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Illegal, Unreported, and Unregulated Fishing as a National Security Threat

Illegal, unreported, and unregulated (IUU) fishing is most often discussed in terms of economic, regulatory, environmental, and food security challenges. IUU fishing certainly touches on each of these areas of concern. But it is also a nontraditional security threat, and one that is underappreciated by most of the policy community in the United States and abroad. This report examines the primary ways in which IUU fishing intersects with national security concerns, how government and nonstate actors are tackling the problem, and areas where more work must be done, including in the largely unregulated high seas beyond national jurisdiction.

What Is IUU Fishing?

IUU fishing encompasses the following activities:

- Illegal fishing refers to the catching of fish and other marine life in waters that fall under the jurisdiction of a coastal state without permission or in violation of that country's laws. It also includes fishing in manners proscribed by international law and in waters under the jurisdiction of a Regional Fisheries Management Organization (RFMO) in violation of that organization's rules.
- Unreported fishing includes catches that are either not reported at all or are misreported to the relevant authorities, either intentionally or not. In either case, unreported fishing undermines coastal state and RFMO efforts to monitor and sustainably manage fisheries.
- Unregulated fishing is legally the most difficult of the three to tackle. It refers to fishing in international waters beyond coastal state jurisdiction and which are not covered by RFMO rules. It also includes activities in waters covered by an RFMO by vessels fishing for species not regulated by the organization's rules, or by vessels without nationality or flying the flag of a country not party to that RFMO and which therefore do not consider themselves bound by the organization's rules.¹

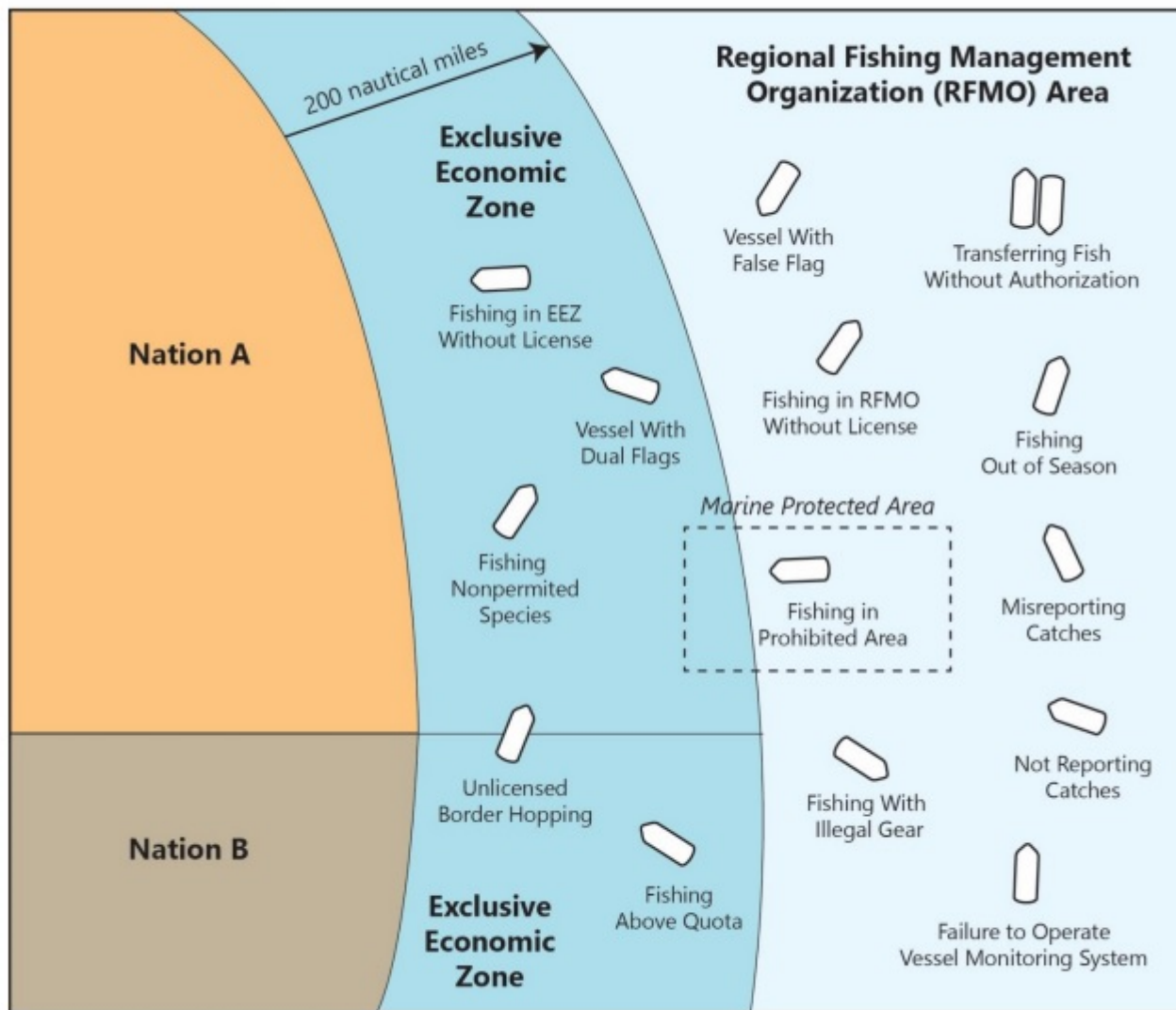
Flag, Coastal, and Port State Responsibilities

Under customary international law and the United Nations Convention on the Law of the Sea (UNCLOS), each country is responsible for keeping a register of the ships that fly its flag and exercising jurisdiction under its domestic law over those ships and their crew regarding "administrative, technical, and social matters."² This includes ensuring the safety of navigation,

¹ Cathy Haenlein, *Below the Surface: How Illegal, Unreported and Unregulated Fishing Threatens Our Security* (London: Royal United Services Institute, 2017), 5–6, https://rusi.org/sites/default/files/201707_rusi_below_the_surface_haenlein.pdf.

