Southern Inshore Fisheries and Conservation Authority

Pia Bateman – Chief Executive Officer

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13th August 2024

Dear Member,

MEETING OF THE TECHNICAL ADVISORY COMMITTEE – 22nd August 2024

A meeting of the Technical Advisory Committee will be held in the meeting room at Unit 3 on Thursday 22nd August 2024 at 14:00 to discuss the business on the under mentioned Agenda. Parking is limited, please consider other forms of transport, or share lifts.

Parking is available at the Premier Inn, Holes Bay Hotel. In order to pay for the parking, you are now required to download the Horizon Parking App, once on the App it will select Premier Inn Poole, then follow the instructions for parking. Poole railway station is approximately a 15-minute walk from the office.

Members of the public can request a guest telephone dial-in code from enquiries@southern-ifca.gov.uk.

Yours sincerely,

Maria Chaplin
Office Manager

AGENDA

1. Welcome

2. Apologies
To receive apologies for absence.

3. Declaration of Interest
All Members are to declare any interests in line with paragraphs (16) and (17) of the Southern IFCA Code of Conduct for Non-Council Members.

4. Minutes – 9th May 2024
To confirm the Minutes of the Technical Advisory Committee meeting held on 9th May 2024 (Marked A).

PROGRESS REPORTS

5. To consider the following:

a) **Chief Executive Officer updates** – to receive an update from the CEO on any matters of relevance.
b) **Research & Policy Team Updates** – to receive an update from DCO Birchenough

ITEMS FOR DECISION

6. Shore Gathering Byelaw – to consider a report from DCO Birchenough and Senior Policy Specialist Condie (Marked B)

7. Solent Oyster Survey Report 2024 & Solent Dredge Permit Category B Permits – to consider a report from IFCO Churchouse (Marked C)

ITEMS FOR INFORMATION

8. Poole Bivalve Survey Report 2024 – to receive a report from IFCO Mullen (Marked D)

9. Fisheries Management Plans Update – to receive a report from PO Wright (Marked E)

10. Marine Licencing Update – to receive a report from IFCO Churchouse (Marked F)

11. Date of Next Meeting

To confirm the date of the next meeting of the Technical Advisory Committee on the 7th November 2024 at Southern IFCA, Unit 3 Holes Bay Park, Sterte Avenue West, Poole Dorset BH15 2AA.

MARKED A

SOUTHERN INSHORE FISHERIES & CONSERVATION AUTHORITY
TECHNICAL ADVISORY COMMITTEE – 9th May 2024

Minutes of the Technical Advisory Committee (TAC), held in the meeting room at the Southern IFCA office in Poole at **14:00 on 9th May 2024.**

Present

Dr Antony Jensen	Chairman, MMO Appointee
Mr Richard Stride	Vice Chairman, MMO Appointee
Ms Elisabeth Bussey-Jones	MMO Appointee
Mr Colin Francis	MMO Appointee
Mr Gary Wordsworth	MMO Appointee
Mr Charlie Brock	MMO Appointee
Mr Stuart Kingston-Turner	Environment Agency
Dr Richard Morgan	Natural England
Ms Pia Bateman	Chief Executive Officer (CEO)

Principal Deputy Chief Officer (PDCO) Sam Dell, Deputy Chief Officer (DCO) Dr Sarah Birchenough, Senior Inshore Fisheries and Conservation Officer (SIFCO) Ms Emily Condie, IFCO's Ms Megan Fullbrook, Ms Celie Mullen and Ms Hester Churchouse, also attended alongside Project Officers Ms Imogen Wright and Mr William Meredith-Davies and Office Manager Ms Maria Chaplin.

Dr Simon Cripps (MMO Appointee) and PO Chelsea Perrins attended the meeting virtually.

Mr T Ferrero (Hampshire and Isle of Wight Wildlife Trust) and Rebecca Nesbitt (Angling for sustainability FISP) joined the meeting from the virtual public gallery.

<u>Apologies</u>
51. Apologies for absence were received from Mr N Hornby (MMO Appointee), Ms L MacCallum (MMO Appointee), Mr J Morgan (MMO Representative).

<u>Declarations of interest</u>
52. The following pecuniary interested were declared: Mr G Wordsworth (Agenda Item 8 &10) (Agenda item 15 personal). The following non-pecuniary interest were declared: Dr R Morgan (Agenda Item 6 & 7), Mr R Stride (Agenda Item 6) and Dr A Jensen (Agenda item 7).

<u>Minutes</u>
53. Members considered the Minutes of the meeting held on the 1st February 2024, these were confirmed and signed.

Dr R Morgan asked that it be noted that although Natural England (NE) supported the outcomes of the Poole Harbour HRA, that NE have identified a potential evidence gap regarding the long-term impacts of dredges upon intertidal habitats, NE put in a bid in 2023 to conduct relevant research. NE were awarded the bid but at the time did not have the resources to carry out the work. NE are hoping to reapply in 2024.

<u>PROGRESS REPORTS</u>
54a. Chief Executive Officer Updates
The CEO discussed some highlights of the previous quarter, most of which feature on the forthcoming agenda; to include the work on the three main MPA workstreams, namely the BTFG 2023 iteration, the progress to date on the Black Seabream Review, to include a summary of a Member Working Group held in recent weeks on Material Considerations and the Decision-Making Process and, finally a status update on Shore Gathering.

The CEO discussed the enormity of work relating to all three of the MPA reviews, recognising not only the officers work to date, but also thanking the Members for their attendance at relevant Working Groups to facilitate and aid the progression of these areas of work. The CEO explained that due to this enormity of work and the crescendo heading into the latter stages of some of these review areas, that some of the annexes to Authority meetings will be full and extensive, reminding Members of the purpose of Executive Summaries to accompany the detailed work, which were developed in order to aid Members and the wider stakeholder community in their navigation of complex matters.

54b. BTFG Byelaw 2023
DCO Birchenough informed members that prior to the last meeting of the TAC, there had been a round of QA with the MMO on the BTFG Byelaw 2023, the byelaw had been returned to them and the MMO suggested that they anticipated no further full rounds of QA, but that there might be minor points to address. The byelaw was received from the MMO at the end of April requiring minimal updates on minor points which did not change the content. Those updates have been made and the byelaw has been sent back to the MMO. The MMO have provided and indication that the byelaw will now be subject to a review by senior parties in the MMO prior to submission to Defra.

54c. Black Seabream Quantification of Impact Exercise
DCO Birchenough outlined for Members the Quantification of Impact Exercise which had taken place with stakeholders regarding an initial iteration of draft measures for the management of black seabream in three Dorset MCZs. The aim of the exercise was to understand how different gear types may be impacted by the initial iteration of management measures, engaging with key stakeholders across both commercial and recreational fishing, both private and charter fleet, to supplement the limited amount of information which is currently publicly available.

DCO Birchenough explained that to ensure that the initial quantification of what this impact might be was fully robust, a series of targeted engagement exercises were undertaken across all relevant sectors. DCO Birchenough, DCO Dell and Senior IFCO Condie conducted a number of meetings in person at the office and on the coast with the aim of gathering not just economic information but also social, cultural, community and well-being aspects which are hard to capture and explore any other way than by direct engagement. The Indicative Habitat Areas which Members had previously agreed, and formed the spatial extent for discussions, are smaller than the relevant MCZ therefore there was a need to obtain data at the appropriate spatial scale as much as possible.

Cumulatively data was fed into the resulting report from the direct engagement, which covered 23 stakeholders and across the different sectors, online available data on charter vessels, which indicated the number of charter vessels operating, the nature of trips, number of trips and costs, landings data obtained from the MMO, for the commercial fleet and the wider literature where studies have been done on Gross Value Added and Total Economic Contribution from various sectors. DCO Birchenough emphasised that the resulting report is a representation of the potential impact built using various datasets, recognising that there are estimations made within the reported data, but that the best possible estimates have been made and that, where possible, this has been summarised to provide an overview of the potential economic impact. DCO Birchenough provided an example from the report, indicating an estimate of just over £1.3 million as the potential economic impact for the Charter sector. Figures have also been used to illustrate associated business effects and well-being and social aspects. DCO Birchenough emphasised how grateful the IFCA are to the stakeholders who participated in the exercise and the help and expertise they provided.

Dr A Jensen thanked the staff for the effort and the work that had been put into this exercise. Dr Jensen commented that the amount of information and detail is quite remarkable and shows the value of this species to the economy and therefore its conservation value as well.

Mr R Stride expressed that has never seen this type of exercise undertaken so comprehensively and that provides a good model for others to follow. Mr G Wordsworth felt that it would be a good idea to see if the IFCA can obtain funding to employ an officer to help with this type of work across all workstreams.

Dr R Morgan outlined to Members that some work on the subject of impacts had been undertaken by Defra and offered to send a link to the online report.

Dr S Cripps concurred that the report is very detailed, and a lot of work has gone into it. Dr Cripps suggested that the approach taken by the IFCA should be considered for publication but also outlined that there is an incentive for the charter industry to keep figures as high as possible in case there is a situation where any losses could be recovered.

DCO Birchenough clarified that the calculations, particularly in relation to data obtained from online sources, are designed to represent the largest potential economic impact. There are a number of skippers that run half day trips as well as full day trips and, from the data available, the half day trips are around £40.00 per person whereas the full day trips are towards £65.00 to £75.00 per person. DCO Birchenough outlined that the costs for full day trips had been used as this provides an indication of the upper end of the potential economic impact.

PDCO Dell commented that the impact assessment in terms of its structure is based around the financial cost/benefit element and is a requirement as part of the byelaw making process.

<u>ITEMS FOR DECISION</u>

55. Black Sea Bream: Material Considerations

The CEO explained the purpose of this item, too firstly to provide an update following a Members Working Group held on the 24th April 2024 which focused primarily on decision making processes and material considerations. Secondly, to provide an overview of process and consider the current stage the Authority are at with regard to Black Seabream (BSB), recognising the stakeholders who have considerable interest in this area of work, and the importance of providing a clear understanding of the decision-making process, how this works, and the matters and considerations that Members will contemplate when considering possible future management in this fishery.

The CEO outlined that as a public body it is paramount that the IFCA maintain full transparency of process, so any interested party can be confident in the processes that Southern are following. The CEO reiterated that for some stakeholders, the outcomes of this area of work could have significant impacts on livelihoods. The CEO discussed the importance of gaining and nurturing trust with the community, to encourage buy-in and ownership and where that can't be achieved, to provide comprehensive understanding and reasoning for the decisions that the Authority make. The CEO reiterated the importance of reflecting on the impact that decisions made by the Authority can have, sometimes positive, sometimes negative and discussed the extremely challenging role to deliver in balancing a healthy marine environment with a viable industry.

The CEO discussed that the purpose of the Working Group was to discuss Material Considerations, namely, all relevant matters which should be taken into account during a decision-making process to ensure that the outcome or decision that is reached is fully informed and proportionate to the risk presented and captured in a decision making matrix.

Mr G Wordsworth informed Members that he was in favour of the idea of the matrix because hopefully it will be transferable to other workstreams. Mr G Wordsworth informed Members that he would like to see the Association of IFCA acknowledging and using the matrix so that other Chief Officers can follow it.

Dr R Morgan stated that he thinks the matrix is a good idea and will provide a clear record of decision making and how this may or may not align with any advice provided by Natural England and any decisions the Authority may take in this regard.

Dr S Cripps proposed an amendment to Recommendation 1, removing ‘ consideration of social, economic and environmental impact’, as the term ‘all material considerations’ captures these three aspects. All Members were in agreement. Mr S Kingston-Turner proposed Recommendations 1 (amended) & 2 together which was seconded by Dr R Morgan, all Members voted in favour.

Resolved
56. That draft management measures for Black Sea bream in Dorset MCZ’s will be developed with consideration of all material considerations.

57. That a Management Matrix be developed to support the Authority when considering Material Considerations vs. draft management options, in order to inform an appropriate decision-making process.

58. Shore Gathering Draft Measures

DCO Birchenough reminded Members that draft measures for the management of shore gathering in MCZs, SACs and SPAs in the District had been developed with Member input through Working Groups. DCO Birchenough outlined that the Shore Gathering Review is one of the Authority’s priority MPA workstreams for the year and is part of the work towards the 2024 Government target for MPAs. Members considered management principles for the review at a previous working group, these have been further developed following Member input and have informed the draft measures, reflecting both our legal duties under the Marine and Coastal Access Act 2019, as it relates to Marine Conservation Zones, and also the Conservation of Habitats and Species Regulations 2017 and the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 for SACs and SPAs.

Senior IFCO Condie advised Members that working in line with the Government target for 2024, the Shore Gathering Review is focused on feature-based management interventions for relevant MPAs. The Review considered the activities of bait collection, shellfish collection, mechanical harvesting by hand, shrimp push netting, crab tiling and seaweed harvesting. Senior IFCO Condie guided Members through the management principles, outlining that the first two principles relate to the evidence that was used, consisting of three defined evidence bases, and that any further evidence received after a specified date will be considered either at the point of Formal Consultation if raised, or as part of any further reviews. The third principle related to the inclusion of a GPS buffer of 10m.

Senior IFCO Condie outlined that principles 4-7 defined how spatial management areas would be determined and how existing management measures would be considered. It was outlined that the application of the principles resulted in three types of management area; year-round prohibitions for areas of seagrass as defined in principle 4 and for relevant SAC and SPA habitats in The Fleet, in line with access requirements already in place under the local nature reserve, seasonal prohibited areas between 1st November and 31st March in Poole Harbour, seasonal prohibited areas during the same period in Langstone Harbour and seasonal prohibited areas between 1st March and 31st August in Southampton Water and the Solent. Senior IFCO Condie outlined to Members that the proposed prohibited areas, drafted based on the principles, did not include all areas currently managed under the Southern IFCA ‘Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds’ byelaw, explaining that any areas under the existing byelaw which, according to current best available evidence, did not contain seagrass, and were therefore not in line with principle 1 were not included. Members were invited to consider this approach and provide any comment.

Senior IFCO Condie outlined that the final principle covered the management of hand gathering of seaweed, through the development of a Code of Conduct, the content of which had been developed in line with other existing codes including one developed between Cornwall IFCA and Natural England.

Dr A Jensen asked Senior IFCO Condie how the proposed measures might affect students from universities, higher education and field study centres going on to the beach to collect samples. Dr A Jensen also queried that there is not a specific recommendation in relation to the areas under the 'Prohibition of Gathering' byelaw merging with the new proposed areas and how this would be addressed.

DCO Birchenough advised Dr A Jensen that additional provisions normally contained within a byelaw would also be included in any byelaw drafted for these measures, for example the ability to consider dispensations for educational, scientific, stocking/breeding purposes. DCO Birchenough also outlined that the recommendation for Members to consider is to proceed with the draft measures as outlined in the report which are management areas based on the current best available evidence. If Members do not wish to open areas that are already closed, then these areas could be reconsidered. The recommendation as it stands proposes the draft measures, which is to have prohibition areas based on the current best available evidence, as per the sources available and detailed in principle 1.

Mr R Stride queried definition 1. "no person shall remove", stating it felt like a circular agreement but was dependent on the definition of harvesting and he wondered where that left the students.

DCO Birchenough confirmed to members that student work would still need to be covered by a dispensation if it involved the taking of sea fisheries resources as samples. The definition proposed is based on the definition that is currently in relevant Southern IFCA management for shore gathering activities. There have been some updates to this definition to avoid creating offences for unintended activities outside the IFCA remit. DCO Birchenough explained that the proposed definition was based on one which stakeholders in the district are used to as it has been in place for over 10 years. DCO Birchenough welcomed any input from Members on refinement of the proposed definitions.

Ms E Bussey-Jones queried, with regards to management under current byelaw and the proposed new measures, whether it would be helpful for all measures to be merged so that stakeholders are not having to comply with multiple different regulations.

DCO Birchenough informed Ms E Bussey-Jones that existing byelaws for shore gathering activities, where appropriate, would be revoked by the new byelaw creating a single management mechanism.

Ms E Bussey-Jones asked about the areas currently closed under the Prohibition of gathering (sea fisheries resources) in seagrass beds byelaw and what the reason is for reopening these when this was not the approach taken for bottom towed fishing gear (BTFG).

DCO Birchenough explained when consideration was given during the BTFG review, the potential impact of BTFG is greater than that of shore gathering and there are more factors to take into account before re-opening any previously closed areas. For example, it would require consideration of how those areas have been used by other gear types in the absence of BTFG.

These considerations are not relevant for the intertidal areas where shore gathering is currently prohibited and recognises the low level of risk posed by shore gathering due to low levels of activity, on this basis the proposed measures are only for areas which comply with the relevant principles.

Dr S Cripps asked DCO Birchenough whether the proposed closed areas replace or add on to existing closure areas. Dr S Cripps felt that it is hard for Members to judge whether there's much difference between existing and proposed closed areas and asked if a map could be provided that shows where existing closure are.

DCO Birchenough informed Dr S Cripps that existing closures are shown on the maps that are provided as part of the item.

Dr R Morgan informed DCO Birchenough that he has reviewed the proposed measures with colleagues at NE and they felt some of the bird seasonal restrictions weren't necessarily in line with specific species. Dr Morgan commented that the rationale in the Principles for defining seasonality in bird sensitive areas raises some potential issues, for example because of the distinction between nesting Terns and wintering birds such as in Langstone Harbour where terns nest during the summer.

Dr Morgan outlined that NE had discussed the proposal to apply the Poole Harbour model for shore gathering management to the Solent, recognising that in Poole Harbour the seasonal winter closure is 1st November to 31st March. Dr Morgan outlined that the general advice that NE gives to any developer about disturbance of wintering birds is that the key sensitive period is 1st October to 31st March. He outlined that there will be inconsistencies with this advice if the Poole Harbour season of 1st November is applied in the Solent thus missing the October month.

DCO Birchenough explained that officers reviewed the advice on seasonality provided by NE and that the seasonality for the proposed measures is based on a consideration of the months where there are 50% or more of the designated species present in that area. The summer closure in the Solent and Southampton Water SPA covers all of the months where this is the case, the winter closures proposed for Langstone Harbour apply this method and are reflective of the model that's been applied in Poole Harbour, the seasonality being consistently applied to other gear types (dredge fishery) and agreed as appropriate through Southern IFCA HRAs. It was determined that based on the low risk posed by shore gathering, that there was a proportionate approach in applying the same winter closure used in the district to all areas, and that for the Chichester and Langstone Harbours SPA does take account of the majority of the months where there are 50% or more of the designated bird species present. There is also a benefit in that the same period applied consistently aids understanding for stakeholders.

Dr R Morgan outlined to Members that there may be additional sources of seagrass data to that which has been used in the review. He outlined that the national seagrass layer is an open-source data set, and there are some differences between that and NE data. Dr Morgan outlined that some of the areas currently closed under the existing byelaw which are proposed to be re-opened on the basis of no feature being present will not have a feature mapped because the area hasn't been surveyed recently, however there is older data which shows features in these areas. NE will be conducting further surveys working with the Wildlife Trust. Dr Morgan highlighted that there are other organisations with expertise in seagrass surveys who may question why areas are being reopened.

Dr S Cripps informed members that this issue arises because MPA boundaries were set around features which creates a mismatch between the MPA and the actual area being protected which falls to bodies like the IFCA to explore and resolve. He commented that on land a wider area/ecosystem would be protected rather than an individual plant, however this is not the case in the marine environment.

Ms E Bussey-Jones stated that the IFCA needs to be satisfied that the areas proposed to be re-opened do not have seagrass in them and that it should be a balance between the best available evidence and the precautionary principle, with any identified risk subject to protection.

Mr R Stride proposed recommendation 1 which was seconded by Mr C Francis, all Members voted in favour.

Mr G Wordsworth proposed recommendation 2 which was seconded by Mr R Stride., All Members were in favour, with the exception of Dr R Morgan and Ms E Bussey-Jones who abstained.

Ms E Bussey-Jones proposed recommendation 3 which was seconded by Mr S Kingston-Turner, all Members voted in favour.

Resolved

59. That Members agree the Management Principles for shore gathering activities occurring in MCZs, SACs and SPAs in the Southern IFCA District.

60. That Members agree the draft measures for shore gathering activities in the above mentioned sites based on the Management Principles.

61. That Members delegate officers to make any inconsequential amendments to the draft measures on the basis of any Formal Advice received by Natural England.

62. Annual review of the Poole Harbour Several Order Management Plan (2024 update)

PO Meredith-Davies informed Members that an annual review had been carried out on the Poole Harbour Several Order 2015 Management Plan: 2020 Revision. The Authority is required to review the document on an annual basis in line with the requirements of The Poole Harbour Fishery Order 2015.

PO Meredith-Davies outlined those inconsequential amendments had been made to the Management plan in the form of amendments to grammar and sentence structure where required and an update to the text in the table for 'Management Plan 2: Aquaculture and the Poole Harbour SSSI' to reflect the phasing of the BTFG review as agreed by the Authority and the consideration of SSSI components under Phase II.

PO Meredith-Davies outlined that the 2024 review had resulted in only those inconsequential amendments being required and as such the 2024 review had not introduced any significant changes to the Management Plan.

The recommendations were taken on mutual consent, with all in favour. Mr G Wordsworth did not vote due to a declared pecuniary interest.

Resolved

63. That Members approve 2024 updates to the Poole Harbour Several Order 2015 Management Plan: 2020 Revision.

64. That Members approve the document for publication on the Southern IFCA website.

ITEMS FOR INFORMATION

65. Wrasse Fishery Information Report

Senior IFCO Condie provided Members with information relating to the Southern IFCA live wrasse fishery in response to requests made for further information on specific topics raised at the February 2023 TAC meeting, namely how management aligns with Southern IFCA legal duties, wrasse welfare as cleaner fish and potential ecosystem wide effects of the fishery.

Dr A Jensen thanked Senior IFCO Condie for providing information in relation to the points raised at the previous TAC and asked whether levels of activity/participation in the fishery were changing. Senior IFCO Condie informed Members that currently Southern IFCA is the only district with a live wrasse fishery, previous fisheries in both Cornwall and Devon have stopped due to logistical issues and changes in participants. She informed Members that for the Southern IFCA district, in the most recent year (2023) the number of fishers went down from 10 to 5 fishers.

67. Poole Bivalve Survey Report 2023

IFCO Mullen presented Members with the survey report from the Poole Harbour Bivalve Survey 2023. Members were informed that the survey is carried out annually in the spring prior to the opening of the dredge fishery under the Poole Harbour Dredge Permit Byelaw and collects data on size (length) and catch per unit effort (CPUE) for the two most commonly harvested species, the Manila clam and the common cockle.

IFCO Mullen outlined that the data from the survey can be used to build a timeseries which can be used; in combination with other data sources such as catch data from the fishery, to assess the sustainability of the fishery in Poole Harbour and inform any reviews of management measures.

IFCO Mullen presented the key points from the 2023 report and informed Members that the results indicated that the harvestable populations of both species remain stable with CPUE showing either no significant differences between years, or for common cockle, an increase in CPUE in the last two survey years. Catch levels and length frequency also remained stable for both species. IFCO Mullen informed Members that the 2024 survey was undertaken in April and the data would be added to the survey timeseries dataset, incorporating data from the 2023 season as the most recently available data on catch levels.

69. Solent Bivalve Survey Report 2023

IFCO Churchouse presented Members with the survey report from the Solent Bivalve Survey 2023. Members were informed that the survey is carried out twice a year to assess the distribution and abundance of bivalve species in three of the Bivalve Management Areas (BMAs) defined under the Solent Dredge Permit Byelaw (SDPB); Southampton Water, Portsmouth Harbour and Langstone Harbour. The survey is carried out in the autumn (pre-fishing season) and the spring (post-fishing season), with a focus on monitoring the stocks of two commercially important bivalve species, the Manila clam and the common cockle.

IFCO Churchouse outlined that the data from the survey is combined with previous years to create a timeseries dataset which can be used to monitor trends in stock levels and help inform management under the SDPB.

IFCO Churchouse presented the key points from the 2023 survey report and informed

Members that for all analyses run on CPUE and average length, where significant results were found, no general trends were observed. In analyses run between the pre-fishing season survey (Autumn 2022) and the post-fishing season survey (Spring 2023), CPUE for Manila clam and Common cockle at/above and below MCRS was found to have no significant difference for all BMAs except for the Common cockle population at/above MCRS within Portsmouth Harbour, where CPUE increased. In analyses run between the post-fishing season survey (Spring 2023) and the pre-fishing season survey (Autumn 2023), CPUE at/above MCRS for the Manila clam in Southampton Water was found to increase and CPUE below MCRS for common cockle in Portsmouth Harbour was seen to decrease, there were no other significant differences. IFCO Churchouse informed Members that the spring survey for 2024 had been carried out in March and the autumn survey was scheduled for September.

Mr C Brock asked whether there was any intention to review MCRS within Portsmouth or Langstone Harbours or whether size frequency was just going to continue to be monitored. Mr C Brock stated the question was related to alignment of measures to aid fishers use of gear between areas. Mr C Brock also asked whether there was any regulation stipulating use of a riddle or riddle bar spacing size.

PDCO Dell responded that there are currently no regulations on riddle use or bar spacing within the fishery.

Ms E Bussey-Jones asked whether the MCRS was the same across both of the areas mentioned by Mr C Brock. PDCO Dell confirmed that the MCRS was the same for all areas and the onus was on the fisher to ensure they are compliant with the MCRS.

Dr A Jensen commented that there has been work done on the relationship between the width and length of Manila clam, which is a key component to the development of riddle bar spacing regulations, showing that there is no perfect relationship between the two which would make defining a riddle size that was suitable for all areas difficult.

71. Fisheries Management Plans Update

DCO Birchenough provided an update to Members on the development of Fisheries Management Plans (FMPs). Members were informed of the Defra workshops which had been held on the T1 and T2 FMPs, attended by Southern, the aim of which was to understand and discuss a collaborative evidence approach for FMPs, understand the evidence gaps identified for the first five published FMPs and how organisations/authorities/stakeholders can work with Defra to support a collaborative process going forward to help address these evidence gaps.

Members were also updated on T3 and T4 FMPs. Southern IFCA submitted a response to the draft Southern North Sea and Channel Skates and Rays FMP and have been made aware of the new T4 FMPs and the associated Delivery Partners which are; Black seabream (MMO), Wrasses complex (MMO), Celtic Sea and Western Channel demersal (MMO), Celtic Sea and Western Channel pelagic (Defra). DCO Birchenough outlined that the T4 FMPs would be delivered by the end of 2025.

73. Marine Licencing Update

IFCO Churchouse provided an update on Marine Licence Applications that the Southern IFCA have received as a consultee, from the MMO. Between February 2024 and April 2024 there were nine MLAs requiring a response and four MLAs deemed to not require a response. Detail on the MLAs requiring a response was provided as part of the report.

MARKED A

SOUTHERN INSHORE FISHERIES & CONSERVATION AUTHORITY
TECHNICAL ADVISORY COMMITTEE – 9th May 2024

75. Poole Harbour Several Order – Request to Amend Business Plan

In accordance with the consideration of information which is exempt by virtue of Schedule 12A of the Local Government Act 1972, the public were excluded from the meeting (virtually and in person) during consideration of this item.

Following an overview provided by PO Meredith-Davies, regarding a change in vessel for a lease bed in Poole Harbour, Members considered the Recommendations.

The Recommendations were taken on mutual consent, with all in favour. Mr G Wordsworth did not vote due to declared pecuniary interests.

Resolved
76. That Members approve the proposed changes to the Business Plan 2020-25 for Lease Bed 3.

<u>Date of Next Meeting</u>
77. That the meeting of the TAC will be on the 22nd August 2024 at Southern IFCA, Unit 3 Holes Bay Park, Sterte Avenue West, Poole Dorset BH15 2AA.

There being no further business the meeting closed at 16.44.

Chairman: **Date:**

EXECUTIVE SUMMARY

Marked B

Shore Gathering Byelaw and Supporting Documentation Decision Paper

Report by IFCO Condie & DCO Birchenough

A. Purpose

For the Members to receive the draft copy of the Shore Gathering Byelaw and supporting documentation.

B. Recommendation

1. That Members:
   a) Provide comment on the draft Shore Gathering Byelaw and Supporting Documentation.
   b) Provide comment on the draft Seaweed Harvesting Code of Conduct.
   c) Provide comment on the draft Fishing for Cockles (Amendment) Byelaw

2. In accordance with IFCA Byelaw Guidance[1], Members agree to formally notify[2] Authority Members and the Secretary of State of the intention to make the Shore Gathering Byelaw and the Fishing for Cockles (Amendment) Byelaw at the Authority meeting on 19th September 2024.

C. Annexes

1. The draft Shore Gathering Byelaw
2. The draft Fishing for Cockles (Amendment) Byelaw
3. The draft Seaweed Harvesting Code of Conduct
4. The draft Impact Assessment
5. The Conservation Assessment Package
6. The Site Specific Evidence Package
7. The Literature Review
8. NE Formal Advice on the Conservation Assessment Package
9. Southern IFCA Response to NE Formal Advice

1.0 Introduction

- Members commenced a review of shore gathering management in late 2022. The review was further informed in 2023 by the publication of The Environmental Improvement Plan 2023[3] which introduced a requirement on IFCAs to ensure that all management measures are in place for all MPAs by 2024 to meet Government targets.
- Subsequently, the scope of the Shore Gathering Review was re-defined to focus on **feature-based management interventions for MPAs: sites designated under the National Site Network (SACs, SPAs and MCZs).**
- A set of Management Principles (*Figure 18, p. 57, Conservation Assessment Package, Annex 5*) to underpin the development of measures was developed through Member Working Groups and agreed by the TAC at the meeting on 9th May 2024. In addition, the TAC agreed a set of draft regulatory measures based on these Management Principles and a code of conduct for seaweed harvesting**.** In reviewing the draft measures, Members also considered initial drafts of the Conservation Assessment Package, Site Specific Evidence Package and Literature Review as supporting documents.

[1] http://www.association-ifca.org.uk/Upload/About/ifca-byelaw-guidance.pdf
[2] formal notification will be made, in writing, to Authority Members and the Secretary of State no less than 14 days (3rd September 2024) before the date of the Authority meeting (19th September 2024) at which the byelaw is to be made. A 'Shore Gathering Byelaw Package' will be included with a cover letter explaining the justification for, and purpose of, the above-named byelaw.
[3] Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)

2.0 Management Development

- Following the TAC meeting in May 2024, Southern IFCA have reviewed comments made by Members at that meeting. In consideration of a point raised by NE at the TAC meeting, prior to the submission of the package for Formal Advice, the following update was made to the draft measures:
  - **Langstone Harbour (under Chichester and Langstone Harbours SPA)** – areas defined for seasonal management (1st November to 31st March) have been re-defined as prohibited areas (year-round)
    - This update was required as the application of the criteria for identifying appropriate seasonality, namely the months where >50% of designated bird species are present, only provided a single month of protection for each of the designated tern bird species with all of the identified preferred areas for this species within the site having the potential to overlap with shore gathering activities.
- Including the above update, Southern IFCA sought Formal Advice from Natural England (NE) on the Conservation Assessment Package and supporting documents (Screening Assessment, Part A/TLSE Assessments, Site Specific Evidence Package [Annex 6], Literature Review [Annex 7]) that underpin the proposed management measures.
- NE provided Southern IFCA with Formal Advice on 26th July 2024 (Annex 8) and Southern IFCA have drafted a response document (Annex 9) providing a response to any points raised by NE indicating how those points had been considered and, where required, any updates that had been made to supporting documents or management. It was determined that **one** update was required to the draft measures under the Byelaw and minor updates to the Seaweed Harvesting CoC.
  - **The Fleet (Chesil and The Fleet SPA)** – the prohibited area (year-round) has been extended to encompass the entirety of the existing bird sensitive area, currently subject to voluntary exclusions by local conservation managers. NE Formal Advice identified that Southern IFCA had partially covered this area in draft measures but not in its entirety.
    - Alignment of the prohibited area with the existing voluntary sensitive area appropriately addresses the risk to designated bird features in line with Management Principle 7(b)(ii).
  - **Seaweed Harvesting CoC** – minor updates were made including updates to wording and the inclusion of a point relating to the replacement of any rocks moved. The amendments are listed under point 5.11, p.18 of Annex 9.
- Additional inconsequential updates were made to the Conservation Assessment Package and associated supporting documents; these are outlined in the Southern IFCA response to the Formal Advice (Annex 9).

3.0 Shore Gathering Byelaw

- The Review and subsequent Management Development process has resulted in proposed management for shore gathering activities through the drafting of:
  - **The Shore Gathering Byelaw** (Annex 1)
  - **The Seaweed Harvesting Code of Conduct** (Annex 3)
- The Shore Gathering Byelaw provides spatial feature-based management for sensitive designated habitats and species within MCZs, SACs and SPAs to mitigate potential impacts from shore gathering activities. Spatial management is further defined by year-round or seasonal management, with three types of management areas under the Byelaw:
  - Prohibited Areas (year-round)
  - Summer Closure Areas (closed 1st March to 31st August)
  - Winter Closure Areas (closed 1st November to 31st March)

- During those periods of closure, no shore gathering activities will be permitted to take place.
- Tables 1-3 in the Impact Assessment (Annex 4, p.14) detail the number of each type of management area and where in the District they occur.

- The prohibitions do not apply to:
  - the fishing for or taking of sea fisheries resources using a vessel provided that no part of the vessel's hull is in contact with the seabed
  - Hook and line in conjunction with a fishing rod
  - Handlines
  - Spear gun
  - A net other than a push net

- The provisions in the Byelaw ensure that all relevant activities are covered. The potential impacts which require spatial management are applicable to all types of shore gathering activity and therefore in order to ensure that identified protections for designated features are appropriately mitigating those impacts, there is a need to manage all relevant activities consistently.
- The total area closed to shore gathering activity year-round through the proposed closure areas under the Shore Gathering Byelaw is 20.28 km^2 representing 0.74% of the Southern IFCA District. **This is an increase of 4.97 km^2 from the current year-round spatial footprint of the Prohibition of Gathering (Sea Fisheries) Resources Byelaw.** The total area closed to shore gathering activity between the 1st November and 31st March is 5.27 km^2 representing 0.19% of the Southern IFCA District. **This remains the same as the current 1st November to 31st March closures under the Poole Harbour Shellfish Hand Gathering Byelaw.** The total area closed to shore gathering activity between the 1st March and 31st August is 17.26 km^2 representing 0.63% of the Southern IFCA District. **There is currently no shore gathering management in the Southern IFCA District occurring in this period.** The total area of the District closed under both year-round and seasonal closures is **42.81km^2 representing 1.56% of the Southern IFCA District.**

- In addition to the Byelaw, Southern IFCA have developed the **Seaweed Harvesting Code of Conduct**. The Code of Conduct is in line with other seaweed harvesting CoCs around the UK and has primarily used a CoC developed by Natural England in conjunction with partners including other IFC Authorities as a base with the inclusion of specific provisions relevant to the needs of applicable National Site Network Sites.

- The development of The Shore Gathering Byelaw requires the following byelaws to be amended:
  - The Fishing for Cockles Byelaw – an amendment is required to remove the provision relating to specifications on hand gathering practices for common cockle, in addition, in light of regulation for this species under the Poole Harbour Dredge Permit Byelaw and the Solent Dredge Permit Byelaw, existing provisions regarding dredge size and deployment can also be removed.
  - This has resulted in the **Fishing for Cockles (Amendment) Byelaw** (Annex 2).
- And the following byelaws to be revoked:
  - Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw
  - Poole Harbour Shellfish Hand Gathering Byelaw
  - Periwinkles Byelaw
  - Fishing for Oysters, Mussels and Clams Byelaw
  - Redeposit of Shellfish Byelaw
- The Byelaw will also require the cessation of the Memorandum of Agreement for Bait Digging in Poole Harbour.

- An Impact Assessment has been drafted to accompany the Byelaw (Annex 4). To estimate the economic cost, Southern IFCA undertook a targeted engagement exercise to gather the potential impact of changes to shore gathering management in the district. In the absence of any available catch data from national mechanisms being available for shore gathering activities, targeted engagement was the most appropriate method to gather this information.
- Through this exercise it was determined that commercial bait digging participants are expected to incur costs as a result of reduced access or loss of access to fishing grounds within year-round prohibition areas under the Byelaw. These costs will be incurred as a direct result of the closure of the fishing area.
- The average annual cost to industry was calculated as £77,609. As the only data available to inform this assessment was from direct engagement, it needs to be caveated that calculations are based on the maximum potential cost if the relevant areas were accessed every day with the maximum quantity of sea fisheries resource taken. Based on Southern IFCA records of activity data and observations made by Officers, the relevant activity has not been observed to occur every day in any location and therefore the estimation of cost is highly likely to be an overestimate.
- The total transition cost to Southern IFCA associated with the new measures is estimated to be £1,717 and would come in the first year of the byelaw. This cost is related to the update of current information boards and production of new information resources. Ongoing compliance costs would form part of the normal annual delivery of work by Southern IFCA.

- The development of the Shore Gathering Byelaw and Seaweed Code of Conduct allows Southern IFCA to meet its duties for MCZs under the Marine and Coastal Access Act 2009, and for SACs and SPAs under the Conservation of Habitats and Species Regulations 2017 and Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. In addition, the progression of this Byelaw will allow the IFCA to meet the Government target of ensuring that management measures are in place for all MPAs by 2024 as this relates to shore gathering.

3.0 Next Steps

- If Members resolve to formally notify the Authority and the Secretary of State, notice will be received of the intention to propose making the Shore Gathering Byelaw and the Fishing for Cockles (Amendment) Byelaw by 3rd September 2024.
- Should the Authority agree to make the byelaw at the meeting on 19th September, notice will be given of the Authority's intention to apply for confirmation of the byelaws by advertising for 2 consecutive weeks. Following this, a 28-day formal consultation period will begin, during which stakeholders will have the opportunity to respond to the Authority. The Authority will then respond and, where appropriate, liaise with objectors with a view to resolving any objections prior to submitting the final byelaw to the MMO for confirmation by the Secretary of State. The MMO will make final quality assurance checks and assess the evidence prior to recommending the byelaw for confirmation by the Secretary of State. Any byelaw will only come into force following confirmation by the Secretary of State.

MARKED B_ANNEX 1

SOUTHERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

MARINE AND COASTAL ACCESS ACT 2009[1]

SHORE GATHERING BYELAW

The Southern Inshore Fisheries and Conservation Authority, in exercise of the powers conferred by section 155(1) of the Marine and Coastal Access Act 2009 makes the following byelaw for that District.

INTERPRETATION

(1) In this byelaw:

a. All positions given by means of coordinate are defined on World Geodetic System 1984 Datum (WGS84);

b. "the Authority" means the Southern Inshore Fisheries and Conservation Authority as defined in Article 4 of the Southern Inshore Fisheries and Conservation Order 2010[2];

c. "crab" means all crab species, including but not limited to Edible crab (*Cancer pagurus*), European green crab (*Carcinus maenas*), Spinous spider crab (*Maja squinado*) and Velvet crab (*Necora puber*);

d. "the District" means the area defined in Article 3 of the Southern Inshore Fisheries and Conservation Order 2010[2];

e. "harvesting" means to remove and retain for the purposes of consumption, selling, displaying, using as part of or wholly for a product or service, cultivating, introducing to the sea or using as bait whether carried out for commercial purposes or otherwise;

f. "prohibited area" means the area enclosed by the co-ordinates listed in Schedule 1;

g. "sea fisheries resources" means that defined in section 153(10) of the Marine and Coastal Access Act 2009[3];

h. "summer closure area" means the area enclosed by the co-ordinates listed in Schedule 3;

i. "winter closure area" means the area enclosed by the co-ordinates listed in Schedule 2.

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[1] 2009 c.23
[2] S.I. 2010/2198
[3] Marine and Coastal Access Act 2009 (legislation.gov.uk)

PROHIBITIONS

(2) No person shall fish for or take sea fisheries resources by hand or with the use of hand operated equipment where the fishing for, or taking is for the purpose of harvesting sea fisheries resources within:

a) a prohibited area;

b) a summer closure area for the period 1st March to 31st August; or

c) a winter closure area for the period 1st November to 31st March.

(3) No person shall have with them any hand operated equipment for use in the course of, or in connection with, the fishing for, or taking of sea fisheries resources for the purpose of harvesting within:

a) a prohibited area;

b) a summer closure area for the period 1st March to 31st August; or

c) a winter closure area for the period 1st November to 31st March.

(4) No person shall use or deploy any form of artificial habitat, structure, or shelter to aid the collection of crab within:

a) a prohibited area;

b) a summer closure area for the period 1st March to 31st August; or

c) a winter closure area for the period 1st November to 31st March.

EXCEPTIONS

(5) Paragraphs (2) and (3) do not apply to the fishing for or taking of sea fisheries resources using a vessel provided that no part of the vessel's hull is in contact with the seabed.

(6) Paragraphs (2) and (3) do not apply when using:

a) hook and line in conjunction with a fishing rod;

b) a handline;

c) a spear gun; or

d) a net other than a push net.

DISPENSATIONS

(7) Paragraphs (2) to (4) do not apply to any person who has obtained a written dispensation issued by the Authority in accordance with paragraph (8) and the authorisation is valid in accordance with paragraph (9).

(8) The Authority may issue a written dispensation for scientific, educational, stocking or breeding purposes.

(9) A dispensation issued under paragraph (8) will only be valid if:

a) The act being undertaken complies with the terms of the dispensation; and

b) The dispensation is carried on the person and produced for inspection when requested by an Inshore Fisheries and Conservation Officer of the Authority or any other person authorised by the Authority to make such a request.

REVIEW

(10) The Authority (or a sub-committee thereof authorised by the Authority to do so) will review the suitability of the byelaw in accordance with any changes in best available evidence, to include any statutory advice provided by Natural England or other such bodies, organisations or persons as the Authority deem fit.

AMENDMENT

(11) The byelaw with the title “Fishing for Cockles” made by the Authority, in exercise of its powers under section 155(1) of the Marine and Coastal Access Act 2009, confirmed on 23rd June 2015, and in force immediately before the making of this byelaw is amended to the “Fishing for Cockles (Amendment) Byelaw”.

REVOCATIONS

(12) The byelaw with the title “Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw” made by the Authority, in exercise of its powers under sections 155(1) of the Marine and Coastal Access Act 2009, confirmed on 20th December 2013, and in force immediately before the making of this byelaw is revoked.

(13) The byelaw with the title “Poole Harbour Shellfish Hand Gathering Byelaw” made by the Authority, in exercise of its powers under sections 155(1) of the Marine and Coastal Access Act 2009, confirmed on 23rd June 2015, and in force immediately before the making of this byelaw is revoked.

(14) The byelaw with the title “Periwinkles” made by the Southern Sea Fisheries District Committee in exercise of its power under section 5 of the Sea Fisheries Regulation Act 1966, confirmed on 17th November 1994, and in force immediately before the making of this byelaw is revoked.

(15) The byelaw with the title “Fishing for Oysters, Mussels and Clams” made by the Southern Sea Fisheries District Committee in exercise of its power under section 5 of the Sea Fisheries Regulation Act 1966, confirmed on 27th September 1994, and in force immediately before the making of this byelaw is revoked.

(16) The byelaw with the title “Redeposit of Shellfish” made by the Southern Sea Fisheries District Committee in exercise of its power under section 5 of the Sea Fisheries Regulation Act 1966, confirmed on 27th February 1995, and in force immediately before the making of this byelaw is revoked.

I hereby certify that the above byelaw was made by Southern Inshore Fisheries and Conservation Authority at their meeting on 19th September 2024 (TBC).

……………………………………………………………….

Pia Bateman
Chief Executive Officer
Southern Inshore Fisheries and Conservation Authority

The Secretary of State for Environment, Food and Rural Affairs in exercise of the power conferred by section 155(3) of the Marine and Coastal Access Act 2009 confirms the Shore Gathering Byelaw made by the Southern Inshore Fisheries and Conservation Authority on 19th September 2024 (TBC).

…………………………………………………………….
A Senior Civil Servant for, and on behalf of, the Secretary of State for Environment, Food and Rural Affairs

Date:

SOUTHERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

Explanatory Note (not part of the byelaw)

This byelaw prohibits the fishing for or taking of sea fisheries resources by hand or with the use of handheld operated equipment where the fishing for or taking is for the purpose of harvesting sea fisheries resources in prohibited and seasonally restricted areas.

The byelaw creates a carriage offence for hand operated equipment used in the course of or in connection with the fishing for, or taking of sea fisheries resources for the purpose of harvesting, in addition to a restriction which prohibits the deployment of any form of artificial habitat, structure, or shelter to aid the collection of crab species.

These measures are in place to protect designated features and supporting habitats within Marine Conservation Zones (MCZs) and within or adjacent to Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

Written dispensations may be granted in accordance with the provisions contained within the byelaw.

The Southern Inshore Fisheries and Conservation Authority's 'Fishing for Cockles' byelaw is amended by this byelaw.

The Southern Inshore Fisheries and Conservation Authority's byelaws: 'Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw' and 'Poole Harbour Shellfish Hand Gathering Byelaw' are revoked by this byelaw.

The Southern Sea Fisheries Committee byelaws: 'Periwinkles', 'Fishing for Oysters, Mussels and Clams' and 'Redeposit of Shellfish' are revoked by this byelaw.

SCHEDULE 1 – PROHIBITED AREAS

Schedule 1 - Prohibited Areas			
Point Number	Latitude	Longitude	Straight Line, unless otherwise stated, to Next Point Number
Chichester Harbour: Areas 1 - 2			
Area 1			
1	50 ° 48.787 minutes N	0 ° 57.393 minutes W	to
2	50 ° 49.095 minutes N	0 ° 56.963 minutes W	to
3	50 ° 48.174 minutes N	0 ° 56.656 minutes W	to
4	50 ° 48.112 minutes N	0 ° 56.977 minutes W	to
5	50 ° 48.375 minutes N	0 ° 57.627 minutes W	to
6	50 ° 48.263 minutes N	0 ° 58.044 minutes W	to
7	50 ° 48.311 minutes N	0 ° 58.093 minutes W	to
8	50 ° 48.330 minutes N	0 ° 58.129 minutes W	to
9	50 ° 48.383 minutes N	0 ° 58.059 minutes W	From point 9 along the coast at the level of mean high water spring tide to point 10
10	50 ° 48.594 minutes N	0 ° 58.067 minutes W	to
11	50 ° 48.641 minutes N	0 ° 58.064 minutes W	From point 11 along the coast at the level of mean high water spring tide to point 1.
Area 2			
12	50 ° 47.374 minutes N	0 ° 57.407 minutes W	to
13	50 ° 47.406 minutes N	0 ° 57.403 minutes W	to
14	50 ° 47.675 minutes N	0 ° 56.729 minutes W	to
15	50 ° 47.675 minutes N	0 ° 56.623 minutes W	to
16	50 ° 47.203 minutes N	0 ° 56.588 minutes W	From point 16 along the coast at the level of mean high water spring tide to point 17
17	50 ° 46.978 minutes N	0 ° 57.014 minutes W	to
18	50 ° 47.050 minutes N	0 ° 57.076 minutes W	From point 18 along the coast at the level of mean high water spring tide to point 12.
Langstone Harbour: Areas 3 - 12			
Area 3			
19	50 ° 49.437 minutes N	0 ° 59.164 minutes W	to
20	50 ° 49.439 minutes N	0 ° 59.314 minutes W	to
21	50 ° 49.495 minutes N	0 ° 59.455 minutes W	to
22	50 ° 49.564 minutes N	0 ° 59.450 minutes W	to
23	50 ° 49.635 minutes N	0 ° 59.400 minutes W	to
24	50 ° 49.701 minutes N	0 ° 59.311 minutes W	to
25	50 ° 49.744 minutes N	0 ° 59.208 minutes W	to

26	50	°	49.751	minutes	N	0	°	59.161	minutes	W	to
27	50	°	49.797	minutes	N	0	°	59.031	minutes	W	to
28	50	°	49.826	minutes	N	0	°	59.001	minutes	W	to
29	50	°	49.839	minutes	N	0	°	58.973	minutes	W	to
30	50	°	49.834	minutes	N	0	°	58.955	minutes	W	From point 30 along the coast at the level of mean high water spring tide to point 19.
Area 4											
31	50	°	48.769	minutes	N	0	°	59.295	minutes	W	to
32	50	°	48.776	minutes	N	0	°	59.320	minutes	W	to
33	50	°	48.812	minutes	N	0	°	59.277	minutes	W	to
34	50	°	48.806	minutes	N	0	°	59.257	minutes	W	From point 34 to point 31.
Area 5											
35	50	°	47.680	minutes	N	1	°	0.052	minutes	W	to
36	50	°	47.657	minutes	N	1	°	0.388	minutes	W	to
37	50	°	47.704	minutes	N	1	°	0.520	minutes	W	to
38	50	°	47.785	minutes	N	1	°	0.525	minutes	W	to
39	50	°	47.878	minutes	N	1	°	0.330	minutes	W	to
40	50	°	47.912	minutes	N	1	°	0.083	minutes	W	to
41	50	°	48.073	minutes	N	1	°	0.011	minutes	W	to
42	50	°	48.259	minutes	N	0	°	59.543	minutes	W	to
43	50	°	48.439	minutes	N	1	°	0.038	minutes	W	to
44	50	°	48.670	minutes	N	0	°	59.514	minutes	W	to
45	50	°	48.631	minutes	N	0	°	59.333	minutes	W	From point 45 along the coast at the level of mean high water spring tide to point 35.
Area 6											
46	50	°	47.922	minutes	N	1	°	0.926	minutes	W	to
47	50	°	47.921	minutes	N	1	°	0.895	minutes	W	to
48	50	°	47.796	minutes	N	1	°	0.757	minutes	W	to
49	50	°	47.748	minutes	N	1	°	0.768	minutes	W	to
50	50	°	47.723	minutes	N	1	°	0.948	minutes	W	to
51	50	°	47.759	minutes	N	1	°	1.010	minutes	W	to
52	50	°	47.776	minutes	N	1	°	1.078	minutes	W	to
53	50	°	47.815	minutes	N	1	°	1.057	minutes	W	to
54	50	°	47.795	minutes	N	1	°	0.987	minutes	W	From point 54 to point 46.

