

An evaluation of the effectiveness of the
Marine Conservation Society's
Good Fish Guide
in motivating sustainable seafood
purchasing behaviour in the UK

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Abstract

In response to the numerous pressures facing marine fisheries globally, seafood guides, a component of the sustainable seafood movement (SSM), have evolved. Using the Marine Conservation Society's (MCS's) Good Fish Guide (GFG) as a case study, this research aims to 1) evaluate knowledge, understanding and use of the MCS GFG in the UK; and 2) conceptualise motivation for purchasing sustainable seafood by identifying potential drivers for using the Guide and an appropriate framework for examining them. Following a comprehensive review of existing concepts and models of behaviour change, the Theory of Planned Behaviour (TPB) was selected as a framework for investigating drivers for using the MCS GFG to purchase sustainable seafood. Adopting a mixed methods approach, a public questionnaire (n=2409) and interviews with stakeholders (n=49), data were collected on perceptions towards seafood sustainability guides.

Analysis showed that, although stakeholder awareness of the MCS GFG was high, public awareness was relatively low with most respondents indicating this study was the first time they had seen or heard of the Guide. Findings suggest the MCS GFG is regarded by stakeholders as having a significant but *indirect* effect on the seafood choices the public are making. The *direct* influence of the Guide, however, was unimportant. Barriers for the public using the Guide included a lack of seafood sustainability knowledge and an absence of information. In general, the study found widespread public agreement regarding individual responsibility for making the right seafood choices. Findings also suggest Guide users may be driven by factors relating to their perception of seafood as a more sustainable source of animal protein and a tendency towards consuming fish.

The study concludes that the MCS GFG has had some limited impact on the sustainability of seafood purchasing in the UK. However, its potential is not being maximised. Drawing on insights from the research, this study highlights several opportunities and recommendations for the MCS GFG to more actively engage with a wider audience to increase diversity amongst Guide users and its accessibility to all sectors of society.

"Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has" ®

Margaret Mead, American cultural anthropologist, 1901-1978

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Author's Declaration

I confirm that this thesis is my own original work and has not been submitted before to any institution for assessment purposes. Further, I have acknowledged all sources used and have cited these in the reference section.

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List of Abbreviations

ABNJ	Areas Beyond National Jurisdiction
AHDB	Agriculture and Horticulture Development Board
AIP	Aquaculture Improvement Project
ASC	Aquaculture Stewardship Council
BBNJ	Biodiversity Beyond National Jurisdiction
BCT	Blockchain Technology
BIAZA	British and Irish Association of Zoos and Aquariums
Big 5	Cod, Haddock, Salmon, Tuna and Prawns
bn	Billion
Brexit	The UK's departure from the EU
CASS	Conservation Alliance for Seafood Solutions
CFP	Common Fisheries Policy
CITES	Convention on International Trade in Endangered Species
COSEE	Centre for Ocean Sciences Education Excellence
COVID-19	Coronavirus disease
CSF	Community Supported Fishery
CSR	Corporate Social Responsibility
DAERA	Department of Agriculture, Environment and Rural Affairs
Defra	Department for the Environment, Food and Rural Affairs
DNA	Deoxyribonucleic Acid
EC	European Commission
EEZ	Exclusive Economic Zone
EJF	Environmental Justice Foundation
ENGO	Environmental Non-Governmental Organisation
EU	European Union
EU	Expected Utility
EV	Expectancy Value
FAO	Food and Agriculture Organisation
FIP	Fisheries Improvement Project
FSA	Food Standards Agency
GAA-BAP	Global Aquaculture Alliance Best Aquaculture Practice
GBSF	Government Buying Standard Food
GDST	Global Dialogue on Seafood Traceability
GES	Good Environmental Status
GFG	Good Fish Guide
GGN	GlobalGap number
GHGE	Greenhouse Gas Emission
GSRA	Global Seafood Ratings Alliance
GSSI	Global Sustainable Seafood Initiative
HRAS	Human Rights at Sea
ICCAT	International Commission for the Conservation of Atlantic Tuna
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fishery Conservation Authority
ILRF	International Labour Rights Forum

IPBES	The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IR	Individual Responsibility
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unregulated and Unreported
kt	Kilotonne
MA	Millennium Ecosystem Assessment
MBA	Monterey Bay Aquarium
MCS	Marine Conservation Society
MMO	Marine Management Organisation
MOD	Ministry of Defence
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSFD	Marine Strategy Framework Directive
MSY	Maximum Sustainable Yield
Mt	Million tonnes
NHS	National Health Service
OL	Ocean Literacy
ONS	Office of National Statistics
PBC	Perceived Behavioural Control
PCBs	Polychlorinated biphenyls
PEB	Pro-environmental Behaviour
PGFG	Pocket Good Fish Guide
PHE	Public Health England
PO	Producer Organisation
RASS	Risk Assessment for Sourcing Seafood
RS	Relative Stability
REM	Remote Electronic Monitoring
RFMO	Regional Fishery Management Organisation
RFS	Responsible Fishing Scheme
RIFG	Regional Inshore Fishery Group
RSPCA	Royal Society for the Prevention of Cruelty to Animals
SACN	Standard Advisory Committee on Nutrition
SASSI	South Africa Sustainable Seafood Initiative
SCR	Sustainable Consumption Roundtable
SDC	Sustainable Development Commission
SDG	Sustainable Development Goal
SEU	Subjective Expected Utility
SFP	Sustainable Fisheries Partnership
SRA	Sustainable Restaurant Association
SSC	Sustainable Seafood Coalition
SSM	Sustainable Seafood Movement
STECF	Scientific, Technical and Economic Committee for Fisheries
SWHFA	South West Handline Fishermen's Association
SWOT	Strengths, Weaknesses, Opportunities and Threats
SWP	Seafood Watch Programme

TAC	Total Allowable Catch
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
US/USA	United States/United States of America
WCED	World Commission on Environment and Development
WTP	Willingness-to-pay
WWF	World Wide Fund for Nature
30x30	Internationally agreed target to protect at least 30% of land and seas by 2030

Chapter One: Introduction

1.1. Introduction

This chapter provides an overview of the research including an introduction to the rationale for the project, the evolution of the sustainable seafood movement (SSM), the development of seafood guides, and the Marine Conservation Society's (MCS's) Good Fish Guide (GFG). The chapter also outlines the aims and objectives of the research and finally, the structure of the thesis.

1.2. Research problem and rationale

Seafood is the most widely traded commodity worldwide (Kroetz et al., 2020), and a vital part of the global food system (Tigchelaar et al., 2022; Farmery et al., 2022; Farmery et al., 2017) (Section 2.3). Wild-caught fish is referred to as the last wild food source that is internationally traded, with fishing regarded as the final frontier in food production between hunting and modern agricultural farming (Bolton et al., 2016; Jacquet et al., 2009). Fish is a core component of a complex marine environment, contributing to biodiversity and other essential ecosystem services, whilst simultaneously functioning to provide food security and employment for millions of people worldwide (Cohen et al., 2019; Béné et al., 2016; MA, 2005a). As a consequence of human reliance on the sea for food and other services, the ocean is under increasing pressure from a range of human activities, including overfishing and other fishing related issues (Lotze et al., 2018) (Section 2.2).

Seafood, referred to recently in the literature as Blue Food ¹ (Cao et al., 2023; Tigchelaar et al., 2022; Golden, 2021), is described as the 'perfect protein' for human consumption (Sharpless and Evans, 2013), with numerous health benefits associated with eating it. It is a

¹ Blue food is 'food derived from aquatic animals, plants or algae that are caught or cultivated in freshwater and marine environments' The Blue Food Assessment. Available at: https://bluefood.earth/#:~:text=*Blue%20food%3A%20food%20derived%20from,in%20freshwater%20and%20marine%20environments

rich source of easily digestible, high-quality protein, contains essential amino acids, vitamins (D, A and B), minerals (including calcium, iodine, zinc, iron, and selenium), micronutrients, and provides essential fats (e.g., long chain omega-3 fatty acids) that protect against cardiovascular diseases (Hicks et al., 2019; FAO, 2016). In recognition of these health and other benefits, seafood is often considered to be a more environmentally responsible and 'climate-friendly' alternative to land-based protein (Crona et al., 2023; Brayden et al., 2018),

To meet growing seafood demand, the potential for expanding sustainable production of marine protein is under investigation. Costello et al., (2020) have estimated that from a combination of wild-fisheries and finfish and bivalve mariculture, production could be increased by 21-44 million tonnes (Mt) by 2050, a 36-74% increase on present output, providing 12-25% of the predicted increase in all 'meat' (animal protein) required to feed the global population in 2050. However, with up to 80% of the world's fish stocks lacking formal assessment (FAO, 2020), less than 1% of fish species assessed (Costello et al., 2012), and the sustainable management of wild-caught fish dependent on the availability of authoritative stock data (Potts et al., 2016), in addition to the various challenges facing the global marine environment, least of all the effects of climate change on marine fisheries (Cheung et al., 2021; Cheung et al., 2013), realising such potential will not be without significant difficulties.

Fishing is also the focus of environmental campaigns to restrict bottom trawling (Dunkley and Solandt, 2021; Steadman et al., 2021), one of the oldest and most widespread methods of capturing fish (Amoroso et al., 2018; Thurstan et al., 2014). Moreover, aquaculture is not without its problems (Froehlich et al., 2017), least of all those related to feeding captive carnivorous fish (Gamble et al., 2021; Naylor et al., 2021; Olesen et al., 2011).

Given perceptions of insufficient wild-fish to meet the demands of a growing world population (Oken et al., 2012), global trade in seafood typically flowing from lower income to middle and high income countries (Watson et al., 2017), and characteristically long and complex seafood supply chains which can be subject to human rights violations and fraud (Paolacci et al., 2021; Blanco-Fernandez et al., 2021; Teh et al., 2019), it is not surprising that the role of seafood in a sustainable diet is regarded by some as something of a 'dilemma'

(Bogard et al., 2019; Farmery et al., 2017; Seto and Fiorella, 2017; Clonan, 2011) (explored further in Section 2.3.5).

1.2.1. Seafood consumption in the UK

The UK is an island nation, with around 17,000 kilometres of coastline, where no one lives more than 120 kilometres (75 miles) from the sea (Barrow, 2014). However, despite this, its long fishing history, having one of the largest fishing fleets (MMO, 2019), the second largest total catch in 2019 compared with EU countries (Uberoi et al., 2022), and being one of the main seafood producers in Europe (Eurostat, 2018), seafood consumption in the UK is relatively low, having reduced substantially since World War Two (WW2) (Figure 1.1).

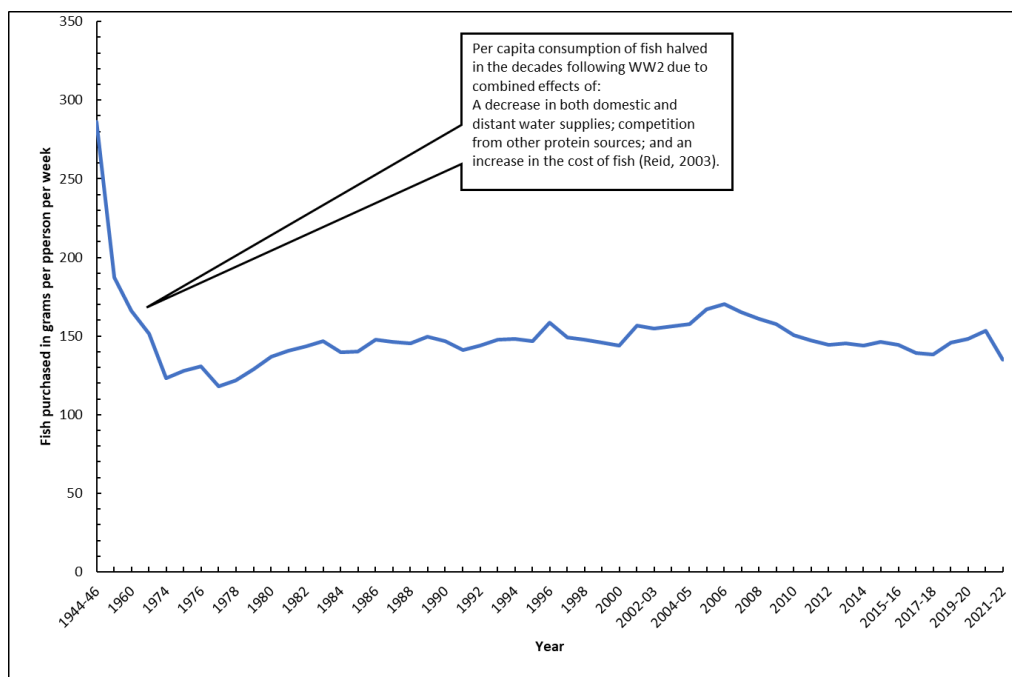


Figure 1.1: Average household purchases of fish per person per week for period 1944/46 to 2021/2022 (Source: Defra Family Food, 2022).

At around 148 g per person per week (Defra, 2022), UK consumption of fish is below that of many European countries and around half that recommended by UK Government guidance on healthy diets (Jacobs et al., 2018). Patterns of UK seafood consumption have undergone significant change since the early 20th century, mainly as a result of a decline in domestic landings, from consuming locally caught species, to consumption of largely imported species

(Harrison et al., 2023; Thurstan and Roberts, 2014). Over-reliance on imported fish has been reported as a particular challenge for the viability of UK fisheries and aquaculture (House of Lords, 2016).

Even with the availability of more than 140 species of saltwater fish in British coastal waters (Duffield, 2013), the UK seafood market is concentrated on a narrow range of species (Simeone and Scarpato, 2014), with 60-80% of all seafood eaten in the UK made up of cod, haddock, salmon, tuna, or prawns, the so-called “Big 5” (Tetley, 2016). Around 70% of seafood consumed in the UK (by value) is imported from overseas, including from lower income countries (FAO, 2018). In 2021 the UK imported 791,000 tonnes of fish and fish products (including 110,160 tonnes of fishmeal), principally cod (85kt), tuna (103kt), and shrimp and prawns (85kt), with most fish and fish products coming from Norway (107.6 kt), China (55.4kt), and Iceland (53kt (MMO, 2022)). Contrarily, the UK exports between 60% and 80% of all UK domestic landings (Uberoi et al., 2020). The “UK Seafood Paradox” of *‘importing what we eat and exporting what we catch’* (Rutherford, 2009), creates challenges for the environmental and social sustainability of seafood, and fish security, both in the UK and overseas (Nash et al., 2022; Billiet, 2019).

Despite these challenges and lower levels of seafood consumption, the UK has none-the-less been credited as having established the markets for sustainable seafood (Roheim et al., 2011). In addition, the situation of the global biodiversity and climate emergencies (Mori, 2020), the increasing dependence on farmed seafood (Urch, 2013), and the occurrence of recent and crucial events, such as, the UK’s departure from the European Union (‘Brexit’), the COVID-19 pandemic (Love et al., 2021), and the invasion of Ukraine by Russia in 2022 (Seafish, 2022a), all provide opportunities for reducing both UK reliance on imported seafood and broadening of the concept of seafood sustainability.

1.2.2. Sustainable Seafood Movement (SSM)

In response to overfishing, the collapse of fish stocks, and concern for sustainability within global seafood markets, various initiatives collectively known as the SSM, have evolved over

30 years with the aims of raising awareness amongst consumers and increasing the sustainability of the fishing and seafood supply chain (Kochen, 2023; Gutiérrez and Morgan, 2015; Hallstein and Villas-Boas, 2013) (Section 2.4). In common with other social food movements (Gutiérrez and Morgan, 2015), the SSM uses market-based approaches to influence consumer choices to increase the sustainability of the seafood supply chain (Barclay and Miller, 2018; Dolmage et al., 2016; Jacquet et al., 2009; Roheim, 2009; Jacquet and Pauly, 2007).

The SSM began in the US in the early 1990's (Tlusty et al., 2019) where, in response to historical mismanagement of fish stocks, a 'shift' from advocating for more traditional or 'state-centred' approaches to fisheries management, to embracing alternative 'market-based' strategies for achieving similar conservation objectives, was being observed (Konefal, 2010). These strategies were characterised by programmes dedicated to changing the seafood purchasing behaviour of retailers, the public and restaurateurs (Konefal, 2013). In his analysis of the movement (summarised in Figure 1.2), Konefal (2013) identifies two categories of initiatives: a) demand and b) supply-orientated initiatives. *Demand* initiatives are of two types of activity: single-species campaigns e.g., *Give Swordfish a Break* (Brownstein et al., 2003) and general demand-orientated campaigns, with the latter taking the form of seafood guides (also referred to as seafood or wallet cards) and consumer education, and a range of restaurant, and retailer initiatives. The dominant approach taken by *supply*-orientated initiatives is described by Konefal (2013) as the founding of private authoritative bodies, such as the Marine Stewardship Council (MSC), which have been the focus of many studies in the context of governance and eco-labelling (See for example, Sun et al., 2017; Hadjimichael and Hegland, 2016; Zhou et al., 2016; Gulbrandsen, 2009). Addressing existing knowledge gaps, the focus of this study is demand-orientated initiatives, specifically seafood guides and consumer education.

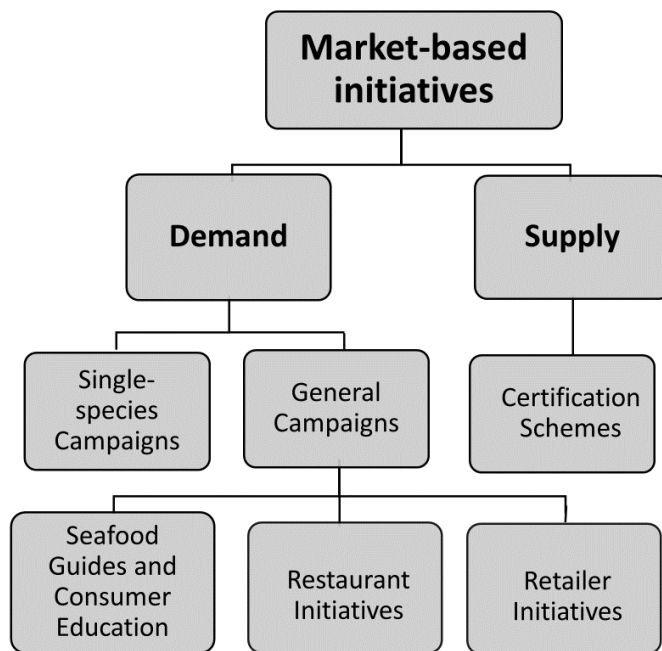


Figure 1.2: A classification of Sustainable Seafood Movement initiatives (Source: Adapted from Konefal, 2013).

Seafood guides are designed to transform shoppers into more environmentally aware and engaged citizens. This is accomplished by raising awareness amongst the public of the issues associated with unsustainable fishing and harnessing their buying power to increase demand for sustainable seafood (Bush, 2011).

Since its inception, the SSM with its ‘coalition of actors’ (Section 3.14) has continued to grow, with seafood sustainability initiatives becoming an important element of broader marine conservation efforts worldwide, including, in particular, in the USA, the UK and Europe (Barclay and Miller, 2018). Opinion, however, on the importance and the role of household consumers within the SSM is mixed. Gutiérrez and Morgan (2015) do not regard consumers as key actors within the SSM, while in contrast, Barclay and Miller (2018) suggest that “*while consumers have hitherto not been active in driving the movement through voting with their wallets or through representative groups agitating for change*” (p.13), they are an important audience group. This perspective is reinforced by Richter and Klockner (2017) who view consumers as compelling participants in marine resource use, with the potential to drive

change in the supply chain from the 'bottom-up'. In contrast, Jacquet et. al. (2009) suggests that *"working with household consumers alone cannot save fish"* (p.54) and advise against putting too much emphasis on the public, asserting that to achieve reduction in seafood demand more quickly, sustainable seafood initiatives are required at higher levels within the seafood and fisheries demand chain.

Clearly questions remain regarding the role of household consumers in underpinning the effectiveness of the SSM. Despite conflicting views in the academic literature, in practice the public are increasingly being called upon to make changes to their consumptive behaviour and lifestyle choices to reduce human impact on natural resources (Eldesouky et al., 2019; Barr et al., 2011; McKinley and Fletcher, 2010; SCR, 2006a). Individuals are encouraged to believe in the 'agency of consumers', to make 'responsible' and 'informed' choices to make a difference (Lewis, 2008).

As part of a global strategic effort to influence public seafood purchasing behaviour, several seafood guides, discussed further in Chapter Two, have been developed. While there has been research highlighting the extensive distribution of cards to the public (Roheim, 2009), despite the number of guides in use internationally, there has been surprisingly limited research into their use or efficacy in influencing individual consumer behaviour, including in the UK. As a result, it is unclear whether seafood guides are achieving their aims. Notably, changing consumer purchasing and consumption habits, increasing the sustainability of seafood markets and, importantly, reducing the impact of overfishing and seafood consumption on the marine environment. This study aims to address this deficit by examining what factors influence seafood guide use and their success in the UK in motivating sustainable purchasing and consumption behaviour towards seafood.

1.2.3. An introduction to the Marine Conservation Society's (MCS's) Good Fish Guide (GFG)

The SSM began in the UK with the founding of the MSC in London in 1997 and has been active for more than 25 years. Although there are a range of UK initiatives aimed at increasing the

sustainability of the seafood supply chain, the only seafood guide widely and publicly available is the MCS GFG. See Appendix 1 for a timeline of events for the SSM in the UK.

The idea for MCS to develop a UK focused campaign to raise awareness amongst public consumers of the issues surrounding seafood consumption was influenced by the publication in the USA of a guide by the Audubon Society, *What's a fish lover to eat?* in 1998 (Safina, 1998). The 2002 review of the EU Common Fisheries Policy (CFP) further engaged UK public interest in sustainable fishing and seafood, persuading conservationists of the potential for consumers to help solve the problems of stock mismanagement and overfishing (MailOnline, 2003). With the MCS GFG, a consumer guide to 'eco' friendly' fish, first published in 2002, its seafood advice and ratings also underpins the sustainable seafood commitments adhered to through sustainable seafood initiatives developed by other organisations in the UK. See Chapter Five for details.

Considering the continuing pressures on global marine resources and ongoing development of new initiatives to help increase the sustainability of seafood worldwide, the SSM continues to grow both in the UK and globally. As highlighted above, one of the main purposes of seafood guides is to influence the purchasing behaviour of public consumers. The MCS GFG encourages the public to believe that by making informed decisions about purchasing seafood, individuals can reduce the impact of their consumption on the sea and help protect marine wildlife (MCS, 2020a).

However, to date, there is limited evidence available to suggest public use of seafood guides is effective in influencing sustainable seafood purchasing and increasing demand for sustainably produced seafood. This study aims to evaluate knowledge and use of the MCS GFG and its effectiveness in motivating sustainable seafood purchasing behaviour in the UK. The study proposes that, as a result of using the MCS GFG, individuals will have more seafood sustainability knowledge, and be more connected with, and have a greater sense of individual responsibility, for the sea. Consequently, it is hypothesised MCS GFG users will purchase

seafood more sustainably, better helping to increase demand for sustainably produced seafood, compared to non-users of the Guide. This study will also address limited knowledge of perceptions of seafood sustainability and attitudes to the MCS GFG within the wider supply chain.

In examining the value of the MCS GFG as an intervention for behaviour change towards purchasing seafood, the potential for the MCS GFG to further engage individuals as ‘marine citizens’ (McKinley and Fletcher, 2012) in the wider protection and management of marine resources will be explored. Additionally, the purchasing of sustainably produced fish and use of the Guide will be examined in the context of wider ethical (or green) consumer purchasing behaviours and the phenomenon of ‘behavioural spillover’ (Thomas et al., 2019; Lanzini and Thøgersen, 2014; Thøgersen, 1999) of these behaviours to guide use and vice versa.

1.2.4. Understanding use of the MCS GFG to purchase sustainable seafood

Seafood purchasing behaviour, not unlike any other type of human behaviour, is complex and influenced by a variety of internal and external or situational factors (Leek et al., 2000). To understand what factors most influence human consumer behaviour, the study draws on numerous behavioural change models and theories (Section 2.5). Over the years these theories have evolved from early models for examining individual behaviour change based on ‘standard economic theory’ and the assumption that people act in their own self-interest (Darnton, 2008). As social-psychological models became more advanced they incorporated the influence of attitudes and intentions towards behaviour (Darnton, 2008; Jackson, 2005). These models and how they could be applied to understanding what motivates individuals to use the MCS GFG to purchase sustainable seafood, are discussed in more detail in Section 2.6.

1.3. Research aims and objectives

Despite investment in various programmes (See Table 2.5 Section 2.4) dedicated to changing the seafood purchasing behaviour of consumers, as mentioned in 1.2.2. above, there has been little investigation into the effectiveness of these initiatives, including in the UK, on changing purchasing and consumption habits. Using the MCS's GFG as a case study, this research has two aims. The first is to evaluate UK consumers' knowledge, understanding and use of the MCS GFG in the UK by achieving the following objectives:

1. Examine UK consumers' (including both public and stakeholder) perceptions of seafood sustainability;
2. Assess knowledge, understanding and use of the Guide among UK seafood consumers;
3. Investigate the effectiveness of the Guide in driving changes in consumer behaviour.

The second aim is to conceptualise motivation for purchasing sustainable seafood by identifying potential drivers for using the Guide and an appropriate theoretical framework for examining them.

The objectives of this aim are to:

4. Identify and test an appropriate theoretical framework for examining motivational factors for using the MCS GFG to purchase sustainable seafood;
5. Explore situational factors i.e., factors external to the model influencing public consumer decision making when buying seafood.

Given that widespread use of the MCS GFG is key to its success, the final research objective for the study is to:

6. Propose recommendations for increasing use of the MCS GFG in the UK to improve the sustainability of the UK seafood market.

Appendix 2 provides further details summarising how the above research aims and objectives relate to the study's overall research questions, as well as to the data collection tools described in Chapter Three (See Tables 3.7 and 3.14).

1.4. Structure of the thesis

This thesis has three main parts, organised into seven chapters. A summary of these chapters and the resulting structure of the thesis is presented in Sections 1.4.1 – 1.4.3.

1.4.1. Context of the research

Part One provides an introduction and context for the research. Chapter One provides an overview including an introduction to the rationale for the project and the structure of the thesis. Chapter Two presents a critical evaluation and synthesis of academic literature related to the use and effectiveness of seafood guides as part of the SSM. This chapter discusses relevant theories and models for understanding individual purchasing behaviour. It also identifies the TPB (Ajzen, 1991) as a suitable conceptual model for examining motivational factors for MCS GFG use, used as a proxy for purchasing sustainable seafood.

1.4.2. Data collection and analysis

Part Two outlines the mixed methods approach to data collection and analysis carried out in Phase 1 and 2 of the study. Chapter Three introduces the research philosophy; the

methodological approach taken to investigate consumer attitudes in the UK towards seafood sustainability; TPB as the theoretical framework proposed to examine what motivates MCS GFG use; and the research methods used to achieve the aims and objectives of the project. Chapter Four examines the main observations obtained from analysis of data collected by public questionnaire for understanding what motivates individual seafood purchasing behaviour. In particular, the chapter investigates public awareness and use of the MCS GFG (Section 4.3). It also examines the effectiveness of the Guide as an intervention for increasing the sustainability of seafood purchasing behaviour (Section 4.5) and seafood sustainability knowledge (Section 4.7). Importantly this chapter examines how, if at all, use of the Guide is reflected in seafood purchases (Section 4.9). Using the TPB as a theoretical framework, this chapter also examines motivational factors for its use (Section 4.17).

Chapter Five presents the results of the stakeholder interview schedule. The interviews aimed to understand what use is being made by stakeholders of the MCS GFG; the influence the Guide is having on the seafood choices consumers are making; and any influence it is having on stakeholder practices, either on the ground i.e., within the seafood supply chain, or on the water, i.e., within the catching sector specifically. The chapter concludes with a discussion of the key findings of the stakeholder interviews.

1.4.3. Synthesis and conclusions

Part Three forms the concluding part of the project. Chapter Six provides a synthesis of public and stakeholder perceptions and attitudes towards seafood guides in use in the UK. It also discusses the development of the model used in the study to conceptualise motivation for individual seafood guide use. Finally, this chapter critically examines the significance of findings in relation to future use of seafood guides as part of the SSM and their potential role in engaging individuals as marine citizens in the management of marine fishery resources. Chapter Seven presents some final concluding remarks regarding the effectiveness of seafood guides as drivers for sustainability in the seafood supply chain. In fulfilment of research objective 6 it makes recommendations for increasing use of the MCS GFG. The chapter also

identifies the contribution made by this research to areas of sustainable seafood consumption, in particular the original contribution made by this research to seafood guide use in UK and proposing areas for future research. The thesis concludes with suggestions for future research of seafood guide use for increasing seafood sustainability in the UK.

Chapter Two: Marine fish, a common resource, a community responsibility

2.1. Introduction

Regarding the value of seafood guides as interventions for motivating individual seafood purchasing behaviour, this chapter critically evaluates, and synthesises literature related to the following research areas:

- challenges facing global marine environments and how these relate to seafood provision;
- challenges facing seafood as part of the global food system;
- understanding of seafood sustainability and the role of seafood in a sustainable diet;
- the SSM and the various initiatives developed within the movement, including seafood guides;
- the importance of individual behaviour changes for achieving “global goals” including ending overfishing.

The chapter also identifies a suitable model for examining motivational factors for seafood guide use. Accordingly, the model is used to guide the design of the two data collection phases, discussed in Chapter Three, and much of the data collection work.

2.2. Challenges facing global marine environments

The global marine environment is important for the provision of food (Stenson and Creddon, 2022; Belton et al., 2020; Hallström et al., 2019; Thilsted et al., 2016). It provides essential ecosystem services (Quiros et al., 2021; McKinley et al., 2019; Worm, 2006), including mitigation of climate change impacts (Issifu et al., 2022; Sala et al., 2021; Sumaila and Tai, 2019), and provides income, supporting livelihoods worldwide (Stewart et al., 2019; Bene et

al., 2016; Little et al., 2016), especially for small-scale, artisanal and aquaculture workers (Bennett et al., 2021; Sivertsvik, 2021; Rudolph et al., 2020).

Ocean ecosystems are under threat from climate change, biodiversity and habitat loss, pollution, and crucially in the context of this study, impacts from the fishing industry, including overfishing (Dulvy et al., 2021; Yan et al., 2021; IPBES, 2019; Dulvy et al., 2014). A number of studies of public understanding of these threats have identified the impact of overfishing on the marine environment as a major public concern (Lotze et al., 2018; Gelcich et al., 2014; Hynes, 2014). Attention tends to focus on stock depletion (Hilborn et al., 2020; Fernandes and Cook, 2013) and reduced landings of the target species, (Vasilakopoulos et al., 2014). Less visible are the impacts affecting the health and resilience of fish stocks, such as, recruitment and growth-overfishing (Hilborn et al., 2017; Borges, 2015; Vasilakopoulos et al., 2011; Myers et al., 1994), with studies showing, that the age and length at which fish typically mature decreases in exploited stocks (Anderson et al., 2018; Hunter et al., 2015).

2.2.2. Challenges for maintaining healthy fish stocks

Since the Neanderthal hunter-gatherers, society has depended upon the marine environment for food and wellbeing (Zilhao et al., 2020), and for international economies and trade throughout history (Pitcher and Lam, 2015). When fisheries became 'industrialised' in the 1950s, however, marine fish stocks, once believed to be inexhaustible (Huxley, 1883), underwent successive depletions of fish '*by size, species, area and depth*' (Pitcher and Lam, 2015). These changes, according to Pitcher and Lam (2015), have been driven, not only by industrialisation, but also by the 'commodification' of fish and the globalised trade of fish products (Belton et al., 2020; Bellmann et al., 2016; Lam and Pitcher, 2012).

Fish provides 17% of the global population intake of animal protein, representing 7% of all proteins consumed, with a rate of increase in consumption higher than all other animal protein foods (FAO, 2020). While fish and fish products are among the most traded food items

globally (Arthur et al., 2021; Hilborn and Costello, 2018; Kittinger et al., 2017; Asche et al., 2015; Madin and Macreadie, 2015) with around 38% (67 Mt) entering international trade in 2018 (FAO, 2020), fish consumption is not uniformly distributed globally. Fish are frequently exported from countries with high fish dependency to more ‘lucrative markets’ in the U.S.A, Europe, and Asia (Seto and Fiorella, 2017; Bellmann et al., 2016). The EU, for example, is one of the largest single markets for fish and fish products (FAO, 2022). With its significant dependency on imported catch, the EU has the second highest global seafood consumption footprint (Guillen et al., 2019) and, in 2017, reported the highest expenditure on fish in the world (EC, 2021). Fish is nonetheless important to coastal communities, particularly those in developing nations which are often among the world’s poorest (Bene et al., 2016; Bene et al., 2015). See Table 2.1 for a summary of world fish supply.

Table 2.1: World fish supply (Source: Adapted from FAO, 2022).

World fish supply (2020)			
177.8 Mt (excludes 36 Mt of algae)			
Direct human-use		Indirect or non-human food use	
157.4 Mt (88.5%)		20.4 Mt (11.5%)	
<i>Wild capture production</i>		<i>Aquaculture production</i>	
90.3 Mt (51%)		87.5 Mt (49%)	
<i>Marine</i>	<i>Inland</i>	<i>Marine</i>	<i>Inland</i>
78.8 Mt (87%)	11.5 Mt (13%)	33.1 Mt (38%)	54.4 Mt (62%)

Whilst it is generally accepted that global catch limits have been reached for most species (FAO, 2016; Zhou et al., 2015), demand for seafood continues to rise steadily globally. This increase is impelled by a ‘complex set of drivers’ including, world population growth; urbanisation; increased levels of development; as well as increasing affluence; and per capita consumption (Clark et al., 2018; Lam, 2016; HLPE, 2014). Worldwide per capita consumption of marine fish has doubled since the 1960s, increasing from an average of 10 kg to 20.2 kgs in 2020, with projections of 21.4 kg in 2030 (FAO, 2022). Accordingly, the proportion of global

fish stocks fished within biologically sustainable levels ², i.e., at or above the level associated with maximum sustainable yield ³ (MSY) has decreased from 90% in 1974 to 64.6% in 2019 (FAO, 2022). In contrast, the percentage of stocks fished at biologically unsustainable levels, i.e., at levels below that needed to produce MSY or overfished, increased from 10% in 1974 to 35.4% in 2019, with the largest increases in stocks being overfished occurring in the late 1970s and 1980s (FAO, 2020) (Figure 2.1).

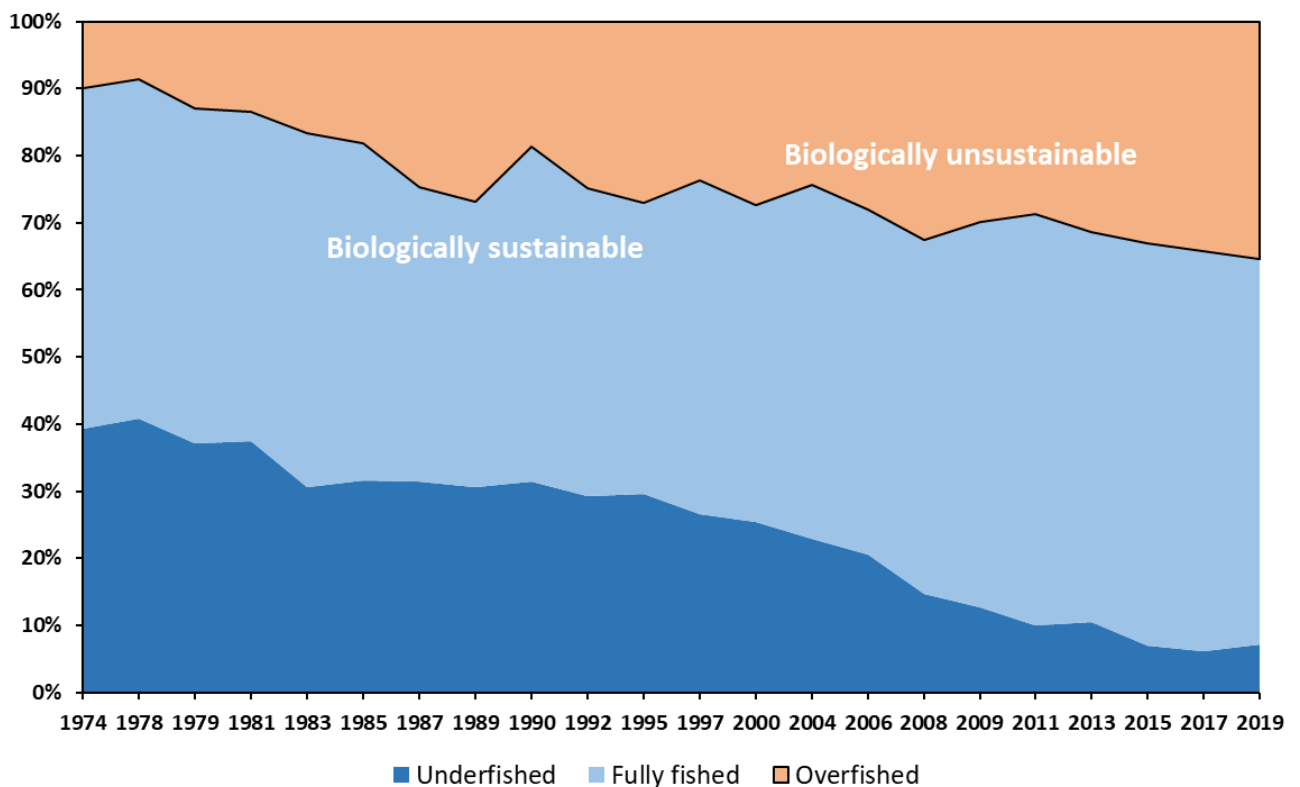


Figure 2.1: Global trends in the state of the world's marine fish stocks, 1974-2019 (Source: FAO, 2022).

In the North East Atlantic, where in 2019 almost 70% of all EU catches were taken (Eurostat, 2020), 28% of stocks assessed by the International Council for the Exploration of the Sea (ICES) in 2020 are considered over exploited i.e., fishing pressure is greater than FMSY ⁴, while in the

² The percentage of stocks fished within biologically sustainable levels is the indicator used to measure progress towards the Sustainable Development Goals (SDGs) target for marine fisheries (Target 14.4) (FAO, 2018).

³ Maximum Sustainable Yield (MSY) is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

⁴ F_{MSY} is the maximum rate of fishing mortality (the proportion of a fish stock caught and removed by fishing) resulting eventually, usually in a long-time frame, in a population size of B_{MSY} .

Mediterranean most stocks (86%) are overfished (STECF, 2022). Where stocks are managed responsibly, stocks have been rebuilt and productivity sustainably increased (FAO, 2022; Hilborn et al., 2020). Around a half of all landings made by UK vessels in 2020 were from ICES area IVa (Northern North Sea) (MMO, 2021). The main stocks in this area include North Sea cod, which is depleted, and haddock, plaice, sole and herring, which are in a healthy state (MMO, 2019). In an analysis of the status of 104 UK stocks carried out in 2019 on behalf of Oceana⁵, 36% were found to be healthy, whilst 20% were found to be in a critical state. The status of the remaining 44% is unknown given their categorisation as data-limited stocks (Guille et al., 2021). While, as mentioned above, production from capture fisheries is regarded as relatively static (Nadarajah and Flaaten, 2017), the annual growth rate of aquaculture continues to increase faster than other major food production sectors (Edwards et al., 2019; FAO, 2018; Troell et al., 2014). Despite concerns for the dependency of farming of certain types of fish on wild fish (Naylor et al., 2000), aquaculture is regarded as critical to filling the 'fish gap' (López-Mas et al., 2023; Gephart et al., 2020; Little et al., 2016).

The threat of overfishing to seafood sustainability worldwide is further complicated by illegal, unregulated, and underreported (IUU) fishing (See Section 2.3.7). Defined by Couper et al. (2015) as, *'the operation of unlicensed craft, either national or foreign, fishing in contravention of national, regional, and international fisheries regulations'* (p.78), illegal fishing causes major social, environmental and economic impacts worldwide (Young, 2016). It is estimated that IUU fishing accounts for 20% of the world catch and may be as high as 50% of catches in some areas (Widjaja et al., 2020). IUU fishing is not only a threat to fish stocks, the marine environment, and the communities that rely on them, it is also implicated in the wider sustainability and equity of the seafood industry, with issues around labour and human rights abuses, including slavery and human trafficking (Widjaja et al., 2020; EJF, 2019).

Other challenges for seafood sustainability include maintaining the health and abundance of marine fish stocks in the face of climate change (Cheung et al., 2021; Oyinlola et al., 2021; Pinnegar et al., 2020), biodiversity and habitat loss (Pitcher et al., 2022; Sala et al., 2021; O'Leary et al., 2020; McCauley et al., 2015), and pollution (Butt et al., 2022; Peng et al., 2020).

⁵ <https://oceana.org/>

Specific impacts of climate change on the ocean, such as sea level rise (Tigchelaar et al., 2021; Myers, 2017), acidification (Gruber et al., 2019; Fleming et al., 2014), and ocean warming (Cheng et al., 2020), are a threat to food security, including to food from the ocean (Oyinlola et al., 2021; Costello et al., 2020; Pinnegar et al., 2020; Froehlich et al., 2018).

Absorption of heat produced by greenhouse gases (GHGs) in the global atmosphere has caused the temperature of the world's ocean to increase in recent years to the warmest levels ever recorded (Cheng et al., 2020), creating biological change in marine species (McQueen et al., 2017; Hobday and Pecl, 2013), and a profound effect on the distribution of fish stocks (Baudron et al., 2020; Pinnegar et al., 2020; Kogovsek et al., 2018; Van de Kooij et al., 2016; Perry et al., 2005). Climate change is also causing ocean deoxygenation (Pinnegar et al., 2020) with implications for fish growth (Baudron et al., 2014), reproduction, and susceptibility to capture and the impacts of fishing (Laffoley and Baxter (eds.), 2019).

Marine fish stocks are an important component of the ocean ecosystem (Hilborn et al., 2017). They contribute to marine biodiversity⁶ which plays a fundamental role not only in supporting marine ecosystems, but also in supporting a wide range of ecosystem goods and services (Fleming et al., 2014). However, established patterns of exhaustive and discriminatory fishing and overfishing, driven by consumer demand and climate change (Van de Kooij et al., 2016), are causing changes to the organisation of marine food webs (Zhou et al., 2015, Burgess et al., 2013, Pauly et al., 2002). McCauley et al. (2015) emphasise how human exploitation of marine fauna is *“responsible for many ecological, commercial and local extinctions”* (p.247). Large-bodied predators at the top of the marine food chain, critical for ecosystem function (Butt et al., 2022; Payne et al., 2016; Lotze and Worm, 2009), are being removed from the system too quickly (Dulvy et al., 2021). As a result of depletion of fish at higher trophic levels, fish are increasingly being harvested from less valuable and lower trophic levels (Thurstan and Roberts, 2014; MA, 2005b). This results in ‘fishing down’ marine food webs, modifying both their structure (Pauly et al., 1998) and ‘triggering’ trophic cascades⁷ (Ripple et al., 2016).

⁶ Biodiversity is defined as, “the variability among living organisms and the foundation of ecosystem services to which human well-being is intimately linked” (Millennium Ecosystem Assessment (MA), 2005b).

⁷ Trophic cascades are defined as ‘indirect species interactions that originate with predators and spread downward through food webs’ (Ripple et al., 2016).

This process can cause ‘regime shifts’ (Daskalov et al., 2007) and risk marine extinctions (Yan et al., 2021; Payne et al., 2016; Myers and Worm, 2003).

Vulnerable species, such as *Chondrichthyes* (sharks and rays), are particularly at risk from fishing activity driven by global trade in fins to meet demand for shark-fin soup in Asia (Dulvy et al., 2014). Additionally, fishing is implicated in the incidental capture (bycatch) of species including birds, turtles, and mammals (Lent and Squires, 2017; Reeves et al., 2013). Once common and widespread fish species, such as common skate *Dipturus batis*, Spurdog *Squalus acanthias*, Atlantic salmon *Salmo salar*, Atlantic halibut *Hippoglossus hippoglossus* and European eel *Anguilla anguilla*, are now threatened species, with many listed as critically endangered (IUCN, 2020). Jacquet and Pauly (2007) suggest that variations in public consumption are essentially a reflection of changes being wrought in the marine food web by the impacts of fishing. This is further echoed by Van Houtan et al. (2013) in their analysis of historical changes in the marine environment in Hawaii, based on species present on restaurant menus.

A further challenge is plastic which is widespread and frequently ‘ubiquitous’ in the marine environment (Thiele et al., 2021; Wootton et al., 2021; Duncan et al., 2018; Santillo et al., 2017). With the input of plastic, typically via rivers (Peng et al., 2020), into the ocean projected to almost triple by 2040 (The Pew Charitable Trusts, 2020a), it presents a major and highly problematic source of marine pollution (Kelly et al., 2020; Duncan et al., 2018; Nelms et al., 2017). Of increasing concern is the ingestion of ‘microplastics’⁸ by commercial fish species (Wootton et al., 2021; Li et al., 2018; Smith et al., 2018; Santillo et al., 2017; Lusher et al., 2013) and their subsequent transfer to humans (Amelia et al., 2021; Thiele et al., 2021; Peng et al., 2020). In addition to microplastics, there are other public health risks which have been associated with eating certain types of seafood (Jacobs et al., 2015) - for example, some fish species are a source of methyl mercury; dioxins; and PCBs (SACN, 2004).

⁸ Microplastics are defined as plastic particles less than 5mm (Duncan et al., 2018).

As experience and understanding of the wider impacts of overfishing on marine biodiversity (Payne et al., 2016, McCauley et al., 2015, Dulvey et al., 2014) and marine ecosystem functioning and services (Jayasinghe et al., 2015), develops, resolving the crisis of unsustainable exploitation of our oceans is becoming ever more critical. Seafood guides have a crucial role in educating consumers about how their individual seafood choices impact on the global marine environment. The efficacy of guides in raising awareness amongst individuals of the impacts of their seafood choices will be explored in more detail in Chapters Four and Five.

2.2.3. Managing the challenges for fisheries and marine biodiversity

With industrial-scale fishing occurring in more than 55% of oceans, and with a global footprint four times that of agriculture (Kroodsma et al., 2018), fishing is acknowledged as the last major world industry exploiting wild natural resources for food (Bolton et al., 2016; Jacquet et al., 2009; Jacquet and Pauly, 2007). Seafood is also the only ‘meat’ widely sold according to species (Iles, 2007). Although unlike many extractive industries, fish stocks are a renewable and potentially infinite resource, without effective regulation and management, fisheries are vulnerable to what is referred to as ‘the tragedy of the commons’⁹ (Hardin, 1968) or a ‘common pool resource problem’ (Kirkpatrick, 2020), a situation in which ‘open access’ to a common resource results in a tendency to over-exploit (Defra, 2018; House of Lords, 2016). See Appendix 3 for a summary of key fisheries and biodiversity management frameworks.

Recognition of these challenges led to the introduction of exclusive economic zones (EEZs) in the mid-seventies and the adoption of the United Nations Convention on the Law of the Sea (UNCLOS) in 1982 (Gullestad et al., 2020; O’Leary et al., 2020). This legal framework gave coastal states rights and responsibilities for the management and use of fishery resources within their EEZs (Palacios-Abrantes et al., 2022; Le Manach et al., 2013). Around 42% of the

⁹ Tragedy of the Commons “*Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.*” Hardin G (1968).

world's oceans, in which around 90% of the world's marine fisheries occur (FAO,1995), are managed through 150 EEZs (White and Costello, 2014). The remainder of the world's oceans (around 58%) are international waters, termed 'high seas'. 'Open access' to typically migratory and transboundary or straddling stocks, such as tuna, swordfish, and sharks, in these waters has resulted in their overexploitation relative to those species inhabiting EEZs (White and Costello, 2014). The impact for management of climate-driven 'shifts' in the distribution of transboundary stocks is also a concern for their sustainable exploitation (Palacios- Abrantes et al., 2022).

Management of stocks, including migratory and straddling stocks, which can occur within and outside EEZs, is agreed through what are often '*complex and multidimensional fisheries negotiations*' (Faulkner, 2021). For example, in the case of tuna, agreement on stock management is reached by negotiations within Regional Fishery Management Organisations (RMFOs) such as the International Commission for the Conservation of Atlantic tuna (ICCAT) and global forums such as those facilitated through the UN or FAO. White and Costello (2014) suggest a complete closure of the high seas to fishing to achieve equitable exploitation of marine resources and protection of the marine ecosystem.

Most stocks in the North East Atlantic are managed under the EU's CFP (Fernandes and Cook, 2013). To address food security, marine health, and concerns for changes in the abundance and distribution of fish stocks caused by climate change, the CFP has undergone periods of reform, notably in 2002 and 2013 (Goti-Aralucea et al., 2018). The reformed CFP, in effect from January 2014, introduced a legally binding commitment to fishing at sustainable levels (i.e., at MSY) to ensure high long-term fishing yields for all stocks by 2015 where possible, and at the latest by 2020 (Hirst, 2015). For the allocation of resources to Member States, the cornerstone of the CFP remains the regulation of fisheries through a system of total allowable catches (TACs) and quotas (Anderson et al., 2018).

At a UK level, fisheries management (including quota allocation) is devolved, with different approaches adopted by the four administrations (England, Scotland, Northern Ireland, and Wales; Ares et al., 2018). Responsibility for the management of fisheries in England lies with

Inshore Fishery Conservation Authorities (IFCAs)¹⁰ in inshore waters (0-6 nm); and the Marine Management Organisation (MMO) in coastal waters (6-12 nm). Similarly, in Scotland fisheries management is devolved to Regional Inshore Fishery Groups (RIFGs) in inshore waters; and to Marine Scotland ¹¹ in coastal waters. In Wales, fisheries (0-12 nm) are managed by the Welsh Government, and in Northern Ireland, by the Department of Agriculture, Environment and Rural Affairs (DAERA)¹². Producer Organisations (PO) ¹³ (Quota Management Groups in Scotland) have responsibility for allocating quota to individual fishing vessels or groups, while for non-sector groups, i.e., those not in the membership of a PO, and vessels 10-meters-and-under, quota is allocated by the MMO in England and by the relevant authority in each of the devolved administrations.

Since the UK's departure from the EU ('Brexit'), responsibility for managing marine fishery resources in offshore waters (12-200 nm) is divided between the EU and UK (Phillipson and Symes, 2018). The UK is however fully responsible for managing fisheries in the UK's EEZ ¹⁴, setting TACs and determining access to fisheries. The effective implementation of environmental targets for UK seas, such as: *'reversing the loss of marine biodiversity; increasing the proportion of protected and well-managed seas; and ensuring that all fish stocks are recovered to and maintained at levels that can produce their maximum sustainable yield'*, set out in the UK Government's *'Green Future'* document (Defra, 2018), and Fisheries (2020) ¹⁵ and Environment (2021) ¹⁶ Acts, are recognised as key to future sustainable management of UK fisheries.

An outcome of internationally agreed frameworks for managing global fisheries and biodiversity is the requirement to establish a network of *Marine Protected Areas* (MPAs) by 2012 (Marchal et al., 2016). Currently only around 7% of the world's oceans are protected,

¹⁰ IFCAs replaced Sea Fisheries Committees in 2011 when the Marine and Coastal Access Act (MCAA) 2009 came into force.

¹¹ <https://www.gov.scot/policies/sea-fisheries/sea-fishery-management/>

¹² <https://www.daera-ni.gov.uk/topics/fisheries>

¹³

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/890051/UK_2020_QMR_-_FINAL.pdf.

¹⁴ Article 61(1) of the UN Convention on the Law of the Sea (UNCLOS) states that: "The coastal State shall determine the allowable catch of the living resources in its exclusive economic zone."

¹⁵ <https://www.gov.uk/government/news/flagship-fisheries-bill-becomes-law>

¹⁶ <https://www.gov.uk/government/publications/environment-bill-2020>

with areas under national jurisdiction significantly more protected (17%) than Areas Beyond National Jurisdiction (ABNJ) (i.e., 'High seas' more than 200 nm from the coast) (O'Leary et al., 2020; Johnson et al., 2019), where only just over 1% is under protection (UNEP-WCMC, IUCN and NGS, 2018; The Pew Charitable Trusts, 2020b). More recent agreement on protecting marine life in international waters is in the UN High Seas Marine Treaty (High Seas Alliance, 2023) (See Appendix 3).

MPAs are recognised as an important tool for protecting the integrity of marine ecosystems (Rees et al., 2020). The EU has committed to establishing MPAs in 30% of European seas by 2030 (EC, 2022a; Johnson et al., 2019). In the UK, there are 314 MPAs, covering 24% of the coasts and seas (Rees et al., 2020). Of these, 178 (56%) are in English waters, covering 51% of inshore and 37% of offshore waters (MMO, 2014). Since 2016 the UK has enhanced the protection of 4 million km² of ocean in its Overseas Territories through its 'Blue Belt' programme (Gov.UK, 2017). However, despite these commitments, there is concern for the level of protection in MPAs with currently only 1% of marine areas in the EU *strictly* protected and ambition only to increase this to 10% by 2030 (Oceana, 2023). In particular, there is concern for the continuation of fishing, especially bottom trawling, which is banned in only 5% of UK MPAs (MCS, 2020b). Trawling intensity has even been observed to be greater in MPAs compared to unprotected areas (Dureuil et al., 2018). Considering this, this study will examine public attitudes to labelling of seafood to indicate fish not caught or farmed in a protected area.

Although bottom trawling is the most common human activity directly affecting the seabed, trawling makes an important contribution to world food supply (Hiddink et al., 2018). Almost 25% of wild-caught fish and invertebrates landed globally is by bottom trawlers (Amoroso et al., 2018). Bottom trawling includes otter trawling for species such as cod and haddock; beam trawling for flatfish such as plaice and sole; and dredging for shellfish such as scallops and mussels (Sainsbury, 1996). Trawling can 'strip' up to 41% of invertebrates from the seabed, with recovery taking years (Hiddink et al., 2018). It is argued however that these effects can be mitigated through effective management (Hilborn et al., 2023; Pitcher et al., 2022; Amoroso et al., 2018) including modifications to trawl gear to reduce disturbance to the

seabed (McConnaughey et al., 2019). Concerns for the impact on climate change of carbon released from the seabed by bottom trawling has also been expressed (Sala et al., 2021).

More recently, demands are being made for the integration of market-based and ecosystem-based methods¹⁷ in ‘seascape’ (Murphy et al., 2021) and ‘jurisdictional’ (Kittinger et al., 2021) approaches to managing marine resources at scale. The ‘seascape’ approach developed by Conservation International¹⁸ involves, ‘large, multiple-use marine areas’ in which “stakeholders co-operate to conserve the diversity and abundance of marine life and promote human well-being” (p.1). The jurisdictional approach builds on ‘place-based’¹⁹ approaches to managing terrestrial resources (Kittinger et al., 2021) where, for example, place-based citizen science²⁰ may be employed to increase science and ecological literacy and foster pro-environmental behaviour (Haywood et al., 2020; Crowell and Schunn, 2014). Meanwhile, the World Wide Fund for Nature (WWF) is calling upon retailers to halve the environmental impact of UK food ‘baskets’, by, in the case of seafood, ensuring all seafood is sourced from sustainable sources by 2030. Although ‘sustainable’ is not defined, it is stated in their ‘Blueprint for action’ that seafood should be ‘certified’ and sourced from areas adopting an area-based ‘seascape’ approach (WWF, 2021).

¹⁷ A major outcome for fisheries of the 2002 Johannesburg World Summit was a requirement to implement an *ecosystem-based approach to fisheries management* (EBFM) by 2010 (Marchal et al., 2016).

¹⁸ <https://www.conservation.org/>

¹⁹ A ‘place-based’ approach is a people-centred, bottom-up approach to managing resources.

²⁰ Citizen science is defined as ‘involvement of members of the public in scientific studies without a formal scientific background’ (Dalby et., 2021).

2.3. Challenges facing global food systems

The ocean has been referred to as '*the world's largest food system*' (Kittinger et al., 2021). Notwithstanding this, fish is acknowledged as '*an often-overlooked component*' of this system (Tookes et al., 2018), and '*peripheral*' to discussions on healthy and sustainable diets (Koehn et al., 2022; Bennett et al., 2021). Despite the ocean covering almost three quarters of the earth's surface, its contribution to global food supply is small compared to agriculture (Schubel and Thompson, 2019). It is argued, for example by Tlusty et al. (2019) and Olson et al. (2014), that until fish is perceived as 'food' rather than as a 'resource', it will not be managed as part of a sustainable food system in the same way as agricultural products.

2.3.1. Challenges for sustainable food systems

A major challenge for global food production is in meeting the nutritional demands of a growing human world population, estimated to reach almost 10 billion by 2050 (UN, 2017). Attempts to address this and other challenges relating to food such as the distribution of information on nutrition and harmonisation of health and sustainability messaging (FAO and WHO, 1992), have been communicated through declarations made in both international policy agreements (Appendix 4), and in the UK, through the provision of policy advice commissioned by the Government (Appendix 5). The adoption of Agenda 21 at the Earth Summit in Rio in 1992, for example, was the first time that over-consumption in the developed world generally was recognised in international policy and measures to increase '*sustainable consumption*' introduced (Seyfang, 2005).

The food system, i.e., the network of processes from production to consumption (Ericksen, 2008), is among the largest drivers of global environmental change, threatening both human health and environmental sustainability (Dimpleby, 2021; Willett et al., 2019; Poore and Nemecek, 2018; Vitterso and Tangeland, 2015). Reducing individual use of land-based animal proteins by switching to a diet which in general is motivated by interest in more environmentally sustainable and healthy consumption is key to improving human and

ecological health (Gonzalez-Garcia et al., 2018). In particular, a diet lower in land-based animal protein provides the opportunity to help mitigate climate change by ‘decarbonising’ the food system through the reduction of greenhouse gas (GHG) emissions (Sranacharoenpong et al., 2015; Raphaely and Marinova, 2014; Scarborough et al., 2014). It requires considerably more energy to produce fish protein compared to vegetable protein (Reynolds et al., 2014). However, depending on species and how fish and shellfish are harvested or produced, seafood has lower GHG emissions than land-based animal protein sources (Koehn et al., 2022; Hallstrom et al., 2019; Hilborn et al., 2018; Scarborough et al., 2014; Rocklinsberg, 2014).

With increasing interest of some consumers, particularly in higher income countries, in how and where food is produced, and the comparatively recent incorporation of fish into social food movements, the potential role of seafood guides in communicating the sustainability of the seafood supply chain must be explored. This is supported by Olson et al. (2014) who suggest seafood guides have a role in helping sustainable and local economies by promoting ‘bottom-up’ initiatives within community-based fisheries to better connect people with their food and the communities that produce it.

2.3.2. Defining a Sustainable Diet – what is sustainability?

An important outcome of the International Scientific Symposium “Biodiversity and Sustainable Diets”, organised by FAO in 2010 (See Appendix 4), was a consensus definition of what constitutes a sustainable diet:

‘Sustainable diets are those diets with low environmental impacts, which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair, and affordable; nutritionally adequate, safe, and healthy; while optimising natural and human resources’ (Burlingame and Dernini, 2012, p.83)

Significantly, one of the expectations was that positioning sustainable diets as a goal would lead to broader scientific, social, and political recognition that “*the health of humans cannot be isolated from the health of ecosystems*” (Burlingame and Dernini, 2012). The definition presented above recognises that sustainable diets have many attributes e.g., health, nutrition, carbon footprint, animal welfare and social justice, for example, and that the sustainability of a ‘product’ should ultimately be assessed based on the sustainability of all its ingredients, especially where it includes ‘controversial’ ingredients, such as fish (Lewis et al., 2010). In short, the concept of ‘switching’ to a sustainable diet is not straightforward.

2.3.3. Consumer choice and preferences

A key component of frameworks to increase the sustainability of food systems and protect the health of ecosystems is recognition of the need for widespread individual behaviour change (Marteau, 2017; Kelly and Barker, 2016; Whitmee et al., 2015; Arnott et al., 2014; SCR, 2006a). Crucially, changes in patterns of individual consumer behaviour are recognised as an important mechanism for reducing the impact of society on the environment (Richter and Klockner, 2017; Jackson, 2005; Seyfang, 2005; Stern, 1999). There is recognition that consumer attitudes and purchasing behaviour towards food must change (Godfray et al., 2018; Springmann et al., 2018a; Meybeck and Gitz, 2017) before a reduction of societal impact on human and planetary health can be achieved.

Gussow (1999) asserts that food choices should safeguard the natural world and are within ‘*planetary budget*’. In contrast, Mason and Lang (2017) argue that it is unrealistic to expect consumers alone to take individual responsibility for the reform of the global food system, especially when their food purchases are typically influenced by price and taste, not sustainability. Personal health and interest in food which is perceived as ‘good for me’, such as fish, is however an important determinant of consumer choice (Birch et al., 2018; Gámbaro et al., 2013). Increasingly consumers too are recognising the interconnection between individual health and planetary health (Marselle et al., 2021; Myers, 2017). This trend is

responsible for driving the current popularity of plant-based diets, particularly amongst ‘millennials’²¹ (Alae-Carew et al., 2022).

2.3.4. Ethical and ‘Green’ dimensions of food choice

Ethical consumerism is defined as: “*the deliberate purchase, or avoidance, of products for political, ethical, or environmental reasons*” (Summers, 2016, p.303), where purchasing decisions are influenced by an appraisal of the moral properties of consumer goods (Carrier, 2010). Although consumption ethics is not a new phenomenon (Newholm et al., 2014), it has flourished in recent decades, both in scope and scale. What was once a focus on environmental or ‘green’ purchasing behaviour has expanded to include issues of animal welfare, human rights, country of origin, fair trade, health, climate change, anti-globalisation amongst other related concerns (O’Connor et al., 2017; Andorfer, 2015; Dowd and Burke, 2013; Zander et al., 2013). Individuals that recognise their consumption has both an environmental and social impact, and structure their purchasing decision in ‘moral’ rather than in ‘utility’ terms are called ‘sustainable’, ‘responsible’ and ‘ethical’ consumers or ‘consumer citizens’, labels that combine environmental and social morals (Valor et al., 2014). (See Section 2.5.1. for discussion of consumer and pro-environmental behaviour).

In the UK, sales of ‘ethical’ food and drink, which includes Fairtrade, organic, vegetarian and plant-based alternatives, and free-range eggs (Ethical Consumer, 2019), are experiencing higher growth in sales than ‘conventional’ products (Ethical Consumer, 2017), representing £12bn in 2018, compared with just over £1bn in 1999 (Ethical Consumer, 2019). Retailers in the UK were also found to be selling 60% more sustainable (MSC certified) seafood than in 2016 (MSC, 2018), with sales of wild-caught certified fish increasing by almost 37 % between 2015 and 2016 (Ethical Consumer, 2018). (Figure 2.2).

²¹ Millennials (also known as generation Y) are the demographic group born in the period 1981-1996.

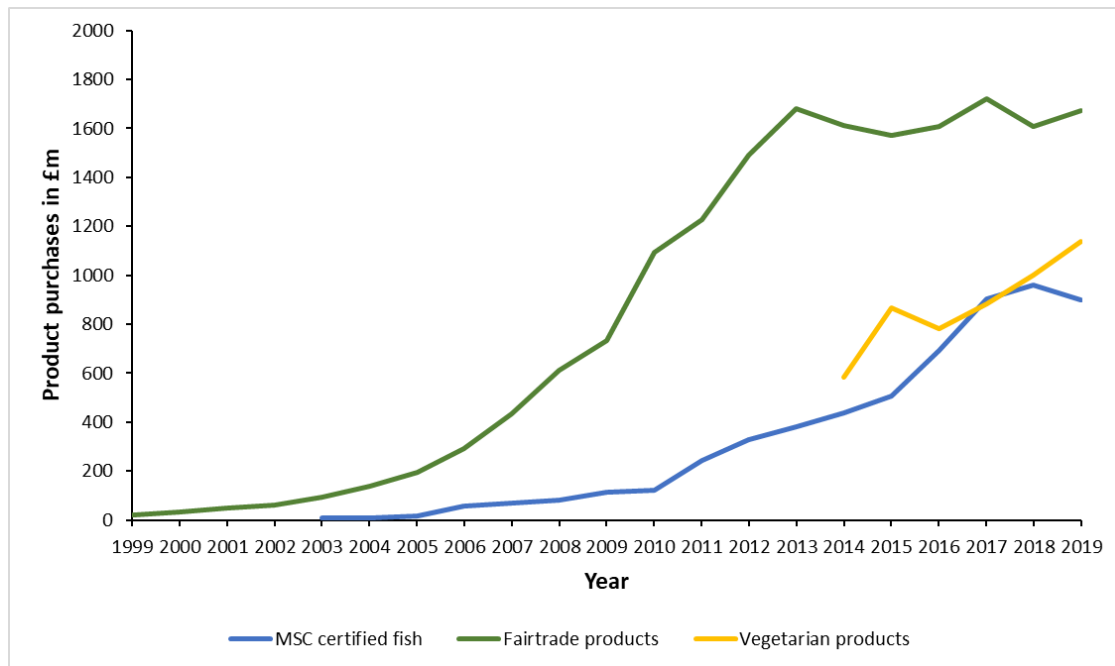


Figure 2.2: Sales of ethical products in UK (Source: Ethical Consumer Markets Report, 2020).

Whilst the range of criteria used to assess seafood sustainability is expanding (Parkes et al., 2010), and opportunity to further expand the concept has been suggested (Ziegler et al., 2016), the main opportunity to increase demand for sustainably sourced seafood, as suggested by Dowd and Burke (2013), is in engaging with a wider environmental and ethical audience.

2.3.5. Role of seafood in a sustainable diet

Wild-caught fish is the last natural, hunted, food humans eat in substantial amounts and according to Halweil (2006), *“one of our few remaining direct connections to the natural world”* (p.5). Seafood sustainability campaigns are reportedly motivating ‘seafood lovers’ to make more sustainable choices to protect marine environments when buying and consuming fish (Barclay and Miller, 2018; Honkanen and Young, 2015), but questions remain as to levels of ocean ‘connectedness’ within society and consumer awareness of the impact of their fish consumption on the marine environment. Dietary recommendations for fish intake have been described as *“the most widely recognised conflict between health and environmental*

sustainability” (Macdiarmid, 2013, p. 18), between seafood industry ability to meet demand and maintaining fish stocks at sustainable levels. Despite such conflicts, fish and shellfish continue to be promoted as healthy alternatives to land-based animal proteins (Thurstan and Roberts, 2014), with consumption of fish increasing more rapidly compared to other animal proteins (Barclay and Miller, 2018).

The term ‘dietary guidelines’ refer to *‘formal, scientifically based guidance at the population level’* (Mason and Lang, 2017). Proposals to introduce environmental considerations into official dietary guidelines date back to the mid-eighties (Gussow and Clancy, 1986). Dietary advice for seafood, however, has mainly been focused on health aspects and has only recently incorporated environmental sustainability (Fischer and Garnett, 2016). Since 2004 the UK Government dietary advice for fish has been to consume at least 2 portions (140 g of fish per portion) of fish per person per week, one of which should be oily. In 2009 the FSA conducted a public review of this advice in accordance with concerns over *‘sustainability issues’*. Based on this review, the latest advice from the UK Government on fish consumption can be found on the NHS website ²². For example, the website advises: *“to ensure there are enough fish to eat now and in the future, we should try to eat a wide variety of fish and to buy fish from sustainable sources”*. Sustainable fish or shellfish are defined by the NHS as, *“those caught or produced in a way that allows stocks to replenish and that does not cause unnecessary damage to marine animals and plants”* (NHS, 2018). In the UK consumers are encouraged to increase fish consumption from current levels of consumption of around 1.15 portions per person per week. Following UK Government advice would increase seafood consumption by 74% (Seafood 2040, 2021), from approximately 161 g/week to 280g/week (14.6 kg per annum).

2.3.6. Defining sustainable seafood terms

The most widely accepted definition of sustainable development comes from the WCED who define sustainable development as: *“development that meets the needs of the present*

²² <https://www.nhs.uk/live-well/eat-well/eight-tips-for-healthy-eating/>

without compromising the ability of future generations to meet their own needs” (WCED, 1987).

Even though consensus on a definition for sustainable fisheries is lacking (FAO, 2016), the sustainability of fisheries globally is preserved in various international agreements such as UNCLOS III and the FAO Code of Conduct for Responsible Fishing (See Appendix 3). These agreements and the *‘three pillars’* (social, economic and environmental) of sustainability commonly associated with sustainable development (Purvis et al., 2018) provide context for defining *‘sustainable fisheries’*.

These *‘three pillars’* are frequently determined as conflicting objectives when applied to fisheries. However, it has been shown by Asche et al. (2018), that if a fishery incorporates all three pillars equally in the design of its management framework, they complement one another, and are all instrumental in achieving maximum benefit from the fishery. It is only when there is failure to recognise the equality and interdependence of the pillars and one objective, typically economic interests, is prioritised over another that the system collapses (Goti-Aralucea et al., 2018). This was found to be the case with the administration of the CFP, the instrument for managing the majority of stocks in the North East Atlantic (Fernandes and Cook, 2013). As regards social sustainability, the FAO (2016) state that the *“sustainability of fisheries production is crucial to the livelihoods, food security and nutrition of billions of people”* (Sofia, 2016. p.40) and that essentially fisheries’ sustainability must benefit society. Table 2.2 summarises the elements of a sustainable fishery as identified by FAO in their biennial Sofia report.

Table 2.2: Elements of a sustainable fishery (Source: Adapted from FAO, 2016. p.40).

SOCIAL	Provide benefits to society: Food; employment; income; nutrition; maintenance of fishing communities; equity in income, gender, and basic human rights.
ENVIRONMENTAL	Maintenance of stock: High abundance; low fishing pressure.
ECONOMIC	Responsible management system: Ability to take effective action in response to changes in the state of the resource.

The FAO Code of Conduct for Responsible Fishing (the ‘Code’) is the ‘most widely accepted set of guidelines on how to manage fisheries’ (FAO, 2016). FAO maintain that if a fishery is responsibly managed i.e., in accordance with the Code, the outcome will be a sustainable fishery, ‘in short, responsible fishing leads to sustainability’ (FAO, 2016).

With increasing consumer interest in seafood sustainability there has been a rise in unsubstantiated sustainability claims being made for a product; this is often referred to as ‘Green’ or ‘Fair’ ‘washing’ (Czarnecki et al., 2014). In response to ‘greenwashing’ of seafood by retailers as ‘sustainable’ or ‘responsibly sourced’, the Sustainable Seafood Coalition (SCC) became established in 2011. By working with the sector, SCC agreed definitions for ‘responsibly sourced’ for wild-captured and farmed fish. Criteria for meeting the agreed definition are summarised in Table 2.3.

Table 2.3: Criteria for wild fishery or farmed source meeting Sustainable Seafood Coalition (SCC) definition of ‘responsibly sourced’.

The fishery or farmed source is:	Wild fishery	Farmed source
Certified to a third-party environmental standard OR	✓	
Stable, productive, and low impact with precautionary management and confidence that the status will be maintained or improved OR	✓	
The member (of the SCC) has identified improvements required to reduce the environmental risk of the fishery AND	✓	
These improvement actions are taking place and the member is measuring & reporting these improvements OR A documented and effective engagement & improvement plan is in place and monitored.	✓	
Certified to a third-party responsibility standard OR		✓
Audited to and compliant with a good aquaculture standard or code of practice OR		✓
Has all required improvement actions communicated and completed within an agreed timescale.		✓

In summary, under the SSC labelling code, responsibility refers to *“the steps taken by a business during the sourcing of own brand fish and seafood. Fish may carry claims of responsibility if it is sourced in line with SSC “Voluntary Code of Conduct on Environmentally Responsible Seafood Sourcing” (the SSC ‘Sourcing Code’)”* (SSC, 2021). At present, sustainability claims cannot be made for seafood produced by aquaculture as the SSC is not aware of any existing certification standards that make claims of sustainability. Only the term ‘responsible’ can be used for farmed seafood. Both terms can however be used for wild-caught seafood, but ‘sustainable’ only where there is third-party certification.

Popular understanding of the term ‘sustainable seafood’ is accepted as *“seafood fished or farmed in a manner that can maintain or increase production in the long term, without jeopardising the health or function of the web of life in our oceans”* (Richter and Klockner, 2017, p. 2). It is also acknowledged that ‘sustainable seafood’ is broadly from *“ecologically responsible fishing that minimises the bycatch of non-target species and brings acceptable levels of ecosystem and environmental impacts”* (Jacquet et al., 2009, p. 45).

A study by Lawley et al. (2019) exploring seafood sustainability knowledge, found a third of respondents either had no knowledge or gave an incorrect answer, however, slightly more than two fifths displayed complex knowledge. Public understanding of sustainability is further emphasised by Richter and Klockner (2017) who refer to the concept of seafood sustainability as ‘fuzzy’. Crucially the authors highlight the importance for consumers of them understanding how knowledge of seafood sustainability can be applied to their taking action to conserve marine resources (Richter and Klockner, 2017). Gutierrez and Thornton (2014) also question consumer understanding of ‘sustainable seafood’ and whether, based on any understanding of what sustainable seafood is, the sustainable seafood market is being driven by the public or by industry.

Zeigler (2016) argues that because seafood sustainability is typically focused on ‘ecological sustainability’, in particular stock status, it does not extend to other aspects of sustainability such as social sustainability and wider environmental impacts such as fuel consumption. These concerns about existing definitions and understanding of sustainable seafood are further explored by McClenachan et al. (2016) who assert that seafood should not be certified as

sustainable if production involves social inequity such as the use of forced or child labour. Given perceived consumer interest in social aspects of sustainability, such as that inherent in locally produced seafood, for example, a 'broader' scope for seafood sustainability, as McClenachan (2016) suggests, is required.

There is a clear lack of understanding regarding public perception of sustainability and how this might affect the use and impact of seafood guides on wider seafood sustainability. This study seeks to better understand the knowledge gap in relation to public and stakeholder understanding of seafood sustainability, and the extent to which public demand for sustainable seafood is influencing the seafood choices available to consumers.

2.3.7. Food and fish labelling

Global trade in seafood is complex and the provenance of seafood often confounded by lack of traceability (Jacquet and Pauly, 2008; 2007), seafood fraud (FAO, 2018), overexploitation (Pardo et al., 2016) and lack of accountability (Packer et al., 2019). Without traceability and labelling to guarantee the identity of seafood, seafood fraud and overexploitation is deemed to '*represent a serious risk*' to Atlantic fisheries and aquaculture (Seatraces, 2020).

The sustainability (and other attributes) of food including fish products is typically communicated through product labelling (Valor et al., 2014; Pieniak et al., 2013). Labelling provides *inter alia* information on ingredients, allergens, provenance, price, net weight, 'best before' or 'use by' date, storage and cooking instructions and the recyclability of the packaging. Front of pack (FOP) nutrition labels (Figure 2.3), first introduced by UK supermarkets and food manufacturers in early 2000, are designed to motivate healthier diets among consumers (Van Camp et al., 2011). Information is presented in a simple to read 'traffic-light' colour coding to specifically help consumers choose between products and to maintain a balanced and healthy diet (NHS, 2022).

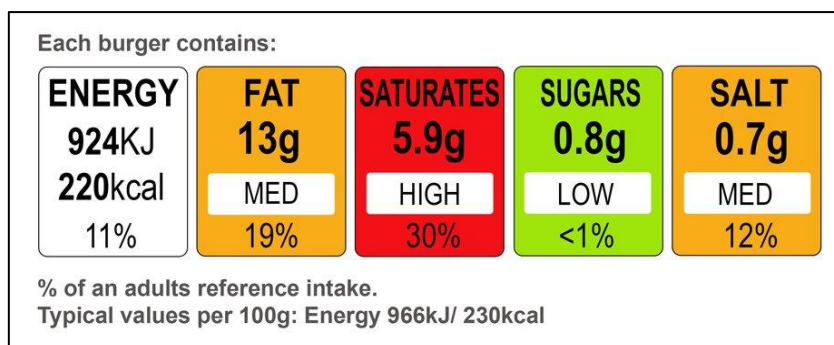


Figure 2.3: Example of Red, amber and green colour coding (Source: NHS, 2022).

Depending on labelling and product type, information for seafood is mandatory or provided voluntarily. Where information is provided voluntarily further distinction is made between ‘self-declared’ or ‘first-party’ (See 2.4.6), and ‘third-party’, labelling, which is invariably awarded following a process of accreditation. For example, to obtain MSC certification, a fishery is audited, and its ability to meet all the requirements of the Standard verified by an independent third party. To enable a product to carry the MSC ecolabel, each ‘actor’ in the supply chain from catching, through processing, to the retailer must hold a valid MSC Chain of Custody certificate, providing full traceability back to the certified fishery of source (Arton et al., 2020; Van Putten et al., 2020).

Studies demonstrate that consumers prefer eco-labelled wild seafood over un-labelled seafood (Bronnmann and Asche, 2017). Eco-labels provide consumers with information that allows them to discriminate between products, to make more informed choices, thereby increasing demand for sustainably produced seafood (Englander et al., 2023). As a result, eco-labels have been used by the SSM to help reduce over-fishing and promote better fishing practices by reshaping consumer consumption habits (HLPE, 2014; Hallstein and Villas-Boas, 2013).

Although there is evidence of willingness-to-pay (WTP) for certified or eco-labelled products including seafood (Hilger et al., 2018) and industry interest in certification (MSC, 2016),

research by Barclay and Miller (2018) demonstrates there is no clear evidence that the SSM in the form of eco-labels has effectively reduced overfishing. Ultimately the success of eco-labelling programmes depends on the public being knowledgeable about them and them prioritising the purchase of eco-labelled products over others (Leadbitter, 2008; Johnston and Roheim, 2006) (The contribution of the MCS GFG to increasing public eco-label knowledge is explored in Section 4.7.3 and the importance of sustainability and its prioritisation discussed in Sections 4.9.3. and 5.5.2). Neither has it been established that advisories such as seafood guides (See Section 2.4) are helping to reduce overfishing by increasing consumer awareness and influencing choice. For example, studies investigating consumer response to a traffic-light advisory, found no significant difference in total seafood sales (Hilger et al., 2018; Hallstein and Villas-Boas, 2013; Hallstein and Villas-Boas, 2009).

Despite these assertions investment in market-based instruments as a solution to help reduce overfishing is considerable (Murphy et al., 2021). By raising awareness amongst consumers of the importance of choosing responsibly produced seafood, purchasing campaigns have helped increase demand for certified, principally MSC certified, seafood (Ponte, 2012). The MCS GFG for example recommends MSC ecolabeled seafood as a ‘better environmental choice’ (See Section 5.5.1). The MSC’s success has also been in obtaining commitment from retailers in the USA and Europe, two of the most dominant global seafood markets, including from Walmart, the largest retailer in the world, to only source MSC certified seafood products (Travaille et al., 2019; Leadbitter, 2008), helping to further increase demand for MSC certified wild-caught seafood and the authority of the MSC over wild-caught seafood sustainability (Ponte, 2012).

Product-related sustainability claims, which may be economic, environmental, or social, although commonly represented by an ‘eco-label’ or logo, may also include a web link to further information (UNEP, 2017). A recent development of this is the concept of ‘storied fish’ (Future of Fish, 2016), which is defined as follows:

“Storied Fish refers to seafood that tells a story about its journey from water to table. The details included in storied fish may be part of a product label, included

in a food brand or tagline, listed on a menu, or highlighted by a server in a restaurant” (Future of Fish, 2016.p.11).

In the context of this study, EU and UK seafood labelling standards are most relevant. European and UK seafood law (EC No 1379/2013) (EC, 2013), states that fish and fishery products require appropriate labelling that indicates the commercial designation (common name) of the species, the production method (caught at sea or in inland waters or farmed) and the catch area or the country of origin (Pieniak, 2013) (Figure 2.4).

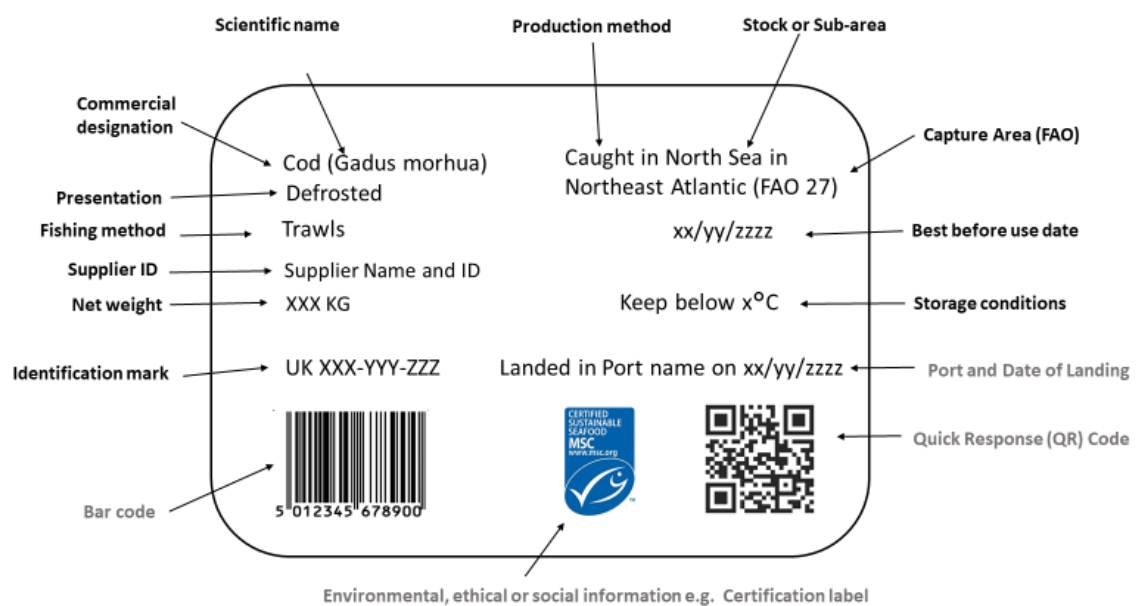


Figure 2.4: Example of EU Fish labelling of a non-prepacked product (Source: Adapted from European Commission (EC), 2014). **Black text** Mandatory details; **Grey text** Voluntary details.

Labels and the information they provide help to address some of the challenges of ‘fish fraud’ facing the sector. Fish fraud (Table 2.4) is committed when ‘*fish is illegally placed on the market with the intention of deceiving the customer, usually for financial gain, and involves criminal activity that can include mislabelling, substitution, counterfeiting, misbranding, dilution and adulteration*’ (FAO, 2018).

Table 2.4: Examples of Fish fraud (Source: Adapted from FAO 2018, p. 154).

ACTION	REASON
Mislabelling	Deliberate e.g., low-value species sold as more expensive species or accidental e.g., misidentification, under-reporting.
Species substitution	Low-value species sold as more expensive species; used to hide: the geographical origin; an illegally harvested species; a protected species; species from a protected area; toxic species e.g., pufferfish, ciguatoxic fish etc., for non-toxic species.
Dilution and adulteration e.g., overuse of glazing (ice) and water-binding agents	To increase weight.

Consumers may be confused or deceived by the use of generic or umbrella terms to describe fish, where the same common name (commercial designation) is used for more than one species, or the converse, where more than one common name is used for the same species. In a study by Hobbs et al. (2019), DNA barcoding was used to investigate sales of shark products in fishmongers and fish and chip takeaways in England. Most samples were identified as Spiny dogfish *Squalus acanthias*, commonly labelled as Rock, Huss or Rock salmon, a species assessed as critically endangered in the North East Atlantic. Despite the species threatened status and a prohibition on landings in the EU, imports from outside of the North East Atlantic are being driven by demand for a species traditionally consumed, battered and fried, in England and coastal towns of Northern Europe (Hobbs et al., 2019).

To reduce opportunities for illegal seafood entering the market and ensure compliance with EU IUU Regulations (EC No. 1005/2008) (EC, 2008), as well as food health and safety standard documents, every consignment of fish imported into the EU is accompanied by a Catch Certificate approved by a ‘competent flag state public authority’ (Lewis and Boyle, 2017; Leroy et al., 2016; Bellmann et al., 2016; Young, 2016).

Although there are marked improvements in compliance with IUU Regulations since the introduction of Catch Certificates (Mariani et al., 2015), limitations to the current labelling of fish products once they reach market persist. Seafood labelling law applies to unprocessed fish products i.e., live, fresh, chilled, or frozen fish, but also includes some processed products (e.g., salted, smoked products, cooked shrimps in their shells). These products can be 'prepacked' and 'non-prepacked' (European Commission (EC), 2015). This means that for many fish products that are further processed, information on their provenance and sustainability status is more difficult to gauge. Another limitation is that although labelling of non-processed fish products is required at all stages in the retail supply chain (Vandamme et al., 2016), this does not apply to restaurants, which must provide mandatory information on allergens and are obliged to provide information on the fish species and catch only if asked (Vandamme et al., 2016).

As mentioned above, market-based incentives such as certification and eco-labelling help reduce the risk of seafood fraud (Barendse et al., 2019; Fox et al., 2018). In a global assessment of species validation of MSC labelled products by Barendse et al. (2019), the study demonstrated more than 99% labelling accuracy. By comparison, a review of seafood mislabelling incidents, comprising 51 articles, analysing 4,500 seafood samples using DNA, by Pardo et al. (2016), reported an average mislabelling rate of 30%. Mislabelling was found to occur more frequently in restaurants and takeaways than in supermarkets and retailers (Pardo et al., 2016). In other studies, incidents of mislabelling and species substitution were also generally found to be higher in restaurants and takeaways (Christiansen et al., 2018; Vandamme, 2016; Kappel and Schröder, 2016; Mariani, 2014).

Although studies examining public understanding of seafood sustainability have been carried out (Lawley et al., 2019; Jonell et al., 2016; McClenachan et al., 2016), there appears to be little investigation of public understanding of mandatory EU labelling and how it relates to seafood sustainability including the use of seafood guides. In a study by Feucht and Zander (2017), use and awareness of mandatory labels was found to be limited, although commercial designation (name of the fish) and geographic origin (Capture or FAO Area or Production Country) were found to be most used. In a study of European consumers by Pieniak et al. (2013), mandatory product information, such as FAO capture areas and the name of the fish,

appeared to be of little interest to consumers. The highest interest was observed for issues relating to health and product quality, and for 'emerging issues' such as sustainability and fish welfare (Pieniak, 2013). Curiously, although interest amongst consumers in sustainability was high, interest in knowing the provenance of the fish and what it was, was low. This suggests participants lacked basic understanding of how essential the information is to consumers wishing to make informed and sustainable seafood choices (Watson et al., 2016). The use of seafood guides could potentially increase understanding of seafood labelling, helping consumers to make more informed and sustainable seafood choices.

2.4. Seafood guides and the sustainable seafood movement (SSM)

As outlined in Chapter One, the SSM uses market-based initiatives, including seafood guides, to raise awareness amongst consumers of issues related to overfishing to help drive demand for sustainably produced seafood. The movement is credited with successfully fostering a market for responsibly sourced seafood by raising public awareness and initiating interactions between ‘disparate actors’ in the seafood supply chain, such as Environmental Non-Government Organisations (ENGOS), retailers, restaurateurs, and fishers, that might not ordinarily engage with each other through their day-to-day work (Barendse et al., 2017, De Vos and Bush, 2011). There is also a presumption that by disseminating large amounts of information, seafood campaigns have not only raised public awareness of the issues surrounding seafood consumption but are also increasing the *‘profile of fish in society’*, creating *‘a new ethical concern for the oceans’* (Jacquet and Pauly, 2007). Halweil (2006) further asserts that by increasing awareness amongst consumers, seafood campaigns have indirectly helped educate other actors in the seafood supply chain who are now being forced to accept that commercial fish are more than a raw material for processing and are in fact *‘wildlife’* fundamental to marine biodiversity and ocean stability.

Seafood guides generally are ‘wallet-sized’ cards, or more recently, App-based, designed to make sustainable seafood consumption more accessible or ‘consumer-friendly’. This is achieved by use of a methodology to rank or rate seafood against several sustainability criteria (Richter et al., 2017; Roheim, 2009). Guides are designed to provide ‘at-a-glance’ information, typically interpreted through a ‘traffic light system’, where if the product is ranked ‘green’, purchasing is recommended; if ranked ‘red’, the advice is to avoid purchasing; or if ranked ‘yellow’ (or orange), the advice is ‘to proceed with caution’ (or eat occasionally) (Parkes et al., 2010; Roheim, 2009; Roheim and Sutinen, 2006). Guides are used by the public in restaurants, fishmongers, and supermarkets to help inform their buying decisions (Dolmage, 2016; Konefal, 2013; Jacquet and Pauly, 2007). Their primary function is *“one of influencing consumers’ decisions toward purchasing seafood on the ‘green list’ and away from purchasing from the ‘red list’ to improve the sustainability of the ocean environment”* (Roheim, 2009, p. 301). By influencing consumers’ decisions, seafood guides aim to change behaviour in favour of purchasing seafood from sustainable fisheries (Jacquet et al., 2009).

Despite this, other studies have challenged the behavioural impact of the guides with Gutierrez and Thornton (2014, p. 8197) stating that although the distribution of cards and smartphone app downloads “*does not translate directly to sales, it does demonstrate a general interest and awareness about seafood sustainability issues by an increasing segment of consumers*”, while others have suggested that guides act as an awareness raising tool (Gurierrez and Morgan, 2015).

Since the production of the first seafood guide in the USA in 1998 (Safina, 1998), around 200 sustainable seafood guides have been produced internationally (Lawley et al., 2016; Roheim, 2009). The most well-known of these is arguably that of the Monterey Bay Aquarium (MBA), produced under the Seafood Watch Programme (SWP) (Kemmerly and Macfarlane, 2009). Since its inception in 2000 to 2019, 68 million wallet cards (or guides) have been distributed to visitors (P. Adame, Seafood Watch Programme, 2019, *Pers. Comm.*). Table 2.5. presents the main seafood sustainability programmes and organisations producing guides globally.

Table 2.5: Summary of the main seafood guides produced globally.

Guide or programme name	Guide introduced in	By, Organisation	In, Country of origin	Performance measures	Format of guide or programme
What's a fish lover to eat?	1998	Audubon Society	USA	Guide no longer exists	Fish list
Guide to Ocean Friendly Seafood	1998	Blue Ocean Institute	USA	No information	Seafood guide or wallet card
Seafood Watch	2000	Monterey Bay Aquarium	USA	Polling of general public and seafood businesses	Aquarium exhibit; App; seafood guide; and website
Pocket Seafood Selector	2001	Environmental Defence	USA	No information	Seafood guide or wallet card
Good Fish Guide	2002	Marine Conservation Society	UK	Webpage views; app downloads; media coverage; businesses using ratings; social media followers	Book; website; seafood guide; and App
Australia's Sustainable Seafood Guide	2004	Australian Marine Conservation Society (AMCS)	Australia	App downloads; website visits	App; seafood guide; and website
Best Fish Guide	2004	Forest and Bird	New Zealand	No information supplied	App; seafood guide; and website
Good Fish Guide	2004	North Sea Foundation/ Good Fish Foundation	Netherlands	App downloads; Menu scan; number of supply chain partners; media coverage	Book; website; seafood guide; and App; restaurant programme
Various e.g., South Africa: SASSI (South Africa Sustainable Seafood Initiative) 2005; Malaysia: SOS (Save our Seafood) Seafood Guide 2009 etc.	First guide introduced in South Africa	World Wide Fund for Nature (WWF)	25 ²³ countries globally	Public survey (WWF Malaya); SASSI Public survey 2010	Seafood guide or wallet card
Oceanwise	2005	Vancouver Aquarium	Canada	Business (restaurant and supplier) membership	Seafood labelling
SeaChoice	2006	SeaChoice	Canada	No information	Website list of Priority species
Mr Goodfish	2010	Mr Goodfish	France	Number of aquaria visitors to Mr Goodfish exhibit; businesses using ratings; webpage views; app downloads; media interest; social media followers	Aquarium exhibit; App; seafood guide; and website
Blue seafood guide (BSG)	2011	Sailors for the Sea	Japan	No information	Seafood guide; website
Seafood sustainability assessment and education programme under development	2017	Qingdao Marine Conservation Society (QMCS)	China	No information currently available	Sustainability ratings in collaboration with Monterey Bay Aquarium Seafood Watch

²³ Link to list of WWF Seafood guides. For the UK a link to the MCS Good Fish Guide is supplied.
http://wwf.panda.org/get_involved/live_green/out_shopping/seafood_guides/ [Accessed August 2022]

2.4.1. Seafood guide awareness, effectiveness, and use

Although there is a body of research, undertaken for the most part in the early stages of the movement, which focusses on various aspects of seafood campaigns, little is known about seafood guide awareness, public use, or their effectiveness in influencing purchasing behaviour (Roheim, 2009). A review of existing studies found that, except for some evaluation of the SWP in the US (Kemmerly and Macfarlane, 2009), there remains little understanding of how guides produced by individual programmes are being used and what their influence is, if any, on consumer seafood purchasing behaviour. Table 2.6. summarises key research on topics related to the SSM and seafood guides.

Table 2.6: Summary of key research applicable to the sustainable seafood movement and seafood guides.

Country	Author(s)	Aims/objectives of the study
Global	Parkes et al. (2010)	A global review of organisations providing sustainable fisheries information.
	Konefal (2013)	Analysis of the ways in which the SSM has contributed to neoliberalisation through its use of market-based strategies.
	Roheim et al. (2018)	Study outlines the evolution and future of the SSM.
USA	Iles (2004)	An evaluation of how environmental campaigns in the US are employing elements of citizenship to urge sustainable seafood consumption.
	Jacquet and Pauly (2007)	Study investigates the limitations and successes of seafood awareness campaigns in the US.
	Jacquet et al. (2009)	Review of limitations of market-based initiatives for increasing sustainability in the seafood market.
	Kemmerly and Macfarlane (2009)	The study aims to provide an evaluation of the effectiveness of the MBA Seafood Watch Program.
	Roheim (2009)	Study provides an analysis of the consistency of advice between seafood guides.
	Gutiérrez and Thornton (2014)	Study aims to understand consumer demand for sustainable seafood.
Netherlands	De Vos and Bush (2011)	Using the case of the Dutch Good Fish Guide or Viswijzer, the authors explore the effectiveness of the Guide as a tool to create wider patterns of interaction between key actors in the Dutch fishery sector.
UK	Gutiérrez and Morgan (2015)	Focusing on the US and UK, the paper explores the roles of key actors in the sustainable seafood movement.

	Caveen et al. (2017)	Paper presents conceptual basis for development of Risk Assessment for Sourcing Seafood (RASS), a risk assessment tool developed by the Seafish Industry Authority (Seafish) in the UK for commercial seafood buyers.
Canada	Dolmage et al. (2016)	In reviewing the success of the Ocean Wise program, the study examines the factors that motivate restaurateurs to, or deter them from, making sustainable seafood choices.
Germany	Feucht and Zander (2017)	Study provides an analysis of consumer understanding of seafood labelling and knowledge of seafood guides in Germany.
Norway	Richter et al. (2017)	This study investigates which factors predict sustainable seafood consumption amongst Norwegian consumers.
South Africa	Barendse et al. (2017)	The authors review the development and successes of South Africa's sustainable seafood initiative, SASSI.
Japan	Iue et al. (2022)	The study aims to illustrate why and how the Blue Seafood Guide (BSG), Japan's first sustainable seafood rating program, was developed to raise awareness around sustainable seafood consumption.

A report by the Bridgespan Group (2004) found that although seafood campaigns between 1999-2004 increased awareness of sustainable seafood, they found *“no clear evidence that this increased salience is leading to big changes in buying practices, nor accelerated fisheries policies”* (Jacquet et al., 2009, p.51). This apparent lack of impact has been explored by others – for example, Feucht and Zander (2017), described sustainable seafood guide use in Germany as a *‘marginal phenomenon that not many consumers are aware of and that is not commonly applied in other areas of consumption’*, while Richter et al. (2017) found 93% of participants in Norway never or almost never used seafood guides, which given the economic and culinary importance of fish in Norway is perhaps unexpected.

An evaluation of the MBA’s SWP confirmed that seafood wallet cards can improve public awareness (Kemmerly and Macfarlane, 2009), and there has been some recognition that consumer behaviour has a role in increasing the sustainability of seafood supply (Hallstein and Villas-Boas, 2013, Vázquez-Rowe et al., 2013). However, several studies indicate that sustainable seafood initiatives, such as eco-labels or seafood guides, by themselves may not be sufficient to motivate consumers to buy sustainable seafood products (Hallstein and Villas-Boas, 2013; Gutierrez and Thornton, 2014; Uchida et al., 2014). Others further maintain that consumers need to be *‘connected’* to the *‘larger sustainability issues of ocean health and sustainable fisheries’* (Gutierrez and Morgan, 2015; Konefal, 2013) to ensure sustainability is driving their seafood purchases.

An understanding of how consumers use seafood guides is essential therefore to improving their efficacy and for achieving their aim of improving the sustainability of the ocean by conserving valuable marine resources. To date there have been no studies carried out on the impact of seafood guides on consumer purchasing behaviour in the UK; a gap which this study explores.

2.4.2. Advantages and disadvantages of seafood guide use

Although higher in the UK (See Section 5.5.1. for discussion of availability of MSC certified seafood in the UK), globally only a small percentage of the seafood consumed is certified against any internationally recognised sustainability standard (Figure 2.2). For this reason, Parkes et al. (2010) suggest that by providing an alternative approach to certification, seafood guides occupy an ‘important niche’, helping consumers to identify sustainably produced fish from a wider range of seafood when choosing from products that are not visibly eco-labelled as sustainable. Seafood guides have, however, been criticised (See Table 2.4) for causing confusion, lacking consensus, and being inconsistent, due to differing methodologies and criteria for assessing sustainability (Jacquet et al., 2009; Roheim, 2009). Although the scope of sustainability criteria used is expanding (Parkes et al., 2010), seafood guides have faced further criticism for their narrow definition of sustainability (Hilborn et al., 2015). This problem is exacerbated by the lack of agreement on what sustainable seafood is (Richter et al. 2017; Roheim, 2009) (Section 2.3.2.). Seafood lists are also deemed to be less transparent, and lacking traceability, compared to certification schemes (Iles, 2004) (Section 2.3.7), while recommendations can be confounded by mislabelling, renaming or non-labelling of seafood (Kroetz et al., 2020; Khaksar et al., 2015; Jacquet and Pauly, 2007 and 2008).

In Konefal’s (2013) analysis of organisations active in the SSM in the period 2005-2006, the analytical approach taken by organisations is described as largely ‘passive’ and ‘hands-off’. Konefal (2013) notes, that although information is provided, ‘the decisions on how to act (or not act) on that information’ is left up to consumers. The paper further criticises the SSM for not advising the public to consume less (or no) seafood to reduce pressures on stocks. According to Konefal (2013), this messaging fails to convey to the consumer that the level of seafood consumption is a problem and that changes, such as to lifestyle, or to the fish choices we make, are not necessary, or at worst temporary, to relieve the pressures on declining fish stocks. Despite these criticisms (summarised in Table 2.7.), the number and use of seafood guides globally persists. Questions remain, however, as to their efficacy in increasing the sustainability of seafood supply chains.

Table 2.7: Advantages and disadvantages of using seafood guides.

Example and Reference		
Pros	Help increase transparency and reduce seafood fraud	Seafood Guides provide recommendations; they are not certification schemes with third-party audits. However, by demanding that restaurateurs (and consumers) ask questions about the provenance of the seafood they are buying, seafood programmes can help reduce seafood fraud (Dolmage et al., 2016).
	Comprehensive	It is the opinion of Richter and Klockner (2017) that ‘seafood guides offer a clear overview of the sustainability level of all major consumed seafood products of a country, together with some information’.
	Provide an alternative and more inclusive approach to certification	Only 16 % of seafood produced globally is certified as sustainable against various standards including the Marine Stewardship Council (MSC) Standard.
	Increase diversity and food security in the marketplace	According to Potts et al. (2016) certified seafood is concentrated in a few species and mostly from developing countries. An advantage of recommendation lists is that ‘they fill an important niche, helping direct consumers towards a wider range of choices in their seafood purchasing decisions of uncertified or unlabelled products’ (Parkes et al., 2010).
	Fish lists provide clear advice of what to eat or avoid	Dietary advice to the public to increase consumption of fish conflicts with the prevailing pressure on fish stocks. ‘Clear advice should be communicated enabling consumers to meet nutritional needs while protecting fish stocks’ (Clonan, 2011). Hallstrom et al. (2019) maintains that to help increase the clarity and detail of what fish to eat, ‘it is important to better understand the relative environmental costs of various seafood sources’.
Cons	Confusion in the marketplace	‘Seafood guides have been criticised for causing confusion in the marketplace, for lacking consensus between organisations and different countries. Each uses a different methodology and criteria for assessing sustainability which is often inconsistent between guides’ (Roheim, 2009). According to Jacquet et al. (2009), ‘different consumer guides provide different recommendations depending on their criteria for assessing and ranking seafood, so that there is confusion generated not only by each card but also between cards’.
	Narrow focus of sustainability	Seafood sustainability is generally based, in the case of wild-caught fish, on the status of the target stock and the ecological impact of the fishery and does not typically address social issues (McClenachan et al., 2016), food security or problems associated with transport and processing of fish such as greenhouse gas emissions (Ziegler et al., 2016).
	Lack transparency	In the opinion of Iles (2004), seafood guides are, ‘weaker, less robust, and less transparent form of certification schemes’. Seafood guide advice is also vulnerable to being ‘undermined by mislabelling, renaming or non-labelling of seafood’ (Jacquet and Pauly, 2007 and 2008).

Passive or 'hands-off' approach	Seafood guides rely on 'consumers taking action (or not) to increase sustainability of seafood supply chain' (Konefal, 2013).
No apparent consideration of alternative approaches like seafood consumption curtailment or replacement	'Nowhere on the cards are people encouraged to eat less seafood' (Konefal, 2013).
Single-species approach	'Seafood guides focus on an individual commodity rather than connecting consumers to the larger sustainability issues of ocean health and sustainable fisheries' (Jacquet and Pauly, 2007; Gutierrez and Morgan, 2015).
Difficult to use	'Using seafood guides takes quite some time and effort' (Richter and Klockner, 2017).
Biased towards organisations philosophy	'Recommendations are often underpinned by assumptions based on the NGOs environmental philosophy (rather than evidence) that may not be explicit to the buyer' (Caveen et al., 2017).
Indiscriminate impact	Seafood guides have been criticised for being indiscriminate and imposing economic costs on responsible operators (Roheim & Sutinen, 2006).

There have been various initiatives to address criticism of seafood guides and resolve inconsistencies in seafood sustainability advice. For example, there were two initiatives, coordinated by Seafood Choices Alliance, an international programme of SeaWeb ²⁴ (a project of the Ocean Foundation ²⁵), tasked with developing a common methodology, first in the US in the early 2000s and then later in Europe in the period 2005-2011. Whilst these ultimately failed to produce an approach that could be adopted universally, a version of the methodology created by participating ENGO's in Europe, continues to be used by WWF, and the Good Fish Foundation (formerly the North Sea Foundation), to assess the environmental sustainability of the origins of seafood species from wild-capture and farmed fisheries (WWF, 2020).

In May 2008, 14 American and Canadian organizations formed the Conservation Alliance for Seafood Solutions and released their 'Common Vision for Environmentally Sustainable Seafood' (Conservation Alliance for Seafood Solutions, 2021). Later, in 2015, The Seafood Certification & Ratings Collaboration ²⁶ was founded, a collaboration of 5 organisations or programmes (Aquaculture Stewardship Council (ASC); Fair Trade USA; MSC; Monterey Bay Aquarium Seafood Watch Programme (SWP); and the Sustainable Fisheries Partnership (SFP)) which aims to increase the sustainability of the global seafood supply (The Seafood Certification and Ratings Collaboration, 2019). This collaboration has also published an online tool (Figure 2.5.), providing a '*global analysis of the sustainable seafood landscape*' ²⁷, which shows almost 37% of seafood produced globally in 2016 is certified, rated or in a Fishery Improvement Project (FIP).

²⁴ <https://seaweb.org/>

²⁵ <https://oceanfdn.org/>

²⁶ <https://certificationandratings.org/>

²⁷ <https://certificationandratings.org/sustainable-seafood-data-tool/>

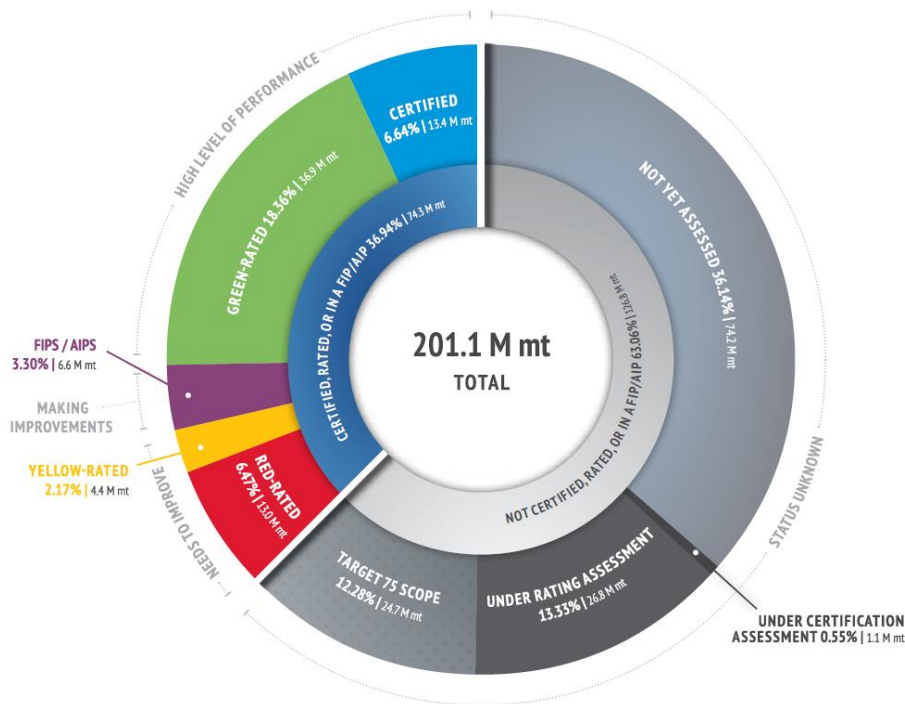


Figure 2.5: Sustainability status of global seafood production (Source: The Seafood Certification & Ratings Collaboration, 2019).

A more recent initiative (2016) to address the issue of inconsistency in seafood advice is the creation of the Global Seafood Ratings Alliance (GSRA)²⁸, a collaboration of seafood ratings organisations, whose goals include the ‘*harmonisation of fisheries and aquaculture environmental sustainability assessments worldwide*’ (GSRA, 2017).

Other marketing initiatives include the online platform FishChoice²⁹, launched in the USA in 2008 to help companies source sustainable seafood. This features recommendations for finfish and shellfish from around 80 sustainable seafood buying guides. The website receives around 30k visitors per month (J. Boevers, FishChoice, 2019, *Pers. Comm.*). Additional seafood initiatives such as Fishery Progress³⁰, the SFP Disclosure Project³¹, the Sustainable Seafood

²⁸ <https://globalseafoodratings.wordpress.com/>

²⁹ <https://fishchoice.com/> FishChoice aggregates sustainable seafood information, ratings and certifications, into a single platform, aligning sustainable seafood sourcing information into one set of data that can be used by suppliers to identify and promote the sustainability of their seafood.

³⁰ <https://fisheryprogress.org/>

³¹ <https://www.sustainablefish.org/Blog/SFP-s-Ocean-Disclosure-Project-A-new-platform-for-transparency>

Coalition (SCC) ³², OceanMind ³³, and the Global Dialogue on Seafood Traceability (GDST) ³⁴, have been established with the aim of increasing transparency, traceability and fisheries management enforcement within the global seafood supply chain (See Chapter 5 for discussion).

³² <https://www.sustainableseafoodcoalition.org/responsible/fishing>

³³ <https://www.oceanmind.global/>

³⁴ <https://traceability-dialogue.org/>

2.5. Towards sustainable seafood behaviour change

Understanding the nature and drivers of human behaviour in relation to seafood consumption is complex. Arising from a domain of psychological, social, and contextual factors (Darnton, 2008), human behaviour has been the subject of innumerable studies, examined through a wide range of theories, concepts and frameworks.

The following sections explore a selection of these frameworks in the context of marine environments and sustainable seafood consumption.

2.5.1. An introduction to individual behaviour change

Fundamental to engaging individuals as '*consumer (and marine) citizens*' in developing environmentally responsible behaviour is understanding of the factors which influence behaviour (Hines et al., 1987).

According to Dual Process Theory (Wason and Evans, 1975), individual behaviour is the result of the interaction of two distinct systems operating in the brain (Figure 2.6), in which some actions are consciously planned, or deliberative (reflective), whilst others are governed by automatic, or non-deliberative (impulsive), processes (Grayot, 2019; Hansen, 2016; Strack and Deutsch, 2004; Tversky and Kahneman, 1974). Consequently, approaches to understanding individual behaviour and how to predict and influence it are generally founded upon this dual system.

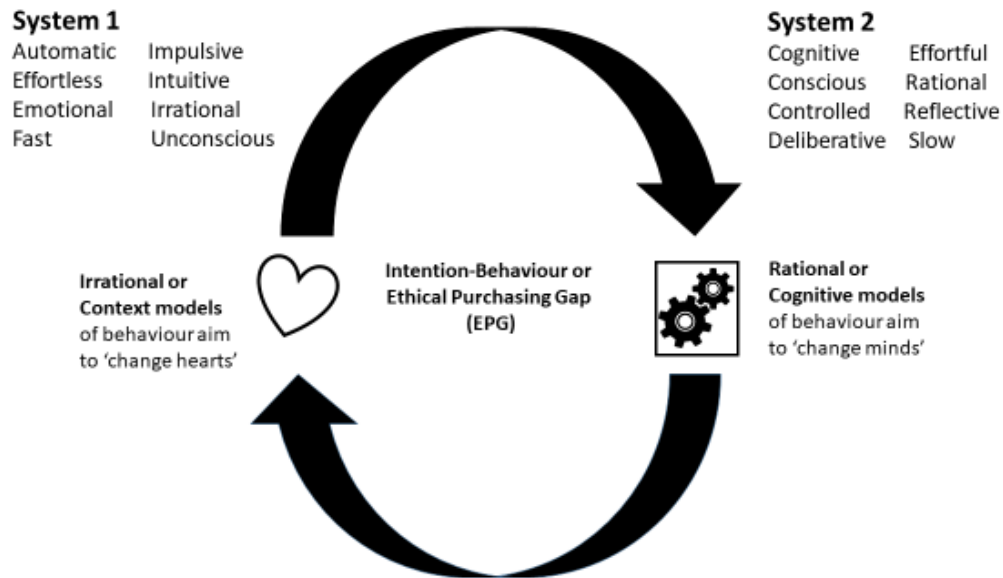


Figure 2.6: Schematic diagram of individual behaviour (Source: Adapted from: Sieck, 2021; Hansen, 2016; and Dolan et al., 2012).

As described by Dolan et al. (2012), rational or '*cognitive models*' of behaviour change aim to 'change minds' by influencing the way people think, while '*context (within which people act) models*', recognise that because individuals are influenced by external factors, their choices are sometimes seemingly irrational and conflicting (Dolan et al., 2012). The context of supermarket shopping for food, including fish, for example, is illustrative of System 1, in which people often apply '*fast and frugal*' heuristics³⁵ to support their decision-making (Kalnikait et al., 2013) and where interventions such as '*nudging*' (See Section 2.5.9.3) are used to influence purchasing behaviour by altering environmental cues (Broers et al., 2017). Dual Process Theory also provides a framework for understanding the intention-behaviour or ethical purchasing gap (EPG) i.e., the gap or difference between intended behaviour, what we know we should do (or buy) and actual behaviour (Olstad et al., 2014). (See Section 2.5.5).

To evaluate the relevance of the various models for this study, a categorisation of frameworks based on the way models are designed to influence behaviour is proposed (Figure 2.7). These models and concepts are further discussed in the following sections.

³⁵ Heuristics or rules of thumb (Kahneman, 2011).

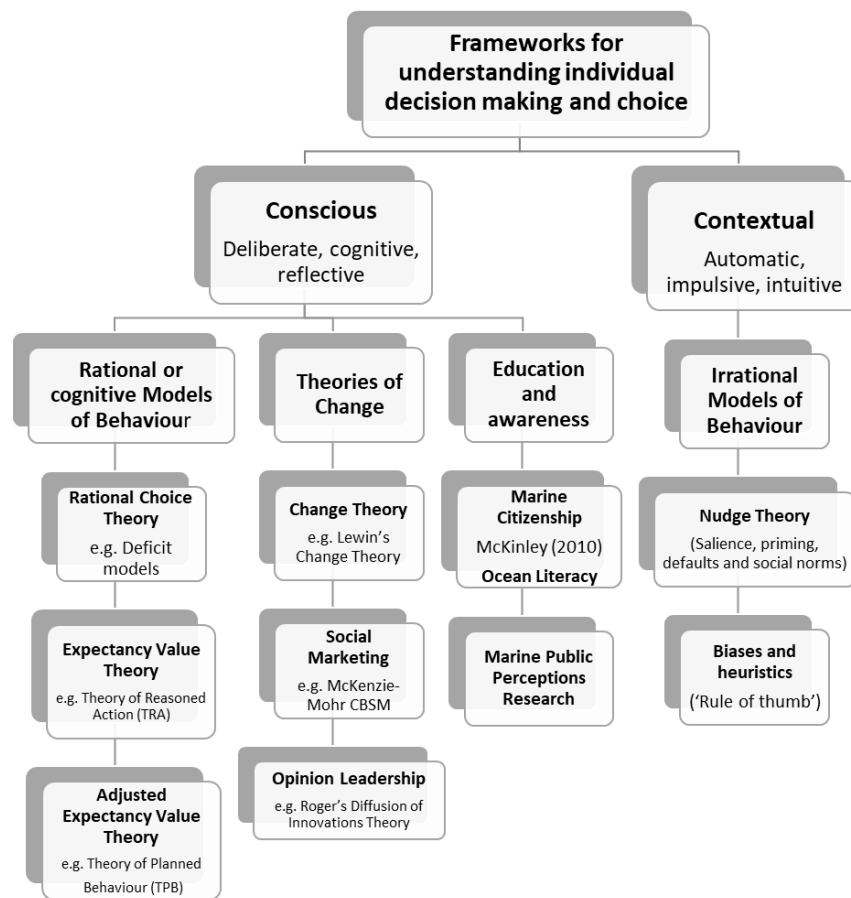


Figure 2.7: Categorisation of frameworks for understanding consumer decision making and choice.

2.5.2. Theoretical behaviour change models and theories

Understanding consumer behaviour is challenging, with key questions surrounding why consumers behave in certain ways, what motivates behaviours, and how responsible behaviour can be encouraged to help achieve national Government and international environmental objectives (Appendices 4 and 5). Conceptual models play an important role in providing *'heuristic frameworks'* for: 1) exploring and conceptualising consumer behaviour; and 2) empirically testing the strength of different kinds of relationships in different circumstances (Jackson, 2005). In short, theoretical models help us to understand specific behaviours by identifying the underlying determining factors that influence them (Darnton, 2008).

In the context of sustainable seafood consumption, Richter and Klockner (2017) identify a range of advantages of theoretical modelling including: understanding of how consumers' decisions are made; the factors influencing seafood consumption and how they interact; and identification of potential interventions to motivate consumer's sustainable seafood purchases. The Norm-activation model (NAM) and TPB, along with the Value-Belief-Norm (VBN), are the most widely used theories in the field of environmental psychology (Klößner, 2013) – summarised in Table 2.8.

Table 2.8: Key behaviour models (Source: Adapted from Jackson, 2005 and Darnton, 2008).

Behaviour Model	Key individual control factors (or determinants)	Description of model or theory	Key Reference
Theory of Interpersonal behaviour (TIB)	Habit and routine	Like the Theory of Reasoned Action (TRA), the TIB includes both expectancy-value and normative belief constructs ³⁶ . TIB includes additional influencing factors, notably habit.	Triandis (1977)
Theory of Reasoned Action (TRA)	Values, beliefs, attitudes	A well-known general theory of social behaviour, the TRA 'adjusts' expectancy value theory to include the influences of subjective norms on behavioural intention.	Fishbein and Ajzen (1975); Ajzen and Fishbein (1980)
Model of Responsible Environmental Behaviour	Knowledge of issues, knowledge of action strategies, locus of control, attitudes, verbal commitment, and an individual's sense of responsibility	A model of predictive variables most strongly associated with responsible environmental behaviour. Knowledge of the problem or issue and how to act is identified as conditional to responsible behaviour or action.	Hines et al. (1987) and Hines (1984)
Theory of planned behaviour (TPB)	Agency, efficacy and control	TPB adjusts TRA to incorporate the individuals perceived control over the outcomes of the behaviour, known as Perceived Behavioural Control (PBC).	Ajzen (1991)

³⁶ Constructs are defined as, "internal attributes or characteristics that cannot be directly observed but are useful for describing and explaining behaviour" (Gravetter and Wallnau, 2017 p.19).

Focus Theory of Normative Conduct	Norms and identity	Cialdini's Focus Theory of Normative Conduct proposes that behaviour is guided by social norms and that the strength or 'salience' of these different kinds of norms is dependent on a variety of 'dispositional' and 'situational' factors.	Cialdini, Kallgren and Reno (1990) and (1991)
Norm Activation Theory (NAM)	Norms and identity	NAM is one of the most widely known models of moral or pro-social and altruistic behaviour. The theory introduces the concept of personal norms as a direct influence of pro-social behaviour.	Schwartz (1977) and (1992)
Value-Belief-Norm (VBN) Theory	Values, beliefs, attitudes	VBN is an adaptation of Schwartz's Norm Activation theory. VBN distinctly links NAM to Value Theory ³⁷ , hypothesising that pro-environmental behaviour arises from values held by the individual towards the outcome of the behaviour.	Stern (1999) and (2000)
Model of pro-environmental behaviour	Agency, efficacy and control	Kollmuss and Agyeman (2002) propose their own model which is based on the work of Fliegenschnee and Schelakovsky (1998) who were in turn influenced by Fietkau and Kessel (1981).	Kollmuss and Agyeman (2002)

Researchers who view environmental behaviour primarily as pro-socially motivated often use NAM (Schwartz, 1977) as a theoretical framework, whereas researchers who view self-interest as the more important influencer, rely more on rational choice models like the Theory of Reasoned Action (TRA) or TPB (Ajzen, 1991; Bamberg and Moser, 2007). In the field of

³⁷ Schwartz Value Theory defines ten broad (or universal) values according to the motivation that underlies each of them (Schwartz, 2012, p.4).

ethical consumerism, the theoretical frameworks of TRA and TPB, are most frequently applied to understand the purchasing decisions of the ethically motivated (Carrington et al., 2010). In particular, TPB has been used to understand motivations for a range of positive or pro-environmental behaviours (PEBs)³⁸ (see for example, Budovska et al., 2020; Passafaro et al., 2019; Wu et al., 2017), including consumer purchasing behaviours such as: purchasing green products (Yadav and Pathak, 2017; Paul et al., 2016; Liobikiene et al., 2016); healthy eating (Malek et al., 2017; McDermott et al., 2015); increasing organic food consumption (Scalco et al., 2017; Arvola et al., 2008); sustainable food consumption (Dowd and Burke, 2013); ethical food choices (O'Connor et al., 2017); and fruit and vegetable consumption (Lien et al., 2002). TPB has also been used as a framework for examining behaviour-change interventions (De Leeuw et al., 2015) and applied extensively in studies to understand what motivates consumers when purchasing fish, including sustainable seafood, and the use of seafood guides (see for example, Arsil et al., 2019; Higuchi et al., 2017; Aghamolaei et al., 2012; BreCARD et al., 2009; Vermeir and Verbeke, 2008) (Section 2.5.4).

Given the wide application of TPB to the understanding of purchasing behaviours, including health, green and ethically motivated purchasing behaviour, in addition to the view of PEB as, *“a mixture of self-interest (e.g., to pursue a strategy that minimises one’s own health risk) and of concern for other people, the next generation, other species, or whole ecosystems (e.g., preventing air pollution that may cause risks for others’ health and/or the global climate)”* (Bamberg and Moser, 2007, p.15), it has been selected as an appropriate framework for examining motivating factors for using seafood guides to purchase sustainable fish.

2.5.3. Rational or cognitive models of behaviour

Rational choice models of behaviour, often called (Subjective) Expected Utility (SEU or EU) models, are based upon standard economic theory and the concept of rational choice i.e., the theory that individuals tend to behave in their own best self-interests, with the aim of

³⁸ Pro-environmental behaviour' (PEB), refers to behaviour that, *“consciously seeks to minimize the negative impact of one’s actions on the natural and built world”* (Kollmuss and Agyman, 2002, p.240).

maximising the 'utility' or 'benefit to themselves' (Darnton, 2008). The original and simplest rational models of pro-environmental behaviour were based on a linear progression of environmental knowledge leading to environmental awareness and concern (environmental attitudes), which in turn was thought to lead to pro-environmental behaviour (Figure 2.8) (Kollmuss and Aygeman, 2002, p.241).

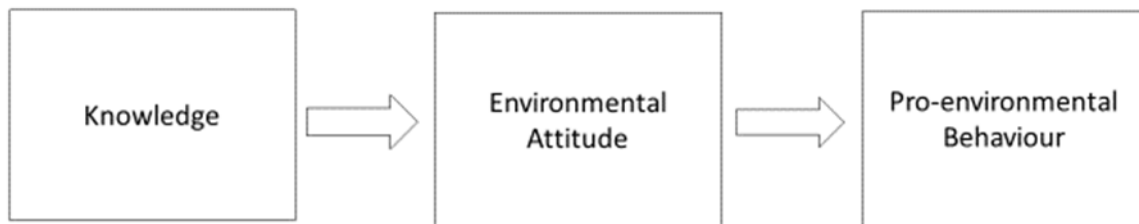


Figure 2.8: Early model of pro-environmental behaviour (Source: Kollmuss and Aygeman, 2002, p.241).

These models, termed information, or knowledge 'deficit' models (Burgess et al., 1998), assumed that providing people with more information or knowledge about environmental issues would automatically result in an increase in more pro-environmental behaviour (Kollmuss and Aygeman, 2002). Proponents of these models argued that environmentally damaging behaviour occurs because of ignorance of the consequences of the behaviour, and that by increasing awareness about the impacts of behaviour and potential solutions, people would engage in more environmentally friendly behaviour (Barr and Gilg, 2007; Owens, 2000). In the seafood context assumptions are made regarding the use of seafood guides for provision of information to change purchasing behaviour (See Section 3.2).

Expectancy value (EV) models provide another framework for understanding and predicting human behaviour (Arvola et al., 2008). EV models belong to a large group of theories which are based on the idea that individuals behave according to the beliefs they hold about the consequences of a behaviour and the values they attach to them (Jackson, 2005). Although EU and EV are both rational choice models where attitudes are the product of linear calculations, EV can be differentiated from EU theory by the fact that it explores the 'antecedent' factors contributing to attitudes (Darnton, 2008). The TRA developed by Ajzen

and Fishbein (1980) (Figure 2.9) is one of the best known of the EV models.

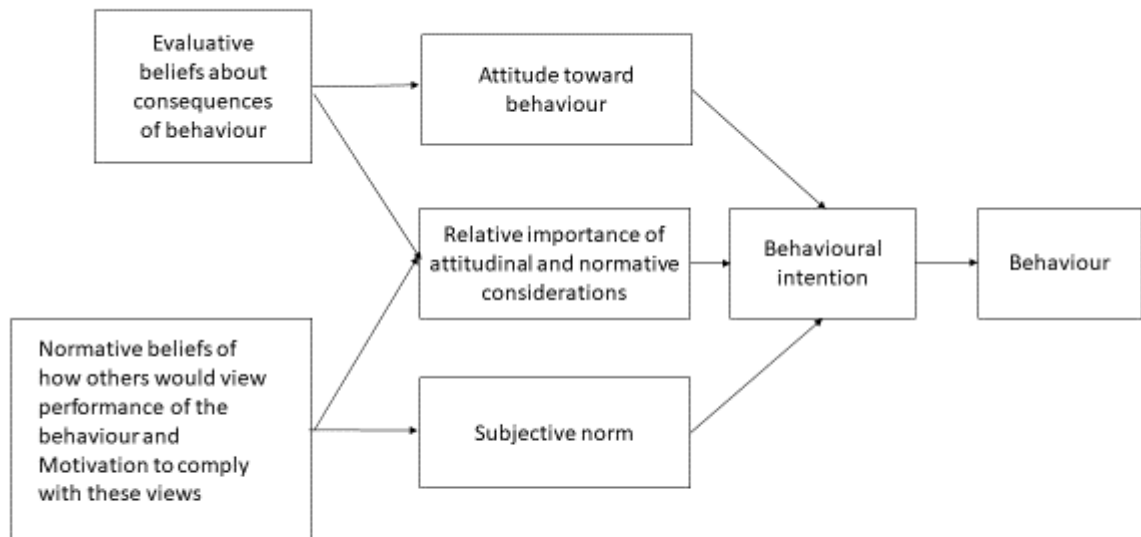


Figure 2.9: Theory of reasoned action (TRA) (Source: Reproduced from Ajzen and Fishbein, 1980).

The model holds that *beliefs* about behavioural outcomes, combined with an *evaluation* of those outcomes determines a person’s *attitude* to that behaviour and, according to Fishbein and Ajzen (1975), attitude towards the behaviour is one of two main influences on people’s *intention* to act in a certain way. In the Ajzen-Fishbein model (1980), intention to act is the immediate precursor and key determinant of behaviour. A second major influence on *behavioural intention* in the TRA is what Fishbein and Ajzen called a person’s *subjective norm*, which they define as a person’s “*perception that most people who are important to him think he should or should not perform the behaviour in question*” (Ajzen and Fishbein, 1980, p. 57). Social normative beliefs refer to the individual’s perception of the behaviours expected of relevant or significant others (Ajzen and Fishbein, 1970). The theory stresses that attitudes must be measured in relation to the specific behaviour in question (and not behaviours of that type) to maximise the predictive power of the attitudinal construct (Arvola et al., 2008).

In response to criticism of rational choice and ‘expectancy value’ theory, ‘adjusted expectancy value’ theory was developed which extends the expectancy value structure of the rational choice model (Jackson, 2005). In particular, the extended models attempt to account for the

influence of other people’s attitudes on individual behaviour (Jackson, 2005). As EV models evolved to become more extended (or ‘adjusted’) through the inclusion of additional factors, so the relative influence of attitudes in predicting behavioural outcomes reduced (Darnton, 2008). This pattern can be observed in the extension of TRA into the even more widely used TPB (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), one of the most frequently cited and influential models for the prediction of human social behaviour (Ajzen, 2011). See Figure 2.10.

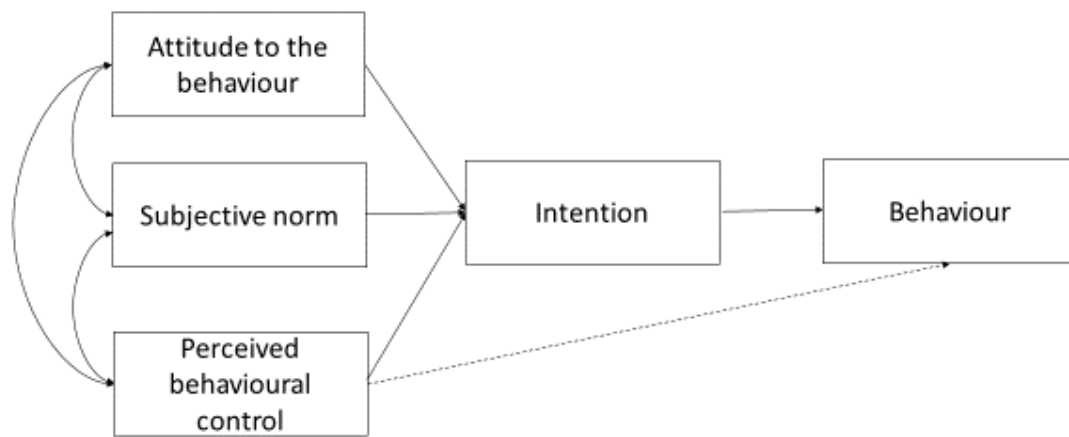


Figure 2.10: Theory of planned behaviour (TPB) (Source: Adapted from Ajzen, 1991).

