

The dimensions of a transnational crime problem: the case of iuu fishing

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Abstract Illegal, Unreported and Unregulated (IUU) fishing is a significant transnational crime problem that costs developing nations from \$2 to \$15 billion in economic losses annually. Perpetrators include established organized crime groups and commercial fishers, while the incidence of IUU fishing is often shaped by public corruption. Various economic drivers, such as the exceptionally high value of some species, and the Flag of Convenience (FOC) system of vessel registration contribute to the significance of the problem. Negative environmental impacts involve the depletion of fish stocks, damage to coral reefs, and stress on marine mammals and birds. Social and economic impacts are severe as well, and are most especially prevalent in developing nations. Theoretically, IUU fishing may be viewed as arising and proliferating due to “criminogenic asymmetries,” especially evident in the uneven patchwork of international laws governing the world’s oceans. A broad range of public and private responses have thus far generated limited success in thwarting IUU fishing.

Keywords IUU fishing · Organized crime · Flags of convenience system · IPOA-IUU · Criminogenic asymmetries

Criminal behavior and other quasi-legal activities associated with the harvesting of fish is a prodigious transnational crime problem that causes anywhere from \$2 to \$15 billion in annual economic losses to developing nations (Liddick 2011). The incidence of illegal, unreported, and unregulated (IUU) fishing implicates a wide range of actors, including organized crime groups, large commercial fishing enterprises, and corrupt public officials. The negative consequences of IUU fishing are vast, and include economic, social, and environmental harm on a global scale. An impressive number of initiatives, public and private, have been undertaken to address the problem; however, the very conditions that give rise to IUU fishing render attempts to combat the problem quite difficult (Organization for Economic Co-operation and Development

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2005; United Nations Office on Drugs and Crime 2010, 2011; Marine Resources Assessment Group 2005).

The purpose of this article is to provide a synthesis of existing research on the problem of IUU fishing; the issues to be explored are, therefore, necessarily manifold. First, a detailed description of the IUU fishing problem will be provided, including methods used, the dimensions of the problem as it exists in various parts of the globe, the relationship between illicit and quasi-licit fishing operators and transnational organized crime, and the severe economic, social, and environmental impacts IUU fishing precipitates. Next, the article will explore and analyze the various conditions and elements that give rise to and foster IUU fishing activities, including economic drivers and the influence of public corruption. In addition, a description and analysis of responses to IUU fishing will be detailed. Finally, aside from the descriptive and analytical components described, this article will also provide theoretical contextualization by suggesting that IUU fishing is perhaps best understood as arising from what Nikos Passas (2001) has termed “criminogenic asymmetries.” (For the sake of clarity, an explanation of Passas’ theory will be provided in the final portion of the paper, where the concept is applied specifically to IUU fishing).

The information provided in this article was collected online, and involves a description and analysis of existing reports.¹ Because this article involves the collation and synthesis of information derived from extant reports, with all of the difficulties and flaws attending the analysis of secondary data, the veracity of these previous publications were scrutinized and rigorously questioned. The conclusions of each source was, so far as it was possible, cross-referenced with other sources and evaluated for authenticity. Any wildly divergent information, or unsupported conclusion, was discarded.

Because the topic of IUU fishing is controversial and the object of much political debate, the author of the present article remained especially sensitive to the intrusion of biases, both personal ones and the potential for those existing among previous researchers. A preliminary step, then, involved an attempt to discard the present researcher’s preconceived notions. After assessing the secondary data for authenticity, the researcher then engaged in an exercise of arguing for alternative (even opposite) explanations for conclusions made by previous researchers. When arguing for alternative explanations produced results deemed improbable, or significantly less likely, only then were conclusions arrived at in previous research included in the present article as probable or factual statements.

IUU fishing: definition, methods, and trends

Perhaps as much as 75 % of the world’s fish stocks are either depleted or overexploited, with the observable collapse and near collapse of some fish species. While this depletion is caused in part by perfectly legal, yet irresponsible, overconsumption, it is

¹ The reports of several organizations were especially useful. For example, the Environmental Justice Foundation, the Food and Agriculture Organization, the Office of Economic Co-operation and Development, TRAFFIC, the Marine Resources Assessment Group, and the United Nations Office on Drugs and Crime provided highly relevant information.

also true that at least 15 % of the total world catch—anywhere from 11 to 26 million tons annually—is associated with IUU fishing (Environmental Justice 2005). In addition to stress on fish stocks and associated negative impacts on broader marine ecosystems, IUU fishing precipitates damage to the food security and livelihood of coastal populations, and may cost world economies as much as \$10 to \$23.5 billion annually (Agnew *et al.* 2009). In Europe, perhaps half of all seafood consumed has illicit origins (House 2000), and in some fisheries, illicit activity accounts for approximately one-third of all catches (Environmental Justice 2005; Marine Resources Assessment Group 2005). In 2006, the National Oceanic and Atmospheric Administration opened 750 investigations into illegal fishing in the northeastern U.S., an increase of 108 % over the previous five years (Environmental Justice 2005).

IUU fishing methods are variations of the same problem; whether overtly illegal or simply beyond the scope of sound regulation, the results are the same—the unsustainable harvesting of fish stocks. A definition of the different components of IUU fishing follows:

Illegal Fishing—where vessels operate in violation of the laws of a fishery. This can entail fishing with no license at all, or fishing in contravention of the terms of the license, for example by using outlawed fishing gear. This definition is used both for fisheries that are under the jurisdiction of a coastal State, and for those that are regulated by Regional Fisheries Management Organizations (RFMOs) (Marine Resources Assessment Group 2008, p. 11).

Unreported fishing—fishing that has been unreported or misreported to the relevant national authority or Regional Fisheries Management Organization, in contravention of national and international laws and regulations (Marine Resources Assessment Group 2008, p. 11).

Unregulated fishing—this generally refers to fishing that is conducted by vessels without nationality, or vessels flying the flag of a State not party to the regional organization governing the particular fishing region or species. Unregulated fishing can also relate to fishing in areas or for fish stocks where there is a lack of detailed knowledge of the resource, and therefore no conservation or management resources in place. In both these cases vessels must be fishing in a manner that violates the conservation and management measures of the regional organization, and/or international law, to warrant inclusion under the term “unregulated fishing” (Marine Resources Assessment Group 2008, p. 11; Liddick 2011, p. 72).

A common practice of IUU operators is the dumping of fish, called “high grading.” By retaining only high quality, large fish, the stock is depleted, and stock assessments are rendered inaccurate. Other common offenses include harvesting of prohibited species, overfishing of permitted species, falsifying catch weights, fishing without a license or out of season, and utilizing banned gear (Marine Resources Assessment Group 2008). Particularly detrimental to third world nations is the practice of fishing in a state’s jurisdictional waters without authorization (Environmental Justice 2007; Kelleher 2002; United Nations Office on Drugs and Crime 2011). For example, most illegal fishing in the Southern African Development Community (SADC) region is perpetrated by Distant Water Fishing Nations (DWFNs) like Spain, China, Taiwan,

Indonesia, Russia, and Korea—IUU fishing in this instance rises to the level of corporate and governmental crime on a transnational scale, as foreign commercial interests, with the complicity of home governments, rob the populace of developing nations (Marine Resources Assessment Group 2008; Environmental Justice 2007; Kelleher 2002; United Nations Office on Drugs and Crime 2011).

IUU fishing in regions around the globe

IUU fishing is a global phenomenon; these illicit activities can be found along coastlines and on the high seas around the world. The following discussion will focus on a few of the most notable regions where IUU fishing proliferates.

An area especially noteworthy in a discussion of IUU fishing is the East Central Atlantic, where West African states in conflict, and with poor or corrupt governance, generate ideal conditions for illicit fishing operations. The shallow seas off the coasts of Africa are especially rich ecosystems, and the poor countries in the region are simply unable to police their territorial waters (Kelleher 2002; Environmental Justice 2007; Brenthurst 2010). For example, aerial surveys reveal rampant IUU fishing in the territorial waters of Guinea, Sierra Leone, and Guinea Bissau; in one Guinean village, five fishermen were killed when their boat was destroyed by an industrial vessel (Environmental Justice 2005). Elsewhere, the civil war in Somalia in the early 1990s fostered rampant IUU fishing there. Trawlers from the Far East, the EU, and the Middle East quickly ascertained the complete lack of governance in the region, and began to exploit the fish resources along the longest coastline in continental Africa (Environmental Justice 2005; United Nations Office on Drugs and Crime 2011). In addition to overfishing for tuna, lobster, shark, and deep water shrimp in Somali waters, hundreds of commercial vessels also damaged coral reefs and contributed to the destructive by-catch of dugongs, sea turtles and dolphins (Environmental Justice 2005; Marine Resources Assessment Group 2008).

