

*Véronique Chadillon-Farinacci, Marc-Antoine DeGrâce* ■

Enforcement in the commercial lobster fishery of Atlantic Canada: Infraction reporting in rural coastal contexts

Egzekwowanie przepisów w komercyjnych połowach homara w Atlantyckiej Kanadzie: raportowanie naruszeń w nadmorskich kontekstach wiejskich

Abstract: This study examines public involvement in reporting fisheries infractions within rural coastal contexts, focussing on the commercial lobster fishery in Atlantic Canada. Using violation records from 2011 to 2021 and Chi-square tests, offences detected by Fisheries and Oceans Canada (DFO) were compared with those reported by the public in terms of the type of infraction, licence status and enforcement response. The results show that public reporting mainly targets visible fishing practices, such as out-of-season fishing or gear violations, while administrative offences are under-reported, reflecting community-based regulatory logics. Reporting patterns are largely consistent across regions, except for illegal lobster trade and transportation. Public-reported violations are more likely to be met with repressive enforcement at the initial stage. These findings highlight the role of rural community norms and the visibility of transgressions in shaping the use of formal law.

Keywords: green criminology, rural criminology, fishing communities, lobster, illegal fishing, offence reporting, enforcement practices, fisheries management

Abstrakt: Przedmiotem badania jest analiza zaangażowania społecznego w zgłaszanie naruszeń w zarządzaniu rybołówstwem w wiejskich społecznościach nadmorskich, koncentrująca się na komercyjnych połowach homara w Kanadzie Atlantyckiej. Z wykorzystaniem danych o naruszeniach z lat 2011–2021 i testów chi-kwadrat, wykroczenia wykryte przez Fisheries and Oceans Canada (DFO) porównane zostały z tymi zgłoszonymi przez społeczeństwo, z uwzględnieniem rodzaju naruszenia, statusu licencji oraz reakcji egzekucyjnych. Wyniki pokazują, że zgłoszenia publiczne dotyczą głównie

Dr Véronique Chadillon-Farinacci, Université de Moncton, Canada, veronique.chadillon-farinacci@umoncton.ca, ORCID: 0000-0003-0129-8163

Marc-Antoine DeGrâce, Université de Moncton, Canada, m-ahachedegrace@cipc-icpc.org, ORCID: 0009-0009-4998-4892

widocznych praktyk połowowych, takich jak połowy poza sezonem lub naruszenia sprzętowe, podczas gdy wykroczenia administracyjne są rzadziej zgłaszane. Wzorce zgłaszania są w większości spójne regionalnie, z wyjątkiem nielegalnego handlu i transportu homara. Naruszenia zgłoszone przez społeczeństwo częściej wiążą się z represyjną reakcją na wczesnym etapie postępowania.

Słowa kluczowe: kryminologia zielona, kryminologia obszarów wiejskich, społeczności rybackie, homar, nielegalne rybołówstwo, zgłaszanie naruszeń, praktyki egzekwowania prawa, zarządzanie rybołówstwem

Introduction

Illegal fishing – also commonly referred to as illegal, unreported and unregulated (IUU) commercial fishing – is the most prevalent and complex fishing-related environmental crime (Belhabib, Le Billon 2022; Petrossian, Lettieri, Clarke 2022). To address the economic, social and environmental harms of illegal fishing, sustainable fisheries policies rely on national laws and regulations (Amidjogbe et al. 2023). Studying illegal fishing in the scope of enforcement practices can help agencies better prevent and address these activities. Some species, such as lobster, are more likely to be poached due to their high value and market demand (Petrossian, Weis, Pires 2015; Petrossian, Clarke 2014). In Canada, lobster has been one of the most lucrative species per unit weight. From 2016 to 2021, the value of landings increased from \$14,300 to \$19,400 per metric ton (Fisheries and Oceans Canada 2021b; 2022). Beyond its high per-unit value, lobster is Canada's single most valuable marine fish industry in absolute terms, sustaining over 8,600 licensed harvesters in five provinces (Gouvernement du Canada 2022). For example, in 2024, its exceptional value density of landed prices of \$CAD18.73 /kg reached roughly six times the groundfish average. For many rural coastal communities, lobster landings are therefore not incidental, but fundamental to local livelihoods. This point helps explain why residents may be motivated to protect the resource through informal monitoring and reporting. Its high economic value underscores the need to address commercial lobster fishing violations. In Atlantic Canada, these enforcement challenges unfold primarily within rural and coastal communities, where fishing activities are embedded in dense social networks and long-standing local norms (McMullan, Perrier 2002).

Several authors argue for integrating communities and sociolegal processes in fisheries management (Davis, Wagner 2006; Harris, Thompson 2023). In rural fishing contexts, community involvement in regulation is not merely complementary to state enforcement, but often constitutes a primary mechanism through which compliance norms are articulated, monitored and enforced (Acheson 1988; McMullan, Perrier, Okihiro 1993). These studies suggest that enforcement can incorporate public input to address non-compliance. This study examines fisheries enforcement by focussing on the origin of infraction reporting in commercial lobster fishing.

However, studies indicate that the relationship between fishers and the authorities is marked by various tensions and disagreements (McMullan, Perrier, Okihiro 1993; Rogers 2010; Barnett, Eakin 2015). Such tension is indeed particularly salient in rural settings, where the proximity between the regulators and regulated actors heightens the visibility of enforcement decisions (Meško 2020). Most fishing offences are reported by fishery officers due to their proactive inspection work. However, some are reported by other sources.

The purpose of the study is to compare violations reported by fishery officers with those reported by the public. In the data source, “public” reports originate from identified individuals, unidentified individuals and tips submitted through the Report-a-Poacher/Crimestoppers hotline. None of these distinguish whether the reporter holds a commercial fishing licence or otherwise has a direct economic stake in the fishery. We therefore treat “public” as an inclusive operational category that may encompass harvesters and licence holders alongside residents and other citizens with no economic interest in lobster fishing. We examine differences in violations of the Fisheries Act, licence status and fishery officers’ responses across the four Department of Fisheries and Oceans (DFO) regions in Atlantic Canada where commercial fishing is authorised, based on the origin of the reported infractions. This highlights where regulatory priorities converge or diverge between state authorities and community actors in rural coastal fisheries. Identifying infractions overreported by the public can help authorities target enforcement more effectively, build trust and reduce risks of vigilante justice.

In the first and second sections, we review the role of the community in regulating behaviour and the discretionary power of fishery officers. The review concludes with Donald Black’s theoretical framework – specifically on how the law behaves. Subsequently, we conduct bivariate analysis on official data to compare the types of infractions, licence status and the response of officers based on whether the incident was reported by the public or by fishery officers. In the discussion section, we outline future research directions and highlight aspects that enhance our understanding of conformity measures in lobster fisheries management. This includes a specific focus on the influence of community norms on enforcement practices. In this sense, our study provides a benchmark for policies that integrate community input in fisheries management.

Community-regulated behaviour: Insights from fisheries and green criminology studies

Regulation in rural contexts cannot be understood solely through formal enforcement mechanisms; it must be situated within community-based systems of social control shaped by proximity, familiarity and distance from centralised legal

institutions (Donnermeyer 2016; 2022). “Community” refers to the network of harvesters, residents and other locally embedded actors bound by shared norms and repeated interactions around the fishery. In such contexts, rurality reflects a relational distance from state authority, shaping distinctive patterns of norm enforcement, tolerance and reporting. Similarly, when citizens view the police positively, they are more likely to report crimes (Schreurs et al. 2018; Graham, Kulig, Cullen 2020) due to the trust fostered by initiatives such as community policing (Weisburd et al. 2024). In this section, we discuss infraction reporting in the fisheries sector from this perspective, considering two elements. On the one hand, fishers already regulate behaviour on the water through their social organisation (Brewer 2012), although they do so according to priorities that may differ from those of the regulators. On the other hand, recent studies in green criminology recognise the participation of the community in reporting poaching activities (Sjöstedt et al. 2022; Berl et al. 2025). Those two elements raise issues that go beyond infraction reporting, as the response of authorities can also be a driver of community regulation.