In TPB, the TRA is adjusted to include a new variable, known as *perceived behavioural control* (PBC) (Armitage and Conner, 2001). This addition allows for analysis of behaviours not completely under a person’s control (Sparks and Shepherd, 1992) and exerts both a direct effect on behaviour, and an indirect effect through intentions (McDermott et al., 2015). PBC is defined as “*the person’s belief as to how easy or difficult performance of the behaviour is likely to be*” (Ajzen and Madden, 1986, p. 457). It is acknowledged as having some similarities with the concept of self-efficacy or agency proposed by Bandura (1977), defined as, “*the conviction that one can successfully execute the behaviour required to produce the outcomes*” (p. 193). Similarly, self-efficacy is described by Hope et al. (2018) as the “*belief in one’s ability to perform a task or make a difference*” (p. 414). Agency is important in influencing behaviour

as it reflects an individual's perception as to whether they can take a certain action, how much effort an individual is prepared to put in or whether, if at all, the behaviour will be attempted (Johe and Bhullar, 2016; Darnton, 2008).

Behavioural intention reflects a person's decision to perform the behaviour (Fishbein & Ajzen, 1975) and, according to Bredahl (2001), also functions to moderate the impact of attitude on behaviour. As stated by Ajzen (1991, pp. 79), "*intentions to perform behaviours of different kinds can be predicted with high accuracy from attitudes toward the behaviour, subjective norms, and perceived behavioural control; and these intentions, together with perceptions of behavioural control, account for considerable variance in actual behaviour*". The theory assumes that behavioral intentions capture the motivational influences of behaviour, thus intentions are seen as the closest determinant of behaviour (Ajzen, 1991; McDermott et al., 2015).

Although TPB is one of the more commonly used models to explore behaviour change, it is worth noting that no single behavioural model has ever been found to accurately (i.e., 100%) predict intentions, with TPB closest at 71% (Alhamad and Donyai, 2021; Ajzen, 1991). Static models such as TPB have been criticised by some authors for their inability to encapsulate the 'dynamics of consumer behaviour' (Scholderer and Trondsen, 2008). For example, TPB does not include factors such as habit, which research shows to be critical in influencing behaviours (Darnton, 2008). In Theory of Interpersonal Behaviour (TIB), for example, the model allows for 'less deliberative' behaviours by including habit, which is perceived as the primary determinant of behaviour (Triandis, 1977), and is represented by a pathway to behaviour that is separate to the one for intention (Darnton, 2008). This model has been used in earlier seafood consumption studies - For example, in a study of Norwegian consumers, Honkanen et al. (2005) found that past seafood consumption behaviour and habit, defined by the authors as, '*a behaviour that is automatically repeated without self-instruction*', rather than attitudes, explained seafood purchase intentions.

Social norms appear in the TPB as 'subjective norms' which is, '*the perceived social pressure to perform or not to perform the behaviour*' (Ajzen, 1991, p.188). As with attitudes, the influence of social norms in the TPB is mediated through intentions (Ajzen, 1991). Cialdini's

Focus Theory of Normative Conduct identifies three types of social norms: descriptive, injunctive, and personal, that have been found to have a profound effect on human action (Cialdini et al., 1990) and are influential both in hindering and in fostering pro-environmental or responsible behaviour (Jackson, 2005). In experiments on littering in public places, Cialdini found that when a researcher dropped litter in an otherwise clean street, individuals tended not to litter themselves. Instead of copying the litterer, it drew their attention to the descriptive norm i.e., that most people had not littered (Cialdini et al., 1990 and 1991). The descriptive norm describes what is typical or 'normal', *'it is what most people do'* and *'if everyone is doing it, it must be a sensible thing to do'* (Cialdini, 1988). By observing and 'imitating' the behaviour of most others, individuals can better inform their own choices (Cialdini et al., 1990). In contrast, to descriptive norms, injunctive norms describe *'what ought to be done'* (Cialdini et al., 1991). Norm-activation Theory (NAM) (Schwartz, 1970) in contrast to TPB focuses on personal norms as the main driver of behaviour (Klockner, 2011). Personal norms, as defined in the NAM, are *"experienced as a feeling of moral obligation to act in accordance with an individual's own value systems"* (Hynes and Wilson, 2016, p. 350).

The use of 'normative messaging' (Vesely and Klockner, 2017) and social marketing (Salazar et al., 2019) (See Section 2.5.7.2), to increase pro-environmental behaviour, makes use of the well-known fact, people copy the behaviour of others (Richter et al., 2018). Social norms are 'shared beliefs' which guide how we should behave and how we expect others to behave (Thøgersen, 2006). They reflect an individual's understanding of the level of 'social approval' or support for engaging in a particular behaviour (Cooke, 2016). Social norms are therefore important in helping to understand the food choices we make (Onwezen et al, 2019; Vermeir and Verbeke, 2008) and are also found to have an impact on sustainable food consumption (Lucas, 2018; Vermeir and Verbeke, 2008; Vermeir and Verbeke, 2006; Verbeke and Vackier, 2005). In sustainable seafood consumption, social norms are important in enabling consumers to align their own choices with purchases made by others (Richter and Klockner, 2017). Closely linked to social norms are personal norms. Personal norms, as outlined above, are experienced as a sense of moral responsibility or obligation towards others which is particularly relevant to pro-environmental behaviour (Thøgersen, 2006), including buying sustainable seafood (Honkanen and Young, 2015).

Given widespread recognition of seafood as both a healthy and more ‘climate-friendly’ choice when compared to other animal proteins (Koehn et al., 2022; Hallstrom et al., 2019), social norms around consumer concern for seafood sustainability are identified by Richter and Klockner (2017) as more ‘unusual’ in light of ‘what is done’ i.e., consuming fish for individual and ‘planetary-health’ reasons. One simple criterion for defining when a behaviour becomes a social norm is when an acceptable amount of people understands ‘*the rule and the situations within which the rule applies*’ (Bicchieri, 2006). As seafood guide use is neither very common or easy to observe it is more difficult for people to identify with it and feel that it is a behaviour carried out by others (Richter et al., 2017). This study uses the TPB to examine motivating factors for using the MCS GFG to chose sustainably produced seafood and discussed in Section 2.6.

2.5.4. Models of fish consumption and purchasing behaviour

Numerous studies have applied conceptual models to identify individual determinants of behaviours related to seafood consumption and/or seafood guide use. In most cases summarised in Table 2.9, TPB is used, with or without the addition of other variables, as the theoretical framework for analysis.

Table 2.9: Summary of studies using theoretical behaviour models to examine factors influencing fish consumption.

Behaviour Model	Key control or influencing factors	Aims/objectives of the study	Examples of Author(s)/Studies
TPB	Attitude; Social norms; PBC (Perceived behavioural control).	TPB was used to explain intention to buy 3 different seafood products: fresh, frozen and shellfish.	Bredahl and Grunert (1995)
TPB	Attitude; Norms; control barriers e.g., price; moral obligation; health involvement.	Study investigates antecedents of seafood consumption and buying behaviour.	Olsen (2004)
TPB	Attitude; Subjective norms; PBC.	Study investigates individual determinants of fish consumption behaviour.	Verbeke and Vackier (2005)

TPB	Attitude; Social and Descriptive norms; PBC.	The study examines the role of norms in explaining attitudes, intention and consumption of a common food (fish) in Vietnam.	Tuu et al. (2008)
TPB	Key barriers: Affordability, lack of awareness of sustainability, lack of knowledge and confidence in cooking; Key drivers: Awareness of sustainability, attitudes, and preferences toward fresh seafood.	In this study TPB is used to identify key drivers and barriers for consumption of sustainable seafood.	Birch (2015)
TPB	Attitude; Social and Personal norms; Perceived consumer effectiveness (PCE).	Study explores the role of determinants of consumers' buying intentions towards sustainable seafood.	Honkanen and Young (2015)
Kollmuss and Agyman (2002)	Subjective knowledge; pro-environmental self-identification; personal responsibility; and PCE.	Study investigates which psychological consumer characteristics influence demand for eco-labelled seafood.	Jonell et al. (2016)
TPB	Attitudes; Subjective norm; PBC; moral obligation; involvement in health; availability; intention.	Using an extended version of TPB the study aimed to determine the factors influencing fresh fish consumption in Croatia.	Tomic et al. (2016)
TPB	Health; Attitude; Subjective norms; Past experience (behavioural control).	Study uses an extended version of TPB to understand determinants of fish consumption in modern Metropolitan Lima.	Higuchi et al. (2017)
TPB	Intentions; Attitudes; Social norms; knowledge; trust; habit; situational factors e.g., price, availability.	Study investigates psychological variables for sustainable seafood consumption.	Richter and Klockner (2017)
TPB	Trust; Social norms; Attitude.	Study explores which factors predict sustainable seafood consumption (use of eco-labels and seafood guides) among Norwegian seafood consumers.	Richter et al. (2017)

2.5.5. Drivers of behaviour change

Although the supply of information has frequently been shown to be an over-simplification of the drivers of behaviour change (Jefferson et al., 2014; Campbell and Arvai et al., 2012) and

barriers to acting not necessarily attributed to lack of understanding or knowledge (Owens, 2000), knowledge of environmental issues has been shown to influence changes in behaviour (Smith et al., 2015). Knowledge is recognised as an important factor in the decisions when purchasing fish (Lawley et al., 2019; Pieniak et al., 2013).

Furthermore, Mont et al. (2014) observes that many policy tools rely on 'changing minds' by influencing the way people think. Such a process depends: on the availability of information; an ability to process it; and the individual making rational choices (Mont et al., 2014). Notwithstanding the importance of information as a driver for many behaviours (Darnton, 2008), Hansen (2016) argues because behaviour is to a large extent automatic, routinised and intuitive and not affected by information, information alone is insufficient to change behaviour. Environmental campaigning however continues to be grounded in the supply of information (Ölander and Thøgersen, 2014; Abrahamse et al., 2005). For example, information in the form of seafood guides, is fundamental to seafood campaigns, internationally and in the UK, and are assumed to drive individual behaviour change by influencing consumer's sustainable seafood choices.

When people do not act rationally i.e. in their best interest and according to their choices, it is often assumed that it is due to 'lack of information or misguided incentives' and is referred to as the *Attitude-Behaviour* (Joshi and Rahman, 2019; Wiederhold and Martinez, 2018; Vermeir and Verbeke, 2006) or *Intention-Behaviour* (Bianchi et al., 2018; Broers et al., 2017; Hassan et al., 2016; Carrington et al., 2010) or *Ethical Purchasing Gap* (Lawley et al., 2016; Bray et al., 2010). An attitude-behaviour gap has been used to describe how, for example, in the case of sustainable food consumption, attitudes alone are often a poor predictor of how consumers will behave in relation to food purchasing (Vermeir and Verbeke, 2006). In the context of seafood consumption, research indicates that although consumers are concerned about the impacts of fishing, there remains a behavioural gap between understanding the importance of sustainable seafood and making the right seafood choices (Oosterveer and Spaargaren, 2011).

Research has also found that conflicts between attitude and behaviour may produce 'dissonance', which can result in behaviour-forming attitude, rather than the other way around (Maio and Haddock, 2009). The term *cognitive dissonance*, coined by Festinger (1957), is used to describe the way people need to have consistency in the way they behave (Golob et al., 2018; Thøgersen, 2004). A study by Priolo et al. (2016) found that people can be encouraged to engage in ecological behaviours by inducing feelings of hypocrisy and inconsistency associated with past lapses of a social norm i.e. by reminding participants of injunctive norms, which as outlined above, '*specify what ought to be done*' (Cialdini et al., 1991), and descriptive norms which describe what is typical of what most people do (Cialdini, 1988), individuals can be encouraged to change their future behaviour in order to avoid negative feelings associated with hypocrisy.

Conversely, where there is inconsistency in behaviours, people are found to use 'compensatory green beliefs' and 'moral licensing' to offset or justify engaging in environmentally damaging behaviour e.g., driving or flying by performing environmentally positive behaviours, such as recycling, and avoid feelings of guilt (Hope et al., 2018). An alternative framework for the study of dissonance is Bem's Self-perception Theory (Bem, 1972 and 1967). The theory proposes that individuals come to know their own '*attitudes, emotions and other internal states*' from examination of their own behaviour and/or the situation in which the behaviour occurs (Bem, 1972), highlighting the importance of individual behaviour in shaping attitudes (Lanzini and Thøgersen, 2014; Jackson, 2005).

Another way in which the concept of dissonance between attitude, including about the self, and behaviour has been assimilated into social psychological theories of pro-environmental behaviour is through inquiry of so-called 'spillover effects' between one kind of environmental behaviour and another (Jackson, 2005). The phenomenon of "*behavioural spillover*" is broadly defined as, "*the effect where change in one behaviour causes a change in another separate but related behaviour*" (Thomas et al., 2019, p.2). The effect on other environmental behaviours may be positive or negative, depending on whether the effect increases or reduces a person's chance of performing the behaviour, and whether the change

in behaviour achieved is, for example, more or, less costly or valuable (Margetts and Kashima, 2017; Lanzini and Thøgersen, 2014).

Research has also shown that people with a strong pro-environmental attitude are more likely to succeed in carrying out relatively difficult environmental behaviours such as purchasing sustainable seafood compared to those individuals with weaker pro-environmental attitudes (Richter and Klockner, 2017; Richter et al., 2017). However, whilst attitudes are acknowledged as having an important role in shaping a person's opinion of the object in question (Ajzen and Fishbein, 1977; Fishbein and Ajzen, 1972), it is not the only influence (LaPiere, 1934), and why according to Broers et al. (2017), the intention-behaviour gap is one of the reasons motivation-based techniques which target the deliberative processing system of the brain (System 2) often have only 'moderate results' (p.912). Alternative approaches to 'filling the gap' are to use behaviour change models exploiting the non-deliberative processing of the brain (System 1) (Figure 2.6) and discussed in Section 2.5.7.

2.5.6. Drivers of fish purchasing behaviour

Despite a global increase in seafood consumption (FAO, 2022), seafood is not universally popular, and many people do not consume the levels of seafood recommended by Government and health professionals (See Section 2.3.5) (Kantor, 2016; Birch and Lawley, 2012). Psychological research has shown that consumers' purchase decisions are influenced by a range of '*psychological and contextual factors and their interactions*' (Klockner, 2011). Not unlike the consumption of other products, the drivers of seafood purchasing, and consumption are complex and influenced by several factors, which have been examined by numerous scholars (summarised in Table 2.10).

Factors influencing seafood purchasing can be considered in terms of situational, environmental, and personal factors (Godfray et al., 2018); egoistic factors, such as health consciousness (Birch et al., 2018), which is especially important in motivating consumption of seafood, and altruistic factors, such as those associated with ethical or social and

environmental consciousness or values (Birch et al., 2018; Hansen et al., 2018). Situational factors (Steg et al., 2014) include factors such as seafood eating habits (Carlucci et al., 2015), and those that relate to where seafood is bought, such as convenience (Olsen et al., 2007; Boldero, 1995) and visibility (Brick et al., 2017).

Table 2.10: Drivers and barriers for seafood purchasing and consumption.

Variable	Author(s)	Variable	Author(s)/Examples of studies
Age	Grieger et al. (2012); Trondsen et al. (2004a); Olsen (2003)	Neophobia ³⁹	Birch et al. (2017); Smith et al. (2015); Birch and Lawley (2013)
Availability	Christenson et al. (2017); Alm and Olsen (2015); Carlucci et al. (2015)	Personal factors e.g., weight	Thong and Solgaard (2017); Trondsen et al. (2004a)
Convenience, time to prepare	Christenson et al. (2017); Thong and Solgaard (2017); Carlucci et al. (2015); Birch et al. (2012); Brunso et al. (2008); Olsen et al. (2007)	Price	Christenson et al. (2017); Carlucci et al. (2015); Grieger et al. (2012); Brunso et al. (2008); Verbeke and Vackier (2005)
Country of origin	Hinkes and Schulze-Ehlers (2018); Brunso et al. (2008)	Product type e.g., fresh vs. frozen	Vanhonacker et al. (2013); Birch and Lawley (2012); Brunso et al. (2008); Bredahl and Grunert (1995)
Culinary skills or competence, confidence, knowledge	Christenson et al. (2017); Carlucci et al. (2015); Almeida et al. (2015a)	Production type i.e., wild-caught vs. farmed	Brayden et al. (2018); Brunso et al. (2008)
Geography, regionality e.g., proximity to the sea	Zhang et al. (2021); Cardoso et al. (2013)	Physical properties e.g., bones	Verbeke and Vackier (2005)
Habit, fish eating (inc. culture)	Musarskaya et al. (2017); Almeida et al., 2015b; Carlucci et al. (2015); Birch and Lawley (2013); Honkanen et al. (2005); Verbeke and Vackier (2005)	Quality	Christenson et al. (2017); Olsen et al. (2017); Altintzoglou and Morten Heide (2016); Birch et al. (2012); Olsen (2004)
Health benefits	Birch et al. (2017); Christenson et al. (2017); Samoggia and Castellini (2017); Carlucci et al. (2015); Birch et al. (2012); Pieniak et al. (2010); Brunso et al. (2008); Pieniak et al. (2008);	Satiety	Brunso et al. (2009); Prell et al. (2002)

³⁹ Dislike of any new or unfamiliar food

	Verbeke and Vackier (2005); Trondsen et al. (2004a); Trondsen et al. (2004b).		
Household members, size e.g., presence and number of children	Carlucci et al. (2015); Brunso et al. (2008); Myrland et al. (2000) Trondsen et al. (2003)	Sensory properties e.g., smell and taste	Christenson et al. (2017; Thong and Solgaard (2017); Birch et al. (2017); Carlucci et al. (2015); Brunso et al. (2008); Verbeke and Vackier (2005)
Lifestyle factors	Stancu et al., 2022; Torrissen and Onozaka (2017); Myrland et al. (2000)	Situational factors e.g., accessibility	Leek et al. (2000)
Variable	Author(s)	Variable	Author(s)/Examples of studies

2.5.6.1. Drivers and barriers relating to sustainable seafood consumption

While the section above explores the overall drivers and barriers to seafood purchasing and consumption, these may be different in the context of *sustainable* seafood consumption. There are nonetheless numerous studies investigating WTP for seafood sustainability attributes such as eco-labelling, welfare, and organic, for example. However, by comparison to investigation of what drives seafood consumption generally, understanding of the motivations for purchasing and consuming sustainable seafood has so far received little attention in the academic literature. Key research is summarised in Table 2.11.

Table 2.11: Driver and barriers for sustainable seafood purchasing and consumption.

Variable	Author(s)	Variable	Author(s)
Affordability	Birch (2015)	Attitude	De La Lama et al. (2018); Richter et al. (2017) Honkanen and Young (2015); Clonan et al. (2011)
Attributes, WTP e.g., sustainability, welfare, organic etc.	Zander and Feucht (2017); Hilger et al. (2015); Ellingsen et al. (2015); Olesen et al. (2010)	Carbon footprint	Vázquez-Rowe et al. (2013)
Eco-labelling/ Certification/WTP	Asche et al. (2021); Hori et al. (2020); Hinkes and Schulze-Ehlers (2018); Bronnmann and Asche (2017); Sun et al. (2017); Van Osch et al. (2017); Brecard et al. (2009)	Geography e.g., Local	Tookes et al. (2018)
Information	Jacobs et al. (2018); O'Rourke & Ringer (2016)	Knowledge, awareness, importance of sustainability	Lawley et al. (2019); De La Lama et al. (2018); Jonell et al. (2016); Almeida et al. (2015b); Dolmage et al. (2016); Birch (2015); Pinto de Moura et al. (2012)

Media effects e.g., newspaper coverage	Bellotti and Panzone (2016)	Moral obligation	Honkanen and Young (2015)
Motivation e.g., health/sustainability; Intentions	Richter and Klockner (2017); Clonan et al. (2011)	Personal responsibility	Jonell et al. (2016)
Social norms	Richter et al. (2017); Honkanen and Young (2015)	Sustainability labelling e.g., traffic light	Hallstein and Vilas-Boas (2013); Hallstein and Vilas-Boas (2009)

Through this study, the role of seafood guides in increasing consumer awareness and knowledge of seafood sustainability and how their use might influence decision making when purchasing seafood will be explored. In addition, the study will characterise a ‘typical’ GFG user so that existing audiences for the Guide might be better targeted and opportunities to engage with new audiences identified (Wright et al., 2015).

2.5.7. Sustainable seafood campaigns

Theories of change, as distinct from aforementioned theories of behaviour, ‘*show how behaviours change over time, and can be changed*’ (Darnton, 2008), with one of the more influential models, Kurt Lewin’s Change or Field theory (Burnes and Cooke, 2013). Seafood campaigns that exploit consumer behaviour change “*to create economic incentives for well-managed fisheries*” (Roheim et al., 2018, p. 393), have been ascribed to both Theory of Change and Social Marketing (Roheim et al., 2018; Jacquet and Pauly, 2007), which will now be explored along with Opinion leadership in the context of seafood purchasing and consumption.

2.5.7.1. Theory of Change

NGOs within the SSM, including MCS, have applied ‘Theory of Change’ to achieving their environmental goals. For example, through its Theory of Change (Figure 2.11), MCS’s values of the ocean are communicated via the GFG to consumers as ‘agents of change’. By making

changes to their individual behaviour when buying fish, it is anticipated that consumers will help achieve MCS's goal of *'fisheries and aquaculture that respect our environment and contribute to thriving seas and society'*. Attainment of this goal progresses MCS's mission to lead change for healthy seas and coasts and ultimately, to fulfilment of MCS's vision of, *'seas full of life: seas and coasts where nature flourishes and people thrive'*.

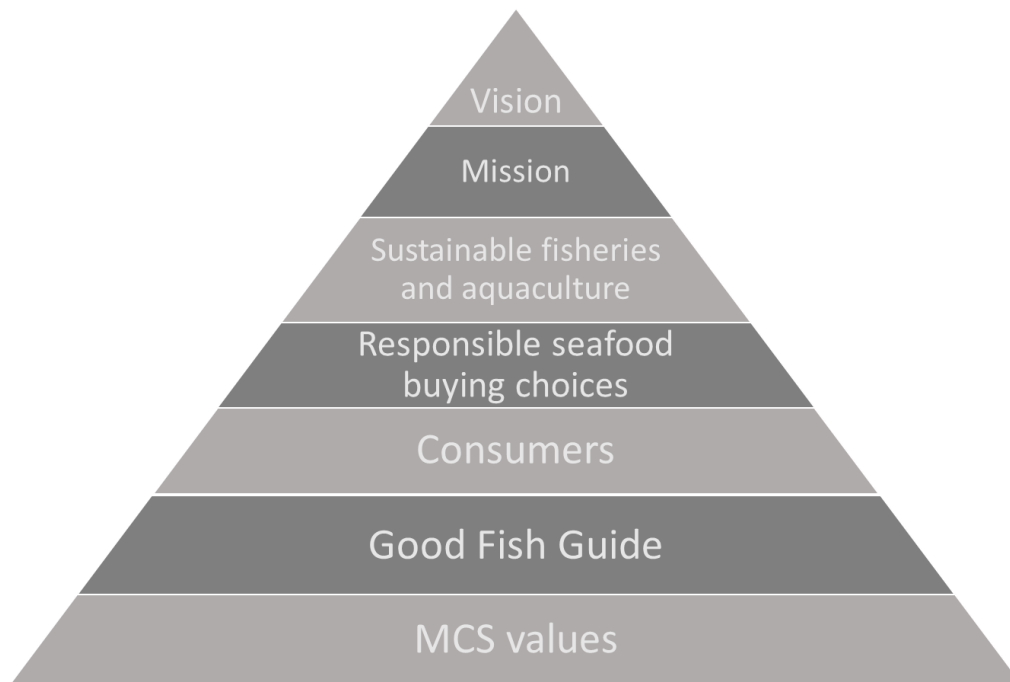


Figure 2.11: The Marine Conservation Society (MCS) Theory of Change (Source: Adapted from MCS Annual Impact Report and Accounts 2018-2019, p. 9 and 18).

The MCS Theory of Change relies on individuals:

1. Being well-informed;
2. Engaged with and connected to the sea;
3. Understanding the benefits and values of being connected to the seas;
4. Making the connection between human health, wellbeing and health of seas and,
5. The need for sustainable seafood, in order to take action for behaviour change (MCS, 2019).

However, a review of how the SSM generally is utilising Theory of Change concludes that there is *"limited empirical evidence that substantial changes in consumer demand for sustainable*

seafood has occurred” (Roheim et al., 2018, p. 393). To better understand the value of consumers as ‘agents of change’ when buying fish, this study investigates consumer demand for sustainable seafood, how well individuals are informed, engaged, and connected to the sea, and understand the impact of their seafood choices on the health of the sea. In addition, the study will use TPB to understand determinants of guide use and how they might be applied to increasing use of the Guide and therefore the potential of the MCS GFG as an intervention for motivating consumer’s sustainable seafood purchases.

Given that there is also limited research and understanding of the impacts of seafood awareness campaigns on the market, (as evidenced by Roheim et al., 2018 and Jacquet and Pauly, 2007, for example), this study will also attempt to gather evidence of any *direct* impact the Guide is having on the UK seafood supply chain.

2.5.7.2. Social marketing

In response to the collapse of several fish stocks globally and increase in public concern for overfishing of our oceans, ENGOs within the SSM have embarked upon seafood related social marketing initiatives. These initiatives are designed to increase public demand for sustainably produced seafood, while reducing demand for unsustainable seafood, and range from eco-labelling of seafood products to the absolute boycott of certain products (Jacquet and Pauly, 2007) (See Appendix 1 for a summary of UK).

Kotler and Zaltman (1971) define social marketing as “*the explicit use of marketing skills to help translate present social action efforts into more effectively designed and communicated programs that elicit desired audience response*” (p.5). A more recent development of social marketing is ‘conservation marketing’ (Wright et al., 2015). This approach uses marketing techniques to help influence and reduce the negative impacts of human behaviour, which is especially important where its impact, for example, in the case of overfishing, is invisible to the public (Wright et al., 2015). Conservation marketing is defined as, “*the ethical application of marketing strategies, concepts and techniques to influence attitudes, perceptions and*

behaviours of individuals, and ultimately societies, with the objective of advancing conservation goals” (ConsMark, 2014). This type of marketing builds on the successful use of social marketing approaches in, for example, demand-reduction campaigns for products such as turtle eggs, rhino horn and elephant ivory (Thomas-Walters et al., 2020; Greenfield and Verissimo, 2018; Verissimo et al., 2017).

Another marketing framework for nurturing sustainable behaviour is community-based social marketing (CBSM). Although it bears similarities to social marketing, its foundation lies in the social sciences rather than in marketing disciplines and has been used as a behaviour change tool for a range of behaviours including promoting sustainable seafood consumption (McKenzie-Mohr and Schultz, 2014). The approach is described as ‘*community-based*’ because it “*focuses on a group of individuals who share a common connection*” (p. 109). This connection is usually geographic but may also include social networks or peer groups (Schultz, 2014). According to Schultz (2014), the main consideration when selecting a behavioural change tool is the enormity of the barriers in relation to the motivation or benefits for the target population to engage in a behaviour. In evaluating the efficacy of the MCS GFG as a behaviour change tool, this study proposes to identify drivers and barriers (See Section 2.5.6) to sustainable seafood purchasing, beliefs surrounding the impact of seafood consumption on the marine environment, and the success of the MCS GFG in motivating consumers to purchase sustainable seafood.

2.5.7.3. Opinion leadership and the role of champions

Opinion leadership is most often identified with models of diffusion, which demonstrate how new ideas and behaviour spread or diffuse through a network or community (Moseley, 2004; Rogers, 2002). *Rogers’ Diffusion of Innovations theory*, first published in 1962, essentially explains the process of adoption of innovations (new ideas) by society (Darnton, 2008). Opinion leaders are ‘*individuals from whom others seek advice and information*’ (Rogers and Cartano, 1962) and are defined as “*people who influence the opinions, attitudes, beliefs, motivations, and behaviours of others*” (Valente and Pumpuang, 2007, p.881). In their review

of techniques to identify opinion leaders, Valente and Pumpuang (2007) declare several functions of opinion leaders: importantly their ability to change social norms; their use as 'change agents'; their ability to remove barriers to change; and their ability to accelerate behaviour change. One of the techniques reviewed by Valente and Pumpuang (2007) for identifying opinion leaders and for spreading new ideas is recruitment of well-known people who are national, regional, or local celebrities as agents of change or role models to encourage behaviour change within the community. An important element affecting the success of a 'celebrity's' ability to influence audiences is identified as *'how well the community or target audience identifies with him or her'* (Valente and Pumpuang, 2007).

In addition to celebrity influence, McKenzie-Mohr and Schultz (2014) suggest that one of the most frequent reasons for individuals engaging in a new sustainable behaviour is people in their social network, such as friends and family or work colleagues, embracing new behaviours. Although the process of social diffusion has been identified as playing a *"critical role in determining the behaviours that we learn about and adopt"* (p.39), in the opinion of McKenzie-Mohr and Schultz (2014) it has not been used to full effect to encourage the uptake of sustainable behaviours such as only purchasing sustainable seafood. Furthermore, while social diffusion is recognised as being most effective where the behaviour can be observed (McKenzie-Mohr and Schultz, 2014), one of the difficulties of promoting sustainable seafood consumption is that the behaviour is not easily observed (Richter and Klockner, 2017). McKenzie-Mohr and Schultz (2014) comment that *"low visibility behaviours"* can nonetheless be encouraged by using *"public and durable commitments"* (p.39). For example, car or 'bumper' stickers, slogans on t-shirts or bags or online petitions or pledges can be used to increase salience (McKenzie-Mohr and Schultz, 2014; Jacquet and Pauly, 2007).

Recent years have seen environmental campaigns increase their success in situations where chefs are recruited as ambassadors of sustainable seafood (López De La Lama et al., 2018; Brownstein et al., 2003). For example, in a study by Lopez De La Lama et al. (2018) to assess the knowledge, attitudes, practices and motivation of chefs in Lima, Peru, to source and exclusively use sustainable seafood, results suggest chefs are aware of the negative impacts

of seafood consumption on the marine environment and understand as professionals they have a responsibility to advocate for the use of sustainable seafood.

Key barriers to the exclusive use of sustainable fish were identified as: seafood supply chain structure; supply issues, in particular, the effort required to identify sustainable suppliers and *'build a relationship of trust'*; customer preferences for *'traditional species'*; and mislabelling (López De La Lama et al., 2018). Recommendations by the authors for future seafood campaigns include recommendations for targeting restaurants rather than chefs, because chefs are often employees and therefore lack powers of autonomy, and for conservation organisations to survey sustainable seafood practices in restaurants and rank them accordingly. This type of initiative was established in the UK in 2009 by Fish2Fork which was successful in influencing the purchasing behaviour of high-profile restaurant franchises such as YO! Sushi (Wright et al., 2015) (See Appendix 1 and Chapter 5 for further discussion).

In the UK, celebrity chefs have also been used to promote seafood sustainability including the consumption of underutilised species where sales of these species in supermarkets have increased because of celebrity involvement (Farmery, 2018; Stevens et al., 2018; Smithers, 2011). Responding to this sort of initiative, recent years have also seen an increase in the Campaigning Culinary Documentary (CCD), an evolving style within food television (Silver and Hawkins, 2017; Phillipov, 2017; Phillipov, 2016; Bell and Hollows, 2011; Hollows and Jones, 2010), which creates a platform for food personalities, typically *'celebrity chefs'*, to *'responsibilise'* consumers (Bell et al., 2017). As consumers, viewers are encouraged to use their purchasing powers and adopt more responsible and ethical lifestyles (Bell et al., 2017; Bell and Hollows, 2011).

A relatively recent example of a high-profile campaign is the "Fish Fight" campaign led by celebrity chef and journalist Hugh Fearnly-Whittingstall (Honkanen and Young, 2015), which aimed to raise consumer's awareness of the practice of discarding fish that fishers were unable to land, ostensibly due to EU quota restrictions imposed by the CFP (See Section

2.2.3.). The campaign encouraged consumers to register their support for the introduction of a discards ban and to only purchase species identified to be less at risk i.e., species not subject to discarding (Honkanen and Young, 2015). In the months following the campaign launch, half a million people from 12 EU Member States signed an online petition to end discards, highlighting the “*importance and the power of public opinion in directly shaping*” important policies (Borges, 2015, p.538). Borges (2015) also identifies market (consumer) choices as an underlying cause of discarding but does not suggest how this problem might be addressed. This need for diversification in seafood is mirrored in the advice from MCS, which encourages consumers to diversify their taste in fish to reduce pressure on commonly eaten fish such as cod and haddock in favour of increasing demand, and thus value, for lesser known or under-utilised⁴⁰ species (Bardey, 2019). In response, supermarkets, have developed initiatives such as Sainsbury’s ‘*Switch the Fish*’ (Ford, 2013), to help educate customers, increase demand for alternative species and reduce discarding. Although the Landing Obligation (or Discard ban) came into force in the UK for all species from 1st January 2019, the ban only applies to quota species, meaning that non-quota species (i.e., non-pressure stocks), such as molluscs e.g., squid, cuttlefish, and gurnard *Triglidae*, can still be legally discarded. Despite the perceived success of the celebrity driven Fish Fight campaign, challenges remain.

Finally, Klein and Ferrari (2015) have called for ‘sustainable seafood leadership’ among marine scientists. Analysis of seafood served to delegates attending marine ecology and conservation meetings held in Australia in 2012-13 and attended by c. 4000 people from around the world, found more of the species served were rated by the Australian Marine Conservation Society (AMCS) (See Table 2.2) as unsustainable than sustainable. Although conference organisers had requested that all seafood served be sustainable, a lack of accountability among caterers was identified. The authors conclude that if science were turned into action and scientists led by example, these meetings have the potential to educate people, delegates and in the seafood supply chain, about sustainability and reduce the consumption of unsustainable seafood.

⁴⁰ Under-utilised species are one’s fishers do not catch their full quota of, or they catch them but then discard them, because they have little or no value or no market for the fish.

In understanding the diffusion impact of the GFG, this study will examine the influence of 'leadership' on consumer decision making (See for example Section 5.5.1).

2.5.8. Education and awareness

The '*instrumentalist*' view of education and public awareness for achieving sustainability goals is embedded in international agreements for protecting the global marine environment (Gough, 2017) (See Appendix 3). In the UK the importance to society of the inclusion of a '*marine dimension*' to school and community education has been a topic of discussion for many years and continues to be an ongoing issue (Winks et al., 2020; Chambers et al., 2019; Fletcher et al., 2009; Greenwich Forum, 1989)

Education has been demonstrated to be an effective intervention for increasing awareness and concern for marine issues, such as those related to litter (Hartley et al., 2015; 2018). Additionally, education is recognised as essential for increasing public involvement in marine conservation and decision making by appealing to individual's sense of personal responsibility for the marine environment, ultimately engaging them through this interest as '*marine citizens*' (Easman et al., 2018). Marine focused education; attachment through personal experience; and a sense of responsibility for the marine environment are identified by McKinley and Fletcher (2010) as key ingredients for the development of individuals as marine citizens, explored further in the next section.

2.5.8.1. Marine Citizenship, Ocean Literacy (OL) and behaviour change

Marine citizenship has been suggested as a useful policy for alleviating 'ocean degradation' (Buchan, 2021). It advocates and promotes 'active behaviour' and is a method of 'bottom-up' ocean management which recognises the possibilities for engaging the public as key actors (i.e., marine citizens) with a role to play in reducing their negative impacts on the marine environment by making changes to their lifestyle choices (McKinley and Fletcher, 2010). Specifically marine citizenship describes, "*the rights and responsibilities of an individual*

towards the marine environment” (McKinley and Fletcher, 2012, p.839). More recent proponents of marine citizenship have suggested it as being about public-facing and socially collective, rather than private or individualised actions, proposing marine citizenship as, *“exercising the right to participate in the transformation of the human-ocean relationship for sustainability”* (Buchan et al., 2023, p. 18). Regardless of whether action is taken by an individual or a group of individuals, and at what political or civic level, in the case of increasing seafood sustainability, awareness of the issue and understanding of what action to take and how is required (Richter and Klocker, 2017).

Parallel to the concept of marine citizenship is Ocean literacy (OL). Originally defined as *“an understanding of the oceans influence on you and your influence on the ocean”* (COSEE, 2005), and framing of an ocean literate person as one who *‘uses ocean knowledge and awareness of ocean issues to communicate about the ocean in a meaningful way and make informed and responsible decisions’*, the concept of OL is evolving (McKinley et al., 2023; Kelly et al., 2022; McKinley and Burdon, 2020). Increasingly there is recognition of OL as being *‘multi-dimensional’* and being more than just about knowledge or increasing public awareness of the marine environment (Kelly et al., 2022; Brennan et al., 2019). McKinley and Burdon (2020) identify the need for individuals to have the tools to *‘transform’* OL into *‘behaviour and actions that promote ocean sustainability’*. Notably the UN Decade of Ocean Science for Sustainable Development (2021-2030) is positioning OL as a key mechanism for motivating behaviour to achieve sustainable management goals for oceans and coasts (Caruso et al., 2022; Kelly et al., 2022; Pecl et al., 2022). For example, in the context of ocean management, where individuals understand the impact of their seafood choices on the marine environment, do they also have the awareness and knowledge of tools such as seafood guides to enable them to *‘translate’* their understanding into action by changing their purchasing behaviour. Although seafood guides have been examined in the context of their value as market-based tools (De Vos and Bush, 2011), their value as a tool for promoting and testing ecological and marine citizenship behaviours has not been fully examined (Seyfang, 2005).

In light of opportunities for strengthening understanding of the interconnectedness between humans and the ocean presented by the momentum of ocean literacy (McKinley et al., 2023), perceptions research (Jefferson et al., 2021), and the UN Ocean Decade (Caruso et al., 2022; Kelly et al., 2022; Pecl et al., 2022; Ryabinin et al., 2019), this study will explore the potential of the MCS GFG as a tool for transforming OL into ‘behaviour and actions’ that promote ocean health and sustainable seafood consumption (McKinley and Burdon, 2020).

2.5.8.2. Marine public perceptions research

Public perceptions research can be considered as a component of broader ocean literacy work which “*explores how people understand, value or engage with an environment*” (Jefferson et al., 2021, p.1). It is an ‘umbrella term’ which includes ‘knowledge, interest, social values, attitudes or behaviours’ (Jefferson et al., 2015). People’s perceptions can influence behaviour (Lotze et al., 2018). Therefore, understanding of public perceptions, how people value, think about and ‘connect’ with the sea, is key to engaging consumers in behavioural change to reduce their impact on the marine environment (Gelcich and O’Keefe, 2016; Jefferson et al., 2015; Jefferson et al., 2014; Gelcich et al., 2014).

Public perceptions of the sea are used in this study to examine public awareness and attitudes to purchasing sustainable seafood. For example, there is concern for the commodification of fish as expressed by Pitcher and Lam (2015), Carlucci et al. (2015) and Jacquet and Pauly (2007), who advocate that to better conserve marine resources, public perceptions and understanding of fish as more than food is required (Tlustý et al., 2019). This study will examine whether MCS GFG users are aware of the need to reduce pressures on marine systems when purchasing seafood, which, according to Jacobs et al. (2018), ‘*is an essential step in triggering behavioural changes*’.

2.5.9. Drivers of irrational behaviour change

Opportunities for reducing the social, economic, and environmental impacts of individual behaviour in society have traditionally focused on ‘changing minds’ by changing the way people think, either through education or by incentive, for example. More recently attempts to change individual behaviour by changing the ‘context’, i.e., situation, in which people live or find themselves, is being exploited to achieve the desired behavioural outcome (Reijnen et al., 2019; Johnson et al., 2012; Wansink and Sobal, 2007).

Interventions for influencing behaviour change may be regulatory and administered through Government policy or non-regulatory and managed through ‘arms-length’ public sector bodies. The latter aims to avoid limiting the choices of individuals as ‘rational agents’ in favour of enabling them to make the ‘right’ consumer choices (House of Lords, 2011). For example, the purpose of the Behavioural Insights Team (BIT) ⁴¹ (also known as the ‘Nudge Unit’) established at the UK Cabinet Office in 2010 was to *“develop more cost-effective and less bureaucratic ways of changing behaviour in ways that give citizens and communities greater control of their own lives”* (Michie and West, 2013, p.3).

The range of interventions that have been identified for influencing human behaviour is summarised in an analysis of interventions developed by the Nuffield Council of Bioethics, known as the *‘Nuffield Ladder’*. An adaptation of the Nuffield Ladder is presented in Table 2.12 to illustrate how a range of interventions, including seafood guides, could be applied to fostering pro-environmental fish purchasing behaviour.

⁴¹ <https://www.bi.team/about-us/>

Table 2.12: Interventions for increasing the sustainability of consumer fish purchasing behaviour (Source: Adapted from Nuffield Intervention Ladder ⁴² Nuffield Council on Bioethics, 2007; House of Lords Table of Interventions (HOL), 2011).

Intervention Category	Indirect action for individual fish purchasing behaviour change				Direct action for change through MCS GFG			
	Eliminate Choice	Restrict Choice	Guide and Enable Choice					
			Incentives/ Disincentives (Fiscal and non-fiscal)	Nudges and Defaults	Changes to physical environment (Choice architecture)	Persuasion	Use of social norms and salience (Opinion Leaders)	Provide information
Examples of intervention to increase seafood sustainability	Legislation to impose ban on sales and/or import of endangered/ overfished species.	Choice editing.	Incentives: Supermarket or restaurant promotions/ offers/pricing/ rewards; Disincentives: Tax or levy on fish products using damaging methods; caught in MPAs etc.	Cafeterias/ school meals e.g., Fish Friday alternatives to Big 5.	Fish counter, supermarket displays; labelling.	Fish Lists – Best Choices and Fish to Avoid; Campaigns e.g., Red Rated.	Fish of the month, Celebrity chefs, recipes; Ocean Ambassadors; Media releases; Stickers, pledges etc.	Good Fish Guide tools: website; App; and Pocket Guide.

⁴² 'The Nuffield Ladder of Interventions is an analysis of interventions developed by the Nuffield Council of Bioethics in a report on ethical issues in public health published in 2007. It classifies categories of public policies according to degree of intervention in the personal life of individuals' (Nuffield Council on Bioethics, 2007).

In addition to the use of social norms, opinion leaders and labelling in influencing behaviour change discussed in previous sections, the following sections outline opportunities for shaping seafood purchasing behaviour which acknowledge the context in which people act.

2.5.9.1. Eliminate choice through legislation, regulation and tax

Market-based approaches to regulation, such as health-motivated taxes, are one way of ‘internalising’ the social costs associated with certain foods (Briggs et al., 2016), and to encourage consumers to adopt healthier and more sustainable diets (Springmann et al., 2018b). Health-motivated taxes have been used, for example, to reduce consumption of sugary drinks (Colchero et al., 2016) and saturated fats (Smed et al., 2016) to improve health and reduce the social burden of associated disease (Paris et al., 2021; Springmann et al., 2020). In a similar way Pigouvian⁴³, also known as ‘sin’ taxes, could be used as a disincentive for producing environmentally damaging food, including seafood, produced using destructive fishing or farming methods (See, for example Lambrechts, 2021).

As mentioned earlier in response to frustrations with the failures of ‘traditional’ fisheries governance (Englander et al., 2023; Murphy et al., 2021; Johnston et al., 2001), market-based approaches such as seafood guides and eco-labels are used by the SSM to create demand for sustainably produced seafood to help reduce the environmental burden of human consumption on marine resources. Although these tools are recognised as providing a supplementary source of pressure to ‘traditional advocacy and regulation’, certification and ecolabelling (See Section 2.3.7) are deemed to have ‘greater credibility in the marketplace’ and therefore more capability to influence trade compared to seafood advisories or cards (Leadbitter, 2008).

The only legislation for seafood products entering the UK is the requirement to comply with EU IUU Regulation which provides for the recognition of catch documentation or Catch Certificates for all imported seafood to demonstrate that it has been caught legally (See

⁴³ Pigouvian taxes are introduced to reflect the true social cost of any economic activity associated with negative or harmful impacts, helping to internalise their cost and motivate a reduction or cessation in harmful production. https://www.economicsonline.co.uk/Definitions/Pigouvian_taxes.html

Section 2.3.7). There is currently no regulation to ensure the sustainability of seafood products entering the UK market or for the provision of supply chain information or traceability controls for non-certified products (Alfnes, 2017). Among other ideas for increasing the sustainability of seafood in the future (Section 4.19), this study will investigate consumer support for a ban on the import and/or catching and landing of unsustainable seafood into the UK.

2.5.9.2. Restrict choice by choice editing

Although the main purpose of seafood guides is to influence the public's seafood choices (Roheim, 2009), the SSM also collaborates with other actors in the seafood supply chain to increase sustainability of the overall seafood industry (De Vos and Bush, 2011). For example, since the mid-2000s, businesses in the UK seafood supply chain, including retailers, have according to Mitchell (2011), continuously examined their supply chains to make sure *“that only responsibly sourced seafood products are offered to the consumer”* (Mitchell, 2011. p.441). This ‘tailoring’ of offerings by retailers and brand owners is known as ‘*choice editing*’ (Lang, 2015). By retailers assuming responsibility for the sustainability of the seafood sold in their supermarkets, they have taken decisions to preclude or ‘delist’ endangered species assessed by MCS (and other ENGOs) as species the public should avoid buying (Mitchell, 2011).

Using the choice editing of fish as a case study, the aim of a study by Gunn and Mont (2014) was to understand how retailers view choice editing as a tool to promote sustainability. According to their study, choice editing for sustainability is a strategy that can be *“taken by retailers which does not rely on consumer behaviour change, but instead mainstreams sustainable products as default options”* (Gunn and Mont, 2014 p. 464). Seafood guides, such as the MCS GFG, are identified by the authors as critical in helping lead market transformation in the following ways: by identifying endangered or black (red)-listed species, seafood guides have helped raise awareness of sustainability issues; guides have also helped consumers recognise the importance and hence the value of sustainability; this in turn has led to retailers delisting species in order to protect their brand image and reputation (Gunn and Mont, 2014). However, the study also found that unless retailers see ‘added brand value’ in removing

endangered species from their shelves, the risks associated with competitive loss and the availability of sustainable products in the volumes required for 'main streaming' may act as barriers to them acting responsibly. An important barrier to choice editing identified by Alfnes (2017) was retailer fear of losing customers by restricting their choice. Given that choice editing is voluntary, Gunn and Mont (2014) stress the importance of introducing legislation to remove '*environmentally destructive seafood products from sale*'. In the study carried out by Alfnes (2017) to investigate consumer attitudes towards regulation of seafood sustainability in seven European countries, the public were found to have a positive attitude towards both supermarkets with sustainable seafood policies and regulation that ensures only sustainable seafood is available for sale (Alfnes, 2017).

2.5.9.3. Guide and enable choice – Nudge, choice architecture and information provision

Nudging is a "*relatively new way to influence behaviour in a sustainable direction without changing people's values or attitudes*" (Mont et al., 2014. p.8) and works mostly on changing non-deliberative or automatic (Figure 2.6) and intuitive components of an individuals' behaviour (House of Lords 2011). Thaler and Sunstein (2008) define Nudge as, "*any aspect of the choice architecture ⁴⁴ that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not*".

In contrast, models of behaviour change are designed to predict deliberative or cognitive behaviour and are frequently based on the values and attitudes an individual has towards that behaviour (Hansen, 2016; Mont et al., 2014) (Section 2.5.3). However, people do not always make 'rational choices' i.e., choices that are in the individual's best interests (Thaler and Sunstein, 2003; Campbell-Arvai, 2012). This occurs because often people rely on various 'judgemental heuristics' to assist their decision-making which are not always the most favoured or best choice to make (Campbell-Arvai, 2012). The philosophy of libertarian or 'soft'

⁴⁴ Choice architecture refers to the environment in which individuals make their choices (Walmsley et al., 2018; Broers et al., 2017).

paternalism, often referred to as '*Nudge*' (Hansen, 2016), is one which seeks to preserve freedom of choice whilst protecting the individual's welfare and enabling them to make better or desired choices voluntarily (Thaler and Sunstein, 2003). This can be achieved by 'engineering' the environment in which choices are made and employing judgemental heuristics (Campbell-Arvai, 2012).

In the context of food consumption, choices are often made automatically (Powell et al., 2019; Velema et al., 2018). In these cases, nudging has been used, for example, to influence healthier food choices such as increasing vegetable and fruit consumption (Velema et al., 2018; Broers et al., 2017; Bucher et al., 2016). Other examples of nudges are the changes that can be made to the features, organisation or layout of the choice architecture. Nudge 'tools' also include the default option, defined by Brown and Krishna (2004) as "*the one consumers will automatically receive if he/she does not explicitly specify otherwise*" (p. 529). By structuring the default option to maximise benefits for the consumer, defaults can be used to "influence behaviour without restricting individual choice" (Dolan, 2012).

Linked to Section 2.3.7. on labelling, the provision of information is widely used to target individual choice or behaviour change (Bellotti and Panzone, 2016; Mont et al., 2014). Whether or not the provision of information can be considered under the umbrella of nudging is a matter of discussion (Hansen, 2016; Mont et al., 2014). There appears however to be acceptance of information provision as a form of nudging if the aim of it is to merely simplify the facts to make choosing easier (Hansen, 2016; Ölander and Thøgersen, 2014). Food labelling is a typical example of how nudging has been used to simplify and 'frame' information (Mont et al., 2014). For example, more descriptive labelling has been used to influence sales in restaurants (Guéguen and Jacob, 2012; Wansink et al., 2001). Renaming of seafood is also undertaken. For example, the lesser known and under-utilised species of witch (*Glyptocephalus cynoglossus*) has been marketed as Torbay sole to increase sales in the UK (Jacquet and Pauley, 2008). To further enhance perceptions of sustainability, products may be described as 'line-caught' (Zhang et al., 2018; Sogn-Grundvåg et al., 2014; Sogn-Grundvåg et al., 2013) or 'local' (Soley et al., 2019; Tookes et al., 2018) to market extrinsic product attributes associated with sustainability. Another example of where simplification and

framing of information is being used is in seafood guides themselves (Section 2.4). The guides aim to help the consumer navigate the complexities of seafood sustainability by 'framing' seafood as a 'green' or 'red' choice according to its inherent sustainability.

2.6. Model of sustainable seafood guide use

One of the two aims of this study is to conceptualise motivation for purchasing sustainable seafood by identifying potential drivers for using the Guide and an appropriate theoretical framework for examining them.

Following a review of the literature and relevant models and frameworks (Figure 2.7), the TPB, one of the most authoritative models in use for predicting human social behaviour (Ajzen, 2011), including in studies to understand what motivates individuals when purchasing sustainable seafood, and the use of seafood guides (See Section 2.5.2), was selected as a basic theoretical framework for evaluating attitudes and intentions towards the MCS GFG when purchasing sustainable seafood. Using the TPB model as an initial framework and drawing insight from other areas of literature discussed in this chapter, a conceptual model of sustainable seafood guide use (Figure 2.12) is proposed in which several motivational determinants (variables) are identified as potential influencers on intentions to use the MCS GFG to inform sustainable seafood purchases.

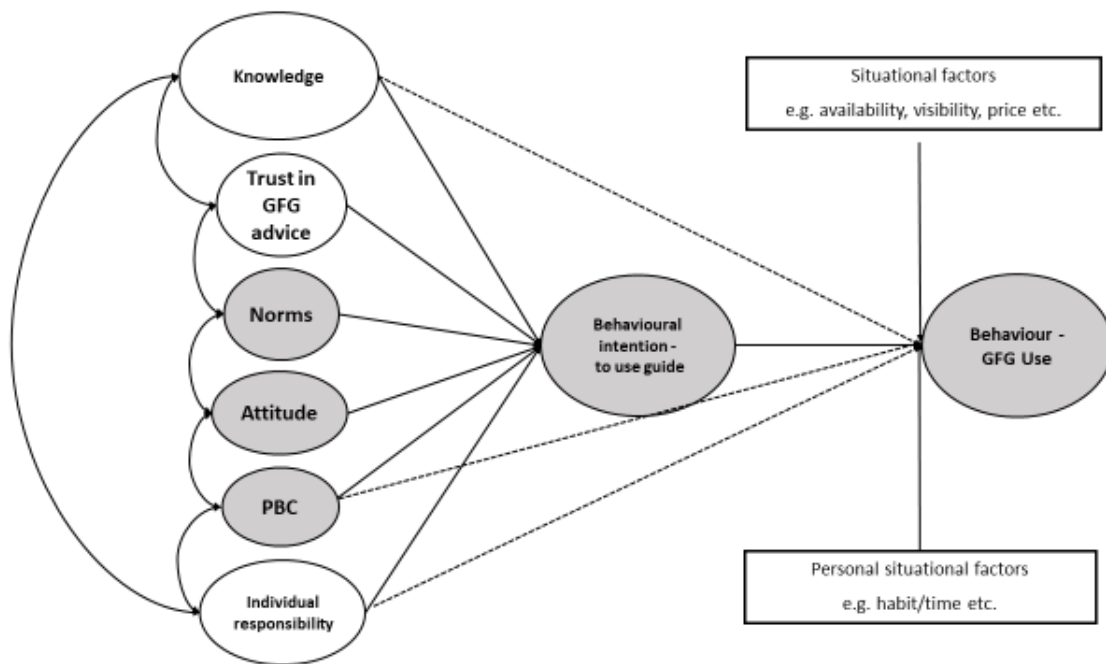


Figure 2.12: Model of sustainable seafood guide use (Source: Adapted from: Ajzen, 1991).

Note: Original TPB model constructs are highlighted in grey, additional dimensions to be considered are presented in white.

This study extends the model of TPB through the addition of constructs for: Knowledge; Trust; and Individual Responsibility. The influence of external (contextual or situational) factors beyond an individual's control (Stern, 2000), for example, price, convenience (availability) and knowledge (information), are, according to Olsen (2004), among the most important control factors influencing consumer's seafood purchases and will be explored in the public and stakeholder surveys. Seafood sustainability knowledge is also included as a variable in the prediction of intention to use the MCS GFG and behaviour i.e., MCS GFG use.

Richter and Klocker (2017) identify two types of knowledge required to motivate pro-environmental behaviour towards seafood consumption: background and procedural i.e., what actions to perform. Respondents background and procedural seafood *knowledge* was determined using four items (See Section 4.17, Table 4.34). The items were designed to gain insight into respondents understanding of the importance of labelling, the information to look

for, to gauge how fish is produced and thus it's level of sustainability, and the importance of sustainability to them.

Trust is an important factor for acceptance of sustainable seafood guidance and belief in the information provided (Jacobs et al., 2018). As discussed in Section 2.5.3., a person's *attitude* to a specific behaviour is one of the main influences on an individual's motivation or intention to act, which is in turn, according to the TPB, is a key determinant of behaviour, such as using seafood guides or purchasing sustainably produced fish (Richter et al., 2017; Honkanen and Young, 2015). Two items are used (Section 4.17, Table 4.34) to examine the significance of individual's feelings of responsibility for the sea (McKinley and Fletcher, 2010) (Section 2.5.8. 1) as a predictor of GFG use.

Although models are useful for understanding human behaviour, they have limitations. According to Jackson (2005), models '*do not offer clear insights into normative (moral), affective (emotional) and cognitive (e.g., habitual) dimensions of people's behaviour*'. Rational choice models do not allow for the fact that, depending on circumstances, individuals do not always act in their own self-interest, that behaviour can be 'irrational' and motivated, for example, by social and altruistic (PEB) interests (Jackson, 2005). TPB, however, allows for the addition of new variables to its model to explain variance in intention or behaviour not already explained by the variables in the original framework (Malek et al., 2017; O'Connor et al., 2017; Azjen, 1991). For example, Honkanen and Young (2015) 'extended' the basic TPB framework to include a personal norm variable to accommodate feelings of personal or moral obligation to engage in pro-environmental behaviour to protect fish stocks.

The model proposed for use in this study incorporates individual responsibility for the sea as a measure of moral obligation to protect the marine environment and will be used to investigate how well it predicts intention to use the MCS GFG and MCS GFG use (Also see Section 3.5). The key control factors are summarised in Section 4.17 Table 4.34.

2.7. Summary

As global demand for seafood continues to increase, concerns for the sustained impact of fishing and seafood consumption on marine resources, and for the apparent ‘commodification’ of fish itself, are being raised (Carlucci et al., 2015, Jacquet and Pauly, 2007, Worm, 2006). Pitcher and Lam (2015) argue that to safeguard global fisheries the ‘*relationship between society and fish*’ must change, from one based primarily upon the value of catching fish for profit, to one of greater awareness and understanding of the non-market value, the ‘natural capital’, of living fish. It has also been suggested that part of the responsibility (and potentially the solution) for sustainable long-term use of marine resources lies in the hands of individuals and their communities (Bates, 2010).

The reliance on people wanting to do ‘*the right thing*’, ‘*their bit*’ for the environment, by making changes to their life-style choices to help solve ecological problems is generally accepted (Nash et al., 2019; Gatersleben et al., 2012; McKinley and Fletcher, 2010). Seafood campaigns rely on raising awareness amongst public consumers and on them taking individual responsibility for reducing the impact of their seafood choices on the marine environment (Iles (2004 and 2007). Konefal (2013) is however critical of this approach, maintaining that creating ‘niche’ markets for sustainable seafood is insufficient to address the problems of global overfishing. However, engagement of individuals as ‘responsible’ marine citizens as identified by McKinley and Fletcher (2010) could boost self-efficacy, helping them to overcome feelings of powerlessness, of ‘*being a tiny cog in a big wheel*’ in the face of reversing global problems such as overfishing (Blake, 1999).

Notwithstanding this, seafood is an internationally traded commodity, with the bulk of seafood consumed in the UK imported. Although self-identity as a ‘marine citizen’ or an ‘environmentally-conscience person’ helps motivate pro-environmental behaviour (Bartels and Reinders, 2016), the efficacy of seafood guides as interventions for motivating sustainable seafood purchasing behaviour is potentially limited by the situation of consumers only being able to buy what is offered to them (Richter et al., 2017), ‘social visibility’ (Brick et al., 2017), and the ‘diffusion of individual responsibility’ experienced when shopping for seafood in a

supermarket (Richter et al., 2018). As suggested by Penca (2020) and Dolman et al. (2016) labelling, including of seafood, could be enhanced to increase consumer support for seafood sustainability. However, advice and labelling are not always enough to change behaviour (Khouja, 2022), often the introduction of taxes or legislation, including bans or mandatory charges, are required to achieve the change in consumer behaviour required (Thomas et al., 2019). For some authors the incontrovertible belief that well informed consumers have the power to drive businesses to find solutions to environmental problems such as overfishing is being used as an excuse for Government inaction (Singh-Watson, 2021; Gjerris et al., 2016). Conversely, if consumers are driving the changes being wrought in ocean food webs as suggested by Jacquet and Pauly (2007) and our taste in fish an adaptation to these changes, increasing the use of interventions such as seafood guides to help consumers better understand the connection between the seafood choices they are making and the impacts of seafood consumption on the ocean could help reduce them.

Drawing insight from the literature review, the model presented in Figure 2.12 provides a framework for the design of the methodology that will be used to investigate public attitudes in the UK to seafood guides and their efficacy as a consumer behaviour change tool. In particular, the literature review provided insight into factors influencing seafood purchasing which directly influenced the design of the public questionnaire and stakeholder interview schedule. Based on observations of attitudes towards the MCS GFG made during the data collection phases recommendations will be made to improve uptake of the Guide to a wider audience. The general methodological approach taken for data collection and analysis is presented in Chapter Three.

Chapter Three: Methodology

3.1. Introduction

This chapter introduces the research philosophy; the methodological approach taken to investigate attitudes of consumers in the UK towards seafood sustainability; the theoretical framework used to examine motivations for using the MCS GFG and its influence on seafood purchasing behaviour; and the research methods used to achieve the aims and objectives of the research project (See Appendix 2 for detailed summary).

3.2. Research philosophy

The research philosophy or paradigm adopted to guide any research project depends on the background of the 'methodological community' carrying out the research and thus on the type of information and data of interest and collected by them i.e. numerical, narrative, or both types of data (Tashakkori et al., 2021). Morgan (2007) argues for the interpretation of paradigms as *"systems of beliefs and practices that influence how researchers select both the questions they study and methods that they use to study them"* (p.49). Paradigm is also interpreted as, *"the lens through which a researcher looks at the world"* (Kivunja and Kuyini, 2017, p.26).

The main philosophical and methodological characteristics of the foremost research paradigms are identified by Guba and Lincoln (1984) as: epistemology; ontology; methodology; and axiology (Table 3.1).

Table 3.1: Interrelationship between paradigms and research elements (Adapted from: Tashakkori et al., 2021; Rehman and Alharth, 2016).

Paradigm	Ontology (Nature of reality)	Epistemology (Knowing; truth)	Axiology (role of values; aims)	Methodology (to obtain knowledge or data; research design)	Methods (to produce knowledge)	Research Approach or Logic
Positivism	Realism (that which we can perceive)	Objective	Value free	Quantitative	Surveys e.g., closed-ended questions	Hypothetico-deductive
Post Positivism	Critical realism	Objective	Influence and bias	Quantitative	Grounded theory	Hypothetico-deductive
Interpretivism (Anti-positivism)	Anti-foundational; interpretative	Subjective	Guided by own values	Qualitative	Ethnography	Inductive
Critical Theory	Historical realism	Subjective	Guided by critique; social justice	Qualitative	Interviews and observation	Inductive
Constructivism (Naturalism)	Reality is constructed	Subjective	All enquiry is value bound	Qualitative	Case studies	Inductive
Transformative	Pluralistic	Both - subjective and objective	Guided by concern for social justice	Both - qualitative and quantitative	Individual interviews	Inductive, hypothetico-deductive
Participatory	Realism	Collaborative	Reformative	Qualitative	Interviews or Focus groups	Inductive
Pragmatism	Multiple kinds of reality	Any source of knowing	Values guided by the study	Both - qualitative and quantitative	Any	Any logic that might help answer research questions

The research philosophy guiding this project is that generally people care about the natural world and want to reduce the impact of their (seafood) consumption on it. However, people are often constrained by situational or external factors, many of them beyond their control. Consequently, their purchasing behaviour is not always in the best interest of the

environment. Assumptions are nevertheless made that if purchasing decisions are supported by appropriate information, the MCS GFG, individuals can be encouraged to make the right seafood choices to help conserve stocks and protect marine life.

Whilst a pragmatic worldview has generally been adopted for this study (See 3.3 below), it may be argued that the research inquiry is also orientated towards positivist and transformative paradigms (See Table 3.1). For example, positivism relies on measurable or quantifiable observations (Mulisa, 2021; Alakwe, 2017) such as those surveyed in this study to measure constructs i.e. internal attributes or drivers for using the MCS GFG. A transformative paradigm is guided by concern for social justice, such as that for the impact of over-exploitation of fisheries on food security and the livelihoods of small-scale fishers and coastal communities highlighted in this study. According to Mertens (2007) a combination of a transformative paradigm and a mixed methods approach, selected for this study and discussed below, provides an appropriate framework for examining concerns for equitability.

3.3. Start of methodological approach

Mixed methods research is defined by Creswell and Creswell (2018) as, “*the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study*”. Along with qualitative and quantitative research, mixed methods research is identified as one of three major research cultures or paradigms (Johnson and Onwuegbuzie, 2004). The main characteristics of these approaches are summarised in Table 3.2.

Table 3.2: Main characteristics of the three major research approaches (Source: Adapted from Creswell and Creswell, 2018).

Qualitative research	Quantitative research	Mixed Methods research
<ul style="list-style-type: none"> • Examines subjective experience or meaning, • Tests theories inductively, • Takes a Constructivist worldview, • Includes Narrative; Phenomenological; Grounded theory; Ethnography; and/or Case studies research in its design, • Focuses on non-numerical data e.g., text and images, • Uses open-ended questions e.g., interview. 	<ul style="list-style-type: none"> • Examines objective theories or hypotheses, • Tests theories deductively, • Takes a Post-positivists worldview, • Includes experimental and/or survey research in its design, • Focuses on numerical data e.g., ordinal, interval, • Uses instrument-based data collection e.g., survey or questionnaire. 	<ul style="list-style-type: none"> • Incorporates use of ‘philosophical assumptions’ and/or ‘theoretical frameworks’, • Test theories inductively and/or deductively, • Takes a Pragmatic worldview, • Includes Convergent; Explanatory sequential; or Exploratory sequential research in its design, • Data may be numerical or non-numerical e.g., text, • Uses both open and closed-ended questions.

The adoption of a mixed methods approach is particularly suited to social research (Doyle et al., 2009), where the subject of investigation, in this case, consumer seafood purchasing behaviour, is often complex. Furthermore, in the case of the supply and purchase of seafood, it is a synthesis of a range of research disciplines, for example, social and behavioural sciences, and marine resource and ecological management. The decision to adopt such an approach was also informed by the need to achieve a balanced and comprehensive understanding of the wide range of factors influencing consumers’ purchasing behaviour, including the seafood supply chain, which in itself is complex. In particular, the approach was chosen to achieve a more in-depth understanding of the complexities of sustainable seafood supply and the decisions determining its purchase. The advantages and disadvantages of using this approach are listed in Table 3.3.

Table 3.3: Advantages and disadvantages of using mixed methods approaches (Source: Adapted from McKim, 2016).

Mixed Methods Approach	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Research may be carried out in steps; • Creates more comprehensive understanding; • Increases knowledge; • Approach helps gain more balanced perspective; • Obtain a more integrated study; • Informs collection of the 2nd dataset; • Provides systematic analysis; • Provides more rigour; • Increases confidence in results; • Enhanced validity (triangulation) of results or findings. 	<ul style="list-style-type: none"> • Requires collection of (at least) 2 types of data; • Can take more time; • Can be more resource intensive; • May require different types of analytical expertise.

A mixed method approach was also taken because, according to Creswell and Plano Clark (2007), such an approach provides assurance against any weaknesses in methods associated with one or the other of the two individual approaches which can be ‘offset’ by drawing on their strengths when the methods are combined (Table 3.4).

Table 3.4: Weaknesses of qualitative and quantitative research approaches (Adapted from: Creswell and Plano Clarke, 2018).

Qualitative research approach	Quantitative research approach
Data collected from an individual may not be representative of organisation	Limited understanding of context in which people live
Bias created by personal interpretation	Biases and interpretation of researcher seldom discussed
Difficulty generalising findings to a large group (or population) because of limited number of participants	Voices of participants not directly heard

The philosophy most strongly associated with a mixed methods approach is one of pragmatism (Creswell and Plano Clark, 2018; Johnson and Onwuegbuzie, 2004) which, as stated above, is the one primarily used in this study. According to Tashakkori and Teddlie (1998), this is based on the suggestion that researchers should use the philosophical and/or methodological approach that works best for the research problem under investigation.

3.4. Research design and logic

The study uses a ‘sequential’ design (Creswell and Plano Clarke, 2011): data collection was conducted in two separate, consecutive phases. This included a quantitative data collection phase (Public questionnaire phase) (Section 3.7); and a qualitative data collection phase (Stakeholder interview phase) (Section 3.14) to gather information to address the questions being proposed in the study (Creswell and Plano Clarke, 2018). A quantitative research approach (Table 3.2) uses probabilistic or random sampling to collect a sample, often large, which is representative of the population being studied. Data is typically collected on ‘closed-ended questions based on predetermined response scales or categories’ (Creswell and Plano Clarke, 2018) (See Section 3.7.1).

A deductive research approach is taken in Phase 1. This is one in which ‘reference is made to hypotheses’ and ‘ideas inferred from theory’ (Bryman, 2016a), where the objective is one of ‘testing or verifying a theory rather than developing it’ (Creswell and Creswell, 2018). In Phase 2 an inductive approach, one where ‘theory is generated or developed from research’ (Bryman, 2016a), was adopted to develop theory from qualitative data collected when carrying out the stakeholder interviews. The phased approach to the study is detailed in Figure 3.1.

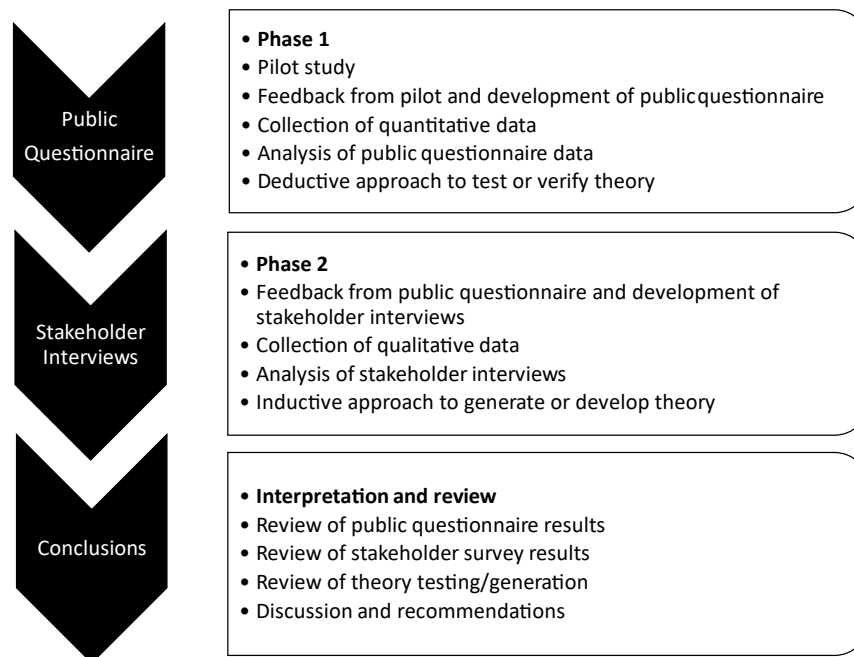


Figure 3.1: Phased approach to study

As shown in Figure 3.1, the primary data collection tools for this research are in Phase 1, an online public questionnaire (Section 3.7); and in Phase 2, semi-structured interviews (Section 3.14). Given the COVID-19 restrictions⁴⁵ in place, interviews were held via Zoom (or Teams) with key stakeholders in the seafood supply chain or community.

⁴⁵ On March 23rd 2020 the UK public were instructed to ‘stay at home’ to restrict the spread of Coronavirus (COVID-19). People were only permitted to leave home for limited reasons such as essential food shopping. <https://www.gov.uk/government/speeches/pm-address-to-the-nation-on-coronavirus-23-march-2020> [Last Accessed November 2021].

As discussed above in Section 3.3. a mixed methods approach was chosen to achieve a more in-depth understanding of the UK sustainable seafood market and determinants for its purchase. The combination of a structured questionnaire and semi-structured interviews, as selected for this study, is often used in mixed methods studies to corroborate results (Harris and Brown, 2019) and thus increase confidence in them. The advantages of using structured questionnaires and semi-structured interviews are outlined in Sections 3.7.1. and 3.14. respectively.

3.5. Theoretical research framework

Tashakkori et al. (2021) refer to a theoretical or conceptual research framework as, “*an inductive framework that is based on previous knowledge, theory, and research, as a tentative explanation for the phenomenon of interest*” (p.29). To examine the role of the MCS GFG in influencing seafood purchasing behaviour, an extended model of the TPB (Ajzen, 1991) was chosen to explore motivation for using the Guide and to underpin the development of the methodological approach in Phase 1. (See Sections 2.5.3. and 2.6. for further discussion of TPB and model used).

The dependent variable, MCS GFG use, is the behaviour measured and the primary focus of this study. The antecedent (or predictor) variables in the extended TPB model (See Section 2.6. Figure 2.12) predicted to influence intention to use MCS GFG are: seafood sustainability knowledge; trust in guide; attitude (to using guide); subjective norm; PBC; and individual responsibility (for the ocean) (Buchan, 2021 and 2023; McKinley and Fletcher, 2012). ‘Non-motivational’ or situational factors (Leek et al., 2000), such as price, accessibility, and availability, also ‘exercise control’ over an individual’s purchasing behaviour (Verbeke and Vackier, 2005). These control factors are related to where and how people shop for seafood, and the choices available to them, for example.

Predictions for the relationships between the variables (Creswell and Creswell, 2018) investigated in this study are included in a detailed summary of research aims, objectives, and research questions presented in Appendix 2.

3.6. Ethics application, considerations, and approval

Both Phases 1 and 2 of this research were conducted in accordance with Cardiff University's Ethics Research policy ⁴⁶. Application for ethics approval for the Phase 1 public questionnaire survey was made to Cardiff University School of Earth and Environmental Sciences Research Ethics Committee on 3rd March 2020 (Appendix 19.1) and for the Phase 2 semi-structured interviews, on 31st March 2021 (Appendix 19.2).

The ethical considerations relating to the public questionnaire survey were centred around informed consent, the rights of participants and their anonymity (Cresswell and Creswell, 2018). Respondents were informed they were able to withdraw consent at any time and did not need to respond to every question if they did not wish to do so (Qu and Dumay, 2011). A briefing for the questionnaire survey in the form of an introductory statement (See Appendix 8) made potential participants aware of:

- The rationale for the research;
- Any requirements for taking part e.g., aged 18 years or over;
- Any instructions for completing the questionnaire;
- Their right to end the questionnaire at any point;
- How data would be used;
- How anonymity would be preserved;
- Provision for accessing information on Cardiff University Ethics Research policy;
- Provision for accessing more information about the research;
- Contact details for the researcher;

⁴⁶ <https://www.cardiff.ac.uk/research/our-research-environment/integrity-and-ethics>

- Offer of an incentive to take part (public survey only) in the research in the form of a Prize Draw.

A social incentive to take part in the research was provided by the suggestion that respondents would be helping the researcher ‘understand and inform sustainable seafood efforts’. A small ‘monetary’ incentive was also offered in the form of a prize draw to increase the odds of response (Edwards et al., 2002). Respondents were invited to provide their contact details, name and/or email and/or telephone number if they wished to enter the draw. It was also stated that any personal data collected for the purpose of the draw would be destroyed once the survey closed and the draw made. See Appendix 19.1 for details of submissions to the Research Ethics Committee.

In Phase 2, the ethical considerations relating to developing the interview guide and conducting the interviews were centred around consent, data protection, confidentiality, anonymity, and the right of the interviewee to be fully informed (Archibald et al., 2019). The interview guide (Appendix 16), sent out in advance to potential interviewees, stated the aim of the research and outlined the purpose and use of the data to be collected including adherence to data protection legislation and anonymisation of data in published thesis. It also contained a [link](#) to more information on Cardiff Ethics Research policy and an invitation to request more information or ask any questions before scheduling and carrying out the interview. Other considerations related to requesting permission to record interview and the security of data (See Section 3.17). See Appendix 19.2 for details of submissions to the Research Ethics Committee.

3.7. Phase 1: Public Questionnaire

The data collection instrument used in Phase 1 was a self-administered on-line questionnaire with a predominantly *closed-ended* (or closed-choice) question format (Section 3.9.1) with a numerical rating scale response (De Vaus, 2014). An *open-ended* format (Section 3.9.2) was used for two of the questions.

Open-ended questions are those where the respondent may reply in whatever way they want, whereas in closed-ended questions using a Likert scale (See Sections 3.9.1. and 3.9.3), the respondent is asked how much they agree or disagree, for example, with a set of fixed choice items (Bryman, 2016a). Table 3.5 summarises the advantages and disadvantages of both question types.

Table 3.5: Comparison of use of Open and Closed-ended questions (Source: Adapted from Bryman, 2016a p.244).

Closed-ended questions		Open-ended questions	
Advantages	Disadvantages	Advantages	Disadvantages
Easy to process answers	Loss of spontaneity	Respondents can answer in their own terms	Time-consuming to administer
Easier comparability of answers	Not all possible answers can necessarily be provided for	Allow for unusual responses	Answers must be coded
Answers easier and quicker to complete	Variation in interpretation or understanding of question	Allow for salience of issues to be explored	Greater effort required from respondents
Category 'Other' may be used to increase range of answers		Useful for generating fixed-choice format answers	Variability in recording responses

3.7.1. Self-administered questionnaire

Self-administered questionnaires are completed by the respondents themselves and one of the most common instruments for gathering social research data (Bryman, 2016a). When compared to face-to-face or telephone interviews, self-administered questionnaires have various advantages (Table 3.6). They are cheaper and quicker to administer and are especially

useful where the sample or audience, is nationally distributed (Bryman, 2016a). This is particularly the case for potential users of the MCS GFG.

Table 3.6: Advantages of using a self-administered questionnaire (Source: Adapted from Bryman, 2016a).

• Economic
• Practical
• Quick and efficient
• Large sample or audience
• Researcher not present
• No time constraints
• Provides quantifiable answers
• Reduces biases
• Anonymity

Typically, self-administered questionnaires may be disseminated through the post, via email or available online (Bryman, 2016a). Online questionnaires may be promulgated by various means, including email or social media channels, such as Facebook or Twitter, discussed in more detail in section 3.11.3. A summary of the advantages and disadvantages of online or web-based surveys compared to postal questionnaires is presented in Table 3.7.

Table 3.7: Advantages and disadvantages of online surveys compared to postal questionnaire surveys (Source: Adapted from Bryman, 2016a p.235).

Advantages	Disadvantages
Low cost	Low response rate
Faster response	Restricted to online populations
Attractive formats	Requires motivation
Automatic skipping	Multiple replies
Unrestricted geographical coverage	
Fewer unanswered questions	
Better response to open-ended questions	
Automated data entry	

The main advantages of using a web-based over a postal questionnaire survey are that they are: cheaper and quicker to administer, especially where there are no costs incurred using software required to produce the questionnaire; the response is generally quicker; and they can reach a much wider audience as there are “*no constraints in terms of geographical coverage*” (Bryman, 2016a). This was especially important to this project as the geographical coverage of GFG use in the UK is unknown.

3.8. Questionnaire development and design

Using the research objectives and questions summarised in Appendix 2, a conceptual model (Figure 3.2) encompassing the key drivers identified as having a potential influence on consumer behaviour was created to map and develop the public questionnaire.

The questionnaire was critically examined by the Supervisory team, with several versions reviewed by this team before finalising a pilot version in March 2020 (Appendix 7). Ethical considerations related to the questionnaire (and stakeholder interview phase) are discussed above in Section 3.6.

The pilot version was launched online using the software platform, Google Forms ⁴⁷; a web-based survey application used to create forms for data collection purposes. Table 3.8 outlines the advantages and disadvantages of using this platform over others.

Table 3.8: Advantages and Disadvantages of using Google Forms over other platforms.

Advantages	Disadvantages
Data collected is stored in Google Sheets which can be downloaded to Microsoft Excel, for example, for analysis	Limitations associated with customisation and text formatting
Free use of platform, permits unlimited questions and responses	Cannot be used offline, an internet connection is required to access and use the form.
Readily accessible	
Easy to use interface which allows data to be collected easily and efficiently	

The questionnaire was designed to segment respondents according to: their awareness of the Guide; their use or not of the Guide; and whether or not they purchase seafood (Figure 3.3). Segmentation of respondents in this way allows relationships to be examined; for example, the level of seafood knowledge of Guide users compared to non-users; the sustainable seafood choices made by Guide users compared to non-users; and the ‘Green’ food shopping habits of Guide users compared to non-users and non-fish buyers (See Appendix 2). This has the advantage of better guiding the respondent, thus preventing them from accidentally

⁴⁷ ‘Google Forms is a survey administration software included as part of the free, web-based Google Docs Editors suite offered by Google’ <https://www.google.co.uk/forms/about/> [Accessed February 2021].

missing follow-on questions or answering questions that are not relevant to them (Bryman, 2016a).

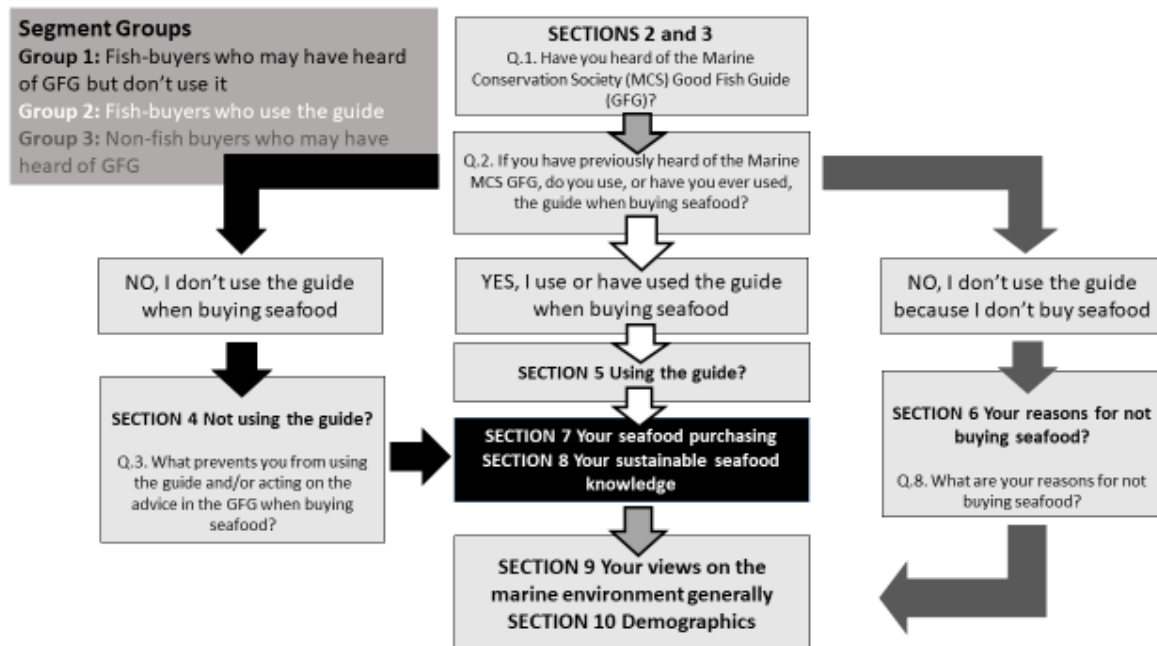


Figure 3.3: Survey question mapping and segmentation of respondents.

3.9. Structure and aims of the questionnaire

The aims of the questionnaire are summarised in relation to the research questions identified for the study in Table 3.9. See Appendix 8 for full questionnaire.

Table 3.9: Structure and aims of public questionnaire with corresponding research question.

Section/Question	Aim
Section 1. Introductory statement	Outlines the rationale for the study, it's purpose and value and an account of why people were being asked to take part in the survey. Some points of instruction on how to complete the questionnaire; qualifying guidelines; and ethical considerations, were also included.
Section 2. Question 1.	To understand the level of awareness of the UK public of the MCS GFG (Research question (RQ 4)).
Section 3. Question 2.	To understand use of the Guide (RQ 6) .
Section 4. Question 3.	To understand what factors would prevent someone from using the MCS GFG and/or acting upon the advice given in the Guide for increasing the sustainability of their seafood purchases (RQ 6) .
Section 5. Questions 4-7	To examine understanding of: the purpose of the MCS GFG (RQ 5) ; how the Guide is being used (RQ 7) ; any changes respondents may have made to their seafood purchasing behaviour as a result of using the Guide (RQ 10) . Qu. 4 includes items designed to measure TPB dimensions: trust in guide; behavioural intention to use guide; and attitude to using the Guide (RQ 11) .
Section 6. Question 8.	To determine respondent's reasons for not buying seafood where applicable (RQ 3) .
Section 7. Questions 9-17	To determine: respondent's understanding of the terms 'sustainable seafood' and 'responsibly sourced' (RQ 1) . See 3.8.2; general seafood eating habits; where seafood is bought; what influences decision making when purchasing seafood (RQ 12) ;

	the frequency and type of seafood purchased (RQ 10) See 3.8.3.1; the level of recognition and understanding of meaning of seafood labels (RQ 13) See 3.8.3.2. Qu. 16 includes one item for the TPB construct, Knowledge (Background; procedural; action skills) (RQ 11) .
Section 8. Questions 18-24	To obtain understanding of: the importance of sustainability to respondents when buying fish (RQ 1) ; the level of confidence and knowledge respondents have to enable them to demand their seafood is sustainable (RQ 2) ; respondent's seafood knowledge and awareness of seafood issues (RQ 3) . See 3.8.3.3; the barriers to consuming <i>sustainable</i> seafood in the UK (RQ 12) ; who influences the seafood choices respondents are making (RQ 12) ; the sources of their seafood knowledge. Qu. 22 and 24 includes items designed to measure TPB dimensions: social or subjective norms, individual responsibility for the sea, and PBC. Qu. 18 and 19 includes items for the TPB construct, Knowledge (Background; procedural; action skills) (RQ 11) .
Section 9. Question 25-27	To understand: how respondents relate to the marine environment (literacy and connectedness (RQ 8) . See 3.8.3.5); respondent's usual shopping habits ('spillover'. See 3.8.3.4); whether GFG-users display more environmentally conscious or 'green' consumer behaviours compared to non-users (RQ 9) ; and what changes consumers might like to see made to the way we shop for seafood in the future.
Section 10. Questions 28-37	Socio-demographic questions were placed at the end of the questionnaire (Bryman, 2016a) for the purpose of gathering basic socio-demographics on gender, age, ethnicity, education, employment and income. Information was also gathered on: household composition; respondent's proximity to the coast; how often respondents visited the coast; and membership of any conservation, wildlife, or any other group or charity.
Section 11. Prize Draw	To incentivise and increase response rate/participation. See Section 3.6 on Ethics.

3.9.1. Attitude statements

The self-administered questionnaire used included a mix of question formats e.g., multiple-choice grid, check boxes, and 'drop-down' lists to allow for multiple types of data to be collected. Statements were used to elicit public attitudes towards several issues relating to seafood production, sustainability, and the use of seafood guides such as the MCS GFG. To explore such attitudes, statements, in conjunction with a Likert-type scale, a widely used technique for measuring attitude strength (Bryman, 2016a), were used. An attitude statement is described by Oppenheim (1992) as, "*a single sentence that describes a point of view, a belief, a preference, a judgement, an emotional feeling, a position for or against something*" (p.174).

A 5-point Likert scale, 1 (strongly disagree) to 5 (strongly agree), was used for most questions. This scale, developed by Rensis Likert (1932), is a format for asking attitude questions. Bryman (2016a) describes the scale as, "*a multiple-indicator or multiple-item measure of a set of attitudes relating to a particular area. The goal of the Likert scale is to measure intensity of feelings about the area in question. In its most common format, it comprises a series of statements (known as items) that focus on a certain issue or theme*" (Bryman, 2016a, p.154). A respondent's attitude is measured by the extent to which they agree or disagree with an item or statement.

Attitude statements were designed to avoid making their purpose too direct or leading (Oppenheim, 1992). Negative statements or items were introduced to help minimise sustainability bias. For example, "*I don't have time to think about the impact of my decisions when purchasing seafood*". Statements were also designed to help minimise 'response sets' such as 'acquiescence', "*a tendency for some people consistently to agree or disagree with a set of questions or items*" (Bryman, 2016a, p. 216) and 'social desirability', "*the tendency to reply 'agree' to items that the respondents believe reflect socially desirable attitudes, in order to show themselves in a better light*" (Oppenheim, 1992, p.181).

In addition to measuring agreement or 'approval', Likert scales have been adapted to measure other traits or attributes such as frequency and importance (Harpe, 2015). Uebersax (2006) recommends that in these instances the scale is referred to as a 'Likert-type' scale, provided it refers to: several items which are summed or averaged; response categories are arranged horizontally; anchored with equally spaced integers; and labelled with approximately evenly spaced steps. *Frequency* of purchase of 17 different fish species in a 12-month period was determined using a 5-point Likert-type scale ranging from 1 (Not at all) to 5 (At least once a week) (Section 3.9.3.1), while the *importance* of a range of sources for obtaining seafood knowledge, for example, was determined using a 5-point Likert-type scale ranging from 1 (Not important at all) to 5 (Very important).

The opportunity to respond 'Not sure' was available and in the case of question 3, 'Not applicable' was also provided (See Pallant, 2020), as if it was the case that it was the first time a respondent had heard of the Guide (Item 9), the other 8 items would not apply. The general format for the survey questions in Google Forms was closed-ended (fixed-choice) Likert-type scale questions presented horizontally (See example in Figure 3.4).

Not using the guide?

3. What prevents you from using the guide and/or acting upon the advice in the GFG when buying seafood? Please indicate how much you agree or disagree with the following statements.

	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure	Not applicable
Following the advice is too complicated, I don't understand it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Following the advice is too difficult, it's not practical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't like asking questions about the fish I want to buy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't have enough time to use the guide to help me choose sustainable fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3.4: Example of a closed-ended 7-point Likert-type scale question. Note: Only 4 of the 9 items included in the question are shown in the above screen print.

3.9.2. Open-ended questions

Building on the work of Grunert et al. (2014) and Lawley et al. (2019), this study uses open-ended questions to obtain understanding of consumers' objective seafood sustainability knowledge for the terms 'sustainable seafood' and 'responsibly sourced'.

For 'sustainable seafood' (Question 9), responses were categorised according to a methodological approach developed by Lawley et al., (2019) in which responses were coded into 4 groups or categories: no, or incorrect response; basic or simple knowledge where only one of the key aspects (or 'pillars', section 2.3.6) of seafood sustainability is referred to; and detailed or complex knowledge, where two or more themes are identified. A definition

provided by the MSC for seafood sustainability - *“leaving enough fish in the ocean, respecting habitats and ensuring people who depend on fishing can maintain their livelihoods”* (MSC, 2022a), was used as a model to frame respondents understanding of the term.

For ‘responsibly sourced’ (Question 10), responses were similarly coded as: Do not know; Incorrect; Correct; and Sceptical response. A correct response was deemed to be one where reference was made to any action (or behaviour) taken by the business to mitigate risk of seafood being unsustainable i.e., ‘the steps taken by a business during the sourcing of own brand fish and seafood’ (SSC, 2021) (Section 2.3.6). An Excel spreadsheet was used to store and code the responses to both questions.

3.9.3. Building Likert-type scales

Likert scales, also referred to as, ‘summated (or aggregated) rating scales’ (Harpe, 2015), were also used to determine a composite measure (De Vaus, 2014) for variables for: seafood purchasing frequency; recognition and understanding of meaning of seafood labels or logos; general or objective seafood knowledge; environmentally-conscious or ‘green’ consumer purchasing behaviour; ocean connectedness; and the various dimensions of the TPB model (See Section 4.17. Table 4.34). *‘For each question people receive a score depending on their answer. The score is allocated to particular answers depending on how favourable the answer is to the attitude (or trait) being measured. The scores for each question are then added together to provide each person with an overall score for that set of questions (scale score)’* (De Vaus, 2014, p.181). The advantages of using multiple indicators are summarised in Table 3.10.

Table 3.10: Advantages of multiple indicators to building scales (Source: Adapted from De Vaus, 2014).

Help get at the complexity of the concept
Assist in developing more valid measures
Increase reliability
Enable greater precision
Information contained in multiple questions can be contained in one variable

The reliability of the scales developed, discussed in more detail below, were assessed by conducting Cronbach Alpha tests in IBM SPSS 25. Cronbach’s Alpha measures internal consistency, a frequently used indicator of reliability, described by Pallant (2020) as “*the degree to which the items that make up the scale are all measuring the same underlying attribute*” (p.6). Items were removed from any given scale in instances where it was recommended to increase its reliability (Pallant, 2020).

3.9.3.1. Seafood purchasing frequency

A definition of seafood ⁴⁸, based on a description for the term provided by Lund (2013), was supplied at the beginning of Section 7 to ensure respondents were made aware of the diversity of species, from both marine and freshwater environments, and range of products, from wild-caught and farmed sources, that constitutes seafood.

The 17 species chosen for the survey were selected on the basis that they were either, and/or: one of the Big 5 (Seafish, 2019; Tetley, 2016); recommended by MCS as alternatives to the Big 5 e.g., hake *Merluccius merluccius* or coley *Pollachius virens* (MCS, 2023a); evaluated as having a high self-sufficiency rate ⁴⁹ but a low % share of total apparent consumption

⁴⁸ “Seafood’ generally covers a diverse or varied group of aquatic organisms, from both marine and freshwater environments, including molluscs, crustaceans, and all types of finfish. Species may be wild-caught or farmed. Seafood includes fresh, frozen, chilled, or tinned fish and products made with or including fish such as fish pies, fish-in-batter, or breadcrumbs, e.g., fish fingers, and prawn curry etc. Fish is also widely used in the production of pet food and health products. Lesser-known by-products of fish processing are also used in the manufacture of other goods such as leather, food wrapping and wine’.

⁴⁹ Self-sufficiency is the ratio of domestic production over domestic consumption (EUMOFA, 2020).

(EUMOFA, 2020), e.g., trout *Oncorhynchus mykiss* or mackerel *Scomber scombrus*; or species 'red-rated' by MCS and identified as Fish to avoid (MCS, 2023b). Depending on where a species is fished or farmed and how, species rated 1 or 2, including those recommended as 'alternatives' or with a high self-sufficiency, are recommended in the MCS GFG as a 'Best choice'.

Squid (or calamari) e.g., *Loligo vulgaris* was also included as it is popularly consumed in bars and restaurants (The Mail, 2016). Plaice *Pleuronectes platessa* was also included as it is identified in earlier versions of the MCS Pocket GFG (PGFG) as a long-lived species subject to high fishing pressure and therefore one consumers should be consuming 'with caution' and/or substituting with less vulnerable species such as lemon sole *Microstomus kitt* or megrim *Lepidorhombus whiffiagonis*, for example. It was also listed as a 'Other' species consumed in the past 12 months by respondents to the Pilot study and identified in a survey of consumers carried out by Seafish, as a species customers seeking more variety, would like included on take-away menus (Seafish and AHDB, 2016).

Respondents were asked how frequently they had purchased the 17 species in the past 12 months prior to completing the questionnaire (See Question 15, Appendix 8). Frequency was self-reported using a 5-point summated rating scale, composed of 17 items, with end points, 0, 'Not at all' and 4, 'At least once a week'. Respondents were also given the opportunity to reply, 'Not sure'. The responses were added to calculate a total sum or composite score for fish purchasing resulting from the sum of the 17 purchased species (Almeida et al., 2015a) between 0 and 68. The higher the composite score, the higher the purchasing frequency for that participant was deemed to be. The response 'Not sure' was not included in the scaling.

3.9.3.2. Consumer awareness of seafood labels or logos

Labelling of food, including seafood, is important for consumers understanding of product sustainability (Cusa et al., 2021). Question 17 (Appendix 8) was designed to obtain understanding of the level of recognition and understanding of the meaning of 10 seafood labels commonly found on seafood products in UK supermarkets. See Section 2.3.7. for

detailed discussion of food and fish labelling. To determine the level of recognition and understanding of each of the 10 logos, a 4-point summated rating scale, composed of 10 items, with end points, 3, “I recognise the logo and fully understand it’s meaning” and 0, “I do not recognise the logo” was used to calculate a single composite score between 0 and 30 for eco-label knowledge. The higher the composite score, the higher the eco-label knowledge for that participant was deemed to be. A Cronbach Alpha score of 0.924 indicates the scale used is highly reliable.

3.9.3.3. General or objective seafood knowledge

Knowledge statements were composed from a study of information presented in the annually published MCS PGFG’s (See The National Mullet Club, 2019) and researchers’ knowledge of the UK seafood market. Seafood issues identified related to net import of fish into the UK (Carmichael, 2019); consumer interest in the UK in a narrow range of species (the Big 5) (Seafish, 2018; Tetley, 2016); and the impacts of climate change on fish stocks, such as the effect of increasing water temperatures on fish distribution (Cheng et al., 2020; Baudron et al., 2020), for example. To explore respondents’ levels of knowledge, a Likert-type scale, composed of 9 items (See Question 19, Appendix 8), with end points, 5, ‘strongly agree’ and 0, ‘Not sure’, was used to calculate a single composite score between 0-45. The higher the composite score, the higher the objective knowledge for that participant. A Cronbach Alpha score of 0.86 indicates the scale used is highly reliable.

3.9.3.4. Green purchasing behaviour

To examine the effect of ‘spillover’ behaviour (Thomas et al., 2019), to whether users of the MCS GFG display more ‘green’ or environmentally-conscious consumer behaviours (e.g., purchase free-range eggs or meat; avoid products containing palm oil etc.) compared to non-users or non-fish buyers, a Likert-type scale, composed of 14 items (See Question 26, Appendix 8), with end points, 5, ‘strongly agree’ and 0, ‘Not sure’, was used to calculate a single composite score for ‘Green’ shopping habits between 0 and 70 for each respondent.

The higher the composite score, the higher the reported commitment for that participant to making ‘green’ purchases was deemed to be. A Cronbach Alpha score of 0.9 indicates the scale used is highly reliable.

3.9.3.5. Connectedness to the sea

To determine the level of connectedness guide-users have with the sea compared to non-users and non-fish buyers, a Likert-type scale, composed of 10 items, including Ocean Literacy Principles 5 and 6 (See Section 2.5.8.1; COSEE, 2005) (Question 25, Appendix 8) with end points, 5, “Strongly agree” and 0, “Not sure”, was used to calculate a single composite score or variable for connectedness between 0 and 50. Negative statements (Items 4, 9, and 10) were reverse scored. The higher the composite score, the higher the ‘connectedness to the sea’ for that participant. A Cronbach Alpha score of 0.85 indicates the scale used is highly reliable.

3.10. Piloting the public questionnaire

Pilot testing is a crucial aspect of social research approaches (Creswell and Creswell, 2018), and provides an opportunity to improve questions, format and instructions, and assess how long the questionnaire will take to complete (Creswell and Creswell, 2018: Table 3.11).

Table 3.11: Summary of reasons for piloting questionnaire (Source: Adapted from Creswell and Creswell, 2018 and Bryman, 2016a).

Reduce confusion and ambiguity	Develop questions
Increase understanding	Improve format
Enhance structure and flow	Refine instructions
Answer research questions	Assess time to complete questionnaire

The public questionnaire was piloted for 2 weeks, commencing on 9th March 2020.

A link to the web-based questionnaire was distributed to the following groups via email:

1. Distribution Groups within Cardiff University, including both staff and post-graduate students (~1000).
2. Marine Conservation Society (MCS) staff, in particular members of fisheries, biodiversity and education teams (20).
3. Friends, family and colleagues (20).

Individuals were invited to provide their comments and feedback through a standardised template (Appendix 9), including topics such as how long it took to complete, clarity of the questions and images. In addition to the feedback template, MCS fisheries staff invited to participate in the pilot were provided with a Survey Question Mapping figure (Figure 3.3) and a Word document of the Pilot draft (vs.17) questionnaire (Appendix 7).

Following receipt of 34 responses to the pilot, revisions were made, and the questionnaire further examined by the Supervisory team before a final version (vs. 20) was produced (Appendix 8). Key changes included making the introduction more concise to improve readability; open-ended questions were moved to a later section so as not to deter interest; where the option 'Other' was given it was removed from the general list of choices and published as a separate question to avoid it being 'shuffled' and causing confusion; where bias was suggested, for example, towards sustainability, statements were rewritten, for example, "I want to do the right thing when buying seafood" was replaced with "It should not all be down to me to do the right thing when buying seafood". A summary of all the feedback received and the changes made to the Pilot to produce a final version of the questionnaire is provided in Appendix 10.

3.11. Distribution of the public questionnaire

A multi-phased approach to collecting data was preferred to ensure the data collected was nationally representative, and not biased towards individuals with an interest in marine conservation, but simultaneously include representation from those members of the public with potential exposure to the Guide. This was especially important given that the study aims to evaluate the effectiveness of the Guide, understand who Guide users are, what motivates them to use the Guide, and to make comparisons between them and non-users. Whilst recognising the potential bias inherent in visitors to public attractions such as zoos and aquaria, discussed in 3.11.1, to achieve this balance, it was proposed that data would be collected by promoting the survey link through the social media channels of public attractions (Table 3.12), as well as through appropriate organisations networks (Appendix 15).

It was proposed to co-ordinate and collect data either in person or with assistance from participating staff at the various centres in the period 1st May to 30th June, but due to Government measures introduced into the UK on March 23rd, 2020, to restrict the spread of Coronavirus (COVID-19), opportunities for collecting data became restricted to remote collection only. Government restrictions introduced included social-distancing measures and restrictions on public travel which resulted in the immediate closure of public attractions such as aquariums etc. Closures implied too that in many cases staff were furloughed and only essential services relating to feeding and caring for animals maintained. As a result of business closures, the annual distribution of the 2020 MCS PGFG was also severely impacted with many 'usual orders' not received or in the case of advanced orders, not dispatched (C. Coombes, MCS, July 2020, *Pers. Comm.*).

Through provision of a grant⁵⁰ it was possible to engage the services of a professional survey company, Cint UK Ltd (See 3.11.4. for details), which enabled remote data collection from

⁵⁰ MCS provided a grant for payment of services of CINT UK Ltd <https://www.cint.com/>. For copy of grant agreement see Appendix 11.

approximately 1100 members of the general public (See 3.11.4). To promote the questionnaire, an article ⁵¹ advertising details of the survey including a link to it was written for the MCS Magazine (in January, in advance of the introduction of Government measures to restrict the spread of COVID-19) and published in March 2020.

3.11.1. Public attractions

According to research carried out in the USA, zoos and aquaria attract ‘conservation-minded’ visitors (Kemmerly and Macfarlane, 2009). Zoos and aquaria are also important destinations for education and raising conservation awareness (Miranda et al., 2023) and because of increased awareness, individuals can be motivated to take conservation action (Moss et al., 2015), such as using the MCS GFG to increase the sustainability of their seafood purchases.

Using the search terms 'UK Zoos', 'UK wildlife parks', 'UK aquariums', 'UK safari parks' and ‘UK visitor centres’ in Google, a database of 153 ‘public attractions’ was created from internet searches and stored in Microsoft Excel. The results for zoos, wildlife parks and aquariums were then checked against a website of British and Irish Association of Zoos and Aquariums (BIAZA)⁵² members, and any centres recognised by BIAZA but not already included were added to the database (Appendix 12).

Aquariums included Sealife Centres (11), (owned by Merlin Entertainments, and in the case of the Cornish Seal Sanctuary, the Sealife Trust), who, in the case of the London Sealife Centre have collaborated with MCS to produce co-branded versions of the PGFG and as a business planned to distribute a total of 200,000 guides in 2020.

⁵¹ <https://www.flipsnack.com/MCSMag/mcs-magazine-spring-2020.html>

⁵² <https://biaza.org.uk/members/all>

A letter of invitation and a recruitment advertisement were produced (Appendix 13). It was planned that each of the distribution centres would be contacted at the beginning of April inviting them to take part in distributing survey details to their visitors from 1st May; however, due to the Coronavirus (COVID-19) pandemic, public attractions started closing to the public from around middle of March 2020.

In response to the closure of public attractions, the letter of invitation and recruitment advertisement were amended (Appendix 14) inviting them to instead distribute details of the survey to their followers through their social media channels. A total of 153 centres were contacted by email between 22nd and 23rd April. The final number of public attractions agreeing to participate in distribution of survey details was 11, representing 7% of organisations contacted. See summary in Table 3.12.

Table 3.12: Summary of public attractions contacted with request to distribute details of survey to their online followers.

Type of centre	% and number of each type	% and number of each type supporting distribution of the MCS GFG	% and number of each type agreeing to participate in distribution of survey details
Aquarium	12% (18)	56% (10)	17% (3)
Sealife Centre	7% (11)	100% (11)	No response ⁵³
Safari Park	3% (5)	60% (3)	20% (1)
Wildlife Park	38% (58)	7% (4)	2% (1) ⁵⁴
Zoo	31% (48)	21% (10)	6% (3)
Outdoor education or visitor centre	9% (13)	38% (5)	23% (3)
Total	100% (153)	28% (43)	7% (11)

⁵³ All non-essential SEALIFE staff including those employed in social media activities were furloughed from outset of pandemic.

⁵⁴ Borth Wild Animal Kingdom also volunteered to contact another of their attractions (Apex Extreme) not listed as one of the 153 centres.

3.11.2. Networks

In addition to the 153 sites contacted, networks including, *MumsNet*, the *Women’s Institute*, *Seafish Fish is the Dish* ⁵⁵ and networks with an interest in marine conservation, such as *Marine Social Sciences Network*, the *Marine Geography Network*, *Project Seagrass* and the *Porcupine Marine Natural History Society*, as well as social media networks managed by the Marine Conservation Society, were invited to promulgate details of the survey (Appendix 15).

3.11.3. Social Media

The use of social media (Figures 3.5 and 3.6) by conservation organisations to reach and inform audiences is widely accepted (Arts et al., 2022; Jacqmarcq, 2021; Büscher, 2016). The advantages and limitations of this type of self-selection approach to obtaining responses are summarised in Table 3.13.

Table 3.13: Advantages and disadvantages of using social media to recruit respondents (Source: Adapted from: Zindel, 2023).

Advantages	Disadvantages
Wide audience	Unpredictable response
Rapid and instant circulation	Uncensored
Economic	Exposure
Ability to target interests	Biased response

⁵⁵ *Fish is the Dish* was replaced by new marketing campaign *Love Seafood* in October 2020. *Love Seafood* dissolved in March 2022.

The Good Fish Guide - has it changed the way you choose your seafood?

Cardiff University is carrying out research into the influence the Marine Conservation Society's Good Fish Guide may or may not have on people's seafood buying decisions. Do you know your Fish to Avoid from your Best Choices? If you're the household food buyer and you're 18 or over then please take part in the survey here http://bit.ly/sus_seafood_survey It's open from May 1st. It doesn't take long, you don't even need to use the Guide, or buy or eat fish, but you can still enter the prize draw! @mcsuk.org #GoodFishGuide @cardiffuni @CardiffUniEarth @sustainablecu

Figure 3.5: Social Media Facebook post.

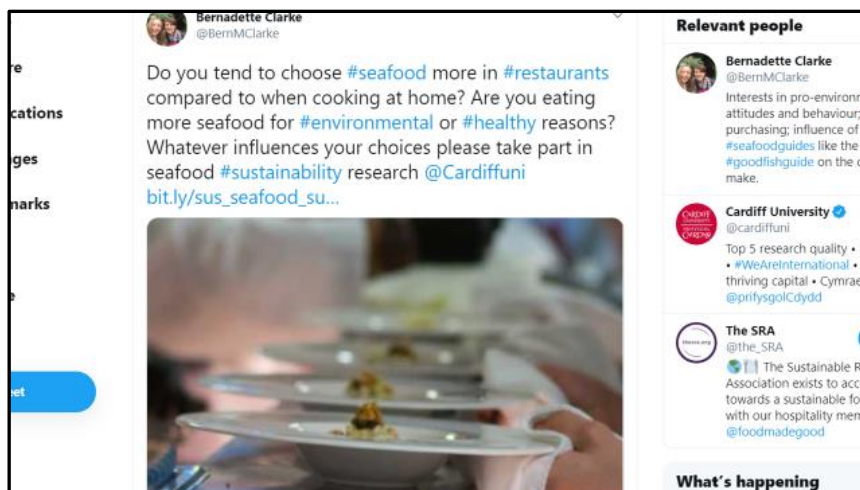
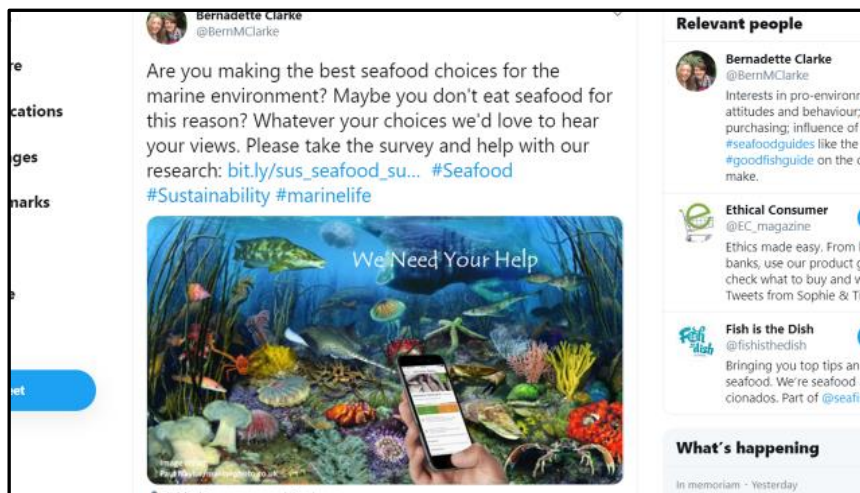


Figure 3.6: Social Media Twitter tweets

Throughout the data collection period, regular email contact was made with the various centres to encourage as much uptake as possible.

3.11.4. Professional distribution

Using the '*Import questions*' facility in Google Forms, two identical versions of the public questionnaire were produced. One copy, with the link advertised in the MCS magazine in March, was designated as the MASTER Copy (for distribution through researchers lists) and the other, designated the Cint Copy (for professional distribution only).

Both versions were launched on Friday 1st May 2020. The Cint survey budget allowed for the collection in approximately one month of around 1100 responses depending on the time (Length of Interview (LOI)) taken for respondents to complete a survey and the number of surveys returned. In the end 1998 responses were collected. A representative sample was not requested due to limitations imposed by cost and grant funding. Inclusion criteria for the data collected was age (18 and above), for individuals to be living in, and nationally distributed throughout, the UK.

3.12. Data analysis

Analysis of quantitative data from the public survey was carried out in IBM SPSS 25. Statistical tests were chosen based on the scale of measurement for the data being used and the type of analysis required (McCrum-Gardner, 2008). Non-parametric tests were used given that the data collected was not normally distributed (McCrum-Gardner, 2008). Likert-type data was treated as ordinal, or as interval or continuous, data (Harpe, 2015; Sullivan and Artino, 2013), depending on whether the subject of analysis was a Likert-type item or Likert-type scale (See Sections 3.9.1 and 3.9.3).

Mann-Whitney U tests were used to test for differences in responses between groups, i.e. whether the medians in two independent samples were equal, for example, the difference in responses between users and non-users of the Guide. Chi-square tests for independence were run to examine the relationship or association between nominal or categorical variables, for example, MCS GFG use and the responses to each of the items or statements in the question. One sample Wilcoxon tests were carried out to determine if responses overall to the items presented differed from the mid-point i.e. Neither agree nor disagree as applied by McKinley et al. (2020). Kruskal-Wallis tests were run where comparisons were being made between 3 or more independent groups or variables and one continuous dependent variable (Pallant, 2020). For example, tests were run to examine the differences between 'eco-label knowledge' across the categories of gender; age; education; household income; and where respondents are buying seafood from a supermarket, the supermarket most frequently used. Coefficient correlation and standard multiple regression analysis was carried out to examine the relationships between the models constructs and assess the predictors of GFG use (Jalilian et al., 2020; Hasan et al., 2019; Aghamolaei et al., 2012; Bredahl and Grunert, 1995) and Pearson's correlation coefficients calculated for the dimensions of extended model of TPB used in the study (Pallant, 2020).

3.13. Limitations of methodology in Phase 1

Any option to collect survey data in-person was negated by the timing of restrictions imposed by the COVID-19 pandemic. This situation was overcome using a self-administered online survey. Although there are advantages to using this type of survey (See Tables 3.5, 3.6 and 3.7), especially its value in reaching a wide audience, and despite the situation of the pandemic, limitations inherent in the self-selection sampling approach used in this study may have resulted in higher-than-expected levels of public awareness, Guide use and seafood sustainability knowledge. Steps were taken to help reduce response bias towards sustainability (See Sections 3.9.1. and 3.10).

A disadvantage of using questionnaires generally is their low response and completion rates. This was largely overcome by engaging the services of a professional data collection company and the promulgation of the survey through a variety of social media channels or networks. Average completion rates for the questionnaire for Cint and public respondents were, 99 % and 97 %, respectively.

3.14. Phase 2: Stakeholder interviews

The data collection instrument used in this phase of the study were semi-structured interviews, recognised as the most frequently used instrument for collecting qualitative data (Bryman, 2016b; Qu and Dumay, 2011). A qualitative research approach (See Table 3.2), described by Creswell and Creswell (2018 p.4), as, “an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem”, using non-probabilistic sampling to collect data was adopted in Phase 2.

Qualitative data is typically ‘collected in interview formats from individual participants’ (Hagaman et al., 2016) and ‘based on questions that do not restrict their (participants) options for responding’ (Creswell and Plano Clark, 2018). Semi-structured interviews are also a convenient method of collecting information and exceptionally useful in understanding how individuals observe their world (Qu and Dumay, 2011). The advantage of collecting qualitative data in this way is that interviews lend themselves to gaining more detailed insight (Bryman, 2016b). In this case, into the ‘seafood world’ and the challenges of increasing sustainability in the seafood supply chain and how, if at all, such challenges might inhibit the effectiveness of interventions such as seafood guides. The advantages and disadvantages of using semi-structured interviews are summarised in Table 3.14.

Table 3.14: Advantages and disadvantages of using semi-structured interviews for qualitative data collection (Source: Adapted from Qu and Dumay, 2011).

Advantages	Disadvantages
Effective and convenient method for collecting information	Requires considerable care and planning
Flexible data collection tool	Interviewer can elicit biased responses
Accessible and transparent	Access to interviewees can be difficult
Basis of interview is in human conversation	Requires effort on part of interviewer to optimise responses
Facilitates a personal response	
Allows insight into the social world under study	The ‘flow’ and effective capture of the interviewee’s ‘story’ requires skilled interviewing techniques
Allows use of probes (or prompts) to ‘draw out’ narrative	
Allows for adjustment of style, pace, number and ordering of questions	No ‘recipe’ for successful interviewing

3.15. Structure and aims of the interviews

As outlined in Section 1.3 the overall aim of the research was to evaluate the effectiveness of the MCS GFG in motivating sustainable seafood purchasing behaviour in the UK. To achieve this, a semi-structured interview schedule comprising of 12 open-ended questions was developed (Appendix 16). In particular, the first 5 questions were designed to elicit understanding of: awareness among stakeholders of the SSM; meaning and importance of sustainability to them; their perceptions of the main drivers influencing the availability of sustainable seafood; and public support for seafood sustainability. The remaining questions, 6-10, focused on evaluation of the awareness, use and effectiveness of the MCS GFG. Questions 11 and 12 were concerned with canvassing ideas for how the MCS GFG might better engage with the public and stakeholders respectively in the future. See Table 3.15, for summary of structure and aims of semi-structured interviews. Whilst Column 2 (Data requirements in Phase 1) in the table relates to the public questionnaire, it is included to show how data collected in Phase 1 provides a basis for collecting data in Phase 2, further discussed in Chapter Six, and how both data collection phases relate to the research objectives.

Table 3.15: Structure and aims of semi-structured interviews.

Research Objective	Data requirements in Phase 1	Data requirements in Phase 2	Phase 2 Interview questions
Examine UK consumer's perceptions of seafood sustainability.	Open-ended questions to determine public understanding of terms 'sustainable seafood' and 'responsibly sourced'; importance of sustainability; public demand for sustainable seafood; reasons for not buying seafood.	Meaning and importance of seafood sustainability to stakeholders; Stakeholder experience of public demand for sustainable seafood; Stakeholder view of consumer or public support for seafood sustainability.	How aware are you of the Sustainable Seafood Movement (SSM), in the UK and globally? What does seafood sustainability mean to you? Why is it important to you? How strong do you think consumer demand is for sustainable seafood? How do you think public concern for the impact of fishing on the marine environment is being reflected in the seafood choices consumers are making?
Explore situational factors i.e., factors external to the model influencing public consumer decision making when buying seafood.	What influences public decision making when buying seafood; Barriers to purchasing sustainable seafood.	Situational and other factors influencing supply of sustainable seafood.	In your opinion what are the main drivers (positive or negative) influencing the availability of sustainable seafood in the UK?
Assess knowledge, understanding and use of the Guide among UK seafood consumers.	Public awareness and use of MCS GFG. Purpose and trust in guide.	Stakeholder awareness and use of MCS GFG. Purpose and trust in guide.	How aware are you of the MCS GFG? What are your views on the information provided in the MCS guide? How, if at all, does your organisation or business use the MCS GFG to help inform your staff, students,

			customers, colleagues, or members about seafood sustainability?
Investigate the effectiveness of the Guide in driving changes in consumer behaviour.	Changes the public have made to their purchasing behaviour as a result of using guide.	Stakeholder view or experience of effectiveness of MCS GFG.	What influence, if any, do you think the MCS GFG is having on the seafood choices consumers are making? How, if at all, would you say the MCS GFG is effectively motivating sustainable stakeholder practice on the ground or water?
Research Objective	Data requirements in Phase 1	Data requirements in Phase 2	Phase 2 Interview questions

3.16. Interview schedule design and distribution

Gutiérrez and Morgan (2015) refer to the basis of the SSM as a ‘coalition of actors’ who came together to develop tools, including seafood guides, to inform sustainable seafood initiatives and increase the supply of sustainable seafood to the consumer.

Key actors – or stakeholders - in this movement are identified by them as: ‘*environmental non-governmental organizations (ENGOs), philanthropic foundations, certification schemes, verification experts, retailers, food service providers, restaurants, chefs, members of the fishing industry, academics, media and engaged consumers*’. Using the key actor groups identified by Gutiérrez and Morgan (2015) as a foundation and with reference to the structure of the UK seafood supply chain (Figure 3.7), key actor groups involved directly or indirectly in the SSM and the supply of seafood in the UK were identified.

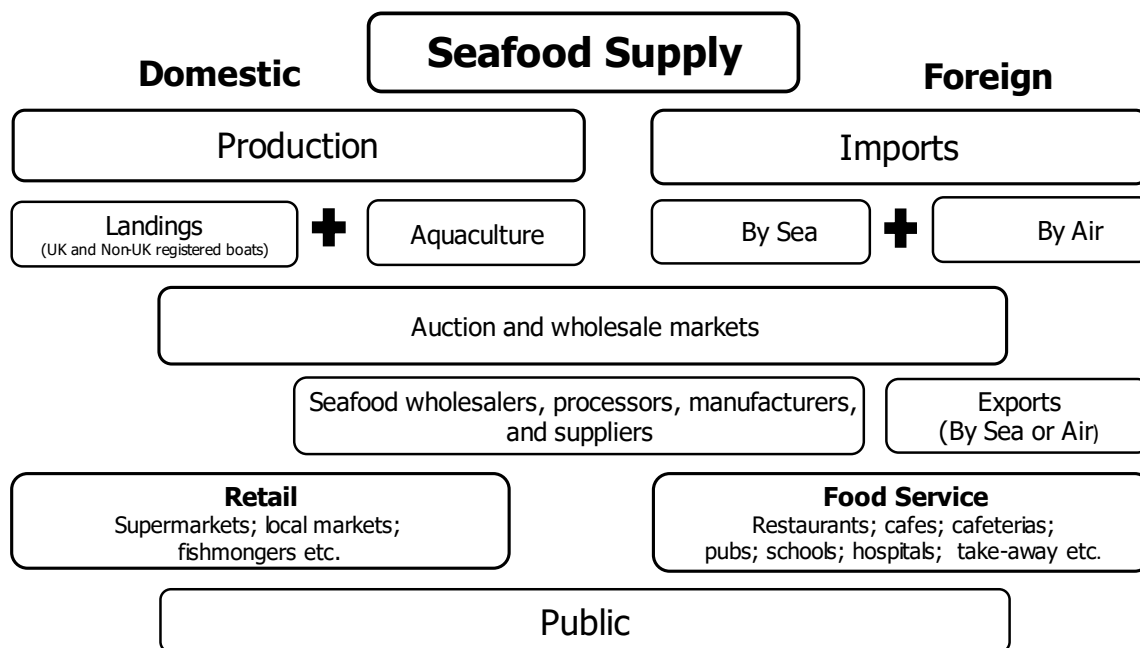


Figure 3.7: Seafood supply and distribution in UK.

Philanthropic foundations were omitted as a key stakeholder group as their influence or direct involvement in the UK seafood movement is less influential when compared to the situation in the USA (Our Shared Seas, 2021). Academics were also omitted in favour of individuals working in industry including in the capacity of consultants. Additional stakeholder groups were identified as Government and public bodies; Seafood wholesalers, processors, manufacturers, and/or suppliers; and Cookery schools and training. The ENGO groups included in the interview process were specifically those managing sustainable seafood initiatives underpinned by MCS GFG seafood advice and ratings (The National Mullet Club, 2019). See Chapters 2 and 5 for discussion. The key groups identified are presented in Figure 3.8.

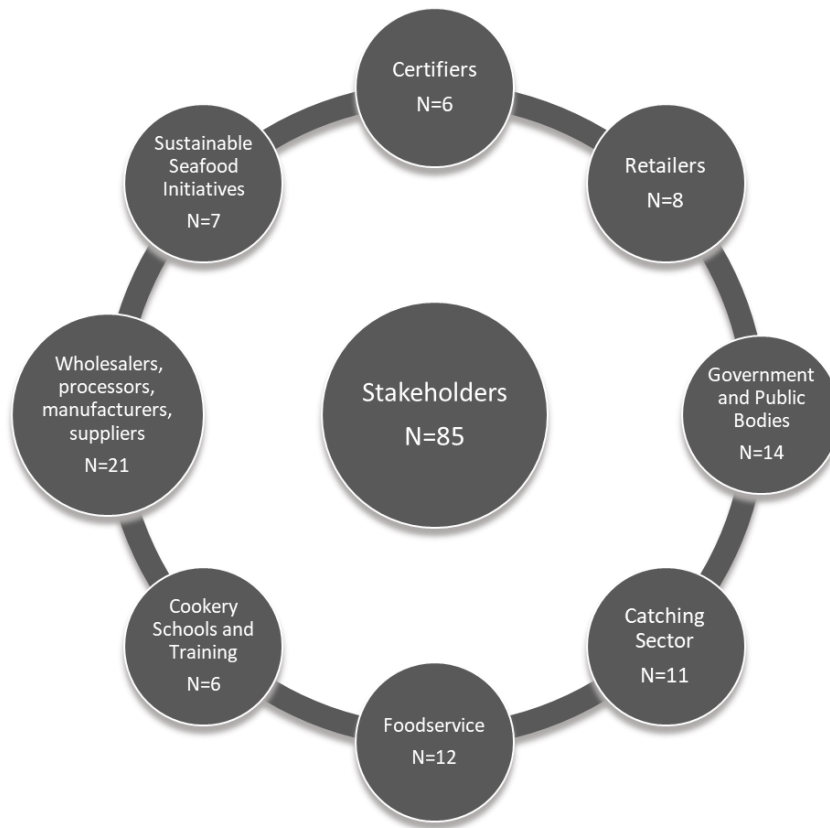


Figure 3.8: Representation in Stakeholder Groups.

As with the development of the public questionnaire, the stakeholder interview guide was critically examined by the Supervisory team and revisions made and reviewed by the team before finalising a version in March 2021 for carrying out interviews. See Appendix 16.

Purposive (or purposeful) sampling, a non-probability form of sampling (Bryman, 2016a), was adopted as a strategy for selecting interviewees. Creswell and Plano Clark (2018) discuss purposive sampling as meaning the deliberate selection of *'participants who have experienced the key concept being explored in the study'*. An important 'element' of purposive sampling is that interviewees are *'selected according to predetermined criteria'* of relevance to the objectives of the research being carried out (Guest et al., 2006). Purposive sampling thus ensures the research questions are central to the selection process; interviewees have relevant experience; and can make a meaningful contribution to the research (Bryman, 2016a). Another important and practical element of non-probabilistic sampling generally is that individuals selected for the study must be accessible (Creswell and Plano Clark, 2018).

For this study, interviewees were generally selected for interview because of their experience, knowledge of the UK seafood and fishing industry, and their competency, in many cases, with seafood sustainability initiatives, including the MCS GFG. A list of 85 individuals, representative of organisations and qualifying for inclusion in one of the eight groups identified in Figure 3.8 was drawn up.

To increase representativeness consideration was given in the selection process to, for example, in the case of the catching sector, the regional distribution of organisations, the industry sector represented by the organisation e.g., handliners and the target species of interest to its members e.g., shellfish. In the case of the retail sector consideration was given to the size and demographic of the supermarket business in question. In the case of seafood supply, consideration was given to including as many popular UK seafood suppliers and brands as possible, for example, Young's Seafood, Birdseye, M&J Seafood, Abel & Cole, Falfish, Direct Seafoods, Whitby Seafoods, Macduff Shellfish and the Big Prawn Company. In the case of UK Government and Public bodies, representation was sought across the four devolved administrations.

Although representation was not sought from individual fish farmers, seafood in the context of this study and the interviews carried out, included farmed seafood. Representation of seafood produced from aquaculture was specifically sought by inviting organisations such as the ASC, the Global Aquaculture Alliance (GAA) and the International Fishmeal and Fish Oil Organisation (IFFO), also known as the Marine Ingredients Organisation, for example, to participate in the interview process.

Invitation letters (Appendix 18) were sent out between 16th April and 22nd June 2021. In total a sample size of 49 interviews was achieved, representing a response rate of 58%. The response rate for individual stakeholder groups (Figure 3.8. above) is summarised in Table 3.16.

Table 3.16: Response rate and representation for each group taking part in semi-structured interviews.

Group	Contact n (%)	Response rate n (%)	Representation n (%)
Sustainable seafood initiatives (underpinned by MCS GFG advice)	7 (8%)	6 (86%)	6 (12%)
Certifiers	6 (7%)	4 (67%)	4 (8%)
Retailers	8 (9%)	4 (50%)	4 (8%)
Government and Public Bodies	14 (16%)	7 (50%)	7 (14%)
Catching Sector	11 (13%)	3 (27%)	3 (6%)
Foodservice	12 (14%)	4 (33%)	4 (8%)
Cookery schools and training	6 (7%)	4 (67%)	4 (8%)
Wholesaler, processor, manufacturer or supplier	21 (25%)	17 (81%)	17 (35%)
Total	85 (99%)	49 (58%)	49 (99%)

Although ‘purposive’ sampling is the most used method of non-probabilistic sampling, according to Guest et al. (2006), ‘guidelines for determining non-probabilistic sample sizes are virtually non-existent’. Consequently, saturation, defined as, ‘*the point at which no new information or themes are observed in the data*’, is most often relied upon, and regarded as the ‘Gold Standard’ for determining a suitable or adequate sample size (O’Rielly and Parker, 2012; Guest et al., 2006). In what is regarded as the first empirical and landmark study to determine sample size (O’Rielly and Parker, 2012), Guest et al. (2006) determined that data saturation was reached ‘for the most part’ by the time 12 interviews were analysed, while in a study carried out by Onwuegbuzie and Leech (2007), the authors refer to studies with sample sizes of between 20 and 50 interviews. 49 interviews were conducted as part of this study. Bryman (2016a) has proposed several factors to be taken into account when deciding how large a sample should be (Table 3.17).

Table 3.17: Factors for assessing adequacy of sample size (Adapted from: Bryman, 2016a. p. 418)

Factor
Saturation, theoretical or data
Minimum requirements for an adequate sample
Research style
Population diversity (Homogeneity)
Scope of research questions

However, Weller et al. (2018) propose that a more useful indicator of saturation is one of ‘salience’ and redefine saturation as, ‘*obtaining the most salient items in a set of qualitative interviews*’. Their study also highlights the importance of ‘probing’ and ‘prompting’ during interview as a mechanism for increasing the amount of information collected from each respondent and thus the efficiency of the interview, thereby reducing the number of interviews required to reach saturation. See Appendix 17 for examples of probes and prompting (in italics) used in this study to help increase the amount of information collected.

3.17. Conducting the interviews

Online, video interviews were carried out via Zoom ⁵⁶, or, in the case of four interviews, Microsoft Teams, between 10th May and 12th August 2021. The use of a video conferencing platform is deemed like an in-person interview, since parties taking part can see each other (Bryman, 2016a). Interviewees can however elect not to turn on their video or camera if they wish to do so. The benefits of using Zoom as a means of collecting qualitative interview data are summarised in Table 3.18.

⁵⁶ Zoom is a virtual or cloud-based video conferencing software platform authored by Eric Yuan and released by Zoom Video Communications in 2012.

Table 3.18: Summary of benefits of using Zoom to collect qualitative interview data. (Source: Adapted from Gray et al., 2020 and Archibald et al., 2019).

Advantages of using Zoom platform	
Relative ease of use	Convenience
Cost-effectiveness	Accessibility
Data management features	No travel constraints
Security options	No time constraints

The use of video conferencing platforms to carry out interviews during the COVID-19 period was especially useful in overcoming restrictions placed on travel and the introduction of ‘social distancing’⁵⁷. It also facilitated more flexible and immediate scheduling of interviews compared to situations where either the interviewer or interviewee was obliged to travel to the interview. Technical difficulties, such as with establishing call connection; audio or video reliability; and audio quality, are identified by Archibald et al. (2019) as ‘challenges’ for the Zoom platform.

The interview questions were sent to interviewees in advance to allow for some preparation, thus increasing the efficiency of the time available for interview and to allay any concerns for their being ‘put on the spot’. With the interviewee’s permission, interviews were recorded. Interviewees were generally familiar with requirements to record Zoom meetings and readily agreed to interviews being recorded. In fact, for the majority of interviewees, Zoom meetings had become a ‘way of life’ since the onset of the pandemic.

Invitations were sent out in the timeframe set to carry out the work, however all 49 interviews were not completed until 12th August. Follow-up emails were sent out at regular but respectful intervals to encourage as many invitees as possible to participate. The first 5

⁵⁷ Social distancing refers to measures taken to reduce social interaction between people to help minimise the transmission of coronavirus (COVID-19).

interviews were used as an opportunity to pilot the questions and address any issues with the interview design. Minor amendments were made to improve understanding.

