

The fewer insider poachers, the more normative compliance: Clues for managing poaching in the shellfish sector.

Authors: Hugo M. Ballesteros; Gonzalo Rodríguez-Rodríguez; Francisco Jesús Ferreiro-Seoane & Helena Martínez-Cabrera.

Department of Applied Economics, Resource Economics Research Group, University of Santiago de Compostela, Avda. Burgo das Nacións S/N, CP 15782 Santiago de Compostela-A Coruña, Galicia, Spain

Received 04 Oct 2020, Accepted 03 Nov 2020, Published online: 13 Dec 2020

Ballesteros, H. M., Rodríguez-Rodríguez, G., Ferreiro-Seoane, F. J., & Martínez-Cabrera, H. (2020). The Fewer Insider Poachers, the More Normative Compliance: Clues for Managing Poaching in the Shellfish Sector. *Deviant Behavior*, 42(6), 747–761. <https://doi.org/10.1080/01639625.2020.1854635>

Abstract:

Shellfish poaching is an act of non-compliance with the laws that regulate fisheries governance. In this paper we explored if compliance with shellfishing laws among Galician licensed shellfish-gatherers (NW Spain) is voluntary or motivated by coercive factors. The results reveal that in those communities with a greater degree of compliance, licensed shellfish-gatherers do not poach and comply with the rules voluntarily. The conditions in these communities favour the co-management of resources in such a way that the participation of gatherers in the governance processes, internal cooperation, self-government capacity or participation in enforcement are significantly greater than in communities where there is no compliance. Furthermore, we have explored the perception of the shellfish-gatherers to minimise poaching in their communities. The interviewees distinguished two types of poachers, depending on whether they belong to the shellfishing industry or not. We made recommendations regarding policy to reduce poaching, which combine coercive and normative strategies.

Keywords: Poaching/ Compliance/Normative and Instrumental deterrence/ Shellfishing

Introduction

Poaching is an act of non-compliance with the laws that regulate the appropriation of natural resources (Bell et al., 2007; Crow et al., 2013; Curcione, 1992; Eliason, 2012; Filteau, 2013; Forsyth & Marckese, 1993b; Moreto & Lemieux, 2015; Raemaekers et al., 2011). In Galicia (NW Spain), shellfish poaching is a far-reaching, endemic activity which is regarded as the main threat to the shellfishing industry. Galician shellfish poachers are many in number and type¹, acting for a variety of motives, poaching by using different degrees of investment, frequency, organization and technology (Ballesteros & Rodríguez-Rodríguez, 2018a). In Galicia, one of the most predatory poaching activities is carried out by licensed shellfish-gatherers, who combine legal shellfishing with illegal extraction. These non-compliers are known as insider poachers (Ballesteros & Rodríguez-Rodríguez, 2018a).

Galician shellfishing is an established economic activity that has been built up around co-management principles (Frangoudes et al., 2008; Meltzoff, 1995). Shellfish-gatherers play a crucial role in the success of the system, they participate in decision making and are fundamental to establish the bases of self-management, cooperation, conflict resolution and the enforcement of shellfishing laws (Ballesteros & Rodríguez-Rodríguez,

¹ Ballesteros and Rodríguez-Rodríguez (2018a) compiled a non-exclusive list of 19 types of poachers present along the Galician coast, who were identified by members of the Galician Fishermen's Association: 1. Insider poachers, 2. Profit-motivated poachers, 3. Unemployed individuals, 4. Needy poachers, 5. Greedy poachers, 6. Poachers for self-consumption, 7. Local youths, 8. Family groups, 9. People at risk of or suffering social exclusion, 10. Drug addicts, 11. Bankruptees, 12. Recreational poachers, 13. Professional poachers, 14. Organised poachers, 15. Old-age pensioners, 16. Tourists or holidaymakers, 17. Retired fishermen, 18. Local residents, 19. House-wives.

2018b). As a result, the existence of insider poachers disrupts the co-governance system, weakens resource conservation measures, jeopardizes their financial sustainability, and undermines the compliance of honest licensed shellfish-gathers.

In order to tackle poaching, including insider poaching, the authorities try to promote compliance with the law by means of two deterrence approaches. The first is the instrumental deterrence approach, based on coercive measures that promote the detection and punishment of offenders. The second is the normative deterrence approach based on voluntary compliance (Hatcher et al., 2000; T. Tyler, 1990; Von Essen et al., 2014). In recent years, the Galician government has emphasised the use of the first approach, promoting the instrumental pursuit of poachers. Despite having made some progress, these coercive measures have not been able to eradicate poaching, which is still deeply rooted in coastal communities (Ballesteros & Rodríguez-Rodríguez, 2019).

The present work puts forward the hypothesis that compliance is voluntary in shellfishing communities where there is no insider poaching. If this relationship exists, the management experiences in communities with a high degree of *voluntary compliance* can provide clues to guide the management of shellfish resources and the fight against poaching. To prove this hypothesis, it was necessary to identify patterns in regulation compliance in Galician shellfishing communities, the motivations behind the compliance of professional shellfish-gatherers and the shared characteristics of those communities where there are no *insider poachers*.

Moreover, given that the perception of those using these resources is fundamental to define, improve and implement conservation policies (Bennett, 2016), it was also necessary to identify the shellfish-gatherers' own solutions put forward to minimise poaching in their communities. By considering their recommendations, it is possible to

propose compliance incentives and they have therefore been assessed and discussed.

Theoretical Framework

Regarding environmental management and regulation compliance, it has been demonstrated that introducing the social dimensions of environmental problems into governance has a positive impact on the preservation of natural spaces and on the social acceptance of its management (Kittinger et al., 2012; Waylen et al., 2010). Nevertheless, relatively little attention has been paid to certain social concepts (Hicks et al., 2016), such as wellbeing or inequality, despite being behind the perpetuation of conflicts related to preservation (Hodgson et al., 2019; Outeiro, Byron, & Angelini, 2018).

The social acceptance of non-compliance varies significantly depending on certain contextual factors, such as the existence of alternative ways of life, social inequality, poverty, the perception of the validity of the rules, or the relationship between those who enforce the rules and those who follow them (Sundström, 2015). In terms of environmental psychology, several theories have been put forward to explain how this behaviour is regulated and which strategies favour pro-environmental behaviour (Steg, 2013; Stern, 2000). As a result, consent theories – or those which deal with the motivation behind rule abidance or obeying an external authority – are in the spotlight of Social Sciences discussions (Joseph, 2003). To this regard, the construction of legitimacy is one of the mechanisms through which social institutions are recognised by the population and are maintained throughout time (Tyler, 2011). The internalisation of values and rules which symbolically represent the authorities, as well as the population's ability to identify with them and/or the groups or people responsible for enforcing them, are some of the ways that institutions ensure the effective enforcement of the laws they sponsor: giving a greater weight to social control mechanisms over dissuasive threats and promoting social

order. Legitimacy can be defined as the state in which the population not only recognises but also justifies the right of the authorities to exercise a power (and to obey it), by perceiving them as the upholders of a shared moral purpose (Jackson et al., 2012). Consequently, in order to make it easier to abide by the rules, the population must not only feel obliged to comply, but also responsible for doing so and for others to comply also. Feeling that there are shared values, objectives, expectations and the definition of roles in society are the keys which make it possible for public cooperation to reproduce behaviours endorsed by the institutions (Tyler & Blader, 2000). To this regard, sociology and psychology have demonstrated that rules are not static and that their fulfilment depends on the behaviour of other members of the group of peers (Elster, 2009; Ramcilovic-Suominen & Hansen, 2012).

