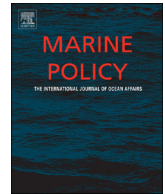




ELSEVIER

Contents lists available at ScienceDirect

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

How much in the clan are you? The community as an explanatory factor of the acceptance of poaching in small-scale fisheries

Hugo M. Ballesteros*, Gonzalo Rodríguez-Rodríguez

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

ARTICLE INFO

Keywords:

Poaching
Shellfish
Galicia
Non-compliance
Community
Small-scale fisheries

ABSTRACT

This work is an in-depth look at the acceptance of poaching in Galicia, exploring the role of the community in tolerating acts of non-compliance with shellfishing regulations in Noia, (Galicia, Northwest of Spain). Tolerated non-compliance attitudes were identified and as a result it was possible to define the motivations behind poaching and which individuals are potentially acceptable in the target community. It was concluded that formal access and withdrawal property rights to shellfishing resources are only granted by the formal users of the resources under certain circumstances, but, fundamentally, only to individuals who are recognised as belonging to the community. To this regard, the concept of community is what sustains the possibilities of co-managing the resources and the acceptance of certain shellfish poaching acts within the community in question. Once the possibility of acceptance was established, the perceptions of the shellfish harvesters were used to measure tolerance towards poaching by asking the following question: Up to what point can poaching be tolerable? The information used in this work was collected in 95 surveys carried out between February and April 2017.

1. Introduction

Shellfish poaching in Galicia is considered to be the most important problem in the shellfishing sector due to the fact that it is an endemic, widespread phenomenon and deeply rooted in coastal communities [1–6]. Attitudes of non-compliance with Galician shellfishing law are founded on a series of incentives promoting illegal shellfish gathering, which are structural in nature: it is, in practice, impossible to carry out a thorough surveillance of the coast, it is difficult to identify and effectively punish poachers, the existence of a well-established black market which demands large quantities of shellfish, and the social acceptance of illegal practices, among others [2].

Recent studies into the management of fisheries highlight the need to study non-compliance attitudes among marine resources users, using methods adapted to the specific nature of each small-scale fishery [7], and forgoing the classic binary approach. The latter only makes a distinction between those who comply and those who do not, the former makes it possible to evaluate the problem by acknowledging the existence of diverse attitudes of acceptance and engagement with fishery regulations [8,9]. Using this approach, some studies have been carried out into the acceptance of non-compliance attitudes in small scale fishing and shellfish harvesting communities, these works mention that tolerance towards illegal shellfish gathering may be based on the

perception that these acts, besides benefitting specific individuals, may be favourable for the wellbeing of the fishing community as a whole by establishing compensation frameworks to promote social justice [3,4,10–12].

The analyses carried out in the aforementioned works are based on two characteristics. The first one is that the shellfish gathering takes place in fishing communities where maritime activities not only support the socioeconomic existence of the same, but also define them culturally and determine the interpersonal relationships of their members [11,13–16]. To this regard, communities depending on natural resources have been described as social constructs defined by the perception, self-association and by the feeling of belonging of their members, in institutional contexts governed by common rules [11,15,17–22]. Nevertheless, these fishing communities are so complex, that it is not possible to accept that they are defined by homogeneous characteristics, uniform beliefs and traits of identity, or by stable and well-defined relationships [19]. Keeping this complexity in mind in this research it was agreed to accept the definition of community given by Agrawal and Gibson [18] based on three core factors: i) the community arises from a local economic homogeneous activity, which is dependent on natural resources, ii) the limits of the community are clearly defined, and iii) its members share common rules and values.

* Corresponding author.

E-mail addresses: victorhugo.martinez@usc.es (H.M. Ballesteros), gonzalo.rodriguez@usc.es (G. Rodríguez-Rodríguez).

<https://doi.org/10.1016/j.marpol.2018.06.014>

Received 6 February 2018; Received in revised form 26 May 2018; Accepted 22 June 2018
0308-597X/© 2018 Elsevier Ltd. All rights reserved.

The second characteristic is that the allotment and organisation of the resources are accomplished by means of a co-management regime, in which informal institutional management can favour a more efficient organisation of resources [20,21,23–34].

In Galicia, shellfishing activities fulfil both premises. On the one hand, shellfish harvesting is carried out under a co-management regime [35], in which the participation of formal shellfish harvesters has been fundamental to establish the institutional architecture of the activity [36–40]. At present, Galician shellfish harvesters hold clear and well-defined formal property rights which stipulate their rights and obligations with regard to shellfishing activities.¹ Furthermore, as they are members of Fishermen's Associations, they benefit from certain self-management capabilities, which imply internal organisational competences, resource management and the organisation of harvesting activities, moreover, they have the capacity to establish internal mechanisms to manage participation, sanctions and representation [41–43]. These characteristics make it possible to bring about informal institutional arrangements regarding the management of shellfish beds, such as, for example, the acceptance of some non-compliance attitudes [3].

On the other hand, in Galicia, there are numerous coastal communities in which their members live, socialize and share identity characteristics and cultural attributes and in which they pass down institutionalized knowledge about fishing and about the exploited ecosystems [44]. In fact, Freire and García-Allut [45] identified over 80 centres of population with some kind of connection to fishing, varying in size, from towns to villages or hamlets, along the Galician coastline. In the majority of cases they depend on fishing for their livelihood, the sector being one of strategic importance for Galicia in that it drives local economies and sustains whole communities. In this scenario, some research revealed that tolerance towards specific acts of non-compliance between peers within the fishing communities depended on the fishermen's moral interpretation of these activities [3,10–12,46–48]. In these cases, the fishing community is presented as an institutional construct in which tolerance towards illegal activities could come about if the collective morality is not violated, for example, approving small illegal operations which guaranteed subsistence incomes for the fishermen. On the other hand, activities which implied any excess, predatory behaviour or involved financial exchanges with outsiders were openly rejected [3,11,12]. This type of relationship between permissiveness subject to motivation and membership to the community is what justifies the study of poaching in a co-management context. In this regard, although several studies into non-compliance highlighted that poaching acceptance is possible in communities that are dependent on natural resources, no one has measured the degree of tolerance of these non-compliance activities. For this reason, in this paper, the limits of poaching tolerance will be explored answering the question: Up to what point can poaching be tolerable?

For the set out above, this paper aims to delve into the acceptance of shellfish poaching in the Galician institutional context on the assumption that an explanatory variable determining the tolerance of certain non-compliance attitudes is the fact that poachers belong to the shellfish harvesting communities. This premise would imply the need to explore the existence of a common idea of community among the formal users of Galician shellfishing resources.

A case study was carried out in the shellfish harvesting community of Noia (A Coruña, North West Spain) to check the initial hypothesis. To address the discussion proposed, several preliminary research questions were answered. First of all, it was ascertained whether or not the

licensed harvesters would tolerate shellfish poaching in certain cases in Noia, if so, under what circumstances. With this in mind, the following questions were asked: Which poaching activities are tolerable in Noia? Moreover, who can undertake such poaching activities? Secondly, an analysis was carried out into the relationship between shellfish harvesting community membership and tolerance towards poaching, drawing on the understanding of the concept of community-based on the perception of the users. Finally, a rank of poachers in terms of the degree of tolerance was generated, indicating which individuals are tolerable, under which circumstances and to what degree.

