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Enclosing the right to fish: A Q-study into fishers' attitudes to rights in Scottish fisheries

Keywords: fishing rights; financial enclosure; Brexit; Q methodology

ABSTRACT

Current management of Scottish fisheries uses a quota system that has marketized the right to fish and led to unforeseen social consequences including inequity and barriers to entry. The potential for reform has been brought to the public's attention following the United Kingdom's decision to leave the European Union. This paper maps the opinions of lead actors in the Scottish fishing industry to changing rights in fisheries and the future of the quota system at this tipping point. The analysis, done by Q-methodology, reveals three unique attitudes. These have been titled: the Investors; the Reformers; and the Realists. These divergent views expose points of tension within the fishing industry and demonstrate the need for including multiple understandings of ownership in future management schemes. The article concludes with a call for greater engagement with all voices in the industry to expose both divergent perceptions and industry consensuses for future policy.

INTRODUCTION

The right to fish in the UK has, for the most part, been considered an unrestricted right for centuries (Barnes, 2009). However, this unrestricted nature has led many to view the inefficiency and overexploitation in fisheries as the product of inadequate property rights (Arnason, 2005). Attempting to overcome these problems, fisheries and the rights to them have been subject to increasing enclosure since the 1970s, through the emergence of rights-based management (RBM). RBM uses property-like and/or market-based features to increase individualised responsibility over the sustainability of the resource, usually by introducing tradeable rights. In doing so, RBM often limits entry to the fishery, enclosing access to common-pool resource to fewer individuals who can trade between themselves in a closed market. As such, the use of RBM, and particularly its tradable iterations, has become highly contentious in fisheries and has had significant social consequences (Murray et al., 2010).

It is not inevitable that a system based on tradeable rights becomes socially inequitable (Asche et al., 2018). However, even successful tradeable rights systems have resulted in a consolidation of valuable assets and a dispossession of less-economically dominant players (e.g. in New Zealand, (McCormack, 2017)). Consequently, investigations into the social implications of enclosure in fisheries have become increasingly popular in the past decade (Carothers and Chambers, 2012; Olson, 2011; Pinkerton and Davis, 2015; Ringer et al., 2018). However, research on fishers' perceptions of enclosure and its associated consequences has been limited (see Frangoudes and Bellanger, 2017 for a French perspective). This paper aims to contribute to this important area of research by empirically mapping the perceptions of lead actors in the Scottish fishing industry to changing rights in fisheries.

Scotland has the fourth-largest sea area within Europe and a long history of commercial fishing, with much of the country's past economic productivity achieved through fishing effort (Coull, 1996). Despite fishing now being a moderately small section of Scotland's economy, the Scottish fleet still contributes 65% of the UK landings by quantity in 2016 (Scottish Government, 2017). It also remains of high cultural value for many coastal regions (Brookfield et al., 2005). For the past decade, rights in fisheries have also been an integral part of Scotland's economic and political consciousness. The economic potential of fishing was a point of debate in the 2014 Scottish independence referendum (Scottish Government, 2013). More recently, the right to 'their fish' in 'their waters' was a crucial argument used by those campaigning to leave the EU.¹ Groups such as 'Fishing for Leave' were vocal in their views of Brexit² as a 'golden opportunity to regain 70% of the UK's fisheries resources' (Fishing For Leave, 2017). Boris Johnson MP stated that the EU were 'pinching our fish' (Hughes, 2016). The Scottish Fishermen's Federation (SFF), the national lobby group that officially represents Scottish fishing, dubbed exiting the EU as a 'sea of opportunity' for the industry, alluding to, amongst other things, additional quota.

Understanding the industry's opinions on rights in fisheries is particularly important at the present juncture, when changes in policies could result in changes to rights and their distribution. As a result of Brexit, the methods used to manage fisheries have been increasingly put under a microscope. Additional quota, distribution of the current quota, and rights of foreign vessels in Scottish waters, have all become central to discussions on the future of Scottish fisheries. Investigations into the expectations of fishers to the outcomes of Brexit have touched briefly on the issue of changing rights (Agnisola et al., 2019), but further analysis is needed. Mapping potential dissonances within the industry will be key to achieving better policy in the future that can more effectively incorporate the needs of an increasingly disparate profession.

This study employs the use of a quali-quantitative method known as Q-method. Q-method is uniquely suited to attitudes research, particularly when set within a complex issue such as fishing rights. The method avoids *a priori* categorisation of participants, instead permitting a range of attitudes to emerge intuitively from a set of knowledgeable stakeholders. Despite originating as a method within psychology, Q-method has been used increasingly within the environmental discourse to examine subjectivities of stakeholders, including mapping perceptions of energy policies (Cuppen et al., 2016); ecosystem services (Hermelingmeier and Nicholas, 2017); and fishers' knowledge and biases (Carr and Heyman, 2012). Additionally, the method has been commonly employed at the early stages of policy design, to help elucidate various options for management (Zabala et al. 2018). Here, Q-method is used to investigate the perceptions of those working within the Scottish fishing industry to rights-based management and increasing enclosure. Understanding these different perspectives could help elicit possible options for the future of fisheries management that best serve the diverse fleet.

This paper initially provides context for rights within Scottish fisheries, before describing the application of Q-method. Subsequently, the results of the study are presented and discussed. The paper identifies that members of the Scottish fishing industry present starkly different perceptions on rights-based management, the right to fish, and the future of their industry. The topology of

¹ The reasons for the overwhelming dislike of the CFP and the EU are obviously more wide-ranging than this, and include the belief that the CFP had ultimately failed in its promises for more sustainable stocks, and continued to be an example of a closed neo-corporatist policy that did not involve all actors in decision-making processes (Gray & Hatchard 2003).

² Brexit is the widely adopted moniker for the UK's exit from the European Union.

perceptions indicates clear tensions between actors that could be addressed at this opportune moment, when industry-wide consultation is in progress.