When carrying out the interviews, care was taken with each interviewee to ask questions in order, using the same wording, to *'ensure the same thematic approach is applied during the interview'* (Qu and Dumay, 2011). In total 32.5 hours of interviewing was carried out with a maximum interview length of 82 minutes, minimum length of 20 minutes, and an average length of interview of 40.6 minutes, generating approximately 330 A4 pages of typed transcript. During the interview process 'snowballing'⁵⁸ of interviewees generated two additional contacts.

3.18. Interview transcription, analysis, and coding

Zoom automatically saves recorded meetings into an audio and a combined audio video file. The files were virtually stored and later downloaded to the researcher's private and secure computer (Gray et al. 2020). Transcriptions were automatically generated as VTT⁵⁹ files. Further editing was carried out using Panopto⁶⁰ to edit captions online for interviews available in this format to produce a transcript. A similar process was followed where interviews were recorded in Teams. This process provided an opportunity for initial interpretation and for the researcher to become 'immersed' in the data before coding began (Braun and Clarke, 2006). Prior to commencing analysis and coding, the relevant interview audio and transcript was emailed to each stakeholder in December 2021. Interviewees were invited to get in touch for clarification if they had any concerns regarding the accuracy of the transcript or how anonymised excerpts and/or verbatim quotes from them might be used and how the findings and results of the research project would be written up and published.

⁵⁸ Process whereby interviewees identify additional or new contacts for interview.

⁵⁹ A VTT file is a text file saved in the Web Video Text Tracks (WebVTT) format.

⁶⁰ Panopto is a software company that provides interview and lecture etc. recording, screencasting, video streaming, and video content management software <http://www.panopto.com>

All 49 transcripts were then imported into NVivo 12⁶¹ for coding. An advantage of using this type of software is that it ensures the actual spoken words of interviewees participating in the research are coded verbatim (Manning, 2017). A process of thematic analysis was used to identify common or recurring themes ('nodes') (Braun and Clarke, 2006), with both 'top-down' or a priori coding, as applied by McKinley et al. (2019), and inductive or 'bottom-up' or emergent coding (Bryman, 2016a) approaches adopted to explore and code the data. Prior to reviewing the data, a framework was created in NVivo to match the format used for each of the semi-structured interviews and thus organise responses. The framework included top-down coding for questions posed in the interviews (See Appendix 20 for full list of codes). Each transcript was then examined to collect responses under these codes and to identify emergent codes. Interviewee responses were also transferred into an Excel workbook for further examination of themes, collation, and analysis of data, and in the case of some data, for example data collected in relation to awareness of the SSM and MCS GFG, to quantify responses. The codes and how they were grouped, and the higher-level themes explored are presented in Appendix 20.

Around 118 nodes were created with approximately 95% of themes observed in 50% of the data i.e., coding of 24-25 transcripts, suggesting that saturation was reached at around this stage of the analysis. See Figure 3.9.

⁶¹ NVivo 12, produced by QSR International, is a windows desktop application that enables users to 'organise, analyse and visualise information' or data.

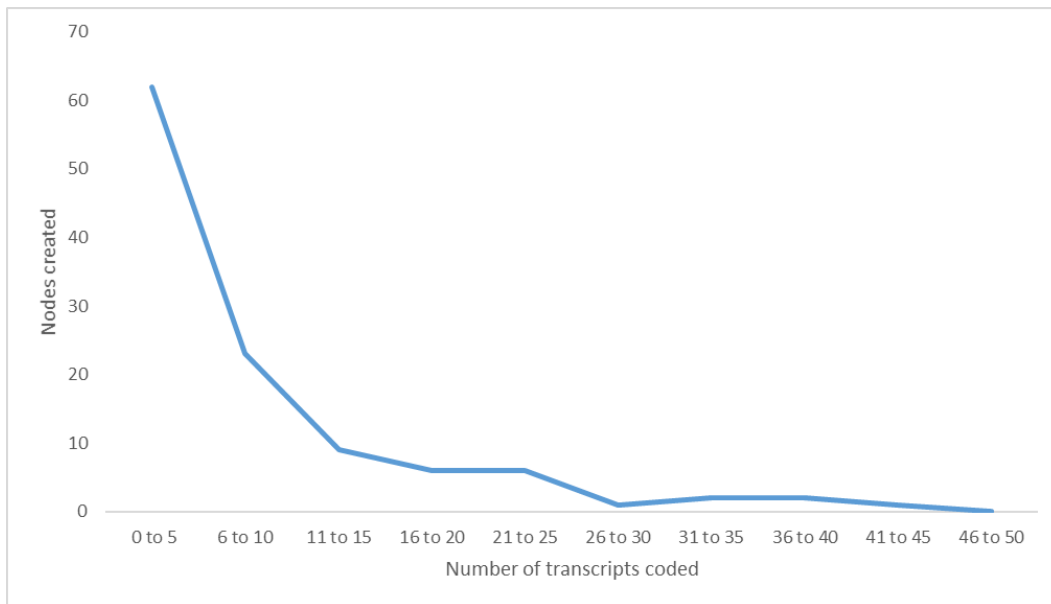


Figure 3.9: Thematic analysis and saturation.

3.19. Limitations of methodology in Phase 2

As with data collection in Phase 1, options to collect data in-person in Phase 2, through in-person semi-structured interviews, was not possible due to restrictions imposed by the COVID-19 pandemic. As noted in Section 3.17, this situation was overcome using the online conferencing software platforms Zoom and Teams. Although there are some disadvantages to using such platforms, the benefits, especially their value in reaching individuals living at distance, and in a national pandemic, outweighed any disadvantages. The main disadvantage of using Zoom for conducting interviews was problems associated with audio quality which for at least two interviews led to difficulty experienced with accurately transcribing all the interview verbatim. Interviews held through Zoom are also inclined to be less fluid compared to the experience of ‘real life’ conversations.

As discussed in Section 3.16, purposive or purposeful sampling was used to recruit interviewees for this study. A feature of this type of sampling is that interviewees are deliberately selected for their relevant experience, knowledge, and ability to make a useful

contribution to the research (Bryman, 2016a). The limitations associated with this sampling method is the bias inherent in choosing interviewees and by implication the potential for them not being representative of the wider population (Etikan et al., 2016) (Table 3.4).

3.20. Summary

This chapter has outlined the general methodological approach adopted to undertake this study. The chapter also highlights the advantages and disadvantages of the data collection instruments used, which are presented in the various tables included in the chapter. In particular, the chapter highlights the methodological approach taken in light of restrictions imposed by the COVID-19 pandemic. The limitations for data collection including introducing sample bias as a disadvantage of using self-selection, and social media specifically (See Table 3.13), to recruit respondents, and purposive sampling for enlisting stakeholders, is summarised in Sections 3.13 and 3.19 respectively. Analysis and coding for both study phases is also discussed. The following chapter presents an analysis of data collected in Phase 1.

Chapter Four: Results and discussion: Public questionnaire

4.1. Introduction

This chapter presents the results of the analysis of data collected from the public questionnaire (Phase 1). Specifically, this chapter investigates public perceptions of sustainable seafood, as well as public awareness and use of the MCS GFG (Section 4.3). Through analysis of the data, it also examines the effectiveness of the Guide as an intervention for increasing sustainable seafood purchasing behaviour (Section 4.5) and seafood sustainability knowledge (Section 4.7).

Importantly this chapter examines how, if at all, use of the Guide is being reflected in the seafood purchases reported (Section 4.9). Using TPB as a theoretical framework, discussed in 2.6 and 3.5, this chapter also examines motivational factors for the Guides use (Section 4.17), including individual's recognition of the importance of sustainability (Gunn and Mont, 2014) (Section 4.9.3) and responsibility for the impact of their seafood choices (4.11).

4.2. Respondent profile

Data were collected during the period 1st May to 7th July 2020. 411 responses to the public questionnaire were collected through the social media channels of public attractions (Section 3.11.1 and 3.11.3) as well as appropriate organisations networks (Section 3.11.2). In addition, 1998 responses were collected professionally (Section 3.11.4) resulting in a final sample size of 2409. A summary of the respondent profile is presented in Table 4.

Table 4.1. Summary of respondent profile.

Demographics		n	%	Demographics		n	%
Gender (n=2356)	Male	1046	44.4	Age (n=2346)	18-29	552	23.5
	Female	1282	54.4		30-49	856	36.5
	Other	6	0.3		50-69	746	31.8
	Prefer not to say	22	0.9		70+	192	8.2
Ethnicity (n=2338)	Bangladeshi	22	0.9	Adults in household (n=2347)	1 adult	487	20.7
	Black British or Afro-Caribbean	46	2		2 adults	1194	50.9
	Chinese	22	0.9		3 adults	383	16.3
	Indian	47	2		More than 3 adults	283	12.1
	Multi-racial	31	1.3	Children in household (n=2350)	No children	1278	54.4
	Pakistani	32	1.3		1 child	640	27.2
	White British	1907	79.2		2 children	308	13.1
	White European	137	5.7		3 children	82	3.5
	Other	50	2.1		More than 3 children	42	1.8
Prefer not to say	44	1.8	Household income (n=2338)	£0-£12,500	230	9.8	
Education (n=2323)	Left school at 16 with qualifications e.g., O Levels/GCSEs	415		17.9	£12,501-£50,000	1297	55.5
	Left school at 18 with qualifications e.g., AS/A Levels	420		18.1	£50,001-£150,000	545	23.3
	No qualifications	74		3.2	Over £150,000	48	2.1
	Post graduate degree	471	20.3	Prefer not to say	218	9.3	
	Teaching or nursing qualification	92	4	Guide use (n=2296)	No, I don't use the Guide when buying seafood	1172	51
	Undergraduate degree	640	27.6		Yes, I use or have used the Guide when buying seafood	662	29
	Vocational qualification e.g., City and Guilds	163	7		No, I don't use the Guide because I don't buy seafood	462	20
	Other	48	2.1	How often do you visit the coast? (n=2340)	At least once a week	174	7.4
Employment (n=2344)	Full-time parent or carer	112	4.8		I live on or near the coast	450	19.2
	In education, full or part-time	109	4.7		Once a month	357	15.3
	In paid employment, full or part-time	1310	55.9		Once every few months	520	22.2
	Retired	379	16.2		Once or twice a year	544	23.2
	Self-employed	177	7.6	Very rarely/never	295	12.6	
	Unemployed	165	7	Member of a conservation, wildlife or any other group or charity? (n=2341)	No	1785	76.2
	Other	92	3.9		Yes	556	23.8

Note: the variation in sample size (n) is due to incomplete responses to questions by respondents in some cases

As shown in Table 4.1, most respondents were female (54.4%). 60% were aged between 18 and 50; 32% aged between 50 and 70; and 8% above 70 years old. Most respondents (79%) were white British, which is representative of this group as being the largest ethnic group in the UK (ONS, 2021). The majority also reported to be from households with 1 (21%) or 2 (51%) adults, with 54% indicating that they have no children and 27% indicating they are single child households. See Appendix 21 for more detailed analysis of household composition.

Almost 48% of adults in the sample were educated to undergraduate (27.6%) or postgraduate (20.3%) degree level. This is almost twice the national average of 27% (ONS, 2011) for residents in England and Wales in 2011 with a degree (or equivalent) qualification. 56% of respondents claimed to be in part or full-time paid employment with a median (55.5%) household income of between £12,500 and £50,000. This compares with a median household income in the UK in the financial year ending March 2020, of £29,900 (ONS, 2021). 54% of respondents in part or full-time paid employment were educated to degree level. Only 24% of all respondents were members of a conservation or wildlife group or charity, comparable to observations in other studies (McKinley et al., 2020). 17% of respondents recruited through Cint were members of charitable organisations compared to 63% of respondents recruited through public distribution lists. This is not perhaps surprising, given that these respondents (n= 366) were recruited through a self-selection process.

To facilitate analysis of the impact of the MCS GFG, respondents (n= 2296) were allocated to one of three categories of Guide use (See Chapter 3 Figure 3.3): individuals who buy seafood but do not use the Guide ('non-users') (n= 1172); individuals who buy seafood and use the Guide ('users') (n=662); and individuals who do not use the Guide because they do not buy seafood (n=462) ('non-fish buyers'). Charity group membership was highest amongst Guide users compared to non-users and non- fish buyers at 33% (Figure 4.1). MCS membership was also slightly higher amongst non-fish buyers at 16%, compared to 14% of Guide users, and lowest amongst non-users at 4%. Amongst all respondents with charity membership, 11% indicated that they were MCS members.

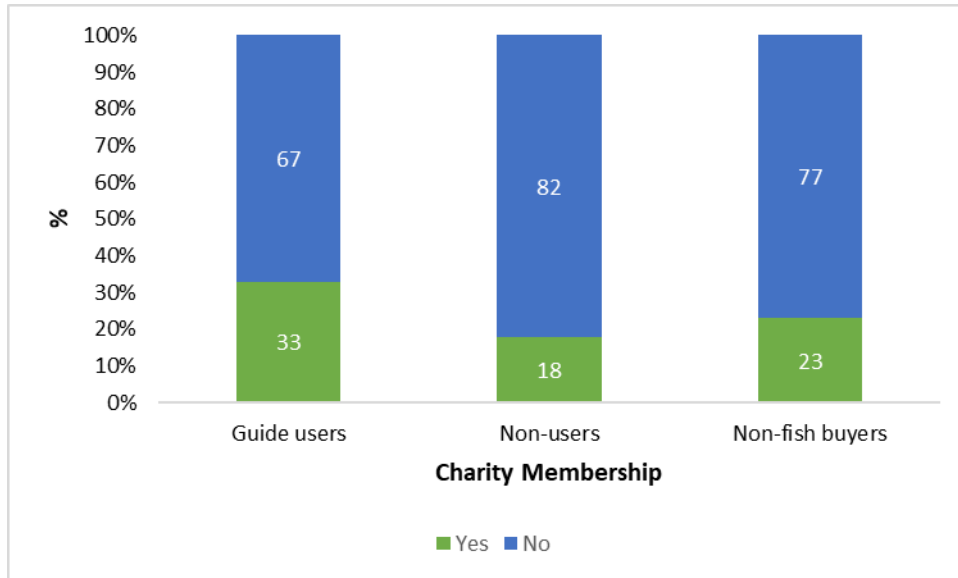


Figure 4.1: Charity membership by category of guide use.

To further explore the potential relationship between guide use and charity group membership, a Chi square test for independence was used which indicated a significant association between guide use and charity group membership, $X^2 (2, n = 2274) = 54.8, p < 0.001$, Cramer's $V = 0.15$ (Table 4.2). See Table 4.5 in Section 4.3 for further examination of guide use.

Table 4.2: Frequency distribution for guide use and charity membership.

Guide use	Membership - No	Membership - Yes	Total
Group 1 Non-users	951 (82%)	210 (18%)	1161 (100%)
Group 2 Users	437 (67%)	219 (33%)	656(100%)
Group 3 Non-fish buyers	353 (77%)	104 (23%)	457 (100%)
Total	1741 (77%)	533 (23%)	2274 (100%)

4.3. Awareness and use of MCS guide

To understand public awareness of the MCS GFG and identify the characteristics of a typical guide user, respondents were asked, "Have you heard of the Marine Conservation Society

(MCS) Good Fish Guide (GFG)". For the majority (54%), the survey was the first time they had seen the Guide. Responses are presented in Figure 4.2.

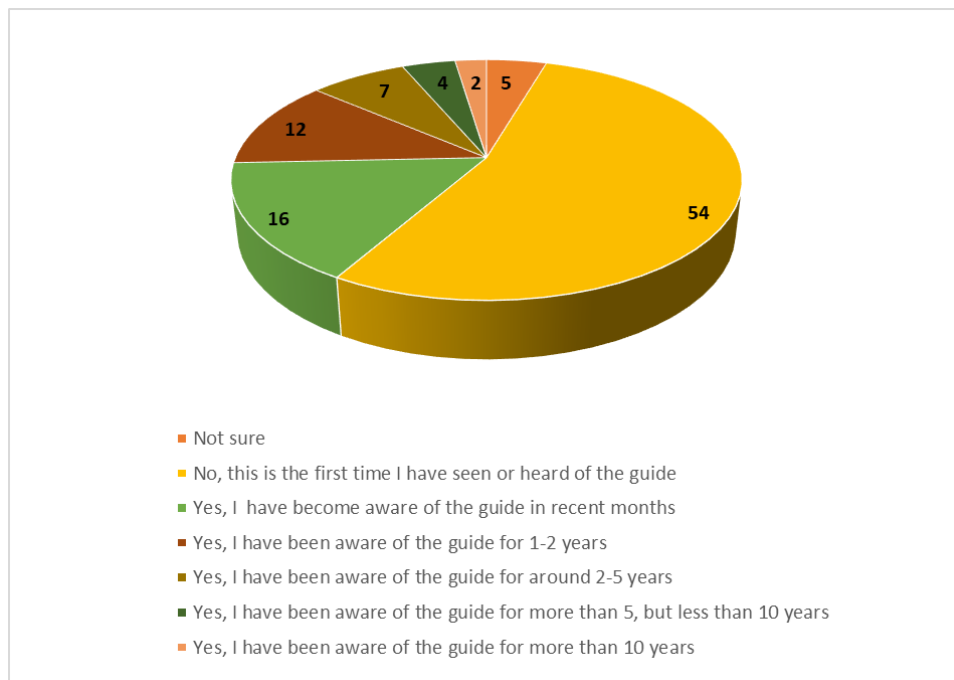


Figure 4.2: Awareness of the Marine Conservation Society Good Fish Guide (n=2359).

To aid understanding of the impact of proximity to the coast on guide awareness, and other factors examined in the study (e.g., purchasing frequency), respondents were asked to provide the first part of their post code. Post codes were then categorised in terms of post code town and UK region. See Appendix 22 for summary of distribution of all respondents supplying postal code data (n=2212) which shows that responses were gathered from across the UK.

A Kruskal-Wallis test, examining whether distribution of guide awareness varied with geographical region (Table 4.3), revealed a statistically significant difference in guide awareness across the 12 UK regions ($X^2(11, n=2209) = 48.99, p < 0.001$). The South West region recorded a significantly higher median score for guide awareness (Md=2) compared to all other regions except Scotland (Md=1) and the Channel Is. (Md=4). The South West region and Scotland were also found to have the highest number of Guide users. See Figure 4.3.

Table 4.3: Variation in median score for guide awareness with geographical region.

Region	N	Median
Channel Islands	1	4
East Midlands	175	1
East of England	238	1
Greater London	284	1
North East	136	1
North West	275	1
N. Ireland	49	1
Scotland	194	1
South East	244	1
South West	281	2
Wales	144	1
West Midlands	188	1
Total	2209	1

Of those respondents with awareness of the Guide (41%, n=983), 62% (n=612) indicated that they use it. For those respondents using the Guide, the preferred format (n= 652) was reported as the App (42%), followed by website (28%) and MCS PGFG (11%). 17% of respondents stated preference for 'All formats' or had 'No preference'. Respondents using the App were predominantly in the age group 30-49 (49%), with its use shared equally amongst males and females.

In response to the question, *"If you have previously heard of the MCS GFG, do you use, or have you ever used, the Guide when buying seafood"*, 51% (n=1172) replied that they do not use the Guide when buying seafood; 29% (n=662) use or have used the Guide; whilst 20% (n=462) of respondents indicated they do not use the Guide because they do not buy seafood. Of the 29% of respondents who indicated they have used or are using the MCS GFG, 57% agreed with the statement, *"I always use the GFG when purchasing seafood"* (See Section 4.5. Figure 4.9). Figure 4.3 summarises Guide use by UK region (n=1715).

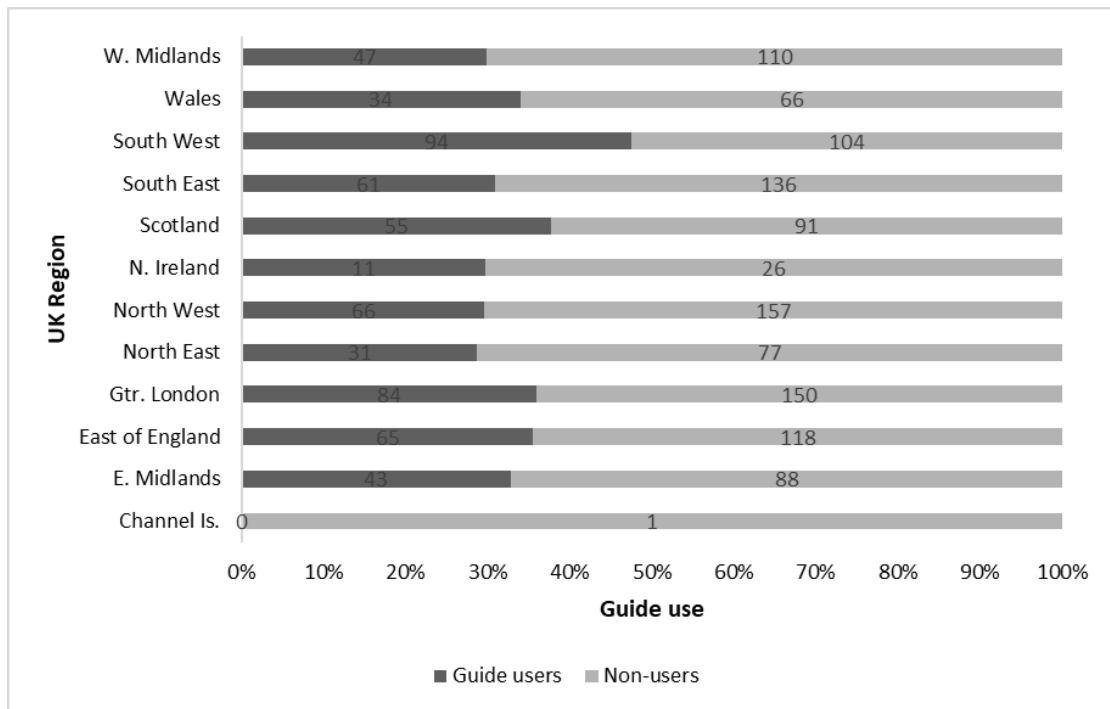


Figure 4.3: Good Fish Guide use by UK Region (n=1715).

The highest number of Guide users as a proportion of all respondents from a given region were from the South West (47.5%) and Scotland (38%). Awareness of the Guide was also found to be higher in these regions, see Table 4.3.

Although data were collected during a period of COVID-19 restrictions, 37.5% reported to visit the coast regularly. The number of visits people made to the coast was examined related to guide use (Figure 4.4).

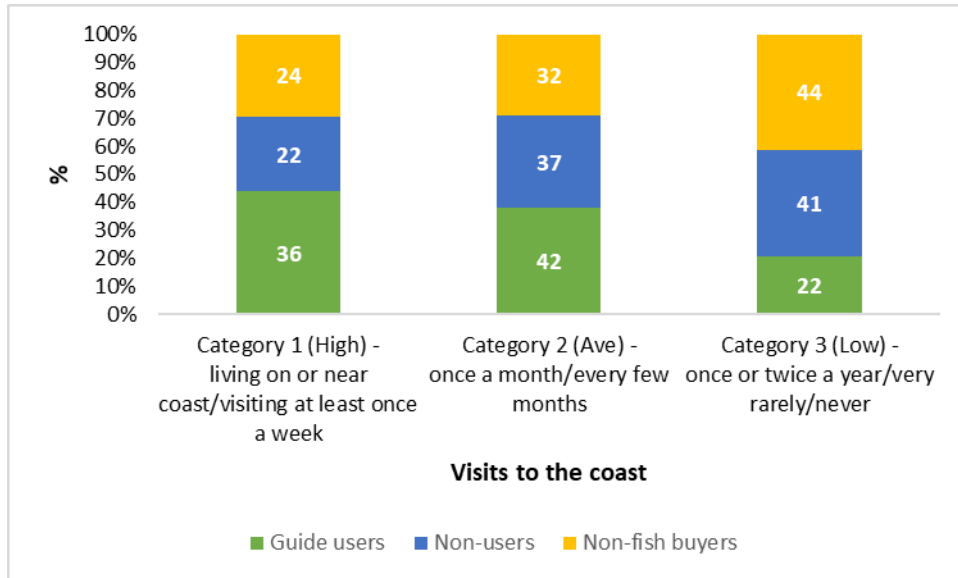


Figure 4.4: Frequency of coastal visits by guide use.

While there appears to be little difference between those respondents visiting the coast once a month/every few months (Category 2) and using the Guide (42%) and those not using it (37%), there does appear to be a difference between users (36%) and non-users (22%) of the Guide living on or near the coast/visiting at least once a week (Category 1) and between users (22%) and non-users (41%) of the Guide visiting the coast once or twice a year/very rarely/never (Category 3). A Chi square test for independence indicated a significant association between guide use and visits to the coast, $X^2(10, n= 2273) = 133.642, p < 0.001$. Cramer's $V = 0.2$ (Table 4.4).

Table 4.4: Frequency distribution or contingency table for guide use and visits to the coast.

Guide use	Category 1 Living on or near the coast/visiting at least once a week	Category 2 Visiting the coast once a month/every few months	Category 3 Visiting the coast once or twice a year/very rarely/never	Total
Group 1 Non-users	254 (22%)	428 (37%)	478 (41%)	1160 (100%)
Group 2 Guide users	234 (36%)	278 (42%)	143 (22%)	655 (100%)
Group 3 Non-fish buyers	109 (24%)	149 (32%)	200 (44%)	458 (100%)
Total	597 (26%)	855 (38%)	821 (36%)	2273 (100%)

Understanding of the purpose of the Guide amongst respondents who indicated they have used or are using the Guide was also examined. 88% of respondents indicated that they agreed with the statement, “*The GFG provides information about how I can reduce my impact on our seas and marine wildlife*”. To understand whether users trust the MCS GFG, respondents were asked to indicate their agreement with the statement, “*The GFG advice for choosing sustainable seafood is accurate and credible*”. 86% of respondents indicated that they agreed with the statement. Trust (See Section 2.6) in the Guide is further examined in relation to motivational factors for guide use discussed in Section 4.17.

To further investigate factors characterising the three groups: users; non-users; and non-fish buyers, the potential influence of several variables on guide use was examined (Table 4.5). See Appendix 23 for more detail. Chi-square tests for independence examined the association between GFG use and the variables listed. A significant association was found in all cases. Cramer’s V, a measure of the effect size⁶² or strength of the relationship between guide use and the variables examined was found as small.

Table 4.5: Influence of factors on guide use.

Variable	X²(df, n), p, Cramer’s V (Φ c)
<i>Gender</i>	$X^2(2,2262) = 46.36, p < 0.001, phi = 0.143$
<i>Recruitment process</i>	$X^2(2,2296) = 21.86, p < 0.001, phi = 0.098$
<i>Age</i>	$X^2(6,2279) = 130.02, p < 0.001, phi = 0.169$
<i>Education</i>	$X^2(14,2257) = 89.53, p < 0.001, phi = 0.141$
<i>Employment</i>	$X^2(12,2277) = 151.56, p < 0.001, phi = 0.182$
<i>Charity membership</i>	$X^2(2,2274) = 54.8, p < 0.001, phi = 0.155$
<i>Coast visits</i>	$X^2(4,2273) = 91.72, p < 0.001, phi = 0.142$

⁶² Following Cohen (1988), Cramer’s V of 0.1 is considered a ‘small’ effect size; 0.3 a ‘medium’ effect size; 0.5 a ‘large’ effect size.

Hierarchical Cluster Analysis was carried out using the program PAST (Paleontological STatistics) ⁶³ to produce a Dendrogram (Figure 4.5) to illustrate how responses to questions about guide use, and other factors examined (Table 4.5), are distributed. The clustering algorithm single linkage, 'nearest neighbour', and the Bray-Curtis similarity index were selected to compute the Dendrogram.

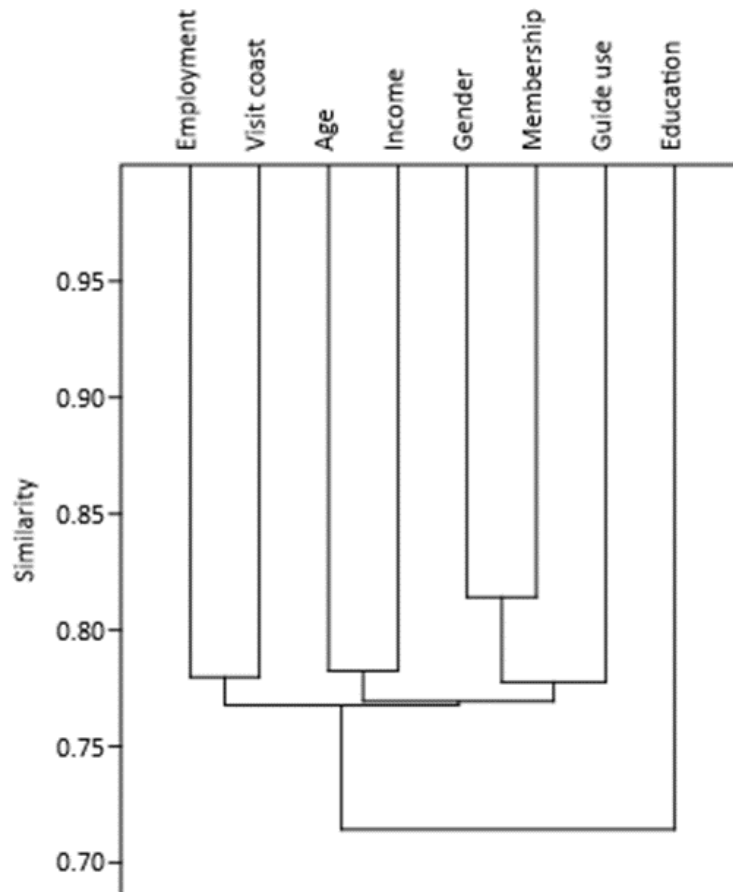


Figure 4.5: Hierarchical Cluster Analysis of guide use and other factors (n=1267).

⁶³ https://palaeo-electronica.org/2001_1/past/issue1_01.htm

As shown in Figure 4.5, gender and membership were most strongly associated with guide use at just above 80% similarity. All factors were found to be above 70% association. Further analysis using Principal Component Analysis (PCA) was carried out, to explore what variables most strongly characterise an individual using the MCS GFG (Figure 4.6).

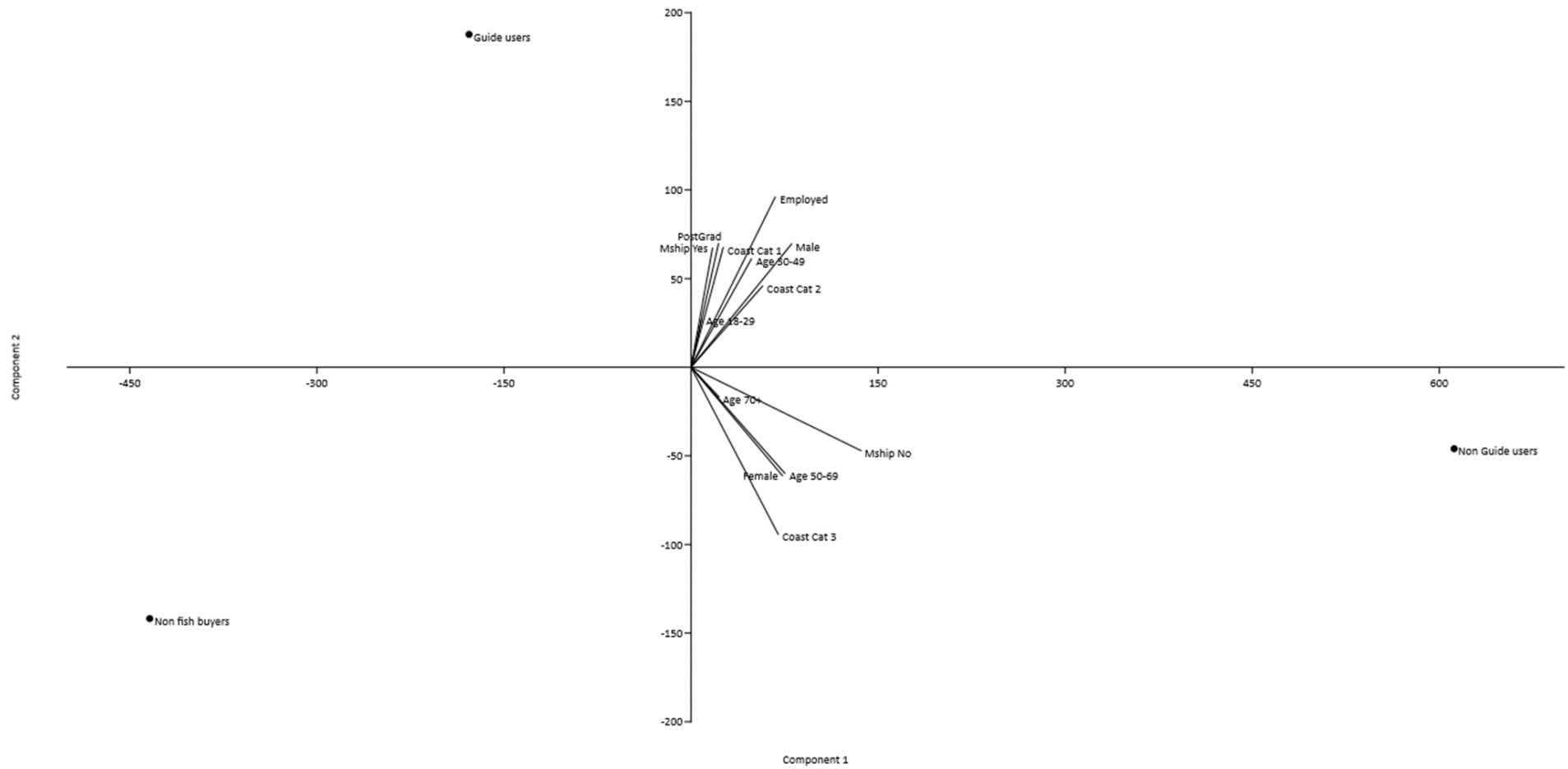


Figure 4.6: Principal Component Analysis (PCA) of factors identifying a GFG user.

In the loading plot (Figure 4.6 above), variables for employment and male gender are indicated by their length as having the most influence on MCS GFG use. The angles between the variables approximate to their correlations, with smaller angles implying high correlations, and 90-degree angles, zero correlation. From Figure 4.6, it can be inferred that, within this sample, which is not necessarily representative of the wider population, Guide users are more likely to be male, are in employment, in the age category 30-49 years, members of a charitable group, with a post graduate qualification, and among those that visit the coast more frequently.

4.3.1. Barriers to using MCS GFG

Respondents not using the Guide (n=1172) were asked to indicate their reasons for this (Figure 4.7). Analysis found that the main reason was that many respondents (69%, strongly agree or agree) had not seen or heard of the Guide prior to the survey. Habit, with a tendency to 'stick' to familiar seafood choices was a barrier for 51% of respondents; not taking the Guide with them when shopping was a barrier for 49%. For 43% of respondents, a lack of sustainability knowledge was reported as a barrier. Ability to understand the Guide or follow its advice were least frequently mentioned by 15% and 14% respectively, suggesting that the advice provided in the Guide is both understandable and practical – this will be explored further in Section 4.9.6.

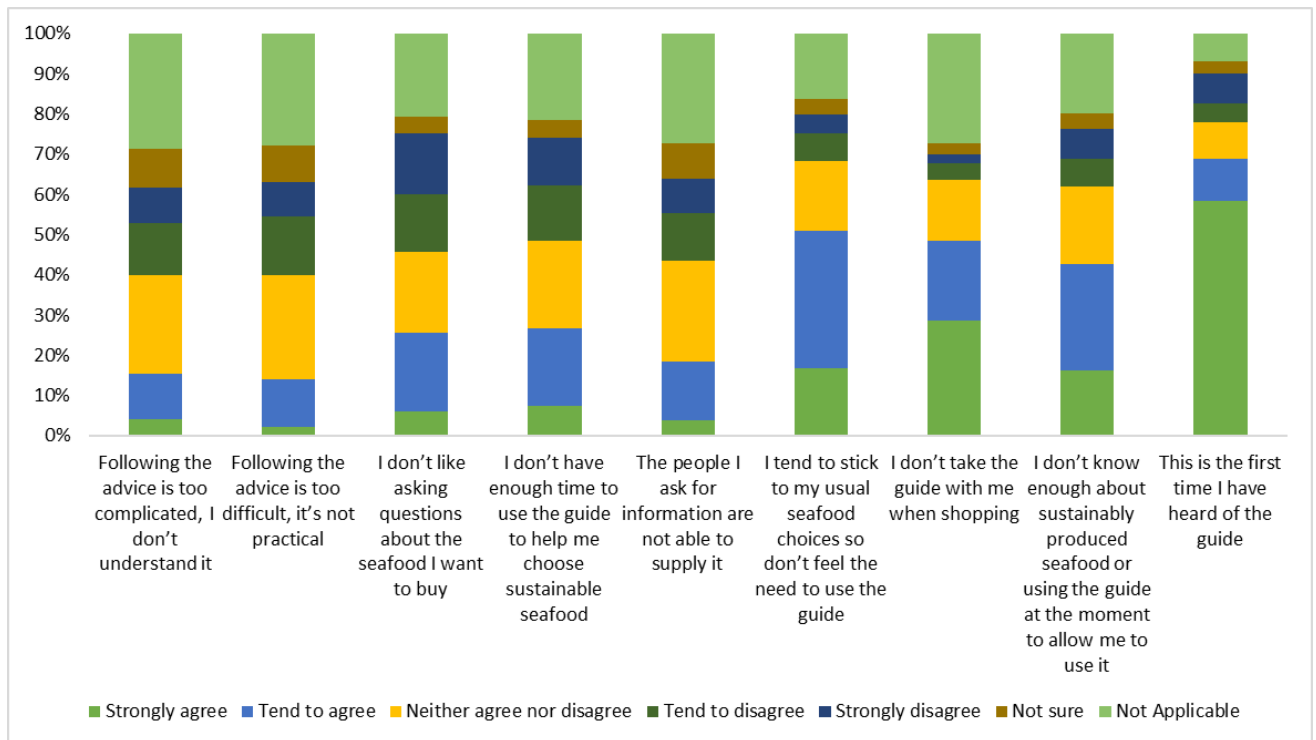


Figure 4.7: Barriers to using the MCS GFG (n=1172).

20% of respondents (n=462) reported that they do not use the Guide because they do not purchase seafood. Barriers to purchasing (Figure 4.8) and consuming seafood are typically associated with the physical and sensory properties associated with fish (Verbeke and Vackier, 2005). Studies have identified additional barriers including a lack of confidence in preparing and cooking seafood (Carlucci et al., 2015) and the perceived expense of seafood (Grieger et al., 2012).



Figure 4.8: Reasons for not buying seafood (n=864).

4.4. Discussion of awareness and use of MCS GFG

General awareness of the Guide across the whole sample was relatively low with a majority indicating this study was the first time they had seen or heard of it. It is important to note that due to the sampling strategy adopted for this study (See Section 3.11) awareness and use of the Guide in the general population is likely to be even lower. Despite the existence of the MCS GFG since 2002, only a very small proportion of respondents indicated they had awareness of it for more than 10 years. However, the level of awareness and self-reported use of the MCS GFG evaluated in this study is very much higher than guide use reported in other studies (e.g., Feucht and Zander, 2017; Richter et al., 2017). This may be attributed to the level of public interest in seafood sustainability in the UK compared to in Germany and Norway where the studies were carried out (See Section 2.4.1). Further, the strength of ENGO seafood sustainability campaigns and public attitudes to sustainable seafood may also influence seafood guide awareness and use. Limited seafood guide use by consumers in

Norway, for example, is attributed to lack of seafood guide knowledge, low interest in seafood sustainability, and a high level of seafood consumption and trust in Norwegian seafood products (Richter et al., 2017). Similarly, lack of seafood sustainability knowledge was given as a reason for not using the Guide for 43% of respondents in this study (See Section 4.8).

The preferred format for using the Guide was the App. This format is widely recognised as both a sustainability and conservation tool (Dalby et al., 2021; Inwood and Dale, 2019). The highest level of awareness and use of the Guide was found in the South West region and Scotland. This situation may be attributed to the strength of long-term volunteer programmes such as Sea Champions⁶⁴ organised by MCS and operating in these areas. These areas are also regarded as having a tradition of fishing and marine related industries and activities (Martini et al., 2023; Martindale, 2012). The PGFG is also distributed from outdoor education and visitor centres to members of the public visiting the coast which may account for increased guide use amongst respondents who more regularly visit the coast. It should be noted, however, that since the outbreak of the COVID-19 pandemic in 2020, the PGFG is not currently being distributed. See Section 5.8.

Studies suggest awareness of sustainable fishing and concern for the impact of seafood consumption on the marine environment among the public is high. For example, in a survey carried out by Defra on Ocean Literacy in England in 2021 (Defra, 2021), 85% of respondents reported that they had some understanding of the term sustainable fishing. A decline (from 85% to 82%) in the proportion reporting that they knew or understood something about sustainable fishing was observed in 2022 (Defra, 2022). 71% of respondents (75% in 2021) in the Defra 2022 study that purchased seafood also said the provision of information about whether or not the fish is endangered or overfished influenced their purchase decision. Only a very small minority (11%) had never visited the coast (Defra, 2022). Other studies also show that through involvement with coastal places, people foster emotional connections from their experiences that can encourage pro-environmental behaviours (Kelly, 2018). Given the levels of public interest in the marine environment and awareness of seafood sustainability being reported, it is not unreasonable to suggest that individuals visiting or living in these coastal

⁶⁴ <https://www.mcsuk.org/what-you-can-do/volunteering/sea-champions/>

areas might be using the MCS GFG to help reduce the impact of their individual seafood choices on the marine environment.

As a first step, from the sample data collected, this study attempted to identify a profile for a typical guide user, which was found to be male, highly educated, aged 30-49 years, in employment, a member of a charitable group, and among those that visit the coast more frequently, as detailed above in Figure 4.4. This is useful in understanding how 'receptive' people are likely to be when targeting audiences to increase the reach or influence of the Guide (Kemmerly and Macfarlane, 2009). In studies referred to by Carlucci et al. (2015) that attempted to identify a sociodemographic profile for 'green' fish consumers, results were inconclusive and showed diversity in terms of gender, age, education, and income. In contrast, Breard et al. (2009) determined that a typical 'green' fish consumer (one that is motivated to purchase eco-labelled fish) is young, well-educated, and female. One factor determining 'green' or 'ethical' consumerism more generally, is that 'green' and 'ethical' consumers, are typically well-educated (Chekima et al., 2016; Summers, 2016). A study by Lucas et al. (2018) identified gender, age, education, and income, as important determinants of 'green' consumption, with income in particular determining choice between 'green' and 'standard' products. Similarly, in studies examining seafood consumption, respondents with the highest consumption of seafood are those in higher sociodemographic groups, particularly those with a post graduate qualification (Farmery et al., 2018). This is mirrored in the results of this study, which found Guide users purchase more seafood than non-users (See Section 4.9.4) and 30% have a postgraduate degree, compared to 17% of non-users. Analysis of the data collected through the public survey found the majority (54%) of respondents identified themselves as women which is to be expected given that females typically have more responsibility for household shopping, particularly food shopping, than males (Maynard, 2021; Emberger-Klein and Menrad, 2018). However, this study found that, within this sample, most Guide users were characterised as male, aged 30-49 years, which is consistent with Smith et al. (2015), who determined that consumers of 'ecofish' were more likely to be males.

As noted above, the main reason for not using the MCS GFG was lack of awareness. This is commonly reported as a barrier to engagement by other conservation initiatives (Dalby et al., 2021). Habit or a tendency to buy familiar products described in other studies (Carlucci et al., 2015; Honkanen et al., 2005; Verbeke & Vackier, 2005), is communicated as a barrier to using the Guide for half of respondents in this study. Not taking the Guide with them when shopping is also a reported barrier. For those using the App, not taking the Guide with them when shopping is unlikely to present a problem as mobile phones are acknowledged as ‘central’ to people’s lives (Volkmer and Lermer, 2019) and generally taken everywhere, including to the supermarket. Lack of mobile reception would however prevent individuals from using their devices. Since April 2021 however, the MCS GFG no longer relies on mobile reception to use its App⁶⁵.

4.5. Influence of guide on fish purchasing behaviour

To better understand the effect of the Guide on seafood consumption, it was shown that overall, use of the GFG has encouraged respondents (n = 662) to make a number of changes to their fish purchasing behaviour (Figure 4.9). 83% of respondents agreed they ‘always check’ where the seafood they ‘*want to buy comes from and how it is caught or farmed*’. ‘*I avoid buying Red Rated seafood i.e., those fish rated 5 in the GFG and listed as Fish to Avoid*’, is ranked second, with 70% of respondents agreeing with the statement.

⁶⁵ <https://www.mcsuk.org/ocean-emergency/sustainable-seafood/about-the-good-fish-guide/get-the-good-fish-guide-app/>

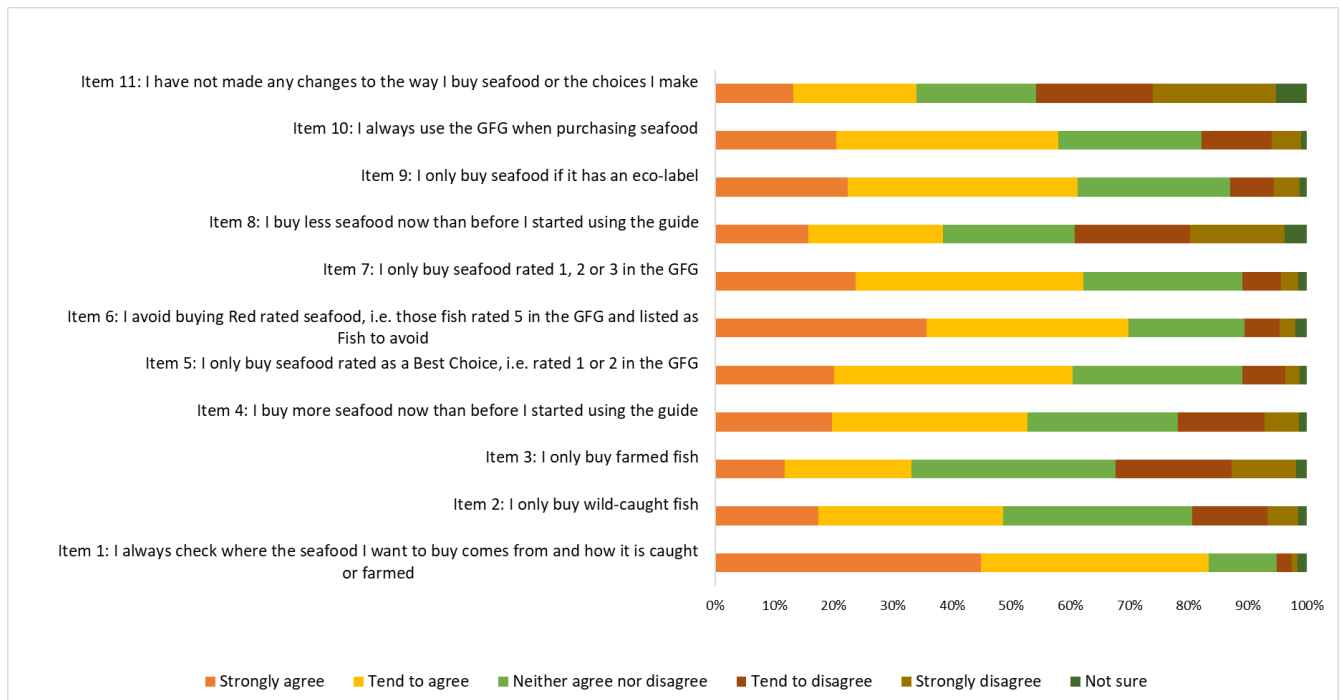


Figure 4.9: Changes consumers have made to their purchasing behaviour as a result of using the MCS GFG.

One sample Wilcoxon tests were carried out to determine if the responses to the eleven statements differed from the mid-point i.e. Neither agree nor disagree. In all cases, except, ‘*I only buy farmed fish*’ and ‘*I buy less seafood now than before I started using the Guide*’, where there was no significant difference ($p \geq 0.05$) between the sample and the hypothetical or given median or mid-point, a significant difference ($p < 0.05$) between medians was found, indicating high levels of agreement with the statements presented. See Appendix 24 for details of median values for Likert responses to items exploring changes individuals have made to their purchasing behaviour as a result of using the MCS GFG.

Slightly more males (55%) indicated that they buy more seafood now than before they started using the Guide. Similarly, male respondents were more likely to agree they always check where the seafood they want to buy comes from (53%); only buy seafood if it has an eco-label (53%), and only buy wild-caught fish (52%). Agreement on avoiding buying red-rated seafood is more equally split, with 49% of males agreeing they avoid buying fish rated 5 in the MCS GFG, compared to 51% of females.

4.6. Discussion of guide influence on fish purchasing behaviour

Most respondents indicated that they always 'check' where the seafood they want to buy comes from and how it is caught or farmed. The need to 'check', by examining labelling or by asking questions, about where seafood comes from and how it is caught or farmed is fundamental to the advice to the public for using the GFG to understand the sustainability of their purchases. A study by Kemmerly and Macfarlane (2009) evaluating the Seafood Watch programme guide on consumer purchasing behaviour, similarly, found more respondents (81%) reporting they checked labels to find out where or how the product was fished or farmed, compared with non-guide users (54%). As observed in the literature despite evidence of widespread mislabelling of seafood (Kroetz et al., 2020; Sotelo et al., 2018), labelling is important for communicating the sustainability of seafood products to consumers (Alfnes et al., 2017; Pieniak et al., 2013; Valor et al., 2014). However, information required to decide on product sustainability, such as information on capture method, or other mandatory information, is often missing (Cundy et al., 2023; Paolacci et al., 2021), emphasising the need for improved and comprehensive consumer facing labelling.

A tendency to neither agree (34%) or disagree (31%) with statements regarding the purchase only of farmed fish, compared to agreement on the purchase only of wild-caught fish (49%), suggests public preference for fish produced in this way. The Guide was also found to be effective in increasing seafood consumption, with more than half (53%) indicating they buy more seafood because of using the Guide (Also see Sections 4.8. and 4.10). 34% agreed they had not made any changes when buying seafood as a result of using the Guide. This suggests that for most users, the Guide is influencing their seafood purchasing behaviour.

See Section 5.8 for further discussion of Guide influence.

4.7. Seafood sustainability knowledge

Data was collected primarily to obtain understanding of respondents' 'objective' seafood sustainability knowledge i.e. 'what an individual *actually* knows' (Brucks, 1985), including seafood labelling and eco-labelling knowledge and sources for this knowledge. The main aim of collecting 'knowledge' data was to determine whether users have more seafood sustainability knowledge compared to non-users and whether that knowledge can be related to guide use.

4.7.1. Impact of guide on increasing seafood sustainability knowledge

84% (n=660) of respondents using the Guide agreed with "*I am more knowledgeable about seafood sustainability since using the GFG*". 47% agreed with the statement, "*I already have enough seafood sustainability knowledge*" i.e., subjective seafood sustainability knowledge, 'what an individual *thinks* they know', Brucks (1985). 28% disagreed that they already have enough seafood sustainability knowledge. In response to the item, "*I've not been using the Guide long enough to say*", there was no strong opinion regarding whether any lack of an individual's seafood sustainability knowledge was related to the length of time they had been using the Guide or not. Subjective knowledge is discussed further in Section 4.9.5.2.

4.7.2. Objective knowledge

Consumers' objective seafood sustainability knowledge was obtained through both open-ended and closed questions. Responses to the open-ended questions asking about understanding of the terms 'sustainable seafood' (Question 9), and 'responsibly sourced' (Question 10), were coded as outlined in 3.9.2. A summary of responses is presented in Table 4.6.

Table 4.6: Summary of responses to objective knowledge questions.

'Sustainable seafood'	Knowledge category	Response (n/%)			Example response
		All (n= 1592)	Users (n=543)	Non-users (n=1049)	
	Do not know response -1	76/5%	9/2%	67/6%	"Don't know/unsure"; "NOT SURE"; "Don't know".
	Incorrect response -2	486/31%	235/43%	251/24%	"Reusable"; "Always available"; "Caught by local boats in our seas"; "Long lasting in the freezer".
	Simple response i.e., naming one aspect of seafood sustainability -3	884/56%	230/42%	654/62%	"Not taking more out of the sea then gets replaced"; "Seafood that can be caught without depleting the stocks. The seafood is able to continue reproducing as they aren't over fished".
	Complex response i.e., naming at least two aspects or 'pillars' of seafood sustainability -4	146/9%	69/13%	77/7%	"It can continue to be produced and harvested at this rate without having a negative impact on the marine ecosystem, and it is also caught using non-harmful methods, with workers treated fairly"; "To me it means that consideration is given to the environment, the fish and the livelihoods of the fishermen making sure that they are not harmed or made extinct".
'Responsibly sourced'	Knowledge category	All (n= 1649)	Users (n=552)	Non-users (n=1097)	Example response
	Do not know response -1	133/8%	39/8%	94/8.5%	"I'm not really sure"; "I have no idea"; "No opinion"; "Not sure".
	Incorrect response -2	1406/85%	470/85%	936/85%	"Responsibly sourced means that the fish we eat are from a farm or someplace where they are looked after"; "Safe to eat"; "They know where it has come from"; "That the animal are not hurt"; "The fish are not farmed".
	Correct response -3	86/5%	29/5%	57/5%	"Sourced through a supply chain that in addition to being environmentally sustainable also considers the suppliers"; "That the retailers consider social and environmental factors into account when dealing with their suppliers"; "A voluntary commitment made by companies to take environmental and social factors into account when managing their relationship

					with suppliers”; “The person selling you the product has checked that it's from a sustainable fishery”.
	Sceptical response -4	24/1%	14/2.5%	10/1%	“This is used by retailers as a form of greenwash which I find untrustworthy”; “This term might be weaker - more subjective and vulnerable to use as a 'green washing' tactic”; “Not much, since farmed salmon often says so!!”; “Not a clue, sounds like one of those meaningless phrases thought up by a marketing team”; “It always makes me laugh as it's meaningless”.

Chi-square tests for independence were run to examine the association between MCS GFG use and respondents’ understanding of ‘sustainable seafood’ and ‘responsibly sourced’. A significant association between guide use and response categories for ‘sustainable seafood’ was found, $X^2(3, n = 1592) = 97.631, p < 0.001, \text{Cramer's } V = 0.248$. The strength of the relationship between guide use and the response categories examined was small to medium. In the case of ‘responsibly sourced’, no significant association between guide use and response categories was found, $X^2(3, n=1649) = 7.693, p= 0.053, \text{Cramer's } V = 0.068$. This result indicates that whilst there is a difference in responses across the knowledge categories for understanding of ‘sustainable seafood’ by users and non-users, there is no significant difference in responses by users and non-users for ‘responsibly sourced’, suggesting lack of understanding of the term by both groups.

Respondents were also asked to indicate how much they agreed or disagreed with 9 statements derived from information contained within the GFG associated with UK seafood sustainability. Items 3, 5 and 8, are of relevance to public understanding of how seafood is sourced in the UK, the status of domestic stocks for key species such as cod, and thus the general concerns for seafood sustainability in the UK. Responses are summarised in Figure 4.10 and Table 4.7.

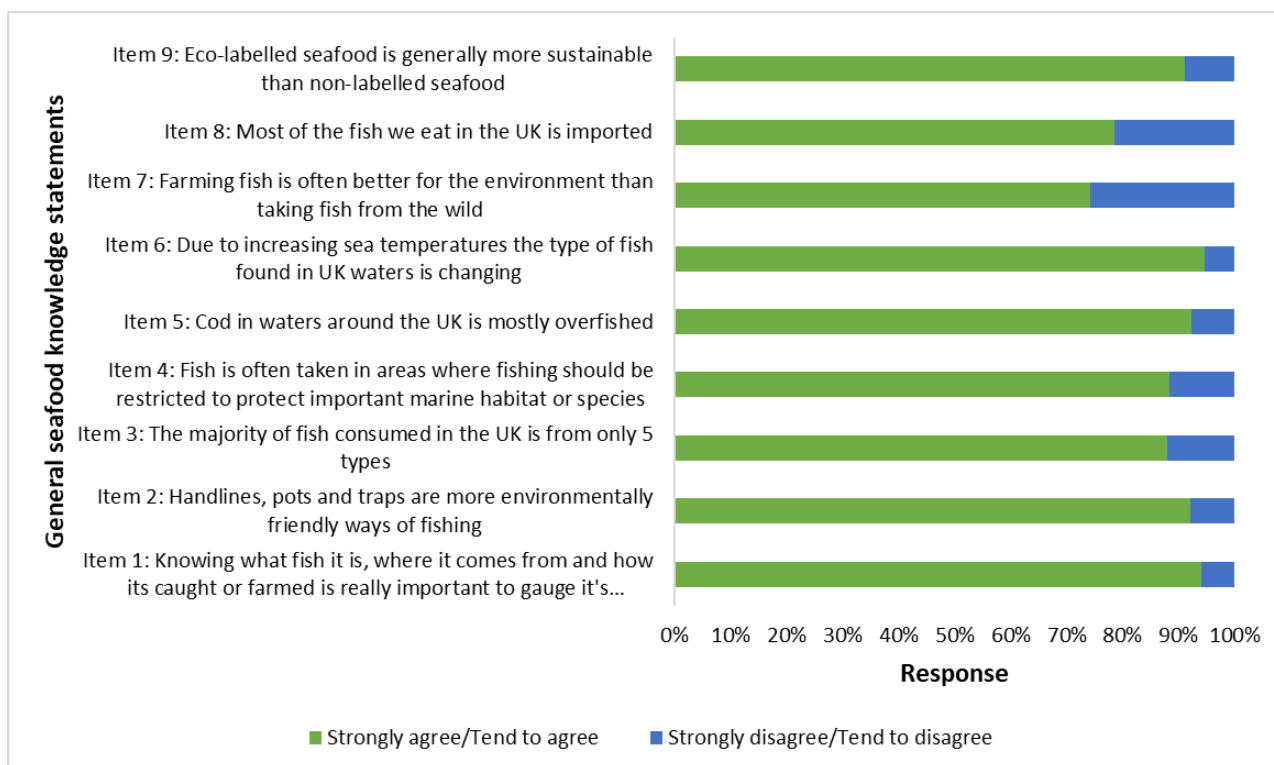


Figure 4.10: Summary of responses to general seafood knowledge statements.

Table 4.7: Summary of responses by guide use to statements of general objective knowledge.

Item	Non-users		Guide users	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
1. Knowing what fish it is, where it comes from and how it is caught or farmed is really important to gauge its sustainability	91	9	98	2
2. Hand-lines, pots and traps are more environmentally friendly ways of fishing	90	10	95	5
3. The majority of fish consumed in the UK is from only 5 types	88	12	88	12
4. Fish is often taken in areas where fishing should be restricted to protect important marine habitat or species	87	13	90	10
5. Cod in waters around the UK is mostly overfished	92	8	92	8
6. Due to increasing sea temperatures the type of fish found in UK waters is changing	95	5	94.5	5.5
7. Farming fish is often better for the environment than taking fish from the wild	74.5	25.5	74	26

8. Most of the fish we eat in the UK is imported	75	25	83	17
9. Eco-labelled seafood is generally more sustainable than non-labelled seafood	89	11	94	6

Chi-square tests for independence were run to examine the association between categorical variables: GFG use; and the response to each of the 9 statements in the question (Table 4.8).

Table 4.8: Summary of analysis of responses to objective knowledge statements.

Item	Pearson Chi-square value (χ^2)	Yates Continuity correction (χ^2)	n	df	Significance (p)	Phi coefficient
1. Knowing what fish it is, where it comes from and how it is caught or farmed is really important to gauge it's sustainability	24.035	22.926	1403	1	p < 0.001	0.131
2. Handlines, pots and traps are more environmentally friendly ways of fishing	10.903	10.189	1160	1	0.001	0.097
3. The majority of fish consumed in the UK is from only 5 types	0.101	0.048	988	1	0.826	-0.01
4. Fish is often taken in areas where fishing should be restricted to protect important marine habitat or species	1.470	1.248	1088	1	0.264	0.037
5. Cod in waters around the UK is mostly overfished	0.014	0	1222	1	0.993	-0.003
6. Due to increasing sea temperatures the type of fish found in UK waters is changing	0.054	0.011	1247	1	0.918	-0.007
7. Farming fish is often better for the environment than taking fish from the wild	0.074	0.04	1045	1	0.841	-0.008
8. Most of the fish we eat in the UK is imported	8.036	7.597	983	1	0.006	0.09
9. Eco-labelled seafood is generally more sustainable than non-labelled seafood	8.502	7.885	1074	1	0.005	0.089

A statistically significant difference was found between responses in the case of items: 1; 2; 8; and 9 (Table 4.8). This implies that the categorical variables are related and the responses (agree or disagree) to these statements are dependent on guide use. In the case of items 3-7, no statistically significant difference was found, implying that in the case of these items, the responses are independent and not related to guide use and that for these responses, knowledge or awareness of the issues presented is more widely appreciated and may be

acquired from other sources. The response to Item 7 (*Farming fish is often better for the environment than taking fish from the wild*), for example, from users and non-users of the Guide, suggests that there was agreement amongst users and non-users of the Guide for perceived benefits to the environment of farming fish, with around 74% of respondents generally in agreement. In the case of Items 1, 2, 8 and 9, the phi co-efficient was 0.10, indicating a small effect for guide use. In all other cases the effect was found to be negligible. These results signify that for over half of the statements presented, knowledge, was not dependent upon guide use. However, general understanding of how to gauge the sustainability of seafood; the relative sustainability of fishing methods; awareness of the prevalence of the consumption in the UK of imported fish; and the perceived benefits for sustainability of eco-labelled fish is higher among those respondents using the MCS GFG.

To further explore respondents' levels of knowledge, a General or Objective Seafood Knowledge Scale was designed (See Section 3.9.3.3. General or objective seafood knowledge). The median score and standard error were calculated for objective knowledge for users (n=662) and non-users (n= 1172) of the Guide (Figure 4.11).

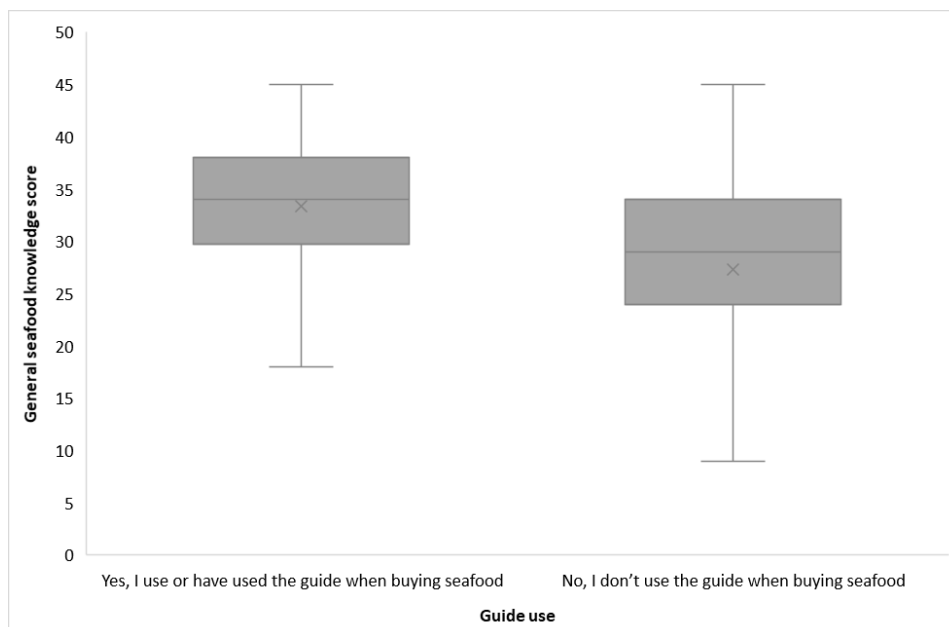


Figure 4.11: Guide use and general (objective) seafood sustainability knowledge.

A Mann-Whitney U test was used to test for equal medians. The test revealed a significant difference in objective knowledge scores for users (Md = 34, n= 662) and non-users (Md = 29, n=1172), $U= 544248.5$, $z= 14.366$, $p < 0.001$, $r= 0.335$. A r value of 0.34 indicates guide use has a medium effect on general or objective seafood sustainability knowledge.

Further tests were carried out to understand whether other factors besides guide use are influencing general seafood knowledge. Kruskal-Wallis tests were run to examine the relationship between 'general or objective seafood sustainability knowledge' and socio-demographic characteristics. Where significant results were obtained, post hoc Mann-Whitney Pairwise Comparison values were examined to identify differences between groups (Pallant, 2020). See Table 4.9.

Table 4.9: Summary of results for differences in general objective seafood sustainability knowledge across the categories listed in the table.

Variable	Group Code	N (%)	Median	Df	H	P
Gender		1827	31	3	5.008	0.171
Female	1	925 (51)	31			
Male	2	878 (48)	32			
Other	3	3 (-)	23			
Prefer not to say	4	21 (1)	30			
Age		1818	31	3	12.496	0.006
18-29	1	398 (22)	32			
30-49	2	684 (38)	32			
50-69	3	582 (32)	31			
70+ years	4	154 (8)	31			
Education		1805	31	7	31.105	p< 0.001
Left school at 16 with qualifications e.g., O Levels/GCSEs	1	308 (17)	30			
Left school at 18 with qualifications e.g., AS/A Levels	2	333 (18)	31			
No qualifications	0	57 (3)	30			
Post graduate degree	6	391 (22)	32			
Teaching or nursing qualification	4	70 (4)	32			
Undergraduate degree	5	495 (27)	31			
Vocational qualification e.g., City and Guilds	3	123 (7)	31			
Other	7	28 (2)	29.5			
Employment		1820	31	6	29.753	p< 0.001
Full-time parent or carer	1	91 (5)	34			
In education, full or part-time	2	80 (4)	30			

In paid employment, full or part-time	3	1040 (57)	31			
Retired	5	298 (16)	31			
Self-employed	4	145 (8)	31			
Unemployed	0	113 (6)	28			
Other	6	53 (3)	29			
Household income		1813	31	4	27.268	p< 0.001
£0-£12,500	1	162 (9)	29			
£12,501-£50,000	2	1019 (56)	31			
£50,001-£150,000	3	443 (24)	31			
Over £150,000	4	38 (2)	36			
Prefer not to say	5	151 (8)	30			
Variable	Group Code	N (%)	Median	Df	H	P

As shown in Table 4.9, there is a statistically significant difference in general objective sustainable seafood knowledge across the categories of age, education, employment and household income. The distribution of scores across the gender categories is the same i.e., there is no significant difference across the category of gender for objective knowledge. Significant pairwise comparisons ($P < 0.05$) for age were recorded between 50–69-year-olds (Md=31) and the two younger age groups (Md=32). The most significant ($p < 0.001$) comparisons recorded between education groups were between those that left school at 16 with qualifications (Md=30) and those with a postgraduate degree (Md=32); and between undergraduates (Md=31) and postgraduates (Md=32). In terms of employment, the most significant comparisons ($p < 0.001$) were those recorded between the 'Other' group (Md=29) and full-time parents or carers (Md=34); between those respondents in the unemployed group (Md=28) and those in paid employment (Md=31); and between the unemployed group and full-time parents or carers. Significant comparisons recorded for income groups were between those in the lowest income group (Md=29) and the three higher income groups; between those in the highest income group (Md=36) and the group who preferred not to say (Md=30); and between the highest income group and those earning £12,501-£150,00 (Md=31).

As shown in Figure 4.12, general objective sustainability seafood knowledge was higher amongst users of the MCS GFG compared to non-users of the Guide. A higher proportion of respondents (70%) using the Guide were found in the high knowledge category (i.e., scoring 31-45 points), compared to non-users (44%). Similarly, the proportion of respondents (2.5%) using the Guide in the low knowledge category (i.e., scoring 0-15 points), was lower than the proportion of non-users (13%).

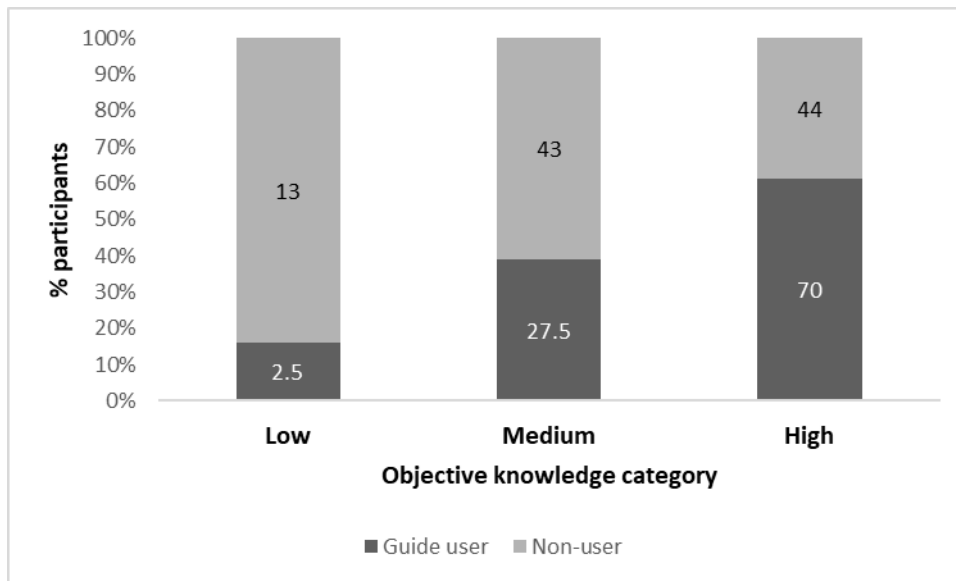


Figure 4.12: Proportion of guide and non-users in each of the general objective knowledge categories.

See Section 4.9.5.1. for further examination of objective seafood sustainability knowledge and its influence on purchasing frequency.

4.7.3. Seafood labelling knowledge

To explore understanding of seafood labelling (See Section 2.3.7.), and its potential role as a mechanism for influencing consumer purchasing behaviour, respondents' knowledge of seafood labelling, mandatory (Fish labelling) and voluntary (Eco-labelling) was examined.

The items presented in Figure 4.13 were designed to elicit understanding of current **mandatory** EU and UK fish labelling for North East Atlantic wild-caught and farmed fish. Responses to the statements by users and non-users of the Guide are summarised in Figure 4.13.

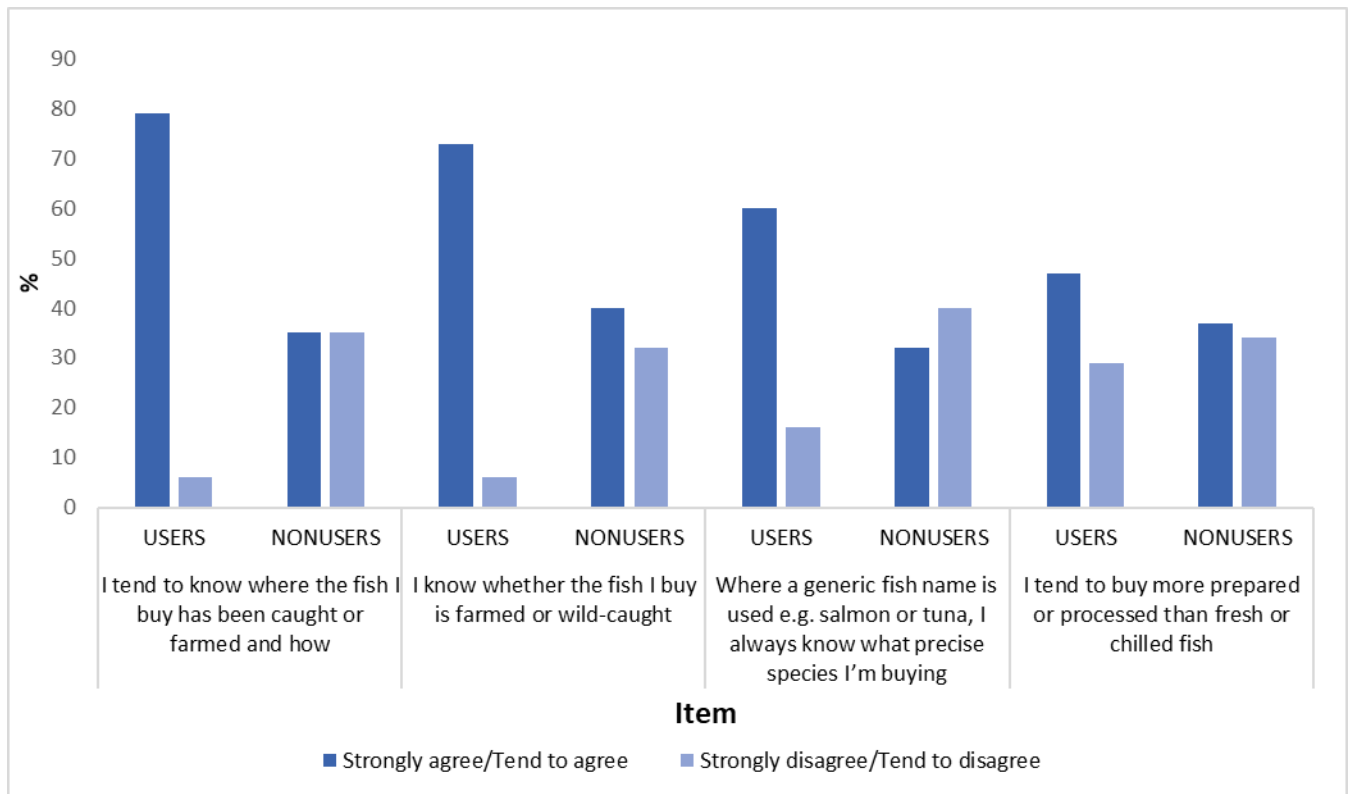


Figure 4.13: Summary of responses to mandatory fish labelling knowledge items.

Chi-square tests for independence were run to examine the association between categorical variables: GFG use; and the response to each of the four statements. Responses were combined in one of two nominal categories, 'Agree' or 'Disagree', for both 'Users' and 'Non-users' of the Guide, thus creating a 'two-dimensional frequency distribution matrix' to evaluate the relationship (Graveetter and Wallnau, p. 574, 2017) (Table 4.10).

Table 4.10: Frequency distribution table for Guide use and item response.

Guide use	Item e.g., I tend to know where the fish I buy has been caught or farmed and how		
	Disagree (Count/%)	Agree (Count/%)	Totals
Non-user	412/50%	410/50%	822
User	41/7%	518/93%	559
n	453	928	1381

A statistically significant difference was found between responses for 'user's and 'non-users' for all four items (Table 4.11). This implies that responses to the statements are dependent

on guide use and indicates that users have a greater understanding of fish labelling and know what information to look for when buying sustainable fish.

Table 4.11: Summary of results for mandatory fish labelling items.

Item	Pearson Chi-square value (X ²)	Yates Continuity correction	n	df	Significance (p)	Phi co-efficient
I tend to know where the fish I buy has been caught or farmed and how	276.349	274.411	1381	1	p< 0.001	0.447
I know whether the fish I buy is farmed or wild-caught	217.137	215.356	1365	1	p<0.001	0.399
Where a generic fish name is used e.g., salmon or tuna, I always know what precise species I'm buying	156.798	155.375	1349	1	p<0.001	0.341
I tend to buy more prepared or processed than fresh or chilled fish	12.941	12.536	1334	1	p<0.001	0.098

Yates Continuity correction values (column 2 in the table above) were used for X² as recommended in situations where both variables have only two values (Pallant, 2020). In addition, in situations where data comprises two 'dichotomous variables', the phi co-efficient may be used as a measure of correlation or relationship strength, thus providing a measure of effect size (Gravetter and Wallnau, 2017). A medium effect was observed in all cases, except, '*I tend to buy more prepared or processed than fresh or chilled fish*', where a small effect was observed. This suggests that whilst there is a difference in responses from guide and non-Guide users, there is no strong agreement or preference for purchasing prepared or processed seafood by either group.

Recognition and understanding of the 10 seafood **ecolabels** associated with wild-caught and/or farmed fish examined in the study by the 2 groups, users (left-hand bars) and non-users (right-hand bars) of the Guide, is summarised in Figures 4.14 and 4.15, and Table 4.12.

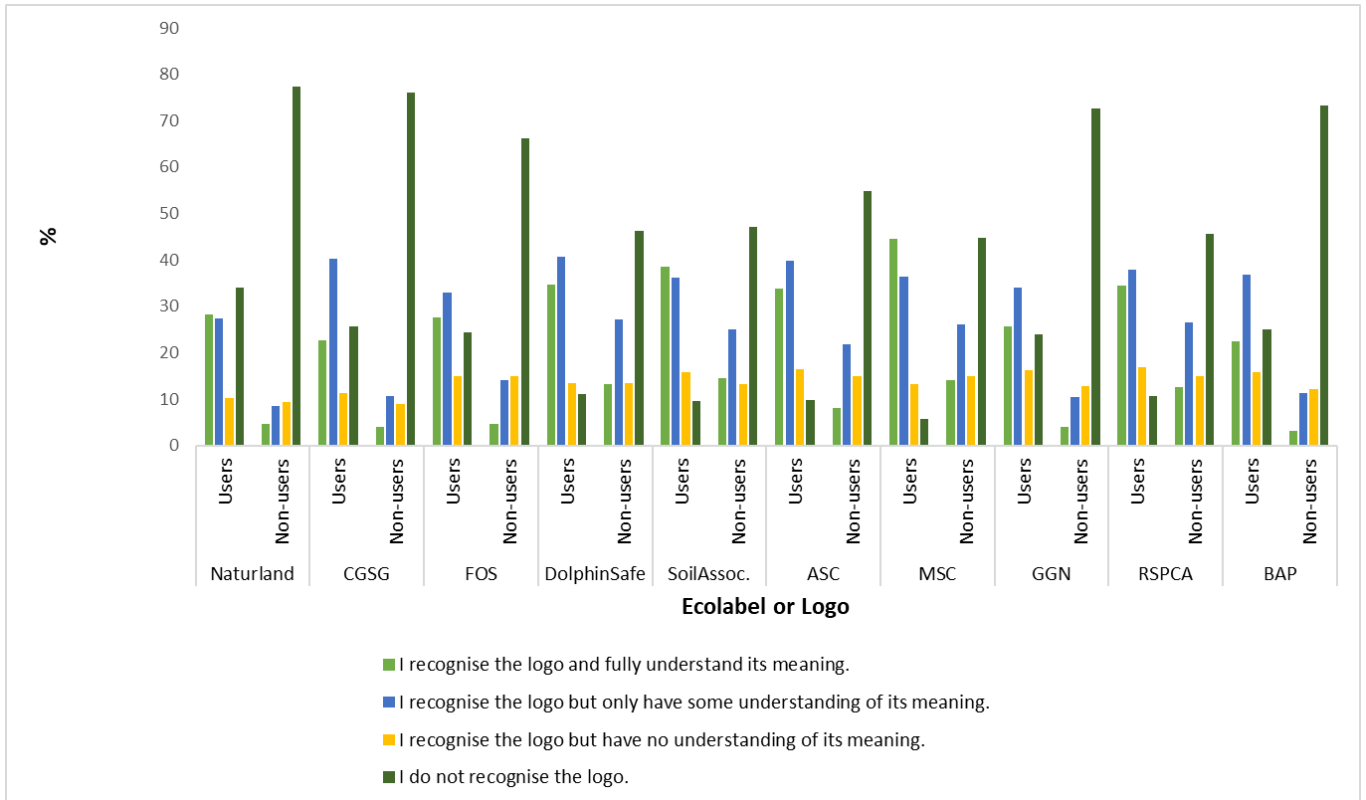


Figure 4.14: Respondents' recognition and understanding of ecolabels.

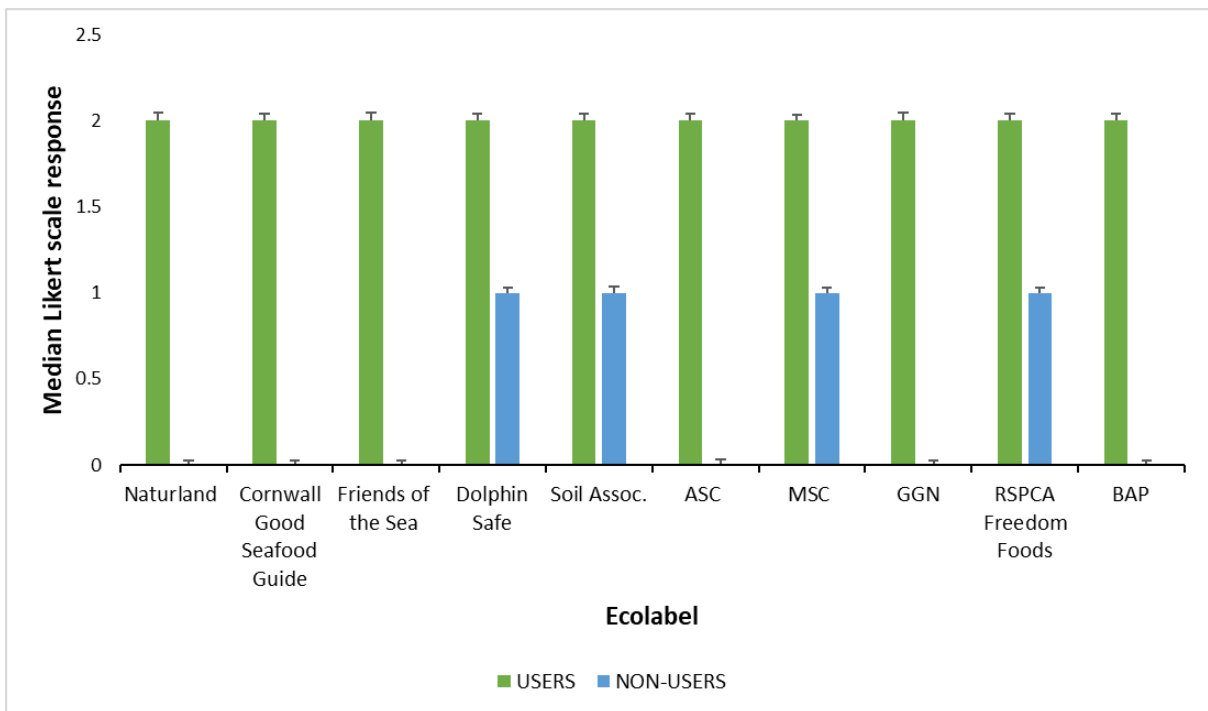


Figure 4.15: Guide use and ecolabel knowledge median Likert-scale response.

In the case of 'Users', a median of 2 (I recognise the logo but only have some understanding of its meaning) (See Section 3.9.3.2 for details of scale used) means that half of the sample gave responses below 2 i.e. 1 (I recognise the logo but have no understanding of its meaning) or 0 (I do not recognise the logo). The other half gave responses above 2 i.e. 3 (I recognise the logo and fully understand its meaning). In, the case of 'Non-users', a median of 1 (I recognise the logo but have no understanding of its meaning) means that half of the sample gave responses below 1 i.e. 0 (I do not recognise the logo). The other half gave responses above 1 i.e. 2 (I recognise the logo but only have some understanding of its meaning) or 3 (I recognise the logo and fully understand its meaning). This implies that within the 'Users' group there are more respondents that recognise the logos compared to individuals in the 'Non-user' group where half the number of respondents did not recognise the logos presented. A median value of 0 (I do not recognise the logo) is indicated for Non-user's recognition and understanding of less widespread labels such as Naturland, the Cornwall Good Seafood Guide, Friend of the Sea, Global G.A.P's consumer label, GGN, and GAA-BAP logos, confirming less knowledge of these labels compared to 'Users'.

Table 4.12: Summary of public recognition and understanding of the 10 eco-labels examined.

Label	MCS GFG User		Non-user		All	
	Most - recognised and understood by - %	Least - not recognised by - %	Most - recognised and understood by - %	Least - not recognised by - %	Most - recognised and understood by - %	Least - not recognised by - %
Marine Stewardship Council (MSC)	45%	6%	14%	45%	25%	31%
Soil Association	38%	10%	15%	47%	23%	34%
Dolphin Safe	35%	11%	13%	46%	21%	34%
RSPCA	35%	11%	13%	46%	21%	33%
Aquaculture Stewardship Council (ASC)	34%	10%	8%	55%	17%	39%
Friend of the Sea	28%	25%	5%	66%	13%	51%
Naturland	28%	34%	5%	77%	13%	62%
GGN Certified Aquaculture	26%	24%	4%	73%	12%	55%

Cornwall Good Seafood Guide	23%	26%	4%	76%	11%	58%
Global Aquaculture Alliance Best Aquaculture Practice (GAA-BAP)	22%	25%	3%	73%	10%	56%

Using the Seafood Logo scale (Section 3.9.3.2), designed to measure eco-label knowledge, the median eco-label knowledge score and standard error was calculated for both categories of Guide users (Figure 4.16).

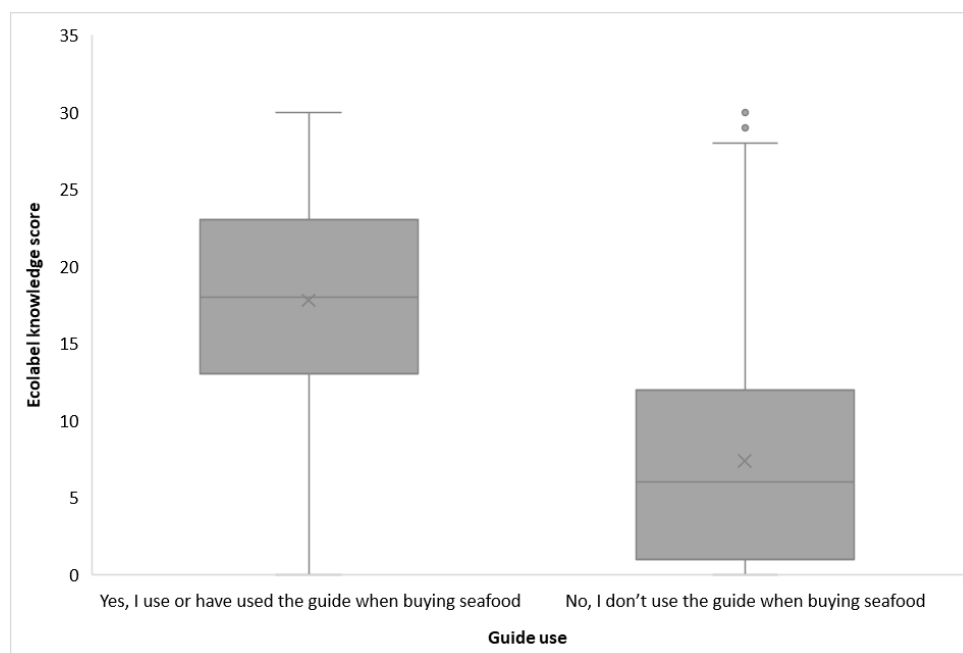


Figure 4.16: Guide use and ecolabel knowledge – all logos.

A Mann-Whitney U test was used to test for equal medians for eco-label knowledge. The test revealed a significant difference in scores for eco-label knowledge between users (Md = 18, n= 662) and non-users (Md = 6, n=1172) of the Guide, U= 655128, z= 24.586, p < 0.001, r=0.5741. A r value of 0.57 indicates guide use has a significant effect on eco-label knowledge.

Figure 4.17 indicates that, overall, the proportion of respondents that both recognise the seafood eco-label and understand its meaning is significantly higher amongst Guide users (31%) compared to non-users (8%). Conversely, the proportion of respondents that do not

recognise the logo is significantly lower amongst Guide users (18%) compared to non-users (60%).

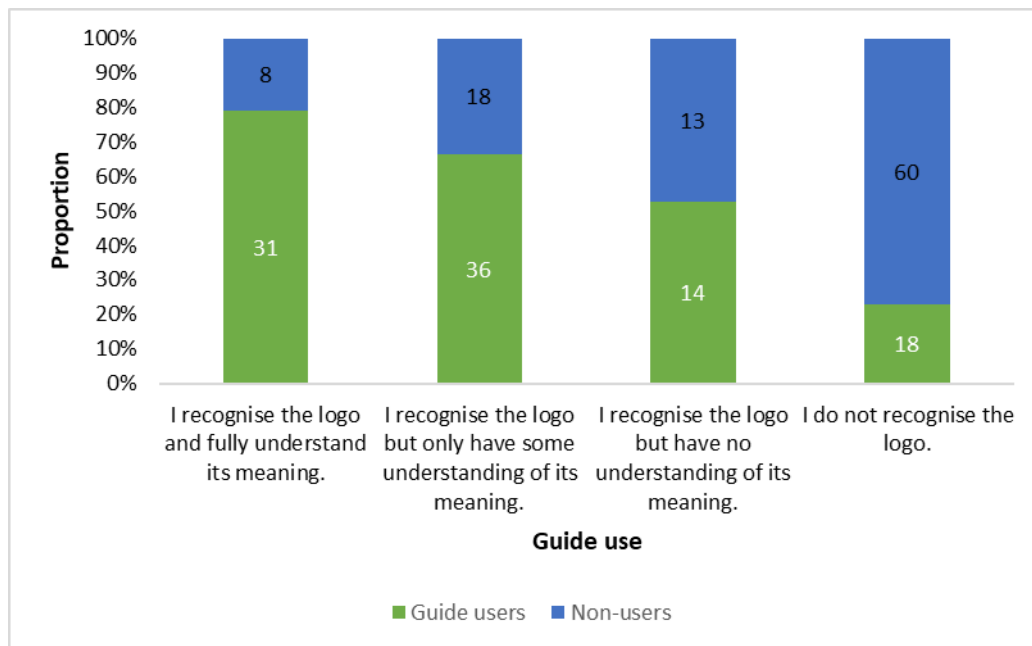


Figure 4.17: Recognition and understanding of all labels between Guide users and non- users.

Kruskal-Wallis tests further examined the influence of other factors besides guide use, exploring differences between ‘eco-label knowledge’ across the categories of gender; age; education; household income; and most frequently used supermarket. Where significant results were obtained, post hoc Mann-Whitney Pairwise Comparison values identified differences between groups, as shown in Table 4.13. Also see Appendix 25 for more detail.

Table 4.13: Summary of results for differences in eco-label knowledge across the categories listed in the table.

Variable	N (%)	Median	Df	H	P
Gender	1827	10	3	15.048	0.002
Age	1818	10	3	126.008	p<0.001
Education	1805	10	7	58.238	p<0.001
Employment	1820	10	6	123.589	p<0.001
Household income	1813	10	4	36.746	p<0.001
Supermarket	1788	10	10	47.59	p<0.001

As shown in Table 4.13, there is a statistically significant difference in eco-labelling knowledge across the categories of gender, age, education, employment, household income and where respondents purchase supermarket fish.

Both female (Md=10) and male (Md=11) respondents were found to record significantly lower median scores than the group which preferred not to report their gender (Md=25). Significant comparisons were recorded between all *age* groups, except between the 2 older groups, 50-69 (Md=7) and 70+ (Md=6). The most significant ($p < 0.001$) pairwise comparisons recorded between *education* groups were between those that left school at 16 with qualifications (Md=6.5) and those with teaching or nursing qualifications (Md=13.5) or a post graduate education (Md=13); and between undergraduates (Md=10) and postgraduates (Md=13).

The most significant ($p < 0.001$) pairwise comparisons recorded between *employment* groups was between those in the 'Other' group (Md=4) and all other groups except those that were retired (Md=7); between those that indicated they were unemployed (Md=6) at the time and all other groups except those that indicated they were either retired or in the 'Other' group. Significant ($p < 0.001$) comparisons recorded for *income* groups were between those in the lowest income group (£0-£12,500) (Md=6) and the other income groups, group 2 (£12,501-£50,000) (Md=10), group 3 (£50,001-£150,000) (Md=11), and group 4 (Over £150,000)

(Md=18), respectively; between those in the highest income group (Md=18) and the group who preferred not to say (Md=8); and those in group 2 earning £12,501-£50,00 (Md=10).

In relation to comparisons between *supermarkets*, the most significant comparisons ($p < 0.001$) were found between Marks and Spencer (Md=17) and all other supermarkets, except Co-Op (Md=16) and Lidl (Md=11).

Figure 4.18 indicates that, overall, eco-label knowledge, is much higher amongst users of the MCS GFG compared to non-users, with a higher proportion of respondents (36.5%) using the Guide in the high knowledge category, compared to non-users (5%). Similarly, the proportion of respondents (16.5%) using the Guide in the low knowledge category, is lower than the proportion of non-users (71%).

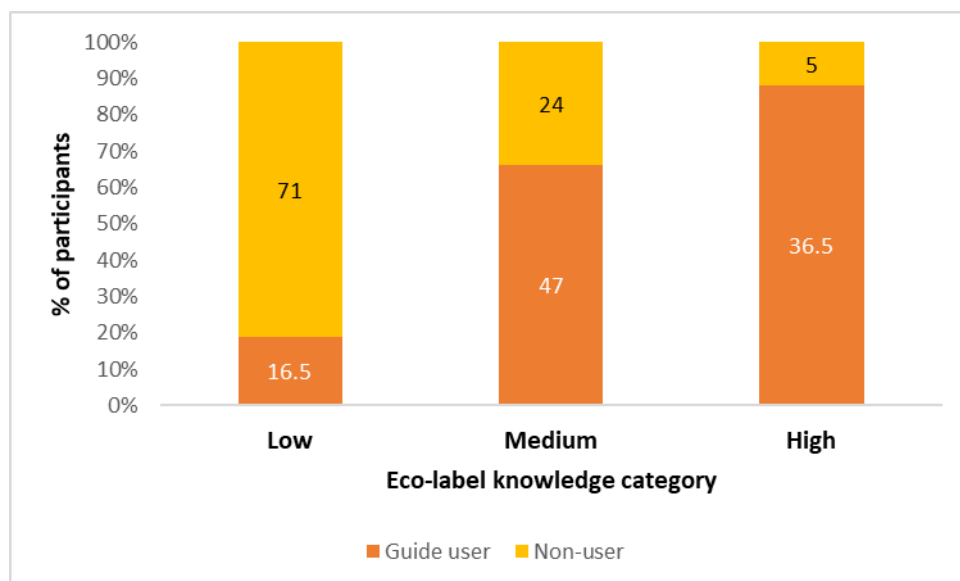


Figure 4.18: Proportion of guide and non-users in each of the eco-label knowledge categories.

Knowledge of less widespread labels such as Naturland, the Cornwall Good Seafood Guide, Friend of the Sea, Global G.A.P's consumer label, GGN and GAA-BAP logos, was also more limited amongst those not using the Guide compared to Guide users (Figure 4.14).

4.7.4. Sources of seafood knowledge

Given the importance of knowledge for consumer choice (Pieniak et al., 2013), and the trust placed in that source of information, respondents, users and non-users of the GFG, were asked to indicate the importance of a range of sources for their seafood knowledge. Responses are summarised in Figure 4.19.

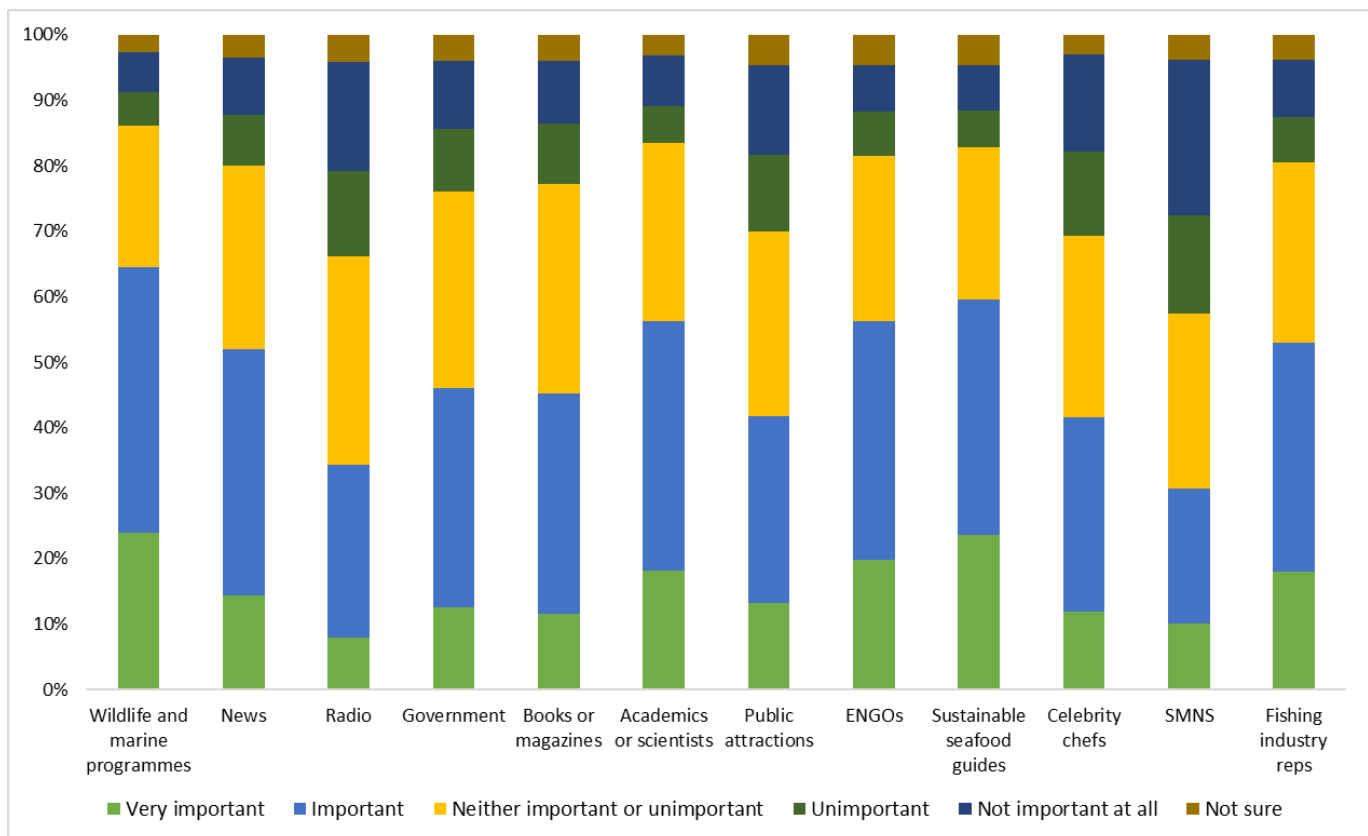


Figure 4.19: Summary of the importance of sources of seafood knowledge.

65% of respondents indicated that programmes such as BBC ‘Blue Planet 2’ were an important source of such knowledge. Sustainable seafood guides were also recognised as important for 60% of respondents, which is especially interesting, given 54% of respondents indicated that the questionnaire is the first time they have seen or heard of the MCS guide and 5% were unsure whether they had heard of it or not (See Section 4.3 Figure 4.2).

One sample Wilcoxon tests were used to determine if the responses overall differed from the mid-point i.e., neither important nor unimportant. In all cases, a significant difference ($p < 0.05$) between observed medians and the hypothetical median was found, indicating a high level of agreement with the statements presented and thus the importance of these sources of knowledge to respondents.

4.8. Discussion of seafood sustainability knowledge

A large majority (84%) of users agreed they have become more knowledgeable about seafood sustainability as a result of using the MCS GFG. Almost half (47%) considered they already had enough seafood sustainability knowledge (Section 4.7.1). However, this is not confirmed by results obtained for public understanding of key seafood sustainability terms (Section 4.7.2). More users compared to non-users stated they did not know what the term 'sustainable seafood' meant, and where an answer was provided, it was incorrect. This echoes findings from Lawley et al. (2019) who found almost a third of respondents either did not know what seafood sustainability meant or had an incorrect understanding. Similarly, a study carried out by Grunert et al. (2014) determined that for many, sustainability is an 'abstract' or 'fuzzy' concept, to which people attach different meanings. In contrast, a study carried out by McClenachan et al. (2016), suggested that consumers have a good understanding of the fisheries sustainability terms examined, which was also supported by Gutierrez and Thornton (2014) who concluded that consumers have a good understanding of the concept of seafood sustainability.

In this study, almost 40% of all respondents did not know either what seafood sustainability means or had an incorrect understanding. The majority (56%) referred to only one aspect of seafood sustainability, i.e., preventing overfishing or decline of the stock. This result is like findings of a survey carried out on behalf of Compassion in World Farming (CIWF), in which most UK adults (67%) think that 'sustainable' on fish packaging tells you that the species of fish is not currently over-fished (ComRes, 2018). Lack of understanding among MCS GFG users of these terms may in part be attributed to there being no definition for 'sustainable seafood'

provided in the Guide. Only 5% of respondents had any understanding of the term 'responsibly sourced'. However, when examined, general seafood sustainability knowledge was found to be significantly higher among Guide users (Section 4.7.2). Results also indicate that for more than half of the knowledge statements presented, responses were not dependent on guide use, suggesting that individuals using the Guide have possession of some seafood sustainability knowledge prior to using it and that their knowledge could not be attributed to guide use.

As found in this study, high levels of knowledge are observed as a driver for engaging in seafood sustainability and other pro-environmental food choices in other studies (Lawley et al., 2019; Peschel et al., 2016), while a lack of seafood sustainability knowledge has been shown to deter participation in seafood sustainability initiatives (Dolmage et al., 2016). Levels of general seafood sustainability knowledge were also found to be significantly higher among those found in this study in younger age groups; with postgraduate qualifications; and in the highest income groups.

From examination of public understanding of mandatory seafood labelling (Section 4.7.3), Guide users were found to indicate a greater understanding of how fish is labelled and what information to look for when buying sustainable fish, compared to non-users. This suggests that MCS GFG use increases knowledge of what information to look for when buying seafood. However, 41% of respondents indicated that they did not know how to interpret labelling information to allow them to choose the most sustainable seafood. Furthermore, 60% of respondents agreed clear information on packaging and menus about seafood is lacking.

As observed in the literature review, although labelling requirements for health and safety values are extensive (FSA, 2022), there is currently no mandatory requirement to supply information about the sustainability of a fish product. Only by examining, information where provided, for example, for live, fresh or chilled wild-caught products, such as: the commercial and scientific name; the FAO catch area; sub-area or division (only applicable to North East

Atlantic); and capture method, and cross-referencing it with information and/or a rating supplied by a seafood guide such as the MCS GFG, can the environmental sustainability of a product be ascertained.

There are challenges across the seafood sector. Labelling for farmed species is less transparent as the country where the fish was farmed may not be the same as the country where they reached their final size. For example, a fish farmed in France but harvested in Iceland would be labelled, 'Farmed Icelandic fish' (Gov.UK, 2022a). An examination of voluntary seafood labelling knowledge (Section 4.7.3) also found that Guide users have significantly more eco-labelling knowledge compared to non-users. Although studies have identified product labelling as an important and frequently used source of information about fish (Lawley et al., 2019; Pieniak et al., 2013), consumers' lack of understanding of eco-labels may not prevent their use in purchasing decisions (Valor et al., 2014). With almost 70% of all respondents having some level of recognition of the MSC label, it was noted as the most widely known ecolabel for seafood among the 10 labels examined.

This study found programmes such as BBC 'Blue Planet 2' to be an important source of seafood knowledge. The success of 'Blue Planet' in raising public awareness and its potential for motivating behaviour change for addressing marine issues such as single use plastic pollution is recognised in both the academic literature (Dunn et al., 2020; Stafford and Jones, 2019) and by the media, as the 'Blue Planet' or 'Attenborough' effect (Gell, 2019). However, the success of the programme in motivating behaviour change in relation to seafood consumption has not been fully investigated.

Seafood guides were also recognised as an important source of seafood knowledge in this study. Seafood guides have the potential to educate consumers about many aspects of seafood sustainability including about the appearance of commercial fish which, according to Cusa et al. (2021), is essential for increasing consumer's seafood literacy, connecting them with the fish they eat, and ultimately increasing their sustainable seafood consumption. In a

study carried out by Pieniak et al. (2013), labelling, retail or supermarket staff, and the internet were identified as important information sources for seafood. This study however found social media/networking sites (SMNS) were indicated as relatively unimportant as a source of seafood knowledge. In another study by Pieniak et al. (2007), non-mass media sources such as fishmongers and family and friends were identified as important and trusted 'personal' sources of information to consumers. In contrast to findings by Pieniak et al. (2007), this study identified academics or scientists as an important source of information (56%). In a study by Jonell et al. (2016), the main sources of information were identified as media, environmental NGOs and friends/colleagues. The information sources least accessed were retailers and fishermen/farmers. Although respondents in this study were invited to provide details of other sources of seafood knowledge not listed, family, friends, or fishmongers, were not highly selected. ENGOs (56%), fishing industry representatives (53%) and media (e.g., news 52%), were however identified as important sources of knowledge or information in this study.

4.9. Seafood purchasing behaviour

This section examines the various factors influencing seafood purchasing. In particular, this section examines how the seafood purchasing behaviour of Guide users and their prioritisation of factors (attributes) when purchasing seafood differs from the behaviour of non-users.

4.9.1. Seafood purchasing influences

82% of all respondents purchasing seafood agreed they have always eaten seafood and for many (70%) a seafood consumption habit was formed in childhood. 68% tended to disagree with the statement 'I don't eat seafood' suggesting that for the majority, seafood is consumed as a part of their normal diet. More than half (55%) agreed they have always tried to only buy sustainably produced seafood. 49% of respondents agreed they have increased the amount of seafood they are eating recently, while 40% agreed that they eat more seafood out of the home (Figure 4.20).

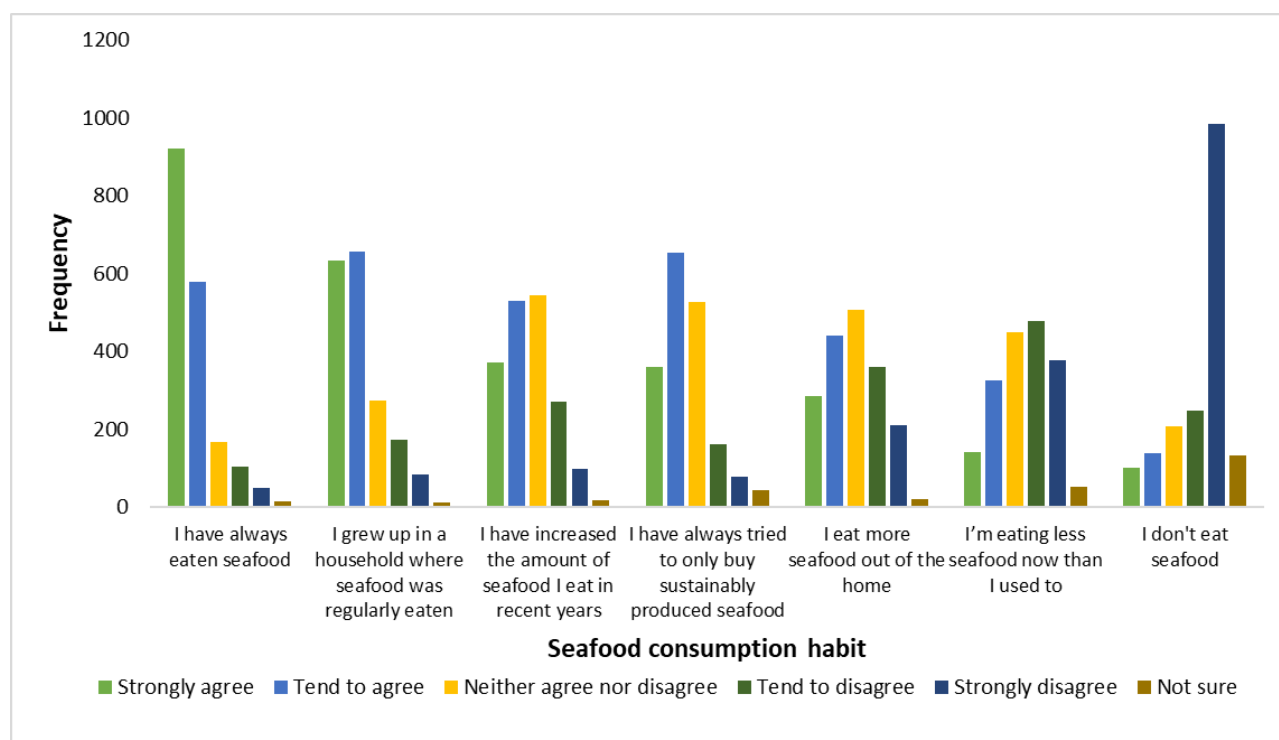


Figure 4.20: Trends in respondents' seafood consumption (n=1834).

One sample Wilcoxon tests were used to determine if the responses overall differed from the mid-point. A significant difference ($p < 0.05$) between medians was found in all cases, indicating high levels of agreement (or disagreement in the case of item 7, “I don’t eat seafood”) with the statements presented.

When asked about purchasing seafood for home consumption, respondents ($n=1587$) suggested supermarkets are most frequently used for purchasing seafood, accounting for almost half (45%) of responses (Figure 4.21).

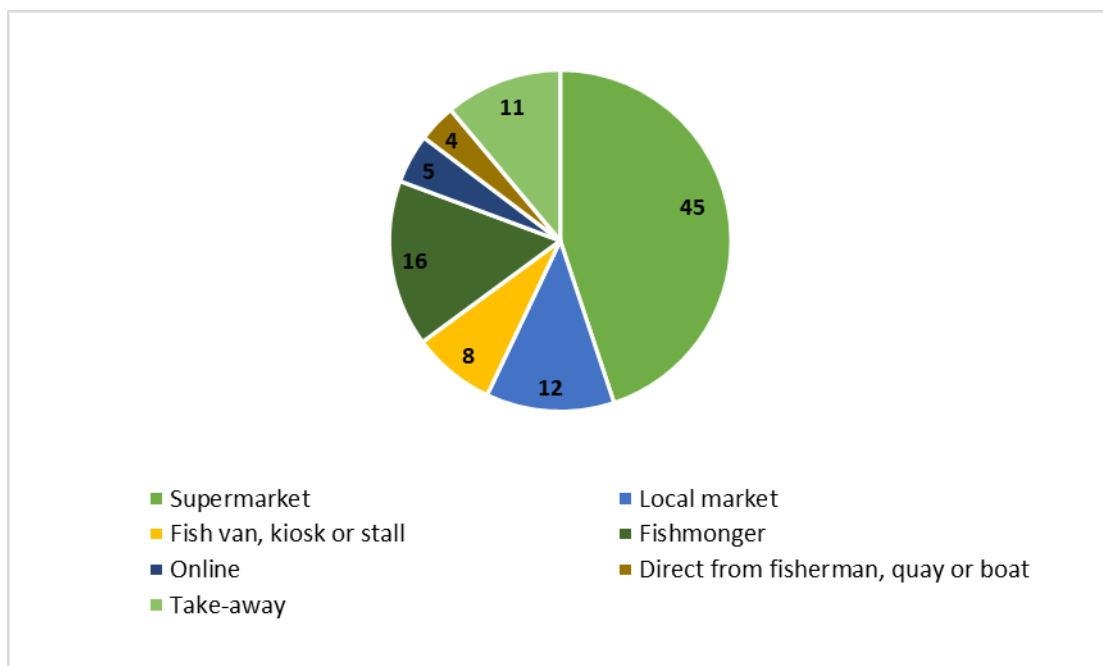


Figure 4.21: Analysis of where seafood is bought ($n=3534$).

The data were further examined to understand whether guide use is having an influence on where seafood is purchased. Figure 4.22 indicates that for Guide users, the proportion of purchases reported as being made from independent sources (such as fishmongers, fish vans etc. and local markets) is 18% more than the proportion of purchases reported by non-users for the same categories, while purchases made online by users are twice those made by non-users. The proportion of purchases reported by users for supermarkets is 21% less than that for non-users.

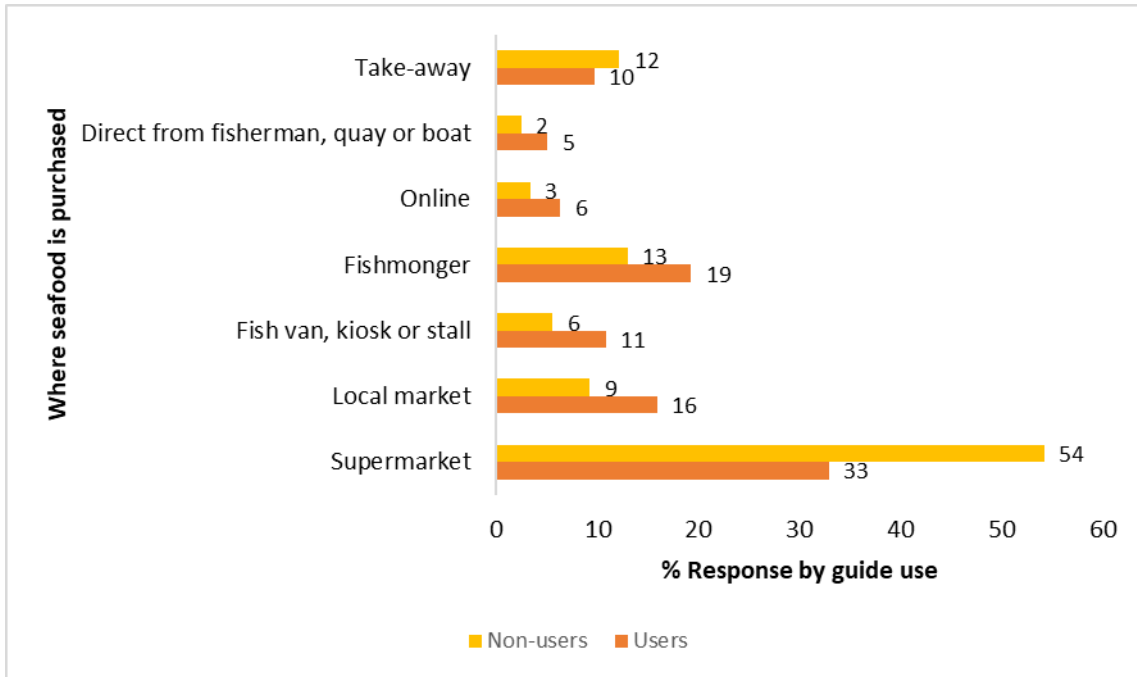


Figure 4.22: Where seafood is purchased by guide use.

Given that supermarkets are reported as the most frequent source of fish for home consumption, by both groups, further analysis examined the potential influence of supermarkets on seafood purchasing. From this, Tesco, the UK’s largest and most popular multiple retailer (Hawthorne, 2021), was the most frequently selected supermarket for purchasing seafood (Figure 4.23).

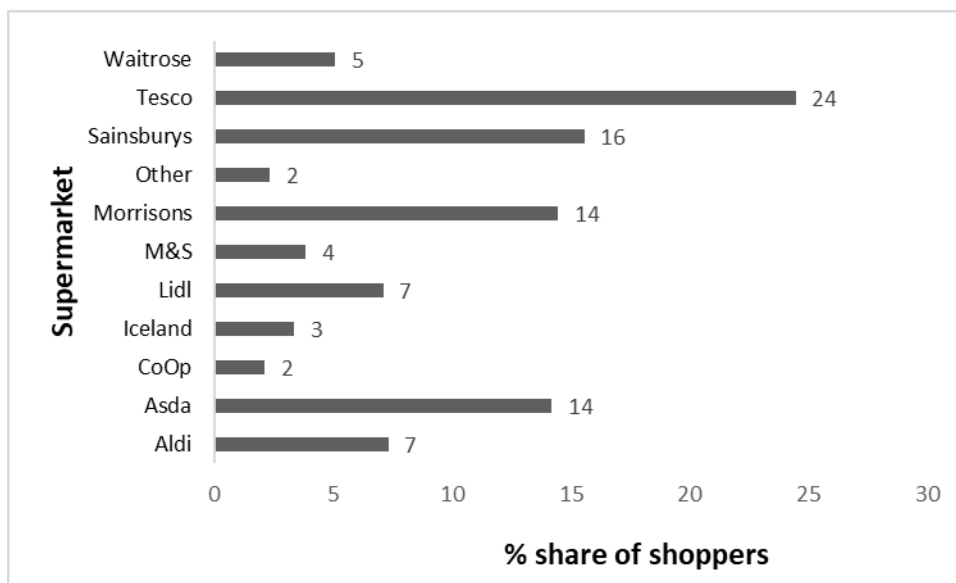


Figure 4.23: Frequency of seafood purchases by supermarket.

To better understand the relationship between socio-demographic factors and respondents' choice of supermarket, further analysis examined regional differences in supermarket preference, summarised in Figure 4.24.

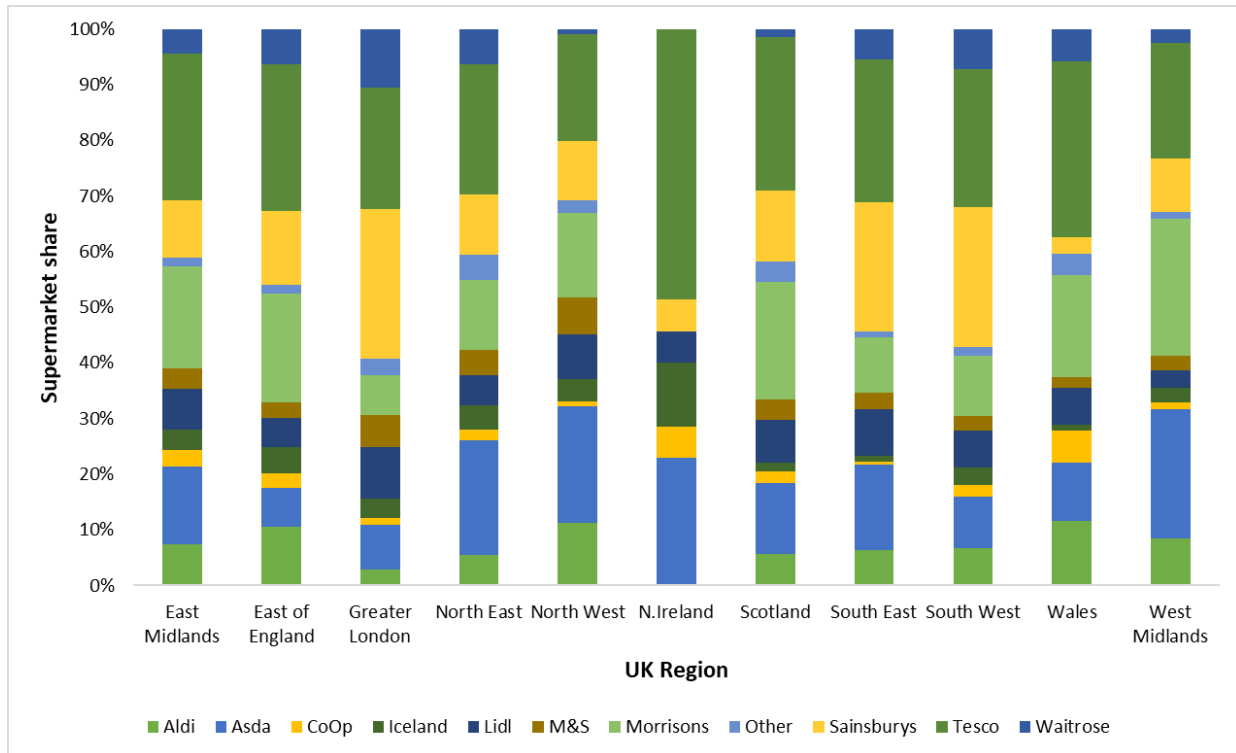


Figure 4.24: Regional difference in supermarket choice for purchasing seafood.

Chi square tests for independence indicated a significant association between supermarket choice and several socio-demographic variables, summarised in Table 4.14.

Table 4.14: Summary of Chi Square tests for independence to indicate association between supermarket choice and socio-demographic variables.

Variable	Pearson Chi-square value X^2	n	df	Significance (p)	Cramer's V co-efficient
UK Region	269.240	1670	100	$p < 0.001$	0.127
Guide use	51.662	1788	10	$p < 0.001$	0.170
Education	134.546	1759	70	$p < 0.001$	0.105
Income	110.117	1770	40	$p < 0.001$	0.125
Gender	86.669	1781	30	$p < 0.001$	0.127
No. of adults	49.283	1775	30	$p = 0.015$	0.096
No. children	88.551	1778	40	$p < 0.001$	0.112
Age	77.139	1772	30	$p < 0.001$	0.120

Results indicated that guide use was most prevalent amongst people shopping in the Co-Operative (Co-Op), Marks & Spencer (M&S) and Waitrose (Table 4.15).

Table 4.15: Supermarket preference for buying fish and guide use (n=1788).

Supermarket	Guide user Count/%	Non-user Count/%
Aldi	30 (22.9%)	101 (77.1%)
Asda	90 (35.4%)	164 (64.6%)
CoOp	24 (63.2%)	14 (36.8%)
Iceland	23 (38.3%)	37 (61.7%)
Lidl	47 (37%)	80 (63%)
M&S	43 (62.3%)	26 (37.7%)
Morrisons	91 (35.1%)	168 (64.9%)
Sainsbury's	97 (34.8%)	182 (65.2%)
Tesco	142 (32.4%)	296 (67.6%)
Waitrose	43 (47.3%)	48 (52.7%)
Other	12 (28.6%)	30 (71.4%)
Total	642 (35.9%)	1146 (64.1%)

A higher proportion (36%) of all Sainsbury's shoppers are undergraduates, which represent 27% of the total sample. Similarly, 35% of Waitrose customers are educated to postgraduate level, 22% of the total sample. For those shoppers in the income group, £12,501-£50,00, represented by 56% of the total sample, Morrisons has the highest proportion (62%) of shoppers in this income group. People shopping in Iceland have the highest proportion of male shoppers (68%), whilst Aldi has the highest proportion of female shoppers (57%). Aldi also has the highest proportion (57%) of shoppers who indicated they are from households with no children (51% of sample), followed by Sainsbury's (56%) and Tesco (56%). M&S has the highest proportion (41%) of shoppers in the younger age group, 18-29, 22% of the total, while Waitrose (44%) and Asda (40%) have the highest proportions of shoppers in the 30-49 age group, representing 38% of the total sample. Sainsbury's has the highest proportion (13%) of shoppers in the oldest age group, which represents 8% of the total sample of shoppers. See Appendix 26 for all results.

4.9.2. Drivers for seafood purchasing

By far the most important influence on seafood purchasing decisions was family (Figure 4.25), with 56% of respondents agreeing family influences their seafood choices. Wildlife (48%) and scientific (39.5%) experts and the fishing industry (34%) are also important influences. Celebrity chefs (32%), media (27%), and social media (21%) appear to have less influence than anticipated, compared to other studies (Jonell et al., 2016).

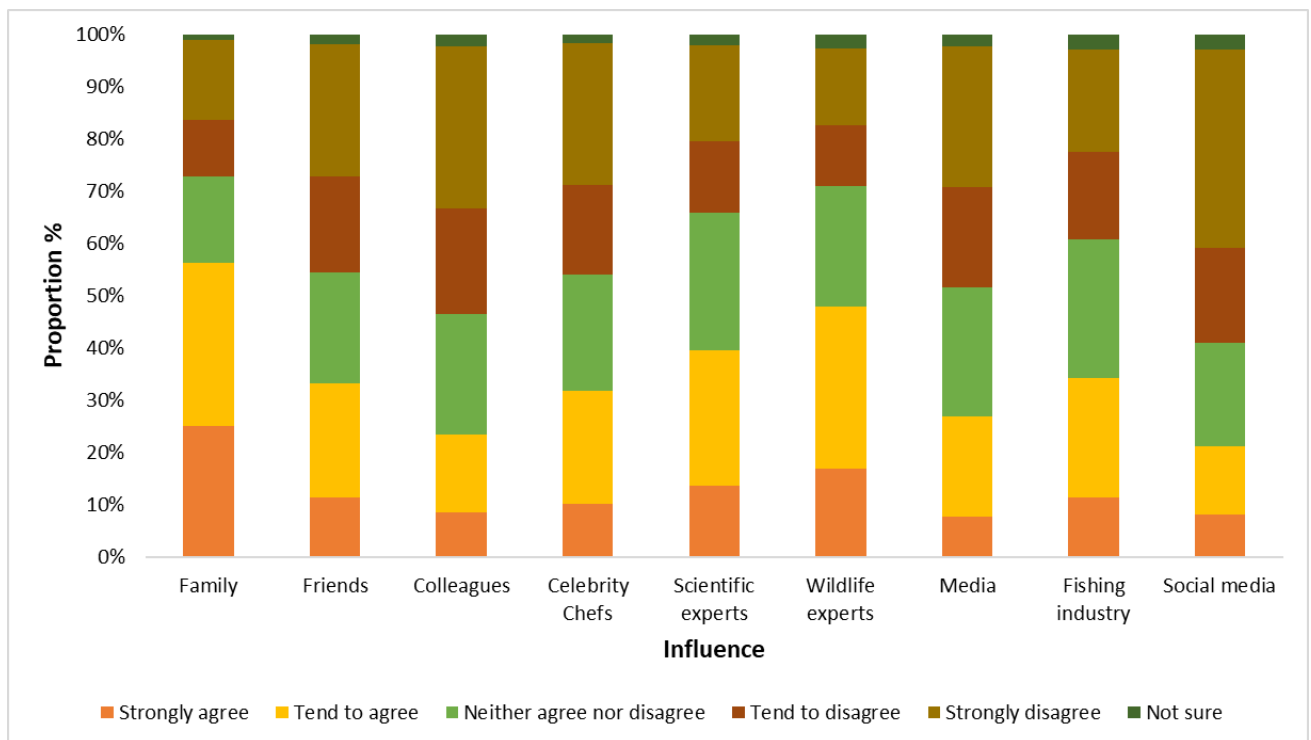


Figure 4.25: Who most influences respondents' seafood purchasing decisions.

One sample Wilcoxon tests were used to determine if the responses overall differed from the mid-point. In all cases, except in the case of scientific experts, a significant difference ($p < 0.05$) between observed medians and the hypothetical median was found, indicating a high level of agreement (or disagreement in the case of work or study colleagues and social media personalities or influencers where the observed median was equal to 2 in both cases) with the importance of the influences presented.

To understand how a range of factors influence consumers when purchasing seafood, respondents were asked to indicate how much they agreed or disagreed with the statement, “the following factors are important to me when buying seafood”. Table 4.16 presents these statements and summarises responses from both users and non-users of the MCS GFG guide.

Table 4.16: Summary of comparison of importance of 14 seafood attributes for seafood purchasing.

Seafood attribute	Guide users (N= 662)		Non-users (N= 1172)	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
Price	71	11	81	5
Easy to cook with recipe in mind	70	10	75	5
Provenance (i.e. who caught or farmed the fish and where)	76	7	41	17
How it’s caught or farmed	79	4	53	12
That it’s good for me	81	7	82	3
Is it wild caught or farmed?	68	5	44	14
Fish welfare	80	4	50	12
That it’s sustainable	86	3	59	8
Taste	85	4	90	2
Social justice (i.e. that the product is fairly traded)	74	6	45	14
Locally caught or produced	72	7	48	14
The type of product it is (e.g., fresh or frozen etc.)	73	5	77	4
That it’s easily available	72	10	78	4
That it’s a more sustainable source of animal protein	75	5	52	11

To further explore the degree to which different types of drivers influence seafood purchases for both users and non-users of the Guide, the various influences were grouped (Table 4.17) according to the different categories discussed in Section 2.5.6.

Table 4.17: Seafood purchasing factor categories.

Factor category	Factors
Situational (5)	Price; Taste; Availability; Easy to cook; Product type.
Egoistic (1)	That it's good for me.
Environmental (4)	Is it wild or farmed?; How it's caught or farmed?; That it's sustainable; That it's a more sustainable source of animal protein.
Ethical or social (4)	Provenance; Fish welfare; Social Justice; Locally caught or produced.

Figure 4.26 indicates that, although important, for users of the Guide, situational factors such as price and taste, appear to be less important considerations when buying fish compared to other factors. Motivational considerations such as health appear to be equally important for both groups, whereas environmental and social considerations such as fish welfare and social justice appear to be more important to consumers using the Guide compared to non-users.