Foreign vessels from China, Russia, and Japan similarly exploit Angola's territorial waters. Some operators don't bother to obtain permission or a license, while in other cases corrupt Angolan officials take bribes in exchange for allowing IUU fishing (Environmental Justice 2005; Marine Resources Assessment Group 2008). Angola's territorial waters—called an Economic Exclusion Zone (EEZ)—is 330,000 square miles, so the three patrol boats the government has assigned to its waters is far too meager. Meanwhile, the foreign trawlers Angola cannot or will not regulate instigate violent attacks on local populations—in one case, a trawler rammed a local boat and killed a fisherman, and in another, two Angolan inspectors “disappeared” while on observation duties aboard commercial ships. In those instances where Angolan authorities have attempted to enforce fishing regulations, they have been physically attacked, and have had their patrol boats sunk by illegal trawlers (Environmental Justice 2005; Marine Resources Assessment Group 2008).

Another region especially vulnerable to IUU fishing is the Pacific Russian coast. Relative to the 1950s through the 1970s, poaching of salmon spawning grounds has increased—in Russia there is practically no effective river protection. Around Kamchatka, commercial IUU fishing is endemic, an “economy within an economy” that employs tens of thousands of illicit workers (Dronova and Spiridonov 2008). During the fishing season, practically every settlement in Kamchatka turns into a salmon

poachers camp of organized groups and locals. Most IUU fishing for salmon in the region involves excessive quota violations—quotas may be exceeded by a factor of ten in the lower reaches of some river basins, where visiting dealers purchase salmon roe on site. The annual illegal catch of salmon in waters around Kamchatka averaged 55,000 tons from 2002 to 2006, while around Sakhalin the number was 80,000 tons (Dronova and Spiridonov 2008).

Much of the illicit salmon catch in the Pacific Northwest centers on the lucrative market for roe (salmon caviar, called “red gold,” is ten times more valuable than salmon flesh—in many cases the fish itself is simply discarded). In just the period May–October 2005, Russian authorities seized from illicit roe traffickers in the Far Eastern Federal District 58.4 tons of salmon roe valued at 24 million rubles (Dronova and Spiridonov 2008). Curiously, Russian drift net operations for “monitoring and scientific reasons” far exceed the numbers required for such purposes. Japanese and Russian IUU salmon fishers typically record their catch of lucrative sockeye, chinook, and coho salmon as less valuable pink and chum salmon—not surprisingly, the amount of sockeye imported to Japan exceeds the reported catch of the species. Other illicit methods involve registration of ships with forged documents in Russian ports, and the widespread practice of keeping several sets of documents aboard fishing vessels. Some companies use twin ships, where fishing is pursued by two vessels with the same names and registration/board numbers. While thousands of salmon violations are officially recorded by enforcement agencies, only a few dozen actually result in any kind of criminal sanction (typically small fines and suspended sentences—in 2006 only 0.7 % of assessed damages were collected by Russian authorities from 4,433 violators) (Dronova and Spiridonov 2008).

The Indonesian archipelago is also a hotbed of IUU fishing activity, with 4.8 million square kilometers of sea territory spread over some 17,000 islands. Thousands of foreign vessels from Japan, Taiwan, South Korea, China, and the Philippines join Indonesian vessels in over-exploiting the fishery, resulting in up to \$2 billion in losses to the Indonesian people every year (Flewwelling and Hosch 2006; JALA and the Environmental Justice Foundation n.d.). Although commercial trawling has been banned in Indonesia by presidential decree since 1980, the law is simply not enforced. Local fishermen contend that trawling activity has actually increased in recent years, with anecdotal evidence that bribery and corruption of Indonesian officials plays a role. The problem is especially severe in North Sumatra, in the Straits of Malacca, where commercial trawlers intrude on the three mile coastal zone reserved for local, artisanal fishers. Local populations, who rely heavily on fish as a food source, have been seriously damaged economically, and violent conflicts between commercial trawlers and local fishermen have resulted in perhaps two hundred deaths over the past fifteen years (JALA and the Environmental Justice Foundation n.d.).

Recent trends

While it is widely agreed that IUU fishing is prodigious and global in scope, there exists substantial variability in the level and trend of IUU catches across regions. In a 2008 analysis of illegal and unreported catches in the territorial waters of fifty-four countries and fifteen high seas regions, researchers found that illicit activity was greatest in the Eastern Central Atlantic and least in the Southwest Pacific (Agnew

et al. 2009). In the Northeast Atlantic, illegal activity exploded in the 1970s and 1980s with devastating impacts on the cod stock, a situation that has only recently improved. In the Southeastern Atlantic, the exclusion of foreign vessels from territorial waters beginning in the late 1980s greatly reduced the illegal catch there, while the reverse appears to be true in the waters of the Southwestern Atlantic. Increased control by coastal states has led to a decline in illegal fishing in the Western Indian Ocean, while an increase in illicit activity in the Northwestern Pacific is due almost entirely to the role played by Chinese and Russian operators poorly policed by their home governments. Estimates of illegal and unreported catch in the Northeastern Pacific is low and continues to decline, but in the Western Central Pacific the problem has been, and remains, relatively high—the waters about Indonesia are especially notorious as an area with a huge amount of unreported catch. Overall, the problem of IUU fishing seems to be declining in some areas, and increasing in others, with the greatest degree of illicit activity associated with high-value demersal fish, lobsters, and shrimps (Agnew et al. 2009).

IUU fishing and organized crime

In addition to violations by commercial fishing operators, it is not uncommon for organized crime groups to engage in IUU fishing. In fact, previously established criminal organizations with transnational reach have been quite active in the illegal harvesting and smuggling of high value products like abalone and sturgeon (House 2000; United Nations Office on Drugs and Crime 2011; Hauck and Sweijd 1999). For example, in the 1990s Russian criminal syndicates were estimated to earn \$4 billion a year through the illegal exportation of some two million metric tons of seafood, mostly Caspian Sea sturgeon and other seafood products to Japan, Europe, and the United States (House 2000; Zabyelina 2014). In one year in Japan, that nation imported \$1 billion in seafood from Russia, a figure six times larger than what appeared in official Russian trade figures—a clear indication of a black market (House 2000). Elsewhere, the illegal harvesting of abalone is thought to generate \$80 million annually, and involves Russian syndicates, Chinese Triads, and other Asian gangs (United Nations Office on Drugs and Crime 2011). In South Africa, organized crime syndicates depleted abalone stocks, which led to the closure of the fishery in 2008. IUU fishing in South Africa is also associated with money laundering, drug trafficking, and racketeering—economic damage is significant, for the criminals continue to smuggle abalone catches out of the country and export it from neighboring states, thus causing losses in export taxes (Marine Resources Assessment Group 2008).

Organized crime groups are notorious for their involvement in the trafficking of caviar (Berry 1999; Zabyelina 2014). Caviar, in fact, exhibits characteristics that render it perfect as an illicit commodity: it has a high value, is not bulky, is easily transported, and its origin is easily disguised. The eggs sell for up to \$500 per kilogram on the black market, but in the United States and Europe, it retails for ten times that amount. High demand and restricted legal supplies top off the perfect formula, providing the opportunity for illegal entrepreneurs to reap enormous profits. Consequently, ten times more sturgeon is caught illegally than legally, which has led to a 90 % drop in Caspian

sturgeon catches (Shivers et al. 2005). The black market in caviar has also bred violence, as officials attempting to halt caviar smuggling have been killed—in the 1990s, two dozen members of a Russian anti-poaching unit were murdered, and in 1996, fifty-four Russian border guards assigned to disrupt the illegal caviar trade were killed in a bombing (Trends in Organized Crime 1997, pp. 23–24).