The first argument for focussing on public reporting in the fishing sector is that harvesters form communities that regulate the behaviour of members and outsiders. On the one hand, their priorities can be compatible with the authorities’. An American ethnographer reports that lobster fishers in Maine agree with many conservation measures; some associations even advocate stricter rules (Acheson 2006). On the other hand, fishers’ priorities regarding illegal fishing may also differ from those of regulatory authorities due to their social organisation. Some offences are tolerated, while others are more severely punished. Indeed, the social organisation of fisheries is partly structured by traditions that transcend control mechanisms imposed by the state. The example of illegal fishing illustrates that fishers’ tolerance can be consistent or discordant with regulations. A Nova Scotia fishery officer reported in a Canadian study that “community poaching” is permitted by its members if it is occasional and for non-commercial purposes, whereas illegal fishing for commercial purposes is prohibited by fishing community norms (McMullan, Perrier 2002) and commercial poachers do not benefit from community benevolence to avoid detection. In Maine, a coastal US state adjacent to the maritime provinces of Canada, tactics to regulate intolerable behaviour include “jokes, comments [...], knots tied in buoy lines, opening others’ traps, cutting trap lines, physical threats, or, rarely, gunfire or arson” (Brewer 2012: 388).

These observations echo studies on variations in tolerance towards poaching in the fishing sector in Spain. Based on self-revealed data from 95 Spanish shellfish fishers, Hugo M. Ballesteros and Gonzalo Rodríguez-Rodríguez (2018b) investigated community membership as an explanatory factor for acceptance of poaching in small-scale fisheries. The authors observed that tolerance and perceived degree of community membership were strongly correlated ($r=0.98$) whether the motivations for poaching are profit or subsistence. In other words, illegal fishing by actors with strong community membership – such as licenced harvesters keeping

part of their catch for personal use – is more tolerated than similar practices by those with weak community ties. The least tolerated poachers are “outsiders” with no informal right to use these resources (Ballesteros et al. 2024). Lower levels of tolerance for certain types of illegal fishing according to community membership could be a driver to report offences. This distinction closely aligns with rural criminological analyses showing that community membership constitutes a key axis that structures the use of formal law in rural settings (Donnermeyer 2016). In settings with high relational density, socially distant actors like outsiders or unauthorised resource users are more likely to be formally reported; law is mobilised to reinforce community boundaries.

A second argument from studies in green criminology which supports public input in reporting crimes is that the direct detection of a crime is limited (Battista et al. 2018; Belhabib, Le Billon 2022). In the case of wildlife officers, whose work is similar to that of fisheries officers, this limitation arises from a low ratio of officers to potential offenders and large enforcement areas (Falcone 2004). Thus, relying on people with privileged access to areas where the infractions occur is worth examining. These individuals include nearby residents of conservation areas (Sjöstedt et al. 2022) and at-sea observers (Faunce et al. 2023). For example, a survey of 2,282 respondents near a transboundary park in Mozambique, South Africa and Zimbabwe found that community motivations to inform authorities are consistent, regardless of direct or indirect involvement in poaching (Sjöstedt et al. 2022). Among other factors, having a good relationship with authorities also contributes to members of the public reporting poachers. A certain alignment in priorities could reflect this relationship and could have beneficial effects on the fight against illegal fishing. However, a study by Martin Sjöstedt et al. (2022) does not document specific types of offences typically reported by the public regarding poaching. Privileged access to certain areas allows for some infractions to be observed, but not all of them. Administrative infractions or hidden activities remain out of sight. Also, the moral dimension of offences plays a significant role in whether they are reported: offences not considered serious are less likely to be reported. In a recent American study, about one third (34%) of 3,717 respondents to an online survey – selected randomly from the Idaho Department of Fish and Game licensing database – who witnessed a violation but decided not to report it indicated they had not done so because they believed the violation was not significant enough to report (Berl et al. 2025). A comparison of types of infractions reported by the public and those reported by authorities must consider these parameters. Rural criminological research shows that in socially dense settings, visibility in shared spaces becomes a key mechanism of social regulation (Donnermeyer 2015). Fishing communities are a prime example of that. Infractions embedded in everyday, observable practices are more easily incorporated into local “crime talk” and collective judgments, increasing public reporting, while administrative or less visible violations remain peripheral to community regulation (Pytlarz, Bowden 2019). Therefore, leveraging community members’ input could encourage consistent reporting of offences and

could improve monitoring of illegal fishing.

Taken together, rural and green criminological scholarship highlights how enforcement, reporting and informal regulation are deeply embedded in community-based social organisation. This literature provides a conceptual framework for interpreting variations in public reporting not merely as individual choices, but as expressions of rural modes of governance shaped by proximity, shared norms and selective reliance on formal authority.

Besides reporting infractions, the authorities can also influence community regulation, as highlighted by recent research. One study indicates that violations detected by at-sea observers in Alaska resulted in little enforcement action from the authorities (Faunce et al. 2023). When comparing two periods within the 20-year span, the share of infractions reported by at-sea observers that were subsequently abandoned nearly doubled. It fluctuated from 13.3% between 2001 and 2006 (119/897) to 29.2% between 2015 and 2020 (782/2862). The researchers also note that from 2015 to 2020, only a minority of violations reported by at-sea observers resulted in sanctions. Specifically, 7.4% of violations reported during this period resulted in penalties (199/2862), a noteworthy decrease compared to the period from 2001 to 2006, where 26.1% of violations led to penalties (324/897). The response from the authorities is important to fishers. When community members in Hawaii perceive enforcement as weak or ineffective, some fishers apply an additional sanction called community repression (Fisk 2021). This remark echoes that “in practice it is the holders of formal ownership rights of the resource who take action to manage poaching where the public authorities are unable to do so” (Ballesteros, Rodríguez-Rodríguez 2018a: 108).

Decisions taken by officers can generate dissatisfaction and lead to acts of self-justice. Two anecdotes closely related to the Atlantic Canadian commercial lobster fishery exemplify this point. In 2023, a lobster fisher in New Brunswick was found to be in possession of lobsters smaller than the legal size. Despite fishery officers’ intervention, about 20 boat captains advised him to remove his traps from the water three weeks before the end of the season (Radio-Canada.ca 2024). The second example illustrates severe retaliation from fishers against an outsider involved in illegal fishing. In 2013, Phillip Boudreau, a Nova Scotian poacher without a fishing licence, was killed by a crew of lobster fishers after several incidents where lobsters were stolen from their traps. In a documentary, a community member expresses his frustration with what he perceives as the ineffectiveness of the authorities: “If it had been dealt with early... Phillip wouldn’t have been on that boat that morning. I mean, don’t get me wrong [...] But the law wasn’t doing their job [27:40]” (CBC Gem 2021). This incident underscores the importance of effective fisheries enforcement and motivates closer attention to the capacities and challenges facing Canadian fishery officers.

Powers, tools and challenges in Canadian fisheries enforcement

The effectiveness of fisheries management measures is linked to the inclusion of stakeholders, communication and monitoring, control and surveillance of activities (Battista et al. 2018; Di Cintio et al. 2023). This section provides context on the work of Canadian fishery officers, emphasising their proactive nature and the tools available to them to enforce the Fisheries Act. Features of their work can accommodate public input, but proactive work does not require public input to proceed, in theory.