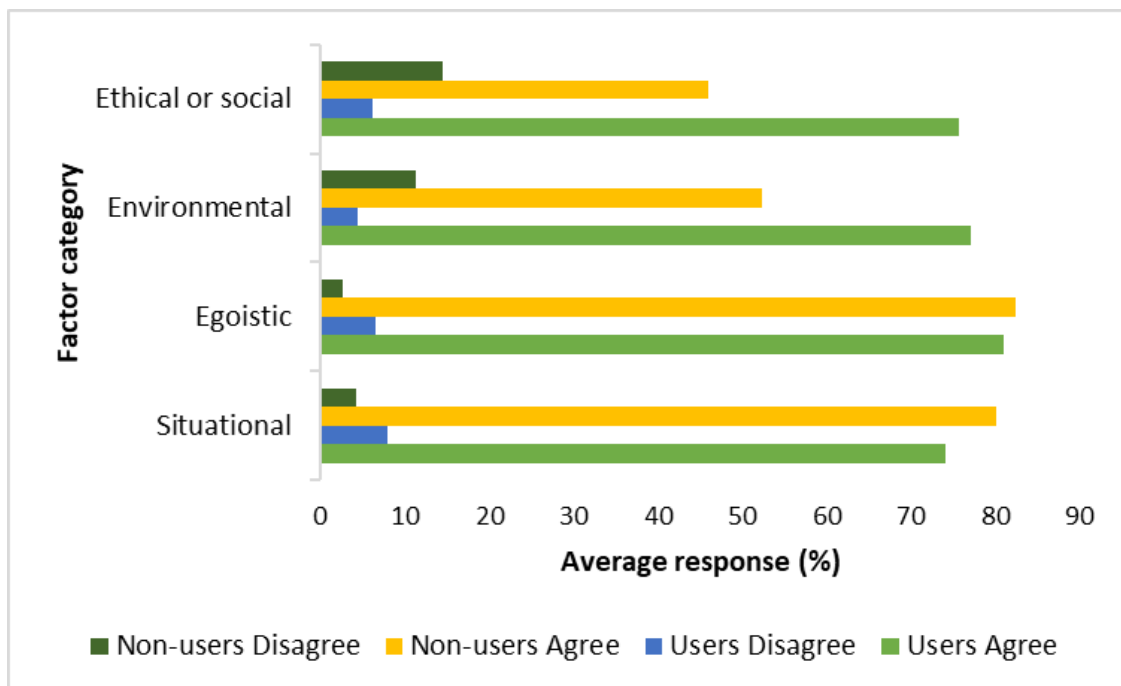


Figure 4.26: Relative importance of seafood purchasing influences for respondents.

To explore the relative importance of purchasing influences for both groups, Chi-square tests for independence examined the relationship between GFG use and each of the 14 seafood

attributes listed in Table 4.17. As before, responses to each of the items in the four groups were combined in two nominal categories, Agree or Disagree, for both users and non-users of the Guide (Table 4.18).

Table 4.18: Contingency table for importance to users and non-users of purchasing drivers.

Guide use	Ethical or social drivers (4) e.g., Fish welfare		Environmental drivers (4) e.g., Production method		Egoistic drivers (1) Health		Situational drivers (5) e.g., Price		Totals
	Disagree (Count/%)	Agree (Count/%)	Disagree (Count/%)	Agree (Count/%)	Disagree (Count/%)	Agree (Count/%)	Disagree (Count/%)	Agree (Count/%)	
User	28/5%	525/95%	33/7%	448/93%	43/7.5%	533/92.5%	72/13%	468/87%	2150
Non-user	144/20%	581/80%	158/23%	521/77%	30/3%	959/97%	62/6%	946/94%	3411
Totals	172	1106	191	969	73	1492	134	1424	5561

A statistically significant difference ($p < 0.05$) was found in all cases, except in the case of product type (Table 4.19), implying that, apart from product type, the categorical variables are related or dependent on guide use and the responses different for users and non-users of the Guide.

Table 4.19: Summary of results for seafood purchasing attributes.

Category	Attribute or factor	Pearson Chi-square value	Yates Continuity correction (χ^2)	n	df	Significance (p)	Phi coefficient
Ethical or social drivers	Provenance	86.891	85.549	1211	1	$p < 0.001$	0.27
	Fish welfare	58.988	57.724	1278	1	$p < 0.001$	0.22
	Social justice	52.169	51.055	1219	1	$p < 0.001$	0.21
	Local	43.843	42.847	1253	1	$p < 0.001$	0.19
Environmental	How it's caught or farmed	51.467	50.266	1309	1	$p < 0.001$	0.20
	Is it wild or farmed?	55.115	53.928	1160	1	$p < 0.001$	0.22
	That it's sustainable	31.346	30.27	1373	1	$p < 0.001$	0.15
	More sustainable protein source	35.826	34.823	1262	1	$p < 0.001$	0.17
Egoistic	It's good for me	16.078	15.097	1565	1	$p < 0.001$	0.10
Situational	Price	22.942	22.042	1548	1	$p < 0.001$	-0.12
	Easy to cook	17.871	17.058	1452	1	$p < 0.001$	-0.11
	Taste	11.474	10.459	1654	1	$p < 0.001$	-0.08

	Product type	1.121	0.885	1452	1	p=0.347	-0.03
	Availability	19.250	18.372	1492	1	p<0.001	-0.11

In the case of product type, no statistically significant difference was found, implying that responses are independent of guide use and product type is universally important when making purchasing decisions.

In the case of ethical or social and environmental determinants, the phi co-efficient is 0.20, indicating a small-medium effect between variables. In the case of egoistical determinants, the effect is small, and negligible in the case of situational determinants. This result indicates that consumers using the Guide attach more importance to ethical or social and environmental attributes when purchasing seafood compared to non-users. The health attributes of consuming fish, whilst slightly more important to non-users, is an important driver for purchasing fish or seafood in both groups. In the case of situational attributes, factors such as price, whilst slightly less important to Guide users, they are important to both groups.

4.9.3. Importance of seafood sustainability

Items were designed to understand the importance of seafood sustainability to the public when purchasing seafood (Figure 4.27).

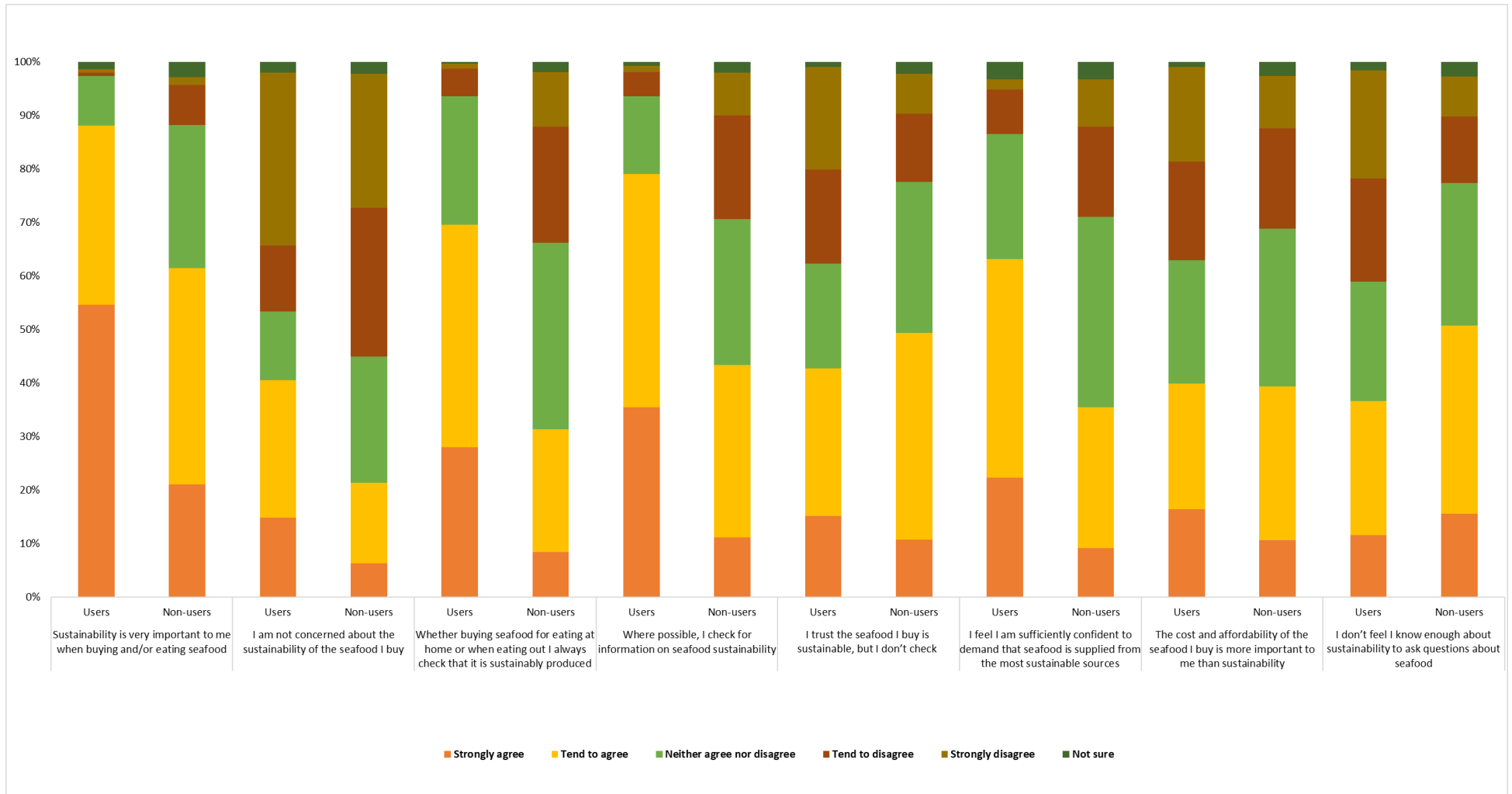


Figure 4.27: Respondents' perceptions and understanding of sustainability in relation to seafood consumption.

Kruskal-Wallis tests examined the differences in responses for each of the items across the categories of guide use; gender; age; education; and household income (Table 4.20). As shown in Table 4.20, there is a statistically significant difference, in most cases, in responses to the items listed across the categories of guide use, gender, age, education, and household income. The contribution of awareness of the importance of sustainability to background knowledge as a motivator for guide use is examined in Section 4.17.

Table 4.20: Summary of results for differences in responses to seafood sustainability statements across the categories listed in the table. P values ≤ 0.05 in bold, where the null hypothesis, i.e., the distribution of responses across categories is the same, is rejected.

Variable Item	Guide use Df = 1	Gender Df = 3	Age Df = 3	Education Df = 7	Household income Df = 4
1. Sustainability is very important to me when buying and/or eating seafood	N = 1818 H = 245.386 p < 0.001	N = 1815 H = 4.539 p = 0.209	N = 1805 H = 8.535 p = 0.036	N = 1792 H = 46.047 p < 0.001	N = 1801 H = 15.532 p = 0.004
2. I am not concerned about the sustainability of the seafood I buy	N = 1821 H = 12.867 p < 0.001	N = 1818 H = 15.722 p = 0.001	N = 1809 H = 120.352 p < 0.001	N = 1797 H = 19.686 p = 0.006	N = 1806 H = 20.709 p < 0.001
3. Whether buying seafood for eating at home or when eating out I always check that it is sustainably produced	N = 1821 H = 301.281 p < 0.001	N = 1818 H = 2.271 p = 0.518	N = 1808 H = 32.462 p < 0.001	N = 1796 H = 33.353 p < 0.001	N = 1805 H = 23.063 p < 0.001
4. Where possible, I check for information on seafood sustainability	N = 1818 H = 272.35 p < 0.001	N = 1814 H = 2.317 p = 0.509	N = 1805 H = 6.993 p = 0.072	N = 1793 H = 35.613 p < 0.001	N = 1802 H = 28.996 p < 0.001
5. I trust the seafood I buy is sustainable, but I don't check	N = 1816 H = 14.656 p < 0.001	N = 1814 H = 10.108 p = 0.018	N = 1804 H = 6.214 p = 0.102	N = 1791 H = 26.241 p < 0.001	N = 1800 H = 30.754 p < 0.001
6. I feel I am sufficiently confident to demand that seafood is supplied	N = 1820 H = 136.181 p < 0.001	N = 1818 H = 22.853 p < 0.001	N = 1808 H = 12.039 p = 0.007	N = 1795 H = 13.409 p = 0.063	P = 1804 H = 34.7 p < 0.001

from the most sustainable sources					
7. The cost and affordability of the seafood I buy is more important to me than sustainability	N = 1819 H = 0.42 p = 0.517	N = 1817 H = 2.811 p = 0.422	N = 1807 H = 49.143 p < 0.001	N = 1794 H = 11.565 p = 0.116	N = 1803 H = 23.304 p < 0.001
8. I don't feel I know enough about sustainability to ask questions about seafood	N = 1821 H = 53.955 p < 0.001	N = 1819 H = 13.52 p = 0.004	N = 1809 H = 8.521 p = 0.036	N = 1796 H = 19.2 p = 0.008	N = 1805 H = 16.296 p = 0.003

4.9.4. Type and frequency of seafood purchased

In order to understand the potential influence of the MCS GFG on the seafood choices the public are making, this section examines the species of fish purchased and the frequency of their purchase by users and non-users of the MCS GFG in the previous 12 months. Species were allocated to one of 4 groups: 'Big 5'; 'Best choice'; 'Fish to avoid'; and 'Others', comprising species not assigned to either of the other groups i.e., mackerel *Scomber scombrus*, mussel *Mytilus edulis*, plaice *Pleuronectes platessa* and squid. See Section 3.9.3.1. for more discussion of species selection.

Respondents were also asked to provide details of any other species they had bought (See Appendix 8. Question 15.a). Other species purchased included: pollack *Pollachius pollachius*; Alaska pollock *Gadus chalcogrammus*; lobster *Homarus gammarus*; crab *Cancer pagurus*; scallop *Pectinidae spp.*; basa *Pangasius bocourti*; lemon sole *Microstomus kitt*; seabass (bass) *Dicentrarchus labrax*; John Dory *Zeus faber*; and gurnard *Chelidonichthys cuculus*, for example.

4.9.4.1. ALL species

Purchasing frequency for the 17 species for users (Left-hand columns) and non-users (Right-hand columns) of the Guide are summarised in Figure 4.28. Popular species such as cod, haddock, prawn, salmon and tuna, collectively known as the *Big 5*, are purchased more frequently by Guide users, compared to non-users. In the case of cod, for example, 22% of Guide users purchase cod 'At least once a week' compared to only 11% of non-users.

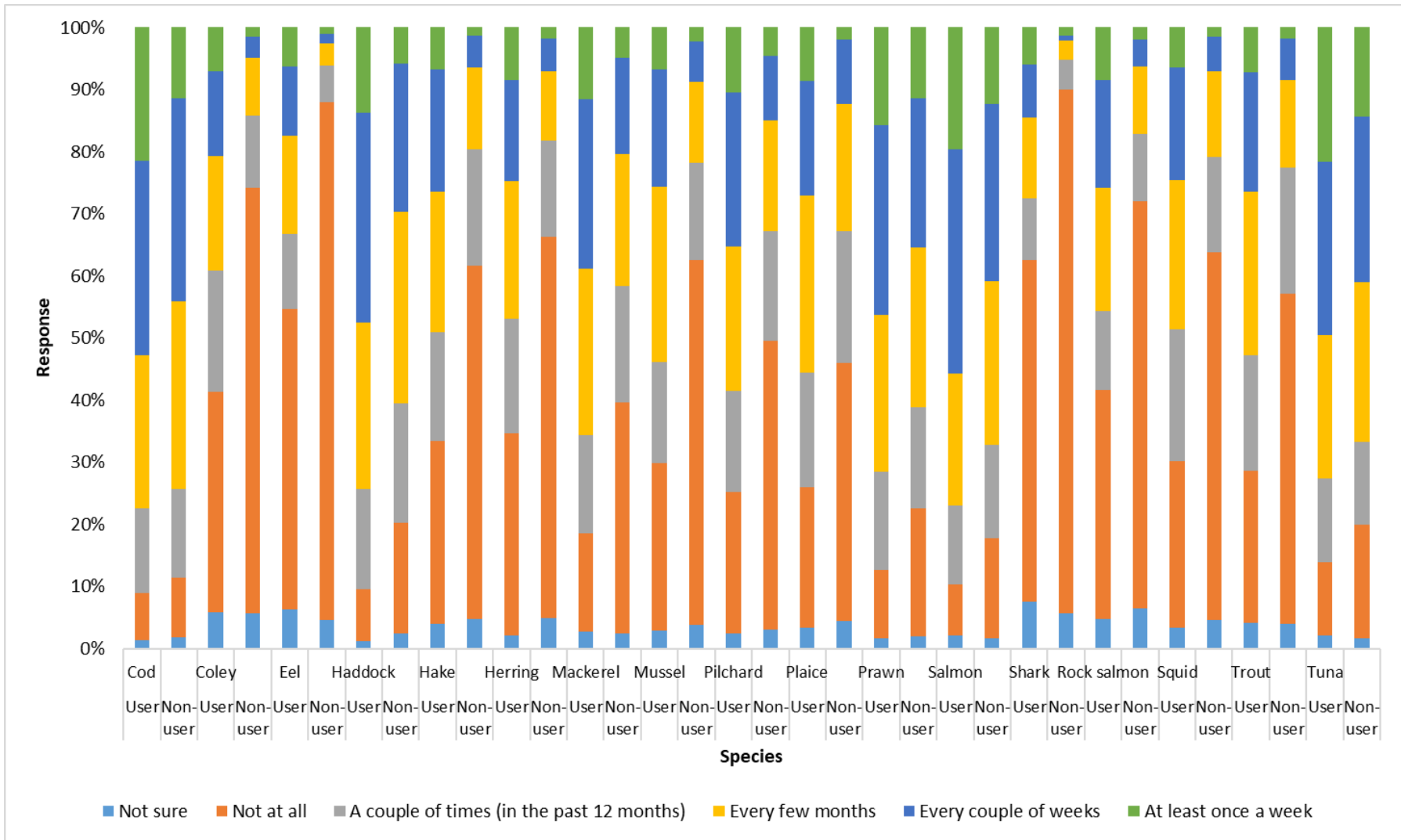


Figure 4.28: Purchasing frequency for individual species by guide use (Guide users LH columns; Non-users RH columns).

Non-Guide users were found to be more reliant on the Big 5 compared to Guide users, with these species comprising 55% of all species purchased by them compared to 40% for Guide users, suggesting that Guide users purchase seafood from a wider range of fish.

See Tables 4.21 and 4.22 which summarise the distribution of purchases i.e. the total count for all species for each of the groups for users and non-users of the Guide. In the case of lesser known species, such as, hake, herring, and mussel, non-users were more likely not to have consumed these species compared to Guide users. For example, in the case of herring, almost twice as many respondents not using the Guide (61%) indicated they have not eaten herring at all, compared to Guide users (33%).

Table 4.21: Purchasing frequency score by guide use and species purchasing group.

Guide use	ALL (n=1844)		GUIDE USERS (n=662)		NON-USERS (n=1172)	
Group	Count	%	Count	%	Count	%
Fish to Avoid	3209	8	2124	11	1085	5
Big 5	19097	48	7624	40	11473	55
Best Choices	8997	23	4941	26	4056	19
Others	8597	22	4374	23	4223	20
TOTAL	39900	100	19063	100	20837	100

Note, the 'count' is the total or composite purchasing score, or frequency based on the coding of responses used in the scale discussed in 3.9.3.1.

Table 4.22: Species ranking.

Species	Total count	% of all purchases	Ranking (All)	Guide users count	% of all purchases	Ranking (Users)	Non-Guide users count	% of all purchases	Ranking (Non-users)
COD	4138	10	1	1590	8	1	2548	12	1
SALMON	3942	10	2	1588	8	2	2354	11	3
TUNA	3865	10	3	1506	8	3	2359	11	2
PRAWN	3622	9	4	1456	8	5	2166	10	4
HADDOCK	3530	9	5	1484	8	4	2046	10	5
MACKEREL	2769	7	6	1294	7	6	1475	7	6
PILCHARD	2363	6	7	1172	6	7	1191	6	7
PLAICE	2258	6	8	1082	6	8	1176	6	8
TROUT	1904	5	9	1034	5	9	870	4	9
MUSSEL	1835	5	10	1022	5	10	813	4	10
SQUID	1735	4	11	976	5	11	759	4	11
HAKE	1727	4	12	970	5	12	757	4	12
HERRING	1652	4	13	951	5	13	701	3	13
ROCK SALMON	1517	4	14	899	5	14	618	3	14
COLEY	1351	3	15	814	4	15	537	3	15
EEL	919	2	16	668	4	16	251	1	16
SHARK	773	2	17	557	3	17	216	1	17
Total	39900	100		19063	100		20837	100	

Surprisingly, species that are red-rated by the MCS GFG, such as eel, shark and Rock salmon, are also consumed more frequently by Guide users compared to non-users. For example, in the case of eel, 67.5% of respondents (n=369) who indicated they have consumed eel in the last 12 months, use the Guide, compared to 32.5% not using the Guide. See Figure 4.29 for a summary of responses for each of the purchasing frequency categories for all species by users and non-users of the Guide.

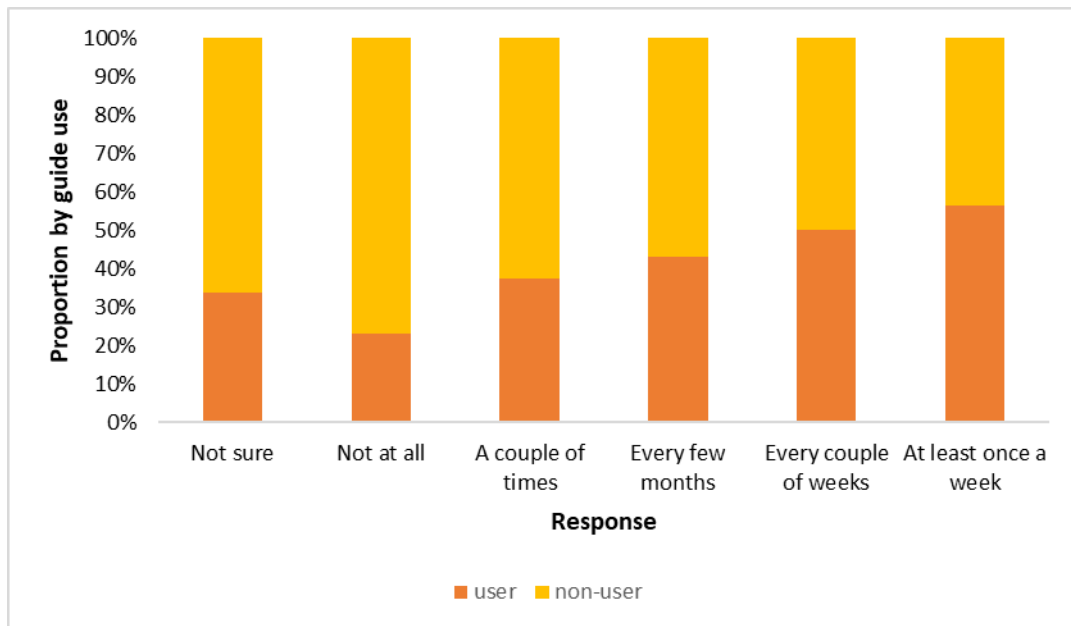


Figure 4.29: Proportion of responses in each purchasing category by guide use.

Analysis also indicates guide-users purchased fish more frequently in the previous 12 months compared to non-users (Figure 4.30). This observation is supported by the finding that 53% of Guide users reported that they buy more seafood now than before starting to use the Guide (See Section 4.5, Figure 4.9).

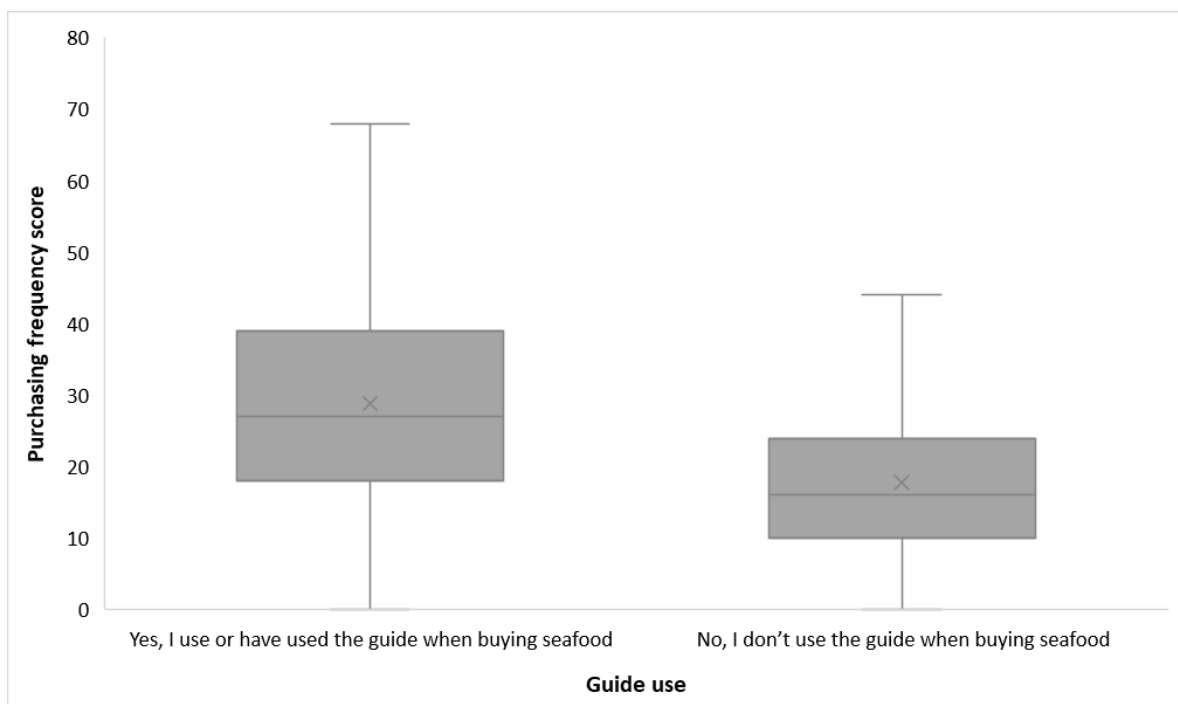


Figure 4.30: Median purchasing frequency score for all species by guide use.

To test for a statistical difference in seafood purchasing frequency between the two groups, a Mann-Whitney U test, was used to compare medians between groups for purchasing frequency of all species. The test revealed a significant difference in the purchasing frequency for users (Md = 27, n= 662) and non-users (Md = 16, n=1172), $U=566017$, $z=16.355$, $p \leq 0.05$. $r=0.38$. A r value of 0.38 indicates guide use has a medium effect on seafood purchasing frequency.

Given MCS GFG (2016) advice to reduce reliance on the ‘Big 5’ and avoidance of fish identified by MCS as species to avoid, analysis of the data to examine the impact of this advice on respondents’ purchasing behaviour was conducted. See Figure 4.31 for a summary of median purchasing frequency for these groups for users and non-users of the Guide. Detailed discussion of this analysis is presented in the following sections (4.9.4.2 to 4.9.4.5).

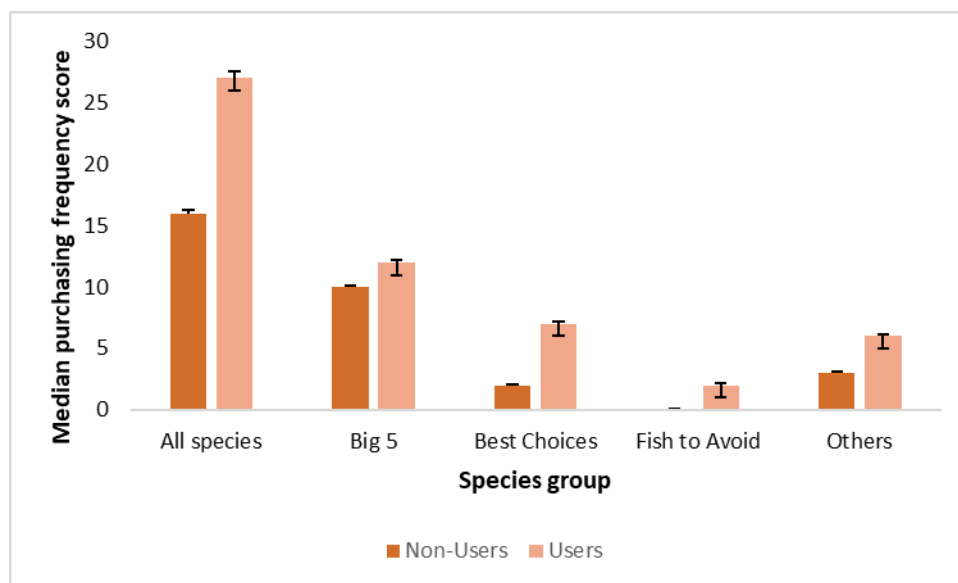


Figure 4.31: Median purchasing frequency score for users and non-users of the Guide for each of the species purchasing groups.

4.9.4.2. BIG 5 species

Species within this group comprised 48% of all species purchased (Table 4.21) with Guide users (40%) less reliant on this group than non-users (55%). However, it is of note that cod was the most popularly purchased species, ranked 1 in both groups. Cod comprises 12% of purchases of all species by non-users, and 8% of purchases of all species amongst users (See Table 4.22 above). Purchasing frequency of the Big 5 species by guide use is presented in Figure 4.32.

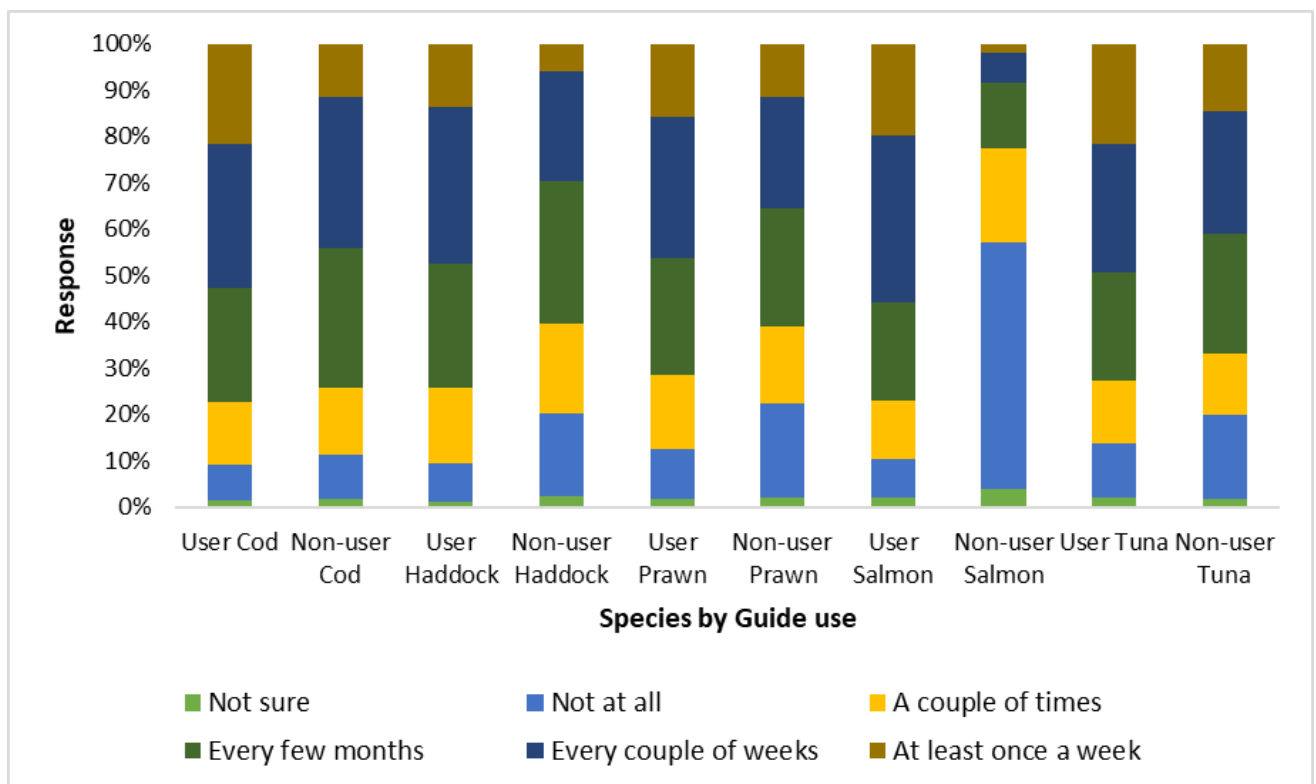


Figure 4.32: Purchasing frequency of Big 5 species by guide use.

No difference in the ranking of species between users and non-users was observed, with consumption of the Big 5 dominating in both groups.

To test for a statistical difference in seafood purchasing frequency (Figure 4.33) of the Big 5 between the two groups, a Mann-Whitney U test was used to compare medians between groups for purchasing frequency of the Big 5 species. The test revealed a significant difference in purchasing frequency for users (Md = 12, n= 662) and non-users (Md = 10, n=1172) of the Guide, $U= 474851$, $z= 7.999$, $p < 0.001$, $r=0.187$. A r value of 0.2 indicates guide use has a small-medium effect on purchasing frequency of the Big 5 species.

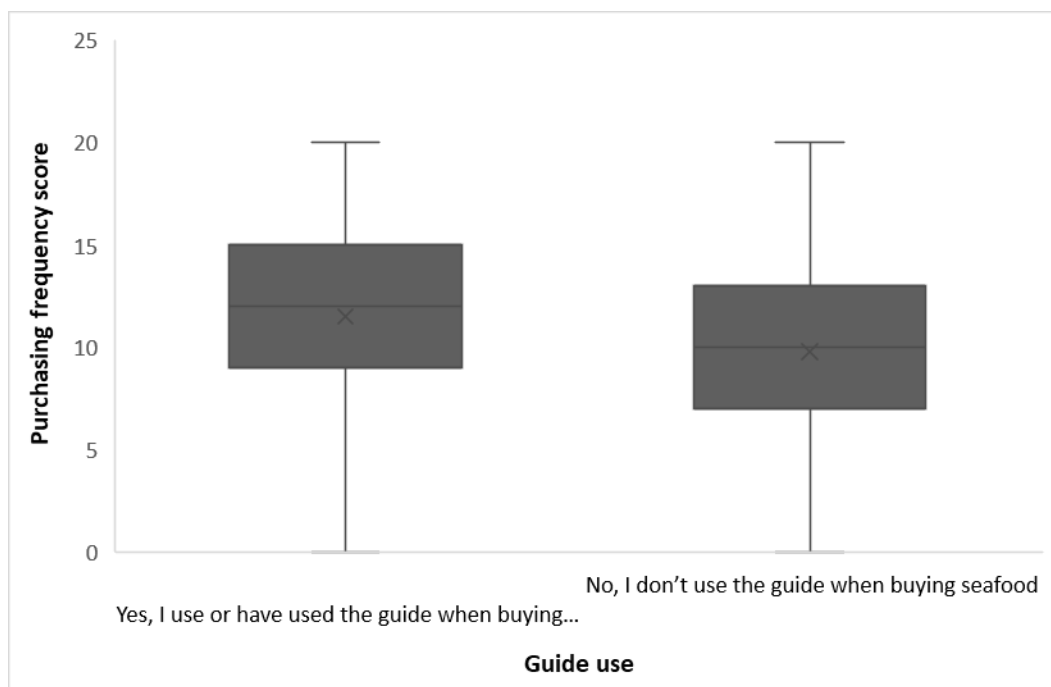


Figure 4.33: Median purchasing frequency for Big 5 species by guide use.

4.9.4.3. BEST CHOICE species

As discussed in Section 3.9.3.1. Best Choices are those species typically rated 1 or 2 in the MCS GFG. Species purchased within this group comprised 23% of all purchases of the 17 species within the past 12 months, with Guide users making more purchases (26%) from this group than non-users (19%) (Table 4.21). Respondent purchasing frequency of Best Choice species by guide use is presented in Figure 4.34.

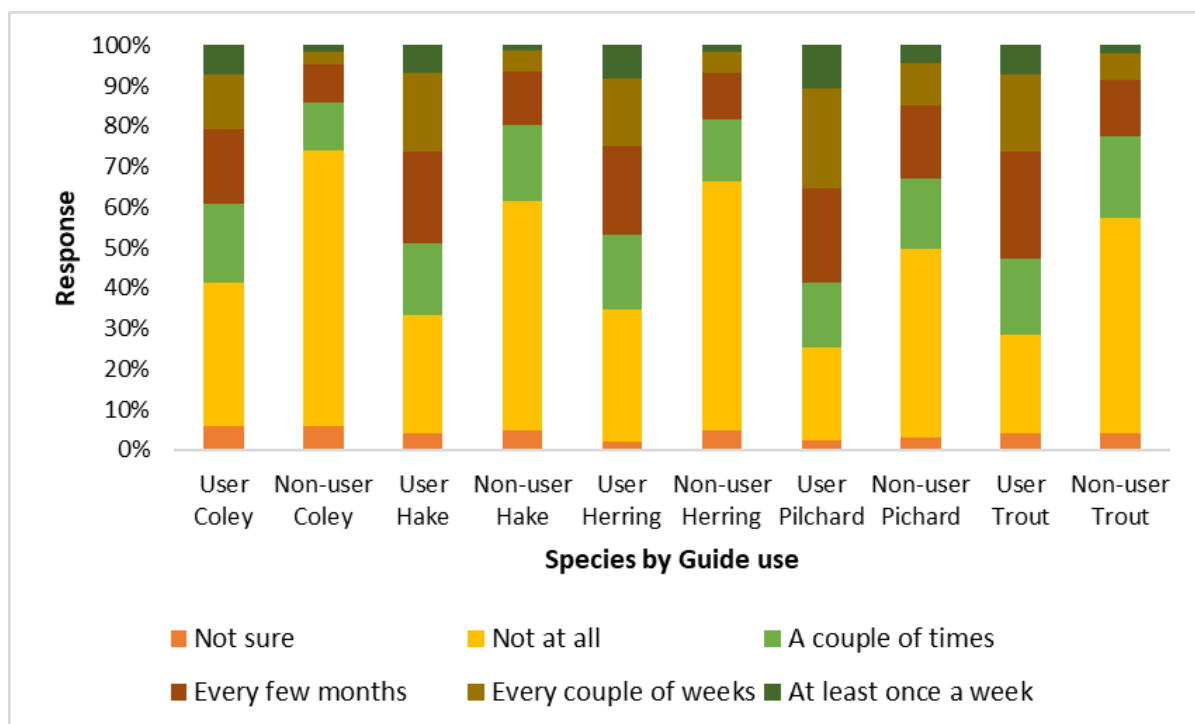


Figure 4.34: Purchasing frequency of Best Choice species by guide use.

To test if there was a significant difference between purchasing frequency (See Figure 4.35) of 'Best Choice' species between the two groups, a Mann-Whitney U test was used to test for equal medians. The test revealed a significant difference in purchasing frequency for users (Md = 7, n= 662) and non-users (Md = 2, n=1172) of the Guide, U= 570204.5, z= 16.852, p < 0.001, r= 0.39. A r value of 0.4 indicates guide use has a medium-large effect on purchasing frequency of Best Choice species.

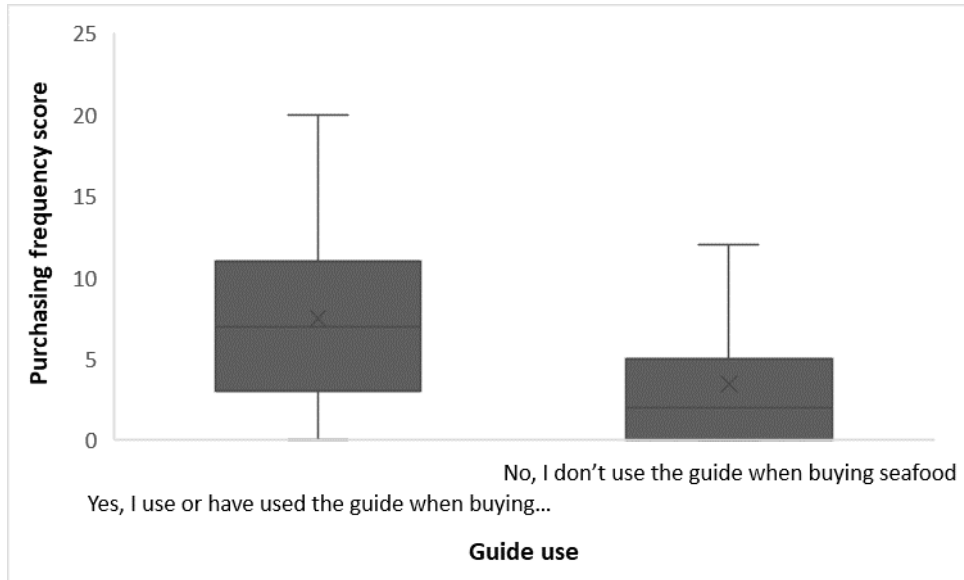


Figure 4.35: Median purchasing frequency for Best choice species by guide use.

4.9.4.4. OTHER species

This group comprised 22% of all purchases overall with Guide users purchasing slightly more from this group (23%) than non-users (20%) (Table 4.21). Mackerel is a popular choice and ranked 6 across all groups (See Table 4.22). Figure 4.36 presents purchasing frequency of 'Other' species and how these differs with guide use.

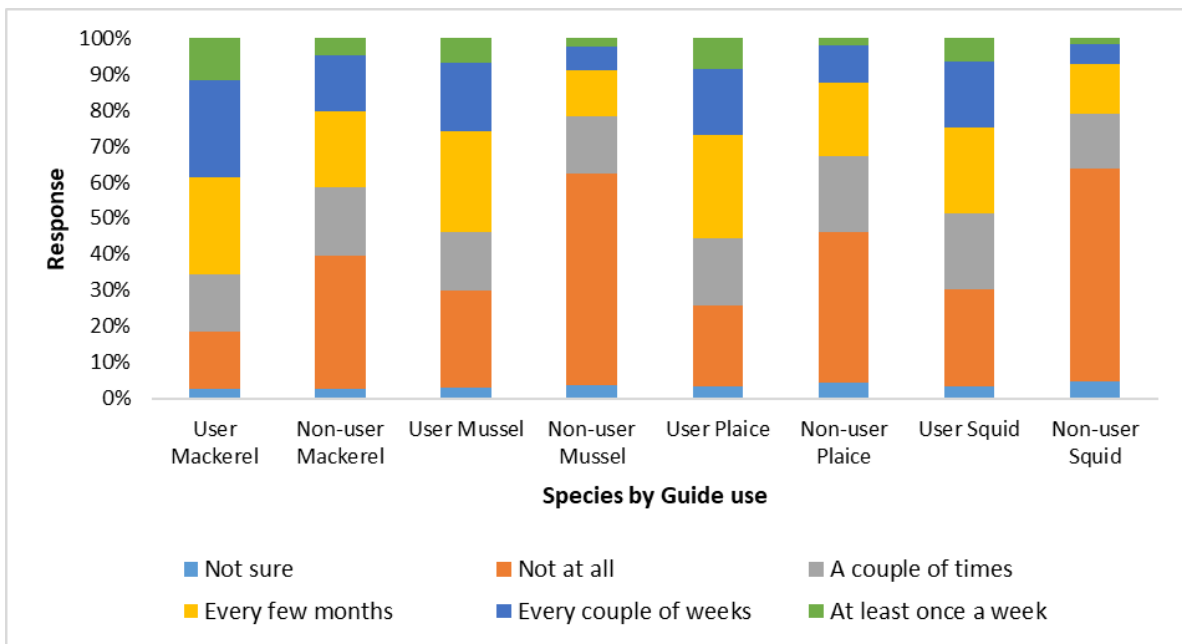


Figure 4.36: Purchasing frequency of Other species by guide use.

To test if there was a significant difference between purchasing frequency (See Figure 4.37) of 'Other' species between the two groups, a Mann-Whitney U test was used to test for equal medians. The test revealed a significant difference in purchasing frequency for users (Md = 6, n= 662) and non-users (Md = 3, n=1172) of the Guide, $U= 562824.5$, $z= 16.131$, $p < 0.001$, $r=0.38$. A r value of 0.4 indicates guide use has a medium-large effect on purchasing frequency of 'Other' species.

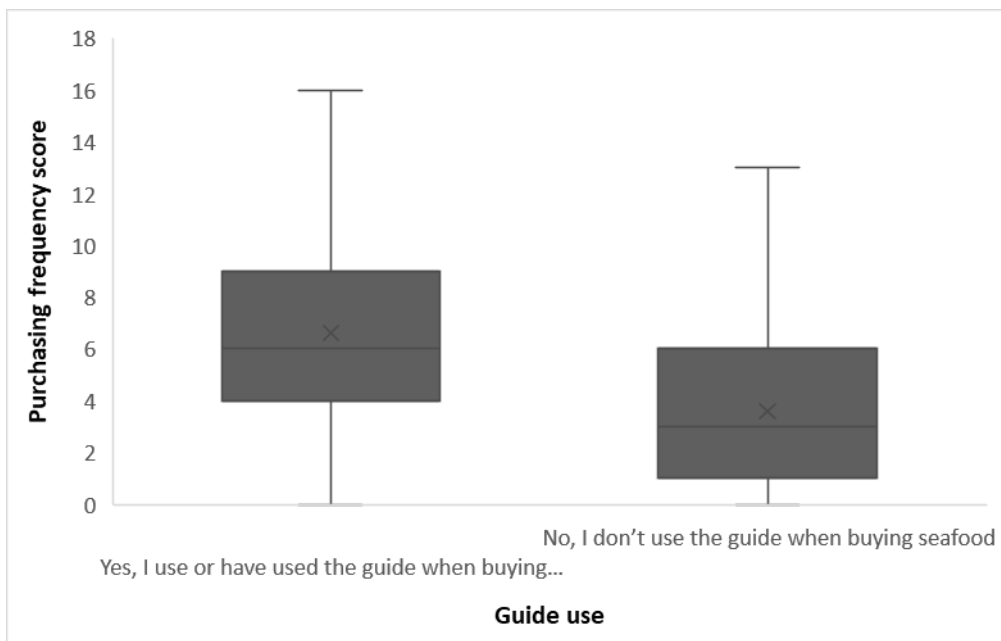


Figure 4.37: Median purchasing frequency for Other species by guide use.

4.9.4.5. FISH TO AVOID species

Also discussed in Section 3.9.3.1, Fish to avoid⁶⁶ are those species rated 5 in the MCS GFG. Purchasing frequency within this species group is lower, contributing only 8% of all purchases made by both groups in the previous 12 months. Fish to Avoid species however comprise 11% of purchases of these species made by Guide-users, compared to 5% by non-Guide users (Table 4.21). Eel and shark are the least frequently purchased species, ranked 16 and 17

⁶⁶ The Fish to avoid species group in the study comprised: European eel *Anguilla anguilla*, Shark e.g., porbeagle *Lamna nasus* and tope *Galeorhinus galeus*, and Rock salmon or spurdog *Squalus acanthias*.

respectively in all groups. Rock salmon is ranked 14 (Table 4.22). Purchasing frequency of Fish to Avoid species by guide use is presented in Figure 4.38.

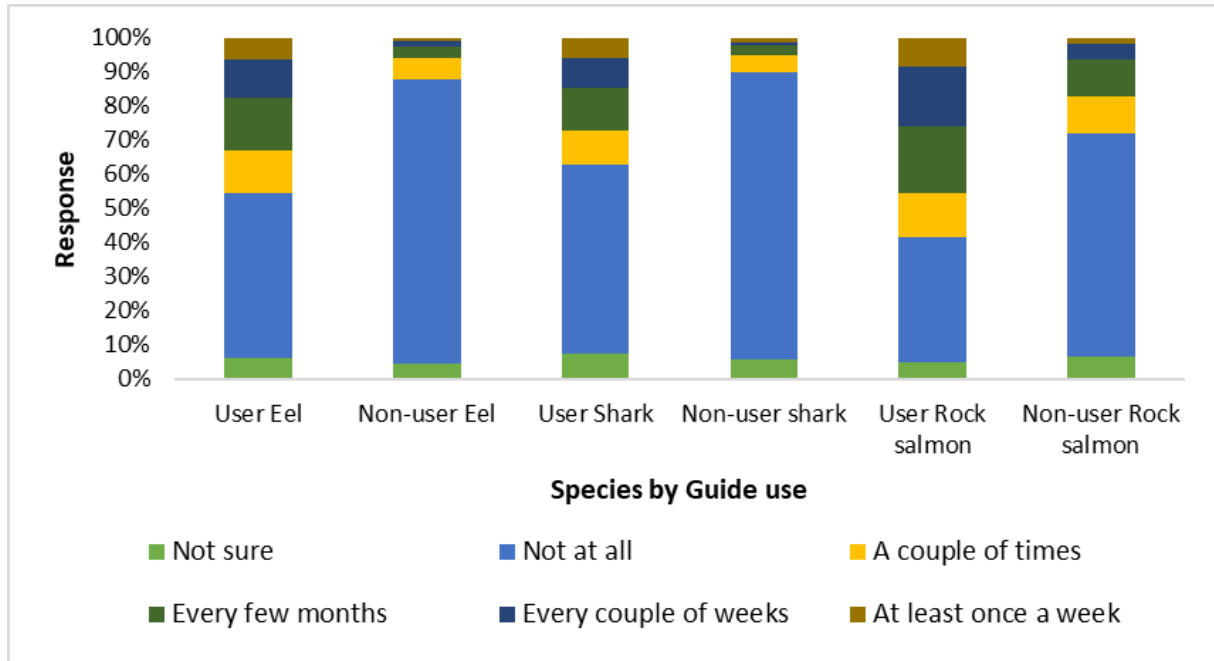


Figure 4.38: Purchasing frequency for Fish to Avoid species by guide use.

To test if there is a significant difference between purchasing frequency (See Figure 4.39) of Fish to Avoid between the 2 groups, a Mann-Whitney U test was used to test for equal medians. The test revealed a significant difference in purchasing frequency for users ($Md = 2$, $n = 662$) and non-users ($Md = 0$, $n = 1172$) of the Guide, $U = 540715$, $z = 15.61$, $p < 0.001$, $r = 0.36$. A r value of 0.4 indicates guide use has a medium effect on purchasing frequency of the Fish to avoid species.

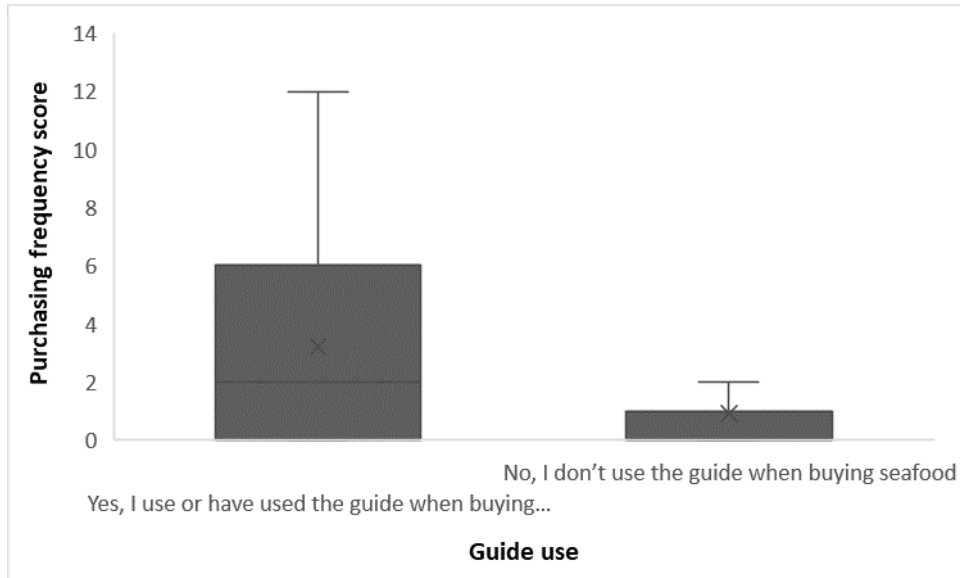


Figure 4.39: Median purchasing frequency for Fish to avoid species by guide use.

Kruskal-Wallis tests were carried out to understand whether, in addition to guide use, other socio-demographic and purchasing factors were responsible for the difference in purchasing frequency for: All species; Big 5; Best Choices; Others; and Fish to Avoid species between users and non-users of the Guide. As shown in Table 4.23, tests revealed a statistically significant difference in total purchasing frequency for all cases across all categories, except in the case of gender for purchasing of Big 5 species.

Table 4.23: Summary of results for differences in purchasing frequency across all the species purchasing categories for the factors listed in the table. P values ≤ 0.05 in bold, where the null hypothesis, i.e., the distribution of responses across categories is the same, is rejected.

Variable	Gender Df = 3	Age Df = 3	Education Df = 7	Household income Df = 4	Household compo -sition (No. Adults) Df = 3	Household compo -sition (No. Children) Df = 4	UK Region Df = 11	Super- market Df = 10
Total purchasing frequency:								
All species	N = 1827 H = 12.646 p = 0.005	N = 1818 H = 64.572 p < 0.001	N = 1805 H = 80.650 p < 0.001	N = 1813 H = 69.226 p < 0.001	N = 1821 H = 30.988 p < 0.001	N = 1824 H = 157.703 p < 0.001	N = 1715 H = 33.569 p < 0.001	N = 1788 H = 68.172 p < 0.001
BIG 5	N = 1827 H = 5.066 p = 0.167	N = 1818 H = 35.397 p < 0.001	N = 1805 H = 42.713 p < 0.001	N = 1813 H = 51.831 p < 0.001	N = 1821 H = 33.557 p < 0.001	N = 1824 H = 87.506 p < 0.001	N = 1715 H = 30.707 p < 0.001	N = 1788 H = 34.488 p < 0.001
Best Choices	N = 1827 H = 11.858 p = 0.008	N = 1818 H = 19.456 p < 0.001	N = 1805 H = 65.141 p < 0.001	N = 1813 H = 49.814 p < 0.001	N = 1821 H = 10.119 p = 0.018	N = 1824 H = 107.048 p < 0.001	N = 1715 H = 24.542 p = 0.011	N = 1788 H = 63.016 p < 0.001
Others	N = 1827 H = 11.571 p = 0.009	N = 1818 H = 59.016 p < 0.001	N = 1805 H = 83.847 p < 0.001	N = 1813 H = 73.063 p < 0.001	N = 1821 H = 35.329 p < 0.001	N = 1824 H = 135.178 p < 0.001	N = 1715 H = 24.718 p = 0.010	N = 1788 H = 58.769 p < 0.001
Fish to Avoid	N = 1827 H = 13.54 P = 0.004	N = 1818 H = 135.507 p < 0.001	N = 1805 H = 47.027 p < 0.001	N = 1813 H = 35.621 p < 0.001	N = 1821 H = 26.724 p < 0.001	N = 1824 H = 162.19 p < 0.001	N = 1715 H = 44.405 p < 0.001	N = 1788 H = 88.87 p < 0.001

Analysis for ‘**All species**’ revealed a statistically significant difference in total purchasing frequency across all groups with males (Md=21) reporting making significantly more purchases compared to females (Md=19); younger age groups (18-29, Md = 23; 30-49, Md = 20) purchasing significantly more compared to older groups (50-69, Md = 17; 70+, Md = 18); people with a post graduate qualification purchasing significantly more (Md=23) compared to those in other education groups; people in the highest household income groups reporting

significantly more purchases (£50,001-£150,000, Md = 22; Over £150,000, Md = 35.5) compared to the lowest income group (£0-£12,500, Md = 15); households with the highest number of both adults (More than 3 adults, Md = 24), and children (More than 3 children, Md = 35); the regions with significantly higher purchasing frequency were observed to be Northern Ireland (Md = 23), Greater London (Md = 22), and East Midlands (Md = 21); most fish purchases were made by people who report to most frequently shop for seafood in M&S (Md = 34).

Further analysis was carried out to examine the influence of UK region and the supermarket, respondents indicated they bought their seafood from, in the case of eel only, on the purchasing behaviour for the three Fish to Avoid species: eel; shark; and Spurdog. Eel⁶⁷ comprised only 2% of all purchases by both users and non-users of the Guide (Table 4.22). For those respondents reporting that they purchased eel in the last 12 months (n=369), 67.5% were Guide users compared to 32.5% of non-users. Of those respondents reporting that they purchased eel at least once a week in the previous 12 months (n=39), 87% were Guide users. The regional distribution of eel purchases is presented in Figure 4.40.

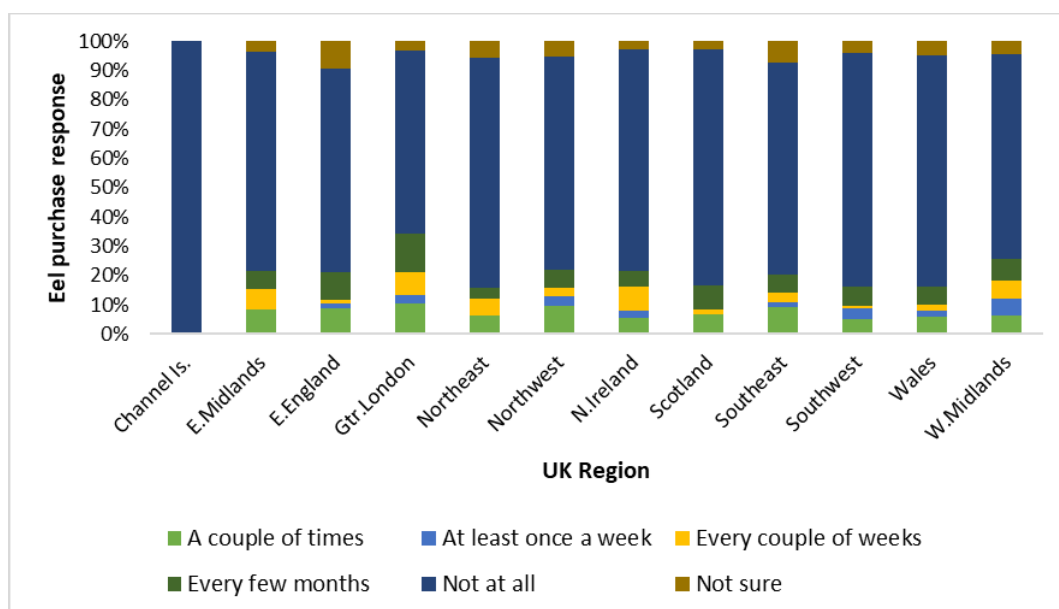


Figure 4.40: Distribution of eel purchases by UK region.

⁶⁷ European eel *Anguilla Anguilla* is assessed by the International Union for Conservation of Nature (IUCN) as critically endangered.

Eel is most frequently purchased in Greater London (n=232), with 34% of respondents indicating they have purchased eel in the last 12 months. 62% of respondents in Greater London indicated that they have not purchased eel at all, compared to 81% of respondents living in Scotland (n=144), where 17%, half the number of respondents in Greater London, indicated they had purchased some eel in the past 12 months.

Eel is also purchased most frequently by respondents indicating they shop in Marks and Spencer (n=69), with 61% of respondents claiming to have purchased eel in the last 12 months and 38% claiming not to have purchased eel at all. By comparison, only 17% of respondents who reported they shopped at Sainsbury's, indicated they had purchased some eel in the past 12 months (Figure 4.41).

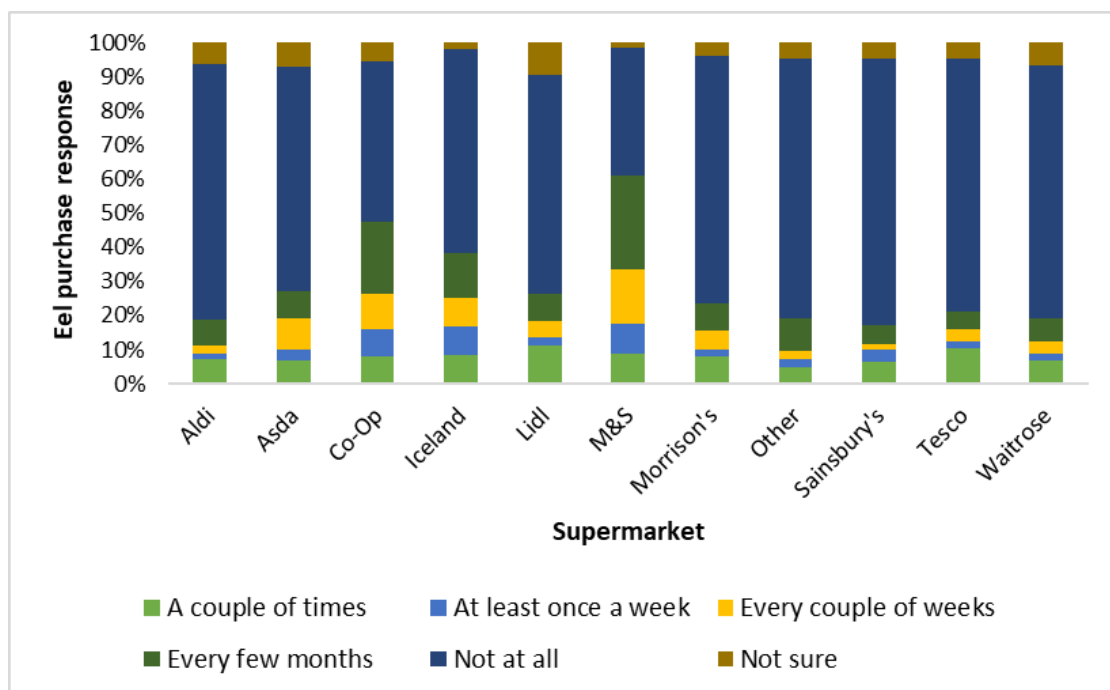


Figure 4.41: Distribution of eel purchases by UK supermarket.

Note: Eel is not necessarily being purchased in the supermarket respondents indicated is the supermarket they most frequently shop in (Lawrence, 2006).

Further analysis of respondents who indicated they shop at M&S and reporting to have purchased some eel in the past 12 months, 86% are using the Guide. For those respondents who indicated they shop at Sainsbury's and have reported purchasing some eel in the past 12

months, 66% indicated they are using or have used the GFG. Marks and Spencer’s have a larger market share in Greater London compared to other UK regions (Figure 4.24).

Analysis found shark comprised only 2% of all purchases by both Guide users and non-users (Table 4.22). For those respondents reporting that they purchased shark in the last 12 months (n=297), 67% use the Guide. Of those respondents reporting that they purchased shark at least once a week in the previous 12 months (n=36), 78% also claim to be using the Guide. The regional distribution of shark purchases is presented in Figure 4.42.

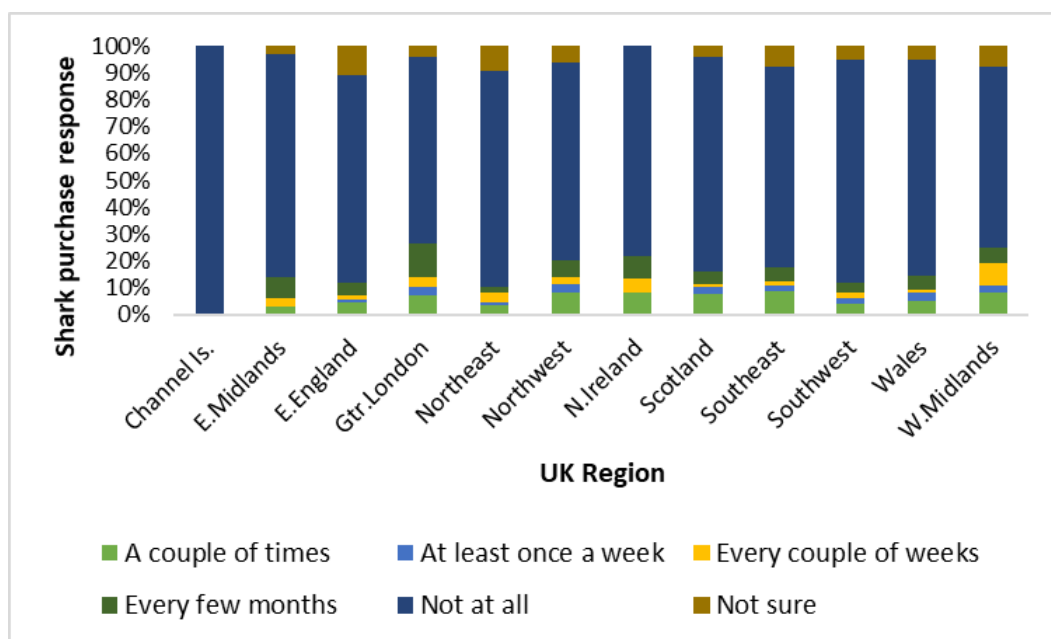


Figure 4.42: Distribution of shark purchases by UK region.

Greater London (n=61, 26%), the West Midlands (n=39, 25%) and Northern Ireland (n=8, 22%) were identified as regions having the highest number of respondents reporting purchasing of shark in the past 12 months, with 70%, 69%, and 62.5% respectively also indicating they were Guide users.

Finally, Rock salmon or spurdog *Squalus acanthias*, comprised only 4% of all purchases by both users and non-users of the Guide (Table 4.22). For those respondents reporting that they purchased Rock salmon in the last 12 months (n=624), 52% also use the Guide compared to

48% who claim not to be using the Guide. Of those respondents reporting that they purchased Rock salmon at least once a week in the previous 12 months (n=62), 73% also claim to be using the Guide. The regional distribution of Rock salmon purchases is presented in Figure 4.43.

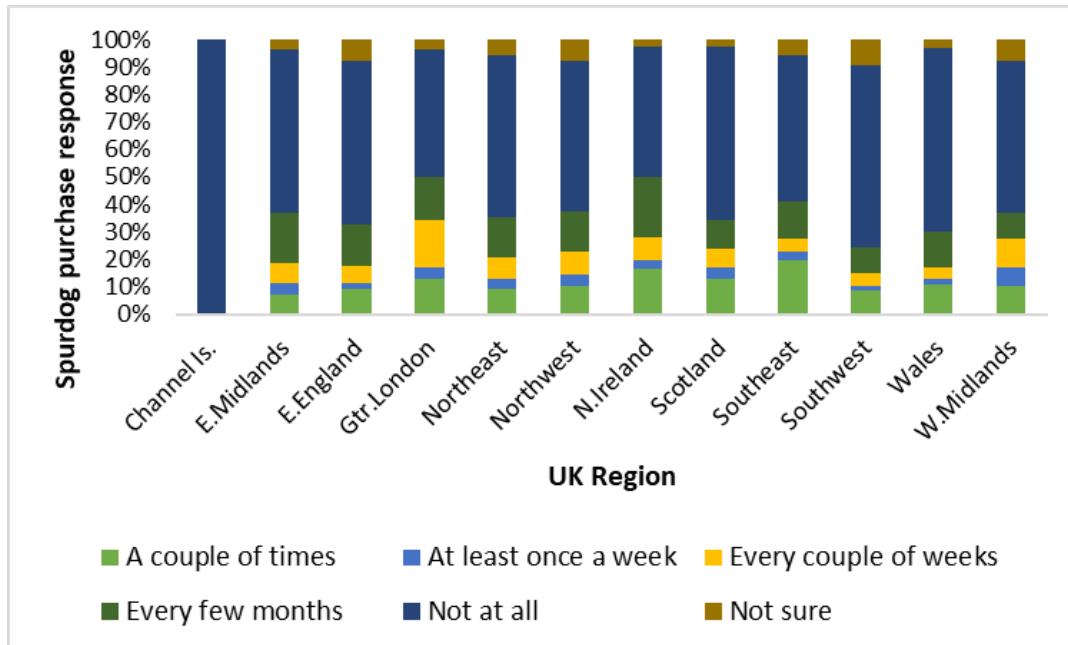


Figure 4.43: Distribution of Rock salmon or Spurdog purchases by UK region.

Northern Ireland (n=18, 50%), Greater London (n=116, 50%) and the South East (n=79, 41%) were identified as regions having the highest number of respondents reporting purchasing of Rock salmon in the past 12 months. In the case of these respondents, 39%, 55% and 44%, living in Northern Ireland, Greater London and the South East, respectively, also claim to have used or be using the MCS GFG.

4.9.5. Influence of seafood sustainability knowledge on purchasing frequency

The relationship between seafood sustainability knowledge discussed in Section 4.7.2 (Tables 4.6 and 4.7) and purchasing frequency was examined, with the results presented in the following sections.

4.9.5.1. Influence of objective knowledge

Using the categories outlined in Table 4.6, a Kruskal-Wallis test revealed a statistically significant difference in purchasing frequency across the four seafood sustainability knowledge response categories (Table 4.24), $X^2(3, n= 1631) = 148.295, p < 0.001$.

Table 4.24: Difference in purchasing frequency across knowledge categories.

Response/knowledge category	Median (Md)	Frequency (n)
1-Do not know	15	81
2-Incorrect	27	515
3-Simple	18	889
4-Complex	15	146
1-Low (0-15)	12	171
2-Medium (16-30)	17	686
3-High (31-45)	23	977

The median values for the four knowledge categories are significantly different, $p < 0.001$ in pairwise comparisons between Group 2 and the other three groups. Group 2, the group recording incorrect responses for the meaning of seafood sustainability, representing 31% of all responses (Section 4.7.2, Table 4.6), had a significantly higher median score (Md=27) for seafood purchasing compared to the other three groups (Figure 4.44).

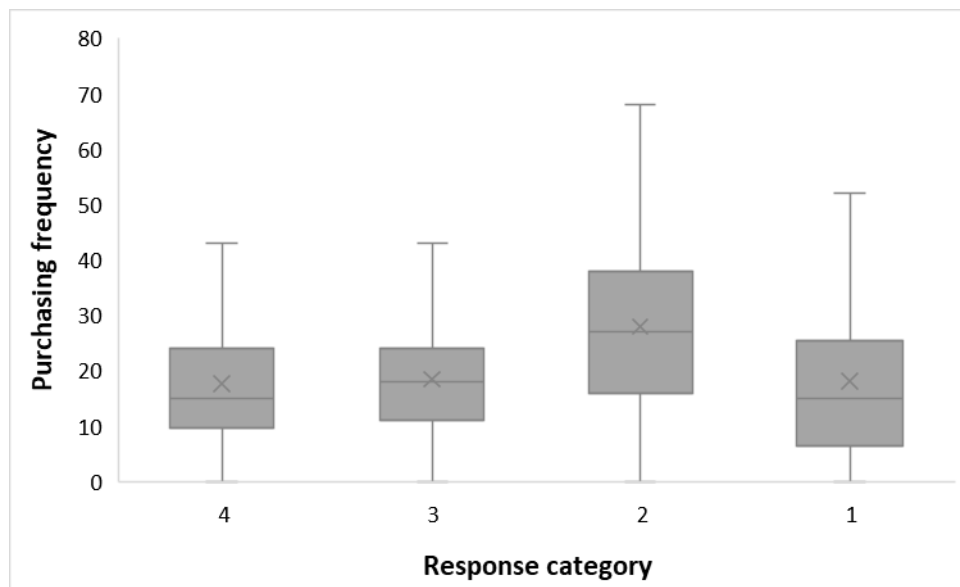


Figure 4.44: Box plot of purchasing frequency by objective knowledge response category.

Further analysis, using a Kruskal-Wallis test revealed a statistically significant difference in purchasing frequency across the three different (general) knowledge categories described in Tables 4.7 and 4.25), $X^2(2, n= 1834) = 175.671, p < 0.001$.

The median values for the three knowledge groups are significantly different, $p < 0.001$ in all pairwise comparisons. The High knowledge category recorded a significantly higher median score (Md=23) than the other two groups (Figure 4.45).

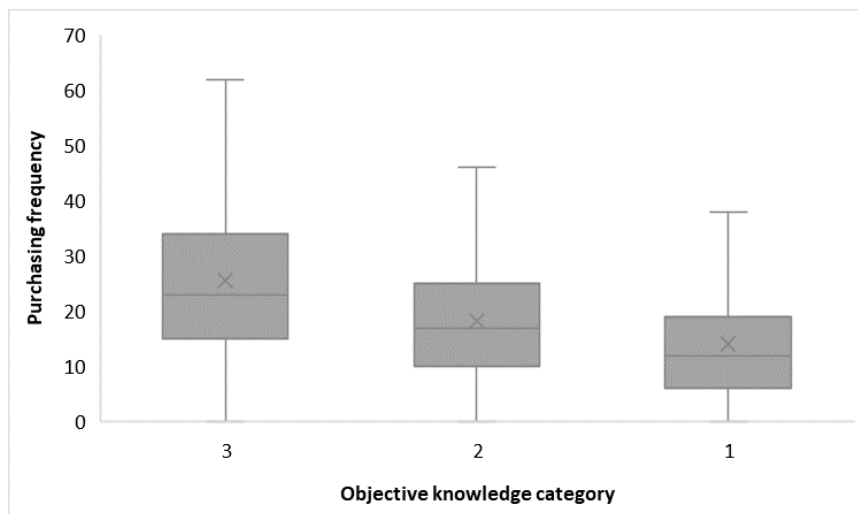


Figure 4.45: Box plot of purchasing frequency by objective knowledge response category.

4.9.5.2. Influence of subjective knowledge

Information about subjective knowledge i.e., an individual’s perception of their own understanding of a topic (Gámbaro et al., 2013) was only gathered from Guide users (n=660). Again, a Kruskal-Wallis test revealed a statistically significant difference in purchasing frequency across the five Likert response categories to the statement, “I already have enough seafood sustainability knowledge” (Group 0, Md = 36, n=15, Not sure; Group 2, Md = 20, n=178, Tend to disagree; Group 3, Md = 24, n=166, Neither agree nor disagree; Group 4, Md = 32, n = 201, Tend to agree; Group 5, Md = 39, n = 100, Strongly agree), $X^2(4, n= 660) = 85.169, p < 0.001$. There were no responses received in Group 1, Strongly disagree.

Where significant results were obtained, tests were run to understand where the differences exist. Post hoc pairwise comparisons revealed significant differences ($p \leq 0.05$) between the median scores for Group 2 (Md=20) and Groups 3 (Md=24), 4 (Md=32) and 5 (Md=39); Group 3 (Md=24) and Groups 4 (Md=32) and 5 (Md=39); Group 0 (Md=36) and Group 5 (Md=39); and Group 4 (Md=32) and Group 5 (Md=39). See Figure 4.46.

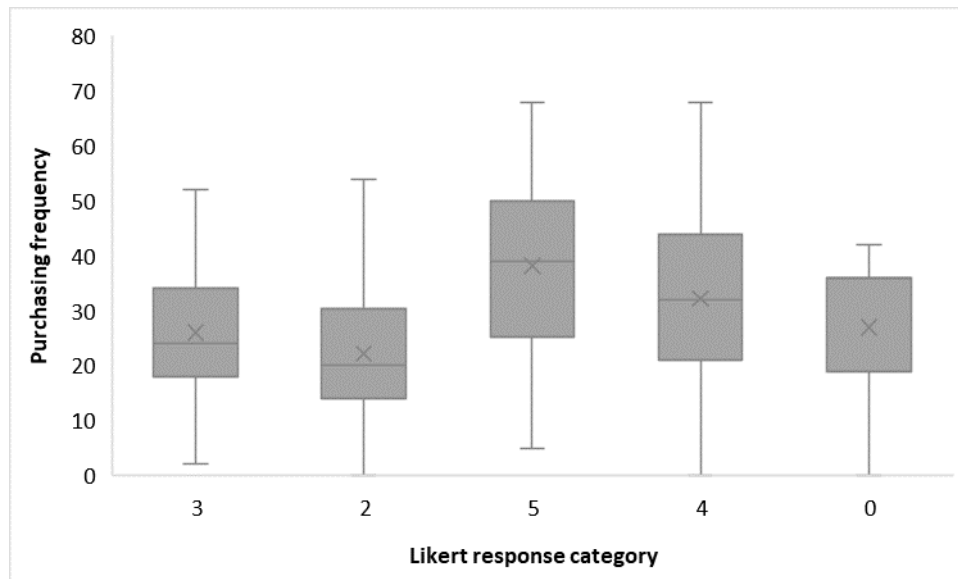


Figure 4.46: Box plot of purchasing frequency by subjective knowledge response category.

Consistent with other studies examining the influence of knowledge on consumption (Gámbaro et al., 2013; Verbeke, 2008), results indicated purchasing frequency appears to increase with knowledge where objective knowledge was determined using closed questions but not where it was determined using open-ended questions. In addition, results suggest respondents with more subjective seafood sustainability knowledge, purchase seafood more frequently highlighting the overall role of knowledge in influencing seafood purchasing behaviour.

4.9.6. Barriers to buying sustainable seafood

Barriers to buying sustainable seafood were considered in terms of consumers' ability to interpret labelling information, accessibility to sustainable seafood, perception of its cost and what sustainable seafood is, for example. The barriers examined are presented in Table 4.25.

Table 4.25: Barriers to purchasing sustainable seafood with responses grouped into two categories of 'strongly agree/ tend to agree' and 'strongly disagree/ tend to disagree'.

Item	Guide users		Non-users	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
1. I don't know how to interpret the information provided through labelling to allow me to choose the most sustainable seafood	41	35	48	19
2. Where I buy seafood there are few choices available	53	23	52	21
3. Sustainable alternatives to my usual and preferred choices are often not available	54	18	35	14
4. I don't give seafood sustainability a lot of thought	33	48	42	31
5. Sustainably produced seafood is more expensive	58	12	54	7
6. Clear information on packaging and menus about where and how seafood is produced is lacking ⁶⁸	64	12	61	8
7. I don't understand what seafood sustainability is, it's all too confusing	32	45	27	39
8. I'm able to make the sustainable seafood choices I want	64	12	34	19

Kruskal-Wallis tests were run to examine the influence of guide use; gender; age; education; and household income on responses to each of the above statements. As shown in Table 4.26, there is a statistically significant difference, in responses to the items listed across the categories of guide use, gender, age, education, household income, and employment. Responses to statements concerning availability (Item 2), and confusion around what seafood

⁶⁸ Source: Charity Awareness Monitor, Oct 17, nfpSynergy.

sustainability is (Item 7) indicates the distribution of responses across the category of guide use is the same.

Table 4.26: Summary of results for differences in responses to statements for barriers to purchasing sustainable seafood and the categories listed in the table. P values < 0.05 in bold, where the null hypothesis, i.e. the distribution of responses across categories is the same, is rejected.

Variable Item	Guide use Df = 1	Gender Df = 3	Age Df = 3	Education Df = 7	Household income Df = 4	Employment Df = 6
1. I don't know how to interpret the information provided through labelling to allow me to choose the most sustainable seafood	N = 1819 H = 10.192 p = 0.001	N = 1818 H = 9.317 p = 0.025	N = 1808 H = 30.852 p < 0.001	N = 1795 H = 19.441 p = 0.007	N = 1804 H = 14.131 p = 0.007	N = 1811 H = 26.782 p < 0.001
2. Where I buy seafood there are few choices available	N = 1822 H = 0.969 p = 0.325	N = 1820 H = 15.592 p = 0.001	N = 1811 H = 12.828 p = 0.005	N = 1798 H = 5.388 p = 0.613	N = 1807 H = 11.376 p = 0.023	N = 1814 H = 9.607 p = 0.142
3. Sustainable alternatives to my usual and preferred choices are often not available	N = 1811 H = 75.867 p < 0.001	N = 1810 H = 8.708 p = 0.033	N = 1800 H = 50.418 p < 0.001	N = 1787 H = 22.163 p = 0.002	N = 1796 H = 18.129 p = 0.001	N = 1803 H = 54.496 p < 0.001
4. I don't give seafood sustainability a lot of thought	N = 1804 H = 36.211 p < 0.001	N = 1803 H = 4.921 p = 0.178	N = 1800 H = 15.452 p = 0.001	N = 1780 H = 43.949 p < 0.001	N = 1789 H = 22.881 p < 0.001	N = 1796 H = 34.325 p < 0.001
5. Sustainably produced seafood is more expensive	N = 1814 H = 5.781 p = 0.016	N = 1812 H = 4.907 p = 0.179	N = 1803 H = 11.432 p = 0.010	N = 1790 H = 10.704 p = 0.152	N = 1799 H = 7.473 p = 0.113	N = 1806 H = 15.135 p = 0.019
6. Clear information on packaging and menus about where and how seafood is produced is lacking	N = 1818 H = 7.019 p = 0.008	N = 1816 H = 17.675 p = 0.001	N = 1807 H = 2.702 p = 0.440	N = 1794 H = 9.411 p = 0.225	N = 1803 H = 0.999 p = 0.910	N = 1810 H = 11.806 p = 0.066
7. I don't understand what seafood	N = 1815 H = 1.402 p = 0.236	N = 1814 H = 9.414 p = 0.024	N = 1804 H = 25.596 p < 0.001	N = 1791 H = 20.396 p = 0.005	N = 1800 H = 18.084 p = 0.001	N = 1807 H = 26.627 p < 0.001

sustainability is, it's all too confusing						
8. I'm able to make the sustainable seafood choices I want	N = 1814 H = 157.073 p<0.001	N = 1811 H = 17.1 p = 0.001	N = 1802 H = 10.559 P = 0.014	N = 1789 H = 15.489 p = 0.030	N = 1798 H = 39.169 p<0.001	N= 1805 H = 25.659 p<0.001

4.10. Discussion of seafood purchasing behaviour

One of the aims of this study is to understand whether the seafood purchasing behaviour of individuals using the MCS GFG is different to non-users.

For the majority of people in this survey seafood consumption is a habit which for most was formed in childhood. Studies suggest consuming seafood as a child influences its consumption in adulthood (Birch and Lawley, 2013; Honkanen et al., 2005; Verbeke and Vackier, 2005; Trondsen et al., 2003). Consistent with other studies, more than half of respondents in this study agreed that family is an important influence on their seafood choices (Mitterer-Dalton et al., 2013; Olsen, 2001). This echoes existing academic literature which suggests household composition, particularly the presence and number of children, to be a strong influence on the type and amount of seafood purchased (Birch et al., 2012; Birch and Lawley, 2012; Verbeke and Vackier, 2005; Trondsen et al., 2003; Myrland et al., 2000). In this study respondents from households with the highest number of both adults and children reported purchasing seafood more frequently. Interestingly, children were not observed as barriers to purchasing and consumption of seafood as recognised in other studies, for example by Trondsen et al. (2003).

Other influences on seafood purchasing behaviour were identified as wildlife and scientific experts. This is likely being determined by the 'Blue Planet' effect discussed earlier (See Section 4.8) and media coverage of the situation of the global climate and biodiversity emergencies being declared by scientific experts in the period of the study (Aitchison et al.,

2021; Nicol and Taherzadeh, 2020). Fishing industry members were also found to be having an influence which may in part be due to the inclusion of fishing in news coverage of 'Brexit' (Stewart et al., 2022; Strong and Wells, 2020) and the development of the UK Fishing Act which also occurred during the study period. Although previous studies have found celebrity chefs, media, and social media to have substantial influence on seafood consumption (e.g., Silver and Hawkins, 2017; Goodman et al., 2017; Lewis, 2008), this was not the case in this study. Celebrity chefs were not identified as influential as expected. This may be partially explained by sensitivities associated with fishing and the seafood industry. For example, the sustainability of mackerel, popularised by campaigns by TV chefs such as Hugh Fearnley-Whittingstall (Daily Mail, 2011), has more recently become embroiled in politics of overfishing and the subsequent suspension of MSC certification of the North East Atlantic stock, resulting in celebrities distancing themselves from earlier campaigns (Marsh, 2023; McDermott, 2013). Mackerel, however, was identified as the 6th most popularly purchased species in this study.

Neither was social media identified as influential as expected. Despite the perceived influence of social media personalities or influencers in society (Iue et al., 2022; Phillipov et al., 2019), 56% of respondents disagreed, 38% strongly, they influenced the seafood choices they make. This study also found social media networking sites (SMNS) were identified as relatively unimportant as a source of seafood knowledge (See Section 4.8). Given the number of individuals taking part in this study with a degree education and the importance to them of wildlife and marine programmes and academics and scientists as sources of knowledge about seafood suggests a perception of media personalities as lacking credibility and thus potential to influence their seafood choices (Schorn et al., 2021). See Sections 5.8.1. and 6.3.1.3. for discussion on MCS GFG social media followers.

People with post graduate qualifications and those in the highest income groups were found to have made significantly more seafood purchases compared to those in other groups examined. See Section 4.4. for discussion of study by Farmery et al. (2018) examining seafood consumption in relation to education and other sociodemographic factors. Results of this study revealed Guide users reported making significantly more seafood purchases than non-

users with the average purchasing frequency for a guide user around 60% more than that reported by an average non-user in the 12 months preceding the study.

Guide users were also revealed as having more general and labelling seafood knowledge than non-users (See Section 4.8). This confirms with other studies which have shown that the possession of knowledge influences consumer behaviour and can also help drive sustainability (Peschel et al., 2016; Gámbaro et al., 2013; Kozar et al., 2013; Verbeke, 2008; Flynn and Goldsmith, 1999). A study by Pieniak et al. (2010) observed consumers with a higher level of knowledge about fish, eat fish more frequently. In a study by Jonell et al. (2016) to investigate determinants for purchasing 'green' fish, knowledge of eco-labels and concern for the negative impacts of seafood production were found to be the best predictors of participants self-reported purchasing behaviour of eco-labelled seafood. Grieger et al. (2012) also identified knowledge as a predictor of consumption of seafood in older Australians. However, a study by Altintzoglou and Heide (2016) found that a difference in knowledge about fish quality did not produce a difference in consumption behaviour in Norwegian consumers. The level of seafood sustainability knowledge possessed by an individual has also been shown to influence the importance of sustainability as a factor when purchasing seafood (Lawley et al., 2019). This study found a significantly larger proportion (88%) of Guide users than non-users (61%) agreed sustainability is very important to them when buying and/or eating seafood. However, responses to the statement concerning the cost and affordability of seafood relative to the importance of sustainability (Figure 4.27) indicates two fifths of all respondents agree the price and affordability of seafood is more important than sustainability.

In addition to the importance of sustainability, other factors, including non-motivational or **situational** factors such as availability (Leek et al., 2000), were examined to understand what drives individuals' decision making when purchasing seafood and how the relative importance to users and non-users of the MCS GFG of these factors is assigned (Murray et al., 2017). (See Section 4.9.2. Table 4.17).

Around half of respondents agreed that where they bought seafood had limited *availability* of sustainable seafood. More than a half of Guide users also reported that often sustainable

alternatives to their preferred choices were unavailable. However, twice the number of Guide users as non-users agreed with the statement, “*I’m able to make the seafood choices I want*”. This suggests that by ‘shopping around’ and not relying completely on supermarkets for their purchases (See 4.9.1.), Guide users are able to overcome any perceived problems of limited choice.

A significant difference in importance of the 14 attributes examined was found between users and non-users in all cases except *product type*. Attributes in the situational category (Table 4.19), including determinants for home consumption of seafood such as taste and convenience explored in other studies (Olsen et al., 2017; Olsen et al., 2007; Olsen, 2003), were all significantly more important to non-users than Guide users, except product type, which was important to both groups. Consistent with the findings of other studies, product type i.e., whether it is fresh, whole, or processed with ‘value-added’ is an important consideration in terms of price, health benefits and lifestyle choices when purchasing and consuming fish (Vanhonacker et al., 2013). Fish is generally perceived as an ‘inconvenient’ food (Olsen et al., 2007), although frozen fish is more convenient than fresh (Birch et al., 2012; Olsen et al., 2007), while fresh fish is viewed as a healthier option (Vanhonacker et al., 2013).

Consistent with studies that identified egoistical factors such as **health** perceptions of fish as a driver for its consumption (Brunsø et al., 2009; Brunsø et al., 2008; Trondsen et al., 2004), in this study a large majority of both Guide users and non-users agreed health was important to them when buying seafood.

Environmental factors were however found to be significantly more important to most Guide users compared to just over half of non-users (Figure 4.23). For example, most respondents using the Guide agreed *production method* i.e., whether the fish is wild-caught or farmed, is important, compared to less than half of non-users.

Currently, global fish production from aquaculture is comparable to wild-caught supply (See Chapter 2, Table 2.1). However, aquaculture continues to expand to meet increasing demand for fish globally, with its contribution to world fish supply anticipated to exceed that of wild-

caught fish (FAO 2022; Asche et al., 2021). Public attitudes to buying farmed seafood is unclear, especially when assumptions of fish as wild-caught are made for fish that is farmed when purchasing seafood (Watson, 2022a). However, studies have shown that concerns for the sustainability of farming Atlantic salmon, for example, influences consumer purchasing behaviour towards it (Whitmarsh and Palmieri, 2011).

Response to the statement, '*farming fish is often better for the environment than taking fish from the wild*', indicated there is agreement amongst a majority of respondents for the perceived benefits to the environment of farming fish. However, when examining the effect of using the Guide discussed in Section 4.6, a tendency to disagree with the statement regarding only purchasing farmed fish was observed. There was agreement however among almost half of respondents that they only buy wild fish. These results suggest that, whilst there is recognition of the perceived benefits to the environment of farming fish, there is preference for wild-caught fish based on qualities, such as 'naturalness' observed in the literature review (Schlag and Ystgaard, 2013). Wild fish is also perceived as tasting better, healthier and slightly more nutritious than farmed fish (Verbeke et al., 2007a). One of the advantages of farmed fish is its perceived lower price compared to wild fish (Vanhonacker et al., 2013). The price of seafood generally is widely perceived as high compared to most other animal proteins (Morales and Higuchi, 2018; Christenson et al., 2017). The importance of *how fish is caught or farmed* was also significantly more important to most Guide users compared to just over half of non-users. Studies demonstrate that consumers are willing to pay a premium for fish labelled as 'line-caught', for example, given the association of the fishing method with a lower impact on the marine environment (Zhang et al., 2018; Sogn-Grundvag et al., 2013). A majority (86%) of respondents using the Guide also agreed *sustainability* was an important attribute when purchasing seafood compared to 59% of non-users, which may suggest Guide users care more for the marine environment than non-users (Note, similar proportions of Guide users and non-users agreed sustainability is very important to them when asked about the importance of sustainability when buying and eating seafood. See above). However, in a study by Verbeke et al. (2007b) of consumer perceptions of sustainability and ethics in relation to fish, no correlation was found between the importance consumers attached to sustainability and ethics and their fish consumption frequency.

Almost 70% of respondents in this study disagreed with the statement, *'I don't eat seafood'*. The proportion of respondents who disagreed and use the Guide is 70% compared to 91% of non-users who disagreed with the statement. However, three quarters of Guide users agreed seafood is a *'more sustainable source of animal protein'*, compared to just over half of non-users who agreed with this statement (Section 4.13). This suggests a 'justification' for eating seafood is its perception as an 'eco-friendlier' protein. As observed in Chapter Two, there is increasing pressure on society and individuals to increase the sustainability and health of our diet, and mitigate against climate change, by reducing intake of red meat and dairy products or by switching to a predominantly plant-based diet (Whitmarsh et al., 2021; Kim et al., 2020; Springmann et al., 2020; Willett et al., 2019).

Reasons for not buying seafood were also investigated. Findings suggest concern for the impact of human consumption on the marine environment is as important as more 'traditional' reasons for not buying seafood such as dislike of the sensory and physical properties associated with it. This suggests barriers to eating fish are evolving and now more specifically reflect growing awareness and concern for the impacts of fishing on the marine environment. Observations from recent literature indicate that public concern for the impacts of fishing and aquaculture on the marine environment is high (Lotze et al., 2018; Hynes et al., 2018; Farmery et al., 2017; Gelcich et al., 2014). However, following a specific diet such as vegetarianism or veganism was reported as a reason for not buying seafood by a minority (13%) of respondents. This, may suggest respondents are not choosing to not eat seafood in favour of following other specific types of diets such as veganism. Only a small minority of respondents cited lack of confidence and price, barriers typically associated with not buying or consuming fish observed in the literature (Christenson et al., 2017; Carlucci et al., 2015; Grieger et al., 2012; Verbeke and Vackier, 2005), as reasons for not buying fish.

Finally, examination of the relative importance, to users and non-users of the Guide, of **ethical or social drivers** when buying seafood revealed this group of factors were significantly more important to users than non-users. A majority of respondents using the Guide agreed the factors in this category are important to them when purchasing seafood, compared to less than half of non-users (Figure 4.23). For example, a larger proportion of Guide users (76%)

than non-users (41%) agreed *Provenance* (i.e., who caught or farmed the fish and where) is important when purchasing seafood. As observed in the literature review, trade in seafood is complex, and vulnerable to lack of traceability and fraud, creating problems for food safety, sustainability and the reputation of seafood generally (Gopi et al., 2019; Fox et al., 2018). Provenance is deemed essential for allowing consumers to make informed choices about the seafood they want to purchase and for helping alleviate these type of problems (Watson et al., 2016). See Chapter 5 for discussion of initiatives to increase traceability and provenance of seafood. A larger proportion of Guide users (72%) compared to non-users (48%) also agreed seafood that is *locally caught or produced* is important when purchasing seafood. In the context of fisheries and seafood markets, local seafood is often promoted as an eco-friendly and socially conscious alternative to globally sourced seafood (McClenachan et al., 2016). Notwithstanding the belief that the consumption of locally produced food may provide '*individual and societal benefits*', limited studies have focused on what underlying motives drive the purchase of these products (Birch et al., 2018). According to Tetley (2016), UK consumers could make a positive contribution to the UK economy (and environment) if they chose to buy locally caught species over farmed and exotic species. However, within the UK and EU seafood markets, there is reliance on imports which have a large carbon footprint and, depending on the product or species, can be associated with social justice issues such as forced labour (McClenachan et al., 2016).

Fish welfare was also observed as important to a large majority (80%) of respondents using the Guide when buying seafood compared to half of (50%) non-users. Although there is general concern for animal welfare, historically very little attention has been given to the welfare of farmed (Boyland, 2018) or wild-caught, commercial fish (Brown, 2015; Mood, 2010; Metcalfe, 2009; Evans, 2009; Kaiser and Huntingford, 2009) or for the sentience of commercial species such as cephalopods (including octopods, squid and cuttlefish) and decapods (including crabs, lobsters and crayfish (Birch et al., 2021). For example, widespread concern in UK, EU and US has recently been expressed for the welfare implications of commercial farming of sentient and solitary animals such as octopus (Lara, 2021; Jacquet et al., 2019). In a recent survey carried out on behalf of Compassion in World Farming (CIWF), 76% of UK adults, believe the welfare of fish should be protected to the same extent as the

welfare of other animals we eat. Whilst 75% of respondents say they would like to see information about the fish's welfare on the label of all fish products (ComRes, 2018), research using discreet choice experiments⁶⁹ suggest that some consumers are willing to pay for improved welfare conditions for farmed fish (Grimsrud et al., 2013; Stubbe Solgaard and Yang, 2011; Olesen et al., 2010). Welfare issues are also implicated in the use of acoustic and lethal deterrents to control predators around sea, typically salmon, cages (Nunny, 2020; Nunny et al., 2018). For example, in response to restrictions imposed by the US Marine Mammal Act on the import of fish into the US – the world's largest seafood market (Godfrey, 2022), from countries relying upon lethal controls, the Scottish Government is committed to banning the fish farming industry from shooting seals to ensure the continued export of Scottish salmon to the US (Campbell, 2020). With aquaculture identified as the fastest growing animal food producing sector in the world (Ellingsen et al., 2015), and the high number of animals involved in seafood production (Paris et al., 2021), the implications for a growing level of concern for ethical considerations such as fish welfare on consumer behaviour when purchasing fish is anticipated as significant (Banovic et al., 2019; Verbeke et al., 2007b; Vanhonacker et al., 2007).

Although *Social justice* is not generally included as a criterion for assessing seafood listed in current sustainability guides (Wijen and Chiroleu-Assouline, 2019; Parkes, 2010), it was found to be important to a significantly larger proportion of Guide users (74%) than non-users (45%). Fair Trade is currently the only certification scheme aiming to improve the living and working conditions of small-scale producer cooperatives and workers in developing countries (Andorfer and Liebe, 2015; Hainmueller and Hiscox, 2015). The label is typically associated with social issues related to practices such as low wages and forced and child labour, which are often associated with damage to the environment, including overfishing (O'Connor et al., 2017). For example, in 2015 an investigative report by the Associated Press (AP), '*Seafood from slaves*', exposed human rights abuses of more than 2,000 migrant workers enslaved by the fishing industry in South East Asia (Bonfanti and Bordignon, 2017). As a result of the report's findings and subsequent threats of trade sanctions against Thailand, a major exporter

⁶⁹ 'A choice experiment is a survey approach designed to elicit consumer preferences based on hypothetical markets' (Koemle and Yu, 2020).

of seafood to the US and EU, by the EU unless IUU fishing practices were not eradicated (Kadfak and Linke, 2021), social issues have moved to the top of the seafood sector agenda (Kittinger et al., 2017). Growing concern for these and other social justice and equity problems, associated with globalised trade in seafood, including slavery and piracy (McClenachan et al., 2016), has prompted calls for recognition of a 'socio-ecological' perspective to seafood sustainability, which may have implications for how sustainability of certain stocks is assessed and certified (Teh et al., 2019; McClenachan et al., 2016; Hilborn et al., 2015).

To date, however, despite concerns for '*ocean equity*' and '*blue*' and '*ocean justice*', terms coined for the purpose of capturing social justice issues in the fishing and seafood industries (Bennett, 2022; Bennett et al., 2021), the application of Fair Trade, to fish products is limited. For example, the Fairtrade Foundation⁷⁰, a charity based in the UK, refers to the availability in the UK of over 6,000 Fairtrade products '*from coffee and tea to flowers and gold*', but not fish. In the US however in 2014, Fair Trade USA launched its Capture Fisheries Program to bring the benefits of Fair Trade to small-scale fishermen (Fair Trade USA, 2019). See Section 4.14. for discussion of organic and fair-trade products.

The '*Big 5*' species dominate self-reported purchases for both groups, users and non-users. Given the dominance of multiple retailers in the supply of seafood to the consumer, and the ubiquity of the Big 5 in retail, it is not surprising that these species were ranked highest, with cod the most popularly purchased species, ranked number one, in both groups. However, MCS GFG users were found to be less reliant on the Big 5, purchasing seafood from a wider range of species compared to non-users. This suggests use of the Guide is helping reduce reliance on a narrow range of popular species and is positively influencing individuals' seafood choices. However, a study carried out by Almeida et al. (2015a) on Portuguese fish consumers found that although people with more seafood knowledge had a more diverse use of species, they were not necessarily the most sustainable choices. This seems to be the case for the majority of respondents (70 %) using the MCSC GFG and claiming to agree with the statement,

⁷⁰ <https://www.fairtrade.org.uk/>

'I avoid buying Red Rated seafood i.e., those fish rated 5 in the GFG and listed as Fish to Avoid'. Surprisingly, MCS GFG users were found to purchase significantly more *Fish to Avoid* species – eel, shark and Rock salmon – than non-users, with species in this group comprising 11% of all purchases for users, compared to 5% of all purchases for non-users.

The three Fish to Avoid species examined, were all found to be most frequently purchased in Greater London and in the case of eel, by respondents indicating they shop in Marks and Spencer, the Co-Op and Iceland. This suggests consumption is not being driven by the availability of eel products, such as jellied eel, in these supermarkets because they are not available in these particular supermarkets, but by the availability of other products, such as smoked eel, widely sold in high-end London restaurants (T. Tanner, Sustainable Restaurant Association (SRA), May 2021, *Pers. Comm.*). This, the availability of other sources of advice on the sustainability of European eel, such as from the Sustainable Eel Group (SEG)⁷¹, and the availability of eel generally in the UK, is likely having a much stronger influence on social norms for people purchasing and consuming eel than the advice in the MCS GFG to avoid eel for conservation reasons. For example, Lough Neagh, in Northern Ireland, featured in 2021 on TV in Celebrity Chef, James Martin's BBC *'Highlands to Islands'* programme (Tinson, 2021), is the largest fishery for wild European eel in Europe. Lough Neagh eel also has Protected Geographical Indication (PGI) status under a recent Defra Geographical Indication scheme (Defra, 2021). Eel products, such as, jellied eel, for example, is a traditional British food originating in the East End of London, and widely available in major UK supermarkets⁷² such as Morrisons, Sainsburys, Tesco and Asda. Although the product is often produced using imported anguillid eels which are non-CITES listed e.g., Japanese *Anguilla japonica*, American *A. Rostrata* or New Zealand *A. dieffenbachii* and *A. australis* eel (Righton et al., 2021; Gollock et al., 2018), eel may also be sourced from within the UK. Social forces, including social habits such as tradition, is identified by Almeida et al. (2015b) as one of the main drivers of seafood consumption in Portugal and may offer some explanation for the persistence of eel consumption in the UK, including among Guide users. Misunderstanding of the use or misuse of common names, for example, common names for spurdog includes Rock salmon, spiny

⁷¹ <https://www.sustainableeelgroup.org/>

⁷² <https://bradleysfish.com/product/jellied-eels-bowl/>

dogfish and huss, and the availability of the species in fish and chip shops (Hobbs et al., 2019) may in part explain consumption of Rock salmon *Squalus acanthias*.

Analysis by Crona et al. (2016) of a NGO campaign in Sweden to raise awareness of declining cod stocks in the North Sea, observed the substitution of domestic for imported cod; an increase in the export of locally landed cod; no overall decline in landings of cod by local fishermen from the North Sea; or the consumption of cod in Sweden. This situation is mirrored by the one for North Sea cod in the UK. Listed as a Fish to Avoid by the MCS GFG, it is exported in favour of the import of Icelandic cod to meet consumer demand for fish from sustainable sources (Planet Tracker, 2020). As highlighted by Crona et al. (2016), the situation of overfishing of our ocean is 'diluted' by the rapid replacement of one species or source with another - of European eel with American or Japanese eel, of North Sea cod with Icelandic or Norwegian cod. This 'dilution' may offer further explanation for MCS GFG users consuming species such as eel. Unlike non-users, Guide users may be more aware of the requirement to specifically 'avoid' European eel, and so actively seek out alternative species. Conversely, non-users may be in receipt of less nuanced messages, resulting in them avoiding purchasing eel – or cod - altogether. Guide users may however be more 'adventurous', more confident, in what seafood they are willing to try, and given their sociodemographic profile, have more opportunity and exposure to trying all types of seafood compared to non-users.

By following the advice of seafood guides and simply ensuring any species identified as one to 'Avoid' is replaced by one not listed in this way allows consumers to continue eating fish, including potentially vulnerable species, 'guilt-free' (Haynes and Podobsky, 2016), a situation which, in the absence of adequate management, inevitably moves the problem of overconsumption of one species to another (Richards et al., 2020). It also creates a situation of 'cat and mouse' between 'sustainable' seafood suppliers and marine conservation organisations who have limited resources to identify and assess the sustainability of every species, every product, available for sale in a market which is as global and complex as seafood.

Guide users most frequently use supermarkets, identified by Watson (2019) as '*premium quality orientated retailers*', suggesting that respondents using the Guide and purchasing seafood in these supermarkets are motivated by assurances of quality and consumer expectation of sustainability (See Chapter 6). Most fish purchases were made by people who reported to most frequently shop for seafood in M&S. Guide users were also observed as less reliant on supermarkets with respondents using the MCS GFG having consistently reported purchasing more seafood from independent sources such as fishmongers, compared to non-users. Given that Guide users are found to have more seafood knowledge and as a result perhaps have more confidence (Brucks, 1985) in their decision making when purchasing seafood, and also report purchasing seafood from a wider range of species compared to non-users, suggests the reasons Guide users have a preference for making their fish purchases from independent sources generally is that these type of outlets offer more variation in species, potentially a more local range of fish, and importantly the opportunity to increase their seafood knowledge (Debusquet et al., 2020; McClenachan et al., 2014; Campbell et al., 2013).

Twice the proportion of Guide users purchased seafood online compared to non-users. More than twice the proportion of respondents using the Guide also reported purchasing seafood direct from fishermen compared to non-users. This may in part reflect adaptations made by many as a result of the 2020 COVID-19 pandemic (Love et al. 2021), which occurred during the data collection process. At this time, restrictions were imposed on restaurants and pubs which resulted in fishermen and seafood suppliers losing buyers, encouraging fishermen, with Government support, to sell direct to the public (Holland, 2021). Another adaptation, at least in part to the COVID-19 pandemic, by industry, was the closure of fresh fish counters in supermarkets such as Tesco, Sainsbury, Morrison's and Asda (Blank, 2020). This was in response to supermarkets prioritising sales of pre-packed seafood prior to the onset of the pandemic and less demand for fresh fish experienced during the COVID-19 pandemic. However, in a bid to reverse this decision, and considering the loss of export markets for British seafood post Brexit (See discussion in Chapter 5), calls have been made to reopen fish counters so that consumers have access to fresh and locally produced seafood (Findlay, 2020).

One of the main barriers identified to sustainable seafood consumption in the UK is a lack of understanding of what sustainable seafood is (Richter et al. 2017; Gutiérrez and Thornton, 2014; Roheim, 2009). However, this study found that the majority have some understanding of the concept of seafood sustainability, which is a key aspect of motivating behaviour change (Goryńska-Goldmann and Gazdecki, 2018). However, examination of knowledge of seafood terms discussed in Section 4.8. suggests some confusion exists. For example, almost half of respondents (46%), more non-users (51%) than users (36.5%), felt they did not know enough about sustainability to ask questions about it in relation to seafood.

There is a perception of sustainable seafood as more expensive than 'conventional' seafood. More than half of respondents agreed sustainably produced seafood is more expensive. However, a minority of around 40% of respondents agreed the cost and affordability of seafood is more important to them than sustainability. This suggests people want to prioritise sustainability over other considerations. See Chapter 5, Sections 5.5.2. and 5.8.2. for discussion of consumer prioritisation of seafood sustainability over other factors such as price.

4.11. Public understanding of the impact of their individual seafood choices on the marine environment

Statements were designed to elicit public understanding of individual responsibility for the impact of human seafood consumption on the sea and belief in the efficacy of making the right personal choices to help reduce it. Responses (n= 1034) to these statements from users and non-users of the Guide are summarised in Table 4.27 and Appendix 27. In addition, Mann-Whitney U tests were run to examine the difference in responses between users and non-users (presented in Table 4.28).

Table 4.27: Summary of responses to individual responsibility items for users and non-users of the Guide.

Item	All		Guide users		Non-users	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
1. I have a responsibility to make the right decisions for the marine environment when buying seafood	80	3	85	3	77	3
2. It is important to care enough about the marine environment to want to help make a difference	81	3	84	4	80	3
3. It should not all be down to me to do the right thing when buying seafood	53	18	59	19	50	18
4. It's easy enough to make the right seafood	50	17	65	13	41	19

choices to reduce my impact on our seas						
5. The seafood choices people make affects fish populations	77	4	79	4	76	4
6. I don't have time to think about the impact of my decisions when purchasing seafood	30	39	37	40	26	36
7. I'm trying to help, but I'm not sure how much impact my choices can make	51	17	50	23	52	14
8. By changing our seafood shopping habits individuals like me can make a difference	71	5	77	5	67	5
Item	All		Guide users		Non-users	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)

Table 4.28: Summary of results examining the difference in responses to individual responsibility statements between users and non-users of the Guide.

Item	N	Md	U	Z	P	R
1. I have a responsibility to make the right decisions for the marine environment when buying seafood	1822	4	466223.5	8.375	p<0.001	0.2
2. It is important to care enough about the marine environment to want to help make a difference	1819	4	436151	5.502	p<0.001	0.13
3. It should not all be down to me to do the right thing when buying seafood	1818	4	418406.5	3.665	p<0.001	0.08
4. It's easy enough to make the right seafood choices to reduce my impact on our seas	1812	3	487717	10.635	p<0.001	0.25
5. The seafood choices people make affects fish populations	1821	4	418590	3.684	p<0.001	0.09
6. I don't have time to think about the impact of my decisions when purchasing seafood	1820	3	388320	0.646	0.518	0.01
7. I'm trying to help, but I'm not sure how much impact my choices can make	1818	4	373549	-0.739	0.460	0.02
8. By changing our seafood shopping habits individuals like me can make a difference	1820	4	440198	5.812	p<0.001	0.14

A significant difference in responses to the items from users and non-users of the Guide was observed in all cases except for items 6 and 7, where the distribution of responses was the same across both categories of guide use.

Responses to items were further examined in order to understand the influence of gender, age, education, income and the number of visits people make to the coast on responses.

The results are summarised in Table 4.29

Table 4.29: Summary of results for differences in responses to statements for individual responsibility for the sea and the categories listed in the table.

Item	Age Df = 3	Gender Df = 3	Education Df = 7	Household income Df = 4	Visits to coast Df = 5
1. I have a responsibility to make the right decisions for the marine environment when buying seafood	N = 1812 H = 0.926 p = 0.819	N = 1821 H = 15.886 p = 0.001	N = 1799 H = 27.711 p < 0.001	N = 1808 H = 9.120 p = 0.058	N = 1809 H = 55.171 p < 0.001
2. It is important to care enough about the marine environment to want to help make a difference	N = 1809 H = 22.648 p < 0.001	N = 1819 H = 12.61 p = 0.006	N = 1796 H = 19.827 p = 0.006	N = 1805 H = 9.997 p = 0.040	N = 1806 H = 25.193 p < 0.001
3. It should not all be down to me to do the right thing when buying seafood	N = 1808 H = 11.952 p = 0.008	N = 1818 H = 5.488 p = 0.139	N = 1795 H = 25.094 p = 0.001	N = 1804 H = 6.672 p = 0.154	N = 1805 H = 20.011 p = 0.001
4. It's easy enough to make the right seafood choices to reduce my impact on our seas	N = 1802 H = 5.949 p = 0.114	N = 1812 H = 5.161 p = 0.160	N = 1790 H = 16.042 p = 0.025	N = 1798 H = 36.408 p < 0.001	N = 1799 H = 67.115 p < 0.001
5. The seafood choices people make affects fish populations	N = 1811 H = 33.669 p < 0.001	N = 1820 H = 8.018 p = 0.046	N = 1798 H = 33.668 p < 0.001	N = 1807 H = 13.313 p = 0.010	N = 1808 H = 17.813 p = 0.003
6. I don't have time to think about the impact of my decisions when purchasing seafood	N = 1810 H = 61.947 p < 0.001	N = 1820 H = 16.85 p = 0.001	N = 1797 H = 18.804 p = 0.009	N = 1806 H = 20.82 p < 0.001	N = 1807 H = 48.525 p < 0.001
7. I'm trying to help, but I'm not sure how much impact my choices can make	N = 1808 H = 10.987 p = 0.012	N = 1818 H = 5.817 p = 0.121	N = 1795 H = 8.507 p = 0.290	N = 1804 H = 2.546 p = 0.636	N = 1805 H = 9.492 p = 0.091
8. By changing our seafood shopping habits individuals like me can make a difference	N = 1809 H = 4.312 p = 0.230	N = 1818 H = 9.147 p = 0.027	N = 1796 H = 13.359 p = 0.064	N = 1805 H = 11.875 p = 0.018	N = 1806 H = 27.493 p < 0.001

4.12. Discussion of individual seafood choices to make a difference

The concept of individual environmental responsibility for reducing the impact of public behaviour is well-established. For example, in the adoption of pro-environmental behaviours such as green consumerism (See Section 2.3.4) and household recycling (Eden, 1993). In relation to the marine environment, marine citizenship (Section 2.5.8.1), is recognised as providing a ‘tool’ for engaging the public in marine issues (Buchan et al., 2023) to help reduce the “*collective day-to-day impact*” of individuals’ “*behavioural and lifestyle choices*” identified by McKinley and Fetcher as partially responsible for the degeneration of the marine environment (2010, p.379).

To investigate whether individuals using the MCS GFG take more ‘responsibility’ for their seafood choices and the impact of them on the marine environment compared to non-users, any potential differences in attitudes to the statements presented were examined.

Results show a significant difference between users and non-users in all cases except for items 6 and 7 (Table 4.27 and 4.28). This suggests that people do think about the impact of their decisions when purchasing seafood. However, around a half (51%) agreed although they were trying to help, they doubted how much difference their choices can make.

A significant difference was also found across the categories of gender, age, UK region, income and the number of visits made by respondents to the coast, suggesting that in most cases these factors are important influences on attitudes towards individual responsibility for purchasing seafood and the impact of those choices. The distribution of responses was the same across age categories which indicates age is not a barrier for encouraging the public to take individual responsibility for their seafood choices.

See Sections 4.17, 6.3.1.6. and 6.1.3.7. for further discussion of motivational factors for using the MCS GFG including PBC and individual responsibility for the sea.

4.13. Behavioural ‘spillover’ associated with guide use

To investigate any potential for ‘behavioural spillover’ associated with guide use to other ‘green’ or ‘ethical’ purchasing behaviours discussed in Section 2.3.4 and vice versa, all respondents were asked to indicate their agreement with a series of statements, summarised in Figure 4.47 and Table 4.30. See Appendix 28 for results for individual groups examined.

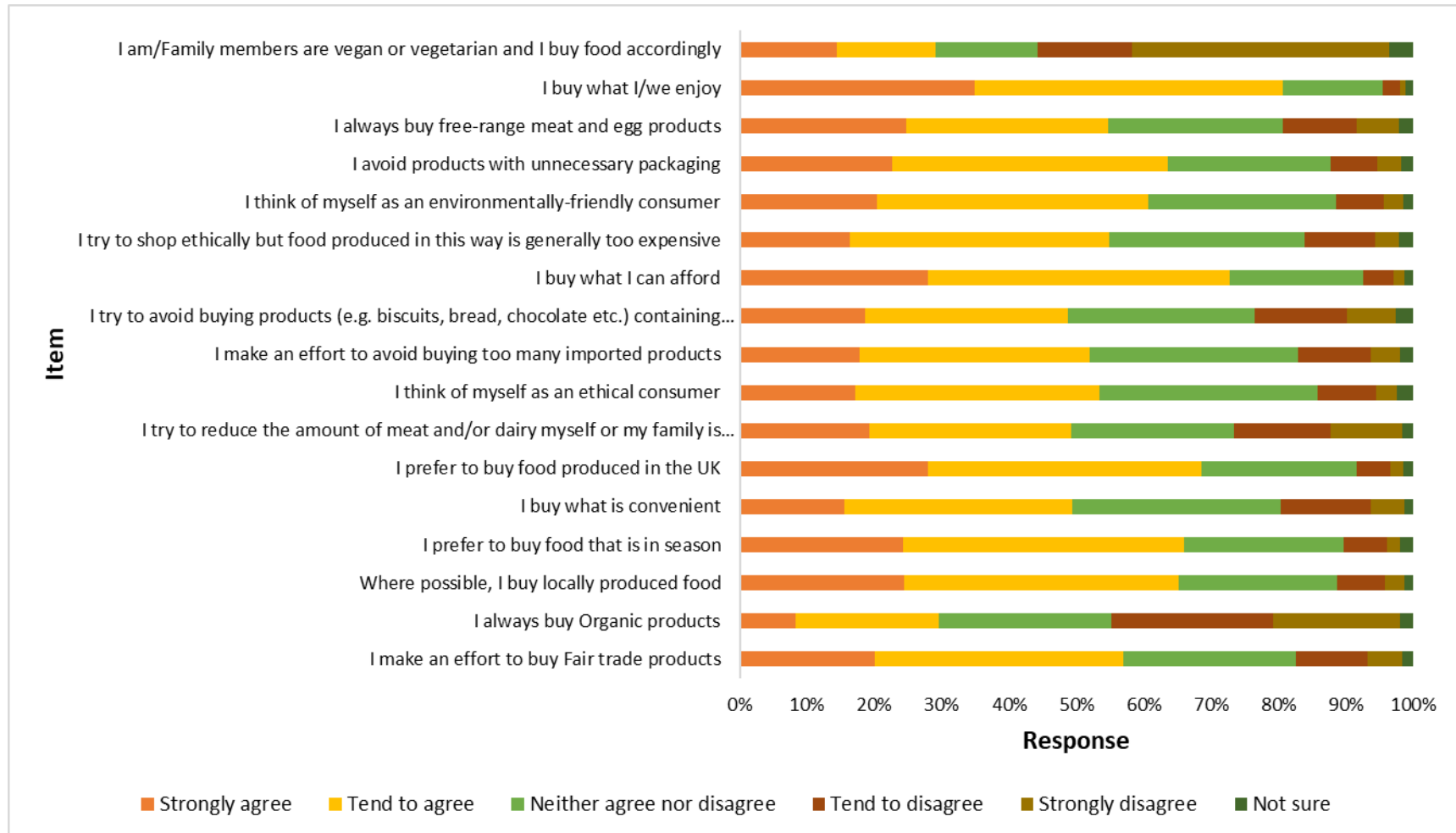


Figure 4.47: Responses to items used to determine respondent's Green shopping habits.

Table 4.30: Summary of responses to each Green shopping habit item.

Item	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
1. I make an effort to buy Fair Trade products	57	16
2. I always buy Organic products	29	15
3. Where possible, I buy locally produced food	65	10
4. I prefer to buy food that is in season	66	8
5. I buy what is convenient	49	18
6. I prefer to buy food produced in the UK	69	7
7. I try to reduce the amount of meat and/or dairy myself or my family is consuming	49	25
8. I think of myself as an ethical consumer	53	12
9. I make an effort to avoid buying too many imported products	52	15
10. I try to avoid buying products (e.g., biscuits, bread, chocolate etc.) containing palm fat or oil	49	21
11. I buy what I can afford	73	6
12. I try to shop ethically but food produced in this way is generally too expensive	55	14
13. I think of myself as an environmentally-friendly consumer	61	10
14. I avoid products with unnecessary packaging	64	11
15. I always buy free-range meat and egg products	55	17
16. I buy what I/we enjoy	81	3
17. I am/Family members are vegan or vegetarian and I buy food accordingly	29	52

Items highlighted in bold in Table 4.30, were used to create a scale for measuring attitudes to making pro-environmental decisions when shopping for food (See Section 3.9.3.4.). Figure 4.48 presents the median 'Green Shopping' score and standard error calculated for the three categories of guide use (i.e., users, non-users, and non-fish buyers).

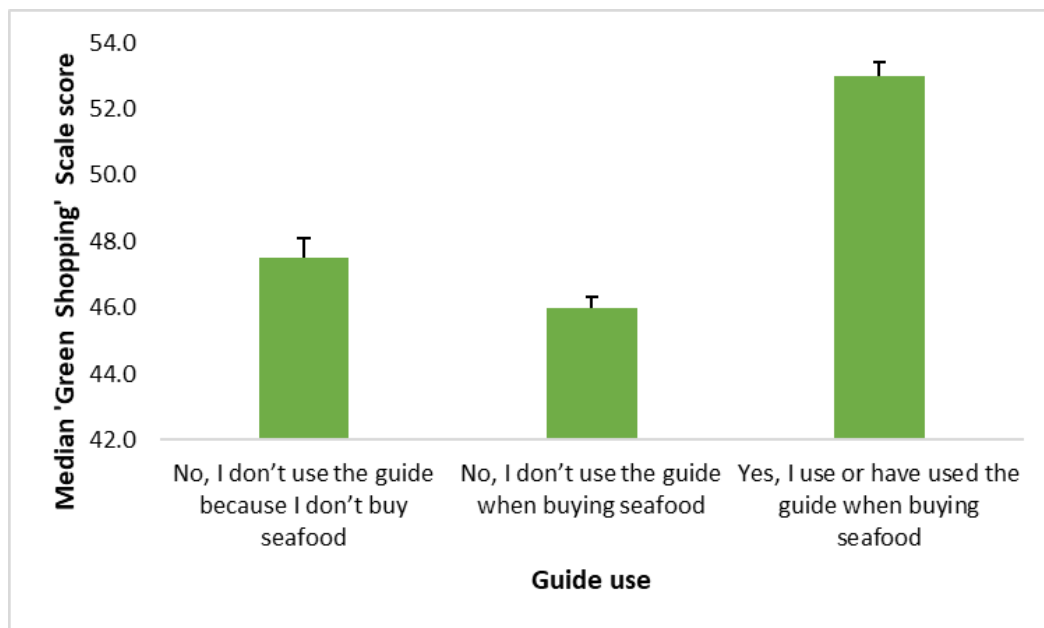


Figure 4.48: Median Green shopping scale score by guide use.

A Kruskal-Wallis test revealed a statistically significant difference in scores across the three categories (Guide users, Md = 53, n=662; Non-Guide users, Md = 46, n=1172; Non-fish buyers, Md = 47.5, n=462), $\chi^2(2, n= 2296) = 227.502, p < 0.001$.

The median values for the three groups are significantly different, $p < 0.001$ in all pairwise comparisons. Guide users recorded a significantly higher median score (Md=53) than the other two groups (See Figure 4.49).

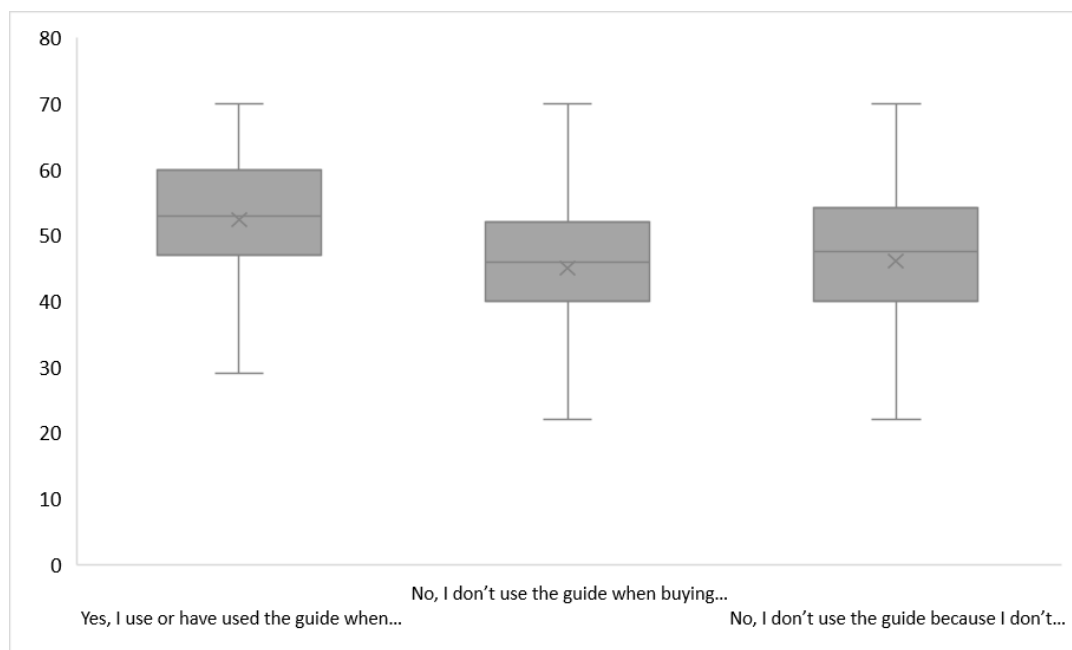


Figure 4.49: Box plot of Green shopping score by guide use.

Further Kruskal-Wallis tests were carried out to understand whether, in addition to guide use, other socio-demographic and purchasing factors were responsible for the difference in 'Green' shopping scale score. Analysis revealed a statistically significant difference in Green shopping scale score across all categories except gender (Table 4.31).

Table 4.31: Summary of results for differences in Green shopping score across the categories listed.

Variable Item	Guide use Df = 2	Gender Df = 3	Age Df = 3	Education Df = 7	Household income Df = 4	Charity group membership Df = 1
Green Shopping scale score	N = 2296 H = 227.502 p < 0.001	N = 2289 H = 6.253 p = 0.100	N = 2279 H = 23.369 p < 0.001	N = 2257 H = 64.106 p < 0.001	N = 2272 H = 21.449 p < 0.001	N = 2274 H = 111.096 p < 0.001

4.14. Discussion of behavioural spillover

To investigate the potential role of ‘spillover’ (Thomas et al., 2019) into other pro-environmental or ‘green’ purchasing behaviours, guide use was examined in the light of any potential differences in attitudes between users, non-users and non-fish buyers, towards purchasing from a range of sustainable or ‘green’ and ‘ethical’ food product categories (Section 4.13). Behavioural spillover theory proposes that engaging in one pro-environmental behaviour can cause the performance of others (Nash et al., 2019; Margetts and Kashima, 2017; Lanzini and Thorgersen, 2014).

Although a majority (53%) of respondents in this study think of themselves as ‘ethical’ consumers, a majority (55%) also agree the perception of food produced in this way is too expensive and would prevent them from shopping ethically. Slightly less than half of all respondents also agreed they buy what is convenient. Convenience is observed in other studies as a key driver when purchasing food for home consumption (Powell et al, 2019; Gatley et al., 2014). Affordability and enjoyment are also important drivers for a high majority of all respondents in this study when purchasing food.

Situational factors (See Sections 4.9.2 and 4.10) including, product type, price and taste, except for product type, were found to be more important to non-users than Guide users. Guide users were also found to have reported to engage in significantly more ‘ethical’ and ‘green’ purchasing behaviour when compared to the other 2 groups. Most Guide users also tended to have a significantly higher perception of themselves as ethical (73%) and environmentally (76%) friendly consumers compared to the other two groups. This suggests individuals using the Guide identify more strongly as ‘green’ and ‘ethical’ and therefore their purchasing behaviours are more likely to ‘spillover’ into other behaviours ‘aligned with the same goal’ (Nash et al., 2019). For example, using the MCS GFG to increase the sustainability of their seafood purchases. Guide users were reportedly more committed to purchasing organic food than the other two groups, with most (51%) agreeing they always buy organic products, compared to around a fifth of non-users and non-fish buyers. Organic food is

generally perceived as expensive (Hansen et al., 2018; Du et al., 2017; Vittersø and Tangeland, 2015) and higher prices are one of the main barriers for its purchase (Klößner, 2011). However, 'green scepticism' or consumer distrust of organically produced food is also a barrier to its consumption (Golob et al., 2018), while high levels of education (Nasir and Karakaya, 2014), 'environmental conscience' (Golob et al., 2018), and a belief in doing 'the right thing' (Arvola et al., 2008) are drivers for purchasing organic food. Guide users also appear as more committed to purchasing free-range products and reducing their consumption of meat and dairy than the other groups. A large majority of Guide users were also found to agree '*seafood is a more sustainable source of animal protein*' (See Section 4.10) which suggests Guide users are likely reducing their consumption of land-based proteins in favour of seafood. Although seafood consumption is considered something of a 'dilemma' for healthy eating and the environment (Lofstedt et al., 2021; Macdiarmid, 2013; Clonan et al., 2011; Brunner et al., 2009), the health benefits (Costello et al., 2020; Tomic et al., 2016; Grieger et al., 2012) and lower environmental burden associated with consuming fish compared to other animal proteins is widely acknowledged (Bogard, 2019; Van Dooren et al., 2014). A larger proportion of Guide users also declared that they bought food suitable for vegan and vegetarian diets compared to the other 2 groups. A study by He et al. (2021) found individuals with higher levels of income and education are more likely to adopt healthier diets i.e., those with a higher intake of seafood and plant-based protein, compared to people in poorer minority groups. Studies have also found that people are willing to pay more for fish than meat because of its perceived health benefits (Morales and Higuchi, 2018).

4.15. Connectedness to the sea

A Likert-type composite scale composed of 10 items (See Section 3.8.3.5), was used to determine whether respondents using the MCS GFG had greater connectedness to the sea compared to non-users and those respondents claiming to not use the Guide because they do not buy fish. Responses are presented in Figure 4.50.

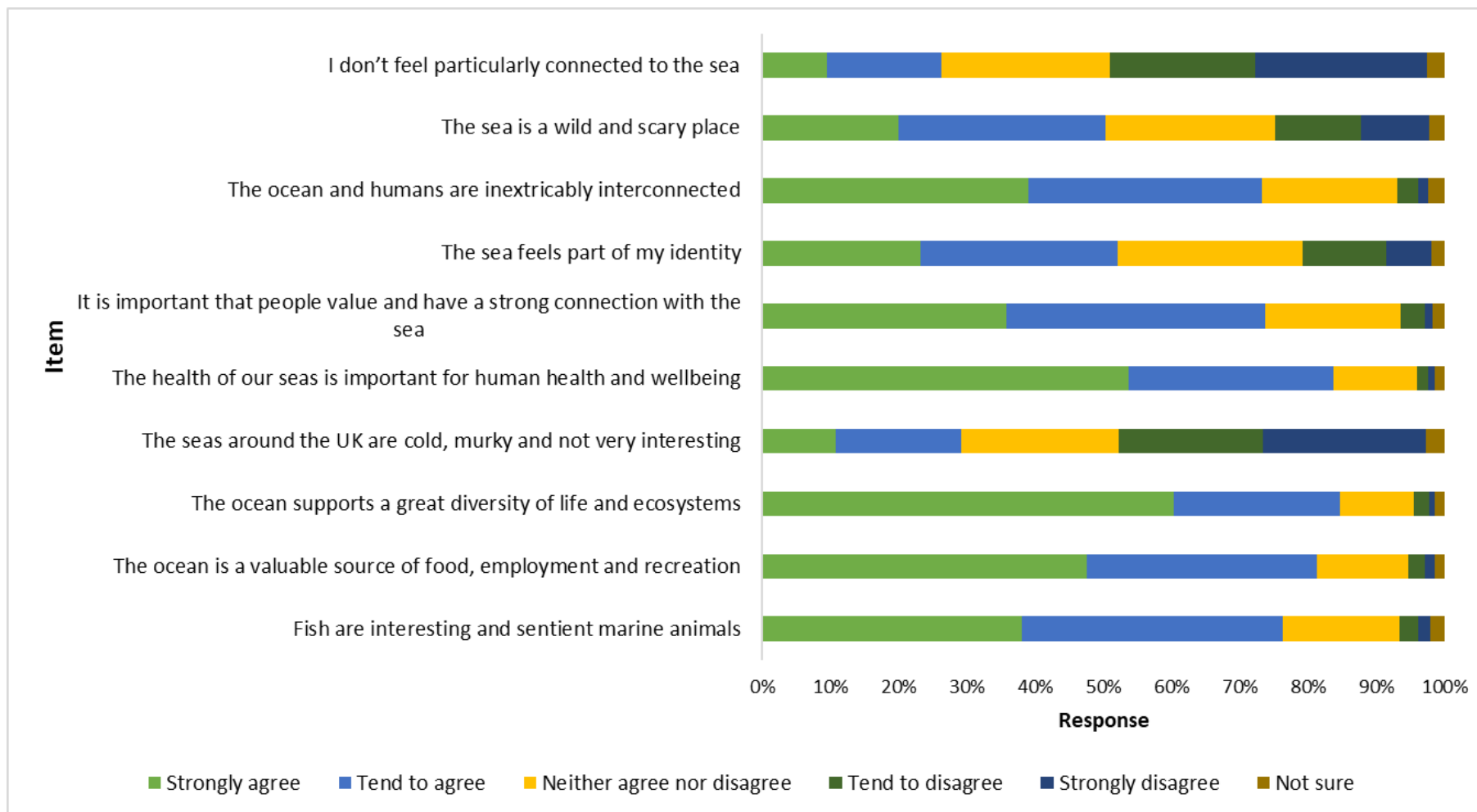


Figure 4.50: Responses by all respondents to items used to determine respondents' connectedness to the sea.