There has also been an observed overlap between IUU fishing and other forms of organized maritime crime, including drug smuggling (Tsamenyi et al. 2008; United Nations Office on Drugs and Crime 2011). Fishing vessels are believed to be integral to the transshipment of cocaine from the Andean region to Mexico, activities which include the provision of offshore refueling services for ships carrying drugs, the transport of cocaine from larger ships to remote landing sites and commercial ports, and direct point-to-point delivery of cocaine shipments (United Nations Office on Drugs and Crime 2006). In 2011, Costa Rican police dismantled a smuggling network that moved cocaine from Ecuador and Colombia to Central America and Mexico; in this case, fishing boats acted as “mother ships” in the transshipment of drugs to faster speedboats. In other cases, significant loads of cocaine have been discovered on fishing vessels inside the carcasses of caught sharks. From 2007 to 2010, 20 % of cocaine seizures involved fishing vessels, accounting for nearly half of the cocaine seized at sea (United Nations Office on Drugs and Crime 2011).

Fishing vessels are also associated with the traffic in other types of illicit drugs, including heroin, marijuana, and amphetamines. Despite a ban in South Africa since 2008, the illicit harvesting of abalone is used by IUU fishers to barter with Asian crime syndicates for methamphetamines and precursor chemicals (United Nations Office on Drugs and Crime 2011). Elsewhere, the use of fishing vessels to transport cannabis from Morocco to Europe was a well-established practice in the 1990s (Van der Veen 2004), and more recently, hashish has been transported on fishing boats from Algeria and Lebanon to France, Italy, and Spain (US Department of State and Law Enforcement Affairs 2010). Conversely, there is anecdotal evidence that some drug smugglers are leaving that illicit industry to engage in IUU fishing—a business deemed by some criminals to be more lucrative and less dangerous (United Nations Office on Drugs and Crime 2011).

A significant link exists between IUU fishing and other forms of transnational organized crime, including trafficking in persons for the purpose of forced labor on fishing boats—a practice that includes the exploitation of women and children. *De facto* slavery in the fishing industry occurs across the world’s oceans, but is especially prevalent off the coasts of West Africa and Southeast Asia (United Nations Office on Drugs and Crime 2011). Working conditions are often brutal, and include physical abuse, sexual exploitation, and in some cases, death (US Department of Justice 2010). The principal actors in these human trafficking crimes are recruiters, senior crew on fishing vessels, and the fishing company or operator (United Nations Office on Drugs and Crime 2011). A nexus between IUU fishing and maritime piracy has been observed as well; specifically, the well-documented incidences of piracy in or near Somali waters seems to have developed within the Somali fishing industry, at least partially as a consequence of illegal fishing (United Nations Office on Drugs and Crime 2011). A similar IUU fishing-piracy link has been observed in Southeast Asia (Liss 2007).

To conclude the discussion of the participation of organized crime groups in IUU fishing, and the link between IUU fishing and other types of transnational organized

crime, it is important to note that IUU fishing is, in fact, characterized by the participation of a wide range of players who may not be part of any particular organized crime group. In fact, it must be emphasized that IUU fishing, at its most pernicious, is often perpetrated by what would be typically perceived as “legitimate” entities—primarily, opportunistic corporate trawlers (and complicit public officials) willing to decimate fish stocks, damage local and national economies, and disrupt social life, all for enormous profits. Moreover, in those cases where previously established organized crime groups are involved in IUU fishing and related crimes, “legitimate” companies and complicit public officials are often implicated as well. For example, Russian organized crime is heavily involved in the smuggling of caviar, a product which is typically routed through states with weak regulations such as the United Arab Emirates (UAE), where counterfeit labels and fraudulent documents are applied to shipments. In one case, the U.S. firm Caviar & Caviar printed counterfeit labels, slapped them on caviar tins in the UAE, and then imported the cargo into the U.S. as legitimate Russian produce (Trends in Organized Crime 1997, pp. 23–24).

Corruption, economic drivers, and other conditions that facilitate IUU fishing

IUU fishing is an activity perpetrated by private commercial enterprises and organized crime groups driven by the opportunity for large profits. Moreover, it is reasonable to conclude that the incidence of illegal and unsustainable fishing practices is significantly linked to poor governance. A recent review of the top fifty-three fishing nations using the United Nations Code of Conduct for Responsible Fisheries awarded failing grades to over half (30 of 53) surveyed, and only a quarter were rated as “passable” (Agnew et al. 2009). Unfortunately, in the case of IUU fishing, poor governance, manifested as a lack of political will, a dearth of resources, and incompetence, is too often supplemented with an unhealthy measure of outright corruption (United Nations Office on Drugs and Crime 2011).

Existing research indicates that in the commercial fishing industry, the licensing process and scientific quotas are vulnerable, and subject to corruption. One study found that fisheries officials in some Pacific island states issued fishing licenses without oversight or accountability, and diverted fees directly into personal bank accounts (Hanich and Tsamnyi 2009). A 2005 audit of the Fisheries and Marine Resources Department in the Solomon Islands found widespread fraud in licensing, costing that nation about \$9 million (United Nations Office on Drugs and Crime 2011). Elsewhere, conflicts of interest are common in African nations, where licensing officials often have direct connections to the fishing industry (Standing 2008; Martini 2013). In a case which ultimately led to the prosecution of officials in two U.S. corporations under the Lacey Act, fourteen South African fisheries officials were found guilty of taking bribes to falsify quota and catch documentation papers that facilitated the illegal export of eighteen tons of rock lobster (U.S. v. Bengis 2011). In another case, a Japanese government tax investigation in 2011 uncovered bribes in the amount of US \$6 million paid by Japanese firms to Russian officials so that established quotas could be exceeded (4 Japanese fishing companies grounded for exceeding quotas in Russia. Japan Today and 26 Jan 2011).

Allegations of corruption in the leasing of territorial waters to foreign fishing fleets have been difficult to substantiate because of the complete lack of transparency in those negotiations, although research from Transparency International suggests that corruption of this type is common in Africa (Martini 2013). What is quite clear is the adverse impact such practices have on local fishers and local economies, as foreign industrial trawlers have often come into violent conflict with artisanal fishers, and territorial waters have been overexploited to the detriment of local populations (United Nations Office on Drugs and Crime 2011; Environmental Justice 2005).

Another circumstance—indeed, what amounts to a *modus operandi*—attending IUU fishing is the registration of fishing vessels to states that are unwilling, or unable, to police operators flying their flag. As many shipping registries are run by private corporate entities, the incentive to register fishing vessels to economically vulnerable, developing nations (as in West Africa, for example) creates a perfect climate for corrupt exchanges (United Nations Office on Drugs and Crime 2011). Recent accounts substantiate this concern over commercial shipping registries. For example, in 2010, the Sierra Leone International Ship Registry, operated out of New Orleans, USA, was de-registered by the Sierra Leonean government due to low revenues and reported serious damage caused by foreign fishing vessels flying its flag. (Actually, a good sign, as a perpetually corrupt government would simply have continued accepting any bribes to provide cover for illegal fishers). In another case, the government of Liberia appointed an independent commission in 2008, which noted improprieties in the renewal of the license of the Liberian International Ship and Corporate Registry (LISCR—headquartered in Virginia, USA) to operate the Liberian register of fishing vessels—allegations have included corruption in the process of negotiation between Liberian officials and the LISCR, gun-running by LISCR officials, and the diversion of fishing revenue that should have accrued to the Liberian state. In sum, those who run commercial fishing registries are often pleased to arrange to have vessels flagged to states that have little capacity (or interest) in enforcing territorial and regional fishing regulations—it is thus that the costs of IUU fishing are reduced, profits maximized, and revenue otherwise intended for local populations (and legitimate fishing operators) diverted (United Nations Office on Drugs and Crime 2011).

Aside from the facilitating effect of corrupt and/or inept governance, there are a number of economic drivers which encourage IUU fishing. In large part, the problem is impelled by the exceptional value of some target species. For example, a Patagonian toothfish may be worth \$1,000, while a single tuna may be valued up to an incredible \$100,000. IUU fishing is so lucrative that the profits of a ship from a single voyage may significantly exceed the price of the ship itself (Le Gallic and Cox 2006; Marine Resources Assessment Group 2005; Schmidt 2005). Aside from high profit margins to IUU fishers, the overexploitation of some global fish stocks is, quite simply, due to increases in the size of the world fishing fleet. The subsidization of distant water fishing fleets contributes to IUU fishing by artificially reducing the capital value of both old and new ships—in short, extremely cheap vessels become available for purchase by illegal fishers. Government subsidies for buybacks and decommissioning exacerbate the problem even further (Clark et al. 2005; Marine Resources Assessment Group 2005). Moreover, as the demand for fish rises and quotas are introduced, incentives to engage in IUU fishing increase (Organization for Economic Co-operation and Development 2004, 2005).

