



Marine  
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# An evidence review of social, economic and environmental impacts in the Lyme Bay Dover Sole Fishery

(MMO1337)

August 2023



...ambitious for our seas and coasts

**Report prepared for:**  
Marine Management Organisation

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# 1. Executive Summary

This report is a summary of the current evidence on the Dover sole (*Solea solea*) fishery in Lyme Bay (ICES 7.e), to support the Marine Management Organisation's (MMO's) decision-making process on possible changes in management of the fishery, to achieve our objectives under the Fisheries Act (2020) and Joint Fisheries Statement.

Following stakeholder comments over the sustainability of the Lyme Bay Dover sole fishery, the MMO launched a consultation to consider whether changes to existing fisheries management measures were required. The consultation and stakeholder engagement process is summarised in section 3. The key environmental, social, and economic concerns raised by stakeholders and the environmental, social, and economic data gathered by the MMO between 2022 and 2023 in partnership with Cefas, Natural England, Seafish and the Inshore Fisheries and Conservation Authority (IFCA) as well as the results from the online consultation and facilitated workshop is summarised in Section 4. A synthesis of the available evidence is in the discussion Section 5, with a conclusion in Section 6, that notes the strengths and weaknesses in the evidence available, highlighting key themes and further evidence needs.

It was found in the consultation that the majority of stakeholders support the need for additional fisheries management in Lyme Bay. The evidence shows that following a quota increase between 2015 and 2022 there has been a corresponding increase of sole 7.e landings. While the Dover sole stock assessment does not yet show major causes for concern, reports from local stakeholders of overfishing and recent ICES advice, which suggests a less positive outlook for the sole stock than previously indicated, supports the need for taking a precautionary approach to management. Furthermore, there is additional environmental evidence that bottom trawling and dredging on coarse sediments found within 30E6 and/or 30E7 may be causing damage to benthic habitats.

From a social and economic perspective, initial data shows the overall trend for most vessel groups have shown a general increase in average annual operating profit between 2011 and 2021. However, vessels in the Lyme Bay Community Interest Company (CIC) group have shown a continued decline in operating profit in 2021 and their operating profit is now lower than it was in 2011. There is evidence of gear conflict and tension between commercial fishers using mobile and static gear and also with recreational fisheries. As well as an important commercial fishery, Lyme Bay is an important area for recreational fishing, both with reported links to the wider local economy.

More evidence is needed to understand the interactions and dynamics between the commercial and recreational fishery in this area in terms of environmental, social and economic factors. The decision-making report found here [Regional Fisheries Groups - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/92342/Regional_Fisheries_Groups_-_GOV.UK_(www.gov.uk).pdf) discusses the decisions made in light of the currently available evidence, balancing this with the need to address sustainability within the fishery.

## 2. Introduction

Between 2017 and 2022, the MMO received reports from a number of commercial fishers (including at South Western Regional Fisheries Groups meetings) and one charter vessel that the increased availability of quota for Dover sole (*Solea solea*) had resulted in increased fishing activity and a competition for space in Lyme Bay, leading to concerns over the sustainable management of the fishery. Furthermore, certain commercial fishers reported gear conflict and a decrease in the number and size of sole caught, as well as negative impacts on the marine ecology. There were also broader concerns over what these issues could mean for the future of this fishery, with younger fishers being dissuaded from entering the fishery.

Lyme Bay (ICES rectangles 30E6 and 30E7) - on which this report focuses - is in an area of the Western Channel off the south coast of England which has an important commercial fishery, particularly for sole. The total available quota for sole in ICES area 7e, which applies to the whole of the Western Channel for English vessels, increased year on year, more than doubling from 513t to 1,211t between 2015 and 2022. As a result, the MMO increased the monthly catch limits for the non-sector, under-10m and over-10m fleets from between 30kg to 225kg per month in 2015 up to 3t in 2019 and 2.8t maximum in 2022.

The MMO has worked with in partnership with the Southern Inshore Fisheries and Conservation Authority (IFCA), Cefas, Natural England, Seafish and local stakeholders to assess the social, environmental, and economic impacts of the increase in activity to inform if any different management measures may be needed, and if so, what measures would be appropriate. The decisions made related to these management measures, in light of the evidence summarised in this document, were published in August 2023. The data and evidence gathered is summarised in Table 1.

**Table 3. Summary of data and evidence reviewed by the MMO Evidence & Evaluation team on the social, economic, and environmental impacts in Lyme Bay.**

<b>Objective, summary of methods and data used to develop evidence</b>	<b>Reference</b>
<p>Objective: To gather views and discuss potential new ways of managing the sole fishery in Lyme Bay.</p> <p>Methods: The MMO carried out an online consultation (29<sup>th</sup> March – 28<sup>th</sup> May, 2023) and an in-person workshop (5<sup>th</sup> June 2023). Consultation responses were submitted online and by hand, questions were a mix of open and closed ended questions. Responses informed the agenda for the workshop.</p>	<p>The <a href="#">consultation results</a> and workshop <a href="#">report</a> can be found here and are summarised in the stakeholder engagement section 3.</p>
<p>Objective: To evaluate the impact of increased fishing effort on common sole in Lyme bay, Cefas conducted fisheries observer trips onboard fixed net vessels in Lyme Bay.</p> <p>Methods: Cefas used landings and observer data to analyse the quantity, catch per unit effort and size of sole caught in Lyme Bay and the wider area 7e from all gear types going back to 2020.</p>	<p>Cefas. (2023). Common Sole <i>Solea solea</i> in Lyme Bay. Available at: <a href="#">Cefas report - Common sole Solea solea in Lyme bay.pdf (publishing.service.gov.uk)</a> is summarised in the environmental evidence section 4.2.</p>
<p>Objective: To assess the amount of gear and how gear is marked, to understand gear conflict in Lyme Bay.</p>	<p>IFCA Southern IFCA., pers. comm. 20-22 September 2022 is summarised in the environmental evidence section 4.2.</p>