The rest of the paper is organised as follows. In the next section, some contextual notes about the target community and the Galician shellfish sector will be presented. The survey and the description of the data analysis are contained in Section 2 as well. Section 3 presents the results of the case of study developed in this research, while the paper concludes with a discussion and some concluding remarks in Sections 4 and 5.

2. Methods

2.1. The community of study

In the community of Noia (Galicia, Northwest of Spain, Fig. 1), shellfish harvesting is a fundamental activity, the importance of which can be illustrated by means of economic indicators. For example, in terms of employment, 466 shellfish harvesters were granted shellfish exploitation permits to work on the town's beaches in 2017, additionally, during the same period, 526 traditional fishing boats were authorised to withdraw shellfish in the same area, employing 1076 crew members [42,43,49].

With regard to production, more than 2545 t of the principal species of bivalves, sold in the local fish market, were withdrawn in 2017 (essentially, cockles and 3 varieties of clams), with an initial sale value of more than 16.1 million Euros. The importance of the community of Noia as a shellfish production centre is made evident if these figures are taken into account in absolute terms. To this regard, the fish market in Noia concentrated 34.41% of the total volume of cockle and clam production sold in Galicia, which amounts to a quarter of the 65.22 million Euros of the initial sale value in 2017 of the aforementioned species [42].

The data set forth regarding employment and production bear witness to the direct impact of local shellfish harvesting. Nevertheless, the economic importance of shellfish harvesting transcends the local sphere and spreads throughout the Galician economy, be it by way of indirect impacts, those corresponding to production or employment generated in sectors supplying shellfish harvesting goods and services, or induced impacts such as those related to the purchasing power of the employees in the sector. Specifically, García-Negro et al. (2016) observed to this respect, that each Euro generated by the production of shellfish harvesting in Galicia on land and at sea requires an input of 0.35 Euros from 41 different branches of the economy. Furthermore, the shellfish industry is a key supplier to other fishing industries, such as canning, as well as to sectors such as bars, restaurants, caterers and, of course, households. It has thus been argued that the Galician shellfish industry is much more than a mere harvesting activity and has consolidated itself as a complex one, with carry-over effects on other sectors of the Galician economy. Fig. 2 presents a historical series of the production values of the main species exploited over the last 10 years, and therefore makes it possible to illustrate the relevance of shellfish harvesting activities in the area of Noia.

Considering the above, the importance of Noia as the main shellfish harvesting centre in Galicia justifies its selection not only in terms of representing Galician shellfish harvesting communities, but also as the study site for this investigation.

¹ An individual license call PERMEX defines the property rights held by the Galician shellfish harvesters. This license specifies the shellfish harvester's quota which is individual, non-transferable and is assessed based on a biological Total Allowable Catch. The local Galician government also rules the gathering processes imposing conditions such as where, when and how the PERMEX's formal holders can access and exploit the resources [42].



Fig. 1. Location of the study site. Noia (Muros-Noia Estuary), on the Galician coast, Northwest of Spain.

Source: Adapted from Rodríguez-Rodríguez et al. [50].

2.2. Survey

The information used in this work was collected by means of a survey, in works related to fisheries management and ordinance, this is a common method used to generate information based on users' perceptions of resources [51–53] and in particular in works regarding shellfish poaching [1,3]. Perception studies have been justified as a valid and valuable method to gather meaningful information about the use of natural resources [54,55].

The questionnaire used in this study included 3 closed-ended, dichotomous type questions and two sets of ordinal questions. The nominal questions measured the respondents' perception with regard to the acceptance of poaching defined by motivations. The aforementioned motivations were detected in 4 interviews with the harvesters and their representatives, carried out prior to the field work. Three key justifications were established for poaching activities in Noia: i) poaching for economic reasons, destined for sale and for the generation of income associated to the illegal commercialisation of shellfish, ii) poaching for self-consumption, and iii) poaching for need, which in the study context is undertaken, fundamentally, by the local unemployed and drug addicts. These motivations coincide and are defined more in depth in the literature dealing with shellfish poaching in Galicia² [3].

The first group of ordinal questions included 14 items which intended to measure the degree of acceptance amongst the shellfish harvesters with regard to shellfish poaching, the second group, however, comprised 10 questions, also using a Likert scale (1–5, where 1 = Very Low and 5 = Very High), aimed at identifying to what degree the harvesters considered different sets of individuals to be members of their communities.

In addition, 5 experimental surveys were carried out, in which problems were detected and resolved, not only with regard to the drafting of the questions, but also with the practical administration of

² Ballesteros and Rodríguez-Rodríguez [3] 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. Unemployed individuals, 2. Tourists or holidaymakers, 3. Old-age pensioners, 4. Retired fishermen, 5. Local residents, 6. Local youths, 7. Housewives, 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. Insider poachers, 16. Profit-motivated poachers, 17. Needy poachers, 18. Greedy poachers, 19. Poachers for self-consumption.

the questionnaire. Based on a statistical population of 466 shellfish harvesters [42], the calculated size of the sample was $N = 95$, taking into account a $\pm 9\%$ margin of error, a confidence level of 95% and a distribution of answers of 50%. Not including the pilot questionnaires, between the months of February and April 2017, 95 valid questionnaires were completed. The respondents were interviewed face to face on the beaches of Noia or at Testal Fish Market by interviewers trained in the administration of the questionnaire.

2.3. Analysis

By means of the aforementioned 14 questions, aimed at measuring the Degree of Tolerance towards shellfish poaching, harvesters were able to grade a list of specific individuals on a Likert scale (1–5), associating them to specific motivations for poaching. The 14 ordinal variables derived from the questionnaire were examined using Cronbach's α ($\alpha = 0.806$) reliability test, confirming a high degree of reliability for the data generated using the scale questions.

The Mann-Whitney U test was used to combine the motivations behind the practising of poaching (3 nominal variables) with the perception of tolerance towards different types of poachers (14 scale variables). This test aimed to check if there is a significant dependency on the poaching tolerance and who the poacher is, considering their motivations for poaching. Besides, using the 14 ordinal variables, two quantitative variables were defined, the first ranked the general tolerance towards shellfish poaching in the community of Noia, the second distinguished and rated tolerance towards poaching carried out by members of the community. The Kolmogorov-Smirnov and Levene tests were used to assess the normality, and homoscedasticity of both variables [56]. Both tests revealed a normal distribution and homogeneity between the variances, and it was, therefore, possible to use them to run parametric tests. To this respect, a *t-student* test was used to combine the quantitative and nominal variables, which tested the existence of tolerance towards poaching dependent on motivations and on whether the poachers belong to the shellfish harvesting community in Noia. Furthermore, Pearson's Correlation Test was used to test the correlation between the quantitative variables Tolerance towards Poaching and Tolerance towards Poaching carried out by Members of the Community.

Finally, the questionnaire included another 12 ordinal Likert (1–5) type questions, resulting in 12 ordinal variables, which assessed the shellfish harvesters' perception of certain groups of potential poachers belonging to their community. With this information, it was possible to draw up a list of individuals belonging to the community in question and, on the other hand, outsiders, in order to compare it with the results from the first 14 ordinal questions.

For all statistical tests, a p-value of < 0.05 was considered significant. All data was processed using the SPSS V.20 statistical package.