There are, in fact, significant incentives, and minimal disincentives, to fish illegally. If the likelihood of engaging in illegal fishing equals the benefits of such activities minus the costs, then it is too often the case that the benefits outweigh the costs (Organization for Economic Co-operation and Development 2005). Legal and illegal fish are sold on the same markets, but legitimate operators are burdened with higher operating costs derivative of conservation and management measures. A good example is long-line vessels that set their lines to minimize by-catch (catch of non-target species like sea birds, turtles, and sharks) in accordance with regulations, but are placed at a competitive disadvantage relative to long-liners that fish with little concern for non-targeted species (Marine Resources Assessment Group 2005). Illegal entrepreneurs are not saddled with overhead costs related to licensing, regulatory observation, vessel monitoring, or catch documentation, nor do they shy away from exploiting workers in low-wage countries. Naturally, this unfair competition pressures legitimate fishing interests to cheat as well, thus exacerbating the problem by creating a snowball effect that multiplies irresponsible and illegal fishing methods (Organization for Economic Co-operation and Development 2005; Environmental Justice 2005). Moreover, when regulations are uneven, regulatory uncertainty prevails, little consideration is given to the income-generating ability of fishing operators, and nation-states and the international community pay insufficient heed to the problem of overcapacity, additional pressure on otherwise legitimate fishers is likely to impel IUU fishing (Organization for Economic Co-operation and Development 2005).

Market forces and aspects of globalization inadvertently facilitate IUU fishing as well. High demand for fish and fish products in key market centers naturally increases prices (and the incentive to meet that demand regardless of legality). Moreover, the global character of fishing operations and fish markets renders product laundering easy and practicable. Since enforcement of fishing regulations is largely dependent on the traceability of the product, features such as the “cold-chain” for transport of fish makes product laundering even simpler—fish can be transferred at sea via “reefers,” transported for long periods of time on specialized, refrigerated carrier vessels, and mixed with legitimate catch—all with a considerable measure of anonymity. Efficiencies in the commercial fishing industry like the “global bunkering system” that allows vessels to refuel at sea, innovations in the general maritime transport sector, and improvements in the global telecommunications and information technology infrastructure allows legitimate commercial fishing operations to more readily bring their products to market, but also provides opportunities for IUU fishers to seamlessly integrate their operations into the legitimate sector (Tsamenyi et al. 2008).

Coupled with the incentive of very high profits, a lack of enforcement capacity invites IUU fishing. The world’s oceans are vast, the resources devoted to law enforcement, insufficient. Even when the minimal chances of apprehension are overcome, penalties usually involve little or no jail time, while fines are insignificant relative to illicit profits (Organization for Economic Co-operation and Development 2005; Environmental Justice 2005). Enforcement and monitoring is expensive, and many countries simply lack the resources to effectively monitor and regulate industrial fishing in their territorial waters. Not only are patrol vessels spread too thin in Economic Exclusion Zones (EEZs), but the vastness of the open ocean presents a daunting jurisdiction for any law enforcer, whether a national regulatory body or Regional Fisheries Management

Organization (RFMO). (Organization for Economic Co-operation and Development 2005; Environmental Justice 2005).

One of the most important factors that contributes to IUU fishing is a perfectly legal practice related to fishing vessel registration common to large-scale, commercial fishing—under international law, nation-states are permitted to issue “Flags of Convenience” (FOCs) to foreign vessels, normally for a relatively small fee. International maritime law also stipulates that the country whose flag a vessel flies is responsible for that ship, thus creating a considerable regulatory loophole that allows IUU fishermen to circumvent management and conservation measures at will (Organization for Economic Co-operation and Development 2004, 2005; Environmental Justice 2005). For example, some vessels engage in flag-hopping, where they simply re-flag several times a year to confuse surveillance (United Nations Office on Drugs and Crime 2011). FOC arrangements are rendered even more problematical due to the dearth of an actual link between the flag nation and the owner of a given fishing vessel. In many cases, FOC vessels are backed by shell companies, joint ventures, and hidden owners, making it difficult to identify and fine owners even when regulations are enforced. The confidentiality of some banks likewise facilitates the system of hidden ownership. There is, in fact, an observable overlap between countries with strong bank secrecy laws—Belize, Gibraltar, the Bahamas, and Liberia are just a few of many examples—and those which utilize the FOC system (Environmental Justice 2005).

Under the FOC system, flag states either are not capable of, do not possess the political will, or simply do not care to exercise control over fishing trawlers flying their flag while operating in the remote territorial waters of foreign nations. Meanwhile, corrupt home governments collect millions of dollars by selling their flag to foreign vessels, simultaneously collecting bribes to permit violations of catch limits. The losers, of course, are local populations, typically already impoverished, who are robbed of the fish resources in their EEZs. Likewise, revenue from sales taxes that would normally go into the public till is also lost under FOC schemes (Organization for Economic Co-operation and Development 2005; Environmental Justice 2005; Marine Resources Assessment Group 2005). In 2001, there were over 1,300 vessels (only counting those over 24 meters) flying Flags of Convenience—about 10 % of the globe’s fishing fleet. A few Flag of Convenience (also called open registry) countries notorious for exploiting the FOC system include St. Vincent, the Grenadines, Panama, Belize, the Bahamas, Cyprus, the Netherland Antilles, Vanuatu, Georgia, Sierra Leone, Cambodia, and Honduras (Environmental Justice 2005; Marine Resources Assessment Group 2005).

It is unfortunate that significant gaps in international law render the legal, but highly detrimental, FOC system the only economically rational way for industrial fishers to operate. FOC registration decreases the operating costs for ship owners, who avoid burdensome overhead associated with safety, insurance, and the training of their crews. Nor do such operators have to pay for licenses, observers, catch documentation schemes, or vessel monitoring systems. Meanwhile, in international waters—that is, the vast expanse of the planet’s oceans—fishing regulations apply only to countries that are party to Regional Fisheries Management Organizations (RMFOs). This means that fishing trawlers need only re-flag to a state not party to a RMFO, and it may fish with no concern for conservation measures or regional agreements. And so, for all intents and

purposes, FOC vessels are beyond the reach of international law (Environmental Justice 2005; Marine Resources Assessment Group 2005).

In addition to the FOC system, the uneven application of port controls facilitates IUU fishing on a large scale. The problem arises because even though port inspections are standardized globally, the results of inspections are rarely passed on to RFMOs, or Flag States. The uneven application of rules, coupled with lackluster information sharing, creates a displacement effect whereby IUU fishers simply move about from port to port, targeting those with less severe regulations (Marine Resources Assessment Group 2005). IUU fishing is, in fact, largely dependent on the existence of so-called “ports of convenience” (Organization for Economic Co-operation and Development 2005; Martini 2013). Many ports provide essential services to IUU fleets, such as the provision of supplies and fuel, and the landing and shipping of illegally harvested fish. A prime example is the port of Las Palmas de Gran Canaria in Spain, which hosts a number of companies that operate illegal trawlers, and serves as a gateway for illegal fish shipped throughout the European Union (United Nations Office on Drugs and Crime 2011; Environmental Justice 2005, 2007).

In sum, a number of economic drivers, including high profit margins associated with illegal fishing, are complimented by a plethora of difficulties in national and international controls, which together render ameliorative efforts problematic. The FOC system, tax havens, insufficient monitoring, feckless penalties, confidential banking systems that facilitate money laundering, and corruption all inhibit national and international measures intended to combat IUU fishing—and ensure that the benefits outweigh the costs for IUU operators.

The impacts of IUU fishing

The incidence of IUU fishing causes significant harm not only to the environment—particularly as it depletes, and in some cases, decimates fish stocks—but also produces severe economic and social harms, especially among developing nations (Organization for Economic Co-operation and Development 2005; United Nations Office on Drugs and Crime 2010).