<p>Methods: Southern IFCA and the MMO carried out patrols in Lyme Bay to look for evidence of gear conflict and examine the catches and gear being used in the sole fishery. These patrols noted the absence of proper marker buoys on some fixed nets in the form of white jerry cans that were hard to see and did not display any vessel identification.</p>	
<p>Objective: To further develop understanding of environmental impacts for consideration in the decision-making process.</p> <p>Methods: MMO worked with Natural England to develop baseline information on habitat and gear type interactions.</p>	<p>MMO. (2023a). Environmental analysis of fishing activity and habitat type in Lyme Bay ICES rectangles 30E6 and 30E7. Available at: <a href="https://www.gov.uk/government/publications/u10m-catch-limits-and-lyme-bay-mmo1337">https://www.gov.uk/government/publications/u10m-catch-limits-and-lyme-bay-mmo1337</a> is summarised in the environmental section 4.2.</p>
<p>Objective: To understand the social and economic aspects of the fishery, and to learn more about the issues and impacts on fishers.</p> <p>Methods: the MMO conducted a short survey and interviews with 17 fishers</p>	<p>MMO. (2022). Social baseline report – Summary of findings. Available at: <a href="https://www.gov.uk/government/publications/u10m-catch-limits-and-lyme-bay-mmo1337">U10m Catch limits and Lyme Bay (MMO1337) - GOV.UK (www.gov.uk)</a> is summarised in the social evidence section 4.3.</p>
<p>Objective: To further develop understanding of economic impacts for consideration in the decision-making process.</p> <p>Methods: MMO worked with Seafish to develop baseline information of economic dependencies.</p>	<p>MMO, (2023b). <a href="https://www.gov.uk/government/publications/u10m-catch-limits-and-lyme-bay-mmo1337">Seafish Economic Assessment Lyme Bay 2011-2021 as of May 2023</a>. Available at: <a href="https://www.gov.uk/government/publications/u10m-catch-limits-and-lyme-bay-mmo1337">U10m Catch limits and Lyme Bay (MMO1337) - GOV.UK (www.gov.uk)</a> is summarised in the economic section 4.4.</p>



## 3. Stakeholder engagement & consultation process

### 3.1 Consultation

The MMO launched a consultation on the 29<sup>th</sup> March – 28<sup>th</sup> May 2023 in order to gather views of local stakeholders on the need for action, perceived issues, and potential management measures in Lyme Bay (Defra, 2023). The consultation contained three parts: 1) questions on the environmental, social, and economic sustainability of the sole fishery; 2) characteristics of commercial fishers; and, 3) opinions on potential management measures, their area of implementation and any other suggestions for management.

The potential management interventions included in the consultation were developed in partnership with a steering group of fishers, scientists, government policy makers and managers. These included the following:

- Increase the minimum landing size of sole to 28cm (currently it is 24cm)
- Separate catch limits for fishing inside 30E6 and 30E7 based on vessel size and gear types
- Gear separation based on area and time inside 30E6 and 30E7
- Enhanced visibility requirements for fixed net markers in Lyme Bay
- Increase fixed net size to 5" for sole inside 30E6 and 30E7
- Increase otter trawl mesh size to above 80mm
- Increase beam trawl mesh size to above 80mm
- Changes to scallop dredges to allow fish to escape more easily

The Regional Fisheries Group (RFG) team at the MMO ensured a high response rate to this consultation by discussing the consultation in person with fisheries stakeholders in ports across the area including (Mevagissey, Brixham, Beer, Axmouth, Exmouth, Lyme Regis and Weymouth) and by offering to fill out the consultation offline with fisheries stakeholders. In total, 246 responses were received from a wide range of fisheries stakeholders including commercial fishers using all gear types, recreational anglers, fish mongers and others working in the fishing industry and some community members. The majority of responses came from sea anglers (57% n=141) and commercial fishers (38% n=93)<sup>1</sup>. All gear types were represented in the consultation (pots, fixed nets, otter trawls, beam trawls, hook and line). There were also responses from crew and skippers who work on vessels over 10m and under 10m.

The majority of respondents to the consultation (84% n=206) responded that management changes were needed for fisheries management in Lyme Bay. When looking specifically at commercial fisher responses the majority agreed that management measures required some change (66% n=62). However, some fishers considered no changes were required (23% n=22), and others that they did not know

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<sup>1</sup> With cross over of n=5 respondents stating they are both a commercial fisher and recreational angler.

(10% n=9). Overall, the highest number of respondents said that there should be a mix of legal and voluntary measures (41% n=101), thereafter, respondents said they wanted to see legal measures (39% n=96) (Defra 2023). This was similar to the finding by the MMO in 2022, where only a minority of fishers surveyed were satisfied with current management and often advocated for a higher quota (12%), while the majority (71%) viewed the quota as too high and needing to be reduced (MMO, 2022).