In so far as the behaviour of poachers, sociology and criminology have focused closely on a two-way approach as a crime deterrent which influences the behaviour of poachers (Ballesteros & Rodríguez-Rodríguez, 2018a; Hampshire et al., 2004; Von Essen et al., 2014). The first is the instrumental approach, which deals with the fight against poaching as a problem with a microeconomic scope, advocating coercive measures as a way of discouraging poaching (Hatcher et al., 2000; Von Essen et al., 2014). The instrumental approach is based on the fundamentals of the economics of crime put forward by Becker (1968) and Stigler (1974). The logic behind instrumental deterrence states that those who do not comply with the law make a rational, utilitarian interpretation of the chances of success or failure of their illegal activity. Success is associated to the benefits of non-compliance. In terms of poaching, success is measured by the ability to poach without being caught. Failure is associated to the costs behind the unsuccessful outcome of the illegal activity. For poachers, deterrence is linked to the risk of being caught, arrested or punished, losing equipment, catches, vehicles or being issued fines or penalties

(Ballesteros et al., 2017). The logic behind instrumental deterrence is to increase the risk, therefore increasing the costs of breaking the law to reduce the offenders' profit margin (Kuperan & Sutinen, 1998). To this end, the objectives of instrumental policies are to increase pressure on offenders, by improving surveillance and control systems, as well as penalties, and handing out rewards and other incentives to those who do comply (Young, 1979). In the case of poaching, it is common to legislate against illegal gatherers by establishing more and harder penalties (Ballesteros & Rodríguez-Rodríguez, 2019; Raemaekers et al., 2011). It is also common to increase the number of security guards and to prepare them to carry out surveillance tasks.

Packages of coercive measures are considered the only possible solution in a context where criminality is endemic. However, in other situations they present shortcomings that compromise their efficiency (Hatcher et al., 2000; Tyler, 1990). The first significant constraint is that improving surveillance and control systems, as well as legislating against poaching, tends to be linked to high transaction costs, which may make the control and surveillance systems financially inefficient or logistically impossible to apply (Sutinen & Kuperan, 1999). Another problem with instrumental policies is that they do not work with every type of offender (Kuperan & Sutinen, 1998); that is, regardless of surveillance, control or the penalties that are applied, there will always be repeat offenders. Consequently, if the objective is to encourage compliance, it is not enough to implement coercive enforcement measures. The institutional framework where they are applied should be analysed and understood so as to offer the best political advice possible. Therefore, as seen in other challenges posed by fisheries management (Hoff et al., 2019; Le Gallic, 2008; Rodríguez-Rodríguez et al., 2019) poaching cannot be fought by using individual strategies. Coercive measures should be complemented by measures that encourage individuals to willingly abide by the rules.

The second approach put forward in the literature is the normative approach, which is in line with the principles of voluntary rule endorsement as a reply to the institutional architecture regulating the governance of resources and its designed legitimacy (Hatcher et al., 2000; van der Toorn et al., 2011). Normative compliance is based on voluntary principles of acceptance of the law, which depend on the morality inherent to the individual and the perceived legitimacy of said laws (Tyler, 1990). As a result, it is necessary for those affected by the law to perceive it as fair, understand that it works, that offenders are punished, and that implementation processes and enforcement of the law are fair and appropriate (Hauck, 2008; Jagers et al., 2012; Schultz, 2015; T. Tyler, 1990).

In terms of management, the normative approach considers the possibility of there being informal arrangements in resource management. The theory explains that it is more likely for honourable management circles to appear when the group of users benefiting from the resource in question is involved in said management (Osterblom et al., 2011). In this regard, the inclusion of informal solutions to fishing problems means considering the institutionalised knowledge inherent in fishing communities, which can generate incentives for compliance among users, promoting the legitimacy of the co-management system in small scale fisheries (Hilborn et al., 2005).

Normative policies also recognise the importance of cultural, community and identity factors that are a deeply rooted part of these communities and that explain the collective acceptance of poaching, and even its practice (Ballesteros & Rodríguez-Rodríguez, 2018b; Eliason, 2012; Von Essen et al., 2014). That is, understanding the institutional framework where the management and appropriation of resources takes place is vital to propose better environmental policies. On the contrary, ignoring the distinctive features of the institutional context where the examples of non-compliance take place, can mean the failure of any deterrence policies. There are many examples of poaching management

based on coercive enforcement that have failed, as they were designed and implemented vertically, excluding the traditional users of the decision-making processes and even of the exploitation of resources (Ballesteros & Rodríguez-Rodríguez, 2018b; Bell et al., 2007; Gezelius, 2002). Policies that do not take into consideration the users simply push them away from regulation compliance, favouring the proliferation of feelings of injustice that can legitimise poaching as an act of rebellion or of cultural and community protection (Ballesteros & Rodríguez-Rodríguez, 2018a; Bell et al., 2007; Forsyth & Marckese, 1993a, 1993b; Gezelius, 2003; Muth & Bowe, 1998). These experiences indicate the importance of the inclusion of resource users in management, which will not only increase the legitimacy of the regulation regime but will also include the users of the resources in their governance, encouraging compliance of the established rules and promoting the enforcement of the same.

This approach also has limitations. There are individuals who are indifferent to the influence of the moral, cultural or identity values that encourage normative compliance (Tyler, 1990); therefore, they do not abide by the rules and ignore the justice which is associated to the same. This limitation suggests that there is a need for effective measures aimed at deterring non-compliance. Packages of instrumental and normative measures should be considered. Furthermore, the institutional framework of the communities should be analysed keeping in mind why poaching takes place; this may possibly lead to the recommendation of economic policies that differ from environmental policies and they may succeed where others have failed.

Methods

The Galician shellfish industry

Galicia is a region in the northwest of Spain, where fishing and shellfish gathering are

fundamental for the local economy (García-Negro et al., 2016).

Figure 1 Galician geoposition in the European Union and in Spain.



Several economic indicators illustrate the importance of the shellfish industry as a productive activity in Galicia: for example, in terms of employment, in 2018 it generated 3,792 direct jobs for land-based shellfish-gatherers (IGE, 2019). In the same period there were 3,059 small boats that employed crews of several shellfish-gatherers, usually 1-3 for each boat (Xunta de Galicia, 2020). The figures for Galician shellfish production between 2015-2019 are also worth noting (Table 1), with more than 44,272 tons of the main species of shellfish being gathered and an auction value of more than €468.9 million in this period (Xunta de Galicia, 2020).

Table 1. Wholesale market value of the main species sold in Galicia, 2015-2019.

Species/Year	2015	2016	2017	2018	2019	2015-19
1. Japanese carpet shell (Ruditapes Philippinarum)	13,680,186 €	22,286,238 €	28,031,501 €	22,286,238 €	30.550.204 €	116.834.367 €
2. Corrugated venus (Venerupis Corrugata)	13,690,069 €	14,595,267 €	14,164,350 €	14,595,267 €	12.762.981 €	69.807.933 €
3. Grooved carpet shell (Ruditapes Decussatus)	13,254,631 €	11,230,858 €	10,148,679 €	11,230,858 €	9.459.055 €	55.324.081 €
4. Goose barnacle (Pollicipes)	7,544,804 €	9,526,385 €	9,573,208 €	9,526,385 €	9.262.752 €	45.433.535 €
5. Cockle (Cerastoderma Edule)	13,410,475 €	9,308,746 €	15,941,734 €	15,447,032 €	21.491.164 €	75.599.151 €
6. Arched razor shell (Ensis arcuatus)	3,996,637 €	5,120,361 €	5,515,120 €	5,120,361 €	6.061.893 €	25.814.371 €
7. Stony sea urchin (Paracentrotus lividus)	2,487,869 €	3,570,898 €	4,531,877 €	4,435,629 €	5.757.214 €	20.783.486 €
8. Banded carpet shell (Venerupis rhomboides)	3,677,838 €	4,419,713 €	4,729,270 €	4,419,713 €	3.996.954 €	21.243.486 €
9. Spinous spider crab (Maja squinado)	3,189,095 €	3,499,786 €	4,307,498 €	3,499,786 €	3.255.253 €	17.751.417 €
10. Common prawn (Palaemon serratus)	1,750,190 €	2,082,641 €	2,229,749 €	2,082,641 €	2.369.585 €	10.514.806 €
11. Velvet swimcrab (Necora púber)	1,724,326 €	1,966,323 €	2,251,780 €	1,966,323 €	1.979.490 €	9.888.242 €
TOTAL						468,994,875 €

Source: Xunta de Galicia, PescadeGalicia.com-Statistical Reports (2020).