² United Nations Convention on the Law of the Sea (UNCLOS), Art. 94 (2), http://www.un.org/depts/los/convention_agreements/texts/unclos/part7.htm.

Common Forms of IUU Fishing



Unregulated fishing may also occur on the high seas, outside of any Exclusive Economic Zone (EEZ) or Regional Fishing Management Organization (RFMO) area.

Source: U.S. National Intelligence Council (NIC), "Global Implications of Illegal, Unreported, and Unregulated (IUU) Fishing," September 19, 2016, 6, https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/NIC_White_Paper_on_IUU_Fishing.pdf.

seaworthiness of the ship, and proper training and labor conditions on board.³ The flag state is in theory the ultimate authority over its ships and should ensure that they operate according to both domestic and international law. Unfortunately, many countries lack the capacity or will to effectively carry out their flag state duties. This explains the phenomenon of "flags of convenience," whereby fishing vessels register with one of 35 flag states known to have lax standards or poor

³ Ibid., Art. 94 (2)–(6).

enforcement capacity to avoid scrutiny.⁴ IUU fishermen will often switch registrations from one flag of convenience to another to hide their history of illicit activities.

UNCLOS grants countries the right to regulate fishing activities within their exclusive economic zones (EEZ), which stretch 200 nautical miles from the coast (barring overlaps with the EEZs of neighbors). Within its EEZ, a coastal state can license foreign fishing vessels to operate, regulate catch limits and types of fishing allowed, establish and enforce marine protected areas, insist on the installation of vessel monitoring systems (VMS), and board, inspect, and arrest vessels as necessary. Regulation of the EEZ is an important source of revenue for many coastal states, which can collect license and other fees from foreign fishing fleets. This is especially true for small island-developing states and others with relatively small tax bases but significant social spending and development needs.

The port state also plays a significant role in combating IUU fishing. This refers to the country in which fishing vessels enter port to offload catches or simply to refuel and resupply. Countries have the right to board and inspect vessels coming into their ports, and can regulate the offloading and transfer of cargo. States also have a responsibility to enforce relevant international conventions, including those that pertain to IUU fishing and correlated activities like human trafficking and smuggling. This responsibility has been strengthened with the entry into force of the Port State Measures Agreement (PSMA), which obligates parties to undertake specific measures to combat IUU fishing.

Regional Fisheries Management Organizations

Combating IUU fishing in the EEZ is the shared responsibility of the flag, coastal, and port states. Beyond the EEZ, in international waters, matters are trickier. In many of these waters, RFMOs take the place of coastal states in regulating fishing. RFMOs are international organizations that are set up by states to coordinate access to mutual fishing resources. An RFMO may regulate all fishing in a certain geographic area—for example, the Northwest Atlantic Fisheries Organization or the Convention on Conservation of Antarctic Marine Living Resources—or set rules only on specific, highly migratory species, especially the different species of tuna. The following diagram of RFMO areas of responsibility shows a collection of the two different types and their areas of overlap.

An RFMO typically employs a committee of experts to assess scientific data on the fishery of interest. The scientists use that data to determine a level of fishing that balances the commercial concerns of member states with the health of the fishing stock in the interests of keeping fishing to a sustainable level. The recommendations an RFMO's scientists make are brought to the organization at large, and adopted or rejected through a consensual agreement or a vote. These then serve as operational and regulatory guidelines for the member nations until the next set of recommendations.

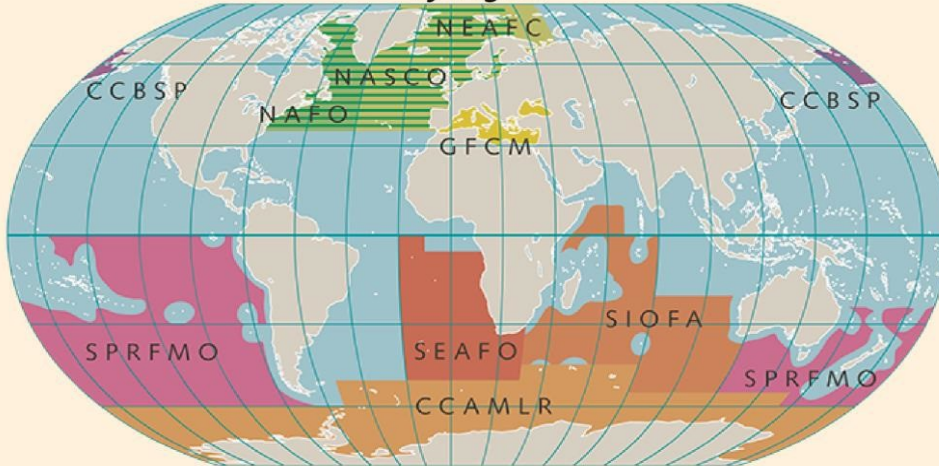
But because membership in RFMOs is voluntary and their regulations are not binding even on members, they can be seen as toothless. Partly because of the vulnerability of some states to pressure and outright corruption stemming from industrial fishing interests, two-thirds of stocks

⁴ ITF Seafarers, International Transport Worker's Federation, "Current Registries Listed as FOCs," accessed October 15, 2017, <http://www.itfseafarers.org/foc-registries.cfm>.

Regional Fisheries Management Organizations (RFMOs)

A regional fisheries management organization (RFMO) is an international organization formed by countries with fishing interests in an area. Some manage all fish stocks in a specific area, while others focus only on highly-migratory species, particularly tuna. Membership is voluntary and countries are not bound by the decisions of an RFMO to which they do not belong.