### **3.2 In-person workshop**

Following the consultation closure, a workshop was held by the MMO on the 19<sup>th</sup> June 2023 in Plymouth, to develop mutual understanding of the key issues, range of views and common aspirations for Lyme Bay. The workshop was facilitated independently by 3KQ and workshop participants were invited by the MMO. To ensure multiple views and perspectives could inform discussions, both direct invites to a purposefully diverse group of stakeholders and an expression of interest was sent to all participants who had taken part in the consultation. The workshop was attended by 25 people,

The workshop gave participants the opportunity to explore the issues and options for managing the sole fishery in Lyme Bay, building on the consultation results. As well as this, it aimed to develop a shared understanding of the complexity of the MMO's decision-making responsibilities, the need to accommodate various interests, and the longer-term ambition to work more collaboratively with local stakeholders. The workshop report can be found [here](#).

## **4. Evidence review of key concerns**

### **4.1 Key concerns**

Concerns over the Lyme Bay sole fishery were raised with the MMO between 2017 and 2023 – informally and through the MMO's consultation on Lyme Bay, as well as at RFG meetings, in a qualitative baseline study on social impacts by the MMO in 2022, and at the facilitated workshop in June 2023.

#### **4.1.1 Environmental concerns**

There were 62 answers to an open-ended question in the consultation which asked respondents about any environmental concerns for Lyme Bay. The responses related to the status of the sole stock and overfishing, seabed habitat damage, increased fishing gear including spatial competition and interactions resulting in

some gear conflict, bycatch including mammals, birds, and crustaceans and wider negative ecosystem impacts as a result of fishing activity.

One of the key findings in the MMO's study in 2022 was that fishing effort had increased. While there was consensus from all participants concerning increased effort, there were mixed views as to the cause of the problems, which related to where fishers were from and what type of gear they fish with. This mix of views were also clear in the consultation results. Fishers from the Lyme Bay ports focused on the increase in other under 10m vessels inside the 6nm netting for sole, which they perceived as having a negative impact on the stock. Fishers from Lyme Bay ports viewed the main problems to be the increased effort caused by the higher catch limits. Brixham and Mevagissey fishers raised concerns about the increase in mobile gear activity including trawlers and scallopers outside the 6nm, who catch the majority of 7e sole quota (MMO, 2022). This is corroborated by data held by the MMO on landings, which shows most of the sole in area 7e is caught by trawlers and dredgers. The data also shows that the majority of sole in 7e is caught outside of Lyme bay (sub rectangles 30E6 and 30E7).

Many respondents to the consultation (21 out of 62 comments) raised concerns about habitat damage related to specific fishing gears (dredging and trawling impact on reefs, seagrass and nursery grounds), as well as the impact of scallop dredges that target sole (5 comments). In particular, there was concern that due to the introduction of the landing obligation, scallopers now must land the quota species they catch, which may have led to an increase in scalloper activity in Lyme Bay targeting sole.

The issue of ghost gear was described as having a negative environmental impact (11 comments). This includes both fixed nets that are caught and towed away by trawlers and/or discarded nets, as well as discarded drums/pots used for whelking. There were also suggestions that fishers set their nets too close to the shoreline (8 comments) and that some fishers set too much fixed net and catch too many fish (3 comments).

#### **4.1.2 Social and economic concerns**

Recreational anglers contributed a high number of responses to the consultation (141) and raised concerns about the degradation of the habitats and impact on the stock due to increased commercial activity, particularly close to the shore. Many were concerned about the impact of these issues - discouraging recreational anglers from visiting Lyme Bay, reducing numbers of tourists which was having a knock-on effect on local communities, local economy, tackle shops, cafes and other hospitality businesses. The recreational anglers view the commercial sector as having an impact on their activity due to poor management, overfishing and complained of little/poor quality sole. Several highlighted the importance of sea angling for mental health and argued that it contributes significantly to the local economy.

There were differing perceptions of importance of socio-economic contributions from the commercial fishery in Lyme Bay to different communities. Some of the consultation responses from fishers from Lyme Bay ports referred to the lack of benefit visiting vessels contribute to their local economy. However, responses from other sectors and from non-fishers raised the point that larger boats catch more than day boats, provide employment and are of greater socio-economic importance to the wider economy.

Commercial fishers explained that Lyme Bay has good fishing grounds, attracting vessels from outside of the area that had, in the past, overfished their local grounds using destructive methods and that they were fearful the same would happen again. Participants also raised the historical context of low quota and sole recovery measures, where many had struggled through difficult times financially to allow the stock to recover. They feared the increased effort would undo all this progress. Perceptions of the level of stewardship different types of fishers have for fishery and conservation vary greatly and are at the heart of some tensions. For example, recreational anglers perceive the commercial fishers to be destructive while CIC vessels consider their practices less damaging than vessels visiting from other areas, and netters broadly perceive triple riggers and scallopers to be more damaging than netting. This influences the management measures that different groups of fishers support. Responses from CIC vessels were concerned that local vessels from Lyme Bay may stop netting for sole entirely due to financial difficulties related to displacement and gear loss. Fishers using mobile gear also communicated their aspirations for a viable fishery and healthy stocks long term. Mobile gear fishers focused on issues such as displacement, the amount of static gear and concerns that changes to management may impact vessel's ability to earn, pay crew and support livelihoods.

Concerns were raised over the tension between mobile and static gear fishers, which manifests as gear conflict and damage, due to improper marking or is alleged to be deliberate. Some fixed net fishers raised safety concerns around gear conflict and interactions at sea.