3. Results

The first question under investigation was if any type of poaching could possibly be acceptable in the shellfish harvesting community of Noia. Table 1 details the results of the Mann-Whitney U test, which explores the degree of tolerance towards poaching among shellfish harvesters depending on the type of poacher. Two fundamental factors were taken into consideration when examining tolerance: i) the motivation behind the practice of poaching (Economic Reasons, Self-Consumption and Need) and ii) the degree of tolerance that the harvesters grant different types of poachers. A descriptive list was obtained of illegal shellfish harvesters, detailing which are potentially acceptable and which are generally rejected according to the perception of the respondents in the community of study.

When poaching is practiced for self-consumption, it is tolerable if the poachers are neighbours, harvesters from the community or local recreational users, whereas it is unacceptable when they are not from the community, such as tourists ($U = 1083.5$, p-value = 0.711) or other

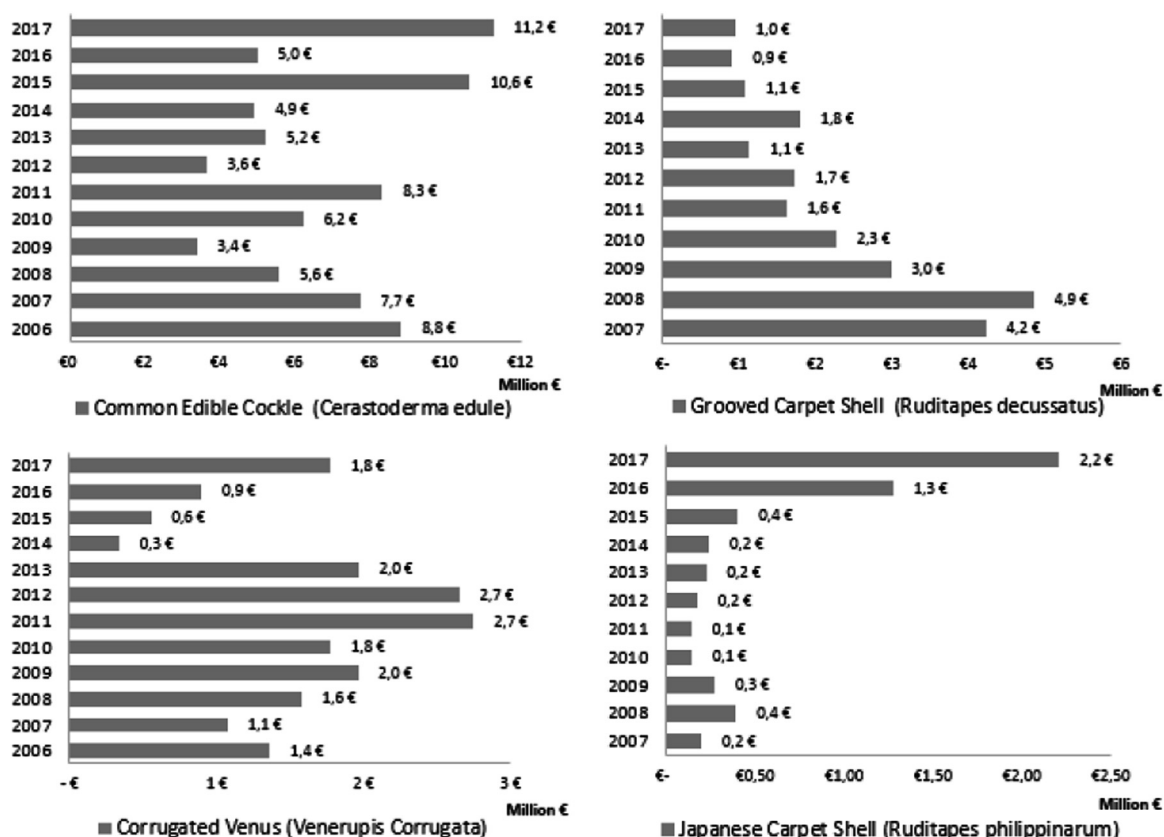


Fig. 2. Historical series (2007–2017) of the initial sale values reached by the main commercial shellfish species in Noia, Common Edible Cockle (*Cerastoderma edule*), Grooved Carpet Shell (*Ruditapes decussatus*), Corrugated Venus (*Venerupis Corrugata*) and Japanese Carpet Shell (*Ruditapes philippinarum*). Quantities expressed in Millions of Euros.

Source: PescadeGalicia.com-Statistical Reports, Xunta de Galicia (2018)

recreational users from outside the community ($U = 1018.50$, p -value = 0.326). When poaching is carried out because of Need, the relationship between poaching motivation and acceptance is always significant, as in the case of Unemployed Individuals and Drug Addicts.

Furthermore, the results suggest that when the fundamental motivation behind poaching is to obtain an income by means of the illegal sale of shellfish, the tendency is for there not to be a dependency relationship between tolerance towards poaching and motivation. In this regard, the dependency relationships between Economic Reasons and tolerance towards poaching were not significant in the following cases: professional poachers from the community, professional poachers from outside the community, shellfish harvesters from the community, shellfish harvesters from outside the community, organised groups of poachers from the community and organised groups of poachers from outside the community. The exception to this pattern of intolerance towards poaching due to economic reasons is the case of poaching practised by neighbours and members of the community of harvesters in Noia ($U = 398.00$, p -value = 0.001).

The data presented in Table 1 confirm that the shellfish harvesters' attitudes of tolerance towards poaching change depending on the motivation behind the practising of illegal shellfish harvesting. However, they also suggest that tolerance depends on whether the poachers belong to the harvesting community. In order to explore this premise and to move onto the second question under investigation, a t -test was applied to correlate the reasons for poaching (Economic Reasons, Need and Self-Consumption) with Tolerance towards Poaching by Members of the Community in the Noia Fishermen's Association, measured using a quantitative variable generated for this purpose (Table 2). The result revealed the significant dependence between Tolerance towards poaching activities by community members and poaching motivated by

Self-consumption, Need and for Economic Reasons. The results are in line with those included in Table 1, highlighting the tolerance of the members of the community when acting due to need and self-consumption. When the motivation is economic in nature, acceptance is more restricted, but possible when dealing with recognised members of the community who do not make a living from professional poaching, or who are not professional shellfish harvesters.

Finally, Pearson's Correlation Test was used to test the correlation between tolerance towards poaching and tolerance towards poaching carried out by members of the community, obtaining a high and significant bilateral correlation ($r = 0.982$, $p = 0.001$), shown in Graph n° 1.

The third objective of the investigation was to rank poachers regarding the degree of tolerance and the degree of membership to the community according to the perception of the shellfish harvesters. The Tolerance to Poaching coefficient was obtained by means of the average score that the $N = 95$ respondents awarded to the group of 14 ordinal variables created to this end. The Community Membership value was calculated in the same way, but based on a group of 12 different ordinal variables generated to measure the membership to the community of a list of potential poachers. Table 3 shows the results.

In line with the hypothesis put forward regarding the relationship between tolerance and membership to the community, the descriptive data included in Table 3 highlight that the most tolerated poachers are those who belong to the community and who are motivated to poach due to self-consumption or need (Local Unemployed Individuals, Shellfish Harvesters and Neighbours who practice poaching for Self-consumption (1.97) and (1.96) and Drug Addicts from the community motivated by need). Acceptance drops to shallow values, approximately between 1.32 and 1.19 points, if the poachers are not local or if they are

Table 1
Tolerance towards poaching grouped by motivation and individuals. Mann-Whitney U Test.
Source: Prepared by the authors.