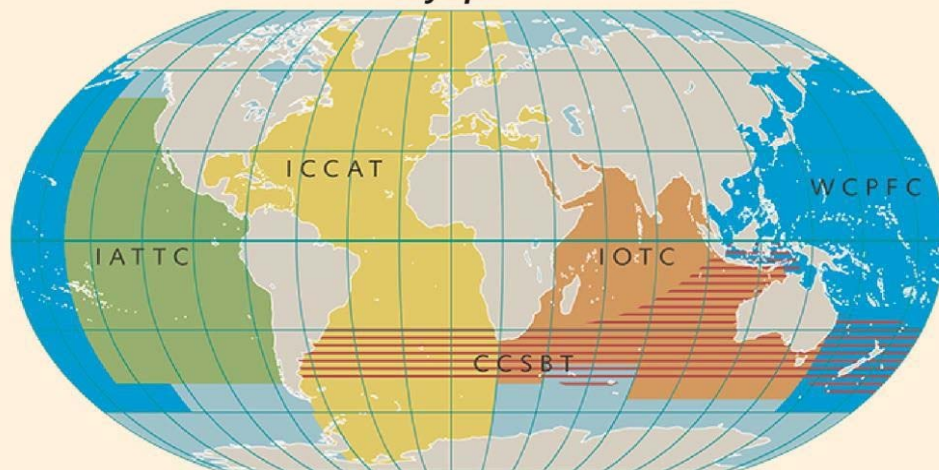
By Region



Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
 Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (CCBSP)
 General Fisheries Commission for the Mediterranean (GFCM)
 North Atlantic Salmon Conservation Organization (NASCO)

North East Atlantic Fisheries Commission (NEAFC)
 Northwest Atlantic Fisheries Organization (NAFO)
 South East Atlantic Fisheries Organization (SEAFO)
 South Indian Ocean Fisheries Agreement (SIOFA)
 South Pacific Regional Fisheries Management Organization (SPRFMO)

By Species



Agreement on the International Dolphin Conservation Program (AIDCP)
 Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

Indian Ocean Tuna Commission (IOTC)
 Inter-American Tropical Tuna Commission (IATTC)
 International Commission for the Conservation of Atlantic Tunas (ICCAT)
 Western and Central Pacific Fisheries Commission (WCPFC)

Source: World Ocean Review, 2013.

Source: World Ocean Review 2, *The Future of Fish: The Fisheries of the Future* (Hamburg: maribus gGmbH, 2013), 66–67, http://worldoceanreview.com/wp-content/downloads/wor2/WOR2_english.pdf.
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fished on the high seas and under RFMO management are either depleted or overexploited.⁵ Nonetheless some RFMOs, such as the South East Atlantic Fisheries Organization and the Commission for the Conservation of Antarctic Marine Living Resources, have been moderately successful. Even in the fisheries where RFMOs have had less impact, they serve as a clearing house for sharing data on fishing sustainability, and help to identify areas where conservation efforts are lacking.

Fishing on the High Seas

While RFMOs have jurisdiction over wide swaths of international waters, much of the high seas beyond coastal state jurisdiction (the EEZ) remain largely “unregulated.” This is true of fishing for species not covered by the species-specific RFMOs and for those international waters that are entirely beyond the jurisdiction of any of the regional bodies. Additionally, ships without nationality and those flying the flag of countries that are not party to an RFMO do not necessarily consider themselves bound by the rules of the organization, making the high seas “unregulated” in their eyes.

In these high seas cases, the flag state and port state maintain responsibility over ships and their activities at various points in the supply chain, but there are few rules to enforce. A notable exception is the UN moratorium on high seas driftnet fishing, which took effect on December 31, 1992, after being unanimously approved by the General Assembly via resolutions 44/225 in 1989, 45/197 in 1990, and 46/215 in 1991.⁶ The U.S. Congress in 1992 enacted the High Seas Driftnet Fisheries Enforcement Act to strengthen implementation of the moratorium on driftnets longer than 2.5 kilometers.⁷ Today the U.S. Coast Guard and Navy cooperate closely with counterparts around the world to enforce the moratorium.

The Food and Agriculture Organization’s Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas lays out obligations for flag states regarding their ships operating in international waters, but to date only 40 countries (including the United States) have acceded to it. Parties to the agreement authorize, and maintain a registry of, vessels allowed to fish on the high seas while flying their flag. They are responsible for ensuring that such ships follow measures, like the high seas driftnet moratorium, for conservation and management of high seas fish stocks. They also agree not to authorize any vessel to fish on the high seas that had previously violated conservation and management measures while flying another state’s flag.⁸

⁵ Sarika Cullis-Suzuki and Daniel Pauly, “Failing the High Seas: A Global Evaluation of Regional Fisheries Management Organizations,” *Marine Policy* 34, Issue 5 (September 2010): 1036–42.

⁶ UN General Assembly A/RES/44/225, Large-scale Pelagic Driftnet Fishing and Its Impact on the Living Marine Resources of the World’s Oceans and Seas, December 22, 1989, <http://www.un.org/documents/ga/res/44/a44r225.htm>; A/RES/45/197, December 21, 1990, <http://www.un.org/documents/ga/res/45/a45r197.htm>; A/RES/46/215, December 20, 1991, <http://www.un.org/documents/ga/res/46/a46r215.htm>.

⁷ U.S. Congress, High Seas Driftnet Fisheries Enforcement Act, November 2, 1992, amended January 12, 2007, <http://legcounsel.house.gov/Comps/High%20Seas%20Driftnet%20Fisheries%20Enforcement%20Act.pdf>.