## **4.2 Summary of evidence - environmental Impacts**

### **4.2.1 Increased fishing pressure and status of sole stock**

The Cefas report (2023) highlights that there was a significant increase of sole 7e landings (+50%) since 2015, mainly by beam trawls. In Lyme Bay, an increase in sole landings, mainly from nets and demersal otter trawls, can be observed since 2015, but also beam trawls and dredges increased to a lesser extent. An increase of effort (fishing days) in particular from set nets and to a lesser extend for demersal otter trawls and dredges in Lyme Bay since 2015 is noted. An increase in Landings Per Unit Effort (LPUE) since 2015 (where effort is days fishing), mainly for demersal

otter trawls inside Lyme Bay is also illustrated. The LPUE of sole outside of Lyme Bay for beam trawls and dredges has also increased. The increases in effort and LPUE are likely to be due to increases in the quota that more than doubled since 2015.

There is a small amount of evidence of change to length composition, which would indicate concerns for the health of the sole stock (Cefas, 2023). This was based on an analysis of MMO landings data, onshore market sampling data, and at sea observer data. The onshore sampling showed no evidence of significant changes in length composition of sole, with the exception of demersal trawls and beam trawls where there is an increase of smaller sole being landed since 2019, from the wider 7e area. Additionally, at sea observer data showed no evidence of change in the length composition of catches across gears in both 7e areas. However, an analysis of market sampling data shows a decrease in mean length for landed sole between 2012 and 2022 for demersal otter trawls and nets in Lyme Bay (Cefas, 2023). Length distributions in Lyme Bay for set nets and otter trawls are variable across this time. There is very limited data for length distributions of beam trawls and dredges in Lyme Bay. Outside of Lyme Bay, a decrease of mean length between 2012 and 2022 for beam trawls and otter trawls was noted. Cefas also noted that sole discard rates were low - 1% across all gears.

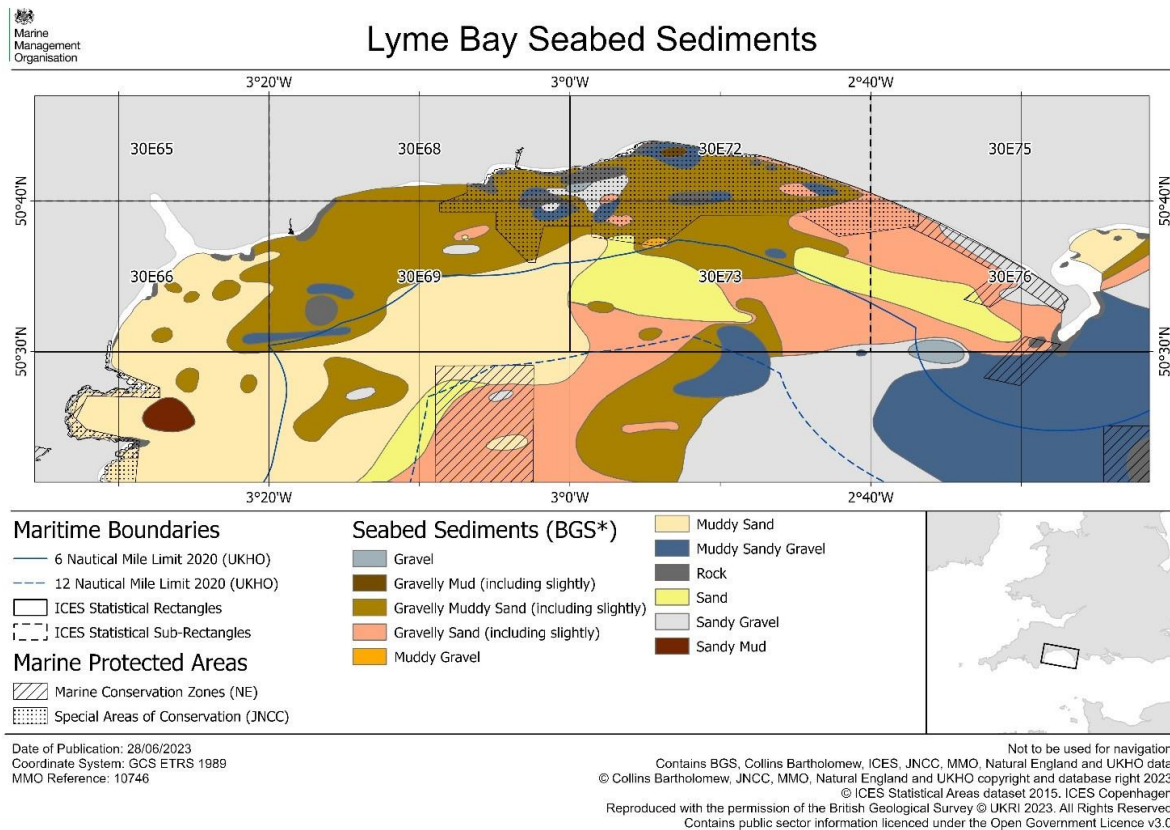
The 2022 ICES advice for sole in area 7e showed an increase in landings since 2015, a spawning stock biomass above Maximum Sustainable Yield (MSY) and fishing pressure just below MSY. Due to very high recruitment years in 2018 and 2020 but very low recruitment in 2021. There was a 23% reduction in quota for 2023. However, since the publication of the Cefas report on sole in Lyme Bay, ICES advice has been released for 2024. This new advice contains a revised spawning stock biomass estimate, lower than previously thought (although still above MSY). The advice is for a 24% reduction in quota for 2024. This new report provides justification for the use of the precautionary approach to ensure the continued sustainability of the sole fishery and mitigate against any risks to the stock, particularly give concerns voiced from local stakeholders.