Area 7											
55	50	°	47.616	minutes	N	1	°	1.070	minutes	W	to
56	50	°	47.605	minutes	N	1	°	1.204	minutes	W	to
57	50	°	47.647	minutes	N	1	°	1.266	minutes	W	to
58	50	°	47.699	minutes	N	1	°	1.167	minutes	W	to
59	50	°	47.660	minutes	N	1	°	1.133	minutes	W	From point 59 along the coast at the level of mean high water spring tide to point 55.
Area 8											
60	50	°	49.589	minutes	N	1	°	1.464	minutes	W	to
61	50	°	49.120	minutes	N	1	°	1.507	minutes	W	to
62	50	°	48.882	minutes	N	1	°	1.924	minutes	W	to
63	50	°	49.478	minutes	N	1	°	2.394	minutes	W	to
64	50	°	49.732	minutes	N	1	°	2.411	minutes	W	to
65	50	°	49.760	minutes	N	1	°	2.100	minutes	W	From point 65 along the coast at the level of mean high water spring tide to point 60.
Area 9											
66	50	°	50.074	minutes	N	1	°	2.375	minutes	W	to
67	50	°	50.022	minutes	N	1	°	2.282	minutes	W	to
68	50	°	49.884	minutes	N	1	°	2.431	minutes	W	to
69	50	°	49.930	minutes	N	1	°	2.576	minutes	W	to
70	50	°	50.071	minutes	N	1	°	2.425	minutes	W	From point 70 along the coast at the level of mean high water spring tide to point 66.
Area 10											
71	50	°	49.798	minutes	N	1	°	0.860	minutes	W	to
72	50	°	49.421	minutes	N	1	°	0.315	minutes	W	to
73	50	°	49.283	minutes	N	1	°	0.443	minutes	W	to
74	50	°	49.543	minutes	N	1	°	1.089	minutes	W	to
75	50	°	49.698	minutes	N	1	°	1.093	minutes	W	From point 75 to point 71.
Area 11											
76	50	°	49.615	minutes	N	1	°	0.201	minutes	W	to
77	50	°	49.600	minutes	N	1	°	0.152	minutes	W	to
78	50	°	49.561	minutes	N	1	°	0.192	minutes	W	to
79	50	°	49.574	minutes	N	1	°	0.252	minutes	W	From point 79 to point 76.
Area 12											
80	50	°	50.357	minutes	N	1	°	1.236	minutes	W	to
81	50	°	50.171	minutes	N	1	°	0.404	minutes	W	to
82	50	°	49.860	minutes	N	1	°	0.039	minutes	W	to

83	50 °	49.697	minutes	N	1 °	0.081	minutes	W	to
84	50 °	50.117	minutes	N	1 °	0.828	minutes	W	to
85	50 °	50.112	minutes	N	1 °	1.307	minutes	W	From point 85 along the coast at the level of mean high water spring tide to point 80.
Portsmouth Harbour: Area 13 - 16									
Area 13									
86	50 °	50.015	minutes	N	1 °	7.693	minutes	W	to
87	50 °	49.944	minutes	N	1 °	7.362	minutes	W	to
88	50 °	49.856	minutes	N	1 °	7.418	minutes	W	to
89	50 °	49.970	minutes	N	1 °	7.735	minutes	W	From point 89 to point 86.
Area 14									
90	50 °	49.495	minutes	N	1 °	7.155	minutes	W	to
91	50 °	49.244	minutes	N	1 °	7.129	minutes	W	to
92	50 °	49.139	minutes	N	1 °	7.741	minutes	W	to
93	50 °	49.437	minutes	N	1 °	7.927	minutes	W	From point 93 to point 90.
Area 15									
94	50 °	50.166	minutes	N	1 °	7.478	minutes	W	to
95	50 °	50.079	minutes	N	1 °	7.362	minutes	W	to
96	50 °	50.015	minutes	N	1 °	7.411	minutes	W	to
97	50 °	50.070	minutes	N	1 °	7.742	minutes	W	to
98	50 °	49.606	minutes	N	1 °	8.179	minutes	W	to
99	50 °	49.683	minutes	N	1 °	8.399	minutes	W	to
100	50 °	49.869	minutes	N	1 °	8.434	minutes	W	to
101	50 °	50.370	minutes	N	1 °	8.968	minutes	W	to
102	50 °	50.444	minutes	N	1 °	9.102	minutes	W	to
103	50 °	50.480	minutes	N	1 °	9.058	minutes	W	From point 103 along the coast at the level of mean high water spring tide to point 104
104	50 °	50.513	minutes	N	1 °	8.933	minutes	W	to
105	50 °	50.417	minutes	N	1 °	8.811	minutes	W	From point 105 along the north side of the jetty to point 106
106	50 °	50.434	minutes	N	1 °	8.768	minutes	W	From point 106 along the coast at the level of mean high water spring tide to point 94.
Area 16									
107	50 °	50.594	minutes	N	1 °	9.266	minutes	W	to
108	50 °	50.508	minutes	N	1 °	9.437	minutes	W	to
109	50 °	50.476	minutes	N	1 °	9.713	minutes	W	to
110	50 °	50.577	minutes	N	1 °	9.696	minutes	W	to

111	50	°	50.682	minutes	N	1	°	9.549	minutes	W	From point 111 along the coast at the level of mean high water spring tide to point 112
112	50	°	50.665	minutes	N	1	°	9.434	minutes	W	to
113	50	°	50.621	minutes	N	1	°	9.243	minutes	W	to
114	50	°	50.601	minutes	N	1	°	9.231	minutes	W	From point 114 along the coast at the level of mean high water spring tide to point 107.
Southampton Water: Areas 17 - 18											
Area 17											
115	50	°	49.546	minutes	N	1	°	15.733	minutes	W	to
116	50	°	49.400	minutes	N	1	°	15.429	minutes	W	to
117	50	°	49.292	minutes	N	1	°	15.269	minutes	W	to
118	50	°	49.175	minutes	N	1	°	15.315	minutes	W	to
119	50	°	49.506	minutes	N	1	°	16.055	minutes	W	to
120	50	°	49.583	minutes	N	1	°	16.011	minutes	W	From point 120 to point 115.
Area 18											
121	50	°	48.570	minutes	N	1	°	18.702	minutes	W	to
122	50	°	48.505	minutes	N	1	°	18.582	minutes	W	to
123	50	°	48.196	minutes	N	1	°	19.328	minutes	W	to
124	50	°	47.905	minutes	N	1	°	19.750	minutes	W	to
125	50	°	47.777	minutes	N	1	°	19.861	minutes	W	to
126	50	°	47.788	minutes	N	1	°	19.902	minutes	W	to
127	50	°	47.873	minutes	N	1	°	19.926	minutes	W	From point 127 along the coast at the level of mean high water spring tide to point 128
128	50	°	48.103	minutes	N	1	°	19.715	minutes	W	to
129	50	°	48.470	minutes	N	1	°	19.136	minutes	W	From point 129 to point 121.
Beaulieu: Area 19											
Area 19											
130	50	°	46.846	minutes	N	1	°	21.762	minutes	W	to
131	50	°	46.634	minutes	N	1	°	21.703	minutes	W	to
132	50	°	46.644	minutes	N	1	°	22.091	minutes	W	to
133	50	°	46.797	minutes	N	1	°	22.120	minutes	W	From point 133 to point 130.
Isle of Wight: Areas 20 - 34											
Area 20											
134	50	°	40.964	minutes	N	1	°	32.675	minutes	W	to
135	50	°	40.853	minutes	N	1	°	32.929	minutes	W	to
136	50	°	40.876	minutes	N	1	°	33.036	minutes	W	to

137	50 °	41.078	minutes	N	1 °	32.770	minutes	W	to
138	50 °	40.995	minutes	N	1 °	32.661	minutes	W	From point 138 along the coast at the level of mean high water spring tide to point 134.
Area 21									
139	50 °	41.664	minutes	N	1 °	32.296	minutes	W	to
140	50 °	41.489	minutes	N	1 °	32.189	minutes	W	to
141	50 °	41.409	minutes	N	1 °	32.522	minutes	W	to
142	50 °	41.448	minutes	N	1 °	32.554	minutes	W	From point 142 to point 139.
Area 22									
143	50 °	42.420	minutes	N	1 °	30.954	minutes	W	to
144	50 °	42.462	minutes	N	1 °	30.944	minutes	W	to
145	50 °	42.486	minutes	N	1 °	30.150	minutes	W	to
146	50 °	42.633	minutes	N	1 °	28.785	minutes	W	to
147	50 °	42.943	minutes	N	1 °	27.643	minutes	W	to
148	50 °	42.860	minutes	N	1 °	27.588	minutes	W	From point 148 along the coast at the level of mean high water spring tide to point 149
149	50 °	42.425	minutes	N	1 °	30.019	minutes	W	From point 149 to point 150
150	50 °	42.424	minutes	N	1 °	30.073	minutes	W	From point 150 along the coast at the level of mean high water spring tide to point 143.
Area 23									
151	50 °	45.439	minutes	N	1 °	19.855	minutes	W	to
152	50 °	45.481	minutes	N	1 °	19.867	minutes	W	to
153	50 °	45.543	minutes	N	1 °	19.661	minutes	W	to
154	50 °	45.533	minutes	N	1 °	19.643	minutes	W	to
155	50 °	45.475	minutes	N	1 °	19.694	minutes	W	From point 155 along the coast at the level of mean high water spring tide to point 156
156	50 °	45.461	minutes	N	1 °	19.738	minutes	W	From point 156 to point 151.
Area 24									
157	50 °	46.036	minutes	N	1 °	18.327	minutes	W	to
158	50 °	46.060	minutes	N	1 °	18.350	minutes	W	to
159	50 °	46.061	minutes	N	1 °	18.263	minutes	W	to
160	50 °	46.036	minutes	N	1 °	18.265	minutes	W	From point 160 along the coast at the level of mean high water spring tide to point 157.
Area 25									
161	50 °	45.863	minutes	N	1 °	17.609	minutes	W	to
162	50 °	45.979	minutes	N	1 °	17.556	minutes	W	to
163	50 °	46.017	minutes	N	1 °	17.495	minutes	W	to
164	50 °	46.081	minutes	N	1 °	16.972	minutes	W	to

165	50	°	45.971	minutes	N	1	°	16.915	minutes	W	to
166	50	°	45.834	minutes	N	1	°	17.499	minutes	W	From point 166 to point 161.
Area 26											
167	50	°	45.942	minutes	N	1	°	16.327	minutes	W	to
168	50	°	45.975	minutes	N	1	°	16.291	minutes	W	to
169	50	°	45.959	minutes	N	1	°	16.099	minutes	W	to
170	50	°	44.953	minutes	N	1	°	13.983	minutes	W	to
171	50	°	44.515	minutes	N	1	°	12.516	minutes	W	to
172	50	°	44.429	minutes	N	1	°	12.355	minutes	W	to
173	50	°	44.268	minutes	N	1	°	12.554	minutes	W	to
174	50	°	44.241	minutes	N	1	°	12.699	minutes	W	to
175	50	°	44.335	minutes	N	1	°	12.828	minutes	W	to
176	50	°	44.392	minutes	N	1	°	13.194	minutes	W	to
177	50	°	44.668	minutes	N	1	°	14.116	minutes	W	to
178	50	°	44.968	minutes	N	1	°	14.700	minutes	W	to
179	50	°	45.129	minutes	N	1	°	14.841	minutes	W	to
180	50	°	45.280	minutes	N	1	°	15.364	minutes	W	to
181	50	°	45.559	minutes	N	1	°	15.588	minutes	W	From point 181 along the coast at the level of mean high water spring tide to point 167.
Area 27											
182	50	°	44.020	minutes	N	1	°	10.487	minutes	W	to
183	50	°	44.112	minutes	N	1	°	10.498	minutes	W	to
184	50	°	44.338	minutes	N	1	°	9.715	minutes	W	From point 184 along the Northern edge of the pier to point 185
185	50	°	44.363	minutes	N	1	°	9.556	minutes	W	to
186	50	°	44.487	minutes	N	1	°	8.955	minutes	W	to
187	50	°	44.200	minutes	N	1	°	9.049	minutes	W	to
188	50	°	43.981	minutes	N	1	°	9.207	minutes	W	From point 188 along the coast at the level of mean high water spring tide to point 182.
Area 28											
189	50	°	43.041	minutes	N	1	°	6.405	minutes	W	to
190	50	°	43.047	minutes	N	1	°	6.346	minutes	W	to
191	50	°	42.865	minutes	N	1	°	6.273	minutes	W	to
192	50	°	42.855	minutes	N	1	°	6.339	minutes	W	From point 192 to point 189.
Area 29											
193	50	°	42.412	minutes	N	1	°	6.047	minutes	W	to

194	50	°	42.510	minutes	N	1	°	6.090	minutes	W	to
195	50	°	42.527	minutes	N	1	°	6.038	minutes	W	to
196	50	°	42.422	minutes	N	1	°	5.882	minutes	W	to
197	50	°	42.386	minutes	N	1	°	5.957	minutes	W	From point 197 to point 193.
Area 30											
198	50	°	42.275	minutes	N	1	°	5.170	minutes	W	to
199	50	°	42.339	minutes	N	1	°	5.168	minutes	W	to
200	50	°	42.337	minutes	N	1	°	5.054	minutes	W	to
201	50	°	42.273	minutes	N	1	°	5.057	minutes	W	From point 201 to point 198.
Area 31											
202	50	°	41.992	minutes	N	1	°	5.626	minutes	W	to
203	50	°	42.060	minutes	N	1	°	5.534	minutes	W	to
204	50	°	42.070	minutes	N	1	°	5.161	minutes	W	to
205	50	°	41.769	minutes	N	1	°	5.054	minutes	W	to
206	50	°	41.738	minutes	N	1	°	5.089	minutes	W	From point 206 to point 202.
Area 32											
207	50	°	41.675	minutes	N	1	°	4.854	minutes	W	to
208	50	°	41.688	minutes	N	1	°	4.838	minutes	W	to
209	50	°	41.410	minutes	N	1	°	4.218	minutes	W	to
210	50	°	41.204	minutes	N	1	°	4.002	minutes	W	to
211	50	°	41.176	minutes	N	1	°	4.065	minutes	W	to
212	50	°	41.357	minutes	N	1	°	4.284	minutes	W	From point 212 to point 207.
Area 33											
213	50	°	41.131	minutes	N	1	°	4.155	minutes	W	to
214	50	°	41.130	minutes	N	1	°	4.098	minutes	W	to
215	50	°	41.021	minutes	N	1	°	4.071	minutes	W	to
216	50	°	41.020	minutes	N	1	°	4.153	minutes	W	From point 216 to point 213.
Area 34											
217	50	°	40.920	minutes	N	1	°	4.216	minutes	W	to
218	50	°	40.919	minutes	N	1	°	4.184	minutes	W	to
219	50	°	40.788	minutes	N	1	°	4.159	minutes	W	to
220	50	°	40.789	minutes	N	1	°	4.206	minutes	W	From point 220 to point 217.

Poole Harbour: Areas 35 - 40												
Area 35												
221	50	°	42.262	minutes	N	1	°	57.039	minutes	W	to
222	50	°	42.236	minutes	N	1	°	56.897	minutes	W	to
223	50	°	42.051	minutes	N	1	°	56.581	minutes	W	to
224	50	°	42.014	minutes	N	1	°	56.615	minutes	W	to
225	50	°	42.019	minutes	N	1	°	56.831	minutes	W	to
226	50	°	42.206	minutes	N	1	°	57.105	minutes	W	From point 226 to point 221
Area 36												
227	50	°	41.826	minutes	N	1	°	56.748	minutes	W	to
228	50	°	41.857	minutes	N	1	°	56.541	minutes	W	to
229	50	°	41.680	minutes	N	1	°	56.555	minutes	W	to
230	50	°	41.589	minutes	N	1	°	56.181	minutes	W	to
231	50	°	41.331	minutes	N	1	°	56.648	minutes	W	to
232	50	°	41.363	minutes	N	1	°	56.757	minutes	W	to
233	50	°	41.365	minutes	N	1	°	56.931	minutes	W	From point 233 to point 227.
Area 37												
234	50	°	39.953	minutes	N	1	°	58.431	minutes	W	to
235	50	°	39.952	minutes	N	1	°	58.336	minutes	W	to
236	50	°	39.885	minutes	N	1	°	58.338	minutes	W	to
237	50	°	39.886	minutes	N	1	°	58.432	minutes	W	From point 237 to point 234.
Area 38												
238	50	°	40.309	minutes	N	1	°	59.785	minutes	W	to
239	50	°	40.310	minutes	N	1	°	59.739	minutes	W	to
240	50	°	40.279	minutes	N	1	°	59.739	minutes	W	to
241	50	°	40.280	minutes	N	1	°	59.785	minutes	W	From point 241 to point 238
Area 39												
242	50	°	40.831	minutes	N	2	°	0.462	minutes	W	to
243	50	°	40.834	minutes	N	2	°	0.383	minutes	W	to
244	50	°	40.726	minutes	N	2	°	0.349	minutes	W	to
245	50	°	40.716	minutes	N	2	°	0.435	minutes	W	From point 245 to point 242
Area 40												
246	50	°	43.779	minutes	N	2	°	0.333	minutes	W	to
247	50	°	43.782	minutes	N	2	°	0.304	minutes	W	From point 247 along the northern edge of the railway line to point 248

248	50	°	43.797	minutes	N	1	°	59.726	minutes	W	to
249	50	°	43.795	minutes	N	1	°	59.695	minutes	W	From point 249 along the coast at the level of mean high water spring tide to point 247.
Studland Bay: Areas 41 -42											
Area 41											
250	50	°	39.320	minutes	N	1	°	57.063	minutes	W	to
251	50	°	39.318	minutes	N	1	°	56.843	minutes	W	to
252	50	°	39.202	minutes	N	1	°	56.845	minutes	W	to
253	50	°	39.204	minutes	N	1	°	57.065	minutes	W	From point 253 to point 250.
Area 42											
254	50	°	38.957	minutes	N	1	°	57.021	minutes	W	to
255	50	°	38.954	minutes	N	1	°	56.740	minutes	W	to
256	50	°	38.820	minutes	N	1	°	56.197	minutes	W	to
257	50	°	38.629	minutes	N	1	°	56.017	minutes	W	to
258	50	°	38.634	minutes	N	1	°	55.545	minutes	W	to
259	50	°	38.571	minutes	N	1	°	55.521	minutes	W	to
260	50	°	38.480	minutes	N	1	°	56.335	minutes	W	to
261	50	°	38.484	minutes	N	1	°	56.395	minutes	W	to
262	50	°	38.591	minutes	N	1	°	56.612	minutes	W	to
263	50	°	38.764	minutes	N	1	°	56.897	minutes	W	From point 263 to point 254.
The Fleet: Area 43											
Area 43											
264	50	°	35.905	minutes	N	2	°	29.958	minutes	W	to
265	50	°	35.840	minutes	N	2	°	30.074	minutes	W	to
266	50	°	34.720	minutes	N	2	°	28.167	minutes	W	to
267	50	°	34.692	minutes	N	2	°	28.222	minutes	W	From point 267 along the coast at the level of mean high water spring tide to point 264.

SCHEDULE 2 – WINTER CLOSURE AREAS

Schedule 2 - Winter Closure Areas 1st November - 31st March both days inclusive			
Point Nu	**Latitude**	**Longitude**	**Straight Line, unless otherwise stated, to Next Point Number**
Poole Harbour: Areas 44 - 53			
Area 44			
The Part of the District that lies below mean high water springs and north of a straight line drawn from:			
268	50 ° 43.203 minutes N	2 ° 2.446 minutes W	to
269	50 ° 43.210 minutes N	2 ° 2.417 minutes W	
Area 45			
270	50 ° 43.779 minutes N	2 ° 0.333 minutes W	to
271	50 ° 43.782 minutes N	2 ° 0.304 minutes W	to point 272 along the northern edge of the railway line
272	50 ° 43.797 minutes N	1 ° 59.726 minutes W	to
273	50 ° 43.795 minutes N	1 ° 59.695 minutes W	From point 273 along the northern edge of the railway line and along the coast at the level of mean highwater springs to point 274
274	50 ° 42.774 minutes N	1 ° 59.543 minutes W	to
275	50 ° 42.738 minutes N	1 ° 59.595 minutes W	From point 275 along the coast at the level of mean highwater springs and along the northern edge of the railway line to point 270.
Area 46			
The Part of the District that lies below mean high water springs and north of a straight line drawn from:			
276	50 ° 42.501 minutes N	1 ° 57.224 minutes W	to
277	50 ° 42.475 minutes N	1 ° 57.189 minutes W	
Area 47			
The Part of the District that lies below mean high water springs and south of a straight line drawn from:			
278	50 ° 40.160 minutes N	1 ° 58.264 minutes W	to
279	50 ° 40.156 minutes N	1 ° 58.981 minutes W	
Area 48			
The Part of the District that lies below mean high water springs and west of a straight line drawn from:			
280	50 ° 40.156 minutes N	1 ° 58.981 minutes W	to
281	50 ° 40.608 minutes N	1 ° 58.699 minutes W	to
Area 49			
The Part of the District that lies below mean high water springs and south of a straight line drawn from:			
282	50 ° 40.357 minutes N	1 ° 59.519 minutes W	to
283	50 ° 40.400 minutes N	1 ° 59.753 minutes W	
Area 50			
The Part of the District that lies below mean high water springs and south of a straight line drawn from:			

284	50	°	40.547	minutes	N	2	°	0.163	minutes	W	to	
285	50	°	40.649	minutes	N	2	°	0.422	minutes	W		
Area 51												
The Part of the District that lies below mean high water springs and south of a straight line drawn from:												
286	50	°	40.906	minutes	N	2	°	1.068	minutes	W	to	
287	50	°	41.189	minutes	N	2	°	1.623	minutes	W		
Area 52												
The Part of the District that lies below mean high water springs and west of a straight line drawn from:												
288	50	°	41.950	minutes	N	2	°	1.641	minutes	W	to	
289	50	°	42.179	minutes	N	2	°	1.837	minutes	W		
Area 53												
290	50	°	42.400	minutes	N	2	°	4.507	minutes	W	to	
291	50	°	42.252	minutes	N	2	°	4.070	minutes	W	to	
292	50	°	41.880	minutes	N	2	°	4.271	minutes	W	to	
293	50	°	41.842	minutes	N	2	°	4.540	minutes	W	From point 293 along the coast at the level of mean high water spring tide to point 290.	

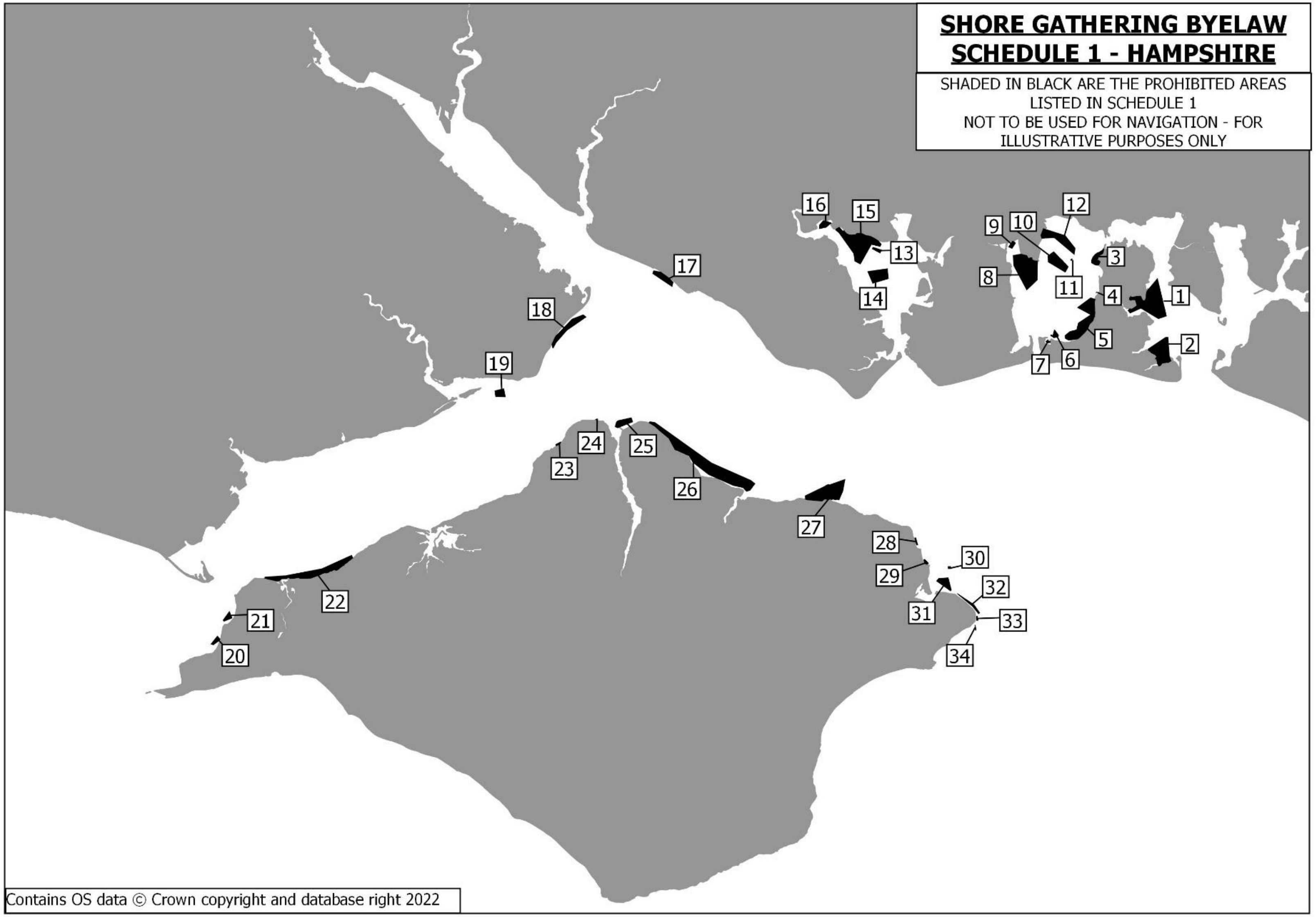
SCHEDULE 3 – SUMMER CLOSURE AREAS

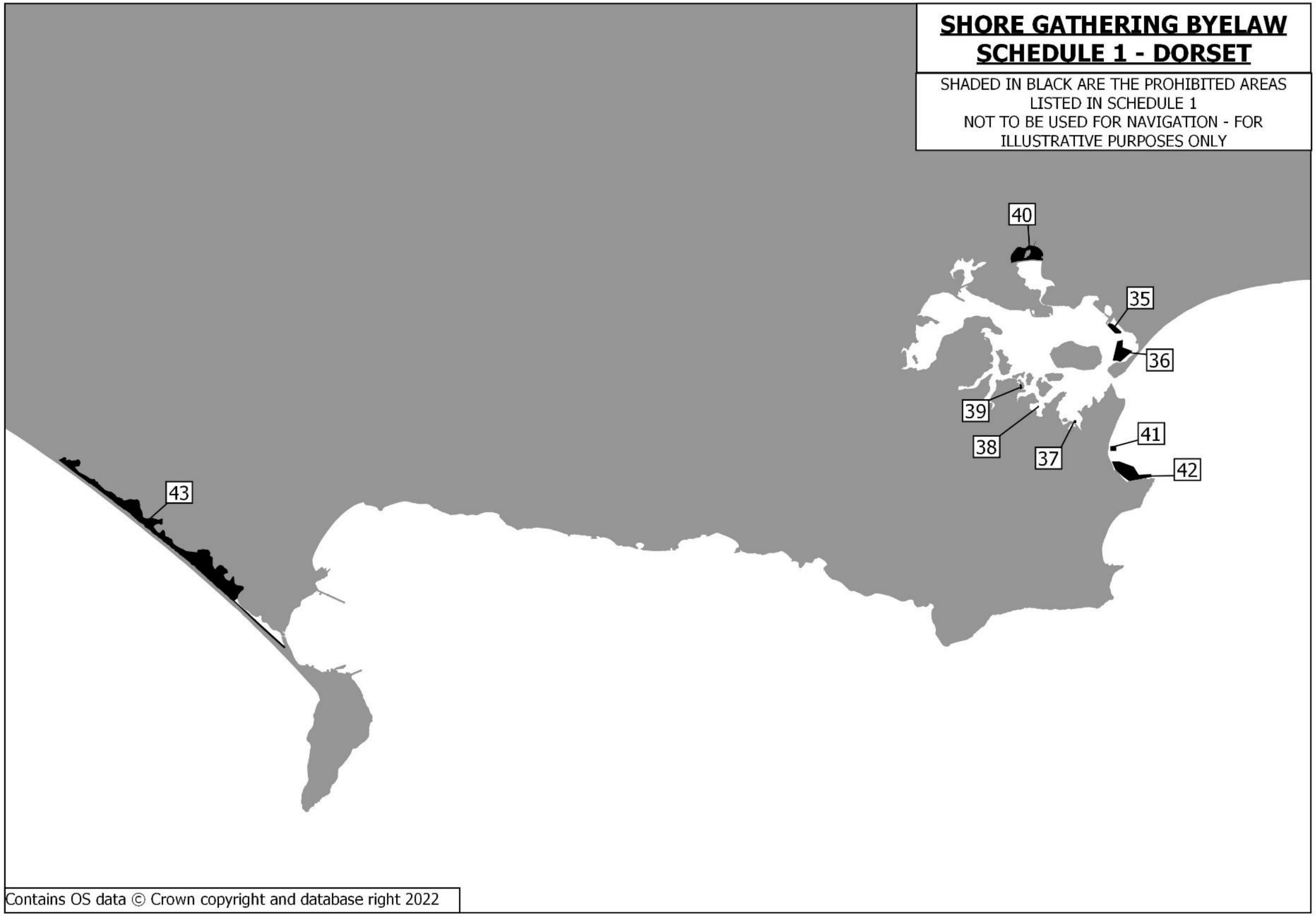
Schedule 3 - Summer Closure Areas 1st March - 31st August both days inclusive			
Point Nu	**Latitude**	**Longitude**	**Straight Line, unless otherwise stated, to Next Point Number**
Southampton Water: Areas 54- 57			
Area 54			
The Part of the District that lies below mean high water springs and north of a straight line drawn from:			
294	50 ° 52.385 minutes N	1 ° 18.782 minutes W	to
295	50 ° 52.381 minutes N	1 ° 18.340 minutes W	
Area 55			
The Part of the District that lies below mean high water springs and west of a line drawn from:			
296	50 ° 54.687 minutes N	1 ° 28.029 minutes W	to
297	50 ° 54.615 minutes N	1 ° 28.103 minutes W	to
298	50 ° 54.423 minutes N	1 ° 27.899 minutes W	to
299	50 ° 54.285 minutes N	1 ° 27.875 minutes W	to
300	50 ° 54.290 minutes N	1 ° 27.588 minutes W	to
301	50 ° 54.133 minutes N	1 ° 27.119 minutes W	to
302	50 ° 54.099 minutes N	1 ° 27.121 minutes W	
Area 56			
303	50 ° 51.902 minutes N	1 ° 23.320 minutes W	to
304	50 ° 50.764 minutes N	1 ° 20.967 minutes W	From point 304 along the coast at the level of mean high water spring tide to point 303.
Area 57			
305	50 ° 50.211 minutes N	1 ° 20.152 minutes W	to
306	50 ° 48.909 minutes N	1 ° 18.558 minutes W	From point 306 along the coast at the level of mean high water spring tide to point 305.
Lymington and Keyhaven: Area 58			
Area 58			
307	50 ° 45.751 minutes N	1 ° 26.758 minutes W	to
308	50 ° 45.207 minutes N	1 ° 28.936 minutes W	to
309	50 ° 43.792 minutes N	1 ° 32.436 minutes W	to
310	50 ° 42.863 minutes N	1 ° 33.302 minutes W	From point 310 along the coast at the level of mean high water spring tide to point 307.
Isle of Wight: Areas 59 - 61			
Area 59			
The Part of the District that lies below mean high water springs and south of a line drawn from:			
311	50 ° 42.424 minutes N	1 ° 30.073 minutes W	to
312	50 ° 42.425 minutes N	1 ° 30.019 minutes W	
Area 60			

The Part of the District that lies below mean high water springs and south of a line drawn from:											
313	50	°	43.549	minutes	N	1	°	25.067	minutes	W	to
314	50	°	43.633	minutes	N	1	°	24.278	minutes	W	
Area 61											
The Part of the District that lies below mean high water springs and south of a line drawn from:											
315	50	°	44.963	minutes	N	1	°	17.590	minutes	W	to
316	50	°	44.962	minutes	N	1	°	17.418	minutes	W	

SCHEDULE 4

PROHIBITED AREAS ILLUSTRATIVE MAPS – the number provided for each Prohibited Area corresponds to the Area Number in Schedule 1




SHORE GATHERING BYELAW
SCHEDULE 1 - DORSET
SHADED IN BLACK ARE THE PROHIBITED AREAS LISTED IN SCHEDULE 1
NOT TO BE USED FOR NAVIGATION - FOR ILLUSTRATIVE PURPOSES ONLY
40
35
36
39
38
37
41
42
43
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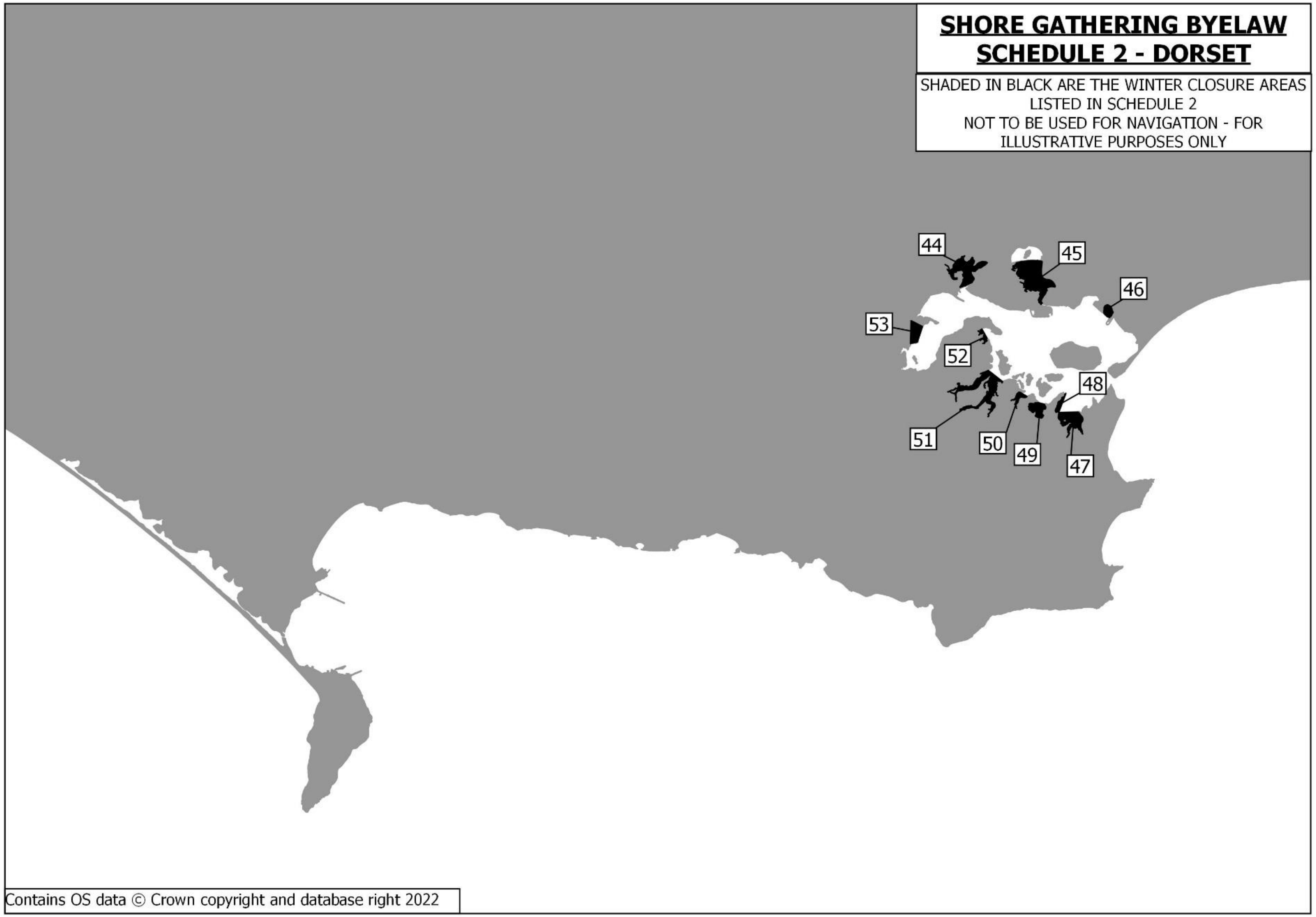
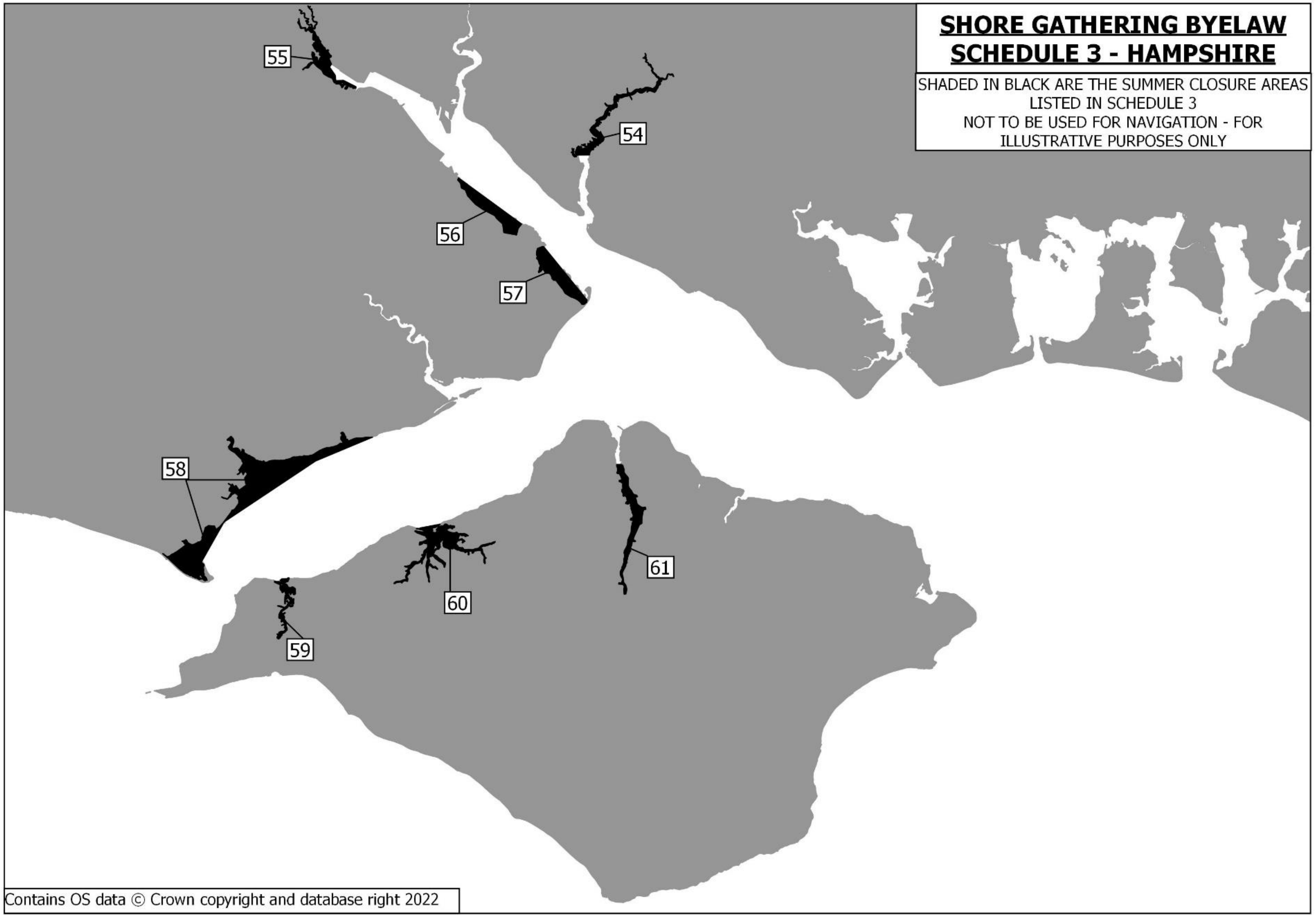
SCHEDULE 5

WINTER CLOSURE AREAS ILLUSTRATIVE MAPS - the number provided for each Winter Closure Area corresponds to the Area Number in Schedule 2



SCHEDULE 6

SUMMER CLOSURE AREAS ILLUSTRATIVE MAPS - **the number provided for each Summer Closure Area corresponds to the Area Number in Schedule 3**



MARKED B_ANNEX 2

SOUTHERN INSHORE FISHERIES AND CONSERVATION AUTHORITY

MARINE AND COASTAL ACCESS ACT 2009[1]

FISHING FOR COCKLES (AMENDMENT) BYELAW

The Southern Inshore Fisheries and Conservation Authority, in exercise of the powers conferred by sections 155(1) of the Marine and Coastal Access Act 2009 makes the following byelaw for that District.

INTERPRETATION

(1) In this byelaw:

a) “the Authority" means the Southern Inshore Fisheries and Conservation Authority as defined in Article 4 of the Southern Inshore Fisheries and Conservation Order 2010[2];

b) “the District” means the Southern Inshore Fisheries and Conservation District as defined in Article 3 of the Southern Inshore Fisheries and Conservation Order 2010[2];

c) “dredge” means a dredge, scoop or similar device that is designed for, or capable of taking any shellfish;

d) “Poole Harbour” means that part of the District in Poole Harbour as lies below Mean High Water Springs and to the west of and within an imaginary line between Point 1 (50° 40.809’N 001° 57.000’W) and Point 2 (50° 40.980’N 001° 56.926’W).

PROHIBITION

(3) A person must not fish for or take from a fishery a cockle between the 1st February and the 30th April inclusive.

(4) A person must not take from a fishery a cockle which will pass through a gauge having a square opening measuring 23.8mm along each side.

EXCEPTIONS

(5) Paragraph (3) does not apply to a person fishing for or taking cockles using a dredge from a vessel within Poole Harbour.

DISPENSATIONS

(6) Paragraphs (3) and (4) do not apply to any person who has obtained a written dispensation issued by the Authority in accordance with paragraph (7) and the authorisation is valid in accordance with paragraph (8).

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[1] 2009 c.23
[2] S.I. 2010/2198

(7) The Authority may issue a written dispensation for scientific, educational, stocking or breeding purposes.

(8) A dispensation issued under paragraph (7) will only be valid if:

a) The act being undertaken complies with the terms of the dispensation; and

b) The dispensation is carried on the person and produced for inspection when requested by an Inshore Fisheries and Conservation Officer of the Authority or any other person authorised by the Authority to make such a request.

REVIEW

(9) The Authority (or a sub-committee thereof authorised by the Authority to do so) will review the suitability of the byelaw in accordance with any changes in best available evidence, to include any statutory advice provided by Natural England or other such bodies, organisations or persons as the Authority deem fit.

AMENDMENT

(10) The byelaw with the title 'Fishing for Cockles' made by the Authority, in exercise of its powers under section 155(1) of the Marine and Coastal Access Act 2009, confirmed on 23rd June 2015, and in force immediately before the making of this byelaw is amended.

I hereby certify that the above byelaw was made by Southern Inshore Fisheries and Conservation Authority at their meeting on 19th September 2024 (TBC).

……………………………………………………………….

Pia Bateman
Chief Executive Officer
Southern Inshore Fisheries and Conservation Authority

The Secretary of State for Environment, Food and Rural Affairs in exercise of the power conferred by section 155(3) of the Marine and Coastal Access Act 2009 confirms the Shore Gathering Byelaw made by the Southern Inshore Fisheries and Conservation Authority on 19th September 2024 (TBC).

…………………………………………………………….
A Senior Civil Servant for, and on behalf of, the Secretary of State for Environment, Food and Rural Affairs

Date:

Explanatory Note (not part of byelaw)

The purpose of this byelaw is to manage fishing for cockles within the Southern IFCA District. The byelaw imposes a closed season for fishing for or taking cockles, except within Poole Harbour if a vessel is being used. The byelaw also sets a minimum conservation reference size for cockles that can be taken from a fishery within the Southern IFCA District.

This byelaw is an amendment to the "Fishing for Cockles Byelaw" made by the Authority, in exercise of its powers under section 155(1) of the Marine and Coastal Access Act 2009, confirmed on 23rd June 2015, and in force immediately before the making of this byelaw. The following amendments were made to the "Fishing for Cockles Byelaw" text:

- *a) Removal of paragraph (3);*
- *b) Removal of reference within paragraph (5) to paragraph (3);*
- *c) Inclusion of 'Dispensations' provision to include revision of text under paragraph (6);*
- *d) Inclusion of 'Review' provision;*
- *e) Renumbering of all paragraphs as required based on (a) to (d).*

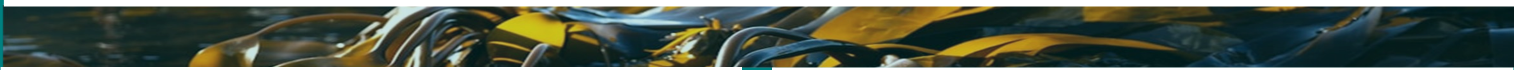
MARKED B_ANNEX 3

Southern IFCA

Seaweed Harvesting

Code of Conduct

This Seaweed Harvesting Code of Conduct applies to Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the Southern IFCA District. The CoC has been adapted from the Natural England CoC for seaweed harvesting (which was developed in conjunction with the Crown Estate, Cornwall and Devon & Severn IFCAs, the National Trust and Cornwall Wildlife Trust) to include reference to relevant features of the District's National Site Network Sites.



1	Ensure you obtain any relevant permissions before undertaking gathering activities, including landowner permission. Natural England should be consulted before harvesting seaweed in a protected site in England.
2	Harvest seaweed only by hand – mechanical methods should not be used. Cut fronds (leaves) well above the point of growth (e.g. the meristem for kelps) and always leave the holdfast attached.
3	Do not use vehicles on the foreshore.
4	Avoid disturbing sea birds by keeping an appropriate distance away.
5	Avoid or minimise trampling on non-target organisms and avoid taking 'bycatch' such as stalked jellyfish, Peacocks Tail, Pink Sea Fan and Seahorses.
6	Collect less than one third of an individual plant to allow for regrowth.
7	Take care to replace any rocks in the position you found them.
8	Harvest sparsely, taking only a small percentage of standing stock.*
9	Rotate harvesting areas to allow ample time for recovery. Harvested areas should be left for up to several years, depending on the species, before harvesting again.*
10	Harvest seaweeds during the active growth season to allow for quicker recovery.*
11	Harvest seaweeds after reproduction has occurred if possible and ensure a substantial proportion of mature plants remain.*
12	Take extra care when harvesting invasive non-native seaweeds to ensure that seaweeds or spores are not transferred to other areas. Follow 'Check, Clean, Dry' biosecurity principles, checking, cleaning and drying all equipment and clothing when moving between sites to ensure that invasive species, pests and diseases are not spread to new areas. ** (https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/). *
13	Do not collect drift seaweed from the entire length of strandlines – harvest sparsely as this constitutes an important habitat.
14	Keep records of volumes & weights of each species of seaweed harvested, along with date and location.
15	Limit harvesting in erosion prone coastal areas (i.e. dunes) where kelp forests dissipate wave energy.
16	Please be aware that foreshores can be hazardous. Do not put yourself at risk of injury by collecting seaweed in adverse conditions and be aware of tides.

*Consult Natural England for further information/ advice

** For information on how to identify non-native seaweeds, please see the GBNNSS website: www.nonnativespecies.org.

Please note that other restrictions/regulations may apply to this activity. Participants should be aware of all relevant regulations.

MARKED B_ANNEX 4

Title: Southern IFCA Shore Gathering Byelaw **IA No:** SIFCA0124 **RPC Reference No:** N/A **Lead department or agency:** Southern Inshore Fisheries and Conservation Authortiy **Other departments or agencies:** Marine Management Organisation, Natural England, Department for the Environment, Food and Rural Affairs (Defra)	**Impact Assessment (IA)** **Date:** 08/08/2024 **Stage:** Development **Source of intervention: Domestic** **Type of measure:** Secondary Legislation **Contact for enquiries:** Deputy Chief Officer, Dr Sarah Birchenough, Southern Inshore Fisheries and Conservation Authority, 01202 721373, enquiries@southern-ifca.gov.uk

Summary: Intervention and Options

RPC Opinion: N/A

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value	**Business Net Present Value**	**Net cost to business per year**	**Business Impact Target Status**
£-700,000	£-700,000	£77,808	Qualifying provision

What is the problem under consideration? Why is government action or intervention necessary?

Shore gathering activities such as shellfish gathering, bait digging, push-netting, mechanical harvesting (by hand), crab tilling and seaweed harvesting have the potential to impact certain sensitive features for which MPAs within the National Site Network are designated. Management is required to ensure that the Southern IFCA (SIFCA) can continue to meet its duties under the Marine and Coastal Access Act 2009, the Conservation of Habitats and Species Regulations 2017 and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 to manage fishing activities in MPAs to ensure features are not adversely affected (Special Areas of Conservation [SACs] and Special Protection Areas [SPAs]), and that Conservation Objectives (Marine Conservation Zones [MCZs]) are furthered. A review of the existing SIFCA management relevant to shore gathering is required as well as consideration of new management interventions to ensure consistent and relevant management for all shore gathering activities in the district in line with Southern IFCA's legal duties

What are the policy objectives of the action or intervention and the intended effects?

- To avoid adverse impact from shore gathering activity on SACs and SPAs, and further the conservation objectives of MCZs in the Southern IFCA District
- To review existing management to ensure that it is based on best available evidence and is relevant and consistent for all shore gathering activities in the District
- To manage activity proportionately by considering management for designated features within MCZs and within or adjacent to SACs and SPAs
- To enhance environmental sustainability within the Southern IFCA District
- Intended effect is protection of designated sensitive features in MPAs (National Site Network sites) from shore gathering activities, success is measured by compliance with regulations, measured through compliance and enforcement outputs and, if required, associated enforcement action.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

0. Do nothing.
1. Create a new Southern IFCA Shore Gathering Byelaw in order to introduce relevant, consistent and feature-based management for shore gathering activities in line with Southern IFCA's legal duties for sites under the National Site Network (SACs, SPAs and MCZs).
2. Create a Southern IFCA byelaw to prohibit shore gathering activities within the full extent of all MPAs under the National Site Network (SACs, SPAs and MCZs).
3. Voluntary measures.

The preferred option is **Option 1**:

- The revocation of the:
    - Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw
    - Poole Harbour Shellfish Hand Gathering Byelaw
    - Periwinkles Byelaw
    - Fishing for Oysters, Mussels and Clams Byelaw
    - Redeposit of Shellfish Byelaw
- The amendment of the Fishing for Cockles Byelaw to remove hand gathering gear restrictions.
- The cessation of the Memorandum of Agreement for Bait Digging in Poole Harbour ('Bait Digging MoA').
- And creation of the Southern IFCA Shore Gathering Byelaw.

Option 1 would best enable Southern IFCA to meet its duties. Spatial management in MPAs utilising a feature-based approach is in line with the current legal duties of the Southern IFCA and is a proportionate response to ensuring appropriate protection of the marine environment from shore gathering activities.

Will the policy be reviewed? It will be reviewed. **If applicable, set review date:** Review in line with provision (10) of the Shore Gathering Byelaw.					
Is this measure likely to impact on international trade and investment?		No			
Are any of these organisations in scope?	**Micro** **Yes**	**Small** **Yes**	**Medium** No	**Large** No	
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** N/A		**Non-traded:** N/A	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible CHAIR: ……………………… Date: ……………..

Summary: Analysis & Evidence

Policy Option 1

Description:

FULL ECONOMIC ASSESSMENT

Base Year	PV Base Year	Period Years	Net Benefit (Present Value (PV)) (£)		
2019	2020	10	**Low:** Optional	**High:** Optional	**Best Estimate:** £-700,000

COSTS (£)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Cost** (Present Value)
	Optional		Optional	**Optional**
	Optional		Optional	**Optional**
Best Estimate	£1,717		£77,609	£669,750

Description and scale of key monetised costs by 'main affected groups'

The **maximum average** annual cost to the UK shore gathering industry is estimated to £77,609 assuming the proposed closures are accessed **every available day**. These consequences are a result of 3 commercial bait diggers being displaced from Holes Bay in Poole Harbour for two extra months of the year and three commercial bait diggers who currently dig in the River Medina for three months of the year only.

The displacement of these groups will impact local bait and tackle shops, the cost of which is included in the figure above.

It should be noted that based on Southern IFCA records of activity data and observations made by Southern IFCA Officers that bait digging activity has not been observed to occur every day in any location. However, given the potential currently for that activity to occur every day during the referenced period, an estimation of cost has been made on this basis, this is highly likely to be an overestimate.

The total transition cost to Southern IFCA associated with the new measures is estimated to be £1,717 and would come in the first year of the byelaw. This cost is related to the update of current information boards and production of new information resources. Ongoing compliance costs would form part of the normal annual delivery of work by Southern IFCA.

Other key non-monetised costs by 'main affected groups'

As a consequence of loss of access to certain areas, there is the potential for displacement of fishing effort to other areas, potentially creating additional conflict with other users and reducing the sustainability of fisheries and the marine environment. This is unlikely as a targeted engagement exercise showed minimum overlap with activity and prohibited areas asides from the groups mentioned under monetised costs.

BENEFITS (£m)	**Total Transition** (Constant Price)	Years	**Average Annual** (excl. Transition) (Constant Price)	**Total Benefit** (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	n/a		n/a	**n/a**

Description and scale of key monetised benefits by 'main affected groups'

The removal of restrictions related to the type of tools allowed when gathering shellfish may increase the efficiency of shellfish related shore gathering activity and therefore the profits, however there is existing non-compliance with the gear restrictions in place therefore it is likely that shellfish is already being gathered with implements in some cases reducing the overall benefit by removing this restriction. It is not possible to monetise this benefit with the data available. There are no studies into the efficiency of gathering using hand equipment vs hand picking only.

Other key non-monetised benefits by 'main affected groups'	
Proposed measures will benefit the sustainability of the marine environment through the protection of sensitive designated features within MCZs and within or adjacent to SACs and SPAs that would otherwise be vulnerable to potentially damaging shore gathering techniques. Certain designated features are also defined as blue carbon habitats contributing to offsetting climate change. Such benefits are difficult to quantify.	
Key assumptions/sensitivities/risks **Discount rate (%)**	3.5
A key assumption is that the management intervention will be successful in preventing shore gathering activities within prohibited areas and that the exclusion of these activities will lead to maintenance and/or recovery of designated sensitive features. Costs to industry have been calculated using information from Southern IFCA stakeholders gathered during an engagement exercise. Data on economic value of harvested species is lacking in landings data and for certain activities, such as recreational harvesting or bait gathering there is no requirement to report landings. Therefore, direct engagement was the only method of obtaining an assessment of potential costs. Costs was calculated using the **maximum** volume of catch and financial gain provided through the engagement exercise. This impact assessment estimates the **maximum impact** to industry on this basis. It should be noted that based on Southern IFCA records of activity data and observations made by Southern IFCA Officers that the levels of effort for relevant activities (bait digging) do not equate to the maximum available period for undertaking this activity and therefore whilst the maximum cost has been calculated, this is highly likely to be an overestimate.	

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £:			**Score for Business Impact Target (qualifying provisions only) £:**
Costs: 77,808	**Benefits:** N/A	**Net:** 77,808	389,042

Evidence Base

1 Problem under consideration and rationale for intervention

1.1 This Impact Assessment (IA) is for the Southern Inshore Fisheries and Conservation Authority (SIFCA) Shore Gathering Byelaw ("the Byelaw"). The Byelaw will manage shore gathering activity in the Southern IFCA District and has been developed through a review of shore gathering activity undertaken by the Southern IFC Authority.

1.2 Shore gathering activities such as shellfish gathering, bait digging, push-netting, mechanical harvesting (by hand), crab tilling and seaweed harvesting have the potential to impact certain sensitive features for which MPAs in the National Site Network are designated. Management is required to ensure that the Southern IFCA (SIFCA) can continue to meet its duties under the Marine and Coastal Access Act 2009, The Conservation of Habitats and Species Regulations 2017 and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 to manage fishing activities in MPAs (National Site Network Sites) to ensure features are not adversely affected (SACs and SPAs), and that Conservation Objectives (MCZs) are furthered. A review of the existing SIFCA management is required to ensure consistent and relevant management for all shore gathering activities in the district.