The most significant economic impact of illegal fishing in territorial waters is the loss of the value of the catch. In addition to this loss of gross national product (GNP), there is additional loss in revenue because levies, landing fees, and taxes are not collected from legitimate operators who are displaced by IUU fishers. Other macro-economic effects include the loss of employment within fishing and fish processing sectors, and a strain on national budgets (Organization for Economic Co-operation and Development 2005; Marine Resources Assessment Group 2005). Secondary economic effects of IUU fishing are legion, and include downstream phases of the fishing industry—marketing, packaging, transport, and fish processing industries are all negatively impacted by IUU operations. Because most IUU catches are not landed within the country from whose waters the fish were taken, there are also losses in terms of bunkering, port dues, vessel maintenance, and revenue derived from transshipment fees. “Multiplier effects” negatively impact investment and employment, with budget pressure on national economies due to the costs associated with monitoring and enforcement. Other secondary economic impacts include a reduction in the value of

catches for local fishing fleets, and health and safety risks when artisanal and industrial vessels clash. (Organization for Economic Co-operation and Development 2004, 2005; Marine Resources Assessment Group 2005). In sum, IUU fishing disrupts the market, lowering the cost of legally harvested fish to the detriment of legitimate operators; subsequent negative adjustments to fishing quotas by national authorities likewise negatively impacts law-abiding fishing operators (Putt and Anderson 2007). Additional human costs involve employment conditions in low-wage countries, where workers associated with the fish industry are often subjected to an abusive and dangerous work environment (Organization for Economic Co-operation and Development 2005; Environmental Justice 2005; Marine Resources Assessment Group 2005; United Nations Office on Drugs and Crime 2010).

The social impacts of IUU fishing are likewise significant. Especially in areas where fish is the major source of protein, illicit fishing contributes to hunger and poverty—often the case in nations such as Senegal, Sierra Leone, Angola, Somalia, Kenya, and Guinea Bissau. Conflicts between foreign vessels and local operators are common in Liberia, as well as Africa's shrimp fisheries and the inland fisheries of Senegal and Mauritania. Armed resistance to fishing surveillance and enforcement operations may be on the upswing in the territorial waters of Somalia and Mozambique, increasing the probability of injury and death. A reduction in fish stocks in local waters also reduces employment opportunities—subsequent decreases in household incomes exacerbates the impoverishment already prevalent (Environmental Justice 2005; Marine Resources Assessment Group 2005).

In addition to severe economic and social impacts, IUU fishing causes harm to target species and ecosystems, precipitating a reduction in biodiversity and ecosystem resilience (United Nations Office on Drugs and Crime 2010). Damage to delicate mangrove areas and prawn inhibits the natural restoration of local fish stocks. In addition to reducing lucrative target species like sharks and tuna, IUU fishing depletes less lucrative stocks that are nevertheless critical food sources for human populations and marine ecosystems (Marine Resources Assessment Group 2008).

IUU fishing negatively impacts a broad range of marine life, most notably tuna and other large pelagic fish that have been targeted for their high market value. (In the Indian Ocean, illegal tuna catches account for close to 10 % of fish caught, or about 130,000 tons annually). Other high seas species commonly taken through IUU fishing include redfish in the North Atlantic, orange roughy around New Zealand and Australia, squid in the Southwest Atlantic, and toothfish in the Southern Atlantic and Antarctic (Marine Resources Assessment Group 2008; United Nations Office on Drugs and Crime 2010). The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) estimated that 16.5 % of the total catch of Patagonian toothfish in 2003/04 was illegal, while the International Commission for the Conservation of Atlantic Tuna (ICCAT) found that 25,000 tons of tuna harvested in 2001/02 was attributable to IUU fishing. The North East Atlantic Fisheries Commission (NEFC) reported that 27 % of redfish caught in 2002 was landed by IUU ships (Marine Resources Assessment Group 2008).

Sharks are especially vulnerable to IUU fishing because of their low fecundity and slow rate of growth. At present, of 591 shark species assessed globally, more than 20 % are on the World Conservation Union's (IUCN) Red List of Critically Endangered, Endangered or Vulnerable species (Lack and Sant 2008, 2009). Illegal fishing for

sharks is associated with the retention of fins (shark fin accounts for only 7 % of the volume of the shark trade, but is 40 % of the *value*). Increased long-line fishing for tunas has contributed to heightened shark by-catch, and by most accounts, discards and unreported catch indicate the damage to shark populations is probably greater than reported (Lack and Sant 2008, 2009).

Some fishing methods are especially detrimental to the environment. For example, the by-catch of long line vessels (legal and illegal trawlers that use nets up to twenty-five miles long) can be devastating to non-target species, including sea birds, turtles, sea mammals, sharks, and killer whales (Organization for Economic Co-operation and Development 2005; Marine Resources Assessment Group 2008). Illegal driftnet fishing in the Mediterranean Sea has caused considerable damage to biodiversity there, and is known to cause the death of thousands of cetaceans every year (Environmental Justice Foundation n.d.). In southern oceans, illegal fishing kills an estimated 100,000 seabirds annually, including thousands of endangered albatrosses (Marine Resources Assessment Group 2008).

Other environmentally harmful fishing methods include the use of illegal fishing gear like gillnets, and some IUU vessels even use explosives to keep whales away from fishing lines (Marine Resources Assessment Group 2008). Driven by a demand for live fish to satisfy up-scale restaurants and aquariums, the use of sodium cyanide to stun fish before capture is common around the Philippines, and causes widespread damage to coral reefs (Barber and Pratt 1998; Pratt 1996). In Tanzania local fishermen use dynamite and hand grenades to catch reef fish in large quantities. This wanton destruction of marine habitat can have especially far-reaching effects, as maerl, coral seagrass beds, and inshore shallow seas are settlement and nursery areas for young fish and other marine animals (Organization for Economic Co-operation and Development 2005; Marine Resources Assessment Group 2005; McManus et al. 1997).

Having described the various deleterious outcomes associated with IUU fishing, it becomes necessary to point out that the overall problem is, in all likelihood, more severe than is known. Unreported harvests probably range from 25 % to 100 % of declared catches. A case study of ten countries found that the total loss from IUU fishing during the study period was \$372 million, or 23 % of the declared value of the catch (Marine Resources Assessment Group 2005).

Responding to IUU fishing

The problem of IUU fishing has acquired increasing international attention in recent years, precipitating a number of efforts geared toward palliation. The results, thus far, are mixed at best.

The United Nations drew up laws and regulations in the 1990s to combat IUU fishing, and in 2001, 110 nations endorsed the U.N. Food and Agricultural Organization's (FAO) International Plan of Action to Prevent, Deter, and Eliminate IUU fishing (IPOA-IUU)—the principal international instrument aimed at addressing the problem. Components of the IPOA-IUU include trade restrictions, port enforcement actions, catch documentation schemes, vessel registration and licensing systems, maintenance of records of fishing vessels, and the implementation of monitoring, control and surveillance (MCS) measures (Organization for Economic Co-operation and

Development 2005). Under the IPOA-IUU, signatory states were expected to develop Plans of Action by 2004, but only six nations met the deadline, and a full third had not even begun to implement National Plans of Action years after passage. Nonetheless, at the World Summit on Sustainable Development in Johannesburg (2002), and at the G8 Summit (2003), nations committed to the IPOA-IUU, and pledged to eliminate subsidies that contribute to illicit fishing (Environmental Justice 2005; Tsamenyi et al. 2008).

In addition to a broad range of national measures,² additional international initiatives have been undertaken. The Round Table of Sustainable Development at the Organization for Economic Cooperation and Development (OECD) established a High Seas Task Force in 2003, and the Rome Declaration on IUU fishing (2005) called on developed nations to provide financial and technical assistance to third world countries to help them develop MCS programs (Environmental Justice 2005; Tsamenyi et al. 2008). Elsewhere, The Sub-Regional Fisheries Commission in West Africa was formed to coordinate surveillance and information sharing, and in 2001, an international MCS network was established that included the EU, the U.S. and Japan, along with forty other members. The West African initiative has enjoyed some success, including the apprehension of several IUU vessels—but the network is voluntary, informal, lacks resources, and has no full-time staff. In fact, as well-intentioned as the aforementioned measures may be, it is probably fair to say that much of it amounts to little more than rhetoric, as the initiatives are typically underfunded (Environmental Justice 2005; Tsamenyi et al. 2008).