Galician shellfishing industry has led to its representation as one of the strategic sectors of the Galician economy (García-Negro et al., 2016) and has positioned it as a key socio-economic research area.

Survey and interviews.

The data were obtained by means of a survey. The questionnaire was designed to be completed in 30 minutes and includes 25 questions. The Galician fishing organisations - “*cofradías*” - were the analysis units in this study; 53 out of the 56 organisations in which there is shellfish gathering were interviewed.

Furthermore, eight in depth interviews were carried out with relevant members of the shellfish-gatherer communities where there is no poaching. The interviews provided qualitative information regarding demographic, economic, cultural, and behavioural traits, which has helped to contextualise the quantitative results of the surveys. The interview form included 15 open-ended questions and on average lasted 82 minutes.

Analysis

In order to test the proposed hypothesis, two qualitative dichotomous variables were generated (V1. There are *Insider Poachers* and V2. *Normative Compliance*). The first established the existence of insider poachers, the second determined if the compliance of licensed shellfish-gatherers is voluntary or not. Pearson's chi-squared statistical test (X^2) was applied to the variables as it is ideal to determine the existence of significant association between nominal variables. The data was processed using SPSS V.20 statistical software.

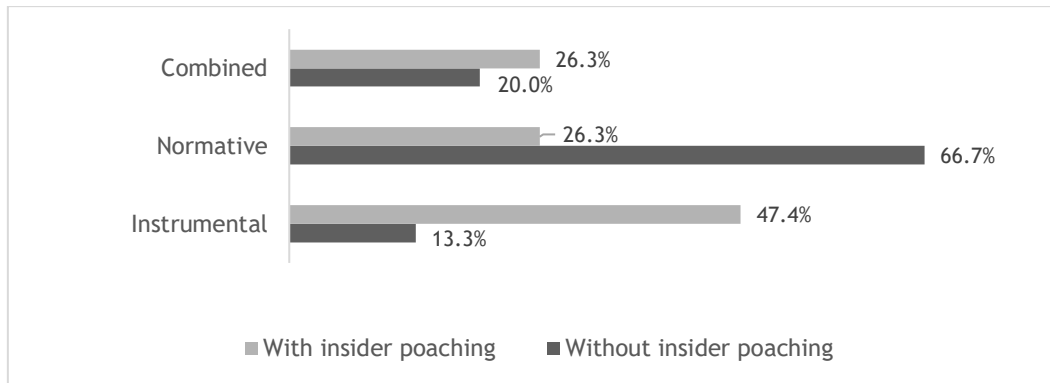
Results

Trends in compliance with shellfish gathering laws in Galician communities

To identify the reasons behind compliance with the rules in Galician shellfish gathering communities, it was necessary to identify those associations in which there were insider poachers, namely in 72.7% of cases². As a result, in the remaining 27.3% there were no incidents of illegal gathering carried out by licensed shellfish-gatherers. Once the communities with and without insider poaching were detected, compliance patterns were identified based on whether compliance was voluntary or instrumental. Figure 2 summarises the results obtained.

² These data mean that in 72.7% of the interviewed associations there are individuals who practice insider poaching. Nevertheless, the data obtained do not identify to what degree or how often these practices take place.

Figure 2 Deterrence trends in Galician fishing associations



In those associations without insider poaching, the compliance trend was essentially voluntary (66.7% of cases) or combined (20%), that is, the interviewees stated that compliance was due to the combination of instrumental and normative reasons. These data are in contrast with those from the communities with insider poachers, where compliance is instrumentally promoted (47.4%).

This information supports the hypothesis of a potential association between the normative compliance of shellfishing laws and the nonexistence of insider poachers in Galician fishing associations. This hypothesis was tested using *Pearson's Chi-squared test* (X^2) and was accepted as the obtained p-value < 0.05 was significant (Table 2).

Table 2 Association between the existence of insider type poaching and normative compliance of shellfishing laws.

H0	Insider poaching	N= 53	X^2	p-value	Rejects H0
H0: Voluntary compliance of shellfishing regulations is not associated with the presence of Insider Poaching	I.P.	38	5.3	0.025*	Yes
	No I.P.	15			

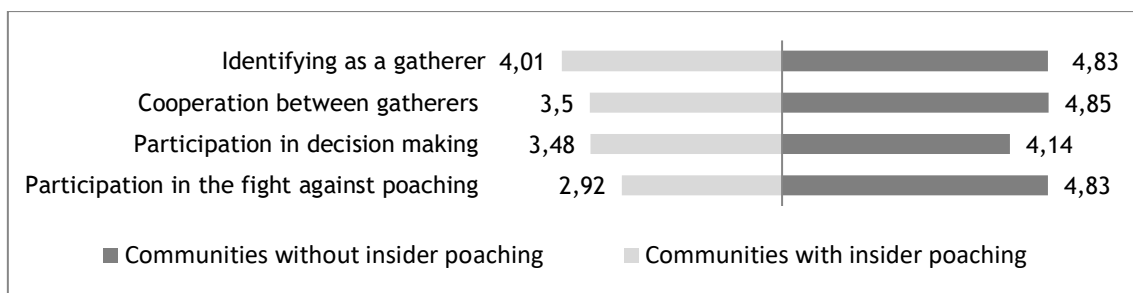
* Rejects H0 for a p-value significance level < 0.05

What happens in communities where there is no insider poaching?

The information from the surveys and interviews was used to gather additional information and to identify what happens in those communities with more and better

compliance. As a result, it was observed that in communities without insider poaching, the shellfish-gatherers had a high degree of internal cooperation, participation in decision making and in the fight against poaching. Furthermore, they exhibited a strong individual identity as gatherers and a solid sense of belonging to their community. Although these characteristics are typical in Galician coastal communities (Freire & García-Allut, 2000), the data indicate that they are more resolutely exhibited in communities with a greater degree of compliance. Figure 3 reveals this trend. The degree of user participation and involvement in governance, cooperation, self-government, or involvement in enforcement are significantly higher in communities without insider poachers.

Figure 3 Shellfish gatherers' perception of key factors for co-management. Difference between communities with and without insider poaching.



*Mean value of answers to Likert questions (1-5), 1 minimum -5 maximum.

The data from the surveys provided other information, for example, that fishing communities work better if the governance processes are based on informal management arrangements. These kinds of informal arrangements are also common in Galician shellfish gathering communities; they are detected more often in communities without insider poaching, 85.5%, than in places with less compliance, 64%.

