

## RISKY SEAFOOD BUSINESS Understanding the global Footprint of the uk's Seafood consumption

### SUMMARY REPORT 2022

### ACKNOWLEDGEMENTS

This report summarises the findings of original research undertaken by MacAlister Elliott & Partners Limited (MEP), commissioned by WWF. It has been written and edited by WWF-UK and MEP.

Please refer to the 'Risky Seafood Business: A comprehensive analysis of the Global Footprint of UK's seafood consumption Technical Report 2022' for the full analysis.

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Front cover: Fishing ships in Lauwersoog, Netherlands. © Rudmer Zwerver / Shutterstock

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INTRODUCTION

# **SECTION 1.**

Cooked Cod © Clarus Chu/WWF-U

The UK was once a net exporter of seafood,<sup>1</sup> with large local and distant fishing fleets that voyaged as far as the Grand Banks in Canada to the west and the Barents Sea to the north to catch our beloved cod. However, owing to the decline of local fish stocks, fishing ground access restrictions and an increase in demand, the UK has been a net importer of seafood since 1984. With the growth of the human population and surges in imports and exports, the UK seafood wholesale trade has increased by 47% from 2010 to 2019, with a retail value of £6.87 billion.<sup>2</sup> At the same time, the UK has remained one of the major fishing nations in Europe, supplying seafood to meet local and international demand.

Decline of global fish stocks, like the collapse of Grand Banks cod stock in Canada, and concerns around aquaculture practices, put seafood sustainability under strict scrutiny in the late 1990s. Seafood guides were produced by non-governmental organisations in the UK and Europe, and consumers were advised to avoid eating species like the overfished North Sea cod. Retailers were asked to stop sourcing from problematic fisheries and fish farms.

In response, various voluntary seafood certification schemes were established to set industry standards to address specific ecological,3 environmental,5.6.7 feed,<sup>7</sup> animal<sup>8</sup> and/or social<sup>9</sup> welfare issues within the seafood supply chains. Improvement projects in fisheries and aquaculture were also developed to improve the sustainability performance of individual supply chains.<sup>10</sup> One particular benefit of these schemes and projects is that they have driven supply chain improvements in countries where the regulation of fisheries and aquaculture activities is less developed, like the certification of catfish in Vietnam.

The UK seafood industry has taken progressive actions, such as supporting fisheries or aquaculture improvement projects, and making public commitments to certification schemes and/or incorporating these standards into their seafood sourcing policies. Additionally, pre-competitive industry platforms like the Sustainable Seafood Coalition (SSC)<sup>11</sup> and Seafood Ethics Action (SEA) Alliance<sup>12</sup> have been formed, through which many UK seafood businesses have joined together to advocate for sectoral improvement of fisheries policies and industry practices.

Closer to home, the overfishing crisis in the Northeast Atlantic has also driven the EU and UK governments to implement long-term management plans to rebuild depleted fish stocks such as cod, haddock and hake since the early 2000s.<sup>13</sup> Other key fisheries management measures have included commitments to reduce fishing intensity, rebuild fish stocks in Europe and ban wasteful discards.<sup>14</sup>

47% WITHIN THE LAST DECADE THE SEAFOOD TRADE IN T **UK HAS INCREASED BY 47** £6.87 BILLION WITH A RETAIL VALUE OF £6.87 BILLION IN 2019<sup>2</sup>

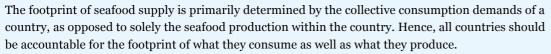
#### WHAT IS?



**Seafood** is fish, shellfish and other types of edible aquatic life (marine and freshwater) consumed by people, and it can be produced by wild-capture fisheries or aquaculture farms.

**Footprint** refers to the impacts of seafood extraction, production, consumption and related socioeconomic activities on nature and the functioning of natural systems, as well as the drivers and pressures that cause those risks and impacts.

#### Why consumption?



This has brought mixed success, however, with some fish stocks like haddock and hake in the North Sea recovering, but the targets were not achieved in the Baltic Sea and the Mediterranean.<sup>15</sup>

We are now facing a 'triple challenge': producing nutritious food for a growing global population while staying on track to keep global temperature increases to within 1.5°C and reversing biodiversity loss. For our future generations to have sufficient resources to thrive, both WWF-UK's Global Footprint report<sup>16</sup> and the WWF Basket<sup>17</sup> call for 100% of marine resources consumed in the UK to be from sustainable sources by 2030.

In recent years, the role of seafood or the 'blue food' as alternative animal protein has also been investigated, amid concerns over the impacts of landbased animal protein consumption to our planet.<sup>18</sup> While the potential benefit of eating more seafood is recognised, to date there is no comprehensive analysis to understand the collective footprint of the UK's seafood consumption on global biodiversity loss, climate change, and their associated risks on nature and people.

The purpose of this report is to fill this gap by providing a high-level, robust and replicable assessment of the global (both domestic and international) environmental and social footprint of the UK's seafood production and consumption. This report then provides evidence, analysis and recommendations to UK governments, businesses and consumers to further improve seafood sustainability and help achieve a reduction in that footprint, and in turn help tackle our nature and climate crises.

The UK's departure from the European Union (EU) offers an opportunity for UK governments to review and improve domestic seafood production policies, and to ensure new trade deals with other countries help mitigate the UK's global environmental, social and economic seafood footprint. UK seafood businesses and consumers can also play important roles to drive the improvement required to build a future in which people live in harmony with nature and where sustainable seafood plays its part in meeting the challenges of the future. **1.5**°C AIM TO KEEP GLOBAL TEMPERATURE INCREASE TO WITHIN 1.5°C AND REVERSING BIODIVERSITY LOSS FOR OUR FUTURE GENERATIONS **100%** CALL FOR ALL MARINE RESOURCES CONSUMED





Fish farming, aquaculture net © Shutterstock / Adnan Buyuk / WWF

Mussel Farming, Scotland Havley Swanlund/WWF-III

# **KEY FINDINGS**

This report analyses the footprint risks of 157 seafood supply chains across the eight most popular seafood groups. The quantity of seafood being eaten in the UK is estimated and the footprint of the UK's domestic seafood production is compared with producing countries that export seafood to the UK. This report also identifies key areas to address and mitigate the risks of the UK's global seafood footprint. Key findings are:









81% of seafood by volume eaten in the UK is imported from overseas, but there are no environmental or social regulatory criteria set for imported seafood apart from ensuring the wild-caught seafood is from a legal source.









Footprint risk indicators including human rights abuses and slow progress on sustainability certification are also urgent issues to address in reducing the UK's global seafood footprint, followed by other footprint risk indicators concerning fish stock health, ecosystem impacts, management effectiveness, and illegal, unreported and unregulated (IUU) fishing.

The UK consumed 887,000 tonnes of seafood in 2019, equivalent to 5.2 billion portions of fish and chips. Nevertheless, the average UK consumption of fish is only a half of the government-recommended two portions of fish a week.

70% of our domestic seafood production is exported overseas, but the new Fisheries Act (2020) does not yet have measurable sustainability targets. Additionally, the UK has a higher seafood footprint than some of our neighbouring countries in the Northeast Atlantic but lower than those countries in Africa and Asia.

Tuna, swordfish, warm-water prawns, squid and some crab species have the highest environmental and social footprint, while mussels and small pelagic fish (e.g. herring) have the lowest footprint.

Certification alone does not guarantee endangered, threatened and protected (ETP) species are free from threats associated with seafood production. The UK's seafood demand directly impacts at least 253 ETP species like birds, sharks and rays, and aquatic mammals and puts their survival at risk. Taking account of the overlapping of natural habitats of these species with fishing and fishfarming activities, the number of potentially affected ETP species increases to a

# **SECTION 3.** SUMMARY RESULTS FOR DIFFERENT SEAFOOD GROUPS

A total of 157 supply chains across eight seafood commodity groups are analysed in this report. Each commodity group underwent a risk assessment comprised of 10 indicators to capture the range of key ecological, climate, social and governance risks associated with the production in these seafood supply chains (Appendix I & II). Each indicator was independently allocated a traffic light score of **Green (Low)**, **Amber (Medium)** or **Red (High)** risk based on the best publicly available evidence. Full methodology details are in Section 7 of this report.