To begin with, fishery officers managed by the DFO have broad powers. They are authorised to search individuals, places and vehicles without a warrant (Canada 1985). This freedom of action stems from the nature of the offences they monitor and the tools available to conduct their work. Fishery officers deal with consensual offences: fish being viewed as a food commodity, not as a victim or individual property (Wyatt, Friedman, Hutchinson 2021; Wyatt 2022). On paper, fishery officers do not need public assistance as complainants to perform their duties. They define offences in their territory in the same way that police officers define some forms of crime in theirs. Fishery officers are therefore not dependent on the existence of a victim; their discretion establishes “whether the event they have observed corresponds to the legal definition of an offence” [own translation] (Boivin 2021: 29). For instance, a Norwegian study using police-reported data found that police officers reported more drug-related offences in pleasant weather (Hart, Pedersen, Skardhamar 2022). The authors attribute this to initiative-taking policing practices, since drug-related crimes are considered consensual crimes. The proactive work of fishery officers offers more insight into resource allocation than trends in Fisheries Act offences.

The tools available to officers are consistent with the proactive nature of their work. The Fisheries Act (1985) and the Integrated Fisheries Management Plan (2019) are the main legislative tools used to manage and monitor commercial, Indigenous and recreational fisheries, as well as aquaculture enterprises (Fisheries and Oceans Canada 2021a; 2021b). Physical inspections of catches, equipment and documentation are conducted to ensure compliance with applicable laws (Miller, Sumaila 2016). Some fisheries are monitored with additional measures, such as vessel monitoring systems, at-sea observers and aerial or marine surveillance (Fisheries and Oceans Canada 2023). Fishery officers impose various penalties, similar to police officers: issuing verbal warnings, giving tickets or making arrests (Engel et al. 2019). The Fisheries Act establishes a dual enforcement approach that includes penalties including fines and equipment seizures through administrative and summary procedures, as well as alternative measures outside the judicial system (Amidjogbe et al. 2023). This variety of methods reflects the various fishery violations. Offences vary according to species, group of species or fishing area. For example, in the Gulf region, to protect the American lobster (*Homarus americanus*), management

measures include a minimum legal carapace size, a maximum hoop size for fishing traps and a prohibition against keeping egg-bearing females (Fisheries and Oceans Canada 2021a).

Proactive enforcement on the water faces many challenges. For example, the extent of the sea makes it difficult for officials to monitor the water (McMullan, Perrier 2002). The inability to control maritime spaces as well as on land creates a criminogenic environment for marine activities (Barlatier 2018). Monitoring marine activities is a complex task; fishery officers cannot be expected to do it alone.

Donald Black's (1976) theory of "the behaviour of law" holds that the quantity and style of law mobilised in response to any given event is not fixed, but varies systematically with features of the social space surrounding it. Rather than treating the law as a uniform response to wrongdoing, Black treats it as a dependent variable shaped by "morphology," the structure of social relationships surrounding an offence. Two dimensions of this morphology are especially relevant to infraction reporting in fisheries: radial location and relational distance.

Building on public involvement in reporting infractions, we use these two dimensions to examine the number and scope of prohibitions mobilised against lobster fishing offences. Radial location refers to how close or far an offence is from the centre of social life. Offences closer to this centre are subject to less "law" than those further away. For instance, community poaching is integrated into social life in some communities in Atlantic Canada (McMullan, Perrier 2002). Therefore, infractions related to this practice are less likely to be reported by the public. Conversely, off-season fishing disrupts the rhythm of life in fishing communities and creates unfair competition among fishers (Gough 2008). As a result, violations related to this practice are more likely to be reported by the public.

Morphology also includes how people relate to each other. Socially integrated people are more likely to use the law than those who are less integrated. This suggests that the public is more likely to report individuals with a weak community membership and outsiders without the right to fish (Ballesteros, Rodríguez-Rodríguez 2018b; Ballesteros et al. 2024). These individuals are not subject to certain infractions, such as quota violations. In both aspects of its morphology, geographic differences can reflect variations in public-reported infractions compared to those reported by the DFO.

On the one hand, fishery officers wield significant discretion in their duties. On the other hand, they operate within an environment where fishers actively participate in regulating behaviour. This dynamic sets the stage for investigating how authorities align with the public regarding types of offences, licence status and officers' responses to reported infractions within Canada's lobster fishery. Our research aims to analyse these variations across the four administrative regions of the DFO where commercial lobster fishing is authorised, as the social organisation of the lobster industry is closely tied to its geographical context. In sum, the discretionary and largely proactive nature of fishery officers' work combined with Black's behaviour-of-law framework outlining when community

members are more likely to mobilise formal law motivate our empirical strategy: comparing types of infractions, licence status and officers’ responses by report origin across DFO regions. We compare these three characteristics of reported infractions based on whether they were reported by the public or by fishery officers. The following section details the data, methods and sample description used to achieve our study’s objective.

Materials, methods and sample description

The dataset originated from a request for access to information (#A-2021-00124) (Government of Canada 2024a). Each line represented a record from the Departmental Violation System database from April 2011 to March 2021 (N = 86,057). We limited observations to those on American lobster for DFO regions where commercial lobster fishing is authorised: the Maritimes, Gulf, Quebec and Newfoundland and Labrador regions (Figure 1). These occurrences represented 15.44% of the dataset (n = 13,286).¹

Figure 1. Fisheries and Oceans Canada (DFO) administrative regions in Canada, with the four regions included in this study highlighted (Quebec, Gulf, Maritimes, and Newfoundland and Labrador)



Source: Own evaluation.

¹ We removed entries that have been censored by the DFO. Based on informal conversations, the censored records appear to report non-offences.

We applied an exclusion criterion to occurrences based on public reporting. In other words, occurrences unlikely to be reported by the public were excluded, such as inspections, assault and obstruction and quota limit violations. Our final sample consisted of 12,213 observations. Additionally, we incorporated the number of lobster permit holders per region for all complete years within the period for context, as the number of permits per zone is not standardised (Wiber, Barnett 2023). These data were accessible on the DFO’s website (Fisheries and Oceans Canada 2024).

Grouping variable

We combined various reports to compare lobster-related infractions across the DFO’s administrative regions. This consolidation helped us differentiate between offences from the DFO and from the public. Firstly, fishing offences attributed to the DFO encompass several categories, including those generated by the department’s own tools, violations reported by staff members from various departments and reports from contracted groups such as fishery guardians. Secondly, illegal fishing activities reported by the public fell into two categories. The first is the “General Public,” which includes violations from both identified and unidentified individuals. The second category, “Report-a-Poacher/Crimestoppers,” comprises reports received through a hotline. None of these subcategories record whether the reporting individual is a licence holder, making it impossible to separate reports from fishers or other economically interested actors from those of the general citizenry.

Table 1 provides an overview of reported fishing offences by origin and region. It includes the average rate and standard deviation of permit holders for the period and regions in order to account for volume relative to the primarily monitored population: lobster fishers. Table 1 shows that 95.95% of the reported offences originated from the DFO, highlighting the predominantly proactive enforcement by fishery officers. This proportion varies by region, especially when adjusted for the number of commercial lobster fishing licence holders.

Table 1. Frequencies of reported infractions by origin, average permit holders and infractions rates for commercial lobster fishery across four DFO administrative regions from 2011 to 2021

	Gulf	Maritimes	Newfound- land and Labrador	Quebec	Total
<i>Reported Infractions by Origin</i>					
DFO	4237	5103	829	1549	11718

	Gulf	Maritimes	Newfoun- dland and Labrador	Quebec	Total
Public	127	245	60	63	495
<i>Permit Holders and Infraction Rates</i>					
Annual average num- ber of permits (SD)	888.273 (278.269)	1410.212 (957.127)	2425.364 (185.371)	591.273 (7.399)	2296.786 (216.039)
Infraction rate per permit holders (an- nual)	4.913	3.792	0.367	2.726	5.317
Public-reported infraction rate per 1000 permit holders (annual)	0.143	0.174	0.025	0.107	0.216

Source: Own evaluation.