Another distinguishing factor observed in fishing associations with greater compliance was that they had organised surveillance. In all these locations, several guards were employed either by the Galician government or by the shellfish gatherers. Moreover,

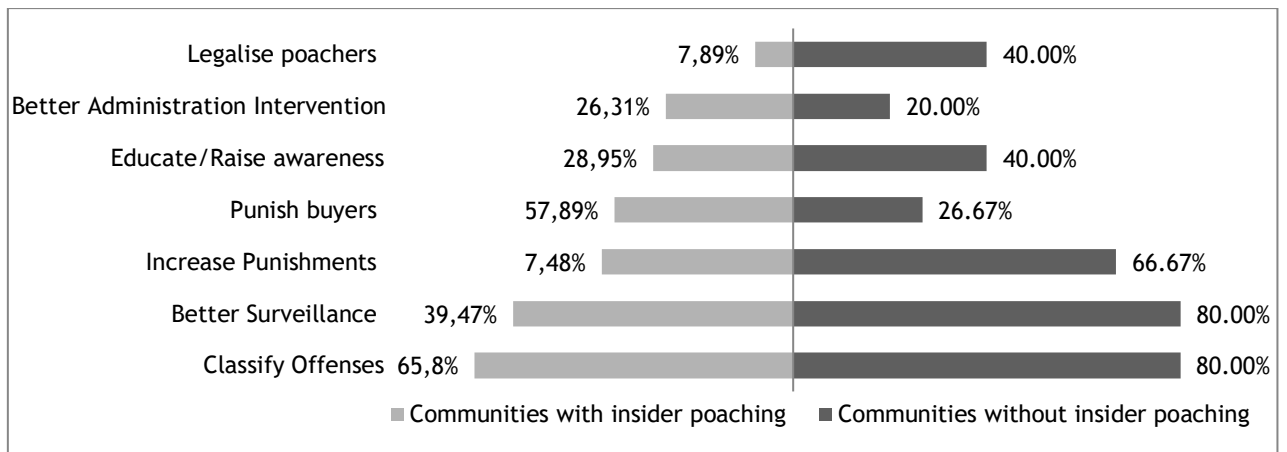
some interviewees stated that they were assisted by law enforcement officers whenever requested, generally when beaches are in urban areas or very near them. The support of the Police with anti-poaching tasks is not very common in Galicia, and this is one of the shellfish gatherers' main complaints (Ballesteros & Rodríguez-Rodríguez, 2018b). To this regard, without the deterrent effect of surveillance and without the support of law enforcement officers, poaching tends to be more common (González Arias et al., 2011).

Furthermore, other types of behaviour were detected that were common in fishing associations without poaching and that could help depict a more precise image of the internal processes in these communities. In so far as belonging to the group of gatherers, it was observed that shellfish gatherers criticized any infringement of the group's internal codes. These codes provide them with a certain degree of self-government and served as a means to resolve conflicts between members. Besides, members general perceived shellfishing regulations as legitimate, they perceived themselves as economic producers relevant to their community, they were proud of their profession and generally rejected poaching of any type. They generally had a good opinion of the work carried out by the administration, although they disagreed on some issues regarding the Galician government's management of the shellfishing sector, for example, they criticised the efficiency of anti-poaching laws.

Analysis of anti-poaching measures put forward by shellfish gatherers

Figure 4 presents the perception of the shellfish gatherers regarding how to minimise poaching in their communities.

Figure 4 Measures to fight poaching suggested by interviewees. Frequency in %.



The general trend is to recommend instrumental measures to mitigate poaching, such as: a) to intensify surveillance and control of shellfish banks; b) to increase fines and penalties; c) to strangle illegal shellfish trading by detecting and deactivating poaching organisations and their distribution centres, or d) classify poaching as a crime³, which would imply prison sentences and severe punishments for poachers.

Other non-coercive measures that can promote normative compliance were mentioned, such as: a) promoting education and awareness campaigns; b) emitting more official shellfish gathering permits to include poachers; c) improving the activities of the regional government in terms of poaching, which would involve more institutional attention and support for shellfishing organisations.

Figure 4 reveals that, although normative type measures are the most recommended in

³At the time of the interview fieldwork, poaching was not considered a crime being ruled by administrative punishments as fines. At present, this measure is included in Article 335.2 of the Spanish Criminal Code, including the possibility of imposing legal sanctions for shellfish poaching by way of fines, bans and prison sentences of between 6 months and 2 years (BOE, 2015). However, as Mosquera (2019) points out, the Spanish sanctions regime against poaching should be revised to improve the efficacy of the current set of anti-poaching measures, both penal and administrative.

Galician fishing associations, it is precisely in communities without insider poaching where non-coercive measures are suggested more often. This situation points to the need to support instrumental type measures with non-coercive action packages that can encourage broader compliance and a better enforcement of the law.

Other relevant information obtained from the field research is that the informants identified two types of poachers, depending on whether they belonged to the shellfishing industry or not. They identified: a) insider poachers, that is, legal shellfish gatherers who contravened their gathering permits in some way, and b) external poachers, individuals who are neither gatherers nor have any formal rights to gather. The anti-poaching policy recommendations put forward by the interviewees were based on this distinction and on the poachers' motivations for illegally gathering shellfish. Overall, they suggested the most severe punishments for external poachers, especially when their activity was intensive, repeated, and undertaken by organised groups or individuals who gathered and sold species that are dangerous for the consumer. According to the interviewees, external poachers are the most common and appear more often.

Severe punishments were also proposed for insider poachers who damaged resources or who, above all, betrayed the internal rules of the gatherers. On the other hand, the interviewees mitigated the penalties for those insider poachers that they regarded as "*acceptable*". These individuals are usually fellow gatherers facing economic difficulties who undertake small extractions motivated by need, generally people with financial problems. In these cases, the interviewees recommended proportional punishments adapted to each person, sometimes even waiving any formal punishment.

Discussion

This work confirms the hypothesis that there is an association between voluntary

compliance with the rules and the nonexistence of insider poaching in Galician fishing associations. Furthermore, the research revealed a high prevalence of insider poaching in the surveyed communities (appearing in 72.7% of cases), which reflects a general problem of compliance and enforcement of shellfish gathering laws. Although the co-governance system is by no means a miracle solution to resolve conflicts and preservation difficulties (Carlsson & Berkes, 2005), analysing the situation in places without insider poaching (27.3% of cases) will provide clues to devise better measures to fight against illegal shellfish gathering in general and to reduce insider poaching in particular. This investigation noted that in those shellfishing communities where regulations are more respected, there are better conditions for co-management and there are incentives favouring voluntary compliance. To this respect, Ostrom (1990) explained that for the good management of common resources and the consolidation of long-lasting institutions, it is necessary to have some basic management principles⁴; one being that the communities must be well defined, and this means recognising the physical and informal borders of the community and who belongs to it (and who doesn't). A good organisation in terms of co-management should have a certain flexibility regarding governance, internal regulation packages for the resource users, informal management arrangements, as well as control mechanisms, internal conflict resolution and a regime of progressive and proportional penalties for episodes of non-compliance (Ostrom, 1990).

4 According to Ostrom (1990) the following conditions must be met for any collective action regarding the management of common resources to be successful: 1) the communities involved in the use of resources and its members must have clearly set out limits; 2) local conditions must be coherent with the appropriation and collaboration rules in place; 3) there must be agreements about collective decisions; 4) there must be internal control mechanisms; 5) there must be a system of progressive penalties; 6) there must be conflict resolution mechanisms; 7) a minimum right to self-organisation must be acknowledged.