COMMOD	TY GROUP	DIRECT IMPACT TO Resource	ECOSYSTEM Impact	CLIMATE CHANGE Impact	ETP SPECIES Impact	SOCIAL CONCERNS	MANAGEMENT EFFECTIVENESS	SUSTAINABILITY Certification Progress	IUU FISHING	RULE OF LAW	LABOUR RIGHTS
WHITEFISH	(Atlantic cod, Greenland cod, haddock, monkfish, Pacific cod, saithe, Alaskan pollock, European pollack) Supply chains assessed: 29	Most supply chains are assessed as medium risk, except some stocks like North Sea cod are at high risk.	Almost all supply chains assessed as medium risk.	Medium to high risk due to the large presence of bottom towed gears.	Almost half of the assessed fisheries are high risk because of the mixed fishery nature.	Most supply chains are assessed as low risk for social concerns, except Russia.	Some fisheries are effectively managed with low risk but majority are assessed as medium risk.	Most fisheries are in Fisheries Improvement Projects (FIP) or certified but many with conditions or only cover parts of the stocks.	Generally low to medium risk. Russia is high risk.	Generally low risk. Russia is high risk.	Generally low to medium risk.
SALMONIDS	(Atlantic salmon, Danube salmon, Pacific salmon, trout) Supply chains assessed: 14	Medium risk for wild- caught and farmed salmonids. Land-based salmon farms in Denmark have low risk.	Medium risk for wild- caught and farmed salmonids. Land-based salmon farms in Denmark have low risk.	Medium risk for farmed salmonids and low risk for wild caught salmon.	Assessed as being the lowest risk commodity category for ETP species.	All supply chains are deemed low risk.	All trout assessed as low risk and salmon as low to medium risk.	Generally medium risk as most farmed salmonids hold certifications but not all are Aquaculture Stewardship Council (ASC) certified. Two supply chains hold no certifications.	Half of the supply chains assessed as low risk (mainly northern Europe) and the other half as medium risk.	All supply chains are deemed low risk.	Generally low to medium risk.
CRUSTACEANS	(European lobster, American lobster, Norway lobster (= scampi/Nephrops), other crab (inc. blue swimming crab, snow crab), edible crab, warm-water prawns, cold-water prawns) Supply chains assessed: 29	Overfished crab fisheries in Asia are high risk. Wild caught cold- water prawn supply chains have low risk.	Even split of risk scores as wild capture fisheries have different ecological impacts by different gear types.	Crustaceans have the highest risk among the assessed categories owing to the relatively small production quantities. Feed is the largest carbon emissions contributor for farmed prawns.	Even split of risk scores. Some fisheries have recorded interactions with ETP species. Little concern over the impacts of prawn farming on ETP species.	High risk for supply chains in Asia relating to debt labour and slave labour.	Asian supply chains are assessed as high risk due to poor management. However, wild capture cold-water prawns are assessed as low risk.	Majority of warm- water prawn farms are certified but not all are ASC. Some crab supply chains in Asia and Norway are assessed as high risk as they hold no certifications.	Atlantic cold-water prawn supply chains assessed as low risk but supply chains in Asia are considered high risk.	All supply chains in Europe and North America are assessed as low risk. However, crab and warm-water prawn production in south- east Asia and Latin America are considered high risk.	Nearly half of the supply chains are assessed as high risk like farmed warm- water prawn supply chains in Asia.
LARGE PELAGICS	(Albacore tuna, skipjack tuna (or stripe-bellied bonito), swordfish, yellowfin tuna) Supply chains assessed: 29	Even split of risk scores. Stocks of skipjack tuna are low risk but yellowfin tuna is assessed as high risk. Stock information for swordfish is limited.	Nearly half of the supply chains assessed as medium risk and half as high risk. Although typical fishing gears don't have contact with the seabed, associated bycatches, particularly juvenile tuna, are high.	Nearly half of the supply chains assessed as medium risk due to dominance of longliners and the other half as low risk because purse seiners catch big quantities of tuna and they are relatively energy efficient.	Large pelagics are the highest risk of all commodity categories. Large number of sharks, turtles, birds and marine cetaceans are incidentally caught.	Large pelagics are among the highest risk of all commodity categories. There are reports of forced labour and unexplained deaths of observers in this fishing industry.	Highest risk among all commodity categories assessed. Effectiveness of regional tuna management organisations requires improvement.	Nearly half of the supply chains have no improvement plans and the remaining supply chains are in FIPs or certified but with conditions or only cover parts of the stocks.	Close to all assessed supply chains are considered medium risk with the exception of Ireland assessed as low risk and Vietnam as high risk.	More than half of the supply chains are assessed as medium risk. Supply chains from Europe are assessed as low risk.	High number of supply chains are assessed as high risk, particularly those in Asia. Ireland is the only exception with low risk.

COMMOD	TY GROUP	DIRECT IMPACT TO Resource	ECOSYSTEM Impact	CLIMATE CHANGE Impact	ETP SPECIES Impact	SOCIAL CONCERNS	MANAGEMENT Effectiveness	SUSTAINABILITY Certification Progress	IUU FISHING	RULE OF LAW	LABOUR RIGHTS
MOLLUSCS	(Squid ( <i>Loligo</i> spp.), scallops (inc. queen scallops, king scallops), shortfin squid, mussels ( <i>Perna</i> spp. and <i>Mytilus</i> spp.) Supply chains assessed: 20	Farmed mussels are assessed as low risk. All squid and scallop fisheries are assessed as medium risk, except scallops from the US assessed as low risk.	Even split of risk scores. Dredging for scallops assessed as high risk and farmed mussels are assessed as low risk.	Farmed mussels are assessed as low risk as a small amount of energy needed. Squid from the US is the only supply chain assessed as high risk due to bottom trawling with relatively small catches.	Farmed mussels are assessed as low risk. The trawl and gillnet squid fisheries in India are considered high risk with reported bycatch of turtles and marine mammals.	Squid supply chains from Asia are assessed as high risk with reports of modern slavery. Most of the supply chains are assessed as low risk.	Management of scallop fisheries in North America are considered low risk but squid fisheries in Asia are not well- managed.	Squid fisheries are high risk due to little or no certification progress, scallop supply chains are considered medium risk as either in FIP or certified, but with conditions or only partial coverage of fisheries.	Squid fisheries from China and Taiwan are assessed as high risk and all mussel supply chains are assessed as low risk.	Most of the supply chains are assessed as medium or low risk, except Indonesia and Argentina are considered high risk.	Half of the supply chains are assessed as medium risk. Some supply chains from Asia and the Americas are high risk.
SMALL PELAGICS	Herring, mackerel, sardines (European pilchard, other)) Supply chains assessed: 21	Only mackerel from China are assessed as high risk due to overfishing. Other fisheries are at medium or low risk.	Almost all fisheries are assessed as low risk as fishing gears have little contact with the sea bed and low levels of bycatch, except China and Thailand which are assessed as medium.	Small pelagic fisheries are assessed as the lowest risk of all commodities.	Most small pelagic fisheries are assessed as low risk except those from the Baltic nations owing to the bycatch of critically endangered harbour porpoise.	Most small pelagic supply chains are assessed as low risk except China and Thailand which are assessed as high risk with reported modern slavery in the fishing industry.	Fisheries in China and Thailand are assessed as high risk. Fisheries management in the Northern Atlantic is considered medium risk as coastal states do not have international agreements on quota.	Most small pelagic supply chains are assessed as medium risk. Supply chains with no known progress towards third- party sustainability certifications are assessed as high risk.	Most European supply chains are assessed as low to medium risk. However, China assessed as high risk.	Most small pelagic supply chains are assessed as low risk.	Just over half of small pelagic supply chains are assessed as low risk. Two supply chains from China and Thailand are however assessed as high risk.
FARMED WHITEFISH	(Catfish (= basa/ Pangasius), European sea bream, European sea bass) Supply chains assessed: 7	Most farmed white fish fingerlings are from hatcheries with low risk to wild populations, but wild caught sea bass is overfished and assessed as high risk.	All farmed whitefish supply chains are assessed as medium risk with some negative impacts such as the creation of localised anoxic conditions and pollution.	Fish feed is the largest contributor to carbon emissions for farmed whitefish which are assessed as medium risk. Catfish from Vietnam are assessed as high risk.	Only catfish farms are assessed as low risk whereas wild caught sea bass fishery poses high risk to ETP species.	Most farmed whitefish supply chains are assessed as low risk, except sea bream from Morocco assessed as medium risk due to lack of information.	All farmed whitefish supply chains are assessed as medium risk.	Catfish is assessed as low risk as major suppliers are certified by the ASC. Medium risk for farmed sea bass and sea bream as not all stages of production are certified.	Only farmed catfish from Vietnam is assessed as high risk.	Only wild caught sea bass from the UK is assessed as low risk.	All farmed whitefish supply chains are assessed as high risk except the UK and Morocco.
FLATFISH	(Plaice, sole) Supply chains assessed: 8	Plaice and sole stocks are not considered to be overfished.	Most flatfish fisheries are assessed as medium risk. Dutch fisheries are assessed as high risk due to the dominance of beam trawling.	Most fisheries are assessed as medium risk. Dutch fisheries are assessed as high risk due to the dominance of beam trawling.	All flatfish fisheries are assessed as medium risk.	Flatfish are one of two commodity categories where all supply chains are deemed low risk.	Almost all fisheries are assessed as medium risk, except Icelandic flatfish fisheries which have better management and are considered low risk.	Some supply chains are in FIPs or certified but with conditions or only partial coverage of the fisheries. The remaining supply chains hold no certifications.	All flatfish supply chains originate from Europe and are assessed as medium or low risk.	Flatfish are one of two commodity categories where all supply chains are assessed as low risk.	Only the UK supply chain is assessed as medium risk.

## **3.1 THE UK'S GLOBAL SEAFOOD FOOTPRINT SNAPSHOT**

The footprint of the UK's seafood consumption is international as we import a lot of seafood from other parts of the world. A total of 157 supply chains covering 33 species groups from 40 countries are covered in this report, representing 82% of UK's annual seafood consumption. The footprints are measured based on a risk assessment comprised of 10 indicators to capture the range of key ecological, climate, social and governance risks associated with production seafood supply chains (Section 7, Appendix I & II). Each indicator was independently allocated a risk score of Low (1), Medium (2) or High (3) risk based on the best publicly available evidence. The higher the score, the bigger the footprint (minimum of 10 and maximum of 30 for all 10 indicators combined).

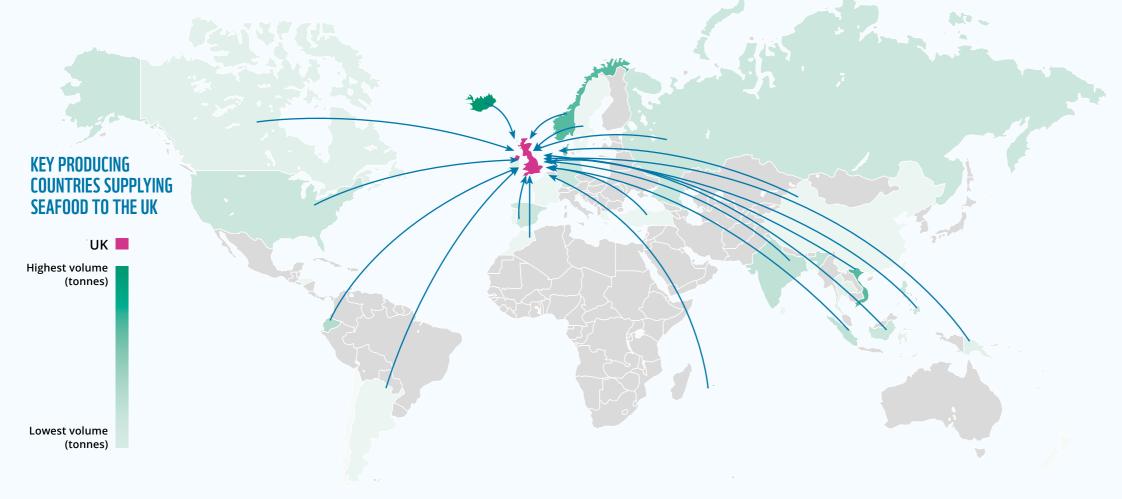


Figure 2. Average footprints of each seafood sub-commodity (species) group based on the studied 157 supply chains. The average footprint of a seafood subcommodity group is calculated according to the total sum of the 10 risk indicators scores divided by the total number of supply chains assessed, with a minimum of 10 and maximum of 30. It should be noted that the average footprint of each sub-commodity group only represents the supply chains that are covered in this report and does not include the footprints of any supply chains outside this report. The grey shading shows the average footprint for each seafood commodity (e.g. Whitefish, etc)'. Summary of the methodology provided in Section 7.