In 2008, the Council of the European Union adopted an IUU regulation that includes catch certification requirements, port control over third country fishing vessels, establishment of an IUU vessel list, and the development of a list of non-cooperating third countries. The EU regulation (EC No 1005/2008) restricts access to European Community ports by placing a burden on fish importing nations to be “free or increasingly free” of IUU fishing, with restrictive trade measures against non-cooperating countries. However, as a final report prepared for the Commonwealth Secretariat observes, “until the measures are actually implemented, it is difficult to draw any definitive conclusions about their practical implications” (Tsamenyi et al. 2008, p. 46).

One of the principal measures toward fisheries management involves the formation of Regional Fisheries Management Organizations (RFMOs), created under international agreements to be responsible for the management of high seas fisheries and fish that migrate through territorial waters of member states. In recent years, RFMOs have developed white and black lists of vessels that are permitted to fish in the waters of member states. The principal RMFOs are:

- The Commission for the Conservation of Southern Bluefin Tuna (CCSBT)
- The Northwest Atlantic Fisheries Organization (NAFO)
- The Northeast Atlantic Fisheries Commission (NEAFC)
- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)
- The Indian Ocean Tuna Commission (IOTC)

² Describing the tremendous range of national laws and initiatives pertaining to IUU fishing is well beyond the scope of this paper. A good source that does outline many national efforts to combat the problem is referenced in this paper: OECD (2005) Why fish piracy persists.

The Inter-American Tropical Tuna Commission (IATTC)
The Western and Central Pacific Fisheries Commission (WCPFC)
The International Commission for the Conservation of Atlantic Tunas (ICCAT)
(Tsamenyi et al. 2008).

Key to the success of RFMOs is their willingness and efficiency in sharing information with other RFMOs and the international community—deficiencies in this area will permit IUU vessels to simply shift their landings to ports of convenience. Many RFMOs have incomplete and incompatible lists and registers, and none provide a definitive source of information for critical data such as port inspections, blacklists, and histories of vessel ownership. RFMO vessel lists are derived from the Flag State of the vessel in question—in the case of corrupt governing bodies, this information is likely to be inaccurate (Environmental Justice 2005). Few RFMOs possess remits that include all marine fish, thus leaving prodigious areas open to unregulated fishing on demersal and pelagic fish. Some high seas fisheries organizations do focus on individual species: these include the International Pacific Halibut Commission and the Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea (Marine Resources Assessment Group 2005).

Improved technologies have the potential to combat IUU fishing. One high-tech enforcement measure involves the installation of satellite vessel monitoring systems (VMS). Precise coordinates are regularly transmitted to a central monitoring center through Global Positioning System (GPS) technology. Unfortunately, commercial fishing trawlers have learned to manipulate the system by tampering with the onboard “blue box,” thereby transmitting “false positives” (Environmental Justice 2005).

Some enforcement efforts indicate heightened seriousness on the part of regulators. For example, after incursions by IUU vessels into Mozambique’s Bazaruto Archipelago National Park, the Mozambican government sent military personnel into the area—gunfire and rocket-propelled grenades came into play, and an illegal long-line trawler was apprehended (Marine Resources Assessment Group 2005). Aerial patrols, ocean-going patrols, and on-board monitors are tangible methods for encouraging regulatory compliance—but again, assets are spread too thin. Verifying landings against logbook data would be pragmatic and efficacious, but the Flag State must agree to permit an on-board observer, which is unlikely in the case of IUU fishing (Environmental Justice 2005).

Additional localized but exemplary efforts indicate that where the political will exists, meaningful amelioration is possible. For example, an MCS system established by the European Union and the Southern African Development Community (SADC) provided training and technical assistance to agencies that monitor and control commercial fishing in Tanzania, South Africa, Namibia, Mozambique, and Angola. A group of West African coastal states comprising the Sub-Regional Fisheries Commission (SRFC) created a Surveillance Operations Coordinating Unit to develop joint air and sea patrols and protocols on hot pursuit in territorial waters. A vessel monitoring system was set up on seventy trawlers, and a database of registered vessels developed (Environmental Justice 2005). Subsequently, in May 2004, a joint mission between the Angolan and Namibian Ministries of Fisheries and the SADC-EU Monitoring, Control and Surveillance Programme utilized a new patrol vessel to board nineteen vessels, and impound six, for violations of SADC fisheries legislation. Air patrols were begun as

well, and uncovered twenty-nine Chinese vessels committing serious violations. As a consequence of the aforementioned initiatives, it is reasonable to conclude that a “demonstration effect” produced empirically positive results. In sum, the implementation of a 200-mile EEZ and the establishment of a viable monitoring, control and surveillance regime have largely eliminated IUU fishing in Namibian waters (Environmental Justice 2005; Organization for Economic Co-operation and Development 2005; Marine Resources Assessment Group 2005; Sumaila et al. 2004).

Some additional gains in fisheries management have been observed. Unregulated fishing for tuna in the Atlantic declined from about 2,000 tons in 1999 to 500 tons in 2002 following trade-related sanctions and the implementation of a black list by the International Commission for the Conservation of Atlantic Tuna (ICCAT) (Marine Resources Assessment Group 2005; Sumaila et al. 2004). Similarly, port state controls implemented by nations subject to the Northeast Atlantic Fisheries Commission reduced the illegal catch of cod in the Barents Sea from 50 % to 20 % of reported catch. In a 2008 study, dozens of EEZs and high seas regions were analyzed, with the researchers concluding that illegal and unreported fishing (not including unregulated fishing) declined in eleven regions and increased in only five of those examined (Agnew et al. 2009).

One set of strategies aimed at reducing IUU fishing that is quite promising, if difficult to implement, are trade-related and catch documentation schemes (Agnew et al. 2009). For example, in 1999, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) implemented a catch documentation scheme aimed at preventing illicit toothfish catches from entering markets in countries belonging to that RMFO. A “white list” of vessels authorized to fish by contracting parties was established, and only those ships on the list were permitted to sell certified toothfish. Similar protections precipitated toothfish catch declines, from 33,000 tons in 1997 to 3,600 tons in 2004 (Agnew et al. 2009).

A corollary to the success of catch documentation and the regulation of fish entering markets is better labeling for fish and fish products—thus enabling consumers to make informed decisions and shun illegally harvested fish. It follows that the success of trade and catch documentation schemes is not merely dependent on the deployment of necessary resources, but ultimately, must be founded on the traceability of fish and fish products. Fortunately, the latest developments in this area are quite positive. For example, in response to the industry need to counter IUU fishers, Seafood Businesses developed a tracking system that assigns barcodes to individual fish, and a state-of-the-art database to track distribution; the company also maintains a website that contains transparent information and a Q&A section for consumers. Another company, Technology Solutions Gulf Wild, allows consumers to track seafood back to the precise fishing vessel, location, and fisherman by entering a unique gill tag number on a website. In addition, a software solution called Trace Register enables all companies in the seafood supply chain to access and share information as products move through the chain (Boyle 2013).

Another encouraging sign is the participation of non-governmental organizations that have become active in combating IUU fishing. Groups like TRAFFIC, Greenpeace, and the World Wildlife Fund (WWF) have launched campaigns and undertaken research that has provided valuable information. TRAFFIC has developed a website that provides information on sourcing, extraction, and analysis of trade data

that can be used to identify IUU fishing activities (TRAFFIC 2014). In addition to the traceability initiatives described above, companies in the seafood industry have joined together to promote responsible fish harvesting. Two entirely private initiatives have been notably successful in combating IUU fishing: the Coalition of Legal Toothfish Operators (COLTO) and the Organization for the Promotion of Responsible Tuna Fisheries (OPRT). COLTO is an international alliance of legal fishers that works with government and conservation groups to reduce illegal toothfish harvesting; the group advises the public about the problem of IUU fishing, offers a reward of US \$100,000 for information leading to the conviction of illegal operators, and hosts an advanced database of fishing vessel information. Established in Japan, the OPRT includes fishing companies from Japan, China, Indonesia, Korea, Ecuador, and the Philippines that work together to monitor IUU fishers, disseminate information to the public, and scrap Japanese long-line tuna vessels (Organization for Economic Co-operation and Development 2005).