RIGHTS-BASED MANAGEMENT IN SCOTTISH FISHERIES

When we talk of rights in fisheries, there are two important questions. The first is who owns the actual fish, and the second is who owns the *rights* to catch fish. Although literature uses the word 'privatisation' when describing the use of fisheries management, this normally refers to the limits on access and use rights rather than the privatisation of the fish stock itself. In marine fisheries under government control, fish stocks are usually considered a public resource.³ More commonly, references to the privatisation of fisheries allude to the privatisation of the right to fish, or privatising who *can* fish. The right to fish has been considered a public right in the UK for centuries, because of its status as a public good described in the previous section. Many have attributed this public right to the Magna Carta, although in Scotland, the right to fish was established by statute with the Fisheries (Scotland) Act 1756 (Appleby, 2005).

The lack of property rights in fisheries has been routinely blamed for the global overexploitation of fish stocks. Global fish stocks continue to be overfished, with 8-14% of fisheries collapsed, and 24-28% overexploited (Branch et al., 2011). Various economists since Gordon (1954) have examined fishers' behaviours and motivations for maximising profitability, including Hardin's (1968) 'tragedy of the commons', contending that 'selfish' fishermen are compelled to act unsustainably to maximise individual returns. Although this view has been countered (Ostrom, 2009), property rights are still routinely upheld as a way of efficient resource management following a Hardinist approach. Since the 1970s, rights-based management (RBM) has been increasingly implemented as a method for halting the 'race to fish'. In theory, RBM allows for more sustainable fishing practices because rights consign fishers with a concern about the health of the stock and a long-term stake within the fishery (Hannesson, 2005; Hilborn et al., 2005). For fisheries resources that do not adhere to strict spatial boundaries, management commonly employs RBM tools such as quotas. Quotas are an assigned share of a species Total Allowable Catch (TAC). They can be given on individual bases, either to vessels or fishers, or as 'pots' to communities. Nearly 80% of these systems also assign tradable rights, i.e. as Individual Transferable Quotas (ITQs) (Carothers and Chambers, 2012). 10% of all sea fish landed are harvested under an ITQ scheme (Arnason, 2005). ITQs have the added component of marketising allocations of catch, in that they can be transferred between fishers by selling or leasing their shares. In allowing transferability, they can aid efficiency in the fishery by allowing inefficient actors to capitalise on selling their rights rather than investing in high cost operations. This then removes them from the network and raises overall efficiency (Hentrich and Salomon, 2006). According to proponents, transferable quota systems can also help avert the collapse of stocks (Costello et al., 2008), enact efficient co-management (Gutiérrez et al., 2011), and promote safer working environments for fishers (Grimm et al., 2012).

There has been a quota system for certain marine species in the UK for decades, operating under the distributed share of the TAC as dictated by the EU. Prior to 1984, UK fisheries were regulated by vessel-based quotas assigned on a fortnightly or monthly basis by the UK Government (Goodlad, 2000). These track records were then replaced by the current system in 1999. Since then, quota in the UK has been

³ Under Scot's Law, they become private property once caught.

allocated on a licence-basis⁴ either by the Fixed Quota Allocation (FQA) system, in tandem with Producers Organisations (POs), or by a central pool managed directly by Marine Scotland. How quota for TAC species is allocated is dependent on the size of vessel and its affiliation with a PO (see Table 1).

The ‘sector’ fleet refers to vessels that are members of a PO, an official body that manages quota under the FQA system and markets fish products (~400 vessels). For the sector fleet, the governmental body Marine Scotland distributes the units to the POs who have the autonomy to manage and allocate their assigned FQA units as they wish. FQA units, acting as an economic tool, are essentially arbitrary units of measurement, although they were originally the equivalent of 100kg of fish per year. How much they are ‘worth’, in terms of catch, is dependent on the annual setting of the TAC by the European Union. The initial distribution of FQA units was based on ‘track records’ of catch from between 1994 and 1996. Vessels which could prove catches from this time period were essentially gifted a valuable asset in the right to fish for species managed under TACs. The sector fleet vessels are the only vessels in the industry that can trade (either by leasing or selling) FQA units on individual bases between licences. As the initial allocation has never been reviewed, despite the UK Government having the option to do so every two years, FQA entitlement has seen no change except where trading has occurred between fishers.

The remaining quota that is not allocated to POs is administered as pooled quota by Marine Scotland and distributed to the two remaining groups of vessels, the ‘10m and under’ and ‘non-sector’ fleets. The ‘10m and under’ (10mu) fleet is a highly diverse group of vessels which are not members of a PO (~1500 vessels). When the FQA system was introduced in 1999, these vessels, who were never obliged to keep log of catches, could not prove any entitlement to FQA units. Instead, any quota available to the 10mu fleet are managed centrally by the Scottish Government. All vessels, regardless of their gear type, are allocated an equal share of a pool of quota on a monthly or yearly basis. In this paper, the ‘non-sector’ fleet refers to any vessels over 10 metres that have chosen not to enter a PO (~150 vessels). These vessels also do not have access to the tradable quota, and are similarly allocated an equal share of quota from a central pool. The quota in the 10mu and non-sector fleets are not tradable, and these vessels are not able to use the tradable quota accessible to the sector fleet. Table 1 below summarises the methods for allocating FQA units to the Scottish fleets, and the current distributive inequities.

Table 1: Quota allocation in Scotland's three fishing fleets, segregated according to allocations by Scottish Fisheries Administration Marine Scotland (distribution data calculated from ‘UK Allocations’ database (UK Government, 2018b) and correct as of June 2019).

FLEET SEGMENT	QUOTA SYSTEM	ALLOCATING AUTHORITY	ALLOCATION RULES	DISTRIBUTION OF QUOTA
SECTOR	Tradable FQA units, attached to vessel licences	Producer Organisations (POs), received from Marine Scotland (as one	Initial allocation was based on track records from 1994-1996. This is still the reference period for all	Just under 400 vessels registered in Scotland are members of a PO. According to Scot Gov, ‘most’ of the quota

⁴ Licences are similarly restricted; no new licences have been made available to vessels since the introduction of the restrictive licensing system in 1993.

		of 4 UK Fisheries Associations)	species bar a handful (e.g. deep sea stocks). Revaluation of units based on relative stability occurs annually on 1 st January. Transfer of units on a limited basis between vessels in the same or different POs. Permanent transfer between Scottish and non-Scottish vessels is currently prohibited under a moratorium.	administered by Marine Scotland is allocated to POs. Within the share allocated to POs, consolidation has resulted in 5 families own nearly half of all FQA units, either wholly or in part (through investment in other fishing corporations).
NON-SECTOR (OVER 10M)	Non-tradable pooled quota	Marine Scotland	Allocation of quota to non-sector boats is done centrally, separately to the 10mu pool. Quota is set by monthly catch limits.	Approximately 150 non-sector vessels in the fleet. Non-sector vessels can have FQA units attached to their licences but are not able to fish against those units.
10M AND UNDER (10MU)	Non-tradable pooled quota	Marine Scotland	Allocation of quota to 10mu boats is apportioned proportionally. Quota is set by monthly catch limits. The total amount is underpinned by recorded landings by 10mu vessels between 2008 & 2012.	Approximately 1500 10mu vessels in Scotland (72% of Scotland's fleet in numbers). The non-sector and 10mu fleets combined share less than 1% of the national quota given to Scotland.