		Type of poacher	Tolerance	N = 95	U	W	Z	p-value	Rejection H ₀
Motivation Self-consumption	<i>H₀: Tolerance to poaching does not depend on whether the poacher is a tourist</i>	Tourist	Tolerable	43	1083.5	2461.5	-0.371	0.711	No
			Intolerable	52					
	<i>H₀: Tolerance to poaching depends on whether the poacher is a local neighbour motivated by self-consumption</i>	Neighbour	Tolerable	43	385.00	1763.00	-6107.0	0.001	Yes
			Intolerable	52					
	<i>Tolerance to poaching depends on whether the poacher is a local shellfish harvester motivated by self-consumption</i>	Shellfish harvester from the community	Tolerable	43	256.00	1634.00	-7082.0	0.001	Yes
			Intolerable	52					
	<i>H₀: Tolerance to poaching depends on whether the poacher is a local recreational poacher motivated by self-consumption</i>	Local Recreational	Tolerable	43	547.00	1925.00	-4979.0	0.001	Yes
			Intolerable	52					
	<i>H₀: Tolerance to poaching depends on whether the poacher is a recreational poacher from outside the community motivated by self-consumption</i>	Recreational Outsider	Tolerable	43	1018.50	2396.50	-0.983	0.326	No
			Intolerable	52					
Motivation Need	<i>H₀: Tolerance to poaching does not depend on whether the poacher is unemployed</i>	Type of poacher	Tolerance	N = 95	U	W	Z	p-value	Rejection H ₀
		Unemployed	Tolerable	44	405.5	1731.5	-5.836	0.001	Yes
	<i>H₀: Tolerance to poaching does not depend on whether the poacher is a drug addict</i>	Drug Addicts	Tolerable	44	620	1946	-4.321	0.001	Yes
			Intolerable	51					
	<i>H₀: Tolerance to poaching does not depend on whether the poacher is a local professional poacher</i>	Type of poacher	Tolerance	N = 95	U	W	Z	p-value	Rejection H ₀
		Local Professional	Tolerable	29	873.00	3084.00	-0.922	0.357	No
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a professional poacher from outside the community</i>	Professional Outsider	Tolerable	29	933.5	3144.5	-0.329	0.742	No	
		Intolerable	66						
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a neighbour</i>	Local for Selling	Tolerable	29	398.00	2609.00	-5361.0	0.001	Yes	
		Intolerable	66						
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a shellfish harvester from outside the community</i>	Harvester Outsider	Tolerable	29	948.00	3159.00	-0.109	0.913	No	
		Intolerable	66						
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a local shellfish harvester</i>	Local Harvester	Tolerable	29	942.5	1377.5	-0.211	0.833	No	
		Intolerable	66						
<i>H₀: Tolerance to poaching does not depend on whether the poachers are local organized groups</i>	Local Organised Groups	Tolerable	29	951.00	3162.00	-0.073	0.942	No	
		Intolerable	66						
<i>H₀: Tolerance to poaching does not depend on whether the poachers are organized groups from outside the community</i>	Organised Groups Outsiders	Tolerable	29	929.500	3140.5	-0.351	0.726	No	
		Intolerable	66						

p-value of < 0.05 was considered significant.

identified as perverse harvesters who only seek to profit economically from illegal shellfish gathering.

Concerning membership to the community, the shellfish harvesters were given a list of potential poachers who might operate in their area. They were asked to appraise them, from 1 to 5, being 1 non-membership and 5 maximum membership to the community (Table 3). The highest degree of membership to the community was given to the shellfish harvesters themselves (4.77) and the neighbours of the town (4.58). These were followed by Unemployed individuals, with a moderate degree of membership (3.27) and Local Recreational Users (2.92). Local Drug Addicts were given 2.15 points, being in a peripheral position into the community. Shellfish harvesters from other towns were appraised with a low degree of membership to the community (2.07). Formal recreational users from outside the community were recognised

as such (1.47). Those individuals who make a living from poaching or who act in an organised manner were given very low scores concerning their membership to the community, regardless of whether they lived locally or not. To this respect, the Organised Groups of Poachers and Professional Poachers were given 1.47 and 1.43 points respectively if they lived in the vicinity, and their scores worsened (1.31 and 1.24) when they were outsiders. Finally, Tourists were identified as the most removed from the community in Noia (1.16).

4. Discussion

The case study developed in the shellfish harvesting community of Noia verified the proposed investigation hypotheses, demonstrating, fundamentally, the relationship between the acceptance of poaching

Table 2
Relationship between tolerance towards shellfish poaching by members of the community and motivations to practice poaching in the shellfish harvesters' community of Noia. Student's statistical t-test.
Source: Prepared by the authors.

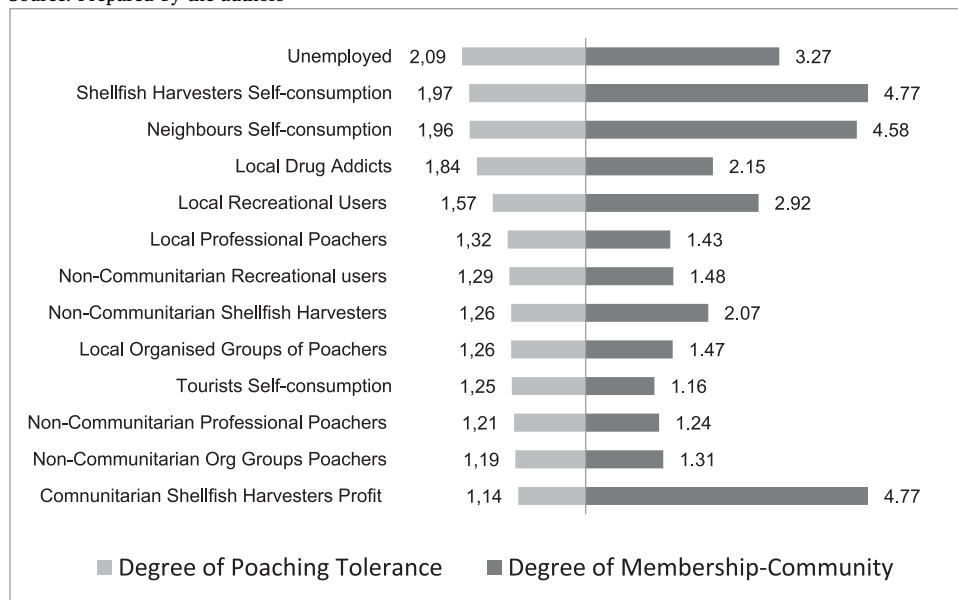
	Tolerance	N = 95	F	Sig.	T	gl	p-value	Rejection H ₀
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a member of the community motivated by self-consumption</i>	Tolerable	43	1.176	0.281	4.029	93	0.001	Yes
	Intolerable	52						
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a member of the community motivated by need</i>	Tolerable	44	0.345	0.56	4.462	93	0.001	Yes
	Intolerable	51						
<i>H₀: Tolerance to poaching does not depend on whether the poacher is a member of the community motivated by economic reasons</i>	Tolerable	29	0.488	0.48	2.519	93	0.013	Yes
	Intolerable	66						

p-value of < 0.05 was considered significant.