A summary of responses from respondents in the three groups, Guide users, non-users and non-fish buyers, is presented in Table 4.32.

Table 4.32: Summary of responses, agree and disagree, to each Connectedness item for each of the three groups.

Item	All Groups (n=2296) (100%)		Guide users (n=662) (29%)		Non-users (n=1172) (51%)		Non-fish buyers (n=462) (20%)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
Fish are interesting and sentient marine animals	76%	5%	82%	5%	74%	4%	75%	5%
The ocean is a valuable source of food, employment and recreation	81%	4%	80%	4%	85%	2%	74%	8%
The ocean supports a great diversity of life and ecosystems ⁷³	85%	3%	83%	4%	86%	2%	83%	4%
The seas around the UK are cold, murky and not very interesting	29%	45%	41%	40%	23%	50%	28%	42%
The health of our seas is important for human health and wellbeing	84%	3%	84%	4%	84%	2%	82%	2%
It is important that people value and have a strong connection with the sea	74%	5%	80%	5%	72%	4%	69%	5%
The sea feels part of my identity	52%	19%	70%	9%	47%	23%	41%	23%
The ocean and humans are inextricably interconnected ⁷⁴	73%	5%	79%	6%	73%	4%	66%	5%
The sea is a wild and scary place	50%	23%	55%	22%	47%	24%	52%	19%
I don't feel particularly connected to the sea	26%	46%	34%	45%	22%	50%	26%	40%

⁷³ Ocean Literacy Principle 5 <http://oceanliteracy.wp2.coexploration.org/>

⁷⁴ Ocean Literacy Principle 6 <http://oceanliteracy.wp2.coexploration.org/>

The median connectedness score was also calculated for each of the three categories of guide use and is presented in Figure 4.51.

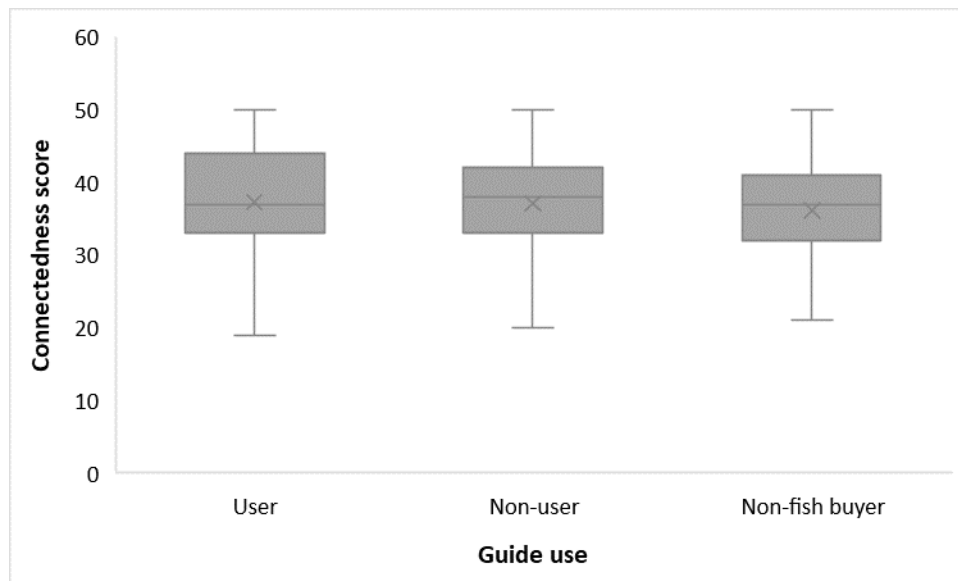


Figure 4.51: Box plot for connectedness scale score by guide use.

A Kruskal-Wallis test revealed no statistically significant difference in scores across the three different categories, (Guide users, Md = 37, n=662; Non-Guide users, Md = 38, n=1172; Respondents who do not buy seafood, Md =37, n=462), $\chi^2 (2, n=2296) = 5.623, p = 0.06$. The median values for the three groups are not significantly different.

Further Kruskal-Wallis tests were run to investigate the influence of other factors on connectedness to the sea (Table 4.33).

Table 4.33: Summary of results for differences in Connectedness scale score across the categories listed.

Variable	Guide use	Gender	Age	UK Region	Household income	Visits to the coast
Item	Df = 2	Df = 3	Df = 3	Df = 11	Df = 3	Df = 5
Connectedness scale score	N = 2296 H = 5.623 P = 0.063	N = 2289 H = 11.302 p = 0.010	N = 2279 H = 118.146 p < 0.001	N = 2147 H = 91.455 p < 0.001	N = 2272 H = 14.082 p = 0.003	N = 2273 H = 154.864 p < 0.001

A statistically significant difference in Connectedness scale score was observed across all categories except Guide use.

4.16. Discussion of connectedness to the sea

This study also sought to identify whether there were any differences in levels of 'connectedness' to the sea between the three groups (See Section 4.15). No significant difference between connectedness scale scores was observed for guide use although a significant difference was found across the categories of gender, age, UK region, income and the number of visits made by respondents to the coast, suggesting that these factors are important influences of people's connection to the sea. As observed in the literature review there are several 'principles' which relate to individuals "*understanding of the ocean's influence on you and your influence on the ocean*" (COSEE, 2005) and which are used to define Ocean Literacy (OL). A large majority (85%) of all respondents agreed with Ocean Literacy Principle 5, 'the ocean supports a great diversity of life and ecosystems' (Table 4.32). An even higher majority (97%) was found amongst respondents to Defra's Ocean Literacy survey (Defra, 2022), who completely or mostly agreed with the principle. 73% of people surveyed in this study also agreed with Principle 6, 'The ocean and humans are inextricably interconnected (or linked)' (slightly more (79%) Guide users than for the other two groups), compared to the Defra survey, in which a large majority (93%) of people completely or mostly agreed with the Principle. However, more Guide users (41%), compared to non-users (23%) agreed "the seas around the UK are cold, murky and not very interesting". More Guide users (55%) also agreed "the sea is a wild and scary place" compared to non-users (47%). This seems incompatible with a large majority of Guide users (70%) compared to non-users (47%) agreeing "the sea feels part of my identity" and suggests Guide use does not engender better understanding of and connection with UK seas.

4.17. Motivational factors for using MCS GFG

As outlined in Sections 2.6 and 3.5, the TPB (Ajzen, 1991) has been applied as a theoretical framework in this study to help explain MCS GFG use among a sample of respondents reporting to use the Guide (See Appendix 29 for a summary of demographics for Guide users). Also outlined in Section 2.6, this study hypothesised that a number of cognitive, emotional, and behavioural factors, could be used to predict intention to use the MCS guide, and that intention to use guide, would, in turn, predict behaviour i.e., self-reported GFG use. Further, it was hypothesised that knowledge, PBC and individual responsibility would directly predict GFG use (See Appendix 2). Situational factors included in the model (Section 2.6. Figure 2.12) were deemed to have a moderating effect on behaviour, accounting for the fact that intention to perform a behaviour does not always result in the behaviour being carried out.

The scale items, their descriptive statistics, and Cronbach Alpha values for each of the model constructs are summarised in Table 4.34.

Table 4.34: Scale items, descriptive statistics, and Cronbach Alpha values for model constructs (n= 662).

Constructs	N	Mean (SD)	% Agree	% Disagree	Cronbach alpha values
Scale items					
Background Knowledge (4 items)					0.78
Sustainability is very important to me when buying and/or eating seafood	655	4.37 (0.9)	88	1	
Whether buying seafood for eating at home or when eating out I always check that it is sustainably produced	655	3.9 (0.92)	70	6	
Knowing what fish it is, where it comes from and how its caught or farmed is really important to gauge it's sustainability	653	4.3 (0.84)	86	2	
I tend to know where the fish I buy has been caught or farmed and how	659	4 (0.92)	79	6	
Trust (1 item)					n/a
The GFG advice for choosing sustainable seafood is accurate and credible	655	4.25 (0.91)	86	23	
Subjective Norms (1 item)					n/a
Most people important to me think I should buy sustainable seafood	654	3.88 (1.09)	72	6	
Attitude towards GFG use (3 items)					0.8
The availability of the GFG has made me more motivated to buy sustainable seafood	658	4.04 (0.98)	78	7	
I am confident the MCS GFG can help me make the sustainable choices I want when buying seafood	659	4.08 (1.01)	78	6	
I find the GFG easy to use and can follow the advice it presents	654	3.97 (1.05)	76	5	
Perceived Behavioural Control (PBC) (3 items)					0.7
It's easy enough to make the right seafood choices to reduce my impact on our seas	652	3.74 (1.07)	65	13	
The seafood choices people make affects fish populations	653	4.16 (0.94)	79	4	
By changing our seafood shopping habits individuals like me can make a difference	653	4.06 (0.98)	77	5	

Individual responsibility (2 items)					0.82
I have a responsibility to make the right decisions for the marine environment when buying seafood	655	4.29 (0.96)	85	3	
It is important to care enough about the marine environment to want to help make a difference	655	4.25 (0.92)	84	4	0.76
Intention (3 items)					
I use the Guide most of the time when I buy seafood, either in a restaurant or in the supermarket etc.	660	3.85 (1.01)	69	7	
I want to make an effort and use the Guide when I buy seafood, either in a restaurant or in the supermarket etc.	660	4.11 (0.99)	80	5	
I may use the Guide to help me chose sustainable seafood in the near future	659	4.13 (1)	80	4	n/a
Behaviour (1 item)					
I always use the GFG when purchasing seafood	654	3.54 (1.15)	58	17	

In all cases, responses to the items were given on a six-point Likert scale, ranging from 0= Not sure; and 1 (=strongly disagree) to 5 (=strongly agree).

Pearson's correlations were computed between the dimensions of the extended TPB and reported use of guide. Table 4.35 presents descriptive statistics and the correlation coefficients for the dimensions of the TPB model used in the study.

Table 4.35: Correlation coefficients for dimensions of extended model of TPB. ** Correlation is significant at the 0.01 level (2-tailed), P< 0.001.

Variables	Mean (SD)	N (Range)	Knowledge	Trust	Subjective norms	Attitude (towards using guide)	PBC	Individual responsibility	Intention (to use guide)	Behaviour (Guide use)
Knowledge	16.45 (3.073)	662 (0-20)	1	0.349**	0.411**	0.399**	0.517**	0.545**	0.478**	0.353**
Trust	4.25 (0.907)	655 (0-5)	0.349**	1	0.187**	0.466**	0.341**	0.307**	0.469**	0.259**
Subjective norms	3.88 (1.088)	654 (0-5)	0.411**	0.187**	1	0.261**	0.328**	0.242**	0.32**	0.353**
Attitude	12.00 (2.673)	662 (0-15)	0.399**	0.466**	0.261**	1	0.539**	0.559**	0.691**	0.475**
PBC	11.8 (2.631)	662 (0-15)	0.517**	0.341**	0.328**	0.539**	1	0.694**	0.523**	0.310**
Individual responsibility	8.45 (1.914)	662 (0-10)	0.545**	0.307**	0.242**	0.559**	0.694**	1	0.465**	0.278**
Intention (to use guide)	12.04 (2.538)	662 (0-15)	0.478**	0.469**	0.32**	0.691**	0.523**	0.465**	1	0.455**
Behaviour (guide use)	3.54 (1.149)	654 (0-5)	0.353**	0.259**	0.353**	0.475**	0.31**	0.278**	0.455**	1

Knowledge, trust, subjective norms, attitude, PBC and individual responsibility each have a positive and significant correlation with intention. Intention, knowledge, PBC and individual responsibility each have a positive and significant correlation with behaviour, GFG use.

Multiple regression analysis was carried out to assess, firstly, the predictors of intention to use the MCS GFG, and secondly, the predictors of GFG use (Jalilian et al., 2020; Hasan et al., 2019; Aghamolaei et al., 2012). Analysis revealed that the variables in the model - knowledge; trust; subjective norm; attitude; PBC; and individual responsibility – explained a statistically significant 56% of the variance in the dependent variable, intention to use guide ($R^2 = 0.56$, $F = 133.352$, $P < 0.001$).

Evaluation of the independent variables revealed that individual responsibility was the only variable not making a statistically significant and unique contribution to the dependent variable, intention. Attitude ($\beta = 0.503$, $p < 0.05$) to using the Guide was found to be making the highest contribution to the prediction of the independent variable, intention. See Table 4.36 for a summary of results.

Table 4.36: Summary of multiple regression output for intention (to use guide).

Variables	R ²	B	SE	Beta β	P	Part correlation coefficient
<i>Intention</i>	0.556					
Constant		0.965	0.440	-	0.029	-
Trust		0.381	0.085	0.136	<0.05	0.118 (1.4%)
Attitude		0.477	0.033	0.503	<0.05	0.378 (14.3%)
Knowledge		0.135	0.028	0.163	<0.05	0.125 (1.6%)
Subjective norm		0.149	0.069	0.064	0.031	0.057 (0.3%)
PBC		0.139	0.038	0.144	<0.05	0.097 (0.9%)
Individual responsibility		-0.83	0.053	-0.63	0.119	-0.41 (-)

By using the regression coefficients (B) and the constant value, 0.965, an equation for predicting intention to use the MCS GFG is provided as: $0.965 + (0.381 \times \text{trustscore}) + (0.477 \times \text{Attitudescore}) + (0.135 \times \text{knowledgescore}) + (0.149 \times \text{socialnormscore}) + (0.139 \times \text{PBCscore})$.

Further analysis revealed that the variables in the model - knowledge; PBC; individual responsibility; and intention – explained a statistically significant 23% of the variance in the dependent variable, behaviour, guide use ($R^2 = 0.232$, $F = 48.913$, $P < 0.001$).

Evaluation of the independent variables revealed that only knowledge ($\beta = 0.165$, $p < 0.05$) and intention ($\beta = 0.357$, $p < 0.05$) are making statistically significant and unique contributions to the prediction of the dependent variable, behaviour. See Table 4.37 for a summary of results.

Table 4.37: Summary of multiple regression output for behaviour (GFG use).

Variables	R ²	B	SE	Beta β	P	Part correlation coefficient
<i>MCS GFG use</i>	0.232					
Constant		0.393	0.243	-	0.106	-
Knowledge		0.061	0.016	0.164	<0.05	0.129 (1.6%)
PBC		0.019	0.022	0.043	0.398	0.029
Individual responsibility		-0.004	0.030	-0.007	0.890	-0.005
Intention		0.162	0.019	0.357	<0.05	0.291 (8.5%)

By using the regression coefficients (B) and the constant value, 0.393, an equation for predicting MCS GFG is provided as: $0.393 + (0.061 \times \text{knowledgescore}) + (0.162 \times \text{intentionscore})$.

4.18. Discussion of motivational factors for using MCS GFG

As previously mentioned, this study aimed to examine whether the TPB could be used as a framework for examining motivational factors for using the MCS GFG guide among a sample of 662 respondents who reported to have used or be using the Guide. As observed in the literature review, TPB assumes that an individual's intention to carry out a behaviour is influenced by three motivational factors: attitude; social norms; and PBC (Bredahl and Grunert, 1995). Underlying each of these factors are beliefs related to the behaviour (Verbeke and Vackier, 2005). The basis for the focus of TPB on behavioural intention rather than on actual behaviour is that despite intentions to carry out a behaviour, an individual may be prevented from doing so due to circumstances beyond their control (Bredahl and Grunert, 1995). In this study the *behaviour* examined is MCS GFG use, a proxy for the purchase of sustainable seafood, which is also influenced by non-motivational factors discussed in Section 4.9.2. and Chapter Five, which may prevent individuals from achieving their goal of using the Guide to help increase the sustainability of their seafood purchases. It is because TPB assumes that intention '*captures the motivational influences on behaviour*', it is accepted as the '*most proximal predictor of behaviour*' (Arvola et al., 2008, p.444). Typically, a small number of items are used to directly estimate each of the major TPB constructs (Ajzen, 2015) as was the case in this study and described in Section 4.17. Table 4.34. In addition to the main TPB constructs, constructs for seafood sustainability knowledge; trust in the Guide; and individual responsibility for the sea were included in the model. It was hypothesised that knowledge; trust; subjective or social norms; attitude; PBC; and individual responsibility for the sea would predict intention to use the MCS guide, and that intention to use guide, would, in turn, predict behaviour i.e., self-reported GFG use. It was also hypothesised that knowledge, PBC and individual responsibility would directly predict GFG use.

The *attitude* construct encapsulates an individual's appraisal of performing a behaviour (Cooke et al., 2016) and is regarded as the best predictor of behavioural intention (Bredahl and Grunert, 1995) and a significant determinant of behaviour (Klößner, 2011). In a study by Birch (2015), a positive attitude was found to be one of the key drivers of sustainable seafood consumption. In this study attitude to using the MCS GFG to help purchase sustainable

seafood was found to explain 14% of the variance in *intention* to use the Guide. This compares well to levels of variance for attitude examined in other studies (McEachan et al., 2011). A high level of *trust* in the information in the MCS GFG was observed which is important to consumers concerned about the impact of their fish consumption on global fish stocks (Jacobs et al., 2018; Oosterveer and Spaargaren, 2011). Trust was identified as making a statistically significant and unique contribution to intention to use the MCS GFG, explaining 1.4% of the variance in intention (See Section 4.10). In a study by Canova et al. (2020), for example, trust was found as having an important role in the purchasing intention and behaviour towards organic food products.

PBC or agency refers to '*people's perceptions of their ability to perform a given behaviour*' (Ajzen, 2020, p. 316). In providing information about '*potential constraints on action*', PBC is held to explain why intentions do not always predict behaviour (Armitage and Conner, 2001). According to Ajzen (1991), intention to carry out a behaviour, together with PBC accounts for a major part of the variance in behaviour. In this study PBC items were designed to understand the perceptions individuals have of the efficacy their seafood choices have in helping to reduce the impact of seafood consumption on the marine environment. Results indicate that in this study PBC did not make a statistically significant and unique contribution to the prediction of behaviour i.e., MCS GFG use.

Other studies have however identified PBC as a statistically significant predictor of intention and behaviour (Menozzi et al., 2017). Intention was nevertheless found to be making a statistically significant and unique contribution to the prediction of the dependent variable, explaining 8.5% of the variance in behaviour. In the TPB, *social norms* are represented by subjective norms (See Section 2.5.3). In the case of this study, the perceived social pressure to purchase sustainable seafood. The social norm construct is generally found to be a weak predictor of intentions (Armitage and Conner, 2001). Similarly, in this study subjective norms were found to explain 0.3% of the variance in intentions.

Constructs were also included for *knowledge*. Knowledge about 'how to act' is identified by Richeter and Klockner (2017) as important for consumption of sustainable seafood. Items to determine the importance of sustainability to individuals and understanding of how to access information to gauge the sustainability of seafood was used as knowledge constructs in this study. Knowledge was found to be making a statistically significant and unique contribution to the prediction of the dependent variable, explaining 1.6% of the variance in both intention and behaviour.

Two statements were designed to investigate *individual responsibility* or recognition of the importance of making the right choices to reduce the impact of seafood consumption on the marine environment when purchasing seafood. Responses suggested people do think about the impact of their seafood choices but are not convinced by the efficacy of individual choice to reduce the impact of overfishing generally (Section 4.11). Although slightly more Guide users (85%) than non-users (77%) agreed they have a responsibility to make the right decisions when buying seafood, the construct for individual responsibility was found to not be making a statistically significant and unique contribution to the dependent variable, intention. Neither was it found to be making a statistically significant and unique contribution to the dependent variable, behaviour.

Generally, TPB has demonstrated that it is a suitable predictor of intention and behaviour, explaining 40-49% of the variance in intention and 26-36% of the variance in behaviour (McEachan et al., 2011; Armitage and Conner, 2001). Analysis of results for this study revealed that the variables, knowledge; trust; subjective norm; attitude; PBC; and individual responsibility significantly predicted intention to use the MCS GFG, with 56% of variance in *intention* explained by the independent variables in the model. Analysis for intention to use guide, knowledge, individual responsibility and PBC, revealed that these factors significantly predicted behaviour i.e., GFG use, with 23% of variance in *behaviour* explained by the independent variables in the model. These results suggest the TPB can provide a suitable framework for examining factors determining MCS GFG use. Similar to results found in other studies (Vermeir and Verbeke, 2008; Kassem et al., 2003), attitude was found to be making a statistically significant and unique contribution to intention to use the Guide.

4.19. The future for seafood sustainability

All respondents were asked what progress they would like to see made towards increasing the sustainability of seafood in the future. See Figure 4.52 for a summary of responses. Responses to the proposals for individual groups is summarised in Table 4.38.

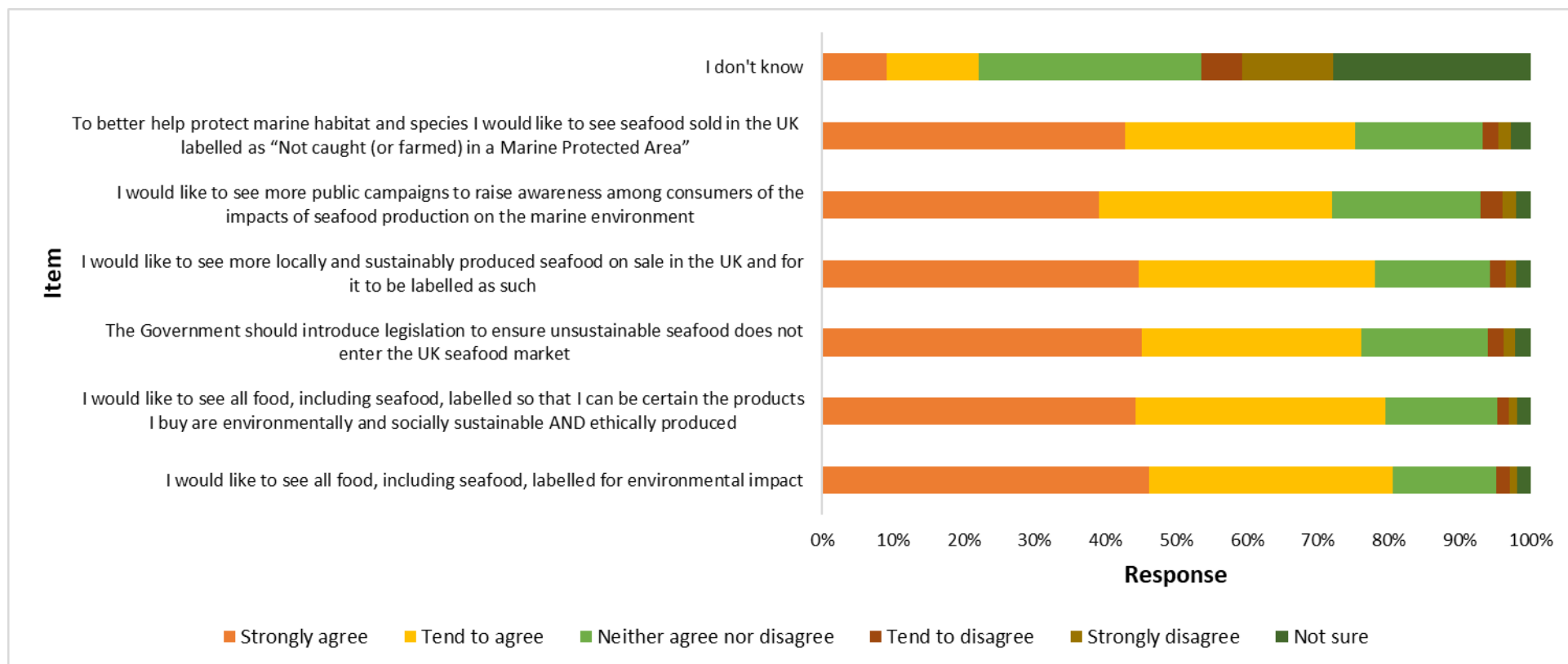


Figure 4.52: Summary of all responses to proposals for increasing seafood sustainability in the future. *Marine Protected Area* is a general term used to describe any protected area in the marine realm which aims to conserve nature and maintain healthy oceans <https://www.biodiversitya-z.org/content/marine-protected-area-mpa>

Table 4.38: Summary of responses by guide use to proposals for increasing seafood sustainability in the future.

Item	All Groups (n=2296) (100%)		Guide users (n=662) (29%)		Non-users (n=1172) (51%)		Non-fish buyers (n=462) (20%)	
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. I would like to see all food, including seafood, labelled for environmental impact	81%	3%	85%	3%	80%	3%	74%	4%
2. I would like to see all food, including seafood, labelled so that I can be certain the products I buy are environmentally and socially sustainable AND ethically produced	80%	3%	82%	3%	80%	3%	73%	4%
3. The Government should introduce legislation to ensure unsustainable seafood does not enter the UK seafood market	76%	4%	77%	4%	76%	4%	74%	5%
4. I would like to see more locally and sustainably produced seafood on sale in the UK and for it to be labelled as such	78%	4%	82%	4%	80%	3%	67%	6%
5. I would like to see more public campaigns to raise awareness among consumers of the impacts of seafood	72%	5%	77%	5%	71%	4%	68%	7%

production on the marine environment								
6. To better help protect marine habitat and species I would like to see seafood sold in the UK labelled as “Not caught (or farmed) in a Marine Protected Area” (a general term used to describe any protected area in the marine realm which aims to conserve nature and maintain healthy oceans)	75%	4%	78%	5%	76%	3%	70%	4%
7. I don't know	22%	19%	34%	20%	16%	20%	16%	12%

One sample Wilcoxon tests were carried out in IBM SPSS 25 to determine if the responses overall to the 7 items presented differed from the mid-point. In all cases, a significant difference ($p < 0.05$) between observed medians and the hypothetical median was found, indicating a high level of agreement with the statements presented and thus support for these suggestions for increasing seafood sustainability in the future. Item 7, ‘I Don't know’ appeared to cause some confusion with a higher number of respondents ‘neither agreeing or disagreeing’ with statement or ‘Not sure’ compared to other items and only 22% of respondents agreeing with the statement. An open question was posted to respondents regarding their thoughts about the future sustainability of seafood. Responses were categorised according to eight emerging themes, summarised in Table 4.39.

Table 4.39: Summary of suggestions by respondents for increasing the sustainability of seafood in the future (n=216).

Category	Better labelling and information at point of sale (n=32) (15%)	Improved fisheries management (n=46) (21%)	Increased awareness through education (n=48) (22%)	Government interventions (n=35) (16%) [inc. introduction of taxes (n=7)]
Example	“To know the impact of consuming or buying that seafood item”; “just make products label more clearer and more informative”; “Traffic light style environmental impact label on packaging. Restaurants and takeaway to display impact of products too”.	“More no take zones”; “Prohibit all fishing in the spawning season”; “Taking peoples licenses away if they participate in unsustainable seafood produce”; “better fishing”; “mcs's must be no take areas”.	“Awareness through advertising on TV”; “I think that educating children from a young age is vitally important, fish served in schools is insulting to the child. We could serve lovely sustainable fish every Friday in schools this would help the industry, market it better as lots goes to Europe because we don't eat enough”.	“Government should create sustainability rating of seafood and it should be mandatory to have this rating on packaged foods”; “If we had strong legislation preventing unethical and unsustainable seafood from entering the market that would help a lot with knowing what we were buying was sustainable”.
Category	Market controls (n=9) (4%)	Ban or restrict fishing (n=15) (7%)	Restricting access by EU vessels to UK waters (n=14) (7%)	Reduce or eliminate consumption of fish (n= 17) (8%)

Example	“For me, just lower prices that cost the same as non- sustainable”; “Supermarkets should only stock fish from sustainable sources”.	“I would ban all fishing, but I know that is not going to happen”; “BAN INSHORE FISHING”; “Get rid of super trawlers”; “Ban bottom trawling, or all trawling. If I do buy seafood, it's usually only pole & line caught or from potting”; “Stop these massive trawlers”.	“Well, we could start by taking greater control of the UK's waters now we're leaving the EU”; “Protect our fishing borders”; “Once Brexit is over then Foreign fishers should not be able to enter British waters to over fish”.	“I don't think people should eat sentient beings”; “Eating less seafood, and when eating it buying it from responsible sources. Like Meat Free Mondays, can there be a Seafood Free Saturday? Or a Fish Free Friday? to raise awareness that when we eat seafood, we should eat fewer of them, and eat the best possibly sourced seafood available”.
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4.20. Discussion of the future for seafood sustainability

A question was designed to understand what progress respondents would like to see made towards increasing the sustainability of seafood in the future. Ideas proposed included more comprehensive labelling; introduction of Government legislation to prevent unsustainable seafood from entering the UK market; and increase in public campaigns to raise public awareness of the impacts of seafood production. A high level of support for the suggestions presented was observed with the highest (81%) for the introduction of labelling for environmental impact.

Attitudes to the availability of more comprehensive labelling of food, including seafood, for environmental impacts (Arrazat et al., 2023; Baggini, 2021); the introduction of universal labelling of food to increase awareness of the environmental, social and ethical impacts associated with seafood products offered for sale (Penca, 2020) ; labelling to identify seafood not taken or produced in marine protected areas (MPAs) designed to protect habitat and

species (See Section 2.2.3); and labelling to identify locally and sustainably produced seafood were all observed as very positive.

As observed in the literature, sustainability and other information about food, including fish products, is typically communicated through product labelling (Pieniak et al., 2013). In response to increasing consumer interest in the environmental impact of food production, several 'traffic-light' format labelling schemes are being piloted on British food labels (Iqbal, 2021). The provision of information in this way has the potential to significantly influence purchasing decisions (Fonner, 2015).

Furthermore, Penca (2020), has proposed that 'enhanced' mandatory labelling of seafood could be used as a fisheries policy and governance tool to help increase seafood sustainability, foster ocean literacy, and meet sustainability goals. A potential barrier to this approach however is the need for more 'background' knowledge (See 4.9.3. and 4.17), of greater consumer involvement with the information presented, to drive changes in purchasing behaviour.

This study has found that people using the MCS GFG have more eco-labelling and seafood knowledge than non-users (Section 4.7) and the majority agree that using the Guide has increased their seafood sustainability knowledge (Section 4.7.1). Seafood guides could therefore be feasibly used to further engage public interest in enhanced (and other) labelling schemes to improve levels of ocean literacy and increase sustainable seafood consumption.

An advantage highlighted by Penca (2020) for enhanced labelling is that it overcomes the perceived problem of narrow interpretation of 'sustainability' presented in the case of eco-labels and discussed in Chapter 5. For example, for decades cetacean bycatch has been and continues to be a major conservation and welfare concern in Europe. Despite implementation of legislation to reduce it, high numbers of animals continue to die each year (Dolman et al., 2016). Dolman et al. (2016) suggests that increased transparency of labelling, for example of

products from fisheries where incidental catches of marine mammals are of conservation concern would help the consumer decide through personal choice whether or not to purchase the product and raise awareness of such issues. Findings by Cucchiara and Kwon (2015), however, suggest positively framed messages are more effective than negatively framed messages for persuading consumers to change their seafood buying habits. For example, seafood could be labelled to highlight efforts being made to reduce wildlife bycatch (Clean Catch UK, 2023). Enhanced mandatory labelling of food and seafood products would also overcome the problem of labelling of products for 'single' values such as 'GHGEs' or 'Fairtrade' where consumers are forced to prioritise one attribute over another when they may prefer to purchase a product that is socially and ecologically sustainable with a low carbon impact, for example.

Respondents were also invited to volunteer their own ideas for increasing the sustainability of seafood in the future. Increasing awareness through education was found to be the most popularly volunteered (22%) which suggests people believe that if society is better educated individuals will make more desirable choices. Belief amongst respondents in the value of education is perhaps also a reflection of the much higher-than-average number of individuals educated to degree or post graduate degree level taking part in this study. A study by Uchida et al. (2014) for example found provision of information about the status of global fisheries and the purpose of the MSC programme, increased WTP for eco-labelled seafood, illustrating the value of increasing awareness through education to achieve support for sustainability initiatives. Government interventions, including the introduction of taxes, was proposed by 16% of respondents. As observed in the literature, several studies have evaluated the benefits of introducing health and/or environmentally motivated taxes to influence consumer behaviour in favour of healthier and more sustainable consumption (Springmann et al., 2018b; Briggs et al., 2016; B  r  , 2015).

Regardless of a high level of support for the suggestions presented in relation to progress on improving food, including seafood, labelling, responses to the open question on increasing the sustainability of seafood in the future, categorised under the theme of 'better labelling

and information at point of sale', was ranked fourth with 15% (n=32) of the total responses received. It is also surprising that in the case of all closed item responses, the number of 'non-fish buyers' agreeing, particularly in relation to labelling, especially labelling for locally and sustainably produced seafood, is consistently lower than for the other two groups, with 67% of non-fish buyers agreeing compared to 82% and 80% of users and non-users respectively, raising questions about perceptions of sustainable diets and what motivates them (Polleau and Biermann, 2021; Fox and Ward, 2008).

4.21. Summary

Phase 1 sought to assess public awareness and use of the MCS GFG. To simplify analysis, respondents (n= 2296) were allocated to one of three categories of Guide use (See Chapter 3 Figure 3.3): individuals who buy seafood but do not use the Guide ('non-users') (n= 1172); individuals who buy seafood and use the Guide ('users') (n=662); and individuals who do not use the Guide because they do not buy seafood (n=462) ('non-fish buyers'). However, this was the first time examining these groups and therefore there was no way of knowing how representative the samples collected were of the wider population.

More specific areas of investigation included: identification of reasons for not using the Guide; reasons for not purchasing seafood; how the Guide is effectively influencing seafood purchasing behaviour; the contribution of the Guide to consumer's seafood sustainability knowledge; and motivational factors for the Guide's use (4.17 and 4.18).

General awareness of the MCS GFG was found to be relatively low with a majority indicating this study is the first time they have seen or heard of the Guide. The highest level of awareness and use of the Guide was found in traditional coastal areas such as the South West and Scotland. In common with other studies (Defra, 2022), a high level of awareness of sustainable fishing and concern for the impact of seafood consumption on the marine environment among respondents in this study also appears high.

Unlike usual 'green' consumers identified in other studies (Chekima et al., 2016; Milovanov, 2015; Markowitz et al., 2012), this study identified typical MCS GFG users as predominantly White British, male, and in the age category 30-49. In common with other studies of pro-environmental consumption (Li et al., 2019), Guide users were also found to identify with the higher sociodemographic groups for education and employment. It should be noted that almost half of respondents (48%) in this study were educated to degree or post graduate degree level, almost twice the national average of 27% (ONS, 2011) for residents in England and Wales in 2011 with a degree (or equivalent) qualification. This suggests that awareness and use of the MCS GFG in the general population is likely lower, and purchasing behaviour, discussed below, potentially different, to that observed in the study population.

Guide users also reported to engage in significantly more 'ethical' and 'green' purchasing behaviour, with most Guide users also tending to have a significantly higher perception of themselves as ethical and environmentally friendly consumers compared to non-users and non-fish buyers. Guide users were also found to visit the coast more often and have a significantly higher charity membership than non-users of the Guide. Typical of people in higher socio-economic groups (Farmery et al., 2018), Guide users were also found to make significantly (60%) more seafood purchases than non-users, with more male users than female agreeing they buy more seafood now than before they started using the Guide. The main reason for not using the Guide for a large majority was lack of awareness of it.

In addition to a dislike of the sensory and physical properties associated with fish examined in other studies (Sawyer et al., 1988), this study identified concern for the impact of human consumption on the marine environment as a reason for not buying seafood. In common with other studies of seafood guide use (Kemmerly and MacFarlane, 2009), always checking where seafood comes from and how it is caught or farmed, was identified as the most popular change made by people reporting to use the Guide when buying seafood.

A large majority (84%) of Guide users agreed they have become more knowledgeable about seafood sustainability because of using the Guide. However, despite this belief, in common with other studies (Lawley et al., 2019), there was a lack of understanding of key seafood sustainability terms with 40% of respondents either not knowing or having an incorrect understanding or what seafood sustainability means. Further, most referred only to one aspect of seafood sustainability, namely overfishing of the stock. This suggests awareness more widely of other aspects of sustainability, such as social justice, is low. However, Guide users were found to have higher levels of general seafood knowledge, although this was not necessarily attributable to guide use, and a greater knowledge of mandatory and voluntary seafood labelling.

Consistent with many studies identifying health as a major driver for fish consumption (Jacobs et al., 2015; Brunner et al., 2009; Pieniak et al., 2008), a large majority of respondents agreed health was important to them when buying seafood. However, apart from product-type, situational factors such as price, taste, and availability, were found as more important to non-users than users, with environmental and ethical and social drivers, of more importance to users than non-users.

Supermarkets are most frequently used for purchasing seafood (Watson, 2019); however, Guide users were less reliant on multiple retailers and found to use more independent suppliers such as fishmongers for purchasing their seafood. MCS GFG users were also found to be less reliant on the 'Big 5', purchasing seafood from a wider range of species, including species identified by MCS as 'Best choices' compared to non-users. Surprisingly, MCS GFG users also reported purchasing more species identified by MCS as 'Fish to avoid', such as eel and shark. Similarly, in an evaluation of seafood guides use carried out by Kemmerly and Macfarlane (2009), respondents reported as continuing to purchase species listed as 'avoid' species. For most people taking part in the survey, seafood consumption is a habit formed in childhood (Birch and Lawley, 2013). As reported in other studies (Birch and Memery, 2020), family was identified as having the most important influence on purchasing behaviour.

Examination of results for the second phase of data collection is discussed in Chapter Five.

Chapter Five: Results and discussion: Stakeholder interviews

5.1. Introduction

This chapter presents the results of the stakeholder interviews. Interviews aimed to elicit stakeholder awareness and understanding of what seafood sustainability is and why it is important; opportunities for increasing its availability; stakeholder perceptions of public concern for any impact of their individual seafood choices on the marine environment; what use is being made by stakeholders of the MCS GFG; the influence of the Guide on the public's seafood choices; and the Guide's influence on stakeholder practices, either on the ground i.e. within the seafood supply chain or on the water i.e. within the catching or farming sectors. Despite the unrepresentative number of interviewees involved, an attempt was made to identify differences in responses between actor or stakeholder groups (See Figure 3.8), by categorising responses according to actor group, see for example Table 5.1.

As outlined in Chapter Three, a total of 49 interviews with seafood industry stakeholders were carried out (See Chapter 3. Table 3.16). Of the individuals interviewed, 69% were male, and 31% female (See Interviewee Profile, Appendix 30). Where appropriate, comparisons are made between results from these interviews and those obtained for the survey carried out in Phase 1. The implications of these are discussed fully in Chapter Six.

5.2. Stakeholder awareness of and involvement with the SSM

In the first instance, the interviews sought to understand stakeholders' awareness of the SSM, both globally and in the UK, and their involvement with it. When asked, 73% of interviewees indicated that they were aware of the movement in general. Awareness was found to be highest amongst the Food Service (100%), Retailer (100%), and the Wholesaler, processor, manufacturer or supplier (Supplier) (88%) groups. One interviewee from the ENGO/Seafood initiatives group, described the intrinsic nature of the movement as market-facing and how it is recognised as different from other conservation movements, stating:

“I think that the sustainable seafood movement is different from traditional conservation groups and traditional conservation efforts in that it does collaborate with the seafood industry and looks to prioritise not only the protection of the environment and marine habitats, but also the sustainability of seafood and the role it has in nutrition and food security” (SH02).

This stakeholder’s view of the SSM as being different from other conservation movements echoes that of Tlusty et al. (2019). Of the respondents with awareness of the movement, 22% considered themselves and their organisations as *‘born out of’, ‘involved in’* or *‘part of’* the movement. 38% of these respondents represented the ENGO/Seafood initiatives Group which is reasonable given their involvement in the SSM. One interviewee stated: *“Very, I’ve been effectively part of it for more than a decade now. I consider we’re playing a role in that sustainable seafood movement”* (SH44). Interviewees also referred to the influence the movement has had on their day-to-day work, with one stating: *“Certainly in the UK it’s been part of my life, what I do in terms of my day-to-day work for the best part of 20 years”* (SH25).

11% indicated they had awareness of the movement but more so in the UK, including one respondent who indicated their business had been involved with sustainability initiatives since the inception of the SSM in the late 1990s. While awareness of the movement was clearly high, nearly a third (27%) had no awareness. All individuals (n=4) from the stakeholder group, *‘Chefs/Cookery schools/Training’*, accounting for 31% of the total, reported having no awareness of the SSM. This suggests that there is a particular need to raise awareness of the SSM within this sector.

Given that the SSM started in the UK with the establishment of the MSC (See Appendix 1), a certification and eco-labelling program for wild-caught seafood which meets international standards set by FAO, the International Social and Environmental Accreditation and Labelling (ISEAL) Alliance⁷⁵, and the Global Sustainable Seafood Initiative (GSSI)⁷⁶ (See discussion in Section 5.5.1 on pre-competitive platforms), it is perhaps unsurprising that there is a relatively high level of awareness of the SSM among interviewees. However, with the UK regarded as

⁷⁵ <https://www.isealalliance.org/>

⁷⁶ <https://www.ourgssi.org/gssi-recognized-certification/>

one of the more progressive markets globally for sustainable seafood (Roheim, 2009), the fact that almost a third of interviewees indicated that they had no awareness of the SSM suggests that gaps in engagement and awareness remain. For the SSM to realise its potential efforts to increase uptake and awareness across the whole supply chain are clearly needed.

5.3. Meaning of seafood sustainability terms

Given the lack of consensus regarding the definition of sustainable seafood, and to make comparisons with public understanding of the terms examined in the previous chapter, interviewees were asked what 'sustainable seafood' and 'responsibly sourced' meant to them and what, if any, distinction they made between the two terms.

Whilst there was acknowledgement that there is no internationally accepted definition for sustainable seafood (FAO, 2016), the '*basic*' concept was recognised as relating to environmental sustainability, specifically stock status, and to MSY.

Comments from interviewees included:

"There isn't an internationally accepted definition for sustainable fisheries; for many people sustainability equals MSY so sustainability is just meeting MSY" (SH38);

"In its simplest form, it's the management of fish stocks for future generations, so essentially we're not overfishing is in the simple management of the stock" (SH11).

Interestingly, this perception of seafood sustainability as simply 'not overfishing' is like public responses for 'sustainable seafood' (Section 4.7.2), discussed further in Chapter Six. However, despite there being no globally recognised definition and lack of agreement on its meaning observed among stakeholders in the seafood supply chain in a study by Lawley et al. (2016), there was wide understanding and acceptance amongst a majority (65%) of interviewees in this study of the '*evolving*' nature of seafood sustainability. Including '*broadening*' of the term beyond environmental and ecological impacts to include recognition of potential issues being

experienced in the seafood supply chain, such as those related to social and economic concerns (as discussed by Bush and Oosterveer, 2019). Interviewees stated:

“The term sustainability has broadened recently. Much broader than when we started” (SH01); “It’s evolving and it’s probably more about delivering transparency to the customer, allowing them to make choice” (SH08); “Well it’s everything from sea to plate” (SH04); “Not just about certification” (SH24).

These observations echo the statement from the United Nations which identifies ‘three pillars’ of sustainability: social, economic and environmental (WCED, 1987). Recognition in this study of the evolving nature of sustainability in relation to the social and economic elements of seafood production mirrors growing concern for lack of attention being given to them (Lout, 2023; Pita and Ford, 2023; Karnad et al., 2021). More vigorous scrutiny of the societal impacts of sustainable fisheries, such as provision of food, employment, income, and nutrition, as well as the social dimensions, such as equity and human rights, highlighted by FAO (2016), is especially important given the nature of the trade in seafood, in particular the length and complexity of seafood supply chains (Malcorps et al., 2021; Watson et al., 2016).

Nevertheless, Tlusty and Thorsen (2017) have suggested that using ‘static’ claims such as ‘sustainable’, risks limiting improvements and adjustment to materialising threats such as from modern day slavery (Tickler et al., 2018) and climate change (Cao et al., 2023). Reflecting upon the definition provided by the WCED for sustainable development in the 1987 Brundtland Report, Tlusty and Thorsen (2017, p. 341) propose a definition of sustainable farmed and wild-caught seafood, as *“the behaviour that drives economic, environmental, and ethical progress towards ensuring seafood availability ‘meets the needs of the present without compromising the ability of future generations to meet their own needs’”*.

60% of interviewees who were asked what the term ‘responsibly sourced’ meant to them (n=42)⁷⁷, indicated understanding of the term, with the majority (64%) of those

⁷⁷ As explained in Chapter 3 (Section 3.14), a semi-structured interview approach was used during this phase of data collection. The flexibility of this methodology allowed questions to be asked in different ways depending on the direction of the interview as determined by interviewees’ experience of a particular topic and other

understanding the term found in the Retailer or Supplier groups. Of the interviewees who indicated little understanding of the term in relation to labelling of seafood products, almost half (47%) comprised of ENGOs and Government and public bodies compared to a small minority (12%) of Suppliers.

In contrast to the view that 'sustainability' is more 'empirical' or 'quantifiable', 'responsibly sourced', was believed to be more about the 'behaviour' or 'action' that can be taken, including the use of tools such as the MCS GFG ratings, to help mitigate reputational risk to a business associated with the sale of unsustainable seafood. This was emphasised by interviewees who stated: *"Responsibility, is the action; sustainable, is the position that you're aiming for, not that you might, you may not ever get there, you know it's a continual improvement game"* (SH26); *"So responsibly sourced would be in terms of looking at where there's risks in the fishery and having actions as to mitigate those risks"* (SH14).

Understanding of the term 'responsibly sourced' by stakeholders conveyed in this study as the 'behaviour' or 'actions', or as defined by the SSC, *"the steps taken by a business during the sourcing of own brand fish and seafood"* (SSC, 2017), and the above definition by Tlusty and Thorsen (2017), supports the concept that responsible behaviour is precursory to seafood sustainability as presented by FAO (2016). Comparisons between interviewee and questionnaire responses for the term 'responsibly sourced' as adopted by the SCC (Section 2.3.6), and used for labelling of seafood by retailers, are discussed further in Chapter Six.

Most (62%) interviewees distinguished between the terms. Of these, 27% made specific reference to the definition for 'responsibly sourced' adopted by the SCC. There was also recognition by those familiar with the SSC definition, that the term is more commonly used for labelling of farmed seafood, with one interviewee commenting: *"Responsible sourcing would be used for aquaculture that [has] met a third-party standard and has chain of custody"* (SH22).

thoughts expressed. This meant not all interviewees were asked the same questions, resulting in variation in sample sizes reported as part of the content analysis in this.

However, it is of note that 38% of interviewees made no distinction between the two terms. Furthermore, the perceptions individuals held regarding the meaning of 'responsibly sourced', ranged from the view that: *"All of the terms are waffle"* (SH33) to: *"So responsible is I think it's about doing the right thing"* (SH29); *"I think the term 'responsible' tends to push everyone to go a bit further"* (SH38).

Considering the FAO (2016) states, *'the concept of responsible fishing is closely related to sustainability'* (p.41), it is perhaps not surprising there was some difficulty in distinguishing between the two terms. However, 'responsibly sourced' used in the context of seafood labelling by UK retailers refers to the behaviour or steps taken by the business to ensure seafood is sourced in compliance with the SSC sourcing codes (SSC, 2021). 'Sustainability' referred to by FAO (2016), is the outcome of behaviour i.e., fishing underpinned by responsible practices determined by the FAO Code of Conduct for Responsible Fisheries which *'recognises the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector'* (FAO, 1995, p.1). Thus, if seafood has been fished (or farmed) responsibly in accordance with the FAO Code, the product can be deemed to be sustainable.

5.4. Importance of sustainability

As discussed in previous chapters, seafood sustainability knowledge is an essential factor influencing the importance of sustainability when purchasing seafood (Lawley et al., 2019; Gunn and Mont, 2014). Accordingly, interviewees were asked why seafood sustainability is important to them. Responses were grouped according to the themes identified by the coding (See Appendix 20) and presented in Table 5.1.

Table 5.1: Summary of interviewee responses regarding why sustainability is important to the various ‘actors’ in the seafood supply chain. Responses are categorised according to actor group (See Figure 3.8).

Responses (n=113/100%)	Business case or interest (n=21/18.5%)	Concern for impact of fishing on planetary, ecosystem health (n=21/18.5%)	Customer expectations, reputation, ‘Doing the right thing’ (n=29/26%)	Perpetuity of stocks for future generations, food nutrition security, (n=17/15%)	Socio-economic, perpetuity of fishing communities (n=7/6%)	It’s my job, interest, passion (n=18/16%)
Actor group (n/%)						
Catching sector (3/6%)	1 (5%)	-	-	-	3 (43%)	-
Cert. scheme (4/8%)	3 (14%)	-	-	3 (17.5%)	1 (14%)	1 (5.5%)
Chefs/Cookery schools/training (4/8%)	2 (9.5%)	3 (14%)	1 (3%)	1 (6%)	-	1 (5.5%)
ENGO/Seafood initiatives (6/12%)	3 (14%)	4 (19%)	3 (10%)	3 (17.5%)	-	-
Food Service (4/8%)	2 (9.5%)	3 (14%)	3 (10%)	2 (12%)	-	3 (17%)
Government and Public Bodies (7/14%)	2 (9.5%)	4 (19%)	2 (7%)	1 (6%)	1 (14%)	1 (5.5%)
Retailer (4/8%)	1 (5%)	1 (5%)	8 (28%)	1 (6%)		1 (5.5%)
Wholesaler, processor, manufacturer or supplier (17/35%)	7 (33%)	6 (29%)	12 (41%)	6 (35%)	2 (29%)	11 (61%)
Total (49/99%)	21 (99.5)	21 (100)	29 (99)	17 (100)	7 (100)	18 (100)
Examples of stakeholder responses	“It’s important to us as a company, it is our ‘lifeblood’ as it were” (SH06)	“there’s innate value in the natural world” (SH02)	“Our customers are asking for it [sustainable seafood]” (SH03)	“Sustainability is, if we don’t have it, what future is there. For ours, and our children’s and, and, for the sea” (SH29)	“It’s, to ensure there is a future for fishing beyond current generations” (SH25)	“It’s important to me because it’s my job. It’s the whole driver for everything that we do” (SH46)
	“It goes without saying that without sustainability within our game, there will be no game” (SH19)	“I think it’s very important in terms of maintaining the health and sustainability of the oceans, which in turn is a major part of the health and maintaining the planet” (SH36)	“It’s our name on the door, they come through and sort of assign all responsibility for all these really tricky, difficult questions to us. If we get it wrong, then they’ll take their business elsewhere” (SH16)	“I enjoy seafood I think nutritionally it’s very valuable. So I think it’s to be shared enjoyed with, with, everybody today and into the future” (SH44)	“[Fishermen] want to ensure that there are sustainable stocks and ecosystems to preserve their way of life for future generations” (SH31)	“I am very much a seafood lover and a diver I wanted to study marine biology, since I was 12. I didn’t think I’d end up in seafood but here I am it’s a very interesting role” (SH35)
	“Sustainability is at the heart of what we do. It is in the interest of all fishing sectors to ensure that our oceans are managed with true sustainability in mind” (SH31)	“a healthy ecosystem ... it’s critical for seafood”(SH49)	“We want to be doing the right thing and be seen to do the right thing” (SH08)	“I think it would be a really huge shame if we missed out on the possibility to harvest seafood sustainably into time” (SH38)	“So sustainability is important because it provides a future for the fishing industry and people to come into the fishing industry and be able to earn a living and feed their families” (SH30)	“For us to be promoting sustainable seafood and making those choices, makes you proud of what you do” (SH47)

Emergent and apriori coding of stakeholder responses found seafood sustainability is perceived by stakeholders as being important for: the perpetuity of **seafood businesses**. The importance of sustainability as a business case for seafood, as the *'lifeblood'* for seafood businesses, was highlighted by 41% of interviewees (n=20), with a third of all responses in the 'Business case or interest' category being provided by the Supplier group. Stakeholders commented, *"It goes without saying that without sustainability within our game, there will be no game"* (SH19); *"Our industry is basically using a natural resource and if you want to continue to use that natural resource, if you don't sustainably manage it, it's not going to be there. It's a simple equation, if you overtake you know from your resource base year on year it's going to diminish"* (SH39); **Planetary or ecosystem health**. Interviewee comments included: *"A healthy ecosystem ... it's critical for seafood"* (SH49); *"Food is coming from the sea, you know so fish are dependent on a healthy ecosystem, over-exploit the population, you're going to end up [with] a smaller, undersized fish, lower value catch"* (SH49).

Further analysis of responses suggests the importance of sustainability for the groups: Supplier (41%); and Retailer (28%) is likely driven by maintaining the reputation of their brand and meeting **customer expectations** of them *'doing the right thing'*. The importance for brand image of driving positive social change for these types of businesses is observed in other studies (Gunn and Mont, 2014; George, 2013). Interviewees commented, *"We want to be doing the right thing and be seen to do the right thing"* (SH08); *"Our customers want to see, our shareholders as well, we have an obligation to be doing the right thing"* (SH11); *"Our customers are asking for it [sustainable seafood]"* (SH03); availability of seafood for **future generations**, for example, stakeholders commented, *"Sustainability is, if we don't have it, what future is there. For ours, and our children's and, and, for the sea"* (SH29); *"I enjoy seafood I think nutritionally it's very valuable. So, I think it's to be shared, enjoyed with, with everybody today and into the future"* (SH44); *"It's about ensuring healthy fish stocks, not just for now but for the future, for our children and grandchildren"* (SH27).

Sustainability was regarded as important by all stakeholders in the catching sector (6% of interviewees) for the endurance of **fishing communities**, for the socioeconomic benefits to fishing communities associated with healthy and well managed and sustainable stocks. Interviewees comments included: *"It's, to ensure there is a future for fishing beyond current generations"* (SH25); *"Well it's important to our men because they fish, where they live"*

(SH45); as well as recognition of sustainability as integral to certain **stakeholder's roles**. Recognition by stakeholders in the Supplier group of the importance of sustainability as an essential part of their role as '*Seafood professionals*', was reflected by most interviewees (61%) in this group referring to seafood sustainability as their job. Interviewees commented, "*It's important to me because it's my job. It's the whole driver for everything that we do*" (SH46); "*It's just been my entire role, really*" (SH01); "*For us to be promoting sustainable seafood and making those choices, makes you proud of what you do*" (SH47).

5.5. Availability of sustainable seafood in the UK

To better understand perceptions of the sustainable seafood market and the availability of sustainable seafood in the UK, interviewees were asked about the main drivers and potential barriers relating to the availability of sustainable seafood and the challenges, if any, it presents for the seafood industry.

Responses were categorised according to their relevance to the five emerging and overarching themes: ***Sustainable market access and leadership; Consumer awareness, knowledge, and priorities; Seafood culture, values, and perceptions; Governance, policy and enforcement;*** and ***Media and adverse publicity*** (See Appendix 20). An analysis of interviewees responses is presented in Table 5.2 and in the discussion and figures in the following sections. Also see Appendix 31 for further detailed presentation of themes and subthemes.

Table 5.2: Analysis and summary of interviewee responses for main drivers and barriers influencing the availability of sustainable seafood in the UK (n= 426).

All theme responses (n=426/100%)	Sustainable fisheries leadership and market access (n= 167/39%)	Consumer awareness, knowledge, and priorities (n=111/26%)	Seafood culture, values and perceptions (n=72/17%)	Governance, policy and enforcement (n=32/8%)	Media and adverse publicity (n= 44/10%)
Actor group (n/% of interviewees)					
Catching sector (3/6%)	6/4%	0/0%	5/7%	3/9%	4/9%
Cert. scheme (4/8%)	15/9%	9/8%	3/4%	2/6%	3/7%
Chefs/Cookery schools/training (4/8%)	13/8%	12/11%	9/13%	-	4/9%
ENGO/Seafood initiatives (6/12%)	21/13%	11/10%	9/13%	4/13%	3/7%
Food Service (4/8%)	16/10%	7/6%	8/11%	1/3%	4/9%
Government and Public Bodies (7/14%)	17/10%	19/17%	11/15%	11/34%	8/18%
Retailer (4/8%)	17/10%	14/13%	4/6%	5/16%	4/9%
Wholesaler, processor, manufacturer or supplier (17/35%)	62/37%	39/35%	23/32%	6/19%	14/32%

Examples of stakeholder responses	<p>"The biggest targets we've got are the big buyers of seafood, if you can get one of them, making a decision then it impacts all consumers" (SH01)</p>	<p>"Customers purchasing and relationship with retailers is underpinned by an expectation that we are you know undertaking responsible practices, sourcing responsibly, even if it doesn't say on the packaging, that's just an inherent expectation" (SH24)</p>	<p>"There is a disconnect between the value of species in the ecosystem and the value of species in the supermarket" (SH38)</p>	<p>"Essentially there's a lack of really well funded monitoring and enforcement mechanisms" (SH02)</p>	<p>"I think some of the things like the Seaspiracy documentary and this confusion around what is sustainable fish, is it even possible to have sustainable fish" (SH03)</p>
	<p>"I think the main driver is the retailer and the food service sector, trying to do the right thing on behalf of their customers" (SH44)</p>	<p>"I think there are risks of some claims on packaging maybe being interpreted as being more sustainable than they are" (SH32)</p>	<p>"It's easier to get fish that has been flown halfway across the world than it is to get locally sourced crab or lobster" (SH46)</p>	<p>"It's a lack of will from Government, absolute lack of will and lack of interest" (SH13)</p>	<p>"I think there is confusion in many customer's minds about what is true sustainability. I think it [Seaspiracy] has raised a huge amount of doubt in customers' minds around what certification actually means" (SH08)</p>
	<p>"I think the problem is that a lot of bulk seafood production isn't all that sustainable, the most sustainable seafood is often quite niche and quite small-scale" (SH15)</p>	<p>"Consumer awareness and voting with their wallets" (SH29)</p>	<p>"I don't think we have a kind of a culture or a perception about just how critical good food is" (SH48)</p>	<p>"I don't think it's up to the consumer, it shouldn't be up to us. We should have a Government that is thinking about our needs and our planetary needs" (SH33)</p>	<p>"Whilst the accessibility of information to inform "good" choices is improving there is an "echo chamber" effect with social media and the mainstream media which can mean many initiatives are "preaching to the converted." (SH43)</p>

5.5.1. Sustainable fisheries leadership and market access

When asked about the main drivers (positive or negative) for the availability of sustainable seafood, access to sustainable seafood markets, market forces (i.e., sustainable seafood supply and customer demand), and leadership within those markets, were highlighted as important. See Figure 5.1. for a summary of leadership themes revealed in the interviews and discussed below.

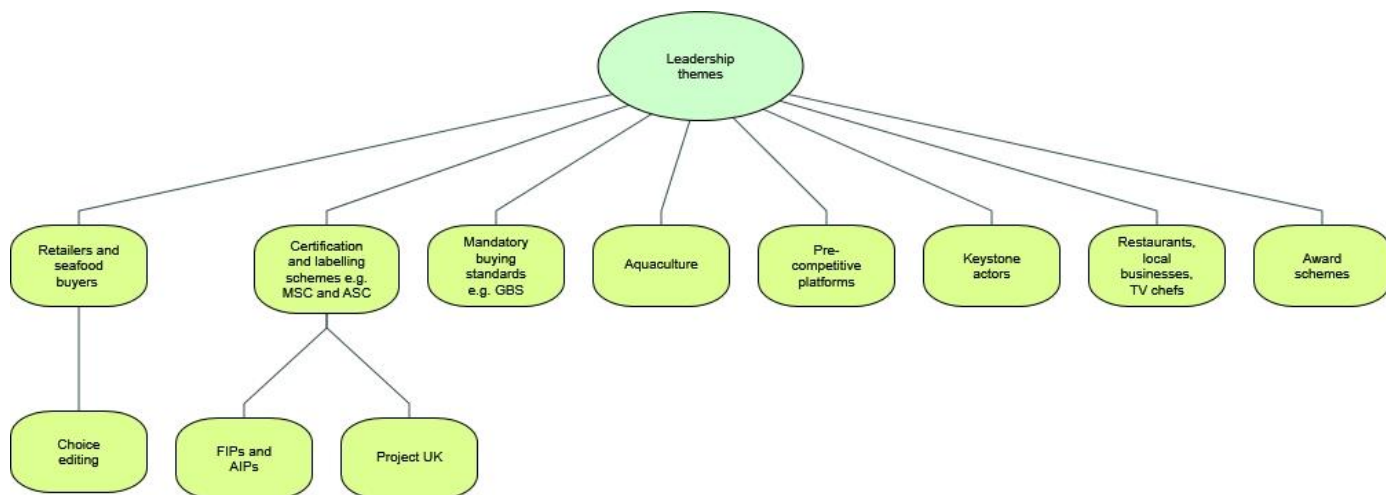


Figure 5.1: A summary of leadership themes highlighted in stakeholder interviews as important for increasing the availability and access to sustainable seafood in the UK.

Retailers and **Seafood buyers** were acknowledged by 51% of interviewees (n= 25) as providing leadership and one of the main drivers for businesses voluntarily supplying sustainable seafood. Interviewees comments included: *“I think the main driver is the retailer and the food service sector, trying to do the right thing on behalf of their customers”* (SH44); *“Certainly in the UK retailers [are] saying we are doing the right thing, we are a responsible retailer, we have a responsible sourcing policy”* (SH26). Specifically, the importance of **Choice editing** by seafood buyers, retailers, and food service in increasing the sustainability of seafood supply to UK consumers was referred to by 22% of interviewees (n=11). Interviewees stated:

“Whether you are eating out or whether you’re going to shop you can only buy what is on the shelf, so the choice editing that is carried out by the food service companies and the retailers is probably the most important driver of enabling the purchase of sustainable seafood at the

consumer level” (SH12); “Consumers can only choose from the offer put in front of them, what’s on the menu in a foodservice outlet, they can only choose from that” (SH11).

Similarly, a study carried out by the Sustainable Consumption Roundtable (SCR) found that choice editing by Government and business is critical for reshaping the market (SCR, 2006b). Choice editing is designed to help ‘norm’ sustainable consumption by reducing opportunities for consumers buying unsustainable and damaging goods by their removal from sale (Gjerris et al., 2016; SDC, 2011). See Figure 5.2. below for aspects of choice editing highlighted by the interviews.

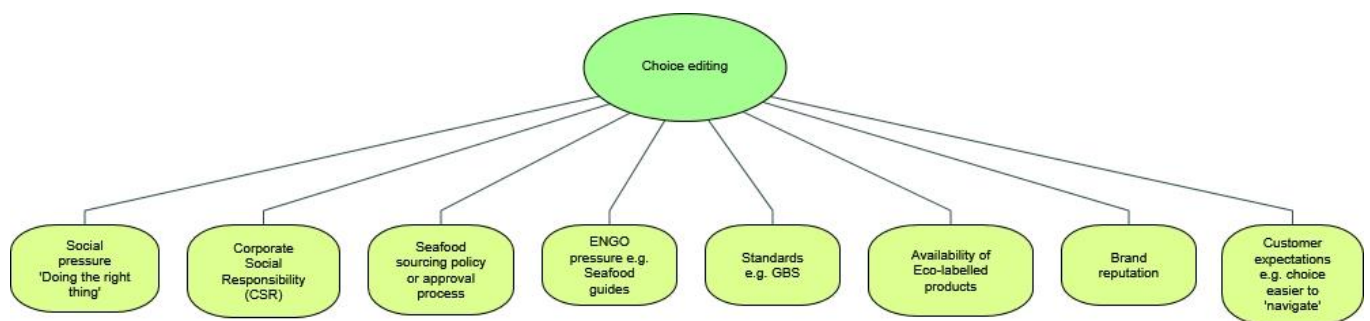


Figure 5.2: Aspects of choice editing highlighted by the stakeholder interviews.

Relating to choice editing, it should be noted that following recommendations by the SCR (2006) to stimulate demand for sustainable seafood, and pressure from the NGO Sustain, the UK Government adopted a mandatory buying standard (**GBS**) in June 2011 for procurement of fish for public-sector food and catering services (See Appendix 5). Directly related to the MCS FFG ratings, the GBS prohibits the use of MCS Fish to Avoid by caterers for all central Government departments and executive agencies, including prisons, armed forces, Ministry of Defence (MOD), and NHS England (Defra, 2011). Public-sector catering outlets provide 33% of UK meals (Carmichael, 2019). In 2019, the GBS positively influenced the sustainability of fish served in meals to 141 million NHS England inpatients, 93 million prison meals (Shelley, 2020), and meals served to around 193,000 UK Forces Service Personnel in 2020 (Gov.UK, 2020). Despite the impact of this standard, it was mentioned by only 4% of interviewees. Interviewees commented, “Mandating public sector organizations [to] have to buy MSC certified fish, I believe has driven that to be a more commonplace offering” (SH36); “There are standards in place. So that’s creating sustainable seafood as the norm in fish in some sectors.

So, you've got the government buying standards that means that sustainable fish should be served in the public sector" (SH13).

Recognition of this initiative by only a small number of interviewees suggests the GBS needs to be promoted to help increase awareness of it and the integration of the MCS GFG advice into it.

In addition, following the publication in 2002 of the MCS GFG 'Top 20 species to be avoided' (Clarke, 2002) and the first seafood sustainability supermarket league table in the UK in 2006 (Lawrence, 2006), MCS has '*sought to exert influence over the major multiple retailers' seafood sourcing policies through frequent supermarket surveys'* (Mitchell, 2011, p.441). In response supermarkets voluntarily removed from sale or 'delisted' species identified as over-exploited or biologically vulnerable. For example, Marks and Spencer delisted swordfish *Xiphias gladius*, bigeye tuna *Thunnus obesus* and Atlantic halibut *Hippoglossus hippoglossus*, whilst Waitrose notably removed orange roughy *Hoplosthesus atlanticus* (Cherry, 2006), a highly vulnerable and deep-water species, from its offer. ENGOs such as MCS have also been influential in persuading chefs to follow their recommendations and remove endangered species from their menus thus delegating them as '*agents of change*' in support of sustainable seafood (De La Lama et al., 2018). For example, leading Chef, Gordon Ramsay, withdrew Bluefin tuna *Thunnus thynnus* from his London restaurants menus and replaced it with less endangered yellowfin tuna *Thunnus albacares* (MailOnline, 2007). Gunn and Mont (2014), however, suggest that in response to pressure from ENGO campaigns and the media, retailers remove unsustainable seafood from their offer in order to protect their brand image but are unlikely to carry out choice editing where they see no 'added brand value'. As discussed in Section 5.4, this study found maintaining brand reputation is key in driving the importance of sustainability for retailers and seafood suppliers.

As well as choice editing carried out by retailers in line with MCS GFG and other ENGO advice to prevent the sale of endangered and vulnerable species, the importance of the contribution made by the **MSC** to increasing the availability of sustainable seafood to consumers in the UK was highlighted by 67% of interviewees (n=33). While this was recognised by all stakeholder

groups, 33% of interviewees were representatives of the Supplier group and 15% the ENGO/Seafood initiative group. For example, interviewees stated: *“So I think the main drivers pushing forward, you know labelling schemes and that kind of thing”* (SH31); *“I think the availability of labelled seafood is getting better. And I think there are increasing numbers of people who recognise that and seek that out”* (SH15); *“As soon as you say we work with MSC, they understand that we're working towards sustainability or we're working responsibly as an industry”* (SH34).

These findings echo earlier studies, identifying the role of choice editing and the influence of the MSC as key factors driving the availability of sustainable seafood in the UK (Honkanen and Young, 2015; Mitchell, 2011). As further recognition of MSC leadership it is worth noting that in order to meet demand, increase sustainability in the seafood supply chain, and reduce the reputational risks to buyers of sourcing unsustainable seafood, many UK seafood businesses and retailers have committed to sourcing only certified seafood. Seafood may be MSC certified or certified by other organisations recognised by the GSSI. Alternatively, seafood from fisheries or farms in ‘recognised’ **FIPs**, referred to by 37% of interviewees in the course of the interviews, in particular representatives from the Retailer (22%) and Supplier (56%) groups, or **Aquaculture Fishery Projects (AIPs)**, which are often fisheries that have completed a MSC pre-assessment, or are in transition towards MSC (or ASC) certification (MSC, 2022b) is also being preferentially sourced (See Appendix 33). In relation to MCS’s recognition of FIPs (and AIPs) in its methodologies, one interviewee commented: *“I know that recently the Guide [MCS GFG] has started awarding an additional half point for a red-rated source that is in a credible FIP and I kind of welcome that as an acknowledgment that if it weren’t for the efforts of multiple retailers often working together in pre-competitive platforms to drive improvements then the sellers of those products would simply sell into a vacuum where there was no pressure to improve”* (SH12).

In 2017 MCS introduced an ‘improving’ rating, a rating between 4 and 5, to indicate fish which have been assessed and rated 5 (red) by MCS due to significant environmental concerns yet ‘credible’ efforts to improve the fishery (or farming system) have been agreed through a

Fisheries (or Aquaculture) Improvement Project (a FIP or an AIP)⁷⁸. MCS believe that by identifying fish from fisheries or farms in this way, and not recommending avoiding them, it is possible to stimulate environmental improvements in the fishery or farming system and so provide an incentive for businesses to support such projects ⁷⁹. FIPs are evaluated by the SFP and published online at Fisheries Progress.org (See discussion below on pre-competitive platforms). Similarly, the ASC, SFP and Seafood Watch have partnered to drive improvements in aquaculture (Iseal, 2023).

However, despite the importance of MSC certification as a key driver for the availability in the UK (and other countries) of sustainable wild-caught seafood, currently only 14% of the global marine wild catch is certified to the MSC standard for sustainable fisheries (MSC, 2021a). In 2020/21 UK consumers spent an estimated £1.25 billion on MSC labelled fish and seafood, an increase of 16% on the previous year, with the number of MSC certified consumer-facing products in the UK doubling between 2015 and 2020 to around 1,600 (Project UK, 2021). With a third of all fish and seafood products sold in the UK retail sector carrying the MSC logo (MSC, 2020a), representing around half of all wild seafood sold by UK retailers (George Clark, MSC, May 2021, *Pers. Comm.*), availability to the UK consumer of MSC certified seafood is considerable.

Nevertheless, the MSC label is not without controversy. The *On the Hook* campaign, was launched in August 2017 to address “*growing concerns amongst many conservationists, academics and ocean advocates that the Marine Stewardship Council eco-labelling program was, and is, failing to deliver its goal of ‘oceans teeming with life’*” (On the Hook, 2023). As a result of the campaign and following an independent review by the Environmental Audit Committee (UK Parliament, 2019), specific criticisms of the MSC were identified as: Unit of Assessment; the holistic assessment of fisheries; carbon emissions from fishing boats; shark

⁷⁸ For a FIP (or AIP) to be considered by MCS in its ratings assessments it should be at a point corresponding to Stage 3 or more of the Conservation Alliance for Seafood Solutions (CASS) Fisheries Improvement Guidelines ⁷⁸, available at <https://solutionsforseafood.org/our-work/fishery-improvement-projects-guidelines/>, or equivalent (MCS, 2018b, p.16).

⁷⁹ See www.fisheryprogress.org for a list of projects.

finning; and barriers to entry for small scale fisheries. Apart from carbon emissions, all these concerns are being addressed. 'Compartmentalisation', the practice of fishing vessels using certified and non-certified fishing methods while utilising the same gear type will be phased out by 2023 (Daly, 2020). Concerns for human rights abuses, including forced and child labour in seafood supply chains (ILRF, 2019), and more recently, the death of an observer at sea on a tuna purse seiner vessel on a voyage from the MSC certified Parties to the Nauru Agreement (PNA) skipjack and yellowfin free school tuna fishery in the Western and Central Pacific Ocean (HRAS, 2020; MSC, 2020b), have also been raised by human rights and environmental groups. In 2022 *On the Hook* launched its own review of the MSC (On the Hook, 2022). Further criticisms of the programme are its exclusion of social sustainability principles and criterion (Teh et al., 2019; Hadjimichael and Hegland, 2016) and lack of penetration of the label in markets in low-income countries (Penca, 2020). A critical analysis of MSC certified fisheries carried out by the French NGO, Bloom, showed that 83% of MSC-certified catches between 2009 and 2017 are taken in 'industrial fisheries' compared to only 7% by 'small-scale coastal fisheries'. Industrial fisheries use 'active' and impactful methods such as bottom trawling and dredging in contrast to coastal fisheries, made up of vessels of less than 12 meters long, use of 'passive' fishing gears such as hooks and lines (Le Manach et al., 2020).

Despite these and other concerns for the marketing of MSC seafood as the 'best environmental choice in seafood' (Christian et al., 2013), the MCS GFG (*'Top Tips' for buying seafood*) recommends ecolabeled seafood, including seafood certified by either the MSC (or ASC), as a 'better environmental choice' (MCS, 2023c). For example, in a study comparing the status and abundance trends of certified stocks with uncertified stocks, MSC certified seafood was found to be 3-5 times less likely to be subject to overfishing than uncertified seafood (Gutiérrez et al., 2012). The MSC aims 'to contribute to the health of the world's oceans by recognising and rewarding sustainable fishing practices' (MSC, 2022c). Accordingly, incentives for fisheries to join the programme have been identified as a desire to improve the sustainability credentials of the fishery and economic motive (Van Putten et al., 2020; Blomquist et al., 2015). The MSC logo also guarantees full traceability from 'ocean to plate' for any seafood product displaying it (Arton et al., 2020). Whilst MSC certification is currently acknowledged, including by MCS, as the best available option for wild-caught seafood,

scrutiny of MSC certified fisheries suggests improvements, some of them ongoing, are needed for them to be universally accepted as sustainable fisheries.

The role of farming fish in the supply of seafood to the market was recognised by 41% of interviewees mentioning **aquaculture**, and 18% the **ASC**, during the interviews. Interviewees commented: *“One thing that the consumer isn't I don't think getting a clear signal on is this the role of aquaculture in providing more seafood”* (SH44); *“A lot of our customers don't know half the fish we sell is farmed, so something like the ASC label, very little recognition of that in the UK marketplace”* (SH26).

Although public understanding of the importance of the role of aquaculture in the supply of seafood is perceived by some interviewees as low, it is the fastest food production sector (Gamble et al., 2021; Bush et al., 2021), with more than half (52%) of seafood produced globally for human consumption from aquaculture, the production of seafood in fresh and salt water, rather than from wild-capture fisheries (FAO, 2020). Among concerns for the sustainability of seafood produced in aquaculture is its dependency on the harvesting of wild fisheries to produce feed for farming fish (Naylor, 2009). Around 18 Mt, representing 10% of global fish production in 2018 (FAO,2020), of the world's fisheries is used to produce fishmeal and oil, including the reduction of species which some argue could be better allocated to human consumption (Willer et al., 2022; The Changing Markets Foundation and CIWF, 2019). The volume of fishmeal and oil used to produce animal feed is however reducing as use of by-products of fish processing increases, currently estimated at 25-35%, with some regions (e.g., the EU) comparatively higher (FAO, 2020). In contrast to other 'controversial' ingredients in farmed animal feed, 49% of the average global production of marine ingredients has been certified in the last five years (MarinTrust, 2021), compared to around 19% of global palm oil production (RSPO, 2023) and around 2-3% of all soya production (Neate and Tholen, 2013).

The most popular metric for assessing efficiency, and thus the impact of using marine feed ingredients on wild stocks, is the *'Fish-in-Fish-Out'* (FIFO) ratio (Kok et al., 2020). Results of the study carried out by Kok et al. (2020) show that while salmon and trout aquaculture are 'net neutral' i.e., produce as much fish biomass as is consumed, most aquaculture species

groups assessed in the study are net producers of fish, and that overall, global fed-aquaculture currently produces three to four times as much fish as it consumes. As suggested by one interviewee, *“It’s the true loaves and fish’s story!”* (SH39). Despite the exponential growth of ASC certified seafood in recent years (ASC, 2022a), the ASC and the GAA-BAP standard, the two largest certification groups, account for only 3% of global aquaculture production (Naylor et al., 2021). However, efforts by aquaculture certifiers (See Chapters 2, 3 and 4) are raising awareness of the contribution of responsible aquaculture to increasing the sustainability of farmed seafood (Troell et al., 2023; ASC, 2022b).

The emergence of ***pre-competitive platforms***⁸⁰ (CEA Consulting, 2021; Caveen et al., 2017), mentioned by a small proportion of interviewees (8%), predominantly from the Retailer and Supplier groups (75%), were also identified as important in helping drive improvements in fisheries management and in increasing traceability and transparency in the seafood supply chain. One interviewee stated, *“That’s where the pre-certification space and the support for fishery improvement projects and fisheries aiming to attain a level of sustainability is, you know [there is] really strong evidence that retailers are working hard to facilitate that”* (SH22).

Support by these groups for pre-competitive platforms is unsurprising given their involvement with this type of initiative. Collaborations such as the Global Tuna Alliance⁸¹, the SFP⁸², the SSC⁸³, the GDST⁸⁴, the Seafood Ethics Action Alliance⁸⁵, the GSSI, and the North Atlantic Pelagic Advocacy Group⁸⁶, are among the increasing number of organisations involved (CEA Consulting, 2021).

⁸⁰ Sustainable seafood pre-competitive platforms or ‘roundtable’ debate engage businesses across the supply chain as members to provide opportunity for sharing knowledge; collecting data; and/or funding projects such as FIPs (CEA, 2021)

⁸¹ <https://www.globaltunaalliance.com/>

⁸² <https://sustainablefish.org/>

⁸³ <https://www.sustainableseafoodcoalition.org/>

⁸⁴ <https://traceability-dialogue.org/>

⁸⁵ <https://www.seafish.org/responsible-sourcing/social-responsibility-in-seafood/seafood-ethics-action-alliance/>

⁸⁶ <https://www.seafish.org/responsible-sourcing/uk-fisheries-management-and-supply-chain-initiatives/north-atlantic-pelagic-advocacy-group/>

The importance of **Keystone actors**⁸⁷ (Osterblom et al., 2015) within the supply chain for driving ‘sustainable leadership’ and ‘transformational’ sustainability at scale (Kittinger et al., 2021; Osterblom et al., 2017) was highlighted as critical to the availability of sustainable seafood to consumers worldwide and in the UK by one (2%) interviewee who stated: *“I think the one I would probably flag up that has the most probability of effecting change more rapidly than anyone else would be [the Seafood Business for Ocean Stewardship] SeaBOS”*(SH19). Despite the contribution being made to increasing global seafood sustainability by scientific partnerships such as SeaBOS (See for example, Gephart et al., 2021; Rudolp et al., 2020; Penca, 2020), only one interviewee referred to this initiative⁸⁸ as a driver for change in the supply chain which suggests wider discussion of the activities of these types of partnerships is required.

Restaurants, local businesses, and TV chefs, referred to by 12% of interviewees, predominantly from these sectors (83%), were also identified as positive drivers for increasing the availability of sustainable seafood in the UK. For example, one interviewee stated: *“Look at the popularity of TV programmes, chef of the year and all of that, I mean there’s that many of them... It’s not just the TV celebrities that are important it’s about what the local people are doing on the ground”* (SH09), while others highlighted the potential influence of these individuals commenting: *“I think the people that could actually influence perceptions or whatever and choices, there are a few occasions when you can engage a consumer or whatever and places like restaurants could do it much better... stuff like Hugh Fearnley-Whittingstall’s ‘Fish Fight’ was very good at getting across some of those slightly hidden stories”*(SH10); *“the way that it’s presented on TV, so a lot of it’s going to be celebrity chefs will have a positive impact”* (SH04).

⁸⁷ Keystone actors e.g., seafood corporations are defined by the following characteristics: ‘they dominate global production revenues and volumes within a particular sector; control globally relevant segments of production; connect ecosystems globally through subsidiaries; and influence global governance processes and institutions’ (Osterblom et al., 2015).

⁸⁸ <https://seabos.org/>

Award schemes and competitions, such as the National Fish and Chip award ⁸⁹, were mentioned by 6% of interviewees, all of them with direct experience of the schemes, as providing ‘leadership’ to transform the sector. Interviewees comments included: *“The National fish and chip awards has transformed that industry because the top, the industry leaders, others follow”* (SH09); *“I think our award process played a big part in it because it got to the stage where you have to be MSC certified to stand a chance in the awards, so you have to have some sort, or at least prove that you, your fish is sustainable”* (SH34).

Barriers identified in the interviews to accessing sustainable seafood markets are summarised in Figure 5.3. and discussed in the following paragraphs.

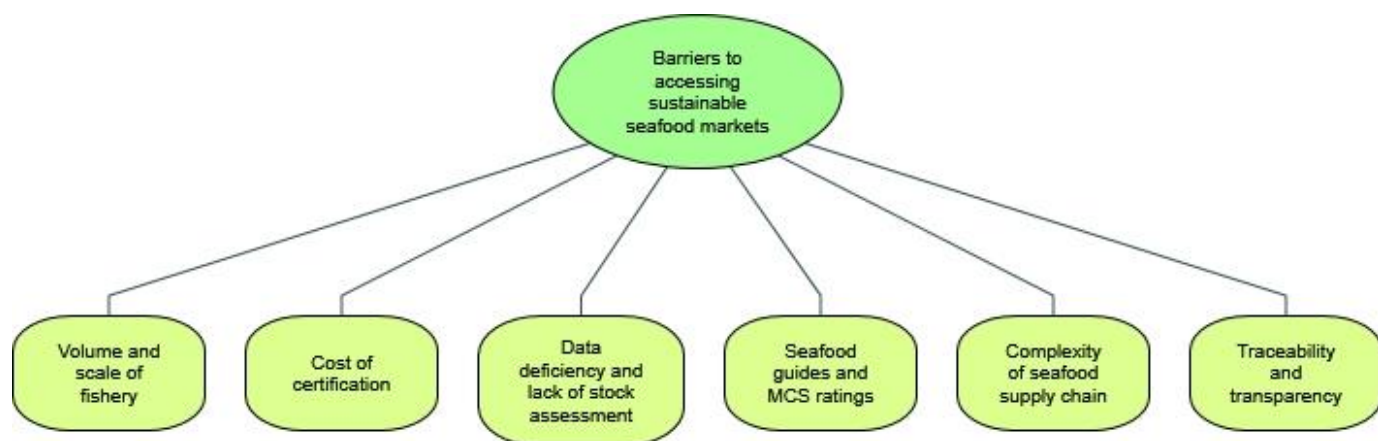


Figure 5.3: A summary of barriers to accessing sustainable seafood markets highlighted in stakeholder interviews.

The **volume** and **scale of fisheries** including the **cost of certification** for small-scale fishermen especially was identified by 22% of interviewees, mainly from the Supplier group (45%), as a barrier to accessing markets for sustainable seafood. Interviewees commented: *“The problem, is that a lot of bulk seafood production isn't all that sustainable and the most sustainable seafood is often quite niche and quite small scale. And when, you know, when you're looking at large, large supermarkets being involved in seafood, you know the quantities*

⁸⁹ The National Fish and Chip award was presented by Seafish (<https://www.seafish.org/promoting-seafood/the-national-fish-chip-awards/>) until recently and now by the National Federation of Fish Friers (NFFF) (<https://www.nfff.co.uk/>), the official body representing the fish and chip industry.

required are really high, which often doesn't lend itself to sustainability” (SH15); “Fishery size is a particular barrier now, as certification costs go up and you need a certain scale of fishery to support that year on year and that precludes a lot smaller scale fisheries” (SH25).

Preferences by processors and retailers for reliable and high volume supplies of ‘uniform’ size and shape fish, was also suggested as creating unfair competitiveness within the market, making it challenging for many small-scale producers, with one interviewee commenting: *“The model for processing is geared around the significant landings of one species, ideally of one size and one shape, so that people can whip through it on the processing, go through filleting machines, of course that does not lend itself to the type of fishing small-scale fishers [do]” (SH05).*

This is evidenced, for example, in the fact that an estimated 93% of Pollock sold in UK supermarkets carries the MSC ecolabel (MSC, 2021b). The fishery for Alaska or Walleye Pollock *Gadus chalcogrammus* is one of the most valuable globally (NOAA, 2023), with catches ranked second only to anchoveta at 3.4 Mt in 2018 (FAO, 2020), and the largest fishery by volume in the MSC program (MSC, 2021a). One interviewee commented on the implications of this approach to the UK fishing industry, stating: *“Something like Alaskan Pollock, generally we sort of see a trend of moving into that fishery and away from a lot of other wild caught species, simply because it's a very high capacity, high volume, general, low grade white fish that is versatile. OK, well, let's not support our UK, local fishing industry, but let's support the globalised Alaskan Pollock, Russian-caught, MSC-certified fish, that's been reprocessed in China!” (SH17).*

Data deficiency and **lack of stock assessment** was referred to by 12% of interviewees as a barrier to fisheries being recognised as sustainable and them accessing sustainable seafood markets. Representatives from the Retailer and Government and Public Bodies groups commented equally (33%). One interviewee commented: *“Data deficiency would probably be the other big one down here [in the Southwest of England]. Many of the fisheries probably, 50% by value, do not have a stock assessment and often they, it's very hard, then to convince people that, that they're sustainable” (SH25).* Another commented, *“There are also data*

issues. In the UK particularly, you know, they've not bothered funding full stock assessments for the fisheries that really need them" (SH13).

To overcome these and other barriers presented by environmental impacts, or lack of management, and increase the availability of local and sustainably produced fish in the UK, **Project UK**⁹⁰ (See Figure 5.1 above) was established. Project UK is a collaboration between the fishing industry, scientists, NGOs and the seafood supply chain, mentioned by 18% of interviewees. The collaboration is working towards "*an environmentally sustainable future for UK fisheries through the implementation of credible Fishery Improvement Projects*" (Project UK, 2021 and 2022). The project encompasses 12 fisheries, through eight FIPs, selected by the supply chain for their '*commercial, economic, and cultural benefits to UK communities*' (Project UK, 2023).

In the context of data deficiency and the barrier it presents for fisheries accessing sustainable seafood markets, **MCS ratings**, and seafood guides more generally, were mentioned by 12% of interviewees as a potential challenge for some UK fisheries given their anticipated inability to meet recognised or 'traditional' sustainability criteria. Interviewees comments included, "*There's a real potential that some ratings, including MCS, actually become a barrier to market*" (SH17); "*Now that Brexit's happened it will be interesting to see [how] the MCS ratings in UK waters will change over the forth coming years*" (SH11).

Concern was expressed for 'small' and 'disparate' fisheries, not currently involved in the Project UK process, who might struggle to access domestic markets post Brexit. One interviewee stated:

"Here is a sector that has got challenges meeting sustainability definitions in the traditional sense, you know some of them have been swept up by Project UK improvement initiatives, but some of them are too small or too disparate for that ... but we [retailers, suppliers etc.] can help you find a market here in the UK so that you can invest in your business and you can improve, then if you have someone else saying to the consumer don't buy this fish because it is not sustainable you've got a conflict, a mixed message" (SH12).

⁹⁰ <https://www.projectukfisheries.co.uk/>

These worries are further highlighted by a recent update of the MCS GFG, in which many crab and lobster fisheries in Scotland were rated as Fish to Avoid due to poor management, lack of data, and in the case of pot fisheries, potential entanglement of whales in mooring ropes attached to crab and lobster pots (McVeigh, 2022). In a statement published by Seafish in response to the change in ratings, agitation was expressed for the lack of recognition of the active management underway in many of the fisheries 'down rated' by the MCS GFG (Lart et al., 2022). The response also acknowledged that whilst entanglement of whales in static gear is a problem, 'the best available scientific data suggests that entanglements of minke whales in potting gear in Scottish waters is an extremely rare event', with less than 0.017 % of the total North Atlantic minke whale population (around 30 animals), affected annually (Martin, 2022). Squid caught in the UK has also been recently added to the MCS Red list (Martin, 2021) due to lack of management and stock assessment despite the increasing abundance of some species in UK waters because of ocean warming (Oesterwind et al., 2020; Van der Kooij et al., 2016). Other studies (WWF, 2022) recognise the challenge of potential loss to livelihoods for small-scale local fisheries that are red-rated in seafood sustainability guides.

The perceived **challenges** communicated by interviewees for the industry for sourcing seafood sustainably, especially wild-caught fish, were attributed to the '**complexity**' of the seafood supply chain, mentioned by 29% of interviewees. Comments were mainly from those in the Supplier (36%) and Retailer (21%) groups. This is to be expected given their roles in sourcing seafood sustainably in a globalised market. Complexities included reference to the '*biological nature*' of the resource; the perception of it generally as '*wild*' and '*hunted*'; and the '*diversity*' inherent in an industry which by its nature is '*ever changing*'. Interviewees comments included: "*The first thing is that it is a really complex, multi connected, interconnected supply chain*" (SH48); "*It's such a big issue from the food that we eat to the marine life that we are destroying, to the livelihoods that rely on it, to corruption on a global scale, and it [is]really challenging to try and have a fish range that is sustainable*" (SH27); "*The biggest challenge we have is the sheer diversity and complexity of the seafood industry*" (SH12).

These challenges, especially the complexity of global supply chains, highlighted by interviewees in this study, reflect those commonly associated with seafood and observed in

the literature (Christiansen et al., 2018; Lewis and Boyle, 2017). Lack of visibility associated with the *'over the horizon nature of the industry'*, and traceability, intrinsic in a commodity which is highly globally traded (Kroetz et al., 2020) were cited as problematic.

Traceability and transparency were mentioned by 31% of interviewees, again, particularly from the Supplier (27%) and Retailer (27%) groups, as a barrier to increasing the availability of sustainable seafood in the UK. Interviewees comments included:

"The level of traceability and visibility that you need can be a challenge in terms of available technology in a such a diverse and widely and globally traded commodity" (SH40);

"The other thing that you'll hear I'm sure pop up time and time again, is the traceability components, you know we're dealing with the last kind of wild caught, you know hunted component of that" (SH24);

"The other factor which makes it particularly challenging is that in wild capture fisheries the majority of the production cycle takes place on the sea beyond the horizon far from the rest of the supply chain being able to see what is happening" (SH12).

Recent years have seen increasing emphasis on traceability within the fishing sector to meet legal requirements for the importation of seafood such as those imposed by the EU IUU Regulation (Sumaila, 2019) and, according to Bhatt et al. (2017), respond to the demand from consumers for *'verifiable information on the source, quality, and safety of the products'*. Accordingly, various initiatives to increase traceability in the seafood supply chain have been developed (Lewis and Boyle, 2017), although the length and complexity of seafood supply chains makes this challenging compared with other produce (Love et al., 2021). Traceability is further exacerbated by a lack of fully digital or documented systems worldwide, including in Europe and in the UK (Bradley et al., 2019), which means it is very difficult to trace fish, whether that be an individual or a box of fish, the whole way through the system, from 'sea to plate'. This was commented on by one interviewee who stated that:

"The ability of a fisher to record the exact details of the catching of the fish is complicated. That system has been very paper based and so recording that system right through, recording that fish the whole way through a paper trail is really an outdated way to do things. We don't

yet have a fully digital or fully documented system and that makes it difficult to analyse the traceability of a fish through the system” (SH48).

This is not an unrecognised challenge, and efforts to address the issues inherent within traceability of seafood are underway. For example, the use of Blockchain technology (BCT), traditionally used in agrifood supply chains, is being applied to increasing traceability in seafood supply chains (Hixon et al., 2021; Fortuna and Risso, 2019). Blockchain, a technology known as Distributed Ledger Technology (DLT), is a software tool based on a common database which is shared among all participants in the supply chain (Patelli and Mandrioli, 2020). *When “applied to the food supply chain it will allow for the storage of a wide range of data, from GPS coordinates of where fish were caught to the batch number of a fish produced through aquaculture” (Gopi et al., 2019, p. 299).*

The proposed advantages of using BCT are that by allowing information about the product to be entered securely into a database by participants along the supply chain, it creates digital traceability, removing the need for a paper-based system (Patelli and Mandrioli, 2020). The information is made available to the consumer, allowing them to make an informed decision about their fish purchase (Gopi et al., 2019). The disadvantages of using BCT are that information must be input at every stage of the supply chain and additional tests must be used to verify that the information supplied is correct for it to be effective (Gopi et al., 2019). For example, DNA profiling can be used to differentiate between species and production methods in situations where substitutions are made for less valuable species, or wild-caught fish substituted with farmed, or vice versa (Pardo and Jiménez, 2020; Gopi et al., 2019; Khaksar et al., 2015). The potential increased cost to the consumer of products with digital traceability is also a disadvantage (Patelli and Mandrioli, 2020). However, the main barrier identified by Hardt et al. (2017) to using digital traceability is ‘*interoperability*’ i.e., the capability to share, explain and understand data. According to Bhatt et al. (2017), effective interoperability requires IT systems in use by businesses along the seafood supply chain to share ‘*a common blueprint or framework*’ which does not currently exist across the global seafood sector. Seafood industry groups such as GDST (See above and Section 2.4.2) are however working to address challenges related to seafood traceability and data sharing interoperability (GDST, 2016).

To further assist businesses in their legal requirement to exercise due diligence on traceability when importing seafood, a publicly available specification (PAS) ⁹¹ or ‘fast-track standardisation document’ has been developed. PAS 1550: 2017 (*Exercising due diligence in establishing the legal origin of seafood products and marine ingredients – Importing and processing – Code of practice*) is a voluntary code of practice developed with support from the Environmental Justice Foundation (EJF), the Pew Charitable Trusts, Oceana, and the WWF, under licence from the British Standards Institute (BSI), to provide a benchmark for developing a due diligence system for importers and processors of seafood (BSI, 2017). Additionally, as part of the ‘*innovations agenda*’ to address issues of traceability and transparency within the SSM, several projects have developed to help gather information in support of exercising due diligence when sourcing seafood. For example, OceanMind ⁹², established in 2018 as an independent not-for-profit organisation, uses innovative technology, including remote sensing, to monitor fishing activity on the ocean and highlight non-compliance (Appendix 32). By providing ‘the eyes on the sea’ (Pew Trust, 2015) required to overcome the ‘over the horizon’ nature of fishing on the high seas, OceanMind provides verification for value claims such as being from a sustainable fishery or IUU-free (Soule, 2019). OceanMind has, for example, partnered with the multiple retailer Sainsburys since 2015, to provide assessment of compliance and support for due diligence for sourcing the retailer’s tuna including independent verification of the catch method used (OceanMind, 2023)⁹³. Issues of transparency within the seafood supply chain are not new – in 2015, to increase transparency in seafood supply chains, the SFP, launched the Ocean Disclosure Project (ODP) ⁹⁴. Asda was the first retailer in the UK to reveal the source of all wild-caught seafood used in its own-brand products through the project (Brown, 2019) (See Appendix 33 for ODP profiles for a selection of UK supermarkets).

⁹¹ <https://www.bsigroup.com/en-GB/our-services/developing-new-standards/Develop-a-PAS/what-is-a-pas/>

⁹² <https://www.oceanmind.global/>

⁹³ <https://oceanmind.global/partners/>

⁹⁴ <https://oceandisclosureproject.org/about-us>

5.5.2. Consumer awareness, knowledge, and priorities

When asked about the main drivers (positive or negative) for the availability of sustainable seafood, consumer awareness, knowledge, and priorities, were highlighted as important. See Figure 5.4. for a summary of themes relating to consumer awareness, knowledge and public consumer priorities revealed in the interviews and discussed below. Also see Appendix 31 for an overview of detailed themes and subthemes for sustainable seafood availability

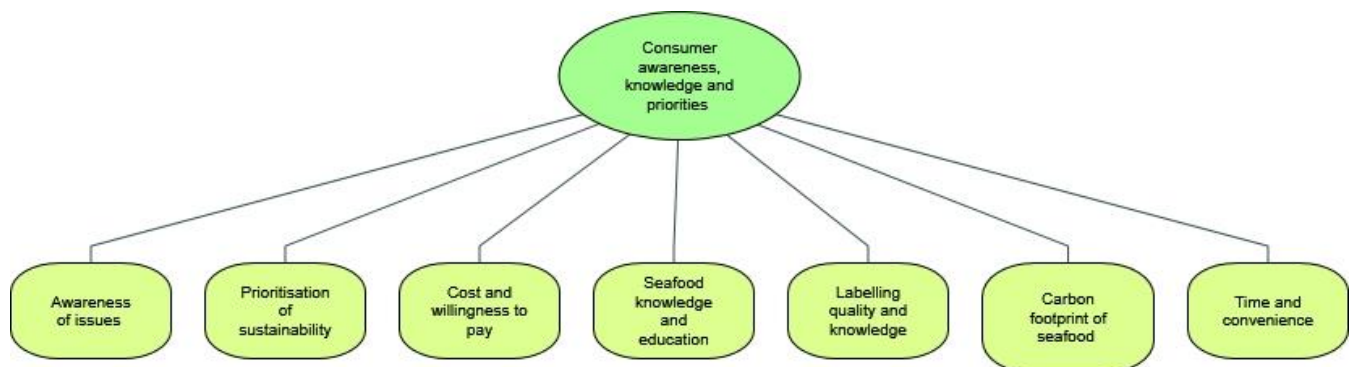


Figure 5.4: A summary of themes related to consumer awareness, knowledge and priorities highlighted in stakeholder interviews as important for the availability and access to sustainable seafood in the UK.

Consumer awareness, or lack thereof, of the issues surrounding seafood sustainability and subsequent demand for it was identified by 37% of interviewees, 44% of them from the Supplier group, as having an influence on the availability of sustainable seafood. One interviewee commented, *“I think one of the big things is a lack of awareness of the issues”* (SH10). There was recognition, however, of consumer awareness and demand for sustainable seafood having a positive influence on the market, with another interviewee stating: *“Consumer awareness, it’s definitely increased in terms of the demand for sustainable seafood,... [it] gets passed down the supply chain to retailers and processors”* (SH14).

Another driver, identified by 20% of interviewees, of the availability of sustainable seafood is consumer **prioritisation of sustainability** over other factors, for example, price, freshness, taste, and convenience. As well as these attributes, the retail environment in which people

shop, prioritisation of fish sustainability over the sustainability of other commodities, and intentions towards seafood sustainability, what people say they will buy, and what they actually buy, i.e. the attitude-behaviour gap (La Piere, 1934), were all highlighted as additional factors limiting the significance of consumer demand for sustainable seafood as a reliable and consistent driver for increasing the sustainability of the UK seafood market.

Interviewees stated: *“I just think it’s ridiculous to think that they’ve [consumers] got time to think about these things, in addition to their sustainable vegetables, sustainable energy, and sustainable meat, dairy, you know sustainable loo rolls, there’s not a hope is there?”* (SH41); *“I think there’s a danger in, [if] we put too much, too much of a weighting on the consumer. I think, yes, there are many consumers out there who do take great care and go to great lengths but frankly speaking, most will be looking for a good quality product at the right price and is it available? Can I get it, when I want it, and [at] the right price?”* (SH17).

The perceived additional **cost** of sustainable seafood and **willingness-to-pay** for sustainably produced seafood, referred to by 41% of interviewees, in particular from the Supplier group (45%), was also suggested as having an influence on availability. Comments from interviewees included:

“Most of it usually comes down to price, in most cases when we’ve looked at, when people look to making quality or ethics-based decision points” (SH39);

“It still teeters between that [sustainability] and price, so it’s still clear that the price plays a very big role and both price and sustainability still fall far short of freshness and taste” (SH35);

“So, when you ask people would they make the choice, they generally say yes, but when given a price premium that’s not associated with quality, that’s just associated with the environment, most people don’t actually react to that, they are not willing to pay more for it, so there is a barrier if the sustainability metric adds cost, significant cost, to the product” (SH40);

“If you ask them, what do they look for when they buy fish, sustainability is six or seventh on the list, always, it’s always price and quality” (SH01).

Despite these observations, literature states that since the early 2000's sustainability has become a decisive matter for the seafood sector (Zander and Feucht, 2017). The belief that fish is a healthier and more nutritious animal protein means that people are often willing to pay more for seafood (Morales and Higuchi, 2018). Studies also demonstrate that the public are willing to pay more for seafood attributes such as higher animal welfare standards and organic or sustainable production (Soley et al., 2019; Zander and Feucht, 2017; Van Osch et al., 2017; Hilger et al., 2015 and 2018; Solgaard and Young, 2011); however, higher levels of household income and education are found to significantly increase WTP more for fish (Morales and Higuchi, 2018).

Seafood sustainability knowledge and education was considered by 33% of interviewees as important for consumers accessing sustainable seafood in the UK with most recognition of its importance by the Supplier group (38%). However, there was some conflict of opinion on whether the responsibility lies with people educating themselves to help reduce the problems associated with marine resource exploitation. Comments on this from interviewees included: *"You can get so much information if you search for it, but people won't do that. They'll just pick it up and put it in the trolley, won't they? I think behaviour and education is probably the biggest challenge"* (SH46); *"Suggesting that consumers ..., need more education, sort of sends us down the path that education is going to solve the problem. And that's not the right, I don't think that's the right way to look at it"* (SH13).

The importance of knowledge as a driver for the public purchasing sustainable seafood highlighted by interviewees and explored by the public questionnaire (Sections 4.7 and 4.17) and other studies, for example Lawley et al. (2019), is discussed in more detail in Chapter 6.

Labelling quality and knowledge were highlighted as a barrier for consumers by 33% of interviewees. Responses from Government and Supplier groups were equally represented (25%). In particular, interviewees mentioned the perceived difficulties associated with lack of background knowledge and ability to interpret labelling, stating: *"If [seafood] has got a responsibly sourced label of some sort, then the consumer might be led to believe that that was completely sustainable, whereas you know, in reality, that's a very complicated issue and*

does the labelling go far enough... the labelling that's used, perhaps isn't as standardised as it could be, with different certifying bodies certifying to different standards, you know some tinned fish will say like, 'caught by line and pole', does the consumer really know what that means" (SH36);

"There are so many labels and accrediting bodies, it's confusing for the consumer. Which is the best one?" (SH27);

"When I look at fish products in a supermarket it takes quite a lot of time to decipher what we've got there, I mean it gives me the FAO area, which means nothing to anyone, and sometimes it talks about the gear, but it's sometimes very hard to find also ... not having that understanding from the consumer point of view of anything about fishing gears, I think that is, there's a gap" (SH38).

Lack of seafood sustainability knowledge and understanding of seafood (mandatory) and eco- (voluntary) labelling has been highlighted as an issue for consumers when buying fish in other studies (Alfnes et al., 2017; Feucht and Zander, 2017).

Issues regarding the **carbon footprint** of seafood and recognition of it as a more sustainable protein compared to other proteins sources was mentioned by 16% of interviewees, with half of comments from the Supplier group. This is not surprising given the attention to reducing carbon emissions in food supply generally and more recent concerns for the specific impact of trawling on climate mitigation (Sala et al., 2021). Mention was made of the problems for seafood sustainability associated with how it is fished and transportation of it over long distances (Farmery et al., 2015). Stakeholders commented: *"I think the big impact, the big problem, as I see it, is [the] carbon footprint of seafood going forward. How do we reduce the CO² output of that protein and will you do that by buying it locally, not shipping it so far" (SH28); "You know, I can easily see us looking at carbon footprints of different fishing mechanisms, methods" (SH16); "We get bucket loads of fish that's been flown in from abroad, which is beautiful, beautiful quality, but there's that question about the carbon footprint, which I think you need to address" (SH04).*

The importance of carbon emissions as a driver for the public purchasing sustainable seafood

highlighted by interviewees and explored through the public questionnaire (Sections 4.9.2) is discussed in more detail in Chapter 6.

Time and convenience were mentioned by 16% of interviewees, mostly retailers (38%) who no doubt have experience of observing and analysing peoples' shopping habits, as another barrier for people making more sustainable seafood choices. Stakeholders commented: *"I think people who want to eat a prawn cocktail sandwich, they just look at the price, they don't look at the quality, the provenance of the prawns"* (SH05); *"People spend 20 seconds in front of a retail shelf buying stuff. I have to continually say to people, it's not a library, they're in and out"* (SH16); *"People are time poor when they're doing this [shopping], they're going around, they've got, you know, a kid crying in the pram or something like that, and they just want to get their shopping done"* (SH24).

5.5.3. Seafood culture, values, and perceptions

Under the broad topic of seafood culture, values and perceptions, subthemes (See Figure 5.5. below) relating more specifically to public taste in seafood, people's connection with the sea, and the perceived importance of coastal and fishing communities to individuals and how this relates to seafood sustainability were highlighted by interviewees as important and are now discussed. Also see Appendix 31 for an overview of detailed themes and subthemes for sustainable seafood availability.

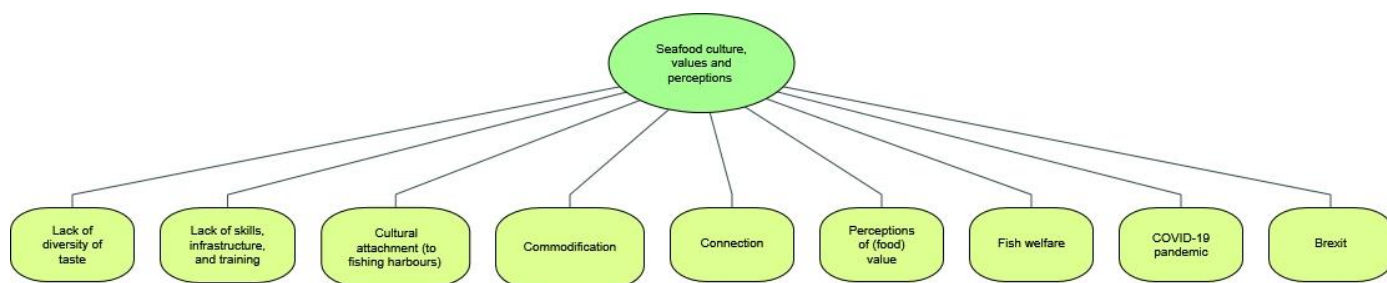


Figure 5.5: A summary of themes related to seafood culture, values, and perceptions highlighted in stakeholder interviews as important for availability and access to sustainable seafood in the UK.

Consumer preference for the Big 5 and **lack of diversity of taste** in fish was mentioned as a barrier to increasing the availability of sustainable seafood by 37% of interviewees, in particular from the Supplier group (28%). This was blamed to some extent on retailers and lack of education despite efforts, including from retailers (See Section 5.8.1), to increase public fish consumption and diversify taste. Interviewees commented that:

“In the UK we don’t eat a huge variety of fish compared to Europe, we seem to be wedded to cod, haddock, tuna, prawns, so I think it would be good if we could educate more people about the wide range of fish in our coastal waters” (SH27); and that *“The major retailers have got a lot to answer for here because as we know the big five species, our love of the big five species in this country hasn't changed. I think that the major retailers have a huge responsibility, but of course what they tend to do is sell what they [know] they can sell, what the public wants”* (SH04); *“Retailers make ‘safe’ decisions”* (SH07).

One interviewee, from the Government and Public Bodies group, alluded to the ‘paradox’ of the situation in the UK of exporting the seafood we catch and importing the seafood we eat (Phillipson and Symes, 2018; Rutherford, 2009). Including processing species caught in British waters and routinely transporting them to Asia to exploit cheap labour in China, for example, before it is shipped back to the UK for sale in supermarkets (Leo, 2020), stating: *“It’s easier to get fish that has been flown halfway across the world than it is to get locally sourced crab or lobster”* (SH46). Another interviewee commented on how the globalisation of industrial fish processing has eroded the value in the UK of once artisanal crafts such as filleting a fish, stating: *“Money, no one wants to pay for labour, to fillet small [quantities of] fish, locally caught fish”* (SH05).

Yet another interviewee commented on how ‘structural’ barriers such as the lack of local processing facilities and **skills** influenced the availability of sustainable seafood creating the necessity for local landings of langoustine or Norway lobster *Nephrops norvegicus* to be transported long distances by road and sea for processing, stating: *“We have no processing facilities really for that in Scotland. There's a processing plant in Arran, but it's much smaller, so the majority of our [Scampi] tails, they now go on a truck, and that truck goes to Northern Ireland”* (SH45). Another interviewee remarked on how lack of **training** was affecting the industry stating, *“There aren’t any courses that young people can do in fishmongery, so we don’t attract people into the industry”* (SH27).

The **cultural attachment** or attraction of fishing harbours to people and their perception of them as active fishing communities was commented on by two interviewees (4%) who stated: *“The cultural attachment to fishing as a way of life, to fishing communities, fishing villages ... in the context of tourism as well [as] the value that [it] brings in itself as a, sort of what the difference [is] between an active fishing village and an abandoned fishing village, that sort of thing”* (SH38); *“People are coming to what they think is a seafood area, they don’t notice that the boats they see in the harbour are basically dive boats or tourist boats”* (SH07).

While many individuals aspire to living on or near the coast (Kelly, 2018), a recent report on health in certain coastal communities, particularly those that relied upon single industries such as fishing, observes that *‘the sea is a benefit but also a barrier’* (Whitty, 2021). In the UK once vibrant fishing communities have been decimated by the decline in the number of UK fishing vessels, almost halved since the early 1990s (MMO, 2021). Similarly, the number of fishers has declined to around 12,000 as fleet size has reduced over time and the industry shifted towards one with fewer and larger boats (MMO, 2020). Accordingly, the number of fishing associated crafts listed as ‘endangered skills’ (Heritage Crafts, 2023), such as withy (willow ‘inkwell’) pot making, sail, rope making, wooden fishing net making, currach, coracle making, compass and navigational instrument making, for example, has increased over time. Whilst the disappearance of some specialist skills is inevitable in any industry, the loss of basic skills, such as fish filleting, discussed earlier, that are fundamental to the seafood sector is detrimental to local employment and business opportunities, the economy and ultimately national food or fish security (Jennings et al., 2016).

The **commodification** or commoditisation of seafood and associated ‘disconnect’ between public understanding of the ‘value’ of a species to an ecosystem compared to its ‘price’ in a supermarket, was also identified as a barrier to sustainability by a small minority of interviewees (8%), with interviewees stating: *“The fact that a fish like tuna can be canned and kind of lose its huge, you know ecosystem value. It’s basically very special as a fish to eat but people see it as a kind of common fish and I think that’s, there is a complete disconnect between the value of species in the ecosystem and the value of species in the supermarket”* (SH38); *“When you start going down the value added route, I think that they [the consumer] lose the identity of the species and the catching methods and all the rest of it”* (SH08). Tuna,

although an ecologically important apex marine predator (Block et al., 2011), is also a highly commoditised species, a ‘cupboard staple’, with the highest per capita consumption of all fish species consumed in Europe (Eumofa, 2019). The topic was further commented on by another interviewee who discussed how ‘detached’ the UK is becoming from the sea, stating: *“As an island nation somehow we’re becoming more and more detached from the sea”* (SH35). A small number of interviewees (10%) opined on the need for the public to make the **connection** between the seafood they consume and the marine environment, stating:

“There is definitely a long way to go in terms of increasing that connection a bit more between people and the fish they eat, which would help awareness of sustainability and how consumers can positively influence change through their purchasing decisions” (SH14); *“I think it is getting through that you should care about the environment. I’m not sure if we’re quite there yet with the connection with seafood, I think there is still more work to be done”* (SH15).

Another barrier to increasing the availability of sustainable seafood in the UK, suggested by 12% of interviewees, was the **perception of value** attached to ‘good’ food generally in the UK and public attitude to consuming fish. Household expenditure on food and non-alcoholic beverages in the UK is lower than in other European countries (Eurostat, 2019), with an average 11% of income spent on food in 2019/20 (Defra, 2021). Seafood consumption is also lower in the UK compared to many European countries (Eumofa, 2019). According to research carried out by Seafish, seafood in the UK is mainly purchased by more affluent, older (45+) people, typically living in 2-person households without children (Watson, 2021). Reference was also made by one interviewee to a ‘disconnect’, the tension between recognition of fishing as ‘food production’ and not as an *‘industry of death’* (SH31).

Whilst stakeholder opinion (4%) of public concern for the sentience and **welfare of fish** was perceived as low, another interviewee commented, *“I believe the single biggest threat [to consumption of seafood] is when people start realising how fish die on a fishing boat”* (SH07). Yet another commented on the absence of standards for the capture and slaughter of wild-caught fish compared to terrestrial meat (described as ‘catch welfare’ by Breen et al. (2020)

⁹⁵), stating, *“There doesn’t seem to be any standards, other than [for] organic[ally] [farmed fish], for the humane slaughter of [wild-caught] fish. We have humane standards for meat, fish drown in air effectively”* (SH27).

The importance of fish welfare as a driver for the public purchasing sustainable seafood, highlighted by interviewees, and explored by the public questionnaire (Section 4.9.2), is discussed in detail in Chapter Six.

The various impacts of the **COVID-19 pandemic** and associated restrictions, mentioned by 37% of interviewees, on for example: people ‘connecting’ more with their local marine environment; fishers selling their catch direct to the public from the quayside ⁹⁶; consumers wanting to buy more British, local fish; them making the connection between personal and planetary health; and with the fishers themselves, were all identified as opportunities for increasing the availability of sustainable seafood. Interviewees commented:

“Consumers..., are changing, becoming more aware of the environment and health and actually merging in their minds, what's healthy for me and what's healthy for the planet, as being almost one in the same. And so, we're seeing, I think it's a really positive thing that people are becoming more aware and looking for more information” (SH40);

“I think the biggest changes we've seen recently, you know influencing customer opinion, is the Covid impacts, essentially what happened there was you know, with people being at home, so you know hospitality essentially having to close down, you've seen customers more willing to try and shop into a species that they might have you know bought when they were eating out” (SH24);

“What I saw through Brexit and through Covid is now, the people who couldn't buy fresh fish, can now buy it directly from the fishermen; what a difference it makes because you're starting

⁹⁵ Catch welfare as described by Breen et al. (2020) is the “capture and handling methods that minimise the physical damage to, and allostatic load on, any retained fish until after they are either slaughtered or released, and thus promote the likelihood for post-release survival and/or good product quality”.

⁹⁶ The model upon which businesses selling seafood direct to the consumer is generally based is the community supported fishery (CSF) model. This model is essentially place-based and imitates the model adopted for Community Supported Agriculture (CSAs) programs (Olson et al., 2014).

to know that person, who's, who's helped, whose feeding you. You know that he's got three daughters who work the stall" (SH45);

"I'm aware of a fisherman who has made some changes to how he fishes and has just spontaneously found that that has created a huge network of people who are interested in sustainability for him that he never even knew existed. So that has made a really big difference to him. So, there's kind of a patchwork of change across the industry as well that connects the consumer more to the industry. I think this fellow's connection to this network has really made a difference to his understanding of what is required and what will actually make his product more desirable" (SH48).

In relation to making better connections with fishers more generally, another stakeholder highlighted the need for the seafood industry to stop treating the catching sector like *"something that ends at the quayside when the catch is landed"* and of the need to connect with fishers by *"taking their thinking down the chain towards the consumer"* (SH12). Like the role suggested by Olson et al. (2014) for seafood guides connecting people with their food and the communities that produce it, it was suggested the MCS GFG could usefully connect fishermen with consumers by enlightening them *"about what real people are thinking about seafood"* (SH12).

During the COVID-19 pandemic the Seafish Industry Authority (Seafish) published guidance for UK fishing vessels owners selling their catch directly to the consumer, either from their vessel, the quayside or from a van, including materials to promote direct sales to the public as an opportunity for them to support local fishermen, try something new, and buy fresh, local fish to 'get the protein you need to stay healthy' (Seafish, 2023). In contrast to a report by the EU identifying changes in seafood consumption as a result of the pandemic which found for the vast majority consumption generally remained the same (EC, 2021), seafood consumption in the UK experienced a 10% boost (Watson, 2023).

Brexit, mentioned by 35% of interviewees, was also identified as having potential to positively influence the availability of seafood to the UK consumer. Interviewees commented:

"I guess Brexit for all its ills, or ..., however, you see it, has you know, put the seafood industry into the spotlight as well, so people are at least a bit more aware as well, of where their seafood is coming from, and you know, what we produce off our shores" (SH18);

“They have never had those [on sale] before because they were servicing the live European market with Langoustines and suddenly, well post Brexit that market is unreliable, so they are having to find another market” (SH07).

Examples of changes being made in the fishing industry in response to Brexit include a bid to safeguard the local fishing industry in Cornwall, with the Cornish Fish Producers Organisation (CFPO) ‘rebranding’ two locally caught and abundant species, spider crab *Maja brachydactyla* and megrim *Lepidorhombus whiffiagonis*, by renaming them ‘Cornish king crab’ and ‘Cornish sole’ respectively, to make them more appealing to UK consumers now that more traditional European markets have been affected post-Brexit (Robinson, 2021).

The impacts of Brexit and the COVID-19 pandemic are already apparent with commitment by UK retailers to source British fish as evidenced by an announcement made by the discount supermarket, Aldi in 2021 (Aldi, 2021), that they would be launching a new premium British Fish ‘Specialbuy’ range, which includes species such as Lemon Sole *Microstomus kitt* and Turbot *Scophthalmus maximus*. Additionally, Morrisons (Morrisons Corporate, 2021), recently acquired Falfish, a ‘family-owned wholesaler of sustainably sourced seafood based in Cornwall’, becoming the first British supermarket to own a fishing boat. Another initiative designed to connect the UK public with local and sustainable seafood, is *Discover Seafood*⁹⁷, an interactive portal, launched by the Fishmongers’ Company’s Fisheries Charitable Trust in 2020. The MMO also launched the UK Government’s Domestic Seafood Supply Scheme (DSSS)⁹⁸ in 2020 to increase the supply of local seafood to consumers in England. Since 2019 advice has been included in the MCS PGFG for choosing local fish to support local fishermen and the future of UK fisheries after ‘Brexit’. Following a recent update of the MCS GFG website in April 2021 a new webpage dedicated to buying local seafood has been published (MCS, 2023d).

⁹⁷ <https://discoverseafood.uk/>

⁹⁸ [https://www.gov.uk/guidance/domestic-seafood-supply-scheme-dsss-how-to-apply-for-project-funding#:~:text=The%20government's%20new%20DSSS%20will,%2For%20processed%20in%20England\).](https://www.gov.uk/guidance/domestic-seafood-supply-scheme-dsss-how-to-apply-for-project-funding#:~:text=The%20government's%20new%20DSSS%20will,%2For%20processed%20in%20England).)

5.5.4. Governance, policy, and enforcement

In addition to the aspirations of the SSM to appeal to the social conscience of consumers, to the individual's sense of responsibility to make the right seafood choices, societal change in behaviour towards the marine environment is achieved in other ways. For example, through the imposition of trade sanctions, the threat of suspension of trade agreements (Petitions, 2022), the introduction of Government taxes, legislation, or nudges and defaults (See Chapter 2 Table 2.12). A third (33%) of interviewees, principally from the Government and Public bodies group (31%), referred to Government, political will (or lack of it) and legislation in relation to effective fisheries management, highlighting a view that market forces alone cannot solve problems of overfishing, and that Government has a responsibility to ensure marine resources are exploited sustainably. Comments included: *"You don't have to look any further than mackerel and tuna to see how politics come into play"* (SH26); *"It's lack of will from the Government, absolute lack of will and lack of interest, short termism. And, you know, always on fisheries they have always been able to blame the EU or blame somebody else and not take responsibility for managing fisheries sustainably"* (SH13); *"International consensus is probably challenging, particularly where fisheries and fishing are perhaps a larger part of different countries' economy"* (SH36).

In the UK, various policy instruments have been adopted to manage the exploitation of marine resources (Section 2.2.3). The EU Catch Certificate and 'carding system', mentioned by 4% of interviewees, was introduced in 2010 to combat IUU fishing, while following Brexit a Fisheries Act was passed into UK law in 2020. In addition, the UK is also committed to several international agreements for achieving the sustainable management of fisheries (Appendix 3). The UK's departure from the EU also provides opportunity for policy change in favour of sustainability (Rees et al., 2020). Ambitious plans for a 'once-in-a lifetime chance' to strategically reform fisheries policy and 'set a gold standard for sustainable fishing around the world' is set out by the Government in documents such as: 'A Green Future: Our 25 Year Plan to Improve the Environment' (Defra, 2018); the Fisheries Act 2020 (HM Government, 2020); and the Joint Fisheries Statement (Gov.UK, 2022b). These incorporate ambition for using tools such as a 'natural capital' approach, which considers the 'value' of nature, to inform decision making around how fisheries are managed (Defra, 2018).

The UK Government has sought to use Brexit to redress what is perceived as a ‘poor deal’ for the UK in relation to the sharing of stocks under the CFP’s principle of ‘Relative Stability’ (RS) (Stewart et al., 2022). The principle of RS for sharing stocks has been criticised for being too ‘static’ an approach for the management of such a ‘highly diverse and dynamic resource’ as fish stocks (Phillipson and Symes, 2018). It also uses a ‘fixed allocation key’ based on historical catches for sharing resources (Fernandes and Fallon, 2020). A more scientific approach being proposed for sharing stocks is one according to the principle of ‘zonal attachment’ (Gullestad et al., 2020). This approach is based on the ‘*spatial distribution of the stock overtime and over the various life-history stages in relation to EEZ boundaries*’ (Pinnegar et al., 2020 p.476). The current use of RS to allocate quotas has also been challenged because of the changes that are occurring in the distribution of stocks due to climate change and stock expansion (Baudron et al., 2020; Fernandes and Fallon, 2020). Such redistribution results in a ‘mismatch’ between quota allocations and the abundance of the species in relation to EEZ boundaries (Baudron et al., 2020). In their study of 19 North East Atlantic fish species, incorporating 13 commercial stocks, over 30 years, the authors found all species had experienced changes in their distribution, including across management areas for 5 species.

The issue of access to and **quota management** including access to fishing opportunities for small-sale fishers was mentioned by 12% of interviewees, again principally from those in the Government and Public bodies group (50%), who commented: “*Well, the main driver is, we have international commitments and obligations here. Things like Convention on Biodiversity, sustainable development goals (SDGs), those are international agreements*” (SH49); “*When it comes to wild fishing there are problems with you know the tragedy of the commons and people over exploiting the resource such that it doesn't produce as much as it could*” (SH44); “*The availability of quota, that's a huge thing, that's a really huge thing, because if a local fisherman can't go and catch a few finfish then how can he provide to a local shop?*” (SH45).

Fishing opportunity is defined by Council Regulation (EC) No. 1224/2009⁹⁹, as “*a quantified legal entitlement to fish, expressed in terms of catches and/or fishing effort*”. In northern Europe fishing opportunities are typically administered through a system of TACs (Carpenter

⁹⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009R1224>

and Williams, 2021), with each member state allocated a fixed percentage or quota of the TAC for each species they have access to (Anderson et al., 2018). Currently the UK has quota for approximately 100 different fish stocks (MMO, 2020). In 2020, 81% of landings comprised of quota species, with almost all landings made by vessels over 10 meters in length (MMO, 2020). However, non-sector vessels (vessels without Producer Organisation (PO) membership), mainly those under 10 meters, which make up 79% of all UK fishing vessels, are allocated a small proportion of the total UK quota, landing less than 1% of the demersal and pelagic fish caught by the UK fleet (MMO, 2020). A similar situation exists for pelagic species such as mackerel. For example, the South West Handline Fishermen's association (SWHFA) is allocated an annual mackerel quota of 1750 tonnes (SWHFA, 2023). This is a fraction - 0.2% - of the catch of around 1 Mt taken in the North East Atlantic in 2020 (ICES, 2021).

Conflict of marine space was also mentioned with one interviewee referring to the issue of '*displacement*' (Bennett et al., 2021; Mangi et al., 2011), of the 'fear' the catching sector have for the sea '*being closed down on them*' (SH49). These type of feelings are no doubt exacerbated by the intense economic attention being given to the potential for growth of the 'Blue economy' in both established and emerging maritime industries such as aquaculture, marine renewable energy, and seabed mining, as a strategy for increasing prosperity in European seas (Soma et al., 2018; Ehlers, 2016), as well as commitments discussed in the literature to establishing MPAs in 30% of European seas by 2030 (EC, 2022b).

In 2022, the 'Blue economy' employed 4.45 million people, with a turnover of 667.2 billion Euros (EC, 2022c). Bennett et al. (2021) have however expressed concern for the implications for social justice of '*rapid and unchecked ocean development*' and are calling for a commitment to 'Blue justice' in order to avoid a number of 'social injustices' identified by them, such as displacement and 'ocean grabbing', impacts on the livelihoods of small-scale fishers, social and cultural impacts, and exclusion from governance. With increasing 'activity' in the sea and Government commitment to an 'ecologically coherent network of well-managed marine protected areas', it is perhaps not surprising that fishers, small-scale especially, are expressing feelings of exclusion.

5.5.5. The influence of media on the availability of sustainable seafood

During the interviews the influence of media, specifically the Netflix documentary, *'Seaspiracy'*¹⁰⁰, was mentioned by 75% of interviewees. In the context of seeking views on drivers influencing the sustainable seafood market, adverse publicity associated with documentaries like *'Seaspiracy'*, was mentioned by 65% of interviewees as having an influence, albeit likely to be short-lived, on the seafood market. Although interviewees acknowledged that the documentary had perhaps focused public attention on seafood sustainability and even *'provided a vehicle for dialogue'*, there was concern for the negative impact of what was generally regarded by interviewees as *'inaccurate'*, *'reckless'*, and *'sensationalist'* journalism on undermining work, including by ENGOs such as the MSC and MCS, to increase the sustainability of the seafood market, particularly in the UK, by the programme stating that *'no seafood is sustainable'* and that people should not eat fish. In particular, interviewees commented on the *'imbalance'* of information presented, the fact that *'good stories'* were missed, with one interviewee stating: *"Probably one of the best choices for low carbon production and low-price protein, is some of our pelagic fisheries. So incredibly strong stories to talk about, yet largely lost in the sort of the fuzz of talking about you know globalised, Far East fisheries, fishmeal, fish farming and all the, all the other, areas of concern"* (SH17).

Despite these concerns, it was also suggested that *'Seaspiracy'* was unlikely to have impacted purchasing behaviour of the UK fish eating public, with interviewees commenting:

"It [Seaspiracy] hasn't I think changed the way of many people. I don't see that as having had a big impact" (SH38); *"Seaspiracy had absolutely no effect. I had no customers write in at all. No emails. Nothing"* (SH16); *"Things like Seaspiracy, they obviously generate interest and awareness amongst consumers in terms of changing shopping habits, yeah if it's something which happens, it happens at the scale at which we almost cannot see it"* (SH24); *"On the whole, I've not seen any change in my fish sales at all, I've had a few people raise the issue with me but I've been able to say look it's a two sided story"* (SH34).

¹⁰⁰ Netflix film documentary, *Seaspiracy*, directed by Ali Tabrizi, launched in March 2021 (See Appendix 1).

One interviewee made a comparison between the impact of inaccuracies highlighted in Seaspiracy and the often '*slandrous, libellous*' remarks made by pressure groups opposed to salmon farming, and how in his experience, such pronouncements had "*not made any difference to salmon sales*" (SH16). This is evidenced by, for example, an increase in volume of UK retail sales of fresh Scottish farmed salmon in 2021 of almost 8% (Salmon Scotland, 2021).

Observations made in this study are also supported by the results of a poll carried out in 2021 by market research firm, Streetbees¹⁰¹, and reported upon by the Grocer, in which 34% of shoppers identified fish (second only to red meat with 37% of the vote) as '*a food of most concern to the environment*'. However, the same article recognised that while shoppers are expressing concern for the impact of fishing on the environment, this is not reflected in fish sales; according to figures provided for the article by Kantar¹⁰², fish is the UK's fastest growing fresh primary protein (Brown, 2021). Total seafood penetration (i.e. the % of shoppers who purchase seafood) in the UK, although higher in 2021 (96.3%) (Watson, 2021), remains very high in 2022 at 95.6% (Watson, 2022b). 'Seaspiracy' has however been credited by some with stimulating growth in the value of 'fish alternatives'. Sales have grown 133.1%, from a value of £2m in 2017, to £5.1m in 2021, with fishless fingers accounting for 39% of sales, compared to 98% in 2017 (Tatum, 2021).