Table 2 shows how these good government principles exist in Galician shellfishing communities, and that they are, in fact, more resolute in communities where compliance is better. This indicator should be taken into account when promoting anti-poaching policies. To this regard, it is necessary to reinforce those factors favouring compliance and the legitimisation of laws in communities where they are working, whereas in those communities where they do not exist or where they are defective, it is necessary to encourage or correct them. Although the challenge to maintain and create long-lasting institutional conditions for the governance of shellfish gathering falls outside the scope of this work, recommending adapted management, which is more closely related to the community, may help to make progress in the legitimisation and normative compliance of shellfish gathering laws.

The second relevant contribution is the identification of two general types of poachers and the nuances that characterise them. The distinction between insider poachers and those outside the shellfish sector influenced the anti-poaching policy recommendations made by the shellfish gatherers, opening up the debate regarding the limits of the community. To this regard Ballesteros & Rodríguez-Rodríguez (2018b), stated that the shellfish gatherer community is an environment of shared interests, a collective project that goes beyond the simple occupation of the space where, to be recognised as a member, it would be necessary to gather shellfish (Ballesteros & Rodríguez-Rodríguez, 2018b). In this work, the interviewees consider external poachers those who invade the space and the shellfishing resources that belong to the community. They are those outside the shellfishing sector, but also those who come from outside the community. In terms of governance, given that outside poachers are regarded as illegitimate gatherers in the community's space, they do not have the opportunity to obtain informal access or exploitation rights to the resources. These types of informal permits are reserved for local

gatherers and members of the community, and they are a characteristic of the pragmatism that pervades the co-management model of Galician shellfish gathering. In short, external poachers are formally and informally forbidden from gathering shellfish (Ballesteros & Rodríguez-Rodríguez, 2018b). Logically, the interviewees suggested coercive measures for external poachers that are aimed at their prosecution and punishment. The suggested measures, generally, were more severe than for insider poachers.

On the other hand, respondents acknowledged “insider poachers” as individuals who belong to the shellfishing sector and who are also part of their community. Their activity and behaviour are important and influence their surroundings. Regarding this issue, interviewees pointed to the relevance of poachers’ motivations for non-compliance as a major factor to establish measures that can minimise insider poaching. It is important to highlight that once the offender has been identified, the other members can be aware of their particular circumstances, because they are usually connected by means of interpersonal exchange networks on which their relationships of trust and reciprocity are based (Bodin & Crona, 2009). If the members of the community do not detect justified reasons for insider poaching, the activities of the poachers shall be interpreted as a threat, placing them at the limits of the community. For those insider poachers who needlessly gather shellfish illegally, for example, those who seek excessive financial gain, interviewees recommended the same type of penalties as for external poachers, more severe and instrumental in nature.

However, when insider poachers gather shellfish because of “*necessity*”, that is, because they have to earn an income to survive, the community establishes moral limits to punish these individuals (Ballesteros & Rodríguez-Rodríguez, 2018a; Gezelius, 2004). Tolerance of “acceptable” insider poachers works as an informal collective compensation mechanism that tries to minimise the needs of shellfish gatherers with

problems (Ballesteros & Rodríguez-Rodríguez, 2018a; Bell et al., 2007; Gezelius, 2003). This is relevant in communities where activities associated to the sea are the core of the economic and social life, because the acceptance of poaching not only serves to protect seafarer professionals in need, but also contributes to the prosperity of the whole seafaring community (Ballesteros & Rodríguez-Rodríguez, 2018a; Bell et al., 2007; Gezelius, 2003). That is, the community as a joint project benefits as a whole when assisting an individual in dire straits. With regard to acceptable insider poachers, the collective community logic has the ability to interpret the socioeconomic context in which the community and its members are immersed, in such a way that when they identify structural threats that have nothing to do with shellfish gathering, such as periods of economic crisis, impoverishment, unemployment, or situations of social injustice, they act as a centre of resistance, tolerating certain non-compliance attitudes (Ballesteros & Rodríguez-Rodríguez, 2018a, 2019; Bell et al., 2007; Forsyth & Marckese, 1993b; Gezelius, 2002; Rizzolo et al., 2017). This understanding of the institutional space where shellfish gathering takes place is a key issue to understanding poaching and the social relationships in seafaring communities. The existence of “acceptable insider poachers” reveals the importance of contextualising poaching. Considering all poachers as decision-makers regardless of their context is a dangerous reductionism that establishes coercive deterrence as the prevailing solution and ignores problems that should be solved by political intervention (Ballesteros & Rodríguez-Rodríguez, 2018a). In order to fight poaching motivated by systemic triggers, it will be necessary to find solutions far from fisheries management, and policies to reduce poverty and inequality must be drawn up and applied. In any case, poaching must be tackled as a complex phenomenon. If poachers gather shellfish for different reasons, with different levels of technology, frequency and organisation, they should be fought in an adaptive way. The distinction between poachers

and the recommendations made by interviewees already point in this direction, above all when dealing with acceptable insider poachers, revealing the importance of setting up control mechanisms, internal conflict resolution and a regime of progressive and proportional penalties to tackle episodes of non-compliance.

In agreement with the aforementioned, the following section sets out the recommended general strategies to fight poaching emphasising measures for insider poaching.

General measures for insider poachers

For “unacceptable” insider poachers, the use of coercive measures such as fines, confiscations and seizures of products, equipment and vessels may be required. The temporary or permanent withdrawal of permits could also be considered. The more serious cases could be revised in order to apply the most severe penalties set out in the Spanish Criminal Code. Additionally, these instrumental measures could be accompanied by normative measures that help redirect the tendency of non-compliance, namely informative or training campaigns about the benefits of compliance for the sustainability of resources on the one hand, and economic sustainability and the community on the other. Other positive aspects of compliance can also be highlighted, such as the fact that selling shellfish legally increases the quality of the product, gatherers increase their sales and taxes are collected to benefit the common good. Also, campaigns that emphasize the negative externalities of non-compliance, such as economic, social, and ecological problems brought about by poaching can be used to influence the behaviour of shellfish gatherers. In short, measures combining instrumental and normative actions are recommended.

And in the case of “acceptable” insider poachers, who gather shellfish to earn an income to survive, the pursuit of poachers is a more complex issue (Ballesteros & Rodríguez-

Rodríguez, 2018a; Gezelius, 2004). Measures that are too harsh can be counterproductive and prompt the appearance of chronic poaching circles (Ballesteros & Rodríguez-Rodríguez, 2019). Therefore, strengthening the terms of self-government offered by the co-management regime in Galician communities can facilitate the adaptive management of poaching. To this regard, informal arrangements, such as rules for the resolution of conflicts or appropriate internal penalty systems, can be better adjusted to minimise non-compliance attitudes than simple coercive punishments. In so far as “acceptable” poaching, governments should consider the need for interventions that do not originate from fisheries management. Given that these types of poachers can appear due to systemic socio-economic problems it would be recommendable to draw up economic policies aimed at reducing the impoverishment of seafaring communities, inequality and unemployment, which will have an impact on the mitigation of this type of poaching (Ballesteros & Rodríguez-Rodríguez, 2019).

For poachers external to the shellfishing sector

In a context that is so favourable for poaching as is Galicia, a very wide range of individuals can fit the definition of outsider poachers (Ballesteros & Rodríguez-Rodríguez, 2018a; González Arias et al., 2011). For high impact external poachers, that is, chronic poachers, violent organised groups who destroy resources, it is possible to recommend their coercive prosecution supporting these policies with normative measures that complement the instrumental ones. The use of progressive punishment measures, such as different ranges of penalties, including administrative and penal sanctions, seizures and confiscations of either products, equipment or vessels can be effective instruments in order to discourage this type of poacher.