1.3 There have been 1357 occurrences of shore gathering within MPAs (SACs, SPAs and MCZs) recorded by SIFCA between July 2007 and March 2024. These occurrences have been recorded as sightings or inspections by Southern IFCA Officers and further information on activity can be found in the supporting document for the byelaw, the Site-Specific Evidence Document[1]. As Southern IFCA patrols are intelligence led and dictated by resource and activity, this figure will not reflect all shore gathering activity which takes place in the District, however the timeseries dataset gives an overview of preferred areas and seasonal patterns. Levels of shore gathering activities occurring in the Southern IFCA District are deemed to be low based on best available evidence with the most occurrences in a single site in a single month being less than 20.

1.4 Shore gathering activity can potentially cause negative outcomes as a result of 'market failures'. These failures can be described as:

- **Public goods and services** – a number of goods and services provided by the marine environment such as biological diversity are 'public goods' (no-one can be excluded from benefiting from them, but use of the goods does not diminish the goods being available to others). The characteristics of public goods, being available to all but belonging to no-one, mean that individuals do not necessarily have an incentive to voluntarily ensure the continued existence of these goods which can lead to under-protection/provision.

- **Negative externalities** – Negative externalities occurs when the cost of damage to the marine environment is not fully borne by the users causing the damage. In many cases no monetary value is attached to the goods and services provided by the marine environment, and this can lead to more damage occurring than would occur if the users had to pay the price of damage. Even for those marine harvestable goods that are traded (such as wild fish), market prices often do not reflect the full economic cost of the exploitation or of any damage caused to the environment by that exploitation.

- **Common goods** – A number of goods and services provided by the marine environment such as populations of wild fish are 'common goods' (no-one can be excluded from benefiting from those goods however consumption of the goods does diminish that available to others). The characteristics of common goods (being available but belonging to no-one, and of a diminishing quantity), mean that individuals do not necessarily have an individual economic incentive to ensure the long-term existence of these goods which can lead, in fisheries terms, to potential overfishing. Furthermore, it is in the interest of each individual to catch as much as possible as quickly as

[1] SIFCA Shore Gathering Site Specific Evidence Document to be linked here

possible so that competitors do not take all the benefits. This can lead to an inefficient amount of effort and unsustainable exploitation

1.5 The Byelaw aims to redress these sources of market failure in the marine environment through the following ways:

- Management measures to ensure that designated features and supporting habitats are not adversely affected (SACs and SPAs) and to ensure that Conservation Objectives are furthered (MCZs) will ensure negative externalities are reduced or suitably mitigated.

- Management measures will support continued existence of public goods in the marine environment, for example conserving the range of biodiversity in the Southern IFC District.

- Management measures will also support continued existence of common goods in the marine environment, for example ensuring the long-term sustainability of stocks of sea fisheries resources in the IFC District.

2 Southern IFCA Legal Duties

2.1 Southern IFCA is responsible for the management of fishing activities in the coastal waters of Dorset, Hampshire and the Isle of Wight. These waters contain highly biodiverse and ecologically rich habitats, providing a range of valuable ecosystem services. The value of these habitats and species is recognised through a range of Marine Protected Area (MPA) designations, collectively contributing to the UK's MPA Network ("the National Site Network").

2.2 Southern IFCA has duties under section 154 of the Marine and Coastal Access Act 2009[2] ("the MaCAA") for the protection of features within marine conservation zones as follows:

(1) The authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered.

(2) Nothing in section 153(2) is to affect the performance of the duty imposed by this section.

(3) In this section –

a. "MCZ" means a marine conservation zone designated by an order under section 116;

b. the reference to the conservation objectives of an MCZ is a reference to the conservation objectives stated for the MCZ under section 117(2)(b)

2.3 Section 125 of the MaCAA also requires that public bodies (which includes the IFCA) exercises its functions in a manner to best further (or, if not possible, least hinder) the conservation objectives for MCZs.

2.4 Southern IFCA has duties under the Conservation of Habitats and Species Regulations 2017[3] and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[4] (referred to jointly in this document as the "Conservation Regulations"). The Conservation Regulations transpose the land and marine aspects of the Habitats Directive and Wild Birds Directive into domestic law and outlines how the National Site Network will be managed.

2.5 The National Site Network is a network of protected sites which are designated for rare and threatened species and rare natural habitat types. These sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), designated under the EC Habitats Directive 1992[5] and the EC Birds

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[2] Marine and Coastal Access Act 2009 (legislation.gov.uk)

[3] The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk)

[4] The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (legislation.gov.uk)

[5] EUR-Lex - 31992L0043 - EN - EUR-Lex (europa.eu)

Directive 2009[6], respectively. The National Site Network also includes MCZs designated under the MaCAA.

2.6 Under Regulation 6 of the Conservation of Habitats and Species Regulations 2017, Southern IFCA, as a named competent authority, must ensure that fishing activity within or adjacent to an SAC or SPA does not damage, disturb or lead to a deterioration of a species which receives protection under the relevant designation, so as to ensure compliance with the Habitats Directive and Birds Directive.

2.7 For MCZs, where section 154 of the MaCAA states that an IFCA's performance in meeting the duty to further Conservation Objectives for features within an MCZ should not be affected by anything listed in the general IFCA duties under section 153, this includes social or economic considerations. Likewise, for SACs and SPAs, the overarching legislation does not provide for the consideration of social or economic factors/impacts when making management decisions which are required to ensure that the duty of no adverse effect is met for activity within or adjacent to these sites. Once these duties have been satisfied, if there is a need for further management intervention then this would be developed in consideration of any other relevant material considerations (matters that should be taken into account when making a decision) which includes consideration of socio-economic factors.

3 Review of Shore Gathering Activity

3.1 Shore gathering is the action of gathering sea fisheries resources in the intertidal or shallow subtidal environment. Activities are carried out on foot and include shellfish gathering, bait digging/collection, shrimp push-netting, crab tilling/collection, mechanical harvesting (by hand) and the harvesting of seaweed by hand from the shore. A selection of shore gathering activities are already managed in the District through a combination of byelaws and non-statutory measures, these measures are:

- Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw
- Poole Harbour Shellfish Hand Gathering Byelaw
- Periwinkles Byelaw
- Fishing for Oysters, Mussels and Clams Byelaw
- Redeposit of Shellfish Byelaw
- Fishing for Cockles Byelaw
- The Bait Digging MoA

3.2 During 2022, Southern Inshore Fisheries and Conservation Authority (IFCA) commenced a review of management for shore gathering activities in the District, to consider where management may be required for Tranche 3 Marine Conservation Zones (MCZs) and in response to an update to the evidence base provided by the Statutory Nature Conservation Body, Natural England, on the location and extent of designated features. In addition, the review encompassed consideration of existing legislation which relates to shore gathering activities.

This review was further informed in 2023 by the publication of The Environmental Improvement Plan 2023 (EIP)[7], introduced by Government as the first revision of the 25-Year Environment Plan[8]. The Environment Plan identified the Government's intention to support progress towards the UN's Sustainable Development Goals under the Global Biodiversity Framework which includes protection of 30% of the global ocean by 2030. At a domestic level, the Government aim to achieve this by enhancing protection for MPAs. Under the goal of Thriving Plants and Wildlife in the EIP, there is a target for 70% of designated features in MPAs to be in favourable condition by 2042 with the remainder in recovering condition and a new interim target of 48% of this to be achieved by 31st January 2028. The delivery of this is to be supported through strengthened protections in MPAs by 2024. Appropriate regulators, including IFCAs, are required to ensure that management measures are in place for all MPAs by 2024 in order for this interim target to be achieved. For the Southern IFCA, this includes management of shore gathering activities in relevant MPAs. In line with the targets for the EIP, the Shore Gathering Review was re-defined to focus on feature-based management interventions for MPAs: sites designated under the National Site Network (SACs, SPAs and MCZs).

[6] EUR-Lex - 32009L0147 - EN - EUR-Lex (europa.eu)
[7] Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)
[8] 25 Year Environment Plan - GOV.UK (www.gov.uk)

Conservation Assessments

3.3 The evidence to support the outcomes of this review was collated through a series of environmental assessments relevant to shore gathering activities for MCZs, SACs and SPAs. A determination of whether management measures are appropriate to meet the legal duties for relevant sites is made through the completion of an MCZ Assessment (for MCZs) or a Habitats Regulations Assessment (HRA, for SACs and SPAs). For the latter, a duty is placed on Southern IFCA as a competent authority under Article 6(3) of the Habitats Directive, whereby any plan or project likely to have a significant effect on an SPA or SAC within the National Site Network, either individually or in combination with other plans or projects, is to undergo an appropriate assessment, namely a Habitats Regulation Assessment (HRA). The plan or project must be assessed in view of the site's conservation objectives. Accordingly, MCZ Assessments and HRAs were undertaken as part of the review.

3.4 The MCZ assessment process is staged, comprising of an initial screening assessment to establish whether an activity occurs or is anticipated to occur/has the potential to occur within the site. Activities which are not screened out are subject to a 'Part A' assessment, akin to the Test of Likely Significant Effect required under the Habitats Directive. The aim of this assessment is to identify pressures capable of significantly affecting designated features or their related processes. Fishing activities and their associated pressures which are not screened out in the Part A assessment are then subject to a more detailed 'Part B' assessment, where assessment is undertaken on a gear type basis. The Part B assessment is akin to the Appropriate Assessment required under the Habitats Directive. The aim of this assessment is to determine whether there is a significant risk of the activity hindering the Conservation Objectives of the MCZ. The Part B assessment assesses the proposed management measures for the relevant activities to determine if the mitigation provided allows the IFCA to meet its legal duties.

3.5 MCZ assessments for shore gathering activities were undertaken for the following MCZs in the Southern IFCA district:

- Bembridge MCZ
- Studland Bay MCZ
- Yarmouth to Cowes MCZ
- Purbeck Coast MCZ
- The Needles MCZ
- Chesil Beach and Stennis Ledges MCZ

3.6 The first stage in the HRA process is a screening of activities (in the same format as for an MCZ assessment), for activities screened in, a Test of Likely Significant Effect (TLSE) is undertaken, which is designed to test whether relevant pressures for an activity are likely to cause a significant effect on the designated features of an SAC or SPA. All the features/sub-features and supporting habitats for a site are subject to the TLSE assessment for relevant activities. Where the potential for a likely significant effect cannot be excluded an Appropriate Assessment must then be undertaken which must consider, in detail, the potential effects of the activity being assessed on any features/sub-features and supporting habitats where a likely significant effect has been identified and determine it proposed mitigation through management measures allows the IFCA to meet its legal duties.

3.7 SAC/SPA assessments for shore gathering activities were undertaken for the following SPAs and SACs in the Southern IFCA district:

- Lyme Bay and Torbay SAC
- Studland to Portland SAC
- Chesil and the Fleet SAC
- Solent Maritime SAC

- South Wight Maritime SAC
- Chesil Beach and The Fleet SPA
- Poole Harbour SPA
- Solent and Southampton Water SPA
- Portsmouth Harbour SPA
- Chichester and Langstone Harbours SPA

3.8 Consideration of feature-based management for MPAs is in line with the legal duties of Southern IFCA in relation to the different designations of MPA. In all cases the term ‘feature’ is used to refer to designated features and supporting habitats for designated features under SPA designations.

3.9 Members of the Southern IFC Authority agreed, through a Working Group in early 2024 and the IFCA Technical Advisory Sub-Committee in May 2024, a set of Management Principles which would underpin the management measures for shore gathering. Defining these principles ensures a transparent approach to management and that this approach is applied consistently across the District.

3.10 The Management Principles are as follows:

1. The best available evidence used to inform feature-based protection for features designated under relevant MCZs, SACs and SPAs is:
    a. The Natural England (NE) designated features layer provided to Southern IFCA in 2023
    b. The National Seagrass Layer obtained from the Defra Government Website
    c. NE (quality assured) commissioned Hampshire and Isle of Wight Wildlife Trust (HIWWT) seagrass data provided to Southern IFCA in 2024
2. Any additional data received after 9th May 2024 will be considered during the period of formal consultation and then (subject to byelaw ratification), in subsequent byelaw reviews, as determined by the provisions of the byelaw.
3. For relevant features a GPS buffer of 10m will be incorporated.
4. Prohibition areas will be defined as follows:
    a. For designated seagrass features within MCZs that occur up to the 2m chart datum contour.
    b. For seagrass designated as a feature or as a supporting habitat, within or adjacent to SACs and SPAs that occur up to the 2m chart datum contour.
5. Existing Southern IFCA management measures for relevant activities in the Poole Harbour SPA will be combined to create a single management approach.
6. With the exception of seagrass, the extent and distribution of feature-based management in the Solent Maritime SAC and district wide SPAs will be developed using Poole Harbour as a model.
7. In the application of the Poole Harbour model to the Solent Maritime SAC and district wide SPAs, the following approach will be taken:
    a. Bird Sensitive Areas (BSA) will be used as the basis for spatial management.
    b. In the absence of BSAs being defined by Natural England in the Solent Maritime SAC and district wide SPAs (excluding Poole Harbour), BSAs will be defined as follows:
        i. For the Solent Maritime SAC and Solent SPAs, BSAs will be initially defined using areas proposed for management as good examples of estuarine habitat under the Bottom Towed Fishing Gear Byelaw 2023 and adapted to be relevant to shore gathering activity.
        ii. For the Solent Maritime SAC, Solent SPAs and The Chesil and The Fleet SPA, consideration will be given to aligning BSAs with directions relating to access and shore gathering activities given by other bodies, for example harbour authorities and conservation bodies.

c. The requirements for seasonal management within BSAs will be considered on the basis of best available evidence.

8. A code of practice will be developed for the gathering of seaweed by hand.

4 Rationale and evidence to justify the level of analysis used in the IA (proportionality approach)

4.1 The level of evidence presented through the environmental assessments to inform the appropriateness and robustness of management intervention to meeting the IFCA's legal duties is appropriate to the problem under consideration. These assessments have been based on best available evidence of feature/supporting habitat location and extent in MPAs as provided to the Southern IFCA by Natural England, as the Government's Nature Conservation Advisors, in 2023, supported by data from The National Seagrass Layer (obtained from the Defra Government website) and NE (quality assured) commissioned HIWWT seagrass data provided to Southern IFCA in 2024.

4.2 The development of the Shore Gathering Byelaw to consider feature-based management interventions for designated features within MCZs and within and adjacent to SACs and SPAs means that, where management is required to meet the IFCA's relevant legal duties for those sites, the development of management is unable to consider socio-economic factors. Information has been sought from stakeholders to inform the anticipated cost to industry through the implementation of the Byelaw as this is the only method through which data would be available for affected activities as landings/catch data is not available for the relevant activities, however no further data has been sought on socio-economic impacts, due to the inability for the IFCA to consider this information when making feature-based management decisions to satisfy legal duties. The Shore Gathering Byelaw is deemed to satisfy those legal duties and thus does not require any further precautionary interventions, in the event that management interventions had been included which were additional to those required to meet the IFCA's legal duties then further consideration of socio-economic impacts, alongside any other relevant material considerations would have been given.

5 Description of options considered

5.1 Option 0: Do nothing

Under this option, management of Shore Gathering activities would continue under the current legislation, and voluntary codes of practice.

5.1.1 This would result in spatial management not being updated to include the current best available evidence on feature location and extent, as well as not introducing management in the relevant Tranche 3 MCZs. Southern IFCA would not fulfil its legal duties of feature-based management for designated features and supporting habitats in SACs, SPAs and MCZs as listed under MaCAA and the Conservation Regulations.

5.2 RECOMMENDED OPTION

Option 1: Create a new Southern IFCA Shore Gathering Byelaw in order to introduce relevant, consistent and feature-based management for shore gathering activities in line with Southern IFCA's legal duties for sites under the National Site Network (SACs, SPAs and MCZs).

Under this option a byelaw would be created based on the Management Principles outlined in Section 3.10 to manage shore gathering activities through a single regulatory mechanism, introducing new and revised feature-based spatial and temporal management for shore gathering activities in SACs, SPAs and MCZs.

5.2.1 Under this option, the following byelaws would be revoked:

- Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw
- Poole Harbour Shellfish Hand Gathering Byelaw
- Periwinkles Byelaw
- Fishing for Oyster mussels and clams Byelaw
- Redeposit of Shellfish Byelaw

5.2.2 This option would require the cessation of the Memorandum of Agreement for Bait Digging in Poole Harbour.

5.2.3 Under this option, the following byelaws would be amended:

- Fishing for Cockles Byelaw

5.2.4 This option would allow Southern IFCA to meet its duties for MCZs under the MaCAA and for SACs and SPAs under the Conservation Regulations. This option, will allow the IFCA to meet the Government target of ensuring that management measures are in place for all MPAs by 2024.

5.3 Option 2: Create a Southern IFCA byelaw to prohibit shore gathering activities within the full extent of all MPAs under the National Site Network (SACs, SPAs and MCZs)

Under this option a single byelaw would be created to prohibit shore gathering activities within the full spatial extent of all MPAs under the National Site Network (SACs, SPAs, MCZs).

5.3.1 This approach would allow Southern IFCA to meet its duties under the MaCAA, however under the Conservation Regulations, Southern IFCA must ensure that fishing activity does not damage, disturb or have an adverse impact upon the features for which an SAC or SPA has been legally protected. As such, full spatial closures of MPAs would be exceeding the legislative requirements upon IFCAs under the Conservation Regulations. Relevant to all National Site Network Sites, this option would be disproportionate to the spatial footprint and level of impact caused by the activities under review and, in going beyond the meeting of IFCA legal duties, would require a full assessment of all relevant material considerations applicable to each site/activity, including balancing the needs of the marine environment with the socio-economics of the fishing industry.

5.4 Option 3: Voluntary measures

5.4.1 Due to the total area and environmental value of the District's SACs, SPAs and MCZs, coupled with the number of different types of shore gathering activity, it is believed that a voluntary agreement would pose too great a risk to the integrity of the environmental designations. In support of this statement, voluntary measures have previously been used to manage bait digging activity within the Poole Harbour SPA under the Bait Digging MoA. Southern IFCA have 81 recorded breaches of the MoA since its introduction in 2013, providing an indication that voluntary measures are no longer suitable to ensure that the appropriate protection is provided to the site.

6 Policy objectives

6.1 The policy objectives of the Shore Gathering Byelaw 2024 are:

- To avoid adverse impact from shore gathering activity on SACs and SPAs, and further the conservation objectives of MCZs in the Southern IFCA District
- To review existing management to ensure that it is based on best available evidence and is relevant and consistent for all shore gathering activities in the District

- To manage activity proportionately by considering management for designated features within MCZs and within or adjacent to SACs and SPAs
- To enhance environmental sustainability within the Southern IFCA District
- Intended effect is protection of designated sensitive features in MPAs (National Site Network sites) from shore gathering activities, success is measured by compliance with regulations, measured through compliance and enforcement outputs and, if required, associated enforcement action

7 The Shore Gathering Byelaw

7.1 The Shore Gathering Byelaw provides spatial management for sensitive habitats and species within MCZs, SACs and SPAs to mitigate potential impacts from shore gathering activities. Spatial management is further defined by prohibition (year-round) or seasonal management, with three types of management areas under the Byelaw:

- Prohibited Areas (year-round)
- Summer Closure Areas (closed 1st March to 31st August)
- Winter Closure Areas (closed 1st November to 31st March)

During those periods of closure, no shore gathering activities will be permitted to take place in accordance with the definitions for shore gathering

7.2 This management is introduced through the following provisions in the Byelaw:

Prohibitions

i. No person shall fish for or take sea fisheries resources by hand or with the use of hand operated equipment where the fishing for, or taking is for the purpose of harvesting sea fisheries resources.
ii. No person shall have with them any hand operated equipment for use in the course of, or in connection with, the fishing for, or taking of sea fisheries resources for the purpose of harvesting.
iii. No person shall use of deploy any form of artificial habitat, structure or shelter to aid the collection of crab.

The definition of 'harvesting' in relation to the above prohibitions is given as: to remove and retain for the purposes of consumption, selling, displaying, using as part or wholly for a product or service, cultivating, introducing to the sea or using as bait whether carried out for commercial purposes or otherwise.

Exceptions

iv. Points (i) and (ii) do not apply to the fishing for or taking of sea fisheries resources using a vessel provided that no part of the vessel's hull is in contact with the seabed
v. Points (i) and (ii) do not apply when using:
    a. Hook and line in conjunction with a fishing rod
    b. Handlines
    c. Spear gun
    d. A net other than a push net

These provisions ensure that all relevant activities are covered. The potential impacts which require spatial management are applicable to all types of shore gathering activity and therefore in order to ensure that identified protections for designated features are appropriately mitigating those impacts, there is a need to manage all relevant activities consistently.

7.3 The byelaw will have year-round prohibition areas in 43 areas of the District. The area numbers in table 1 align with those in the schedule of the byelaw.

Table 1 Year-round prohibitions as defined in the Byelaw

Area of District	Shore Gathering Prohibition Area Number
Chichester Harbour	1 - 2
Langstone Harbour	3 – 12
Portsmouth Harbour	13 – 16
Southampton Water	17 - 18
Beaulieu	19
Isle of Wight	20 – 34
Poole Harbour	35 – 40
Studland Bay	41 - 42
The Fleet	43

7.4 The byelaw will have seasonal prohibition between 1st November and 31st March in 10 areas of the district. The area numbers in table 2 algin with those in the schedule of the byelaw.

Table 2 Seasonal prohibitions between 1st November and 31st March as defined in the Byelaw

Area of District	Shore Gathering Prohibition Area Number
Poole Harbour	44 – 53

7.5 The byelaw will have seasonal prohibition between 1st March and 31st August in 8 areas of the district. The area numbers in table 3 algin with those in the schedule of the byelaw.

Table 3 Seasonal prohibitions between 1st March and 31st August as defined in schedule

Area of District	Shore Gathering Prohibition Area Number
Southampton Water	54 - 57
Lymington & Keyhaven	58
Isle of Wight	59 - 61

7.6 The Byelaw provides for the Authority to issue a written dispensation to any person committing an act which would otherwise constitute an offence against the byelaw if the act is for the purpose of educational, scientific, stocking or breeding purposes, is being undertaken in accordance with that purpose and the dispensation is carried on board and produced for inspection when requested by an IFCO of the Authority or any other person authorised by the Authority to make such a request.

7.7 The Byelaw provides for the Authority to review the suitability of the byelaw in accordance with any changes in best available evidence, to include any statutory evidence provided by Natural England or other such bodies, organisations or persons as the Authority deems fit.

7.8 The total area closed to shore gathering activity year-round through the proposed closure areas under the Shore Gathering Byelaw is 20.28 km^2 representing 0.74% of the Southern IFCA District. **This is an increase of 4.97 km^2 from the current year-round spatial footprint of the Prohibition of Gathering (Sea Fisheries) Resources Byelaw.** The total area closed to shore gathering activity between the 1st November and 31st March is 5.27 km^2 representing 0.19% of the Southern IFCA District. **This remains the same as the current 1st November to 31st March closures under the Poole Harbour Shellfish Hand Gathering Byelaw.** The total area closed to shore gathering activity between the 1st March and 31st August is 17.26 km^2 representing 0.63% of the Southern IFCA District. **There is currently no shore gathering management in the Southern IFCA District occurring in this period.** The total area of the District closed under both year-round and seasonal closures is 42.81km^2 representing 1.56% of the Southern IFCA District.

7.9 In addition to the Byelaw, Southern IFCA have developed the Southern IFCA Seaweed Harvesting Code of Conduct has been developed. The Code of Conduct is in line with other seaweed harvesting CoCs around the UK and has primarily used a CoC developed by Natural England in conjunction with partners including other IFC Authorities as a base with the inclusion of specific provisions relevant to the needs of applicable National Site Network Sites.

The CoC includes voluntary provisions for:

- Obtaining relevant permissions
- Harvesting only by hand
- No use of vehicles
- Avoiding disturbance to sea birds
- Avoiding trampling or taking of non-target species
- Collection of less than 1/3 of an individual plant
- Cutting fronds above the point of growth and leaving the holdfast
- Harvesting sparsely and taking only a small percentage of standing stock
- Rotating harvest areas
- Harvesting during the active growing season
- Harvesting after reproduction has occurred and ensuring a sustainable proportion of mature plants remain
- INIS protocols
- Not collecting drift seaweed from the entire length of stand lines
- Keeping records of volumes of species harvested
- Limiting harvesting in erosion-prone coastal areas where kelp forests dissipate wave energy
- Being aware of hazards on the foreshore

8 Consultation

8.1 Formal Consultation

8.1.1 To be added following completion of Formal Consultation period.

9 Monetised and non-monetised costs and benefits of each option (including administrative burden)

9.1 Option 1 will be analysed in comparison to Option 0.

9.2 The creation of the Southern IFCA Shore Gathering Byelaw may result in the following costs:

- Direct costs to the fishing industry as a result of reduced access or loss of access to fishing grounds.
- Costs to Southern IFCA for information boards to support compliance.
- Indirect costs to the fishing industry associated with displacement to other fishing grounds.

9.3 Costs to the fishing industry from reduced access or loss of access to fishing grounds and compliance costs to Southern IFCA can be monetised and these estimated values have been collated and presented as part of this IA.

9.4 Indirect costs to the fishing industry associated with displacement are difficult to value and are therefore described here as non-monetised costs.

10 Costs and Benefits to the Fishing Industry

10.1 To estimate the economic cost, Southern IFCA undertook a targeted engagement exercise to gather the potential impact of changes to shore gathering management in the district. In the absence of any available catch data from national mechanisms being available for shore gathering activities, targeted engagement was the most appropriate method to gather this information.

Through this exercise it was determined that commercial bait digging participants are expected to incur costs as a result of reduced access or loss of access to fishing grounds within year-round prohibition areas under the Byelaw. These costs will be incurred as a direct result of the closure of the fishing area.

10.2 Specifically, it was determined that changes to bait digging management in the southern section of Holes Bay, Poole Harbour would displace 3 commercial bait diggers for two months of the year, this equates to a total **maximum** estimated loss of £14,640 to diggers and £20,496 to merchants if diggers were to **dig every day of each of the two months.** This is based on a maximum of 61 available days, with weight range of 7lbs-8lbs per day and a payment of £10 per lb of bait paid to the digger. Maximum merchant loss is calculated using a sale price of £18 - £24 per lb of bait recognising that the payment to the differ of £10 would need to be removed, making a profit price of £8-14 per lb for a merchant. It should be noted that based on Southern IFCA records of activity data and observations made by Southern IFCA Officers that bait digging activity has not been observed to occur every day in this, or any other location. However, given the potential currently for that activity to occur every day during the referenced period, an estimation of cost has been made on this basis, this is highly likely to be an overestimate.

10.3 Changes to bait digging management in the River Medina, Isle of Wight would displace 3 commercial bait diggers for the 'summer months of the year'. Assuming the summer months to be June, July and August, and if diggers were to **dig every day of each of the three months,** there would be a total **maximum** estimated loss of £22,080 to diggers and £30,912 to merchants. This is based on a maximum of 92 available days, with weight range of 7lbs-8lbs per day and a payment of £10 per lb of bait paid to the digger. Maximum merchant loss is calculated using a sale price of £18 - £24 per lb of bait recognising that the payment to the differ of £10 would need to be removed, making a profit price of £8-14 per lb for a merchant. The same note regarding actual versus potential levels of activity applies in this case also.

10.4 The removal of gear restrictions on current shellfish harvesting will have a financial benefit to the fishing industry, for example through the ability to gather Manila clam using hand operated equipment rather than by just hand picking. However, it is noted that there has been non-compliance historically with the restriction on Manila clam harvesting being by hand picking only therefore it is likely that a proportion of currently gathered Manila clam is already undertaken using such an implement and thus the benefit to fishers will be lower than if there was full compliance with this regulation. In addition, the gathering for cockles which can take place using a hand-held implement is likely to reveal other shellfish species unintentionally, resulting in their collection, again lessening the potential financial gain by removing this measure. The complexity of the current measure which limits the use of hand operated equipment to certain species provides no additional environmental benefit over that achieved through the proposed spatial restrictions therefore it is proposed to be revoked through the making of the Shore Gathering Byelaw. It is not possible to quantify the potential financial benefit or revoking this measure due to the lack of data available on the efficiency of hand picking vs hand rakes when used in shellfish gathering and the above outlined factors regarding current practice.

10.5 The exercise also involved meeting with six commercial shellfish gatherers operating across Poole and the Solent. The proposed closure areas do not affect those operating in Poole as they remain unchanged from current management. There is not expected to be conflict between new proposed closure areas and shellfish gatherers in the Solent which would result in an economic loss.

10.6 Due to there being low levels of seaweed gathering, crab tilling and push netting and no recorded instances of mechanical harvesting activity in the district, along with no requirement to provide data to either Southern IFCA or the Marine Management Organisation (MMO) for these activities, there is currently no method of determining participants in this fisheries and thus actively engage to understand any economic impact. However, due to the low levels or absence of activity, participants are not expected to incur a measurable cost.

10.7 The total annual cost to the industry (based on quantified **maximum** economic losses defined for bait diggers and merchants in paragraphs 10.2 and 10.3) is £88,128.

11 Costs to Southern IFCA

11.1 Southern IFCA is anticipating that additional costs for compliance and enforcement as a result of the Byelaw, over and above those already directed towards compliance and enforcement for shore gathering activity as part of business as usual, will be minimal due to the low risk posed by this activity and current low levels of effort across all relevant activities. There is therefore no monetary amount attributed to additional patrol work. Costs will be related to the development of new information resources and updates to current information boards at key areas across the district to support participants in compliance. The costs of which are to be £1,950.

11.2 Under section 153 of the MaCAA, Southern IFCA has the lead responsibility of enforcing an IFCA byelaw. The Authority’s existing compliance and enforcement strategy would be the most likely and effective method of enforcing the recommended byelaw.

11.3 The best form of engagement will be with stakeholders whilst they are participating in shore gathering activities therefore can be incorporated into the above mentioned business as usual patrols related to shore gathering activities.

12 Total monetised costs

12.1 The Equivalent Annual Net Direct Costs to Business (EANDCB) as a result of the proposed measures are estimated to be a **maximum of £77,808**.

13 Non-monetised costs

13.1 There is expected to be displacement of approximately six bait diggers from the previously mentioned areas of Poole Harbour and the River Medina on the Isle of Wight. Relative to the scale of the shore gathering fishery, this number of participants is not significant.

14 Non-monetised Benefits

14.1 The creation of the Shore Gathering Byelaw 2024 may result in the following benefits:

- Improved sustainability of the marine environment through the protection of sensitive designated features within MCZs and within or adjacent to SACs and SPAs that would otherwise be vulnerable to potentially damaging fishing techniques.

- A potential increase in the delivery of ecosystem services.

- A potential increase in the sustainability of the fisheries, leading to a socio-economic benefit for fishermen and associated businesses.

- Potential reputational benefits to shore gathering participants and the fishing industry.

14.2 These benefits are difficult to value and therefore described as non-monetised.

14.3 The MCZ and HRA assessments carried out to inform the review of shore gathering activity demonstrate that methods of shore gathering are likely to have a significant effect on certain sensitive features/supporting-habitats for which sites in the District are designated and therefore prevent the furthering of Conservation Objectives for MCZs and lead to an adverse effect on features within or adjacent to SACs and SPAs, in all cases affecting overall site integrity. The creation of prohibited and seasonal management areas under the Byelaw provides a benefit to these MPAs through protection of these sensitive features/supporting-habitats contributing to the achievement of overall site integrity.

14.4 The sensitive habitats and species designated for the National Site Network sites in the Southern IFC District which relate to the assessments for shore gathering activity include: seagrass, reef features, estuarine habitats (i.e. saltmarsh, intertidal sediments), sea-pens and burrowing megafauna, subtidal sediment habitats, native oyster, pink sea fans, peacock's tail, stalked jellyfish spp., seahorse species and bird species with associated supporting habitats. The outputs from the assessments indicate that abrasion, penetration or disturbance of the seabed, removal of non-target and target species, and disturbance of bird species were main pressures which required management consideration.

14.5 The sensitive habitats and species listed above contribute to the biodiversity of the marine environment and provide a variety of roles in supporting food webs, providing areas for feeding, breeding, roosting and protection for species and supporting the development of species communities and characteristic biotopes. These services would be maintained and potentially enhanced by the Byelaw.

14.6 Protection of these features/supporting habitats is also anticipated to deliver additional ecosystem services. The seagrass habitats offer important areas for nutrient cycling, carbon and nitrogen fixing and by protecting areas of sensitive habitat, a natural refuge is created for populations of exploited and bycatch species.

14.7 It is anticipated that the Byelaw will manage the fishery-ecosystem interaction, supporting biodiversity within the prohibited areas. The effective management of shore gathering activity in MPAs demonstrates that these fisheries can be managed in an appropriate way in designated sites. The Byelaw therefore provides these fisheries with the opportunity to demonstrate their environmental credentials. In an ever-more environmentally aware society, this information may increase consumer confidence in these fisheries which may in turn have associated social and economic benefits.

15 Risks and Assumptions

15.1 Cost estimates are based on conversations with fishery participants during a targeted engagement exercise. The values are the maximum estimates based on the figure providers by stakeholders. There is no MMO landings data available for shore gathering activities, therefore there is no way to corroborate the potential financial impact on industry or to provide a value supported by regional/national data collection.

15.2 Estimated costs to the fishing industry are likely to be an overestimate, as participants are likely to offset some of the lost revenue by fishing in other areas and current costs are based on daily occurrence of activity at maximum harvest levels which is known not to occur from Southern IFCA data and observation. It is also possible that the increased environmental status within the prohibited areas could coincide with relatively more abundant fishing grounds, and therefore the analysis may have underestimated the value of reduced fishing ground.

15.3 The number of participants to be displaced has been obtained through the targeted engagement exercise. There is possibility this number does not reflect the full displacement.

15.4 Displacement of fishing effort is difficult to quantify and impossible to predict where activities will be displaced to.

16 Impact on small and micro businesses

16.1 The Byelaw will impact on small (<50 employees) and micro (<10 employees) businesses including individual fishery participants and a small but unknown number of bait and tackle shops, through targeted engagement with fishery participants, it is thought that bait harvested supplies up to 10 bait and tackle shops across the district.

16.2 Using information provided by commercial bait diggers, the financial cost to all bait shops is estimated to be a maximum of £51,408 per year due to spatial management. This cost however is based on the utilisation of management areas, currently accessible, every day for a defined time period (see section 10.3 and 10.4) which, based on sightings/inspection data and Officer knowledge is unlikely to be the case and in addition does not take into account the ability of participants to relocate to locally available areas not subject to restrictions to undertake activities.

16.3 It would not be possible to exempt small and micro businesses from the Byelaw. The approach taken under the Shore Gathering Byelaw is to manage activity by aligning the prohibited areas with the Management Principles developed by the Authority to ensure consistency in approach across the District and ensure that closures are developed for feature-based management within MCZs and within or adjacent to SACs in line with the Southern IFCA duties. This has resulted in some new prohibited areas and extensions to some existing prohibited areas. The spatial footprint of the Byelaw is as follows:

- Prohibited Areas - Year-round closures: 20.28 km^2
- Winter Closure Areas - 1st November to 31st March: 5.27 km^2
- Summer Closure Areas - 1st March to 31st August: 17.26 km^2

Through targeted engagement with fishery participants, it is understood that due to current levels of activity and preferred locations, there is minimal overlap between prohibited and seasonal areas and activities therefore the impact of the proposed measures is low.

17 Wider impacts (consider the impacts of your proposals)

17.1 There is the potential for businesses directly related to fishing to be affected as a result of the proposed measures. This is aimed to be abated through the mitigation to the fishing industry by the relatively small overlap between shore gathering activities and proposed prohibited areas a small increase in size of spatial management compared to existing regulations ($3.79km^2$ for year-round prohibited areas).

17.2 There are potential social implications associated with the proposed byelaw, these have the potential to include the suppliers, fuel costs and time costs associated with sourcing new suppliers, travelling to and utilising alternative fishing grounds.

17.3 It is anticipated that the introduction of the proposed measures will achieve the conservation objectives of the MPAs within the district in the National Site Network (SACs, SPAs, MCZs) thus maintaining the overall integrity of these sites.

17.4 Decreased disturbance to birds in prohibited areas and nature reserves has the potential to increase site utilization by migratory and nesting birds and increase the related eco-tourism.

17.5 Potential increases in the density and biodiversity of species in the prohibited areas could positively contribute towards the health of the marine environment. Additionally, protection of habitats defined as ‘blue carbon habitats’ could contribute to offsetting climate change.

18 South Marine Plan

18.1 As per paragraph 58(3) of the MaCAA, Southern IFCA must have regard to the South Marine Plan[9] when undertaking any decision which is not an authorisation or enforcement decision. As per paragraph 58(4), a byelaw would fall under the definition of ‘authorisation or enforcement decision’.

18.2 That said, the proposed measures ensure compatibility with the following objectives and policies of the South Marine Plan:

- **Objective 3:** To support the diversification of a sustainable fishing industry **S-FISH-1**
- **Objective 10:** To support marine protected area objectives and a well-managed ecologically coherent network with enhanced resilience and capability to adapt to change **S-MPA-1, S-MPA-4**
- **Objective 12:** To safeguard space for, and improve the quality of, the natural marine environment, including to enable continued provision of ecosystem goods and services, particularly in relation to coastal and seabed habitats, fisheries and cumulative impacts on highly mobile species **S-BIO-3, S-BIO-4, S-DIST-1, S-FISH-4,**

19 Monitoring and Evaluation

19.1 The Authority is able to review the suitability of the Byelaw in accordance with any changes in evidence, to include any statutory evidence provided by Natural England or other such bodies, organisations or persons as the Authority deems fit. At the time that any such evidence is available, prior to any review taking place, consideration will be given to the evidence provided in conjunction

[9] https://www.gov.uk/government/collections/south-marine-plans

with the IFCA's priority workstreams, balancing any identified need for a review with resource capacity.

19.2 Monitoring of compliance with the Byelaw will be carried out through the Authority's compliance and enforcement framework[10].

[10] Compliance-and-Enforcement-Framework-2023.pdf (toolkitfiles.co.uk)

MARKED B_ANNEX 5

Southern Inshore Fisheries and Conservation Authority

Conservation Assessment Package

Supporting Document for

Shore Gathering Byelaw

Document Control

Title	Conservation Assessment Package for Shore Gathering Byelaw
SIFCA Reference	SIFCA/Conservation Assessment Package_SGByelaw_2024
Author(s)	S Birchenough
Approver(s)	P Bateman
Correspondence	S Birchenough
Owner	Southern IFCA

Revision History

Date	Author	Version	Status	Reason	Approver(s)
10/06/24	*S Birchenough*	*1.0*	*Initial draft*	*Drafted in full on the basis of the decision at the TAC meeting of May 2024 to proceed with draft measures for shore gathering activities.*	*P. Bateman*
07/08/24	*S Birchenough*	*2.0*	*Updated draft*	*Updates made in accordance with:* *any updates identified through NE Formal Advice* *updates to byelaw text based on latest version of draft byelaw* *updates to maps for Solent and Southampton Water SPA to provide more clarity by addition of 'east' and 'west' maps for the site*	*P. Bateman*

Correspondence History

This document has been distributed for information and comment to:

Organisation	Name	Date Sent	Comments Received
Natural England	Dr Richard Morgan	14th June 2024	26th July 2024 – Formal Advice

Contents

Section A: Introduction

1.0 Shore Gathering Review

During 2022, Southern Inshore Fisheries and Conservation Authority (IFCA) commenced a review of management for shore gathering activities in the District, to consider where management may be required for Tranche 3 Marine Conservation Zones (MCZs) and in response to an update to the evidence base provided by the Statutory Nature Conservation Body, Natural England, on the location and extent of designated features. In addition, the review encompassed consideration of a review of existing legislation which relates to shore gathering activities.

This review was further informed in 2023 by the publication of The Environmental Improvement Plan 2023 (EIP)[1], introduced by Government as the first revision of the 25-Year Environment Plan[2]. The Environment Plan identified the Government's intention to support progress towards the UN's Sustainable Development Goals under the Global Biodiversity Framework which includes protection of 30% of the global ocean by 2030. At a domestic level, the Government aim to achieve this by enhancing protection for MPAs. Under the goal of Thriving Plants and Wildlife in the EIP, there is a target for 70% of designated features in MPAs to be in favourable condition by 2042 with the remainder in recovering condition and a new interim target of 48% of this to be achieved by 31st January 2028. The delivery of this is to be supported through strengthened protections in MPAs by 2024. Appropriate regulators, including IFCAs, are required to ensure that management measures are in place for all MPAs by 2024 in order for this interim target to be achieved. For the Southern IFCA, this includes management of shore gathering activities in relevant MPAs.

In line with the targets for the EIP, the Shore Gathering Review was re-defined to focus on **feature-based management interventions for MPAs: sites designated under the National Site Network (SACs, SPAs and MCZs).**

2.0 Scope of Conservation Assessment Package

This Conservation Assessment Package considers the review of shore gathering activities in the Southern IFCA District and the resulting development of management measures in the form of The Shore Gathering Byelaw 2024 and the Southern IFCA Seaweed Harvesting Code of Conduct. The Part B/Appropriate Assessment part of the assessment process reviews these two management measures as providing mitigation against potential impacts for relevant Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

[1] Environmental Improvement Plan 2023 - GOV.UK (www.gov.uk)
[2] 25 Year Environment Plan - GOV.UK (www.gov.uk)

Management measures for shore gathering activities must ensure that Southern IFCA is able to meet legal duties under the following legislation:

***The Marine and Coastal Access Act 2009 ('the MaCAA')*[3]**

Duties under Section 154 of MaCAA

(1) The authority for an IFC district must seek to ensure that the conservation objectives of any MCZ in the district are furthered
(2) Nothing in section 153(2) is to affect the performance of the duty imposed by this section

Section 125 of MaCAA also requires that public bodies (which includes IFCAs) exercise their functions in a manner to best further (or, if not possible, least hinder) the conservation objectives for MCZs.

The Conservation of Habitats and Species Regulations 2017[4], as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[5] (collectively 'the Conservation Regulations')

The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, ('2019 Regs') transposes the land and marine aspects of the Habitats Directive and the Wild Birds Directive into domestic law and outlines how the National Site Network will be managed and reflect any changes required by EU Exit.

As a competent authority, Southern IFCA must exercise its functions…so as to secure compliance with the requirements of the Habitats Directive and the Wild Birds Directive.

In line with legal duties under the MaCAA in relation to MCZs and the Conservation Regulations for SACs and SPAs, and for feature-based management, the review considered the following:

- Feature-based management for features **within** MCZs
- Feature-based management for features **within or adjacent to** SACs or SPAs[6]

A determination of whether management measures are appropriate to meet the legal duties for relevant sites is made through the completion of an MCZ Assessment (for MCZs) or a Habitats Regulations Assessment (HRA, for SACs and SPAs). For the latter, a duty is placed on Southern IFCA as a competent authority under Article 6(3) of the Habitats Directive, whereby any plan or project likely to have a significant effect on an SPA or SAC within the National Site Network, either individually or in combination with other plans or projects, is to undergo an appropriate assessment, namely a Habitats Regulation Assessment (HRA). The plan or project must be assessed in view of the site's conservation objectives.

[3] Marine and Coastal Access Act 2009 (legislation.gov.uk)
[4] The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk)
[5] The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (legislation.gov.uk)
[6] The term 'adjacent' means a feature (to include any buffer) which extends across the boundary of the designated site, to ensure that the integrity of that part of the feature which exists within the boundary of the site is not affected by activity occurring over that same feature where it extends outside the boundary of the site.

Both types of assessment follow a stepwise process:

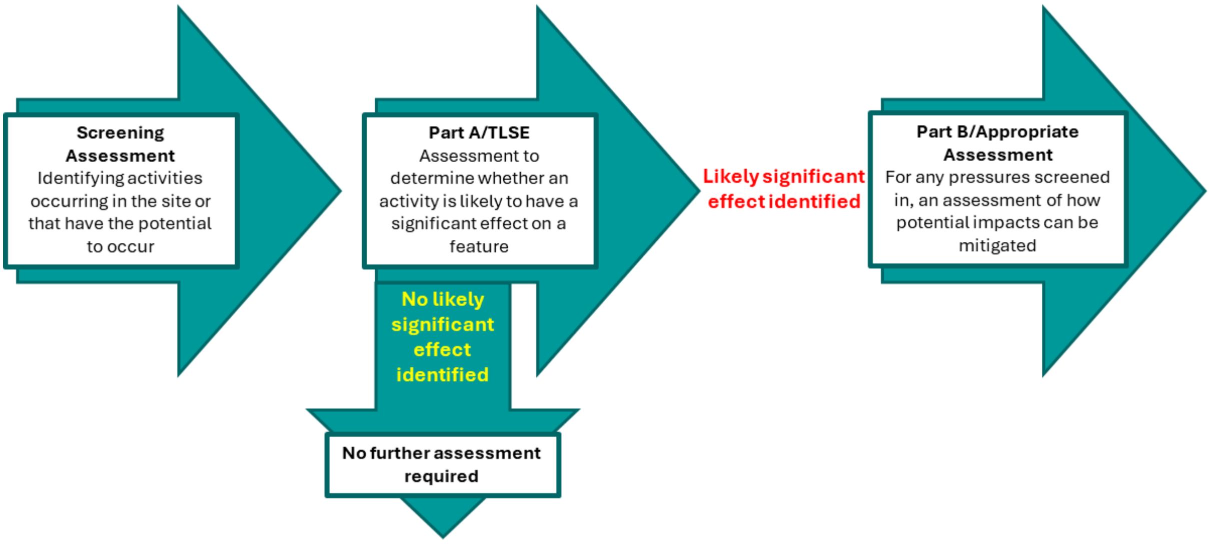

Figure 1: the stepwise process for carrying out an MCZ Assessment or a Habitats Regulations Assessment (HRA). The terms 'Part A' and 'Part B' refer to MCZ Assessments, the terms 'TLSE' and 'Appropriate Assessment' refer to HRAs. TLSE = Test of Likely Significant Effect.

Accordingly, the following relevant Conservation Assessments have been undertaken as part of this package:

- Marine Conservation Zone Assessments
- Habitats Regulations Assessments

3.0 Supporting Documentation

This Conservation Assessment Package is to be read in conjunction with the **Shore Gathering Site Specific Evidence Packages** and the **Shore Gathering Literature Review**.

The Assessments in this Package have been informed by[7]:

- The Shore Gathering Site Activity Screening Document
- The Shore Gathering Part A Assessment Package
- The Shore Gathering TLSE Assessment Package

[7] Note that these documents are provided to Natural England in order to inform the provision of Formal Advice on the conclusions of the Conservation Assessments, these documents do not form part of the final Byelaw package but can be made available on request.

Section B: Relevant Activities

Through the Shore Gathering Review, the following activities have been identified as occurring or having the potential to occur within the Southern IFCA District, these activities are grouped into two types of 'Operation' by Natural England with corresponding 'Advice on Operations' provided. On this basis activities will be referred to by their Advice on Operations heading throughout this document.

Advice on Operations heading: **Shore-based activities**

Relevant activities in the Southern IFCA District:

- Bait digging/collection
- Shellfish gathering
- Crab tiling/collection
- Shrimp push-netting
- Mechanical harvesting (by hand)

Advice on Operations heading: **Seaweed harvesting**

Relevant activities in the Southern IFCA District:

- The harvesting of seaweed by hand from the shore

These activities do not all occur in all designated sites. As part of the stepwise process outlined in Figure 1, the Screening Assessment identified which National Site Network Sites had shore-based activities and/or seaweed harvesting either occur or have the potential to occur. Activities listed as 'occurring' were based on information contained within the **Shore Gathering Site Specific Evidence Packages** supporting document which considers data held by Southern IFCA, this was supplemented by anecdotal knowledge where required. Activities listed as having the 'potential' to occur were based on knowledge of habitats/species which could be found in each site, ability to access the site and local knowledge of the use of other similar sites. Section C1.0 details the outcomes of the Screening Assessment and indicates which National Site Network Sites were taken through to the Part A/TLSE stage of the stepwise process and the relevant Advice on Operations heading which was assessed.

For the activities under consideration in these assessments, method summaries are provided below. Information is also provided in the **Shore Gathering Site Specific Evidence Packages** supporting document on the following:

- Existing Southern IFCA shore gathering management specific to each designated site
- Levels of activity of shore gathering activities for each designated site
- Recorded catches associated with shore gathering activities for each designated site
- Any recorded offences associated with shore gathering activities for each designated site
- Combined summary of activity levels, catches and offences across the District MPAs

1.0 Method Summaries

The following sections provide method summaries for each of the above-listed shore gathering activities.

1.1 Bait Digging/Collection

Bait digging is carried out in the intertidal zone on mud and sand sediment habitats. The shore is usually accessed by foot, or in less usual cases via a vessel to the intertidal zone. The target species are marine polychaete worms (including *Arenicola marina, Hediste diversicolor, Alitta virens*).

These species are most often collected using a fork or spade, which is placed in the sediment and used to lift and turn over a pile of sediment. Garden forks and spades which can easily be purchased are typically used. The worms are then removed by hand from the sediment pile. The practice of returning the dug sediment to the hole created (backfilling) is recommended. Marine worms are collected for both commercial and recreational purposes.

1.2 Shellfish Gathering

Shellfish gathering is carried out in the intertidal zone on soft to coarse sediment types. The intertidal zone is accessed by foot and shellfish are collected by hand. This activity is carried out for commercial and recreational purposes the extent of which varies dependent upon the time of year. Recreational activity most often occurs in good weather over the summer months, whilst commercial activity can occur in most weathers and more often during periods when other shellfish fisheries are closed.

Manila clam and common cockle

Clams can be found by identifying their syphon holes in the sediment, and then simply picking the animal out of the sand by the hand or using a small handheld instrument such as a knife to ‘pop up’ up the clam.

Cockles are often also collected when gathering clams by hand. Separately, cockles may be targeted on sandier sediments using either small hand rakes or, garden-sized rakes. These typically have a sediment penetration depth of approximately 10cm.

Oysters

Pacific oysters, a non-native invasive species to the coasts of the Southern IFC District, are found on the sediment surface (typically coarse sediment) or attached to manmade structures such as sea walls and pontoons. Native oysters are usually found sub-tidally (although may occur intertidally) but due to predominance in the sub-tidal are much less likely to be collected by hand. Pacific oysters are simply picked up by hand without the need for any tools.

Razor clams

Razor clams are found in sandy sediments at or below the low tide line. They are located by finding the figure eight siphon hole on the sediment surface. Salt (typically fine table salt) is poured over the siphon hole and after a few seconds or minutes, the razor clam pushes up through the salt to clear the hole. The razor clam is then removed by hand.

1.3 Crab Tiling/Collection

Crab collection for use as bait for angling is carried out on the shore by foot. Rocks and boulders are overturned to find crabs. Crabs are retained if they are ‘soft’, having recently moulted their exoskeleton. The most common species targeted is *Carcinus maenas* due to its abundance, but *Necor puber* and *Cancer pagarus* may also be taken if found.

Crab tilling refers to a more targeted process where people place artificial structures, such as tiles, bricks, mats or tyres on the seabed between the high and low water marks. This is more likely to occur in areas where natural structures are not present for example; mud flats, sand flats, or coarse sediment types. The structures are left in place, with persons periodically returning at low water to turn over the objects or look within them and collect crabs which have recently moulted by hand.

1.4 Shrimp Push Netting

Shrimp (prawn) push netting is a recreational activity in which a person pushes a small hand-held net along the seabed in shallow water. The net mouth is approximately 1m x 0.5m in width and height, with a straight bar at the bottom. The net skims the surface of the sediment collecting the shrimp (*Palaemon* spp.) in the back of the net. This activity can only occur on large spring tides for approximately an hour at low water. Shrimp are usually found near rocks or algae covered areas. Push netting has been stated to occur primarily between July to mid-September.

1.5 Mechanical Harvesting

Mechanical collection refers to the use of machines or basic mechanics to gather or extract shore-based resources such as animals or plants, from their natural environment. This method is often used to increase efficiency and productivity compared to manual collection which typically uses simple tools (e.g., a rake, spade, etc.). The most common type of mechanical harvesting is through bait pumps.

Bait Pump

A specialised pump that collects sand or mud from the exposed shoreline at low tide and filters it to collect target species such as lugworm (*Arenicola marina*). Bait pumping originated in the 1800s with British fishermen using a hand-operated mechanism to extract bait from the sand. This evolved into the first mechanical pump in the early 1900s.

1.6 Seaweed Harvesting

Seaweeds are typically gathered by accessing rocky shores as the tide falls. Parts of the seaweed plant are cut off using scissors. Typically, the holdfast of the plant is left attached to the rock, and only a small number of the plant fronds are cut with scissors by hand. Loose seaweed may also be taken from the drift line along sandy or less rocky shores.

All seaweeds in the UK are described as edible, however some have become more popular due to taste, and texture including, *Fucus vesiculosus, Chondrus crispus, Palmaria palmata, Himanthalia elongate, Ulva* species, and *kelp* species. Seaweeds may also be collected for a specific purpose including for use in animal feed, cosmetics and pharmaceuticals.

Section C: National Site Network Sites

The following section details each of the National Site Network Sites relevant to the management of shore gathering activities, based on the outputs of the Screening Assessment and thus the sites which were taken forward to the Part A/TLSE stage.

1.0 Screening Assessment Outcomes

The Shore Gathering Review considered the need for feature-based management across all National Site Network Sites within the Southern IFCA District, therefore all MCZs, SACs and SPAs in the District were subject to the Screening Assessment. The outcome of the Screening Assessment required the following sites to be subject to a Part A Assessment (Section 1.1) or a Test of Likely Significant Effect (TLSE) (Section 1.2).

1.1 MCZs

Six MCZs were determined to require Part A Assessment from the outcomes of the Screening Assessment.