We make two observations from this table. To begin with, in three out of the four regions, more permit holders correlated with more infractions. For example, the Maritimes region, with the second highest number of permit holders, has the highest number of both DFO-reported offences (5,103) and public-reported offences (245). However, Newfoundland and Labrador did not follow this trend. Next, infraction rates per permit holder varied greatly across regions. The Gulf region had the highest rate, at 4.913 infractions per permit holder from 2011 to 2021. The Maritimes region followed with a rate of 3.792, which is 22.808% lower than the Gulf region. Newfoundland and Labrador had the lowest rate (0.367), while Quebec was between them, with 2.726 infractions per permit holder for the same period.

Independent variables

To explain the differences in offence reporting based on the origin, we analysed three variables: type of infractions, fishing licence status and fishery officers’ response. Table 2 lists fishing violations by category in alphabetical order. Table 3 shows the frequencies of reported infractions by type across the four regions from 2011 to 2021.

Table 2. Fishing violations by category

Variable	Description
Area/Time	This violation pertains to fishing beyond the Lobster Fishing Area (LFA) boundaries or outside the permitted seasons as per the fishing licences.
Gear-related	This category covers violations involving illegal fishing gear, including exceeding trap limits, using non-compliant traps, and gear conflicts (tampering with another harvester's gear). These infractions were grouped together due to their focus on gear-related issues.
Illegal lobster trade and transportation	This category covers violations related to the commercial aspects of fishing infractions, specifically involving activities such as purchasing, selling, transporting, and exporting of illegal lobster.
Registration/Licence	This administrative violation is related to the fishing permit.
Reporting	This violation involves the failure to accurately report fishing activities.
Species/Size limit	This violation occurs when the caught fish do not comply with the species or size restrictions.

Note: These definitions are based on the Fisheries Act and court rulings reviewed as part of a broader research project on territorial conflicts in the commercial lobster fishery.

Source: Own evaluation.

Table 3. Frequencies of type of reported infractions across four DFO administrative regions from 2011 to 2021

	Gulf	Maritimes	Newfoundland and Labrador	Quebec	Total
Area/Time	511	775	77	128	1,491
Gear-related	786	832	190	290	2,098
Illegal lobster trade and transportation	694	1,253	211	455	2,613
Registration/Licence	1,345	1,215	242	551	3,353
Reporting	577	941	107	62	1,687
Species/Size limit	451	332	62	126	971
Total	4,364	5,348	889	1,612	12,213

Source: Own evaluation.

Firstly, the most frequent type of infraction was related to registration or licensing, accounting for approximately 27.45% of all fishing infractions reported between 2011 and 2021. The second most common type of offence involved illegal lobster trade and transportation, accounting for just over 20% of the reported offences. Together, these two types made up nearly half of all reported infractions in the dataset (48.849%).

Secondly, licence status indicates whether fishing is authorised. There were several categories in the original dataset. To make sense of these categories while avoiding maintaining subdivisions with only a few cases, we grouped “domestic unlicensed,” “foreign unlicensed” and “non-fisher” under unauthorised fishing. This group represents the formal right to fish, which could be akin to community membership. Typically, “unlicensed” fishers and “non-fishers” have lower community affiliation than licenced fishers (Ballesteros, Rodríguez-Rodríguez 2018b). Table 4 lists the frequencies of reported fishing offences according to licence status across the regions during the study period. Authorised fishers accounted for most infractions, with 10,623 occurrences, representing about 86.98% of all reported fishing infractions.

Table 4. Frequencies of reported infractions according to licence status across four DFO administrative regions from 2011 to 2021

	Gulf	Maritimes	Newfoundland and Labrador	Quebec	Total
Authorised	4,063	4,695	778	1,087	10,623
Unauthorised	301	653	111	525	1,590
Total	4,364	5,348	889	1,612	12,213

Source: Own evaluation.

Thirdly, each offence was categorised into one of nine original officer responses, which we reclassified into five types of responses. Responses related to charges (laid, not approved, pending or under review) were grouped together as they signify the officers’ intention. This aggregation has limitations but provides insight into officers’ responses. “Other” includes responses that could not be grouped elsewhere. Three responses were kept as is: warning, seizure and ticket issuance. Table 5 shows the frequencies of reported infractions by fishery officers’ responses across the four regions from 2011 to 2021. Notably, responses related to charges and warnings accounted for 91.54% of officers’ responses, totalling 11,179 cases.

Table 5. Frequencies of reported infractions according to fishery officers’ responses across four administrative regions from 2011 to 2021

	Gulf	Maritimes	Newfoun- dland and Labrador	Quebec	Total
Intent to lay charges	1,584	2,220	274	935	1,491
Other	34	102	0	2	2,098
Seizure	253	459	66	97	2,613
Ticket	1	2	1	16	3,353
Warning	2,491	2,565	548	562	1,687
Total	4,363	5,348	889	1,612	11,242

Source: Own evaluation.

For our analysis, we used Chi-square independence tests to compare the origin of reported fishing violations across three variables: type of infraction, licence status and fishery officer responses by region (Field, Miles, Field 2012; Tabachnick, Fidell 2014). However, the assumption that no more than 20% of cells may have an expected count below five was not met for the Maritimes, Quebec and Newfoundland and Labrador regions when cross-referencing the origin of reported infractions and fishery officers’ actions. Therefore, we only conducted Chi-square tests for the overall result and the Gulf region. In all other cases, this assumption was consistently met.

Data structuring and analysis were conducted using R version 4.3.2 (R Core Team 2023a). We used the R packages dplyr for data manipulation and cleaning (Wickham, François et al. 2023), readxl for importing Excel files (Wickham, Bryan et al. 2023), writextl for exporting Excel files (Ooms, McNamara 2024) for data preparation. Descriptive statistics and Chi-square independence tests were performed using the stats library (R Core Team 2023b).

Results

The following sections present the results of Chi-square independence tests, aligning with our objective to analyse reporting variations across the four DFO regions from April 2011 to March 2021. We compared the type of infractions, licence status and fishery officers’ responses based on the origin of the report (DFO or public) for each region and globally. Table 6 shows Chi-square (χ^2) statistics, degrees of freedom (DF), p-values and contingency coefficients (CC) for the types of reported infractions, licence status and fishery officers’ responses in relation to the origin of reported offences globally and across all four regions.