Table 3

Average Degree of Tolerance towards Poaching and Average Degree of Membership to the Community of Shellfish Harvesters in Noia, according to the perception of the N = 95 respondents. Data comparison.

Source: Prepared by the authors



Degree of Tolerance towards Poaching: 1. Very low, 2. Low, 3. Medium, 4. High, 5. Very high.

Degree of Membership to the Community: 1. Very low, 2. Low, 3. Medium, 4. High, 5. Very high.

and membership to the community of those individuals involved in non-compliance activities.

However, before reaching this conclusion, other investigation questions had to be resolved. To this regard, the results shown in Table 1 made it possible to show that tolerance towards the illegal gathering of shellfish depends, directly, on the poachers' motivation to carry out this activity.

The relationship between membership to the community, motivations behind poaching and the acceptability of certain non-compliance activities was confirmed in the t-tests (Table 2) and in the Pearson's Correlation test (Fig. 3). The significance of this contribution lies in the fact that it verifies the importance not only of the motivation behind poaching, but also of the identity of the poacher, if there is to be any tolerance towards poaching. To this respect, it was observed that the first type of "acceptable" poaching, namely, shellfish gathering for self-consumption, is only limited to neighbours, professional shellfish harvesters and local recreational users, and is intolerable if carried out by outsiders. Similarly, tolerance of other "acceptable" poachers, those who operate due to necessity, was only identified in individuals known by the harvesters to be from their environment: the unemployed and drug addicts from the town. On the other hand, poaching motivated by Economic Reasons was rejected in 6 out of the 7 types of poachers analysed in Table 1, the only potentially tolerable case being that which involves members of the community.

These outcomes establish a fundamental basis: tolerance, by way of conceding informal access and withdrawal property rights to fishery resources, only appears in specific circumstances, but, above all, they are only granted to members of the community. This fact introduces the relevance of the institutional context and, as a result, also of the central role of the community in the debate regarding the acceptability of non-compliance activities.

The results obtained in this investigation, fundamentally those in Table 3, made it possible to verify that there is a notion of community among the interviewees which determines the management of the fishery resources and may favour tolerance of specific poaching activities. When analysing this community perception using the definition given by Agrawal and Gibson [18], it was observed that:

- i. Noia is a community which depends on marine resources, shellfish harvesting is hugely relevant in terms of production is, therefore, a fundamental activity for the local council, bringing about clear and robust direct and induced impacts on the local and Galician economy [51,57]. The importance of shellfish harvesting can be exemplified taking into account that the number of direct jobs related to shellfishing in 2017 was 1542 harvesters, the total number of employees in the town being 5097 [42,43,49,58]. Given this importance, efficient management of shellfish harvesting activities, including the coordination of policies to deal with shellfish gathering problems, such as poaching, will become issues of common interest in communities, like the one in this study, which are highly dependent on natural resources.
- ii. The results shown in Table 3 reveal the latent community consciousness among shellfish harvesters in Noia, illustrated by their ability to determine who belongs to their group and who is an outsider. The relevance of this fact lies in that the limits of the community are established in terms of familiarity. Setting the boundaries, in turn, will favour the development of management conditions that are necessary for the shellfish beds to be managed as a common-pool resource and from a collective perspective [27,59]. That will imply that, depending on who the poacher is, institutional informal arrangements related to the poaching acceptance could take place. In this regard, the interviewees were presented with a list of potential poachers, and they differentiated between locals and outsiders, classifying them by degrees of association to their community. From this ranking results in a more accurate definition of community, since, from the shellfish harvester's perspective the community members should be local, but they must be related to the shellfish harvesting activity as well.

The outcomes in Table 3 illustrate this setting, where the shellfish harvesters are the central core of the community, followed by members of their environment (neighbours, unemployed individuals, local recreational users). According to the harvesters, the most detached from the community are those who, by definition, are outsiders (for example, tourists), but also those who, despite residing in the community, are identified as outsiders because they

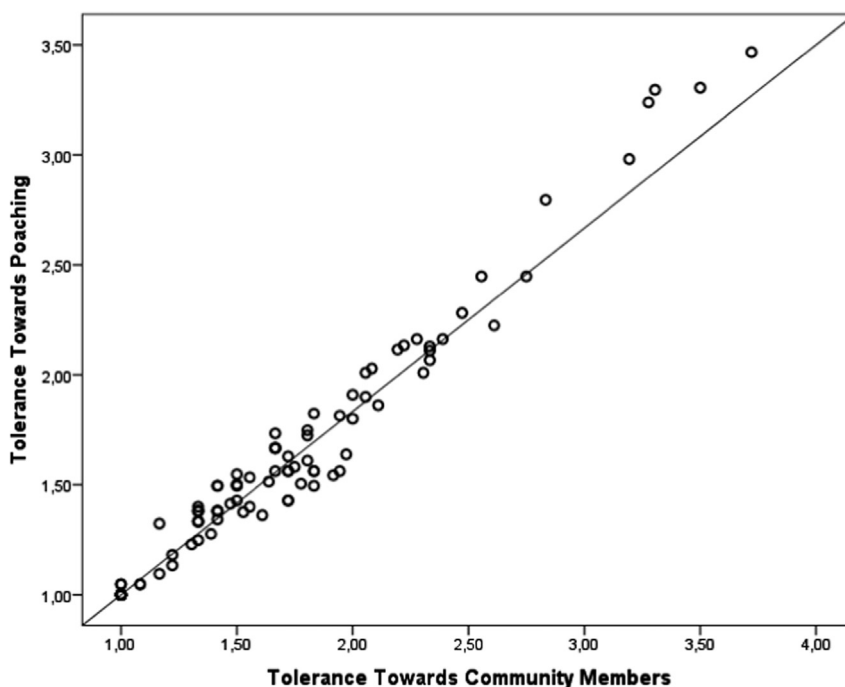


Fig. 3. Correlation between tolerance towards poaching and tolerance towards poaching carried out by members of the community. Source: Prepared by the authors. Graph generated using IBM SPSS Statistics 20.

undertake activities which affect the general interests of the shellfishing collective negatively. The underlying interpretation is that whoever is detrimental to the community is excluded, given that the community is a shared context of interests, a collective project which goes further than the mere occupation of the geographical space. The Organised Groups of Local Poachers³ or the Professional Poachers,⁴ who live in Noia and gather shellfish illegally for profit, recurrently, and generally in a predatory way are an excellent example of the informal community exclusion related to abusive shellfish harvesting practices.

On the other hand, there are those from outside the community, which are included as members of the community, namely shellfish harvesters from different areas. The explanation for this inclusion is once again related to the active undertaking of shellfish harvesting, given that 15% of the harvesters, who make up the Shellfish Harvesters' Association in Noia, are from neighbouring towns [42].

The interpretation of the aforementioned is that the community has limits and includes individuals who do not necessarily coincide with the established political-geographical boundaries. Therefore, how much in the clan users are matters, being the community not only about geographical proximity but shared values, cultures, rules, project, co-existing different layers that express the closeness to the project of the collective.