The FQA system is itself precarious. Hatcher & Read (2001) describe the allocation of FQA units in the UK as an 'informal agreement' between government and industry, without an adequate legal framework, and denotes the actual legal status of quota to be 'very weak'. In theory, the 'right' to fish that comes with the purchasing or leasing of FQA units could be removed or amended at the behest of the permitting body, i.e. Marine Scotland. Yet, the ability to buy, sell and lease FQA units in Scotland means that quota units are reminiscent of a capital asset. Additionally, due to the continued practice of static quota allocation, a perception of permanence has been created. This has formed an expectation from fishers who are granted sustained use rights (Appleby et al., 2016). This was legitimised by the MMO stating that there is an 'established legitimate expectation' for fishers to access quota and the associated quota species (Appleby, 2013). Crucially, due to this lack of legal title,

the system is not akin to an ITQ. Rather, Appleby et al. (2016) describe the situation as a 'squatting claim' of fishers against a legally public asset.

Even without legal certainty, the FQA system in Scotland has seen uninterrupted investment since its inception, as fishers strive to stay viable. However, with the ongoing investment, there have also been several unanticipated consequences of the quota allocation system that have significantly affected the structure of the industry. Firstly, the trait of transferability within the FQA system has led to major consolidation of assets in the Scottish sector fleet. A 2018 report identified that only 5 families own close to half of all Scottish available quota, either wholly or in part through investment in other fishing corporations (Dowler, 2018). This has engendered an increasingly competitive market for access to FQA units. The value of tradeable quota units has steadily been rising, with rental and purchasing now accounting for a significant portion of the costs associated with sector fishing (alongside fuel and vessel maintenance) (Seafish, 2018).

With progressively increasing costs associated with trying to stay viable, financial barriers have become more and more noticeable for those both within and outside of the industry. Inequity between the Scottish fleets is steadily increasing. Whilst any vessel can become a member of a PO, and thus have access to tradeable FQA units, this is not a straightforward process. Upon joining, vessels may have no track record to prove entitlement to FQA units, and the price to lease or buy units for popular catch is often unaffordable.

The market for the right to fish has thus become a significant financial barrier to both those already fishing and potential new entrants. Within the sector fleet, maintaining access to quotas can lead to individuals with high degrees of debt (Stewart, 2014). This can prevent older generations of fishers from retiring, resulting in what has been termed in other areas as the 'greying of the fleet' (Ringer et al., 2018). They have also been cited as the cause of decreased shares of ownership in vessels (Cardwell and Gear, 2013). A recent study for the whole of the UK showed that all vessel owners within their sample were over 40 years of age (Seafish, 2017). The problems of recruitment into the industry have become the centre of several discussion across authorities and industry (e.g. the new All-Party Parliamentary Group on Fisheries recently held an event with industry leads to discuss recruitment into a career which is currently struggling with an aging population). The commodification of what is usually regarded as a public asset has been a steady process that has dispossessed many out of a stronger economic position, and led to sharp disparities in incomes (NEF, 2017). As such, the reallocation of quota has been included as an option within the post-Brexit Fisheries Bill, which at the time of research was progressing through the UK's House of Commons (UK Parliament, 2019).

The possible reallocation of quota also needs to be considered in the context of the UK's possible exit from the EU, which has potential to make additional quota available to the Scottish fleet. Under the Common Fisheries Policy (CFP), shared waters and reciprocal access meant that European vessels had access to stocks within the UK's Exclusive Economic Zone. EU vessels currently land 51% of all catch by weight in Scottish waters on average (Napier, 2016). Additionally, the CFP acknowledges certain historic fishing rights within member states' 6-12nm zones. There are several areas within the Scottish 6-12nm zone that allow French, German, Dutch and Irish vessels access to fishing. Reciprocally, UK vessels can fish within five areas around the coasts of the same four countries (Churchill, 2016). The UK's fishing fleet felt that the allocation of the EU's TAC was unfair and did not 'accurately reflect the resources in UK waters' (UK Government, 2018a). The ability to control one's own resources, and limit who can fish those resources, became a significant argument for fishing representative groups' public backing of the Leave campaign. Consequently, post-Brexit, the UK could be in line for additional quota

in the form of a higher share of TACs. However, there are contentions as to how this additional quota will be distributed (Dickie, 2019).

METHOD

The study applied Q-method to establish the range of perspectives that could emerge within the industry. Q-method is a quali-quantitative technique which employs a specially designed factor analysis to study subjectivity (Stephenson, 1935). It differs from the usual factor analysis which usually correlates tests across participants, by instead correlating participants across a series of issues. As such, Q-method allow researchers to identify collective points of views on issues beyond the obvious divisions (McKeown and Thomas, 2013). In turn, Q-method can reveal invaluable insights into stakeholder behaviours (Watts and Stenner, 2012).

Q-method was additionally deemed appropriate within this study because of its ability to obtain powerful results with only a small sample of respondents. Recruitment of fishing personnel to the study proved difficult. In some cases, this difficulty was a symptom of the timing, wherein the research was conducted during a busy period of negotiations for industry representatives. For other approached individuals, reservations to participate were an indication of a growing mistrust within the industry. Individuals were cautious to voice opinions that may be misrepresented, particularly during a highly contentious political time. Knowing that recruitment may prove difficult, Q-method allowed for a robust set of results from a small but knowledgeable sample.