⁸ Food and Agriculture Organization (FAO), Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, April 24, 2003, <http://www.fao.org/docrep/MEETING/003/X3130m/X3130E00.HTM>.

Table 1. Major UN Agreements Related to IUU Fishing

Agreement	Conclusion	Entry into force	Membership
United Nations Convention on the Law of the Sea	1982	1994	168 ratified
UN Driftnet Moratorium	1989	1992	All
Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas	1993	2003	40 acceded
UN Fish Stocks Agreement ⁹	1995	2001	86 ratified
Port State Measures Agreement	2009	2016	51 acceded ¹⁰

While the high seas beyond RFMO jurisdiction are often overlooked in discussions of IUU fishing (effectively avoiding the “unregulated” part of the problem), overfishing in these waters contributes to the same direct and indirect national security threats as illegal fishing in other areas. The high seas also serve as a refuge for ships engaged in illegal transshipment—the practice whereby a ship engaged in IUU fishing transfers its catch to a large refrigerated cargo vessel, muddling the chain of possession behind a catch. By mixing illegally caught fish in with legal catches far out at sea unobserved, the cargo vessel evades authorities who might prohibit fish caught illegally or in illegal waters. Transshipment also allows ships to avoid catch limits—transferring excess catch to a cargo vessel that will then offload the catch at another port. Indonesia’s minister of marine affairs and fisheries Susi Pudjiastuti—who implemented a ban on transshipment in Indonesian waters shortly after taking office in 2014—underscored the problem during the 2017 Our Ocean Conference in Malta, saying that “The high seas have become almost a duty-free zone for all kinds of illegal activity.”¹¹

⁹ The treaty established a framework for cooperation on the management of stocks that migrate across or straddle multiple national jurisdictions and high seas. Officially the Agreement for the Implementation of the Provisions of the Convention Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, August 4, 1995, http://www.un.org/depts/los/convention_agreements/convention_overview_fish_stocks.htm.

¹⁰ FAO, “Parties to the Port State Measures Agreement,” updated October 18, 2017, <http://www.fao.org/fishery/psm/agreement/parties/en>.

¹¹ Susi Pudjiastuti [Remarks at Our Ocean Conference, Valletta, Malta, October 5, 2017], <http://ec.europa.eu/avservices/video/player.cfm?ref=l144404>.

Global Coverage of Exclusive Economic Zones vs. High Seas



Source: A.D. Rogers, U.R. Sumaila, S.S. Hussain, and C. Baulcomb, *The High Seas and Us: Understanding the Value of High-Sea Ecosystems* (Oxford: Global Ocean Commission, 2016), 5, http://www.oceanunite.org/wp-content/uploads/2016/03/High-Seas-and-Us.FINAL_.FINAL_.high_.spreads.pdf.

Most commercially valuable fish caught in international waters are also harvested within EEZs, meaning that overfishing in the former contributes to revenue loss and food security threats in the latter. Among the 10 most valuable taxa caught globally from 2000 to 2010, the percentage of the global value caught in the high seas ranged from 20 percent for small pelagic fish to 85 percent for bigeye tuna.¹² Some, but far from all, of these valuable species and their high seas habitats are protected by RFMOs.

This not only means that efforts to combat IUU fishing within EEZs and RFMO areas is undercut by unregulated harvesting in the high seas, but that fishing vessels have an incentive to operate beyond national jurisdiction where possible—they can catch commercially valuable fish without sending revenue to coastal states or abiding by restrictions meant to ensure that species are only caught at sustainable levels. This has led some scholars to float the idea of a total closure of the high seas to fishing.¹³ The United Nations is expected to begin negotiations in 2018 on the establishment of marine conservation areas in international waters.¹⁴

¹² U. Rashid Sumaila et al., “Winners and Losers in a World Where the High Seas Is Closed to Fishing,” *Scientific Reports*, February 12, 2015, Table 1.

¹³ Ibid., 1; Crow White and Christopher Costello, “Close the High Seas to Fishing?,” *PLOS Biology* 12, Issue 3 (March 2014): 1.

¹⁴ UN General Assembly, Report of the Preparatory Committee Established by General Assembly Resolution 69/292, July 21, 2017, http://www.un.org/Depts/los/biodiversity/prepcom_files/Procedural_report_of_BBNJ_PrepCom.pdf.

A Direct and Indirect National Security Threat

IUU fishing affects national security in two ways. First, it directly supports illicit networks engaged in the trafficking of narcotics, weapons, wildlife, and people, along with other maritime crimes—all issues that represent nontraditional security threats to the United States and other nations. Second, IUU fishing damages local livelihoods and food security, creating more fertile recruiting grounds for piracy, organized crime, armed insurgency, and terrorism in affected communities. Compounding both the direct and indirect security threats is the fact that IUU fishing reduces revenues for governments in coastal states, reducing their ability to confront these and other challenges.

Support for Illicit Networks

IUU fishing supports, both directly and indirectly, nonstate actors engaged in organized crime, piracy, and armed insurgency and terrorism. It has become a part of the portfolio of illegal criminal organizations, thereby supporting both directly and indirectly their other illicit activities. Since 2009, the UN General Assembly has expressed “concern about possible connections between transnational organized crime and illegal fishing.”¹⁵ This linkage between IUU fishing and other criminal activities has given rise to the concept of “fisheries crime.” FISH-i Africa, a regional taskforce established in 2012 to combat illegal fishing, describes fisheries crime as illegal fishing combined with “crimes such as tax evasion, human rights abuse, including human trafficking, drug, wildlife, diamond and arms smuggling, fraud and pollution.”¹⁶

The involvement of organized crime in IUU fishing is entirely predictable considering the dynamics at work, as explained by Cathy Haenlein:

As demand increases and supplies dwindle, the corresponding rise in profits explains a further set of drivers.... Indeed, the vastness of the high seas and law-enforcement capacity mean that the chances of being apprehended are low, while fish can be laundered easily into legitimate catches. Even where enforcement is effective, penalties are small.... The result is a low-risk, high-reward environment perfectly tailored to the interests of criminal actors.¹⁷

For example, in July 2016, Italian authorities arrested ‘Ndragheta crime boss “Fish King” Franco Muto and 56 others for organized crime. Muto’s organization not only controlled most of the fishing vessels along Italy’s Tyrrhenian coast, but also engaged in drug trafficking, extortion, and robbery. Russian organized criminal gangs have been heavily involved in the trade of illegally harvested sturgeon caviar. South Africa’s Cape Flats gangs traffic illicit abalone with Chinese triads in exchange for drugs, drug precursors, and cash.¹⁸ As a result, researchers with TRAFFIC International have described coastal South Africa as “transformed from a network of small fishing

¹⁵ UN General Assembly, Resolution Adopted by the General Assembly on 4 December 2009, A/RES/64/72, 19 March 2010, para 61.

¹⁶ Stop Illegal Fishing, “FISH-i Africa,” 13, cited in Haenlein, *Below the Surface*, 14.

¹⁷ Haenlein, *Below the Surface*, 8.

¹⁸ U.S. National Intelligence Council (NIC), “Global Implications of Illegal, Unreported, and Unregulated (IUU) Fishing,” September 19, 2016, 15, https://www.dni.gov/files/documents/Newsroom/Reports%20and%20Pubs/NIC_White_Paper_on_IUU_Fishing.pdf.

communities, [t]o outposts of international organized crime battling for the opportunity to harvest and export abalone.”¹⁹

The connection between IUU fishing and human trafficking has been widely documented and, while reliable statistics are impossible to come by, the scale of the problem is clearly enormous. A 2011 UN Office on Drugs and Crime study documented numerous cases of human trafficking and rights abuses aboard IUU vessels, including hundreds of Senegalese men kept aboard a ship off Sierra Leone and Vietnamese fishermen kept at sea for 18 months off South Africa.²⁰ A Bloomberg report in 2012 documented Indonesian fishermen held in debt bondage on fishing vessels off New Zealand.²¹ Modern slavery is pervasive and hard to combat among IUU fishing fleets because many vessels stay out at sea for months, illegally transferring catches without ever entering a port to avoid scrutiny, hide the source of their catches, and keep crews in often-brutal conditions without any hope of escape.²²

The Thai fishing industry has become the poster child for modern-day slavery at sea. A 2013 study by the International Labor Organization found that 25 percent of workers on Thai long-haul fishing ships were being subjected to forced labor. Four years earlier, a UN report on human trafficking found that nearly 60 percent of Cambodian migrants trafficked into the Thai fishing industry reported witnessing the murder of a coworker by a ship’s captain.²³ These issues entered the international consciousness in 2015 when the AP undertook a series of investigations into the Thai fishing industry, which earned the paper the Pulitzer Prize the following year. The AP documented how Thai fishing vessels relied upon migrants from neighboring Southeast Asian states tricked on board with promises of productive employment and then kept in modern-day slavery.²⁴ The outcry from the AP investigations led to the eventual release of more than 2,000 slaves.²⁵ The United States and European Union threatened sanctions against imports of Thai seafood unless authorities acted to crack down on human traffickers and better regulate the fishing industry.

¹⁹ Kimon De Greef and Serge Raemaekers, *South Africa’s Illicit Abalone Trade: An Updated Overview and Knowledge Gap Analysis* (Cambridge: TRAFFIC International, 2014), cited in Haenlein, *Below the Surface*, 28.

²⁰ UN Office on Drugs and Crime (UNODC), *Transnational Organized Crime in the Fishing Industry* (Vienna: United Nations, 2011), 44, http://www.unodc.org/documents/human-trafficking/Issue_Paper_-_TOC_in_the_Fishing_Industry.pdf.

²¹ E. Benjamin Skinner, “The Fishing Industry’s Cruellest Catch,” Bloomberg, February 24, 2012, <https://www.bloomberg.com/news/articles/2012-02-23/the-fishing-industrys-cruellest-catch>.

²² Haenlein, *Below the Surface*, 26.

²³ NIC, “Global Implications of IUU Fishing,” 16.

²⁴ Robin McDowell, Margie Mason, and Martha Mendoza, “AP Investigation: Slaves May Have Caught the Fish You Bought,” AP, March 25, 2015, <https://www.ap.org/explore/seafood-from-slaves/ap-investigation-slaves-may-have-caught-the-fish-you-bought.html>.

²⁵ Haenlein, *Below the Surface*, 26.



Numerous gray reef sharks patrol a reef full of healthy corals at Millennium Atoll in the southern Line Islands. This is a rare sight elsewhere; in fact, it is what reefs may have looked like a thousand years ago. Source: National Geographic.

IUU fishing vessels also play a significant role in other forms of trafficking, particularly of drugs. The UN Office on Drugs and Crime (UNODC) and the U.S. Justice Department have documented numerous cases of illicit fishing ships involved in trafficking cocaine from South America to the United States, as well as heroine and cannabis.²⁶ UNODC has also cited European Maritime Analysis and Operations Centre (Narcotics) data finding that in 40 coordinated interdictions at sea between 2007 and 2010, 20 percent of those vessels on which cocaine was seized were fishing boats.²⁷

In addition to organized crime, trafficking, and modern slavery, IUU fishing has been used to support insurgent and terrorist groups. For example, during the Sri Lankan civil war in the 1990s and 2000s, the Liberation Tigers of Tamil Eelam, which the U.S. government labeled a terrorist organization, used IUU fishermen who were already adept at avoiding the authorities to smuggle contraband through Indian and Sri Lankan waters.²⁸

Facilitating the Rise of Other Threats

IUU fishing takes money out of the pocket of governments in coastal and small island developing states that could otherwise be used for social services, infrastructure, and other necessary

²⁶ UNODC, *Transnational Organized Crime*, cited in Haenlein, *Below the Surface*, 27.