- iii. The investigation verified the existence of internal rules which regulate the behaviour of the shellfish harvesters as a collective, including informal *rules of the game*, which define the local approval of non-compliance activities. Although the associations of Galician shellfish harvesters enjoy a certain degree of self-regulation, and it is common to find internal operating rules [35], during this field study some informal institutional arrangements among the

harvesters were revealed. These arrangements emerged when analysing the perception of the shellfish collectors with respect to poaching activities carried out by other work colleagues. To this regard, whilst small-scale withdrawals for self-consumption were deemed to be acceptable, any activity carried out in order to sell shellfish were openly rejected by the collective, achieving the lowest degree of tolerance in Table 3. Regarding this issue, the harvesters made statements during the interviews to the effects that they did not reproach any colleague who, by consensus, occasionally took some shellfish home. Nevertheless, they defined as the worst type of poaching, that which is carried out by other shellfish harvesters who take advantage of their knowledge of the locations and conditions of the shellfish beds and withdraw illegally for a profit. In the first case, any acts of non-compliance were always a well-known activity, limited in quantity, restricted to legal size species and, ultimately, authorised by the shellfish harvesting collective, however, in the second case, there is a violation of the harvesters' internal codes, which may be considered as an act of treason against the group.

These findings made it possible to make progress in the study of the community as a centre in which values and rules are shared, in which the boundaries and frontiers are clear, in which informal management arrangements are established and in which the individuals who can take advantage of these arrangements are easily recognised. Besides, the community is the basis upon which they sustain the possibilities of co-managing the fishery resources and the acceptance of certain acts of non-compliance. The importance of this discussion is that by knowing limits of the community, including who and in which degree belongs to it, it is possible to adapt the management of shellfishing to local institutional conditions. Since the informal arrangements which will trigger the tolerance of non-compliance attitudes are related to the membership to the community, the combat of communitarian poachers could be addressed by the combination of formal measures and pragmatic co-management arrangements [59]. Nevertheless, all the poachers recognised as outsiders would be beyond of the influence of the community as an informal enforcement system, consequently should be

³ The organised poachers have been described like poachers who work in groups with varying degrees of organisation to harvest and commercialize the shellfish they poach, at times using technological means. They are very familiar with local conditions and can harvest large amounts of shellfish, basically for profit [3].

⁴ Ballesteros and Rodríguez-Rodríguez [3] described "Professional poachers" like illegal shellfish gatherers for whom poaching is their main source of income. They poach with a high degree of frequency and tend to be rejected within their local community [3].

combated with measures nested in the formal management sphere.

One last question should be addressed in the discussion of the results obtained in this investigation. Table 3 offers another consistent approach: it establishes a justified ranking of the acceptability of poaching activities, which measures the poaching phenomenon, recognising that acceptance is possible, but also grading the level of tolerance. This contribution has yet another perspective: the fact that the degree of tolerance towards poaching could be used to organise the poachers operating in a community as a whole, which in turn can be used to steer political action against poaching. The different level of tolerance drives to the fact that different types of poachers should be approached in an adjusted manner, depending on each case. Poaching as a complex problem should be addressed articulating packages of actions which bring about the application of combined measures of coercive-instrumental actions, with normative measures [3,60–62]. In this way, it could be recommended that the poachers with a lesser degree of tolerance, those recognised as outsiders or who often poach predatorily and violating the community's morality, were combated emphasising the application of formal instrumental-coercive deterrence measures. In contrast, it suggests that "tolerable poachers" whose motivations for poaching are mainly related with social injustice situations such as unemployment, poverty or need, should be managed informally from the community. Furthermore, the existence of a socioeconomic framework in which poverty and need promote the poaching activities implies that some of the policies that can help to address the issue have little or nothing to do with fishery management, but rather with the set of public policies designed to reduce social exclusion and inequality [3].

5. Concluding remarks

Analysing tolerance towards poaching allows us to make progress in the fight against it, mainly because it is possible to identify the circumstances and individuals against which any political action should intervene, this will make it necessary to adapt institutional action mechanisms to favour the efficiency of interventions.

This work discussed the importance of the community as the place wherein lies the ability to establish informal resource regulation, as an informal system of compliance and enforcement with respect to shellfish harvesting management and problem solving. The community's ability to set up informal regulations, which is inherent to the co-management regime, depends on the effective recognition of the "community" by part of its peers. This work not only makes it possible to verify the existence of this recognition, but also to visualise the boundaries of the community through the designation of degrees of association to the same. The community's ability should be used in order to direct any action against poaching, considering that the greatest challenge in fishery management is to establish incentive structures to promote the fulfilment of fishing regulations [21,24]. To this regard, one of the lessons learnt from this work is that poachers are perceived differently and therefore the management of poaching should offer a range of measures adapted to the specific institutional context in which it takes place. These measures should include coercive type actions, fundamentally implemented by public administrations, but should also integrate the institutionalised knowledge which resides in the communities in order to promote normative measures. This combination could promote compliance with regulations in general and, if necessary, draw up informal agreements to favour the pragmatic management of resources, such as the acceptance of specific poaching activities. Additionally, the information presented about the terms of poaching's acceptability together with further data about its impacts over the marine ecosystems should be considered to manage the harvesting activity properly. Consider poaching as a factor which influences the shellfishing gathering would be essential to, for example, set TACs and allocate harvester's quotas accurately. Future research should focus on gathering reliable information about poaching and IUU

activities, furthering our knowledge and understanding about these issues.