There is clear evidence that fishing pressure has increased in Lyme Bay over the past decade. Currently, the stock is considered healthy. However, continued and further analysis will be required to monitor and assess the state of the sole stock and ensure it remains at sustainable levels.

#### **4.2.2 Gear interactions and benthic habitat impacts**

The effect that different gear types can have on sediment types is summarised in an analysis by the MMO in partnership with Natural England (Cantrell et al., 2023; MMO, 2023a). The information shows the sensitivity of habitat types found in Lyme Bay to the gear types used, based on a scientific literature review. The classifications for sediment type are based on British Geological Survey (BGS) data. In Lyme Bay (ICES areas 30E6 and 30E7), there are four main sediment types: subtidal sand, subtidal coarse sediment, subtidal mixed sediment and rocky reef. The fishing activity data is currently provided for vessels under 10m and over 12m. Data for vessels under 10m comes from data entered by fishers into the Catch App during

2022 and data for over-12m vessels is from VMS data. To consider likely exposure of different sediment types in Lyme Bay to different fishing gears, fishing activity data was extracted for each ICES sub rectangle and then the predominant sediment type allocated for each sub-rectangle using the mapped information on sediment types (Figure 1).



**Figure 3. Map showing the distribution of seabed sediment types in Lyme Bay. Based on British Geological Survey data. ICES sub-rectangles are shown as well as marine protected areas (see key).**

The analysis shows that subtidal sand is the least sensitive habitat. Clean sand and ‘well sorted’ sediments generally appear to have greater resilience to and recovery from bottom-towed gear disturbance. However, as the mud fraction of sand increases (for example muddy sand vs coarse sand) recovery times increase. Set nets are likely to be of limited concern to subtidal sand habitats. Under-10m Catch App data shows that dredging and trawling were mostly taking place in areas made up of sandy sediment and some mixed sediment. VMS data for over-12m vessels shows that dredging and bottom trawling is currently mostly taking place in areas of mixed sediment, which is less frequently fished by bottom towed gears in the under-10m category, and at low risk from other gears, such as nets lines and traps, compared to other habitat types.

Rocky reefs and mixed sediment are more sensitive habitats and recovery times are longer than for sand. Rocky reef habitat is generally considered highly vulnerable to impact from bottom towed gear. The reef habitat in Lyme Bay is contained within a Marine Protected Area and protected by various management measures which

include a complete prohibition of bottom towed gear in some areas. This habitat was therefore not considered further in the MMO analysis. Mixed sediments are more susceptible to surface and subsurface penetration from bottom towed gear than subtidal sand and subtidal coarse sediments and recovery of mixed sediments may also be slow.

Subtidal coarse sediments are generally not considered to be sensitive to static demersal gears. The highest levels of activity for bottom trawls in the under-10m vessel category is seen in areas with coarse sediment, which is also popular for a range of other gears. These areas also have some activity in the over-12m category for dredging. Bottom trawling and dredging on coarse sediments are associated with a high level of environmental risk. The interaction of gear in the areas with this type of sediment is therefore a particular concern for the sustainability of Lyme Bay (Table 2).

**Table 4. Risk matrix for the major habitat types and fishing gear types found in Lyme Bay. Key included below.**

Gear type matrix	Nets and lines	Traps	Otter trawl	Beam trawl	Dredging
Subtidal sand	1	1	4	5	6
Subtidal coarse sediment	2	3	6	7	9
Subtidal mixed	2	3	9	9	9
Rocky reef	4	6	9	9	9

Low risk	1-3	1
Medium risk	4-6	6
High risk	7-9	9

The fishing activity data is currently only provided for vessels under 10m and over 12m. Therefore, there is an evidence gap in the fishing activity data for 10 – 12m vessels due to the different regulations under which these vessels operate. Furthermore, the evidence analysis is based on a literature review and expert analysis. Therefore, in order to improve the understanding of the local specificities of environmental impact in Lyme Bay, an underwater ecological survey of the benthic habitat may be needed.

### 4.3 Summary of evidence – Social Impacts

The MMO undertook a survey of the views of some of the fishers from the Lyme Bay area in the summer of 2022 (MMO, 2022). This included semi-structured interviews and a short survey with fishers in Axmouth, Lyme Regis, West Bay, Brixham and Mevagissey who had caught sole in Lyme Bay. Despite a relatively small sample size (17 out of 253 vessels that landed 7e sole in 2022), the in-depth insights provided the MMO with an improved understanding of the experiences of fishers.

In general, the results from the study highlighted two overarching perspectives which are distinguished between those who fish from Lyme Bay ports (Lyme Regis, West Bay, Axmouth and Beer) and those whose home ports are registered as outside Lyme Bay but fish in Lyme Bay (e.g. Mevagissey and Brixham). Those who fish from

Lyme Bay ports felt the increase in catch limits had created what they termed a 'honey pot fishery'. These fishers were concerned that they were seeing more vessels, shooting longer nets and felt pushed off their traditional fishing grounds. Those from Brixham, and Mevagissey considered that they have a right to fish in Lyme Bay and do not see spatial conflict as a significant issue.