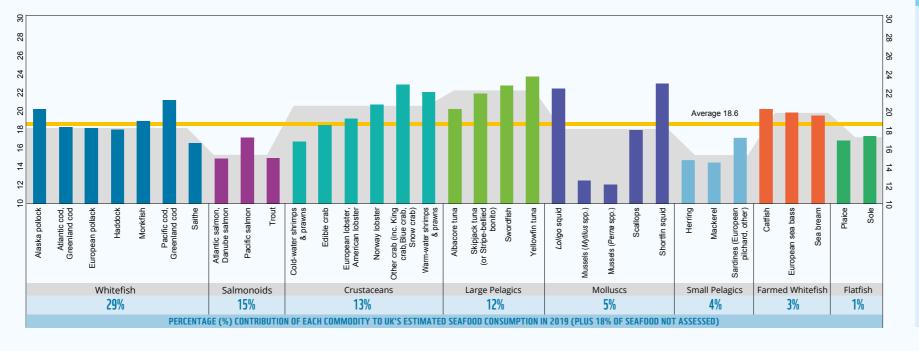
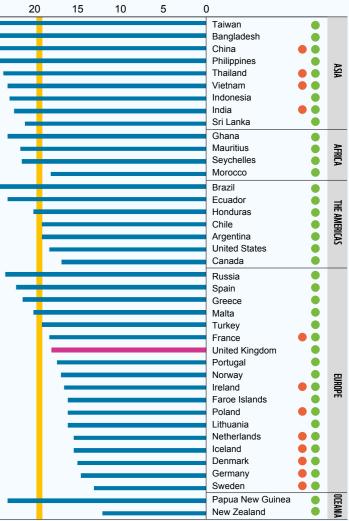


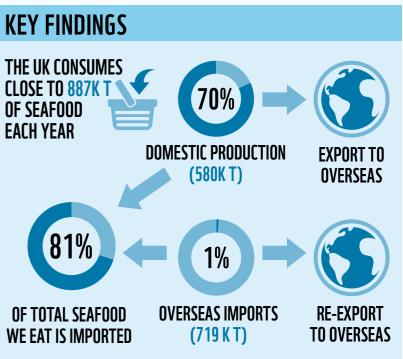
Figure 1. Average footprints of each seafood producing country based on the studied 157 supply chains. The average footprint of a seafood producing county is calculated according to the total sum of the 10 risk indicators scores divided by the total number of supply chains assessed, with a minimum of 10 and maximum of 30. It should be noted that the average footprint of each country only represents the supply chains that are covered in this report and does not include the footprints of any supply chains outside this report. Summary of the methodology provided in Section 7. Some countries are seafood producers () as well as processors () of the UK's seafood.

30

25



Average 19.6



# SECTION 4.

Although significant quantities of seafood are caught or farmed in the UK, only 30% of this is consumed domestically, implying that we import what we eat, and export what we catch in UK waters.

**UK PROFILE** 

Around 70% of UK-produced seafood was exported overseas, mainly to the EU, indicating a low self-sufficiency rate of the seafood that is consumed in the UK. In other words, as a country, the UK is doubly dependent on the conditions in which the seafood we eat is produced abroad, and the demands and market access of other countries for the seafood we produce in the UK.

Despite being one of the major global producers of small pelagics, whitefish and salmonids, the UK imports a significant amount of these species to meet our demand

Commodity Group	Estimated consumption assessed in this report (%)	Estimated self-sufficiency rate (%)	Commodity Group	Estimated consumption assessed in this report (%)	Estimated self- sufficiency rate (%)
WHITEFISH	29%	23%	MOLLUSCS	5%	77%
SALMONIDS	15%	25%	SMALL PELAGICS	4%	2%
			FARMED WHITEFISH	3%	2%*
CRUSTACEANS	13%	29%	FLATFISH	1%	50%
LARGE PELAGICS	12%	0.3%	OTHER SEAFOOD (NOT ASSESSED)	18%	5%

\*Sea bass caught in the UK are included in this commodity group for the ease of analysis

This is in part because UK consumers have strong preferences for the species they like to eat, built up over many years. The 33 species groups covered in this study make up around 82% of the total volume that the UK consumed in 2019, even though this report identifies that approximately 124 species or species groups were imported to the UK. The so-called 'Big Five' species of haddock, cod, salmon, prawn and tuna make up around 62% of the UK's seafood consumption.<sup>19</sup> A study found that UK consumers are relatively risk-averse when it comes to choosing seafood, with habitual behaviour and safe choices as key drivers for such preferences.20 It also revealed that consumers were interested in supporting locally produced seafood but there is limited evidence to prove locally produced is equivalent to sustainable. UK retailers and processors have tried to introduce lesser-known seafood species, for example coley (saithe) and hake, to UK consumers with mixed success.<sup>21</sup> The study also showed that there is more work to be done to raise awareness of less wellknown seafood species among UK consumers.

and at the same time exports large quantities to other countries. For example, key export commodity groups are salmonids (salmon), small pelagics (mackerel, herring) and crustaceans (Norway lobster, edible crab, lobster).

Apart from molluscs (like mussels and scallops) and flatfish (such as sole and plaice), the estimated selfsufficiency rate of most species groups in the UK is below 30%. In fact, the UK is almost completely reliant on imports of some species, including large pelagics and farmed whitefish species.

Current UK governments recommendations suggest that the UK people should consume two portions of fish or seafood, with at least one portion of oily fish, per week.22 However, the UK public currently only consumes half of the recommended amount.23 This has led to calls to increase seafood consumption.<sup>24</sup> Additionally, the recently published UK Food Strategy White Paper (in June 2022) highlights the importance of a prosperous seafood sector in the UK to build resilience in an unpredictable world.25

Given the low self-sufficiency levels in UK seafood consumption, the interest of consumers and published dietary recommendations, there is a golden opportunity for the UK governments, businesses and the seafood production sector to work together to improve the sustainability and lower the footprint of our seafood production and - in doing so - ensure the sector can support increased demand for seafood from UK consumers.

5.1 RISK FROM Regulations, Policies

Since 2020 the UK has been outside

state that can manage its own marine

with other countries. Regarding the

has either passed new laws like the

The UK Fisheries Act was passed in 2020<sup>26</sup> and it sets out eight objectives to ensure the sustainability of seafood produced in the UK. The Fisheries Act requires UK governments to set out details as to how they will achieve the objectives through the Joint Fisheries Statement (JFS). However, sustainability targets had not been set in the JFS at the

like the IUU regulation.

time this report was written.

the UK.

There are regulations on seafood safety, labelling and traceability including the Food Information to Consumers Regulation 2011,<sup>27</sup> the Fish Labelling Regulations 2014<sup>29</sup> and the Control Regulation 1224/2009.28 The current regulations require UK seafood traders (e.g. producers, suppliers and retailers) to ensure some level of traceability along the supply chain and provide basic information (e.g. fishing areas and fishing methods) to consumers, however there is no legal requirement that an indicator of sustainability performance be provided to consumers. Voluntary certification schemes and ecolabels are available for some of the seafood sold in

Fisheries Act or transposed EU laws

resources and make its own trade deals

regulations relating to seafood, the UK

the EU, becoming an independent

AND TRADE

# SECTION 5.

#### Porbeagle shark (Lama nasus) © naturepl.com / Doug Perrine / WWF

# communities.

While the transposed EU IUU Regulation (Council Regulation 1005/2008)<sup>31</sup> provides a certain level of assurance to prevent, deter and eliminate imported seafood linked to IUU fishing activities from entering the UK, there is no legal requirement for imported seafood to meet any minimum standard that is comparable to the UK Fisheries Act (2020). Furthermore, the IUU Regulation does not have the same kind of mandatory due diligence reporting requirements that are in place for deforestation risk commodities.32



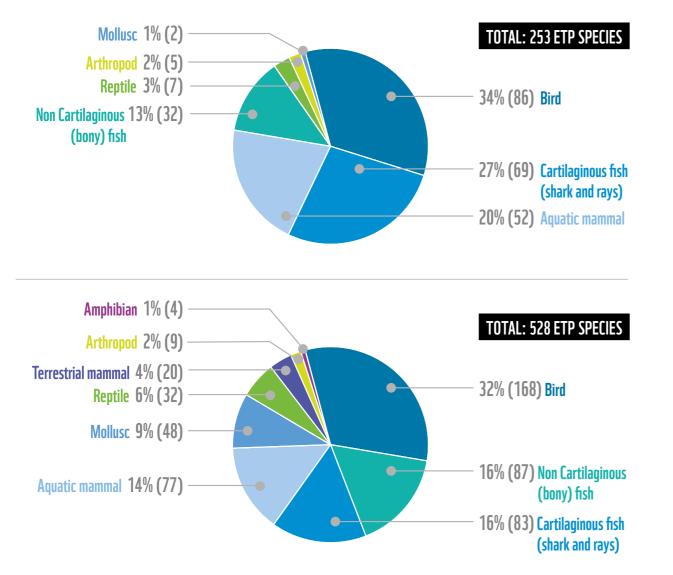
## **RISK CASE STUDIES**

Although over 80% (by weight) of the seafood consumed in the UK is imported, at the time of writing there are no national regulations, similar to the US Marine Mammal Protection Act (MMPA) import Provision (1972),<sup>30</sup> or require due diligence to ensure imported seafood is sourced from well-managed fisheries or farms which do not cause negative impacts to the marine environment or local



#### **5.2 RISK TO ENDANGERED, THREATENED AND PROTECTED (ETP) SPECIES**

The fisheries and farms associated with the UK's global seafood supply chains impact many species around the world. Many of these are considered as vulnerable, endangered, or threatened with extinction at local or international levels. Records show that at least 253 ETP species have been directly impacted by fishing or fish-farming activities (Figure 3a). An estimated total of 528 ETP species are at risk of interacting with fisheries and farms associated with the supply chains (Figure 3b), meaning fishing or fish-farming activities overlap with their natural habitats. Therefore, the survival of close to half of all the recorded species (253 of 528) is threatened by the UK's demand for seafood.