Table 6. Chi-square statistics and contingency coefficients for our three variables of interest

	χ^2 statistic	df	p-value	CC
<i>Types of Reported Infractions</i>				
Global	225.89	5	< 0.0001	0.135
Gulf	58.6	5	< 0.0001	0.115
Maritimes	231.52	5	< 0.0001	0.204
Newfoundland and Labrador	16.277	5	0.006	0.134
Quebec	12.85	5	0.025	0.089
<i>Licence Status</i>				
Global	175.15	1	<0.0001	0.119
Gulf	199.45	1	<0.0001	0.209
Maritimes	82.924	1	<0.0001	0.124
Newfoundland and Labrador	0.16634	1	0.683	0.014
Quebec	3.6667	1	0.056	0.048
<i>Response by Fishery Officers</i>				
Global	284.65	4	<0.0001	0.151
Gulf	138.06	4	<0.0001	0.175
Maritimes	NA	NA	NA	NA
Newfoundland and Labrador	NA	NA	NA	NA
Quebec	NA	NA	NA	NA

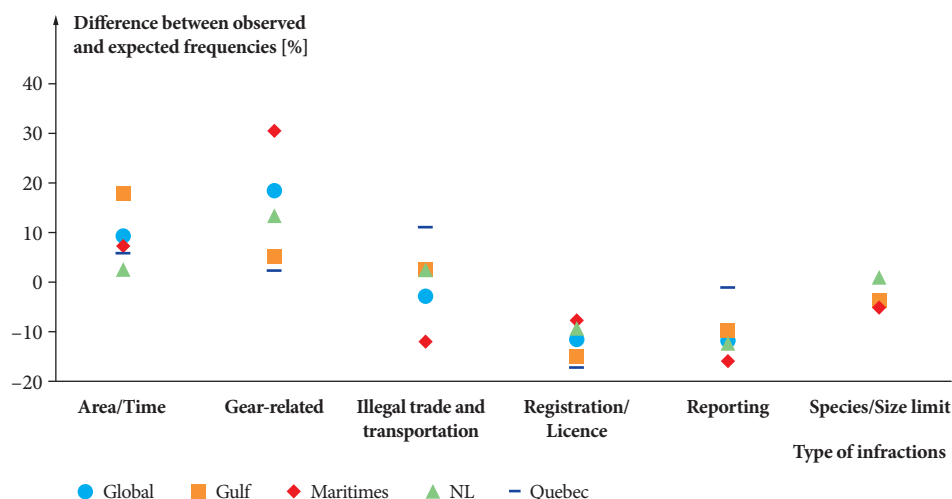
Source: Own evaluation.

Type of reported infractions

The Chi-square test results indicate notable regional variations in how the origin of reporting correlates with distinct types of infractions. Globally, there is a significant association between the origin of reporting and the types of infraction ($\chi^2 = 225.89$, $p < 0.0001$). This suggests that types of reported fishing infractions varied significantly based on whether they were reported by the DFO or the public. Figure 2 shows the differences between categories and regions. From the deviations between observed and expected frequencies reported by the public, we calculated the percentage they represent relative to the total number of observations in each region. Each region is identified by a different marker. The height of this marker is placed in front of the percentage of weighted deviations. This illustrates offences

that are overreported or underreported by the public, indicated by a percentage above or below 0%, respectively.

Figure 2. Deviations between observed and expected frequencies of reported lobster fishing infractions by a public source by infraction type and DFO region (2011–2021)



Source: Own evaluation.

Two offences were consistently overreported by the public across all regions: fishing outside lobster zones or out of season (Area/Time) and gear-related infractions. Both categories involve observable fishing practices occurring within shared fishing spaces, making them particularly visible to community members with regular access to coastal and maritime environments. These are closely tied to operational contexts and lobster harvesting practices, affecting observable fishing methods and conditions. In the Gulf region, fishing outside lobster zones or out of season is particularly overreported, with an excess of 18.21% compared to the observed 127 offences reported by the public. Additionally, the contribution to the Chi-square level was highest for this offence in this region (dev. = 23.129; χ^2 cont. = 61.387). Gear-related offences were significantly overreported by the public, both globally and in the Maritimes region. In the Maritimes, this overreporting was 30.97% higher than expected based on public-reported offences. This highlights a unique characteristic of the Maritimes, where gear-related infractions were more influenced by their reporting origin than any other offence in any other region. This could be linked to the fact that the effect size, expressed by the contingency coefficient, was the highest for this region (CC = 0.204). The Maritimes also stand out with the highest number of offences (5,348) and the second highest number of permit holders (average = 1,410.212). We hypothesise that this contributed to the global results.

Offences related to species/size limits, registration, licences and reporting were underreported by the public across all regions. These infractions typically require direct inspection or access to documentation, limiting their detectability by nonauthorised observers. The underreporting ranged from -0.67% to -16.72% of the expected values. Notably, both registration and licences were underreported by the public more significantly in two regions: Quebec (dev. = -10.534; χ^2 cont. = 40.101) and Newfoundland and Labrador (dev. = -7.222; χ^2 cont. = 44.367). These offences significantly contributed to the relationship between the origin of the report and the type of offence.

Finally, for illegal lobster trade and transportation offences, public reporting varied by region. Although this type of infraction does not contribute much to the overall statistical relationship, two regions showed divergent trends. In Quebec, these offences were overreported by 11.46%, while in the Maritimes they were underreported by 11.59% compared to the expected values. Although this infraction does not heavily impact the overall statistical relationship, these regional differences highlight the importance of considering local factors in reporting practices and types of infractions.

Licence status

Another series of Chi-square tests examined the relationship between reporting origin and fishing licence status. The results indicate significant associations in half of the regions. Overall, there was a statistically significant association across all regions ($\chi^2 = 175.15$, $p < 0.0001$, CC = 0.1189). However, in Newfoundland and Labrador – and to a lesser extent in Quebec – there was no meaningful relationship between reporting origin and licence status ($\chi^2 = 0.16634$, $p = 0.6834$, CC = 0.0137). For this variable, there were two categories: authorised and unauthorised. Unauthorised fishing was significantly overreported, with public reports being overrepresented in two regions. This pattern indicates that public reporting was disproportionately directed towards actors without formal authorisation to fish. The Gulf region is particularly noteworthy, as unauthorised fishing there was significantly overreported (31.69%) compared to the 127 offences reported by the public. Also, the Gulf region ($n = 4,364$) showed a stronger association for this variable ($\chi^2 = 199.45$, $p < 0.0001$, CC = 0.2091). In other regions, the degree of overreporting ranged from 11.88% for Quebec to 18.81% for the Maritimes. Maintaining all proportions, this resulted in overreporting that was 1.7 to 2.7 times higher in the Gulf region. These results suggest how fishing infractions were reported. The licensing status of fishing activity varied across most geographic regions.

Response by fishery officers

The Chi-square tests comparing the origin of fishing violations with the responses by fisheries officers yielded noteworthy results overall, especially in the Gulf region. We conducted only two tests due to violations of the assumptions required for the Chi-square test in other regions. This selective approach implies minimal variability in response patterns among the Maritimes, Quebec and Newfoundland and Labrador, which violated statistical assumptions.

The global results indicate a significant association between the origin of the reports and the types of action taken ($\chi^2 = 284.65$, $p < 0.0001$, $CC = 0.151$). Across regions, responses to public-reported offences were consistently orientated towards formal enforcement measures rather than informal or discretionary responses. In the Gulf region, fisheries officers' actions differed significantly based on whether the infraction was reported by the DFO or the public ($\chi^2 = 138.06$, $p < 0.0001$, $CC = 0.175$). The contingency coefficients were remarkably similar, ranging from 0.1509 to 0.1751, indicating that the effect sizes were small. However, the actions of fisheries officers consistently aligned, whether considering the global results or specifically those in the Gulf region. In both cases, warnings issued by fisheries officers when offences were reported by the public were underrepresented (globally: $dev. = -172.427$). Warnings were underrepresented for offences reported by the public, with -34.83% out of 495 occurrences across all regions and -43.26% out of 127 occurrences in the Gulf region. This trend was consistent across the other regions, with 45 warnings in the Maritimes, 10 in Newfoundland and Labrador and 5 in Quebec over the study period. Additionally, public reports were never followed by tickets during this period.