Though controversial, market-based measures can help alleviate IUU fishing. Tariffs on countries that exploit the FOC system and are known to have vessels that engage in IUU fishing, easing the marketing of legally caught fish and species harvested by artisanal fishers, and trade embargoes against certain nations that facilitate IUU fishing are measures that could produce observable results (Agnew et al. 2009). The reduction of the size of the global fishing fleet would promote economic efficiencies by eliminating the perceived need for distant water fleet subsidies—the actual withdrawal of subsidies would likely reduce competitive pressure from IUU operators, as the availability of inexpensive vessels decreased (Clark et al. 2005).

Discussion: theoretical contextualization and criminogenic asymmetries

A synthesis of the existing research on IUU fishing would remain inchoate without some attempt to provide theoretical contextualization. While the present work in no way has sought to systematically test any theory, the following brief discussion elucidates some broad points, and may suggest a course for additional inquiry.

Aside from the economic approach which applies a cost-benefit analysis to IUU fishing activities (Organization for Economic Co-operation and Development 2005), manifestations of the problem seem to comport well with the broad “opportunity” perspective in the field of criminology.³ Certainly, highly desirable fish species and the vastness of the world’s oceans—suitable targets and territory lacking capable guardians—provide ample opportunity for profit-driven operators to violate a broad patchwork of fishing regulations.⁴ Pivoting on the notion that criminals respond in a rational way to incentives and disincentives (and take advantage of opportunities in the business environment that make the success of criminal ventures more likely), the concept of “criminogenic asymmetries” seems especially well-suited to a discussion of IUU fishing.

³ Although it is beyond the scope of this article, fisheries compliance theory may well be another fruitful avenue of theoretical inquiry. See Gezelius and Hauck (2011).

⁴ The language used here references Cohen and Felson’s (1979) “routine activities approach.”

A direct consequence of globalization processes, “criminogenic asymmetries” may be viewed as conditions in the international community which facilitate or enable transnational criminal enterprises (including IUU fishing). Developed by Nikos Passas, criminogenic asymmetry is defined as “structural disjunctions, mismatches and inequalities in the spheres of politics, culture, the economy and the law” (Passas 2001, p. 23). Passas contends that these asymmetries are criminogenic in that they create or increase the demand for illegal goods and services, they generate incentives for people and organizations to engage in illegal activities, and they make it more difficult for authorities to control certain crimes. Moreover, these complex and large-scale asymmetries, largely the work of agents of nations, tend to be multiplied and exacerbated by the process of globalization (Passas 1999, 2001). Passas states that these asymmetries “provide the catalyst for globalization to produce criminal opportunities, motives to take advantage of those opportunities, and weaker controls” (Passas 2001, p. 33). Passas also observes that corruption is a central component of the systemic processes described—it is seen as both “result and cause...a conservative force that maintains or increases asymmetries” (Passas 2001, p. 26).

The preceding examination of IUU fishing suggests that a prominent asymmetry that gives rise to and facilitates this particular transnational crime is the prodigious range and disparate nature of laws governing territorial waters and the high seas. Even if concerns over national sovereignty are overcome and significant, far-reaching measures like the IPOA-IUU are accepted by a large portion of the international community, nations prioritize and deploy resources in a widely differential manner. In the case of laws differing substantively—that is, the vast range of regulations pertaining to protected species, quotas, permissible tackle, catch documentation schemes, monitoring and control systems, tax laws, and port controls—and the prevalence of unequal law enforcement, whether due to lack of resources, bribery, or other causes, legal asymmetries provide opportunities for entrepreneurs to exploit weaknesses and cracks in the regulatory framework. In fact, the lack of a “normative regulatory framework” enables fishing operators to engage in what Passas has referred to as “crime without law violation” (Passas 2001, p. 28). Significant regional and international asymmetries in the relative strength and enforcement of fishing laws around the globe produces what may be viewed as a hydraulic effect, where pressure on illegal fishers in one region merely pushes illicit activities to other areas. For example, as the European Union attempts to severely restrict the importation of IUU-sourced fish and fish products, intense pressure there will increase the cost of doing business for illegal operators, thus creating cost asymmetries which will likely displace nefarious fishing activities to regions with less stringent or poorly enforced rules.

The nature of the Flag of Convenience (FOC) system itself creates economic and cost asymmetries that promotes IUU fishing. As noted, FOC registration reduces overhead costs for fishing operators by passing on the burden of regulatory compliance to states unable or unwilling to enforce regulations. The resulting asymmetry in the cost of doing business places commercial fishers committed to regulatory compliance at a severe competitive disadvantage, which naturally increases the likelihood that they too will cheat. Most notably, the uneven application of global port controls—legal, political and cultural asymmetries—generates so-called “ports of convenience,” where illegal fishers can bring their catch to market without fear. Similarly, while port

inspections are standardized globally, information is poorly shared with relevant bodies like Regional Fisheries Management Organizations (knowledge asymmetries).

Economic inequity among nation-states is the progenitor of power asymmetries, which contribute to the success of transnational criminal enterprises such as IUU fishing. As noted, absent assistance from other nations or the international community, relatively poor, developing countries—like those in West Africa, or Indonesia—lack the resources to adequately enforce fishing laws or protect the fish resources in their territorial waters. Under these conditions, industrial trawlers from relatively powerful nations easily intrude on and exploit the Economic Exclusion Zones of developing states. Similarly, the citizens of poor nations are vulnerable to predation by wealthy ones who establish and run shipping registries—in the case of IUU fishing, commercial interests register vessels to the governments of poor nations unwilling to, or incapable of, policing those operators who fly their flag.

Economic vulnerability arising from global economic asymmetries contributes to political norms, attitudes and beliefs (political and cultural asymmetries) that undermine regulatory enforcement. For example, developing countries preoccupied with feeding their populations are more likely to exhibit political and cultural norms that place a relatively low priority on environmental protection, the conservation of fish species, or the enforcement of international conventions. Economic and cultural asymmetries between richer and poorer nations may even foster the *normalization* of public malfeasance in less developed countries, where economic necessity is cited as an excuse, and corruption rationalized as “the cost of doing business.”⁵ In fact, legal, political, economic, and cultural asymmetries may interact in such a way that extremely harmful practices, including the cooptation of public functions by private interests, are characterized as mere “technical violations” (see Passas 1997, p. 2).

In sum, the interplay of asymmetries in law, economics, power, and culture—arising from globalization processes, and often shaped by systemic corruption—seem to provide an optimal breeding ground for transnational crimes like IUU fishing.

Conclusion

IUU fishing is a significant transnational crime problem that causes severe economic, social, and environmental harm. Various causes exist, including a range of economic drivers, difficulties in enforcement, and legal, economic, political, and cultural asymmetries inextricably linked to the processes of globalization.

Clearly, the protection of living marine resources and the enforcement of regulations intended to thwart IUU fishing presents what may be appropriately described as a conundrum. While likely necessary, the spate of regulations in recent years that have brought about gains in the conservation of some fish species have also contributed to and perhaps exacerbated legal, supply–demand, and cost/price asymmetries that provide ample opportunity for IUU fishers. It follows that a leveling out, a reduction in observed regulatory asymmetries, is foundational to successfully reducing IUU fishing.

⁵ Though one might convincingly argue that the “normalization” of corruption is not confined to poor nation-states.

Though difficult to accomplish, a global, normative framework for the policing of commercial fishing activities should be more fully developed and implemented (the IPOA-IUU is certainly a significant step in that direction). Obviously, a governance mechanism for the high seas is required. A more comprehensive body of RFMOs would be optimal, with more species-specific conventions (while most tuna and salmon are covered by RFMOs, few other species are protected). International cooperation and a consistent application of regulations will be critical to any real progress, while monumental reform (or elimination) of the FOC system must be a central component of any meaningful, palliative effort (Vukas and Vidas 2001; Marine Resources Assessment Group 2005).