References

- [1] M. Alló, M.L. Loureiro, The impact of illegal harvesting on time preferences and willingness to participate in shellfish resource management, *Resour. Energy Econ.* (2017), <http://dx.doi.org/10.1016/j.reseneeco.2017.10.006>.
- [2] H.M. Ballesteros, G. Rodríguez-Rodríguez, R. Bande Ramundo, Incentivos estructurales para la práctica del furtivismo marisquero en Galicia: una aproximación cualitativa., in: *La Gob. Marítima Eur. Retos Planteados Por La Reforma La Política Pesq. Común*: 2017: pp. 235–257.
- [3] H.M. Ballesteros, G. Rodríguez-Rodríguez, "Acceptable" and "unacceptable" poachers: lessons in managing poaching from the Galician shellfish sector, *Mar. Policy* 87 (2018) 104–110, <http://dx.doi.org/10.1016/j.marpol.2017.10.015>.
- [4] H.M. Ballesteros, G. Rodríguez-Rodríguez, Economic crisis and poaching: Advice on anti-poaching management from the Galician shellfish sector, *Deviant Behav.* (2018).
- [5] M.Á. González Arias, F.J. Molano Martín, C. Bandín Buján, O. Furtivismo Mariño, e a súa incidencia na Comunidade Autónoma de Galicia, Xunta de Galicia, Santiago de Compostela, 2011.
- [6] J.L. Sequeiros, A despensa de area: cambio social e formas productivas no sector marisqueiro das Rías Baixas galegas, Edicións Xerais de Galicia, Vigo, 1995.
- [7] M. Hauck, Small-scale fisheries compliance: integrating social justice, legitimacy and deterrence, in: R.S. Pomeroy, N. Andrew (Eds.), *Small-scale Fisheries Management: Frameworks and Approaches for the Developing World*, CABI, 2011, pp. 196–215.
- [8] W.J. Boonstra, S. Birnbaum, E. Björkvik, The quality of compliance: investigating fishers' responses towards regulation and authorities, *Fish. Fish.* 18 (2017) 682–697, <http://dx.doi.org/10.1111/faf.12197>.
- [9] D. Cepić, F. Nunan, Justifying non-compliance: the morality of illegalities in small scale fisheries of Lake Victoria, East Africa, *Mar. Policy* 86 (2017) 104–110, <http://dx.doi.org/10.1016/j.marpol.2017.09.018>.
- [10] S. Bell, K. Hampshire, S. Topalidou, The political culture of poaching: a case study from northern Greece, *Biodivers. Conserv.* 16 (2007) 399–418, <http://dx.doi.org/10.1007/s10531-005-3371-y>.
- [11] S. Gezelius, Regulation and Compliance in the Atlantic Fisheries: State/Society Relations in the Management of Natural Resources, Springer Science & Business Media, Dordrecht, 2003, <http://dx.doi.org/10.1007/978-94-010-0051-2>.
- [12] S. Gezelius, Food, money, and morals: compliance among natural resource harvesters, *Hum. Ecol.* 32 (2004) 615–634, <http://dx.doi.org/10.1007/s10745-004-6099-5>.
- [13] Ö. Bodin, B.I. Crona, Management of natural resources at the community level: exploring the role of social capital and leadership in a rural fishing community, *World Dev.* 36 (2008) 2763–2779, <http://dx.doi.org/10.1016/j.worlddev.2007.12.002>.
- [14] M. do C. García-Negro, A pesca: actividade económica estratéxica., in: XVIII Xornadas Técnicas Difusión Do Sect. Pesqueiro. Novembro 2013, Celeiro. <https://www.youtube.com/watch?v=iylzvsChs2Y>, 2013.
- [15] J.R. McGoodwin, Comprender las culturas de las Comunidades Pesqueras. Clave para la ordenación pesquera y la seguridad, FAO Documento Técnico de Pesca. No. 401. Roma, FAO. 2002. 301p., 2002. <http://www.sidalc.net/cgi-bin/wxis.exe/?IsisScript=FAOCR.xis&method=post&formato=2&cantidad=1&expression=mfn=001884> (accessed 23 August 2014).
- [16] I. Maya Jariego, D. Florido del Corral, J. Sáez, F. Sobrado Llopart, A tale of two coasts: networks of artisanal boat skippers in a fishing reserve in the Gulf of Cádiz and a recreational port in Islas Baleares, *Ocean Coast. Manag.* 161 (2018) 105–116, <http://dx.doi.org/10.1016/j.ocecoaman.2018.05.002>.
- [17] A. Agrawal, Common property institutions and sustainable governance of resources, *World Dev.* 29 (2001) 1649–1672, [http://dx.doi.org/10.1016/S0305-750X\(01\)00063-8](http://dx.doi.org/10.1016/S0305-750X(01)00063-8).
- [18] A. Agrawal, C.C. Gibson, The role of community in natural resource conservation, *Communities Environ. Ethn. Gen.*, State Community Based Conserv. 27 (2001).
- [19] J.J. Pascual-Fernández, K. Frangoudes, S. Williams, Local institutions, in: J. Kooiman, M. Bavinck, S. Jentoft, R. Pullin (Eds.), *Fish Life Interact. Gov. Fish., MARE Publi*, Amsterdam University Press, Amsterdam, 2005, p. 427 <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Fish+for+Life:+Interactive+governance+for+fisheries#0> (accessed 15 October 2014).
- [20] S.R. Kellert, J.N. Mehta, S.A. Ebbin, L.L. Lichtenfeld, Community natural resource management: promise, rhetoric, and reality community natural resource management, *Soc. Nat. Resour.* 13 (2000) 705–715, <http://dx.doi.org/10.1080/089419200750035575>.
- [21] S. Jentoft, Institutions in fisheries: what they are, what they do, and how they change, *Mar. Policy* 28 (2004) 137–149, [http://dx.doi.org/10.1016/S0308-597X\(03\)00085-X](http://dx.doi.org/10.1016/S0308-597X(03)00085-X).
- [22] S. Jentoft, Legitimacy and disappointment in fisheries management, *Mar. Policy* 24 (2000) 141–148, [http://dx.doi.org/10.1016/S0308-597X\(99\)00025-1](http://dx.doi.org/10.1016/S0308-597X(99)00025-1).
- [23] R. Grafton, R. Hilborn, D. Squires, M. Tait, M. Williams, Handbook of marine fisheries conservation and management. <http://books.google.com/books?hl=en&lr=&id=zZACECFPeIAC&oi=fnd&pg=PR11&dq=Handbook+of+Marine+Fisheries+Conservation+and+Management&ots=WyXGE6XeTa&sig=jl6cgoMdVCHgLE90TejJHqkqt7s> (accessed 26 February 2014).
- [24] R. Hilborn, J.M.L. Orensanz, A.M. Parma, Institutions, incentives and the future of fisheries, *Philos. Trans. R. Soc. Lond. B. Biol. Sci.* 360 (2005) 47–57, <http://dx.doi.org/10.1098/rstb.2004.0179>.