²⁷ UNODC, *Transnational Organized Crime*, 81, cited in Haenlein, *Below the Surface*, 28.

²⁸ NIC, "Global Implications of IUU Fishing," 14.

spending.²⁹ At the same time, it undercuts local livelihoods leading to economic displacement and desperation. The combination of these two effects directly undermines stability and security, and indirectly contributes to the spread of threats from nonstate actors.

IUU fishing is often undertaken by distant-water fleets with which local fishermen cannot compete commercially. And regardless of who is doing the fishing, IUU operations undercut local and international efforts to ensure fishing is done sustainably. The Food and Agriculture Organization estimates that in 2013 almost 90 percent of global fish stocks were either being overfished at biologically unsustainable levels or were fully fished with no room for increased production.³⁰ IUU fishing, which accounts for an estimated 20 percent of global catches, is a major contributor to this problem.³¹ Over the long term it helps drive down fish stocks, making it more and more difficult for local communities to secure enough catch for their own needs, much less to sell for profit. And this burden falls disproportionately on those least able to endure it.

Estimates of losses due to IUU fishing vary widely, but a frequently cited figure is \$10–23.5 billion annually.³² The problem is not evenly distributed, with the highest level of IUU fishing generally occurring where monitoring capacity is lowest and nearby developing nations can least afford the lost revenue. For instance, the waters off West Africa were estimated to face the highest levels of IUU fishing from 2000 to 2003, up to 37 percent of all fish caught in the region. Next were the waters around the Pacific Islands (34 percent), Northeast Asia (33 percent), and the eastern coast of South America (32 percent).³³

An estimated 40 million people work in the fishing industry worldwide, mostly in developing Asia and Africa. And more than 1 billion people, clustered disproportionately in coastal regions, rely on fish as their primary source of animal protein. Communities that have traditionally relied on the fishing industry often have few options to replace their damaged livelihoods, leading to the kind of desperation on which pirates, criminal gangs, terrorist groups, and other nefarious nonstate actors thrive.³⁴

An academic study of 2,600 piracy incidents reported to the International Maritime Bureau between 2004 and 2013 found that “states with reduced values of fisheries production are more likely to experience piracy,” suggesting that “changes in labor opportunities in the fishing section—driven primarily by overfishing—increase the number of potential pirate recruits.”³⁵ For example, a surge in illegal fishing by Chinese trawlers in the Gulf of Guinea since 2008 has made it difficult for local fishermen to make a living. Attacks on fishing boats, tankers, and cargo ships in the gulf have, in turn, soared over the last decade.³⁶

²⁹ Haenlein, *Below the Surface*, 36.

³⁰ Food and Agriculture Organization (FAO), *The State of World Fisheries and Aquaculture 2016*, 5–6, <http://www.fao.org/3/a-i5555e.pdf>.

³¹ Stop Illegal Fishing, “Fish-i Africa: Issues, Investigations and Impacts,” 6, cited in Haenlein, *Below the Surface*, 6–7.

³² David Agnew et al., “Estimating the Worldwide Extent of Illegal Fishing,” *PLOS ONE* 4, No. 2 (February 2009), <http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0004570&type=printable>.

³³ *Ibid.*, Table 2.

³⁴ NIC, “Global Implications of IUU Fishing,” 9, 12, 14–15.

³⁵ *Ibid.*, 16.

³⁶ *Ibid.*, 16–17.

Some studies have also suggested a more direct, and ironic, link between IUU fishing and piracy in the case of Somalia. According to a 2016 report from the U.S. National Intelligence Council,

IUU fishing also contributed to the increase in piracy off Somalia in the 2000's because many Somali fishers, who had learned to seize vessels in order to prevent illegal fishing in their historic fisheries transferred these initially defensive skills to piracy, according to scholars. As Somali fishers' incomes decreased as stocks diminished, they applied their newfound ship-seizing skills to piracy.³⁷

Efforts to Combat IUU Fishing

Port State Measures Agreement

The Agreement on Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing (PSMA) is the most ambitious, and potentially most impactful, international effort to combat IUU fishing.³⁸ The agreement was adopted by the Food and Agricultural Organization in 2009 and entered into force in 2016 as the first legally binding treaty intended to combat IUU fishing. The agreement now has 51 participants accounting for two-thirds of the global fish trade, including the United States which ratified it in 2015.³⁹ Other members include Japan, which is both a major fish importer and has one of the world's largest distant water fishing fleets, and Indonesia, whose waters are home to up to a third of global IUU fishing.

Unfortunately, to date China remains noticeably absent from the agreement. Though its ships are common violators of IUU regulations, China generally does not land foreign vessels at its ports. China has, however, engaged in productive bilateral conversations with the United States in recent years on how to better combat IUU fishing at its ports.

The PSMA obligates parties to undertake a number of efforts to better manage their ports to detect, prevent, and report IUU fishing. Participants must require foreign fishing vessels to request permission before entering port and to provide details about their identities, activities, and catches. The port state authority can take various actions against suspected illegal fishing vessels, including refusing them permission to offload, refuel, or resupply, or denying entry to port altogether. Parties to the PSMA met for the first time in Oslo, Norway, in May 2017 to discuss implementation of the agreement, including the roles of RFMOs and international organizations, and the procedures for notifying other members when a ship violates the treaty.⁴⁰

Pew Charitable Trusts has found that better implementation of the PSMA in larger, more heavily trafficked ports will be likely to drive vessels engaged in IUU to smaller and less well-equipped alternative ports. This in turn could assist the monitoring efforts of authorities struggling with the sheer scale of the IUU fishing problem. One of the major difficulties in preventing IUU is monitoring the vessels in the enormous expanses of ocean that regulations try to cover. Because

³⁷ Ibid., 17.