5.6. Stakeholder perceptions of public support for seafood sustainability

Interviewees (n=41) were asked how they thought public concern for the impact of fishing on the marine environment influences consumers' seafood choices. Responses indicated a perceived growing awareness of more broad issues, such as those related to the physical impacts of scallop dredging and beam trawling on the environment, for example. Slightly

¹⁰¹ <https://www.streetbees.com/>

¹⁰² <https://www.kantar.com/>

more interviewees (19%) indicated public concern is being reflected in the choices the public are making, than not (15%), commenting:

“I think increasingly so, I think people are aware of the impacts on the environment of seafood. I think particularly scallop dredging and beam trawling those have been highlighted in recent years by several campaigns and most recently Seaspiracy” (SH15); *“I don't think it's being reflected much to be honest. I think there has been some increased awareness at a very, very limited level”* (SH38); *“I would say very little. If there's scallops on the menu, they eat scallops, they don't think where they come from and there's the scale issue. Most people think, well okay I'm just eating three scallops, in the grand scheme of things it's a very small amount, it doesn't matter, I don't often eat them, but as a result they are on the menu in lots of restaurants, they're being dredged off the bottom, and so there is a mass, knock on effect, because they're perpetuating demand even if it's in a small way. I don't think people associate their choices, fish and shellfish, with any broader issue”* (SH10).

24% suggested public confusion around seafood sustainability makes choosing difficult, commenting: *“I think because of the complexity of sourcing fish, I think it's very, very difficult for consumers [the public] to be very knowledgeable about what they should be doing”* (SH21); *“I don't know if they are. I don't know if people know enough about it”* (SH27). 17% suggested the public devolve responsibility for making the right seafood choices to the retailer. Interviewees commented, *“I think consumers, the majority of consumers, devolve that responsibility to the retailer”* (SH26). It was also suggested by 17% of interviewees that, where there is a level of concern for the impact of seafood consumption on the marine environment, it is likely that individuals would be making the choice not to eat seafood and in the case of some, turning to plant-based alternatives or analogs (Kazir and Livney, 2021). Interviewees commented: *“I think this is binary. I think public concern turns people off eating fish, the safe thing to do is to not eat fish”* (SH07); *“Well, I think the concerned people are becoming vegan actually, we're seeing so many people turning to veganism, particularly the young generation, because we've got a mixed message about what is considered sustainable”* (SH04); *“My hunch is that the more aware consumers tend to shy away from seafood generally”* (SH02).

12% of interviewees identified an intention-behaviour gap between what the public say they will do and what they actually do, with one interviewee stating: *“I think there is a gap, certainly a gap between concern and action”* (SH13), while 7% commented that public

concern for the impact of fishing is only evident in a minority of people. One interviewee commented, *“In a small enclave of customers there is plenty of interest in it”* (SH05).

Of those interviewees (n=25) asked whether they thought consumers understand the impact of their individual seafood choices on the marine environment, 60% indicated that it was unlikely the public were making the connection, that this was perhaps ‘a step too far’. The remainder suggested the public understand the impact of their seafood choices, but also proposed understanding is likely to be limited, or they do not care, or where there is concern, people chose not to eat fish. One interviewee commented:

“Yes, I think so, everyone that picks up a piece of fish, they're aware that they're buying a product that is harvested from the wild. I don't think the public at this point recognise the difference between farmed and wild seafood, they just see it all as seafood” (SH12).

A majority (57%) of interviewees (n=21) commenting on the strength of consumer demand for sustainable seafood suggested demand for sustainable seafood was high or increasing, that no one wanted ‘unsustainable’ seafood. Stakeholders’ comments included:

“I think if you asked anyone, concern about the environment and concern about the oceans is very strong. Definitely, people want to buy sustainable fish, there's no doubt about it. But we know that consumer choices, what consumers buy, isn't dictated by what they would like to buy” (SH13); *“I don't think there is demand for unsustainable seafood so I would say pretty much there is 100% demand for sustainable seafood. I've never heard anyone say I don't care if my seafood is sustainable as long as it's cheap. I've heard people say I don't want to pay a lot of money for seafood, but I expect it to be sustainable”* (SH12); *“I think it's growing. I think the general population is becoming increasingly mindful of the footprint that ecological, social, economic footprint”* (SH39).

Care for the marine environment observed in this study is mirrored in research carried out by the Economist Intelligence Unit, which also indicates care for the environment is growing, with searches for sustainable goods increasing globally by 71% since 2016 (EIU, 2021). As observed in the literature it is generally acknowledged that consumers have a role in

influencing the market for sustainable seafood (Barclay and Miller, 2018; Richter and Klockner, 2017). In research carried out by Globescan on behalf of the MSC, two-thirds of respondents (n=11,512) agreed that in order to save the ocean, *'we have to consume fish only from sustainable sources'* (Globescan, 2020). However, interviewees (18%) in this study suggested that seafood sustainability is a priority for only a 'vocal' minority of dedicated, often better-educated, consumers, typically identified in the academic literature as 'eco-warriors' (Fullerton et al., 2020).

5.7. Stakeholder awareness, use and perceptions of the MCS GFG

In addition to general perceptions of the SSM, interviews sought specific understanding of stakeholder awareness and use of the MCS GFG. Awareness amongst interviewees of the MCS GFG was extremely high at 96%. When asked, *'how aware are you of the MCS GFG'*, 78% of interviewees replied that they were, *'very or fully aware or aware for quite a while or a long time'*; 8% replied they were *'quite or fairly aware'*; 10%, *'aware'*; whilst two respondents, 4%, replied they were unaware of the MCS GFG before taking part in the interview.

Given the nature and origins of the SSM it is not surprising awareness of the MCS GFG in the UK among seafood supply chain actors is observed as high. Expectedly, the greatest awareness of the MCS GFG was amongst interviewees in 'Food Service' (100%); 'Wholesaler, processor, manufacturer or supplier' (Supplier) groups (88%); and 'ENGO/Seafood initiatives' underpinned by the MCS GFG (83%). See Table 5.3 for summary of guide awareness amongst different stakeholder groups.

Table 5.3: Level of awareness of MCS GFG amongst interviewees (n=49). Responses are categorised according to actor group (See Figure 3.8).

Level of awareness	Very or fully aware	Aware	Unaware	Quite or fairly aware	n/%
Actor or stakeholder group					
Catching sector	1 (33%)	1 (33%)		1 (33%)	3 (6%)
Certifiers	3 (75%)		1 (25%)		4 (8%)
Chefs/Cookery schools/training	3 (75%)	1 (25%)			4 (8%)
ENGO/Seafood initiatives	5 (83%)			1 (17%)	6 (12%)
Food Service	4 (100%)				4 (8%)
Government and Public Bodies	4 (57%)	2 (29%)	1 (14%)		7 (14%)
Retailer	3 (75%)	1 (25%)			4 (8%)
Wholesaler, processor, manufacturer or supplier	15 (88%)			2 (12%)	17 (35%)
Total	38 (78%)	5 (10%)	2 (4%)	4 (8%)	49 (100%)

It was perceived by interviewees that because food service ¹⁰³ or catering industry is a more diverse industry with a ‘*much wider range of species available*’ and less seafood expertise compared to other stakeholder groups in the seafood supply chain, awareness and use of the Guide to support sustainable decision-making in this sector is likely to be more widespread. Interviewees stated: “*They [Food Service] generally don't have the same sort of dedicated resource that most seafood companies and retailers have, so the challenge still exists in [the] uptake of responsible and sustainable seafood practices by restaurants, fast food places, anywhere, that's in that sector, hotels and universities*” (SH35); “*Food Service sector finds it more difficult to give the time and energy to research it [sustainability]*” (SH06); “*Food Service use MCS a lot*” (SH28).

Despite a feeling that use of the Guide in the food service sector is widespread, the potential for fraud has been identified as more of a risk for the public eating seafood in restaurants and takeaways compared to when eating seafood out of the home (Pardo et al., 2016; Vandamme,

¹⁰³ ‘The food service industry refers to any company or business essential to the preparation and distribution of food products outside of the home’ (Thomas, 2023).

2016; Mariani, 2014). This may also contribute to wider awareness of the Guide in the food service. One interviewee stated: *“In the food service sector where there are fewer large businesses and a multiplicity of small to medium size enterprises that form the supply base, the risk of selling cheaper less sustainable raw material is much, much higher in foodservice than it is in retail (SH12).*

When asked, *“how, if at all, does your organisation or business use the MCS GFG”*, a high number of interviewees (73%) stated that they use the Guide. The Guide was found to be most used by Suppliers (42%); ENGO/Seafood initiatives (17%); and Government and Public bodies (14%). The catching sector (0%) and Retailers (3%) were found to least use it. Additional analysis provided insight into the various ways in which the GFG is used by different stakeholders – application includes for example, use as a reference, educational or information source, a risk assessment tool, or as in some cases, the MCS GFG advice is integrated into the businesses buying or sourcing policy, standard or methodology. The categories of use identified by analysis of interviewee responses are summarised in Table 5.4.

Table 5.4: Stakeholder use of MCS GFG (n=43).

Responses (n=43)/100%	Risk assessment tool (n=10/23%)	MCS advice integrated into sourcing policy or approval process, standard or methodology (n=15/35%)	Information or training for staff, customers, members, or students etc. (n=11/26%)	Advocacy improvement for (n=3/7%)	Other (n=4/9%)
Actor group (n/% of total no. of interviewees)					
Catching sector (3/6%)	-	-	-	-	-
Cert. scheme (4/8%)	-	-	2/18%	-	1/25%
Chefs/Cookery schools/training (4/8%)	-	-	4/36%	-	-
ENGO/Seafood initiatives (6/12%)	1/10%	5/33%	-	1/33%	-
Food Service (4/8%)	1/10%	1/7%	1/9%	-	-
Government and Public Bodies (7/14%)	-	2/13%	1/9%	-	3/75%
Retailer (4/8%)	-	1/7%	-	-	-
Wholesaler, processor, manufacturer or supplier (17/35%)	8/80%	6/40%	3/27%	2/66%	-
Total (49/99%)	10/100%	15/100%	11/99%	3/99%	4/100%

Examples of stakeholder responses	<p>"A lot of our customers use the MCS ratings as a way of demonstrating that they've risk assessed their supply of seafood and they, a lot of them, will have in their policy documents must be [MCS GFG rating] three or above" (SH28)</p>	<p>"The MCS ratings are integrated, are core to what we do" (SH06)</p>	<p>"Well, in the restaurant we used to give out PGFGs, I was amazed at how many people picked them up" (SH05)</p>	<p>"It's part of the advocacy for improvement with governments and fishermen, and fishermen's organisations, so it has a really positive role to play in providing the evidence, concise evidence as to what needs to improve" (SH40)</p>	<p>"There isn't a MSC certified option for every fish available in the UK" (SH22)</p>
	<p>"So it's definitely part of our risk assessment" (SH35).</p>	<p>"As an organisation, we don't want to be sourcing anything that's Red Rated" (SH14)</p>	<p>"It's the first thing (PGFG) that we give to people, it's the first thing I make sure staff share" (SH04)</p>	<p>"So it's a good trigger to get things moving and easy to use and very clear" (SH42)</p>	<p>"I would really want to see fisheries that we were managing on that guide, because it would be a positive reinforcement" (SH37)</p>
	<p>"If a fishery isn't MSC certified, it will go through a kind of risk scoring mechanism, and we would use the GFG for that" (SH40)</p>	<p>"So we, we have a policy that we won't sell any MCS 5-rated products" (SH47)</p>	<p>"It's also really helpful for new members of the team as well" (SH46)</p>	<p>"We use it as a national sort of stick to beat the Government with a bit as well" (SH13)</p>	<p>"So I'm probably interested in it from a TAC setting perspective" (SH46).</p>

The MCS GFG was reported by 20% of interviewees as used as a ‘tool’, typically by seafood buyers (80%), or as a ‘suite’ of tools, which include other guides or platforms such as Monterey Bay Aquarium’s Seafood Watch, Seafish RASS, FishSource, or trade organisations such as the Frozen at Sea Fillets Association ¹⁰⁴, and the Norwegian Seafood Council ¹⁰⁵ as part of their ‘*risk assessment*’ process when sourcing seafood.

The MCS guide was also reported by less than a third of interviewees (31%) as being *integrated into businesses buying or sourcing policy statements*, documents or decision-making trees, or used in the compilation of ‘sustainability overviews’ for products presented to potential seafood buyers. In addition, 6% of interviewees stated that where there is, for example, a data deficiency in a fishery, and as a result has been scored badly, the MCS GFG rating can provide a ‘*trigger*’ for identifying measures, such as data collection, for improvement in the fishery.

Interviewees further stated that the MCS GFG is widely used as an *information tool*, for training and educational or research purposes (22%). One interviewee commented: “*They might not necessarily follow the guidance, but they’ll use the data*” (SH01). The PGFG was communicated as a useful resource for chefs, especially in catering and training, with it reported as issued to around 500 lecturers in over 150 catering colleges nationwide in the UK. It was also suggested the PGFG is useful for inducting an organisation’s new members of staff or educating customers or members, for example. Another interviewee suggested the Guide was useful for people with a ‘green’ conscience and motivated as ‘food citizens’ when purchasing seafood, stating: “*It’s the best option there is out there for a food citizen, rather than a consumer, as a tool to help them think about their fish procurement*” (SH33).

¹⁰⁴ <https://fasfa.co.uk/>

¹⁰⁵ <https://fishfriersreview.co.uk/uncategorized/norwegian-seafood-council-launches-campaign-to-deliver-sustainability-message/#:~:text=Additional%20research%20shows%20that%20only,fish%20they%20sell%5B2%5D.>

Through the interviews, information was also gathered as to what might prevent use of the GFG. Reasons were grouped in emergent themes. The most frequently reported reason for stakeholders not using the Guide was their establishing a relationship with another organisation offering similar guidance or their use of other platforms. On the other hand, interviewees reported that they were happy with using the Guide and noted that it *‘works well’*. A summary of stakeholders’ responses is presented in Table 5.5.

Table 5.5: Reasons for stakeholders not using or discontinuing to use the MCS GFG (n=21)

Business in a bespoke partnership; uses other platforms; or own policy (n=6/28.5%)	Availability of GFG recommendations (n=1/5%)	Lack of supply chain knowledge and transparency (n=4/19%)	Limitations of guide; interpretation of data; available information (n=4/19%)	Works well (n=6/28.5%)
“We want to go through our own decision tree process so that we can provide ourselves with assurance that fisheries meet our sourcing policy” (SH26)	“The only thing I find difficult, is the list of stuff on the green list, there is a lot of it you wouldn’t generally be able to get hold of. So it’s things like, it was the farmed sea bass, it says ‘onshore production France’. I don’t think I have ever seen French onshore farmed sea bass for sale” (SH10)	“The problem is, is the supply chain honesty. It’s all very well us turning around to a wholesaler or a fishery and asking where did you catch that, is it sustainable?” (SH09)	“I don’t think it takes in some of those issues of how the biomass is calculated on the basis of historical data” (SH35)	“If any of the advice was incorrect or you know, later on, we found out, but to be honest we haven’t had an issue around that” (SH47)
“I think the MCS guide is more widely used in Food Service than it is in retail now because of more retailers either have a relationship with the SFP or the WWF” (SH12)		“We gave up using the MCS traffic light system because our suppliers couldn’t answer the questions that we were asking of them” (SH33)	“They’ll be many fisheries that would meet the criteria that you would describe as good which aren’t in the Guide and that would be one limitation” (SH37)	“If MCS fundamentally changed the methodology behind the Guide” (SH24)
“We’ve got a relationship with SFP and we use their system to guide us in terms of assessment of the fisheries that we use” (SH16)		“You need to know the right questions to ask, and you need to know the information from the Guide and trust the response that you’re getting in order to	“The issue of sea areas from which stocks are fished and how they, how that, information translates into usability with merchants and consumers who want to	“No, I think as long as it is maintained, and there’s a genuine point of contact, that you know we can have that dialogue, as long as that can be maintained,

		make that informed choice” (SH22)	buy sustainable seafood” (SH21)	then I think it holds a good degree of credibility” (SH17)
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Stakeholders were also asked for their views on the information provided in the MCS GFG. In particular, views were sought on the accuracy and credibility of the Guide and the practicality of the GFG advice. A summary of stakeholder views is presented in Table 5.6.

Table 5.6: Interviewee views on the information provided in the MCS GFG (n=84) ¹⁰⁶.

Responses (n=84) Actor group (n/% of interviewees)	Scientific rigour, accuracy, credibility of guide (n=29/34.5%)	Clarity and detail of information provided in guide (n=20/24%)	Relevance of guide to consumer setting (n=11/13%)	Transparency of consultation process for updating ratings (n=8/9.5%)	Scope of guide (n=12/14%)	Unit of assessment for producing ratings or profiles (n=4/5%)
Catching sector (3/6%)	-	-	-	-	2/17%	1/25%
Cert. scheme (4/8%)	1/3%	1/5%	1/9%	-	1/8%	-
Chefs/Cookery schools/training (4/8%)	4/14%	3/15%	-	-	-	-
ENGO/Seafood initiatives (6/12%)	4/14%	3/15%	1/9%	2/25%	2/17%	-
Food Service (4/8%)	2/7%	1/5%	1/9%	-	1/8%	-
Government and Public Bodies (7/14%)	6/21%	4/20%	4/36%	-	2/17%	-
Retailer (4/8%)	1/3%	2/10%	1/9%	-	1/8%	-
Wholesaler, processor, manufacturer or supplier (17/35%)	11/38%	6/30%	3/27%	6/75%	3/25%	3/75%
Total (49/99%)	29/100%	20/100%	11/99%	8/100%	12/100%	4/100%
Examples of stakeholder responses	"I think generally it is very accurate. It's updated, generally on a yearly basis,	"I have occasionally gone on to the Guide but there is an incredible amount of	"The simple idea of having red, amber, green, is great, but if you take the great	"Well they are certainly very open, they are certainly quite	"It's not all encompassing. The risk is around where it is processed, how it is	"I do like the Guide, but it's how it accounts for the range of vessels within these kind of

¹⁰⁶ Interviews took place in 2021 before the launch of a new version of the online guide in April 2022.

	which means that you know, the profiles are kept current and updated as much as they can be" (SH14).	information on there, all extremely valid and everything else, but there's just so much of it" (SH16)	British cod, is it red, amber or green?" (SH07)	happy to converse with people like myself" (SH42)	processed, it's the people in the supply chain" (SH08)	broad units [FAO Areas]" (SH35)
	"There's a scientific rigour and a process in compiling it so we're happy with the accuracy" (SH40)	"It [the website] seems like a very well put together set of information, so basically its very comprehensive" (SH10)	"The pack labelling doesn't really support it to the level of granularity that you'd require to make those very informed decisions" (SH26)	"I always thought they were very fair and level headed and listened if we challenged back" (SH28)	"One of the dangers is focussing only on the sustainability of the fish, but missing out on the sustainability of other factors, such as, ensuring we have sustainability of fishermen in the future as well" (SH17)	"It's more looking at nuances, where you've got a lot of different countries which may operate on one stock using a particular gear type and there may be a difference between how Country A operates, [compared] to Country B" (SH14)
	"I certainly felt confident in the information. I felt it was based on a pretty robust system" (SH48)	"Traffic light rating is perfect everyone gets it. It's really easy to communicate. Red is bad. Green is good." (SH13)	"It [the MCS GFG] is a more involved tool that requires a decent degree of baseline knowledge and information in order to then impart the Guide into the consumer setting (SH22)	"I really like the transparent consultation process" (SH02)	"The socio economics of the area, those type of things should be considered in sustainability as well" (SH45)	"They [fishing vessels] may be fishing on the same stock or the same grounds, but our methods are entirely different. Our approach is often quite different" (SH17)

One interviewee in the Certification scheme group recognised the role of the MCS GFG in terms of its importance to the *'UK landscape for sustainable fish'*. A small number of interviewees (8%) expressed admiration for the impact of the Guide, despite perceived limitations associated with the size of the organisation and the number of employees working on the MCS GFG. Interviewees stated: *"I am in perpetual amazement as to how MCS manage to do it"* (SH01); *"It's punched above its weight for years and has, you know, achieved massive, massive, things"* (SH25).

Interviewee responses relating to the ***scientific rigour, accuracy, and credibility of the Guide*** in general were very positive (79%). Although there was recognition of the Guide being updated regularly, and of it being a useful and informative tool, interviewees also acknowledged that it is a 'guide', a 'snapshot', with one interviewee stating, *"I think it's probably often behind the times, I mean fish stocks change quickly"* (SH41). Another commented that the credibility of the Guide is undermined by *"sometimes the recommendations or the fish to eat are either not available for large chunks of the year or are available [only] in very low tonnages"* (SH25).

Interviewees' views on the ***clarity and level of detail of information provided in the Guide*** were mixed with some (60%) suggesting it is user-friendly, comprehensive, and the 'traffic light' system easy to understand, while others (40%) considered the information too complex and the amount of information difficult to navigate, that it needed to be simplified, made more consumer friendly. Suppliers (42%) commented more favourably than the other groups. In terms of the level of detail in the Guide, one interviewee commented, *"The detail that goes into [it], like every functional unit ¹⁰⁷, you know like every area, whether it's the IFCA [Inshore Fishery and Conservation Authority] area within 12, or six to 12, and then everything else as well, it's great"* (SH03). However, another commented that it is not information that can be translated into useable information for the consumer, stating, *"No retailer is ever going to be able to break their scampi down to functional unit on pack"* (SH40).

¹⁰⁷ 'For the purposes of management and stock assessment, *Nephrops* are split into a number of stocks or ICES 'functional units' (FUs) based on the discrete patches of mud which they inhabit' (Marine Scotland, 2017).

Opinion offered on the consistency between MCS GFG methodologies for rating wild-caught and farmed seafood was also divided: one interviewee stated, *“So the comparison between farmed and wild caught standards. I’m not quite sure whether something gets a bit of an easier pass if it’s farmed because of the emphasis on extinction”* (SH13), and another that, *“The overall slant is too negative towards aquaculture”* (SH44).

Concern was expressed by 22% of interviewees for the **relevance of the information provided in the Guide to the consumer setting**. In particular, concerns regarding the inadequacy of product labelling to support decision making (45%), mirroring those from other studies highlighting the limitations of labelling for consumers wishing to make informed decisions about the sustainability of the fish they are purchasing (Defra, 2013; Gutiérrez et al., 2012; Oken et al., 2012). Concerns for lack of knowledge in the seafood supply chain (18%), the complexity of seafood sustainability (18%), and situational factors such as consumer knowledge and the time required to use the MCS GFG to examine seafood products for sustainability attributes in store (18%), were equally reported.

16% of interviewees also volunteered opinions on the MCS **consultation process** for updating ratings. Opinion regarding the transparency of the process and the opportunity it provides for contributing to the accuracy of the information presented in the Guide was positive (88%). One interviewee, however, commented on the additional burden for their business of reviewing the update, stating, *“The challenge for us is when it, you know comes out sort of every six months, the changes, we need to go through and check all that and it is quite a lot of work”* (SH47).

Opinions were also offered by 24% of interviewees on the **scope of the Guide**. Whilst there was acceptance of limitations to the Guide associated with ability to assess and list every species, with one interviewee stating, *“Obviously, not everything’s listed on it”* (SH13), and another, *“There’ll be many fisheries which would meet the criteria that you would describe as good which aren’t in the Guide”* (SH37), concerns were expressed by 12% of interviewees in

particular for the focus of the Guide on environmental sustainability to the exclusion of social and other factors, including the socio-economic sustainability of the fishing communities themselves. One interviewee stated: *“We have a social duty to protect these [small-scale] fishermen”* (SH05). As discussed in Section 5.3, a majority (65%) of interviewees in this study commented on the ‘*evolving*’ nature of seafood sustainability and of the need to recognise issues such as those related to social and economic concerns when considering seafood sustainability. Another interviewee highlighted that in situations where there are differences in the criteria for the various aquaculture certification schemes available (See Appendix 6), there is potential for misinterpretation. For example, given the lack of consideration of people in the MCS ‘equation’ (See Section 5.3), there is a risk that consumers may make assumptions by thinking that if seafood such as prawns, for example, is rated green or a ‘good choice’ in the Guide, social factors such as issues of child labour are accounted for. The interviewee stated: *“You know you could have fish that is green rated, which is fished by slave labour”* (SH19).

Other interviewees (6%) expressed confusion regarding the target audience for the Guide, with one interviewee stating: *“It's trying to deliver maybe slightly different messages to different people and that and that's quite a hard thing to do”* (SH18). More broadly, another interviewee, representing Government and Public bodies, recognised the lost opportunity for the Guide to connect consumers with fishers (and the marine environment), stating: *“I've sort of struggled to see how its connected or what's the impact, what's the power that can be given to that guide, there needs to be a connection between the fishers and the likes of the restaurants or the fish sellers. The consumer needs to understand the link”* (SH49).

The **unit of assessment** for producing the ratings or profiles also attracted some criticism from a small minority of interviewees (8%), mainly representatives of the Supplier group (75%). For example, assessment of the management of a stock or fishery within an FAO area, in which there are numerous fishing fleets or operators from various countries prosecuting the stock, was deemed insufficiently ‘nuanced’ to reflect the sustainability efforts of individual countries, fleets or vessels. By way of comparison the ‘unit of certification (UoC)’ adopted by the MSC, is defined as: *“The target stock or stocks (biologically distinct unit(s)) combined with the fishing gear and vessel type(s) pursuing that stock.”* At its simplest, a single vessel with a

single gear could be the UoC, although it is more likely that a number of vessels within the same fishery would form the UoC (MSC, 2020c).

5.8. Guide influence

Questions were designed to ascertain stakeholder perceptions of public influence of the MCS GFG and how, if at all, the Guide is motivating sustainable stakeholder practice on the 'ground' or 'water'.

5.8.1. Influence of guide on consumer seafood choices

Interviewees' responses were categorised according to whether the data collected indicated the Guide was having a *direct* influence on the seafood choices the public are making or an *indirect influence* e.g., as a result of the influence of the Guide through choice editing by retailers discussed in Section 5.5.1. A data summary is presented in Table 5.7.

Table 5.7: Influence of MCS GFG on the seafood choices the public are making.

Responses (n= 60/100%)	Direct influence (n=36/60%)				Indirect influence (n= 24/40%)	
	'Don't know' (n=8/22%)	Little to no influence (n=6/17%)	Guide use amongst a small sector of society (n=14/39%)	Guide functions to raise awareness (n=8/22%)	Influence of Choice editing (n=20/83%)	Influence of Customer expectations/Brand trust/devolution of responsibility to retailer etc. (n=4/17%)
Actor group (n/% of interviewees)						
Catching sector (3/6%)	1/12.5%		1/7%	1/12.5%		
Cert. scheme (4/8%)			2/14%			
Chefs/Cookery schools/training (4/8%)		1/16.5%		1/12.5%	1/5%	1/25%
ENGO/Seafood initiatives (6/12%)	3/37.5%		2/14%		3/15%	
Food Service (4/8%)		1/16.5%	1/7%	1/12.5%	1/5%	1/25%
Government and Public Bodies (7/14%)	1/12.5%	1/16.5%	2/14%	3/37.5%	3/15%	
Retailer (4/8%)	1/12.5%	2/34%	1/7%		1/5%	1/25%

Wholesaler, processor, manufacturer or supplier (17/35%)	2/25%	1/16.5%	5/36%	2/25%	11/55%	1/25%
Total (49/99%)	8/100%	6/100%	14/99%	8/100%	20/100%	4/100%
Examples of stakeholder responses	"It's difficult to answer that because I personally don't know anyone that uses it" (SH01)	"In all honesty very little" (SH08)	"Probably some consumers are very interested in it because they feel they're making a conscious decision to support sustainable fishing" (SH45)	"It's a positive guide that is helping to improve consumer awareness and promote sustainable choices" (SH43)	"So it's influencing the restaurants and retailers and therefore the choice that they give to the consumer, I think that's really important" (SH40)	"Of course the main consumer is expecting the person they're buying from to have made the right choices" (SH04)
	"I genuinely don't know how often or well consumers are using it" (SH18)	"You know, as I probably pointed to, very little. Consumers like what consumers like" (SH35)	"I would have thought that the actual number of, the percentage of, the public that were, that were, consulting the GFG would be quite small" (SH21)	"I think it's making you think of it [seafood sustainability] more" (SH23)	"So it's definitely helping indirectly you would say in terms of shaping what's on offer to consumers" (SH14)	"I think consumers rely on their providers to make those decisions for them" (SH05)
	"I don't know how much it's used by consumers" (SH32)	"I don't think people are that aware of the MCS good fish guide that's the biggest problem" (SH10)	"I think again in a certain sector of society it is having an influence" (SH48)	"Anything that just encourages people to think about what they're putting in the trolley or buying is a good thing" (SH46)	"I've heard numerous times, interesting complaints, that they can't sell this because it's not on the good fish guide, that's a good thing sometimes" (SH37)	"It's not that our customers don't care about this [sustainability], but they devolve that responsibility to us" (SH26)

16% of interviewees felt they were unable to comment on what influence the MCS GFG was having on consumer's seafood choices, responding that the question was hard to answer, that it would be difficult to quantify any *direct* influence the Guide had. Responses also alluded to the complex suite of drivers that determine consumer fish purchasing behaviour, including situational factors, such as taste, convenience, and price, competing with the Guide's influence. 12% of interviewees considered the Guide to have little to no influence and explained this by referring to a lack of awareness and consumer habit and taste including preference for the Big 5 species (See Section 5.8.2 for discussion of barriers to consumers using and following the MCS GFG advice).

Responses from 29% of interviewees suggested their perception of public awareness of the Guide is low, that its use is only amongst a small or minority, interested, sector of society, and therefore its direct influence on public choices is likely limited. One interviewee commented that the number of PGFGs (one of the available formats for the Guide, see Appendix 8, Question 5) distributed or website hits would be having an effect on a small sector of society, stating: *"The Marine Conservation Society has a great deal of supporters and followers and so, by virtue of that fact, it must be being used by you know, a portion of society"* (SH22).

This comment reflects the way in which many organisations typically evaluate the influence of their seafood sustainability programmes (WWF, 2022). MCS, for example, collates metrics for: the number of GFG ratings produced; media interest; web visits; number of 'connections' made with business and industry; social media followers; number of PGFGs distributed, and until recently ¹⁰⁸ the number of times the App is downloaded (MCS, 2018a and 2021). MCS currently has around 290,000 followers across social media platforms Facebook, LinkedIn, Twitter and Instagram (MCS, 2021). MCS were in the media (broadcast and online, newspapers and magazines) 6,567 times in 2020/21 (MCS, 2021), an average of 126 mentions per week. The total reach of the GFG for the period 2020-2021 is estimated at 468,030 (MCS, 2021). As of May 2023, 965 follow MCS GFG on Instagram and 1655 on Twitter. MCS also estimates the number of businesses and seafood meals the Guide influences in a year. It has

¹⁰⁸ On April 29th, 2021, MCS launched a new brand, website and strategy, including a rebrand of the Good Fish Guide. Up until April 2021 the GFG App was available for download through the App Store or Google Play. The new App is now only available by adding it to your phone's home screen from the MCS GFG website.

been calculated by MCS that their GFG ratings influence over 750 million seafood meals a year (MCS, 2020c), around 105,000 tonnes of seafood. Based on UK household consumption of 477,000 tonnes of fish in 2017 (MMO, 2018), this influence equates to around 22 %, by weight, of household consumption. Businesses using the MCS GFG are reported as selling over 20% of the seafood consumed in the UK (UK Parliament, 2020).

16% of interviewees suggested the Guide raises awareness of seafood sustainability, helping consumers to think about the choices they are making. For example, MCS has assisted in increasing consumer awareness through collaborations such as *'Point the Fish Finger'* (Sustain, 2015), an initiative led by Sustain, the sustainable food and farming advocacy organisation ¹⁰⁹.

41% of responses suggested the influence of the MCS GFG on choice editing (See Section 5.5.1) undertaken by businesses who use the MCS GFG as a risk assessment tool (20%) or have integrated the MCS GFG advice into their decision making when buying fish (31%) (See Table 5.4) is far more significant than any influence the Guide may be having on consumer purchasing behaviour directly. There is evidence to support this view from stakeholders. For example, MCS encourages consumers to diversify their taste in fish to reduce pressure on commonly eaten fish, the 'Big 5', by choosing sustainable alternatives, typically lesser known or under-utilised species for which there is less consumer demand (Farmery et al., 2020). By moving away from more traditional choices, it is expected consumers can both help reduce pressure on overfished stocks and reduce wasteful practices by increasing the value of underutilised species (Fernandez, 2018). A further example was seen when in 2011, the multiple retailer Sainsbury's introduced their *'Switch the fish'* campaign, which encouraged consumers to 'broaden' their taste in fish by making alternative fish choices. Customers wishing to purchase any one of the Big 5 ¹¹⁰ species were offered a lesser-known alternative species free of charge. Despite low perceptions by one interviewee of the influence of the campaign, analysis showed sales volume for all fish species increased by 12% on *'Switch the*

¹⁰⁹ <https://www.sustainweb.org/>

¹¹⁰ In referring to the 'Big 5', Sainsbury's mean the five species with the highest consumption levels in the UK i.e. cod, haddock, salmon, tuna and prawns. Alternative species are recognised by them as any outside of the Big 5 (Future Foundation, 2012).

Fish' day and by 40% week-on-week for alternative species. An increase of 21% in sales of alternative fish species was observed for the period July to December in 2011, compared to the same period in the previous year (Future Foundation, 2012). However, in a choice experiment study by Witkin et al. (2015), unfamiliarity was observed as a barrier for consumer support for underutilised species and that 'even well-informed consumers placed a high value on familiar species' (Witkin et al. 2015, p. 56). Regardless, the authors maintain that with appropriate education, consumer preference towards lesser known and abundant species can be achieved to meet conservation objectives.

Similarly, in a study carried out by Simeone and Scarpato (2014), of consumption of low commercial value fish in Italy, lack of market diversity is highlighted as damaging to the marine environment as well as for local fish-based 'gastronomic traditions' and the profitability of small-scale fisheries. Zhou et al. (2015) also suggest that by '*shifting fishing effort away from highly targeted stocks towards currently underutilised species*' (p. 716) it can help reduce the impacts of overfishing on the marine environment and increase fisheries production. The study acknowledges, however, that such a 'shift' would require a significant change in attitudes towards seafood, particularly in developed countries. In an examination by Farmery et al. (2020) of media messaging to increase consumption of under-utilised species to reduce pressure on more popular and over-fished stocks, the authors caution for the need for advice around 'switching fish' to be accompanied by messages to limit or eat less seafood to reduce the risk of overfishing of non-pressure stocks.

In the specific context of the influence of the MCS GFG, it has also played a significant role in influencing restaurant chains Bella Italia, Café Rouge and JD Wetherspoon to improve their seafood sourcing performance and to adopt the '*Sustainable Fish City*' pledge ¹¹¹, which is underpinned by MCS ratings (MCS, 2016a). Caterers serving over one billion meals per year have now signed up to the Sustainable Fish Cities pledge to buy only verifiably sustainable fish ¹¹². MCS ratings also underpin projects delivered by other organisations, including

¹¹¹ <https://www.sustainweb.org/sustainablefishcity/>

¹¹² <https://www.sustainweb.org/sustainablefishcity/achievements/>

Fish2Fork,¹¹³; *Food For Life Served Here (FFLSH)* ¹¹⁴, an accreditation from the Soil Association that awards sustainable catering; the *Sustainable Restaurant Association* ¹¹⁵, an initiative which aids food-service businesses to work towards sustainability; *Cornwall Good Seafood Guide* ¹¹⁶, a project of the Cornwall Wildlife Trust designed to promote the consumption of local and sustainably produced seafood; and *Reserve Seafood*, a project facilitated by the *Blue Marine Foundation* (Blue) ¹¹⁷, appreciably increasing the reach and impact of the MCS GFG ratings (MCS, 2017), while as mentioned earlier (See Section 5.5.1), MCS ratings are incorporated into the GBS for procurement of fish for public-sector food and catering services. Underpinning of the MCS GFG advice in this way suggests that the *indirect* influence of the Guide on the seafood choices consumers are making, although not quantified, is significant.

5.8.2. Perceptions of barriers for consumers using and following the MCS GFG advice

Interviewees were asked what, if anything, might prevent consumers from using the MCS GFG and making the choices being recommended by the Guide. A summary of responses is presented in Table 5.8.

¹¹³ <http://www.fish2fork.com/> (Site now unavailable)

¹¹⁴ <https://www.foodforlife.org.uk/about-us/food-for-life-served-here>

¹¹⁵ <https://thesra.org/>

¹¹⁶ <https://www.cornwallgoodseafoodguide.org.uk/>

¹¹⁷ <https://www.lymebayreserve.co.uk/reserve-seafood/>

Table 5.8: Barriers to the public using and following the MCS GFG advice.

Responses (n=30/100%)	Guide awareness (n=6/20%)	Situational factors, time, habit, taste etc. (n=5/17%)	Availability of recommendations, niche products (n=5/17%)	Prioritisation of sustainability - WTP (n=7/23%)	Supply chain knowledge, information, labelling (n=7/23%)
Actor group (n/% of interviewees)					
Catching sector (3/6%)		1/20%		1/14%	
Cert. scheme (4/8%)			1/20%		
Chefs/Cookery schools/training (4/8%)	1/16%			2/29%	1/14%
ENGO/Seafood initiatives (6/12%)				1/14%	2/29%
Food Service (4/8%)		1/20%		1/14%	
Government and Public Bodies (7/14%)	1/16%		1/20%	1/14%	
Retailer (4/8%)		1/20%			1/14%
Wholesaler, processor, manufacturer or supplier (17/35%)	4/67%	2/40%	3/60%	1/14%	3/43%
Total (49/99%)	6/99%	5/100%	5/100%	7/99%	7/100%
Examples of stakeholder responses	"I don't think people are that aware of the MCS good fish guide that's the biggest problem" (SH10)	"People don't want to carry guides around, you know interrogate things at fixture" (SH26)	" <i>Salmon, which is farmed in recirculating aquaculture systems [RAS], goodness me, where are you going to find that</i> " (SH44)	I suppose when expendable incomes tighten for whatever reason if the species is not competitive there will be a significant percentage of people who'll shop on price" (SH09)	"I'm not sure that for a typical consumer that information is available in an easily digestible form, either at fixture or indeed, you know on social media" (SH08)
	"I just don't think the awareness is that high of [the] guide" (SH35)	"People are pretty set on what they want" (SH34)	"I would think availability. Dive-caught scallops instead of farmed scallops, where would they buy those, you	"If something is a sustainable option but it's double the price of the unsustainable	"I would struggle to use it myself, I think, because not all of the information that you need to make a decision is

			wouldn't buy those in a supermarket because they're extremely expensive" (SH42)	option, people will go to the unsustainable option" (SH27)	provided by the seller of the fish" (SH01)
	"How aware are consumers of the MCS good fish guide" (SH11)	"They care more about what they're going to put into their mouths at that given moment than they do about what the good fish guide is recommending" (SH27).	"Availability, if the green rated sources are not on the shelves they can't buy them. It's the choice editing by retail and food service that is the primary filter on consumer choice" (SH12)	"I think probably cost you know it will be cheaper to eat some of these fish rather than the expense of having others I guess" (SH46)	"You can't use the GFG if you can't get the information that you need to use it" (SH13)

The main barriers to the public successfully following the Guides advice were: public awareness of the Guide; situational factors; availability of recommendations made by the Guide; prioritisation of sustainability and cost; and seafood supply chain knowledge and information.

Lack of **public awareness of the MCS GFG** was identified as a barrier to consumers using the Guide by 12% of interviewees, with one interviewee stating, *“I don’t think people are that aware of the MCS good fish guide that’s the biggest problem”* (SH10). **Situational factors**, identified by 10% of interviewees, such as the time required to interrogate the labelling information available to them and match it with the GFG advice, consumer habit, and taste or preferences, were identified as specific barriers to consumers using the Guide. One interviewee stated: *“People don’t want to carry guides around; you know interrogate things at fixture”* (SH26).

The complexity of the information presented in the Guide and the ability of an average shopper to ‘internalise’ it and then apply it to a ‘real world’ shopping situation was identified as another specific barrier. This type of difficulty is typical of those identified in other studies examining ‘green’ purchasing behaviour (Feucht and Zander, 2017; Johnstone and Tan, 2014). As mentioned by 6% of interviewees in this study, consumers generally spend seconds in supermarkets selecting an individual item. According to Kalnikait and Rogers (2013), ‘real world’ decision making involves consideration of one or two product factors. Their study of supermarket shoppers found that key to meeting consumers’ product information needs and supporting low-involvement decision-making, is for design of shopping technologies such as mobile apps to concentrate on providing information that is simple and relevant, so as not to ‘overwhelm’ shoppers. In a study by Emberger-Klein and Menrad (2018) on the effect of information provision on supermarket consumers' use of and preferences for carbon labels in Germany, the authors found that whilst consumers preferred ‘scale labels’ that used a traffic-light colour system, such as that used by the MCS GFG, carbon labels generally are not important in the consumer’s decision-making process. The influence of other factors such as price (Hinkes and Schulze-Ehlers, 2018; Sogn-Grundvag et al., 2013; Brecard et al., 2009), habit (Ouellette and Wood, 1998), and familiarity with species (Witkin et al., 2015), were suggested as potentially more important to shoppers generally than sustainability intentions.

A further barrier, identified by 10% of interviewees in this study, was the **availability of recommendations** for often 'niche' products, such as salmon produced in recirculating aquaculture systems (RAS). One interviewee stated: *"Salmon, which is farmed in recirculating aquaculture systems [RAS], goodness me, where are you going to find that"* (SH44).

It could be argued that MCS recommendations for niche products such as salmon farmed in RAS systems can create awareness of innovations in the sector. For example, in 2019 the production of land-based salmon was estimated at less than 1% of salmon farmed globally. This is anticipated to increase rapidly with global production estimated at 150k tonnes by 2025 (Murray, 2022). Further as part of a strategy to increase food security, encourage environmental sustainability, and increase growth and diversification in UK aquaculture, plans exist to produce around 14,000 tonnes of Atlantic salmon in land-based systems such as RAS in England by 2040 (Huntington and Cappell, 2020). One of the challenges for a RAS however is its high energy consumption (Badiola et al., 2018). As discussed in Section 5.5.2. assessment of the carbon footprint of seafood production methods is anticipated to become of increasing interest to suppliers.

As discussed in 5.5.2, **prioritisation of sustainability** and **willingness-to-pay** and a lack of **supply chain knowledge, information, and labelling quality**, were identified as barriers for the public using the Guide by 14% of interviewees in both cases. Interviewees remarked: *"If something is a sustainable option but it's double the price of the unsustainable option, people will go to the unsustainable option"* (SH27); *"You can't use the GFG if you can't get the information that you need to use it"* (SH13).

Comparisons with these barriers and those explored by the public questionnaire for using the MCS GFG advice (Section 4.3.1) is discussed in more detail in Chapter Six.

5.8.3. Influence of guide on seafood sustainability practice

Interviewees were asked how, if at all, the MCS GFG is motivating sustainable stakeholder practice, with responses categorised based on whether impacts were discussed relating to on

the ground i.e., in the supply chain or water i.e. the catching or farming sector. A summary of data relating to these categories is presented in Table 5.9.

Table 5.9: Effect of MCS GFG on seafood sustainability practice.

Responses (n= 51)	Effect on the ground (n=28/55%)	Effect on the water (n= 23/45%)
Actor group (n/% of interviewees)		
Catching sector (3/6%)	-	2/9%
Cert. scheme (4/8%)	3/11%	1/4%
Chefs/Cookery schools/training (4/8%)	4/14%	1/4%
ENGO/Seafood initiatives (6/12%)	4/14%	4/17%
Food Service (4/8%)	2/7%	2/9%
Government and Public Bodies (7/14%)	2/7%	3/13%
Retailer (4/8%)	1/4%	3/13%
Wholesaler, processor, manufacturer or supplier (17/35%)	12/43%	7/30%
Total (49/99%)	28/100%	23/99%
Examples of stakeholder responses	“I certainly think on the supply side it’s having a lot of impact, like I say, because people do use the Guide to choose the fish they are putting on their menus, so people are basing their menus around more positively rated seafood” (SH06)	“So for me the MCS guide really fails on the water. I think it has almost had a negative effect on the fishermen, because the ones that are fishing with low impact [gears] are not rewarded by either better prices or better [market] access. So it’s not helping to motivate small-scale fishers” (SH05)
	“I don’t think it’s as affective as Greenpeace used to be when they got onto the roof of Tesco’s” (SH07)	“I don’t think it is. I don’t think there is a clear connection between them, for example, changing your rating and anyone from that fishery acting differently. I think there’s a clear correlation between MSC certifications suspension of certification and what people in that fishery do because there is that economic element, that loss of market” (SH38)
	“Its influence on UK retailers is big, for a fish guide its significant” (SH44)	“I would say that it definitely has an effect, people pay attention to the ratings in the fishing sector” (SH22)

A high majority of interviewees (86%) commented positively, including all (100%) representatives from the Chefs and more than half (53%) from the Supplier groups, on the impact the Guide is having on the ground, amongst seafood buyers and retailers in particular. Comments from interviewees included: *“I think it is useful for businesses”* (SH01); *“All the UK retailers definitely look at it”* (SH03); and *“Yes, it definitely has had influence”* (SH19).

The impact of the Guide on the water, on the supply side, exclusively the catching sector, was not however deemed to be as effective. Almost three quarters (74%) of interviewees did not consider the Guide to be having an influence on the water. Negative comments included: *“I think you’ll see other fishermen though that just see MCS ratings as being a hindrance, these tend to be more or your local day-boat fishermen”* (SH11); *“On the water I’m unclear I don’t think there are many fishing companies that take the same view as downstream more consumer facing parts of the market”* (SH12); *“So it’s not helping to motivate small-scale fishers. So for me the MCS guide really fails on the water”* (SH05).

Ineffectiveness on the water was attributed to lack of direct engagement with the catching sector and difficulty in relating the use of the GFG ratings to any tangible economic benefit or loss. Comments from interviewees included: *“In reality, not very much. There wasn’t, you know not in the same way as we have like FIPs or MSC that involve stakeholders and fishers and get them to work on improvements, there isn’t an equivalent I’m aware of for MCS so yes that kind of outreach doesn’t exist”* (SH25); *“I haven’t heard of fisheries directly seeking to improve their MCS rating by changing the way they manage their fishery”* (SH02). In contrast one interviewee commented: *“Any drive to get a better rating to sell more product is probably really useful”* (SH31). Another observed: *“I would say that it definitely has an effect, people pay attention to the ratings in the fishing sector”* (SH22).

Opinion also suggested that the MCS GFG could be limiting efforts to improve sustainability because of the organisations perceived lack of understanding of FIPs, with one interviewee stating: *“I think in some ways the MCS could be limiting more effort [to improve] in areas because of its lack of understanding of FIPs and how they are implemented”* (SH35).

Interviewees were also of the opinion that if MCS wanted to drive change within the sector then it needed to provide recommendations for improvement, stating: *“Where we’ve got deficiencies within these fisheries, what are the gaps that need closing, essentially what I’m talking about is the recommendations piece, the actions that are needed to improve scores from an MCS perspective would be useful. If you want to drive some of the change on the ground, then some practical application of improvement required for scores, would be more useful (SH24); “So I suppose one of the challenges is that the GFG doesn’t necessary provide those recommendations straight away, which can make it challenging to know to what extent scores can be improved going forward and how to do so” (SH14).*

Conversely, as presented in Table 5.4 (Section 5.7), the Guide is credited with providing advocacy for data gathering, for improvement in a fishery, with one interviewee stating: *“I think it’s been very effective in highlighting to the regulator and to the market, where change is needed and it’s, it’s, the credibility of MCS that’s helped in that process or driven that process” (SH40).*

Finally, it should be noted that 12% of interviewees stated they did not know or appeared from analysis of their comments to confuse MCS with the MSC organisation. See Section 5.9.3. for further discussion relating to confusion of their respective acronyms.

5.9. Increasing GFG engagement

To identify opportunities for increasing engagement with the MCS GFG, interviewees were asked if they had any suggestions as to how the MCS GFG might better engage with and motivate consumers to increase the effectiveness of the Guide and the sustainability of the UK seafood market ¹¹⁸. A summary of responses relating to the themes emerging from the data collected is presented in Table 5.10.

¹¹⁸ It should be noted that interviews with stakeholders took place between 10th May and 12th August 2021, just after the launch of the newly transformed MCS GFG website and App in April 2021. The website and App underwent a three-year transformation, funded by a £1 million donation from The Moondance Foundation, received in 2019 (MCS, 2021).

Table 5.10: Ideas for increasing public and stakeholder engagement with the MCS GFG.

Ideas (n=76/100%)	App/QR Code (n=5/6%)	Point of sale information (n=12/16%)	Increasing engagement with supply chain (n=41/54%)	Increasing public awareness, social norms around seafood sustainability (n=18/24%)
Examples of stakeholder responses	“What there needs to be is almost a way that you can scan a product, and it just gives you what [rating] it is” (SH01)	“I think if it could be better linked up with a clear and consistent labelling system” (SH36)	“I think there’s definitely some types of groups that MCS could engage with more” (SH03)	“I do think there is a lot of work to be done on social media, in simple messaging, in bringing the tool to life in a modern format” (SH08)
	“Would be great if you could have a QR code on retail facing products and then just simply zap it with your phone” (SH32)	“Matching the information that MCS is giving with the purchasing environment” (SH22)	“Make a bigger point of supporting those fishermen that are going the extra mile” (SH19)	“The Pocket Guide is a good route in, there’s some good impactful stories that get the message across well” (SH10)
	“I always thought what would be a brilliant idea is to make an APP so that you could scan a product, and then it would bring up the profile of the MCS” (SH29)	“So I think restaurants, putting it on menus a bit more so actually having some sort of logo” (SH23)	“Perhaps [MCS] would benefit from looking more at the social impact of the Guide. Small-scale fishermen are not served particularly well by it” (SH05)	“Really reaching the people who need to be motivated to make better choices is notoriously difficult” (SH31)
	“A way to go to be more accessible, have an APP [that] can let you scan the barcode of the product, and then it will tell you automatically if it's, like which category it's in” (SH38)	“I think making direct links to products on shelves” (SH43)	“I think they should get more fishmongers involved” (SH04)	“I think celebrity chefs are probably one of the best routes, one of the best ways to influences that kind of stuff” (SH37)
	“I really want them to target fishmongers and food service outlets, to try and get them to put a QR code, here’s what we’re selling” (SH35)	“I think having a visibility of that information at the point of sale. That socialises people to that kind of thinking, that kind of choice” (SH48)	“A roll out of more localised ones [guides], I think they are kind of better at engaging with local issues and local businesses in their area” (SH15)	“Understanding of the different segments of society and what motivates [them] and tailoring your approach. I think the GFG really lands well with particular people but [others] it will completely miss” (SH48)

Despite criticism by interviewees of lack of direct engagement with the catching sector (no explicit reference was made to the farming sector), MCS is widely engaged in various activities, including ‘political advocacy’, to increase the profile of marine and fisheries conservation in the UK. For example, MCS has called on the UK Governments to ban bottom trawling in MPAs after research published by the organisation showed it was taking place in 98% of the UK’s offshore MPAs (Dunkley and Solandt, 2021). Through the GFG rating consultation process (MCS, 2023e)¹¹⁹, MCS has highlighted, for example, areas for improving the GlobalGap¹²⁰, a farm assurance scheme, feed mill standard (MCS, 2020c). Through the environmental coalition, Greener UK¹²¹, MCS has worked to influence the Fisheries Act 2020, advocating for the adoption of fully documented fisheries management including the use of Remote Electronic Monitoring (REM)¹²² on fishing vessels to monitor catches and fishing activity (MCS, 2023f). However, stakeholders’ responses suggest there is ‘room for improvement’ regarding engagement of the MCS GFG with the public and stakeholders. Suggestions were made for: making direct links with GFG advice and seafood products on shelf; increasing engagement with stakeholders in the seafood supply chain, especially the catching sector; and in increasing norms around seafood sustainability to encourage uptake of the Guide.

5.9.1. Making direct links with MCS GFG advice and seafood purchasing environment

10% of interviewees suggested public access to the Guide could be substantially increased by using *mobile phone technology* to scan an on product Quick Response (QR) or Barcode (Kalnikait et al., 2013). This technology would provide immediate sustainability advice to the consumer, linking the MCS GFG rating with the seafood product on shelf, without the need to ‘interrogate’ information at source, thus eliminating some barriers to using the Guide such as time, effort and lack of appropriate information (Section 5.8.2).

¹¹⁹ Ratings consultations are carried out twice per year, in February and August, with feedback welcome from “*anyone with technical insight and information that could contribute to the comprehensiveness and quality of the MCS GFG ratings*” (MCS, 2023e).

¹²⁰ https://www.globalgap.org/uk_en/for-producers/globalg.a.p./cfm/

¹²¹ <https://greeneruk.org/>

¹²² REM includes integrated on-board systems of cameras, gear sensors, video storage, and global positioning system units, which capture comprehensive videos of fishing activity (Defra, 2021).

Such technology would help overcome the lack of appropriate labelling information. As previously mentioned, there is a legal requirement in the EU and UK to label fresh and chilled seafood (EC, 2013). However, the legislation is not always fully adhered to, is often misinterpreted, or confused by multiple sources for the product on sale supplied and does not apply to products that have been further processed. This means that it is difficult for users of the MCS GFG to align information in the Guide with information available to them in the purchasing setting. As discussed in Sections 4.9.6, 5.5.2 and 5.8.2, labelling quality and lack of sustainable seafood knowledge is a barrier to both the public and stakeholders using the Guide effectively to purchase sustainable seafood. This topic is discussed further in Chapter Six.

Additional suggestions were made by 24% of interviewees for linking MCS GFG advice with products on supermarket shelves or restaurant menus by improving the quality and consistency of information at the point-of-sale, by e.g., including the MCS GFG logo and/or 'traffic light' rating on packaging or menus. Provision of point-of-sale information in the form of enhanced labels or eco-labels, as mentioned by interviewees, is one approach to increasing seafood sustainability knowledge which is key to the importance of sustainability when purchasing seafood (Lawley et al., 2019).

5.9.2. Increasing engagement with stakeholders in the seafood supply chain

As a 'tool', the MCS GFG was regarded positively by 39% of stakeholders in this study. However, it was suggested that, to increase engagement with it, the Guide could be 'tailored' to meet individual business needs. Interviewees commented: *"I think we might have some questions about making it a bit clearer about what's moved, you know when they change ratings, we could do with like a real summary of that, that would really help our business, we have to go through and check it all, but yeah it's quite good, a good tool"* (SH47); *"One way would be to really market the tool as a resource for decision making"* (SH01).

Another interviewee suggested it would be useful if stakeholders were able to request specific advice on products they were intent on sourcing, commenting, *“It would be quite useful for us to be able to talk to the MCS and say, we would like your opinion on this fishery before we go further with the retailer”* (SH42). As the MCS GFG already provides a consultancy service¹²³, clearly this service needs to be more widely communicated.

As discussed in Section 5.7. food service is perceived as a diverse sector with less seafood expertise compared to other stakeholder groups in the seafood supply chain and therefore one in which the MCS GFG could bring value. Stakeholders stated: *“I mentioned this really long tail of businesses, not working on seafood sustainability at all. I think probably increased adoption of the Guide amongst those, businesses that don't have significant resource already going in to seafood sustainability, I think, is a really good market or sector for the Good Fish Guide to appeal to; I'm thinking fish and chip shops, but also, you know small restaurants, some of the retailers, you know the kind of convenience retailers”* (SH02); *“Where people could put more pressure on is in Food Service, there's only 2 companies that are engaged in [sustainability] really in any kind of scale, between them [they] have got 40 per cent of the market share, that means 60 per cent of the market in fresh Food Service is small traders and small importers”* (SH12).

Suggestions were made by two interviewees (4%) for using the *Cornwall Good Seafood Guide* (CGSG) as a model for the ‘role out’ of a system of local guides to support local fishers and businesses following sustainable practices. The CGSG, managed under the auspices of the Cornwall Wildlife Trust (See Chapters 2, 3 and 4 for further discussion of CGSG), is currently the only example of a local seafood eco-labelling scheme whose seafood advice is underpinned by the MCS GFG methodology.

Research carried out by this study on recognition of seafood logos found there was a higher

¹²³ <https://www.mcsuk.org/ocean-emergency/sustainable-seafood/good-fish-guide-for-businesses/our-seafood-services-for-business/>

recognition of the CGSG logo by respondents (50%) indicating their post code was in the South West (n=211), compared to recognition of the logo by respondents (39%) living nationally (n=1764). Additionally, as discussed in Chapter Four, this study also found awareness of the MCS GFG and guide use is significantly higher in the South West compared to other regions, indicating the contribution of local seafood guides and product labelling in increasing awareness of seafood sustainability. The contribution of guides to increasing awareness of seafood labelling schemes is supported by research carried out by Marcone (2021) to investigate the impacts of the CGSG on fishers in the South West and the attitudes towards labelling schemes amongst the public. Although the study found that because fishers joining the scheme had already adopted sustainable fishing practices, the scheme had not led to any changes in fishing practice, fishers participating in the scheme agreed they benefitted from *'the work done by the CGSG to promote seafood to the wider public'* (Marcone, 2021).

Interviewees also suggested there could be more collaboration with the catching sector, that the organisation should be engaging more with stakeholders in the supply chain and working alongside retailers and food service operators *'to become part of the solution'* not sitting *'outside the camp'*. For example, improved engagement with FIPs was highlighted by interviewees. One interviewee commented: *"Helping to create FIPs, so establishing, helping the prioritisation and advocacy for creation of further FIP work"* (SH40). It was also suggested that MCS could better connect with the catching sector by *'championing'* British seafood. Interviewees commented: *"There aren't enough people backing British fishing where they are sustainable and making improvements, so something like that would be useful"* (SH31); *"I think there could be other elements [of the GFG], to perhaps champion sectors of the catching sector"* (SH17). MCS's calls on the UK Government for the use of REM on fishing vessels could provide an opportunity to work with and *'champion'* fishing companies in the sector who have been advocating for and using the technology for many years.

The MCS has partnered with a range of businesses, including retailers and seafood suppliers, who support the organisations conservation work (MCS, 2023g). Collaborations with stakeholders in the seafood supply chain in recent years include MCS partnering with M&J,

an independent seafood supplier, a division of one of Europe’s largest foodservice providers, the Brakes Group¹²⁴, the MSC and the ASC, to produce a ‘*Simply Sustainable List*’ (M&J, 2023) to help businesses make responsible choices when sourcing seafood. MCS ratings and logo have also been displayed by Brakes in the past to identify the sustainability of their various seafood products to online buyers (Figure 5.6).

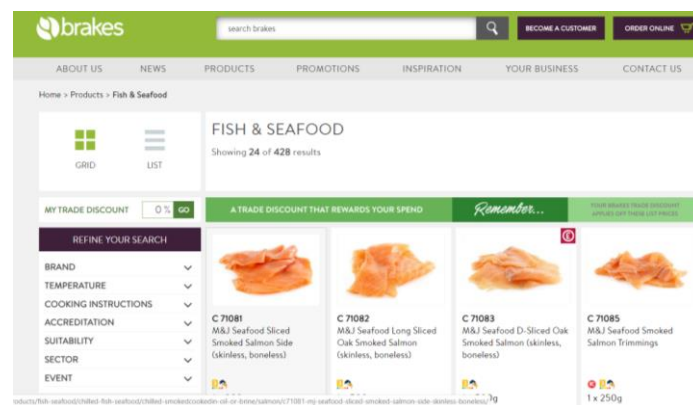


Figure 5.6: Brakes fish and seafood displaying MCS logo and rating (Source: Brakes – image now unavailable online).

An example of an earlier collaboration was between MCS, the MSC, SeaWeb’s Seafood Choices and Sustain: the alliance for better food and farming, to produce “Good Catch, the essentials” (Sustain, 2023). The publication was designed for catering professionals to “help restaurants and related businesses improve the sustainability of the seafood they buy, serve and promote’.

More recently MCS in association with the Master Chefs of Great Britain¹²⁵ organised a sustainable seafood competition (The Full Range Ltd., 2021), and presented at an ‘upskilling’ day organised by Zest Quest Asia (Waddell, 2021), to extend the organisations engagement with the restaurant industry and ‘early career’ chefs. These type of collaborations and events

¹²⁴ <https://www.brake.co.uk/>

¹²⁵ <https://www.masterchefsgb.co.uk/>

all provide opportunities for increasing engagement with actors in the SSM and the seafood supply chain.

5.9.3. Increasing social norms around seafood sustainability

Suggestions from interviewees for MCS increasing social norms around seafood sustainability included ideas for MCS using advertising, as well as the use of magazines, websites and billboards, to communicate its messaging. *“It's just getting the message out there and it's going to be people who are advertising on TV and magazines”* (SH04); *“It's how the MCS can make contact with the consumer, customers, is that advertising [in] magazines?”* (SH11); *“Has [MCS] ever used any advertising? Whether that be billboards or anything”* (SH18); *“Most retailers have a magazine of some form now, most of us have corporate websites, foody websites, where there is the opportunity to engage differently. So, I think that's the type of area they should explore”* (SH08).

Increasing public awareness of marine issues using ‘billboards’ was employed by MCS in 2018. Working with the advertising agency Ocean Outdoor ¹²⁶, digital screens featuring messaging for MCS’s #STOPThePlasticTide campaign, a new MCS plastic-free living book, #MayNotContainFish campaign, and ‘Join the Great British Beach Clean’ ¹²⁷ but not sustainable seafood were on display across major UK cities. The digital boards were considered to have helped ‘amplify’ MCS messaging by providing distinctive advertising space to showcase MCS campaigns worth the advertising equivalent of nearly £2.7m. This suggests advertising in this way could be successfully employed for increasing social norms around sustainable seafood. However, another interviewee suggested that with the huge increase in marketing through social media and advertising, people are becoming overwhelmed, commenting, *“I think you know given the proliferation of social media and advertising and confusion and noise in today's world people aren't aware of anything anymore”* (SH28).

¹²⁶ <https://oceanoutdoor.com/ocean-news/ocean-for-oceans/we-are-changing-our-relationship-with-plastic-are-you/>

¹²⁷ https://media.mcsuk.org/documents/MCS_Annual_Impact_Report_2018-2019.pdf

“A call for action, a call for better” (SH13) was also suggested as a way in which MCS could engage with the public to increase the effectiveness of the Guide. A ‘call-to-action’ approach has been used by MCS in the past, for example, from 2015, users of the PGFG were asked to let MCS know if they were ‘*Seeing red*’ i.e., had found ‘red-rated’ fish in supermarkets or on restaurant menus, by emailing MCS or sharing their finds on Twitter using #redrated to spread the message (MCS, 2016b). In December 2019, MCS replaced the call with a public ‘pledge’ urging businesses to remove red-rated fish from sale and for governments to do more to address the underlying issues of red-rated seafood’ (MCS,2020) ¹²⁸ (Figure 5.7).



Figure 5.7: MCS ‘call to action’ pledge to say no to red-rated seafood (Source: MCS Pocket Good Fish Guide 2020, MCS, 2020a).

Research by McKenzie-Moher and Schultz (2014) indicates people can be encouraged to adopt low-visibility behaviours such as sustainable seafood consumption (Richter and Klockner, 2017) by using pledges, petitions, and window or ‘bumper’ stickers (See Section 2.5.7.3 for discussion of opinion leadership and the role of champions). 7,031 pledges to remove red-rated fish from sale were received in the period up to 31 March 2020 ¹²⁹, suggesting that pledging support for avoiding unsustainable or red-rated seafood could be a successful way to increase salience and the diffusion of responsible behaviour throughout society (Jacquet and Pauly, 2007).

¹²⁸ https://media.mcsuk.org/documents/Marine_Conservation_Society_Annual_Impact_Report_2019-20.pdf

¹²⁹ We want you to say no to red-rated seafood. Marine Conservation Society. Posted 16th December 2019. <https://www.mcsuk.org/news/red-rated-campaign> Take Action <https://www.mcsuk.org/campaigns/red-rated-seafood-home> [Accessed 13th January 2020]

The role of celebrity chefs and cooking programmes in diffusing seafood sustainability messaging and increase *social norms* for using sustainable seafood was also suggested by 8% of interviewees. One interviewee commented: *"I think celebrity chefs are probably one of the best routes, one of the best ways to influence that kind of stuff"* (SH37).

Examples of this type of initiative are already seen within the MCS's 'Ocean Ambassadors' initiative which include wildlife filmmakers, presenters, naturalists, chefs and authors, to help raise the profile of the 'ocean emergency' and inspire change (MCS, 2023h). Celebrity chefs are enlisted to promote use of sustainable seafood and can be used to 'responsibilise' public behaviour (Bell et al., 2017). However, individuals from the catching or farming sector do not appear to have been prioritised as 'opinion' or sustainable seafood leaders to champion sustainable fishing or farming practices in this way. In the context of 'championing' British seafood and engaging more with primary producers (mentioned in Section 5.9.2), this approach is worth exploring in more detail.

The application of the Guide to the provision of *simple messaging* including for example, helping translate Government policy, commitment to sustainability objectives in legislation such as the UK Fisheries Act 2020, into information the public can access and understand, was among other suggestions for increasing the Guides effectiveness. One interviewee stated: *"So how can the Guide [be used to] help explain to consumers that the fish that they're eating, the fish they're buying, meets all of those objectives, in particular, the sustainability objective"* (SH49).

It was also suggested that to engender public support for choosing sustainable seafood, messaging in the MCS GFG should focus on more tangible issues for the public to reduce pressure on declining fish stocks. One interviewee commented: *"Declining seal populations, birds, things that people care slightly more about, taking that back to declining fish stocks"* (SH10). Another suggested the PGFG was 'good for headlining', commenting: *"realistically I'm not going to go search 1000 things on my phone while I'm at the supermarket, it (the PGFG) is quite handy to take out and see just the top things that one would choose"* (SH38).

The importance too of ‘tailoring’ engagement of the Guide with different ‘segments of society’ to understand what ‘motivates’ them to make better seafood choices was also raised as important for making the Guide accessible to all sectors of society. Stakeholders commented, “Really reaching the people who need to be motivated to make better choices” (SH31); “I think the GFG really lands well with particular people but [others] it will completely miss” (SH48).

As mentioned in 5.9. above the MCS launched a ‘new look’ GFG website and App in April 2021 shortly before the start of the Stakeholder interview phase on 10th May. As a major part of the transformation, previously photographed images of fish were replaced with stylised images (Figure 5.8).



Figure 5.8: GFG tweet for launch of rebranding of Good Fish Guide in April 2021 (Source: @GoodFishGuideUK, 2021).

While undoubtedly an attempt to increase the appeal of the site to wider audiences, the move could be criticised as a lost opportunity for the Guide to educate consumers more about ‘real’ commercial fish, connecting them with the fish they eat (Cusa et al., 2021). Given that the interview process was in progress when the launch of the new guide occurred, opinion was

not sought specifically on the latest version of the MCS GFG website or App. A small number (12%) of interviewees however volunteered views, commenting:

“I think the graphics and the look of the whole thing is good. It doesn’t hurt to refresh I suppose” (SH02); “It said [MCS communication regarding the launch] it was going to be much easier to use. Although actually I’m not sure whether I would agree with that. I don’t much like the design either” (SH06); “That’s [the] bit you want to see, what the actual colour of the [fish] skin is” (SH23).

Further investigation is clearly needed to understand the impact of these recent changes on use and practicability of the MCS GFG.

Finally, several interviewees (22%) raised concern for the confusion caused by the similarity between the acronyms, MCS and MSC, with one commenting, *“I think it’s incredibly unfortunate that they have such close names” (SH41)*. Another suggested that it was unlikely people even understood the difference between ratings and certification, commenting: *“I think there is still a lot of confusion, even for people in the seafood industry, between MSC and MCS. I don’t think people understand the difference between ratings and certification” (SH06)*.

5.10. Summary

The MCS GFG is marketed primarily as providing advice for the public to eating ‘eco-friendly’ fish. However, it was not found to be having a notable direct influence on their purchasing behaviour. Nonetheless, awareness of the MCS GFG amongst stakeholders in the UK seafood supply chain was high in this study. Analysis of interviews suggested that the Guide is widely used by a majority of seafood buyers and credited with having considerable influence on their seafood purchasing behaviour. Even so, it was indicated that the SSM had ‘moved on’, that the ‘battle’ with the major retailers to remove endangered seafood from their offer has been won. The focus of the Guide on environmental or ecological sustainability and its exclusion of other issues, such as social justice, climate change, and carbon emissions, for example, was identified as a weakness in the relevance of the Guide to the complex challenges faced by

seafood businesses when sourcing sustainable seafood. It was also suggested that with the increase, in particular, of seafood collaborations, of pre-competitive platforms, of FIPs, and other initiatives as part of the 'improvements agenda', the Guide is perhaps not having the influence it once had, and that it needs to establish new ways of working with the supply chain.

Barriers for increasing use of the MCS GFG are identified as, a deficiency of supply chain seafood sustainability knowledge; accountability; choice editing by retailers; and the compatibility between the information presented in the Guide and existing quality of seafood labelling. Challenges for increasing the sustainability of the UK seafood supply include interpretation of seafood sustainability, consumer awareness, UK seafood culture, and Government commitment to seafood sustainability. The influences of Brexit, the COVID-19 pandemic, and adverse publicity, such as 'Seaspiracy', were all acknowledged as opportunities for increasing sustainable seafood supply through engagement of the MCS GFG with the seafood supply chain.

Chapter 6: Synthesis and Discussion

6.1. Introduction

The review of the literature presented in Chapter Two identifies the difficulties facing global marine environments and, in particular, recognises the challenges for the sustainable management of fish stocks. It also discusses the SSM, which in response to the failures of traditional approaches to fisheries management, has championed the use of market-based strategies, including the distribution and use of seafood guides, to help increase awareness of the need to reduce the impact of human consumption on the ocean by only choosing sustainable seafood.

Chapter Three outlines the methodological approach adopted for collecting data on perceptions and attitudes towards seafood guides. Analysis of data collected for the study is presented and discussed in Chapters Four and Five, identifying several factors influencing public and stakeholder use of seafood guides in the UK and their effectiveness in motivating seafood sustainability.

This Chapter builds on key observations and discussions from Chapters Four and Five and has three main sections. Firstly, in fulfilment of Objectives 1-3, and 5 (See Section 1.3), it provides a synthesis of public and stakeholder perceptions and attitudes towards seafood guides in use in the UK (Section 6.2). Secondly, to fulfil Objective 4, this chapter discusses the model used in the study to conceptualise motivation for using the MCS GFG to purchase sustainable seafood (Section 6.3). Finally, it critically examines the significance of findings in relation to future use of seafood guides as part of the SSM (Section 6.4). In fulfilment of Objective 6, recommendations for increasing use of the MCS GFG in the UK are presented in Chapter Seven (Section 7.2.6).

6.2. A synthesis of public and stakeholder perceptions and attitudes towards seafood guides

6.2.1. Awareness and use of the MCS GFG

The use of consumer guides to highlight the sustainability credentials of products is not new (Peattie, 2001). Seafood guides, although considered a recent phenomenon in relation to food consumption (Feucht and Zander, 2017), have become more familiar due to growing concerns for overfishing (Nghiem and Carrasco, 2016). Despite this, it was anticipated that public awareness and use of the MCS GFG in the UK would be low, similar to the findings of earlier studies (Richter et al., 2017; Feucht and Zander, 2017). However, notwithstanding stakeholders' perceptions of low levels of public awareness of the Guide (Section 5.5.2), this study found public awareness and use of the MCS GFG guide to be higher than expected, and much higher than reported in other studies (Iue et al., 2022; Richter et al., 2017; Feucht and Zander, 2017). It should be noted that the self-selection sampling approach used in this study may have resulted in people with an interest in seafood sustainability participating, leading to the higher-than-expected levels of public awareness. Given that self-selection can bias a representative sample (Buchan et al., 2023; Priolo et al., 2016), further studies may be required to more fully understand awareness and use of the MCS guide.

When considering awareness of the Guide, concerns were raised by more than a fifth of stakeholders (22%) relating to the 'unfortunate' similarity between the acronyms of two of the most recognisable sustainable seafood organisations in the UK, i.e., MCS and MSC, and the potential for 'mixing' the organisations up. It is conceivable therefore that despite implementing measures to avoid confusion such as: including the name of the organisation in full; providing a link to the GFG website in the public online questionnaire and to interviewees; and in the case of the public questionnaire including an image of the cover of the hard copy guide in circulation in 2020 when the survey was carried out, some uncertainty as to the identity of the organisation producing the GFG prevailed further impacting levels of MCS GFG

awareness. It was also suggested that people may not be aware of the distinction between ratings and certification, and thus the implications for the lack of transparency and potential for seafood fraud associated with seafood that is rated as sustainable compared to seafood that is certified as sustainable. To allow individuals to better discriminate between these two approaches to seafood sustainability it is suggested more effort is invested in raising awareness of this distinction between the two organisations.

In terms of stakeholder awareness, as expected, and consistent with reports of the influence of the SSM on the sourcing policies of large businesses in the seafood supply chain (Roheim et al., 2018; Gutierrez and Morgan, 2015; Mitchell, 2011; Roheim, 2009), awareness and use of the MCS guide amongst stakeholders across most groups (See Chapter 5 Tables 5.5 and 5.6) in the UK seafood industry was extremely high.

As indicated by stakeholders (Section 5.8.2), lack of awareness of the Guide was found to be the main reason for most respondents not using it (Section 4.3.1). Contrary to stakeholder perceptions, however, ability to understand the Guide or follow its advice were reported as presenting the lowest barriers to those with awareness of the Guide wanting to use it. Within the supply chain, a lack of seafood sustainability knowledge was highlighted as a barrier to using the Guide for stakeholders in the food service industry (Section 5.7). In contrast, only a minority (18.5%) of respondents in the public survey indicated that an inability to obtain information from the people they asked was a barrier for them using the MCS GFG, which contrasts with the findings of Kemmerly and Macfarlane (2009) who identified an inability to obtain relevant information about seafood sourcing and supply chains as a key barrier to guide use.

Although not evidenced by results in this study (See Section 5.7, Table 5.6), the perception of stakeholders is that because the food service industry is diverse, the MCS GFG is more popularly used by this sector rather than by retailers. Structurally, these sectors are very different, with food service more fragmented, comprising of a multitude of different business

models (Thomas, 2023). In contrast, retail is dominated by fewer and larger businesses in competition with each other for customer's loyalty and market share. Their structure may help explain why the MCS GFG (and other campaigns) has more positively influenced the retail sector. Additionally, stakeholders suggested that because 'choice editing' is typically carried out by retailers and their suppliers, and perhaps not so vigorously in food service, the perceived risk of purchasing unsustainable seafood, in particular 'red-rated' species, is higher when purchasing seafood from food service outlets than in retail. This has been found to be the case in other studies examining sales of endangered species in food service (Pardo and Jiménez, 2020; Pardo et al., 2018; Vandamme et al., 2016). The persistent lack of, or insufficient, accountability in seafood supply chains may also explain the continuing availability of endangered species to consumers (Packer et al., 2019).

Even though the PGFG ¹³⁰ was well liked, particularly amongst stakeholders involved in education and training, the most popularly used guide format by the public was the mobile application or App. This is perhaps not surprising given the widespread use and ownership of mobile phones in the UK and the use of Apps to provide consumer information to enable individuals to make more informed decisions, including more ethical and sustainable choices, when purchasing goods including food (Fuentes and Sörum, 2019; Mu et al., 2019; Nghiem and Carrasco, 2016). Preference for the App may provide insight regarding how best to further engage with different audiences on seafood sustainability issues. Notwithstanding this, opportunities for developing the PGFG for education and training purposes should not be overlooked in favour of exclusive promotion of the App.

¹³⁰ The Pocket Guide – See https://www.sustainabilityexchange.ac.uk/marine_conservation_society_mcs_pocket_good_fis was 'retired' in 2020 with a view to developing a version of the leaflet with a longer shelf life. Since the COVID-19 pandemic, however, many outlets are reported to have wanted to move away from printed materials, which are seen as less hygienic and less environmentally friendly (C. Coombes, May 2022, *Pers. Comm.*).

6.2.2. Effectiveness of MCS GFG in driving changes in consumer behaviour

Analysis of the data found that the way in which use of the Guide has most influenced individuals' purchasing behaviour is by them always 'checking' where seafood comes from and how it is caught or farmed (Section 4.5). This type of behaviour is common within consumerism; for example, checking of food labels for health and nutritional information is widely encouraged (NHS, 2022). A study by the British Nutrition Foundation found 64% of UK shoppers check nutritional information on food labels and 41% look at labels particularly when buying a new food item (BNF, 2021). Checking labels is a common aspect of judging whether products are 'good' or 'bad' (Eden et al., 2008). In the context of seafood, labels can be checked for details such as fishing capture method to determine the impact on marine wildlife (Maesano et al., 2020). However, as previously mentioned, this type of information is often missing, making 'checking' available information with that supplied by the MCS GFG and its relevance to the consumer setting a barrier to driving changes in consumer behaviour.

Approximately half (51%) of stakeholders reported the use of the MCS GFG as being integrated into their business' buying policies and/or used as part of the process adopted by the business for assessing 'risk' in the supply chain when sourcing seafood (Section 5.7). As a result of this, choice editing by retailers and fish suppliers would inevitably reduce, or eliminate in some cases, the risk to consumers of buying seafood assessed by the MCS GFG as unsustainable. Theoretically, choice editing for sustainability removes the need for the public to 'check' available information, other than for confirmation, provided customers trust the supermarket in which they shop and/or the product brands they are purchasing (Eldesouky et al., 2019).

However, despite stakeholder perceptions that customers 'expect' retailers to source responsibly on their behalf, thereby assigning all responsibility for sustainable purchasing decisions to them (Gutierrez and Morgan, 2015), less than half of all respondents (47%) agreed they trusted that the seafood they were buying was sustainable but did not check to confirm that this is the case (Section 4.9.3). This suggests that some shoppers do not rely on

retailers to source seafood sustainably and that by them not consistently ‘checking’, sustainability is not always a priority for them when purchasing seafood. This situation raises questions in relation to where responsibility for seafood sustainability lies.

Further analysis of data found that for both users and non-users of the Guide, only a small majority of respondents (52%) agreed that where they bought seafood their choices were limited. Whilst a minority (44%) agreed they can make the sustainable seafood choices they want with almost twice as many users as non-users agreeing this is the case (Section 4.9.6). Given the popularity of the ‘Big 5’ species among the UK public (Tetley, 2016), including among participants in this study, and a tendency to ‘stick’ to their usual choices cited by the majority of respondents, it is unsurprising that most respondents indicated that they are satisfied with available seafood choices – people are choosing what they know and what is readily available, rather than diversifying their selection. This echoes studies which have found seafood consumption in several high-income countries, including the UK, to rely on a narrow range of species (Richter and Klockner, 2017; Jennings et al., 2016), which are typically imported (Robinson et al., 2022; Lofstedt et al., 2020). This was, in turn, highlighted through the interviews with participants commenting that consumers can only choose from the offer available to them (Richter et al., 2017), that *“it’s the choice editing by retail and food service that is the primary filter on consumer choice” (SH12)*.

The second most important influence of the Guide on individuals’ purchasing behaviour was the avoidance of ‘red-rated’ species. As mentioned above, choice editing by retailers and fish suppliers in line with MCS and other seafood sustainability advice seeks to reduce, or eliminate, consumption of seafood assessed by the MCS GFG (and others) as ‘red-rated’ (Steenson and Creedon, 2020; Bardey, 2019). Surprisingly, Guide users more frequently reported purchasing ‘red-rated’ species, specifically eel, Rock salmon and shark, compared to non-users. While unexpected, a similar observation was made in an evaluation of seafood guides use carried out by Kemmerly and Macfarlane (2009), with respondents reported as continuing to purchase species listed as ‘avoid’ species. This suggests that while people may have good intentions towards seafood, their choices do not always prioritise sustainability.

In common with other seafood guides, the MCS GFG is promoted primarily as a tool for harnessing public demand for sustainable seafood to increase the sustainability of the seafood market (Brownstein et al., 2003). Stakeholders in this study suggest effectiveness of the MCS GFG may be better achieved through direct influence of the supply chain rather than public demand. That it is the response to social pressure, to commitments driven by Corporate Social Responsibility (CSR)¹³¹, and the subsequent use of defaults and choice editing undertaken by retailers and their suppliers to maintain brand reputation and evidence engagement with corporate citizenship to meet customer expectations of ‘doing the right thing’ (Nickerson et al., 2021; Pulker et al., 2018; Camilleri, 2017) that is having the most influence on the choices consumers are making or are able to make.

Little evidence was provided by interviewees to indicate that the Guide is having a *direct* influence on consumer choices, with people only able to choose from what is available to them. This is consistent with the findings of Roheim et al. (2018) whose study concluded that Theory of Change strategies, typically used by the SSM to bring about change in seafood consumption patterns, are not having a substantial effect on increasing public demand for sustainable seafood. Despite this, this study found that a majority (63%) of GFG users, compared to 35% of non-users, felt sufficiently confident about seafood sustainability to demand their retailer supply seafood from the most sustainable sources, suggesting that the Guide might be having some effect.

6.2.3. Understanding of key seafood terms

Although unanimity on a definition for sustainable fisheries and understanding of what comprises sustainable seafood is lacking, as discussed in Section 2.3.6, ‘sustainable seafood’ is popularly regarded as seafood that has been produced with minimal impact to the marine ecosystem (Lawley et al., 2019; Richter and Klockner, 2017; Brécard et al., 2009). Definitions also sometimes refer to social impacts, for example, “*Sustainable seafood is caught or farmed*

¹³¹ The term corporate social responsibility (CSR) is defined by Korschun et al. (2014) as ‘discretionary business practices and contributions of corporate resources intended to improve societal well-being’.

with minimal environmental and social impacts, and in such a way that it can be produced in perpetuity” (Sustainable Fisheries, 2022). Despite MSY being a widely accepted metric, even fishing at sustainable levels removes between 50 and 80% of the targeted fish population according to Stafford (2019). Consequently, the definition of ‘sustainability’ itself remains one of the primary challenges within the SSM (Lawley et al., 2019; Tlustý et al., 2012; Jacquet et al., 2009).

This study examined public and stakeholder understanding of two key seafood terms, ‘*sustainable seafood*’ and ‘*responsibly sourced*’. Most respondents supplied a ‘basic’ explanation of sustainable seafood, typically equating it to not overfishing or depleting the stock and to maintaining it in perpetuity for the benefit of future generations. Overall, stakeholders communicated a similar understanding of the concept of sustainable seafood (See Section 5.3) but further acknowledged that the meaning of seafood sustainability had ‘evolved’ to include issues associated with peoples’ livelihoods, coastal communities, and social equity. This development reflects the increasing importance of social responsibility to the SSM examined in other studies (for example, Lout, 2023) and to the sustainable development discourse more generally (Farmery et al., 2022; Springmann et al., 2020; Österblom et al., 2017). Relating to this, concerns were expressed regarding the exclusion of criteria for social factors within the MCS GFG for assessing seafood and making recommendations for consumers choosing sustainable seafood. This and the finding that social justice (discussed further in Section 6.2.6) is important to GFG users suggests a requirement for the inclusion of criteria for social responsibility in the MCS GFG assessments. Notwithstanding the importance to stakeholders of social issues observed in this study, the ultimate goal for supply chain sustainability, particularly in retail, appears to be exclusive sale of certified, and in the case of wild-caught, MSC certified, seafood. MSC labelled products now account for an estimated 54% of the value and 51% of the volume of all wild caught fish and seafood sold in UK retail with seven of the UK’s ten leading supermarkets using the blue ecolabel on more than 50% of their wild seafood range (MSC, 2022d).

Whilst this is unsurprising given the advantages of certification for increasing traceability and transparency, it is unexpected, given the views expressed by interviewees regarding, for

example: the monopoly for large industrial fisheries of certification schemes (Le Manach et al., 2020); recognition of the inappropriateness of certification schemes for small-scale or fisheries in developing countries (Stoll et al., 2019); the potential for marginalisation of ‘locally’ produced seafood (Pitta and Ford, 2023); and the current omission in the MSC Standard of the social dimensions of seafood sustainability (MSC, 2023)¹³². In context of these views, aspirations for sales only of certified, in particular MSC certified, seafood, could be regarded as lacking in ambition (or imagination) and potentially limiting in terms of acknowledgment of the wider aspects of sustainability discussed in Chapter 5 Section 3.

Despite the SSC initiative to ‘harmonise’ standards for labelling and sourcing of seafood (Steenon and Creedon, 2022), only 5% of the public examined in this study indicated that they understood the term ‘responsibly sourced’ as it appears on supermarket labelling of seafood. Analysis of responses suggests that for a large majority there is no distinction being made between this term and ‘sustainable seafood’. Further there was misunderstanding of its meaning, with some respondents thinking the term meant that the seafood was farmed, or from the sea, or that it was safe to eat. Understanding of the term amongst stakeholders was much higher, particularly among the Wholesaler, Processor etc. and Retailer groups which is to be expected given their involvement with the SSC. However, almost 40% of stakeholders made no distinction between the two terms, suggesting they are used interchangeably.

As with a small number of stakeholders (n=2), who expressed some scepticism for the term, with one stating ‘responsibly sourced’ is a *“weasel word used by retailers as a way to do very little and claim that you bring more than you are”* (SH13), there was also some scepticism expressed by a very small percentage of the public for use of the term as ‘greenwashing’ by retailers. For example: *“This term might be weaker - more subjective and vulnerable to use as a ‘green washing’ tactic”* (P241) – See Chapter 4 Section 4.7.2.

¹³² The MSC published a new fisheries standard (version 3) in October 2022. The reviewed standard is reported to include *‘better protections for marine life, as well as stronger fisheries management and compliance requirements’*.

These findings suggest there is a gap in comprehension, and therefore in ability to fully interpret supermarket labelling of seafood for sustainability, and that efforts need to be made to address these deficiencies across a range of audiences.

6.2.4. Importance of sustainability to the public and stakeholders

One of this study's findings is that the importance of sustainability for stakeholders, especially for seafood suppliers and retailers, is primarily driven by maintaining brand reputation and meeting customer expectations of '*doing the right thing*' (Section 5.4). The SSM has successfully created market-based tools, including FIPs, sustainable seafood sourcing policies, sustainable seafood guides, eco-labels, and traceability schemes as incentives to improve the sustainability of fisheries (Gutierrez and Morgan, 2015). Use of these tools provides opportunities for retailers to protect the reputation of their brand and distinguish themselves from competitors (Packer et al., 2019), but have they succeeded in achieving their aims (See Section 1.2.2.), principally reducing the impact of overfishing and seafood consumption on the marine environment.

In a study by Pulker et al. (2018), 71% of the world's largest supermarkets were found to have made CSR (Section 6.2.2.) commitments to not selling species classified as endangered, including partnering with organisations such as SFP, MSC, and the Seafish Responsible Fishing Scheme, to increase the sustainability of their own brand seafood. The study concludes, however, that given the position of influence of supermarkets in the food system they could do more to reduce production of food containing ingredients with high social and environmental impacts (Pulker et al., 2018). This is echoed by the findings in this study where stakeholders, including those from the retail sector, commented that supermarkets could be doing more to support and educate consumers about seafood sustainability e.g., provision of further information at point-of-sale and increasing transparency through better labelling.

Supermarkets are most frequently used for purchasing seafood for almost half (45%) of respondents in this study with Tesco, the largest multiple retailer in the UK, the most selected supermarket. However, MCS GFG use was more prevalent amongst shoppers purchasing seafood from smaller supermarket chains, for example, the Co-Op, M&S, and Waitrose with most fish purchases made by people who reported most frequently shopping for seafood in M&S. Guide users were also found to be less reliant on supermarkets, reporting a fifth of seafood purchases as from independent sources such as fishmongers or vans. This may help explain why, as discussed in 6.2.2, more people using the Guide feel that they are able to make sustainable seafood choices.

In contrast to stakeholder perception of sustainability as being of low importance to the public, analysis found fewer respondents than expected agreed (40%) that the cost and affordability of seafood is more important to them than sustainability. 71%, a fifth more Guide users than non-users, agreed that sustainability is very important to them when buying and/or eating seafood. Most respondents (56%), more users than non-users, agreed they have always tried to only buy sustainable produced seafood. These results suggest sustainability is important to the public when purchasing seafood despite barriers of price perceptions observed in other studies (for example, Carlucci et al., 2015; Birch et al., 2012). For further discussion, see Sections 6.2.5. and 6.2.6.

Even though stakeholders suppose customers devolve responsibility for seafood sustainability to them (See Section 6.2.2), half of respondents, slightly less users (45%) than non-users (53%), disagreed they are not concerned about the sustainability of the seafood they buy, suggesting that when shopping for seafood there are public concerns for seafood sustainability. Interestingly, almost a third (28%) of all public respondents agreed they are not concerned about the sustainability of the seafood they buy, with twice as many users (40%) compared to non-users (21%) agreeing it is of no concern for them. This may suggest that Guide users perceive their sellers to have a stronger commitment to sustainability, resulting in a feeling of assurance that seafood purchases from these vendors are sustainable. Alternatively, because users are found to have more seafood sustainability knowledge, they

may have more confidence in their ability to make sustainable choices compared to those with less knowledge. These findings indicate that retailers need to provide more point-of-sale information to help customers increase their seafood sustainability knowledge and where applicable provide assurances of sustainability.

6.2.5. Concern for the impact of individual seafood choices on the marine environment

Stakeholder perception of the Guide was that it is typically of interest to a small and vocal minority of 'eco-warriors'. Although Guide users reported making significantly more 'green' and 'ethical' purchases than non-users or non-fish buyers and perceive themselves as more ethical and environmentally friendly consumers overall, a high level of public interest in seafood sustainability and concern for the marine environment was observed.

When asked if public concern for the impact of fishing on the marine environment is being reflected in consumers' seafood choices, interviewees acknowledged growing public concern for the impact of fishing on the marine environment, specifically the broader issues related to the impact of bottom towed gear. However, it was suggested people do not make the *connection* between their own seafood choices and the collective impact of them on the marine environment. The public survey contradicts this, suggesting individuals do think about the impact of their seafood choices and believe that by changing their shopping habits they can make a difference (See Section 4.11). This attitude is reflected in a study of pro-environmental behaviour (PEB) by Osbaldiston and Schott (2012) in which it is concluded that everyone can do something to make a difference, that the 'cumulative' results of small actions can have a big impact.

In terms of their seafood purchases, MCS GFG users were observed to be less reliant on the Big 5, purchasing seafood from a wider range of species, including lesser-known species, than non-users. Of the 14 attributes relating to importance to consumers when purchasing seafood examined, product type was found to be an important consideration for both users and non-

users of the Guide. As found in other studies, product type was identified as a key consideration in terms of price, convenience, and lifestyle, for example, when purchasing and consuming fish (Vanhonacker et al., 2013). However, stakeholder comments indicated that any expectation of consumers making and understanding the connection between the fish they are buying and the impact of its purchase on the marine environment is being lost through increasing commodification of fish – this is echoed in earlier studies (Pitcher and Lam, 2015; Lam and Pitcher, 2012). In particular, the loss of identity of species and their intrinsic ecological value through value-added processing reduces consumers awareness of seafood products as once living fish (Oishi et al., 2017). In the UK, 95% of seafood sold in 2019 in supermarkets was pre-packed, rather than from a fish counter (Watson, 2019).

Further, as observed in Chapter Five, because fishing, particularly, large-scale fishing, takes place out at sea, most people do not see or experience the reality of commercial fishing. The public are more familiar with what is visible to them, for example, the type of fishing associated with inshore fleets such as potting, which is regarded as low-impact and as having community and cultural importance (Martino et al., 2023). By comparison, the impact of other marine issues, such as plastic litter and oil pollution, on the marine environment is more visible and therefore often perceived to be of greater concern (Defra, 2022; Dunn et al., 2020).

Several interviewees held the view that if individuals have concerns for the impacts of fishing, such as for the welfare of fish or ‘decimation’ of stocks, they are likely to stop eating fish altogether. One stakeholder commented, *“If you are ideologically opposed to certain things happening, if you're very involved with some of the movements that are happening at the moment, you're probably never going to want to eat fish”* (SH45). This view is reflected by 28% of questionnaire respondents who cited concern for the impact of human consumption on fish stocks, marine life and the environment as reasons for not buying seafood. However, despite concerns for the impact of seafood consumption, the public involved in this study were predominantly seafood consumers, with most (82%) stating that they had always eaten seafood and only 13% indicating that they do not eat seafood. For almost half (49%) there was agreement they had increased their seafood consumption in recent years. In contrast,

only 25% indicated that they consume less seafood now. Most (53%) Guide users were also found to agree that they buy more seafood because of using the Guide rather than less. This suggests that despite concerns for the environmental impact of seafood production, people who have an interest in eating fish are increasing the amount of seafood they consume. Importantly, the MCS GFG is playing a role in stimulating this interest, particularly among those that perceive themselves as ethical and environmentally friendly consumers.

In relation to opinion on drivers for public consumption of seafood, analysis of stakeholder responses recognised seafood as healthy and nutritious with a lower carbon footprint compared to land-based animal protein. This opinion concurs with results from the public survey which found 60% of respondents agreed seafood is a more sustainable source of animal protein than alternatives. As observed in the literature, eating seafood as an alternative to land-based animal protein is acknowledged as beneficial for both human and planetary health (Gephart et al., 2021; Willett et al., 2019; Christenson et al., 2017) as well as being vital for meeting increasing human demand for healthy and nutritious food globally (Golden et al., 2021; Schubel and Thompson, 2019).

Although health is a main driver for eating more fish (Jennings et al., 2016), the perception of fish as expensive prevents people from increasing their consumption (Seafish, 2017; Brunso et al., 2009). In this study, most respondents (55%) considered sustainable seafood as expensive; however, expense was only communicated as a reason for not buying seafood by 8% of respondents, compared to other factors such as dislike of the physical (14%) and sensory (15%) properties of fish. This suggests that, in common with views expressed by stakeholders in this and those in other studies, there is an expectation by consumers of seafood as more expensive, sustainable seafood in particular, compared to other animal proteins (Kochen, 2023; Morales and Higuchi, 2018; Zander and Feucht, 2017), and that there is a willingness to pay for its health and other attributes (Hilger et al., 2018; Lucas et al., 2018; Pieniak et al., 2008; Trondsen et al., 2004).

6.2.6. Increasing the availability of sustainable seafood in the UK

Individuals taking part in the public survey and stakeholders were asked about drivers and barriers for the availability of sustainable seafood in the UK. Seafood sustainability knowledge, especially, understanding of labelling, was highlighted as a barrier for consumers accessing sustainable seafood in the UK in this study. This is of concern, given that in a study carried out by Pieniak et al. (2013), in addition to retail or supermarket staff, labels are most frequently used as a source of information. As well as labelling knowledge, the process of checking labels for where and how seafood has been caught or farmed also relies on the availability of this information, and time and effort required to access it (Richter and Klockner, 2017). As mentioned, mandatory labelling for area of capture and capture method, for example, only applies to fresh or chilled fish, it does not apply to fish that has been further processed (EC, 2013). This implies that for a large proportion of fish products on sale in supermarkets, where the largest proportion of people shop, the only indicator of sustainability is the presence on-pack of an eco-label and/or 'enhanced' labelling or product 'storying' (Figure 6.1).

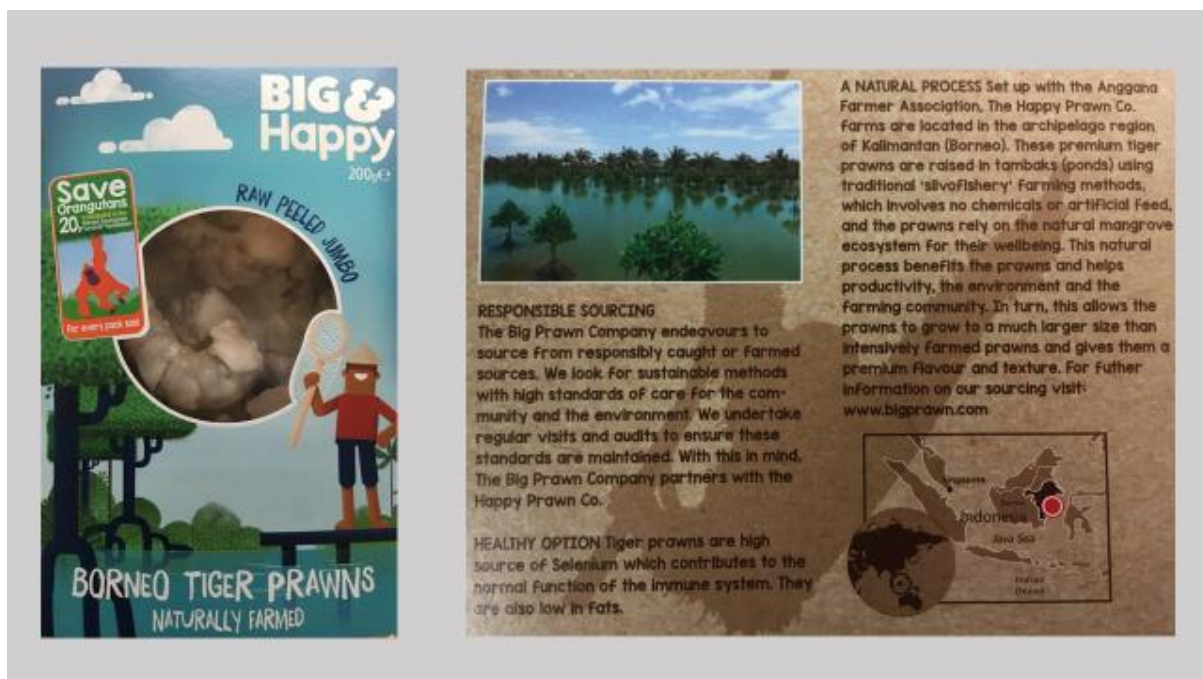


Figure 6.1. Example of product 'storying' for tiger prawns produced in tambaks (ponds) in Borneo by the Big Prawn Company using traditional 'silvofishery' farming methods involving no chemicals or artificial feed. 20 pence is contributed to the Borneo orangutan survival foundation for every pack sold.

One of the main findings of this study is that Guide users have more labelling and general seafood sustainability knowledge than non-users. For example, the proportion of Guide users who recognised the 10 eco-labels examined and understand their meaning was found to be significantly higher than non-users. Similarly, restaurateurs participating in the Ocean Wise programme were found to have more knowledge of seafood issues than non-members (Dolmage et al., 2016). Although knowledge was not found to be necessarily attributable to guide use, a large majority of users (84%) credited their increased seafood sustainability knowledge to use of the Guide, which suggests the MCS GFG is an effective tool for increasing seafood sustainability knowledge.

Stakeholders perceived the relevance of the Guide to the consumer setting and the availability of information required to follow the GFG advice as barriers to consumers using the Guide to purchase sustainable seafood. In particular, the complexity of ‘internalising’ (Osbaldiston, and Sheldon, 2003) and using information required to choose sustainable seafood, especially in cross-referencing information in the Guide with available labelling information, was perceived as problematic for consumers using the Guide and following its advice.

There was, however, agreement amongst respondents that they know how to interpret labelling information to allow them to choose the most sustainable seafood, although 62% agreed clear information on packaging and menus about how and where seafood is produced is lacking. In common with other studies, inadequate labelling of products can be a barrier to sustainability when shopping for seafood and other food categories (Atkinson and Rosenthal, 2014; Grunert et al., 2014). This suggests a reliance by the public, in particular Guide users, on eco-labels as a ‘cue’ for purchasing sustainable seafood (Valor et al., 2014).

Despite seafood consumption habits being reported as a reason for not needing to use the Guide by around half of respondents, a lack of suitable alternatives was a reported barrier to buying sustainable seafood by two fifths of questionnaire respondents. This was also

mentioned by stakeholders, who commented on the lack of availability of choices recommended by the Guide, especially 'niche' products, as a barrier to following the MCS GFG advice. The barriers for using the MCS GFG identified in this study are mirrored in other studies and include: the time taken to use them; availability of recommended species; the ability to interpret the information in guides; and apply it to information available to the individual in a consumer setting (Jacquet et al., 2009). However as discussed (See Sections 4.9.6 and 5.5) ability to interpret labelling and choice, including the availability of alternatives, were not found to be important barriers to the public accessing sustainable seafood.

Situational factors, in particular the time taken to shop for individual items (typically 15-20 seconds) and prioritisation of other factors over sustainability were identified by stakeholders as additional barriers to purchasing sustainable seafood. However, this contradicts the findings of the public questionnaire, which only found a minority (27%) cited insufficient time as a reason for not using the Guide. Additionally, only two fifths of respondents (39%) agreed they do not give seafood sustainability a lot of thought, with more non-users agreeing with the statement compared to users.

As mentioned in 6.2.1., although a minority of the public (18.5 %) agreed the ability of people to supply the information they ask for is a barrier to using the Guide, lack of seafood sustainability knowledge within the seafood supply chain itself was identified as a barrier for stakeholders. In particular, the ability to satisfactorily transfer information from the catching sector through the supply chain to the fish buyer or restaurateur is perceived as problematic, without clear accreditation.

The importance of the social and environmental dimensions of seafood consumption to the public were also examined by this study. Fish welfare was observed by stakeholders in this study and in the literature as an emerging issue for seafood consumption (Lam, 2019; Ellingsen et al., 2015; Meijboom and Bovenkerk, 2012). Contrary to stakeholders' perceptions of lack of public emotion towards fish, fish welfare was found to be important to a majority

(61%) of respondents, with it being more important to users (80%), compared to non-users (50%). Ethical or social drivers, including welfare, were also significantly more important to Guide users compared to non-users. Further, 76% of all respondents agreed '*fish are interesting and sentient marine animals*', with more Guide users agreeing (82%), compared to the other two groups. Studies show that public awareness of sentience in fish and concern for fish welfare is growing (Seibel et al., 2020; Grimsrud et al., 2013). As a result, consumers are requesting and willing to pay for fish welfare – e.g., in a study by Stubbe Solgaard and Yang (2011), almost half (48%) of the Danish consumers sampled were willing to pay 25% more for welfare rainbow trout.

As discussed in Chapter Five, Brexit and the COVID-19 pandemic were identified by stakeholders as opportunities for increasing the supply of locally produced seafood from the large amount of fish and shellfish that '*doesn't even hit the quay wall*' (SH48) but is loaded from boats onto refrigerated lorries for export. Locally caught or produced seafood was deemed an important seafood attribute for most (56%) purchasing respondents, again, with it being significantly more important to Guide users compared to non-users. This finding indicates the value of highlighting locally produced seafood to increase the appeal of the Guide, and to marketing of seafood more generally (Birch et al., 2018; Tookes et al., 2018).

The COVID-19 pandemic was suggested by stakeholders as having provided an opportunity to explore alternative models for purchasing seafood that would have the benefit of shorter, more resilient, and sustainable supply chains. During the period of this study the public reported purchasing 4% of their seafood direct from the quay or fishers, with twice as many Guide users compared to non-users, reporting buying seafood in this way. Similarly, other studies have reported increases in direct sales of seafood to the public as an adaptation to supply chain disruptions caused by the COVID-19 pandemic (Stoll et al., 2021; Bennett et al., 2020)

As mentioned earlier, the model upon which fishers selling local seafood direct to the consumer is generally based is the community supported fishery (CSF) model. This model is essentially place-based and imitates the model adopted for Community Supported Agriculture (CSAs) programs (Olson et al., 2014). The benefits of CSFs over other retail business models are that they are purposefully designed to connect consumers with their food (Brinson et al., 2011).

Additionally, CSFs have non-market benefits such as those derived from consumers making social connections with fishing communities and increased consumer awareness through education (Olson et al., 2014; McClenachan et al., 2014; Brinson et al., 2011). Direct sales could also provide an opportunity for connecting the *“challenges, the views, and ideas of real fishermen with the concerns and buying considerations of the people who are ultimately going to buy that fish”* (SH12).

There are advantages associated with creating markets for local and abundant seafood such as stronger traceability, a reduction in the carbon footprint of seafood, and the use of more selective and less damaging fishing gears (Bolton et al., 2016; McClenachan et al., 2014). As described in the literature (Soley et al., 2019; Murray et al., 2017; Witter and Stoll 2017), these types of models also address concerns regarding the impacts of ‘commodity-scale’ fisheries, as communicated by stakeholders in this study, and consumer interest in local and sustainable seafood, mentioned above ¹³³.

Provenance, how seafood is caught or farmed, and social justice, were found to be significantly more important to Guide users. The importance of these dimensions to a certain sector of society when purchasing seafood is discussed further in Section 6.4.

¹³³ Examples of CSFs in the UK are Catchbox, the UK’s first CSF (Towers, 2013); Soleshare (<https://www.soleshare.net/#home>); Sole of Discretion (<https://soleofdiscretion.co.uk/>); and Community Catch Box (<https://www.mycommunityfishbox.com/>).

6.3. Development of a conceptual model for understanding and predicting seafood guide use

One of the aims of the study was to develop a conceptual model of motivational factors for using the MCS GFG to purchase sustainable seafood. In Phase 1, a model based on the TPB was developed to predict MCS GFG use, and a deductive approach taken to examine MCS GFG use. In Phase 2 an inductive approach was adopted to develop theory from analysis of stakeholder responses in relation to potential barriers for using the MCS GFG and following its advice. Traditional constructs of social or subjective norms, attitude, and PBC, associated with rational choice models such as TPB, were used. In addition, the model incorporated constructs for seafood sustainability knowledge, trust in the MCS GFG and individual responsibility (for the sea).

It was predicted that individuals with trust in the Guide's advice and a greater sense of individual responsibility for the impact of their seafood choices on the marine environment would be more strongly motivated to use the MCS GFG. In addition, it was predicted that individuals with more seafood sustainability knowledge and who more strongly believed in the efficacy of their seafood choices for reducing the impact of human consumption on the marine environment would be more motivated to use the MCS GFG.

As observed in the literature, conceptual models have been used to recognise determinants of behaviours related to seafood consumption including identification of possible interventions to motivate consumer's sustainable seafood purchases such as seafood guide and eco-label use (Richter and Klockner, 2017). A conceptual model was developed for this study to understand what motivates GFG use thereby identifying opportunities for increasing its use.

6.3.1. Conceptualisation of drivers for seafood guide use

As discussed in Chapters Three and Four, it was hypothesised that knowledge, trust, subjective or social norms, attitude, PBC, and individual responsibility for the sea would predict intention to use the MCS guide. It was also hypothesised that intention to use the Guide, would, in turn, with knowledge, PBC and individual responsibility, *directly* predict behaviour i.e., self-reported MCS GFG use. See Figure 6.2 for illustration of the extended model of TPB used in the study, including correlation co-efficient and significant predictor (β) values for the various dimensions discussed in more detail in Section 4.17.

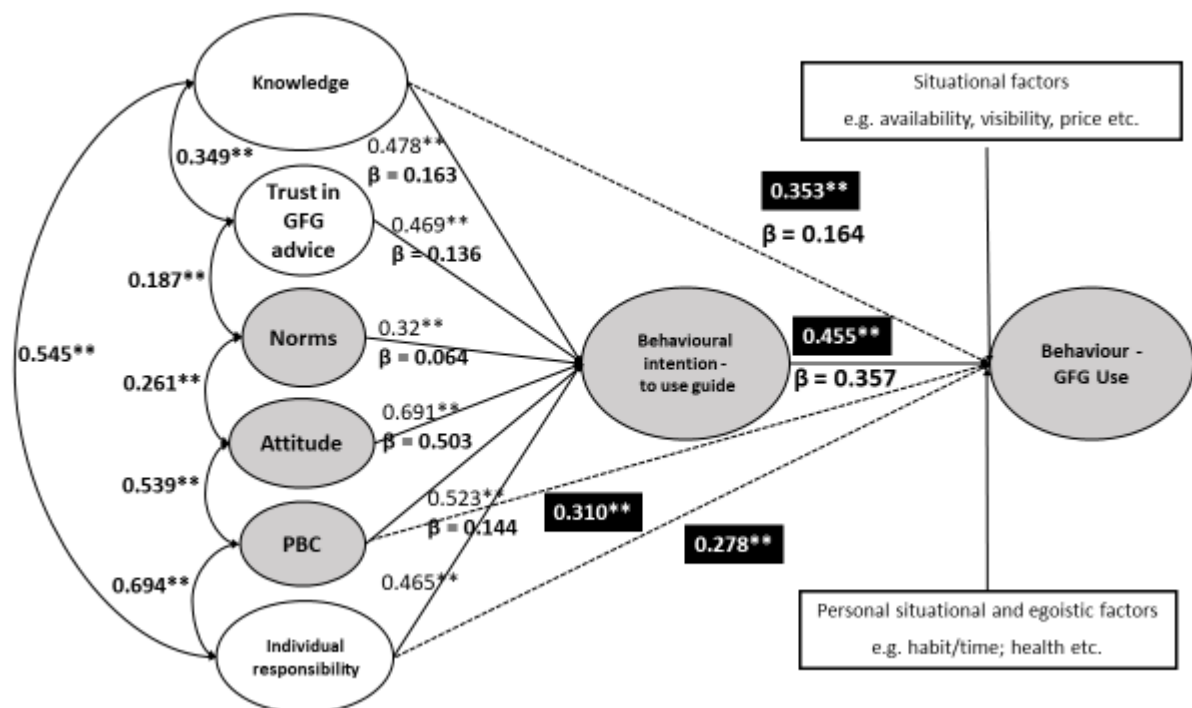


Figure 6.2: Theoretical framework for understanding motivation and predicting use of the MCS GFG (n = 662). Note: ** Correlation is significant at the 0.01 level (2-tailed), $P < 0.001$. Beta values (β) for significant predictors ($P < 0.05$).

Through this study attitude (to using the MCS GFG), and intention, were found to be the strongest predictors of intention (to use the Guide) and behaviour (MCS GFG use), respectively. The model above explains 56% of variance and is a significant predictor of intention to use the MCS GFG. In the case of MCS GFG use, the model explains 23% of the

variance and is a significant predictor of behaviour. As described in other studies (Boldero, 1995), attitude and intention positively predict behaviour. Each of the following sections (6.3.1.1 to 6.3.1.8) discuss the findings of the study in relation to individual predictors and how well they fit the model.

6.3.1.1. Knowledge and information

As observed in the literature, knowledge or information-deficit models of behaviour assume it is only through ignorance of the consequences of behaviour that people behave in the way they do (Barr and Gilg, 2007; Owens, 2000). When information is supplied to increase public awareness of the impact of their behaviour, it is expected people will change in favour of adopting more sustainable behaviours (Mont et al., 2014; Kollmuss and Agyeman; 2002).

In this study (See Section 4.17 Table 4.34 for summary of model constructs) the importance attached to seafood sustainability and knowing where fish is from and how it is produced is used to determine the level of an individual's 'background knowledge'. This is the knowledge required to motivate responsible seafood consumption (Richter and Klockner, 2017). 'Procedural knowledge', i.e. the 'know-how', to increase the sustainability of an individuals' seafood purchases (Richter and Klockner, 2017), is encapsulated in the importance attached to 'always checking' and knowing where the fish purchased has been caught or farmed and how. As discussed in 6.2.1., the most important change people have made to their purchasing behaviour as a result of using the Guide was reported by users as them always 'checking' where seafood comes from and how it is caught or farmed.

Seafood sustainability knowledge was considered by many interviewees in this study as important for consumers accessing sustainable seafood in the UK. Studies examining the influence of knowledge on decision making when buying food conclude it drives sustainable purchasing (Lawley et al., 2019; Peschel et al., 2016; Valor et al., 2014). However, although MCS GFG users were found to have significantly more general and seafood labelling knowledge compared to non-users, general or objective seafood knowledge was not found

to be necessarily attributable to guide use. Understanding of seafood terms such as 'sustainable seafood' and 'responsibly sourced' was also found as generally lacking. Despite this, knowledge was found to make a statistically significant and unique contribution to the dependent variables, intention (to use guide) and behaviour (guide use) (See Tables 4.36 and 4.37, Section 4.17).

6.3.1.2. Trust

The majority (86%) of public respondents reported that they trust that the MCS GFG advice is accurate and credible. When asked for their views on the scientific rigour, accuracy and credibility of the Guide, interviewees responded very positively. Trust is key to the value and usefulness of an information source (Pieniak et al., 2007). According to Richter and Klockner (2017), trust in the advice a seafood guide is providing is crucial, especially when their use is being used as a proxy for sustainable seafood consumption as is the case in this study. Trust was found to be making a statistically significant and unique contribution to the dependent variable in the model (Table 4.36, Section 4.17). These findings support the value of trust in an information source such as the MCS GFG identified in this and other studies (Canova et al., 2020; Atkinson and Rosenthal, 2014; Pieniak et al., 2007).

6.3.1.3. Social or subjective norms

Social norms as applied to TPB refers to the individual's perception of the behaviours expected of them by people that are important to them such as family or friends (Ajzen and Fishbein, 1970). Just under half of all respondents agreed that '*most people important to me think I should buy sustainable seafood*', with twice as many Guide users (72%) as non-users (35%) agreeing.

Norms for increasing the availability of sustainable seafood suggested by stakeholders included the influences of celebrity chefs, retailers, restaurateurs, and the media. Family was

found to most influence the seafood choices by most of questionnaire (56%) respondents (Section 4.9.2). This finding is consistent with other studies examining the type of people influencing seafood choices (Govzman et al., 2021; Birch and Memery, 2020; Olsen, 2001). Celebrity chefs (32%) and media (27%) were found to have less influence compared to other studies (Jonell et al., 2016). Fewer respondents (21%) agreed social media personalities influenced their seafood choices. This may help explain the relatively low numbers of GFG followers on Instagram and Twitter highlighted in Section 5.8.1. The influence of norms conflicting with sustainable seafood consumption were highlighted by one stakeholder as those around the availability of endangered species such as eel, found in 'high-end' restaurants.

According to Fishbein and Ajzen (1975) social norms and attitude, discussed below, are the two main influences on people's intentions to act. Although making a significant unique contribution to the prediction of the dependent variable, intention, the relative contribution of subjective norm to variance in the dependent variable, is very small (Table 4.36 Section 4.17). As highlighted by stakeholders in this study and in the literature, seafood guide use is not easily observed and therefore people cannot readily identify with the behaviour (Richter and Klockner, 2017). This may help explain the small contribution being made by the norm construct to the model. Results suggest a campaign focus on family relations might be compatible with increasing social norms around seafood guide use.

6.3.1.4. Attitude

Attitude to using the MCS GFG was found to be the strongest predictor, explaining 14.3% of the variance in intention to use it (Table 4.36). In contrast to stakeholders' perceptions of the public's ability to use and understand the MCS GFG, attitude to using the MCS GFG to help purchase sustainable seafood amongst Guide users is very positive, with users agreeing the Guide is easy to use and follow. A large majority of respondents (78%) also indicated that the Guide has motivated them to buy sustainable seafood and increased their confidence in using it to make sustainable seafood choices (Table 4.35 Section 4.17).

This study found attitude as the best determinant of behavioural intention, a significant determinant of behaviour and a key driver of sustainable seafood consumption. As such, these findings conform with those of other studies, namely Bredahl and Grunert, 1995; Klöckner, 2011; and Birch, 2015 respectively.

6.3.1.5. Intention and 'attitude-behaviour' gap

Public intentions towards using the Guide to purchase seafood sustainably were found to be high, with a large majority of respondents stating that they either use the Guide most of the time (69%) or that they want to make an effort and use the Guide (80%) or may use the Guide to help them choose sustainable seafood in the near future (80%). 'Intention' was also found to be making a statistically significant and unique contribution to the prediction of the dependent variable, behaviour i.e., GFG use (Table 4.37 Section 4.17). Attitude towards the Guide, discussed above, and intention (to using it) were also found to be highly correlated (Figure 6.2 Section 6.3.1).

As observed in this study, consumers care about buying sustainable seafood, but as declared by Oosterveer and Spaargaren (2011), there remains a behavioural gap between understanding the need for sustainable seafood and buying accordingly. In this study, a small number (12%) of stakeholders referred unprompted to the intentions people have towards prioritising seafood sustainability and the gap between concern and acting. Interviewees commented: *"People say one thing and do another" (SH19); "I think it's one of those things where consumers, what they say and what they do are two different things" (SH25); "I think there's a gap, certainly a gap between concern and action" (SH13).*

Although the literature has revealed that individuals with concern for the environment and those who believe their actions can make a difference are more willing to engage in behaviours to protect the environment (Johnstone and Tan, 2015; Barr and Gilg, 2007; Eden, 1993), people also fail, for various reasons, to act on these concerns (Grimmer and Miles,

2017; Blake, 1999). Barriers observed in this study for individuals taking action and using the MCS GFG to purchase sustainable seafood were noted in Sections 4.3.1. and 4.9.6. and include, for example, the choices available to them, lack of time, money, and information, similar to those observed by Blake (1999).

As observed in the literature, people may also use '*compensatory green beliefs*', the idea that engaging in eco-friendly behaviour can be performed to offset the negative impacts of engaging in environmentally harmful behaviours (Hope et al., 2018). This suggests that people may be using the Guide and choosing 'sustainable seafood' to 'offset' negative impacts associated with exploitation of marine resources more generally. '*Higher loyalties*' such as family needs, are also used to reduce an individual's feelings of guilt for not acting in the interests of the environment (Hope et al., 2018). Higher loyalties such as health involvement, lifestyle, and moral obligation to meet family members nutritional needs are all important drivers for prioritising seafood consumption over environmental concerns (Christenson et al., 2017; Tomic et al., 2016; Olsen, 2001).

'Neutralising techniques', for example 'brand loyalty' (discussed in Section 6.2.1), also provide a useful explanation for how individuals justify their 'deviant behaviours' (Johnstone and Tan, 2015). This is further supported by Carrigan and Attalla (2001) who suggest that with appropriate information consumers can be made to feel that their purchasing decisions matter and they can make a difference. However, an 'information overload' may cause them to make less preferential choices. Concerns for this were suggested by some stakeholders, who commented that the information in the MCS GFG may be too complex, that the messaging needs to be simplified, made more consumer-friendly, in order to appeal to a wider audience.

6.3.1.6. Perceived Behavioural Control (PBC)

PBC relates to whether a person feels they can take a certain action, and importantly, the effort they are prepared to invest to help make a difference. Findings suggest a large majority (65%) of respondents using the Guide, compared to 41% of non-users, agreed they found it easy to make the right seafood choices to reduce their impact on the sea. An even larger number of respondents (78%) using the Guide felt that the seafood choices people make affects fish population and that by changing seafood shopping habits individuals can make a difference (77%). This is a complete contrast, as discussed above, to stakeholders, who believed the influence of the Guide on consumers' seafood choices is limited and the primary influence of the MCS GFG is its *indirect* influence through choice editing undertaken by retailers in response to seafood campaigns and consumer expectation of them '*doing the right thing*'.

PBC was however found to only be making a statistically significant and unique contribution to the dependent variable, intention, with contribution to variance in the dependent variable very small (Table 4.36). The relationship between the constructs, PBC and individual responsibility, discussed below, is highly correlated (0.694, $p < 0.001$), suggesting overlap or potential problems with multicollinearity. However, examination of the output, '*collinearity diagnostics*', from the multiple regression procedure indicated there were no issues within the model and assumptions about the data had not been violated (Pallant, 2020). The two variables were found to be the only factors not making a statistically significant and unique contribution to the model in the prediction of GFG use.

6.3.1.7. Individual responsibility for the sea

As discussed in 6.2.4. public interest in seafood sustainability and concern for the marine environment is observed as high. Further, when asked to think about the impact on the marine environment of the seafood choices an individual makes (Section 4.11), a very high majority (85%) of users, compared to 77% of non-users, agreed, they have a responsibility to

make the right decisions for the environment when buying seafood, and it is important to care enough to want to make a difference (84%).

However, analysis of the variables revealed, individual responsibility is the only one not making a statistically significant and unique contribution to either of the dependent variables, intention to use the Guide or MCS GFG use (Figure 6.2, Section 6.3.1). This suggests Guide use is not driven by moral beliefs such as individual responsibility for the sea, or that there is some overlap with other variables (Pallant, 2020), such as PBC, discussed above. As outlined in 6.3.1.6, examination of the statistical output did not suggest there was a problem with the model.

Furthermore, respondents using the Guide are inclined towards consuming fish, suggesting that guide use may be motivated by an egotistical interest in consuming seafood. Seafood is also perceived by a large majority (60%) of all respondents, more so by Guide users (75%), as a more sustainable animal protein. For example, farmed seafood, particularly shellfish and seaweeds, by comparison to many sources of traditional protein, has a negligible impact on the environment (Schubel and Thompson, 2019). Findings suggest that although Guide users are not necessarily being driven by moral responsibility towards the sea, people, Guide users in particular, believe they can help solve the problem of overfishing by making more responsible seafood choices.

6.3.1.8. Guide use

In this study MCS GFG use was used as a proxy for purchasing sustainable seafood. Analysis revealed that intention (to use guide), knowledge, individual responsibility and PBC, significantly predicted MCS GFG use, with 23% of variance in the dependent variable (behaviour) explained by the independent variables in the model (Figure 6.2). Intention was also found to be making a statistically significant and unique contribution to the prediction of

behaviour. As observed in the literature, intention captures the motivational influences of behaviour and is regarded as its closest determinant (Higuchi et al., 2017; Arvola et al., 2008).

While unlike the profile described in other studies for a typical 'green' fish consumer (Carlucci et al., 2015; Milovanov, 2015; Brecard et al., 2009), MCS GFG users are identified in this study as commonly white British; male. This finding is compatible with Smith et al. (2015), who determined that consumers of 'ecofish' were more likely to be males; in the age group 30-49; with a post-graduate qualification; and in employment. Given their higher levels of income and education, the socio-demographic profile of a guide user may be considered as one of privilege which is important in driving pro-environmental behaviours such as using the MCS GFG (Öykü and López-Sintas, 2022). This position also provides GFG users with more opportunities for purchasing seafood and prioritising seafood sustainability over other concerns compared to individuals who are less fortunate in terms of their education and income.

Most Guide users agreed people important to them think they should buy sustainable seafood. However, stakeholders' perception of the lack of widespread awareness and use of the MCS GFG, also the reason given by many respondents for not using the Guide, and its appeal to a small, privileged sector of society, indicate limited use of the MCS GFG. These findings suggest an intervention like the MCS GFG alone is insufficient in directly influencing the sustainability of the UK seafood market.

As examined in Chapter Two, the MCS Theory of Change requires that individuals are well-informed, engaged with, and understand the benefits and values of being connected to the sea. Individuals are also required to understand the connection between human health, wellbeing, and the health of the sea, for them to change their seafood purchasing behaviour (MCS, 2019). Despite these aspirations, this study found no evidence of increased levels of connectedness to the sea among GFG users compared to non-users or individuals not buying seafood. Although many respondents agreed that ocean health is important for human health

and wellbeing, stakeholders suggested individuals are not making the connection between their seafood choices and the impact of human consumption on the health of the sea.

This suggests there are some gaps with respect to individuals understanding of the impact their seafood consumption has upon the marine environment. A study by Wessells et al. (1999) assessing consumer preferences for eco-labelled seafood concluded that in addition to raising awareness and understanding of the environmental consequences of fisheries, consumers also need to understand the connection between sustainable fisheries and the impact of their seafood purchasing decisions for them to change their behaviour and for any behaviour change to significantly influence fisheries. The potential for engaging the public as 'marine citizens' to help reduce the impact of seafood consumption on the marine environment through more widespread use of seafood guides such as the MCS GFG is discussed in the section below and further in Chapter Seven.

6.4. Application and future use of guides as part of the sustainable seafood movement

This section critically examines the significance of findings in relation to future use of the MCS GFG and seafood guides as part of the SSM; the potential of seafood guides for increasing ocean literacy and marine citizenship; and thus, their role in engaging individuals as marine citizens in increasing the sustainability of the seafood market and concomitantly improving the management of marine fishery resources.

Findings suggest the success of the Guide is not in *directly* influencing the seafood choices consumers are making, and in them shaping the sustainability of the seafood supply in the UK. The success of the Guide is in persuading seafood suppliers, especially retailers, to increase the sustainability of their seafood offer by removing species identified by the MCS GFG as unsustainable or endangered through the process of choice editing (Greenwood,

2015; Mitchell, 2011) as evidenced in the incorporation of MCSs advice into Government Buying Standards (GBS), as previously discussed. In contrast to its success ‘on the ground’, findings suggest the Guide has not been hugely successful ‘on the water’, in working with the catching sector, to influence changes in attitudes or fishing practices.

6.4.1. Strengths and weaknesses of seafood guide use

As with any intervention influencing public behaviour change, there are strengths and weaknesses associated with the application of seafood guides to driving improvements within the seafood supply chain.

Human behaviour, including purchasing behaviour, is complex. MCS GFG use and ability to follow its advice is influenced by various situational and personal factors (Figure 6.2), including socio-economic factors such as education and employment, the availability of recommendations, and the cost of sustainable seafood, not everyone can prioritise seafood sustainability. Attitude to using the Guide was found to be important in predicting its use. The model includes constructs for knowledge and trust which are identified as crucial for motivating interest in seafood sustainability and confidence in using the information provided.

Reliance on individuals and market forces to the exclusion of other sustainability drivers such as Government legislation or financial disincentives such as tax is a potential weakness associated with seafood guide use. In the USA, for example, *“the bottom line is that it is literally against the law to harvest seafood unsustainably in the U.S.”* (Sustainable Fisheries, 2022). Legislation also prohibits, for example, the import of seafood which does not meet United States standards for protecting marine mammals (Molinari, 2023).

Since the UK’s departure from the EU, the effective implementation of environmental targets for UK seas, including maintaining fish stocks at sustainable levels, at MSY, is set out in key

legislation such as the Fisheries Act 2020 (HM Government, 2020), and the Joint Fisheries Statement (Gov.UK, 2022b), discussed in Chapters Two and Five. However, as mentioned in Chapter Two, restrictions on the capture of fish from stocks below MSY levels do not apply to fish that is imported. The only restriction on seafood imported into the UK is that it is legal and not from IUU fisheries, this does not guarantee sustainability (European Court of Auditors, 2022).

A Strength, Weakness, Opportunities, and Threats (SWOT) analysis was carried out on the MCS GFG in relation to its use as a 'tool' for increasing seafood sustainability in the UK supply chain. The value of carrying out an analysis in this way is that SWOT can provide critical information about a range of factors affecting the success of an organisation or industry (Irfan et al., 2020). The analysis includes internal and external considerations (Benzaghta et al., 2021), which are within (e.g., reputation) or outside the control of the organisation (e.g., competitors) (Berry, 2017). Strengths are referred to by Benzaghta et al. (2021) as the internal factors that help an organisation reach its goals, while weaknesses are factors that restrict an organisation's success. Opportunities are identified by them as external factors that "help an organisation reach its goals" (p.56), and threats, 'barriers' to achieving goals. The results of the analysis, based on observations resulting from a synthesis of results obtained in Phases 1 and 2 of the study, are presented in Table 6.1.

Table 6.1: SWOT analysis of MCS GFG use to increase the sustainability of the UK seafood supply chain.

I N T E R N A L	<p>Strengths</p> <ul style="list-style-type: none"> • The MCS GFG is the only UK seafood guide, providing comprehensive advice on what seafood to eat or avoid. • The MCS GFG guide advice can be tailored to individual business and supply chain sector needs. • Awareness and use of the MCS GFG among stakeholders in UK supply chain is extremely high. • MCS GFG listings can be adapted to appeal to different audiences and ethnicities e.g., Afro Caribbean or Chinese community etc. • MCS GFG is found to have a substantial but indirect effect on the public’s seafood choices. • The MCS GFG is well-respected and trust in the Guide is high. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • The MCS GFG does not include wider aspects of sustainability in its criteria for assessing seafood as sustainable. • Barriers limiting public use of the Guide e.g., time taken to use it; seafood knowledge; availability of recommendations made by it. • MCS GFG is deemed to have little effect ‘on the water’. • The Guide is found to play a limited role in directly shaping the seafood market. • Lack of diversity of public use in the Guide. • MCS GFG use is perceived as only among a small, interested, sector of society.
E X T E R N A L	<p>Opportunities</p> <ul style="list-style-type: none"> • Seafood products can be linked to MCS GFG sustainability advice e.g., through mobile phone technology or enhanced labelling. • The Guide contributes to public understanding of terms used in retail for labelling of seafood. • The Guide increases awareness and knowledge of seafood eco-labelling. • The Guide increases interest in purchasing seafood including of local, lesser-known and underutilised species. • Importance of seafood sustainability to businesses is in maintaining reputation and ‘doing the right thing’. • Fisheries Act 2020; UN SDGs e.g., 14 “Life Below Water”. • Seafood is perceived by many as a more sustainable animal protein. 	<p>Threats</p> <ul style="list-style-type: none"> • Lack of awareness and use of the Guide. • Relevance of the Guide’s advice to the consumer setting. • Complexity of seafood supply chain. • Public taste in seafood. • Competition from other collaborations in the SSM. • Public confusion around seafood sustainability. • Perception of public concern for the impact of seafood consumption as evident in only a minority of people. • MCS GFG use is not driven by individual responsibility for the sea. • Prioritisation of seafood sustainability.