MCZ Site Name	Relevant Advice on Operations
Chesil Beach and Stennis Ledges	• Shore-based activities • Seaweed harvesting
Purbeck Coast	• Shore-based activities • Seaweed harvesting
Studland Bay	• Shore-based activities • Seaweed harvesting
The Needles	• Shore-based activities • Seaweed harvesting
Yarmouth to Cowes	• Shore-based activities • Seaweed harvesting
Bembridge	• Shore-based activities • Seaweed harvesting

It was determined that the following sites would not be taken forward to a Part A Assessment on the basis that they are entirely subtidal, and are not able to be accessed for activities operating from the shore, therefore there is no potential for overlap between either of the Advice on Operations headings and the features of these sites:

- South of Portland MCZ
- Poole Rocks MCZ
- Southbourne Rough MCZ

1.2 SACs and SPAs

Five SACs and five SPAs were determined to require a TLSE Assessment from the outcomes of the Screening Assessment.

Site Name	Relevant Advice on Operations
Lyme Bay and Torbay SAC	• Seaweed harvesting
Chesil and The Fleet SAC	• Shore-based activities • Seaweed harvesting
Studland to Portland SAC	• Seaweed harvesting
Solent Maritime SAC	• Shore-based activities
South Wight Maritime SAC	• Shore-based activities • Seaweed harvesting
Chesil Beach and The Fleet SPA	• Shore-based activities • Seaweed harvesting
Poole Harbour SPA	• Shore-based activities • Seaweed harvesting
Solent and Southampton Water SPA	• Shore-based activities • Seaweed harvesting
Portsmouth Harbour SPA	• Shore-based activities • Seaweed harvesting
Chichester and Langstone Harbours SPA	• Shore-based activities • Seaweed harvesting

For Lyme Bay and Torbay SAC where only one Advice on Operations heading is applicable, this is due to there being no suitable habitat in that site for the excluded AoO and therefore no potential for overlap or impact. For the Solen Maritime SAC it is recognised that the site overlaps with other designated sites which may have features that are suitable for seaweed gathering. However, there are no features designated under the Solent Maritime SAC itself which would support the target species for seaweed harvesting therefore when assessing this site on its own this activity can be screened out as not requiring a Part A Assessment, risks to habitats within designated sites where seaweed harvesting could occur that may overlap with the Solent Maritime SAC will be considered under the Part A Assessment for each relevant other site.

It was determined that the Solent and Isle of Wight Lagoons SAC would not be taken forward to a TLSE Assessment as all the lagoons designated for the site are in areas which are not accessible to shore gathering activities and are also not target habitats for the relevant activities. It was also determined that the Solent and Dorset Coast SPA would not be taken forward for a TLSE Assessment as the features of the site are breeding summer birds which interact with the water column (feeding) and shingle habitats (breeding). The areas where the birds may be using shingle habitats are identified as being within the Poole Harbour SPA, Solent and Southampton Water SPA and the Chichester and Langstone Harbours SPA therefore the assessments for these species will be undertaken through the assessments for those relevant SPAs.

2.0 Information on Designated Sites

2.1 Marine Conservation Zones

For each site, detail is provided on the location and the location of designated features within the site. Detail of the designated features is provided along with the assigned General Management Approach, listed as either ‘recover’ or ‘maintain’, the GMA indicates what is required to achieve the Conservation Objectives for the site.

For sites with designated habitats, the conservation objectives are that the protected habitats:

1. are maintained in favourable condition if they are already in favourable condition
2. be brought into favourable condition if they are not already in favourable condition

For each protected feature, favourable condition means that, within an MCZ:

1. its extent is stable or increasing
2. its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part of inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate.

Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.

For each species of marine fauna, favourable condition means that the population within a zone is supported in numbers which enable it to thrive, by maintaining:

1. the quality and quantity of its habitat
2. the number, age and sex ratio of its population. Any temporary reduction of numbers of a species is to be disregarded if the populations is sufficiently thriving and resilient to enable its recovery.

Any alteration to a feature brought about entirely by natural processes is to be disregarded when determining whether a protected feature is in favourable condition.

2.1.1 Chesil Beach and Stennis Ledges MCZ

The Chesil Beach to Stennis Ledges MCZ covers an area of 37 km^2 running along the coastline of Chesil Beach. The area covers a variety of rocky and sediment habitats and includes the Pink Sea Fan as a designated feature.

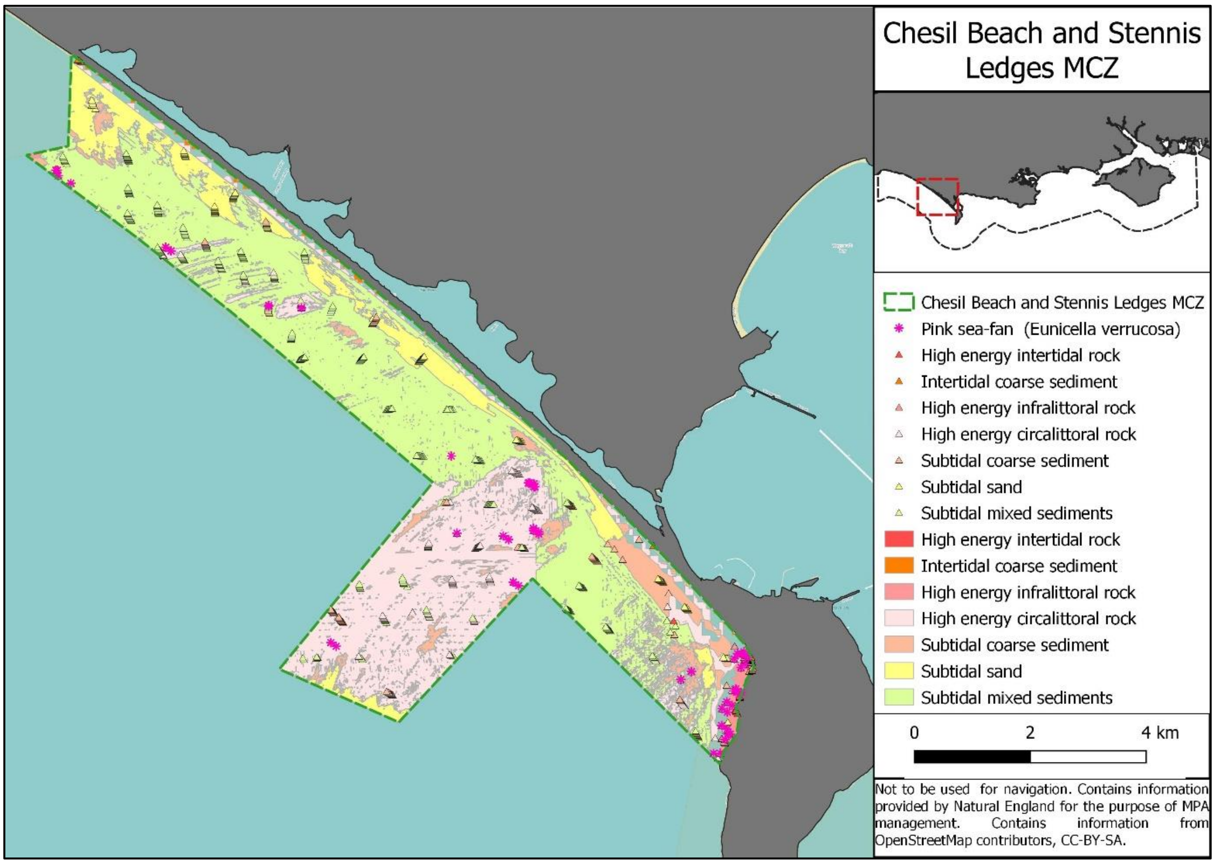

Figure 2: The location and extent of the supporting habitats of the Chesil Beach and Stennis Ledges MCZ (boundary shown by the dashed green line).

Table 1: Designated features of the Chesil Beach and Stennis Ledges MCZ.

Designated features	General management approach
High-energy circalittoral rock	Recover
High-energy infralittoral rock	Maintain
High-energy intertidal rock	Maintain
Intertidal coarse sediment	Maintain
Native oyster (*Ostrea edulis*)	Recover
Pink sea fan (*Eunicella verrucosa*)	Recover
Subtidal coarse sediment	Maintain
Subtidal mixed sediments	Maintain
Subtidal sand	Maintain

2.1.2 Purbeck Coast MCZ

The Purbeck Coast MCZ covers an area of 282 km^2. The MCZ covers the area of coastline from Ringstead Bay in the West to north of Swanage Bay in the East. The Purbeck Coast MCZ is designated for a range of intertidal and subtidal habitats and species.

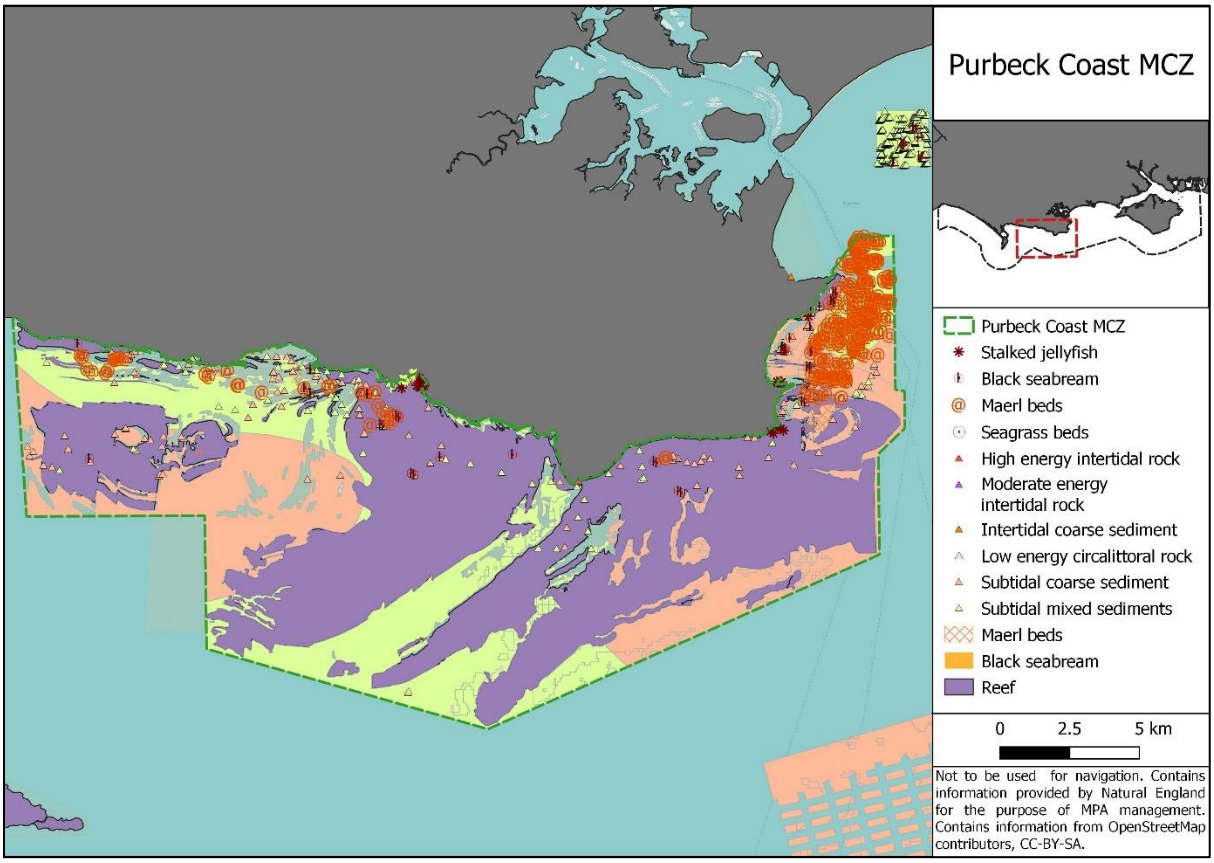

Figure 3: The location and extent of the supporting habitats of the Purbeck Coast MCZ (boundary shown by the dashed green line).

Table 2: Designated features of the Purbeck Coast MCZ.

Designated features	General management approach
Black seabream (*Spondylisoma cantharus*)	Recover
High-energy intertidal rock	Maintain
Intertidal coarse sediment	Maintain
Maerl beds	Recover
Moderate energy intertidal rock	Maintain
Peacock's Tail (*Padina pavocina*)	Maintain
Stalked jellyfish (*Haliclystus spp*)	Maintain
Subtidal coarse sediment	Maintain
Subtidal mixed sediments	Maintain

2.1.3 Studland Bay MCZ

The Studland Bay MCZ is approximately 4 km^2 and relatively sheltered from prevailing south westerly winds by Ballard Down.

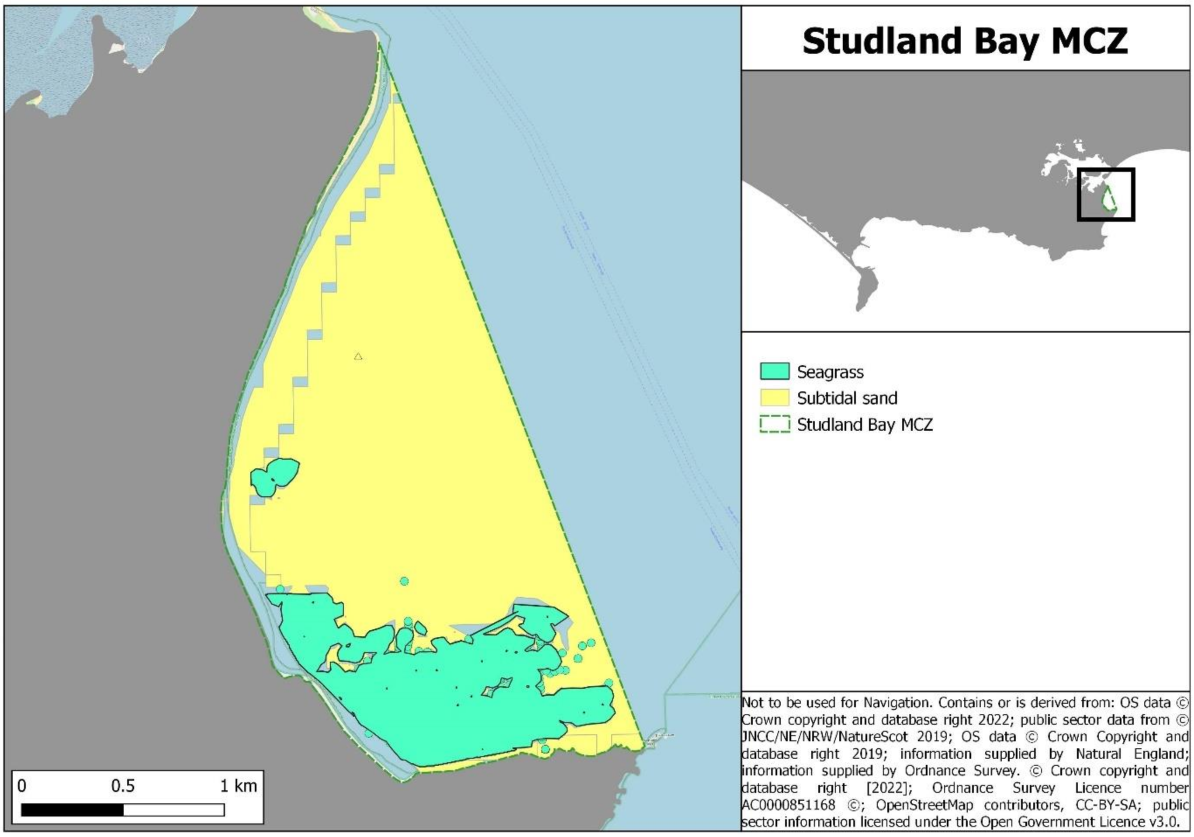

Figure 4: The location and extent of the supporting habitats of the Studland Bay MCZ (boundary shown by the dashed green line).

Table 3: Designated features of the Studland Bay MCZ.

Designated features	General management approach
Intertidal coarse sediment	Maintain
Long snouted seahorse (*Hippocampus guttulatus*)	Maintain
Seagrass beds	Recover
Subtidal sand	Maintain

2.1.4 The Needles MCZ

The Needles MCZ is located on the west coast of the Isle of Wight and covers an area of 11 km^2. The MCZ covers the coastline from Fort Albert down to the Needles Geological feature along the mean high-water mark and extends up to 3 km from the shoreline.

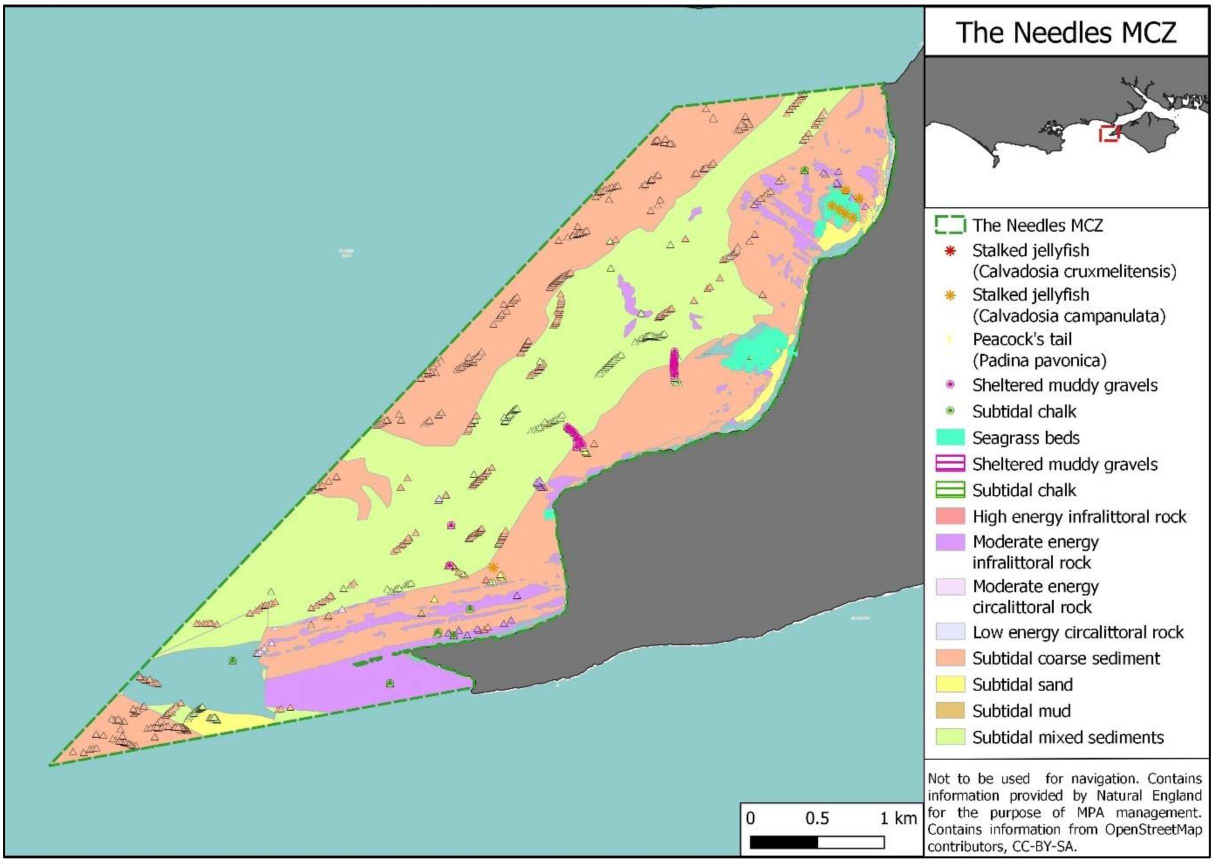

Figure 5: The location and extent of the supporting habitats of The Needles MCZ (boundary shown by the dashed green line).

Table 4: Designated features of The Needles MCZ.

Designated features	General management approach
High-energy infralittoral rock	Maintain
Moderate-energy circalittoral rock	Maintain
Moderate-energy infralittoral rock	Maintain
Native oyster (*Ostrea edulis*)	Recover
Peacock's Tail (*Padina pavocina*)	Recover
Seagrass beds	Recover
Sheltered muddy gravels	Recover
Stalked jellyfish (*Calvadosia campanulata*)	Maintain
Subtidal chalk	Recover
Subtidal coarse sediments	Recover
Subtidal mixed sediments	Recover
Subtidal mud	Recover
Subtidal sand	Recover

2.1.5 Yarmouth to Cowes MCZ

The Yarmouth to Cowes MCZ covers 16 km^2 and stretches from Gurnard in the east, a village west of Cowes, to Yarmouth pier in the West and extends to the edge of the Western Solent deep water channel.

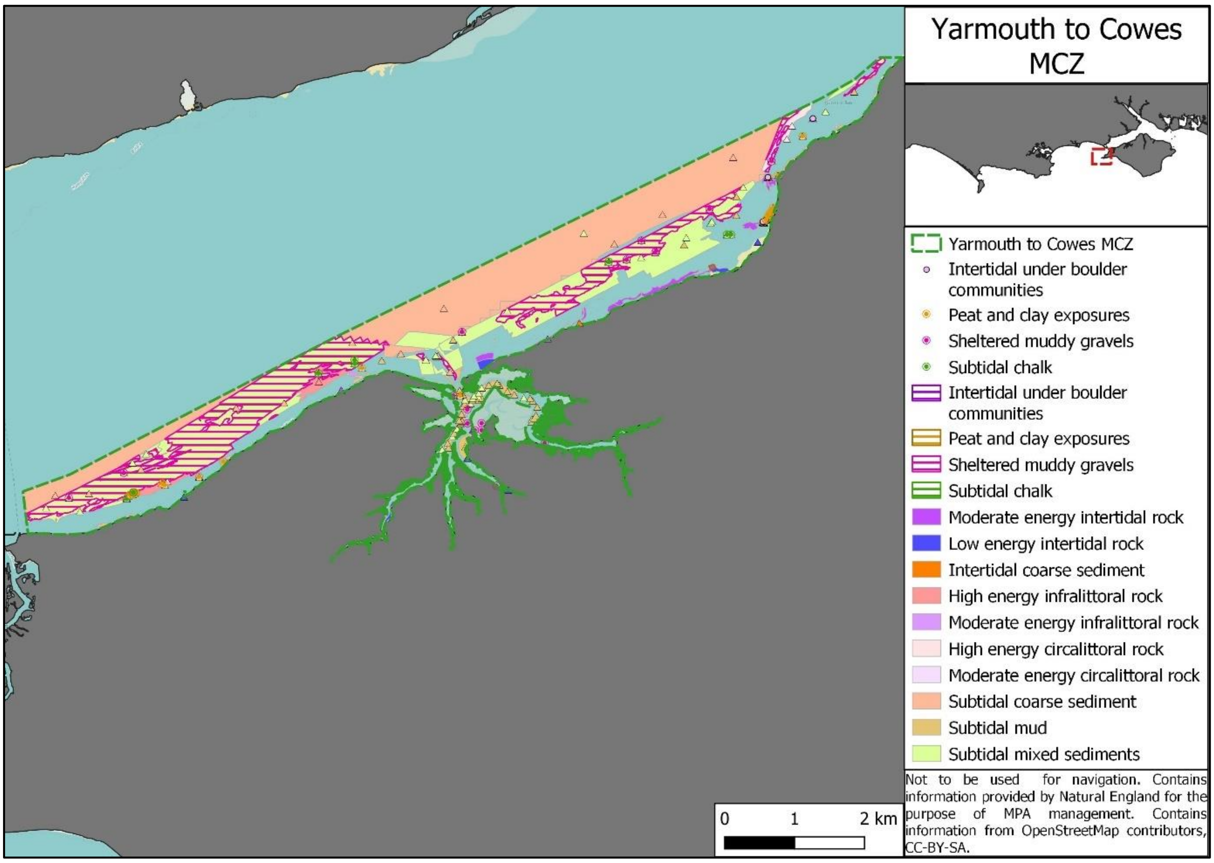

Figure 6: The location and extent of the supporting habitats of the Yarmouth to Cowes MCZ (boundary shown by the dashed green line).

Table 5: Designated features of the Yarmouth to Cowes MCZ.

Designated features	General management approach
Bouldnor Cliff geological feature	Maintain
Estuarine rocky habitats	Maintain
High-energy circalittoral rock	Recover
High-energy infralittoral rock	Recover
Intertidal coarse sediment	Maintain
Intertidal under boulder communities	Maintain
Littoral chalk communities	Maintain
Low energy intertidal rock	Maintain
Moderate energy circalittoral rock	Recover
Moderate energy infralittoral rock	Recover
Moderate energy intertidal rock	Maintain
Native oyster (*Ostrea edulis*)	Recover
Peat and clay exposures	Recover
Sheltered muddy gravels	Recover
Subtidal chalk	Recover

Subtidal coarse sediments	Maintain
Subtidal mixed sediments	Recover
Subtidal mud	Recover

2.1.6 Bembridge MCZ

The Bembridge MCZ covers an area of 75 km^2 and stretches southwards from Nettlestone Point in the North, to Ventnor in the South, and stretches to the edge of the deep-water channel in the Eastern Solent.

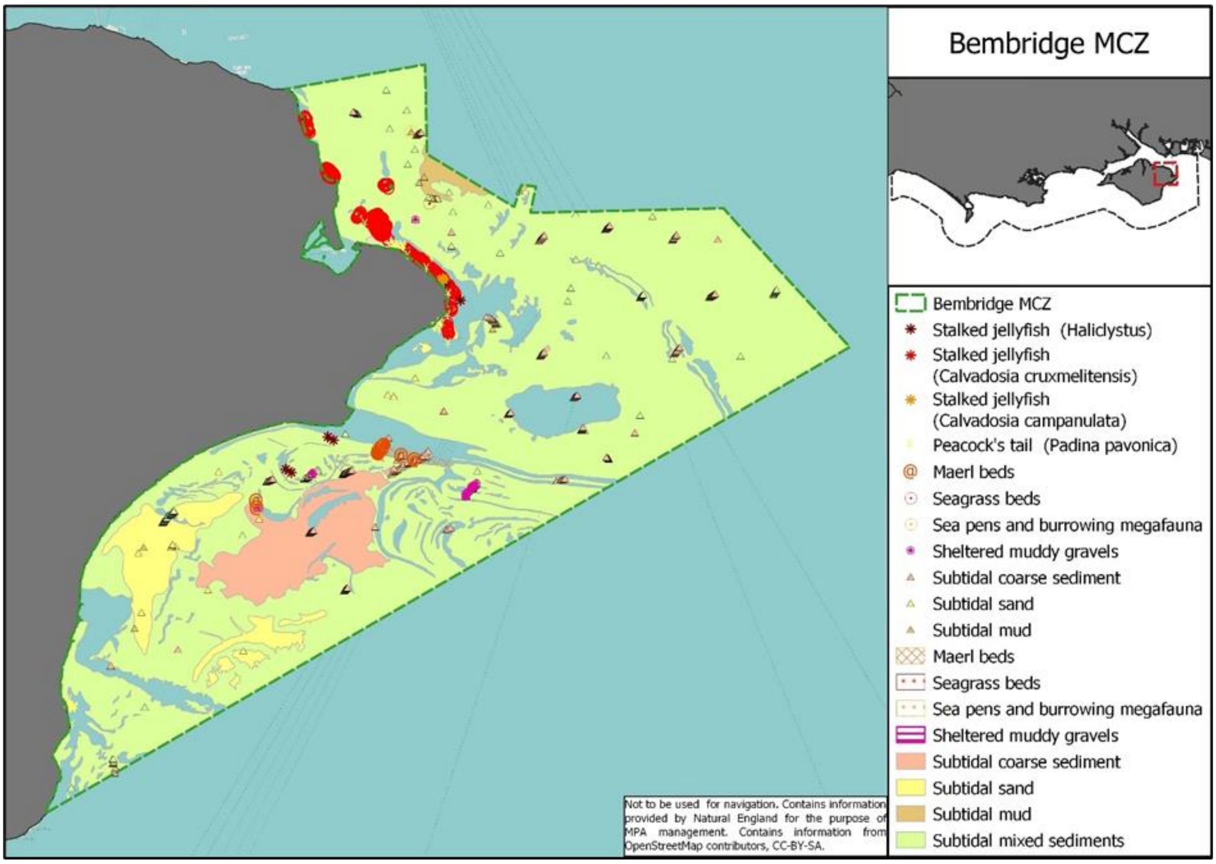

Figure 7: The location and extent of the supporting habitats of the Bembridge MCZ (boundary shown by the dashed green line).

Table 6: Designated features of the Bembridge MCZ.

Designated features	General management approach
Maerl beds	Recover
Native oyster (*Ostrea edulis*)	Recover
Peacock's Tail (*Padina pavocina*)	Recover
Seagrass beds	Recover
Sea-pen and burrowing megafauna communities	Recover
Sheltered muddy gravels	Maintain
Short snouted seahorse (*Hippocampus hippocampus*)	Maintain
Stalked jellyfish (*Calvadosia campanulata*)	Maintain
Stalked jellyfish (*Haliclystus spp*)	Maintain
Subtidal coarse sediments	Maintain
Subtidal mixed sediments	Recover
Subtidal mud	Recover
Subtidal sand	Maintain

2.2 Special Areas of Conservation

For the SACs, information is provided on the location and the location of qualifying features within the site as well as details on the qualifying features under the designation.

The Conservation Objectives for all sites are the same. The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Condition Status of its qualifying features by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of the qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of the qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of each of the qualifying species
- The distribution of qualifying species within the site

2.2.1 Lyme Bay and Torbay SAC

The Lyme Bay and Torbay SAC cover an area of 31 km^2; the SAC overlays the Devon & Severn and Southern IFCA boundary. The area within the Southern IFCA District encloses the Lyme Bay Reefs.

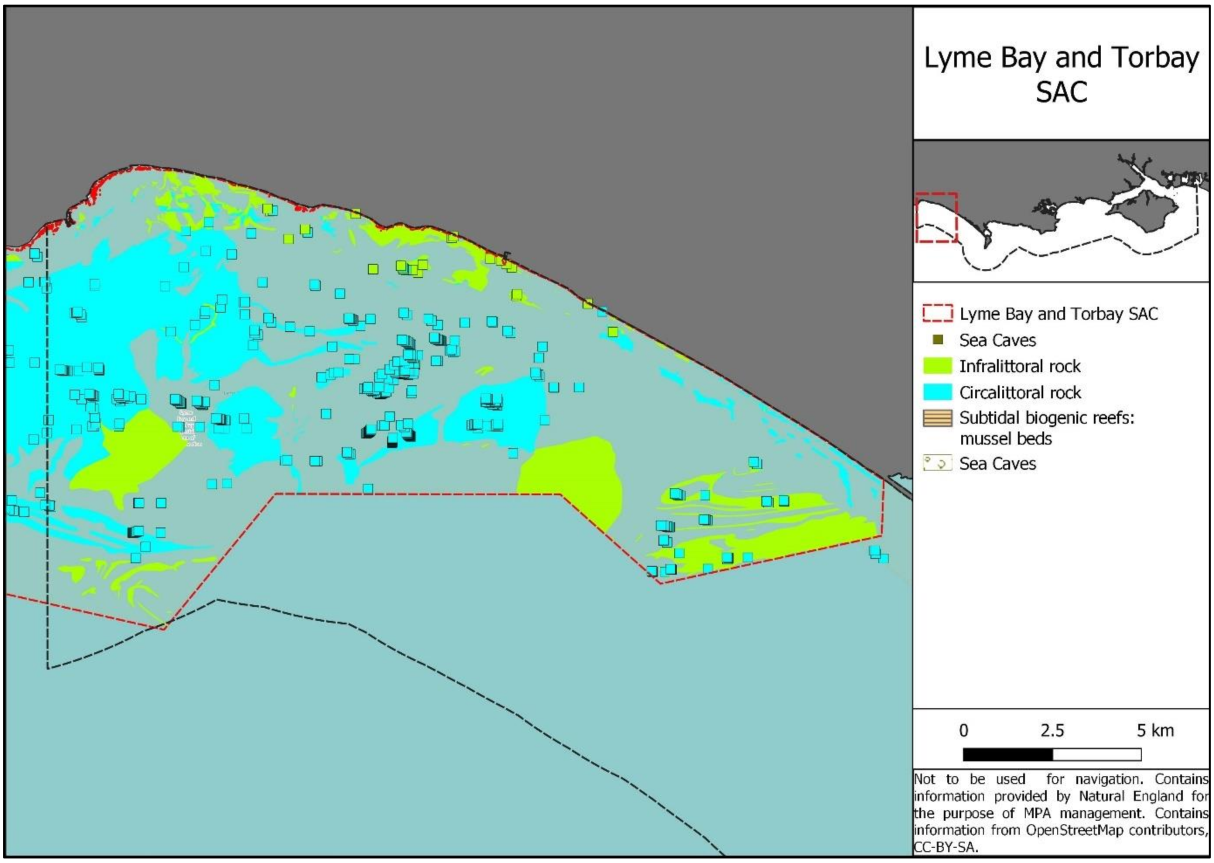

Figure 8: The location and extent of the supporting habitats of the Lyme Bay and Torbay SAC (boundary shown by the dashed red line).

Table 7: Qualifying features for Lyme Bay and Torbay SAC.

Qualifying features	Reefs Submerged or partially submerged sea caves

2.2.2 Chesil and The Fleet SAC

The Chesil and the Fleet SAC covers an area of 16 km^2. The Fleet supports the largest diversity of species and habitat of any coastal lagoon in the UK and aside from the entrance at the southeastern end, The Fleet is largely sheltered from waves and tidal processes.

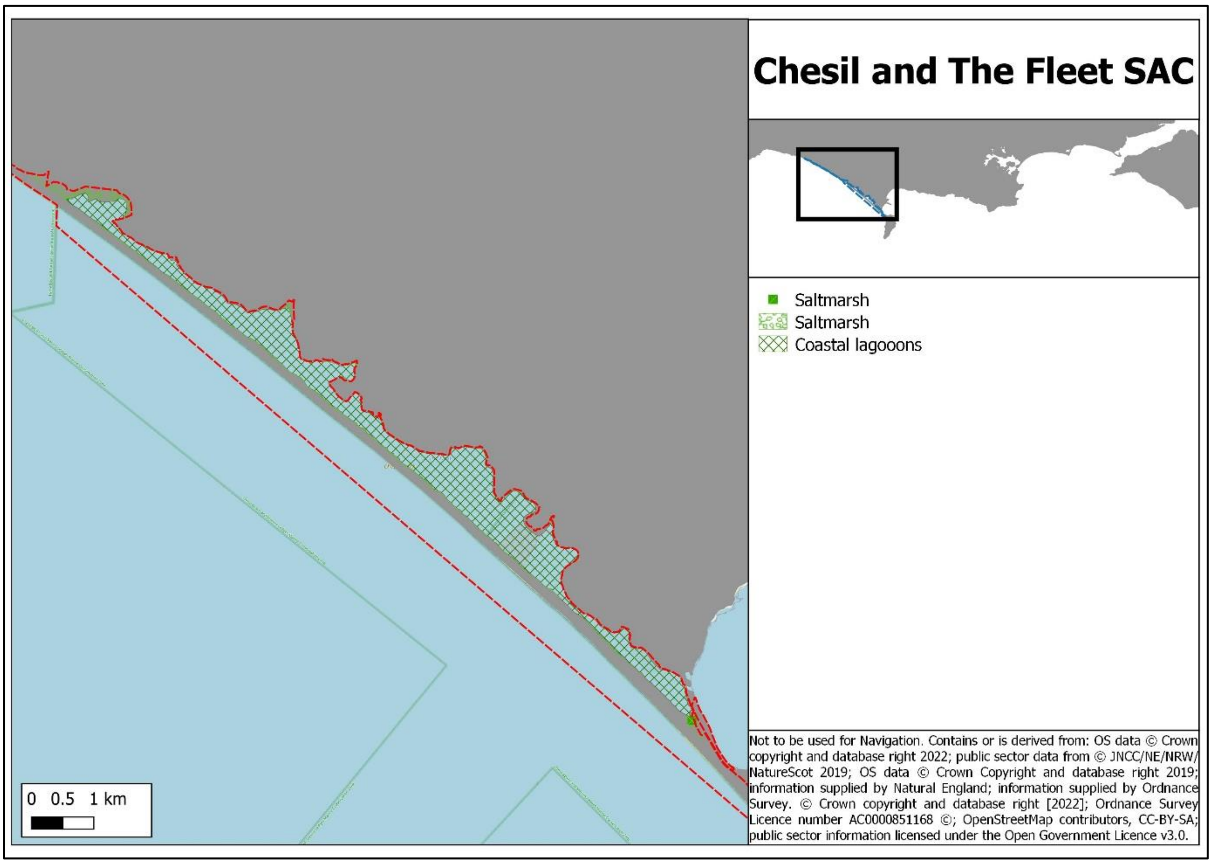

Figure 9: The location and extent of the supporting habitats of the Chesil and The Fleet SAC (boundary shown by the dashed red line).

Table 8: Qualifying features of the Chesil and The Fleet SAC.

Qualifying Features	Annual vegetation of drift lines Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) Coastal lagoons Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) Perennial vegetation of stony banks

2.2.3 Studland to Portland SAC

The Studland to Portland SAC covers the area from Studland Bay to Ringstead Bay as well as the area covering the Portland Reefs. The total area covered by the SAC is 332 km^2.

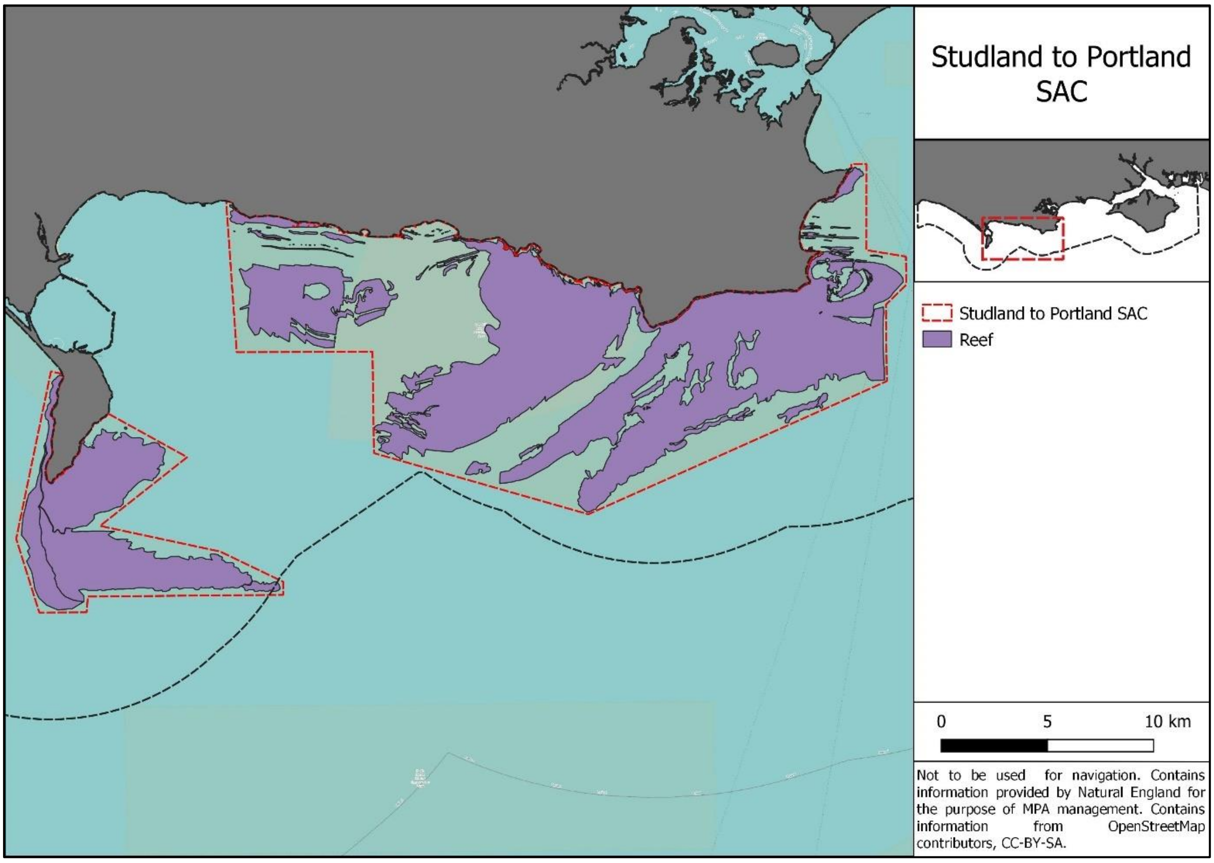

Figure 10: The location and extent of the supporting habitats of the Studland to Portland SAC (boundary shown by the dashed red line).

Table 9: Qualifying features of the Studland to Portland SAC.

Qualifying Features	Reefs

2.2.4 Solent Maritime SAC

The Solent Maritime SAC covers a broad range of estuarine and marine habitats and an area of 113 km^2.

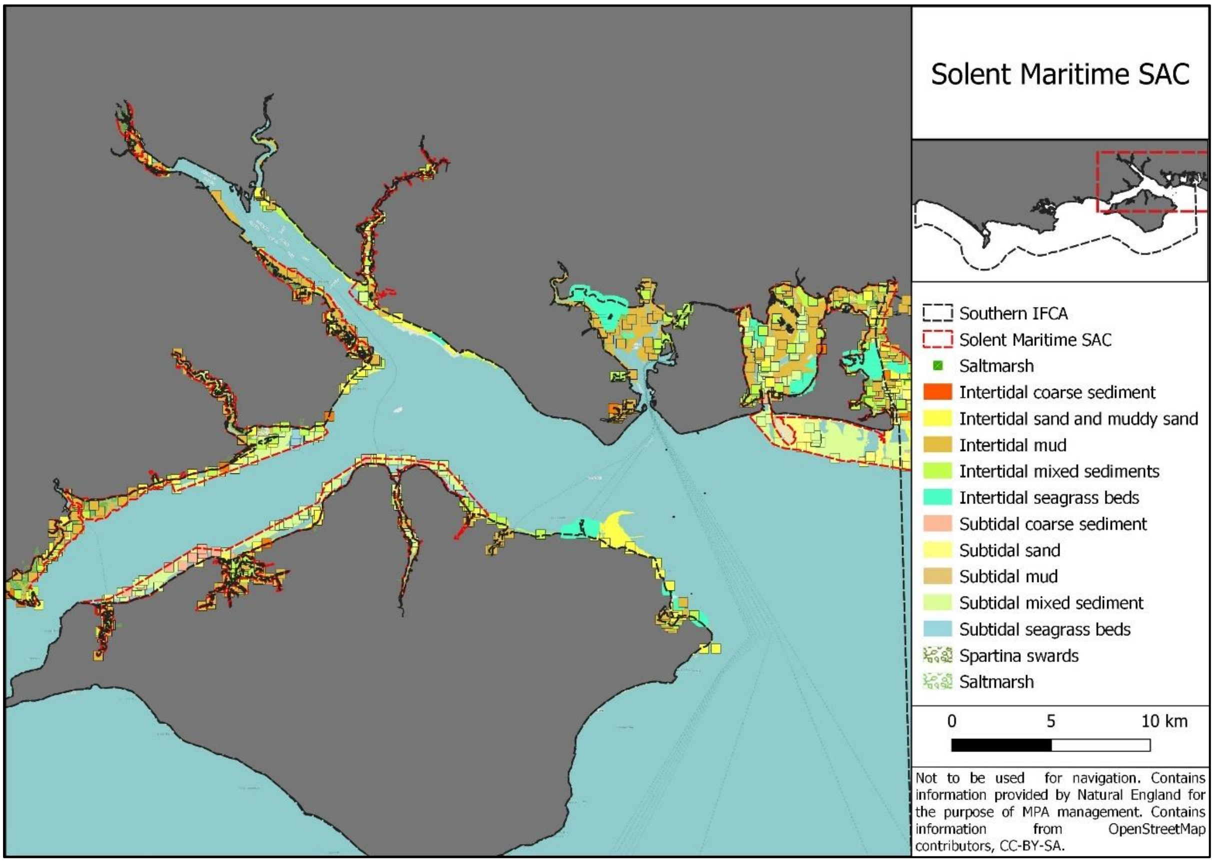

Figure 11: The location and extent of the supporting habitats of the Solent Maritime SAC (boundary shown by the dashed red line).

Table 10: Qualifying features of the Solent Maritime SAC.

Qualifying Features	Annual vegetation of drift lines
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
	Coastal Lagoons
	Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
	Estuaries
	Mudflats and sandflats not covered by seawater at low tide
	Perennial vegetation of stony banks
	Salicornia and other annuals colonising mud and sand
	Sandbanks which are slightly covered by sea water all the time
	Shifting dunes along the shoreline with *Ammophila arenaria* (“White Dunes”)
	Spartina swards (*Spartinion maritimae*)

2.2.5 South Wight Maritime SAC

The South Wight Maritime SAC covers an area of 199 km^2, running the full length of the south coast of the Isle of Wight from The Needles to Bembridge. The area covers extensive reef and sea cave systems.

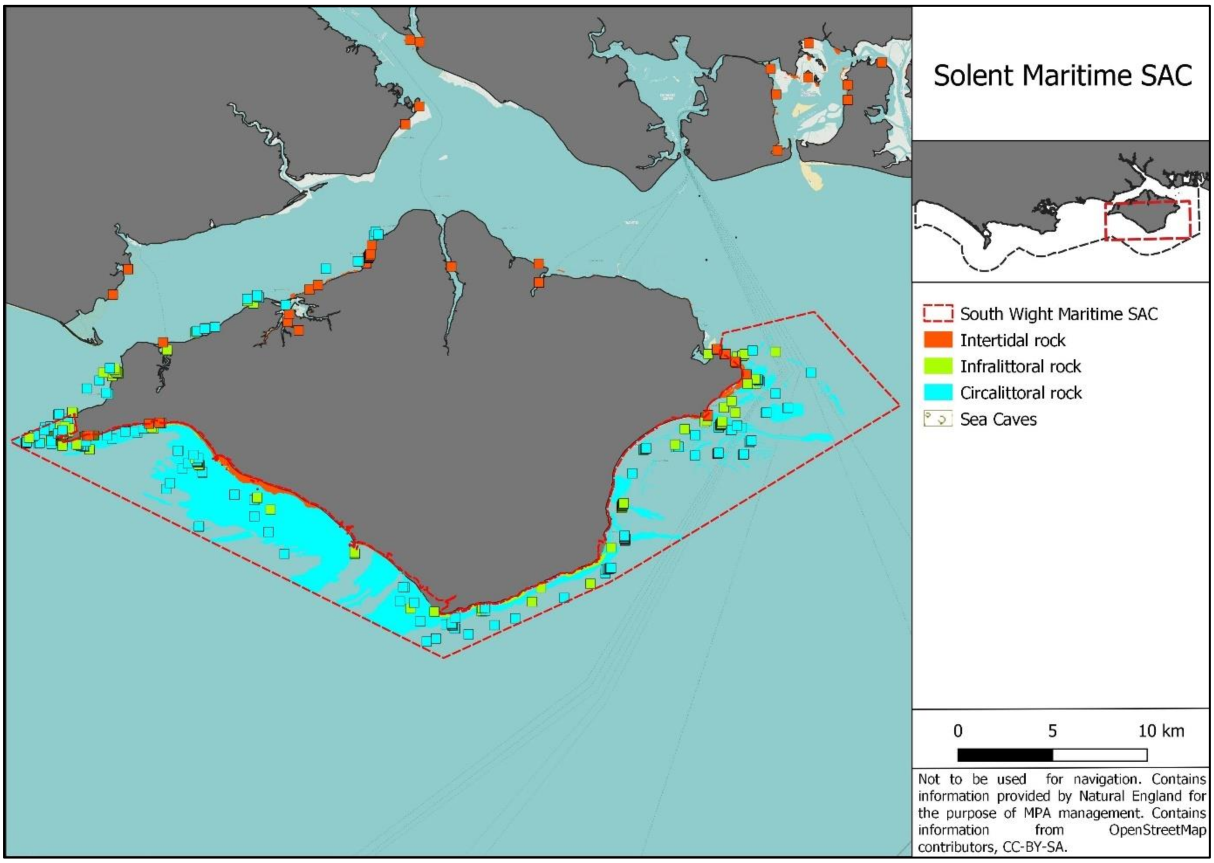

Figure 12: The location and extent of the supporting habitats of the South Wight Maritime SAC (boundary shown by the dashed red line).

Table 11: Qualifying features of the South Wight Maritime SAC.

Qualifying Features	Submerged or partially submerged sea caves
	Vegetated sea cliffs of the Atlantic and Baltic coasts
	Circalittoral rock
	Infralittoral rock
	Intertidal rock
	Subtidal stony reef

2.3 Special Protection Areas

For the SPAs, information is provided on the location and the location of qualifying features within the site and supporting habitats. Detail is provided in tables for each site on the qualifying features and the associated supporting habitats.

The Conservation Objectives are the same for all sites and apply to the site and the individual species and/or assemblage of species for which the site has been classified. The objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The populations of each of the qualifying features
- The distribution of qualifying features within the site

2.3.1 Chesil Beach and The Fleet SPA

The Chesil Beach and the Fleet SPA covers an area of 7 km^2. The Fleet supports the largest diversity of species and habitat of any coastal lagoon in the UK and aside from the entrance at the southeastern end, The Fleet is largely sheltered from waves and tidal processes.

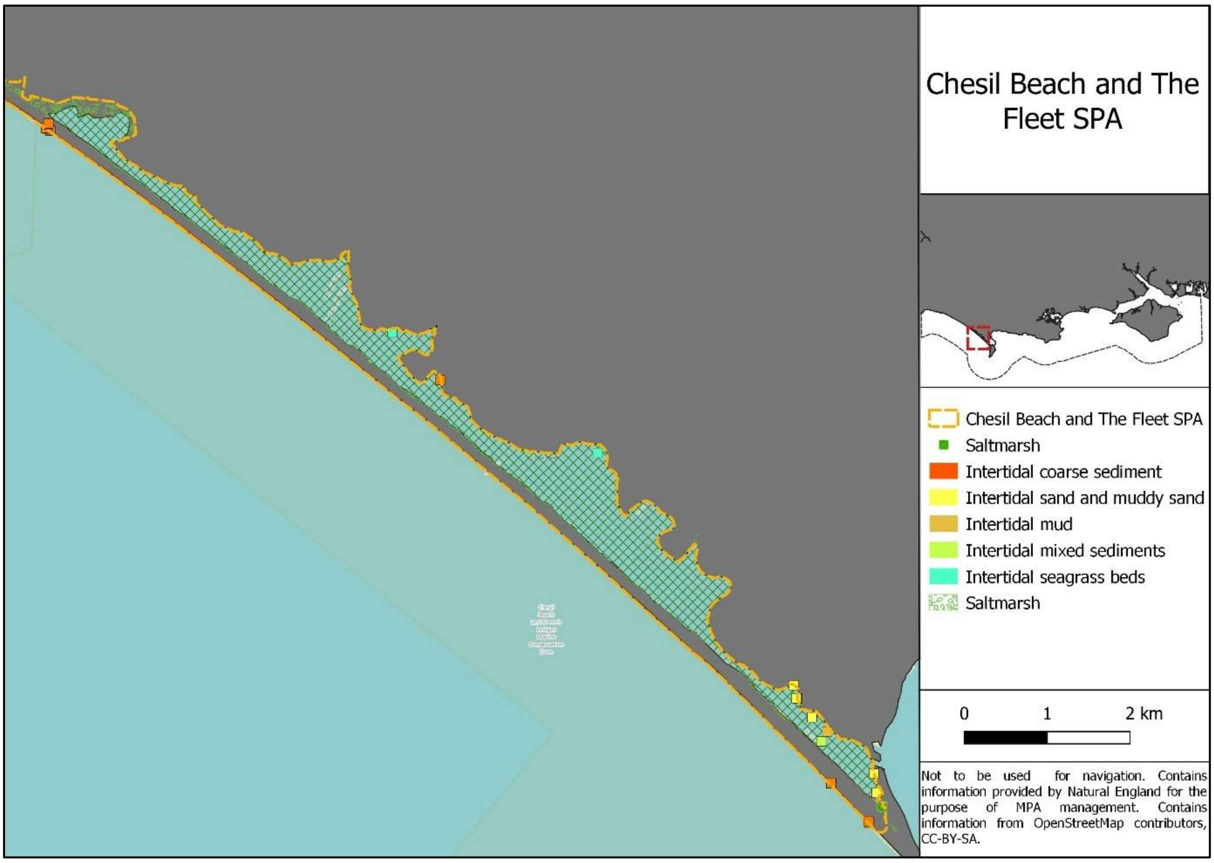

Figure 13: The location and extent of the supporting habitats of the Chesil Beach and The Fleet SPA (boundary shown by the dashed yellow line).

Table 12: Qualifying features and supporting habitats of the Chesil Beach and The Fleet SPA.

Qualifying Features	Little tern (*Sternula albifrons*), Breeding
	Wigeon (*Mareca Penelope*), Non-breeding
Supporting Habitats	Coastal lagoons
	Intertidal coarse sediment
	Intertidal mixed sediment
	Intertidal sand and muddy sand
	Intertidal seagrass beds
	Intertidal mud
	Water column

2.3.2 Poole Harbour SPA

Poole Harbour SPA comprises of large tidal mudflats, saltmarsh, and seagrass beds. The SPA covers an area of 42 km^2 and is an important feeding habitat for migratory birds.