**Figure 3a and 3b:** Pie charts of all species recorded as having interacted with a fishery or farm at least once (top), and as being at risk of interacting with a fishery or farm (bottom) categorised by group. Note that data was not available for all supply chains included in this report. The full list of ETP species is available as an Appendix of the Technical Report.

In reality, the UK's seafood consumption is likely to pose an even higher level of threat to marine biodiversity, and certification alone cannot guarantee that seafood produced under such schemes is not putting ETP species at risk. ETP species interaction data were only available for around 60% of the 157 supply chains studied, primarily from the reports of Fishery Improvement Projects (FIPs) and certification schemes like the Marine Stewardship Council (MSC) and the Aquaculture Stewardship Council (ASC). This means the analysis is likely to be an underrepresentation of the potential impact of UK seafood consumption on ETP species, as there is a lack of data for 40% of the supply chains studied. Details of the full analysis are available in the Technical Report. In terms of those species with records of direct interactions (Figure 3a), birds are most at risk –and seabird species like the Balearic shearwater, common eider and Atlantic puffin are currently categorised as endangered. The group facing the second highest risk are cartilaginous fish like angel sharks, shortfin mako sharks and giant manta rays. Mammals come in third, with species like the North Atlantic right whale, sea otter and humpback whale listed as endangered or critically endangered. The fourth group are bony fish such as the critically endangered European eel and endangered deepwater redfish. These four groups represent 94% of the species recorded as being at risk as a result of the UK's seafood consumption.

#### **5.3 RISK FROM AQUAFEED**

Aquaculture production is becoming increasingly important in meeting our rising demand for seafood. While farmed molluscs (oysters, clams and mussels) require no external feed inputs, most farmed seafood species sold in UK supermarkets – such as salmon, sea bass, sea bream and trout – require feed to grow. The feed used in aquaculture is composed of fishmeal, fish oil and other ingredients like plant or other animal-based proteins.

Globally about two-thirds of fishmeal and fish oil (FMFO) is made from wild fish caught specifically for aquafeed, and the other third comprises trimmings and by-products (e.g. offal) of fish caught for human consumption. There are various sustainability concerns around FMFO, including ecosystem impacts such as the depletion of the wild stocks used for FMFO, the use of fish in feed that could otherwise be used for human consumption, whether fish used in FMFO originate from IUU fishing activities, and the lack of traceability and transparency of aquafeed ingredients. In response, a continuing decrease in FMFO in aquafeeds is predicted as feed companies develop formulations which increasingly reduce the need for marine ingredients, replacing them with fishery and aquaculture processing by-products or trimmings (predicted to reach 49% by 2022)33, 34 and plant-based protein alternatives.

While carefully calibrated diets – including plant-based ingredients and FMFO produced from wild-caught fish – are used in salmon and trout farms, the complex and opaque feed supply chains for warm-water prawns in Asia are extremely challenging to trace.

The seafood market currently relies on assurances of sustainability from aquaculture practitioners, including aquafeed producers, who may in turn be covered by certification schemes for marine products. However, there is still concern over the transparency and traceability of the source of FMFO ingredients.<sup>35</sup> Trade data on feed alone do not improve clarity over sustainability because it is impossible to know what ingredients are included in the feed. Such complexity, limited transparency and lack of corporate accountability across the sector restricts external scrutiny – and, in turn, is likely to mask the full scale of social and environmental problems in aquaculture supply chains.

#### 5.4 RISK FROM PROCESSING AND TRADING IN THE UK SEAFOOD SUPPLY CHAIN

One of the major risks of seafood consumption is the complex supply chain, particularly when the seafood has been processed before being imported to the UK.

The UK is a market which focuses on processed products, with few consumers interested in whole fish. Seafood products available in the UK are often processed multiple times. For example, freshly wild-caught or farmed fish will be gutted and headed in the fishing vessels or primary factories in the producing countries, and packed in frozen fish blocks. The frozen fish blocks will then be transported to factories in another country and further processed into breaded fish fingers and other products before they are shipped to the UK. At least 16% of the commodities investigated were imported into the UK from an intermediary country. These intermediary countries may carry out processing themselves, or may be on trade routes from the country of origin to the UK.

By far the main processing country in the UK seafood supply chain is China, followed by Germany, Poland, Thailand and Denmark. The Netherlands is identified as a key trading country for seafood imported by the UK. Whitefish (Alaskan pollock, Atlantic cod, haddock), farmed whitefish (catfish, sea bass and sea bream) and salmonids (Atlantic and Pacific salmon) are the main groups of commodities (65%) that are processed, but also included are crustaceans (Norway lobster, blue crabs), large pelagics (skipjack and yellowfin tuna) and molluscs (scallops).

Harvested and raw seafood sometimes travels far from its fishing grounds in Europe to processing countries in Asia, then processed products are shipped back to the UK. As processed seafood has significantly changed its form, shape or content, the current labelling regulation does not require these products to report what species they contain. Furthermore, instead of the fishing country, the processing country has become the country of origin of these products.

It is therefore not surprising that there are risks of mislabelling of products, a lack of traceability, carbon footprint of transporting seafood for processing, and uncertainty around other issues associated with buying seafood products (such as lack of information on supply chain contributions to other social and environmental issues).

# SECTION 6.

ler Greece © Clarus Chu/WWF-UI

# **CONCLUSION & RECOMMENDATIONS**

As a net importer of seafood, the UK's seafood footprint has significant environmental and social impacts far beyond our shores. In recognition of this, the seafood industry and governments have made some positive progress and improvements on how seafood is produced, managed and sold in the UK in the past two decades, such as commitments to certification schemes, support of fisheries improvement projects and advocacy on fisheries policy reforms, but there is much more still to do.

This report analyses the global footprint of the UK's seafood consumption and highlights opportunities to shift towards lower footprint (or impact) species that could potentially help address the nature and climate crises. The sustainability performance of major seafoodproducing countries for the UK market is assessed and key sustainability issues that require further improvement are identified.

Seafood has the potential to be a part of the solution to the triple challenge of meeting the needs of people while restoring nature and keeping the global temperature within safe limits. It is estimated that global seafood production could increase by 36-74% by 2050 to support the demand for protein if fisheries policy reforms, technological innovations and wider acceptance of new approaches including land-based farmed seafood can be achieved.<sup>36</sup> If the public follow the UK governments' recommendation to consume two portions of fish a week, and to account for future human population growth, urgent and collective action must be taken to ensure 100% of our seafood comes from sustainable sources, including an increase in consumption of UK locally produced seafood and a reduced reliance on imported seafood.

Concerted and collaborative efforts from UK governments and retailers are required to shift UK seafood production onto a sustainable footing for

the long term and avoid exporting our environmental footprint to other countries. UK governments should lead the way in filling the current gaps in regulations and standards for both imported and domestic seafood. UK businesses should support sectoral transformation on seafood sourcing. At the same time, consumers can help by making responsible seafood choices.

Specific recommendations for the UK governments, business and consumers are as follows.

#### **RECOMMENDATIONS FOR UK GOVERNMENTS**

- 1. Set meaningful and measurable targets for UK domestic seafood production to meet the objectives of the Fisheries Act (2020), and to ensure fish stocks are healthy, fishing does not exceed sustainable limits, the recovery of ETP species including through implementation of Remote Electronic Monitoring (REM) with cameras, protection of biodiversity, and that seafood production progresses towards Net Zero.
- 2. Develop a set of core environmental standards for imported seafood alongside those for agricultural products to help deliver a strong and comprehensive sustainable food strategy. The US Marine Mammal Protection Act (1972) provides an example of how this can be done in the context of protecting marine mammals from the impacts of fishing.

- 3. Strengthen the illegal, unreported and unregulated (IUU) fishing regulations to develop due diligence requirements for imported seafood (similar to deforestation risk commodities) and demonstrate leadership in international fisheries management and trade forums.
- 4. Provide financial support, for example through the UK's Blue Planet Fund, to lower income countries and the UK Seafood Fund for UK producers like fishers and fish farmers to help reduce their seafood production footprint and support technical innovations.

#### **RECOMMENDATIONS FOR UK BUSINESSES**

- Adopt the Seascape approach of the WWF Basket that goes beyond certifications with time-bound and publicly available targets to reduce seafood footprints, including through promoting low footprint seafood consumption and investing in regional seafood processing facilities.
- 2. Work with supply chains including catching and fish farming sectors to close traceability gaps of their products to reduce IUU fishing risks and increase transparency of fishmeal and fish oil used in feed.
- 3. Publicly disclose sustainability information on seafood species sold to inform consumer choices.
- 4. Advocate for improvements to government regulations, third-party certification schemes including small scale fisheries and support seafood producers on technological innovations to reduce seafood footprints.

#### RECOMMENDATIONS FOR UK Consumers

- 1. Opt for lower footprint seafood choices where possible, particularly locally produced seafood such as UK mussels, to decrease the demand for imported seafood.
- 2. Follow <u>WWF's 'top tips</u>'<sup>37</sup> on seafood consumption, including more diverse and low trophic level species like sardines, to reduce pressure on more popular choices.
- 3. Support calls for more stringent core environmental standards for imported food and improved labelling requirements, including for seafood.



# SECTION 7.

on farm in Aysen Region, Chile © Yawar Motion Films / WWF-US

## METHOD

The findings and analysis in this report are based on the following summarised steps:

Data on annual import and export volumes for the focus resources for the period 2015-2019 were obtained from Her Majesty's Revenue and Customs (HMRC) trade data.<sup>38</sup> Marine Management Organisation (MMO) landings data<sup>39,40</sup> were used to calculate total volumes of each sub-commodity group assessed in this study landed in 2019 by the UK fleet. Total quantities of farmed seafood produced in UK waters in 2018 (the most recent data available at the time of analysis) were determined from Eurostat 'Production from aquaculture excluding hatcheries and nurseries' data.<sup>41</sup> These data sources were then aligned as closely as possible in terms of species/family classification, based on the most important seafood commodities for UK consumers and their domestic and international supply chains.