Our findings suggest that enforcement actions are more likely when offences are reported by the public: officers are more likely to seize equipment and catches or try to lay charges to a greater extent. Globally, seizures represented an excess of 10.83% compared to what we would expect if there were no statistical relationship between the origin and the response to the infraction. Seizures in the Gulf region followed that trend, with a similar 11.57% overrepresentation of seizures. Finally, charges of all types – whether filed, unapproved, pending or under review – followed the same trend, being globally overreported by the public by 22.67% and by 26.97% for the Gulf region, with a high contribution to the Chi-square value ($dev. = -34.255$; $\chi^2 \text{ cont.} = 18.580$). However, we can only comment on the intention to lay charges, not whether they were approved by Crown prosecutors. This analysis highlights regional differences in fisheries management responses based on the source of reported offences, reflecting varying priorities between public and institutional sources.

Discussion

In this paper, we compare community priorities with infraction reporting in the fisheries sector, focussing on whether reports come from the DFO or the public. We examine the types of violations, licence status and fishery officers' responses. Our discussion centres on two main points: the community's role in regulating behaviour and reporting, and its relationship with authorities and how this can affect reporting.

Firstly, studies have shown that lobster fishers regulate behaviour on the water through their social organisation (Brewer 2012; Waring, Acheson 2018), even though their priorities may differ from those of regulatory authorities (McMullan, Perrier, Okihiro 1993; McMullan, Perrier 2002). Our study aligns with existing literature and theory, showing that the types of infractions that were reported varied significantly based on whether they were reported by the DFO or the public. The public mainly reports two types of offences across all regions: fishing outside designated lobster zones or out of season and gear-related violations. The first type involves geographical and temporal restrictions on where and when fishers can operate. The second type involves the use of equipment and the tools and techniques fishers can use. Both are closely tied to operational context and harvesting practices, and they are observable to those with access to the coast or waters. Rural criminological research highlights that in settings characterised by dense social networks and shared use of space, the visibility of behaviours becomes a central mechanism of social regulation (Donnermeyer 2015; Pytlarz, Bowden 2019). In these coastal communities, infractions tied to observable practices – such as using certain gear or fishing out of season – are more likely to be reported by community members than administrative violations or less visible ones. This result also echoes other studies highlighting the privileged position of certain individuals in reporting infractions (Faunce et al. 2023; Berl et al. 2025). In addition, those two types of infractions are closely tied to the organisation of lobster harvesting. This connection to “social life” referenced by Black (1993) makes these infractions more likely to be observed and reported by the public. Moreover, this aligns with studies on the acceptability of poaching practices, as tolerance is strongly associated with group or community membership (Ballesteros, Rodríguez-Rodríguez 2018a; 2018b; Ballesteros et al. 2024). This overreporting by the public may indicate that they consider these infractions important.

Furthermore, researchers agree that poaching is not tolerated by fishing communities when it is conducted for commercial purposes (McMullan, Perrier 2002; Ballesteros, Rodríguez-Rodríguez 2018a; 2018b). Similarly, while our study cannot confirm a link between commercial illegal fishing and reporting, our findings support the idea that the public overreports infractions by unauthorised fishers. Fishers take violations by outsiders more seriously, as shown by overreporting in three out of the four regions. Conversely, the public underreports certain infractions,

such as those related to permits or reporting. We put forward three hypotheses to explain underreporting by the public in the light of the studies.

1. Some fishing offences are actively tolerated, as indicated by the case of community poaching (McMullan, Perrier 2002; Ballesteros, Rodríguez-Rodríguez 2018b).
2. Other offences are met with public indifference because they are not considered immoral or serious (Graham, Kulig, Cullen 2020; Sjöstedt et al. 2022) (e.g. administrative infractions).
3. Underreporting is explained by the fact that some fishing offences are more difficult for the public to detect because they take place out of sight. In contrast, fishery officers have direct access to boats and their contents: it is part of their duty to ensure compliance.

Future studies could look at this through interviews with fishers and fishery officers. Moreover, the case of illegal transactional lobster offences (buying, selling, transporting and exporting) is intriguing: it presents a mixed picture, as some regions exhibit overreporting by the public, while others show underreporting. This type of infraction exemplifies an ambiguity that is not seen in other infractions, where there is consensus. This suggests that such infractions could lead to practices being accepted or tolerated by certain communities, indicating that the local nature of acceptability norms must be examined when studying fishing infractions and public reporting. More information about the individuals involved and contextual elements would help to deepen this idea.

Secondly, our study also sheds light on harvesters' contribution to official social control mechanisms and their relationship with authorities. From a rural criminological perspective, public reporting can be understood as a form of co-production of order that emerges where formal enforcement is spatially and relationally constrained (Bowden, Meško 2025). Rather than indicating greater punitiveness, community reporting functions as a compensatory mechanism that reinforces state presence where informal regulation and expectations of collective responsibility remain strong.

On the one hand, several papers have characterised the relationship between fishers and authorities as distrustful and tense and with the perception that the authorities are ineffective (McMullan, Perrier, Okihiro 1993; Rogers 2010; Barnett, Eakin 2015; CBC Gem 2021; Fisk 2021). On the other hand, criminological studies indicate that a good relationship with the authorities encourages reporting (Schreurs et al. 2018; Sjöstedt et al. 2022). Our study indicates that despite some types of fishing violations being overreported by the public, they represented between 2.91% and 6.75% of all reported offences in the four regions; this is a modest share, though we lack an external benchmark for these victimless offences. Comparing regions therefore serves less to support spatial analysis than to establish an internal point of reference. Places with low public contributions may highlight areas needing better relationships with authorities or better normative aspects of fishing infractions. Improving these could enhance public reporting and compliance.

Studies suggest that the authorities' response may not always align with what the public perceives as important or serious (Fisk 2021; Faunce et al. 2023; Radio-Canada.ca 2024). Our study also reaches a mitigated conclusion: a repressive approach is more likely when an offence is reported by the public; that same repressive response is the initial response from the authorities, and it is incomplete as it does not account for the judicial process that follows. This is significant because other studies and anecdotal evidence suggest that insufficient sanctions can lead to dissatisfaction among fishers and can potentially trigger a repressive community response (CBC Gem 2021; Fisk 2021; Radio-Canada.ca 2024). Therefore, the fishery officers' response must be taken within a continuum of enforcement. Our results raise questions about what happens in the subsequent stages of the process, considering both immediate enforcement actions and subsequent judicial processes. Future studies on these subsequent stages, incorporating court data, would be relevant to better understand how infractions, their origins and the responses integrate into the overall process. This would enhance our understanding of the public's role in controlling illegal fishing and its implications for the relationship with regulatory authorities.

Conclusion and future implications

In conclusion, this paper contributes to research on public reporting of offences and its place in the context of fisheries management. It sheds light on the discretion of Canadian fishery officers, which guides their actions, and proposes that it can coexist with and even be informed by public concerns. However, integrating community norms into enforcement practices remains challenging, as it requires acknowledging the public as key informants and acting accordingly.

To effectively co-produce order on the water, community perspectives can be better integrated into enforcement guidelines. For example, consultations should clearly explain the decisions taken, ensure their coherence with existing policies and decrease potential conflicts with informal norms when possible. By bridging these two aspects, fishers' vulnerability to self-justice and retaliation can be reduced, and the legitimacy of the rule of law and effective due process can be enhanced.

Future research should more directly connect infraction-reporting patterns to the economic incentives structuring both compliance and unauthorised fishing. Comparative studies across fisheries with different value profiles could clarify whether the pattern observed here (strong public engagement with visible offences and weak engagement with administrative or concealed ones) can be generalised beyond the lobster industry or instead reflects the particular economic stakes in this case. Qualitative work with fishers and officers, paired with longitudinal tracking of individual fishing grounds, would help establish whether economic pressure (e.g. price spikes or quota changes) shifts community tolerance for poaching and, in turn, public reporting behaviour.

Incorporating community perspectives encourages adherence to due process and prevents conflicts that lead to self-regulation, while strengthening trust and cooperation between fishers and fishery officers. This approach is crucial since the criminalisation of fishers as “poachers” exacerbates divisions between citizens and the state (Song et al. 2020).