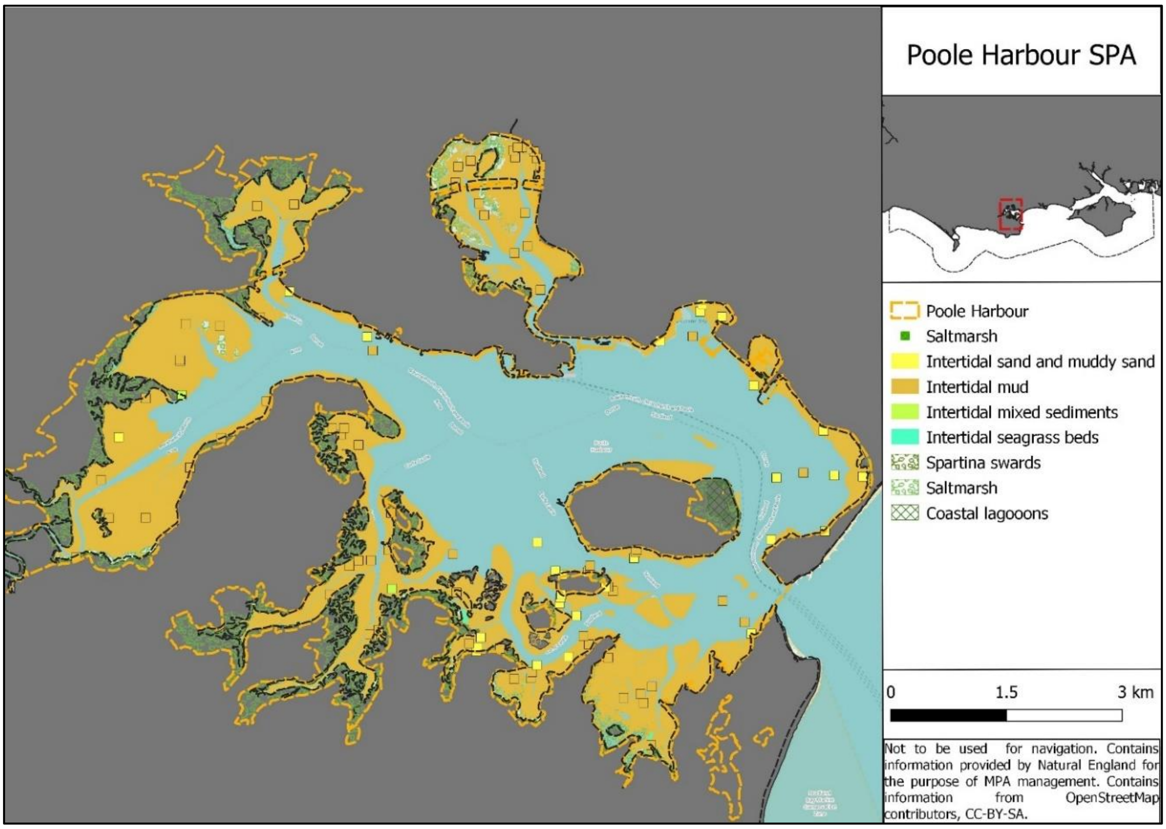

Figure 14: The location and extent of the supporting habitats of the Poole Harbour SPA (boundary shown by the dashed yellow line).

Table 13: Qualifying features and supporting habitats of the Poole Harbour SPA.

Qualifying Features	Avocet (*Recurvirostra avosetta*), Non-breeding
	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Little egret (*Egretta garzetta*), Non-breeding
	Mediterranean gull (*Ichthyaetus melanocephalus*), Breeding

	Sandwich tern (*Thalasseus sandvicensis*), Breeding
	Shelduck (*Tadorna tadorna*), Non-breeding
	Spoonbill (*Platalea leucorodia*), Non-breeding
	Waterbird assemblage, Non-breeding
Supporting Habitats	Coastal lagoon
	Coastal reedbed
	Freshwater and coastal grazing marsh
	Mediterranean and thermo-Atlantic halophilous scrubs
	Salicornia and other annuals colonising mud and sand
	Atlantic salt meadows
	Spartina swards
	Intertidal seagrass beds
	Intertidal mixed sediments
	Intertidal mud
	Intertidal sand and muddy sand
	Water column

2.3.3 Solent and Southampton Water SPA

The Solent and Southampton Water SPA reaches from Hurst Spit in the West to Hill Head in the East, covering sections of the Hampshire coastline and the north coast of the Isle of Wight. The SPA covers 54 km^2 of estuarine habitats that support a range of invertebrates and migratory birds.

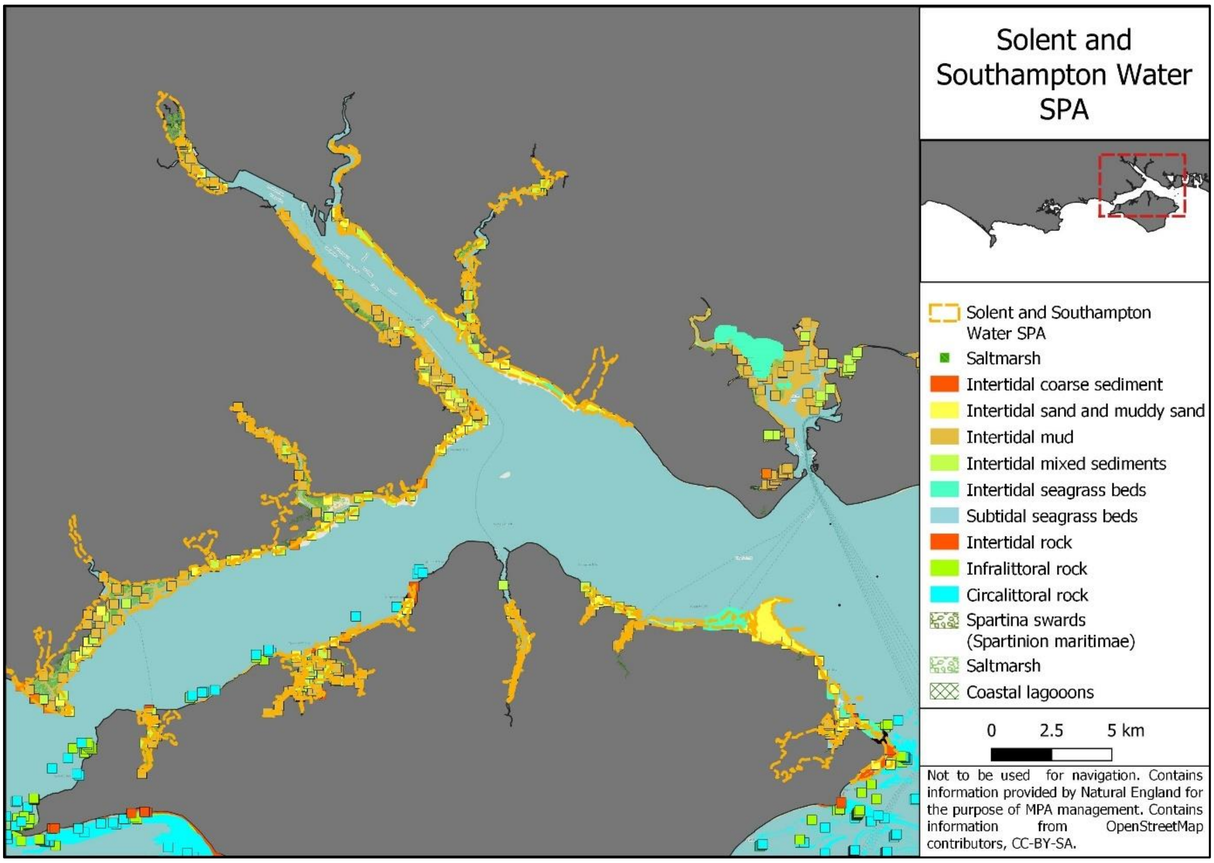

Figure 15: The location and extent of the supporting habitats of the Solent and Southampton Water SPA (boundary shown by the dashed yellow line).

Table 14: Qualifying features and supporting habitats of the Solent and Southampton Water SPA.

Qualifying Features	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Little tern (*Sternula albifrons*), Breeding
	Mediterranean gull (*Ichthyaetus melanocephalus*), Breeding
	Ringed plover (*Charadrius hiaticula*), Non-breeding
	Roseate tern (*Sterna dougallii*), Breeding
	Sandwich tern (*Thalasseus sandvicensis*), Breeding
	Teal (*Anas crecca*), Non-breeding
	Waterbird assemblage, Non-breeding
Supporting Habitats	Coastal lagoon
	Coastal reedbed
	Freshwater and coastal grazing marsh
	Salicornia and other annuals colonising mud and sand
	Atlantic salt meadows
	Spartina swards
	Intertidal seagrass beds
	Intertidal rock
	Intertidal coarse sediment
	Intertidal mixed sediments
	Intertidal mud
	Intertidal sand and muddy sand
	Infralittoral rock
	Subtidal seagrass beds
	Circalittoral rock
	Water column

2.3.4 Portsmouth Harbour SPA

Portsmouth Harbour is an important habitat for large numbers of nationally and internationally important bird species. The SPA covers 13 km^2.

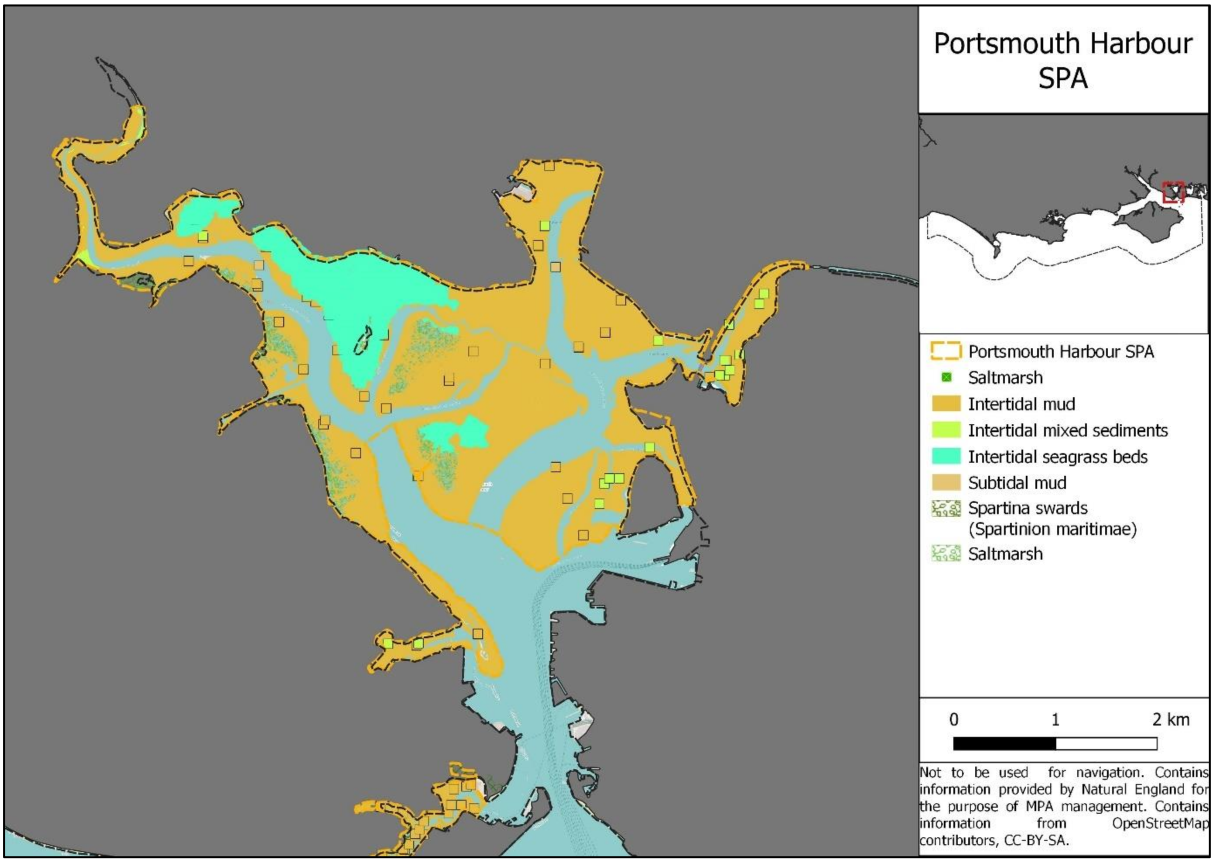

Figure 16: The location and extent of the supporting habitats of the Portsmouth Harbour SPA (boundary shown by the dashed yellow line).

Table 15: Qualifying features and supporting habitats of the Portsmouth Harbour SPA.

Qualifying Features	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Dunlin (*Calidris alpina alpina*), Non-breeding
	Red-breasted merganser (*Mergus serrator*), Non-breeding
Supporting Habitats	Coastal lagoon
	Freshwater and coastal grazing marsh
	Salicornia and other annuals colonising mud and sand
	Atlantic salt meadows
	Spartina swards
	Intertidal seagrass beds
	Intertidal mixed sediments
	Intertidal mud
	Subtidal mud
	Water column

2.3.5 Chichester and Langstone Harbours SPA

Chichester and Langstone Harbour cover two estuary basins with large mudflats and sandflats. The habitats support large numbers of overwintering birds with the SPA covering an area of 58 km^2.

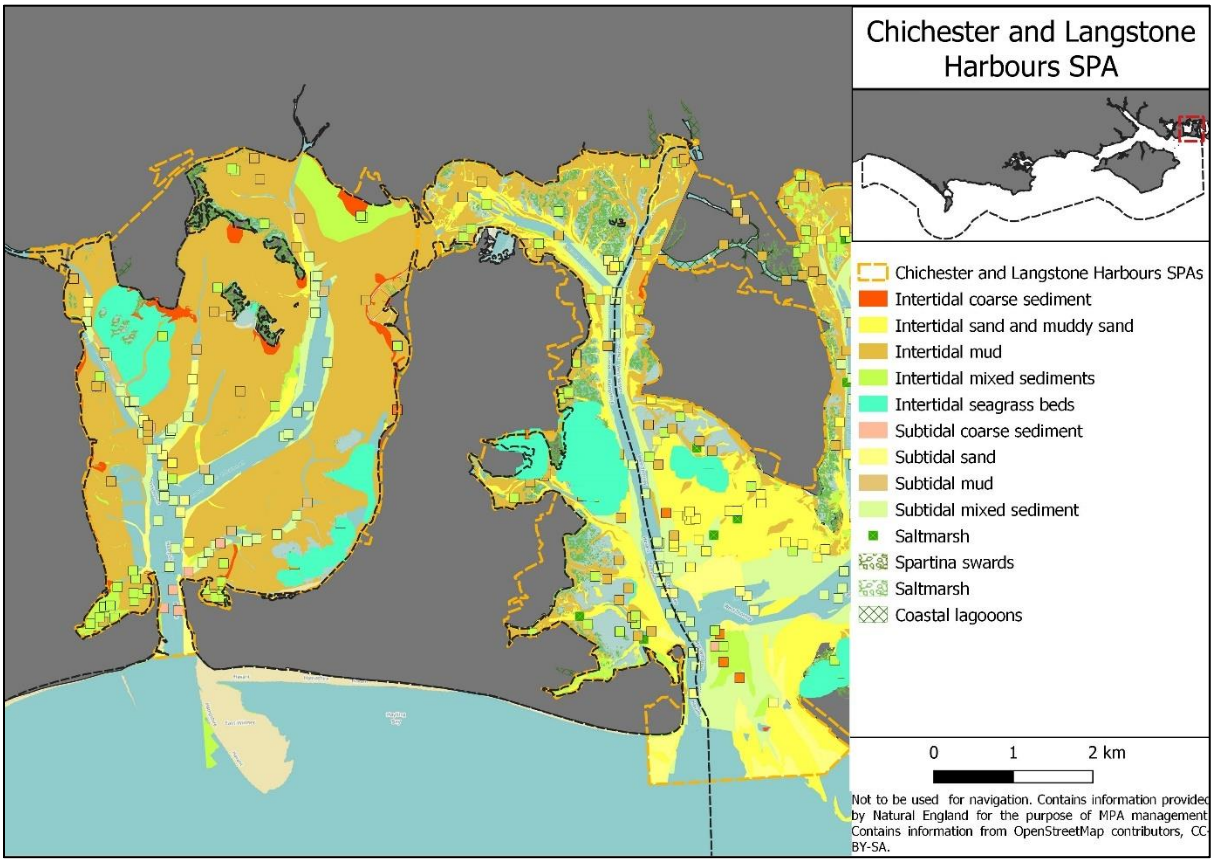

Figure 17: The location and extent of the supporting habitats of the Chichester and Langstone Harbour SPA (boundary shown by the dashed yellow line).

Table 16: Qualifying features and supporting habitats of the Chichester and Langstone Harbours SPA.

Qualifying Features	Bar-tailed godwit (*Limosa lapponica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Curlew (*Numenius arquata*), Non-breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Dunlin (*Calidris alpina alpina*), Non-breeding
	Grey plover (*Pluvialis squatarola*), Non-breeding
	Little tern (*Sternula albifrons*), Breeding
	Pintail (*Anas acuta*), Non-breeding
	Red-breasted merganser (*Mergus serrator*), Non-breeding
	Redshank (*Tringa totanus*), Non-breeding
	Ringed plover (*Charadrius hiaticula*), Non-breeding
	Sanderling (*Calidris alba*), Non-breeding
	Sandwich tern (*Thalasseus* sandvicensis), Breeding
	Shelduck (*Tadorna tadorna*), Non-breeding
	Shoveler (*Spatula clypeata*), Non-breeding
	Teal (*Anas crecca*), Non-breeding
	Turnstone (*Arenaria interpres*), Non-breeding

	Waterbird assemblage, Non-breeding
	Wigeon (*Mareca penelope*), Non-breeding
	Shoveler (*Spatula clypeata*), Non-breeding
Supporting Habitats	Coastal lagoon
	Coastal reedbed
	Freshwater and coastal grazing marsh
	Salicornia and other annuals colonising mud and sand
	Atlantic salt meadows
	Spartina swards
	Intertidal seagrass beds
	Intertidal rock
	Intertidal coarse sediment
	Intertidal mixed sediments
	Intertidal mud
	Intertidal sand and muddy sand
	Subtidal coarse sediment
	Subtidal mixed sediment
	Subtidal mud
	Subtidal sand
	Water column

Section D: Part A and TLSE Assessments

For the sites listed in Section C above which were identified through the Screening Assessment as needing to progress to the next stage, Part A Assessments were carried out for MCZs and TLSE Assessments for the SACs and SPAs.

For both types of assessment, each type of activity was assessed with respect to the potential pressures which may be exerted on designated features. The assessment was undertaken using the Advice on Operations and Supplementary Advice provided by Natural England for each site. The Advice on Operations provides a broad-scale assessment of the sensitivity of designated features to different activity-derived pressures, using nationally available evidence on their resilience (ability to recover) and resistance (the level of tolerance) to physical, chemical and biological pressures. The broad-scale assessment of sensitivity to the pressures is measured against a benchmark. It should be noted that these benchmarks are representative of the likely intensity of a pressure caused by typical activities, and do not represent a threshold of an 'acceptable' intensity of a pressure. It is therefore necessary to consider the specifics of the activity being assessed as they are relevant to the Southern IFCA District, i.e., assessing the potential for a significant effect of a pressure on a feature using knowledge on activity levels, occurrence, intensity, gear type, operation etc. The determination of whether a pressure/feature interaction needed to be carried forward to the Part B/Appropriate Assessment stage considered this site and District-specific detail alongside the broader Advice on Operations.

The two relevant Advice on Operations are:

- Shore-based activities
- Seaweed harvesting

1.0 Part A Assessments

Part A Assessments were carried out for sites listed in Section C2.1.

The outcomes of the Part A Assessments identified the following pressures as having a potential likely significant impact:

Shore-based activities

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Removal of non-target species
- Removal of target species
- Visual disturbance

Seaweed harvesting

- Abrasion/disturbance of the substrate on the surface of the seabed
- Removal of non-target species
- Removal of target species
- Visual disturbance

Tables 17-18 below provide a summary of the outputs of these assessments for each site, indicating the pressures which may exert a significant impact, the designated features relevant to each pressure, the MCZ for which that pressure/feature combination is applicable, the rationale for screening into the next stage in the assessment process, and the relevant attributes listed by Natural England in the Supplementary Advice for designated sites which may be affected by the exertion of that pressure on that feature.

(*) note that not all relevant attributes will apply to all features, however information is provided on all applicable relevant attributes as they apply to habitats, seagrass and species.

Table 17: Summary of outcomes for the Part A Assessments for shore-based activities.

Advice on Operations: Shore-based activities				
Potential Pressure	**Relevant Designated Features**	**Relevant MCZ**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	High-energy intertidal rock	• Chesil Beach and Stennis Ledges	Shore-based gathering of mussels has the potential to take place over intertidal rock causing an abrasion risk - however this activity is not currently documented as occurring in the Southern IFCA Distict. Species associated with rock habitats may also be subject to abrasion from trampling. Where seagrass beds overlap with the presence of the target species there is a risk of abrasion. There is also a risk of abrasion from trampling. There is a risk to species associated with seagrass habitats from damage to the habitat by abrasion.	**For Habitats:** Distribution: presence and spatial distribution of biological communities Extent and distribution Structure and function: presence and abundance of key structural and influential species Structure: physical structure of rocky substrate Structure: sediment composition and distribution Structure: species composition of component communities **Specific for seagrass:** Structure: biomass Structure: rhizome structure and biomass **For Species:** Population: abundance Population: population size
	Moderate-energy intertidal rock	• Purbeck Coast • Yarmouth to Cowes		
	Low-energy intertidal rock	• Yarmouth to Cowes		
	Seagrass beds	• Studland Bay • The Needles • Bembridge		
	Peacock's Tail	• Purbeck Coast • The Needles • Bembridge		
	Stalked jellyfish (*Haliclystus* spp)	• Purbeck Coast • Bembridge		
	Stalked jellyfish (*Calvadosia campanulate*)	• The Needles • Bembridge		
	Long snouted seahorse	• Studland Bay		
	Short snouted seahorse	• Bembridge		
Penetration and/or disturbance of the substratum below the	Seagrass beds	• Studland Bay • The Needles • Bembridge	Shore-based activities could cause penetration in seagrass beds where the feature overlaps	

surface of the seabed, including abrasion	Stalked jellyfish (*Haliclystus* spp)	• Bembridge	with the presence of target species. Shore based activities could cause abrasion to seagrass beds and thus stalked jellyfish where the feature overlaps with the location of the target species.	Population: recruitment and reproductive capability Presence and spatial distribution of the species Supporting habitat: extent and distribution
	Stalked jellyfish (*Calvadosia campanulate*)	• The Needles • Bembridge		
Removal of non-target species	Seagrass beds	• Studland Bay • The Needles • Bembridge	Overlap between seagrass beds and the target species risks the removal of non-target species associated with seagrass beds or removal of seagrass blades.	
	Long snouted seahorse	• Studland Bay		
	Short snouted seahorse	• Bembridge		
	Stalked jellyfish (*Haliclystus* spp)	• Bembridge		
	Stalked jellyfish (*Calvadosia campanulate*)	• The Needles • Bembridge		
Removal of target species	Seagrass beds	• Studland Bay • The Needles • Bembridge	Overlap between seagrass beds and the target species introduces a risk to the feature through the removal of the target species.	
Visual disturbance	Long snouted seahorse	• Studland Bay	The only activity which would occur below the level of the water is push netting, activity levels are very low however this is the potential for a visual disturbance.	
	Short snouted seahorse	• Bembridge		

Table 18: Summary of outcomes for the Part A Assessments for Seaweed Harvesting.

Advice on Operations: Seaweed harvesting				
Potential Pressure	**Relevant Designated Features**	**Relevant MCZ**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	High-energy intertidal rock	• Chesil Beach and Stennis Ledges • Purbeck Coast	There is potential for abrasion to be caused by seaweed harvesting on suitable habitats or trampling in order to reach suitable habitats. For species which are found in rocky habitats, there is the risk of abrasion due to the action of seaweed harvesting. If seaweed removal / the removal of seaweed occurred within seagrass beds where there is an impact to the bed from abrasion, there could be further impacts to associated species.	**For Habitats:** Distribution: presence and spatial distribution of biological communities Extent and distribution Structure and function: presence and abundance of key structural and influential species Structure: physical structure of rocky substrate Structure: sediment composition and distribution Structure: species composition of component communities **Specific for seagrass:** Structure: biomass Structure: rhizome structure and biomass **For Species:** Population: abundance Population: population size Population: recruitment and reproductive capability Presence and spatial distribution of the species Supporting habitat: extent and distribution
	Moderate-energy intertidal rock	• Purbeck Coast • Yarmouth to Cowes		
	Low-energy intertidal rock	• Yarmouth to Cowes		
	High-energy infralittoral rock	• Chesil Beach and Stennis Ledges • Purbeck Coast • The Needles • Yarmouth to Cowes		
	Moderate-energy infralittoral rock	• The Needles • Yarmouth to Cowes		
	High-energy circalittoral rock	• Chesil Beach and Stennis Ledges • Yarmouth to Cowes		
	Moderate-energy circalittoral rock	• The Needles • Yarmouth to Cowes		
	Littoral chalk communities	• Yarmouth to Cowes		
	Subtidal coarse sediment	• Chesil Beach and Stennis Ledges • Purbeck Coast • The Needles		

		• Yarmouth to Cowes		
	Subtidal mixed sediments	• Chesil Beach and Stennis Ledges • Purbeck Coast • The Needles • Yarmouth to Cowes		
	Subtidal sand	• Chesil Beach and Stennis Ledges • Studland Bay • The Needles • Bembridge		
	Subtidal mud	• The Needles		
	Seagrass beds	• Studland Bay • The Needles • Bembridge		
	Native oyster	• Chesil Beach and Stennis Ledges • The Needles • Yarmouth to Cowes • Bembridge		
	Pink-sea fan	• Chesil Beach and Stennis Ledges		
	Peacock's Tail	• Purbeck Coast • The Needles • Bembridge		
	Stalked jellyfish (*Haliclystus* spp)	• Purbeck Coast • Bembridge		
	Stalked jellyfish (*Calvadosia campanulata*)	• The Needles • Bembridge		
	Long snouted seahorse	• Studland Bay		

	Short snouted seahorse	• Bembridge		
Removal of target species	High-energy intertidal rock	• Chesil Beach and Stennis Ledges • Purbeck Coast	Removal of seaweeds may impact the structure/function of rock habitats. Removal of seaweeds may impact seagrass beds if found in the same locations. Where seaweeds are found in habitats used by designated species, there is a risk that removal could apply pressure to the community left behind.	
	Moderate-energy intertidal rock	• Purbeck Coast • Yarmouth to Cowes		
	Low-energy intertidal rock	• Yarmouth to Cowes		
	High-energy infralittoral rock	• Chesil Beach and Stennis Ledges • Purbeck Coast • The Needles • Yarmouth to Cowes		
	Moderate-energy infralittoral rock	• The Needles • Yarmouth to Cowes		
	High-energy circalittoral rock	• Chesil Beach and Stennis Ledges • Yarmouth to Cowes		
	Moderate-energy circalittoral rock	• The Needles • Yarmouth to Cowes		
	Littoral chalk communities	• Yarmouth to Cowes		
	Subtidal mixed sediments	• Chesil Beach and Stennis Ledges • Purbeck Coast • The Needles • Yarmouth to Cowes		
	Subtidal sand	• Chesil Beach and Stennis Ledges • Studland Bay		

		• The Needles • Bembridge		
	Peacock's Tail	• Purbeck Coast • The Needles • Bembridge		
	Seagrass beds	• Studland Bay • The Needles • Bembridge		
	Long snouted seahorse	• Studland Bay		
	Short snouted seahorse	• Bembridge		
Removal of non-target species	Seagrass beds	• Studland Bay • The Needles • Bembridge	Although seaweed harvesting by hand is very selective and seaweeds can be harvested without the accidental harvest of non-target species by careful review of fronds when harvesting, if the harvester is unfamiliar with the species there is the risk of accidental removal of certain designated species as a non-target species. If removal of seaweed occurs within a seagrass bed there is the potential for an impact to the seagrass feature through disturbance/removal of associated species as non-target species. It is noted that seaweed harvesting is very selective and accidental harvest of non-target species is low so risk relates to	
	Peacock's Tail	• Purbeck Coast • The Needles • Bembridge		
	Stalked jellyfish (*Haliclystus* spp)	• Purbeck Coast • Bembridge		
	Stalked jellyfish (*Calvadosia campanulata*)	• The Needles • Bembridge		

			small, difficult to see non-target species associated with seagrass communities or associated sediment communities.	
Visual disturbance	Long snouted seahorse	• Studland Bay	Seaweed harvesting may occur in the shallow subtidal/below the level of the water therefore there is the potential for visual disturbance.	
	Short snouted seahorse	• Bembridge		

2.0 TLSE Assessments

TLSE Assessments were carried out for sites listed in Sections C2.2 and C2.3.

The outcomes of the TLSE Assessments identified the following pressures as having a potential likely significant impact:

SACs

Shore-based activities

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Removal of non-target species
- Removal of target species

Seaweed harvesting

- Abrasion/disturbance of the substrate on the surface of the seabed
- Removal of target species

SPAs

Shore-based activities

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion
- Removal of non-target species
- Removal of target species
- Visual disturbance

Seaweed harvesting

- Abrasion/disturbance of the substrate on the surface of the seabed
- Removal of target species
- Removal of non-target species
- Visual disturbance

Tables 19-20 (SACs) and 21-22 (SPAs) below provide a summary of the outputs of these assessments for each site, indicating the pressures which may exert a significant impact, the designated features relevant to each pressure, the SAC/SPA for which that pressure/feature combination is applicable, the rationale for screening into the next stage in the assessment process and the relevant attributes, listed by Natural England in the Supplementary Advice for designated sites which may be affected by the exertion of that pressure on that feature.

(*) note that not all relevant attributes will apply to all features, however information is provided on all applicable relevant attributes as they apply to habitats, seagrass and species.

2.1 SAC TLSE Assessments

Table 19: Summary of outcomes for the TLSE Assessments for SACs for shore-based activities.

Advice on Operations: Shore-based activities				
Potential Pressure	**Relevant Designated Features**	**Relevant SAC**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	Annual vegetation of drift lines	• Chesil and The Fleet • Solent Maritime	Shore gathering activities can exert an abrasion/disturbance pressure on the seabed. For saltmarshes, shore-based activities will not directly interact with the feature as it is not the target habitat type. However, saltmarsh may be trampled when gaining access to the target habitats. Where seagrass overlaps with areas where target species are found there is a risk of abrasion from shore-based activities. There is also a trampling risk in accessing areas for target species. For subtidal seagrass the only activity which would take place is push netting, there is the potential for trampling of seagrass whilst undertaking this activity.	Distribution of the feature, including associated transitional habitats, within the site Distribution: presence and spatial distribution of biological communities Extent and distribution Extent of support habitat (habitat) Extent of the feature within the site Future extent of habitat within the site and ability to respond to seasonal changes Structure and function (including typical species): key structural, influential and distinctive species Structure and function: presence and abundance of key structural and influential species Structure and function: sediment size and availability Structure: sediment composition and distribution Structure: biomass Structure: species composition of component communities Structure: physical structure of rocky substrate.
	Perennial vegetation of stony banks	• Chesil and The Fleet • Solent Maritime		
	Coastal lagoons	• Chesil and The Fleet		
	Mediterranean and thermo-Atlantic halophilous scrubs	• Chesil and The Fleet		
	Atlantic salt meadows	• Chesil and The Fleet • Solent Maritime		
	Salicornia and other annuals colonising mud and sand	• Solent Maritime		
	Spartina swards	• Solent Maritime		
	Intertidal seagrass beds	• Solent Maritime		
	Intertidal mixed sediments	• Solent Maritime		
	Intertidal mud	• Solent Maritime		

	Intertidal sand and muddy sand	• Solent Maritime		
	Subtidal seagrass beds	• Solent Maritime		
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Coastal lagoons	• Chesil and The Fleet	Shore-based activities could cause penetration to the seabed. Shore-based activities could cause penetration and disturbance to seagrass beds where the feature overlaps with the location of target species.	
	Intertidal seagrass beds	• Solent Maritime		
	Intertidal mixed sediments	• Solent Maritime		
	Intertidal mud	• Solent Maritime		
	Intertidal sand and muddy sand	• Solent Maritime		
Removal of target species	Intertidal seagrass beds	• Solent Maritime	If there is an overlap between the location of the target species and seagrass beds, there is a risk that removal of the target species would impact the seagrass feature. From shore-based activities removal of target species may occur and exert this pressure.	
	Intertidal mixed sediments	• Solent Maritime		
	Intertidal mud	• Solent Maritime		
	Intertidal sand and muddy sand	• Solent Maritime		
	Subtidal seagrass beds	• Solent Maritime		
Removal of non-target species	Intertidal seagrass beds	• Solent Maritime	If there is overlap between the location of the target species and seagrass beds there is a risk of removal of non-target species associated with seagrass communities or removal of seagrass itself accidentally.	
	Subtidal seagrass beds	• Solent Maritime		

Table 20: Summary of outcomes for the TLSE Assessments for SACs for seaweed harvesting.

Advice on Operations: Shore-based activities				
Potential Pressure	**Relevant Designated Features**	**Relevant SAC**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	Annual vegetation of drift lines	• Chesil and The Fleet	There is the potential for abrasion to be caused during seaweed harvesting for suitable habitats where target species occur and during trampling when accessing sites.	Distribution: presence and spatial distribution of biological communities Structure and function: presence and abundance of key structural and influential species Structure: physical structure of rocky substrate Structure: species composition of component communities
	Perennial vegetation of stony banks	• Chesil and The Fleet		
	Infralittoral rock	• Lyme Bay and Torbay • Studland to Portland • South Wight Maritime		
	Circalittoral rock	• Lyme Bay and Torbay • Studland to Portland • South Wight Maritime		
	Subtidal stony reef	• Studland to Portland • South Wight Maritime		
	Submerged or partially submerged sea caves	• South Wight Maritime		
	Intertidal rock	• South Wight Maritime		
	Coastal lagoons	• Chesil and The Fleet		
	Mediterranean and thermo-Atlantic halphilous scrubs	• Chesil and The Fleet		
	Atlantic salt meadows	• Chesil and The Fleet		

Removal of target species	Coastal lagoons	• Chesil and The Fleet	For coastal lagoons, removal of seaweeds may impact the structure/function of the habitat but only where suitable habitat is found within lagoons, i.e. - cobbles and coarse sediments. Removal of seaweeds may impact the structure/function of the rock habitat.	
	Infralittoral rock	• Lyme Bay and Torbay • Studland to Portland • South Wight Maritime		
	Circalittoral rock	• Lyme Bay and Torbay • Studland to Portland • South Wight Maritime		
	Subtidal stony reef	• Studland to Portland • South Wight Maritime		
	Submerged or partially submerged sea caves	• South Wight Maritime		
	Intertidal rock	• South Wight Maritime		

2.2 SPA TLSE Assessments

Table 21: Summary of outcomes for the TLSE Assessments for SPAs for shore-based activities.

Advice on Operations: Shore-based activities				
Potential Pressure	**Relevant Designated Features**	**Relevant SPA**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	Coastal lagoons	• Chesil Beach and The Fleet	Shore gathering activities can exert an abrasion/disturbance pressure on the seabed. For saltmarsh and reedbeds, shore-based activities will not directly interact with the feature as it is not the target habitat type. However,	Disturbance caused by human activity; Non-breeding population: abundance; Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season;
	Coastal reedbeds	• Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
	Atlantic salt meadows	• Chesil Beach and The Fleet		

		• Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours	saltmarsh may be trampled when gaining access to the target habitats. Where seagrass overlaps with areas where target species are found there is a risk of abrasion from shore-based activities. There is also a trampling risk in accessing areas for target species. For subtidal seagrass the only activity which would take place is push netting, there is the potential for trampling of seagrass whilst undertaking this activity.	Supporting habitat: food availability (bird)
	Freshwater and coastal grazing marsh	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Mediterranean and thermo-Atlantic halophilous scrubs	• Poole Harbour		
	Salicornia and other annuals colonising mud and sand	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Spartina swards	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour		

		• Chichester and Langstone Harbours		
	Intertidal mixed sediments	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal mud	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal sand and muddy sand	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
	Intertidal rock	• Solent and Southampton Water • Chichester and Langstone Harbours		
	Subtidal seagrass beds	• Solent and Southampton Water		
Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion	Coastal lagoons	• Chesil Beach and The Fleet	Shore-based activities could cause penetration to the seabed.	
	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water	Shore-based activities could cause penetration and disturbance to seagrass beds where the feature	

		• Portsmouth Harbour • Chichester and Langstone Harbours	overlaps with the location of target species.	
	Intertidal mixed sediments	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal mud	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal sand and muddy sand	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
	Subtidal seagrass beds	• Solent and Southampton Water		
Removal of non-target species	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours	If there is overlap between the location of the target species and seagrass beds there is a risk of removal of non-target species associated with seagrass communities or removal of seagrass itself accidentally.	
	Subtidal seagrass beds	• Solent and Southampton Water		

Removal of target species	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours	From shore-based activities removal of target species may occur and exert this pressure. If there is an overlap between the location of the target species and seagrass beds, there is a risk that removal of the target species would impact the seagrass feature.	
	Intertidal mixed sediments	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal mud	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal sand and muddy sand	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
Visual disturbance	Bird species	• Chesil Beach and The Fleet • Poole Harbour (except common tern, sandwich tern and Mediterranean gull) • Solent and Southampton Water • Portsmouth Harbour	Shore gathering may result in a visual disturbance to the feature. The exceptions listed are as a result of: • Poole Harbour – habitats used by these species are not	

		• Chichester and Langstone Harbours (except shoveler)	suitable or accessible for shore gathering • Chichester and Langstone Harbours – the feature is not sensitive to the pressure.	

Table 22: Summary of outcomes for the TLSE Assessments for SPAs for seaweed harvesting.

Advice on Operations: Seaweed harvesting				
Potential Pressure	**Relevant Designated Features**	**Relevant SPA**	**Rationale**	**Relevant Attributes (*)**
Abrasion/disturbance of the substrate on the surface of the seabed	Coastal lagoons	• Chesil Beach and The Fleet	There is the potential for abrasion to be caused during seaweed harvesting and during trampling when accessing sites. Although saltmarsh and reedbeds are not the target habitat there is a risk of trampling to gain access to habitats suitable for shore gathering activities. Although sediment habitats are not the target habitat, there is a risk of trampling to gain access to habitats suitable for seaweed harvesting. Activity has the potential to cause abrasion by the removal of seaweeds or trampling to reach seaweed harvesting areas.	Disturbance caused by human activity; Non-breeding population: abundance; Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season; Supporting habitat: food availability (bird)
	Coastal reedbeds	• Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
	Atlantic salt meadows	• Chesil Beach and The Fleet • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Freshwater and coastal grazing marsh	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		

	Mediterranean and thermo-Atlantic halophilous scrubs	• Poole Harbour		
	Salicornia and other annuals colonising mud and sand	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Spartina swards	• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Subtidal seagrass beds	• Solent and Southampton Water		
	Intertidal mixed sediments	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal mud	• Chesil Beach and The Fleet		

		• Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal sand and muddy sand	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Chichester and Langstone Harbours		
	Intertidal rock	• Solent and Southampton Water • Chichester and Langstone Harbours		
	Infralittoral rock	• Solent and Southampton Water		
	Circalittoral rock	• Solent and Southampton Water		
	Subtidal coarse sediment	• Chichester and Langstone Harbours		
	Subtidal mixed sediments	• Portsmouth Harbour • Chichester and Langstone Harbours		
	Subtidal sand	• Chichester and Langstone Harbours		
	Subtidal mud	• Portsmouth Harbour		
Removal of non-target species	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour	If removal of seaweed occurs within a seagrass bed there is the potential for an impact to the seagrass feature through disturbance/removal of associated species as non-target species. It is noted that	

		• Chichester and Langstone Harbours	seaweed harvesting is very selective and accidental harvest of non-target species is low so risk relates to small, difficult to see non-target species associated with seagrass communities or associated sediment communities.	
	Subtidal seagrass beds	• Solent and Southampton Water		
Removal of target species	Coastal lagoons	• Chesil Beach and The Fleet	If removal of seaweed occurs within a seagrass bed there is the potential for an impact to the seagrass feature. Removal of seaweeds may impact the structure/function of the rock habitat. If removal of seaweed occurs within relevant rock or sediment habitats there is the potential for an impact to the feature. Removal of seaweeds may impact the structure/function of coastal lagoon habitat but only where suitable habitat is found within lagoons, i.e. - cobbles and coarse sediments.	
	Intertidal seagrass beds	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Subtidal seagrass beds	• Solent and Southampton Water		
	Intertidal mixed sediments	• Chesil Beach and The Fleet • Poole Harbour • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours		
	Intertidal rock	• Solent and Southampton Water • Chichester and Langstone Harbours		
	Infralittoral rock	• Solent and Southampton Water		
	Circalittoral rock	• Solent and Southampton Water		

	Subtidal mixed sediments	• Portsmouth Harbour • Chichester and Langstone Harbours		
Visual disturbance	Bird species	• Chesil Beach and The Fleet • Poole Harbour (except common tern, sandwich tern and Mediterranean gull) • Solent and Southampton Water • Portsmouth Harbour • Chichester and Langstone Harbours (except shoveler)	Seaweed harvesting may result in a visual disturbance to the feature. The exceptions listed are as a result of: • Poole Harbour – habitats used by these species are not suitable or accessible for shore gathering • Chichester and Langstone Harbours – the feature is not sensitive to the pressure.	

Section E: Management

In consideration of the identified potential pressure/feature interactions through the Part A/TLSE Assessment process, definitions for shore gathering activity and a set of Management Principles were developed to underpin management development.

The Management Principles were reviewed through a Southern IFCA Authority Members Working Group and agreed at the meeting of the Technical Advisory Sub-Committee in May 2024. Draft management measures were developed underpinned by the Management Principles.

1.0 Management Principles

The Management Principles which underpin the management measures for shore gathering (as outlined in Sections E2.0 and E3.0) are given in Figure 18. Management Principles 1 and 2 refer to the evidence used to inform the development of measures, Principles 3-8 refer to the development of management under two measures, a byelaw and a code of conduct.

There are two management measures developed for shore gathering activities:

- The Shore Gathering Byelaw
    - Management under this Byelaw is in line with Management Principles 3-7
- The Southern IFCA Seaweed Harvesting Code of Conduct
    - Management under the CoC is in line with Management Principle 8

1. The best available evidence used to inform feature-based protection for features designated under relevant MCZs, SACs and SPAs is:
   a. The Natural England (NE) designated features layer provided to Southern IFCA in 2023
   b. The National Seagrass Layer obtained from the Defra Government Website
   c. NE (quality assured) commissioned Hampshire and Isle of Wight Wildlife Trust (HIWWT) seagrass data provided to Southern IFCA in 2024

2. Any additional data received after **9th May 2024** will be considered during the period of formal consultation and then (subject to byelaw ratification), in subsequent byelaw reviews, as determined by the provisions of the byelaw.

3. For relevant features a GPS buffer of 10m will be incorporated.

4. Prohibition areas will be defined as follows:
   a. For designated seagrass features within MCZs that occur up to the 2m chart datum contour
   b. For seagrass designated as a feature or as a supporting habitat, within or adjacent to SACs and SPAs that occur up to the 2m chart datum contour

5. Existing Southern IFCA Management measures for relevant activities in the Poole Harbour SPA will be combined to create a single management approach.

6. With the exception of seagrass, the extent and distribution of feature-based management in the Solent Maritime SAC and district wide SPAs will be developed using Poole Harbour as a model.

7. In the application of the Poole Harbour model to the Solent Maritime SAC and district wide SPAs, the following approach will be taken:
   a. Bird Sensitive Areas (BSA) will be used as the basis for spatial management
   b. In the absence of BSAs being defined by Natural England in the Solent Maritime SAC and district wide SPAs (excluding Poole Harbour), BSAs will be defined as follows:
      i. For the Solent Maritime SAC and Solent SPAs, BSAs will be initially defined using areas proposed for management as good examples of estuarine habitat under the Bottom Towed Fishing Gear Byelaw 2023 and adapted to be relevant to shore gathering activity
      ii. For the Solent Maritime SAC, Solent SPAs and The Chesil and The Fleet SPA, consideration will be given to aligning BSAs with directions relating to access and shore gathering activities given by other bodies, for example harbour authorities and conservation bodies
   c. The requirements for seasonal management within BSAs will be considered on the basis of best available evidence

8. A code of practice will be developed for the gathering of seaweed by hand.

Figure 18: Management Principles for shore gathering activities which underpin management measures.

2.0 Shore Gathering Byelaw

2.1 Spatial Management

The Shore Gathering Byelaw provides spatial management for sensitive habitats and species within MCZs, SACs and SPAs to mitigate potential impacts from shore gathering activities. Spatial management is further defined by prohibition (year-round) or seasonal management, with three types of management areas under the Byelaw:

- **Prohibited Areas** (year-round)
- **Summer Closure Areas** (closed 1st March to 31st August)
- **Winter Closure Areas** (closed 1st November to 31st March)

During those periods of closure, no shore gathering activities will be permitted to take place in accordance with the definitions for shore gathering given in Section E2.2.

The detail of the location of each type of management area is provided in Table 23 below and shown in relation to the relevant designated sites (note that some sites overlap) in Annex 1.

Table 23: Location and number of types of management area within relevant areas of the District.

Area	Type of Management Area	No. of Each Type in the Site
Chichester Harbour	Prohibited Area	2
Langstone Harbour	Prohibited Area	10
Portsmouth Harbour	Prohibited Area	4
Southampton Water	Prohibited Area	2
	Summer Restricted Area	4
Beaulieu	Prohibited Area	1
Lymington and Keyhaven	Summer Restricted Area	1
Isle of Wight	Prohibited Area	15
	Summer Restricted Area	3
Poole Harbour	Prohibited Area	6
	Winter Restricted Area	10
Studland Bay	Prohibited Area	2
The Fleet	Prohibited Area	1

2.2 Prohibitions

The prohibitions under the Shore Gathering Byelaw are given as follows. These are applicable to all three types of management area during the relevant closed period.

i. No person shall fish for or take sea fisheries resources by hand or with the use of hand operated equipment where the fishing for, or taking is for the purpose of harvesting sea fisheries resources.
ii. No person shall have with them any hand operated equipment for use in the course of, or in connection with, the fishing for, or taking of sea fisheries resources for the purpose of harvesting.
iii. No person shall use of deploy any form of artificial habitat, structure or shelter to aid the collection of crab.

The definition of 'harvesting' in relation to the above prohibitions is given as: *to remove and retain for the purposes of consumption, selling, displaying, using as part or wholly for a product* *or service, cultivating, introducing to the sea or using as bait whether carried out for commercial purposes or otherwise*.

The Byelaw provides two exceptions:

- Points (i) and (ii) do not apply to the fishing for or taking of sea fisheries resources using a vessel provided that no part of the vessel's hull is in contact with the seabed.
- Points (i) and (ii) do not apply when using:
    a. Hook and line in conjunction with a fishing rod
    b. Handlines
    c. Spear gun
    d. A net other than a push net

These definitions ensure that all relevant activities are covered. The potential impacts which require spatial management are applicable to all types of shore gathering activity and therefore in order to ensure that identified protections for designated features are appropriately mitigating those impacts, there is a need to manage all relevant activities consistently.

3.0 Seaweed Harvesting Code of Conduct

For the management of seaweed harvesting outside of the management areas defined in the Shore Gathering Byelaw, the Southern IFCA Seaweed Harvesting Code of Conduct has been developed. The Code of Conduct is in line with other seaweed harvesting CoCs around the UK and has primarily used a CoC developed by Natural England in conjunction with partners including other IFC Authorities as a base with the inclusion of specific provisions relevant to the needs of applicable National Site Network Sites.

The CoC is provided as Annex 2.

The CoC includes voluntary provisions for:

- Obtaining relevant permissions
- Harvesting only by hand
- No use of vehicles
- Avoiding disturbance to sea birds
- Avoiding trampling or taking of non-target species
- Collection of less than 1/3 of an individual plant
- Replacing any rocks removed
- Cutting fronds above the point of growth and leaving the holdfast
- Harvesting sparsely and taking only a small percentage of standing stock
- Rotating harvest areas
- Harvesting during the active growing season
- Harvesting after reproduction has occurred and ensuring a sustainable proportion of mature plants remain
- INIS protocols
- Not collecting drift seaweed from the entire length of stand lines
- Keeping records of volumes and weights of species harvested
- Limiting harvesting in erosion-prone coastal areas where kelp forests dissipate wave energy
- Being aware of hazards on the foreshore

4.0 Other Applicable Southern IFCA Management

In addition to the management assessed in this document, the following Southern IFCA management will also apply to shore gathering activities:

- **Minimum Conservation Reference Size Byelaw** – MCRS set for a variety of species, applicable to commercial and recreational participants and throughout the supply chain
- **Oyster Close Season Byelaw** – defines a period during which no person may take native oysters of between 1st March and 31st October in any year, both days inclusive
- **Temporary Closure of Shellfish Beds Byelaw** – where any shellfish bed is depleted and requires closure to recover, the Committee may establish a temporary shellfish bed closure, wherein no person may take shellfish from the defined shellfish bed
- **Scallop Fishing Byelaw 2019** – sets a daily time period during which scallops can be fished for or taken of between 0700 and 1900 local time
- **Oysters Byelaw** – defines the MCRS for native oyster of 70mm
- **Mussels Byelaw** – defines the MCRS for mussels of 50mm

The Southern IFCA Fishing for Cockles Byelaw will be amended along with the introduction of the Shore Gathering Byelaw, the amended Byelaw will contain the provisions for a closed season for fishing for cockles of between 1st February and 30th April inclusive and the MCRS for cockle, stated as a person must not take from a fishery a cockle which will pass through a gauge having a square opening measuring 23.8mm along each side.

Section F: Part B Assessments and Appropriate Assessments

The aim of the Part B Assessments (MCZs) and Appropriate Assessments (SACs and SPAs) is to ensure that the activities will not prevent the furthering of Conservation Objectives or have an adverse effect on designated features respectively.

The following evidence was used to carry out the required Part B Assessments/Appropriate Assessments. Table 24 indicates where this evidence can be found in supporting documentation.

Evidence Type	Relevant Document
Site Specific	
Feature location and extent	**Site Specific Evidence Packages**
Existing shore gathering management	
Records of shore gathering activities	
Records of catches of target species from shore gathering activities	
Records of offences related to shore gathering activities	
For SPAs, evidence on seasonality and prey preferences of designated bird species	**Provided as Annex 3 to this document**
General	
Evidence from peer-reviewed literature on activities and potential impacts	**Literature Review**
Methods for relevant shore gathering activities	**Listed in Section B1.0 of this document**
Existing management which applies across the Southern IFCA District	**Site Specific Evidence Packages**
Existing management for shore gathering activities from other authorities	

Consideration was also given to the relative sensitivities of different habitats to different pressures, fishing activities and access to the intertidal areas. This work has been carried out over several years through a number of studies looking to map sensitivities for designated habitats (Tillin *et al.,* 2010[8]; Hall *et al.,* 2008[9]; Tyler-Walters & Arnold, 2008[10]). These sensitivity analyses identify that the sensitivity of a particular habitat is reduced for more dynamic habitats, with lower levels of activity and the frequency of activity occurring over the same area. For all habitats analysed, seagrass beds showed the highest sensitivity with the

[8] Tilin, H.M., Hull, S.C. & Tyler-Walters, H. 2010. Development of a Sensitivity Matrix (pressures-MCZ/MPA features). Report to the Department of Environment, Food and Rural Affairs (DEFRA) from ABPMer, Southampton and the Marine Life Information Network (MarLIN) Plymouth: Marine Biological Association of the UK. Defra Contract No. MB0102 Task 3A, Report No. 22. 947 pp.

[9] Hall, S.J. & Harding, M.J.C. 1997. Physical disturbance and marine benthic communities: the effects of mechanical harvesting of cockles on non-target benthic infauna. J. App. Ecol., 34, 497-517.

[10] Tyler-Walters, H. & Arnold, C. 2008. Sensitivity of intertidal benthic habitats to impacts caused by access to fishing grounds. CCW Policy Research Report No. 08/13.

sensitivity analysis by Tillin *et al.* (2010) showing a high sensitivity, particularly to abrasion impacts with a high confidence in the analysis outcome.

The below table lists Management Principles 3-8, the resulting management and how these relate to ensuring that the IFCA is meeting its legal duties in relation to the relevant protected sites.