Another particularly interesting alternative, of an instrumental nature, for high impact

poachers who benefit from illegal shellfish trafficking, would be to strangle the trading of poached products. These measures would affect other links of the poaching chain beyond the gatherers, that is, it would also strike individuals who purchase, intermediaries and traders. This measure would demand the surveillance and control of trading routes, as well as appropriate and proportional punishments for traders and intermediaries. General measures of a normative nature should be promoted as well.

Finally, for sporadic and opportunistic poachers who carry out low-impact poaching, such as recreational beach users, tourists, holidaymakers, neighbours from the shellfishing communities, etc (Ballesteros & Rodríguez-Rodríguez, 2018a) the recommendation is normative actions of compliance using complementary instrumental measures as support. Educational and awareness campaigns regarding the problems associated to illegal gathering, such as exposure to food-poisoning due to the consumption of shellfish with no health and safety guarantees or the imposition of opportunity costs, can help encourage compliance. From an instrumental point of view, low intensity progressive punishments can be applied, such as fines, confiscations, and seizures on beaches.

Final considerations

This research suggests that a particular relevance be given to the incentives for normative compliance among Galician shellfish-gatherers communities ruled by co-management systems, as well as the need for enhancing them in order to improve socio-ecological resilience. However, poaching is a many-sided phenomenon that cannot be solved with standardized measures. Each case should be studied individually, and adaptive actions should be drawn up and implemented accordingly. Based on this premise, this article puts forward a set of strategies to fight poaching, which combine normative incentives but also instrumental deterrence measures. Thus, the definition of packages of normative and

instrumental measures will probably help to improve enforcement and compliance of shellfishing regulations in the Galician context. It will also improve the chances that virtuous cycles are generated, increasing the weight of social control over coercive measures or direct interventions by authorities, enabling the self-regulation of the communities involved in the local management of shellfish resources.

However, it is important to highlight that the proposed recommendations are theoretical in nature. Their empirical confirmation and field application would allow to test their validity, and also offer ways of improving its design and application. Broadening the scale and developing a reference framework which connects the fisheries governance systems with results regarding the sustainability of natural resources will be further steps so as to delve deeper into the interpretation of this phenomenon. Moreover, this would also enable the comparability of cases and facilitate the accumulation of knowledge. More precise knowledge could help making recommendations that are more nuanced and adapted to the socio-economic reality and the institutional frameworks of seafaring communities.

Acknowledgements

Hugo M. Ballesteros work has been funded by a Postdoctoral Research Contract by the Xunta de Galicia, Project ED481B 2018/088.

References

- Ballesteros, H. M., & Rodríguez-Rodríguez, G. (2018a). “Acceptable” and “unacceptable” poachers: Lessons in managing poaching from the Galician shellfish sector. *Marine Policy*, *87*, 104–110.
<https://doi.org/10.1016/j.marpol.2017.10.015>
- Ballesteros, H. M., & 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*(May), 188–196.
<https://doi.org/10.1016/j.marpol.2018.06.014>
- Ballesteros, H. M., & Rodríguez-Rodríguez, G. (2019). “Economic Crisis and Poaching: Advice on Anti-Poaching Management from The Galician Shellfish Sector.” *Deviant Behavior*, *40*(12), 1508–1521.
<https://doi.org/10.1080/01639625.2018.1525804>
- Ballesteros, H. M., Rodríguez-Rodríguez, G., & Bande Ramudo, R. (2017). Incentivos estructurales para la práctica del furtivismo marisquero en Galicia: una aproximación cualitativa. In J. Pueyo Losa & J. Jorge Urbina (Eds.), *La reforma de la gobernanza pesquera internacional y europea*. (pp. 233–251). Aranzadi SAU / Thomson Reuters.
- Becker, G. S. (1968). Crime and Punishment: an Economic Approach. In F. N.G., C. A., & W. R. (Eds.), *The Economic Dimensions of Crime* (pp. 13–68). Palgrave Macmillan UK. https://doi.org/10.1007/978-1-349-62853-7_2
- Bell, S., Hampshire, K., & Topalidou, S. (2007). The political culture of poaching: a case study from northern Greece. *Biodiversity and Conservation*, *16*(2), 399–418.

<https://doi.org/10.1007/s10531-005-3371-y>

Bennett, N. J. (2016). Using perceptions as evidence to improve conservation and environmental management. *Conservation Biology*, 30(3), 582–592.

<https://doi.org/10.1111/cobi.12681>

Bodin, Ö., & Crona, B. I. (2009). The role of social networks in natural resource governance: What relational patterns make a difference? *Global Environmental Change*, 19(3), 366–374. <https://doi.org/10.1016/j.gloenvcha.2009.05.002>

BOE, Ley Orgánica 1/2015, de 30 de marzo, por la que se modifica la Ley Orgánica 10/1995, de 23 de noviembre, del Código Penal., Boletín oficial del estado 27061 (2015). <https://www.boe.es/boe/dias/2015/03/31/pdfs/BOE-A-2015-3439.pdf>

Carlsson, L., & Berkes, F. (2005). Co-management: Concepts and methodological implications. *Journal of Environmental Management*, 75(1), 65–76.

<https://doi.org/10.1016/j.jenvman.2004.11.008>

Crow, M. S., Shelley, T. O., & Stretesky, P. B. (2013). Camouflage-Collar Crime: An Examination of Wildlife Crime and Characteristics of Offenders in Florida. *Deviant Behavior*, 34(8), 635–652. <https://doi.org/10.1080/01639625.2012.759049>

Curcione, N. (1992). Deviance as delight: Party boat poaching in southern California. *Deviant Behavior*, 13(1), 33–57. <https://doi.org/10.1080/01639625.1992.9967897>

Eliason, S. L. (2012). Trophy Poaching: A Routine Activities Perspective. *Deviant Behavior*, 33(1), 72–87. <https://doi.org/10.1080/01639625.2010.548289>

Elster, J. (2009). Norms. In P. Bearman & P. Hedström (Eds.), *The Oxford Handbook of Analytical Sociology* (pp. 195–217). Oxford University Press.

<https://doi.org/10.1093/oxfordhb/9780199215362.013.9>

Filteau, M. R. (2013). Detering Defiance: “Don’t Give a Poacher a Reason to Poach”.”

International Journal of Rural Criminology, 1(2), 236–255.

<https://doi.org/10.18061/1811/53696>

Forsyth, C. J., & Marckese, T. A. (1993a). Folk Outlaws: vocabularies of motives.

International Review of Modern Sociology, 23(Spring), 17–31.

<https://doi.org/10.2307/41421592>

Forsyth, C. J., & Marckese, T. A. (1993b). Thrills and skills: A sociological analysis of

poaching. *Deviant Behavior*, 14(2), 157–172.

<https://doi.org/10.1080/01639625.1993.9967935>

Frangoudes, K., Marugán-Pintos, B., & Pascual-Fernández, J. J. (2008). From open access to co-governance and conservation: The case of women shellfish collectors in Galicia (Spain). *Marine Policy*, 32(2), 223–232.

<http://linkinghub.elsevier.com/retrieve/pii/S0308597X07001145>

Freire, J., & García-Allut, A. (2000). Socioeconomic and biological causes of management failures in European artisanal fisheries: the case of Galicia (NW

Spain). *Marine Policy*, 24(5), 375–384. [https://doi.org/10.1016/S0308-](https://doi.org/10.1016/S0308-597X(00)00013-0)

[597X\(00\)00013-0](https://doi.org/10.1016/S0308-597X(00)00013-0)

García-Negro, M. C., Rodríguez-Rodríguez, G., Ballesteros, H. M., & Sálamo Otero, P.