As Q-method is used to extract viewpoints from a deliberately non-random population, the results of its application cannot be directly extrapolated to represent a wider population. As such, in order establish the prevalence of emergent viewpoints within the entire industry, for example, further methods would be employed (Danielson 2009). Furthermore, within a study sample, it will not be possible to capture and synthesise all possible viewpoints, as the limited set of statements will not be indicative of every perception. Zabala et al. (2018) argues there must be a 'trade-off between inclusiveness and cognitive overloading of respondents.' Farrell et al. (2017; 138) agree that simplicity within the sample of statements is important so as not to become 'unwieldy and time-consuming' for participants. As such, limiting the Q-sample may mean limiting the range of viewpoints, for the sake of efficiency.

Despite these reservations, Q-method is still a rigorous method for structuring viewpoints, and is particularly advantageous for highlighting 'quieter' stakeholders by providing an equal platform for all voices to be heard (Pike et al., 2015). Q-method consists of a number of clear steps, which result in a set of 'factors' representing a variety of viewpoints. The steps involved consist of (i) establishing a concourse; (ii) reducing the concourse to a set of statements (the Q-sample); (iii) selecting the group of participants (the P-sample); (iv) sorting the Q-sample in interviews (the Q-sorting); and (v) data analysis and interpretation.

Defining the concourse

The first step is to define the 'concourse', also known as the 'volume of discussion' of an issue (Brown, 1986). This involves determining the various facets of the issue that is to be analysed. Extracting these key concepts can be done via several methods. In this study, an initial review of grey literature and policy was supplemented with 10 semi-structured interviews with industry representatives, between April 2017 and December 2018. Both interviews and literature were thematically analysed in NVivo using open coding. The emergent themes were as follows: (i) *governance and management*; (ii)

financial enclosure; (iii) national ownership narratives (iv) knowledge dissemination and transparency; and (v) future of rights in fisheries. The concourse was then captured by writing a longlist of statements within these themes, until redundancy set in and no additional value could be added by new statements.

The Q-Sample

The concourse can then be refined to construct a list of meaningful statements, known as the Q-sample, to be given to the participants. A Q-sample typically consists of between 20 and 60 statements (Webler et al., 2009). Refinement was done using a somewhat unstructured approach with an aim to have approximately equal number of statements for each of these identified themes, capturing as much diversity and uniqueness in the concourse whilst staying true to the results from the thematic analysis. This provided an initial Q-sample of 37 statements, which was pilot tested with two participants who did not take part in the final Q-sorting. The pilot participants provided feedback and suggestions for removing or rewording statements, and were particularly useful for helping establish the language of the statements. The final Q-sample consisted of 35 statements.

The P-Sample

The next step is to purposively select the P-sample. Participants of Q-method are usually a range of ‘*decision-makers and opinion leaders*’ (Webler et al., 2009), i.e. knowledgeable and experienced stakeholders who will likely be representative of the emergent factors. Unlike usual population sampling, Q-method works best with a small number of participants, which is usually between 12 and 40 (Barry and Proops, 1999; Brown, 1980). Selection of the participants was done using both media review and snowball sampling. A total of 14 individuals participated in the Q-sorting, with 3 of the 10 initial interviewees returning to take part. Key stakeholder and demographic data for the participants can be found in Table 2.

Table 2: Participant demographics and stakeholder categories

INTERVIEW	STAKEHOLDER CATEGORY	GENDER	AGE CATEGORY
1	Local Authority	Male	55-64
2	Fishers association	Male	55-64
3	Sector fisher/ vessel owner	Male	55-64
4	Producer organisation representative	Male	45-54
5	Fishers association	Male	55-64
6	Non sector fisher	Male	55-64
7	Non sector fisher	Male	55-64
8	Inshore group	Female	25-34
9	Fishers association	Female	55-64
10	Processors, marketers and agents	Male	55-64
11	Sector fisher	Male	55-64

12	Processors, marketers and agents	Male	55-64
13	Sector fisher/ vessel owner	Male	55-64
14	Producer organisation representative	Male	55-64
		<i>Male: 12</i>	<i>25-34: 1</i>
		<i>Female: 2</i>	<i>35-44: 0</i>
			<i>45-54: 1</i>
			<i>55-64: 12</i>

The Q-Sorting

Following selection of the participants and construction of the statements, interviews known as Q-sortings took place. Participants were given information sheets prior to the interviews, which set out the researchers' commitment to anonymity. All interviewed participants provided informed consent prior to inclusion in the research. The 14 interviews were done between January and April 2019, taking place either face-to-face using physical cards, or via a dedicated online software (QSortware). Participants were first asked to divide the 35 statements into three piles, 'Agree', 'Disagree' or 'Neutral'. This helped individuals become familiar with the content and made the second sorting simpler. The participants were then asked to rank the statements in a 'forced distribution' curve, with 9 ranks ranging from -4 (strongly disagree) to +4 (strongly agree) (see Figure 1). Each statement was placed into each box within the curve, with the final 'filled' distribution representing that individual's 'Q-sort'. The participants were encouraged to speak openly about their choices, and their reasoning was captured either in person during the interview, or in a post-sorting telephone or skype interview if using QSortware online. These interviews were transcribed, and participants were sent a copy of the transcript if they wished. This action gave them the option to retract anything they did not want included. The transcribed interviews are also essential for helping interpret the results of the statistical analysis.

Strongly disagree			Neutral			Strongly agree		
-4	-3	-2	-1	0	+1	+2	+3	+4

Figure 1: Q-sorting matrix with 35 boxes, one for each statement

Analysis

The results of the Q-sortings were entered into a dedicated software, PQMethod, for analysis (Schmolck and Atkinson, 2002). PQMethod first uses Principal Component Analysis (PCA) to produce Eigenvalues, which can be used to assess how many factors should be extracted for analysis. Ideally, only factor with an Eigenvalue over 1.00 would be considered; additionally, not all factors with an Eigenvalue over 1.00 must be included (McKeown and Thomas, 2013). The chosen factors can then be rotated using Varimax rotation to reveal the maximum variance explained, which should ideally be above 40% (Watts and Stenner, 2005). PQMethod, using PQROT, then automatically flags which Q-sorts load significantly onto which extracted factors, using the Significant Factor Loading value (at $p < 0.01$ level this is calculated as $SFL = 2.58(1/\sqrt{\text{number of statements}})$) (Watts and Stenner, 2012).