The MMO's social impact baseline report (MMO, 2022) sought to establish if there was spatial conflict, how it affects stakeholders and what strategies are used to mitigate this. The study found that fixed net vessels reported losing the most gear, with 87% of netters having experienced gear conflict in 2022. However, all the netters explained how they work with the local trawlers and other netters to give other vessels space to work and avoid gear loss. This is done using radio, a WhatsApp group run by a local fisherman and clear gear marking. Smaller vessel skippers reported problems arising when larger visiting vessels begin working in the area and report limited cooperation. 41% of fishers said that triple rigs and scallop dredgers working in and around Lyme Bay has increased. This may mean that gear conflict between mobile and static gear is more likely. Five per cent of fishers reported either directly experiencing gear damage from trawlers on grounds where trawling was prohibited or had heard of incidents from other fishers. There was further evidence of gear conflict in the consultation results with 11 fishers reporting ghost gear as a specific environmental problem and 4 further comments of gear conflict and the financial impact resulting of gear damage and loss for netters, which may be leading to reduced days at sea for some.

As part of the consultation, participants were asked to rank several possible reasons why the sustainable management of the sole fishery is important. The most commonly chosen first choice across all participants was that the fishery "should be there for future generations" (182), followed by "it supports the local economy" (120), then, "it brings me/others together as a community" (114), thereafter, "it is part of who I am" (108), and "it contributes to my income" (79), and lastly, "it's my only income" (37). These results highlight the importance of the sustainable management of the sole fishery for future generations as well as important contribution to the economy and to a community identity / sense of place.

While the social value associated with Lyme Bay was captured through the consultation and to some extent through the MMO 2022 study, there are gaps in understanding. One important research gap relates to the level of dependency of different fishers in Lyme Bay. In order to understand how different commercial fishers are impacted by management measures, there is a need to improve social and economic data. In particular, there is an important research gap around the livelihood strategies that commercial fishers have adopted in order to maintain their income and identity as fishers. These adaptative strategies – e.g. income diversification - may be contributing to their resilience and maintaining fishing activity locally. However, these may also be eroding the social and economic sustainability of the fisheries if fishers end up moving out of the fishery.

While the views of recreational anglers were not considered in the MMO 2022 social baseline study, they were collected as part of the consultation. Anglers raised ecological concerns related to the impact of the commercial sector fishing activity



taking place close to shore and impacting the recreational anglers' activities. Anglers also raised the impact of this activity on local businesses and tourism. There is more work to be done to understand how recreational fishing interacts with the commercial sector.

Finally, the in MMO study (2022), the consultation process and the facilitated workshop highlighted that there is a willingness from industry to stay involved in this project, and therefore there may be scope for the MMO to trial a more flexible and participatory approach to fisheries management. The MMO will continue to keep the South West RFG and the Lyme Bay steering group involved in fisheries management decisions and explore ways of integrating fishers' knowledge into management.

#### 4.4 Summary of Evidence – Economic impacts

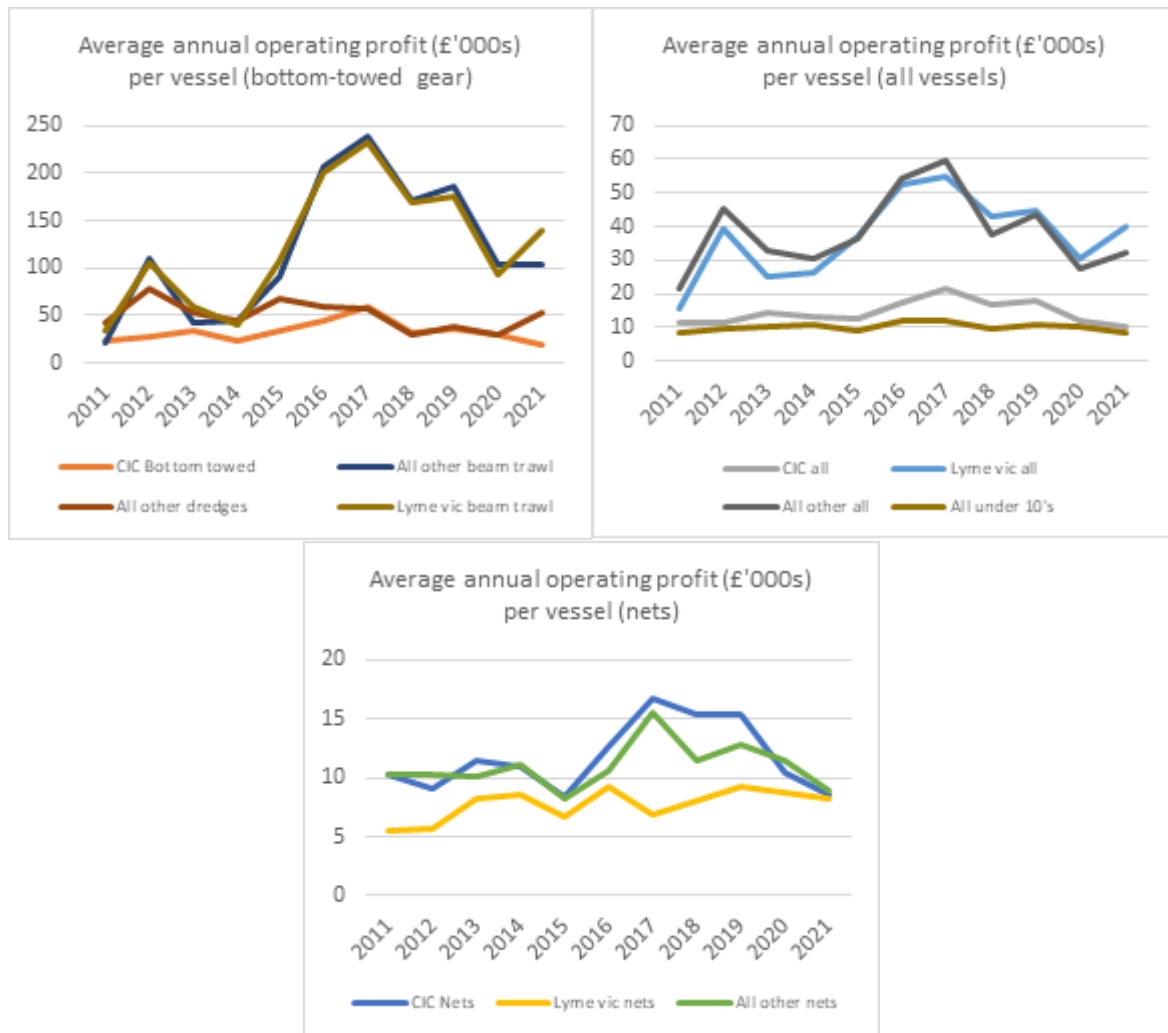
Economic analysis of vessel income and costs was carried out by Seafish (2023), and further summarised by MMO (2023b) for all vessels with recorded landings of sole from the ICES rectangles 30E7 and 30E6 between 2015 and 2022<sup>2</sup>. The vessels were grouped based on their home port and gear types used. Three home port categories were used:

1. Community Interest Company (CIC) made up of 51 vessels from: Axmouth, Beer, Lyme Regis and West Bay
2. Lyme Bay Vicinity: 52 vessels from Weymouth, Portland, Exmouth, Exeter, Teignmouth and Brixham
3. All Other Ports: 122 vessels from 31 ports, including ports such as Shoreham, Newlyn, Mevagissey and Plymouth (which accounted for the majority of catches in this category, listed by order of importance).

All vessel groups show a general increase in average annual operating profit between 2011 and 2017 and a decrease between 2017 and 2020. Most groups show an increase in annual operating profit in 2021 compared to 2020 and an overall increase since 2011. Vessels in the Lyme Bay CIC group however show a continued decline in operating profit in 2021 and their operating profit is now lower than it was in 2011 (Figure 2). This reduction is particularly apparent for vessels using fixed nets in the CIC group and is visible to a lesser extent for all categories of vessel using fixed nets. The average annual operating profit across all under-10m vessels regardless of home port or gear type is relatively stable but after a peak in 2016 is only fractionally higher in 2021 compared to 2011 (with inflation factored in).

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<sup>2</sup> The data for this analysis has been extracted from a national dataset. Seafish produced the dataset by combining costs and earnings information from vessel accounts provided by vessel owners to the annual Seafish UK Fleet Survey with official effort, landings and capacity data for all active UK fishing vessels provided by the MMO. All values from 2011 to 2020 have been adjusted for inflation to match 2021 values.



**Figure 4. Average annual operating profit (£000's) per vessel each year (2011-2021) across different vessel groups**

The data show that the reduction in average annual operating profit is potentially related to days at sea for CIC netters which is down 20% from 2011 and 43% from 2017. No other vessel category has seen such a level of reduction, and some have even seen increases in days at sea. It is however noticeable that all CIC categories, not just CIC netters, have experienced a continued reduction in days at sea since 2021 and in landing per kW per day at sea for 2021 compared to 2020. It could also be due to the increase in operating cost, where CIC netters, Lyme Bay vicinity netters, all other netters and all under 10m vessels have all seen an increase in costs when compared to 2011 and 2017. Lastly, it could be related to a reduction in landings per day at sea as the data also shows a significant decrease for all netters, all under 10's and all CIC categories. In contrast, other vessel categories such as Lyme Bay vicinity beam trawlers have increased their landings.

Analysis of the average price per tonne landed (of all species of fish) shows an upwards projection for all vessel categories. Netters and under 10's generally have higher landed prices than other vessel types. The difference in price per tonne seems to be based on gear category rather than location - CIC nets average landed

price per tonne of £3,883 whereas CIC bottom towed gear average price is £2,787. The average landed price per tonne for CIC as a whole is £3,317, Lyme Bay vicinity is £3,083 and all other ports is £2,919 (all based on 2021 figures). This suggests gear type has more of an effect on landed prices than which of the three location categories the vessel is in, however vessels in the CIC have a higher average landed price than vessels in the other location groups. Therefore, the reason the CIC vessels are seeing lower operating profits is not because they are achieving lower prices for their catch, as they have a higher average price for their catch than other location groups.

There is a gap in the data for the value of recreational sector to the local economy and its interaction with the commercial sector. There is a need to understand the value of recreational angling to different sections of the local and regional economy (tourism, hospitality, tackle shops). There is also a need to understand the value of different sectors of the commercial fishery to the local economy in Lyme Bay and CIC ports, as well as the broader benefits of the sole fishery to society and locally beyond the economy.