COMMODITY GROUP	RESOURCE SUB-CATEGORIES	COMMODITY GROUP	RESOURCE SUB-CATEGORIES
WHITEFISH	Atlantic cod, Greenland cod, haddock, monkfish, Pacific cod, saithe, Alaskan pollock, European pollack	MOLLUSCS	Squid ( <i>Loligo</i> spp.), scallops (incl. queen scallops, king scallops), shortfin squid, mussels ( <i>Perna</i> spp. and <i>Mytilus</i> spp.)
SALMONIDS	Atlantic salmon, Danube salmon, Pacific salmon, trout	SMALL PELAGICS	Herring, mackerel, sardines (European pilchard, other)
CRUSTACEANS	European lobster, American lobster, Norway lobster (scampi/Nephrops), other crab (incl. blue swimming crab, snow crab), edible crab, warm-water prawns, cold-water prawns	FARMED WHITEFISH	Catfish (basa/Pangasius), European sea bream, European sea bass
LARGE PELAGICS	Albacore tuna, skipjack tuna (or stripe-bellied bonito), swordfish, yellowfin tuna	FLATFISH	Plaice, sole

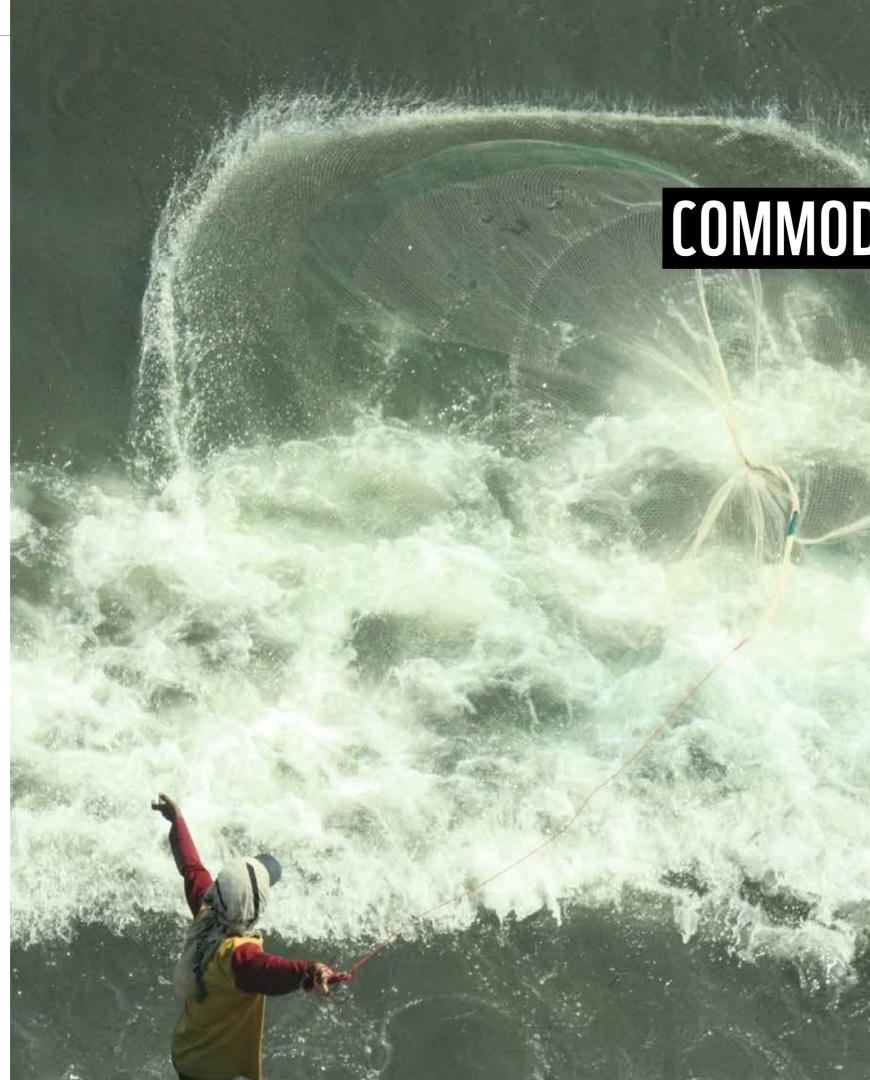
3

The UK's seafood consumption was subsequently estimated as the product of domestic production (wild capture and/or aquaculture) and international imports, minus exports of the UK's production.

The primary source countries which were collectively responsible for around 90% of UK imports of each resource on average were included in the assessment, along with the UK's domestic production. This resulted in 157 production supply chains (representing around 82% of the assessed seafood by volume in 2019) and an additional 37 intermediary (processing/trade) supply chains being considered in the study.

A risk assessment comprised of 10 indicators was undertaken to capture the range of key ecological, social and governance risks associated with seafood production supply chains, at a deliberately high level. The indicators were: 1. Direct impact on population(s) or stock(s) of resource, 2. Ecosystem impact, 3. Climate change impact, 4. Endangered, threatened and protected (ETP) species impact, 5. Social concerns associated with supply chain, 6. Management effectiveness, 7. Sustainability certification progress, 8. Fisheries Governance: IUU fishing, 9. Rule of law, and 10. Labour rights. See Appendex I & II.

For each supply chain, each indicator was independently allocated a traffic light score of 1 (Low), 2 (Medium) or 3 (High) risk based on the best publicly available evidence. In order to facilitate some comparison of the relative levels of risk associated with different supply chains for a commodity, and more cautiously different commodities, the sum of the 10 risk indicator scores was considered as the supply chain footprint – the higher the score, the bigger the footprint (minimum of 10 for a 'low risk' score of 1 for all 10 indicators, maximum of 30 for a 'high risk' score of 3 for all 10 indicators).



# SECTION 8. Commodity profiles

Throw net © Clarus Chu/WWF-UK

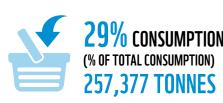


Alaskan pollock (Theragra chalcogramma) Atlantic cod (Gadus morhua) **European pollack** (*Pollachius pollachius*) Greenland cod (Gadus ogac) Haddock (Melanogrammus aeglefinus) Monkfish (Lophius spp.) Pacific cod (Gadus macrocephalus) Saithe (Pollachius virens)



**IMPORTS 197,191 TONNES** 







**AVERAGE FOOTPRINT** 



Saithe Haddock

Atlantic cod, European pollack Greenland cod Monkfish

Alaskan

pollock

Pacific cod, **Greenland cod**  (tonnes)

**Highest volume** 



Lowest volume (tonnes)

Whitefish represents one of the most important seafood commodities for the UK, making up 29% of all of the seafood eaten in 2019. Atlantic cod, haddock and Alaskan pollock drive the UK whitefish market, and imports make up approximately 77% of the whitefish the UK consumes. Nevertheless, the UK also exports around 28% of its whitefish to other countries.

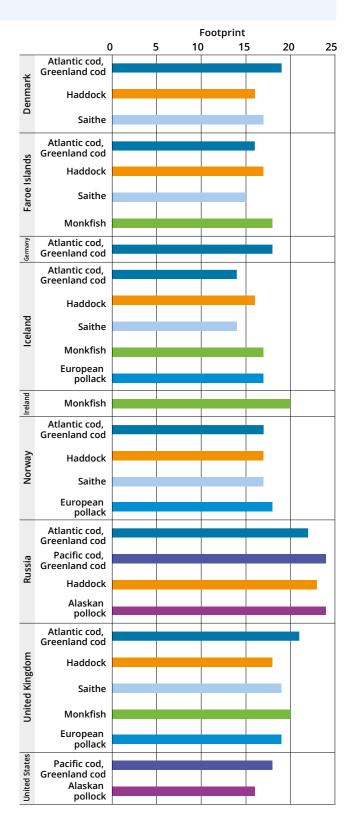
Considering all of the main supply chains together, saithe is associated with the lowest footprint while Pacific cod and Alaska pollock (fished by Russia in particular) scored the highest.

In general, the footprints of supply chains originating from the US and Iceland fall at the lower end of the scale, and UK, Ireland and Russia at the upper end. For Atlantic cod in particular, the UK is at the top end of the scale of footprint scores, marginally lower than Russia, and Iceland has the lowest footprint score. For haddock, supply chains originating from the UK and Norway have the lowest footprint and Russia the highest. Conversely, the UK and Ireland supply chain footprints for monkfish are the joint highest out of supply

## 2019 DOMESTIC PRODUCTION AND IMPORTS (T)

countries. European pollack is a minor contributor to the UK's whitefish consumption and footprint scores for supply chains vary little.

It should be noted that while the UK imports a large quantity of whitefish from China, China is not a major whitefish producer. Risk assessments cannot be conducted as the imported volumes from China cannot be definitively connected to origin fishing countries. Nevertheless, it is reported that significant volumes of whitefish from Russia could be entering the UK via processing in China.





Atlantic salmon (Salmo salar) Danube salmon (Hucho hucho) Pacific salmon (Oncorhynchus spp.) Trout (Oncorhynchus spp., Salmo trutta)



#### DOMESTICALLY PRODUCED 168,106 TONNES

IMPORTS 100,627 TONNES





25% UK SELF-SUFFICIENCY RATE Salmonid consumption in the UK is dominated by farmed Atlantic salmon (or Danube salmon). It is interesting to find out that while the UK imports a significant volume of salmon, a large quantity of salmonids (mainly salmon) is also produced and exported.