The final step in the Q-method is factor interpretation. This involves critically determining the major narratives emergent within each factor and providing justification and explanation using the participants' interviews. This is aided by using the distinguishing statements, identified by their z-scores. A z-score is a measurement of how much priority a factor gives each statement with the Q-sample, thus the higher the z-score, the more the factor has agreed with that statement. The z-scores can then be ranked and converted to a factor score.

RESULTS

Analysis of Q-Sort scores

Following analysis of the 14 Q-sorts, four factors initially emerged with Eigenvalues in excess of 1.00. However, only three of these had more than one Q-sort load significantly upon it. In order to maximise variance, the extracted factors were thus reduced to three. These three factors accounted for 61% of the explained variation. PQMethod, using PQROT, then automatically flagged which Q-sorts load significantly onto which extracted factors, using the Significant Factor Loading value set at 0.4361. All sorts uniquely loaded onto one of these factors (Table 3).

Table 3: Factor matrix of loading values (significant loading at above the SFL indicated by grey boxes)

Q-SORT	FACTOR 1	FACTOR 2	FACTOR 3
1	0.2186	0.2679	0.8150
2	-0.1083	-0.0028	0.7174
3	0.5998	0.1475	0.1962
4	0.1785	0.6219	0.1802
5	-0.0258	0.8469	0.0813
6	-0.3913	0.5933	0.031
7	-0.1568	0.6987	0.318
8	0.2174	0.8239	-0.0757
9	0.184	0.1683	0.7766
10	0.3249	0.0463	0.8213
11	0.7610	-0.1006	-0.0402
12	0.8148	0.1859	0.0059
13	0.7222	-0.2779	0.2155
14	0.5824	0.0365	0.3522
EIGENVALUES	4.0370	2.8746	1.6925

Table 4 presents the statements used in the Q-sample, identifying the distinguishing statements for each factor using the z-scores as calculated by PQMethod. Z-scores which were statistically significant at $p < .05$ and $p < .01$ were identified, and all z-scores converted into factor scores (from -4 to +4 in this study) to provide an 'average' sort for each factor.

Table 4: Q-sample with factor sort values (* indicates statement significance at $p < .05$; ** indicates statement significance at $p < .01$)

No.	Statement	Factor		
		1	2	3
1	Fisheries are over managed	0	-1	-1
2	It is difficult to diversify into new fisheries	2	2	1
3	Non-quota species should be incorporated into the FQA system	-1	-1	-2
4	Fishing has become more costly because of the quota market	3	3	2
5	There should be quota reserved for new fishers	2	3	2
6	Quota in the non-sector/inshore was distributed fairly after the latest reform	3**	-3**	0**
7	The FQA system should stay but units be redistributed more equitably	-3**	2	3

8	The FQA system should be scrapped and a completely new system introduced	-4	-1**	-4
9	There has been too much investment to change the quota system	4	-3**	3
10	Buying or leasing quota is the main barrier for new entrants	2	2	0**
11	The method for trading quota is efficient	1**	0	-1
12	'Unwritten' rules are often more important and efficient than official regulations	0	0	-1
13	The non-sector and sector fleets are treated equally	0	-4**	-1
14	Ownership of quota has done nothing to stop illegal fishing	-2**	1	0
15	Individuals in the fishing industry are listened to by regulators	-1	-2	1**
16	Local knowledge is being adequately used for regulations	-3	-2	0**
17	Brexit is going to provide greater scope for better, fairer fisheries management	1	1	2
18	An independent Scotland will mean better, fairer fisheries management	-3**	1	1
19	Conservation should be the number one priority for Scotland's seas, even if it means excluding other users	-1	0	1
20	Foreign fleets are given too many rights in Scotland's waters	3*	1	0
21	Reciprocal access is important for Scotland's fishing communities	0	0	1
22	An open market is more important than excluding foreign fleets	0	0	1
23	The Scottish government generally supports the fishing industry	0*	2*	3*
24	Local authorities should have more statutory powers to limit who fishes where	-2	-1	-1
25	Rights to fishing resources are easily understood and the information readily available	1*	-1	0
26	The distribution of quota in Scotland is fairly regulated	2	-3**	2
27	Fewer individuals and companies owning quota is better for the management of stocks	-2	-2	-1
28	The problem of 'slipper skippers' is the most important issue in the current quota system	-1**	1**	-3**
29	There is too much informality in the current system of management	1	0	-2**
30	The FQA system increases stewardship over fish stocks	1	-2*	0
31	The right to fish should be for everyone	0*	1*	-3**
32	Individuals in other marine industries should get more say on who gets to fish where	-2	-1	-2
33	Individuals in coastal communities should get more say on who gets to fish where	-1	3**	-2
34	Fish are a public asset	-1**	4	4

35	The quota system is easily understood and information is readily available	1	0	-3**
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Each factor has been given a profound title by the authors to provide readers a short, clear identification of the factor. The titles have been synthesised from a combination of each factor's distinguishing statements and the concurrent interviews. The three factors have been termed:

- Factor 1: The Investors
- Factor 2: The Reformers
- Factor 3: The Realists

These factors represent the range of viewpoints emergent from the quantitative analysis. Below, these viewpoints are discussed using their distinguishing statements and corresponding interviews to provide context for the participants' choices. Statements within these sections are represented in text as (*number*), as can be found within Table 4.

Factor 1: The Investors

Factor 1 consists of 5 individuals, explaining 21% of the study variance. The participants significantly loading on this factor include three sector skippers/vessel owners, a representative for a producer's organisation that also owns pelagic & demersal vessels, and a representative for a vessel management agency that also trades quota (Table 2).

Factor 1 has been termed the '**Investors**'. Despite an understanding that the present regime of quota was not '*perfect*', the individuals in Factor 1 viewed it as an ingrained part of the system that should not, and more importantly could not, be altered (8). A major feature of maintaining the *status quo* was the financial implications that change would bring (9). Many in the factor had invested large heavily, or known others to do so, in order to stay both economically and legally viable. This commitment by investment has engendered a sense of ownership and entitlement over the quota units, despite their lack of legal title. Any idea of change, whether that was re-allocating units or scrapping the system entirely, was viewed as potentially detrimental for the future of the industry.