Management Principle	
(3) For relevant features a GPS buffer of 10m will be incorporated.	The use of a GPS buffer ensures that potential impacts from accidental trampling are reduced and increases protection for relevant features from accidental incursions. The size of the buffer is relevant to the use of hand-held GPS units and the nature of the activity being undertaken; i.e. hand-held equipment operated by a single operative.
(4) Prohibition areas will be defined as follows: a. For designated seagrass features within MCZs that occur up to the 2m chart datum contour. b. For seagrass designated as a feature or as a supporting habitat, within or adjacent to SACs and SPAs that occur up to the 2m chart datum contour.	Seagrass is identified as the habitat with the highest sensitivity to shore gathering activities with significant impacts possible from low levels of activity. This impact is applicable year-round. Prohibition areas for identified designated seagrass features within MCZs and within or adjacent to SACs and SPAs up to the 2m chart datum contour provide protection to this feature year-round ensuring that activities such as push netting which have the potential to occur subtidally are managed within a distance from the shore which is proportionate in relation to where the activity can take place. The identification of seagrass as both a designated feature (MCZs and SACs) and a supporting habitat (SPAs) necessitates prohibited areas for all National Site Network Sites where this habitat is designated. This protection also addresses potential impacts to designated species which may be associated with seagrass beds; stalked jellyfish species and seahorse species.
(5) Existing Southern IFCA Management measures for relevant activities in the Poole Harbour SPA will be combined to create a single management approach.	Combining seasonal (1st November to 31st March) prohibition areas for shellfish harvesting which are based on the advice received from NE on Bird Sensitive Areas (BSA) within Poole Harbour with areas currently managed under a Memorandum of Agreement for Bait Digging will provide protection to both the designated features and supporting habitats of the Poole Harbour SPA from all shore gathering activities. The measures will address non-compliance which is currently observed in relation to the MoA for bait digging and align seasonal closures through a regulatory mechanism. This provides additional protection against bait collection activity and, in line with the definition, recognises that the impacts from identified pressures are the same for all shore gathering activities and therefore appropriate protections require management of all relevant activities in the same way. Consistency in management from previous measures will aid understanding from stakeholders which will encourage greater levels of compliance. In addition, considering the relatively low levels of activity (maximum 35 occurrences of one activity spread over a single month) utilising the identified BSAs as areas of importance for designated features is a proportionate approach to management

	which allows the achievement of relevant conservation objectives.
(6) With the exception of seagrass, the extent and distribution of feature-based management in the Solent Maritime SAC and district-wide SPAs will be developed using Poole Harbour as a model. (7) In the application of the Poole Harbour model to the Solent Maritime SAC and district-wide SPAs, the following approach will be taken: a. Bird Sensitive Areas (BSA) will be used as the basis for spatial management.	Due to the absence of advice on key BSAs and the identification of low levels of shore gathering activity in the District SPAs (<20 sightings in a single month) and the Solent Maritime SAC (max. 6 sightings in a single month), a proportionate approach to meeting the relevant conservation objective is necessary. The Poole Harbour model utilises BSAs as an identification of key areas for designated features and supporting habitats within the site and management on this basis has been in place since 2015. NE have supported the management as appropriate in meeting the legal duties of Southern IFCA in relation to the site. The application of this approach to the District SPAs and Solent Maritime SAC will allow key areas for designated features to be protected; encompassing bird features, supporting habitats and designated estuarine and sediment habitats under the Solent Maritime SAC.
b. In the absence of BSAs being defined by Natural England in the Solent Maritime SAC and district-wide SPAs (excluding Poole Harbour), BSAs will be defined as follows: i. For the Solent Maritime SAC and Solent SPAs, BSAs will be initially defined using areas proposed for management as good examples of estuarine habitat under the Bottom Towed Fishing Gear Byelaw 2023 and adapted to be relevant to shore gathering activity. ii. For the Solent Maritime SAC, Solent SPAs and The Chesil and The Fleet SPA, consideration will be given to aligning BSAs with directions relating to access and shore gathering activities given by other bodies, for example harbour authorities and conservation bodies.	Consideration of existing measures and alignment with areas already identified for protection provides a robust method of defining areas which are most likely to be key to designated features/supporting habitats in the absence of advice on where BSAs occur in SPAs other than Poole Harbour. This approach ensures the appropriate protections can be provided to address the pressure/feature interactions identified for designated bird features, supporting habitats and estuarine and sediment habitats under the Solent Maritime SAC; whilst also ensuring consistency with the management of other fishing activities in the District and recognising the different level of effort and impact resulting from different types of fishing activity. Utilising areas afforded protection from other gear types increases the overall level of cumulative protection. Where existing measures are in place under other bodies/authorities, alignment provides the ability to increase the overall cumulative protection afforded to a particular feature, build on existing evidence as to which areas are key for designated features and support consistency for stakeholders with the aim of increasing compliance through improved understanding and stakeholder buy in. Whilst the Solent Maritime SAC does not have bird species as a designated feature, the designated estuarine and sediment features align with supporting habitats for the overlapping SPAs. Protecting these habitats through the identification of BSAs for the SPAs addresses the impacts to the features of this site in a proportionate way to the activity being managed. The alignment of spatial management in The Fleet with existing closures under other authorities combined with the required spatial management for seagrass provides a

	year-round prohibition in this site, addressing potential adverse impacts to all relevant designated features under the SAC, SPA and MCZ covering this site.

c. The requirements for seasonal management within BSAs will be considered on the basis of best available evidence.	Based on the availability of evidence for designated bird features in the Solent SPAs and a consideration of proportionality reflecting the low levels of activity. The draft measures have set seasonal management of BSAs as follows:
	
	Langstone Harbour: year-round closures
	• This provides protection for the months where >50% of designated bird species are present and accounts for the presence of tern species during the summer months
	• A seasonal closure on the basis of only using >50% of the designated bird species being present would only provide a single month's protection for each of the designated tern bird species therefore a year-round closure is required as the areas utilised by these species have the potential to overlap with shore gathering activities.
	(note that in other locations where bird species are designated the seasonality and access to locations where terns may be breeding differ therefore different management is applied)
	
	Solent and Southampton Water SPA: 1st March to 31st August
	• This covers 100% of the seasonal period where >50% of designated bird species are present.
	
	Prohibition of all shore gathering activities within the BSA during these periods will mitigate impacts of disturbance and impacts to supporting habitats during the period when they are most important to designated species.
	
	• There are two bird species: Dark-Bellied Brent Goose and Teal which, based on seasonality information provided by NE, would have only one month of overlap with the closed season (seasonality October to March).
	• Considering the specific species, dark-bellied brent goose is noted to roost on the water overnight and during the day will roost close to preferred feeding areas, given as seagrass beds and areas of green algae.
	  o Under the Byelaw, all seagrass beds will be protected as year-round prohibited areas providing protection to these species when they are feeding and roosting during the day.
	  o Roosting overnight on the water removes the potential for interaction with the activities being assessed and managed through this Byelaw.
	• For Teal, the species roosts on the open water and feeds in saltmarsh, creeks and mudflats with Southampton Water and Newtown Creek highlighted as important areas.
	  o Roosting on the open water removes the potential for interaction with the activities being assessed and managed through this Byelaw.

	◦ Saltmarsh is not a target habitat for shore-based activities or seaweed harvesting and therefore whilst there may be access, the levels of activity observed and the fact that operations will not be taking place in this habitat limiting the time a person would be there is deemed to not significantly affect the ability to feed in this habitat. ◦ The greatest number of records observed in a single month for shore-based activities is less than 20, with large areas of the site having no observed shore-based activities recorded. Newtown Creek has no recorded occurrences of shore-based activities. • The proposal for summer closure areas in line with the Principles for the SG Review allows Southern IFCA to meet its legal duties for designated sites, considering the specifics of the behaviours of relevant designated features, whilst being proportionate to the risk posed by shore-based activities based on levels of activity and how those activities are conducted. **Chichester Harbour and Portsmouth Harbour:** there are no additional areas identified for protection beyond the permanent closures associated with seagrass beds. Utilising work undertaken in defining potential BSA through the BTFG Review, there were no areas identified as requiring additional protection in these sites. For Chichester Harbour, only a small portion of the Harbour sits within the Southern IFCA District. In both these Harbours, within the Southern IFCA District, there are large areas closed for seagrass habitat which will provide additional protection to sediments and for disturbance from birds, outside of these areas the occurrence of shore gathering activities is further limited by access. Based on the low levels of activity observed (no activity observed in Chichester Harbour and max. 8 occurrences per month in Portsmouth Harbour – all in areas proposed to be closed through seagrass closures), it is determined that no additional seasonal management is required. For the Solent Maritime SAC, year-round protection to identified key areas of designated habitat is provided for bottom towed fishing gear (BTFG). Protections afforded for shore gathering overlap with Solent SPAs and are thus subject to the above seasonal restrictions, however given the low levels of activity for relevant shore gathering operations and the nature/degree of impact compared to other fishing methods (BTFG) the impacts are deemed to not cause an adverse impact to the features of the SAC under the Shore Gathering 2024 Byelaw.
(8) A code of practice will be developed for the gathering of seaweed by hand.	Consideration of the levels of activity which are currently seen in the Southern IFCA District for seaweed harvesting does not currently indicate that a regulatory approach to management is required. The identified pressures in relation to rocky habitats and associated species (including designated species for

	MCZs of peacocks tail, stalked jellyfish species and seahorse species) can be addressed through a code of practice, the provisions of which have been developed to include mitigation for trampling, abrasion, awareness of associated species and good practice, to address impacts to the target species. The code of practice has been developed in line with other codes of practice, including those developed by NE in conjunction with other IFCAs. This ensures a consistency in approach and ease of understanding for stakeholders which will help increase voluntary compliance.

Note: the management for shore gathering by Southern IFCA does not remove or supersede existing measures relevant to shore gathering activities which are enforced/monitored by other relevant bodies/regulatory authorities. Stakeholders undertaking shore gathering activities will need to ensure that they are abiding by all relevant regulations and/or voluntary measures and will need to seek guidance from the appropriate body for any regulations which are under the remit of that body.

Examples include:

- Statutory Nature Conservation Order – Fareham Creek, Portsmouth Harbour
- Landowner permission to harvest bait commercially
- SSSI consent from Natural England
- Harbour authority regulations for digging around moorings, jetties etc.
- National and regional codes of best practice for bait digging

Southern IFCA measures such as Minimum Conservation Reference Size will continue to be enforced under the relevant legislation, applicable to recreational and commercial shore gathering activities. The combination of management created by the measures considered in this assessment and maintained existing measures strengthens the level of protection afforded to designated sites.

Section G: Conclusion

Based on the information presented in this document, and the consideration of available evidence in the form of designated feature location and extent, current & historic levels of activity, the potential for impact from shore gathering activities considering gear type and method of operation, the evidence provided in literature and NE advice on designated sites, it is concluded that the management under the Shore Gathering Byelaw, in combination with the Southern IFCA Seaweed Harvesting Code of Practice and existing or amended Southern IFCA Byelaws will provide suitable and appropriate mitigation to ensure that the Conservation Objectives of relevant MCZs can be furthered and that there will be no adverse effect on designated features of relevant SACs or SPAs.

Section H: In-Combination Assessment

As part of the assessment process, Southern IFCA is required to consider the in-combination effect of draft measures with other fishing activities and also other non-fishing plans/projects in relevant areas.

For fishing activities, the appropriate conservation assessments have been completed for the management of activities identified as having a potential impact on National Site Networks within the District. These include:

- Bottom towed fishing gear
    - This encompasses specific assessments relevant to management of dredge fishing in Poole Harbour and the Solent
- Net fishing

These assessments concluded, with appropriate management in place, that there will be no adverse effect or no impact to the furthering of conservation objectives.

For other activities, there are no potential in combination effects identified for the relevant pressure/feature interactions:

- Pot/trap fishing
- Rod and line angling

Considering non-fishing plans or projects, the Southern IFCA is a consultee in the marine licencing process administered by the MMO. Southern IFCA reviews relevant applications for works taking place in the marine environment and through this process identifies whether there is likely to be an overlap with fishing activity. From the marine licence applications reviewed from March 2023 to date, there is no identified in combination effect.

Section I: Integrity Test

On the basis that the management in the form of the Shore Gathering Byelaw, the Southern IFCA Seaweed Harvesting Code of Conduct and existing and amended Southern IFCA Byelaws is concluded to provide suitable and appropriate mitigation to ensure that the Conservation Objectives of relevant MCZs can be furthered and that there will be no adverse effect on designated features of relevant SACs or SPAs, and in the absence of any identified in-combination effect, the integrity test is passed.

Annex 1: Maps of designated sites with spatial management areas under the Shore Gathering Byelaw 2024

Marine Conservation Zones

- For Chesil Beach and Stennis Ledges MCZ spatial management is defined for the Chesil Beach and The Fleet SPA and Chesil and The Fleet SAC, being relevant to the designated features of those sites, maps are therefore provided under these sites.
- There are no management areas defined under the Byelaw for:
    - Purbeck Coast MCZ

Special Areas of Conservation

- There are no management areas defined under the Byelaw for:
    - Lyme Bay and Torbay SAC
    - Studland to Portland SAC
    - South Wight Maritime SAC

For these sites, suitable mitigation is provided through the Southern IFCA Seaweed Harvesting Code of Conduct for relevant designated habitats/species.

Studland Bay MCZ

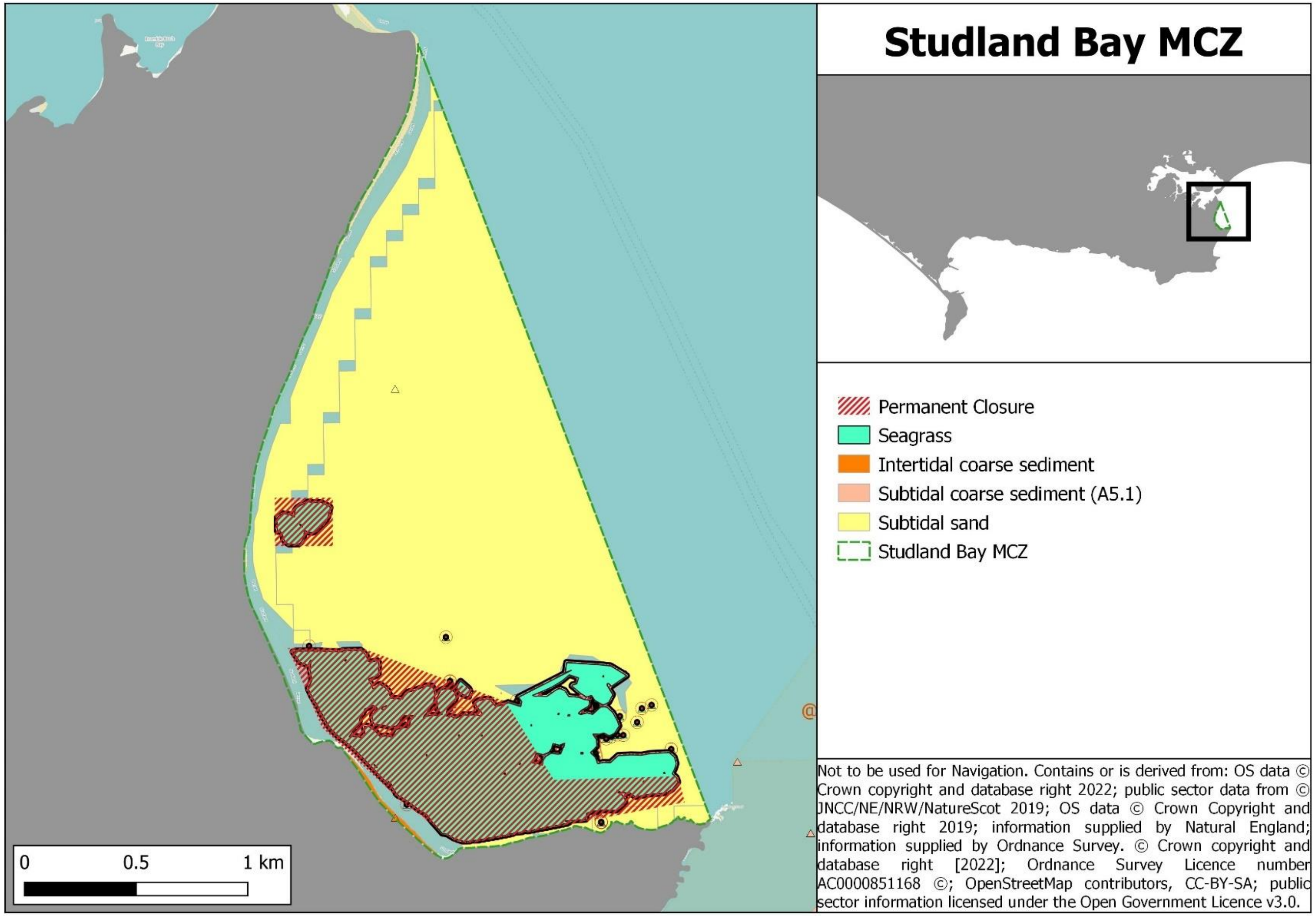

Figure 19: Studland Bay MCZ showing designated features and spatial management under the Shore Gathering Byelaw 2024.

The Needles MCZ

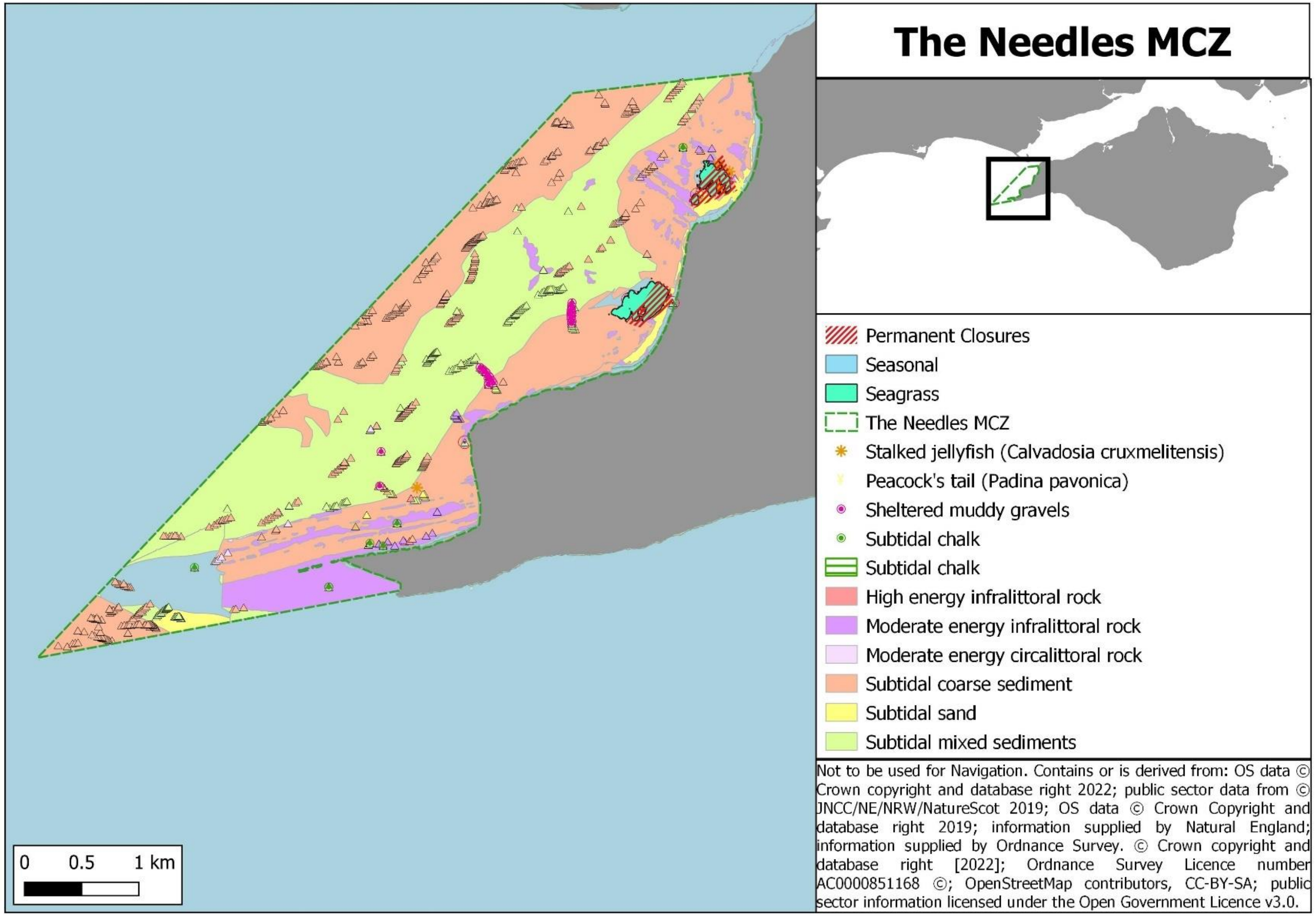

Figure 20: The Needles MCZ showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Yarmouth to Cowes MCZ

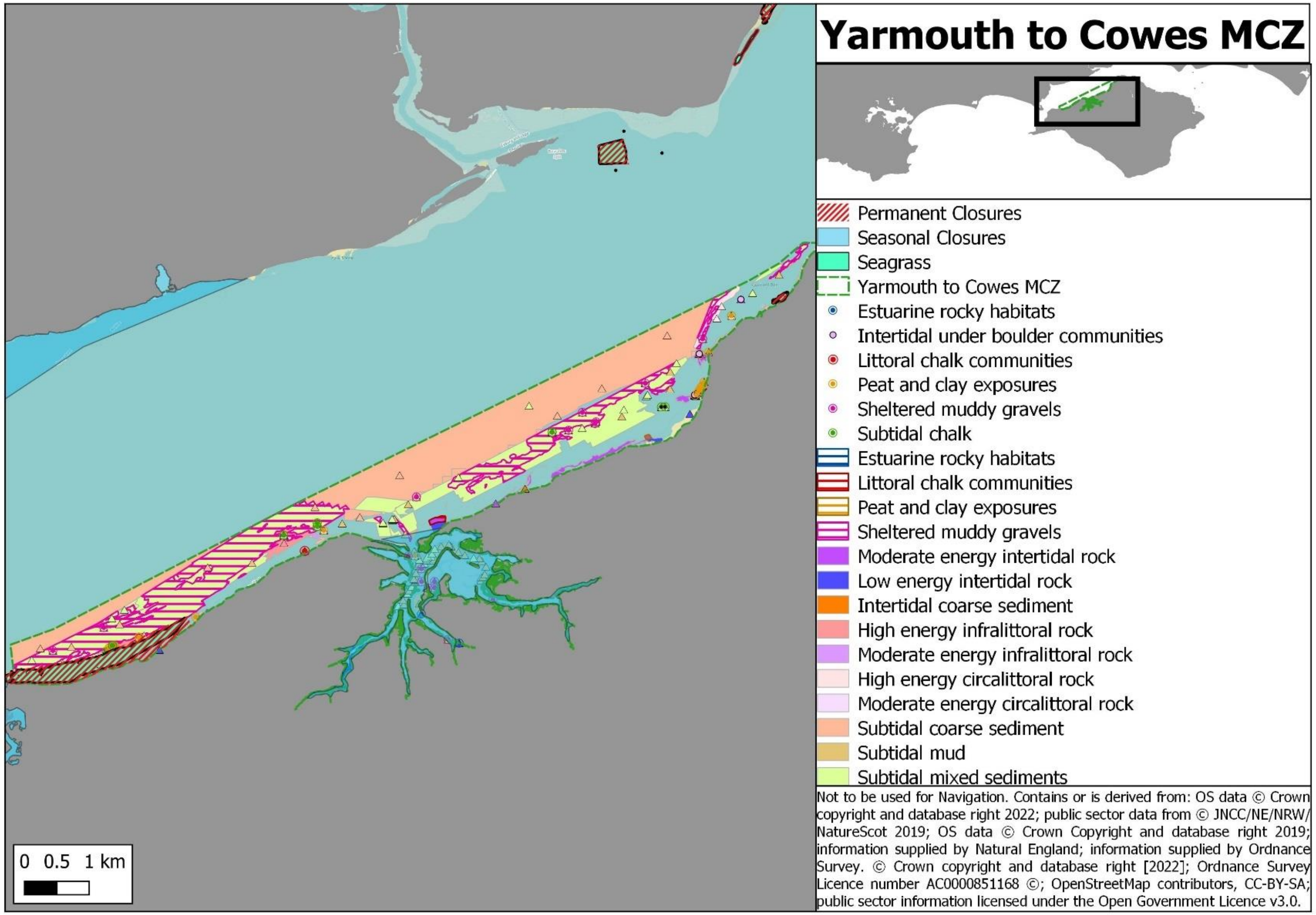

Figure 21: Yarmouth to Cowes MCZ showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Bembridge MCZ

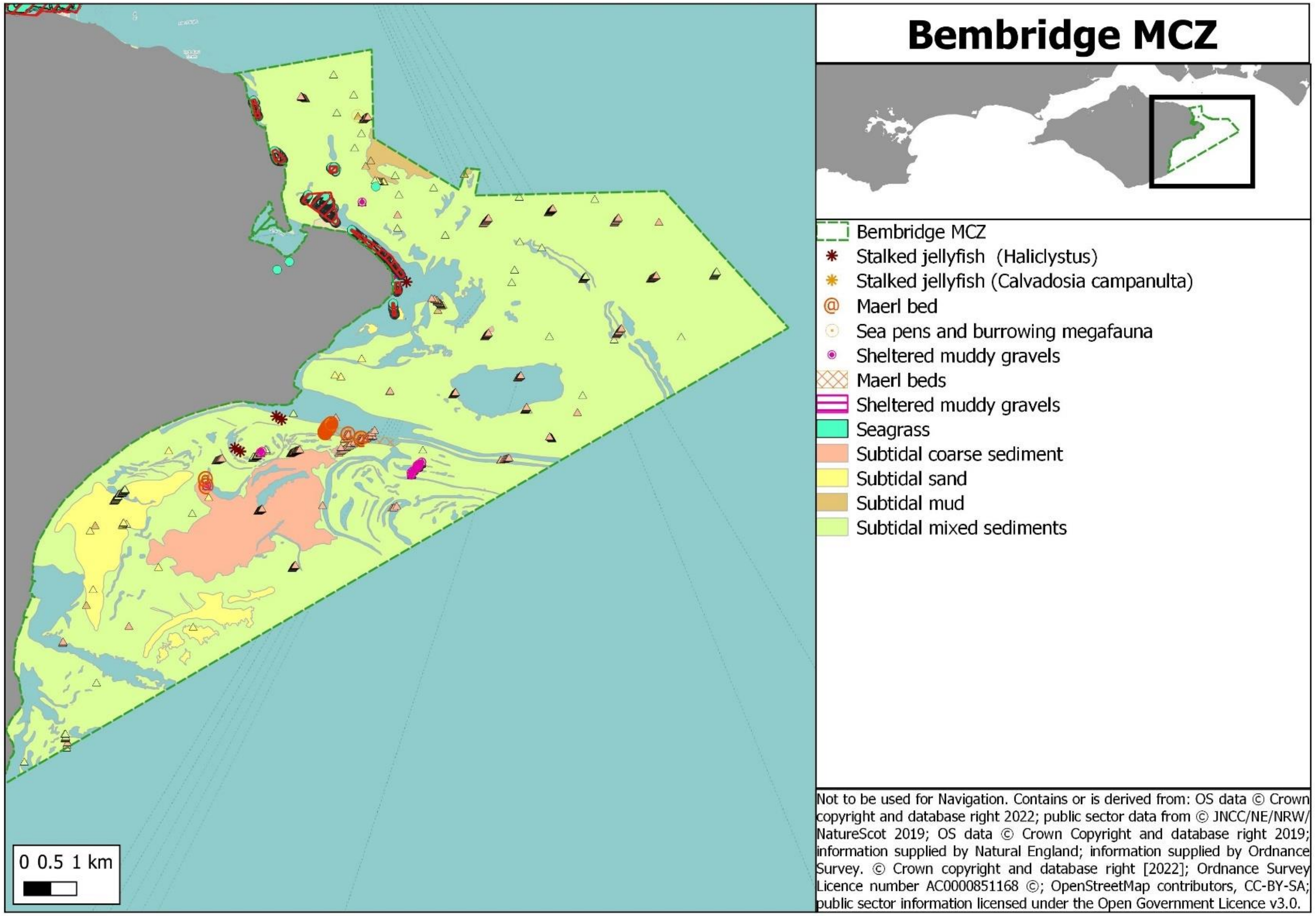

Figure 22: Bembridge MCZ showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Chesil and The Fleet SAC

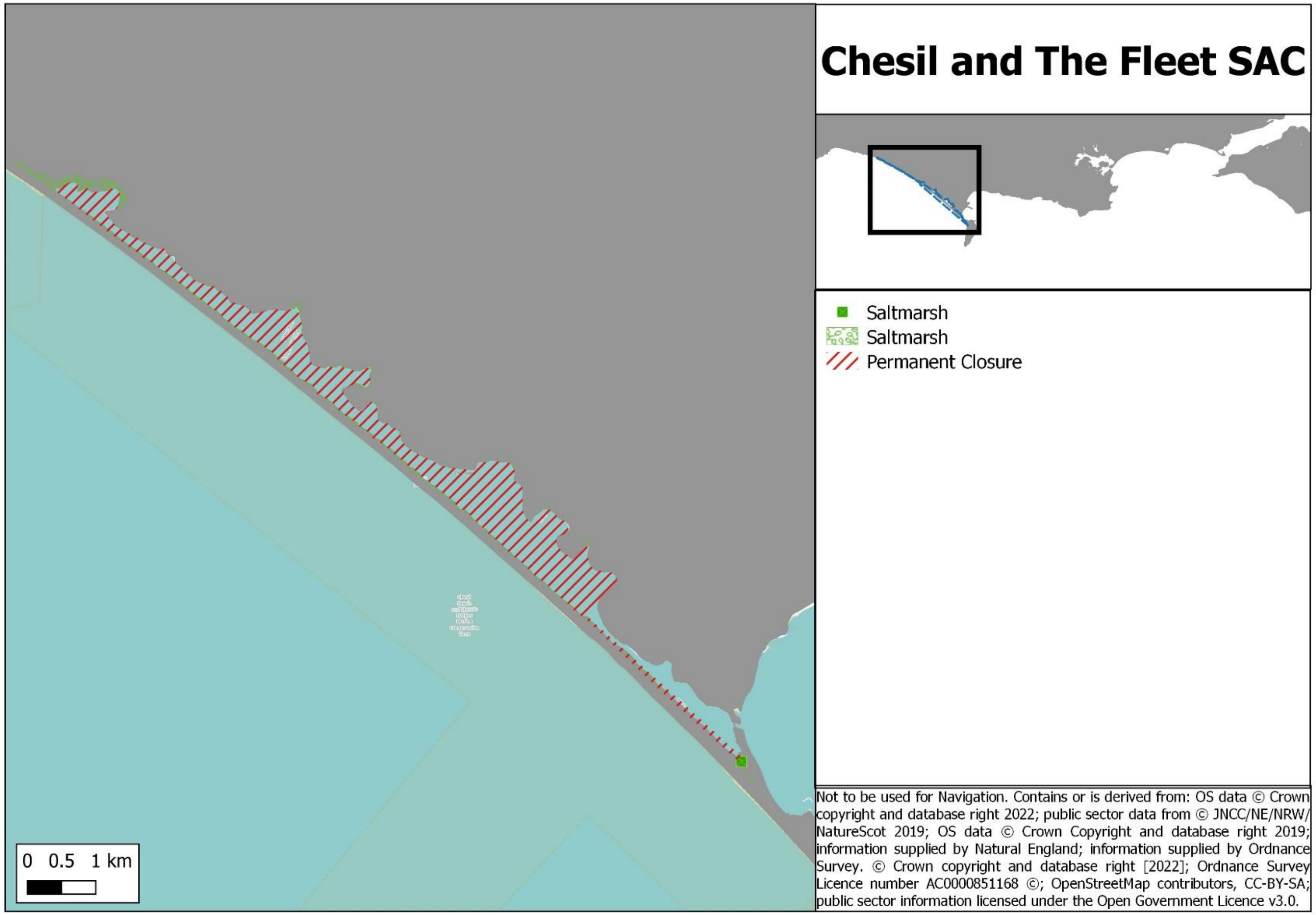

Figure 23: Chesil and The Fleet SAC showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Solent Maritime SAC

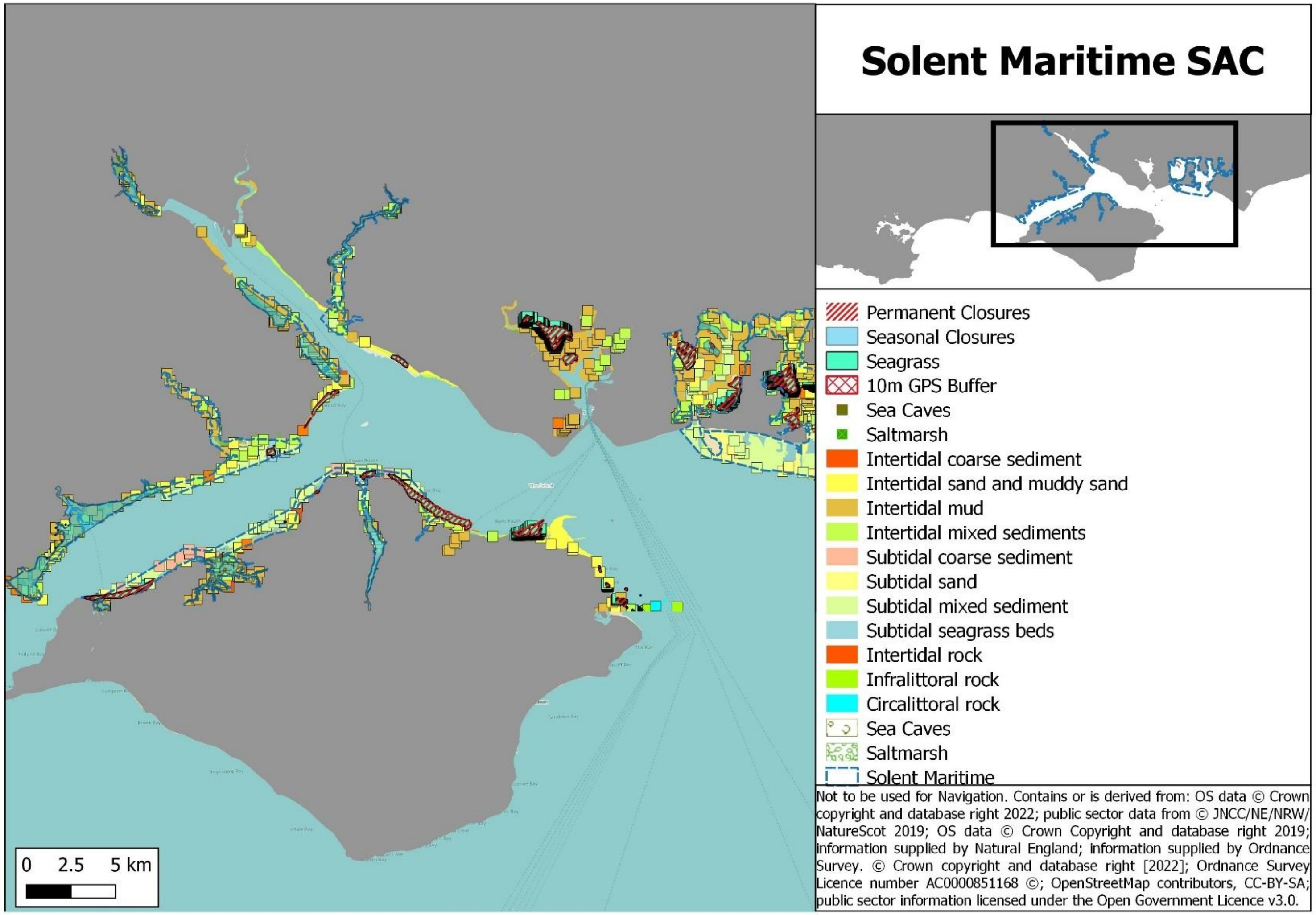

Figure 24: Solent Maritime SAC showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Chesil Beach and The Fleet SPA

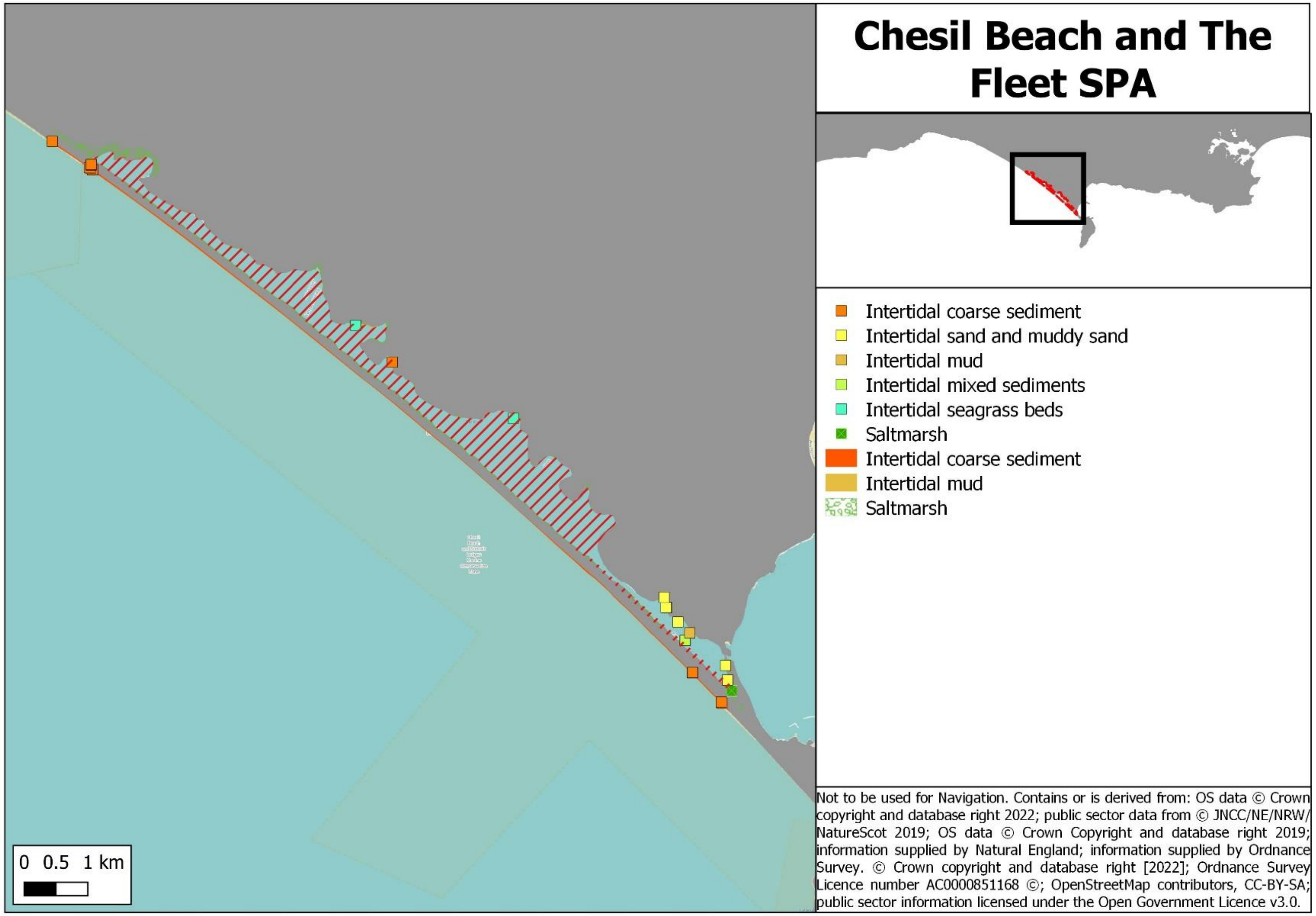

Figure 25: Chesil Beach and The Fleet SPA showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Poole Harbour SPA

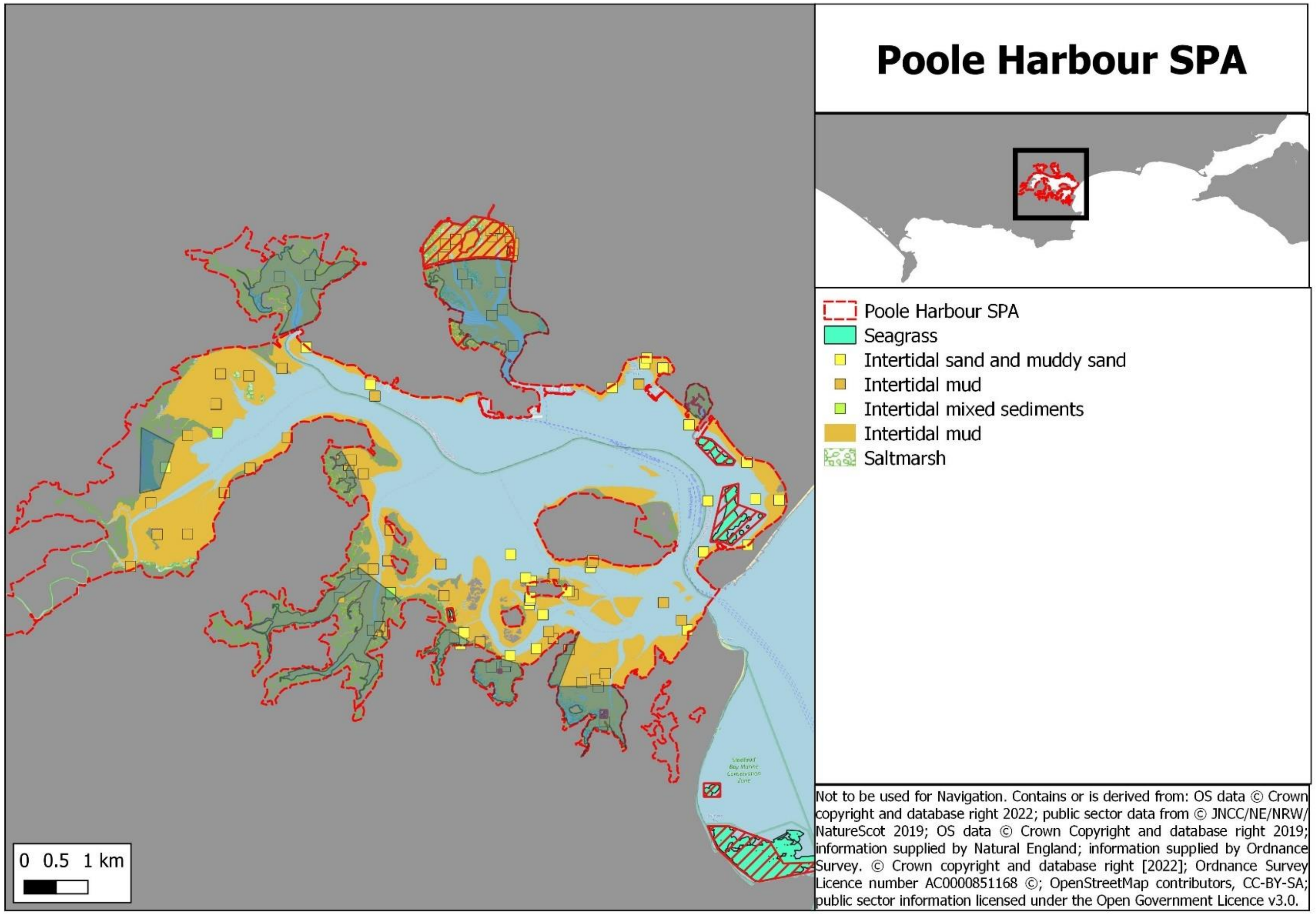

Figure 26: Poole Harbour SPA showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Solent and Southampton Water SPA

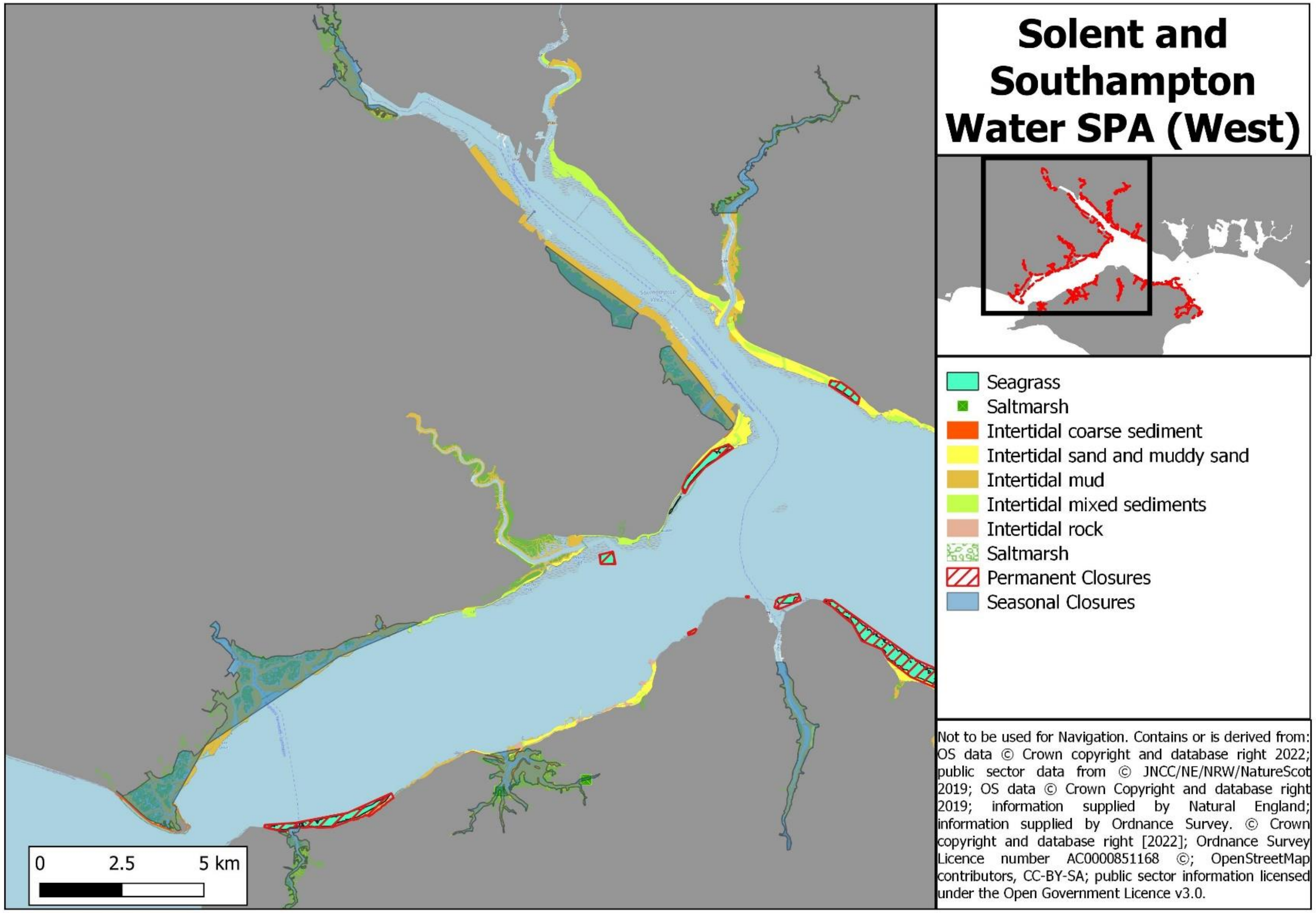

Figure 27: Solent and Southampton Water SPA (West) showing designated features and spatial management under the Shore Gathering Byelaw 2024.

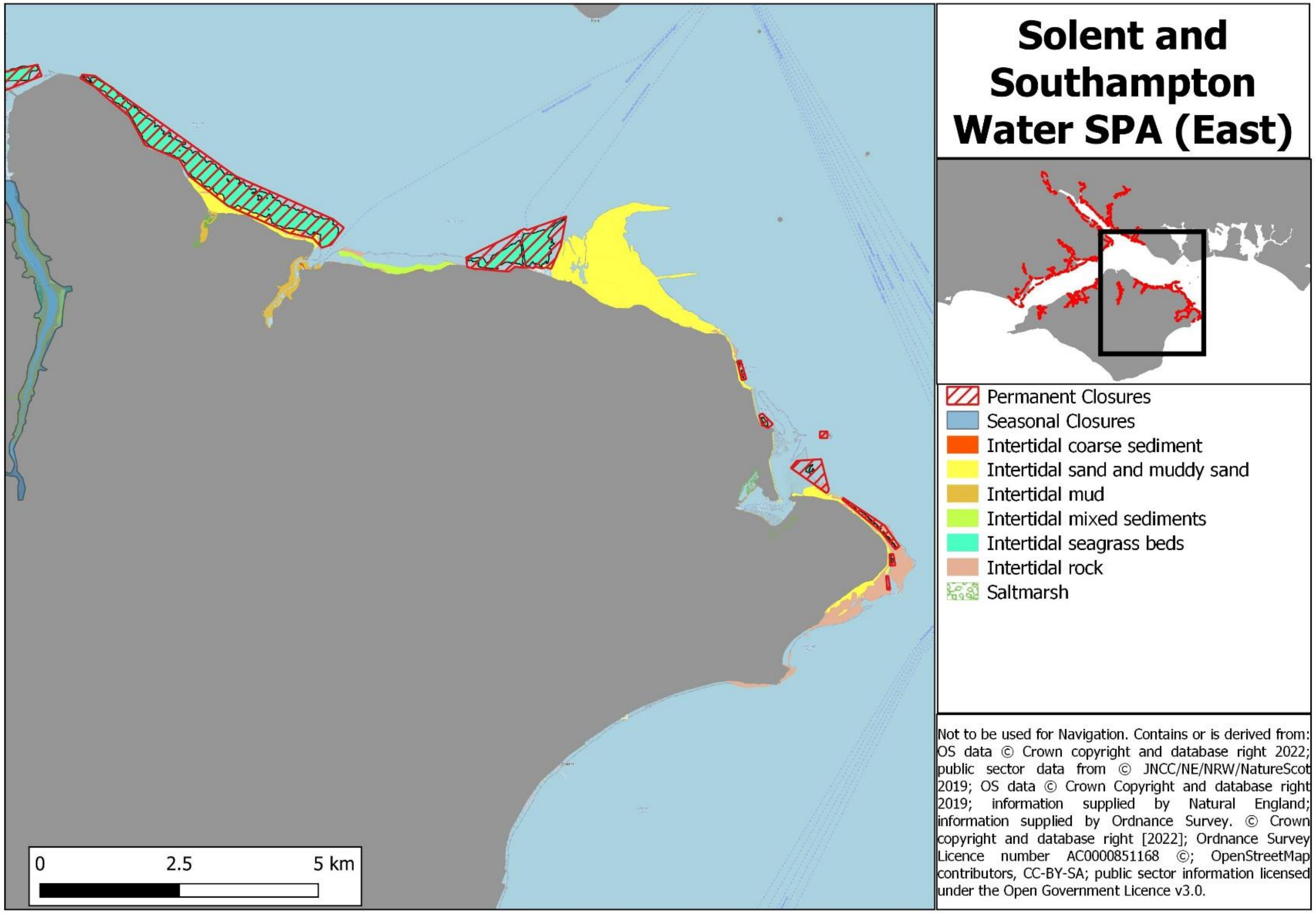

Figure 28 Solent and Southampton Water SPA (East) showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Portsmouth Harbour SPA

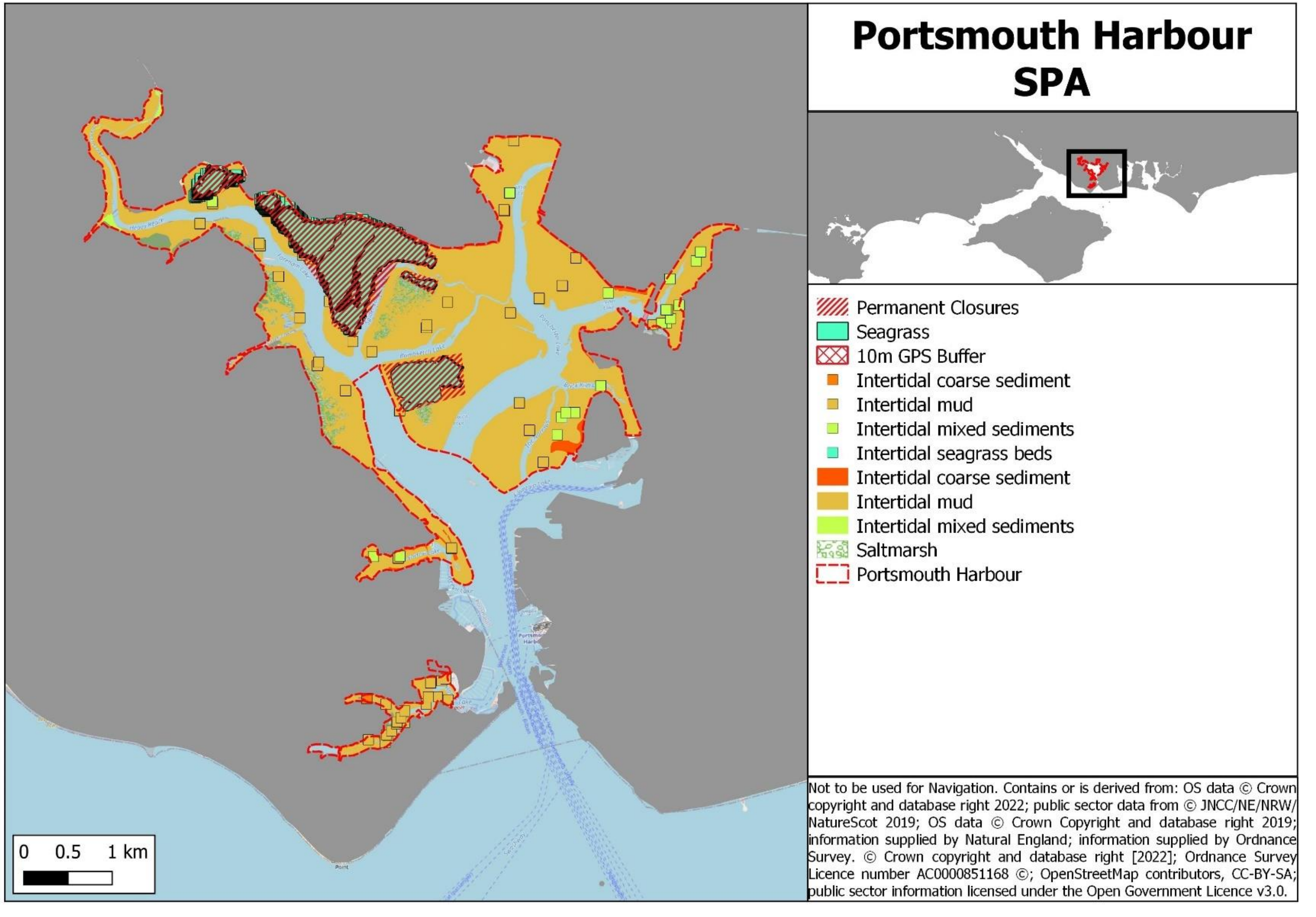

Figure 29: Portsmouth Harbour SPA showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Chichester and Langstone Harbours SPA

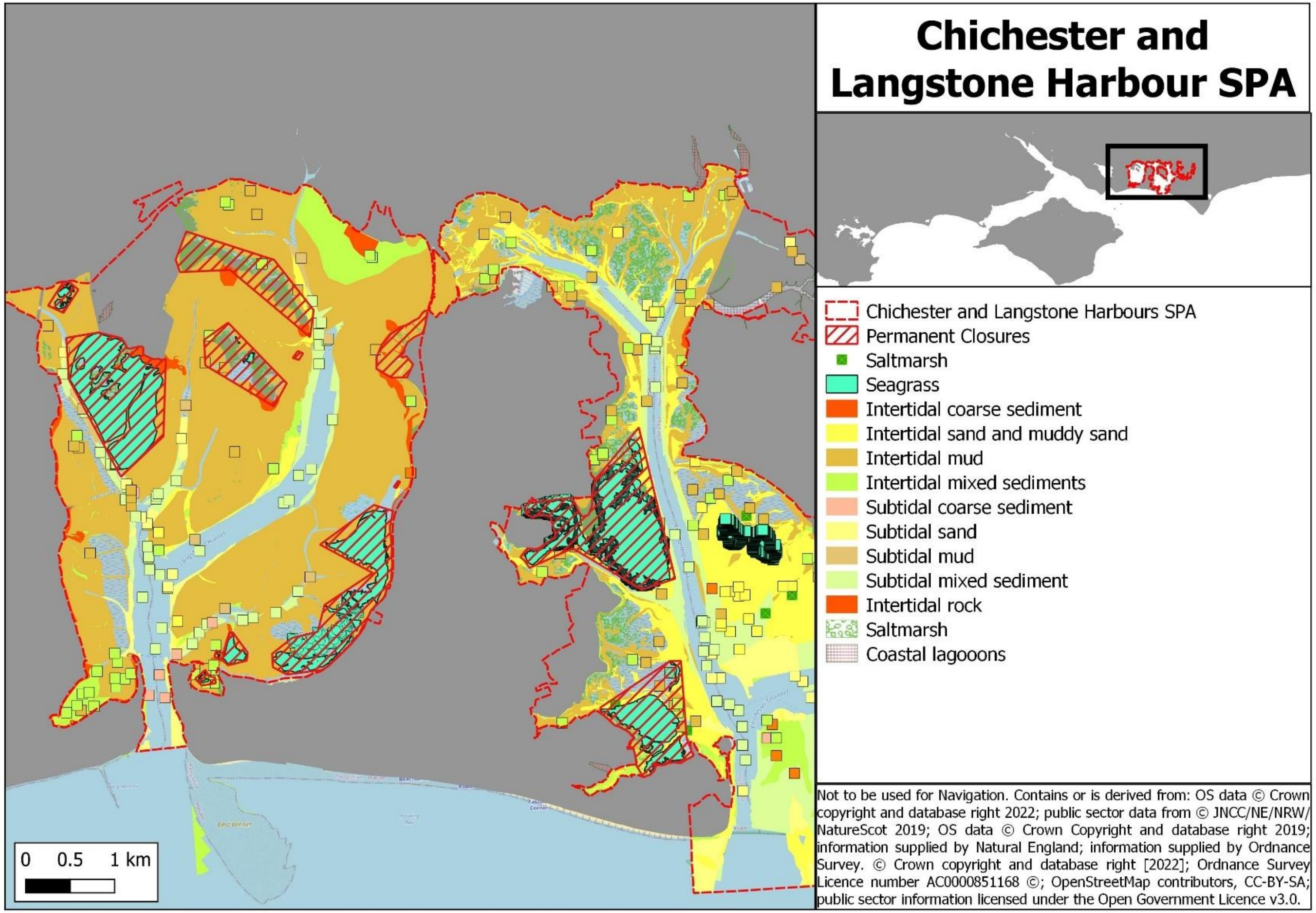

Figure 30: Chichester and Langstone Harbours SPA showing designated features and spatial management under the Shore Gathering Byelaw 2024.