Denmark and the Faroe Islands are considered to have a lower footprint than the UK and Norway for farmed Atlantic salmon in part due to their better performance on rule of law and labour rights, and salmon from Denmark are farmed on land using recirculating aquaculture systems (RAS) that have no contact with the marine environment. Trout production, in particular in the UK, differs from that of Atlantic salmon and takes place on relatively small farms using ponds or raceway systems. However, trout supply chains have similar footprints to those of Atlantic salmon. Wild-capture production of Pacific salmon in Canada and the US is associated with a slightly higher footprint, largely to

## 2019 DOMESTIC PRODUCTION AND IMPORTS (T)

Highest volume (tonnes)

Lowest volume

(tonnes)

#### **AVERAGE FOOTPRINT**





Atlantic salmon, Danube salmon

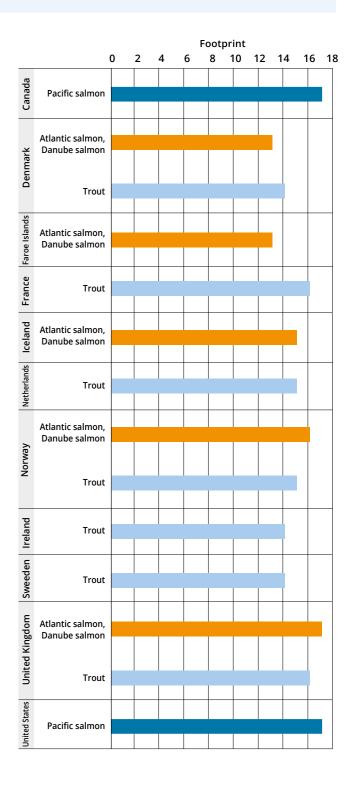
Trout

Pacific salmon

do in Da Fr ar pr Pa fig

do with the status of the stocks and risk of bycatch, including of ETP species.

Data indicated that the UK imports salmonids from China, France, Germany, Poland and Sweden, but supply chain analysis could not be conducted as these countries do not produce salmonids. It is likely that a notable portion of the Pacific salmon arriving in the UK from China are in fact fished in Russia. Similarly, Atlantic salmon imported from Sweden are believed to be originally produced in Norway.





American lobster (Homarus americanus) Cold-water prawns (Crangon crangon, Pandalus spp., other/unidentified) Edible crab (Cancer pagarus)

European lobster (Homarus gammarus) Norway lobster (Nephrops norvegicus) Other crab (incl. king crab, blue crab, snow crab – Paralithodes camchaticus, Chionoecetes spp., Callinectes sapidus)

**Farmed: Warm-water prawns** (mostly *Penaeus* spp. or *Crangon* spp., also *Parapenaeus longirostris, Pandalidae*, other/unspecified)

DOMESTICALLY PRODUCED 67,674 TONNES

IMPORTS 84,120 TONNES









The UK imports crustaceans from almost all continents, spreading across Asia, Europe, North and Latin America. At the same time, the UK exports half of its own crustacean production to other countries. Apart from wildcapture crustaceans, warm-water prawns are mainly from aquaculture production and account for 69% of imported crustaceans. Vietnam and India collectively make up around half of the UK's warm-water prawn imports. While a majority of UK-produced wild-capture edible crabs are consumed domestically, large volumes of Norway lobster, particularly large individuals, are exported to Europe and beyond. Although the UK produces its own lobster, around half the lobster we consume is from North America.

The UK also relies on imports from countries such as Norway, Canada and Iceland for cold-water prawns. Overall, Iceland's supply of wild capture cold-water prawns falls at the lowest end of the footprint scale, whereas farmed

### 2019 DOMESTIC PRODUCTION AND IMPORTS (T)

**AVERAGE FOOTPRINT** 







Warm-water

prawns

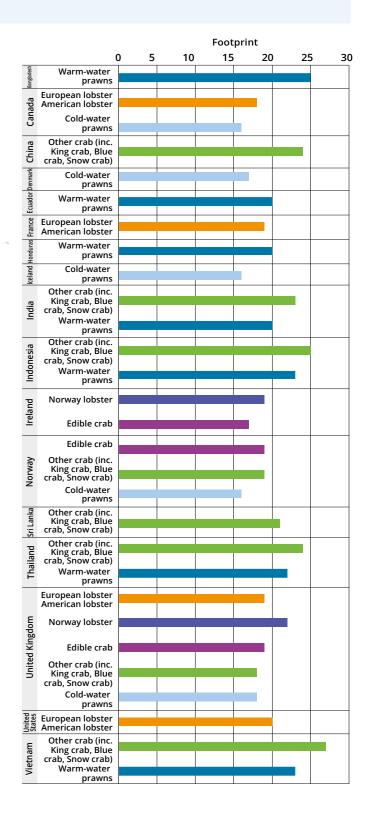


Highest volume (tonnes)

Cold-water Edible prawns crab

e European lobster, American lobster

, Norway lobster Other crab Lowest volume (tonnes) warm-water prawns and wild capture crabs from Southeast Asia have the highest footprints. Deforestation of tropical mangroves and significant feed inputs to support highly intensive pond production of warm-water prawns lead to a high risk of ecological and climate change impacts. It's particularly concerning to find that Norway lobster – which are only caught in Europe and the Mediterranean – are processed in China, India and Vietnam before entering the UK.





## **8.4 LARGE PELAGICS**

#### SUB-COMMODITY GROUPS

Albacore tuna (Thunnus alalunga) Skipjack tuna (Katsuwonus pelamis) Swordfish (Xiphias gladius) Yellowfin tuna (Thunnus albacares)



The UK relies almost totally on imports for large pelagic species: only 0.3% of our consumption is produced domestically. Skipjack tuna makes up over 90% of imported tuna species, and they are sold in tinned form. Major skipjack tuna producing countries are Ecuador, Ghana, Mauritius and the Philippines. Yellowfin tuna comprised 6.5% of total large pelagic imports, and less than 1% was comprised of albacore tuna and swordfish. Interestingly, the UK also exports large pelagics, implying that we act as a reexporter of our imported seafood. The environmental and social footprint associated with the UK's consumption of large pelagic species is relatively high compared with other seafood commodities. The ecosystem impact, ETP species impact, rule of law, and labour rights concerns contribute to the high footprints across all supply chains studied, except albacore tuna. Furthermore, there are high rates of bycatch associated with the pelagic gears deployed by the fisheries (e.g. purse seines and longlines), particularly when fish aggregating devices (FADs) are used – they not only attract tuna, but also

### 2019 DOMESTIC PRODUCTION AND IMPORTS (T)

other vulnerable or endangered marine species.

Import data indicates that the UK imports pelagics from Denmark, Germany and the Netherlands but it is likely they act as intermediary trading countries, not producers. Thailand is identified as a processing country for large pelagics like skipjack tuna before they enter the UK.

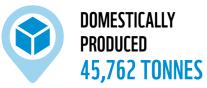
		Footprint				
	0	) 5	5 10	) 1	5 20	) 25
Brazil	Swordfish					
Chile E	Swordfish					
	Skipjack tuna					
Ecuador	(or Stripe- bellied bonito)					
ECI	Yellowfin tuna					
e	Yellowfin tuna					
France	Albarcore tuna					
	Skipjack tuna					
na	(or Stripe-					
Ghana	bellied bonito)					
	Yellowfin tuna					
е	Swordfish					
Greece	Albarcore tuna					
Indo	Swordfish					
nesia	Skipjack tuna (or Stripe-					
opul Indo	bellied bonito)					
Mauritius   Malta reland Indonesia   Indoa	Albarcore tuna					
Aaltal	Albarcore tuna					
sr	Skipjack tuna					
uritit	or Stripe- bellied bonito)					
	Yellowfin tuna					
Portugal Philippines Papua New Guinea	Skipjack tuna (or Stripe-					
s Papu Gu	bellied bonito)					
ippine	Skipjack tuna (or Stripe-					
Phi	bellied bonito)					
gal	Skipjack tuna (or Stripe-					
ortu	bellied bonito)					
٩.	Albarcore tuna					
	Swordfish					
helles	Skipjack tuna					
Seycho	or Stripe- bellied bonito)					
Š	Yellowfin tuna					
	Swordfish					
	Skipjack tuna					-
in.	(or String					
Spain	Yellowfin tuna					
-	Albarcore tuna					
Vietnam sri Lanka	Swordfish					
am St						
Vietr	Swordfish					



Scallops (mainly king scallops Pecten maximus, also Pecten spp., Chlamys spp., *Placopecten* spp.)

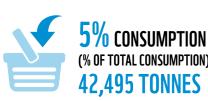
Shortfin squid (Illex spp., Todarodes sagittatus, Ommastrephes sagittatus) Squid (Loligo spp.)

Farmed: Mussels (Mytilus spp, and Perna spp.)



**IMPORTS 9,763 TONNES** 







Molluscs have the highest self-sufficiency rate among all the seafood commodities studied, implying that significant quantities of what the UK produces are consumed locally. Farmed Mytilus mussels, and wild-capture Loligo squid, king and queen scallops are important components of UK mollusc production; and around one-third of this production is exported. Nevertheless, the UK imports molluscs including farmed Mytilus mussels from other European countries,

farmed Perna mussels from New Zealand, Loligo and shortfin squid from Asian countries, and scallops from the Americas. The molluscs present a very diverse range of footprints. Assessed farmed mussel productions have the lowest footprints thanks to their filter feeding behaviours which mean no food is required, with low impact on ETP species, and minimal impacts to the marine habitats in most of their producing countries in Europe and Oceania. In fact, farming

### 2019 DOMESTIC PRODUCTION AND IMPORTS (T)



Lowest volume (tonnes)

Scallops Mytilus mussels

**AVERAGE FOOTPRINT** 

Perna

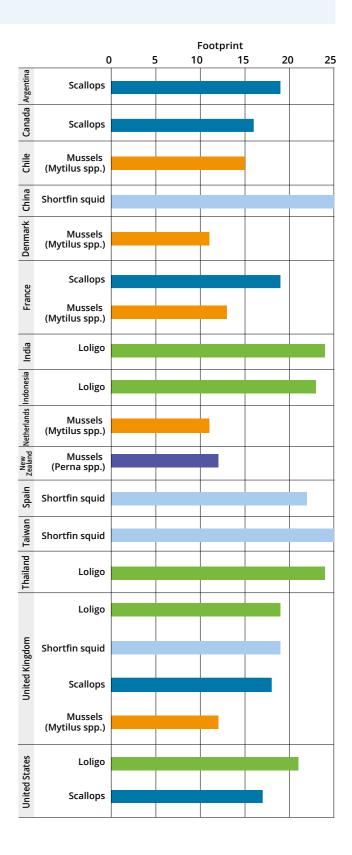
mussels

Loligo squid

Shortfin squid

Highest volume (tonnes) mussels is generally considered to be one of the most environmentally sustainable aquaculture practices that currently exist.

In contrast, overfishing, IUU risk, ineffective fisheries management and human rights abuse concerns have resulted in high seafood production footprints for the Loligo and shortfin squid species, particularly those from Asian countries such as China, India, Thailand and Taiwan.