Declaration of Conflict Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no specific funding for this work.

References

- Acheson J.M. (1988). *The Lobster Gangs of Maine*. Hanover: University Press of New England.
- Acheson J.M. (2006). ‘Lobster and groundfish management in the Gulf of Maine: A rational choice perspective.’ *Human Organization* 65(3), pp. 240–252.
- Amidjogbe E., Nakamura J., Tomassi A., Hupperts R., Bojang B., and Amador T. (2023). ‘Enforcement approaches against illegal fishing in national fisheries legislation.’ *Marine Policy* 149, pp. 1–12. <https://doi.org/10.1016/j.marpol.2023.105514>
- Ballesteros H.M. and Rodríguez-Rodríguez G. (2018a). ‘Acceptable’ and ‘unacceptable’ poachers: Lessons in managing poaching from the Galician shellfish sector.’ *Marine Policy* 87, pp. 104–110. <https://doi.org/10.1016/j.marpol.2017.10.015>
- Ballesteros H.M. and Rodríguez-Rodríguez G. (2018b). ‘How much in the clan are you? The community as an explanatory factor of the acceptance of poaching in small-scale fisheries.’ *Marine Policy* 97, pp. 188–196. <https://doi.org/10.1016/j.marpol.2018.06.014>
- Ballesteros H.M., Rodríguez-Rodríguez G., Failer P., Forse A., and Drakeford B.M. (2024). ‘A classification of poachers from the sea: Four types to rule them all.’ *Society & Natural Resources* 37(4), pp. 495–520. <https://doi.org/10.1080/08941920.2023.2291781>
- Barlatier J. (2018). ‘L’apport du renseignement criminel dans le domaine maritime’ [The role of criminal intelligence in the maritime domain]. *Sécurité globale* 13(1), pp. 59–66. <https://doi.org/10.3917/secug.181.0059>
- Barnett A.J. and Eakin H.C. (2015). ‘We and us, not I and me’: Justice, social capital, and household vulnerability in a Nova Scotia fishery.’ *Applied Geography* 59, pp. 107–116. <https://doi.org/10.1016/j.apgeog.2014.11.005>

- Battista W., Romero-Canyas R., Smith S.L., Fraire J., Effron M., Larson-Konar D., and Fujita R. (2018). 'Behavior change interventions to reduce illegal fishing.' *Frontiers in Marine Science* 5. <https://doi.org/10.3389/fmars.2018.00403>
- Belhabib D. and Le Billon P. (2022). 'Fish crimes in the global oceans.' *Science Advances* 8(12), pp. 1–14. <https://doi.org/10.1126/sciadv.abj1927>
- Berl J.L., Meade D.J., Wardle A.G., and Whiting J.C. (2025). 'Sportsperson perceptions and involvement in reporting wildlife crimes.' *Human Dimensions of Wildlife* 30(1), pp. 52–58. <https://doi.org/10.1080/10871209.2024.2309354>
- Black D. (1993). *The Social Structure of Right and Wrong*. San Diego: Academic Press.
- Black D.J. (1976). *The Behavior of Law*. San Diego, New York, Berkeley: Academic Press.
- Boivin R. (2021). *Petit traité d'analyse criminelle* [A brief treatise on crime analysis]. Montréal: Les Presses de l'Université de Montréal.
- Bowden M. and Meško G. (eds.) (2025). *Rural Criminology in Global Perspective: State of the Art on the World's Continents*. Bristol: Bristol University Press. <https://doi.org/10.2307/jj.12348229>
- Brewer J.F. (2012). 'Don't fence me in: Boundaries, policy, and deliberation in Maine's lobster commons.' *Annals of the Association of American Geographers* 102(2), pp. 383–402. <https://doi.org/10.1080/00045608.2011.641889>
- Davis A. and Wagner J. (2006). 'A right to fish for a living? The case for coastal fishing people's determination of access and participation.' *Ocean & Coastal Management* 49(7–8), pp. 476–497. <https://doi.org/10.1016/j.ocecoaman.2006.04.007>
- Di Cintio A., Niccolini F., Scipioni S., and Bulleri F. (2023). 'Avoiding 'paper parks': A global literature review on socioeconomic factors underpinning the effectiveness of marine protected areas.' *Sustainability* 15(5), 4464. <https://doi.org/10.3390/su15054464>
- Donnermeyer J.F. (2015). 'The social organisation of the rural and crime in the United States: Conceptual considerations.' *Journal of Rural Studies* 39, pp. 160–170. <https://doi.org/10.1016/j.jrurstud.2014.11.014>
- Donnermeyer J.F. (2016). 'Without place, is it real?' *International Journal for Crime, Justice and Social Democracy* 5(3), pp. 27–40. <https://doi.org/10.5204/ijcjsd.v5i3.332>
- Donnermeyer J.F. (2022). 'Theoretical and empirical gaps in rural criminology.' In M. Bowden and A. Harkness (eds.) *Rural Transformations and Rural Crime*. Bristol: Bristol University Press, pp. 31–48. <https://doi.org/10.51952/9781529217773.ch003>
- Engel R.S., Worden R.E., Corsaro N., McManus H.D., Reynolds D., Cochran H., Isaza G.T., and Calnon Cherkauskas J. (2019). 'Explaining the decision to arrest.' In R.S. Engel, R.E. Worden, N. Corsaro, H.D. McManus, D. Reynolds, H. Cochran, G.T. Isaza, and J. Calnon Cherkauskas (eds.) *The Power to Arrest*. Cham: Springer International Publishing, pp. 29–74. https://doi.org/10.1007/978-3-030-17054-7_3
- Falcone D. (2004). 'America's conservation police: Agencies in transition.' *Policing: An International Journal of Police Strategies & Management* 27(1), pp. 56–66. <https://doi.org/10.1108/13639510410519912>
- Faunce C.H., Smith J., Kingham A., and Jaszka D. (2023). 'Fisheries observers as enforcement assets: 21 years of lessons from the North Pacific.' *Marine Policy* 158, pp. 1–12. <https://doi.org/10.1016/j.marpol.2023.105868>