At a foundational level, the difficult, controversial task of balancing human interests and needs with the conservation of fish species and stocks must be thoughtfully addressed. In addition, it must be recognized that the problem of IUU fishing is, at its core, not merely a manifestation of profit-driven, transnational crime perpetrated by corporate interests and organized criminals, but also a phenomenon—not unlike transnational organized crime in general—that is linked to, if not derivative of, weak, incompetent and corrupt governance. And so, curtailing IUU fishing will be dependent on the promotion and perpetuation of sustainable and responsible commercial fishing, *and* the political will to foster governments and regulatory bodies characterized by integrity. In the final analysis, progress on a global scale will likely require a modification of certain patterns of consumption, a difficult behavioral change critical not only for humans and their nutritional interests, but for stressed and endangered fish populations as well.

Finally, it's important to acknowledge that the present study is not without limitations. Inherent weaknesses in the analysis of secondary data are not easily overcome, and biases among researchers, perhaps subconscious, may flavor conclusions. Moreover, this work is in no way meant to be exhaustive, but will hopefully serve as a useful source, perhaps a launching pad, for additional research—certainly, further elaboration of economic cost-benefit models (see OECD 2005) and a more in-depth exploration of criminogenic asymmetries that facilitate IUU fishing are warranted.

References

- 4 Japanese fishing companies grounded for exceeding quotas in Russia. Japan Today, 26 Jan. 2011, available at <http://www.japantoday.com/category/business/view/4-japanese-fishing-companies-grounded-for-exceeding-quotas-in-russia>.
- Agnew DJ, Pearce J, Pramod G, Peatman T et al (2009) Estimating the worldwide extent of illegal fishing. *PLoS ONE* 4(2):e4570. doi:10.1371/journal.pone.0004570
- Barber CV, Pratt RV (1998) Poison and profits: cyanide fishing in the Indo-Pacific. *Environment* 40:5–34
- Berry J (1999) Armed gangs threaten world caviar stocks. *The Sunday Telegraph*, July 18, 1999. Retrieved at <http://www.highbeam.com/doc/1P2-19129915.html>
- Boyle M (2013) Fish to plate: traceability in the seafood industry. House, Chatham
- Brenthurst Foundation (2010) Maritime development in Africa: an independent specialist's framework. Johannesburg
- Clark CW, Munro GR, Sumalia UR (2005) Subsidies, buybacks, and sustainable fisheries. *J Environ Econ Manag* 50:47–58
- Cohen L, Felson M (1979) Social change and crime rate trends: a routine activity approach. *Amer Soc Rev* 44: 588–608
- Dronova N, Spiridonov V (2008) Illegal, unreported, and unregulated pacific salmon fishing in Kamchatka. Europe-Russia, WWF-Russia and TRAFFIC

- Environmental Justice Foundation (2005) *Pirates & profiteers: how pirate fishing fleets are robbing people and oceans*. London
- Environmental Justice Foundation (2007). *Pirate fish on your plate: tracking illegally-caught fish from West Africa into the European Union*. London
- Flewwelling P and Hosch G (2006) Review of the state of world marine capture fisheries management: Indian Ocean country review: Indonesia.
- Gezelius S, Hauck M (2011) Toward a theory of compliance in state-regulated livelihoods: a comparative study of compliance motivations in developed and developing world fisheries. *Law and Soc Rev* 45(2):435–470
- Hanich Q, Tsamnyi M (2009) Managing fisheries and corruption in the Pacific island region. *Mar Pol* 33:386–388
- Hauck N, Sweijd NA (1999) A case study on abalone poaching in South Africa and its impact on fisheries management. *ICES J on Mar Sci* 56:1024–1032
- House TW (2000) International crime threat assessment. *Trends Organ Crim* 5:56–59
- Trends in Organized Crime* (1997) 3:23–24.
- Kelleher K (2002) Robbers, reefers and ramasseurs: a review of selected aspects of fisheries MCS in seven West African countries. Sub-Regional Fisheries Commission, Food and Agriculture Organization
- Lack M, Sant G (2008) Illegal, unreported, and unregulated shark catch: a review of current knowledge and action. International, TRAFFIC
- Lack M, Sant G (2009) Trends in global shark catch and recent developments in management. International, TRAFFIC
- Le Gallic B, Cox A (2006) An economic analysis of illegal, unreported and unregulated (IUU) fishing: key drivers and possible solutions. *Marin Pol* 30:689
- Liddick D (2011) *Crimes against nature: illegal industries and the global environment*. Praeger, Santa Barbara
- Liss C (2007) *The roots of piracy in Southeast Asia*. Institute, Nautilus
- Marine Resources Assessment Group (2005). Review of the impacts of illegal, unreported and unregulated fishing on developing countries: final report. London
- Marine Resources Assessment Group (2008). Study and analysis of the status of IUU fishing in the SADC region and an estimate of the economic, social and biological impacts, volume 2: main report. London
- Martini M (2013) *Illegal, unreported and unregulated fishing and corruption*. International, Transparency
- McManus JW, Reyes JRRB, Rodolfo B, Nanola CL (1997) Effects of some destructive fishing practices on coral cover and potential rates of recovery. *Environ Manag* 21:69–78
- Organization for Economic Co-operation and Development (2004) *Fish piracy: combating illegal, unreported and unregulated fishing*. Paris
- Organization for Economic Co-operation and Development (2005) *Why fish piracy persists: the economics of illegal, unreported and unregulated fishing*. Paris
- Passas N (1997) Causes and consequences of corruption. 8th International Anti- Corruption Conference. Lima, Peru
- Passas N (1999) A structural analysis of corruption: the role of criminogenic asymmetries. *Trans Org Cr* 4(1): 41–54
- Passas N (2001) Globalization and transnational crime: effects of criminogenic asymmetries, in Combating transnational crime: concepts, activities, and responses. Williams P and Vlassis D (eds.), pp. 22–56. Frank Cass
- Pratt VR (1996) The growing threat of cyanide fishing in the Asia Pacific Region and the emerging strategies to combat it. *Coast Manag Trop Asia* 5:9–11
- Putt J, Anderson K (2007) A national study of crime in the Australian fishing industry. Criminology, Australian Institute of
- Schmidt CC (2005) Economic drivers of illegal, unreported, and unregulated (IUU) fishing. *Inter J Marin Coast Law* 20:479–507
- Shivers, C.J Corruption endangers a treasure of the caspian. *New York Times*, Nov 28, 2005. <http://www.nytimes.com/2005/11/28/international/asia/28sturgeon.html>
- Standing A (2008) *Corruption and industrial fishing in Africa*. Chr. Michelsen Institute
- Sumaila UR, Skogen MD, Morten D, Boyer D et al (2004) Namibia's fisheries: ecological, economic and social aspects. Eburon Academic Publishers, Delft
- TRAFFIC (2014) Trade data analysis can unmask illegal fishing activities. Retrieved March 24, 2014, at <http://www.traffic.org/home/2014/2/24/trade-data-can-unmask-illegal-fishing-activities>
- Tsamnyi M, Palma MA, Milligan B, Mfodwo K (2008) Development impact of the council regulation establishing a European community system to prevent, deter and eliminate illegal, unreported and unregulated fishing on commonwealth ACP member countries: final report. Secretariat, Commonwealth
- United Nations Office on Drugs and Crime (2006) Report of the sixteenth meeting of heads of national drug law enforcement agencies. Latin America and the Caribbean, Buenos Aires

- United Nations Office on Drugs and Crime (2010) The globalization of crime: a trans-national organized crime threat assessment. Vienna
- United Nations Office on Drugs and Crime (2011) Transnational organized crime in the fishing industry. Vienna
- US Department of Justice (2010) Trafficking in persons report. Washington
- US Department of State, Bureau for International Narcotics and Law Enforcement Affairs (2010) International narcotics control strategy report: vol. 1. Washington
- Van Der Veen H (2004) The trans-Mediterranean drug complex: drug trade, drug control, and the prospects for instituting social, political, and economic rights. *Medit Pol* 3(9):515–522
- Vukas B and Vidas D (2001) Flags of convenience and high seas fishing: the emergence of a legal framework. In O.S. Stoke (ed.), *Governing high seas fisheries: the inter-play of global and regional regimes*, pp, 54–90. Oxford University Press
- Zabyelina G (2014) The ‘fishy business:’ a qualitative analysis of the black market in caviar. *Trends in Org Crim* DOI. doi:[10.1007/s12117-014-9214-z](https://doi.org/10.1007/s12117-014-9214-z)