**8.6** SMALL PELAGICS

#### SUB-COMMODITY GROUPS

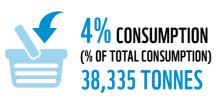
Herring (Clupea harengus, Clupea pallasii)
Mackerel (Scomber scombrus, Scomber japonicus, Scomber australasicus)
Sardines (European pilchard Sardina pilchardus and 'other' sardine species Sardinops spp., Sardinella spp., undefined)



DOMESTICALLY PRODUCED 103,259 TONNES









While the UK is a large producer of small pelagic species, we also export an almost equal amount of this domestic production to other countries. At the same time, the UK imports almost the same quantity of small pelagics that it consumes. It is possible that – as with large pelagics – the UK also re-exports some of its imported small pelagics to other countries. Apart from countries from Europe, Morocco, China and Thailand also supply small pelagics to meet UK consumer demand.

As was the case for mussels, average footprint scores of small pelagics are also low among all seafood commodities. However, continuous failures in reaching agreement on catch quotas between producing

### **2019 DOMESTIC PRODUCTION AND IMPORTS (T)**

**AVERAGE FOOTPRINT** 

Herring

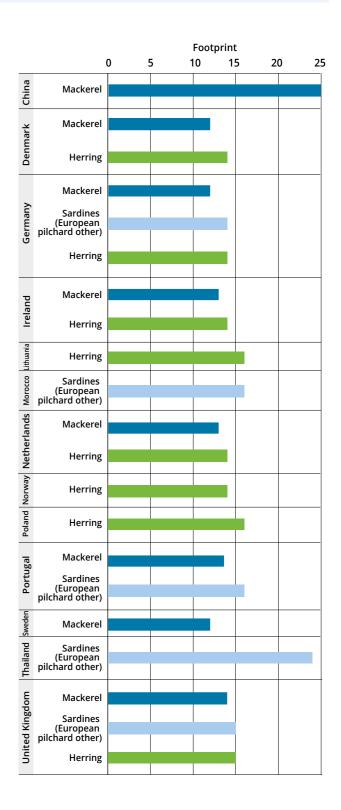
Mackerel



Sardines

Highest volume (tonnes)

Lowest volume (tonnes) countries in the Northeast Atlantic in recent years have cast serious doubt on the long-term sustainability of small pelagics such as mackerel and herring. Pacific mackerel from China and sardines from Thailand have significantly higher footprints owing to stock status concerns, ineffective fisheries management, rule of law issues and human rights abuse concerns.





## **8.7 FARMED** WHITEFISH

#### SUB-COMMODITY GROUPS

Catfish (Pangasius spp.) European sea bass (Dicentrarchus *labrax, Dicentrarchus* spp.)

Sea bream (Sparus aurata, Dentex dentex, Pagellus spp., Sparidae spp., Ray's bream *Brama* spp.)



DOMESTICALLY PRODUCED **412 TONNES** 





3% consumption (% OF TOTAL CONSUMPTION) **25,639 TONNES** 



Farmed sea bass and catfish (basa or Pangasius) are featured in the top five most popular farmed seafood species in the UK, promoted as alternative whitefish to cod and haddock. Farmed sea bass and sea bream are mainly produced in Turkey and Greece, while Vietnam is the biggest global producer of catfish. Sea bass and sea bream are also imported to the

UK through Germany and the Netherlands as intermediary countries.42

Sea bass and sea bream are often produced on the same farms but in separate cage systems, and catfish are mainly grown in pond systems. Potential use of unsustainable feed, pollution owing to effluent discharge to the nearby environment, and labour rights concerns

### 2019 DOMESTIC PRODUCTION AND IMPORTS (T)

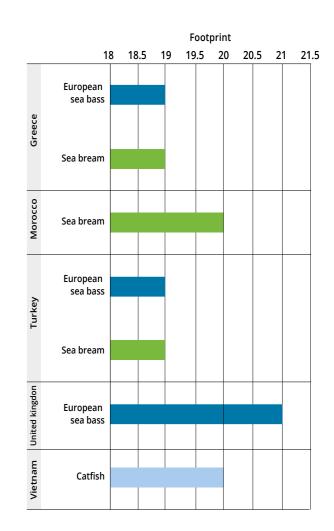
Lowest volume (tonnes)

**Highest volume** 

(tonnes)

are the key impacts of these farmed whitefish.

This report includes wild-capture sea bass caught by the UK fishing fleet and recreational fishers. Wild sea bass have been overfished and commercial fishing has been banned within 12nm of UK shores. Furthermore, ETP species impact and ineffective management has led to it having a higher footprint when compared with farmed sea bass.



#### **AVERAGE FOOTPRINT**







Catfish

Sea bream

European sea bass



For both sole and plaice, the UK's national production provides around half of its annual consumption. Imports are derived from countries in Northern Europe like Iceland and the Netherlands,

2019 DOMESTIC PRODUCTION AND IMPORTS (T)

Denmark and the Faroe Islands. Flatfish are the least consumed commodity group overall in this report. Effective fisheries management, healthy fish stocks, low risk for IUU fishing and low concerns

#### SUB-COMMODITY GROUPS

**European plaice** (*Pleuronectes* platessa) **Dover sole** (Solea solea) Lemon sole (Microstomus kitt)

DOMESTICALLY PRODUCED Ň 5,433 TONNES **IMPORTS** 2,599 TONNES **EXPORTS** 2,879 TONNES 1% CONSUMPTION (% OF TOTAL CONSUMPTION) **5,152 TONNES** 



Highest volume (tonnes)

Lowest volume (tonnes)



for human rights abuses help Iceland outcompete other European countries, including the UK, to have the lowest production footprints for sole and plaice.

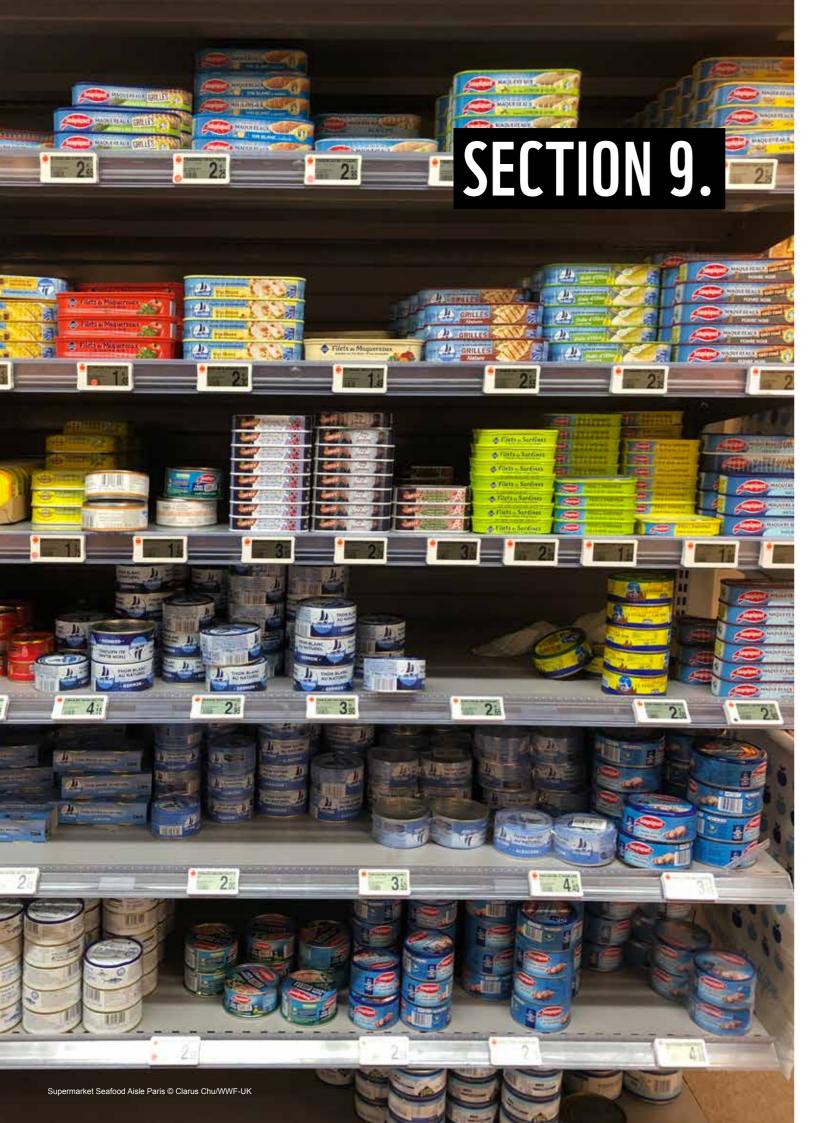


#### **AVERAGE FOOTPRINT**



Plaice





## **APPENDIX**

#### 9.1 APPENDIX I

Description of risk assessment indicators and general approach to scoring – Wild capture production supply chains

INDICATOR Number And Code	INDICATOR	MAIN Source(s)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(1) ENV_1	Direct impact on population(s) or stock(s) of resource	WWF Seafood Guide assessments, <sup>43</sup> IUCN Red List, <sup>44</sup> CITES Appendix <sup>45</sup> For tuna, WWF Back to Biology report <sup>46</sup>	Indicator of potential sustainability of fishery, considering stock assessment estimates and/ or species vulnerability ratings, where available	CITES Appendix I or II and/or IUCN Red List CR/EN/VU and/or assessed as overfished and depleted (e.g. F above fishing mortality reference points and stock biomass below biological reference points) For tuna, the stock level is below SSB40	IUCN Red List NT and/or assessed as overfished but not depleted DR depleted but not overfished (e.g. stock above limit reference points and/or target reference points (or equiv.) but F above limit reference points) Or lack of direct or indirect evidence to support assessment For tuna, information on SSB is missing	Not listed by CITES and IUCN Red List LC and/ or assessed as below fishing mortality and above biomass target reference points (or equiv.) For tuna, the stock level is above SSB40
(2) ENV_2	Ecosystem impact	WWF Seafood Guide assessments, independent assessment based on available evidence	Indicator of potential wider ecosystem impacts of fishery, for example bycatch of other target and non- target species (excluding ETP species), habitat/ VME damage due to physical impacts of gear and sensitivity of exposed habitats	Evidence of high likelihood of risk/evidence of significant impacts	Evidence of moderate likelihood of risk Or lack of direct or indirect evidence to support assessment	Evidence of low likelihood of risk/ no significant impacts