One of the key strengths of the MCS GFG is that currently it is the only publicly and widely available seafood guide in the UK. One interviewee referred to it as, *“the only show in town!”* (SH19). The Guide is well-respected and well-trusted. However, despite extremely high stakeholder awareness and use, public awareness of the Guide is low and a barrier to more widespread and diverse use. Exclusion of wider aspects of sustainability in its criteria for assessing seafood as sustainable and its relevance to the consumer setting are identified as weaknesses. Opportunities exist in its contribution to public understanding of labelling of seafood and in stimulating interest in purchasing seafood including of lesser-known and underutilised species. Considering Government commitments to maintaining fish stocks at sustainable levels, several recommendations for increasing the reach of the MCS GFG by, for example, engaging with consumers through the Guide to help highlight the sustainability objectives of the UK Fisheries Act, the UN SDGs e.g., SDG 14 “Life Below Water”, and other fishery management policies, are outlined in Chapter Seven.

There is also scope for building on opportunities identified by stakeholders in ‘Brexit’, media coverage, and the COVID-19 pandemic, for better ‘connecting’ the public with the sea and coastal communities through the catching sector, and other stakeholders within the SSM. In particular, the MCS GFG could be more effective in reducing the impact of society on the marine environment and help in bringing important benefits to coastal communities’ dependent on the sea by: improving public and stakeholder understanding of seafood sustainability; promoting the consumption of locally produced and abundant seafood; increasing diversity of public taste in seafood; increasing diversity of public interest in the Guide; and reducing reliance on imports, thereby reducing ‘fish’ miles and increasing food and fish security.

6.4.2. TPB model of conceptualised drivers for MCS GFG use

Lack of a statistically significant relationship between GFG use, and individual responsibility (IR) for the sea, suggests a sense of IR is not the main reason for using the MCS GFG when purchasing seafood. Alternatively, as mentioned in Section 6.3.1.6., due to IR and PBC being

highly correlated, there was some overlap and therefore difficulty separating the unique contribution made by each of the predictors (Pallant, 2020).

Findings suggest Guide users may be driven by factors relating to their perception of seafood as a more sustainable source of animal protein (Section 4.9.2). MCS GFG users were found to purchase more seafood compared to non-users (Section 4.9.4), suggesting use of the Guide is motivated more generally by a 'love of seafood' and a tendency towards consuming fish. Guide users were also found to be more interested in seafood attributes such as welfare, and in buying products that are organically produced or fairly-traded, compared to non-users (Section 4.9.2), which suggests that interest in the Guide could be increased by developing its scope to embrace these qualities where they exist for seafood.

In addition, there is potential for increasing the role of the MCS GFG in better engaging or 'recruiting' individuals as 'active' marine citizens in the management of marine fishery resources by developing their ocean literacy and sense of individual responsibility for the sea (Buchan, 2021; Gutierrez and Morgan, 2015). Wider appeal and use of the Guide may also be achieved by the inclusion of social justice and life-cycle analysis (LCA) criteria e.g., GHG emissions when assessing the sustainability of seafood recommended by the MCS GFG. Inclusion of these type of factors will have the benefit of improving the relevance of the Guide to the various challenges identified in this study as facing stakeholders in the seafood supply chain including the climate emergency.

6.5. Summary

This chapter has presented a synthesis of the main findings of the research.

Section 6.2. provided a synthesis of public and stakeholder perceptions and attitudes towards using the MCS GFG. Findings indicate the MCS GFG is well used and known amongst

stakeholders in the UK seafood supply chain. Although awareness amongst consumers is not as high, there are opportunities for increasing awareness of the MCS GFG. For example, through wider engagement with stakeholders, especially the catching sector, to inform the public of the benefits to the environment and individual health of purchasing locally and sustainably produced seafood. There are also opportunities for the MCS GFG to support small-scale UK fisheries which are not well suited to certification schemes or meeting the demands of multiple retailers for large and continuous supplies of fish.

Section 6.3. presented a conceptual model for examining motivating factors for predicting MCS GFG use. As is typical of TPB models, attitude towards using the Guide was found to most strongly predict intentions to use it. Analysis also revealed that intention (to use guide) and knowledge, significantly predicted guide use, used as a proxy for purchasing sustainable seafood. This analysis suggests that by undertaking work to improve attitudes towards using the Guide, developing public seafood sustainability knowledge, IR for the sea, and belief in the efficacy of individuals making sustainable seafood choices to help improve the health of the marine environment, wider uptake of the Guide could be encouraged. Analysis of public and stakeholder responses identified various factors - situational and personal – relating to the complexities of purchasing behaviour limiting MCS GFG use.

Finally, Section 6.4. outlined the potential for expanding the role of seafood guides in further developing the sustainability of the UK seafood supply chain and presented a SWOT analysis of guide use as part of the UK SSM. The next chapter re-examines the aims of the study and makes recommendations for increasing use of the MCS GFG in the UK to improve the sustainability of the UK seafood market.

Chapter 7: Conclusion

7.1. Introduction

The aims of this research (Section 1.3) were to critically evaluate knowledge, understanding and use in the UK of the MCS GFG and, using a suitable framework, conceptualise motivation for using the Guide to purchase sustainable seafood. To achieve this, the study investigated consumer attitudes towards seafood sustainability and levels of awareness and use of the MCS GFG amongst consumers (i.e., the public and stakeholders in the UK seafood supply chain).

This chapter re-examines these aims in order to draw conclusions from the study's findings. It also highlights the contribution made by this research to understanding of the role of seafood guides in engaging support for seafood sustainability and thus their value as interventions in the fields of consumer education and marine social science. In addition, areas for future research and use of seafood guides determined by this study are summarised.

7.2. Concluding comments

7.2.1 UK consumer's perceptions of seafood sustainability

Regardless of interviewees' perceptions of seafood sustainability as only a priority for a vocal minority of eco-warriors, overall, the study found widespread agreement with regards to public responsibility for making the right seafood choices, and the importance of caring enough to want to make a difference. However, lack of knowledge, including understanding of 'eco-labels' and key seafood terms, was identified as an important barrier for the public using the MCS GFG and accessing sustainable seafood (See Sections 4.9.6. and 5.8.2). Although awareness amongst interviewees of the SSM was high, knowledge gaps were also found to exist within the supply chain.

Crucially, the public can only choose from the 'offer put in front of them'. Choice editing by buyers including widespread accessibility to certified seafood, typically MSC in the case of wild-caught and ASC in the case of farmed seafood, was observed as a major influence driving the availability of 'sustainable seafood' in retail in this study, like in many other studies (for example, Mitchell, 2011) (Section 5.5). In light of challenges of traceability and transparency for seafood sustainability discussed in Section 5.5.1, it can be concluded that a desire to overcome these challenges, while protecting brand reputation and meeting customer expectations of them 'doing the right thing' (Section 5.4), is driving a preference by retailers for sales of certified seafood. However, barriers identified in this study for small-scale, UK fishers, especially those in mixed demersal fisheries, accessing sustainable seafood markets, include the cost of certification and ability to meet recognised sustainability criteria (Section 5.5.1). Accordingly, there is a risk that sales of seafood, produced locally with fewer food miles, are precluded in favour of certified seafood, often from more industrialised fisheries or farms, including from overseas.

One of the advantages of seafood guide use is that it is acknowledged as providing an alternative and more comprehensive approach than certification (Section 2.4.2). However, seafood guides, including the MCS GFG, were also proposed in this study as a barrier to market for small-scale, diverse, UK fisheries because they cannot always meet their sustainability criteria. Concern for the exclusion of social and other factors, including the socio-economic sustainability of the fishing communities themselves (Section 5.7), further suggests the need for the inclusion of these type of factors and that a re-evaluation of what constitutes 'sustainable' in the context of seafood is required.

In consonance with customer expectations of 'doing the right thing', responsibility for seafood sustainably is perceived by interviewees as devolved to retailers. Despite this, respondents in this study were not found to be unanimous in trusting that the seafood they buy is sustainable. This suggests that despite business perceptions of customers trust in their commitment to only supplying sustainable seafood, there is doubt in the minds of some

members of the public. This shows businesses need to do more to demonstrate accountability.

This study found most respondents to feel a sense of responsibility regarding making the right seafood choices. However, interviewees' perceptions of public concern for the impact of individuals' seafood choices on the marine environment is that people are not making the connection between their own choices and the impact of them on the marine environment. Neither was individual responsibility (for the sea) observed in this study as a statistically significant predictor of either intention or behaviour i.e., MCS GFG use (See Section 7.2.4.). From this it may be concluded that it is unlikely guide use is motivated by a moral obligation towards protecting the sea and that effort is required to overcome behavioural barriers to encourage more responsible public choices, rather than focusing on enhancing connection to the ocean.

Seafood is further regarded by most respondents in this study as a more sustainable source of animal protein than alternatives (Sections 4.9.2. and 5.5.2). Notwithstanding this, this study found concern for the impact of human consumption on the marine environment is as important as more 'traditional' reasons for not buying seafood, such as disliking its sensory and physical properties (Section 4.3.1). This suggests that where there are strong feelings of concern for the impact of seafood production on the marine environment, people choose alternative diets.

7.2.2. Knowledge, understanding and use of the Guide among UK seafood consumers

Although public use of the Guide was higher than expected, general awareness was relatively low with most respondents indicating this study was the first time they had seen or heard of the Guide (Section 4.3). This suggests there is an element of the MCS GFG 'missing a trick', and that by, 'preaching to the converted' (e.g., MCS members or followers) it is not being made accessible to all sectors of society. Perceptions of the Guide as only used by a small and

privileged sector of society further suggests a lack of diversity in its awareness and use which needs to be addressed.

The highest level of awareness and use of the Guide was found in typical coastal areas, the South West region and Scotland. Given that MCS GFG users were found to consume more seafood, be less reliant on the Big 5 and supermarkets for purchasing seafood (See 7.2.3. and 7.2.5.), suggests that with more access to the sea and proximity to local suppliers, there is a greater variety of seafood available and, with that, more need for consumers to consult information on the sustainability of a wider range of fish. Further analysis of GFG users found they visited the coast more frequently. Although travel to the coast appeared to influence people's connection to the sea, Guide users were not found to have a stronger connection to the sea compared to non-users or non-fish buyers (Section 4.15). From this it may be concluded that guide use is not influencing a connection with the sea and that effort is required to better connect people with the sea through the food they are consuming to help conserve resources.

GFG users were also found to have significantly higher charity membership and perception of themselves as ethical and environmentally friendly consumers compared to the other two groups (Section 4.13). For many users, the Guide was found to be stimulating sustainable seafood purchasing. From this it may be concluded that it is being used by people to alleviate feelings of inconsistency - cognitive dissonance, between their interest in eating seafood, and concerns for the impact of its consumption on the marine environment.

Awareness of the MCS GFG among stakeholders was found to be extremely high. Guide use amongst stakeholders was also very high with around half reporting its use as integrated into their business' buying policies and/or used as part of the process adopted by the business for assessing 'risk' in the supply chain when sourcing seafood (Section 5.7). The most common reason for stakeholders not using the Guide was that they had established a relationship with another organisation or are using other seafood sustainability platforms. From this it may be concluded that with continuing growth of the SSM, globally and in the UK, the MCS GFG is experiencing competition from others working in the seafood sustainability landscape who have developed different approaches (See Appendix 1 for a timeline of events for MCS and

the SSM in the UK). To redress this, the MCS GFG needs to review how it works with other organisations within the SSM to maintain the relevance and thus the influence of the Guide.

7.2.3. Effectiveness of the Guide in driving changes in consumer behaviour

Findings from this study suggest the MCS GFG was not considered to be having an effect 'on the water' in the same way as, for example, certification schemes such as the MSC. However, the MCS GFG was regarded by interviewees as having a significant impact on the ground, amongst seafood buyers, retailers in particular, providing insight into one aspect of the Guide's effectiveness in terms of influencing the wider sector. In terms of its effect on the ground, this was found as best being achieved through choice editing carried out voluntarily by retailers and seafood suppliers in the UK seafood supply chain in response to recommendations made by the MCS GFG, which as referred to above, is used by half of stakeholders interviewed when sourcing seafood. The direct influence of the Guide on public seafood choices, and the consequent role of the public as agents of change in shaping the UK seafood market, was found to be limited. By, restrictions imposed on public buying by choice editing, including on the availability of 'niche' products recommended by the Guide.

As a result of these restrictions and a tendency for individuals to 'stick' to their usual seafood choices as a reason for not using the MCS GFG, interest in a limited number of species - the Big 5 has become entrenched in UK consumers. Important influences on seafood purchasing decisions, such as availability, convenience, and familiarity with seafood products, further reinforces the habit in the public of consuming the Big 5 by a positive feedback loop created by limited choice and ubiquitous availability of these species in supermarkets. People become 'locked into' unsustainable consumption behaviour (Jackson, 2005).

As mentioned in Chapter One, seafood interest in a narrow range of species creates challenges for sustainability. To help overcome this situation the Guide could be used more effectively to increase awareness of under-utilised species by encouraging retailers to list

'Best Choices' to increase the diversity of seafood choices available to the public. Situational factors influencing seafood purchasing are discussed more in Section 7.2.5.

As mentioned above in Section 7.2.2, Guide users were found to purchase significantly more (60%) seafood than non-users (Section 4.9.4), with a majority agreeing they buy more seafood as a result of using the Guide; be less reliant on supermarkets; less reliant on the Big 5; and have more labelling, including appreciation of eco-labels, and seafood sustainability knowledge than non-users (Section 4.7.3). Notwithstanding the socio-economic status of a typical guide user and the requirement for the Guide to be more widely available and distributed, this research concludes that the MCS GFG is a helpful intervention for encouraging diversity in taste, including in under-utilised species, and increasing seafood knowledge and consumption. GFG users are also found to have more confidence to demand that seafood is supplied from the most sustainable sources which is fundamental to MCS Theory of Change discussed in Sections 2.5.7.1. and 6.3.1.8. However, it is concluded that the direct influence of the MCS GFG on the seafood supply chain in this way is likely to be limited given that awareness of it is relatively low and perceived as only used by a small and privileged sector of society.

7.2.4. Theoretical framework for examining motivational factors for using the MCS GFG

A conceptual model based on the TPB was used to explore individual's motivation for using the Guide – See Figure 6.2. Attitude, knowledge, PBC and trust were found to be the strongest determinants of behavioural intentions, with intentions and knowledge found as the strongest determinants of behaviour. Overall, the study concluded that TPB is a good framework to measure and predict intentions (to use the MCS GFG) and behaviour (MCS GFG use).

Attitude to using the Guide was found to be the most significant predictor of intention and intention the most important predictor of MCS GFG use (See Section 4.17). From these results it may be concluded that if a positive attitude towards the Guide including public

understanding of its purpose, as providing information about how an individual can reduce the impact of their seafood consumption on the marine environment, is widely promoted, uptake in use of the MCS GFG can be encouraged. Background knowledge was found to be significantly correlated with intention and behaviour and a significant influence on MCS GFG use, directly and indirectly (through intentions). From this it may be concluded that individuals knowing the importance of sustainability and understanding how seafood products are labelled is fundamental for using the MCS GFG. Therefore, poor quality seafood sustainability information, such as the absence of information about where fish being purchased is caught or farmed and how, is likely, as discussed further below and in Section 7.2.5, to be an important barrier to using the Guide and accessing seafood sustainability advice.

PBC or agency was not found to be a significant predictor of guide use. From this it can be deduced that either the public do not believe their individual seafood choices are having an impact or that by making changes to their seafood purchasing behaviour they can make a difference. Effort is therefore required to help individuals believe in the efficacy of their behaviour and that by making more sustainable seafood choices they can help reduce the impact of human consumption on the marine environment. Public trust in the Guide was found to be high. Stakeholder responses relating to the scientific rigour, accuracy and credibility of the Guide in general was also observed as very positive and trust found to be important in predicting guide use. These results demonstrate the value of transparency invested in research and the consultation process for updating the MCS GFG.

Social norms around purchasing sustainable seafood are observed in the literature as difficult to observe. Despite this the variable was found to significantly predict intention to use the MCS GFG. From this it may be concluded that if work is undertaken to increase the visibility of seafood guide use, especially by people identified in this study as influencing the seafood choices people are making, such as, family, wildlife and scientific experts (Section 4.9.2), through advertising, media, or social media networking sites, for example, norms around guide use and thus their use can be increased.

Although it was hypothesised that individual responsibility would have both a direct and an indirect effect through intentions on behaviour, the variable was found to have no effect within the model. These findings suggest that although the public may care about the marine environment, MCS GFG use is not being driven by a moral obligation to make the right decisions when buying seafood, that it is not all down to them. From this it can be concluded that the need for individuals to take more responsibility for their seafood purchases is being diminished by assumptions that retailers are accepting responsibility for seafood sustainability on behalf of their customers, that as discussed in Section 7.2.1., responsibility for making the right decisions for the marine environment is being devolved by them to retailers (Seafish, 2018). This situation suggests more work needs to be done to raise awareness of individual responsibility and how people can take action for the sea (Buchan et al., 2023; McKinley et al, 2022; McKinley and Fletcher, 2012).

The model also recognises the importance of external or situational factors beyond an individual's control, such as, price, availability, health motivations and labelling information, in influencing the use of the MCS GFG to purchase sustainable seafood discussed in more detail in section 7.2.5.

7.2.5. Situational factors influencing consumer decision making when buying seafood

Situational factors such as seafood consumption habit, which for most participants in this study was formed in childhood, is identified in studies as an important factor influencing seafood consumption in adulthood (Samoggia & Castellini, 2017; Birch and Lawley, 2013). Similar to findings in other studies (Birch and Lawley, 2012; Trondsen et al., 2003) family was found to be by far the most important influence on seafood purchasing decisions. Motivational factors such as health benefits associated with consuming seafood were also confirmed as an important incentive for purchasing seafood.

Environmental and social considerations such as fish welfare and social justice were however found to be more important to individuals using the Guide compared to non-users, whereas price and taste, were found as less important for Guide users compared to other factors when buying fish. As mentioned above, MCS GFG users recognise themselves more as ethical and

environmental consumers compared to non-users and non-fish buyers, attaching more importance to, for example, buying organic and free-range products (Section 4.13). Given preferences by Guide users for these products, which in many cases, are not as affordable as those produced to less rigorous standards (Lucas et al., 2018), and their socio-economic status similar to those in other studies examining these type of product attributes (Hansen et al., 2018; Gerini et al., 2016), the importance of employment, income and education, cannot be ignored as drivers for MCS GFG use.

Despite public opinion of the limited seafood offer in supermarkets, individuals in this and other studies (for example, Watson, 2019) were found to most frequently purchase seafood in supermarkets. As alluded to above in Section 7.2.1. and 5.5.3, supermarkets are perceived as 'safe' environments in which to purchase seafood. Guide users were however found to be less reliant on them, reporting making almost a fifth (18%) more purchases from independent sources such as fishmongers, fish vans etc. and local markets, and twice as many online purchases, as non-users. They were also found to purchase seafood from a wider range of species, suggesting Guide users are seeking a greater variety of seafood by using independent suppliers.

Unexpectedly, Guide users were also found to purchase more potentially endangered species such as shark, spurdog *Squalus acanthias* and eel *Anguilliformes*. Given the risks attached by supermarkets to supplying unsustainable seafood, it may be concluded that in seeking more variety in seafood and wanting to support more local and independent suppliers, people are potentially at more risk of purchasing species identified by the MCS GFG as 'red-rated' and species to avoid. This suggests that effort is required in educating the supply chain and individuals more about seafood sustainability and that agreement is reached on how it is recognised.

Based on findings (Section 5.8.2), it can be concluded that the key barriers perceived by stakeholders as limiting public use of the Guide were:

- limited awareness of the Guide;
- the time taken to use it;

- public taste in seafood;
- availability of niche products recommended by the Guide;
- the ability of the public to relate information in the Guide with available labelling information;
- information and labelling quality;
- lack of supply chain knowledge;
- prioritisation of seafood sustainability;
- willingness-to-pay (WTP) for sustainable seafood.

Despite stakeholders' views, lack of supply chain knowledge, ability to understand the Guide or follow its advice were not recognised by the public as key barriers for using it, rather time taken to use the Guide was reported as a more important barrier (Sections 4.3.1). From this it may be concluded that people in the supply chain e.g., retail assistants and the public are more informed than stakeholders expect. Alternatively, people may be self-reporting improbable levels of knowledge and ability to understand the Guide, suggesting that further studies are required to better understand how the MCS GFG is being used and whether the perceived barriers listed above are in fact significant barriers to its use.

A lack of clear information on packaging and menus about where and how seafood is produced was, however, identified as the main barrier to purchasing sustainable seafood by a majority of all respondents in this study (Section 4.9.6). From this, it can be concluded that the quality of seafood labelling must be improved so that the public can more easily access sustainable seafood.

7.2.6. Recommendations for increasing use of the MCS GFG in the UK to improve the sustainability of the UK seafood market

This study has found the MCS GFG to have some limited impact on the sustainability of seafood purchasing in the UK – however, its potential is not being maximised. Drawing insight

from both phases of data collection and in fulfilment of the final objective of this research, several recommendations for a range of audiences are proposed as follows:

1. Public use of guide;
2. Stakeholder use of guide;
3. MCS development of guide; and
4. Recommendations for stakeholders supporting public seafood sustainability knowledge and understanding.

7.2.6.1. Recommendations for increasing public awareness and use of the MCS GFG

1. In response to concerns raised in this study for the framing of seafood sustainability, generally, and by the MCS GFG specifically (Section 5.7), **this study recommends:**

The MCS GFG broaden its scope for assessing seafood sustainability to include criteria (for example, for: equity and social justice as recognised by socially-responsible or fairly- traded products; fish welfare in wild-caught (and farmed) seafood; nutrition; food security; assessing GHG emissions from catching, processing, transport and distribution) so as to engage with audiences with wider environmental and sustainability awareness to increase the relevance and reach of the Guide.

2. This research defines a typical guide user, thereupon identifying opportunities for the MCS GFG to more actively engage with a wider audience to increase diversity amongst Guide users and its accessibility to all sectors of society. In response to concerns raised in this study for lack of engagement of the Guide with all 'segments of society' (Section 5.9.3), **this study recommends:**

MCS evaluate opportunities for overcoming barriers for GFG use so as to better engage with all sectors of society.

3. This research also identifies motivational factors for predicting use of the MCS GFG, for example, positive attitude to using the Guide; trust in the Guide; and seafood sustainability knowledge (Section 4.17), thus identifying opportunities for increasing MCS GFG use among the UK public. **This study recommends:**

MCS promote understanding of the purpose and use of the Guide, why it is important to purchase only sustainable seafood, and how. This will increase trust in the Guide and a positive attitude to using it, as well as improving seafood sustainability knowledge which is required to motivate interest in using the Guide to purchase sustainable seafood. It is also recommended that the MCS GFG is used to 'responsibilise' the seafood choices the public are making, emphasising the importance of individuals in helping to make a difference to protect our seas.

4. Opportunities presented by external shocks, such as COVID-19 and Brexit, for fishers selling seafood direct to the public observed in this study (Sections 5.5.3 and 6.2.6) suggest the community supported fishery (CSF) model, upon which businesses selling seafood direct to the consumer is generally based, could be more widely adopted by the UK catching (and farming) sector. Given the ability of this type of model to educate consumers and connect them with seafood and the communities that produce it, **this study recommends:**

The MCS GFG is used to encourage development of CSFs to increase the environmental, social and economic benefits associated with consuming more diverse and locally produced seafood.

5. One of the most important drivers identified in this and other studies for purchasing seafood is human health. Seafood is also regarded by a majority in this study, in particular Guide users, as a more sustainable source of animal protein than alternatives (Section 4.9.2). However, one of the 'dilemmas' identified in the literature for consuming seafood is the potential conflict between lack of sustainability and

known health and other benefits of consuming seafood. Various authors (Farmery et al., 2018; Jacobs et al., 2018; and Clonan et al., 2011) have highlighted the importance of communicating nutritional advice that will allow consumers to balance their dietary needs with protecting fish stocks by actively recommending only fish that is sourced from sustainable sources. To help better align public and planetary health, **this study recommends:**

MCS collaborate directly with health professionals (nutritionists and dieticians), especially where knowledge about fish sustainability is lacking, to help address any conflict between consuming more fish for health (and planetary) reasons and, where applicable, dwindling fish stocks, by communicating seafood sustainability information to practitioners. It is recommended consumption of oily fish such as mackerel and herring, which are species with high self-sufficiency rates and abundant in UK waters, be especially encouraged;

MCS create reciprocal links with the National Health Service (NHS) and the GFG website to communicate sustainability and health information to users of both sites.

7.2.6.2. Recommendations regarding increasing stakeholder use of guide

1. In order to increase engagement with stakeholders and accessibility to the MCS GFG (Section 5.9.2), **this study recommends:**

The MCS GFG is further marketed as a decision-making tool for sourcing seafood across the seafood supply and value chain, and its advice tailored to individual business needs¹³⁴;

¹³⁴ It should be noted that in November 2021, after the stakeholder interviews ended in August, the MCS GFG launched 'Good Fish Guide for business', an online tool to help businesses manage their seafood sourcing and provide advice on sustainable alternative fish species.

2. In light of the importance attached to the ‘improvement agenda’ by stakeholders within the SSM, to Fishery Improvement Projects (FIPs) in particular, **this study recommends:**

The MCS GFG ratings process more strongly recognises the importance of Fishery Improvement Projects (FIPs) to the improvement agenda when assessing the sustainability of seafood;

3. Considering reasons for stakeholders not using the MCS GFG (Section 5.7), perceptions of poor relations with the catching sector and ineffectiveness of the Guide on the water being partially attributed to lack of direct engagement with the sector (Section 5.8.3), **this study recommends:**

MCS review how the MCS GFG works with other stakeholders, in particular those in the catching sector, in order to foster better relations through collaboration in, for example, pre-competitive, and other appropriate groups or platforms.

7.2.6.3. Recommendations regarding MCS development of guide

1. Since the launch of its Fisheries Programme in 1998, and the MCS GFG in 2002, MCS has grown exponentially from an organisation with a staff membership of around 10, to one of 92 in 2022 (MCS, 2022). The MCS GFG, comprising approximately 600 sustainability ratings, covering around 130 species, and 475,000 people visiting the GFG website in 2020, aims to help consumers reduce the impact of their consumption by making ocean-friendly choices. In light of recommendations made in Sections 5.9.1. and 5.9.2. to improve accessibility to the Guide and increase engagement with it, **this study recommends:**

MCS in collaboration with retailers and/or seafood suppliers, develop point of sale information such as a traffic-light labelling scheme and/or a mobile app with the ability to scan seafood product barcodes using mobile phone camera technology to obtain detailed MCS GFG information, thus linking information and advice in the Guide to product on shelf;

Using the model provided by the Cornwall Good Seafood Guide, the MCS develop and 'role out' a franchise for adapting the MCS GFG, for use by, for example, the Wildlife Trusts or Inshore Fishery Conservation Authority's, to promote sustainable UK fisheries at local and regional scales.

7.2.6.4. Recommendations regarding stakeholders increasing support for public understanding of seafood sustainability

- 1.** A lack of clear information on packaging and menus about where and how seafood is produced is identified in this study as the main barrier to purchasing sustainable seafood by a majority of all respondents (Section 4.9.6). To address this, **this study recommends:**

Opportunities are created for enhanced labelling of seafood, to enable consumers to make more informed choices about the social and environmental impact of the seafood they are purchasing in line with their priorities. For example, labelling for environmental impact; local; fair-trade; GHG emissions; and fish welfare, including 'catch welfare' practices.

- 2.** Lack of understanding of 'eco-labels' and the terms '*sustainable seafood*' and '*responsibly sourced*' amongst stakeholders (Section 5.3) and the public (Section 4.7) suggests there is a gap in comprehension and therefore in ability to fully interpret seafood labelling which is a barrier to using the MCS GFG or accessing sustainable seafood. To address this, **this study recommends:**

Retailers engage in supporting customer (and stakeholder) understanding of ‘ecolabels’ and seafood terms used in relation to labelling of seafood in retail, including promoting customer use of the MCS GFG to help increase their seafood sustainability knowledge.

7.3. Contribution of this research

Research into the effectiveness of seafood guides, specifically the MCS GFG, in the UK in motivating sustainable seafood purchasing behaviour has not previously been investigated. Therefore, this research makes an original contribution to the debate regarding the influence of seafood guides on the sustainability of the seafood supply chain.

This research has specifically contributed to:

- the identification of motivational factors for using seafood guides;
- understanding of seafood guide awareness and use in the UK;
- limitations for using seafood guides thereby identifying areas for further improvement of them as tools for influencing consumer seafood purchasing behaviour;
- research into seafood guides as part of the SSM;
- studies examining factors influencing seafood purchasing behaviour.

7.4. Areas for future research

While this study has provided a valuable assessment of attitudes, knowledge, and use of the MCS GFG, weaknesses are identified in relation to the research process. Although valuable in reaching a wide and nationally distributed audience, and interviewees at distance, especially in a pandemic, limitations to the data collection methodologies (outlined in detail in Chapter Three) suggest inherent bias in the sampling approach may have resulted in higher-than-expected levels of seafood sustainability knowledge, MCS GFG awareness and use. A number of areas for further investigation have also been identified:

- The TPB was determined as a useful model for examining motivational factors for using the MCS GFG (4.17 and 4.18). However, constructs for individual responsibility for the sea and PBC were not found as significant determinants of behaviour i.e., GFG use. In light of these findings, further examination and testing of the model in different social, economic and geographical contexts is required to explore other predictors of guide use, for example, interest in consuming seafood or climate change and self-identity as an environmentally friendly or ethical consumer.
- Gaps were identified in awareness and engagement of stakeholders in the SSM (Section 5.2), including lack of general awareness of key influences within the movement such as 'Keystone actors'. To increase uptake and awareness of the SSM across the whole supply chain, and anticipate future developments influencing the role of the SSM, research is required to identify where gaps exist in each of the sectors;
- Guide users were found to purchase significantly more seafood than non-users (Section 4.9). GFG awareness and use and seafood purchasing frequency is observed as having a regional dimension (Sections 4.3 and 4.9.1). Guide users are also revealed as being less reliant on the Big 5 and supermarkets (Section 4.9.1). It is unclear however how the assumption of a greater range of seafood available in coastal areas, commented on in this study, and proximity to the sea is driving use of the Guide which would benefit from further investigation;
- Given recognition of the importance of the role of farming fish in the supply of sustainable seafood in the UK (Section 5.5.1), greater understanding of the contribution it makes and consumer attitudes to seafood produced in this way, including recognition of existing and emerging eco-labels for farmed seafood, is required;
- This study provided a 'snapshot' of MCS GFG use. A more detailed, and in-depth, longitudinal, study of Guide users is required to more thoroughly investigate how the Guide is being used, the effect of it on individuals purchasing behaviour, and barriers

to using it (summarised in 7.2.5.). This would further benefit development of seafood guides and their effectiveness in driving change in seafood markets;

- Considering the possibility that due to the self-selection sampling approach adopted by this study, individuals interested in the subject of seafood and sustainability may have participated in the research to a higher extent than others, further studies to understand awareness and use of the MCS GFG more fully across all sectors of society, including amongst more diverse groups, is required.

7.5. Final remarks

As an island nation, the seas surrounding the UK are important. They belong to everyone, providing essential benefits, including for many, provision of food. Society's most direct impact on the ocean is through the fish we consume (IPBES, 2019; Brownstein et al., 2003). To minimise this effect and maintain the fish and shellfish in our seas in perpetuity for the benefit of society, marine wildlife and the environment, seafood consumption must be sustainable. The findings from this study suggest the MCS GFG is a valuable tool for motivating sustainable seafood consumption in the UK and has the potential, if not a crucial role, to further engage people – the public and stakeholders - in the seafood supply chain to ensure we take societal and individual responsibility for the impacts of our seafood consumption.

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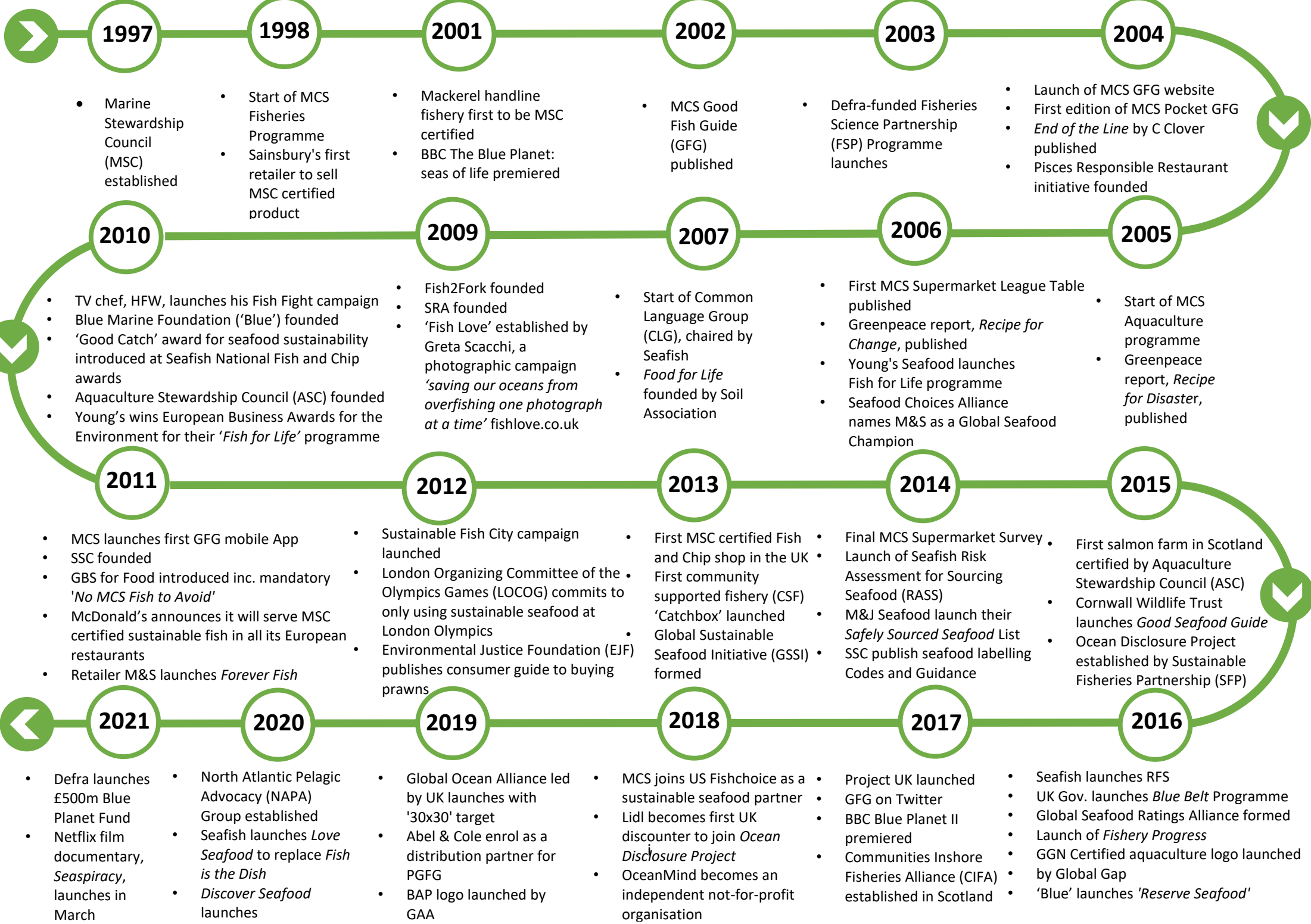
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APPENDICES

Appendix 1

Timeline of events for MCS and the SSM in the UK



1997

- Marine Stewardship Council (MSC) established

1998

- Start of MCS Fisheries Programme
- Sainsbury's first retailer to sell MSC certified product

2001

- Mackerel handline fishery first to be MSC certified
- BBC The Blue Planet: seas of life premiered

2002

- MCS Good Fish Guide (GFG) published

2003

- Defra-funded Fisheries Science Partnership (FSP) Programme launches

2004

- Launch of MCS GFG website
- First edition of MCS Pocket GFG
- *End of the Line* by C Clover published
- Pisces Responsible Restaurant initiative founded

2010

- TV chef, HFW, launches his Fish Fight campaign
- Blue Marine Foundation ('Blue') founded
- 'Good Catch' award for seafood sustainability introduced at Seafish National Fish and Chip awards
- Aquaculture Stewardship Council (ASC) founded
- Young's wins European Business Awards for the Environment for their 'Fish for Life' programme

2009

- Fish2Fork founded
- SRA founded
- 'Fish Love' established by Greta Scacchi, a photographic campaign 'saving our oceans from overfishing one photograph at a time' fishlove.co.uk

2007

- Start of Common Language Group (CLG), chaired by Seafish
- *Food for Life* founded by Soil Association

2006

- First MCS Supermarket League Table published
- Greenpeace report, *Recipe for Change*, published
- Young's Seafood launches Fish for Life programme
- Seafood Choices Alliance names M&S as a Global Seafood Champion

2005

- Start of MCS Aquaculture programme
- Greenpeace report, *Recipe for Disaster*, published

2011

- MCS launches first GFG mobile App
- SSC founded
- GBS for Food introduced inc. mandatory 'No MCS Fish to Avoid'
- McDonald's announces it will serve MSC certified sustainable fish in all its European restaurants
- Retailer M&S launches *Forever Fish*

2012

- Sustainable Fish City campaign launched
- London Organizing Committee of the Olympics Games (LOCOG) commits to only using sustainable seafood at London Olympics
- Environmental Justice Foundation (EJF) publishes consumer guide to buying prawns

2013

- First MSC certified Fish and Chip shop in the UK
- First community supported fishery (CSF) 'Catchbox' launched
- Global Sustainable Seafood Initiative (GSSI) formed

2014

- Final MCS Supermarket Survey
- Launch of Seafish Risk Assessment for Sourcing Seafood (RASS)
- M&J Seafood launch their *Safely Sourced Seafood* List
- SSC publish seafood labelling Codes and Guidance

2015

- First salmon farm in Scotland certified by Aquaculture Stewardship Council (ASC)
- Cornwall Wildlife Trust launches *Good Seafood Guide*
- Ocean Disclosure Project established by Sustainable Fisheries Partnership (SFP)

2021

- Defra launches £500m Blue Planet Fund
- Netflix film documentary, *Seaspiracy*, launches in March

2020

- North Atlantic Pelagic Advocacy (NAPA) Group established
- Seafish launches *Love Seafood* to replace *Fish is the Dish*
- *Discover Seafood* launches

2019

- Global Ocean Alliance led by UK launches with '30x30' target
- Abel & Cole enrol as a distribution partner for PGFG
- BAP logo launched by GAA

2018

- MCS joins US Fishchoice as a sustainable seafood partner
- Lidl becomes first UK discounter to join *Ocean Disclosure Project*
- OceanMind becomes an independent not-for-profit organisation

2017

- Project UK launched
- GFG on Twitter
- BBC Blue Planet II premiered
- Communities Inshore Fisheries Alliance (CIFA) established in Scotland

2016

- Seafish launches RFS
- UK Gov. launches *Blue Belt* Programme
- Global Seafood Ratings Alliance formed
- Launch of *Fishery Progress*
- GGN Certified aquaculture logo launched by Global Gap
- 'Blue' launches 'Reserve Seafood'

Appendix 2 Detailed summary of research aims, objectives, research questions and how they relate to the methodologies used

Research Aim	Research objective (RO)	Research question (RQ)	Related Public Survey questions	Related Stakeholder Interview questions	Hypotheses (H); Model predictions (P)	Variables; Relationships to be investigated
	1. Examine UK consumers' (including both public and stakeholder) perceptions of seafood sustainability	1. Do consumers understand the importance of seafood sustainability?	Qu. 9 and 10 - seafood terms; Qu.18 - importance of sustainability.	Qu.1 Awareness of SSM; Qu.2. Meaning of sustainability; Qu.3 Importance of sustainability.	P1. PBC will predict intention to use guide.	PBC ; PBC and intention to use GFG; PBC and GFG use.
		2. Is there consumer demand for sustainably produced seafood?	Qu.18. Item 6.	Qu. 4. Drivers and barriers for availability of sustainable seafood; Qu.5.c. How strong is consumer demand for sustainable seafood?	P2. Subjective norm will predict intention to use GFG.	Subjective norm ; Subjective norm and intention to use GFG.

<p>To evaluate UK consumers' knowledge, understanding and use of the MCS GFG in the UK</p>		<p>3. What perceptions do the UK public have of the impact of their seafood choices on marine resources?</p>	<p>Qu.8. Reasons for not buying seafood; Qu.24. Impact of seafood choices on the marine environment.</p>	<p>Qu.5. How do you think public concern for the impact of fishing is being reflected in the seafood choices consumers are making? Qu.5b. Do you think consumers understand the impact of their individual seafood choices?</p>	<p>P3. Individual responsibility (for the ocean) will predict intention to use GFG and directly influence sustainable seafood purchasing behaviour i.e. GFG use.</p>	<p>Individual responsibility; Individual responsibility and sustainable seafood purchasing behaviour i.e. GFG use; Individual responsibility and intention to use GFG.</p>
	<p>2. Assess knowledge, understanding and use of the Guide among UK seafood consumers</p>	<p>4. How aware are consumers of the MCS GFG?</p>	<p>Qu.1. Have you heard of the MCS GFG?</p>	<p>Qu.6. Awareness of the MCS GFG.</p>		
		<p>5. Do consumers understand the Guide's purpose and trust in it?</p>	<p>Qu.4. Item 2.</p>	<p>Qu. 7. Purpose and trust in guide.</p>	<p>P4. Trust in guide will predict intention to use MCS GFG.</p>	<p>Trust; Trust in GFG and intention to use GFG.</p>
		<p>6. What use is being made of the GFG?</p>	<p>Qu.2. and 3. Public use of guide.</p>	<p>Qu.8. Stakeholder guide use.</p>		

	7. How is the MCS GFG being used?	Section 5 Using the guide Qu.4. to 7.	Qu.8. Stakeholder guide use.	P5. Behavioural intention will predict GFG use.	Behavioural intention; Intention and sustainable seafood purchasing behaviour i.e. GFG use
	8. Are guide-users more connected to the sea compared to non-users and non-fish buyers?	Qu.25.	Not investigated.	H1. GFG users are more connected to the sea compared to non-users.	GFG use and connection to the sea.
	9. Do GFG-users display more 'green' consumer behaviours compared to non-users and non-fish buyers?	Qu.26.	Not investigated.	H2. GFG users display more environmentally conscious consumer behaviours.	GFG use and other 'green' or pro-environmental consumer or purchasing behaviour ('Spillover').
3. Investigate the effectiveness of the Guide in driving changes in consumer behaviour	10. What effect is the Guide having on seafood purchasing behaviour as a result of using the Guide?	Qu. 6 and 15.	Qu.9. Influence of guide on public consumers; Qu.10. Influence of guide on seafood sustainability practice.	H3. GFG users make more sustainable seafood purchases or choices compared to non-users.	Seafood purchases and guide use.

<p>To conceptualise motivation for purchasing sustainable seafood by identifying potential drivers for using the Guide and an appropriate theoretical framework for examining them.</p>	<p>4. Identify and test an appropriate theoretical framework for examining motivational factors for using the MCS GFG to purchase sustainable seafood</p>	<p>11. Does an extended TPB model provide a suitable framework for examining motivational factors for using MCS GFG?</p>	<p>Trust Qu. 4. Item 2; Intention Qu.4. Items 3, 5 and 6; Attitude Qu.4. Items 8, 9 and 11; Ind. Resp. Qu.24. Items 1 and 2; PBC Qu. 24. Items 4, 5 and 8; Social Norms Qu. 22; Knowledge Qu. 16. Item 1, Qu. 18. Items 1 and 3, Qu. 19. Item 1; Behaviour i.e. GFG use Qu.6. Item 10.</p>	<p>Qu. 7. Purpose and trust in guide.</p>	<p>P6. Attitude towards using the GFG will predict intention to use guide.</p>	<p>Attitude; Attitude to using guide and intention to use guide.</p>
	<p>5. Explore situational factors i.e. factors external to the model influencing public consumer decision making when buying seafood</p>	<p>12. What factors influence consumer decision making when buying seafood in the UK?</p>	<p>Qu.11-13, habit and accessibility; Qu.14. What influences your decision making when buying seafood?; Qu. 20. Barriers to purchasing sustainable seafood; Qu.21. Who influences decision making?</p>	<p>Qu.4. Drivers and barriers for increasing availability of sustainable seafood in the UK.</p>		

		13. Do GFG users have more seafood sustainability knowledge compared to non-users?	Qu. 16, 17 and 19; Qu.23. Sources of knowledge.	Not investigated.	H4. GFG users have more seafood sustainability and labelling knowledge compared to non-users. P7. Sustainable seafood knowledge will predict intention to use GFG, directly influence sustainable seafood purchasing behaviour i.e. GFG use.	Knowledge (background); Seafood sustainability knowledge and sustainable seafood purchasing behaviour i.e. GFG use; Seafood sustainability knowledge and intention to use GFG.
6. Propose recommendations for increasing use of the MCS GFG in the UK to improve the sustainability of the UK seafood market.	14. How can use of the MCS GFG in the UK be increased to improve the sustainability of the UK seafood market?			Qu. 11 and 12.		

Appendix 3 Summary of key fisheries and biodiversity management frameworks

Jurisdiction	Legislation, Policy, Agreement or Guidelines	Lead Agency and status	Aim/Outcomes
International	United Nations Conference on the Human Environment (1972)	UN; Stockholm Declaration, non-binding treaty	'The first world conference to make the environment a major issue'. Conference also resulted in the creation of UN Environment Programme (UNEP). https://www.un.org/en/conferences/environment/stockholm1972#:~:text=The%20Stockholm%20Declaration%20which%20contained,and%20the%20well%20being%20of
International	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1975)	CITES; International Agreement, legally binding (on Parties to Convention)	CITES aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. https://cites.org/eng
International	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (1982)	International; Legally binding instrument	First international treaty to protect species and habitats and bring countries together to decide how to act on nature conservation. https://eur-lex.europa.eu/EN/legal-content/summary/bern-convention.html
International	United Nations Convention on Law of the Sea (UNCLOS III) (1982)	UN; Legally binding treaty	The Convention is described as "an unprecedented attempt by the international community to regulate all aspects of the resources of the sea and uses of the ocean, and thus bring a stable order to mankind's very source of life". Article 63 (1) obliges coastal states to manage their living resources in a sustainable manner. https://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm
International	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1983)	UN; Legally binding treaty	CMS provides a global platform for the conservation and sustainable use of migratory animals and their habitats. https://www.cms.int
International	United Nations Conference on Environment and Development (UNCED) (Rio 'Earth Summit') (1992)	UN; Rio Declaration, Non-binding	Main outcomes of the Summit: Framework Convention on Climate Change; Convention on Biological diversity (CBD); Agenda 21. The Summit also established the United Nations Commission on Sustainable Development (CSD). https://www.un.org/en/conferences/environment/rio1992
International	UN Convention on Biological Diversity (Convention on Biological Diversity (CBD)) (1993)	UN; Legally binding treaty	Signed by 150 Government leaders at the 1992 Rio Earth Summit, the CBD is dedicated to promoting sustainable development. Conceived as a practical tool for translating the principles of Agenda 21 into reality, the Convention recognises 'that biological diversity is about more than plants, animals and micro-organisms and their ecosystems, that it is about people and their need for food security, medicines, fresh air and water, shelter, and a clean and healthy environment in which to live'. https://www.cbd.int/convention/
International	United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks (UN Fish Stocks Agreement) (1995)	UN; Legally binding treaty	This Agreement obliges coastal states to co-operate in relation to the management, exploitation and conservation of straddling and highly migratory stocks, such as mackerel, either directly or through appropriate sub-regional fisheries management organisations. https://www.un.org/depts/los/fish_stocks_conference/fish_stocks_conference.htm
International	Food and Agriculture (FAO) Code of Conduct for Responsible Fishing (The Code) (1995)	FAO; Voluntary instrument	The Code sets out principles and international standards of behaviour for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. The Code recognises the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all those concerned with the fishery sector. The Code takes into account the biological characteristics of the resources and their environment and the interests of consumers and other users. https://www.fao.org/3/v9878e/v9878e.pdf

International	Oslo & Paris Convention for the Protection of the NE Atlantic (OSPAR Convention) (1998)	OSPAR Commission; Legally binding on contracting parties	Legal instrument to regulate co-operation on environmental protection of the North East Atlantic. https://www.ospar.org/convention
International	World Summit on Sustainable Development (2002)	UN; Johannesburg Declaration, non-binding treaty	The Johannesburg Declaration builds on the Stockholm (1972) and Rio (1992) declarations, adopting a Political Declaration and Implementation Plan which included activities and measures to achieve development that takes into account respect for the environment https://www.un.org/en/conferences/environment/johannesburg2002#:~:text=The%202002%20World%20Summit%20on,account%20respect%20for%20the%20environment
International	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (High Seas Fishing Compliance Agreement) (2003)	FAO; Legally binding treaty	The Agreement aims to enhance the role of flag States and ensure that a State strengthens its control over its vessels to ensure compliance with international conservation and management measures. https://www.fao.org/iuu-fishing/international-framework/fao-compliance-agreement/en/
International	Convention on Biological Diversity (CBD) (2010)	UN; Legally binding treaty	CBD sets out Strategic Plan for Biodiversity (2011-2020), including its 20 Aichi Biodiversity Targets https://www.cbd.int/sp/targets/ e.g., Strategic Goal B, Target 6: “By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits”. https://www.cbd.int/2010-target/
International	The United Nations Conference on Sustainable Development (Rio + 20) (2012)	UN; Voluntary instrument, <i>‘The Future We Want’</i>	The third international conference on sustainable development met to renew commitment to ‘sustainable development and to ensuring the promotion of an economically, socially and environmentally sustainable future for our planet and for present and future generations’. Building on the Millenium Development Goals agreed as targets for 2015 by a UN summit in 2000, the conference launched new goals, the UN Sustainable Development Goals (SDGs). https://www.un.org/en/conferences/environment/rio2012
International	Transforming our World. The 2030 Agenda for Sustainable Development (2015)	UN; Voluntary instrument – Domestic Frameworks for achieving 17 sustainable developmental goals (SDGs)	SDG 14: ‘Conserve and sustainably use the oceans, seas and marine resources for sustainable development’. SDG 14.4. ‘By 2020, effectively regulate harvesting and end overfishing, illegal, unreported, and unregulated (IUU) fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics’. https://sdgs.un.org/2030agenda
International	Paris Climate Agreement (Paris Climate Accord) (2015)	UN; Legally binding treaty	The Paris Agreement builds upon the UN Framework Convention on Climate Change (1992). It aims to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. https://www.un.org/en/climatechange/paris-agreement
International	Stockholm 50 Climate Change (2022)	UN; Publication of Stockholm+50 Recommendations and Actions for Renewal and Trust, non-binding	International meeting convened by the UN to commemorate the 50 years since the 1972 United Nations Conference on the Human Environment , which made the environment a pressing global issue for the first time. https://www.stockholm50.global/

International	High Seas Marine Treaty (BBNJ Treaty) (2023)	UN; To be ratified	The BBNJ Treaty aims to establish large-scale marine protected areas in the high seas. One of the Global Biodiversity Framework's targets is to effectively conserve and manage 30% of land and sea by 2030 – "30x30" target. This replaces CBD Aichi target 11 agreed in 2010. https://news.un.org/en/story/2023/06/1137857
EU	Habitats and Wild Birds Directive (Habitats Directive) (1992)	EU; Legal instrument - Council Directive 92/43/EEC of 21 May 1992	Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments. https://www.legislation.gov.uk/eudr/1992/43/contents
EU	Marine Strategy Framework Directive (MSFD) (2008)	EU; Legal instrument – Council Directive 2008/56/EC of 17 June 2008	Safeguarding healthy commercial fish and shellfish populations is one of the 11 descriptors of the MSFD for achieving Good Environmental Status (GES) ¹³⁵ , ensuring the maximum sustainable yield (MSY) for all stocks by 2015 where possible, and at the latest by 2020. https://www.legislation.gov.uk/eudr/2008/56/contents
EU	Common Fisheries Policy (CFP) (2013)	EU; Legal instrument – Council Regulation EU No. 1380 of 11 December 2013	In 2013, agreement on a new CFP for the long-term environmental, economic and social sustainability of fishing and aquaculture activities was reached and came into effect from 1 January 2014. Achieving maximum sustainable yield (MSY) by 2015 where possible, and at the latest by 2020, and having healthy fish stocks form the guiding principles of the 2013 CFP. https://oceans-and-fisheries.ec.europa.eu/policy/common-fisheries-policy-cfp_en
EU	Maritime Spatial Planning Directive (2014)	EU; Legal instrument - Council Directive 2014/89/EU of 23 July 2014	In July 2014, the European Parliament and the Council adopted Directive 2014/89/EU to create a common framework for planning in the European Union. The Directive places a legal requirement on Member States to develop and implement Maritime Spatial Plans (MSP) (by 2021 at the latest) to promote sustainable development and to identify the utilisation of maritime space for different sea uses as well as to manage spatial uses and conflicts in marine areas. https://www.legislation.gov.uk/eudr/2014/89
EU	Deep Sea Access Regulation (2016)	EU; Legal instrument – Council Regulation EU No. 2336 of 14 December 2016	The regulation repeals Regulation (EC) 2347/2002 establishing specific conditions for fishing for deep-sea stocks in the north-east Atlantic and provisions for fishing in international waters of the north-east Atlantic. The regulation includes a ban on bottom trawling below 800 metres in EU waters and the obligation to close areas to bottom trawling below 400 metres where 'vulnerable marine ecosystems' are present or likely to occur. https://www.legislation.gov.uk/eur/2016/2336
UK	Marine and Coastal Access Act (2009)	UK; Legal Act of Parliament	Marine and Coastal Access Act (2009) provides a legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by putting in place a new system for improved management and protection of the marine and coastal environment. https://www.legislation.gov.uk/ukpga/2009/23/contents
UK	UK Marine Strategy Regulations (2010)	UK; Legal instrument	This statutory instrument transposes the requirements of the MSFD 2008/56/EC into UK law. It establishes a high-level legal framework that ensures that the obligations which the Directive places on the UK are assigned to a competent authority, and those competent authorities are given the necessary powers to carry out their roles. The MSFD requires the UK to take necessary measures to achieve or maintain a GES in the marine environment by 2020.

¹³⁵ The MSFD Directive defines Good Environmental Status (GES) as "The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive".

			http://www.legislation.gov.uk/uksi/2010/1627/memorandum/contents
UK	Fisheries Bill (2017-19)	UK; Legal instrument	The Bill, published on 25 October 2018, is a framework bill that will provide the UK Government with powers to manage fisheries (including setting annual TACs) within its territorial waters once it has left the CFP. It will also provide the UK Government and devolved administrations with powers to set out the legal framework for controlling access to UK fisheries and fisheries management and to amend the fisheries regulations that will be transposed into UK law from EU legislation. https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-8442#fullreport
UK	EU Withdrawal Bill (2018)	UK; Legal instrument - European Union (Withdrawal) Act 2018	A Bill to repeal the European Communities Act 1972 and make other provision in connection with the withdrawal of the United Kingdom from the EU. http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted
UK	Environmental Principles and Governance Bill (2018)	UK; Legal instrument	The draft Environment (Principles and Governance) Bill sets out how the UK will maintain environmental standards as it leaves the EU and builds on the vision of the UK Government's 25 Year Environment Plan. https://www.gov.uk/government/publications/25-year-environment-plan . https://www.gov.uk/government/publications/draft-environment-principles-and-governance-bill-2018
UK	Fisheries Bill (2019-20)	UK; Legal instrument	The revised UK Fisheries Bill followed on from the Fisheries Bill 2017-2019 introduced in the previous UK parliament on 25 October 2018. The Bill provides the legal framework for the UK to operate as an independent coastal state once the UK has left the European Union and the CFP after the transition period.
UK	Fisheries Act (2020)	UK; Legal Act of Parliament	The new Act allows the UK to take back control of its waters out to 200 nautical miles, as an independent Coastal State. https://www.gov.uk/government/news/flagship-fisheries-bill-becomes-law
UK	Environment Act (2021)	UK; Legal Act of Parliament	The Act provides the UK with a new framework for environmental protection now that it has left the EU. https://www.legislation.gov.uk/ukpga/2021/30/enacted#:~:text=An%20Act%20to%20make%20provision,that%20of%20ail%20to%20meet%20environmental

Appendix 4 Summary of key international declarations for a sustainable food system

Year	Lead Agency	Event/initiative	Programme/outcomes/ goals/advice
1992	UN	Rio Earth Summit	Agenda 21. Changing consumption patterns: https://www.un.org/esa/dsd/agenda21/res_agenda21_00.shtml
1992	FAO and WHO	International Conference on Nutrition (ICN1)	World Declaration and Plan of Action for Nutrition. Final report: https://apps.who.int/iris/handle/10665/61254
1995	FAO and WHO	International consultation on dietary guidelines	Establishes the scientific basis for the development and evaluation of <i>Food-Based Dietary Guidelines</i> : https://apps.who.int/iris/handle/10665/42051
1996	FAO	World Food Summit	Plan of Action and Rome declaration on world food security. Final report: https://www.fao.org/3/w3548e/w3548e00.htm
2010	FAO	International Scientific Symposium	Report <i>Sustainable Diets and Biodiversity</i> provides a definition of a sustainable diet: http://www.fao.org/3/a-i3004e.pdf
2012	UN	Conference on Sustainable Development (Rio + 20)	Launch of 'Zero Hunger Challenge' and Report 'The Future We Want' https://www.un.org/en/conferences/environment/rio2012
2013	FAO	Second International Conference on Nutrition (ICN2)	Report of the Joint FAO/WHO Secretariat on the Conference https://www.fao.org/3/i4436e/i4436e.pdf Declaration on Nutrition https://www.fao.org/3/ml542e/ml542e.pdf and Framework for Action https://www.fao.org/3/mm215e/mm215e.pdf
2015	UN	Transforming our World. The 2030 Agenda for Sustainable Development.	Sustainable Developmental Goals (SDGs) https://www.un.org/sustainabledevelopment/sustainable-development-goals/ e.g., SDG 2: Zero hunger; SDG 13: Climate action.
2015	Global panel on Sustainable Agriculture and Food Systems for Nutrition https://www.glopan.org/	'A call to action for World leaders and their Governments' to address nutritional crisis'.	Panel commissioned Foresight1 report (2016): <i>Food systems and diets: Facing the challenges of the 21st century</i> . London, UK. https://glopan.org/sites/default/files/ForesightReport.pdf Foresight 2 report, <i>Future Food Systems: For people, our planet and prosperity</i> (2020) https://www.glopan.org/foresight2/
2020	EU	A European Green Deal https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	Farm to fork strategy https://ec.europa.eu/food/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

Appendix 5 Development of UK sustainable food (and fish) policy

Date	Lead Agency/Body	Report	Aim and objectives	Relevance for fisheries and seafood
1999	Environment Agency	A Better Quality of Life: a strategy for sustainable development for the UK (Environment Agency, 1999)	Government sets out how it proposed to deliver sustainable development.	Goal of 'an enhanced contribution of fishing to local economies and social inclusion'.
2002	Defra	The Strategy for sustainable farming and food – Facing the Future (Defra, 2002)	Sets out a strategy for sustainable farming and food in wake of Curry Commission Report (The Policy Commission on the Future of Farming and Food) published in 2001 following the outbreak of Foot and Mouth disease in England.	No specific reference to seafood only to fish in context of anti-smuggling.
2003	Defra	Changing Patterns - UK Government framework for sustainable consumption and production (DTI, 2003)	Following the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, this strategy sets out a framework for how the Government will take forward its commitment to sustainable consumption and production.	Defines sustainable consumption and production as "continuous economic and social progress that respects the limits of the earth's ecosystems, and meets the needs and aspirations of everyone for a better quality of life, now and for future generations to come". Reference to Strategy Unit for the 'Future of Fish Stocks' project which aims to develop a long-term strategy for the sustainable future of the UK marine fishing industry.
2005	UK Government Sustainable Development Commission (SDC)	Securing the future - delivering UK sustainable development strategy (SDC, 2005)	Strategy aims to enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations.	Reiterates WSSD commitments to restore depleted fish stocks by 2015; tackle IUU fishing.
2006	Sustainable Consumption Roundtable (SCR), National Consumer Council (NCC) and the SDC	I will if you will, towards sustainable consumption (SCR, 2006a)	To establish a Sustainable Consumption Action Framework as a guide for government policy. Report sets out how a significant shift towards more sustainable lifestyles is possible through behaviour change.	Harness scope of choice editing to promote lifestyle changes e.g., by removing endangered species like cod from sale entirely until they have recovered; recommendations on procurement policies in public sector catering including promoting more sustainable fish species; work with partners including NGOs to promote lesser known and sustainable species and MSC certified fish.
2007 (November)	Defra	Public Understanding of Sustainable Consumption of Food (Owen et al., 2007)	To help inform the development of a pro-environmental behaviour strategy and identify key (5) behaviour goals with respect to food purchasing.	Avoid fish from uncertified or unsustainable stocks; buy certified fish; promote local fish.
2008 (July)	Cabinet Office	Food Matters Towards a strategy for the 21st Century (Cabinet Office, 2008)	To review the main trends in food production and consumption in the UK. <i>Food Matters</i> called for better	Supermarkets to only sell wild-caught fish from sustainable sources i.e. MSC certified.

			integration of food policy across Government and highlighted two challenges: climate change and obesity.	
2008	Sustainable Development Commission (SDC)	Green, healthy and fair - A review of government's role in supporting sustainable supermarket food (SDC, 2008)	Review how government relates to the supermarkets as gate-keepers of the food system. Its purpose to advise UK government on the effectiveness of their food system policies and progress towards sustainable development. Recommends Defra work with supermarkets and stakeholders to develop a roadmap for a sustainable food system.	Recommends Defra work collaboratively with FSA and Department of Health to identify synergies and conflicts between health promotion and sustainable diets (including sustainably sourced fish, meat and dairy) and align health and sustainability messages to consumers and the food industry; Harness the 'choice editing' role of supermarkets, to influence consumer awareness of the impact of their choices, reformulate products, and improve diet.
2009 (September)	Defra Council of Food Policy Advisors	First Report from the Council of Food Policy Advisors (Defra Council of Food Policy Advisors, 2009)	Report identified priority areas for government action including defining a low impact (sustainable) diet.	No reference to fish, fishing, or seafood.
2009 (December)	Sustainable Development Commission (SDC)	Setting the table – advice to Government on priority elements of sustainable diets (SDC, 2009)	To map existing research and initiatives on a sustainable diet; identify priorities for potential messages around which the Government should seek to build consensus; examine how changes in UK food consumption patterns could deliver positive sustainability outcomes (e.g., reduced climate change impacts, improved health and nutrition, reduced environmental impacts, improved economic and social benefits).	Recommendation to 'eat fish from certified or sustainable fish stocks'.
2010 (January)	Defra	Food 2030 Strategy (HM Government, 2010)	Sets out Government vision and priorities for a sustainable and secure food system for 2030 in response to challenges for food – sustainability, security and health – and to a call for more joined up food policy.	Report recognises the importance of fish for health and of the need to 'actively' manage our seas to conserve stocks and raise awareness and consumption of alternative species to make up the 'shortfall' to meet FSA recommendations.
2010 (March)	Defra Council of Food Policy Advisors	Food: a recipe for a healthy, sustainable and successful future Second Report of the Council of Food Policy Advisors (Defra, 2010)	The purpose of the Council of Food Policy Advisors is to advise the Secretary of State for Environment, Food and Rural Affairs on food policy in England. The report sets out the Council's advice on the priorities that it believes should define the Government's agenda for food policy in the year ahead. Priorities include the role of consumers in driving change towards healthy and sustainable diets, recommending that Government facilitate and encourage this change.	To achieve a 'demand-led transition', recommendations for fish include setting 'targets to shift fish consumption towards products only from sustainably managed stocks certified under Marine Stewardship Council or equivalent standards and eliminate consumption of threatened and endangered species'.
2011 (March)	Sustainable Development Commission (SDC)	Looking Back, Looking Forward Sustainability and UK Food Policy 2000-2011 (SDC, 2011)	'This final Sustainable Development Commission (SDC) report on food matters, to the Governments of the UK, reviews the growth of UK policy during the 2000s to 2011. It covers the lifetime of the SDC and assesses the current state of thinking in relation to the challenges ahead'.	Report refers to the Gangmaster Licensing Act (2004) which, in response to the deaths of twenty-one cockle-pickers in Morecambe Bay in 2004, set up a new Authority to regulate gang labour, including in fish processing and shellfish industries. Report also highlights the importance of contribution by business, particularly retailers, towards more sustainable and ethical sourcing of fish by prioritising sales of MSC certified seafood. In light of the now

				abandoned FSA-led Integrated Advice to Consumers project concern is expressed for the conflict between advice to eat more fish for health while stocks are under threat, putting the onus on consumers to choose 'wisely', when 'what is required is a 'joining up' of policy on stocks, nutrition, environment, employment and consumer culture'.
2011	The Government Office for Science	Foresight. The Future of Food and Farming. Final Project Report (The Government Office for Science, 2011)	The Foresight Report into the Future of Food and Farming examined the decisions that policy makers would need to take to address challenges of future food security. Its aims were 'to explore the pressures on the global food system between now and 2050 and identify the decisions that policy makers need to take today, and in the years ahead, to ensure that a global population rising to nine billion or more can be fed sustainably and equitably'.	Acknowledges capture fisheries and aquaculture as important, in terms of both nutrition and providing livelihoods, especially for the poor. Suggests responsible fishing can be incentivised by pressures from consumers and retailers. Recognises importance of biodiversity-sensitive fisheries. Identifies priority action for policy makers for fisheries as ensuring their long-term sustainability.
2012	Defra	Green Food Project (Defra, 2012)	The Green Food Project online forum was set up to gather views from members of the public and interested parties on the future of food production and the environment in England and what changes needed to be made to the existing UK food system to meet the challenge of increasing food production and improving the environment over the next 30 to 40 years.	In response to the question, "the food we eat affects both our health and the environment. How can we encourage people to eat a diet that is balanced and sustainable?", fish, shellfish and algae were identified as efficient and nutritious sources of food that use minimal amounts of land, freshwater and energy. Meat substitutes were also suggested as an area of opportunity'.
2013 (July)	Defra	Sustainable Consumption Report. Follow-Up to the Green Food Project (Defra, 2013)	Report identified three main themes: "Principles of a healthy and sustainable diet"; "Consumer behaviour"; and "Sustainable consumption and growth". The report also highlighted issues with food labelling, caused by a lack of universal definition of sustainability and by the lack of reliable and impartial sourcing information.	One of the 8 principles of a sustainable diet identified is: Choosing fish sourced from sustainable stocks, taking seasonality and capture methods into consideration. In relation to retailers 'creating brand value around sustainability', the report recommends they enter into partnerships with NGOs such as WWF and the Marine Conservation Society.
2015 (March)	Defra	Government Buying Standard (GBSF) for food and catering services (Defra, 2015)	The Government Buying Standards for Food and Catering Services (GBSF) were introduced in 2011 as a means of meeting the Greening Government Commitments ¹³⁶ when buying and providing food and catering services. The nutrition standards within the GBSF aim to ensure healthier food and drink options are available across the public sector and includes vending.	All fish (including where it is an ingredient in a composite product) are demonstrably sustainable with all wild-caught fish meeting the FAO Code of Conduct for Responsible Fisheries (includes Marine Stewardship Council certification and Marine Conservation Society 'fish to eat', or equivalent). No 'red list' or endangered species of farmed or wild fish shall be used (Marine Conservation Society 'fish to avoid').
2016 (February)	Food Standards Agency	Our Food Future (FSA, 2016)	'The research was commissioned to add to a growing evidence base on UK consumers' views of the world we live in, where we are headed, and what we want to see from Our Food Future'. The overarching aims for this work were to bring the consumer voice to the heart of conversations about food for the public, Government and industry'.	No specific reference to fish, fishing or seafood. One respondent however referred to the "1000s of tonnes of fish dragged out in one go...if it's the wrong fish, it doesn't get used... It's terrible."

¹³⁶ <https://www.gov.uk/government/publications/greening-government-commitments-2021-to-2025/greening-government-commitments-2021-to-2025>

2018	Public Health England (PHE)	A quick guide to the Government's healthy eating recommendations (PHE, 2018)	The document provides a concise summary of government's healthy eating recommendations and signposts to the evidence upon which they are based.	Guide recommends to 'Aim for at least two portions (2 x 140g) of fish a week, including a portion of oily fish. Oily fish includes salmon, sardines, mackerel and kippers'.
2020	UK Government	The National Food Strategy (UK Government, 2020)	The National Food Strategy is the first independent review of England's entire food system for 75 years. The findings of this review will be used to develop a National Food Strategy for England and will build on the work underway in the Agriculture Bill, the Environment Bill, the Fisheries Bill, the Industrial Strategy, and the Childhood Obesity Plan.	In relation to Recommendation 13 to strengthen Government procurement rules to ensure that taxpayer money is spent on healthy and sustainable food, reference is made to Government leadership and the success of the GBSF which requires that, in the case of fish, all fish procured by the Government should be sustainable i.e. Certified by either the Marine Stewardship Council or the Marine Conservation Society.
Date	Lead Agency/Body	Report	Aim and objectives	Relevance for fisheries and seafood

Appendix 6 Seafood Ecolabels

Ecolabel	General description	Social Component	Social description	Seafood-specific standard?	Website
Naturland	Naturland is a German-based organic farming association with standards for organic aquaculture and wild-capture fish.	Yes	The Standards include social responsibility criteria including: respect of basic human rights; freedom to accept or reject employment; freedom of association and/or access to trade unions; equal treatment and opportunities; the complete absence of child labour; basic health and safety provisions; and a number of employment conditions.	No, but includes standards for both farmed and wild-capture fish.	https://www.naturland.de/en/
Friend of the Sea (FoS)	A leading international certification project for products originated from both sustainable fisheries and aquaculture. The FoS certification scheme is composed of: an aquaculture standard; a fish feed standard; a fish oil and fishmeal standard; a wild capture fishery standard; and a chain of custody standard concerning products deriving from a FoS certified aquaculture or fishery. Standard has specific link with Global G.A.P.	Includes social accountability requirements.		Yes	https://friendofthesea.org/
Aquaculture Stewardship Council (ASC)	The ASC is an independent, international non-profit organisation that has developed a certification programme for responsible aquaculture. The ASC was founded in 2010 through a partnership between WWF and the Sustainable Trade Initiative (IDH) with the aim to create a global set of standards which define responsible aquaculture and then to provide independent certification and internationally recognised on-pack labelling to identify and reward products sourced according to those standards.	Yes	The ASC certification includes Farm Standards on worker and community rights that are primarily based on core United Nations International Labour Organisation (ILO) conventions relating to child labour, forced labour, discrimination, health and safety, working hours and remuneration.	Yes	https://www.asc-aqua.org/
Marine Stewardship Council (MSC)	The Marine Stewardship Council is an international non-profit organisation which has set credible standards, epitomised with the blue tick logo, for sustainable fishing and supply chain traceability. The MSC standard is designed to promote ecological sustainability of fisheries resources and associated ecosystems.	In progress	In January 2018 MSC announced key changes to MSC certification requirements include strengthening labour requirements. In recognition of growing concern about labour abuses in the global seafood supply chain, the MSC will extend its existing provisions to address forced labour in fisheries and supply chain companies. New requirements for seafood suppliers and processors introduced in March 2019 to combat forced and child labour in seafood businesses require the introduction of independent audits of labour practices for supply chain companies if a risk of forced or child labour practices is established. Introduced as part of an update made to the MSC's Chain of Custody Standard, the	Yes	https://www.msc.org/uk

			new rules require all MSC certificate-holders to undergo an audit of their labour practices and policies, unless they can demonstrate that they are at “lower risk” of practising forced or child labour. The audit requirement will come into effect on 28 September 2019, with companies given a 12-month grace period to implement a labour audit.		
Global Aquaculture Alliance (GAA) Best Aquaculture Practices (BAP)	An international, non-profit organisation committed to feeding the world through responsible, sustainable aquaculture with more than 2,000 BAP-certified processing plants, farms, hatcheries, and feed mills in 33 countries and six continents. The GAA Best Aquaculture Practices (BAP) facility certification standards defines the most important elements of responsible aquaculture and provides quantitative guidelines by which to evaluate adherence to those practices for processing plants, farms, hatcheries and feed mills. Fully accredited ISO 65.	Yes	Processing plants and farms certified against the BAP standards must ensure a safe, healthy working environment. In total, the BAP processing plant standards contain 48 clauses related to worker safety, health and employee relations and intentionally address wages and other terms of employment and the use of child and forced labour. Took a stand against child labour and forced labour in the shrimp supply chain by prohibiting BAP-certified processing plants from outsourcing the processing of shrimp to third-party entities, from 1 January 2016	Yes	https://www.aquaculturealliance.org/
GGN Certified aquaculture	The GGN label is the consumer label for aquaculture products (salmon, trout, mussels and shrimp) from Global Gap Certified farms. Using the GGN number on the product label the consumer is led through an online portal to details for the origin of the product and what the producer’s farm looks like. Products are farmed in line with certified, responsible farming practices that cover food safety, environmental protection, animal welfare, social responsibility, and supply chain transparency.	Yes	Certification includes commitment to social responsibility.	No, but includes farmed seafood and algae.	https://www.globalgap.org/uk_en/ggn-label/
Soil Assoc.	UKs leading organic certifier offering a huge range of organic and sustainable certification schemes across food, farming, catering, beauty & wellbeing, fashion & textiles and forestry. The Soil Association developed the world’s first organic standards in the 1960s. Its licensees must meet strict European laws about the production of organic food and go further in key areas such as animal welfare, protecting human health, and safeguarding the environment. The <i>Food for Life Served Here</i> Award is an independent endorsement, backed by annual inspections, for food providers who are taking steps to improve the food they serve. The aim of the scheme is to encourage and reward caterers who, for example, source environmentally sustainable and ethical food and	No		No, but includes standards for farmed fish. MCS ratings and sustainable seafood advice underpins assessment of seafood for The Food for Life Served Here Award.	https://www.soilassociation.org/

	champion local food producers.				
RSPCA Assured	RSPCA Assured is the only assurance provider dedicated solely to animal welfare. The RSPCA standard for farmed fish is designed to minimise stress, injury and disease in farmed fish in three key areas of concern: the environment in which the fish is raised; during handling and; when fish is transported and slaughtered.	No		No, but includes welfare standards for farmed fish, principally Atlantic salmon and trout.	https://www.rspcaassured.org.uk/
Dolphin Safe	The Dolphin Safe label was developed by the Earth Island Institute in the USA in 1990. The standard prohibits the “intentional chasing, encircling or netting of marine mammals and use of driftnets and gillnets” (Clarke, 2003).	No		Yes, specifically tuna, principally yellowfin tuna.	https://savedolphins.eii.org/campaigns/dsf
Cornwall Good Seafood Guide	Whilst not a certification scheme, the Cornwall Wildlife Trust (CWT) has developed a seafood labelling scheme, the Cornwall Good Seafood Guide (CGSG), to “provide clear and accurate information to help consumers and businesses make environmentally informed decisions when purchasing Cornish seafood” (Cornwall Wildlife Trust) (Marcone, 2021).	No		Yes. MCS methodology underpins the ratings produced as part of a scheme to encourage the public to eat a wider variety of more local and sustainable seafood.	https://www.cornwallgoodseafoodguide.org.uk/
Source: Table produced with content from Seafish TESS (Seafish, 2022b) (Tools for Ethical Seafood Sourcing https://www.seafish.org/responsible-sourcing/tools-for-ethical-seafood-sourcing/ and/or information from the relevant organisations website					



Section 1:

Seafood Sustainability Consumer Survey

I'm carrying out research at Cardiff University into the influence the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) may or may not have on consumer decision making when buying seafood.

Seafood is perceived as a healthy and more environmentally-friendly source of animal protein compared to other sources. Alongside a growing human population, there is increasing demand for seafood and per capita global consumption. As efforts to increase provision of sustainable seafood continue, this study will help us to understand your views and thoughts on your experiences of shopping for and consuming seafood. Additionally, this study will help us to understand the factors influencing consumer decision making relating to seafood.

If you are 18 years or over, resident in the UK and have responsibility for buying food for yourself, your family or household, please take about 10 minutes to complete this questionnaire.

You do NOT need to have used the GFG or eat seafood to take part in the survey - we want to hear from everyone, including why you might not use the Guide or what might stop you from eating or buying seafood.

When completing the questionnaire please ensure that you fill out the answers on your own, that you answer honestly and from your own knowledge. Please try to answer all questions but know you have the right to end the questionnaire at any point and not respond to every question.

Any data collected during this research project will be held in accordance with all applicable data protection legislation and will only be used for the purpose of this research. For information on Cardiff University Ethics Research policy or for more information about my research, please contact Bernadette Clarke by emailing: ClarkeBM@Cardiff.ac.uk

As a thank you for your time and help in completing the survey, your name can be entered into a prize draw for the chance of winning FREE individual membership (for 1 year) to the Marine Conservation Society (MCS) or a copy of the River Cottage Cookbook. Further details of how to enter the draw may be found at the end of the survey. Thank you for your interest in helping with this research.

Section 2: Seafood, guides and you

'Seafood' generally covers a diverse or varied group of aquatic organisms, from both marine and freshwater environments, including molluscs, crustaceans and all types of finfish. Species may be wild-caught or farmed. Seafood includes fresh, frozen, chilled or tinned fish and products made with or including fish such as fish pies, fish-in-batter or breadcrumbs, e.g., fish fingers, and prawn curry etc. Fish is also widely used in the production of pet food and health products. Lesser known by-products of fish processing are also used in the manufacture of other goods such as leather, food wrapping and wine.

Question 1. Have you heard of the Marine Conservation Society (MCS) Good Fish Guide (GFG)?	Please select <i>only the most relevant</i> statement to you:
Yes, I have become aware of the Guide in recent years	
Yes, I have been aware of the Guide for around 2-5 years	
Yes, I have been aware of the Guide for more than 5, but less than 10 years	
I have been aware of the Guide for more than 10 years	
No, this is the first time I have seen or heard of the Guide	
Not sure	

Question 2. The term "sustainable seafood" is often used. Please tell me in your own words what sustainable seafood means to you?
Question 2.a. The term "responsibly sourced" is also often used in connection to seafood. Please tell me in your own words what responsibly sourced means to you?

Question 3. Do you buy seafood?	Yes, go to Question 5.	No, go to Question 4.
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Section 3: Your reasons for not buying seafood

Question.4. What are your reasons for <i>not</i> buying seafood? Please select all statements that apply to you.	Please tick <i>all</i> statements that apply to you:
I do not like the physical properties associated with eating mainly fresh fish e.g., bones, eyes, blood, skin etc.	

I do not like the sensory properties associated with eating fish e.g., smell, taste etc.	
The sea is polluted and the fish living in it is contaminated	
Too many fish are being removed from our seas and this makes me concerned about buying seafood	
I am concerned about the impact of seafood production on our marine environment and wildlife	
I am not confident in preparing or cooking seafood	
It's too expensive	
I (or other people in my household) am vegetarian or vegan and do not include seafood as a part of my normal diet	
I used to buy seafood but I have changed my diet and no longer do	
Other? Please specify	

Question 4.a. If you selected 'other' in Q.4, please provide details here:	Go to Section 9. Q.24
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Section 4: Your seafood purchasing

Question 5. General seafood eating habits? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I have always eaten seafood						
I started eating seafood as an adult						
I grew up in a household where seafood was regularly eaten						
I have only started to eat seafood in recent years						
I have only increased the amount of seafood I eat in recent years						
I have always tried to only buy sustainably produced seafood						
I only eat seafood when I eat out						
I'm eating less seafood now than I used to						
I don't eat seafood						

Question 6. Where do you buy seafood for home consumption?	Multiple choice Please tick <i>all</i> that apply to you:
Supermarket	
Local market	
Fish van, kiosk or stall	
Fishmonger	
Online	

Take-away	
Other?	

Question 6.a. If you selected 'other' in Q.6, please provide details here:	
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Question 7. If you buy seafood at a supermarket, which one do you shop in most frequently?	Drop down list
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Question 7.a. If you selected 'other' in Q.7, please provide details here:	
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Question 8. What influences your decisions when buying seafood?	Please rank your choices from 1-5, 1 least important and 5 most important
Price	
That they are familiar species	
Easy to cook with recipe in mind	
Provenance i.e. who caught or farmed the fish and where	
How it's caught or farmed	
That it's good for me	
Whether its wild caught or farmed	
Fish welfare	
That it's sustainable	
Taste	
Social justice i.e. that the product is fairly traded	
Locally caught or produced	
That it's easily available	
That it's a more sustainable source of animal protein	
Other. Please specify.	

Question 8.a. If you selected 'other' in Q.8, please provide details here:	
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Question 9. For the following, please indicate how often, approximately, you have bought each one in the last 12 months?	At least once a week	Every couple of weeks	Every few months	A couple of times	Not at all	Not sure
Cod						
Coley						
Dab						
Eel						
Haddock						
Hake						








Herring						
Lemon sole						
Mackerel						
Mussel						
Pilchard or sardine						
Plaice						
Prawn						
Salmon						
Shark						
Rock salmon						
Squid or calamari						
Trout						
Tuna						
Whitebait						
Other (=20)						

Question 9.a. If you selected 'other' in Q.9, please provide details here:

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Question 10. In relation to the seafood you buy, how much do you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I tend to know where the fish I buy has been caught or farmed and how						
I know whether the fish I buy is farmed or wild-caught						
Where a generic fish name is used e.g., salmon or tuna, I always know what precise species I'm buying						
I tend to buy more prepared or processed than fresh or chilled fish						

Question 11. Please tick the statement that most applies to your level of recognition and understanding of the following 8 fish labels or logos:	I recognise the logo and fully understand its meaning.	I recognise the logo but only have some understanding of its meaning.	I recognise the logo but have no understanding of its meaning.	I do not recognise the logo.
				

Section 5: Importance of sustainability and your sustainable seafood knowledge

Question 12. When thinking about the sustainability of seafood, to what extent do you agree or disagree with the following statements on seafood sustainability:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Don't know
Sustainability is very important to me when buying and/or eating seafood						
Whether buying seafood for eating at home or when eating out I always check that it is sustainably produced						
Where possible, I check for information on seafood sustainability						
I feel I am sufficiently confident to demand that seafood is supplied from the most sustainable sources						
I don't feel I know enough about sustainability to ask questions about seafood						

Question 13. Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure

Knowing what fish it is, where it comes from and how its caught or farmed is really important to gauge its sustainability						
Handlines, pots and traps are more environmentally friendly ways of fishing						
The majority of people in the UK choose from only 5 types of fish						
Fish is often taken in areas where fishing should be restricted prohibited to protect important marine habitat or species						
Cod in waters around the UK is mostly overfished						
Due to increasing sea temperatures the type of fish found in UK waters is changing						
Farming fish is often better for the environment than taking fish from the wild						
Most of the fish we eat in the UK is imported						
Eco-labelled seafood is generally more sustainable than non-labelled seafood						

Question 14. Thinking about your experiences buying fish please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I don't know how to interpret the information provided through labelling to allow me to choose the most sustainable seafood						
Where I buy seafood there are limited choices available						
Sustainable alternatives to my usual and preferred choices are often not available						
Sustainably produced seafood is more expensive						

Clear information on packaging and menus about where and how seafood is produced is lacking						
I don't understand what seafood sustainability is, it's all too confusing						
I'm able to make the sustainable seafood choices I want						

Question 15. Is there anyone that influences the seafood choices you make?	Please rank in order of importance, from 1-5, 1 least important and 5 most important
Family	
Friends	
Work or study colleagues	
Celebrity chefs	
Scientific experts	
TV personalities	
Environmental or wildlife experts	
Media e.g., newspaper, radio etc.	
Fishing industry members or representatives	
Social media personalities/influencers	
Other, please specify	

Question 15.a. If you selected 'other' in Q.15, please provide details here:	
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Question 16. To what extent do you agree or disagree with the following statement:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Most people important to me think I should buy sustainable seafood						

Question 17. Where do you obtain your seafood related knowledge?	Please identify the 5 most useful sources for your knowledge and rank them in order of importance, 1 least important and 5 most important.
TV e.g., wildlife and marine programmes such as BBC Blue Planet.	
News – printed and online e.g., internet or apps	
Radio	
Government	
Books or magazines	
Academics or scientists	
Public attractions e.g., aquaria, zoos and wildlife parks	

ENGOs	
Seafood Guides e.g., MCS Good Fish Guide	
Celebrity chefs	
Social Media/Networking Sites e.g., Facebook	
Internet	
Fishing industry/representatives	
Other? Please outline in box below.	

Question 17.a. If you selected 'other' in Q.20, please provide details here:	
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Question 18. When thinking about the impact of your choices on the marine environment, Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I have a responsibility to make the right decisions for the marine environment when buying seafood						
It is important to care enough about the marine environment to want to help make a difference						
It's easy enough to make the right seafood choices to reduce my impact on our seas						
The seafood choices people make affects fish populations						
I believe making sustainable seafood choices is important for the marine environment						
I'm trying to help, but I'm not sure how much impact my choices can make						
I want to do the right thing when buying seafood						
By changing our seafood shopping habits individuals like me can make a difference						

Section 6: Using the MCS GFG?

Question 19. If you have heard of the Marine Conservation Society (MCS) Good Fish Guide (GFG), do you use or have you ever used it?	
Yes	Go to Q.21

No	Go to Q.20
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Section 7: Not using the Guide?

Question 20. What prevents you from using the Guide and/or acting on the advice in the GFG when buying seafood? Please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Following the advice is too complicated, I don't understand it						
Following the advice is too difficult, it's not practical						
I don't like asking questions about the seafood I want to buy						
I don't have enough time to use the Guide to help me choose sustainable seafood						
The people I ask for information are not able to supply it						
I tend to stick to my usual seafood choices so don't feel the need to use the Guide						
I use the Guide and experience few to no problems						
I don't know enough about sustainably produced seafood or using the Guide at the moment to allow me to use it						
This is the first time I have heard of the Guide						
Other						

Question 20.a. If you selected 'other' in Q.23, please provide details here:	
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Section 8: Using the Guide

Question 21. Please indicate to what extent you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Don't know
The GFG provides information about how I can reduce my impact on our seas and marine wildlife						

The GFG advice for choosing sustainable seafood is accurate and credible						
I use the Guide most of the time when I buy seafood, either in a restaurant or in the supermarket etc.						
I have the GFG but I haven't really used it to help me make decisions about seafood consumption						
I want to make an effort and use the Guide when I buy seafood, either in a restaurant or in the supermarket etc.						
I may use the Guide to help me choose sustainable seafood in the near future						
I probably won't use it						
The availability of the GFG has made me more motivated to buy sustainable seafood						
I am confident the MCS GFG can help me make the sustainable choices I want when buying seafood						
I'm not sure the Guide is helpful or useful when purchasing sustainably produced seafood						
I find the GFG easy to use and can follow the advice it presents						
I don't need to use a guide to help me purchase sustainable seafood						

Question 22. What changes have you made when buying seafood as a result of using the MCS GFG? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I always ask where the fish I want to buy comes from and how it is caught or farmed						
I only buy wild-caught fish						
I only buy farmed fish						
I buy more seafood now than before I started using the Guide						
I only buy fish rated as a Best Choice, i.e. rated 1 or 2 in the GFG						
I avoid buying red rated fish, i.e. those rated 5 in the GFG and listed as fish to avoid						
I buy less seafood now than before I started using the Guide						

I only buy fish rated 1, 2 or 3 in the GFG						
I only buy seafood if it has an Eco-label e.g., Marine Stewardship Council (MSC), Aquaculture Stewardship Council (ASC) etc.						
I always use the GFG when purchasing seafood						
I have not made any changes to the way I buy seafood or the choices I make						

Question 23. In your opinion, are you more knowledgeable about seafood sustainability since using the MCS GFG? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I am more knowledgeable about seafood sustainability since using the MCS GFG						
I am not more knowledgeable since using the MCS GFG						
I've not been using the Guide longer enough to say						

Section 9: Your views on the marine environment generally

Question 24. Thinking about the wider marine environment, please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Fish are interesting, intelligent and sentient marine animals						
The ocean is a valuable source of food, employment and recreation						
The ocean supports a great diversity of life and ecosystems ¹³⁷						
The seas around the UK are cold, murky and not very interesting						
The health of our seas is important for human health and wellbeing						
It is important that people value and have a strong connection with the sea						

¹³⁷ Ocean Literacy Principle 5 <http://oceanliteracy.wp2.coexploration.org/>

The sea feels part of my identity						
The ocean and humans are inextricably interconnected ¹³⁸						
The sea is a wild and scary place						
I don't feel particularly connected to the sea						

Question 25. When thinking about your usual food shopping habits, please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I always buy Fair Trade products						
I rarely buy Organic products						
Where possible, I buy locally produced food						
I prefer to buy food that is in season						
I buy what is convenient						
I tend to avoid products with unnecessary packaging						
I prefer to buy food produced in the UK						
I try to reduce the amount of meat and/or dairy myself or my family is consuming						
I think of myself as an ethical consumer						
I try to avoid buying too many imported products						
I buy what I can afford						
I tend to buy free-range meat and egg products						
I try to avoid buying products (e.g., biscuits, bread, chocolate etc.) containing palm fat or oil						
I try to shop ethically but food produced in this way is generally too expensive						
I think of myself as an environmentally-friendly consumer						
I buy what I/we enjoy						
I am/Family members are vegan or vegetarian and I buy food accordingly						
Other? Please specify						

¹³⁸ Ocean Literacy Principle 6 <http://oceanliteracy.wp2.coexploration.org/>

Question 25.a. If you selected 'other' in Q.25, please provide details here:	
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Question 26. What progress would you like to see made to increase the sustainability of seafood in the future? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I would like to see all food, including seafood, labelled for environmental impact						
I would like to see food, including seafood, labelled so that I can be certain the products I buy are environmentally, socially AND ethically produced						
The Government should introduce legislation to ensure unsustainable seafood does not enter the UK seafood market						
I would like to be able to buy more locally and sustainably produced seafood and for it to be labelled as local or British or from UK						
To better protect marine habitat and species I would like to see seafood sold in the UK labelled as <i>"Not caught (or farmed) in a Marine Protected Area"</i> (a general term used to describe any protected area in the marine realm which aims to conserve nature and maintain healthy oceans)						
I don't know						
Other. Please specify						

Question 26.a. If you selected 'other' in Q.26, please provide details here:	
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Section 10: More about you

27. *Gender*: Male; Female; Other; Prefer not to say?

28. *Age*: 18-29; 30-39; 40-49; 50-59; 60-69; 70-79; 80+

29. *Ethnicity*: White British; White European; Black British or Afro-Caribbean; Indian; Pakistani; Multiracial; Bangladeshi; Chinese; Other; Prefer not to say?

30. *Family/household members*: Single/live alone; Number of children Age 0-5; 6-11; 12-18; Adults 18+

31. *Education*: No qualifications; Left school at 16 with qualifications e.g., O Levels/GCSEs; Left school at 18 with qualifications e.g., AS/A levels; Undergraduate degree; Post graduate degree; Teaching or nursing qualification; Vocational qualification e.g., City and Guilds; Other?

32. *Employment*: Paid employment (full or part-time); Self-employed; Fulltime parent or carer; In education (full or part-time); Unemployed; Retired; Other?

33. *Household income*: £0- £12,500; £12,501-£50,000; £50,001-£150,000; Over £150,000; Prefer not to say?

34. *What is your post code?*

35. *How often do you visit the coast*: I live on the coast; once a week; once a month; once every few months; once or twice a year; very rarely/never?

36. *What leisure activities or hobbies do you engage in generally?* Please tick all the things you are involved in or enjoy: Cooking; dining out; TV cooking programmes; wildlife programmes; volunteering; hiking or walking; camping; swimming; keeping fit; music; watching films at home or cinema; cycling; other?

37. *Are you a member of any conservation, wildlife or any other group or charity? Please state which one(s):*

Section 11: Prize Draw

Question 38-40



Section 1: Introductory statement

Seafood Sustainability Survey – help us to understand and inform sustainable seafood efforts

I'm carrying out PhD research at Cardiff University into the influence the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) may or may not have on consumer decision making when buying seafood.

As efforts to increase provision of sustainable seafood continue, this study will help us to understand your experiences of shopping for and consuming seafood and thus the factors influencing consumer decision making when buying seafood.

If you are 18 years or over, resident in the UK and have responsibility for buying food for yourself, your family or household, please take about 10 -20 minutes (depending on how many questions are applicable to you) to complete this questionnaire.

You do NOT need to have used the GFG or buy or eat seafood to take part in the survey – we want to hear from everyone, including why you might not use the Guide or what might stop you from buying or eating seafood.

When completing the questionnaire please ensure that you fill out the answers on your own, that you answer as honestly as possible and from your own knowledge. Please try to answer all questions but know you have the right to end the questionnaire at any point and not respond to every question. *Please also note, when answering a question please ensure you click on an answer before clicking the Next button and moving to the next section, otherwise the questionnaire will assume your answer is No, when it may be Yes.*

Any data collected during this research project will be held in accordance with all applicable data protection legislation and will only be used for the purpose of this research. For information on Cardiff University Ethics Research policy or for more information about my research, please contact Bernadette Clarke by emailing: ClarkeBM@Cardiff.ac.uk

PRIZE DRAW!



As a **thank you** for your time and help in completing the survey, your details can be entered into a **Prize Draw** for the chance of winning FREE individual membership (for 1 year) to the Marine Conservation Society (MCS), a copy of the River Cottage Cookbook or a plastic-free mini-hamper. Further details of how to enter the draw may be found at the end of the survey.

Thank you for your interest in helping with this research.

Section 2: Seafood guides and you

This section asks you about your awareness of seafood guides, specifically, the Good Fish Guide (GFG) produced in the UK by the Marine Conservation Society (MCS).



Question 1. Have you heard of the Marine Conservation Society (MCS) Good Fish Guide (GFG)?	Please select <i>only the most relevant</i> statement to you:
Yes, I have become aware of the Guide in recent months	
Yes, I have been aware of the Guide for 1-2 years	
Yes, I have been aware of the Guide for around 2-5 years	
Yes, I have been aware of the Guide for more than 5, but less than 10 years	
Yes, I have been aware of the Guide for more than 10 years	
No, this is the first time I have seen or heard of the Guide	
Not sure	

[Go to Next Section 3](#)

Section 3: Are you using the MCS GFG?

Question 2. If you have previously heard of the Marine Conservation Society (MCS) Good Fish Guide (GFG), do you use, or have you ever used, the Guide when buying seafood?	
No, I don't use the Guide when buying seafood	Go to Section 4. - Not using guide
Yes, I use or have used the Guide when buying seafood	Go to Section 5. - Using guide
No, I don't use the Guide because I don't buy seafood	Go to Section 6. - Not buying seafood

[Go to Section 4, 5 or 6 depending on response](#)

Section 4: Not using the Guide?

Question 3. What prevents you from using the Guide and/or acting on the advice in the GFG when buying seafood? Please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure	Not Applicable
Following the advice is too complicated, I don't understand it							
Following the advice is too difficult, it's not practical							
I don't like asking questions about the seafood I want to buy							
I don't have enough time to use the Guide to help me choose sustainable seafood							
The people I ask for information are not able to supply it							
I tend to stick to my usual seafood choices so don't feel the need to use the Guide							
I don't take the Guide with me when shopping							
I don't know enough about sustainably produced seafood or using the Guide at the moment to allow me to use it							
This is the first time I have heard of the Guide							

Go to Section 7 Your seafood purchasing

Section 5: Using the Guide

This section asks you about your experience of using the Guide and what changes you have made, if any, to the way you buy seafood as a result of using the Guide.

Question 4. Please indicate to what extent you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
The GFG provides information about how I can reduce my impact on our seas and marine wildlife						

The GFG advice for choosing sustainable seafood is accurate and credible						
I use the Guide most of the time when I buy seafood, either in a restaurant or in the supermarket etc.						
I have the GFG but I haven't really used it to help me make decisions about seafood consumption						
I want to make an effort and use the Guide when I buy seafood, either in a restaurant or in the supermarket etc.						
I may use the Guide to help me chose sustainable seafood in the near future						
I probably won't use the GFG that often when making choices about eating or buying seafood						
The availability of the GFG has made me more motivated to buy sustainable seafood						
I am confident the MCS GFG can help me make the sustainable choices I want when buying seafood						
I'm not sure the Guide is helpful or useful						
I find the GFG easy to use and can follow the advice it presents						
I don't need to use a guide to help me purchase sustainable seafood						

Question 5. When using the MCS GFG which format do you prefer?	Drop down list: Website Mobile App Pocket GFG All of the above No preference Unsure
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Question 6. What changes have you made when buying seafood as a result of using the MCS GFG? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I always check where the seafood I want to buy comes from and how it is caught or farmed						
I only buy wild-caught fish						
I only buy farmed fish						

I buy more seafood now than before I started using the Guide						
I only buy seafood rated as a Best Choice, i.e. rated 1 or 2 in the GFG						
I avoid buying red rated seafood, i.e. those fish rated 5 in the GFG and listed as fish to avoid						
I only buy seafood rated 1, 2 or 3 in the GFG						
I buy less seafood now than before I started using the Guide						
I only buy seafood if it has an eco-label						
I always use the GFG when purchasing seafood						
I have not made any changes to the way I buy seafood or the choices I make						

Question 7. In your opinion, are you more knowledgeable about seafood sustainability since using the MCS GFG? Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I am more knowledgeable about seafood sustainability since using the MCS GFG						
I already have enough seafood sustainability knowledge						
I've not been using the Guide longer enough to say						

[Go to Section 7 Your seafood purchasing](#)

Section 6: Your reasons for not buying seafood

Question 8. What are your reasons for you <i>not</i> buying seafood? Please select all the statements that most apply to you and/or your family or household.	Please select <i>all</i> the statements that most apply to you:
I do not like bones, eyes, blood, skin etc. associated with eating fresh fish	
I do not like the taste and/or smell of fish	
Our seas are polluted and the fish living in them are contaminated	

Too many fish are being removed from our seas and this makes me concerned about buying seafood	
I am concerned about the impact of fishing on our marine environment and wildlife	
I'm allergic to seafood	
I am not confident in preparing or cooking seafood	
It's too expensive	
I (or other people in my household) am vegetarian or vegan and do not include seafood as a part of my normal diet	
I used to buy seafood but I have changed my diet and no longer do	
Other? Please specify	

Go to Section 9 Your views on the marine environment generally

Section 7: Your seafood purchasing

This section asks you about sustainable seafood; your general seafood eating habits; where you buy seafood; what influences the decisions you make when buying seafood; the type of fish you buy; and your recognition of some seafood labels.

'Seafood' generally covers a diverse or varied group of aquatic organisms, from both marine and freshwater environments, including molluscs, crustaceans and all types of finfish. Species may be wild-caught or farmed. Seafood includes fresh, frozen, chilled or tinned fish and products made with or including fish such as fish pies, fish-in-batter or breadcrumbs, e.g., fish fingers, and prawn curry etc. Fish is also widely used in the production of pet food and health products. Lesser known by-products of fish processing are also used in the manufacture of other goods such as leather, food wrapping and wine.

Question 9. The term "sustainable seafood" is often used. Please tell me in your own words what sustainable seafood means to you?

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Question 10. The term "responsibly sourced" is also often used in connection to seafood. Please tell me in your own words what responsibly sourced means to you?

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Question 11. Please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I have always eaten seafood						
I grew up in a household where seafood was regularly eaten						
I have increased the amount of seafood I eat in recent years						

I have always tried to only buy sustainably produced seafood						
I eat more seafood out of the home						
I'm eating less seafood now than I used to						
I don't eat seafood						

Question 12. Where do you buy seafood for home consumption?	Please tick <i>all</i> that apply to you:
Supermarket	
Local market	
Fish van, kiosk or stall	
Fishmonger	
Online	
Direct from fisherman, quay or boat	
Take-away	
Other?	

Question 13. If you buy seafood at a supermarket, which one do you shop in most frequently?	Drop down list
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Question 13.a. If you selected 'other' in Q.13, please provide details here:	
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Question 14. What influences your decisions when buying seafood? Please indicate how much you agree or disagree with the following statement, "the following factors are important to me when buying seafood"	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Price						
Easy to cook with recipe in mind						
Provenance i.e. who caught or farmed the fish and where						
How it's caught or farmed						
That it's good for me						
Is it wild caught or farmed?						
Fish welfare						
That it's sustainable						

Taste						
Social justice i.e. that the product is fairly traded						
Locally caught or produced						
The type of product it is e.g., fresh or frozen etc.						
That it's easily available						
That it's a more sustainable source of animal protein						

Question 14.a. If there are other factors that influence your decisions when buying seafood , please provide details here:

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Question 15. For the following, please indicate how often, approximately, you have bought each one in the last 12 months?	At least once a week	Every couple of weeks	Every few months	A couple of times in the past 12 months	Not at all	Not sure
Cod						
Coley						
Eel						
Haddock						
Hake						
Herring						
Mackerel						
Mussel						
Pilchard or sardine						
Plaice						
Prawn						
Rock salmon						
Salmon						
Shark						
Squid or calamari						
Trout						
Tuna						

Question 15.a. If there are other species you have bought in the last 12 months, please provide details here:

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Question 16. In relation to the seafood you buy, how much do you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure

I tend to know where the fish I buy has been caught or farmed and how						
I know whether the fish I buy is farmed or wild-caught						
Where a generic fish name is used e.g., salmon or tuna, I always know what precise species I'm buying						
I tend to buy more prepared or processed than fresh or chilled fish						

Question 17.



Please tick the statement that most applies to your level of recognition and understanding of the following seafood labels or logos:	I recognise the logo and fully understand its meaning.	I recognise the logo but only have some understanding of its meaning.	I recognise the logo but have no understanding of its meaning.	I do not recognise the logo.
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Go to Next Section 8 Importance of sustainability and your sustainable seafood knowledge

Section 8: Your sustainable seafood knowledge

This section asks you what you know about sustainable seafood; who influences your seafood choices; where you obtain your seafood knowledge; and about the impact your choices make.

Question 18. When thinking about the sustainability of seafood, to what extent do you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Sustainability is very important to me when buying and/or eating seafood						
I am not concerned about the sustainability of the seafood I buy						
Whether buying seafood for eating at home or when eating out I <i>always</i> check that it is sustainably produced						
<i>Where possible</i> , I check for information on seafood sustainability						
I trust the seafood I buy is sustainable, but I don't check						
I feel I am sufficiently confident to demand that seafood is supplied from the most sustainable sources						
The cost and affordability of the seafood I buy is more important to me than sustainability						
I don't feel I know enough about sustainability to ask questions about seafood						

Question 19. Please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Knowing what fish it is, where it comes from and how it is caught or farmed is really important to gauge it's sustainability						
Handlines, pots and traps are more environmentally friendly ways of fishing						
The majority of fish consumed in the UK is from only 5 types						

Fish is often taken in areas where fishing should be restricted to protect important marine habitat or species						
Cod in waters around the UK is mostly overfished						
Due to increasing sea temperatures the type of fish found in UK waters is changing						
Farming fish is often better for the environment than taking fish from the wild						
Most of the fish we eat in the UK is imported						
Eco-labelled seafood is generally more sustainable than non-labelled seafood						

Question 20. Thinking about your experiences buying seafood please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I don't know how to interpret the information provided through labelling to allow me to choose the most sustainable seafood						
Where I buy seafood there are few choices available						
Sustainable alternatives to my usual and preferred choices are often not available						
I don't give seafood sustainability a lot of thought						
Sustainably produced seafood is more expensive						
Clear information on packaging and menus about where and how seafood is produced is lacking ¹³⁹						
I don't understand what seafood sustainability is, it's all too confusing						
I'm able to make the sustainable seafood choices I want						

¹³⁹ Source: Charity Awareness Monitor, Oct 17, nfpSynergy.

Question 21. Is there anyone that influences the seafood choices you make? Please indicate how much you agree or disagree with the following statement, "the following people influence the seafood choices I make".	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Family						
Friends						
Work or study colleagues						
Celebrity chefs						
Scientific experts						
Environmental or wildlife experts						
Media (TV, newspaper, radio etc.) personalities						
Fishing industry members or representatives						
Social media personalities/influencers						

Question 21.a. If there are other people that influence your decisions when buying seafood, please provide details here:	
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Question 22. To what extent do you agree or disagree with the following statement.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Most people important to me think I should buy sustainable seafood						

Question 23. Where do you obtain your seafood related knowledge? Please indicate how important to you the following sources are in obtaining knowledge about seafood.	Very important	Important	Neither important or unimportant	Unimportant	Not important at all	Not sure
TV wildlife and marine programmes such as BBC Blue Planet.						

News – TV, printed and online e.g., internet or apps						
Radio						
Government						
Books or magazines						
Academics or scientists						
Public attractions e.g., aquaria, zoos and wildlife parks						
Environmental Non-Governmental Organisations (ENGOS)						
Sustainable seafood guides						
Celebrity chefs						
Social Media/Networking Sites e.g., Facebook						
Fishing industry representatives						

Question 23.a. If there are other sources for your seafood knowledge, please provide details here:

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Question 24. When thinking about the impact of your seafood choices on the marine environment, please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I have a responsibility to make the right decisions for the marine environment when buying seafood						
It is important to care enough about the marine environment to want to help make a difference						
It should not all be down to me to do the right thing when buying seafood						
It's easy enough to make the right seafood choices to reduce my impact on our seas						

The seafood choices people make affects fish populations						
I don't have time to think about the impact of my decisions when purchasing seafood						
I'm trying to help, but I'm not sure how much impact my choices can make						
By changing our seafood shopping habits individuals like me can make a difference						

Go to Next Section 9 Your views on the marine environment generally

Section 9: Your views on the marine environment generally

This section is about how you relate to the marine environment; your usual shopping habits; and what changes you might like to see made to the way we shop for seafood in the future.

Question 25. Thinking about the wider marine environment, please indicate how much you agree or disagree with the following statements:	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
Fish are interesting and sentient marine animals						
The ocean is a valuable source of food, employment and recreation						
The ocean supports a great diversity of life and ecosystems ¹⁴⁰						
The seas around the UK are cold, murky and not very interesting						
The health of our seas is important for human health and wellbeing						
It is important that people value and have a strong connection with the sea						
The sea feels part of my identity						
The ocean and humans are inextricably interconnected ¹⁴¹						
The sea is a wild and scary place						
I don't feel particularly connected to the sea						

¹⁴⁰ Ocean Literacy Principle 5 <http://oceanliteracy.wp2.coexploration.org/>

¹⁴¹ Ocean Literacy Principle 6 <http://oceanliteracy.wp2.coexploration.org/>

Question 26. When thinking about your usual food shopping habits, please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure
I make an effort to buy Fair Trade products						
I always buy Organic products						
Where possible, I buy locally produced food						
I prefer to buy food that is in season						
I buy what is convenient						
I avoid products with unnecessary packaging						
I prefer to buy food produced in the UK						
I try to reduce the amount of meat and/or dairy myself or my family is consuming						
I think of myself as an ethical consumer						
I make an effort to avoid buying too many imported products						
I buy what I can afford						
I always buy free-range meat and egg products						
I try to avoid buying products (e.g., biscuits, bread, chocolate etc.) containing palm fat or oil						
I try to shop ethically but food produced in this way is generally too expensive						
I think of myself as an environmentally-friendly consumer						
I buy what I/we enjoy						
I am/Family members are vegan or vegetarian and I buy food accordingly						

Question 27. What progress would you like to see made towards increasing the sustainability of seafood in the future? Please indicate how much you agree or disagree with the following statements.	Strongly agree	Tend to agree	Neither agree nor disagree	Tend to disagree	Strongly disagree	Not sure

I would like to see all food, including seafood, labelled for environmental impact						
I would like to see all food, including seafood, labelled so that I can be certain the products I buy are environmentally and socially sustainable AND ethically produced						
The Government should introduce legislation to ensure unsustainable seafood does not enter the UK seafood market						
I would like to see more locally and sustainably produced seafood on sale in the UK and for it to be labelled as such						
I would like to see more public campaigns to raise awareness among consumers of the impacts of seafood production on the marine environment						
To better help protect marine habitat and species I would like to see seafood sold in the UK labelled as <i>“Not caught (or farmed) in a Marine Protected Area”</i> (a general term used to describe any protected area in the marine realm which aims to conserve nature and maintain healthy oceans) ¹⁴²						
I don't know						

Question 27.a. If you have any ideas for increasing the sustainability of seafood in the future, please provide details here:	
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Go to Next Section 10 More about you

Section 10: More about you

28. *Gender*: Male; Female; Other; Prefer not to say

29. *Age*: 18-29; 30-39; 40-49; 50-59; 60-69; 70-79; 80+

¹⁴² <https://www.biodiversitya-z.org/content/marine-protected-area-mpa>

30. *Ethnicity*: White British; White European; Black British or Afro-Caribbean; Indian; Pakistani; Multiracial; Bangladeshi; Chinese; Other; Prefer not to say

31. *Family/household members*: Single/live alone; Number of children; Partner/Spouse; Number of adults

32. *Education*: No qualifications; Left school at 16 with qualifications e.g., O Levels/GCSEs; Left school at 18 with qualifications e.g., AS/A levels; Undergraduate degree; Post graduate degree; Teaching or nursing qualification; Vocational qualification e.g., City and Guilds; Other

33. *Employment*: Paid employment (full or part-time); Self-employed; Fulltime parent or carer; In education (full or part-time); Unemployed; Retired; Other

34. *Household income*: £0- £12,500; £12,501-£50,000; £50,001-£150,000; Over £150,000; Prefer not to say

35. *What is your post code? Only first part required and not for identification purposes, only to map where people are answering from.*

36. *How often do you visit the coast*: I live on or near the coast; at least once a week; once a month; once every few months; once or twice a year; very rarely/never

37. *Are you a member of any conservation, wildlife or any other group or charity? 37.a. Please state which one(s):*

Go to Next Section 11 Prize Draw

Section 11: Prize Draw

If you would like to be entered into a prize draw for the chance of winning FREE individual membership (for 1 year) to the Marine Conservation Society (MCS), a copy of the River Cottage Cookbook or a plastic-free mini hamper, please provide your name and/or contact email or phone number. The draw will be made once the survey closes and winners contacted soon after. Please note, any personal data collected for the purpose of this draw will be destroyed once the survey is closed and the draw made.

Question 38-40



Sustainable Seafood Consumer Survey PILOT March 2020

I would like to invite you to take part in piloting this survey as part of research into the influence the Marine Conservation Society (MCS) Good Fish Guide (GFG) may or may not have on consumer decision making when buying seafood. The purpose of the survey and why it is important is outlined in the introductory statement in the questionnaire.

In particular, I would like feedback on how long it takes you to complete the survey; overall, did all the structure/flow of the questionnaire make sense; did all the questions make sense to you; how clear are any images used?

To assist you in providing feedback, I have produced a template for your response. For information the questionnaire was created in Google Forms.

The pilot will run between 9th and 23rd March 2020. Please return any feedback by 23rd March.

Many thanks in anticipation of your assistance,

Bernadette Clarke

1. Section 1: Introductory statement.

Comments:

2. Section 2: Seafood and you. Questions 1-3.

Comments:

3. Section 3: Your reasons for not buying seafood. Question 4.

Comments:

4. Section 4: You and seafood purchasing. Questions 5-11.

Comments:

5. Section 5: Your sustainable seafood knowledge. Questions 12-18.

Comments:

6. Section 6: Marine Conservation Society (MCS) Good Fish Guide (GFG) use. Question 19.

Comments:

7. Section 7: Not using the Guide? Question 20.

Comments:

8. Section 8: Using the Guide? Questions 21-23.

Comments:

9. Section 9: Your views on the marine environment generally. Questions 24-26.

Comments:

10. Section 10: More about you. Questions 27-37.

Comments:

11. Section 11: Prize Draw. Questions 38-40.

Comments:

12. How long did it take to complete the survey?

13. What device did you use to complete the survey? e.g., laptop/PC/Phone etc.

14. How did the survey display on this device?

15. Overall, did all the structure/flow of the questionnaire make sense? Yes/No – if no, please indicate where improvements could be made.

16. Did all of the questions make sense to you? Yes/No – if no, please indicate where improvements could be made.

17. Were all of the images clear in the questionnaire? Yes/No – if not, please indicate where improvements could be made.

18. Where applicable, is any routing (skip logic or branching) of questions clear and logical? Yes/No – if no, please indicate where improvements could be made?

19. Any other comments please?

Please email your response to ClarkeBM@Cardiff.ac.uk by March 23rd, many thanks for your help, Bernadette.

Appendix 10

Summary of feedback received and changes made to Pilot version

Section/Question	Feedback	Action/Comment ☑
Section 1: Introductory statement.	<ul style="list-style-type: none"> • Good! Quite wordy may be possible to shorten this slightly. Make the prize stand out (MS). • It's pretty long – most of the detail is understandable and needed to explain what the study is about –but any reduction in the length would be good (SF). • Good introduction (CB). • Clear and easy to understand (HT). • The introduction is quite long and wordy – could you shorten it a bit/be more concise? I'd split out the amount of time it takes to make it clear at the bottom (LT). • Suggest edit to main heading – help us to understand and inform sustainable seafood efforts (SS). 	<ul style="list-style-type: none"> • Introduction shortened, made more concise. Main heading amended as suggested.
Section 2: Seafood and you. Questions 1-3.	<ul style="list-style-type: none"> • Straight forward questions. Although I'll be looking up what the true definition is of 'responsible seafood'! (SF). • Background info – just wondering if this would be clear to all of general public. Could also be shorter. You have Q.2. and then Q.2.a (LT). • The open form questions for 2 & 3 will take people a long time to consider and might be a deterrent from going any further. Maybe move them somewhere else in the survey (SS). 	<ul style="list-style-type: none"> • Open-ended question (Q.2. and Q.3.) moved to start of Section 7. Your seafood purchasing (Q. 9. and Q.10. Final version).
Section 3: Your reasons for not buying seafood. Question 4.	<ul style="list-style-type: none"> • The list doesn't include 'I don't like the taste of fish' (SF). • You cannot tick more than one option here. Add (please specify) after other (LT). 	<ul style="list-style-type: none"> • Text changed from, "I do not like the sensory properties associated with eating fish e.g., smell, taste etc." to, "I do not like the taste and/or smell of fish".

		<ul style="list-style-type: none"> • Format of question changed to 'Checkbox' in order to collect respondent's multiple reasons for not buying fish. • 'I'm allergic to seafood' added to reasons for not eating seafood as suggested in Pilot survey feedback.
<p>Section 4: You and seafood purchasing. Questions 5-11.</p>	<ul style="list-style-type: none"> • Not really important but could Q.7.a be Q.6.a? • Q. 5 – do you mean I only eat fish when I go out (i.e. not at home) or do you mean fish is the only meal I buy when I go out? (CB). • Q. 5. Could 2 options be combined: I have only started to eat fish in recent years & I have only increased the amount of fish I eat in recent years? • Q.5. Should this whole question be unavailable for people that select No for Q3? If so, the last option can be removed i.e. I don't eat fish (SS). • Q.6: Is there sufficient difference between a local market and a fish monger? I'd combine or remove 'local market' (SS). • Q.8. It is confusing – I thought you had to put a tick in every row and was told off! I naturally wanted to rank all the options 1-5 (MS). • Q.8. On the sections where we had to answer least to most important I couldn't rank each questions, as I could only choose answers 1-5 once overall (KS). • Q.8. It's really hard to only rank 5 of the list of 14 options – usually with a ranking question there would be as many options as there are ranks – suggest reducing the list of options to 10 and asking people to rank from 1-10. Or split the list into two separate questions that are similar in type (e.g., all the sustainability and welfare options together, and all the price / taste/availability options. Not sure an 'Other' option is helpful in a ranking question (SF). 	<ul style="list-style-type: none"> • Q.5. No options cannot be combined, one relates to where fish is bought other than a supermarket, and the other relates to supermarkets other than those listed. • Q.5. General seafood eating habits. Item "I only eat seafood when I eat out" changed to, "I eat more seafood out of the home" (Q.11. Final version). • Q.5. Items, "I started eating seafood as an adult" and "I have only started to eat seafood in recent years" deleted as information about influences such as childhood and length of time eating fish are being captured by other items e.g., "I have always eaten seafood" and "I have only increased the amount of seafood I eat in recent years". • No, a distinction is being made between those that purchase seafood and those that do not, and those that may buy seafood but not eat it themselves. • Ranking Questions (Q.8,15 and 17) reformatted to 5-point Likert scale-type questions. • Q.6. (Q.12. Final version) Item 'Direct from fishermen, quay or boat' added as suggested in Pilot survey feedback. Also as a reflection of the situation of increasing number of people buying direct from fishermen in response to collapse of export market and reduced demand from food

	<ul style="list-style-type: none"> • Q.8. I couldn't answer this question properly as an error message saying 'can't have multiple responses per column' kept appearing. I think you have the settings wrong for this question so that you can only pick one answer per column rather than per row (HT). • Q.8. Put other at the end of the options? Can you split it into two questions – first pick your top 5, then rank them? (LT). • Q.8. Typo Whether <u>its</u> wild caught or farmed; it's very long – can it be shortened? (LT). • Q.8: When you tweak this one, you might also want to check that people can't select more than one rank for each option. I think it would work better as a strongly agree / strongly disagree one with the statement "The following factors are important to me" (CC/DP). • Q.8: as indicated, this is a confusing and time consuming format. To follow the process correctly, the question needs to be closely read and the answers very closely considered. Suggest this question format is reconsidered to simplify. • Q.8: There are a lot of options. Could some be combined or removed i.e. 'That they are familiar species' and 'Easy to cook with recipe in mind' seem very similar. And maybe 'provenance' can be combined with 'Locally caught or produced'. • Q.8: Seems like a loaded way to phrase this option 'That it's a more sustainable source of animal protein'. Maybe better to say 'Sustainability compared with other animal proteins' (SS). • Q.9. I personally would have 'other' at the end of the list rather than the second option (HT). • Q.9. I've been thinking about this question, and how useful the results would be. I've struggled with it a lot, as I think 	<p>service industry due to restrictions imposed in UK during COVID-19 pandemic.</p> <ul style="list-style-type: none"> • Q.8. (Q.14. Final version) "That they are familiar species" removed as information on species consumed, including Top 5, collected in Q.15 Final version. Also item, "That it's easily available" also reflects familiarity. • Q.8. In response to Pilot survey feedback, item "The type of product e.g., fresh or frozen etc." added (Q.14 Final version). • Where questions are 'shuffled', 'Other' is shuffled with other options. 'Other' removed from list of options and produced as a stand-alone question. • Q.9. (Q.15 Final version) is designed to collect information on self-reported consumption of species in order to understand whether the seafood choices people make are being influenced by MCS GFG. • Q.9. is also related to Q.22 (Q.6 Final version) about the changes people say they make as a result of using the GFG. It is being hypothesised that people using the Guide (and arguably with more sustainability knowledge as a result of using the Guide) will have a more diverse choice of fish (Almeida et al., 2015a) compared to those that don't. • Any changes in demand for alternatives to the Big 5 for example will be obtained from interviews with Businesses. • Dab, Lemon sole and whitebait were removed from the list of fish choices, dab and lemon sole as they are no longer included in 2020 version of GFG and whitebait because it is removed from
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	<p>Q.22 gives much more useful (information) about changes in buying habits. As you know, any given species isn't good or bad as it depends on stock and method, so this doesn't tell us whether they've made more sustainable choices or not, it only tells us what species they like to buy. They might always go for pot-caught langoustine for example, so we can't assume anything about someone who says they buy scampi/langoustine. Can seafood species purchases be got from seafood sales data elsewhere? That said, if you want to track whether people are changing their seafood species, a more indicative question might be: Please indicate if you have changed your consumption of the following seafood over the past 5 years: <i>Increased / Decreased / Stayed the same – I eat this often / Stayed the same – I eat this rarely / I never eat this / Not sure</i>. Then we pick 5-10 species at most for people to provide answers for. I agree with this approach; I think it is more indicative (CC/DP). Or if the question stays as it is, I think we need an extra frequency between 'Every few months' and 'a couple of times' – maybe "every now and then"? Also, I nearly missed that it was specific to the last 12 months, so maybe the last option should be 'not at all <i>in the last 12 months</i>' just to emphasise the time period. I think a good list could be: Cod; Tuna; Atlantic salmon; King or Tiger prawns; Coldwater / northern prawns; Pollock; Seabass; Mackerel; European eel; Shark; Mussels. I also would be interested in these, but in the interests of keeping the list short, I don't think they are as important: Haddock; Brown crab; Scampi / Langoustine / Dublin Bay prawn; Pacific salmon; Scallops; Oysters; Squid / calamari; Trout; Coley / saithe; Hake; Sardines / pilchards</p> <ul style="list-style-type: none"> • Q.10. Options one and two are quite similar? 	<p>Red List and also Pilot survey responses indicated it was not consumed.</p> <ul style="list-style-type: none"> • Options 1 and 2 in Q.10 are not similar, item 1 relates to understanding of what fish it is and where and how it is caught or farmed, whereas item 2 relates to understanding of whether the seafood is from wild-caught or farmed sources. • Q.11 (Q.17 Final version) 2 logos added, Cornwall Good Seafood Recommended logo and Friends of the Sea, and logos numbered from 1-10.
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	<ul style="list-style-type: none"> • Q.11. I think you should number the logos rather than say top left etc. Please can the Cornwall Good Seafood Recommended logo be included? (MS). • Q.11. There's a high risk of people not selecting the right logo with the descriptions - it's clear if you take the time, but better to put the key words e.g., RSPCA/Soil Association /ASC/BAP/GGN/MSC/SAFE/Naturland next to each row as well (SF) • Q.11. Would it be easier to do it with numbers? (LT). • Q. 11. I think it's better to number the logos and call them Logo 1, 2, 3 etc. It would be great to see 'Responsibly Sourced' and 'Sustainably Sourced' on there (CC). 	
<p>Section 5: Your sustainable seafood knowledge. Questions 12-18.</p>	<ul style="list-style-type: none"> • Q.12. When thinking about the sustainability of seafood, to what extent do you agree or disagree with the following statements? on-seafood-sustainability. (LT). • Q12: These two seem to repeat each other: "Whether buying seafood for eating at home or when eating out I always check that it is sustainably produced" and "Where possible, I check for information on seafood sustainability". • This one is negative and the rest are positive, so people might misread it. Might be better to rephrase: • I don't feel I know enough about sustainability to ask questions about seafood (CC) • Q13: I think people will guess that they should agree with all of these statements, so it might be a bit unintentionally leading (CC). • Q.13. Just missing an apostrophe in 'it's sustainability' (SS) • Q.13. Fish is often taken in areas where fishing should be restricted to protect important marine habitat or species (SS). 	<ul style="list-style-type: none"> • Text deleted as suggested. • Intention is to have a mix of positive and negative responses? • Q.12 (Q.18 Final version) comprises items designed to elicit understanding of the importance of sustainability to individuals when buying seafood, their commitment to ensuring it is and their confidence to demand that their seafood supply is sustainable. • To reduce the bias towards sustainability the following items were added: "I am not concerned about the sustainability of the seafood I buy"; "I trust the seafood I buy is sustainable, but I don't check"; "The cost and affordability of the seafood I buy is more important to me than sustainability". • Q.13 (Q.19 Final version), text amended to 'restricted'. • Q.13 (Q.19) Text amended to, "The majority of fish consumed in the UK is from only 5 types".

	<ul style="list-style-type: none"> • Q.13: The majority fish consumed in the UK is from only 5 types of fish (SS). • Q.14: Where I buy fish there are not many fish choices available (SS). • Q.15. Ranking a list of 10 options with just 1-5 is difficult – either increase the number of ranks or (reduce) the list of options (SF). • Q.15 and Q.17 there was the same problem as question 8 (HT). • Q.15. Same as comment on Q.8 (LT). • Q15: as per Q8 suggest changing the format to make it simpler to complete this question. And are they able to complete it if they don't have any influencers? Isn't Q17 extracting the same or very similar info? (SS). • Q.17. As above – too many options to rank 1-5 (SF). • Q17: If people use the GFG, should they tick eNGOs or Seafood Sustainability Guides? Might be good to keep both options, but to be aware that they are not mutually exclusive (CC). • I think 15 and 17 could be merged into one question (CC). • Q17: as per Q15 and Q8 regarding format (SS). • Q17: TV news is missing which I think is important. And is 'internet' a bit too broad? Presumably many of the other sources listed would have the info on the internet as the primary vehicle? i.e. NGOs, academics, government. I think you need to check if you want the 'who' or the 'how' they're getting info in this question (SS). • Q 18: aren't these 2 very similar? 'I believe making sustainable seafood choices is important for the marine environment' and 'By changing our seafood shopping habits individuals like me can make a difference'. Possibly combine or remove one? (SS). 	<ul style="list-style-type: none"> • Q.14 (Q.20) Text amended to, "Where I buy seafood there are few choices available". • Item, "I don't give seafood sustainability a lot of thought" added. • As above, ranking questions (Q.8, 15 and 17) reformatted. • Q.15. Items for TV and Media personalities combined. • Q.15 (21) and Q.17 (23) are different. Q.15 relates to social norms, influences, and Q.17 relates to where seafood knowledge is obtained. • Q.17. 'News' added to TV, • 'Internet' item deleted. • Format of Q.17 (23) changed to 5-point Likert scale, "Very important" to "Not important at all", to indicate how important the various sources are to the respondent for obtaining knowledge about seafood. • Q.18 (Q.24) relates to Individual responsibility and self-efficacy. "I believe making sustainable seafood choices is important for the marine environment" deleted as this statement is similar, as suggested, to other items. • To reduce the bias towards sustainability the following items were added to Q.18 (24): "It should not all be down to me to do the right thing when buying seafood" and "I don't have time to think about the impact of my decisions when purchasing seafood". Item, "I want to do the right thing when buying seafood" deleted.
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<p>Section 6: Marine Conservation Society (MCS) Good Fish Guide (GFG) use. Question 19.</p>	<ul style="list-style-type: none"> • Does there need to be a question about whether they use the printed version, App or Online? Also a question about where they first heard about the GFG – e.g., magazine/news article; internet search; public event; radio; direct from MCS; can't remember (SF). • I think it would make sense to have a '<i>I haven't used or seen this guide</i>' option (HT). • Might be useful to put a pic of the GFG on Q.20. (LT). 	<ul style="list-style-type: none"> • Section 6: Using the Guide. New question added – Section 5. Q.5 (Final version). This question appeared in an earlier version but was later removed to limit number of questions, now reinstated as should provide information useful for making recommendations related to investment in seafood guide interventions. • Section 6. Q.19 reconstructed into Section 3. Q.2 (Final version). Question amended to include 3 options: using guide when buying fish; not using guide when buying fish; and not using guide because "I don't buy seafood". Note this section now follows Section 2. Seafood guides and you Q.1. about awareness of the Guide. • Image of 2020 guide added to Q.1 (Final version).
<p>Section 7: Not using the Guide? Question 20.</p>	<ul style="list-style-type: none"> • Q. 20: This statement shouldn't apply, as only ppl who said No to Q.19 would see Q.20 'I use the Guide and experience few to no problems' 	<ul style="list-style-type: none"> • "I use the Guide and experience few to no problems" deleted. • Based on Pilot survey feedback, item, "I don't take the Guide with me when shopping", added. • Based on Pilot survey feedback, a new column response, "Not applicable" was added as if it is the situation that it is the first time a respondent has heard of the Guide, the other 8 items might not apply.
<p>Section 8: Using the Guide? Questions 21-23.</p>	<ul style="list-style-type: none"> • Q.21. has too many similar questions – you need to concentrate – it would be easy to accidentally misread and give the opposite answer – when you scroll down you can no longer see the column headings with descriptor – making it difficult (MS). • Q21. I think these two repeat each other: "I use the Guide most of the time when I buy fish, either in a restaurant or in the supermarket etc." and "I want to make an effort and use the Guide when I buy fish, either in a restaurant or in 	<ul style="list-style-type: none"> • Q.21 (Section 5. Q.4 Final version) combines items related to purpose of guide; trust in guide; intention to use guide; motivation inspired by guide to buy sustainable seafood; and attitude to guide. • 'Most', 'want', 'may' etc. represent different levels of intention to use guide. • Q.22 (Q.6 Final version) 'Ask' changed to 'check' to include asking about and/or reading labels etc.