- org/10.1098/rstb.2004.1569.
- [25] J.G. Sutinen, K. Kuperan, A socio-economic theory of regulatory compliance, *Int. J. Soc. Econ.* 26 (1999) 174–193, <http://dx.doi.org/10.1108/03068299910229569>.
- [26] T. Dietz, E. Ostrom, P.C. Stern, The struggle to govern the commons, *Science* 302 (2003) 1907–1912, <http://dx.doi.org/10.1126/science.1091015>.
- [27] M. Cox, G. Arnold, S. Villamayor Tomás, A review of design principles for community-based natural resource management, *Ecol. Soc.* 15 (2010).
- [28] E. Schlager, E. Ostrom, Property-rights regimes and natural resources: a conceptual analysis, *Land Econ.* 68 (1992) 249, <http://dx.doi.org/10.2307/3146375>.
- [29] A. Scott, Introducing property in fishery management, in: R. Shotton (Ed.), *Use Prop. Rights Fish. Manag.*, pp. 1–13. (Proceedings Fish Rights99 Conference Fremantle), FAO Fisheries Technical Paper. No. 404/1., Rome: p. 468.
- [30] K. Kuperan, J. Sutinen, Blue water crime: deterrence, legitimacy, and compliance in fisheries, *Law Soc. Rev.* 32 (1998) 309–338.
- [31] K. Kuperan, N.M.R. Abdullah, Small-scale coastal fisheries and co-management, *Mar. Policy* 18 (1994) 306–313, [http://dx.doi.org/10.1016/0308-597X\(94\)90045-0](http://dx.doi.org/10.1016/0308-597X(94)90045-0).
- [32] G. Tebet, M. Trimble, R. Pereira, Using Ostrom's principles to assess institutional dynamics of conservation: lessons from a marine protected area in Brazil, *Mar. Policy* 88 (2018) 174–181, <http://dx.doi.org/10.1016/j.marpol.2017.10.037>.
- [33] K. Guerin, Property rights and environmental policy: A New Zealand perspective. <http://ideas.repec.org/p/nzt/nztwps/03-02.html> (accessed 21 October 2014).
- [34] G. Rodríguez-Rodríguez, H.M. Ballesteros, I. Alcoforado, Property rights in aquaculture: an approach from mussels farming in Galicia, *Rev. Galeg.- Econ.* 23 (2014).
- [35] Xunta de Galicia, Lei 11/2008, do 3 de decembro, de pesca de Galicia. http://www.xunta.gal/dog/Publicados/2008/20081216/Anuncio4C1EE_es.html.
- [36] K. Frangoudes, B. Marugán-Pintos, J.J. Pascual-Fernández, From open access to co-governance and conservation: the case of women shellfish collectors in Galicia (Spain), *Mar. Policy* 32 (2008), pp. 223–232 <http://linkinghub.elsevier.com/retrieve/pii/S0308597x07001145> (accessed 21 February 2014).
- [37] K. Frangoudes, B. Marugán-Pintos, J.J. Pascual-Fernández, Gender in Galician Shell-fisheries: transforming for governability, in: M. Bavinck, R. Chuenpagdee, S. Jentoft, J. Kooiman (Eds.), *Governability of Fisheries and Aquaculture: Theory and Applications*, Springer, 2013, p. 382, <http://dx.doi.org/10.1007/978-94-007-6107-0>.
- [38] X.M. Mahou Lago, Implementación y Gobernanza: La política de marisqueo en Galicia., EGAP. [http://egap.xunta.es/Documentos/Publicacions/\[1275644264\]marisqueo_public68.pdf](http://egap.xunta.es/Documentos/Publicacions/[1275644264]marisqueo_public68.pdf) (accessed 29 March 2014).
- [39] B. Marugán-Pintos, E colleron ese tren... Profesionalización das mariscadoras galegas, Xunta de Galicia. Consellería de pesca e asuntos marítimos. <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:e+colleron+ese+tren#0> (accessed 29 July 2014).
- [40] S.K. Meltzoff, Marisqueadoras of the shellfish revolution: the rise of women in co-management on Illa de Arousa, Galicia, *J. Polit. Ecol.* 2 (1995) 20–38 <http://hdl.handle.net/10535/3487>.
- [41] Xunta de Galicia, Decreto 8/2014, do 16 de xaneiro, polo que se regulan as confrarías de pescadores de Galicia e as súas federacións, 2014. https://www.xunta.gal/dog/Publicados/2014/20140129/AnuncioG0165-220114-0009_gl.html.
- [42] Xunta de Galicia, PescadeGalicia.com-Statistical Reports. www.pescadegalicia.com (accessed 5 January 2018).
- [43] Xunta de Galicia, Orde do 23 de decembro de 2016 pola que se aproba o Plan xeral de explotación marisqueira para o ano 2017, 2017. https://www.xunta.gal/dog/Publicados/2016/20161230/AnuncioG0427-271216-0001_gl.html.
- [44] F. Calo Lourido, A cultura da terra e a cultura do mar, *Portvgalia* 35 (2014) 151–163.
- [45] J. Freire, A. García-Allut, Socioeconomic and biological causes of management failures in European artisanal fisheries: the case of Galicia (NW Spain), *Mar. Policy* 24 (2000), pp. 375–384, [http://dx.doi.org/10.1016/S0308-597X\(00\)00013-0](http://dx.doi.org/10.1016/S0308-597X(00)00013-0).
- [46] R.B. Reyes, O.A. Pombo, G.P. Díaz, Fishers' reasons for poaching abalone (Haliotidae): a study in the Baja California Peninsula, Mexico, *North Am. J. Fish. Manag.* 29 (2009) 237–244, <http://dx.doi.org/10.1577/M06-032.1>.
- [47] L. Wood, Motives for poaching in marine protected areas in the seychelles, *West. Indian Ocean J. Mar. Sci.* 3 (2004) 199–208, <http://dx.doi.org/10.4314/wiojms.v3i2.28466>.
- [48] K. Hampshire, S. Bell, G. Wallace, F. Stepukonis, “Real” poachers and predators: shades of meaning in local understandings of threats to fisheries, *Soc. Nat. Resour.* 17 (2004) 305–318, <http://dx.doi.org/10.1080/08941920490278656>.
- [49] Xunta de Galicia, Rexistro de buques pesqueiros da Comunidade Autónoma de Galicia, Xunta de Galicia, Santiago de Compostela, 2017. <https://www.pescadegalicia.gal/Publicaciones/CDR2016/indice.html>, 2016.
- [50] G. Rodríguez Rodríguez, S. Villasante, M. do Carme García-Negro, Are red tides affecting economically the commercialization of the Galician (NW Spain) mussel farming? *Mar. Policy* 35 (2011) 252–257, <http://dx.doi.org/10.1016/j.marpol.2010.08.008>.
- [51] M. do C. García-Negro, G. Rodríguez-Rodríguez, H.M. Ballesteros, P.Sálamo. Otero, Táboas Input-Output da Pesca-Conservas Galega 2011, 1st ed., Xunta de Galicia, Santiago de Compostela, 2016. <https://libraria.xunta.gal/es/taboas-input-output-pesca-conservas-galegas-2011> (accessed 10 October 2017).
- [52] B.J. Bergseth, G.R. Russ, J.E. Cinner, Measuring and monitoring compliance in no-take marine reserves, *Fish. Fish.* (2015) 240–258, <http://dx.doi.org/10.1111/faf.12051>.
- [53] C. Pita, G.J. Pierce, I. Theodossiou, Stakeholders' participation in the fisheries management decision-making process: fishers' perceptions of participation, *Mar. Policy* 34 (2010) 1093–1102, <http://dx.doi.org/10.1016/j.marpol.2010.03.009>.
- [54] N.J. Bennett, Using perceptions as evidence to improve conservation and environmental management, *Conserv. Biol.* 30 (2016) 582–592, <http://dx.doi.org/10.1111/cobi.12681>.
- [55] J.S. Kahler, G.J. Roloff, M.L. Gore, Poaching risks in community-based natural resource management, *Conserv. Biol.* 27 (2013) 177–186, <http://dx.doi.org/10.1111/j.1523-1739.2012.01960.x>.
- [56] A. Field, Discovering Statistics Using SPSS, in: *Discov. Stat. Using SPSS*. doi:10.1017/CBO9781107415324.004, 2009.
- [57] M. do C. García-Negro, Economía pesqueira: achegas desde un curso universitario, Sotelo Blanco, Santiago de Compostela, 2010.
- [58] IGE, Información municipal Noia, 2018. http://www.ige.eu/igebdt/esq.jsp?Paxina=002003001&c=-1&ruta=fichas%2Fbdmunicipal_tablas.jsp%3FESP%3D15057 (accessed 21 January 2018).
- [59] E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action*, Cambridge University Press, 1990, <http://dx.doi.org/10.1017/CBO9780511807763>.
- [60] B.J. Bergseth, M. Roscher, Discerning the culture of compliance through recreational fisher's perceptions of poaching, *Mar. Policy* (2018), <http://dx.doi.org/10.1016/j.marpol.2017.12.022>.
- [61] A. Hatcher, S. Jaffry, O. Thébaud, E. Bennett, Normative and social influences affecting compliance with fishery regulations, *Land Econ.* 76 (2000) 448–461.
- [62] T. Tyler, *Why People Obey the Law*, Paperback. <http://press.princeton.edu/titles/8230.html> (accessed 22 September 2015).