The issue of 'fairness' was also highlighted by the Investors. Individuals in the factor believed the distribution and allocation of quota to the sector fleet had been carried out in an equitable fashion. Arguments for equitability centred on the historical track records, a contentious point for some in the industry, but viewed by the Investors as effective and representative of the practices of the time. Some additionally questioned the fairness of other allocation methods. Similarly, the factor believed that quota in the non-sector and 10mu fleets was also distributed equitably (6). On the other hand, any potential change to the regime was deemed as unfair, especially on those that had invested for their livelihood. One participant argued that alterations to the current system would be like '*robbing Peter to pay Paul*'. On a practical level, the idea of the non-sector being provided more quota was deemed unsuitable and inefficient by the Investors, who regularly stated that smaller vessels did not optimise the quota they currently had (7).

For the Investors, modifying the FQA system was not the immediate priority for the future of the industry. Rather, it appears those in the factor were more concerned with the notion of national ownership over Scottish fish stocks. They strongly agreed with the statement that foreign fleets are

given too many rights within Scottish waters (20). Particular reference was made to Norway, with one participant indicating that Norway had been given a *'better deal'* regarding who they allowed to fish in their territorial waters. They contended this was due to Norway having representatives who were more in touch with their industry. Conversely, they viewed Scotland's European ministers as both geographically and politically removed from themselves.

Correlating with this issue, the factor also strongly disagreed with the idea of an independent Scotland being beneficial for the fishing industry (18). Participants were quick to comment that they had yet to see anything that would suggest a better outcome for their industry following independence. This is understandable for a factor who predominantly voted out of the EU, and an incumbent Scottish Government who appear set on re-entering should the chance appear. Despite their arguments against European fleets and Scottish independence, the factor was not very forthcoming with praise for Brexit as it currently stands. The duration of the process appeared to be taking its toll on participants, who continue to be frustrated with the lack of certainty for the future.

The Investors were also the only factor of the three extracted that did not agree that fish were a public asset (34). As will be shown, both other factors placed this statement at +4; here it sits at a -1. This does not necessarily indicate they disagree with the fact. Rather, participants argued they view them as an asset to be regulated *'for the public'*. This also correlates with the statement that the right to fish should be for everyone, which was placed in neutral, signifying an uncertainty over the issue (31).

Factor 2: The Reformers

Factor 2 consists of 5 individuals, explaining 21% of the study variance, and include a representative for a producer's organisation with a large 10mu fleet, a predominantly non-sector fishermen's association, two non-sector fishers, and a representative of a regional inshore fisheries group (Table 2).

Factor 2's views, as predominantly representatives of the inshore or small-scale fleet, appears to be in direct opposition to the individuals in Factor 1. Principally, Factor 2 strongly disagreed that the level of investment means that change is impossible (9). Given their commitment to change, they have been titled the **'Reformers'**. The Reformers were strong in their conviction that the consolidation of units within the sector fleet was bad for the industry, contending that quota in the hands of fewer people did not promote greater stewardship or sustainability (30). Instead, such consolidation hindered sustainable practices and endangered fish stocks, as large vessels continued to accumulate quota and smaller, lower impact, vessels were penalised. They also argued this consolidation allowed for a concentration of control to a minority group, and away from the larger proportion of fishers who worked on 10mu vessels and/or outside the sector fleet.

However, starting from scratch was viewed as unrealistic (8). Rather, many of the individuals were keen to see a fairer allocation of FQA units through reform of the system and reallocation. How reallocation would occur was not explicitly expressed, although there was repeated mention of the reallocation that occurred in the Faroe Islands.⁵ Participants additionally argued that reform should include increasing transparency throughout the system, as a critical part of effective and sustainable

⁵ The Faroese Parliament passed a reform of national fisheries policies in September 2018, with one of the facets of the reform being the public auction of a percentage of fish quotas. The government specify that these rights must be used by the holders, with any unused rights to be returned to authorities.

governance. Similarly, they argued for greater representation for their section of the industry. The Reformers felt that there was a significant divergence in how the sector fleet and non-sector fleet are treated (13). The sector fleet was deemed as well-represented and particularly vocal in their wants. In comparison, individuals in the Reformers group expressed concern that the needs of lower impact fishers were not being prioritised, or even ignored, as their fleet struggled to maintain a representative organisation for such a diverse group of fishers.

The Reformers also strongly and significantly agreed with the notion of coastal communities having more of a voice in suggesting who gets to fish and in which area (33). This is understandable for a group that predominantly works close to shore and/or to their local communities, and also in the presence of other competing industries. The use of a Regulating Order was mentioned by some participants, which grants the right to manage shellfish fisheries within a certain area. A Regulating Order is currently in use within the Shetland Isles to the north of Scotland to manage many of the region's shellfish species, but no other Orders have been successfully established. Other participants were proponents for a 'top-slicing'⁶ method that could be applied using zonal attachment, i.e. attributed to specific zones. These sorts of methods allow for greater local say in how inshore fisheries are managed by providing the power of exclusivity. Subsidiarity to a local, and participatory, organisation was viewed as particularly beneficial for communities that are highly reliant on their inshore waters with little opportunity for other areas of employment.

These arguments came strangely in opposition to the idea that local authorities should have more statutory powers over fishing rights (24). There was agreement by the factor that the Scottish Government was supportive of the Scottish fishing fleets (23), with indications from some that bottom-up management would be most effective in combination with a national framework of governance rather than increased subsidiarity to LAs. This would mean a greater role for fishers in controlling their industry, instead of adding another layer of 'bureaucracy' in the form of local government.

On the issue of Brexit, like many in the fishing industry, individuals in Factor 2 predominantly voted to leave or represented organisations whose members wished to leave. Despite this, leaving the European Union was of less importance for the Reformers. National spokespeople, such as the SFF, have made a number of assertions regarding the repatriation of quota to the entirety of the Scottish fleet following the UK's exit from the EU. However, participants in Factor 2 contended this was mostly offshore quota that would be of little help to inshore fishers. These arguments have been reflected in other media, with small-scale fishers contending that the '*sea of opportunity*' guaranteed by the national lobby groups will not be available for the majority of Scottish fishers (Dickie, 2019).

