Secretary General (A/54/429). Fifty-fourth session, agenda items 40 (a) and (c), Oceans and the law of the sea: Law of the sea; Results of the review by the Commission on Sustainable Development of the Sectoral Theme of "Oceans and Seas." United Nations. (<https://digitallibrary.un.org/record/319707?v=pdf>).
- [65] United Nations General Assembly. (2015). Transforming our world: The 2030 Agenda for Sustainable Development (A/RES/70/1). Seventieth session, agenda items 15 and 116, Resolution adopted by the General Assembly on 25 September 2015. United Nations. (<https://undocs.org/A/RES/70/1>).
- [66] J.J. Urbina, Towards an international legal definition of the notion of fisheries crime, *Mar. Policy* 144 (2022) 105214, <https://doi.org/10.1016/j.marpol.2022.105214>.
- [67] K.A. Waylen, A. Fischer, P.J.K. McGowan, E.J. Milner-Gulland, Deconstructing community for conservation: why simple assumptions are not sufficient, *Hum. Ecol.* 41 (4) (2013) 575–585, <https://doi.org/10.1007/s10745-013-9594-8>.
- [68] N. Weeratunge, C. Béné, R. Sirirwardane, A. Charles, D. Johnson, E.H. Allison, P. K. Nayak, C. Badjeck, Small-scale fisheries through the wellbeing lens, *Fish Fish* 15 (2) (2014) 255–279, <https://doi.org/10.1111/faf.12016>.
- [69] S. Willis, E. Holliday, Triggering death: Quantifying the true human cost of global fishing, FISH Safety Foundation, 2022. (<https://fishsafety.org/wp-content/uploads/2024/02/White-Paper-Triggering-Death-November-2022.pdf>).
- [70] R.M. Wise, I. Fazey, M. Stafford Smith, S.E. Park, H.C. Eakin, E.R.M. Archer Van Garderen, B. Campbell, Reconceptualising adaptation to climate change as part of pathways of change and response, *Glob. Environ. Change* 28 (2014) 325–336, <https://doi.org/10.1016/j.gloenvcha.2013.12.002>.
- [71] J.H. Wright, N.A.O. Hill, D. Roe, J.M. Rowcliffe, N.F. Kumpel, M. Day, F. Booker, E. J. Milner-Gulland, Reframing the concept of alternative livelihoods, *Conserv. Biol.* 30 (1) (2016) 7–13, <https://doi.org/10.1111/cobi.12607>.
- [72] S. Yea, C. Stringer, Caught in a vicious cycle: connecting forced labour and environmental exploitation through a case study of Asia-Pacific, *Mar. Policy* 134 (2021) 104825, <https://doi.org/10.1016/j.marpol.2021.104825>.