## 5. Discussion

Following comments from local stakeholders that the increased availability of quota for sole in 7e had led to concerns over the sustainable management of the fishery, an investigation was conducted by the MMO into whether management measures for the sole stock in Lyme Bay should be revised. The Cefas report (2023) confirms that there was a significant increase of sole 7e landings (+50%) since 2015 which follows the increase in quota, which more than doubled over that period. Since the publication of the Cefas report, recent ICES advice has been released for 2024. This new advice contains a revised biomass estimate, which, although still above MSY, is lower than previously thought and thus the advice is for a 24% reduction in quota for 2024. This supports the views of the fishers who had initial concerns for the stock and the increased fishing activity.

In regard to the increased competition, the social research report carried out by the MMO (2022) highlights that those who fish from the four CIC ports (Bay ports, Beer, Axmouth, Lyme Regis and West Bay), felt the increase in available quota and corresponding catch limits was of concern, in regards to the number of vessels and amount of gear used during the sole season and, in particular they felt pushed off their traditional grounds. The economic data from Seafish (2023) supports this in that, while all vessel groups show a general decrease in annual operating profit between 2017 and 2020<sup>3</sup>. Most groups show an increase in annual operating profit in 2021 compared to 2020 and an overall increase since 2011. However, vessels in the Lyme Bay CIC group show a continued decline in operating profit in 2021 and their operating profit is now lower than it was in 2011. This reduction is particularly apparent for vessels using fixed nets in the CIC group and is visible to a lesser

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<sup>3</sup> Likely due to Covid-19

extent for all categories of vessel using fixed nets. The Seafish economic data supports the views of fishers in the social report and in the consultation, that some sectors are benefitting from the uplift in catch limits and others are not. Commercial fishers raised a range of economic themes related to the management of the sole fishery. The most common was the financial losses due to gear damage and loss for netters, which is reducing days at sea for some. This is also highlighted in the social report whereby netters detail loss of nets. The issue of ghost gear was also further illuminated in the open-ended question of the consultation regarding any environmental concerns. Therefore, gear conflict and loss appears to be a major social, economic and environmental issue that needs to be addressed in Lyme Bay.

In terms of environmental impacts, there is evidence that dredging and trawling is mostly take place in areas made up of sandy sediment and some mixed sediment (under-10m catch app data), and that dredging and bottom trawling is mostly taking place in areas of mixed sediment (VMS data for over-12m vessels) (MMO, 2023a). These habitats are less frequently fished by bottom towed gears in the under 10m category and the risks from other gears are relatively low for this habitat type. The highest levels of activity for bottom trawls in the under 10m vessel category is seen in areas with coarse sediment and this area is also popular for a range of other gears. These areas also have some activity in the over 12m category for dredging. Bottom trawling and dredging on coarse sediments are associated with a high level of environmental risk. The consultation responses raised this issue through comments of dredging and trawling impact on seafloor habitats. This highlights the need for further assessment of spatial measures for different gear types.

## 6. Conclusion

Following concerns raised by stakeholders in Lyme Bay, an analysis was carried out by the MMO to review the social, environmental, and economic impacts of increased fishing activity in Lyme Bay. The MMO collaborated with various organisations, including Southern IFCA, FCA, Cefas, Natural England, Seafish, and local stakeholders to gather relevant data and insights. To address the challenges identified, the MMO carried out an online consultation and an in-person workshop to gather stakeholder views and explore new ways of managing fishing effort of the sole fishery in Lyme Bay.

There is evidence of increased competition for space in Lyme Bay, and concern is voiced particularly by those from the Lyme Bay ports, who have felt pushed off their traditional fishing grounds due to increased fishing activity (MMO, 2022; Defra, 2023). There has been a considerable increase in sole landings since 2015 following quota increases. Stakeholders from commercial and recreational fishing sectors have been raising concerns about the stock's sustainability. Although stock assessments for sole have not shown any major concerns, with spawning stock biomass above MSY (Cefas, 2023; ICES, 2022), the most recent ICES advice suggests spawning stock biomass may be lower than previously thought, and a 24% reduction in quota has been suggested for 2024 (ICES, 2023). Furthermore, there

are risks associated with bottom trawling and dredging on coarse sediments, which are considered highly vulnerable to impact. In conclusion, the evidence suggests that the MMO should take a precautionary approach, and changes to management for the sole fishery in Lyme Bay must be considered.

Furthermore, gear conflict and loss were highlighted as significant issues. In particular, this has been impacting the livelihoods of netters and reducing their fishing days. Evidence from an analysis of economic data underscored disparities in the benefits derived from the uplift in catch limits over time. While most vessel groups experienced an overall increase in profit since 2011 (all, aside from CIC netters), there has been a decline in annual operating profit for vessels in the Lyme Bay CIC group, primarily those using fixed nets (Seafish, 2023).

There are various evidence gaps which need further investigation. The main gap is in understanding the socio-economic context and the different levels of dependency on the fishery, how fishers have adapted their livelihoods to cope with recent difficulties and the implications for resilience and sustainability. There is also a need to investigate the views of recreational anglers in more detail, the economic value of this sector and the economic benefits of different commercial sectors to different areas of the local and regional economy. In order to better understand the environmental impacts of fishing on different areas of the seabed, further evidence could be developed through environmental surveys so that any environmental impacts can be assessed and monitored alongside changes in management.

Finally, the engagement process followed and the review of evidence by the MMO has emphasised the need for a holistic approach to fisheries management, considering social, environmental, and economic impacts and the trade-offs between them. By involving local stakeholders and integrating fishers' knowledge, a more flexible and participatory management approach could be trialled to ensure the long-term sustainability of the sole fishery in Lyme Bay.

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