Other participants were complimentary of the CFP, particularly regarding its regulations for small scale fishers, but chastised its poor implementation. This is noteworthy as the benefits of the CFP are rarely explicated by the media or industry spokespeople. The policy itself is necessarily complicated, spanning wide areas of fisheries governance including trade and product marketing, but these aspects are not often foregrounded in analysis. The acknowledgment of the positive by some of the participants was an interesting divergence from the dominant narrative.

⁶ Top slicing of quota refers to the practice of extracting quota prior to the usual annual allocation and redistributing that 'slice' to the inshore fleet.

Finally, as opposed to the Investors, the Reformers agreed strongly with the statement of fish being a public asset (34). Whilst they overwhelmingly agreed that fish populations needed to be managed, there was an emphasis against the privatisation that the current regime had inflicted upon a public resource. One participant cited the situation in New Zealand, whose ITQ system has been regularly held up as the archetype for effective rights-based management. According to the interviewee, small-scale fishers have been increasingly dispossessed of opportunities in their industry. Now, the country's 'small group of "heavy weights"' appear to be at the centre of decision-making processes because of their economic standings (McCormack, 2017), a situation that they argued mirrored Scotland.

Factor 3: The Realists

Factor 3 consists of 4 individuals, explaining 20% of the study variance. The individuals significantly loading on this factor represented a coastal local authority, a populous fishermen's association, a national fishermen's organisation, and a processor (Table 2). Factor 3 have been termed the '**Realists**', because of a focus on the need to maintain and improve sustainable regulation for the good of both the industry and the resource.

Importantly, the Realists were the only factor to disagree that the right to fish should be for everyone. Their arguments largely revolved around the need for regulation around such rights in order to avoid unsustainable practices. Interestingly, this is despite their assurance that fish are a public asset, a statement they strongly agreed with. The Realist participants do not equate the resource as a public good with the right to exploit it. Rather, viewing the resource as a public asset means viewing it as needing managed for the public. For the Realists, this management requires restrictions on who can access and use it.

The Realists also reflected many of the opinions of the Investors regarding the quota system, including that either reforming or scrapping the regime would be unwise (8). Their arguments centred on the need to maintain supply for a constant market. They stated that any redistribution could disrupt the production chain for an in-demand product, and result in stranded assets. Additional arguments surrounded the safety aspect, as 10mu vessels were deemed fundamentally unable to catch the same species in the same inclement conditions endured by larger vessels.

However, there were a few differences that make the Realists significantly dissonant with the other factors. Firstly, the participants were uniquely cognisant of the lack of information feeding into, and out of, the industry (35). This was in reference to most aspects of fishing, including stock information, management practices, and the quota system. Individuals in the fishermen's associations were especially vocal in the need to educate not only those working in the industry, but the general public as well.

Concurrently, they were also aware of a lack of participatory effort that stifled flows of knowledge from industry workers (16). Whilst they agreed that individuals were listened to by regulators (1), they felt that more efficient processes for using local knowledge could empower fishers into being a significant part of regulating and managing procedures. They also significantly agreed that the Scottish Government generally supported the fishing industry (23), although further support could be provided. Many comparisons were made to the UK government and its treatment of the English and Welsh fleets, which some interpreted as lacking.

Areas of Consensus

Although there were clear divisive issues emergent between the groups, there was also a relatively high proportion of statements that did not significantly distinguish for any one factor at $p > 0.05$. These consensus statements prove some harmony within the Scottish fishing fleet and could be crucial for finding balance in the future. Unsurprisingly, the most agreed upon statement through the groups was that quota had meant the practice of commercial fishing has become more costly (4). Many participants clarified that this was in conjunction with other aspects of the industry, including the rising costs of licences and vessel maintenance.

Another similarly agreed upon issue was that of incentives available for new entrants to the industry. Encouraging employment in fisheries has been an ongoing issue for the Scottish, and UK, governments. Establishing a reserve of quota that could be leased to new entrants is a potential course of action that could entice new fishers to FQA-managed fisheries by decreasing initial upfront costs (5). This quota could also help fishers that wish to diversify but are financially unable to do so; all factors similarly agreed that diversification was difficult within the current regime (2).

The idea of incorporating more species into the FQA system was universally disagreed upon by all factors (3). Participants advised against this, arguing that it would be unnecessarily costly for stocks that can be successfully managed through other means. Current management of non-FQA species, such as crab and lobster, utilises a number of different controls, including minimum landing sizes. The Shetland inshore brown crab and scallop fishery has been MSC⁷ certified, indicating some degree of effective management through controls other than transferable quotas. However, this fishery has also operated under a Regulating Order since 2000, and so the fishery's success must also be measured against this added level of exclusivity.

Another disagreed upon statement by all factors was the idea of letting other marine industries have priority say over the right to fish (32). Nearly every argument against this was centred on the static versus roving industry dispute. As increasing encroachment into the marine environment occurs by emergent industries like offshore renewables and aquaculture, traditional practices that require free movement are progressively displaced. It is therefore understandable that representatives of a dynamic industry would want to minimise the power that static industries have on their ability to fish.

DISCUSSION

This analysis of interviews with members of the Scottish fishing industry have demonstrated a diverse range of perceptions to rights-based management and the 'public' right to fish. Crucially, the study also maps the clear differences in priorities regarding reform of the current system. These three viewpoints, which we have termed the Investors, the Reformers, and the Realists, are important as they empirically demonstrate a clear divide within the fishing industry that has not yet been thoroughly addressed within academic literature. The establishment of a market for a previously public right has fundamentally changed how stakeholders perceive ownership over fisheries resources. These views have in turn resulted in very different priorities over the future of Scottish

⁷ Marine Stewardship Council. The global organisation certifies fisheries with a Fisheries Standard if they meet the three core principles of: 1. Sustainable fish stocks; 2. Minimising environmental impact; and 3. Effective fisheries management.

fisheries. The following section critically discusses the implications of these diverse viewpoints and what they may mean for the future of Scottish fisheries management.