	<p>the supermarket etc.” This phrasing might be confusing – I think the statements need to be black and white, as the level of agreement selected by the respondent will provide the nuance: I may will use the Guide to help me chose sustainable fish in the near future (CC).</p> <ul style="list-style-type: none"> • Q.22. This one could be two different options – one for where, and one for how – and change ‘ask’ to check, to include fish bought from supermarkets – i.e. to include reading lables: I always ask check where the fish I want to buy comes from and how it is caught or farmed (CC). • Q. 23. Because you’re asking if people strongly disagree with the first statement, you don’t need the other two. You could change the last column to “Not sure / haven’t been using the Guide long enough to say” (CC). 	<p>Although ‘asking’ requires a stronger commitment, ‘checking’ is however more realistic and has broader meaning as suggested.</p> <ul style="list-style-type: none"> • Q.22 (Q.6 Final version) Item “I only buy seafood if it has an Eco-label e.g., Marine Stewardship Council (MSC), Aquaculture Stewardship Council (ASC) etc.” amended to, “I only buy seafood if it has an eco-label” to avoid giving examples of eco-labels in advance of Q.17. which asks about recognition and understanding of seafood labels. • Q.23(Q.7) Item, “I am not more knowledgeable since using the MCS GFG” deleted in order to avoid use of negatives and replaced with, “I already have enough seafood sustainability knowledge”.
<p>Section 9: Your views on the marine environment generally. Questions 24-26.</p>	<ul style="list-style-type: none"> • Q. 24. These two are almost the opposite of each other, so could be combined into one option – if they agree with one, they’ll probably disagree with the other: “I don’t feel particularly connected to the sea” and “The ocean and humans are inextricably interconnected”. • People might think fish are interesting but unintelligent, so a combined statement might not give you the most useful data. • Q.25. Add ‘other’ (LT). • Q. 25. I’m not sure the ‘other’ option is useful here, or in any of the other strongly agree/disagree questions. Maybe better to let them add any extras into a catch all ‘anything else you’d like to add’ at the end (CC). • Q.25. ‘I think of myself as an environmentally-friendly consumer’ and ‘I think of myself as an ethical consumer’. Is it necessary to have both these options? (SS). • Q.26. What ethical means to different people could skew the results: “I would like to see food, including seafood, 	<ul style="list-style-type: none"> • Q.24 (Q.25) includes statements relating to Ocean Literacy principles and connectedness with the marine environment. • Item, “Fish are interesting, intelligent and sentient marine animals” amended to, “Fish are interesting and sentient marine animals”. • Q.25. (Q.26) The intention is to see whether respondents differentiate between being an ‘environmentally-friendly’ and ‘ethical’ consumer. • Q.25. “I look for low carbon options” was proposed in Pilot survey feedback, considerations for carbon emissions are reflected in items, “Where possible, I buy locally produced food”, “I try to reduce the amount of meat and/or diary myself or my family is consuming” and “I prefer to buy food produced in the UK”.

	<p>labelled so that I can be certain the products I buy are environmentally, socially AND <i>ethically</i> produced”. Doesn’t need an ‘I don’t know’ or ‘Other’ option. (CC).</p> <ul style="list-style-type: none"> • Q.26: I think the MPA question is a bit simplistic and maybe misleading. Most MPAs will allow some form of fishing to continue, so any labelling would need to overcome that. It’s probably more helpful for the opposite type of labelling to emerge e.g., ‘Responsibly caught using low impact gear from Lyme Bay Marine Reserve.’(SS). 	<ul style="list-style-type: none"> • Q.26 (Q.27 Final version) The item on MPAs is designed to elicit the strength of support for areas (MPAs) that exclude fishing and/or fish farming. • Q.26. The following was proposed through Pilot survey feedback, “I would like to see more education provided to consumers that seafood is not sustainable and that oceans are suffering huge biodiversity losses”. A new item, “I would like to see more public campaigns to raise awareness amongst consumers of the impacts of seafood production on the marine environment” was added to question (Q.27. Final version). • Q.27. (Final version) Part a: “If you have any ideas for increasing the sustainability of seafood in the future, please provide details here:” added to invite ideas from the general public for increasing seafood sustainability.
Section 10: More about you. Questions 27-37.	<ul style="list-style-type: none"> • Q.30. The addition of ‘partner’ doesn’t quite fit. Might need to have it has partner / spouse? • Why is it asking if there are 2 adults or 3+ adults – how does that affect things? • I live very near the coast but not right on the coast – I visit the sea more than once per week – so maybe include that option (MS). 	<ul style="list-style-type: none"> • Q.30 (Q.31) Item amended to Partner/Spouse • Students (18+) for example, and people with lodgers, tend to live in households with other students or adults. • Q.35 (Q.36) ‘I live on the coast’ amended to ‘I live on or near the coast’. • Item, ‘Once a week’ amended to ‘At least once a week’.
Section 11: Prize Draw. Questions 38-40.	<ul style="list-style-type: none"> • Do you need anything in background to say about that this information will be destroyed when survey has closed? (LT). 	<ul style="list-style-type: none"> • Note added: “Any personal data collected for the purpose of this draw will be destroyed once the survey is closed and the draw made”.
How long did it take to complete the survey?	<ul style="list-style-type: none"> • Just under 50 minutes – quite long ... may put some people off as we are all busy these days! (MS). 	<ul style="list-style-type: none"> • Although length of time to complete survey is of potential concern, in reality, time to complete the questionnaire should take between 10-15 and 25-30 minutes depending on the number of

	<ul style="list-style-type: none"> • A good 40 minutes – certainly not the 10 minutes suggested in the introduction (SF). • 15 mins (my own fault. I didn't realise for the ranking questions I didn't need to answer every line) (CB). • 20-30 mins (HT). • Definitely takes longer than 10 – I'd say 25 minutes. Could be worth shortening the sections before you get to the GFG if that's the primary focus of the questionnaire. Might be too many questions for a public survey? (LT). • 1 hour (CC). 	<p>questions applicable to the respondent, with someone not buying seafood taking 16 questions, someone buying fish but not using the Guide taking 32 questions, and someone buying seafood and using the Guide taking 35 questions.</p>
<p>How did the survey display on the device you were using?</p>	<ul style="list-style-type: none"> • Good (PC) – although as already said some of the questions had so many rows the question could not be seen when you had scrolled down (MS). • Fine (PC) (CB). • Very clear (PC), pictures were clear where used (HT). • Fine (PC) but was quite narrow. Might be quicker if made wider? (LT). 	
<p>Overall, did all the structure/flow of the questionnaire make sense? Yes/No – if no, please indicate where improvements could be made.</p>	<ul style="list-style-type: none"> • Overall I felt there were too many questions, and in several questions there were too many options especially where ranking 1-5 was required (SF). • Yes (CB). • Yes (HT). • I think the order of Qs could be reviewed – it starts off with the GFG and then skips to general sustainable questions, then back again (LT). • Yes (CC). • Q. 1-3. The open form questions for 2 & 3 will take people a long time to consider and might be a deterrent from going any further. Maybe move them somewhere else in the survey so they can have some easier ones to start (SS). 	<ul style="list-style-type: none"> • Order of questions, including order of open questions, reviewed and some changes made – details above.

<p>Did all of the questions make sense to you? Yes/No – if no, please indicate where improvements could be made.</p>	<ul style="list-style-type: none"> • Most questions made sense, but I wasn't always sure what conclusion you'd be able to draw from them (SF). • Yes (HT). • Q.5. doesn't make sense, "General fish eating habits?"; "I have only increased the amount of fish I eat in recent years" - is this meant to be compared to other foods... or? (LT). • I would delete Q.7.a as you already have a space for it in Q.6. (LT). • As mentioned above – don't think it's helpful to have 'other' listed in the various options for all of the multiple choice questions (CC). • There are too many options for each question – I had to keep scrolling back up to remind myself of which header was which. This would be very difficult on a smaller screen, especially a smartphone. (CC/DP). 	<ul style="list-style-type: none"> • Q.5. Item, "I have <i>only</i> increased the amount of fish I eat in recent years", <i>only</i> deleted, as this should have read, "I have increased the amount of fish I eat in recent years". • Q.7. (Q.13) refers specifically to collecting supermarket names
<p>Were all of the images clear in the questionnaire? Yes/No – if not, please indicate where improvements could be made.</p>	<ul style="list-style-type: none"> • Yes, all clear (SF) • Yes (CB) • Yes (CC/DP) 	
<p>Where applicable, is any routing (skip logic</p>	<ul style="list-style-type: none"> • HT – See comment above on Q.19. • If you do not click an answer to a question, it assumes you have said no (LT). • Yes (CC/DP). 	<ul style="list-style-type: none"> • Note made in instructions in introductory statement to this effect.

<p>or branching) of questions clear and logical? Yes/No – if no, please indicate where improvements could be made?</p>		
<p>Any other comments please?</p>	<ul style="list-style-type: none"> • Hopefully these comments are useful to you. Really good survey and I hope you get plenty of responses. Good Luck! (CB). • Overall I think some non-essential questions and/or options within questions need to be removed or combined to speed up the survey. I've suggested a couple in previous responses above (SS). 	
<p>No. of pilot survey responses</p>		<p>34</p>
<p>No. of detailed responses</p>		<p>8</p>

Appendix 11 Copy of Marine Conservation Society (MCS) grant agreement

[NAME]

[ADDRESS]

[ADDRESS]

[20/03/2020]

Dear [NAME]

Regarding Project: Increasing distribution of the Sustainable Seafood Consumer Survey related to Bernadette Clarke's PhD research

Marine Conservation Society has agreed to pay you £3000 (inclusive of any tax which may be payable) in accordance with this letter (**Grant**) for the period starting on the date of this letter and ending on 31/12/2020 (**Grant Period**) to assist you in the project, details of which are set out in Schedule 1 (**Project**).

Purpose of Grant

1.1 You will only use the Grant for the delivery of the Project and in line with the terms and conditions set out in this letter.

Payment of Grant

Subject to clause 8, we will pay the Grant to you in line with the payment schedule in Schedule 3, provided that funds are available when payment is due.

No Grant will be paid unless we are satisfied that the payment will be used for proper expenditure in the delivery of the Project.

Use of Grant

The Grant will be used by you for the delivery of the Project in line with the agreed budget in Schedule 3.

If any part of the Grant is unspent at the end of the Grant Period, you will immediately return this unspent money to us.

Accounts and records

The Grant will be shown in your accounts as a restricted fund and will not be included under general funds.

You will keep separate, accurate and up-to-date accounts and records of the receipt and expenditure of the Grant money received under this letter.

We will have the right to review your accounts and records that relate to the expenditure of the Grant and will have the right to take copies of these accounts and records.

Monitoring and reporting

You will closely monitor the delivery and success of the Project throughout the Grant Period to make sure that the aims and objectives of the Project are being met and that the terms of this letter are being complied with.

If requested, you will provide us with a final report on completion of the Grant Period which will confirm whether the Project has been successfully and properly completed.

You will provide us with any further information, explanations and documents that we may reasonably require in order for us to establish that the Grant has been used properly in line with this letter.

Acknowledgment and publicity

You will acknowledge the Grant in your annual report and accounts, including an acknowledgement of MCS as the source of the Grant.

You will comply with all reasonable requests from us to facilitate visits, provide reports, statistics, photographs and case studies that will help us in our promotional and fundraising activities relating to the Project.

Intellectual property rights

We both agree that all rights, title and interest in or to any information, data, reports, documents, procedures, forecasts, technology, know-how and any other intellectual property rights owned by either us or you before the date of this letter or developed by either us or you during the Grant Period, will remain the property of that party.

Withholding of Grant

Without prejudice to our other rights and remedies, we may withhold payment of the Grant if we reasonably consider it to be inappropriate for any further payment of Grant money to be made.

liability

We accept no responsibility for any consequences that may come about from you running the Project, the use of the Grant or from withdrawal of the Grant. You will compensate us, our employees, agents, officers or sub-contractors for all claims, demands, actions, costs, expenses, losses, damages and all other liabilities arising from or incurred by reason of the actions and/or omissions of you in relation to the Project, the non-fulfilment of your obligations under this letter or your obligations to third parties.

Subject to clause 0, our liability under this letter is limited to the payment of the Grant.

Data Processing

You shall process any Data you receive from MCS solely for the purpose of delivering the project set out in Schedule 1 and for no other purpose except with the express written consent of MCS.

You and anyone assisting shall comply with any requirements under data protection legislation, including but not limited to the General Data Protection Regulation (EU) 2016/679 and the Data Protection Act 2018.

You consent to MCS holding data relating to you for legal and administrative purposes in connection with the delivery of the Services. MCS will store this data securely in accordance with the General Data Protection Regulation (EU) 2016/679 and the Data Protection Act 2018, and will not disclose it to a third parties save where it is necessary for insurance purposes and /or in order to comply with legal requirements.

Warranties

You warrant to us that you have all necessary resources and expertise to deliver the Project and you will always comply with all relevant legislation and applicable codes of practice.

Duration

Except where otherwise stated in this letter, the terms of this letter will apply from the date of this letter until the anniversary of expiry of the Grant Period.

Any obligations under this letter that remain unfulfilled following the expiry or termination of the terms set out in this letter will survive such expiry or termination and continue in full force and effect until they have been fulfilled.

Termination

We may bring this agreement to an end and stop payment of the Grant by giving you three months written notice.

Governing law

The terms set out in this letter will be governed by and interpreted in accordance with the law of England and we both agree to irrevocably submit to the exclusive jurisdiction of the English courts.

Anti-Bribery and Anti-Slavery

You shall:

(a) comply with all applicable laws, statutes, regulations, and codes relating to anti-bribery and anti-corruption including but not limited to the Bribery Act 2010;

(c) comply with all applicable laws, statutes, regulations, and codes relating to anti-slavery including but not limited to the Modern Slavery Act 2015; or

.....

[Type name of name of signatory here, and sign above the dotted line]

Signed for and on behalf of the Company and registered charity Marine Conservation Society

We acknowledge receipt and accept the contents of this letter

.....

[Type name of name of signatory here, and sign above the dotted line]

For and on behalf of [organisation name]

Schedule 1 – the Project

Project name: Increasing distribution of the Sustainable Seafood Consumer Survey related to Bernadette Clarke’s PhD research

Purpose: The purpose of the Project is to provide financial support to increase the distribution of the Sustainable Seafood Consumer Survey related to Bernadette Clarke’s PhD research

Key outputs and deliverables:

The survey has been distributed to at least 600 members of the public via a professional survey distribution company such as Cint.

The data will be incorporated into the wider PhD research and analysed to help establish the impact of the MCS Good Fish guide.

A summary report indicating key results and outcomes of the research provided to MCS, outwith a full PhD thesis.

Deadlines: The survey should be undertaken in 2020 and a summary report provided to MCS as soon as is practical, but no later than end June 2021.

Budget: £3000 inclusive of any taxes.

Schedule 2 – organisation, payment and other details

MCS's Nominated Officer:

Email:

Telephone:

Nominated Officer: [name of contact at your organisation]

Email:

Telephone:

Organisation: [name of your organisation]

Address:

All payments shall be made into the following account:

Bank:

Account name:

Account number:

Sort code:

Bank address:

IBAN:

SWIFT:

Payments shall be made in GBP, unless otherwise agreed.

Payments made in a currency other than GBP will be paid net of bank charges at the exchange rate offered at the date of payment. The amount of the Grant is fixed in GBP and will not be affected by fluctuations in the exchange rate.

Appendix 12 List of Public Attractions (n =153)

Name of venue	Type of venue
Africa Alive	Safari
All Things Wild Nature Centre	Wildlife
Amazon World Zoo Park	Zoo
Amazonia (Norfolk)	Zoo
Amazonia (South Lanarkshire)	Zoo
Anglesey Sea Zoo	Zoo
Aquarium at World Museum Liverpool	Aquarium
Askham Bryan Wildlife and Conservation Park	Wildlife
Banham	Zoo
Battersea Park Childrens Zoo	Zoo
Beale Park	Wildlife
Belfast	Zoo
Birdworld	Wildlife
Birmingham Wildlife Conservation Park	Wildlife
Blackpool	Zoo
Blair Drummond Safari and Adventure Park	Safari
Blue Planet	Aquarium
Blue Reef, Hastings	Aquarium
Blue Reef, Newquay	Aquarium
Blue Reef, Portsmouth	Aquarium
Borth Wild Animal Kingdom	Wildlife
Brancaster Activity Centre Norfolk Coast	Outdoor education
Bristol Aquarium	Aquarium
Bristol Zoo Gardens	Zoo
Brownsea Island Villa	Visitors centre
Calderglen	Wildlife
Camperdown Wildlife Centre	Wildlife
Cardigan Bay Marine Wildlife Centre	Visitors centre
Chessington World of Adventures	Zoo
Chester Zoo	Zoo
Colchester	Zoo
Combe Martin Wildlife and Dinosaur Park	Wildlife
Cornish Seal Sanctuary	Sealife Trust
Cotswold Wildlife Park and Gardens	Wildlife
Crocodiles of the World	Zoo
Curraghs Wildlife Park	Wildlife
Dartmoor Zoological Park	Zoo
Deep Sea World	Aquarium

Drayton Manor Zoo	Zoo
Druidstone Wildlife Park	Wildlife
Drusillas Park	Zoo
Dudley Zoological Gardens	Zoo
Dumfries House Visitor Centre	Visitors centre
DWT Seaton Jurassic	Visitors centre
DWT Wembury Marine Centre	Visitors centre
Exmoor Zoological Park	Zoo
Five Sisters Zoo	Zoo
Flamingo Land Resort	Zoo
Folly Farm Adventure Park and Zoo	Zoo
Gauntlet Bird of Prey - Eagle and Vulture Park	Wildlife
Golders Hill Park Zoo	Zoo
Hammerton Zoo Park	Zoo
Hanwell Zoo	Zoo
Harewood Bird Garden	Wildlife
Hawk Conservancy Trust	Wildlife
Hobbedown	Wildlife
Howletts	Zoo
Ilfracombe Aquarium	Aquarium
International Centre for Birds of Prey	Wildlife
Island Farm Donkey Sanctuary	Wildlife
Isle of Wight	Zoo
Jersey Zoo	Zoo
Jimmy's Farm and Wildlife Park	Wildlife
Kirkleatham Owl Centre	Wildlife
Kirkley Hall Zoological Gardens	Zoo
Knowsley Safari	Safari
Lake District Coast Aquarium	Aquarium
Lake District Wildlife Park	Wildlife
Lakeland Wildlife Oasis	Wildlife
Lakes Aquarium	Aquarium
Linton Zoo Conservation Park	Zoo
Living Sea Centre, Flamborough	Visitors centre
Longleat	Zoo
Lotherton Wildlife World	Wildlife
Mablethorpe Seal Sanctuary and Nature Centre	Wildlife
Macduff Marine Aquarium	Aquarium
Manor House Wildlife Park	Wildlife
Marwell	Zoo
Monkey World Ape Rescue	Wildlife
National Lobster Hatchery	Aquarium
National Marine Aquarium	Aquarium

New Forest Wildlife Park	Wildlife
Noah's Ark Zoo Farm	Zoo
Northumberland Country Zoo	Zoo
Ocean Explorer Centre	Visitors centre
Oceanarium	Aquarium
Old Coastguard Station	Visitors centre
Old MacDonald's Farm	Wildlife
Paradise Wildlife Park	Wildlife
Peak Wildlife Park	Wildlife
Pensthorpe Natural Park	Wildlife
Ponderosa	Zoo
Port Lympne	Zoo
Raptor Foundation	Wildlife
Reaseheath Mini Zoo	Zoo
RZSS Edinburgh Zoo and Education Centre	Zoo
RZSS Highland Wildlife Park	Wildlife
SEA LIFE Birmingham (National Sealife Centre)	Sealife
SEA LIFE Blackpool	Sealife
SEA LIFE Brighton	Sealife
SEA LIFE Great Yarmouth	Sealife
SEA LIFE Hunstanton	Sealife
SEA LIFE Loch Lomond	Sealife
SEA LIFE London	Sealife
SEA LIFE Manchester	Sealife
SEA LIFE Scarborough	Sealife
Sealife Adventure	Aquarium
SEALIFE Weymouth	Sealife
SeaQuarium Rhyl	Aquarium
Shaldon Willife Trust	Wildlife
Shepreth Wildlife Park	Wildlife
South Lakes Safari Zoo	Zoo
St Abbs Visitor Centre	Visitors centre
Stratford-upon-Avon Butterfly Farm	Wildlife
The Ark Open Farm	Wildlife
The Big Cat Sanctuary	Wildlife
The Deep	Aquarium
The Fine Foundation Chesil Beach Centre	Visitors centre
The Fine Foundation Wild Seas Centre	Visitors centre
The Living Rainforest	Wildlife
Thrigby Hall Wildlife Gardens	Wildlife
Tilgate Nature Centre	Wildlife
Trentham Monkey Forest	Wildlife
Tropical Butterfly House	Wildlife

Tropical World	Wildlife
Tropiquaria	Zoo
Twycross Zoo	Zoo
Welsh Mountain	Zoo
Welsh Wildlife Centre	Visitors centre
West Midland Safari Park	Safari
Wild Discovery	Wildlife
Wild Futures Monkey Sanctuary	Wildlife
Wild Place Project	Wildlife
Wild Planet Trust - Living Coasts	Aquarium
Wild Planet Trust - Newquay Zoo	Zoo
Wild Planet Trust - Paignton Zoo Environmental Park	Zoo
Wild Zoological Park	Zoo
Wildwood Trust	Wildlife
Williamson Park	Wildlife
Wingham Wildlife Park	Zoo
Woburn Safari Park	Safari
Woodside Wildlife Park	Wildlife
WWT Arundel	Wildlife
WWT Castle Espie	Wildlife
WWT Llanelli Wetland Centre	Wildlife
WWT London Wetland Centre	Wildlife
WWT Martin Mere	Wildlife
WWT Slimbridge	Wildlife
WWT Washington	Wildlife
Yorkshire Wildlife Park	Wildlife
ZSL London	Zoo
ZSL Whipsnade Zoo	Zoo
ZSS Highland Wildlife Park	Zoo

Appendix 13 Letter of invitation and recruitment advert

Addressee details:
Name
Address
Date



Bernadette Clarke
School of Earth and Ocean Sciences and
Sustainable Places Research Institute
Cardiff University
Email: ClarkeBM@Cardiff.ac.uk
Mobile: [REDACTED]

Dear Name

My name is Bernadette Clarke and I'm carrying out research at Cardiff University into the influence of the Marine Conservation Society (MCS) Good Fish Guide (GFG) on consumer decision making when purchasing seafood. As part of this research I am inviting the general public to take part in an online survey.

The aim of the survey is to understand if and how the MCS GFG influences consumers when making decisions about the fish they choose to buy and eat, and what, if any, changes consumers are making to their fish consumption habits and purchasing behaviour as a result of using the MCS GFG. This will help me to understand the impact of the Guide on sustainable fish consumption in the UK.

As a regular and long-term supporter of the distribution of the MCS Pocket Good Fish Guide, I would like to ask you if you would be willing to advertise the survey on your premises? The advert, included for information, could be printed and displayed on a wall or notice board as an A4 poster, for example, ideally close to the point of distribution for the MCS guide if at all possible.

Please do not hesitate to get in touch with me if you would like to discuss the project in more detail, or would like more information about the data collection process.

It would be wonderful if you could support the research in this way. I will look forward to hearing from you,

Yours sincerely,

Bernadette Clarke

PhD student

Cardiff University

Recruitment advert:



I'm carrying out research at Cardiff University into the influence the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) may or may not have on consumer decision making when buying seafood.

Why?

As efforts to increase provision of sustainable seafood continue, this study will help us to understand your experiences of shopping for and consuming seafood and thus the factors influencing consumer decision making when buying seafood.

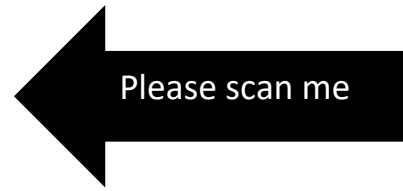
If you are 18 years or over, resident in the UK and have responsibility for buying food for yourself, family or household, and interested in helping protect our marine resources, please take about 10 -20 minutes to complete this questionnaire depending on how many questions are applicable to you.

You do NOT need to have used the Guide or eat fish to take part in the survey

How?

There are 3 ways you can access the survey:

1. Use this link: http://bit.ly/sus_seafood_survey
2. Scan the QR Code to open the survey in your phone or tablet:



3. Email me for a link to the survey or for more information: ClarkeBM@Cardiff.ac.uk

When?

You can take part in the online survey from **1st May until 30th June 2020**

As a *thank you* for your time and help in completing the survey your name can be entered into a prize draw for the chance of winning **FREE** individual membership (for 1 year) to the Marine Conservation Society (MCS), a copy of the River Cottage Cookbook (Hardback) or a plastic-free hamper. Further details of how to enter the draw may be found at the end of the survey.

Thank you in advance for your participation!

Appendix 14 Ammended letter of invitation and recruitment advert

22nd April 2020



Bernadette Clarke
School of Earth and Environmental Sciences/
Sustainable Places Research Institute
Cardiff University
Email: ClarkeBM@Cardiff.ac.uk
Mobile: [REDACTED]
Home telephone: [REDACTED]

My name is Bernadette Clarke and I'm carrying out research at Cardiff University into the influence the *Marine Conservation Society (MCS) Good Fish Guide (GFG)* may or may not have on consumer decision making when purchasing seafood. As part of this research I am inviting the general public to take part in an online survey.

The aim of the survey is to understand if and how the *MCS GFG* influences consumers when making decisions about the fish they choose to buy and eat, and what, if any, changes consumers are making to their fish consumption habits and purchasing behaviour as a result of using the *MCS GFG*. This will help me to understand the factors influencing consumer decision making when purchasing fish and thus the impact of the Guide on sustainable fish consumption in the UK.

You may already be a supporter of the distribution of the *MCS Pocket Good Fish Guide*, or it may be that your organisation does not distribute the Guide or perhaps you have not heard of it? Respondents to the survey however do NOT need to have used the GFG or buy or eat seafood to take part in the survey – I would like to hear from everyone, including why people might not use the Guide or what might stop them from buying or eating seafood.

As an organisation for whom education and conservation is an integral part of your business I would like to ask you if you would be willing to distribute the details of my survey please? I appreciate that it is unlikely that it will be possible to distribute the survey to the general public from your site at this time, and that you may very well be closed due to restrictions

imposed by the Coronavirus (COVID-19) pandemic, but I wondered if there might be any possibility of distributing the questionnaire through your social media networks and/or Newsletter please?

A **summary text** outlining how people can access the survey, its purpose and value, is outlined in the box below which I am hoping you will be able to distribute for me please. Currently, I am planning for the public survey to run from 1st May until 30th June 2020; however, given the current situation this might need to be flexible.

Please do not hesitate to get in touch with me if you would like to discuss the project in more detail or would like more information about the data collection process.

Whilst I understand you will have other priorities, particularly at the current time, it would be very much appreciated if you could support this research in this way. I will look forward to hearing from you, thanking you in anticipation of your assistance in this matter.

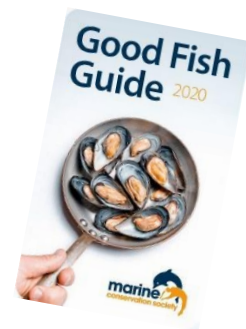
Yours sincerely,

Bernadette Clarke

PhD student

Cardiff University

Summary text



I'm carrying out research at Cardiff University into the influence the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) may or may not have on consumer decision making when buying seafood.

Why?

As efforts to increase provision of sustainable seafood continue, this study will help us to understand your experiences of shopping for and consuming seafood and thus the factors influencing consumer decision making when buying seafood.

If you are 18 years or over, resident in the UK and have responsibility for buying food for yourself, family or household, and interested in helping protect our marine resources, please take about 10 - 20 minutes (depending on how many questions are applicable to you) to complete this questionnaire.

You do NOT need to have used the Guide or buy or eat fish to take part

How?

You can access the survey by using this link: http://bit.ly/sus_seafood_survey

When?

You can take part in the online survey from **1st May until 30th June 2020.**

If you have any queries or for more information about my research, please contact Bernadette Clarke by emailing: ClarkeBM@Cardiff.ac.uk

As a *thank you* for your time and help in completing the questionnaire your name can be entered into a prize draw for the chance of winning **FREE** individual membership (for 1 year) to the Marine Conservation Society (MCS), a copy of the River Cottage Cookbook (hardback) or a plastic-free mini hamper. Further details of how to enter the draw may be found at the end of the survey.

Thank you in advance for your participation!

Appendix 15 List of organisations invited to promulgate survey details

Name of organisation
Cornwall WT
Marine Geography Network
Marine Social Sciences Network
MCS e-news, social media and the Volunteer & Community Engagement team
MCS Sea Champions
Mumsnet
National Trust
Porcupine Marine Natural History Society
Project Seagrass
Sea For Yourself (Defra/Seafish)
Seafish, Fish is the Dish
Sustain
Womens Institute

Appendix 16 Interview guide or schedule for interviewee use



Seafood Sustainability - Stakeholder semi-structured interviews

The main aim of this research is to evaluate the effectiveness of the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) (click to follow link to guide) in motivating sustainable seafood purchasing behaviour in the UK.

Any data collected during this research project will be held in accordance with all applicable data protection legislation and in strict confidence. Any data will only be used by me for the purpose of this research. Data will be anonymised, it will not be shared, and it will not be possible to identify you from any data or results published in my thesis.

For more information on [Cardiff University Ethics Research](#) policy, please click on the link.

If you would like further information prior to carrying out the interview or to ask any questions, please email me: ClarkeBM@Cardiff.ac.uk

Introductions. Please tell me about your role

Question 1. Awareness of SSM

How aware are you of the Sustainable Seafood Movement (SSM)?

Question 2. Meaning of sustainability

What does seafood sustainability mean to you?

Question 3. Importance of sustainability

Why is it important to you?

Question 4. Drivers and barriers for increasing sustainable seafood availability?

In your opinion, what are the main drivers (positive or negative) influencing sustainable seafood availability in the UK?

Question 5. Consumer (public) support for seafood sustainability

How do you think public concern for the impact of fishing on the marine environment is being reflected in the seafood choices consumers are making?

Question 6. Awareness Marine Conservation Society (MCS) Good Fish Guide (GFG)

How aware are you of the MCS GFG? ¹⁴³

Question 7. Purpose and trust in guide

What are your views on the information provided in the MCS guide?

¹⁴³ MCS GFG comprises website, app and Pocket Good Fish Guide

Question 8. Stakeholder guide use

How, if at all, does your organisation or business use the MCS GFG to help inform your staff, students, customers, colleagues or members about seafood sustainability?

Question 9. Influence of guide on consumers

What influence, if any, do you think the MCS GFG is having on the seafood choices consumers are making?

Question 10. Influence of guide on seafood sustainability practice

How, if at all, would you say the MCS GFG is effectively motivating sustainable stakeholder practice on the ground or water.

Question 11. Engaging better with consumers

Any suggestions as to how the MCS GFG might better engage with and motivate consumers to increase the effectiveness of the Guide?

Question 12. Engaging better with seafood supply chain

Any suggestions as to how the MCS GFG might better engage with stakeholders to help increase the sustainability of the UK seafood supply?

Any other comments you would like to make?

Appendix 17 Interviewer guide or schedule with probes (in italics)



Seafood Sustainability - Stakeholder semi-structured interviews

The main aim of this research is to evaluate the effectiveness of the Marine Conservation Society (MCS) *Good Fish Guide* (GFG) (click to follow link to guide) in motivating sustainable seafood purchasing behaviour in the UK.

Any data collected during this research project will be held in accordance with all applicable data protection legislation and in strict confidence. Any data will only be used by me for the purpose of this research. Data will be anonymised, it will not be shared, and it will not be possible to identify you from any data or results published in my thesis.

For more information on [Cardiff University Ethics Research](#) policy, please click on the link.

If you would like further information prior to carrying out the interview or to ask any questions, please email me: ClarkeBM@Cardiff.ac.uk

Introductions. Please tell me about your role

Question 1. Awareness of SSM

How aware are you of the Sustainable Seafood Movement (SSM)? *In the UK? Globally?*

Question 2. Meaning of sustainability

What does seafood sustainability mean to you?

You may also be familiar with the term, responsibly sourced? If so what distinction if any do you make between the two?

What challenges if any does it present for the seafood industry?

Question 3. Importance of sustainability

Why is it important to you?

Question 4. Drivers and barriers for increasing sustainable seafood availability?

In your opinion, what are the main drivers (positive or negative) influencing access to or the availability of sustainable seafood in the UK?

Is there anything that might prevent consumers from making better or more sustainable fish choices? E.g., their seafood knowledge? Recognition of eco-labels? Labelling? Price? UK Consumer taste?

Question 5. Consumer (public) support for seafood sustainability

How do you think public concern for the impact of fishing on the marine environment is being reflected in the seafood choices consumers are making?

Do you think consumers understand the impact of their individual seafood choices?

How strong is consumer demand for sustainable seafood?

Question 6. Awareness Marine Conservation Society (MCS) Good Fish Guide (GFG)

How aware are you of the MCS GFG?

(MCS GFG comprises website, app and Pocket Good Fish Guide)

Question 7. Purpose and trust in guide

What are your views on the information provided in the MCS guide?

How accurate, practical and credible do you think the guidance is?

Question 8. Stakeholder guide use

How, if at all, does your organisation or business use the MCS GFG to help inform your staff, students, customers, colleagues or members about seafood sustainability?

Is there anything that might prevent you/your organisation from using the Guide? E.g., complexity of information; practicalities etc.?

Question 9. Influence of guide on consumers

What influence, if any, do you think the MCS GFG is having on the seafood choices consumers are making?

Is there anything you can think of that might prevent consumers making the choices being recommended in the MCS GFG?

Question 10. Influence of guide on seafood sustainability practice

How, if at all, would you say the MCS GFG is effectively motivating sustainable *stakeholder* practice on the ground or water.

Question 11. Engaging better with consumers

Any suggestions as to how the MCS GFG might better engage with and motivate consumers to increase the effectiveness of the Guide?

Question 12. Engaging better with seafood supply chain

Any suggestions as to how the MCS GFG might better engage with *stakeholders* to help increase the sustainability of the UK seafood supply or market?

Stakeholder – any individual, business or organisation in the seafood supply chain or industry.

Any other comments you would like to make?

Appendix 18 Interview invitation letter

Date



Bernadette Clarke
School of Earth and Environmental
Sciences/
Sustainable Places Research Institute
Cardiff University
Email:
Mobile:
Home telephone:

Dear

I hope you are keeping well in what I imagine has been a difficult time for the fishing, seafood and supply chain industries.

I'm currently carrying out research at Cardiff University into the effectiveness of the *Marine Conservation Society (MCS) [Good Fish Guide](#)* (GFG) in motivating sustainable seafood purchasing behaviour in the UK.

As part of this research I would like to invite you to take part in the stakeholder interviews I am planning to carry out in May and early June 2021 to help me understand the availability of sustainable seafood in the UK and the impact of the Guide on its supply and consumption.

Any data collected during this research project will be held in accordance with all applicable data protection legislation and in strict confidence. Any data will only be used by me for the purpose of this research. Data will be anonymised, it will not be shared, and it will not be possible to identify you from any data or results published in my thesis. For more information on [Cardiff University Ethics Research](#) policy, please click on the link.

As a valued member of the seafood sustainability community, it would be very much appreciated if you could support my research in this way. I would be happy to forward a copy of the 12 questions I would plan to ask you in advance of a scheduled interview which should take no more than one hour. I am proposing that the interview is via Zoom, at a time convenient to you, and that it is recorded for the purposes of analysis.

I will look forward to hearing from you. Thank you in anticipation of your interest in taking part.

Yours sincerely,

Bernadette Clarke

PhD student, Cardiff University

For Staff Projects			
Name of Chief/Principal Investigator:			
Contact details:			
Other members of research team:			
For Student Projects			
Name of Student:		Bernadette M Clarke	
Contact details:		Email: ClarkeBM@Cardiff.ac.uk	
Name of Supervisor(s):		Dr RC Ballinger; Dr E McKinley	
Contact details:		[REDACTED]; [REDACTED]	
Other members of research team:		Dr LC Cullen-Unsworth	
SECTION 2. SCREENING QUESTIONS			
		Yes	No
2.1	<p>Is the research project categorised as ‘Research’ (as defined in the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)?</p> <p><i>If no (i.e. the research project is a Service Evaluation or Audit), the Committee is not required to conduct a review of the proposal but may choose to do so. Please contact the School Ethics Officer to seek advice before proceeding with this application.</i></p>	Yes	
2.2	<p>Does the research project involve human participants, human material or human data (as defined in the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)?</p> <p><i>If no, you are not required to submit the research proposal to this Committee. Please do not continue with this application.</i></p>	Yes	
2.3	<p>Does the research project require review by an external ethics committee (refer to Appendix 1 of the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)? Please note that this includes all research projects involving participants who lack the capacity to consent.</p> <p><i>If yes, the research project should be submitted to the relevant external ethics committee for review and does not fall within the remit of this Committee. Please contact the Research Governance Team for further advice. Please do not continue with this application.</i></p>		No
2.4	<p>Has the research project been ethically reviewed by another university or research institution (for example, where the Chief/Principal Investigator for the research project is based at another institution)?</p>		No

	<i>If yes, please provide evidence of the review conducted (such as an outcome letter or communication) and the ethical review policy of the relevant institution or committee. Please do not continue with this application.</i>		
2.5	Does the research project <u>only</u> involve the use of information that is publicly and lawfully available e.g., census data, population statistics published by government departments and personal letters/diaries in public libraries. Note: research projects involving the use of Human Data obtained from social media (or similar internet forums) do not fall within this category. <i>If yes, you are not required to submit the research proposal to this Committee. Please do not continue with this application.</i>		No
2.6	Does the research project fall within the scope of the UK Policy Framework for Health and Social Care Research ? This Framework broadly applies to research taking place within, or involving, the health and social care systems. <i>If yes, you will need to apply to the Research Governance Team for Sponsorship using the Advanced Project Information Proforma (APIP) (available on the Cardiff University intranet). The Research Governance Team will advise you on the approvals that are required for the research project after it has conducted a review of the APIP and supporting documentation. Please do not continue with this application until you have sought advice from the Research Governance Team.</i>		No
2.7	Does the research project involve the collection or use of Human Tissue (including, but not limited to, blood, saliva and bodily waste fluids)? <i>If yes, the research project should be submitted to the Human Tissue Act Compliance Team (HTACT) prior to submission to an ethics committee. Please do not continue with this application until you have sought advice from HTACT.</i>		No
2.8	Does the research project fall within the scope of the University's Security-sensitive Research Policy ? This Policy broadly applies to research involving terrorism, extremism or radicalisation (or access to materials of such a nature). <i>If yes, you must register the research in accordance with the Policy and comply with the IT and security arrangements contained in the Policy.</i>		No
2.9	Has the research project received scientific review? (For student research projects, review by the research project supervisor is an acceptable form of scientific review) <i>If no, please obtain appropriate scientific review before submitting the application to this Committee.</i>	Yes	
2.10	[SPECIFIC TRAINING REQUIREMENTS FOR RESEARCHERS]		N/A
2.11	[COMMITTEE-SPECIFIC QUESTIONS]		N/A
If the research project involves the use of animals, please contact the Cardiff University Biological Standards Office bs@cardiff.ac.uk to seek further advice.			

SECTION 3. PROJECT SUMMARY

3.1 Summarise the research project (including the purpose and its methodology) using language that would be understood by a lay person.

I'm carrying out research into the influence the Marine Conservation Society (MCS) Good Fish Guide (GFG), a consumer guide to choosing sustainably produced fish, may or may not have on consumer decision making when purchasing seafood. As part of this research I am inviting the general public to take part in an online survey. The aim of the survey is to understand if and how the MCS GFG influences consumers when making decisions about the fish they choose to buy and eat, and what, if any, changes consumers are making to their fish consumption habits and purchasing behaviour as a result of using the MCS GFG. This will help me to understand the factors influencing consumer decision making when purchasing fish and thus the impact of the Guide on sustainable fish consumption in the UK.

3.2 Describe the research question(s).

To evaluate awareness of the Guide, questions such as, 'how aware is the UK public of the GFG?', 'what understanding do consumers have of seafood sustainability?' will be asked. To examine, for example, how the Guide is being used, questions to understand what the drivers and barriers to consuming sustainable seafood in the UK will be asked. To determine the effectiveness of the Guide in motivating sustainable seafood consumption, questions around seafood demand, the type of seafood choices consumers are making and knowledge of seafood sustainability will be posed.

3.3 Estimated start date.

1st May 2020 (consumer survey)

3.4 Estimated end date (usually the end of data collection).

30th June 2020

3.5 Is the research project funded? *If yes, please name the funding body.*

No

3.6 Are there any potential conflicts of interest? *If yes, please confirm the action you propose to take to address such conflicts.*

No

3.7 Does the research project involve the use of **only** common methodology(ies) previously approved by the SREC? *If yes, please provide details in 'Section 10: Supporting Documents' below and attach the relevant documentation (e.g., protocol or stand operating procedure for the common methodology(ies)) to this application.*

Yes

3.8 [COMMITTEE-SPECIFIC QUESTIONS]

SECTION 4. FULL REVIEW CRITERIA

<i>Note: CM means common methodology(ies) previously approved by the SREC. For each response given as 'Yes-CM', please provide details of the CM in the text box below.</i>		Yes	Yes-CM	No
4.1	Will the research project be performed without the participants' prior consent?			No
4.2	Does the research design include an element of deception, including covert research?			No
4.3	Will the research project involve children under the age of 18 or 'at risk' (vulnerable) adults or groups? <i>The Cardiff University Safeguarding Children and Adults at Risk: Policy and Guidance sets out examples of 'at risk' or 'vulnerable' adults.</i>			No
4.4	Does the research project include topics which may be considered highly sensitive for participants? <i>This includes sexual behaviour, illegal activities, political, religious or spiritual beliefs, race or ethnicity, experience of violence, abuse or exploitation, and mental health.</i>			No
4.5	Does the research project require access to records of a sensitive or confidential nature, including Special Category Data, for the purposes of the General Data Protection Regulation and Data Protection Act 2018?			No
4.6	Is permission of a gatekeeper required for initial or continued access to participants? <i>This includes participants in custody and care settings, or research in communities where access to research participants is not possible without the permission of another adult, such as another family member or a community leader.</i>			No
4.7	Does the research project involve intrusive or invasive procedures? <i>This includes the administration of substances, vigorous physical exercise, procedures involving pain or more than mild discomfort to participants (including the risk of psychological distress, discomfort or anxiety to participants).</i>			No
4.8	Does the research project involve visual or audio recordings where participants may be identified?			No
4.9	Does the research project involve the collection or use of human tissue?			No
4.10	Is there a risk to the safety and wellbeing of the Researchers?			No
4.11	[SCHOOL-SPECIFIC CRITERIA]			
For each response given as 'Yes-CM', please provide details of the CM that has been approved by the SREC.				
PROCEDURE TO FOLLOW, BASED ON RESPONSES IN SECTION 4:				

	<ul style="list-style-type: none"> • If any ‘Yes’ box applies, the research project should follow a full ethics review. • If all ‘No’ boxes apply, the research project may be considered for proportionate review. • If a combination of only ‘No’ and ‘Yes-CM’ boxes applies, the research project may be considered for proportionate review.
SECTION 5. RECRUITMENT	
5.1	How will you recruit participants to the research project? <i>If appropriate, please include sampling criteria.</i>
	Participants in the consumer survey will be recruited by advertisement at a number (~45) of designated public venues currently involved in regularly distributing 500 or more Marine Conservation Society (MCS) Pocket Good Fish Guides (PGFGs) annually e.g., wildlife parks, zoos and aquariums and Sealife centres etc.; through MCS and other social media networks e.g., Marine Social Sciences; and perhaps also through ██████████, a commercial vegetable and fish box scheme, with whom MCS has co-branded a guide. There is also the possibility that funding will be made available to pay for a professional company to also deliver the survey e.g., Cint.
5.2	How many participants are you aiming to recruit? <i>If applicable, please include a breakdown of participants by type and number.</i>
	2000+ consumers
5.3	What is the inclusion and exclusion criteria for participants?
	Participants must be age 18 or over; resident in the UK; and be mainly responsible for the food shopping for themselves and/or their family or household to take part in the consumer survey.
5.4	How will the research project address recruitment of participants who are not fluent in the English/Welsh language?
	The questionnaire is self-administered, and will rely on participants completing the survey in English themselves.
5.5	Will the research project involve participants that are Cardiff University staff or students or people who are likely to become students or clients of the University or the place in which you may otherwise work? <i>If applicable, please provide details.</i>
	Unlikely. University staff and students will not be targeted, therefore their involvement poses no risk.
5.6	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 6. CONSENT PROCEDURES	
6.1	How will informed consent be obtained? <i>Please include who will be taking consent, how consent will be recorded, when participants will be provided with information about the research project, and how long potential participants will be given to decide whether to take part.</i>
	Informed consent will be obtained for respondents to the online questionnaire by the provision of: my name and contact details as the main researcher; an outline of the rationale for the study, it’s purpose and value; and an account of why people are being asked to take part in the survey. A statement for the provision of access to information on Cardiff University Ethics Research policy or for more information about the research, will also be included in the introduction at the start of the online questionnaire.
6.2	Will participants be offered any incentives to take part in the research project?

Yes, all participants in the consumer survey may, if they wish, provide a contact name and/or email and/or telephone number to be entered into a prize draw with a chance to win individual membership of MCS for 1 year and/or a River Cottage cook book. Any ID data will be extracted prior to processing in order to maintain anonymity.	
6.3	If a questionnaire is to be used, will you give participants the option of omitting questions they do not wish to answer?
Yes, such an option is included in the introduction at the start of the online questionnaire.	
6.4	Will participants be informed that their participation is voluntary and that they may withdraw at any time and for any reason?
Yes, also included in the introduction at the start of the online questionnaire.	
6.5	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 7. POSSIBLE HARM TO PARTICIPANTS/RESEARCHERS	
7.1	Is there is a risk of the <u>participants</u> experiencing physical, emotional or psychological harm or distress? <i>If yes, please provide details of how ethical issues will be handled and how any risks will be minimised. Please consider whether the research project includes topics which could be considered as highly sensitive for participants.</i>
No	
7.2	Is there a risk of the <u>Researcher(s)</u> experiencing physical, emotional or psychological harm or distress? <i>If yes, please provide details of how ethical issues will be handled and how any risks will be minimised.</i>
No	
7.3	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 8. DATA MANAGEMENT, CONFIDENTIALITY AND DATA PROTECTION	
8.1	How, and by whom, will data be collected?
Through an online survey and collected by researcher.	
8.2	Will you be accessing or collecting Personal Data (identifiable personal information) as part of the research project? <i>If yes, please confirm what data will be accessed and/or collected (including details of the information participants are asked to provide on a written consent form).</i>
Yes – Personal Data i.e. demographic data possibly including name and/or contact emails, will be collected, and stored on a personal laptop which is password protected and only accessible to me.	
8.3	How long will you retain the Personal Data collected in connection with the research project?
10 years, after which it will be deleted or destroyed.	
8.4	What efforts will be made to anonymise the data collected (where possible)?
Individuals will be identified only by a number or code.	

8.5	Are you proposing to utilise ‘public task’ as the lawful basis for processing Personal Data for the purposes of the research project (as recommended in the University’s GDPR Guidance for Researchers)? <i>If no, please explain why and what alternative lawful basis you propose to use.</i>			
Yes				
8.6	Have you utilised/incorporated into the Participant Information Sheet the template GDPR privacy information for research participants? <i>If no, please explain why this has not been used.</i>			
Yes				
8.7	For how long will the collected anonymised data be retained?			
As above, 10 years.				
8.8	Who will have access to the data?			
Researcher				
8.9	Will the data be shared in any way, for example through deposit in a data repository, with third parties, or a transcription service?			
No				
8.10	[SCHOOL-SPECIFIC QUESTIONS]			
SECTION 9. OTHER ETHICAL CONSIDERATIONS				
Please outline any other ethical considerations raised by the research project and how you intend to address these. You are obliged to bring to the attention of the SREC any ethical issues not covered in this Ethics Review Application Proforma.				
SECTION 10. SUPPORTING DOCUMENTS				
I have attached the documents, as indicated in the table below, in support of this application.				
Please note that the documents listed below MUST BE provided where relevant to the research project, alongside any other documents relevant to recruitment, consent and participation.				
		Yes	No	Version no. (where applicable)
1	Research Project Protocol/Proposal			
2	Recruitment Adverts/Invitation Letters	Yes		
3	Participant Information Sheet			
4	Consent Form			
5	Data Collection Tools (e.g., questionnaires)	Yes		
6	Other participant communications (e.g., debrief sheets)			
7	Protocol(s) or Standard Operating Procedure(s) of documented and ethically approved common methodology(ies) being used for the research project			
8	[Evidence of training completion]			

SECTION 11. SIGNATURES AND DECLARATIONS

General declaration

I confirm that:

- a. The information in this form is accurate to the best of my knowledge and belief and I take full responsibility for it.
- b. I have the necessary skills, training and or/expertise to conduct the research project as proposed.
- c. I am familiar with the University's health and safety requirements and policies and that all relevant health and safety measures have been taken into account for the research project.
- d. I am familiar with, and will comply with, the University's Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data and the University's [Research Integrity and Governance Code of Practice](#).
- e. The relevant equality and diversity considerations have been taken into account when designing the research project.
- f. If the research project is approved, I undertake to adhere to the research project protocol, the terms of the full application as approved and any conditions set out by the Committee and any other body required to review and/or approve the research project.
- g. I will notify the Committee and all other review bodies of substantial amendments to the protocol or the terms of the approved application, and to seek a favourable opinion from the Committee before implementing the amendment.

FOR STAFF PROJECTS

Signed:

Chief/Principal Investigator

Print name:

Date:

FOR STUDENT PROJECTS

Signed:

Student

Signed:

Supervisor

Print name:

Bernadette Clarke

Print name:

Date:

February 26th 2020

Date:

Contact details:			
Other members of research team:			
For Student Projects			
Name of Student:	Bernadette M Clarke		
Contact details:	Email: ClarkeBM@Cardiff.ac.uk		
Name of Supervisor(s):	Dr RC Ballinger; Dr E McKinley		
Contact details:	BallingerRC@Cardiff.ac.uk; McKinleyE1@Cardiff.ac.uk		
Other members of research team:	Dr LC Cullen-Unsworth		
SECTION 2. SCREENING QUESTIONS			
		Yes	No
2.1	<p>Is the research project categorised as ‘Research’ (as defined in the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)?</p> <p><i>If no (i.e. the research project is a Service Evaluation or Audit), the Committee is not required to conduct a review of the proposal but may choose to do so. Please contact the School Ethics Officer to seek advice before proceeding with this application.</i></p>	Yes	
2.2	<p>Does the research project involve human participants, human material or human data (as defined in the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)?</p> <p><i>If no, you are not required to submit the research proposal to this Committee. Please do not continue with this application.</i></p>	Yes	
2.3	<p>Does the research project require review by an external ethics committee (refer to Appendix 1 of the Cardiff University Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data)? Please note that this includes all research projects involving participants who lack the capacity to consent.</p> <p><i>If yes, the research project should be submitted to the relevant external ethics committee for review and does not fall within the remit of this Committee. Please contact the Research Governance Team for further advice. Please do not continue with this application.</i></p>		No
2.4	<p>Has the research project been ethically reviewed by another university or research institution (for example, where the Chief/Principal Investigator for the research project is based at another institution)?</p> <p><i>If yes, please provide evidence of the review conducted (such as an outcome letter or communication) and the ethical review policy of the relevant institution or committee. Please do not continue with this application.</i></p>		No
2.5	<p>Does the research project <u>only</u> involve the use of information that is publicly and lawfully available e.g., census data, population statistics published by government departments and personal letters/diaries in public libraries.</p>		No

	<p>Note: research projects involving the use of Human Data obtained from social media (or similar internet forums) do not fall within this category.</p> <p><i>If yes, you are not required to submit the research proposal to this Committee. Please do not continue with this application.</i></p>		
2.6	<p>Does the research project fall within the scope of the UK Policy Framework for Health and Social Care Research? This Framework broadly applies to research taking place within, or involving, the health and social care systems.</p> <p><i>If yes, you will need to apply to the Research Governance Team for Sponsorship using the Advanced Project Information Proforma (APIP) (available on the Cardiff University intranet). The Research Governance Team will advise you on the approvals that are required for the research project after it has conducted a review of the APIP and supporting documentation. Please do not continue with this application until you have sought advice from the Research Governance Team.</i></p>		No
2.7	<p>Does the research project involve the collection or use of Human Tissue (including, but not limited to, blood, saliva and bodily waste fluids)?</p> <p><i>If yes, the research project should be submitted to the Human Tissue Act Compliance Team (HTACT) prior to submission to an ethics committee. Please do not continue with this application until you have sought advice from HTACT.</i></p>		No
2.8	<p>Does the research project fall within the scope of the University's Security-sensitive Research Policy? This Policy broadly applies to research involving terrorism, extremism or radicalisation (or access to materials of such a nature).</p> <p><i>If yes, you must register the research in accordance with the Policy and comply with the IT and security arrangements contained in the Policy.</i></p>		No
2.9	<p>Has the research project received scientific review? (For student research projects, review by the research project supervisor is an acceptable form of scientific review)</p> <p><i>If no, please obtain appropriate scientific review before submitting the application to this Committee.</i></p>	Yes	
2.10	[SPECIFIC TRAINING REQUIREMENTS FOR RESEARCHERS]		N/A
2.11	[COMMITTEE-SPECIFIC QUESTIONS]		N/A
<p>If the research project involves the use of animals, please contact the Cardiff University Biological Standards Office bs@cardiff.ac.uk to seek further advice.</p>			
SECTION 3. PROJECT SUMMARY			
3.1	Summarise the research project (including the purpose and its methodology) using language that would be understood by a lay person.		

I'm carrying out research at Cardiff University using a mixed methods approach including a survey and semi-structured interviews to evaluate the effectiveness of the Marine Conservation Society (MCS) [Good Fish Guide](#) (GFG) in motivating sustainable seafood purchasing behaviour in the UK.

In Phase 1 members of the general public were invited to take part in an online consumer survey. Respondents were recruited using a professional data company (CINT UK) and separately by myself through advertisement of a link to the survey via the social media networks of participating organisations e.g., public attractions such as wildlife parks and zoos, for example.

The aim of the survey was to understand if and how the MCS GFG influences consumers when making decisions about the fish they choose to buy and eat, and what, if any, changes consumers are making to their fish consumption habits and purchasing behaviour as a result of using the MCS GFG.

In Phase 2 I will be conducting a number of stakeholder interviews. The aim of carrying out these interviews is to help verify data collected in Phase 1. Data collected from the interviews will also help me understand stakeholder's perspective of: how the MCS GFG is influencing the sustainability of the UK seafood supply chain; the barriers and drivers for consumers when purchasing sustainable seafood; the importance of seafood sustainability to stakeholders; and the level of consumer demand for sustainable seafood, for example.

3.2 Describe the research question(s).

To understand stakeholder use of the Guide, the question, "Does your organisation or business use the MCS GFG to help inform your staff, students, customers, colleagues or members about seafood sustainability?" will be asked. To help frame understanding of the importance of seafood sustainability to stakeholders in the UK seafood supply chain, the question, "Why is seafood sustainability important to you?" will be asked. To determine the effectiveness of the Guide in motivating sustainable seafood purchasing behaviour, the question, "What influence, if any, do you think the MCS GFG is having on the seafood choices consumers are making?", and "How, if at all, would you say the MCS GFG is effectively motivating sustainable stakeholder practice on the ground or water?", will be asked. Please see copy of outline of proposed Stakeholder interview questions accompanying this application.

3.3 Estimated start date.

10th May 2021

3.4 Estimated end date (usually the end of data collection).

30th June 2021

3.5 Is the research project funded? *If yes, please name the funding body.*

No

3.6 Are there any potential conflicts of interest? *If yes, please confirm the action you propose to take to address such conflicts.*

No

3.7 Does the research project involve the use of **only** common methodology(ies) previously approved by the SREC? *If yes, please provide details in 'Section 10: Supporting Documents' below and attach the relevant documentation (e.g., protocol or stand operating procedure for the common methodology(ies)) to this application.*

Yes

3.8	[COMMITTEE-SPECIFIC QUESTIONS]			
SECTION 4. FULL REVIEW CRITERIA				
<i>Note: CM means common methodology(ies) previously approved by the SREC. For each response given as 'Yes-CM', please provide details of the CM in the text box below.</i>		Yes	Yes-CM	No
4.1	Will the research project be performed without the participants' prior consent?			No
4.2	Does the research design include an element of deception, including covert research?			No
4.3	Will the research project involve children under the age of 18 or 'at risk' (vulnerable) adults or groups? <i>The Cardiff University Safeguarding Children and Adults at Risk: Policy and Guidance sets out examples of 'at risk' or 'vulnerable' adults.</i>			No
4.4	Does the research project include topics which may be considered highly sensitive for participants? <i>This includes sexual behaviour, illegal activities, political, religious or spiritual beliefs, race or ethnicity, experience of violence, abuse or exploitation, and mental health.</i>			No
4.5	Does the research project require access to records of a sensitive or confidential nature, including Special Category Data, for the purposes of the General Data Protection Regulation and Data Protection Act 2018?			No
4.6	Is permission of a gatekeeper required for initial or continued access to participants? <i>This includes participants in custody and care settings, or research in communities where access to research participants is not possible without the permission of another adult, such as another family member or a community leader.</i>			No
4.7	Does the research project involve intrusive or invasive procedures? <i>This includes the administration of substances, vigorous physical exercise, procedures involving pain or more than mild discomfort to participants (including the risk of psychological distress, discomfort or anxiety to participants).</i>			No
4.8	Does the research project involve visual or audio recordings where participants may be identified?	Yes		
4.9	Does the research project involve the collection or use of human tissue?			No
4.10	Is there a risk to the safety and wellbeing of the Researchers?			No
4.11	[SCHOOL-SPECIFIC CRITERIA]			
For each response given as 'Yes-CM', please provide details of the CM that has been approved by the SREC.				

PROCEDURE TO FOLLOW, BASED ON RESPONSES IN SECTION 4:	
<ul style="list-style-type: none"> • If any ‘Yes’ box applies, the research project should follow a full ethics review. • If all ‘No’ boxes apply, the research project may be considered for proportionate review. • If a combination of only ‘No’ and ‘Yes-CM’ boxes applies, the research project may be considered for proportionate review. 	
SECTION 5. RECRUITMENT	
5.1	How will you recruit participants to the research project? <i>If appropriate, please include sampling criteria.</i>
Participants in the stakeholder interviews will be recruited by personal invitation i.e. via a letter emailed to them.	
5.2	How many participants are you aiming to recruit? <i>If applicable, please include a breakdown of participants by type and number.</i>
An absolute maximum of 50 interviewees	
5.3	What is the inclusion and exclusion criteria for participants?
Participants must be working in one of the following sectors within the UK seafood supply chain - Certification; Chef/cookery school/training; ENGO/Sustainability initiative; Fishing industry; Food Service; Government; Restaurant/Fish & Chips; Retailer; Supplier/Processor/Wholesaler.	
5.4	How will the research project address recruitment of participants who are not fluent in the English/Welsh language?
The interviews will be conducted in English	
5.5	Will the research project involve participants that are Cardiff University staff or students or people who are likely to become students or clients of the University or the place in which you may otherwise work? <i>If applicable, please provide details.</i>
Unlikely. University staff and students will not be targeted, therefore their involvement poses no risk.	
5.6	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 6. CONSENT PROCEDURES	
6.1	How will informed consent be obtained? <i>Please include who will be taking consent, how consent will be recorded, when participants will be provided with information about the research project, and how long potential participants will be given to decide whether to take part.</i>
As the main researcher I will be taking consent. Consent will be recorded using the consent form approved by Cardiff University and be specific to that participant. Informed consent will be discussed prior to the interview taking place and taken prior to the start of the interview. Prior to the interview taking place the following information will be supplied: my name and contact details as the main researcher; an outline of the rationale for the study, it’s purpose and value; and an account of why people are being asked to take part in the interview. A statement for the provision of access to information on Cardiff University Ethics Research policy will also be provided as part of emails exchanged as part of the process of agreeing when and how the interview will take place.	
6.2	Will participants be offered any incentives to take part in the research project?
No	

6.3	If a questionnaire is to be used, will you give participants the option of omitting questions they do not wish to answer?
The interview will be semi-structured and participants given the option of omitting questions should they not wish to answer.	
6.4	Will participants be informed that their participation is voluntary and that they may withdraw at any time and for any reason?
Yes, at the beginning of the interview participants will be informed that their participation is voluntary and that they may withdraw at any time and for any reason.	
6.5	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 7. POSSIBLE HARM TO PARTICIPANTS/RESEARCHERS	
7.1	Is there is a risk of the <u>participants</u> experiencing physical, emotional or psychological harm or distress? <i>If yes, please provide details of how ethical issues will be handled and how any risks will be minimised. Please consider whether the research project includes topics which could be considered as highly sensitive for participants.</i>
No	
7.2	Is there a risk of the <u>Researcher(s)</u> experiencing physical, emotional or psychological harm or distress? <i>If yes, please provide details of how ethical issues will be handled and how any risks will be minimised.</i>
No	
7.3	[SCHOOL-SPECIFIC QUESTIONS]
SECTION 8. DATA MANAGEMENT, CONFIDENTIALITY AND DATA PROTECTION	
8.1	How, and by whom, will data be collected?
Data will be collected by conducting one-to-one interviews using Zoom where possible. Interviewees will also be asked in advance if I have their permission to record the interview using the record facility in Zoom and/or using recording equipment supplied by the University.	
8.2	Will you be accessing or collecting Personal Data (identifiable personal information) as part of the research project? <i>If yes, please confirm what data will be accessed and/or collected (including details of the information participants are asked to provide on a written consent form).</i>
Yes – Personal Data including name and/or contact emails, job title and organisation, will be collected and stored on a personal laptop which is password protected and only accessible to me.	
8.3	How long will you retain the Personal Data collected in connection with the research project?
10 years, after which it will be deleted or destroyed.	
8.4	What efforts will be made to anonymise the data collected (where possible)?
Interviewees will only be identified by a number or code.	

8.5	Are you proposing to utilise ‘public task’ as the lawful basis for processing Personal Data for the purposes of the research project (as recommended in the University’s GDPR Guidance for Researchers)? <i>If no, please explain why and what alternative lawful basis you propose to use.</i>			
Yes				
8.6	Have you utilised/incorporated into the Participant Information Sheet the template GDPR privacy information for research participants? <i>If no, please explain why this has not been used.</i>			
Yes				
8.7	For how long will the collected anonymised data be retained?			
As above, 10 years.				
8.8	Who will have access to the data?			
Researcher				
8.9	Will the data be shared in any way, for example through deposit in a data repository, with third parties, or a transcription service?			
No				
8.10	[SCHOOL-SPECIFIC QUESTIONS]			
SECTION 9. OTHER ETHICAL CONSIDERATIONS				
Please outline any other ethical considerations raised by the research project and how you intend to address these. You are obliged to bring to the attention of the SREC any ethical issues not covered in this Ethics Review Application Proforma.				
SECTION 10. SUPPORTING DOCUMENTS				
I have attached the documents, as indicated in the table below, in support of this application.				
Please note that the documents listed below MUST BE provided where relevant to the research project, alongside any other documents relevant to recruitment, consent and participation.				
		Yes	No	Version no. (where applicable)
1	Research Project Protocol/Proposal			
2	Recruitment Adverts/Invitation Letters	Yes		
3	Participant Information Sheet			
4	Consent Form	Yes		
5	Data Collection Tools (e.g., questionnaires)	Yes		
6	Other participant communications (e.g., debrief sheets)			
7	Protocol(s) or Standard Operating Procedure(s) of documented and ethically approved common methodology(ies) being used for the research project			
8	[Evidence of training completion]			

SECTION 11. SIGNATURES AND DECLARATIONS

General declaration

I confirm that:

- h. The information in this form is accurate to the best of my knowledge and belief and I take full responsibility for it.
- i. I have the necessary skills, training and or/expertise to conduct the research project as proposed.
- j. I am familiar with the University's health and safety requirements and policies and that all relevant health and safety measures have been taken into account for the research project.
- k. I am familiar with, and will comply with, the University's Policy on the Ethical Conduct of Research involving Human Participants, Human Material or Human Data and the University's [Research Integrity and Governance Code of Practice](#).
- l. The relevant equality and diversity considerations have been taken into account when designing the research project.
- m. If the research project is approved, I undertake to adhere to the research project protocol, the terms of the full application as approved and any conditions set out by the Committee and any other body required to review and/or approve the research project.
- n. I will notify the Committee and all other review bodies of substantial amendments to the protocol or the terms of the approved application, and to seek a favourable opinion from the Committee before implementing the amendment.

FOR STAFF PROJECTS

Signed:

Chief/Principal Investigator

Print name:

Date:

FOR STUDENT PROJECTS

Signed:

Student

Signed:

Supervisor

Print name:

Bernadette Clarke

Print name:

Date: 10th May 2021

Date:

Please submit the completed application and supporting documents to [INSERT DETAILS] Your electronic submission should contain wet-ink or electronic signatures of all relevant parties. Please note that if any information is missing, the application may be returned to you.

Appendix 20 Full list of nodes (codes) and sub-themes

Framework - Question No. (number of codes)	Codes (number of files i.e. interviewee responses)	Relational or sub-themes	High-level themes	Section details for high-level themes discussed in thesis
	Apriori or Top-down codes	Apriori or Top-down codes		
	Emergent or Bottom-up codes	Emergent or Bottom-up codes		
Question One (3)	Awareness of SSM (45)			Section 5.2.
	Awareness (of SSM) globally (7)			
	Awareness (of SSM) UK (12)			
Question Two (6)	Basic seafood sustainability (38)			Section 5.3.
	Broader seafood sustainability (32)			
	Challenges for seafood industry (39)			
	Economic or business case (4)			
	Integrity, trust (1)			
	Responsibly sourced (41)			
Question Three (11)	Business case or interest (20)		Business case or interest	Section 5.4. Table 5.1.
	Concern for human impact on natural environment (13)		Concern for impact of fishing on planetary, ecosystem health	
	Consumer or customer expectation (13)		Customer expectations, reputation, 'Doing the right thing'	
	Fish for future generations (7)		Perpetuity of stocks for future generations, food security, nutrition	

	Food system/security (7)		Customer expectations, reputation, 'Doing the right thing'	
	It's my role, job, career (10)		It's my job, interest, passion	
	Love, passion for the sea, ocean (8)			
	Reputation (5)			
	Responsibility, doing the right thing (12)			
	Socio economic, local communities (7)			
	Value ecosystem services, planetary health (11)			
Question Four (2)				Section 5.5. Table 5.2. Appendix 31
Barriers (28)	Adverse publicity, Seaspiracy (32)		Media and adverse publicity	
	Awareness of issues (3)		Consumer awareness, knowledge, and priorities	
	Catching sector, fishermen (13)		Seafood culture, values and perceptions	
	Commodisation (4)		Seafood culture, values and perceptions	
	Complexity (14)		Sustainable fisheries leadership and market access	
	Data deficiency, stock assessment (6)		Governance, fisheries management, policy and enforcement	
	Diversity of taste (18)		Seafood culture, values and perceptions	

	Food Service (2)		Sustainable fisheries leadership and market access	
	Greenwashing, false claims (8)		Sustainable fisheries leadership and market access	
	Labelling quality and knowledge (16)		Consumer awareness, knowledge, and priorities	
	Lack of confidence with fish (6)		Consumer awareness, knowledge, and priorities	
	Lack of professional skills or training (5)		Consumer awareness, knowledge, and priorities	
	Local seafood (4)		Seafood culture, values and perceptions	
	MCS ratings, seafood guides (6)		Sustainable fisheries leadership and market access	
	Loss of fish counters (4)		Consumer awareness, knowledge, and priorities	
	Marine feed ingredients/standards (3)		Sustainable fisheries leadership and market access	
	Government, political will, and legislation (16)		Governance, fisheries management, policy and enforcement	
	Price and WTP (20)		Consumer awareness, knowledge, and priorities	
	Prioritisation of sustainability (10)		Consumer awareness, knowledge, and priorities	
	Regionality, proximity to coast (4)		Seafood culture, values and perceptions	

	Seafood knowledge, education (16)		Consumer awareness, knowledge, and priorities	
	Time, convenience, ask questions (8)		Consumer awareness, knowledge, and priorities	
	Traceability and transparency (15)		Sustainable fisheries leadership and market access	
	Unethical markets, competition (6)		Sustainable fisheries leadership and market access	
	Perception of value, cost of food (6)		Seafood culture, values and perceptions	
	Volume, scale inc. cost of certification (11)		Sustainable fisheries leadership and market access	
	Welfare (4)		Seafood culture, values and perceptions	
	What is sustainable seafood (5)		Sustainable fisheries leadership and market access	
Drivers (21)	Aquaculture, farmed seafood (1)		Sustainable fisheries leadership and market access	
	Award schemes (3)		Sustainable fisheries leadership and market access	
	Brexit, Covid-19, Staycations (11)		Seafood culture, values and perceptions	
	Carbon footprint (8)		Consumer awareness, knowledge, and priorities	

	Carding system (2)		Governance, fisheries management, policy and enforcement	
	Celebrity chefs, TV cooking programmes (3)		Media and adverse publicity	
	Connection with sea (5)		Seafood culture, values and perceptions	
	Consumer demand, awareness, environmental conscience (18)		Consumer awareness, knowledge, and priorities	
	Fish is a good source of nutrition (3)		Seafood culture, values and perceptions	
	Food quality and safety, brand reputation (4)		Sustainable fisheries leadership and market access	
	GBS (2)		Sustainable fisheries leadership and market access	
	GFG, seafood guides (9)		Sustainable fisheries leadership and market access	
	Keystone actors or players (1)		Sustainable fisheries leadership and market access	
	Market, supply, and demand (13)		Sustainable fisheries leadership and market access	
	Media (9)		Media and adverse publicity	
	MPAs, protected areas (2)		Governance, fisheries management, policy and enforcement	

	MSC products, certification (33)		Sustainable fisheries leadership and market access	
	Pre-competitive platforms (4)		Sustainable fisheries leadership and market access	
	Quota management, international agreements (6)		Governance, fisheries management, policy and enforcement	
	Restaurants, local businesses (3)		Sustainable fisheries leadership and market access	
	Retailers, seafood buyers (25)		Sustainable fisheries leadership and market access	
Question Five (7)	Choice not to eat fish (9)		Public concern	Section 5.6.
	Messaging (6)		Individuals understanding of the impact of their seafood choices	
	Consumer demand for sustainable seafood (26)		Consumer demand for sustainable seafood	
	Impact of eating fish on marine environment (21)			
	Is concern affecting choice (36)			
	Motivation as eco-warriors (9)			
	Trust (in retailer/brand) (6)			
Question Six (1)	Awareness of GFG (49)			Section 5.7. Table 5.3.
Question Seven (9)	Trust (in guide) (6)		Scientific rigour, accuracy, credibility of guide	Section 5.7. Table 5.6.
	Transparent, credible, accurate (26)		Clarity and detail of information provided in guide	

	Quality of information (41)		Relevance of guide to consumer setting	
	MCS punches above its weight (4)		Transparency of consultation process for updating ratings	
	Consultation process (9)		Scope of guide	
	Scope of guide (1)		Unit of assessment for producing ratings or profiles	
	Unit of assessment (1)			
	Accuracy (3)			
	Clarity (4)			
Question Eight (3)	Not using guide (12)	Use own tools, decision making tree		Section 5.7
		Partnered with other organisations		
		Limitations of guide		
		Lack of supply chain knowledge		
		Other		
	What might prevent use of guide (19)		Business in a bespoke partnership; uses other platforms; or own policy	Section 5.7. Table 5.5.
			Availability of GFG recommendations	
			Lack of supply chain knowledge and transparency	
			Limitations of guide; interpretation of data; available information	
			Works well	
	Yes we use the guide (38)	Information source staff etc.	Information or training for staff, customers, members, or students etc.	Section 5.7. Table 5.4.
		Risk assessment tool	Risk assessment tool	

		Advocacy for improvement	Advocacy for improvement	
		Integrated into buying policy or standard	MCS advice integrated into sourcing policy or approval process, standard or methodology	
		Other	Other	
Question Nine (2)	Influence of guide on consumers (43)	Direct effect (29)	'Don't know'	Section 5.8.1. Table 5.7.
		Indirect effect (22)	Little to no influence	
			Guide use amongst a small sector of society	
			Guide functions to raise awareness	
			Influence of choice editing	
			Influence of Customer expectations/Brand trust/devolution of responsibility to retailer etc.	
	Barriers to using guide, following advice (11)	Situational factors, time etc. (4)	Guide awareness	Section 5.8.2. Table 5.8.
		Guide awareness (6)	Situational factors, time, habit, taste etc.	
		Availability, niche products (4)	Availability of recommendations, niche products	
		Price, WTP (7)	Prioritisation of sustainability - WTP	
		Supply chain knowledge, information, labelling (7)	Supply chain knowledge, information, labelling	
Question Ten (3)	Influence on ground (32)		Effect on the ground	Section 5.8.3. Table 5.9.
	Influence on water (26)		Effect on the water	

	Useful business tool (3)			
Question Eleven (12)	Ability to scan product barcode (6)		Making direct links with MCS GFG advice and seafood purchasing environment	Section 5.9 Table 5.10
	Access and use of GFG as tool for consumers (6)		Increasing engagement with stakeholders in the seafood supply chain	
	Comments on NEW app, website (5)		Increasing social norms around seafood sustainability	
	Foodservice (4)			
	Food, fish festivals (1)			
	Menus, information available to consumer (4)			
	Myth busting (2)			
	Nutrition and other perspectives (1)			
	Pocket Guide (10)			
	Simplistic messaging (17)			
	Social media (6)			
	TV adds, magazine articles (6)			
Question Twelve (4)	Increasing uptake or engagement (45)			Section 5.9 Table 5.10
	Market GFG as tool for industry (4)			
	MCS position/approach (3)			
	Updates (4)			
Other Codes (6)	Is sustainable or certified seafood more expensive (3)			
	Intention gap (6)			
	Confusion between MCS and MSC (11)			

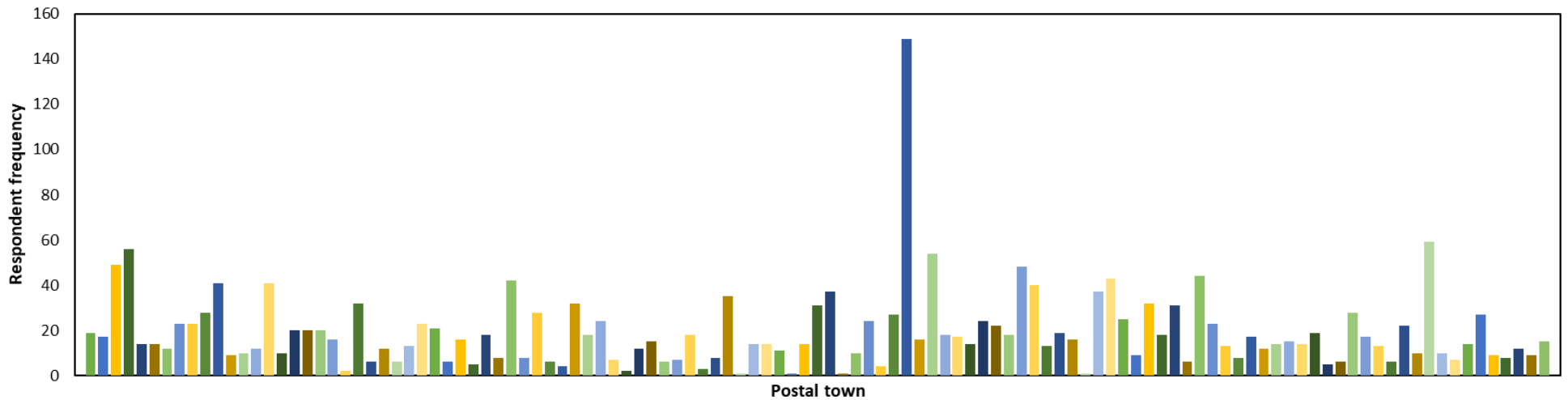
	Choice editing (11)			Figure 5.2
	Anti whaling (3)			
	Alignment and collaboration (3)			
Total 118				

Appendix 21 Detailed analysis of household composition

Household composition	n	%
<i>Living alone/Single adult</i>	487	21%
No children	347	71%
1 child	116	24%
2 children	11	2%
3 children	11	2%
More than 3 children	2	0.4%
<i>2 adults</i>	1194	51%
No children	644	54%
1 child	297	25%
2 children	205	17%
3 children	37	3%
More than 3 children	11	1%
<i>Multiple occupancy i.e. 3 or more adults</i>	666	28%
No children	287	43%
1 child	227	34%
2 children	90	14%
3 children	34	5%
More than 3 children	28	4%

Appendix 22 Summary of distribution of respondents by postal town (n=2212)

The figure illustrates the national distribution of the survey with responses received from all post code areas in the UK except from: East Central London (EC); Guernsey (GY); Isle of Man (IM); and West Central London (WC). Post codes prefixed – E, N, NW, SE, SW and W (n=149), were combined in one postal town, London.



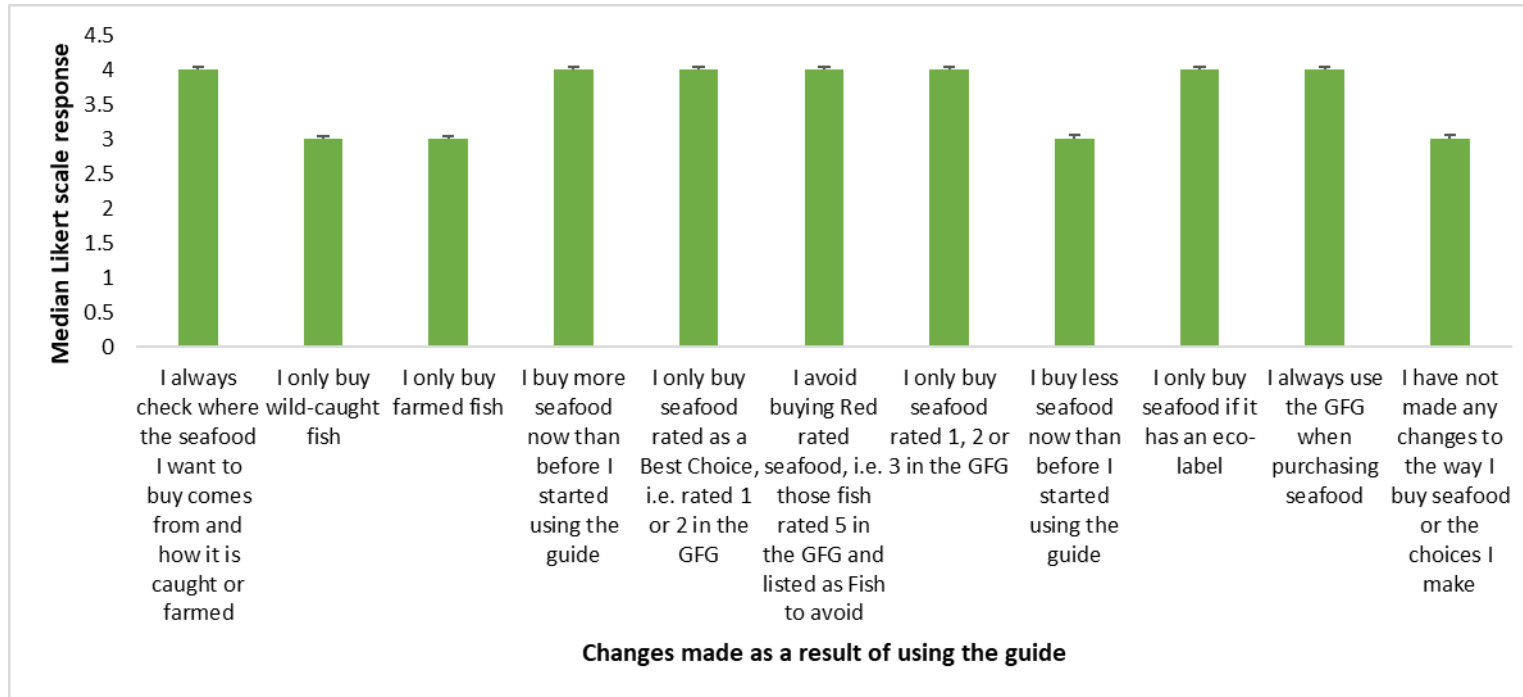
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|------------------|----------------|-----------------------------|--------------|----------------|-------------|
| ■ Aberdeen | ■ Bath | ■ Belfast | ■ Birmingham | ■ Blackburn | ■ Blackpool |
| ■ Bolton | ■ Bournemouth | ■ Bradford | ■ Brighton | ■ Bristol | ■ Bromley |
| ■ Cambridge | ■ Canterbury | ■ Cardiff | ■ Carlisle | ■ Chelmsford | ■ Chester |
| ■ Cleveland | ■ Colchester | ■ Comhairle nan Eilean Siar | ■ Coventry | ■ Crewe | ■ Croydon |
| ■ Darlington | ■ Dartford | ■ Derby | ■ Doncaster | ■ Dorchester | ■ Dudley |
| ■ Dumfries | ■ Dundee | ■ Durham | ■ Edinburgh | ■ Enfield | ■ Exeter |
| ■ Falkirk | ■ Galashiels | ■ Glasgow | ■ Gloucester | ■ Guildford | ■ Halifax |
| ■ Harrogate | ■ Harrow | ■ Hemel | ■ Hereford | ■ Huddersfield | ■ Hull |
| ■ Ilford | ■ Inverness | ■ Ipswich | ■ Jersey | ■ Kilmarnock | ■ Kingston |
| ■ Kirkaldy | ■ Kirkwall | ■ Lancaster | ■ Leeds | ■ Leicester | ■ Luton |
| ■ Linclon | ■ Liverpool | ■ Llandrindod | ■ Llandudno | ■ London | ■ Newport |
| ■ Manchester | ■ Medway | ■ Milton Keynes | ■ Motherwell | ■ Newcastle | ■ Paisley |
| ■ Northampton | ■ Norwich | ■ Nottingham | ■ Oldham | ■ Oxford | ■ Reading |
| ■ Perth | ■ Peterborough | ■ Plymouth | ■ Portsmouth | ■ Preston | ■ Slough |
| ■ Redhill | ■ Romford | ■ Salisbury | ■ Sheffield | ■ Shrewsbury | ■ Stockport |
| ■ Southall | ■ Southampton | ■ Southend | ■ St. Albans | ■ Stevenage | ■ Taunton |
| ■ Stoke-on-Trent | ■ Sunderland | ■ Sutton | ■ Swansea | ■ Swindon | ■ Wakefield |
| ■ Telford | ■ Tonbridge | ■ Torquay | ■ Turo | ■ Twickenham | ■ Worcester |
| ■ Walsall | ■ Warrington | ■ Watford | ■ Wigan | | |
| ■ York | | | | | |

Appendix 23 Influence of factors on guide use

Variable	Non-users (n= /%)	Users (n/%)	Non-fish buyers (n/%)	χ^2 (df, n), p, Cramer's V (Φc)
Gender				$\chi^2(2,2262)$ =46.36, p < 0.001, <i>phi</i> =0.143
Males	542 (47%)	336 (52%)	147 (32%)	
Females	619 (53%)	306 (48%)	312 (68%)	
Recruitment process				$\chi^2(2,2296)$ = 21.86, p < 0.001, <i>phi</i> = 0.098
Cint	1040 (89%)	538 (81%)	383 (83%)	
Public lists	132 (11%)	124 (19%)	79 (17%)	
Age				$\chi^2(6,2279)$ = 130.02, p < 0.001, <i>phi</i> = 0.169
18-29	200 (17%)	198 (30%)	149 (32%)	
30-49	394 (34%)	290 (45%)	149 (32%)	
50-69	450 (38%)	132 (20%)	134 (29%)	
70+	124 (11%)	30 (5%)	29 (6%)	
Education				$\chi^2(14,2257)$ = 89.53, p < 0.001, <i>phi</i> = 0.141
Left school at 16 with qualifications e.g., O Levels/GCSEs	234 (20%)	74 (11%)	98 (22%)	
Left school at 18 with qualifications e.g., AS/A Levels	214 (18%)	119 (18%)	75 (17%)	
No qualifications	42 (4%)	15 (2%)	17 (4%)	
Post graduate degree	198 (17%)	193 (30%)	69 (15%)	
Teaching or nursing qualification	32 (3%)	38 (6%)	20 (4%)	
Undergraduate degree	325 (28%)	170 (26%)	120 (27%)	
Vocational qualification e.g., City and Guilds	88 (8%)	35 (5%)	38 (8%)	
Other	23 (2%)	5 (1%)	15 (3%)	
Employment				$\chi^2(12,2277)$
Full-time parent or carer	47 (4%)	44 (7%)	18 (4%)	

In education, full or part-time	48 (4%)	32 (5%)	28 (6%)	= 151.56, p < 0.001, <i>phi</i> = 0.182
In paid employment, full or part-time	587 (50%)	453 (69%)	241 (53%)	
Retired	248 (21%)	50 (8%)	60 (13%)	
Self-employed	97 (8%)	48 (7%)	24 (5%)	
Unemployed	93 (8%)	20 (3%)	50 (11%)	
Other	46 (4%)	7 (1%)	36 (8%)	
Charity membership				$\chi^2(2,2274)$ = 54.8, p < 0.001, <i>phi</i> = 0.155
Yes	210 (18%)	219 (33%)	104 (23%)	
No	951 (82%)	437 (67%)	353 (77%)	
Coast visits				$\chi^2(4,2273)$ = 91.72, p < 0.001, <i>phi</i> = 0.142
Category 1 (At least once a week/I live on or near the coast)	254 (22%)	234 (36%)	109 (24%)	
Category 2 (Once a month/Once every few months)	428 (37%)	278 (42%)	149 (32%)	
Category 3 (Once or twice a year/Very rarely/never)	478 (41%)	143 (22%)	200 (44%)	

Appendix 24 Guide effectiveness



Appendix 25 Summary of results for differences in eco-label knowledge across the categories listed in the table

Variable	Group Code	N (%)	Median	Df	H	P
Gender		1827	10	3	15.048	0.002
Female	1	925 (51)	10			
Male	2	878 (48)	11			
Other	3	3 (-)	17			
Prefer not to say	4	21 (1)	25			
Age		1818	10	3	126.008	< 0.001
18-29	1	398 (22)	15			
30-49	2	684 (38)	12			
50-69	3	582 (32)	7			
70+ years	4	154 (8)	6			
Education		1805	10	7	58.238	< 0.001
Left school at 16 with qualifications e.g., O Levels/GCSEs	1	308 (17)	6.5			
Left school at 18 with qualifications e.g., AS/A Levels	2	333 (18)	11			
No qualifications	0	57 (3)	7			
Post graduate degree	6	391 (22)	13			
Teaching or nursing qualification	4	70 (4)	13.5			
Undergraduate degree	5	495 (27)	10			
Vocational qualification e.g., City and Guilds	3	123 (7)	9			
Other	7	28 (2)	6			

Employment		1820	10	6	123.589	< 0.001
Full-time parent or carer	1	91 (5)	16			
In education, full or part-time	2	80 (4)	13.5			
In paid employment, full or part-time	3	1040 (57)	12			
Retired	5	298 (16)	7			
Self-employed	4	145 (8)	11			
Unemployed	0	113 (6)	6			
Other	6	53 (3)	4			
Household income		1813	10	4	36.746	< 0.001
£0-£12,500	1	162 (9)	6			
£12,501-£50,000	2	1019 (56)	10			
£50,001-£150,000	3	443 (24)	11			
Over £150,000	4	38 (2)	18			
Prefer not to say	5	151 (8)	8			
Supermarket		1788	10	10	47.59	< 0.001
Aldi	1	131 (7)	7			
Asda	2	254 (14)	10.5			
Co-Op	3	38 (2)	16			
Iceland	4	60 (3)	9			
Lidl	5	127 (7)	11			
M&S	6	69 (4)	17			
Morrison's	7	259 (15)	11			

Sainsbury's	8	279 (16)	10			
Tesco	9	438 (24)	10			
Waitrose	10	91 (5)	9			
Other	11	42 (2)	5.5			

Appendix 26 Influence of socio-demographic variables on supermarket choice

Supermarket * UK Region Crosstabulation

		UK REGION											Total
		2 East Midlands	3 East of England	4 Greater London	5 North East	6 North West	7 N.Ireland	8 Scotland	9 South East	10 South West	11 Wales	12 West Midlands	
1 Aldi	Count	10	19	7	5	25	0	7	11	13	12	12	121
	% within Supermarket	8.30%	15.70%	5.80%	4.10%	20.70%	0.00%	5.80%	9.10%	10.70%	9.90%	9.90%	100.00%
	Adjusted Residual	0.2	1.8	-2.7	-1.1	2.5	-1.7	-1	-0.8	-0.1	1.9	0.3	
2 Asda	Count	18	12	19	23	46	8	18	30	15	11	36	236
	% within Supermarket	7.60%	5.10%	8.10%	9.70%	19.50%	3.40%	7.60%	12.70%	6.40%	4.70%	15.30%	100.00%
	Adjusted Residual	-0.1	-3	-2.8	2.2	3	1.5	-0.3	0.7	-2.4	-0.9	3.5	
3 CoOp	Count	4	5	3	2	2	2	3	1	4	5	2	33
	% within Supermarket	12.10%	15.20%	9.10%	6.10%	6.10%	6.10%	9.10%	3.00%	12.10%	15.20%	6.10%	100.00%
	Adjusted Residual	0.9	0.8	-0.8	-0.1	-1.2	1.6	0.2	-1.5	0.2	2.3	-0.6	
4 Iceland	Count	5	9	8	5	9	4	2	2	6	1	4	55
	% within Supermarket	9.10%	16.40%	14.50%	9.10%	16.40%	7.30%	3.60%	3.60%	10.90%	1.80%	7.30%	100.00%
	Adjusted Residual	0.4	1.4	0.1	0.8	0.7	2.7	-1.2	-1.8	0	-1.3	-0.5	
5 Lidl	Count	10	9	22	6	18	2	10	17	13	7	5	119

	% within Supermarket	8.40%	7.60%	18.50%	5.00%	15.10%	1.70%	8.40%	14.30%	10.90%	5.90%	4.20%	100.00%
	Adjusted Residual	0.3	-1.2	1.5	-0.7	0.6	-0.3	0.1	1	0	0	-1.9	
6 M&S	Count	5	4	14	4	15	0	4	6	5	2	4	63
	% within Supermarket	7.90%	6.30%	22.20%	6.30%	23.80%	0.00%	6.30%	9.50%	7.90%	3.20%	6.30%	100.00%
	Adjusted Residual	0	-1.1	1.9	0	2.5	-1.2	-0.5	-0.5	-0.8	-0.9	-0.8	
7 Morrisons	Count	24	35	15	14	33	0	29	19	21	17	37	244
	% within Supermarket	9.80%	14.30%	6.10%	5.70%	13.50%	0.00%	11.90%	7.80%	8.60%	7.00%	15.20%	100.00%
	Adjusted Residual	1.3	2	-3.8	-0.5	0.1	-2.5	2.3	-1.9	-1.3	0.7	3.5	
8 Sainsburys	Count	12	24	63	12	24	2	17	44	47	3	15	263
	% within Supermarket	4.60%	9.10%	24.00%	4.60%	9.10%	0.80%	6.50%	16.70%	17.90%	1.10%	5.70%	100.00%
	Adjusted Residual	-2.1	-0.9	5.1	-1.4	-2.2	-1.6	-1.1	2.9	3.9	-3.6	-2.1	
9 Tesco	Count	35	48	51	26	43	17	39	49	42	32	32	414
	% within Supermarket	8.50%	11.60%	12.30%	6.30%	10.40%	4.10%	9.40%	11.80%	10.10%	7.70%	7.70%	100.00%
	Adjusted Residual	0.6	0.7	-1.1	-0.2	-2	3.3	1.1	0.3	-0.6	1.8	-1.2	
10 Waitrose	Count	6	11	25	7	2	0	2	10	14	6	4	87
	% within Supermarket	6.90%	12.60%	28.70%	8.00%	2.30%	0.00%	2.30%	11.50%	16.10%	6.90%	4.60%	100.00%
	Adjusted Residual	-0.3	0.6	4.1	0.6	-3.1	-1.4	-2	0	1.6	0.4	-1.5	

11 Other	Count	1	3	7	4	5	0	5	2	3	3	2	35
	% within Supermarket	2.90%	8.60%	20.00%	11.40%	14.30%	0.00%	14.30%	5.70%	8.60%	8.60%	5.70%	100.00%
	Adjusted Residual	-1.1	-0.4	1	1.2	0.2	-0.9	1.3	-1.1	-0.5	0.7	-0.7	
	Count	130	179	234	108	222	35	136	191	183	99	153	1670
	% within Supermarket	7.80%	10.70%	14.00%	6.50%	13.30%	2.10%	8.10%	11.40%	11.00%	5.90%	9.20%	100.00%

Supermarket * Guide use Crosstabulation

		Guide use		Total	
		1	2		
Supermarket	1	Count	101	30	131
		% within Supermarket	77.1%	22.9%	100.0%
		Adjusted Residual	3.2	-3.2	
2	Count	164	90	254	
	% within Supermarket	64.6%	35.4%	100.0%	
	Adjusted Residual	.2	-.2		
3	Count	14	24	38	
	% within Supermarket	36.8%	63.2%	100.0%	
	Adjusted Residual	-3.5	3.5		
4	Count	37	23	60	
	% within Supermarket	61.7%	38.3%	100.0%	
	Adjusted Residual	-.4	.4		
5	Count	80	47	127	
	% within Supermarket	63.0%	37.0%	100.0%	

	Adjusted Residual	-3	.3	
6	Count	26	43	69
	% within Supermarket	37.7%	62.3%	100.0%
	Adjusted Residual	-4.7	4.7	
7	Count	168	91	259
	% within Supermarket	64.9%	35.1%	100.0%
	Adjusted Residual	.3	-.3	
8	Count	182	97	279
	% within Supermarket	65.2%	34.8%	100.0%
	Adjusted Residual	.4	-.4	
9	Count	296	142	438
	% within Supermarket	67.6%	32.4%	100.0%
	Adjusted Residual	1.8	-1.8	
10	Count	48	43	91
	% within Supermarket	52.7%	47.3%	100.0%
	Adjusted Residual	-2.3	2.3	
11	Count	30	12	42
	% within Supermarket	71.4%	28.6%	100.0%
	Adjusted Residual	1.0	-1.0	
Total	Count	1146	642	1788
	% within Supermarket	64.1%	35.9%	100.0%

Supermarket * Education Crosstabulation

	Education							Total
	0 No qualifications	1 Left school at 16	2 Left school at 18	3 Vocational	4 Teacher or Nurse	5 Undergraduate	6 Postgraduate	

1 Aldi	Count	7	21	24	15	3	29	23	6	128
	% within Supermarket	5.50%	16.40%	18.80%	11.70%	2.30%	22.70%	18.00%	4.70%	100.00%
	Adjusted Residual	1.6	-0.2	0	2.3	-0.9	-1.3	-1.1	3.1	
2 Asda	Count	10	60	52	18	6	61	44	1	252
	% within Supermarket	4.00%	23.80%	20.60%	7.10%	2.40%	24.20%	17.50%	0.40%	100.00%
	Adjusted Residual	0.8	3	0.9	0.2	-1.3	-1.2	-1.7	-1.5	
3 CoOp	Count	0	4	9	3	1	8	10	0	35
	% within Supermarket	0.00%	11.40%	25.70%	8.60%	2.90%	22.90%	28.60%	0.00%	100.00%
	Adjusted Residual	-1.1	-0.9	1.1	0.4	-0.3	-0.6	1	-0.7	
4 Iceland	Count	4	9	14	5	4	13	10	1	60
	% within Supermarket	6.70%	15.00%	23.30%	8.30%	6.70%	21.70%	16.70%	1.70%	100.00%
	Adjusted Residual	1.6	-0.4	1	0.5	1.2	-1	-1	0.1	
5 Lidl	Count	4	18	32	10	5	22	31	2	124
	% within Supermarket	3.20%	14.50%	25.80%	8.10%	4.00%	17.70%	25.00%	1.60%	100.00%
	Adjusted Residual	0.1	-0.8	2.1	0.6	0.1	-2.5	0.9	0.1	
6 M&S	Count	1	7	21	1	5	16	17	1	69
	% within Supermarket	1.40%	10.10%	30.40%	1.40%	7.20%	23.20%	24.60%	1.40%	100.00%

	Adjusted Residual	-0.8	-1.6	2.6	-1.8	1.5	-0.8	0.6	0	
7 Morrisons	Count	6	53	47	19	11	64	49	4	253
	% within Supermarket	2.40%	20.90%	18.60%	7.50%	4.30%	25.30%	19.40%	1.60%	100.00%
	Adjusted Residual	-0.7	1.8	0	0.5	0.5	-0.8	-1	0.1	
8 Sainsburys	Count	6	42	38	9	8	99	67	4	273
	% within Supermarket	2.20%	15.40%	13.90%	3.30%	2.90%	36.30%	24.50%	1.50%	100.00%
	Adjusted Residual	-1	-0.8	-2.2	-2.5	-0.8	3.6	1.3	0	
9 Tesco	Count	13	76	75	32	13	134	87	4	434
	% within Supermarket	3.00%	17.50%	17.30%	7.40%	3.00%	30.90%	20.00%	0.90%	100.00%
	Adjusted Residual	-0.2	0.3	-0.8	0.5	-1	1.9	-0.9	-1.1	
10 Waitrose	Count	0	5	13	4	8	27	31	1	89
	% within Supermarket	0.00%	5.60%	14.60%	4.50%	9.00%	30.30%	34.80%	1.10%	100.00%
	Adjusted Residual	-1.7	-3	-1	-0.9	2.6	0.6	3.1	-0.3	
11 Other	Count	4	6	2	4	3	9	12	2	42
	% within Supermarket	9.50%	14.30%	4.80%	9.50%	7.10%	21.40%	28.60%	4.80%	100.00%
	Adjusted Residual	2.4	-0.5	-2.3	0.7	1.1	-0.9	1.1	1.8	
	Count	55	301	327	120	67	482	381	26	1759

% within Supermarket	3.10%	17.10%	18.60%	6.80%	3.80%	27.40%	21.70%	1.50%	100.00%
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Supermarket * Household income Crosstabulation

		Household income					Total	
		1 £0-£12,500	2 £12,501-£50,000	3 £50,001-£150,000	4 Over £150,000	5 PNTS		
Supermarket	1 Aldi	Count	18	70	26	0	15	129
		% within Supermarket	14.0%	54.3%	20.2%	0.0%	11.6%	100.0%
		Adjusted Residual	2.1	-.5	-1.2	-1.7	1.4	
	2 Asda	Count	24	139	67	3	20	253
		% within Supermarket	9.5%	54.9%	26.5%	1.2%	7.9%	100.0%
		Adjusted Residual	.3	-.4	.8	-1.1	-.2	
	3 CoOp	Count	10	19	5	2	0	36
		% within Supermarket	27.8%	52.8%	13.9%	5.6%	0.0%	100.0%
		Adjusted Residual	4.0	-.4	-1.5	1.4	-1.8	
	4 Iceland	Count	13	35	9	1	2	60
		% within Supermarket	21.7%	58.3%	15.0%	1.7%	3.3%	100.0%
		Adjusted Residual	3.5	.3	-1.7	-.3	-1.4	
	5 Lidl	Count	15	76	22	1	12	126
		% within Supermarket	11.9%	60.3%	17.5%	0.8%	9.5%	100.0%
		Adjusted Residual	1.2	1.0	-1.9	-1.1	.5	
	6 M&S	Count	5	34	24	3	2	68
		% within Supermarket	7.4%	50.0%	35.3%	4.4%	2.9%	100.0%
		Adjusted Residual	-.5	-1.1	2.1	1.3	-1.6	

7 Morrisons	Count	17	161	55	4	21	258
	% within Supermarket	6.6%	62.4%	21.3%	1.6%	8.1%	100.0%
	Adjusted Residual	-1.4	2.2	-1.2	-.7	-.1	
8 Sainsburys	Count	18	147	73	6	31	275
	% within Supermarket	6.5%	53.5%	26.5%	2.2%	11.3%	100.0%
	Adjusted Residual	-1.5	-1.0	.9	.0	1.9	
9 Tesco	Count	31	256	108	12	27	434
	% within Supermarket	7.1%	59.0%	24.9%	2.8%	6.2%	100.0%
	Adjusted Residual	-1.5	1.3	.3	1.0	-1.8	
10 Waitrose	Count	3	34	38	5	9	89
	% within Supermarket	3.4%	38.2%	42.7%	5.6%	10.1%	100.0%
	Adjusted Residual	-1.9	-3.5	4.1	2.3	.6	
11 Other	Count	4	24	5	1	8	42
	% within Supermarket	9.5%	57.1%	11.9%	2.4%	19.0%	100.0%
	Adjusted Residual	.1	.1	-1.9	.1	2.6	
Total	Count	158	995	432	38	147	1770
	% within Supermarket	8.9%	56.2%	24.4%	2.1%	8.3%	100.0%

Supermarket * Gender Crosstabulation

		Gender					
		1 Female	2 Male	3 Other	4 PNTS	Total	
Supermarket	1 Aldi	Count	79	50	0	0	129
		% within Supermarket	61.2%	38.8%	0.0%	0.0%	100.0%
		Adjusted Residual	2.5	-2.2	-.5	-1.3	
	2 Asda	Count	117	132	0	5	254

	% within Supermarket	46.1%	52.0%	0.0%	2.0%	100.0%
	Adjusted Residual	-1.6	1.4	-.7	1.4	
3 CoOp	Count	17	19	0	1	37
	% within Supermarket	45.9%	51.4%	0.0%	2.7%	100.0%
	Adjusted Residual	-.6	.4	-.3	.9	
4 Iceland	Count	19	41	0	0	60
	% within Supermarket	31.7%	68.3%	0.0%	0.0%	100.0%
	Adjusted Residual	-3.0	3.2	-.3	-.8	
5 Lidl	Count	58	60	0	8	126
	% within Supermarket	46.0%	47.6%	0.0%	6.3%	100.0%
	Adjusted Residual	-1.1	-.1	-.5	5.8	
6 M&S	Count	38	30	1	0	69
	% within Supermarket	55.1%	43.5%	1.4%	0.0%	100.0%
	Adjusted Residual	.7	-.8	2.6	-.9	
7 Morrisons	Count	140	116	2	0	258
	% within Supermarket	54.3%	45.0%	0.8%	0.0%	100.0%
	Adjusted Residual	1.2	-1.0	2.6	-1.9	
8 Sainsburys	Count	146	131	0	2	279
	% within Supermarket	52.3%	47.0%	0.0%	0.7%	100.0%
	Adjusted Residual	.6	-.4	-.7	-.7	
9 Tesco	Count	212	223	0	1	436
	% within Supermarket	48.6%	51.1%	0.0%	0.2%	100.0%
	Adjusted Residual	-1.0	1.5	-1.0	-2.0	
10 Waitrose	Count	55	35	0	1	91
	% within Supermarket	60.4%	38.5%	0.0%	1.1%	100.0%
	Adjusted Residual	1.9	-1.9	-.4	.0	

11 Other	Count	23	17	0	2	42
	% within Supermarket	54.8%	40.5%	0.0%	4.8%	100.0%
	Adjusted Residual	.5	-1.0	-.3	2.3	
Total	Count	904	854	3	20	1781
	% within Supermarket	50.8%	48.0%	0.2%	1.1%	100.0%

Supermarket * No. of Adults Crosstabulation

		Adults				Total	
		1 Single adult	2 2 adults	3 3 adults	4 More than 3 adults		
Supermarket	1 Aldi	Count	30	69	17	129	
		% within Supermarket	23.3%	53.5%	13.2%	10.1%	100.0%
		Adjusted Residual	.7	.5	-.9	-.6	
2 Asda	2 Asda	Count	53	121	38	254	
		% within Supermarket	20.9%	47.6%	15.0%	16.5%	100.0%
		Adjusted Residual	.0	-1.3	-.4	2.5	
3 CoOp	3 CoOp	Count	13	11	6	36	
		% within Supermarket	36.1%	30.6%	16.7%	16.7%	100.0%
		Adjusted Residual	2.3	-2.5	.1	.9	
4 Iceland	4 Iceland	Count	24	23	7	60	
		% within Supermarket	40.0%	38.3%	11.7%	10.0%	100.0%
		Adjusted Residual	3.7	-2.1	-.9	-.4	
5 Lidl	5 Lidl	Count	27	64	21	125	
		% within Supermarket	21.6%	51.2%	16.8%	10.4%	100.0%
		Adjusted Residual	.2	-.1	.3	-.5	

6 M&S	Count	11	36	13	9	69
	% within Supermarket	15.9%	52.2%	18.8%	13.0%	100.0%
	Adjusted Residual	-1.0	.1	.7	.3	
7 Morrisons	Count	40	148	48	22	258
	% within Supermarket	15.5%	57.4%	18.6%	8.5%	100.0%
	Adjusted Residual	-2.3	2.0	1.3	-1.8	
8 Sainsburys	Count	57	153	45	23	278
	% within Supermarket	20.5%	55.0%	16.2%	8.3%	100.0%
	Adjusted Residual	-.1	1.3	.1	-2.0	
9 Tesco	Count	88	217	66	63	434
	% within Supermarket	20.3%	50.0%	15.2%	14.5%	100.0%
	Adjusted Residual	-.3	-.7	-.4	2.0	
10 Waitrose	Count	15	54	14	8	91
	% within Supermarket	16.5%	59.3%	15.4%	8.8%	100.0%
	Adjusted Residual	-1.0	1.5	-.1	-.9	
11 Other	Count	11	18	7	5	41
	% within Supermarket	26.8%	43.9%	17.1%	12.2%	100.0%
	Adjusted Residual	1.0	-1.0	.2	.1	
Total	Count	369	914	282	210	1775
	% within Supermarket	20.8%	51.5%	15.9%	11.8%	100.0%

Supermarket * No. of Children Crosstabulation

					Children						
					0 No children	1 1 child	2 2 children	3 3 children	4 More than 3 children		Total

Supermarket	1 Aldi	Count	74	35	16	4	0	129
		% within Supermarket	57.4%	27.1%	12.4%	3.1%	0.0%	100.0%
		Adjusted Residual	1.4	-6	-7	-2	-1.5	
	2 Asda	Count	106	91	34	15	8	254
		% within Supermarket	41.7%	35.8%	13.4%	5.9%	3.1%	100.0%
		Adjusted Residual	-3.3	2.5	-5	2.3	2.2	
	3 CoOp	Count	14	17	3	1	1	36
		% within Supermarket	38.9%	47.2%	8.3%	2.8%	2.8%	100.0%
		Adjusted Residual	-1.5	2.4	-1.0	-.2	.6	
	4 Iceland	Count	30	16	8	5	1	60
		% within Supermarket	50.0%	26.7%	13.3%	8.3%	1.7%	100.0%
		Adjusted Residual	-.2	-.5	-.2	2.1	.1	
	5 Lidl	Count	62	31	27	5	1	126
		% within Supermarket	49.2%	24.6%	21.4%	4.0%	0.8%	100.0%
		Adjusted Residual	-.5	-1.2	2.4	.3	-.7	
	6 M&S	Count	21	29	15	4	0	69
		% within Supermarket	30.4%	42.0%	21.7%	5.8%	0.0%	100.0%
		Adjusted Residual	-3.5	2.4	1.8	1.1	-1.1	
	7 Morrisons	Count	132	91	27	4	4	258
		% within Supermarket	51.2%	35.3%	10.5%	1.6%	1.6%	100.0%
		Adjusted Residual	.0	2.3	-1.9	-1.8	.0	
	8 Sainsburys	Count	156	78	41	2	1	278
		% within Supermarket	56.1%	28.1%	14.7%	0.7%	0.4%	100.0%
		Adjusted Residual	1.8	-5	.2	-2.7	-1.8	
9 Tesco	Count	243	97	69	17	10	436	
	% within Supermarket	55.7%	22.2%	15.8%	3.9%	2.3%	100.0%	

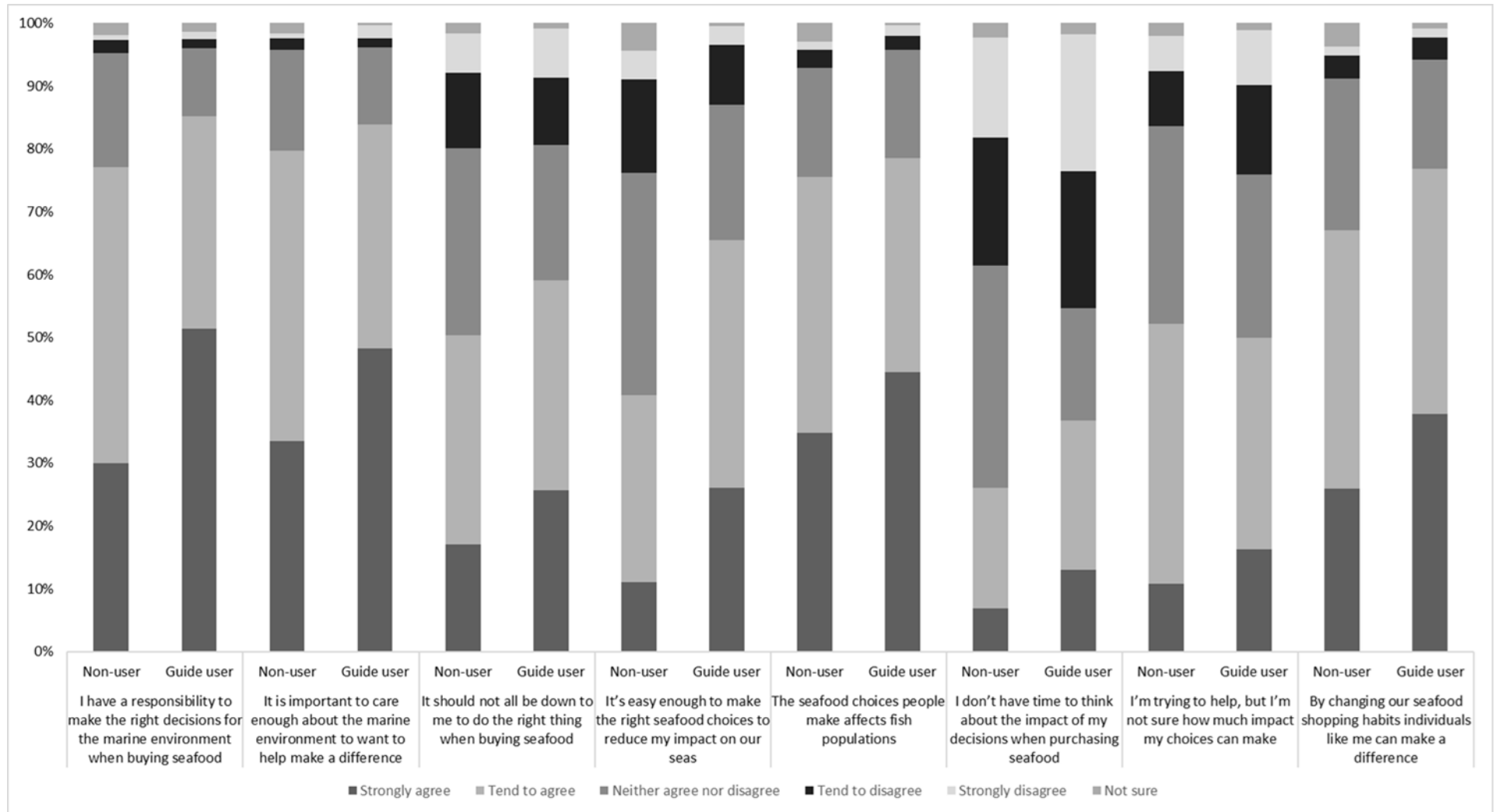
	Adjusted Residual	2.1	-3.7	1.0	.5	1.4	
10 Waitrose	Count	49	27	8	5	2	91
	% within Supermarket	53.8%	29.7%	8.8%	5.5%	2.2%	100.0%
	Adjusted Residual	.5	.1	-1.6	1.1	.5	
11 Other	Count	25	9	7	0	0	41
	% within Supermarket	61.0%	22.0%	17.1%	0.0%	0.0%	100.0%
	Adjusted Residual	1.3	-1.0	.5	-1.2	-.8	
Total	Count	912	521	255	62	28	1778
	% within Supermarket	51.3%	29.3%	14.3%	3.5%	1.6%	100.0%

Supermarket * Age Crosstabulation

		Age				Total	
		1 18-29	2 30-49	3 50-69	4 70+		
Supermarket	1 Aldi	Count	38	42	40	9	129
		% within Supermarket	29.5%	32.6%	31.0%	7.0%	100.0%
		Adjusted Residual	2.1	-1.4	-.1	-.5	
	2 Asda	Count	68	102	72	12	254
		% within Supermarket	26.8%	40.2%	28.3%	4.7%	100.0%
		Adjusted Residual	2.0	.6	-1.1	-2.2	
	3 CoOp	Count	13	13	8	3	37
		% within Supermarket	35.1%	35.1%	21.6%	8.1%	100.0%
		Adjusted Residual	1.9	-.4	-1.3	.0	
	4 Iceland	Count	22	18	18	2	60
		% within Supermarket	36.7%	30.0%	30.0%	3.3%	100.0%
		Adjusted Residual	2.8	-1.4	-.2	-1.4	

5 Lidl	Count	36	46	31	6	119
	% within Supermarket	30.3%	38.7%	26.1%	5.0%	100.0%
	Adjusted Residual	2.2	.1	-1.3	-1.3	
6 M&S	Count	28	23	16	2	69
	% within Supermarket	40.6%	33.3%	23.2%	2.9%	100.0%
	Adjusted Residual	3.8	-.9	-1.5	-1.6	
7 Morrisons	Count	48	102	88	19	257
	% within Supermarket	18.7%	39.7%	34.2%	7.4%	100.0%
	Adjusted Residual	-1.4	.4	1.1	-.5	
8 Sainsburys	Count	42	110	91	36	279
	% within Supermarket	15.1%	39.4%	32.6%	12.9%	100.0%
	Adjusted Residual	-3.1	.4	.5	3.1	
9 Tesco	Count	80	171	143	42	436
	% within Supermarket	18.3%	39.2%	32.8%	9.6%	100.0%
	Adjusted Residual	-2.2	.4	.8	1.3	
10 Waitrose	Count	12	40	29	9	90
	% within Supermarket	13.3%	44.4%	32.2%	10.0%	100.0%
	Adjusted Residual	-2.1	1.2	.2	.6	
11 Other	Count	4	14	19	5	42
	% within Supermarket	9.5%	33.3%	45.2%	11.9%	100.0%
	Adjusted Residual	-2.0	-.7	2.0	.9	
Total	Count	391	681	555	145	1772
	% within Supermarket	22.1%	38.4%	31.3%	8.2%	100.0%

Appendix 27 Responses to individual responsibility statements for users and non-users of the Guide



Appendix 28 Summary of responses for all groups to Green shopping habit statements

Item	All Groups		Group 1 Guide users		Group 2 Non-users		Group 3 Non-fish or seafood buyers	
	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)	Strongly agree/tend to agree (%)	Strongly disagree/tend to disagree (%)
1. I make an effort to buy Fair Trade products	57	16	75	7	48	20	53	17
2. I always buy Organic products	29	15	51	8	20	18	23	19
3. Where possible, I buy locally produced food	65	10	75	6	62	11	59	12
4. I prefer to buy food that is in season	66	8	76	7	64	8	57	12
5. I buy what is convenient	49	18	46	24	51	15	50	20
6. I prefer to buy food produced in the UK	69	7	76	6	67	7	62	9
7. I try to reduce the amount of meat and/or dairy myself or my family is consuming	49	25	64	14	40	33	50	22

8. I think of myself as an ethical consumer	53	12	73	5	45	15	47	13
9. I make an effort to avoid buying too many imported products	52	15	66	8	46	18	45	19
10. I try to avoid buying products (e.g., biscuits, bread, chocolate etc.) containing palm fat or oil	49	21	64	12	42	25	43	23
11. I buy what I can afford	73	6	68	8	74	5	77	5
12. I try to shop ethically but food produced in this way is generally too expensive	55	14	59	16	53	13	54	14
13. I think of myself as an environmentally-friendly consumer	61	10	76	6	53	11	59	12
14. I avoid products with unnecessary packaging	64	11	74	7	60	12	59	12
15. I always buy free-range meat and egg products	55	17	71	7	48	22	48	19
16. I buy what I/we enjoy	81	3	77	6	81	3	84	2

17. I am/Family members are vegan or vegetarian and I buy food accordingly	29	52	45	35	17	65	37	43
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Appendix 29 Summary of demographics for Guide users

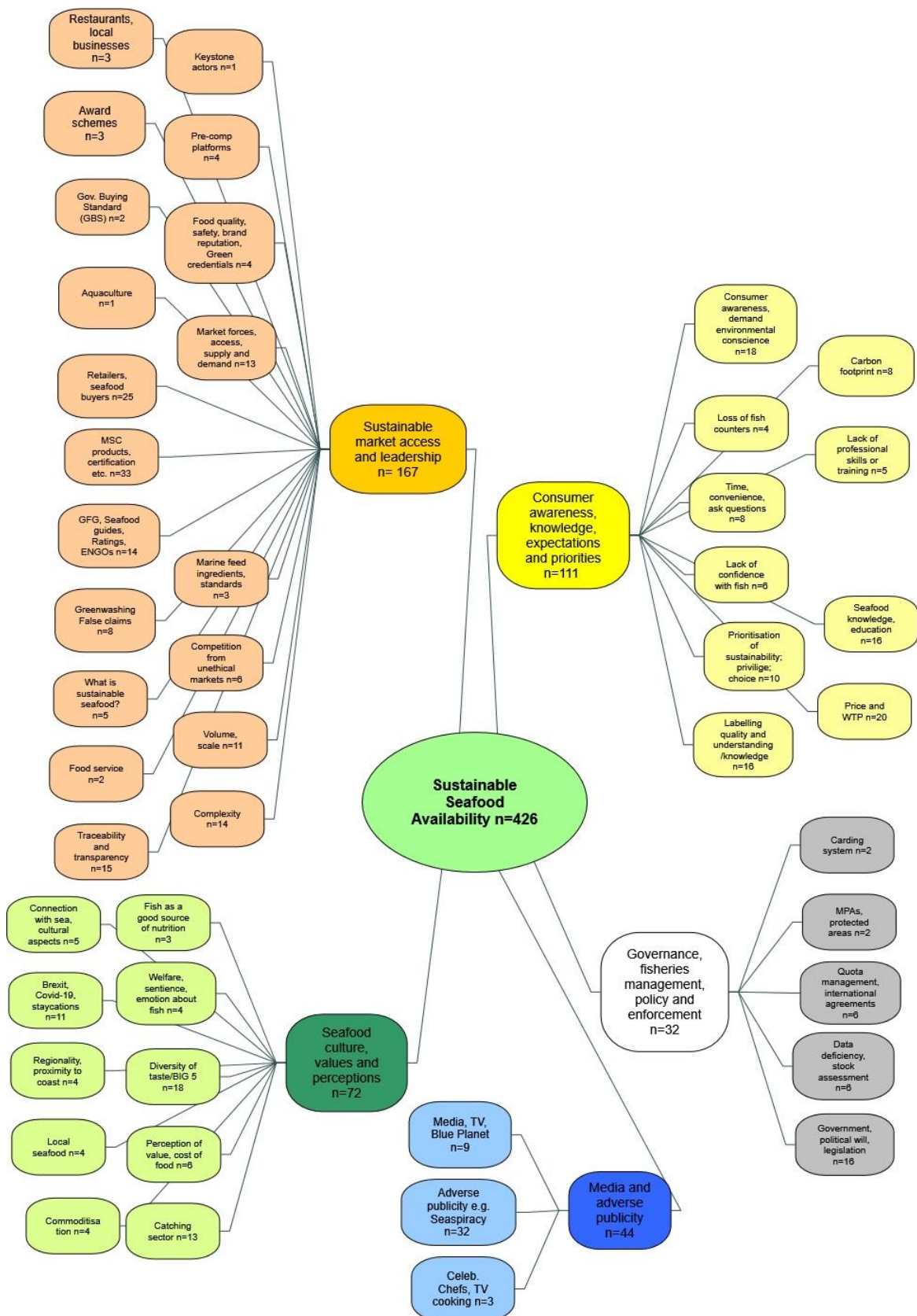
Demographics – Guide users only (n =662)		n	%	Demographics – Guide users only (n =662)		n	%	
Gender (n=658)	Male	336	51	Education (n=649)	Left school at 16 with qualifications e.g., O Levels/GCSEs	74	11	
	Female	306	47		Left school at 18 with qualifications e.g., AS/A Levels	119	18	
	Other	2	0		No qualifications	15	2	
	Prefer not to say	14	2		Post graduate degree	193	30	
Age (n=650)	18-29	198	30		Teaching or nursing qualification	38	6	
	30-49	290	45		Undergraduate degree	170	26	
	50-69	132	20		Vocational qualification e.g., City and Guilds	35	5	
	70+	30	5		Other	5	1	
Ethnicity (n=652)	Bangladeshi	16	2		Employment (n=654)	Full-time parent or carer	44	7
	Black British or Afro-Caribbean	19	3			In education, full or part-time	32	5
	Chinese	8	1	In paid employment, full or part-time		453	69	
	Indian	19	3	Retired		50	8	
	Multi-racial	9	1	Self-employed		48	7	
	Other	17	3	Unemployed		20	3	
	Pakistani	14	2	Other		7	1	
	Prefer not to say	19	3	Household income (n=653)	£0-£12,500	36	6	
	White British	484	74		£12,501-£50,000	366	56	
	White European	47	7		£50,001-£150,000	184	28	
Adults in household (n=657)	1 adult	109	17		Over £150,000	21	3	
	2 adults	339	52		Prefer not to say	46	7	
	3 adults	127	19	How often do you visit the coast? (n=655)	At least once a week	94	14	
	More than 3 adults	82	12		I live on or near the coast	140	21	
Children in household (n=657)	No children	260	40		Once a month	129	20	
	1 child	220	33		Once every few months	149	23	
	2 children	125	19		Once or twice a year	103	16	
	3 children	32	5		Very rarely/never	40	6	
	More than 3 children	20	3	Member of a conservation, wildlife or any other group or charity? (n=656)	No	437	67	
			Yes		219	33		

Appendix 30 Interviewee profile

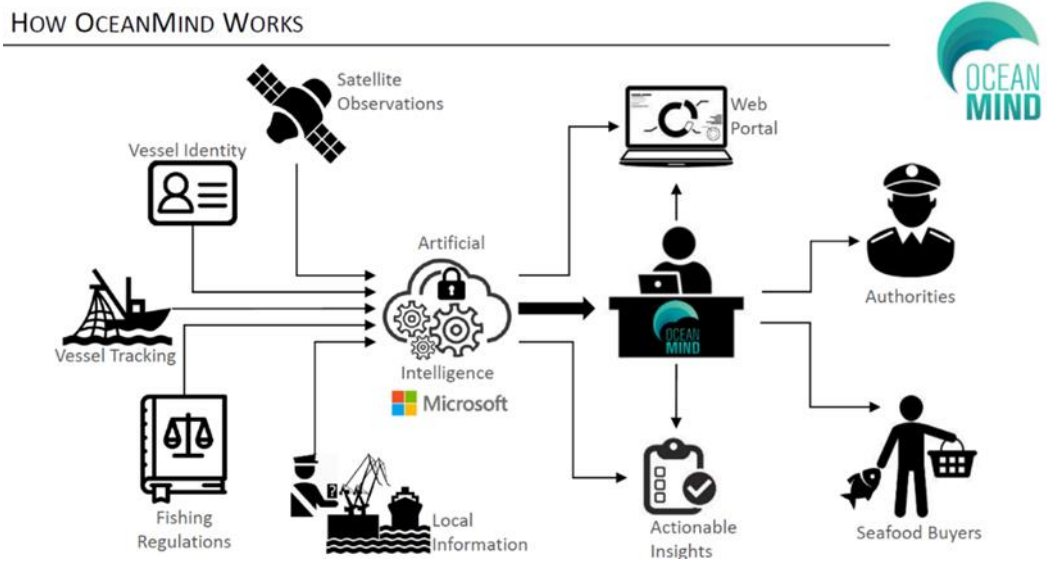
ID	GENDER	GROUP
SH01	M	Supplier, processor, wholesaler or manufacturer
SH02	M	ENGO/Seafood initiatives
SH03	F	Supplier, processor, wholesaler or manufacturer
SH04	F	Chefs/Cookeryschools/training
SH05	F	Food Service
SH06	M	Supplier, processor, wholesaler or manufacturer
SH07	M	Supplier, processor, wholesaler or manufacturer
SH08	M	Retailer
SH09	M	Food Service
SH10	M	Chefs/Cookeryschools/training
SH11	M	Supplier, processor, wholesaler or manufacturer
SH12	M	Supplier, processor, wholesaler or manufacturer
SH13	F	ENGO/Seafood initiatives
SH14	M	Supplier, processor, wholesaler or manufacturer
SH15	M	ENGO/Seafood initiatives
SH16	M	Retailer
SH17	M	Supplier, processor, wholesaler or manufacturer
SH18	M	ENGO/Seafood initiatives
SH19	M	Certification scheme
SH20	M	Chefs/Cookeryschools/training
SH21	M	ENGO/Seafood initiatives
SH22	M	Certification scheme
SH23	M	Chefs/Cookeryschools/training
SH24	M	Retailer
SH25	M	Supplier, processor, wholesaler or manufacturer
SH26	M	Retailer
SH27	F	Supplier, processor, wholesaler or manufacturer
SH28	M	Supplier, processor, wholesaler or manufacturer
SH29	F	Supplier, processor, wholesaler or manufacturer
SH30	M	Catching sector

SH31	F	Catching sector
SH32	M	ENGO/Seafood initiatives
SH33	F	Food Service
SH34	M	Food Service
SH35	M	Supplier, processor, wholesaler or manufacturer
SH36	F	Government and Public Bodies
SH37	M	Government and Public Bodies
SH38	F	Government and Public Bodies
SH39	M	Certification scheme
SH40	M	Supplier, processor, wholesaler or manufacturer
SH41	M	Supplier, processor, wholesaler or manufacturer
SH42	M	Supplier, processor, wholesaler or manufacturer
SH43	F	Government and Public Bodies
SH44	M	Certification scheme
SH45	F	Catching sector
SH46	F	Government and Public Bodies
SH47	F	Supplier, processor, wholesaler or manufacturer
SH48	F	Government and Public Bodies
SH49	M	Government and Public Bodies

Appendix 31 Mind map of more detailed themes and subthemes for sustainable seafood availability



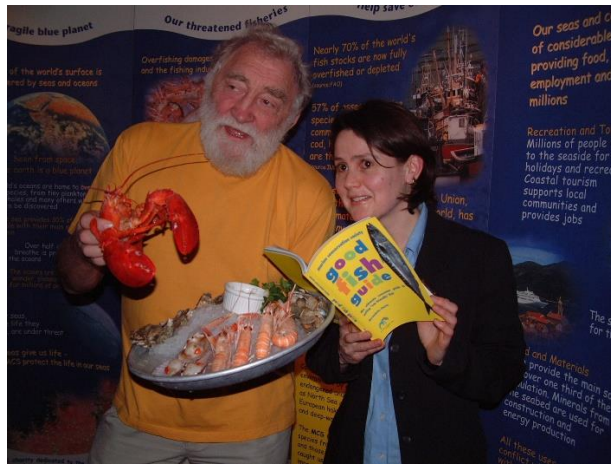
Appendix 32 How OceanMind works (Source: OceanMind, 2020).



Appendix 33 Ocean Disclosure Project (ODP) profiles for a selection of UK supermarkets (Source: ODP, 2022). ¹⁴⁴

Supermarket	No. of wild-caught species used	% volume from certified fisheries	% volume from a FIP	No. of farmed species used	% volume from certified farms
Asda	33	5	93	11	91
CoOp	19	59	30	5	100
Morrisons	57	66	14	11	99
Sainsburys	37	80	-	7	100
Tesco	44	64	10	11	100
Waitrose	50	92	3	11	Inc. in volume for wild-caught

¹⁴⁴ <https://oceandisclosureproject.org/profiles> [Accessed May 2022].



Good Fish Guide launch, London, 2002.