(2016). Táboas Input-Output da Pesca-Conservas Galega 2011. In *Consellería do Mar* (1st ed.). Xunta de Galicia. [https://libraria.xunta.gal/es/taboas-input-output-](https://libraria.xunta.gal/es/taboas-input-output-pesca-conservas-galegas-2011)

[pesca-conservas-galegas-2011](https://libraria.xunta.gal/es/taboas-input-output-pesca-conservas-galegas-2011)

- Gezelius, S. (2002). Do Norms Count? State Regulation and Compliance in a Norwegian Fishing Community. *Acta Sociologica*, 305–314.
<https://doi.org/10.1080/000169902762022888>
- Gezelius, S. (2003). *Regulation and Compliance in the Atlantic Fisheries: State/Society Relations in the Management of Natural Resources*. Springer Science & Business Media. <https://doi.org/10.1007/978-94-010-0051-2>
- Gezelius, S. (2004). Food, money, and morals: Compliance among natural resource harvesters. *Human Ecology*, 32(5), 615–634. <https://doi.org/10.1007/s10745-004-6099-5>
- González Arias, M. Á., Molano Martín, F. J., & Bandín Buján, C. (2011). *O Furtivismo Mariño e a súa incidencia na Comunidade Autónoma de Galicia*. Xunta de Galicia.
- Hampshire, K., Bell, S., Wallace, G., & Stepukonis, F. (2004). “Real” Poachers and Predators: Shades of Meaning in Local Understandings of Threats to Fisheries. *Society & Natural Resources*, 17(4), 305–318.
<https://doi.org/10.1080/08941920490278656>
- Hatcher, A., Jaffry, S., Thébaud, O., & Bennett, E. (2000). Normative and social influences affecting compliance with fishery regulations. *Land Economics*, 76(August), 448–461.
- Hauck, M. (2008). Rethinking small-scale fisheries compliance. *Marine Policy*, 32(4), 635–642. <https://doi.org/10.1016/j.marpol.2007.11.004>
- Hicks, C. C., Levine, A., Agrawal, A., Basurto, X., Breslow, S. J., Carothers, C.,

Charnley, S., Coulthard, S., Dolsak, N., Donatuto, J., Garcia-Quijano, C., Mascia, M. B., Norman, K., Poe, M. R., Satterfield, T., Martin, K. S., & Levin, P. S.

(2016). Engage key social concepts for sustainability. *Science*, 352(6281), 38–40.

<https://doi.org/10.1126/science.aad4977>

Hilborn, R., Orensanz, J. M. L., & Parma, A. M. (2005). Institutions, incentives and the future of fisheries. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 360(1453), 47–57.

Series B, Biological Sciences, 360(1453), 47–57.

<https://doi.org/10.1098/rstb.2004.1569>

Hodgson, I. D., Redpath, S. M., Fischer, A., & Young, J. (2019). Who knows best?

Understanding the use of research-based knowledge in conservation conflicts.

Journal of Environmental Management, 231, 1065–1075.

<https://doi.org/10.1016/j.jenvman.2018.09.023>

Hoff, A., Frost, H., Andersen, P., Pallezo, R. ., Rueda, L. ., Triantaphyllidis, G. .,

Argyrou, I. ., Tsikliras, A. ., Motova, A., Lehuta, S., Curtis, H. ., Rodríguez

Rodríguez, G., Ballesteros, H. M., Valeiras, J., & Bellido, J. M. (2019). Potential economic consequences of the Landing Obligation. In S. S. Uhlmann, C. Ulrich, &

S. J. Kennelly (Eds.), *The European Landing Obligation - reducing discards in*

complex, multi-species and multi-jurisdictional fisheries. Springer International

Publishing AG, part of Springer Nature: Dordrecht. [https://doi.org/10.1007/978-3-](https://doi.org/10.1007/978-3-030-03308-8_6)

[030-03308-8_6](https://doi.org/10.1007/978-3-030-03308-8_6)

IGE. (2019). *Permisos de marisqueo a pé por sexo e idade 2018*.

[https://www.ige.eu/igebdt/esqv.jsp?ruta=verTabla.jsp?OP=1&B=1&M=&COD=3](https://www.ige.eu/igebdt/esqv.jsp?ruta=verTabla.jsp?OP=1&B=1&M=&COD=3739&R=2[0];0[2018]&C=1[all]&F=&S=998:12&SCF=)

[739&R=2\[0\];0\[2018\]&C=1\[all\]&F=&S=998:12&SCF=](https://www.ige.eu/igebdt/esqv.jsp?ruta=verTabla.jsp?OP=1&B=1&M=&COD=3739&R=2[0];0[2018]&C=1[all]&F=&S=998:12&SCF=)

- Jackson, J., Bradford, B., Hough, M., Myhill, A., Quinton, P., & Tyler, T. R. (2012). Why do people comply with the law? *British Journal of Criminology*, 52(6), 1051–1071. <https://doi.org/10.1093/bjc/azs032>
- Jagers, S. C., Berlin, D., & Jentoft, S. (2012). Why comply? Attitudes towards harvest regulations among Swedish fishers. *Marine Policy*, 36(5), 969–976. <https://doi.org/10.1016/j.marpol.2012.02.004>
- Jefferson, R., Mckinley, E., Capstick, S., Fletcher, S., Grif, H., & Milanese, M. (2015). Understanding audiences : Making public perceptions research matter to marine conservation. *Ocean & Coastal Management*, 115, 61–70. <https://doi.org/10.1016/j.ocecoaman.2015.06.014>
- Joseph, J. (2003). *Social Theory: Conflict, Cohesion and Consent*. Edinburgh University Press. <https://kar.kent.ac.uk/id/eprint/902>
- Kittinger, J. N., Finkbeiner, E. M., Glazier, E. W., & Crowder, L. B. (2012). Human Dimensions of Coral Reef Social-Ecological Systems. *Ecology and Society*, 17(4), art17. <https://doi.org/10.5751/ES-05115-170417>
- Kuperan, K., & Sutinen, J. (1998). Blue water crime: deterrence, legitimacy, and compliance in fisheries. *Law & Soc'y Rev.*, 32(2), 309–338.
- Le Gallic, B. (2008). The use of trade measures against illicit fishing: Economic and legal considerations. *Ecological Economics*, 64(4), 858–866. <https://doi.org/10.1016/j.ecolecon.2007.05.010>
- Meltzoff, S. K. (1995). Marisqueadoras of the Shellfish Revolution: The Rise of Women in Co-management on Illa de Arousa, Galicia. *Journal of Political Ecology*, 2, 20–

38. <http://hdl.handle.net/10535/3487>

Moreto, W. D., & Lemieux, a. M. (2015). Poaching in Uganda: Perspectives of Law Enforcement Rangers. *Deviant Behavior, July*, 1–21.

<https://doi.org/10.1080/01639625.2014.977184>

Muth, R. M., & Bowe, J. F. (1998). Illegal harvest of renewable natural resources in North America: Toward a typology of the motivations for poaching. *Society & Natural Resources, 11*(1), 9–24. <https://doi.org/10.1080/08941929809381058>

Osterblom, H., Constable, A., & Fukumi, S. (2011). Illegal fishing and the organized crime analogy. *Trends in Ecology & Evolution, 26*(6), 261–262.

<https://doi.org/10.1016/j.tree.2011.03.017>

Ostrom, E. (1990). *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press.

<https://doi.org/10.1017/CBO9780511807763>

Outeiro, L., Byron, C., & Angelini, R. (2018). Ecosystem maturity as a proxy of mussel aquaculture carrying capacity in Ria de Arousa (NW Spain): A food web modeling perspective. *Aquaculture, 496*, 270–284.