Annex 2: Southern IFCA Seaweed Harvesting Code of Conduct

MARKED B_ANNEX 3

Southern IFCA

Seaweed Harvesting Code of Conduct

This Seaweed Harvesting Code of Conduct applies to Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the Southern IFCA District. The CoC has been adapted from the Natural England CoC for seaweed harvesting (which was developed in conjunction with the Crown Estate, Cornwall and Devon & Severn IFCAs, the National Trust and Cornwall Wildlife Trust) to include reference to relevant features of the District's National Site Network Sites.

1	Ensure you obtain any relevant permissions before undertaking gathering activities, including landowner permission. Natural England should be consulted before harvesting seaweed in a protected site in England.
2	Harvest seaweed only by hand – mechanical methods should not be used. Cut fronds (leaves) well above the point of growth (e.g. the meristem for kelps) and always leave the holdfast attached.
3	Do not use vehicles on the foreshore.
4	Avoid disturbing sea birds by keeping an appropriate distance away.
5	Avoid or minimise trampling on non-target organisms and avoid taking 'bycatch' such as stalked jellyfish, Peacocks Tail, Pink Sea Fan and Seahorses.
6	Collect less than one third of an individual plant to allow for regrowth.
7	Take care to replace any rocks in the position you found them.
8	Harvest sparsely, taking only a small percentage of standing stock.*
9	Rotate harvesting areas to allow ample time for recovery. Harvested areas should be left for up to several years, depending on the species, before harvesting again.*
10	Harvest seaweeds during the active growth season to allow for quicker recovery.*
11	Harvest seaweeds after reproduction has occurred if possible and ensure a substantial proportion of mature plants remain.*
12	Take extra care when harvesting invasive non-native seaweeds to ensure that seaweeds or spores are not transferred to other areas. Follow 'Check, Clean, Dry' biosecurity principles, checking, cleaning and drying all equipment and clothing when moving between sites to ensure that invasive species, pests and diseases are not spread to new areas. ** (https://www.nonnativespecies.org/what-can-i-do/check-clean-dry/). *
13	Do not collect drift seaweed from the entire length of strandlines – harvest sparsely as this constitutes an important habitat.
14	Keep records of volumes & weights of each species of seaweed harvested, along with date and location.
15	Limit harvesting in erosion prone coastal areas (i.e. dunes) where kelp forests dissipate wave energy.
16	Please be aware that foreshores can be hazardous. Do not put yourself at risk of injury by collecting seaweed in adverse conditions and be aware of tides.

Please note that other restrictions/regulations may apply to this activity. Participants should be aware of all relevant regulations.

*Consult Natural England for further information/ advice

** For information on how to identify non-native seaweeds, please see the GBNNSS website: www.nonnativespecies.org.

Annex 3: Seasonality & Prey Tables for Designated Bird Species

Seasonality data on designated bird species for the Southern IFCA District Special Protection Areas (SPAs) as provided by Natural England through their Designated Sites database. Green months indicate where >50% of the designated species are present within each area.

SPA	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chesil Beach and The Fleet	Wigeon (NB)	Wigeon (NB)	Wigeon (NB)	Wigeon (NB) Little Tern (B)	Wigeon (NB) Little Tern (B)	Little Tern (B)	Little Tern (B)	Wigeon (NB) Little Tern (B)	Wigeon (NB)	Wigeon (NB)	Wigeon (NB)	Wigeon (NB)
Chichester and Langstone Harbours (18)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shelduck (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shelduck (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shelduck (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Common Tern (B) Curlew (NB) Dunlin (NB) Little Tern (B) Redshank (NB) Ringed Plover (NB) Sanderling (NB) Sandwich Tern (B) Shelduck (NB) Turnstone (NB)	Common Tern (B) Little Tern (B) Ringed Plover (NB) Sanderling (NB) Sandwich Tern (B) Shelduck (NB)	Common Tern (B) Curlew (NB) Little Tern (B) Sandwich Tern (B) Shelduck (NB)	Common Tern (B) Curlew (NB) Little Tern (B) Redshank (NB) Sandwich Tern (B)	Common Tern (B) Curlew (NB) Grey Plover (NB) Little Tern (B) Redshank (NB) Ringed Plover (NB) Sanderling (NB) Sandwich Tern (B) Turnstone (NB)	Bar-tailed godwit (NB) Common Tern (B) Curlew (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Redshank (NB) Ringed Plover (NB) Sanderling (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shelduck (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)	Bar-tailed godwit (NB) Curlew (NB) Dark-bellied brent goose (NB) Dunlin (NB) Grey Plover (NB) Pintail (NB) Red-breasted merganser (NB) Redshank (NB) Ringed-plover (NB) Sanderling (NB) Shelduck (NB) Shoveler (NB) Teal (NB) Turnstone (NB) Wigeon (NB)
Poole Harbour (8)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Shelduck (NB) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Mediterranean Gull (B) Shelduck (NB) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B) Shelduck (NB) Spoonbill (NB)	Common Tern (B) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B)	Common Tern (B) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B)	Common Tern (B) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B)	Common Tern (B) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B)	Common Tern (B) Little Egret (NB) Mediterranean Gull (B) Sandwich Tern (B) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Sandwich Tern (B) Shelduck (NB) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Shelduck (NB) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Shelduck (NB) Spoonbill (NB)	Avocet (NB) Black-tailed godwit (NB) Little Egret (NB) Shelduck (NB) Spoonbill (NB)
Portsmouth Harbour (4)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Dunlin (NB) Red-breasted merganser (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Dunlin (NB) Red-breasted merganser (NB)	Dark-bellied brent goose (NB) Dunlin (NB) Red-breasted merganser (NB)	Dark-bellied brent goose (NB) Red-breasted merganser (NB)					Black-tailed godwit (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Dunlin (NB) Red-breasted merganser (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Dunlin (NB) Red-breasted merganser (NB)
Solent and Southampton Water (9)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Mediterranean Gull (B) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Common Tern (B) Little Tern (B) Mediterranean Gull (B) Ringed Pover (NB) Sandwich Tern (B)	Common Tern (B) Little Tern (B) Mediterranean Gull (B) Ringed Plover (NB) Roseate Tern (B) Sandwich Tern (B)	Common Tern (B) Little Tern (B) Mediterranean Gull (B) Roseate Tern (B) Sandwich Tern (B)	Black-tailed godwit (NB) Common Tern (B) Little Tern (B) Mediterranean Gull (B) Roseate Tern (B) Sandwich Tern (B)	Black-tailed godwit (NB) Common Tern (B) Little Tern (B) Mediterranean Gull (B) Ringed Pover (NB) Roseate Tern (B) Sandwich Tern (B)	Black-tailed godwit (NB) Common Tern (B) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Ringed Plover (NB) Teal (NB)	Black-tailed godwit (NB) Dark-bellied brent goose (NB) Ringed Plover (NB) Teal (NB)

	> half of the potential species present
	< half of the potential species present
	none of the potential species present
B	Breeding population present
NB	Non-breeding population present

Prey preference data for designated bird species for the Southern IFCA District Special Protection Areas (SPAs) as provided by Natural England through their Designated Sites database and species profiles available on the RSPB website.

Feature	Prey (as relevent to shoregathering activities)
Avocet (*Recurvirostra avosetta*)	crustaceans worms
Bar-tailed Godwit (*Limosa lapponica*)	shellfish marine snails marine worms shrimps
Black-tailed Godwit (*Limosa limosa islandica*)	worms
Curlew (*Numenius arquata*)	shellfish shrimps worms
Common Tern (*Sterna hirundo*)	fish
Dark-bellied Brent Goose (*Branta bernicla bernicla*)	eel-grass
Dunlin (*Calidris alpina alpina*)	worms
Grey Plover (*Pluvialis squatarola*)	shellfish worms
Little Egret (*Egretta garzetta*)	fish
Little Tern (*Sternula albifrons*)	fish
Mediterranean Gull (*Ichthyaetus melanocephalus*)	fish
Pintail (*Anas acuta*)	NA
Red-breasted Merganser (*Mergus serrator*)	fish
Redshank (*Tringa totanus*)	molluscs crustaceans
Ringer Plover (*Charadrius hiaticula*)	marine worms crustaceans molluscs
Roseate Tern (*Sterna Dougallii*)	fish
Sanderling (*Calidris alba*)	marine worms crustaceans molluscs
Sandwich Tern (*Thalasseus sandvicensis*)	fish incl. sandeels, sprats, whiting
Shelduck (*Tadorna tadorna*)	small shellfish aquatic snails
Shoveler (*Spatula clypeata*)	plant matter sifted from the water
Spoonbill (*Platalea leucorodia*)	small fish
Teal (*Anas crecca*)	NA
Turnstone (*Arenaria interpres*)	crustaceans molluscs
Wigeon (*Mareca penelope*)	aquatic plants

MARKED B_ANNEX 6

Southern Inshore Fisheries and Conservation Authority

Shore Gathering

Site Specific Evidence Packages

Supporting Document for the

Shore Gathering Byelaw

Contents

Tables

Figures

This document provides site specific evidence for Marine Conservation Zones (MCZs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the Southern IFCA District relevant to the Shore Gathering Review.

Note that information provided on shore gathering activity within each site is based on Southern IFCA sightings data. This data is collected during Southern IFCA patrols and therefore is not a true representation of overall effort for a particular activity as observations will only have been made when a patrol is operating in the relevant area, however the nature of Southern IFCA patrols and the cumulative analysis of data from multiple years allows for an indicative picture of activity occurring within the relevant sites.

Section A: MPAs in the Scope of the Shore Gathering Review

Table 1 displays the National Site Network Sites relevant to the Shore Gathering Review. Site specific evidence for each of these sites is provided in Section 0 – Section 3.

Table 1 MPAs within the Southern IFCA District included in the Shore Gathering Review.

MCZs	SPAs	SACs
Bembridge	Chesil Beach and the Fleet	Chesil and the Fleet
Chesil Beach and Stennis Ledges	Chichester and Langstone Harbour	Lyme Bay and Torbay
Purbeck Coast	Poole Harbour	Solent Maritime
Studland Bay	Portsmouth Harbour	South Wight Maritime
The Needles	Solent and Southampton Water	Studland to Portland
Yarmouth to Cowes		

National Site Network Sites which are not included in the Shore Gathering Review are those which are entirely subtidal and therefore are not able to be subject to shore gathering activities.

1.0 Marine Conservation Zones (MCZs)

1.0 <u>Chesil Beach and Stennis Ledges MCZ</u>

1.0.1 Designated Features of the MCZ

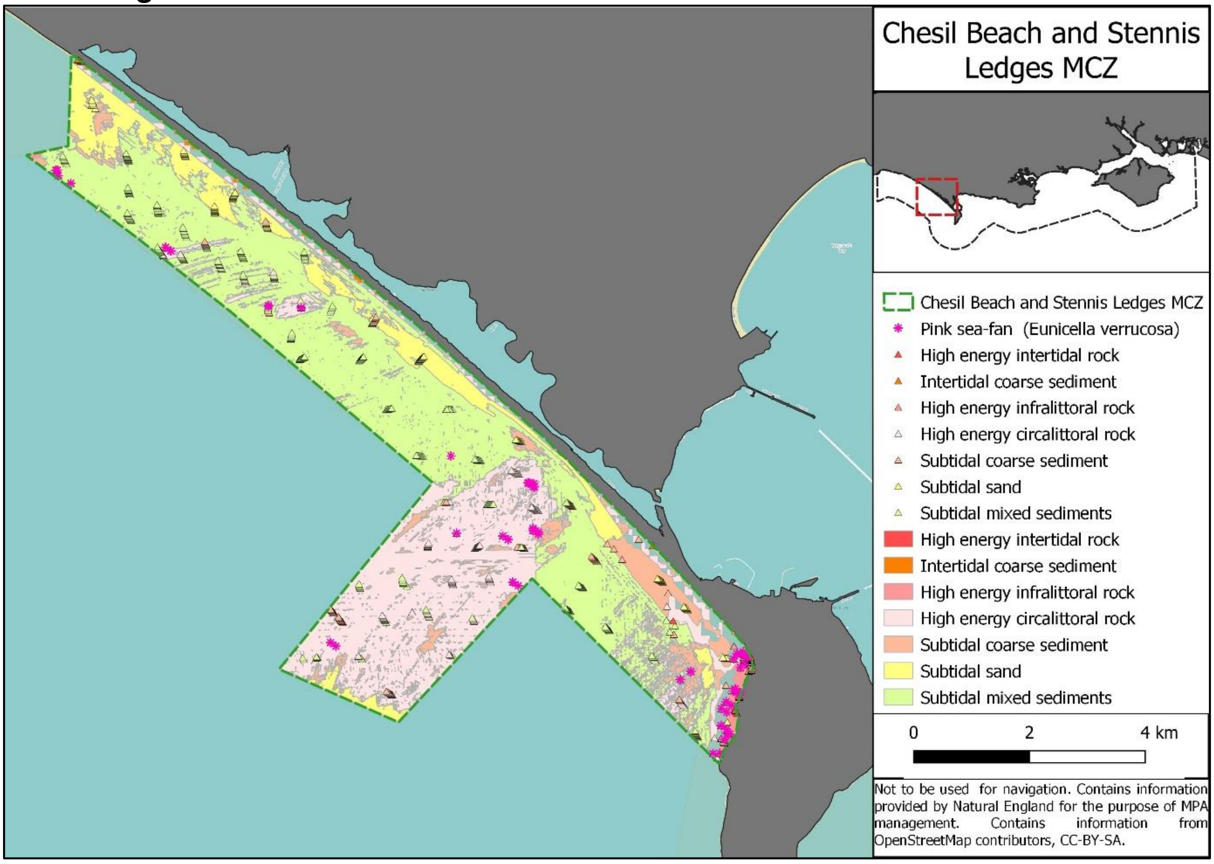

Figure 1 The location and extent of the supporting habitats of the Chesil Beach and Stennis Ledges MCZ (boundary shown by the dashed green line).

The Chesil Beach to Stennis Ledges MCZ covers an area of 37 km^2 running along the coastline of Chesil Beach. The area covers a variety of rocky and sediment habitats and includes the Pink Sea fan as a designated feature[1]. The designated features of the MCZ are displayed in Figure 1 and Table 2.

Table 2 Designated features of the Chesil Beach and Stennis Ledges MCZ.

Designated Features	High-energy circalittoral rock
	High-energy infralittoral rock
	High-energy intertidal rock
	Intertidal coarse sediment
	Native oyster (*Ostrea edulis*)
	Pink sea-fan (*Eunicella verrucosa*)
	Subtidal coarse sediment
	Subtidal mixed sediments
	Subtidal sand

[1] https://designatedsites.naturalengland.org.uk/

1.0.2 **Shore Gathering activity in the MCZ – Southern IFCA Sightings Data**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Chesil Beach and Stennis Ledges MCZ.

1.0.3 **Recorded catches within the MCZ**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in Chesil Beach and Stennis Ledges MCZ.

1.0.4 **Recorded Offences within the MCZ**

As of October 2023, there have been no recorded offences linked to shore gathering activities occurring in Chesil Beach and Stennis Ledges MCZ.

1.1 **Purbeck Coast MCZ**

1.1.1 **Designated Features of the MCZ**

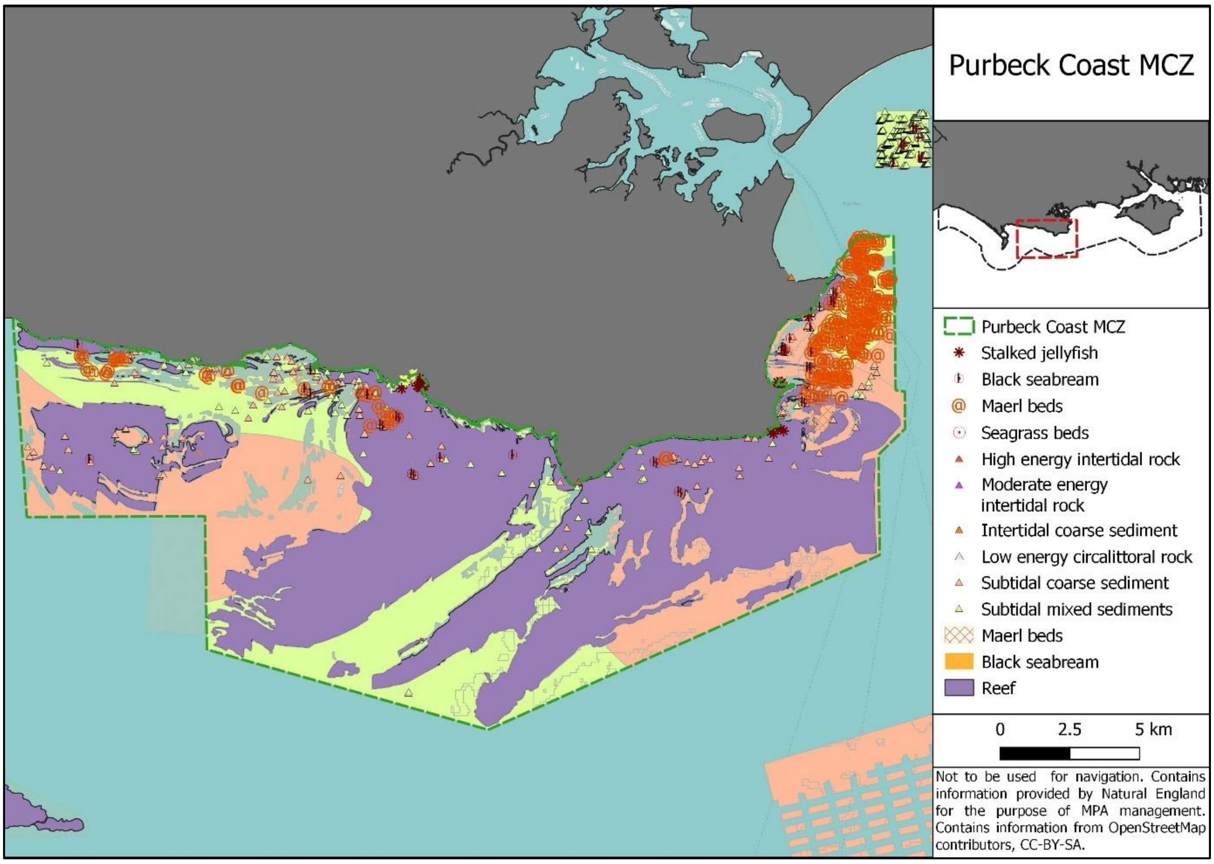

Figure 2 The location and extent of the supporting habitats of the Purbeck Coast MCZ (boundary shown by the dashed green line).

The Purbeck Coast MCZ covers an area of 282 km^2. The MCZ covers the area of coastline from Ringstead Bay in the West to north of Swanage Bay in the East[2]. The Purbeck Coast MCZ is designated for a range of intertidal and subtidal habitats and species as displayed in Figure 2 and Table 3.

[2] https://designatedsites.naturalengland.org.uk/

Table 3 Designated features of the Purbeck Coast MCZ

Designated Features	Black Seabream (*Spondylisoma cantharus*)
	High Energy Intertidal Rock
	Intertidal Coarse Sediment
	Maerl Beds
	Moderate Energy Intertidal rock
	Peacock's tail (*Padina Pavocina*)
	Stalked Jellyfish (*Haliclystus spp*)
	Subtidal Coarse Sediment
	Subtidal Mixed Sediments

1.1.2 **Shore Gathering activity in the MCZ – Southern IFCA Sightings Data**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Purbeck Coast MCZ.

1.1.3 **Recorded catches within the MCZ**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Purbeck Coast MCZ.

1.1.4 **Recorded Offences within the MCZ**

As of October 2023, there have been no recorded offences linked to shore gathering activities occurring in Purbeck Coast MCZ.

1.2 <u>Studland Bay MCZ</u>

1.2.1 Designated Features of the MCZ

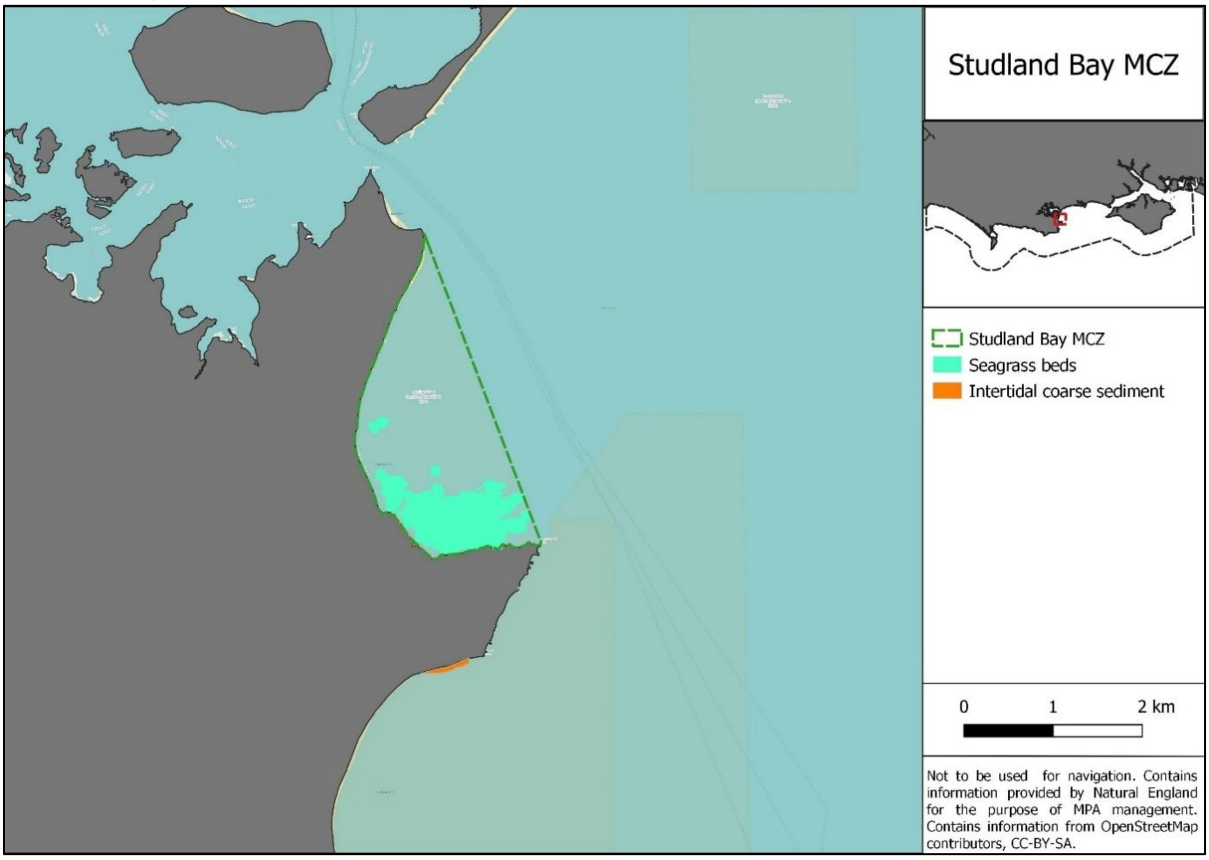

Figure 3 The location and extent of the supporting habitats of the Studland Bay MCZ (boundary shown by the dashed green line).

The Studland Bay MCZ is approximately 4 km^2 and relatively sheltered from prevailing southwesterly winds by Ballard Down[3]. The designated features of the Studland Bay MCZ are displayed in Figure 3 and Table 4

Table 4 Designated features of the Studland Bay MCZ

Designated Features	Intertidal coarse sediment
	Long snouted seahorse (*Hippocampus guttulatus*)
	Seagrass beds
	Subtidal sand

1.2.2 Shore Gathering activity in the MCZ – Southern IFCA Sightings Data

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Studland Bay MCZ.

Information provided to Southern IFCA from an MMO call for evidence on non-licensable activities indicated that push-netting for prawns has occurred in this site.

[3] https://designatedsites.naturalengland.org.uk/

1.2.3 **Recorded catches within the MCZ**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Studland Bay MCZ.

1.2.4 **Recorded Offences within the MCZ**

As of October 2023, there have been no recorded offences linked to shore gathering activities occurring in Studland Bay MCZ.

1.3 **The Needles MCZ**

1.3.1 **Designated Features of the MCZ**

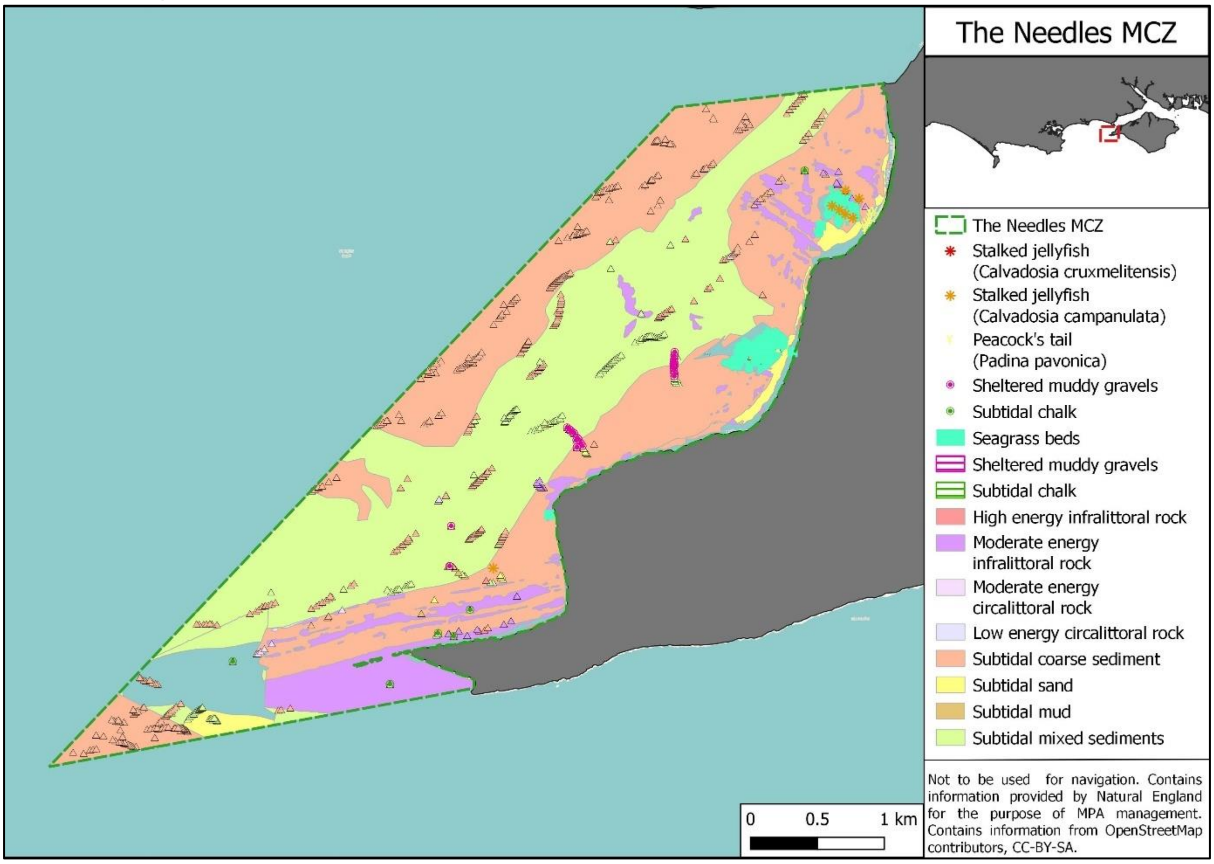

Figure 4 The location and extent of the supporting habitats of The Needles MCZ (boundary shown by the dashed green line).

The Needles MCZ is located on the west coast of the Isle of Wight and covers an area of 11 km^2. The MCZ covers the coastline from Fort Albert down to the Needles Geological feature along the mean high-water mark and extends up to 3 km from the shoreline. The designated features of the MCZ are displayed in Figure 4 and Table 5.

Table 5 Designated features of The Needles MCZ

Designated Features	High Energy Infralittoral Rock
	Moderate Energy Circalittoral Rock
	Moderate Energy Infralittoral Rock
	Native Oyster (*Ostrea edulis*)
	Peacock's tail (*Padina Pavocina*)
	Seagrass Beds
	Sheltered Muddy Gravels

	Stalked Jellyfish (*Calvadosia campanulata*)
	Subtidal Chalk
	Subtidal Coarse Sediments
	Subtidal Mixed Sediments
	Subtidal Mud
	Subtidal Sand

1.3.2 **Shore Gathering activity in the MCZ – Southern IFCA Sightings Data**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in The Needles MCZ.

1.3.3 **Recorded catches within the MCZ**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in The Needles MCZ.

1.3.4 **Recorded Offences within the MCZ**

As of October 2023, there have been no recorded offences linked to shore gathering activities occurring in The Needles MCZ.

1.4 Yarmouth to Cowes MCZ

1.4.1 Designated Features of the MCZ

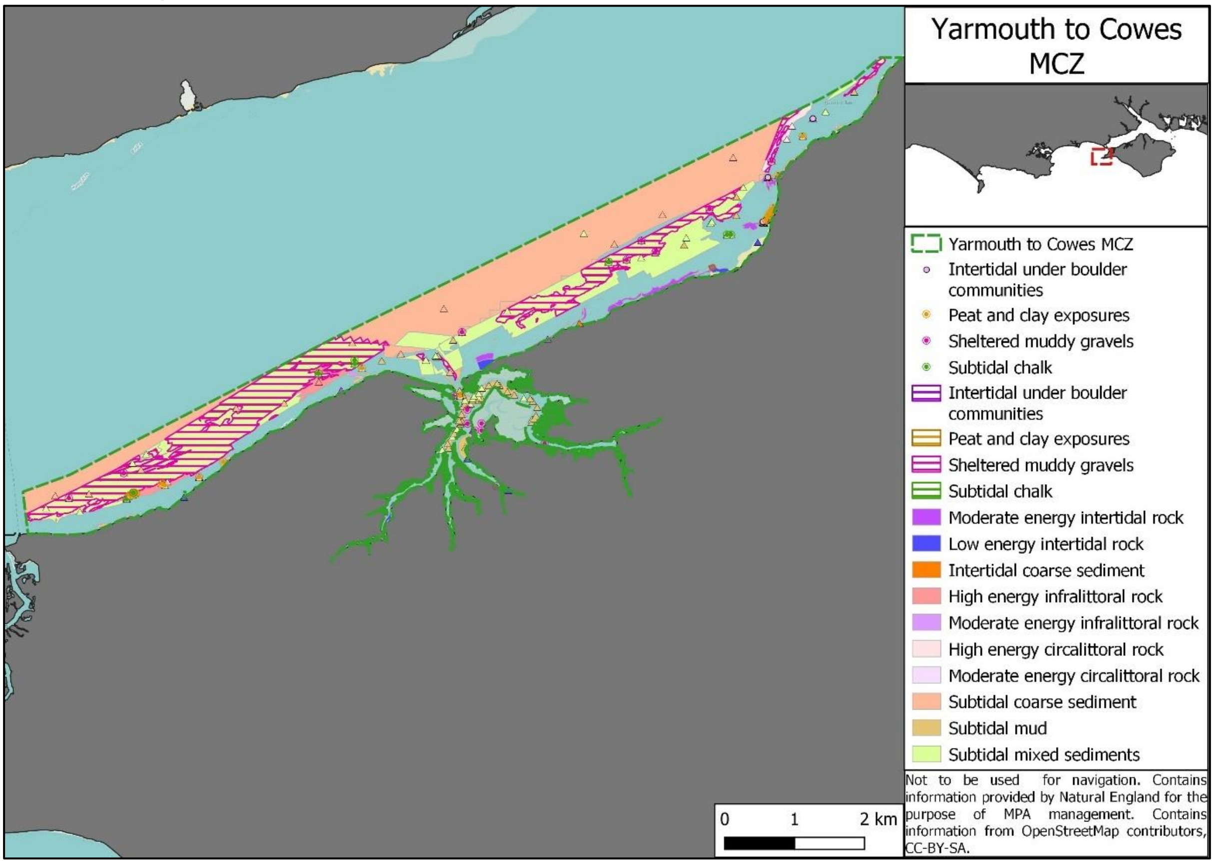

Figure 5 The location and extent of the supporting habitats of the Yarmouth to Cowes MCZ (boundary shown by the dashed green line).

The Yarmouth to Cowes MCZ covers 16 km^2 and stretches from Gurnard in the east, a village west of Cowes, to Yarmouth pier in the West and extends to the edge of the Western Solent deep water channel. The designated features of the Yarmouth to Cowes MCZ are displayed in Figure 5 and Table 6.

Table 6 The designated features of the Yarmouth to Cowes MCZ.

Designated Features	Bouldnor Cliff geological feature
	Estuarine rocky habitats
	High-Energy Circalittoral Rock
	High-Energy Infralittoral Rock
	Intertidal coarse sediment
	Intertidal under boulder communities
	Littoral chalk communities
	Low-energy intertidal rock
	Moderate Energy Circalittoral Rock
	Moderate Energy Infralittoral Rock
	Moderate energy intertidal rock
	Native Oyster (*Ostrea Edulis*)
	Peat and Clay Exposures
	Sheltered Muddy Gravels

	Subtidal Chalk
	Subtidal Coarse Sediments
	Subtidal Mixed Sediments
	Subtidal Mud

1.4.2 **Existing Shore Gathering Management Specific to the MCZ**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area. Area 25 is within the Yarmouth to Cowes MCZ.

1.4.3 **Shore Gathering activity in the MCZ – Southern IFCA Sightings Data**

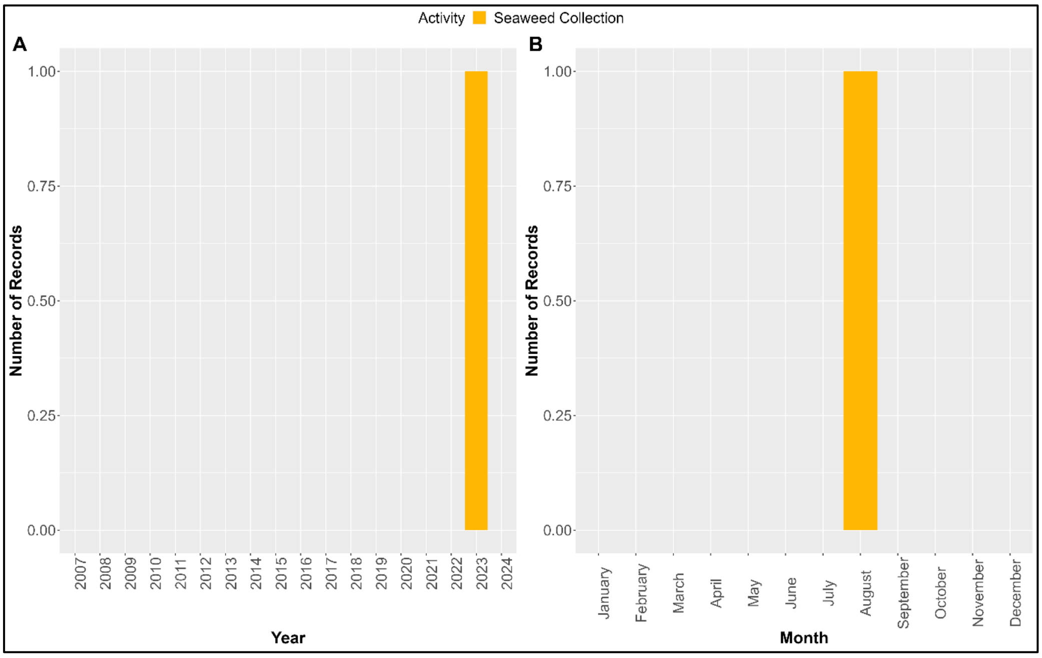

Figure 6 Records of shore gathering activity occurring in the Yarmouth to Cowes MCZ.

Figure 6 displays the only recorded occurrence of shore gathering activity in the Yarmouth to Cowes MCZ and Figure 7 the spatial distribution. The activity recorded was seaweed gathering and was observed in January 2023.

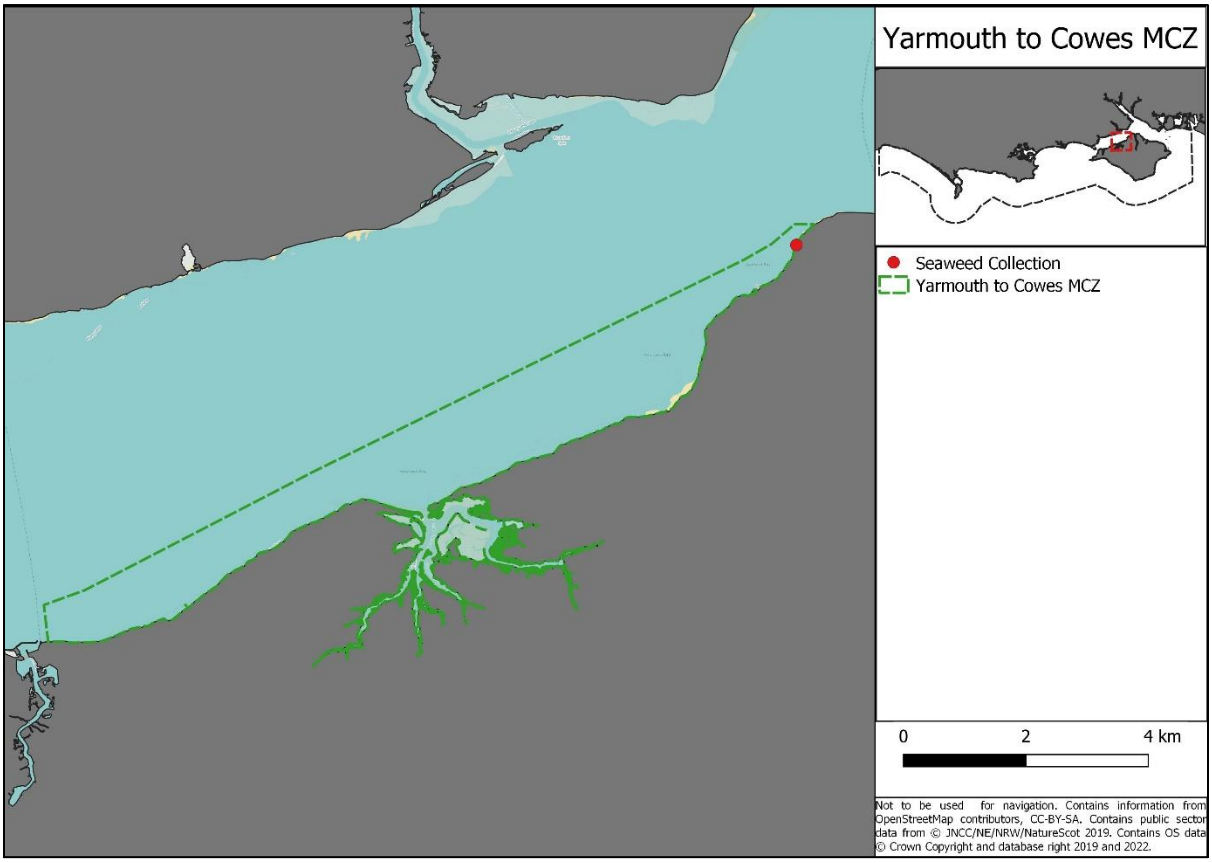

Figure 7 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Yarmouth to Cowes MCZ (boundary shown by the dashed green line).

1.4.4 Recorded catches within the MCZ

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Yarmouth to Cowes MCZ.

1.4.5 Recorded Offences within the MCZ

As of October 2023, there has been no recorded offences linked to shore gathering activities occurring in the Yarmouth to Cowes MCZ.

1.5 <u>Bembridge MCZ</u>

1.5.1 Designated Features of the MCZ

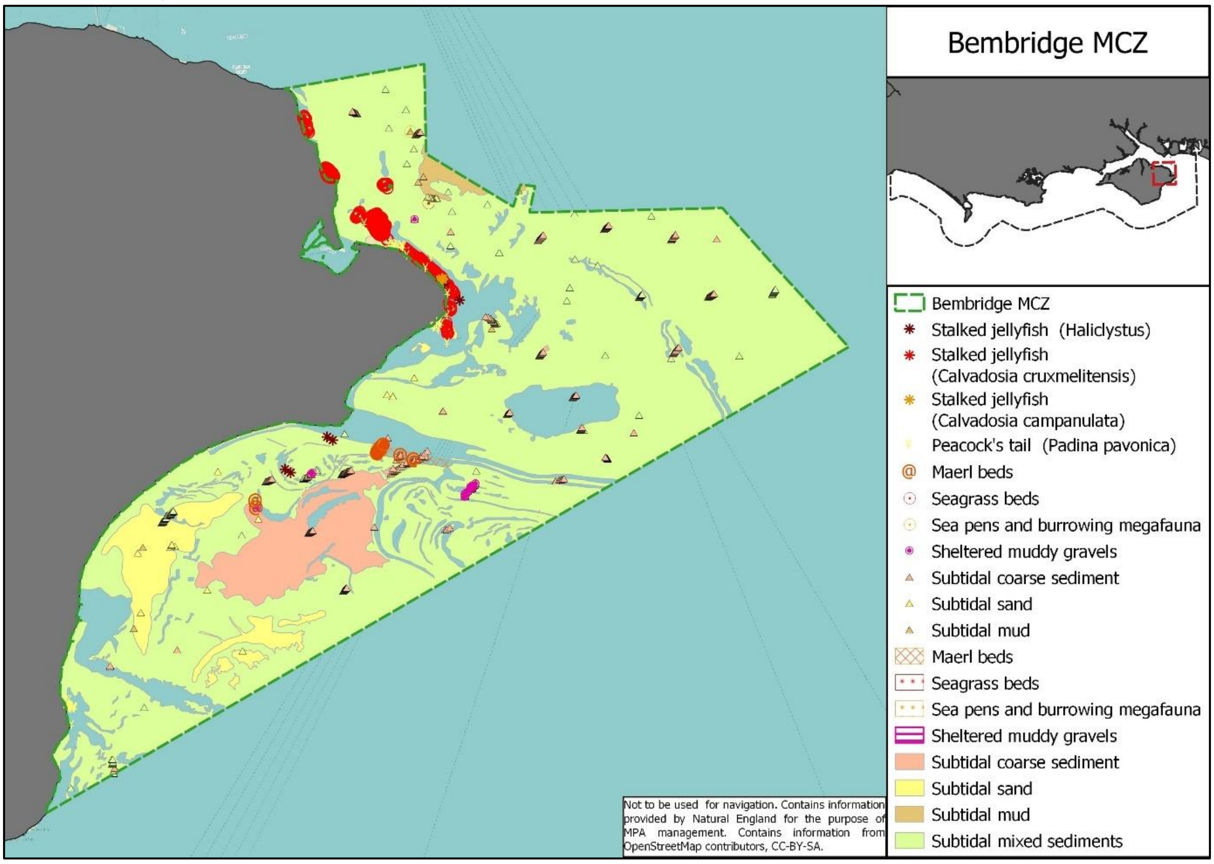

Figure 8 The location and extent of the supporting habitats of the Bembridge MCZ (boundary shown by the dashed green line).

The Bembridge MCZ covers an area of 75 km^2 and stretches southwards from Nettlestone Point in the North to Ventnor in the South and stretch to the edge of the deep-water channel in the Eastern Solent. The designated features are displayed in Figure 8 and Table 7.

Table 7 The designated features of Bembridge MCZ

Designated Features	Maerl Beds
	Native Oyster (*Ostrea Edulis*)
	Peacock's tail (*Padina Pavocina*)
	Seagrass beds
	Sea-pen and burrowing megafauna communities
	Sheltered Muddy Gravels
	Short Snouted Seahorse (*Hippocampus hippocampus*)
	Stalked Jellyfish (*Calvadosia campanulata*)
	Stalked Jellyfish (*Haliclystus spp*)
	Subtidal Coarse Sediments
	Subtidal Mixed Sediments
	Subtidal Mud
	Subtidal Sand

1.5.2 **Existing Shore Gathering Management Specific to the MCZ**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 17-21 are within the Bembridge MCZ.

1.5.3 **Shore Gathering activity in the MCZ**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Bembridge MCZ.

1.5.4 **Recorded catches within the MCZ**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Bembridge MCZ.

1.5.5 **Recorded Offences within the MCZ**

As of October 2023, there has been no recorded offences linked to shore gathering activities occurring in the Bembridge MCZ.

2. Special Protection Areas (SPAs)

2.0 Chesil Beach and the Fleet SPA

2.0.1 Designated Features of the SPA

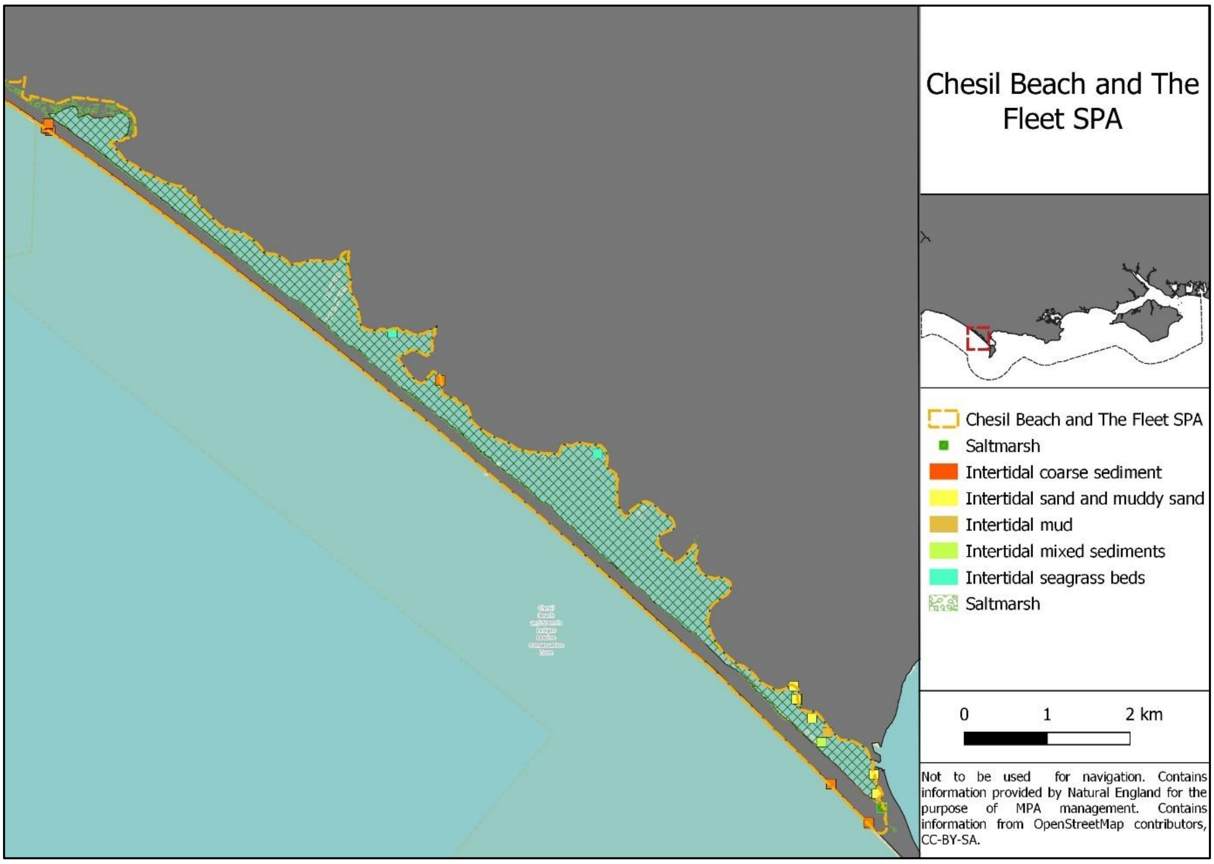

Figure 9 The location and extent of the supporting habitats of the Chesil Beach and The Fleet SPA (boundary shown by the dashed yellow line).

The Chesil Beach and the Fleet SPA covers an area of 7 km^2. The Fleet supports the largest diversity of species and habitat of any coastal lagoon in the UK [4] and aside from the entrance at the southeastern end, The Fleet is largely sheltered from waves and tidal processes[5]. The qualifying features and their supporting habitats are displayed in Figure 9 and Table 8.

Table 8 Qualifying features and their supporting habitats in the Chesil Beach and The Fleet SPA.

Qualifying Features	Little Tern (*Sternula albifrons*), Breeding
	Wigeon (*Mareca Penelope*), Non-breeding
Supporting Habitats	Coastal Lagoons
	Intertidal Coarse Sediment
	Intertidal Mixed Sediment
	Intertidal Sand and Muddy Sand
	Intertidal Seagrass beds
	Intertidal Mud
	Water Column

[4] Bamber, R. N. 1997. Assessment of saline lagoons within Special Areas of Conservation (SACs). Peterborough: English Nature.
[5] https://designatedsites.naturalengland.org.uk/

2.0.2 **Existing Shore Gathering Management Specific to the SPA**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 29 are within the Chesil Beach and the Fleet SPA.

2.0.3 **Shore Gathering activity in the SPA**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Chesil Beach and The Fleet SPA.

Information provided by Natural England indicates that bait digging, cockle raking, and crab tiling have taken place within the site. No information is provided on the specific location or date when this activity was observed.