Correcting disparities in narratives

The Investors do not view reform of the system as a priority. Rather, their focus appears to be surrounding the other ownership narrative in fisheries management, that of reclaiming and boosting access to Scottish fish stocks from foreign vessels. The Investors made repeated mention of 'our' waters, how to protect 'our' fish, or what would happen to access rights in 'our' territory. The language of ownership surrounds the Brexit discourse, and has become the dominant narrative of the most vocal, and well-represented, fleet. The SFF, as the national lobby group, has been particularly dominant in the media. The group has maintained a consistent narrative surrounding the increased fishing opportunities after Brexit, which would be 'spread across all fishing communities' (Fishing News, 2019). Additionally, although they concede that FQA units have become more costly, they state that reforming the FQA system would undermine a 'settled and defined resource allocation system' and risk 'bankrupting existing businesses' (Fishing News, 2019).

Media analysis completed by the New Economics Foundation found that the SFF received 49% of the total coverage on Brexit and the fishing industry since 2016, whereas organisations 'specifically representing the small-scale fleet received only 2%' of coverage (NEF, 2019). As such, it has become increasingly apparent that other divergent perceptions in the fishing industry are not equally voiced. There have been concerted, and progressively more effective, efforts from stakeholders to ensure representation for different aspects of the industry. The 10mu fleet has been historically underrepresented in an official capacity, without the support of organisations like POs to advocate and market their products. However, groups such as the Scottish Creel Fishermen, Coastal Producer's Organisation, and the Communities Inshore Fisheries Alliance, have recently been established to specifically represent these underrepresented vessels. By providing more suitable representation for a substantial proportion of the industry, there can be real opportunity for cooperative management. Greater representation should lead to better 'models of democratic engagement' which Geczi (2007) states will allow policies to develop outside the 'prison of the market'.

In turn, representation can help achieve an increase in the transfer of knowledge between industries, authorities, and the public. According to the Realists, who advocate for improving the current system rather than reforming it, there has been a lack of efficiency in using fishers' knowledge for management purposes. Using fishers' knowledge in a more collaborative way should allow for more sustainable and equitable management (Carr and Heyman, 2012). It could help authorities understanding the plurality of ownership narratives, and prevent or correct some of the issues of enclosure witnessed in this study, and prevent or correct some of the issues of enclosure witnessed in this study.

Fairness in reform?

The priority for the Reformers continues to be striving for equitability through reform and reallocation, a perspective that has not been as powerfully vocalised. Reforming the system, and reallocating quota to more small-scale vessels, arguably could help achieve environmental sustainability by diversifying catches and relieving pressure from high impact stocks. Allowing access to quota could also empower a large proportion of the fleet by providing a greater economic stake in the industry. For the Reformers, this would bring back balance to an industry that saw '*millionaires made overnight*', according to one participant, and move power back towards the '*powerless*' majority.

Successful reform does not amount to merely redistributing resources but also reconstructing the process of resource allocation, to achieve both '*procedural justice*' as well as '*distributive justice*' (Tornblom and Vermunt 1999). This has been demonstrated in land reform in Scotland, which has attempted to combat historic land grabbing by incentivising landowners to critically engage with how they are managing the land, framing community buyouts as a more sustainable model for the future (as stipulated in the Land Reform Act 2016). For efficient procedural justice to be achieved, however, reform would need to take account of these divergent views over the ownership of fishing rights. The reform of the Faroe Island's fisheries policy included a reallocation of fishing rights through auctions and development quotas. However, research suggests there are significant barriers to the reform's success, including a fundamental lack of consensus on many of the matters (Danielsen and Agnarsson, 2018).

As such, reform of Scottish fisheries policy would need to adequately include the views of the Investors for it to work efficiently. A reliance on the long '*tradition*' of the system has engendered an ongoing expectation for many in the industry, who now view the right to fish as their possession rather than as a public right. Consequently, government intervention using reallocation has been previously unwanted by sector fishers who would see their quota diminished, even if it meant helping reduce barriers to entry for new fishers (Stewart, 2014). Any reform of the quota management system should provide financial stability for those who had invested, so as to minimise further inequity, potentially in the form of financial compensation for reallocated units.

Opportunities for the future

The study has also provided evidence of a number of consensuses agreed upon by the participants, which may help provide insights for future policy by bridging the gap between these divergent perspectives. These agreements, such as ringfencing quota for new entrants, and restricting the ability of other industries to influence fishing restrictions, are equally as important for the sustainability of fisheries management in Scotland. This study has brought to light these consensuses, establishing a need to engage more comprehensively with individuals from across the industry. There have been concerted efforts by the Scottish Government in the past to engage with the diverse fishing industry through consultations, including one in 2014 about the allocation of quota (Scottish Government, 2014). However, the results of this consultation have never been published. Following Brexit, a new 'in-depth nationwide discussion' with stakeholders was launched in 2018 (Scottish Government 2019). Named the 'Future of Fisheries Management', the consultation gives the opportunity for different, 'quieter' voices to be heard, and might provide further opportunity for identifying the consensuses within the industry.

CONCLUSION

This study, the first using Q-method for mapping perspectives on privatisation in fisheries, has revealed clear conflicts within the Scottish fishing industry. The use of Q-method has provided a unique topology of perceptions within and between different groups of fishers, empirically proving a complex and heterogenous industry. These significant results indicate some increasing divides between fishers and within fleets, as well as some clear consensuses, over their future management. Understanding these perceptions is crucial at this stage, as the results of the EU referendum represents a pivotal moment with potential for change to fisheries management. The results of the Q-method have revealed that for some, Brexit represents an opportunity to rebalance what they see as a detrimental and unjust system, welcoming reform and reallocation of rights. However, for others, this moment is an opportunity to further consolidate and extend powers over resources they see as

rightfully theirs. Considering the multiple understandings of rights and fairness emergent in this small group of individuals, this article concludes with a need to facilitate better inclusion of this range of viewpoints in fisheries management. Attempts to do so should include more effective engagement with the diverse range of fishers present in Scotland. This includes the need for better representation for the 'quieter' voices in the industry, but also an understanding of the 'ownership' perspective of other individuals. The current government consultation could allow such engagement, and might be the opportunity to bridge these divergent views.

ETHICAL STATEMENT

The authors claim no conflicts of interest with the work or its results. The work was carried out following approval from Heriot-Watt University's Research Ethics Committee. All participants provided informed consent for their inclusion within the study, and their data has been stored and protected following GDPR procedures. The research was funded by a James Watt Scholarship from Heriot-Watt University.

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