³⁸ FAO, "Agreement on Port State Measure to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing," updated May 19, 2017, http://www.fao.org/fileadmin/user_upload/legal/docs/037s-e.pdf.

³⁹ "Countries Signed to UN-Brokered Illegal Fishing Treaty Meet for First Time," UN News Centre, May 29, 2017, <http://www.un.org/sustainabledevelopment/blog/2017/05/countries-signed-to-un-brokered-illegal-fishing-treaty-meet-for-first-time/>.

⁴⁰ Ibid.

noncompliant ports will likely see an uptick in traffic and a greater proportion of IUU-engaged vessels following implementation of the PSMA at larger ports, the smaller ports will provide a target-rich environment for law enforcement to identify and track suspicious vessels.

Although the PSMA is lauded as a great step forward in enforcing international fishing laws, many of the details behind coordination and implementation are still being worked out. Verifying compliance with the agreement requires better coordination and exchange of up-to-date information between all parties, including flag states, coastal states, and RFMOs.⁴¹ Meanwhile, implementation, even in signatory states, remains lacking. One major problem is that investigators in ports need to be better trained to look for not only illegally caught fish onboard vessels, but evidence of crimes that often accompany IUU fishing such as human trafficking.

Shiprider Agreements

Another process the U.S. government has undertaken to enforce fishing regulations is the implementation of cooperative boarding inspection agreements, or shiprider agreements. Through these agreements, law enforcement personnel from coastal states join their U.S. counterparts for in-classroom and onboard training and enforcement of IUU regulations. Although the U.S. Coast Guard faces significant challenges in patrolling the United States' own EEZ and its ability to train and assist others with enforcement is limited by the number of vessels in its fleet, the Coast Guard is able to send observers onto partner vessels. Additionally, the U.S. Navy lends a hand by taking on teams when passing through relevant coastal waters in the Asia Pacific through the Oceania Maritime Security Initiative.⁴² Getting U.S. Coast Guard personnel onto other flag and coastal state vessels helps ensure they are being searched properly and local authorities will eventually be able to carry out law enforcement themselves.

The Africa Maritime Law Enforcement Program (AMLEP) is another shiprider program operated by the United States, which seeks to build partner capacity with a goal of creating sustainable local maritime law enforcement bodies. AMLEP utilizes classroom training and at-sea boardings, either from coastal state or U.S. Navy ships.⁴³

Coast Guard teams engaged in shiprider programs teach partners the mechanics of at-sea boarding and searches of suspect vessels. Although much of the focus is on illicit activities like smuggling, human trafficking, and piracy, teams also search for evidence of IUU-related crime, including searching compartments for illegal catches and reviewing ship documentation.

Monitoring Efforts

One of the key obstacles to successful enforcement of fishing regulations is the difficulty of monitoring ships engaged in IUU fishing. The enormity of the ocean and the number of ships

⁴¹ Pew Charitable Trusts, "Implementing the Port State Measures Agreement: A Methodology for Conducting a Capacity Needs Assessment," April 21, 2017, accessed September 25, 2017, <http://www.pewtrusts.org/en/research-and-analysis/reports/2017/04/implementing-the-port-state-measures-agreement>.

⁴² U.S. Department of the Navy, "USS Rushmore to Begin Oceania Maritime Security Initiative," August 15, 2017, http://www.navy.mil/submit/display.asp?story_id=101933.

⁴³ U.S. Africa Command, "Africa Maritime Law Enforcement Partnership (AMLEP) Program," accessed September 27, 2017, <http://www.africom.mil/what-we-do/security-cooperation/africa-maritime-law-enforcement-partnership-amlep-program>.

passing through it leads to a daunting problem of scale. Authorities rely on a number of sources of data to best track suspicious vessels. One of the best such sources of ship data is the automated identification system (AIS).

AIS is a system by which ships broadcast their coordinates and basic information like ship name, size, destination, and current status. That data can be collected via satellite, through shore-based systems, other ships in the vicinity, or even buoys equipped with transceivers. It is also transmitted to local authorities to monitor marine traffic in their waters.

All ships over 300 gross tons on international voyages, and cargo ships over 500 gross tons regardless of destination, are required by the International Maritime Organization (IMO) to be equipped with an AIS.⁴⁴ Although there are certain carve-outs for ships concerning national security, most ships are expected to be running AIS while in operation. All of this data is tracked and can be plotted to a map, showing ships in near real time as well as their history. AIS websites tracking ships by their IMO number are plentiful, as are services that track the data more carefully for corporations.

The National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration (NOAA), and the U.S. intelligence community make use of their remote detection capabilities to contribute to marine law enforcement efforts. An example of this cooperation is SeaVision, run by the Department of Defense and the Department of Transportation, which uses unclassified terrestrial and satellite AIS, radar, and satellite imagery to map and track vessels of interest.⁴⁵

Similar to AIS data but more closely related to fisheries management is vessel monitoring system (VMS) data. VMS is a specifically satellite-based monitoring system that tracks fishing vessels.⁴⁶ It is utilized by coastal states to track vessels operating in their waters and to allow coordination across multiple nations' EEZs in an effort to ensure compliance by fishing vessels. The U.S. Coast Guard and NOAA make constant use of the system to track more than 4,000 vessels in U.S. waters.⁴⁷

In a similar vein, the Safe Ocean network is the U.S. State Department's program to connect with public- and private-sector partners engaged in combating IUU. Currently, it primarily serves as a mechanism for sharing information in support of maritime domain awareness. The State Department is also working with its Safe Ocean Network partners on developing policy and legal frameworks that ensure cases brought against IUU violators can be pursued. Unfortunately, many Safe Oceans partners and other VMS collectors are not sharing lessons learned and refuse to divulge proprietary information. The U.S. government is doing its best to share the end result of the information and make the data available to all interested parties.