INDICATOR Number And Code	INDICATOR	MAIN Source(s)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(3) ENV_3	Climate change impact	Based on Parker & Tyedmers (2014) <sup>47</sup> and The Seafood Carbon Emissions Tool <sup>48</sup>	Indicator of fishery's relative contribution to climate change. For sake of simplicity and high-level application, only takes into account production method (on worst case scenario basis)	Independent assessment based on combination of Parker & Tyedmers (2014): Bottom trawling responsible for notable portion of production and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) greater than 10	Independent assessment based on combination of Parker & Tyedmers (2014): Pots & traps / Hooks & Lines / Gillnets / Pelagic trawls (large pelagics) / Dredges responsible for largest portion of production and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) between 5 and 10	Independent assessment based on combination of Parker & Tyedmers (2014): Divers / Surrounding nets / Pelagic trawls (small pelagics) responsible for largest portion of production and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) less than 5
(4) ENV_4	ETP impact	ETP case study, WWF Seafood Guide assessments, MSC assessments, <sup>49</sup> Fisheries Progress FIP reports, <sup>50</sup> independent assessment based on other available evidence	Indicator of ETP (Endangered, Threatened and Protected) impact associated with fishery. Considered separately to Env_2 as flags this specific risk for further investigation/ consideration	Evidence of high levels of interactions/ known impacts on ETP species	Evidence of moderate levels of interaction/ ETP bycatch at levels considered to not be having a detrimental effect on the population (with some evidence to support assumption) Or lack of direct or indirect evidence to support assessment	Evidence of low levels of interaction/ evidence to support no significant impacts of int
(5) Social_1	Social concerns associated with supply chain	Independent assessment based on available evidence and/ or Global Slavery Index 2018 – Spotlight on modern slavery in the fishing industry <sup>51</sup>	Indicator of social risks associated with the fishery or supply chain, such as human trafficking, forced labour and poor working conditions	Evidence of high risk e.g. recent (<5 years) examples of issues or concerns raised in literature and/or country's fishing industry categorised as high risk based on Global Slavery Index	Evidence of moderate risk e.g. older (>5 years) examples of issues or concerns or proxy evidence of relevant social risks available and/or country's fishing industry categorised as medium risk based on Global Slavery Index Or lack of direct or indirect evidence to support assessment	Evidence of low risk and/or country's fishing industry categorised as low risk based on Global Slavery Index

INDICATOR Number And Code	INDICATOR	MAIN Source(s)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(6) MGT_1	Management effectiveness	WWF Seafood Guide assessments, Independent assessment combined with evidence sources such as FishChoice, <sup>52</sup> MCS Good Fish Guide <sup>53</sup>	Indicator of governance effectiveness associated with fishing industry. Whereas Social_3 and Mgt_3 are at the country level and consider specific outcomes of governance effectiveness (e.g. prevalence of IUU fishing – Mgt_3), this indicator takes into account evidence of specific strengths/ issues associated with management of the fishery	Governance/ management considered ineffective or largely absent	Known issues with governance/ management regime that require improvement Or lack of direct or indirect evidence to support assessment	Governance/ management considered effective
(7) MGT_2	Sustainability certification progress	MSC, Fishery progress FIP reports and WWF MSC objection information recorded on MSC website	Indicator of extent of third-party sustainability certification associated with supply chain	No evident sustainable certification or FIP progress or with WWF's objection not withdrawn or with WWF's unsustainable statement	Production partially certified and/or production (partially or in full) part of a FIP. Where applicable, WWF's objection was withdrawn. or Production largely/fully certified and without WWF's objection, but the certification is associated with conditions	Production largely/ fully certified and without WWF's objection or conditions
(8) Mgt_3	Fisheries Governance: IUU Fishing	IUU Fishing Index <sup>54</sup>	Index of countries' vulnerability, prevalence and response to IUU fishing	Index >3	Index 2-2.99	Index <2
(9) Social_2	Rule of Law	Rule of Law Indicator <sup>55</sup> World Bank Governance Indicators	Perception of how good laws are and how well they are implemented	Indicator <-0.3	Indicator -0.3-1	Indicator ≥1
(10) Social_3	Labour Rights	ITUC Global Rights Index <sup>56</sup>	Perception of how well basic labour rights are implemented	Index 4-5	Index 2-3	Index=1

#### 9.2 APPENDIX II

Description of risk assessment indicators and general approach to scoring – Aquaculture production supply chains

INDICATOR Number And Code	INDICATOR	MAIN Source(s)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(1) ENV_1	Direct impact on population(s) or stock(s) of resource	Independent assessment based on available evidence	Indicator of potential impacts of production method on wild stock, for example through genetic modification or disease	Documented evidence of high risks / known impacts	Evidence of potential risk but extent of impacts unknown Or lack of direct or indirect evidence to support assessment	Evidence of low likelihood of risk/ no significant impacts
(2) ENV_2	Ecosystem impact	Independent assessment based on available evidence	Indicator of potential wider ecosystem impacts of farming method, for example mortality of non-ETP bycatch, habitat impacts	Evidence of high likelihood of risk/evidence of significant impacts	Evidence of moderate likelihood of risk Or lack of direct or indirect evidence to support assessment	Evidence of low likelihood of risk/ no significant impacts
(3) ENV_3	Climate change impact	Based on Boyd (2013) <sup>57</sup> , The Seafood Carbon Emissions Tool <sup>48</sup> and Gephart et al. (2021) <sup>58</sup>	Indicator of aquaculture production methods' relative contribution to climate change (on worst case scenario basis)	Independent assessment based on conclusion that production method likely to have high carbon footprint relative to most wild capture fisheries and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) greater than 10	Independent assessment based on conclusion that production method likely to have moderate carbon footprint relative to most wild capture fisheries and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) between 5 and 10	Independent assessment based on conclusion that production method likely to have low carbon footprint relative to most wild capture fisheries and The Seafood Carbon Emissions Tool: Average GHG emissions (tonnes of CO2 per kg of fish) less than 5
(4) ENV_4	ETP impact	ETP case study, independent assessment based on available evidence	Indicator of ETP species impact associated with aquaculture production method. Considered separately to Env_2 as flags this specific risk for further investigation/ consideration.	Evidence of high levels of interactions/ known impacts on ETP species	Evidence of moderate levels of interaction/ETP species bycatch at levels considered to not be having a detrimental effect on the population (with some evidence to support assumption) Or lack of direct or indirect evidence to support assessment	Evidence of low levels of interaction/ evidence to support no significant impacts of interactions

INDICATOR Number And Code	INDICATOR	MAIN Source(S)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(5) Social_1	Social concerns associated with supply chain	Independent assessment based on available evidence	Indicator of social risks associated with aquaculture industry or supply chain.	Evidence of high risk e.g. recent (<5 years) examples of issues or concerns raised in literature	Evidence of moderate risk e.g. older (>5 years) examples of issues or concerns or proxy evidence of relevant social risks available Or lack of direct or indirect evidence to support assessment	Evidence of low risk or of compliance wit social standard
(6) MGT_1	Management effectiveness	Independent assessment based on available evidence	Indicator of governance effectiveness associated with aquaculture industry. Whereas Social_2 and Mgt_3 are at the country level and consider specific outcomes of governance effectiveness (e.g. prevalence of IUU fishing – Mgt_3), this indicator takes into account evidence of specific strengths/issues associated with management of the aquaculture industry	Governance/ management considered ineffective or largely absent	Known issues with governance/ management regime that require improvement Or lack of direct or indirect evidence to support assessment	Governance/ management considered effective
(7) MGT_2	Sustainability certification progress	ASC, <sup>59</sup> BAP, <sup>60</sup> GlobalGAP <sup>61</sup> or other* *For mussels, this includes MSC	Indicator of extent of third-party sustainability certification associated with supply chain	No evident sustainable certification progress	Production partially/fully certified by body other than ASC	Production largely/fully certified by ASC (or MSC for mussels)

INDICATOR Number And Code	INDICATOR	MAIN Source(s)	RATIONALE	HIGH RISK (=3)	MEDIUM RISK (=2)	LOW RISK (=1)
(8) MGT_3	Fisheries Governance: IUU Fishing	IUU Fishing Index <sup>33</sup>	Index of countries' vulnerability, prevalence and response to IUU fishing. Extrapolated to a country's aquaculture industry (except mussels) as assume that IUU risk for the two industries would be largely comparable, mainly in relation to supply of feed.	Index >3	Index 2-2.99	Index <2 Also for all mussel ( <i>Mytilus</i> spp. and <i>Perna</i> spp.) supply chains
(9) Social_2	Rule of Law	Rule of Law Indicator <sup>34</sup> World Bank Governance Indicators	Perception of how good laws are and how well they are implemented	Indicator <-0.3	Indicator -0.3-1	Indicator ≥1
(10) Social_3	Labour Rights	ITUC Global Rights Index <sup>35</sup>	Perception of how well basic labour rights are implemented	Index 4-5	Index 2-3	Index=1

Details of all evidence and information used to inform the indicator assessment are provided within commodity chapters and Appendix 1 of the Technical Report.

#### 9.3 APPENDIX III

Limitations to the analysis of the UK's seafood supply chains

#### The UK's marine resource footprint is globally extensive but poorly understood

The HMRC trade data were used to establish and analyse the UK's seafood sourcing geographical footprint. However, the data is not sufficient to allow the user to accurately determine the geographical source of fish products entering the country since it reports the country of dispatch and not the raw material sourcing location, nor other intermediary steps in the supply chain.

Alongside the trade data limitations, it is also not possible to trace the majority of the UK's seafood imports back through processing or trade intermediaries in the supply chain, or even to the specific point of production, and therefore it is not possible to assess the full extent of risks associated with the supply chain.

### **?** Challenge of country-specific supply chain analysis

This study attempts to conduct supply chain analysis at a country level based on the most popular commodities involved, but in practice this is extremely challenging as within one country multiple different supply chains exist. Therefore, it is not possible for the UK to make simple sourcing decisions on a country-by-country basis

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