<https://doi.org/10.1016/j.aquaculture.2018.06.043>

Raemaekers, S., Hauck, M., Bürgener, M., Mackenzie, A., Maharaj, G., Plagányi, É. E., & Britz, P. J. (2011). Review of the causes of the rise of the illegal South African abalone fishery and consequent closure of the rights-based fishery. *Ocean & Coastal Management, 54*(6), 433–445.

<https://doi.org/10.1016/j.ocecoaman.2011.02.001>

- Ramcilovic-Suominen, S., & Hansen, C. P. (2012). Why some forest rules are obeyed and others violated by farmers in Ghana: Instrumental and normative perspective of forest law compliance. *Forest Policy and Economics*, 23, 46–54.
<https://doi.org/10.1016/j.forpol.2012.07.002>
- Rizzolo, J. B., Gore, M. L., Ratsimbazafy, J. H., & Rajaonson, A. (2017). Cultural influences on attitudes about the causes and consequences of wildlife poaching. *Crime, Law and Social Change*, 67(4), 415–437. <https://doi.org/10.1007/s10611-016-9665-z>
- Rodríguez-Rodríguez, G., Ballesteros, V. H. M., Valeiras, J., & Bellido, J. M. (2019). Input-output analysis of the economic impacts of the landing obligation: Snap-shot from the trawler fleet in Northern Iberian waters (Spain). *Ocean & Coastal Management*, 172(February), 146–156.
<https://doi.org/10.1016/j.ocecoaman.2019.02.006>
- Schultz, O. J. (2015). Defiance and obedience: Regulatory compliance among artisanal fishers in St Helena Bay. *Marine Policy*, 60(October), 331–337.
<https://doi.org/10.1016/j.marpol.2014.09.012>
- Steg, L. (2013). Environmental psychology: history, scope and methods. In L. Steg, A. E. van den Berg, & J. I. M. de Groot (Eds.), *Environmental Psychology: An Introduction* (pp. 1–12). BPS Blackwell.
- Stern, P. C. (2000). New Environmental Theories: Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues*, 56(3), 407–424.
<https://doi.org/10.1111/0022-4537.00175>
- Stigler, G. J. (1974). The Optimum Enforcement of Laws. *Essays in the Economics of*

Crime and Punishment, 1(3), 55–67. <https://doi.org/10.1086/259646>

Sundström, A. (2015). Covenants with broken swords: Corruption and law enforcement in governance of the commons. *Global Environmental Change*, 31, 253–262.

<https://doi.org/10.1016/j.gloenvcha.2015.02.002>

Sutinen, J. G., & Kuperan, K. (1999). A socio-economic theory of regulatory compliance. *International Journal of Social Economics*, 26(1/2/3), 174–193.

<https://doi.org/10.1108/03068299910229569>

Tyler, T. (1990). *Why people obey the law?* Yale University Press.

Tyler, T. (2011). Why people cooperate: The role of social motivations. In *Politics, Philosophy & Economics*. <http://ppe.sagepub.com/content/5/1/81.short>

Tyler, T. R., & Blader, S. L. (2000). *Cooperation in groups: Procedural Justice, Social Identity, and Behavioral Engagement*. Psychology Press, Taylor & Francis Group.

van der Toorn, J., Tyler, T., & Jost, J. T. (2011). More than fair: Outcome dependence, system justification, and the perceived legitimacy of authority figures. *Journal of Experimental Social Psychology*, 47(1), 127–138.

<https://doi.org/10.1016/j.jesp.2010.09.003>

Von Essen, E., Hansen, H. P., Nordstrom Kallstrom, H., Peterson, M. N., & Peterson, T. R. (2014). Deconstructing the Poaching Phenomenon: A Review of Typologies for Understanding Illegal Hunting. *British Journal of Criminology*, 54(4), 632–651.

<https://doi.org/https://doi.org/10.1093/bjc/azu022>

Waylen, K. A., Fischer, A., McGowan, P. J. K., Thirgood, S. J., & Milner-Gulland, E. J. (2010). Effect of local cultural context on the success of community-based

conservation interventions. *Conservation Biology*, 24(4), 1119–1129.

<https://doi.org/10.1111/j.1523-1739.2010.01446.x>

Xunta de Galicia. (2020). *PescadeGalicia.com-Statistical Reports*.

www.pescadegalicia.com

Young, O. R. (1979). Compliance & Public Authority. In *Compliance and Public Authority: A Theory With International Applications*. Johns Hopkins Univ. Press.

<https://www.taylorfrancis.com/books/9781315064475>

Hugo M. Ballesteros

Department of Applied Economics, Resource Economics Research Group, University of Santiago de Compostela, Avda. Burgo das Nacións S/N, CP 15782 Santiago de Compostela-A Coruña, Galicia, Spain

Hugo M. Ballesteros is Postdoctoral researcher at Department of Applied Economics of the University of Santiago de Compostela. He is member of the Fisheries and Natural Resource Economics Research Group. His main areas of interest are related whit fisheries management with emphasis on environmental issues forced by anthropogenic causes as poaching, IUU fishing or discarding. He has recently published in Marine Policy, Ocean & Coastal Management, Deviant Behaviour and Revista Galega de Economía.

ORCID ID: <https://orcid.org/0000-0001-7644-3746>

Corresponding author: victorhugo.martinez@usc.es

Gonzalo Rodríguez-Rodríguez

Department of Applied Economics, Resource Economics Research Group, University of Santiago de Compostela, Avda. Burgo das Nacións S/N, CP 15782 Santiago de Compostela-A Coruña, Galicia, Spain.

Gonzalo Rodríguez-Rodríguez is a professor of in the Department of Applied Economics at the Faculty of Economics of Santiago de Compostela. He is Director of the Fisheries and Natural Resource Economics Research Group of Santiago de Compostela University. His primary research includes IUU fishing, market interactions between fisheries and aquaculture, fisheries discards and economic impact of fishing sector. He has recently published in Marine Policy, Fish and Fisheries, Ocean & Coastal Management, Deviant Behaviour, International Journal of Entrepreneurship and Small Business.

gonzalo.rodriguez@usc.es

ORCID: <https://orcid.org/0000-0002-8312-5698>

Francisco Jesús Ferreiro-Seoane

Department of Applied Economics, Resource Economics Research Group, University of Santiago de Compostela, Avda. Burgo das Nacións S/N, CP 15782 Santiago de Compostela-A Coruña, Galicia, Spain

Francisco Jesús Ferreiro-Seoane. Ph.D. in Economics, Professor of the Political Economy section of the Department of Applied Economics in the Faculties of Law and Political Science at the University of Santiago de Compostela (Spain). He is member of Fisheries Economics Research Group, University of Santiago de Compostela. His main areas of interest are related to political economy, public administration, and public policy.

ORCID ID: <https://orcid.org/0000-0002-3984-3158>

e-mail: franciscojesus.ferreiro@usc.es

Helena Martínez-Cabrera

Department of Applied Economics, Resource Economics Research Group, University of Santiago de Compostela, Avda. Burgo das Nacións S/N, CP 15782 Santiago de Compostela-A Coruña, Galicia, Spain

Helena Martínez-Cabrera is Research Assistant at the Department of Applied Economics at the University of Santiago de Compostela and member of the Fisheries and Natural Resource Economics Research Group. She has been involved in two FP7 and one H2020 multidisciplinary research & innovation projects on transitions to sustainability. Specialized in the connections between socio-economic and natural systems, her research interests orbit around societal change, factors that trigger collective action and processes by which quality of life is derived.

e-mail: helena.martinez.c@usc.es

ORCID ID: <https://orcid.org/0000-0001-7900-7819>