During the Barack Obama administration, the White House and Departments of State and Commerce cochaired a program to combat IUU fishing by tackling fraud on the part of suppliers.

⁴⁴ International Maritime Organization, "AIS Transponders," accessed September 27, 2017, <http://www.imo.org/en/OurWork/safety/navigation/pages/ais.aspx>.

⁴⁵ SeaVision, "About SeaVision," accessed September 27, 2017, <http://seavision.mda.gov/about-seavision>.

⁴⁶ European Commission, "Vessel Monitoring System (VMS)," updated September 28, 2017, https://ec.europa.eu/fisheries/cfp/control/technologies/vms_en.

⁴⁷ NOAA, "Vessel Monitoring System Program," accessed September 27, 2017, http://www.nmfs.noaa.gov/ole/about/our_programs/vessel_monitoring.html.

There are a number of steps that IUU fishing vessels take to hide the provenance of illegally caught fish, including the misrepresentation of the species making up a catch and poor documentation of a catch's chain of custody. These issues with the traceability of a catch greatly complicate monitoring efforts and IUU fishing vessels will frequently mix legally and illegally caught fish to prevent law enforcement from definitively declaring a catch illegal. In 2015 the Presidential Task Force on Combating IUU Fishing and Seafood Fraud authored an action plan with 15 recommendations for addressing the problems created by violators, ensuring the healthy and sustainable use of fish stocks in a manner fair to all law-abiding nations.⁴⁸



A yellowfin tuna is reeled in from a small Costa Rican vessel fishing outside the original limits of the Cocos National Park. Source: National Geographic.

In nongovernmental spaces, companies such as Google and Vulcan are turning to technology to tackle the environmental threat posed by IUU fishing. Recognizing the monitoring problem that governments face in managing their EEZs and flagged vessels, Google has partnered with the National Geographic Society, Leonardo DiCaprio Foundation, and others to launch Global Fishing Watch. This platform collects AIS data from around the world and maps it in near real time, allowing observers to monitor fisheries from afar.⁴⁹ In a complementary move, Microsoft cofounder Paul Allen's Vulcan is investing \$40 million in SkyLight, a system that synthesizes satellite

⁴⁸ NOAA, "Presidential Initiative on Combating Illegal, Unreported, and Unregulated (IUU) Fishing and Seafood Fraud," accessed September 27, 2017, <http://www.nmfs.noaa.gov/ia/iuu/taskforce.html>.

⁴⁹ Global Fishing Watch, "About the Project," accessed October 15, 2017, <http://globalfishingwatch.org/the-project>.

imagery, shipping records, and reports by port authorities to track illegally operating vessels and boast coastal states' capability to enforce fishing regulations.⁵⁰

Another nongovernmental effort is led by the Marine Stewardship Council (MSC), a nonprofit organization that works with fisheries, retailers, and restaurants to ensure sustainable operations. Fisheries that operate transparently and above-board are certified by the MSC, which advises restaurants, supermarkets, and other purveyors of seafood on which sources to use. Consumers can see the MSC label and are able to avoid fish with uncertain provenance.⁵¹

Conclusion

With nearly 90 percent of global fish stocks already overexploited or fully fished, the need for sustainable fisheries management is critical. Coastal and small island developing states meanwhile rely heavily on revenues from foreign fishing vessels in their EEZs. IUU fishing, which accounts for an estimated 20 percent of catches worldwide, undermines not only these food security and economic imperatives; it represents a security threat for the United States and global partners. Illicit fishing bolsters criminal networks, supports drug trafficking and modern slavery, and likely contributes to the rise of piracy, armed insurgency, and other nonstate threats in affected communities.

Successfully combating IUU will require a multifaceted effort spanning years. It will also need buy-in from governments, international organizations, corporations, and consumers. Some areas that could be tackled individually to provide a stronger foothold for the fight against IUU include:

- Examining ways to strengthen criminal penalties for IUU, and not just administrative fines that can be shrugged off
- A stronger legal framework for management of the high seas, including the possibility of large no-take zones
- Improved sharing of VMS and AIS data between nations
- Addressing the use of fisheries subsidies that incentivize IUU—a discussion already begun at the World Trade Organization's Doha Ministerial Conference
- Increasing the accountability of flag states, especially those that offer flags of convenience
- Improving sharing of data between RFMOs and other international organizations.

Sections of the U.S. government have recognized the threats posed by rampant IUU fishing and are working with partners around the world to bolster monitoring and enforcement responses. Debates are ongoing in international forums on how to extend further protections to vulnerable fish populations, including in the currently unregulated sections of the high seas. But responses

⁵⁰ "Paul Allen Wants to Use Satellites and Software to Fight Illegal Fishing," Bloomberg Technology, October 5, 2017, <https://www.bloomberg.com/news/articles/2017-10-05/paul-allen-wants-to-use-satellites-and-software-to-fight-illegal-fishing>.

⁵¹ "Marine Stewardship Council," accessed October 18, 2017, <https://www.msc.org/>.

have so far been insufficient for the scale of the problem. One major step in building support for more robust and creative responses to IUU fishing is to recognize it for what it is—a threat to food security, economic well-being and good governance, and national security.

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A school of bigeye trevally at Roca Partida, the smallest and most remote of the four Revillagigedo Islands.



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