- Field A.P., Miles J., and Field Z. (2012). *Discovering Statistics Using R*. London, Thousand Oaks: Sage.
- Fisk J.J. (2021). 'Care, not incarceration: Exploring the carcerality of fisheries enforcement and potential decolonial futures in Hawai'i.' *Heliyon* 7(4), e06916. <https://doi.org/10.1016/j.heliyon.2021.e06916>
- Gough J. (2008). *La gestion des pêches au Canada: des premiers jours jusqu'à l'an 2000* [Fisheries management in Canada: From the earliest days to the year 2000]. Sillery (Québec): Les éditions du Septentrion.
- Graham A., Kulig T.C., and Cullen F.T. (2020). 'Willingness to report crime to the police: Traditional crime, cybercrime, and procedural justice.' *Policing: An International Journal* 43(1), pp. 1–16. <https://doi.org/10.1108/PIJPSM-07-2019-0115>
- Harris J.L. and Thompson B.S. (2023). 'Supporting places left to the sea: A place-based research agenda for regional coastal transformations in the blue economy.' *Progress in Environmental Geography* 2(4), pp. 266–288. <https://doi.org/10.1177/27539687231212672>
- Hart R., Pedersen W., and Skardhamar T. (2022). 'Blowing in the wind? Testing the effect of weather on the spatial distribution of crime using Generalized Additive Models.' *Crime Science* 11(1), 9. <https://doi.org/10.1186/s40163-022-00171-2>
- McMullan J.L. and Perrier D.C. (2002). 'Lobster poaching and the ironies of law enforcement.' *Law & Society Review* 36(4), pp. 679–718.
- McMullan J.L., Perrier D.C., and Okihiro N. (1993). 'Regulation, illegality and social conflict in the Nova Scotia Lobster Fishery.' *The Journal of Legal Pluralism and Unofficial Law* 25(33), pp. 121–146. <https://doi.org/10.1080/07329113.1993.10756446>
- Meško G. (2020). 'Rural criminology – a challenge for the future.' *European Journal of Crime, Criminal Law and Criminal Justice* 28(1), pp. 3–13. <https://doi.org/10.1163/15718174-02801001>
- Miller D.D. and Sumaila U.R. (2016). 'IUU fishing and impact on the seafood industry. A DNA-based perspective.' In A. Naaum and R. Hanner (eds.) *Seafood Authenticity and Traceability*. London: Academic Press, Elsevier, pp. 83–95. <https://doi.org/10.1016/B978-0-12-801592-6.00004-8>
- Petrossian G., Weis J.S., and Pires S.F. (2015). 'Factors affecting crab and lobster species subject to IUU fishing.' *Ocean & Coastal Management* 106, pp. 29–34. <https://doi.org/10.1016/j.ocecoaman.2015.01.014>
- Petrossian G.A. and Clarke R.V. (2014). 'Explaining and controlling illegal commercial fishing: An application of the CRAVED theft model.' *British Journal of Criminology* 54(1), pp. 73–90. <https://doi.org/10.1093/bjc/azt061>
- Petrossian G.A., Lettieri J. and Clarke R.V.G. (2022). 'Addressing the security issues related to illegal commercial fishing.' In M. Gill (ed.) *The Handbook of Security*. Cham: Springer International Publishing, pp. 429–445. https://doi.org/10.1007/978-3-030-91735-7_20
- Pytlarz A. and Bowden M. (2019). 'Crime-talk', security and fear in the countryside: A preliminary study of a rural Irish town and its hinterland.' *International Journal of Rural Criminology* 4(2), pp. 138–172. <https://doi.org/10.18061/1811/87912>

- R Core Team (2023a). *R: A Language and Environment for Statistical Computing*. Vienna: R Foundation for Statistical Computing.
- Rogers C. (2010). *Making Connections: The Relationship Between Science and Traditional Ecological Knowledge in a Prince Edward Island Lobster Fishery*. Halifax: Dalhousie University [Master thesis].
- Schreurs W., Kerstholt J.H., De Vries P.W., and Giebels E. (2018). 'Citizen participation in the police domain: The role of citizens' attitude and morality.' *Journal of Community Psychology* 46(6), pp. 775–789. <https://doi.org/10.1002/jcop.21972>
- Sjöstedt M., Sundström A., Jagers S.C., and Ntuli H. (2022). 'Governance through community policing: What makes citizens report poaching of wildlife to state officials?' *World Development* 160, 106065. <https://doi.org/10.1016/j.worlddev.2022.106065>
- Song A.M., Scholtens J., Barclay K., Bush S.R., Fabinyi M., Adhuri D.S., and Haughton M. (2020). 'Collateral damage? Small-scale fisheries in the global fight against IUU fishing.' *Fish and Fisheries* 21(4), pp. 831–843. <https://doi.org/10.1111/faf.12462>
- Tabachnick B.G. and Fidell L.S. (2014). *Using Multivariate Statistics*. Pearson New International Edition. Harlow: Pearson (Always learning).
- Waring T. and Acheson J. (2018). 'Evidence of cultural group selection in territorial lobstering in Maine.' *Sustainability Science* 13, pp. 21–34.
- Weisburd D., Wilson D.B., Gill C., Kuen K., and Zastrow T. (2024). 'Are we underestimating the crime prevention outcomes of community policing? The importance of crime reporting sensitivity bias.' *Journal of Law and Empirical Analysis* 1(1). <https://doi.org/10.1177/2755323X241233469>
- Wiber M.G. and Barnett A. (2023). '(Re)assembling marine space: Lobster Fishing areas under conditions of technological and legal change in Atlantic Canada.' *Science, Technology, & Human Values* 48(3), pp. 500–524. <https://doi.org/10.1177/01622439211042416>
- Wyatt T. (2022). *Wildlife Trafficking: A Deconstruction of the Crime, Victims and Offenders*. Cham: Springer International Publishing. <https://doi.org/10.1007/978-3-030-83753-2>
- Wyatt T., Friedman K., and Hutchinson A. (2021). 'Are fish wild?' *Liverpool Law Review* 42(3), pp. 485–492. <https://doi.org/10.1007/s10991-021-09285-0>

Internet sources

- CBC Gem (2021). *The Killing of Phillip Boudreau Rocks the Nova Scotia Community of Isle Madame*, Cbc.ca. Available online: <https://www.cbc.ca/cbcdocspov/episodes/the-killing-of-phillip-boudreau> [17.01.2024].
- Fisheries and Oceans Canada (2021a). *Integrated Fisheries Management Plan – Lobster*, Glf.dfo-mpo.gc.ca. Available online: <https://www.glf.dfo-mpo.gc.ca/glf/en/integrated-fisheries-management-plan-lobster> [24.03.2024].
- Fisheries and Oceans Canada (2021b). *Seafisheries Landed Quantity by Province, 2020*, Dfo-mpo.gc.ca. Available online: <https://www.dfo-mpo.gc.ca/stats/commercial/land-debarq/sea-maritimes/s2020pq-eng.htm> [23.08.2022].

- Fisheries and Oceans Canada (2022). *Seafisheries Landings Dashboard*, Dfo-mpo.gc.ca. Available online: <https://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-eng.htm> [25.07.2023].
- Fisheries and Oceans Canada (2023). *At-Sea Observers and Electronic Monitoring*, Dfo-mpo.gc.ca. Available online: <https://www.dfo-mpo.gc.ca/fisheries-peches/sdc-cps/eng-comm/faq/obs-eng.html> [24.03.2024].
- Fisheries and Oceans Canada (2024). *Atlantic Region Licences*, Dfo-mpo.gc.ca. Available online: <https://www.dfo-mpo.gc.ca/stats/commercial/licences-permis/licences-permis-atl-eng.htm> [25.07.2023].
- Gouvernement du Canada (2022). *Permis de la région de l'Atlantique* [Atlantic region licences], Dfo-mpo.gc.ca. Available online: <https://www.dfo-mpo.gc.ca/stats/commercial/licences-permis/licences-permis-atl-fra.htm> [26.08.2022].
- Government of Canada (2024a). *Completed Access to Information Requests*, Open.canada.ca. Available online: https://open.canada.ca/en/search/ati?ati%5B0%5D=ati_organization_en%3ALibrary%20and%20Archives%20Canada [08.05.2024].
- Radio-Canada.ca (2024). *Accusé d'avoir pêché du homard de taille trop petite, un pêcheur plaide non coupable* [Accused of catching undersized lobster, fisher pleads not guilty], Radio-Canada.ca. Available online: <https://ici.radio-canada.ca/nouvelle/2065126/pecheur-bathurst-caraquet-homards-taille> [01.05.2024].

Legal acts

- Fisheries Act (R.S.C., 1985, c. F-14). Available online: <https://laws-lois.justice.gc.ca/eng/acts/f-14/>.

Other

- Ooms J. and McNamara J. (2024). *writexl: Export Data Frames to Excel 'xlsx' Format*.
- R Core Team (2023b). *Stats: The R Stats Package*.
- Wickham H., Bryan J., Kalicinski M., and Komarov V. (2023). *readxl: Read Excel Files*.
- Wickham H., François R., Henry L., Müller K., and Vaughan D. (2023). *dplyr: A Grammar of Data Manipulation*.