2.0.4 **Recorded catches within the SPA**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Chesil Beach and The Fleet SPA.

2.0.5 **Recorded Offences within the SPA**

As of October 2023, there has been no recorded offences linked to shore gathering activities occurring in the Chesil Beach and The Fleet SPA.

2.1 **Poole Harbour SPA**

2.1.1 **Designated Features of the SPA**

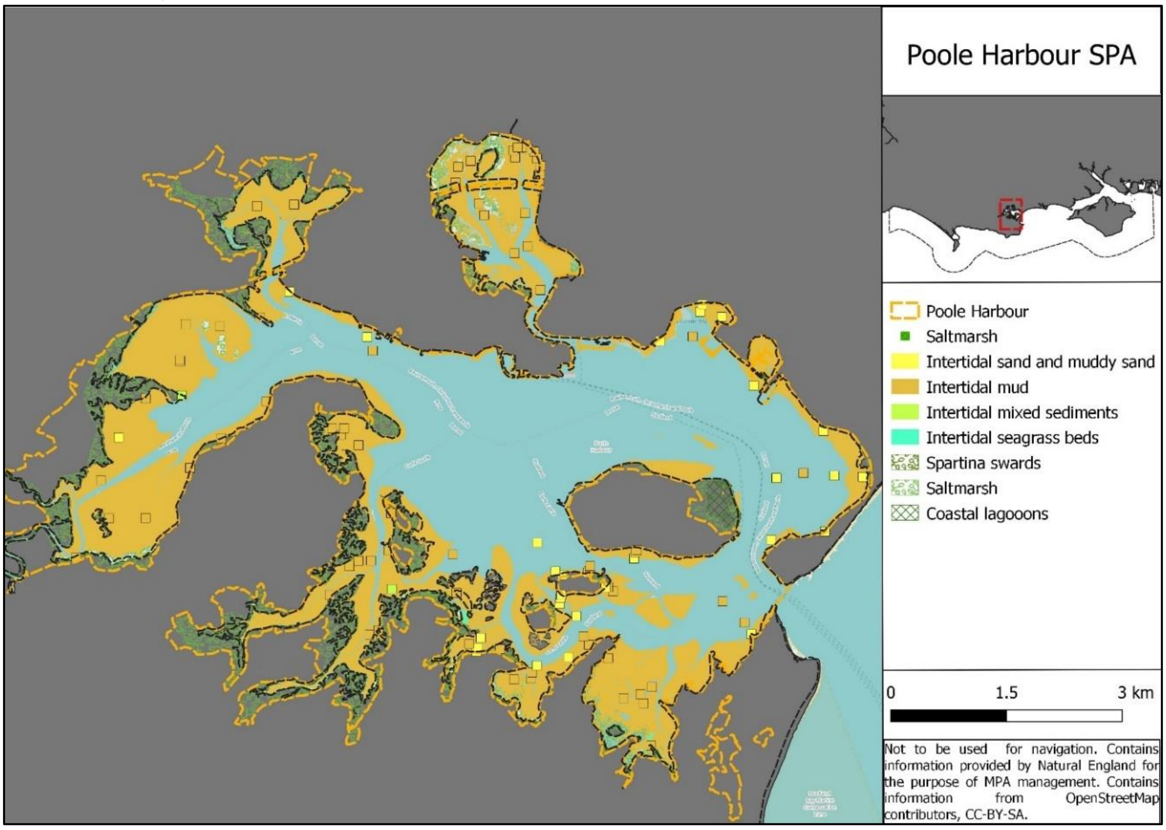

Figure 10 The location and extent of the supporting habitats of the Poole Harbour SPA (boundary shown by the dashed yellow line).

Poole Harbour SPA comprises of large tidal mudflats, saltmarsh, and seagrass beds. The SPA covers an area of 42 km^2 and is an important feeding habitat for migratory birds[6]. The qualifying features and their supporting habitats are displayed in Figure 10 and Table 9.

Table 9 Qualifying features and their supporting habitats in the Poole Harbour SPA.

Qualifying Features	Avocet (*Recurvirostra avosetta*), Non-breeding
	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Little egret (*Egretta garzetta*), Non-breeding
	Mediterranean gull (*Ichthyaetus melanocephalus*), Breeding
	Sandwich tern (*Thalasseus sandvicensis*), Breeding
	Shelduck (*Tadorna tadorna*), Non-breeding
	Spoonbill (*Platalea leucorodia*), Non-breeding
	Waterbird assemblage, Non-breeding
Supporting Habitats	Coastal lagoon
	coastal reedbed
	freshwater and coastal grazing marsh
	Mediterranean and thermo- Atlantic Halophilous scrubs
	Salicornia and other annuals colonising mud and sand
	Atlantic salt meadows
	Spartina swards

[6] https://designatedsites.naturalengland.org.uk/

	Intertidal seagrass beds
	Intertidal mixed sediments
	Intertidal mud
	Intertidal sand and muddy sand
	Water column

2.1.2 **Existing Shore Gathering Management Specific to the SPA**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 26-28 are within the Poole Harbour SPA.

Poole Harbour is subject to the Poole Harbour Shellfish Hand Gathering Byelaw. From the 1st of November to 31st March, both days inclusive, a person must not take from a fishery, shellfish of any kind by hand gathering or with the use of a hand tool, in the defined areas within Poole Harbour.

The Poole Harbour Bait Digging Memorandum of Agreement (MoA) was produced in partnership with industry, other authorities, NGOs, and other bodies. The agreement sets out a range of voluntary permanent and seasonal spatial closures, in addition to provisions on backfilling holes, avoiding taking green spawning worms, keeping to access paths, avoiding digging around moorings, slipways and sea walls, being aware of the use of torch lights to disturb roosting birds and keeping to all local byelaws and regulations.

2.1.3 **Shore Gathering activity in the SPA**

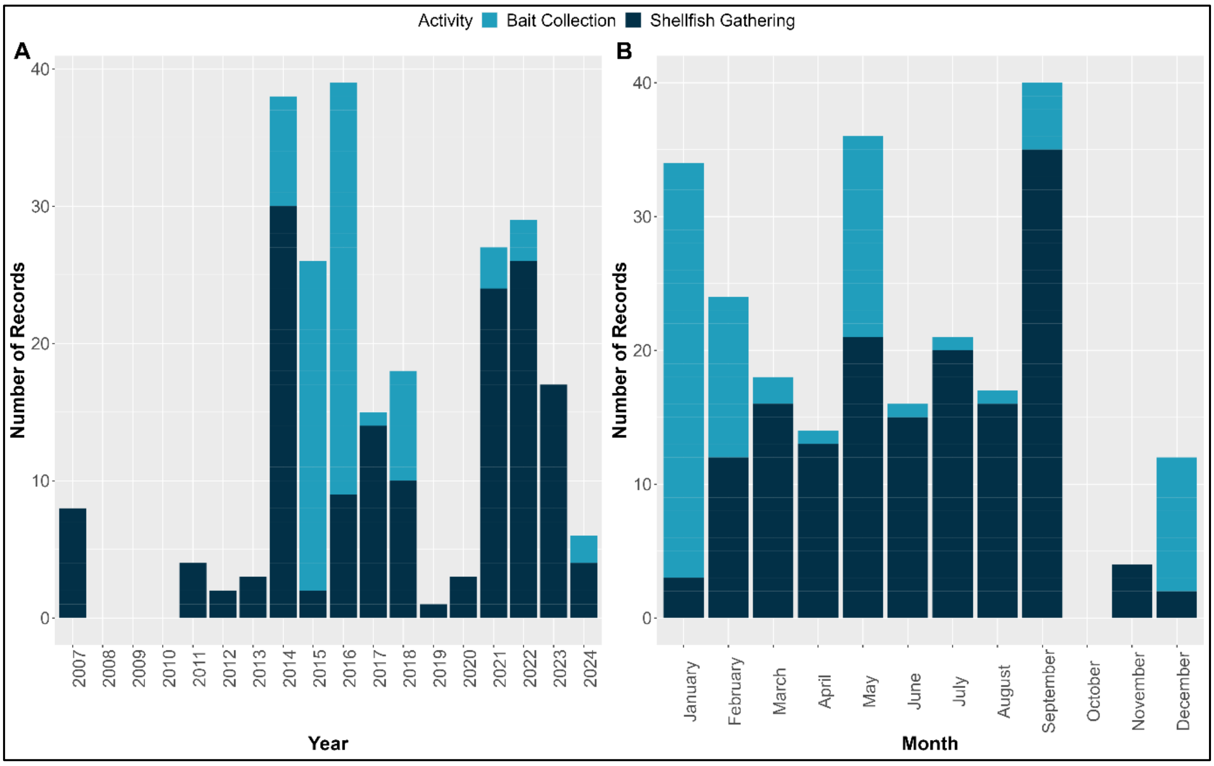

Figure 11 Records of shore gathering activity occurring in the Poole Harbour SPA.

Records of shore gathering activity in the Poole Harbour SPA date back to 2007 and are comprised of bait collection and shellfish gathering and are displayed in Figure 11A. Bait digging activity appears to peak in 2015 and 2016 with 24 and 30 records respectively. However, this should be viewed with the understand that the data is based on Southern IFCA sightings data. Bait digging appears to mostly occur from December to January (Figure 11B) however this should also be considered in line with the data source.

Shellfish gathering peaked in 2014 with 30 records. Similar but lower levels were observed in 2021 and 2022 with 24 and 26 records respectively. Monthly records remain relatively consistent from February to August with a with between 12 and 20 records. Shellfish gathering peaks in September with a total of 35 records.

Spatial distribution is displayed in Figure 12. High density areas of shellfish gathering include Whitley Lake, Arne Bay, and Rockley Spit (East to West). High density areas of Bait collection include Blue Lagoon and Holes Bay (East to West). Note that some records will represent activity prior to the introduction of existing management measures.

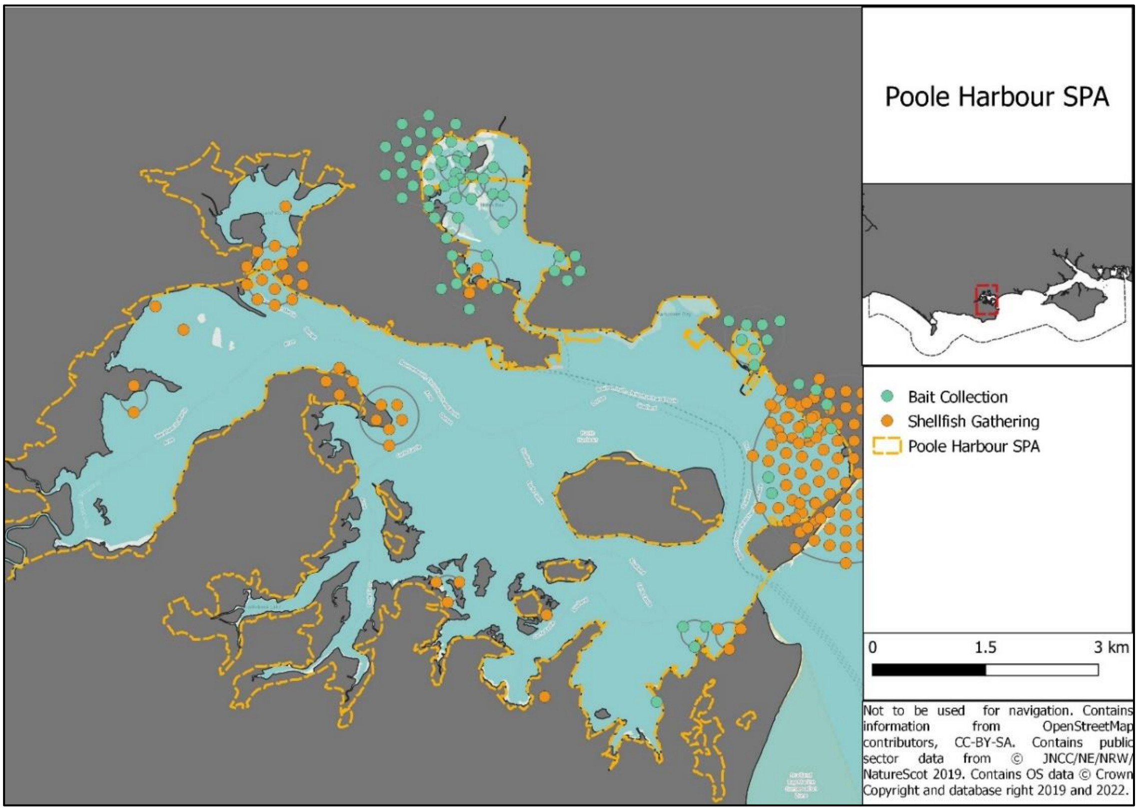

Figure 12 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Poole Harbour SPA (boundary shown by the dashed yellow line) as of October 2023.

2.1.4 **Recorded catches within the SPA**

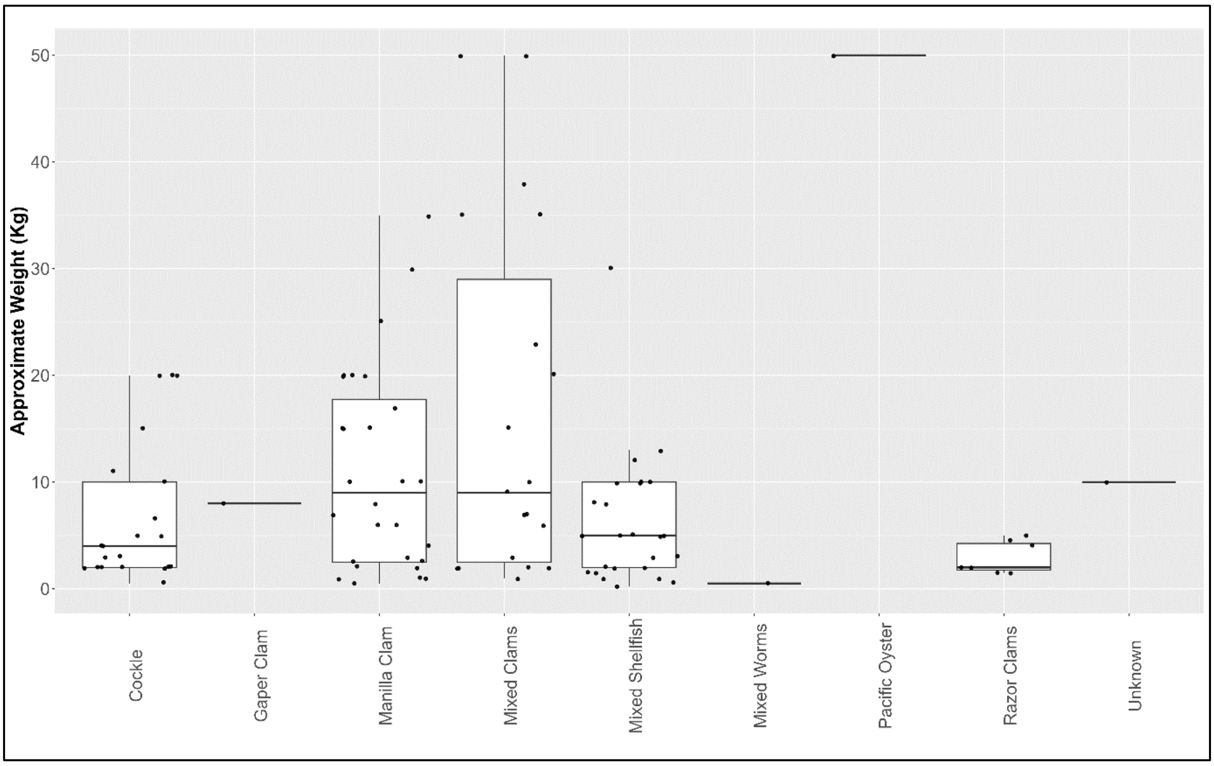

Figure 13 Approximate weight of catch associated with shore gathering activity in the Poole Harbour SPA.

Figure 13 displays the range of weights recorded on Southern IFCA search records of species caught through shore gathering activity (shellfish) in Poole Harbour SPA since 2007. Table 10 displays the mean weight for each species.

Table 10 The mean weight of recorded catches associated with shore gathering activity in the Poole Harbour SPA.

Species	Mean Weight (kg)
Cockle	6.71
Gaper Clam	8.00
Manila Clam	11.01
Mixed Clams	16.68
Mixed Shellfish	6.14
Mixed Worms	0.50
Pacific Oyster	50.00
Razor Clams	2.93
Unknown	10.00

2.1.5 **Recorded Offences within the SPA**

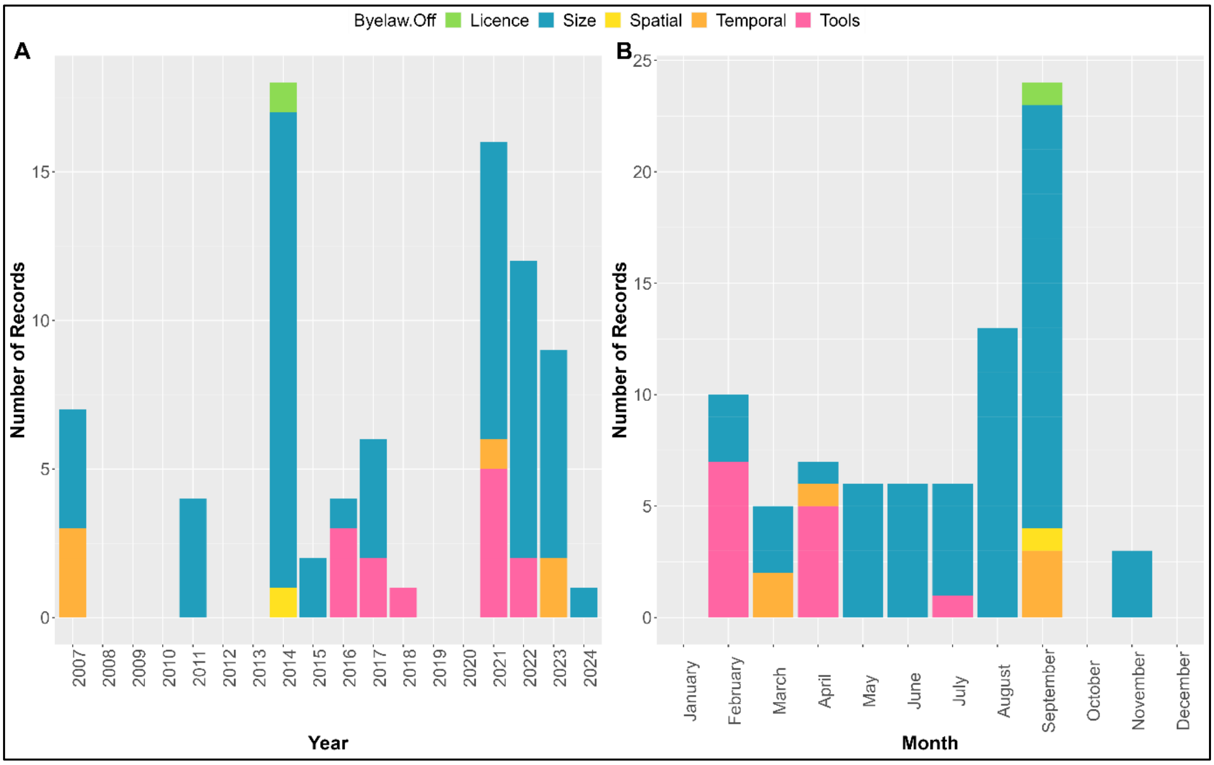

Figure 14 Recorded offences and the theme of infringement in the Poole Harbour SPA.

Figure 14 A and B display the yearly and monthly trends in offences related to shore gathering activity within the Poole Harbour SPA since 2007. Offences peaked in 2014 with 18 records. Similar to the levels of activity discussed in section 2.1.3, offences peak at the end of the summer. In this case it is likely due to targeted patrol work occurring in September 2014.

Infringements relating to undersized species occur most frequently, followed by the use of tools. A summary of current shore gathering related management can be found in Sections 2.1.2 and 5.

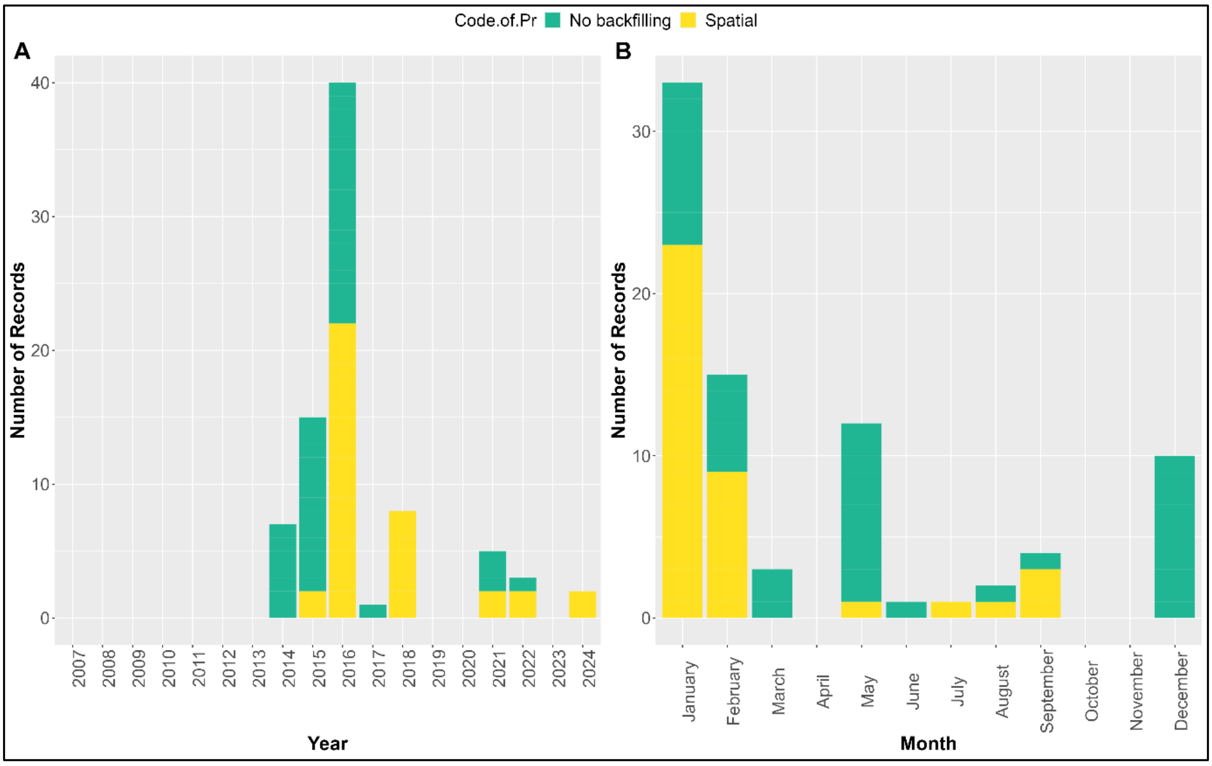

Figure 15 Poole Harbour Bait Memorandum of Agreement infringements by theme

There are 81 recorded infringements of the Pool Harbour MoA recorded in IFCA search and intelligence records. The majority of recorded infringements relate to digging in permanent or seasonal spatial closures and are displayed in Figure 15.

2.2 Solent and Southampton Water SPA

2.2.1 Designated Features of the SPA

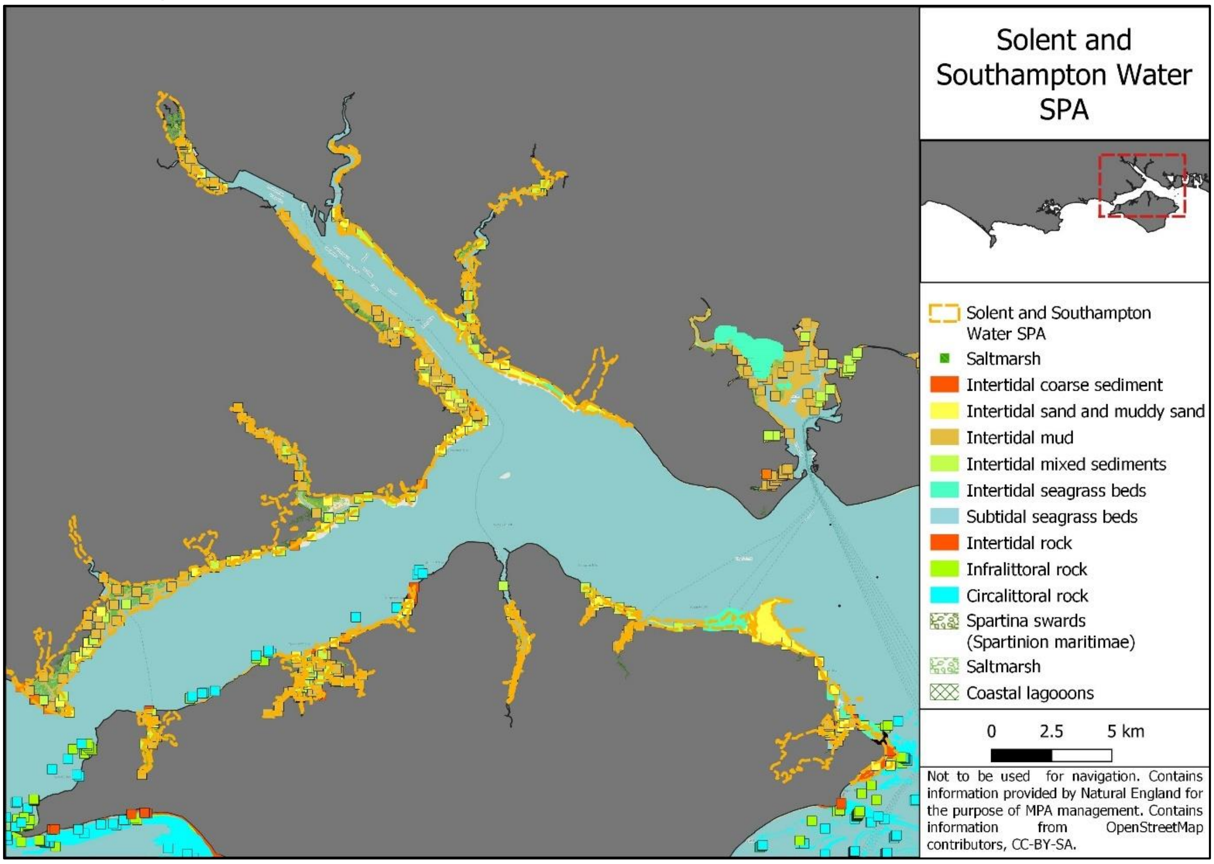

Figure 16 The location and extent of the supporting habitats of the Solent and Southampton Water SPA (boundary shown by the dashed yellow line).

The Solent and Southampton Water SPA reaches from Hurst Spit in the West to Hill Head in the East, covering sections of the Hampshire coastline and the north coast of the Isle of Wight. The SPA covers 54 km^2 of estuarine habitats that support a range of invertebrates and migratory birds[7]. The qualifying features and their supporting habitats are displayed in Figure 16 and Table 11.

Table 11 Qualifying features and their supporting habitats in the Solent and Southampton Water SPA

Qualifying Features	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Little tern (*Sternula albifrons*), Breeding
	Mediterranean gull (*Ichthyaetus melanocephalus*), Breeding
	Ringed plover (*Charadrius hiaticula*), Non-breeding
	Roseate tern (*Sterna dougallii*), Breeding
	Sandwich tern (*Thalasseus sandvicensis*), Breeding
	Teal (*Anas crecca*), Non-breeding
	Waterbird assemblage, Non-breeding
Supporting Habitats	Coastal Lagoon
	Coastal Reedbed

[7] https://designatedsites.naturalengland.org.uk/

	Freshwater And Coastal Grazing Marsh
	Salicornia And Other Annuals Colonising Mud And Sand
	Atlantic Salt Meadows
	Spartina Swards
	Intertidal Seagrass Beds
	Intertidal Rock
	Intertidal Coarse Sediment
	Intertidal Mixed Sediments
	Intertidal Mud
	Intertidal Sand And Muddy Sand
	Infralittoral Rock
	Subtidal Seagrass Beds
	Circalittoral Rock
	Water Column

2.2.2 **Existing Shore Gathering Management Specific to the SPA**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of 29 prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 15-23 and area 25 overlap with the Solent and Southampton Water SPA.

2.2.3 **Shore Gathering activity in the SPA**

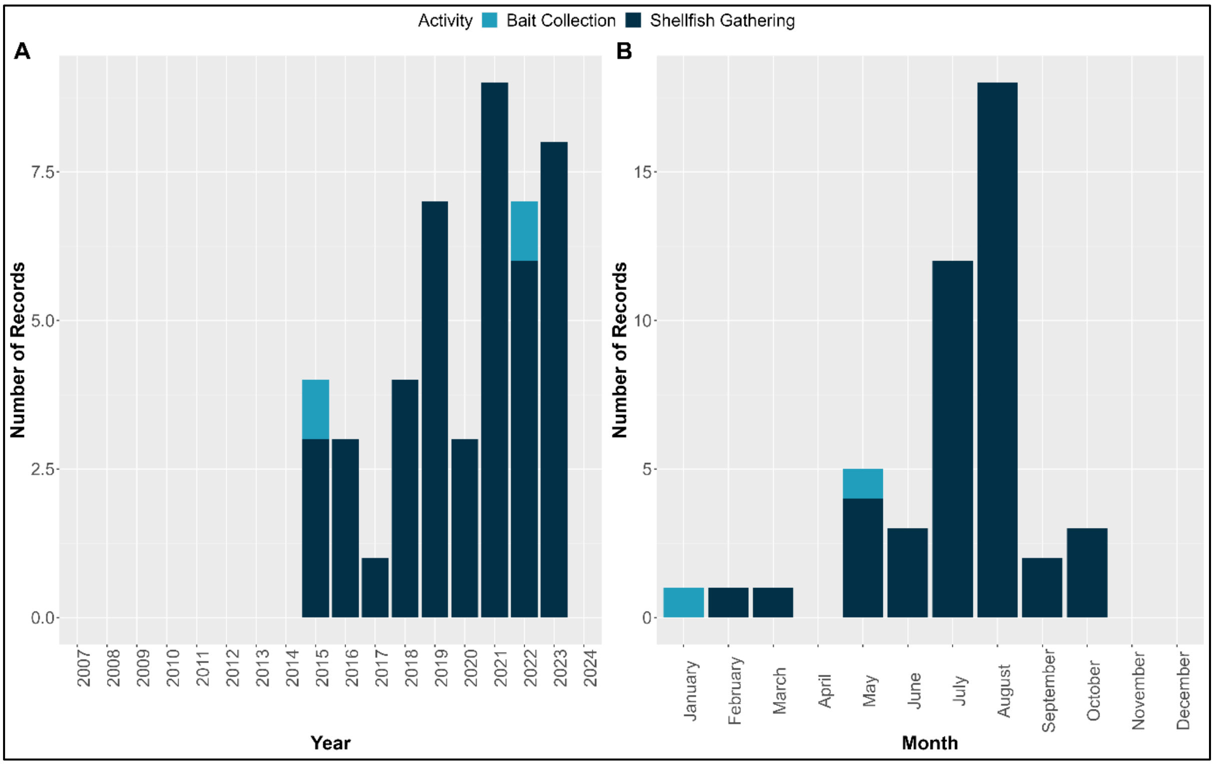

Figure 17 Records of shore gathering activity occurring in the Solent and Southampton Water SPA.

Figure 17 displays records of shore gathering activity occurring in the Solent and Southampton Water SPA. Shellfish gathering is the most commonly occurring activity in the Solent and Southampton Water SPA. With Peaks occurring in 2021 and in the months of July and August.

Figure 18 displays the spatial distribution of all shore gathering activity observed by Southern IFCA in the Solent and Southampton Water SPA. The area of highest levels of activity is Hill Head.

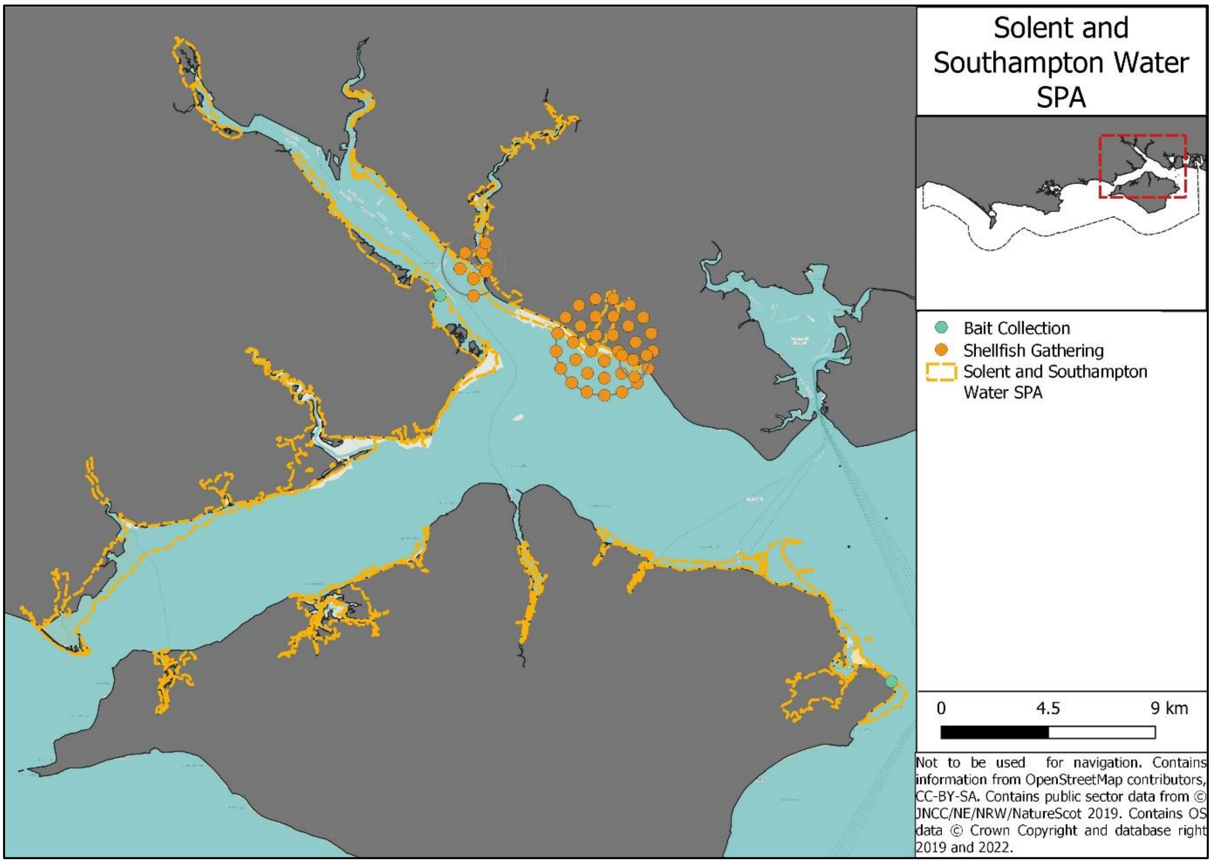

Figure 18 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Solent and Southampton Water SPA (boundary shown by the dashed yellow line) as of October 2023.

2.2.4 **Recorded catches within the SPA**

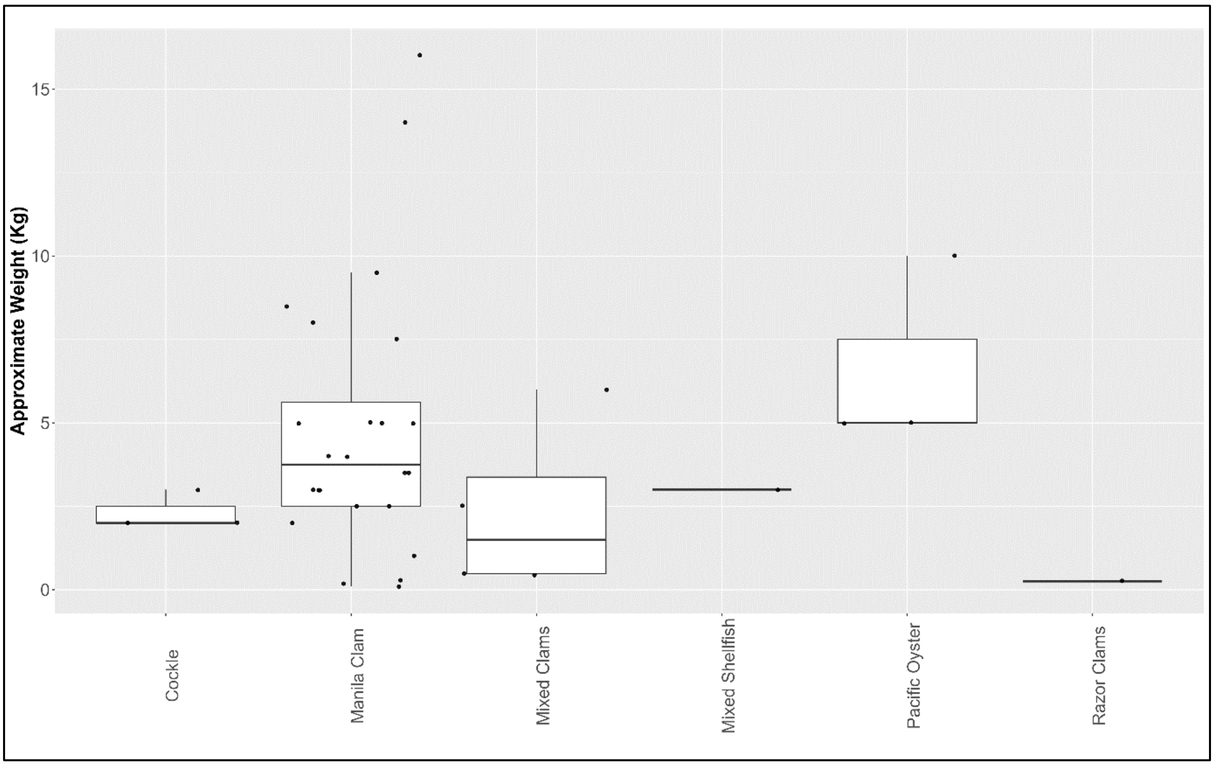

Figure 19 Approximate weight of catch associated with shore gathering activity in the Solent and Southampton Water SPA.

Figure 19 displays the range of weights recorded on Southern IFCA search records carried out in the Solent and Southampton Water SPA since 2015. Table 12 displays the mean weight for each species.

Table 12 The mean weight of recorded catches associated with shore gathering activity in the Solent and Southampton Water SPA.

Species	Mean Weight (kg)
Cockle	2.33
Manila Clam	4.83
Mixed Clams	2.36
Mixed Shellfish	3.00
Pacific Oyster	6.67
Razor Clams	0.25

2.2.5 **Recorded Offences within the SPA**

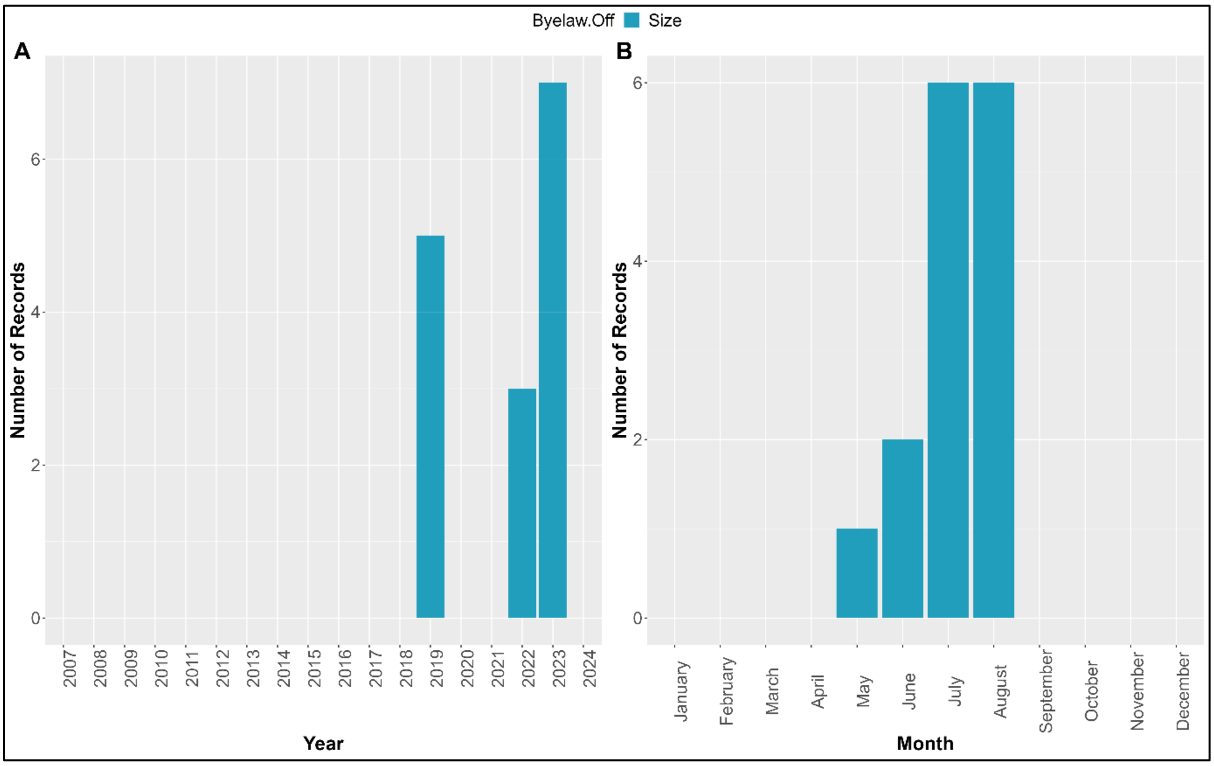

Figure 20 Recorded offences and the theme of infringement in the Solent and Southampton Water SPA.

Figure 20 displays recorded offences related to shore gathering activity within the Solent and Southampton Water SPA. All records of offences relating to shore gathering activities in the Solent and Southampton Water SPA have been in relation to Minimum Conservation Reference Size. With the peak number of offences occurring in 2023.

2.3 **Portsmouth Harbour SPA**

2.3.1 **Designated Features of the SPA**

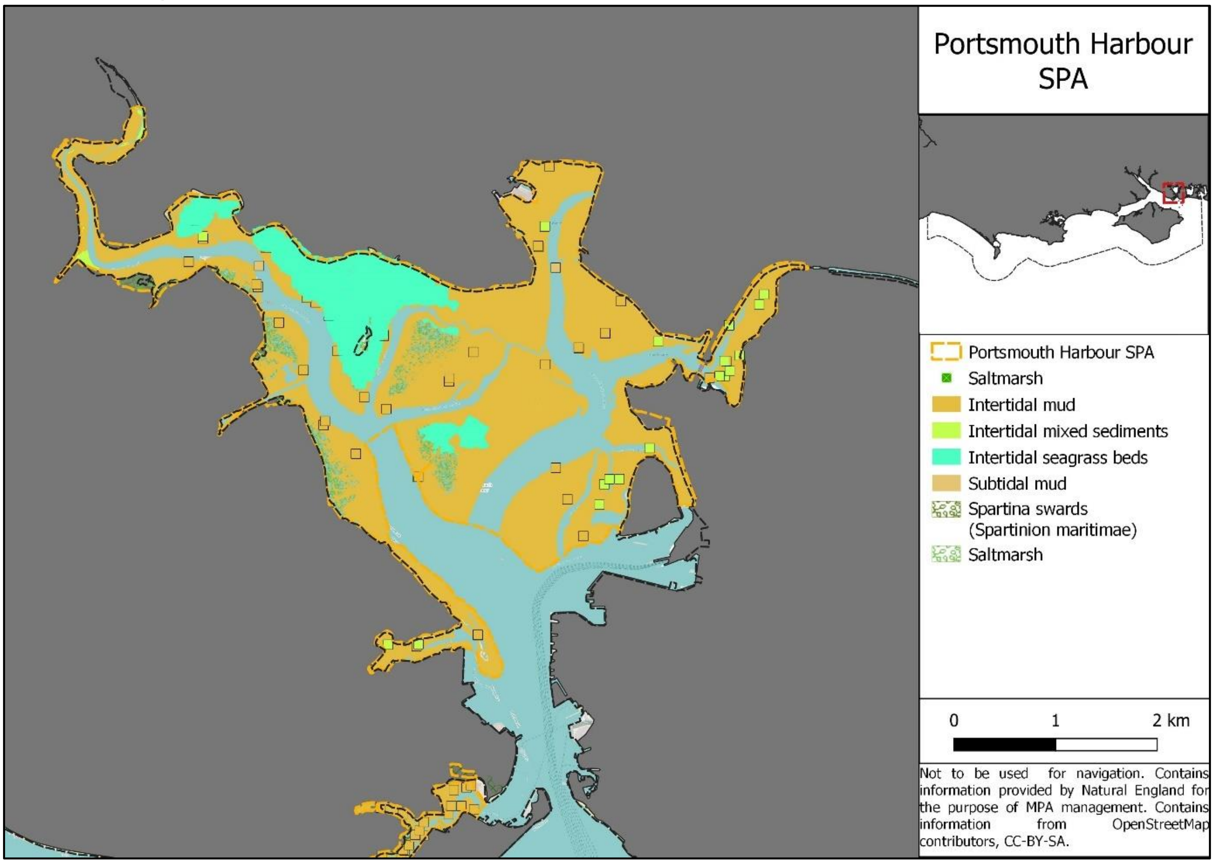

Figure 21 The location and extent of the supporting habitats of the Portsmouth Harbour SPA (boundary shown by the dashed yellow line).

Portsmouth Harbour is important habitat for large numbers of nationally and internationally important bird species. The SPA covers 13 km^2 and the qualifying features and their supporting habitats are displayed in Figure 21 and Table 13[8].

Table 13 The qualifying features and supporting habitats of the Portsmouth Harbour SPA.

Qualifying Features	Black-tailed godwit (*Limosa limosa islandica*), Non-breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Dunlin (*Calidris alpina alpina*), Non-breeding
	Red-breasted merganser (*Mergus serrator*), Non-breeding
Supporting Habitats	Coastal Lagoon
	Freshwater And Coastal Grazing Marsh
	Salicornia And Other Annuals Colonising Mud And Sand
	Atlantic Salt Meadows
	Spartina Swards
	Intertidal Seagrass Beds
	Intertidal Mixed Sediments
	Intertidal Mud
	Subtidal Mud
	Water Column

[8] https://designatedsites.naturalengland.org.uk/

2.3.2 **Existing Shore Gathering Management Specific to the SPA**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of 29 prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 8-14 are within the Portsmouth Harbour SPA.

2.3.3 **Shore Gathering activity in the SPA**

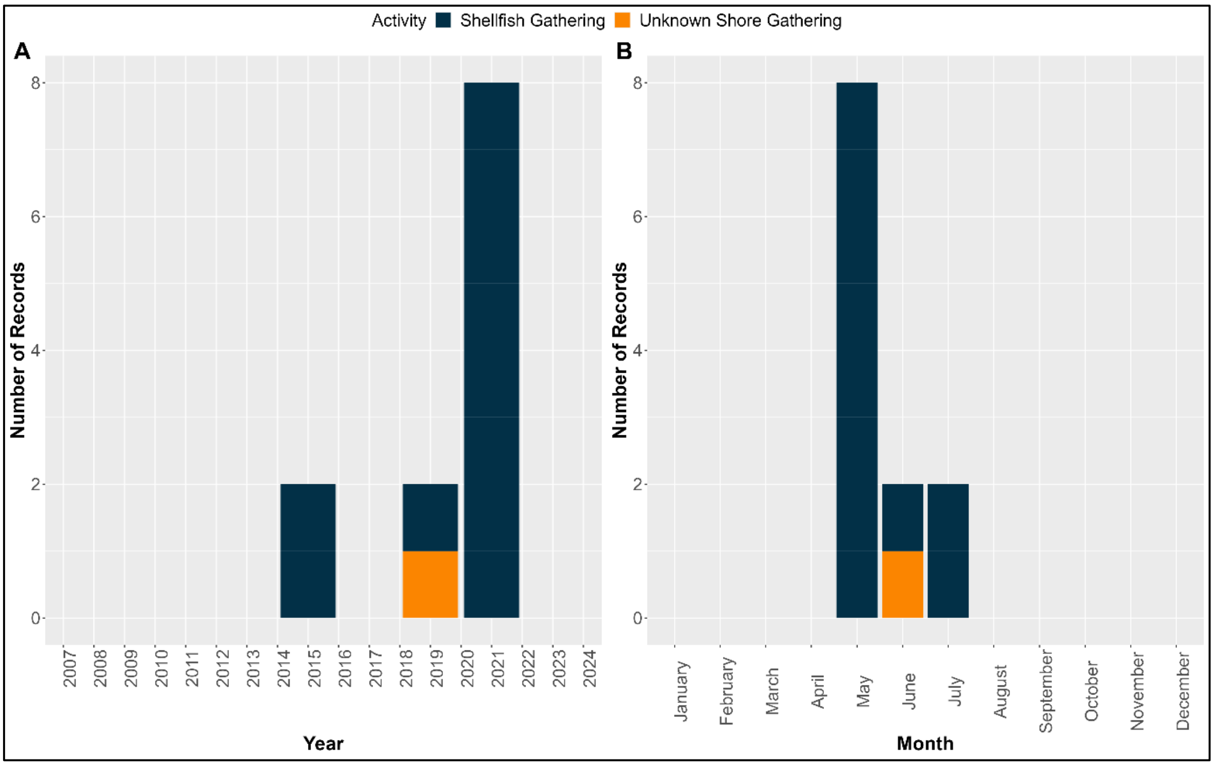

Figure 22 Records of shore gathering activity occurring in the Portsmouth Harbour SPA.

Figure 22 displays annual and monthly trends in shore gathering activity within the Portsmouth Harbour SPA. The majority of shore gathering records indicate shellfish gathering is the most common shore gathering activity occurring in the Portsmouth Harbour SPA.

Figure 23 displays the spatial distribution of all shore gathering activity observed by Southern IFCA in the Portsmouth Harbour SPA as of October 2023. The area with the highest density of activity is to the west of Portchester Castle.

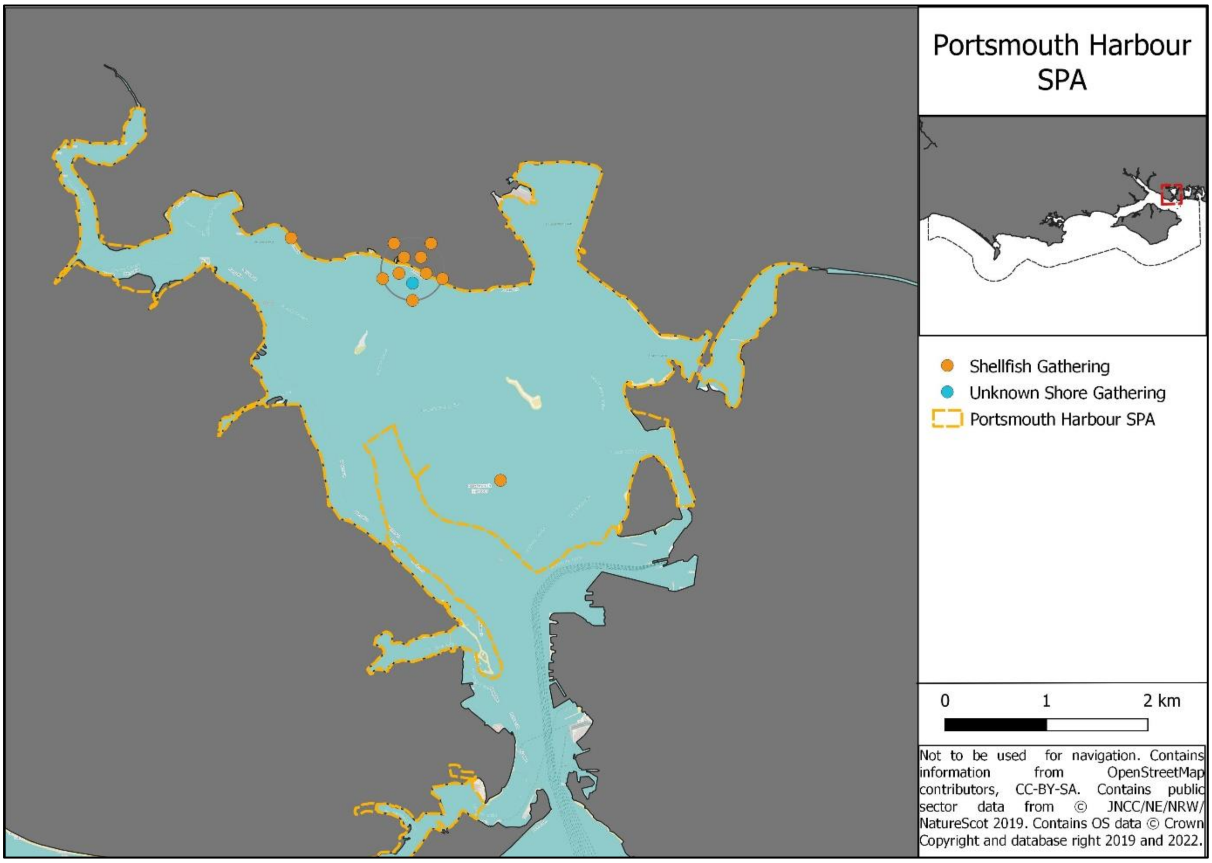

Figure 23 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Portsmouth Harbour SPA (boundary shown by the dashed yellow line) as of October 2023.

2.3.4 Recorded catches within the SPA

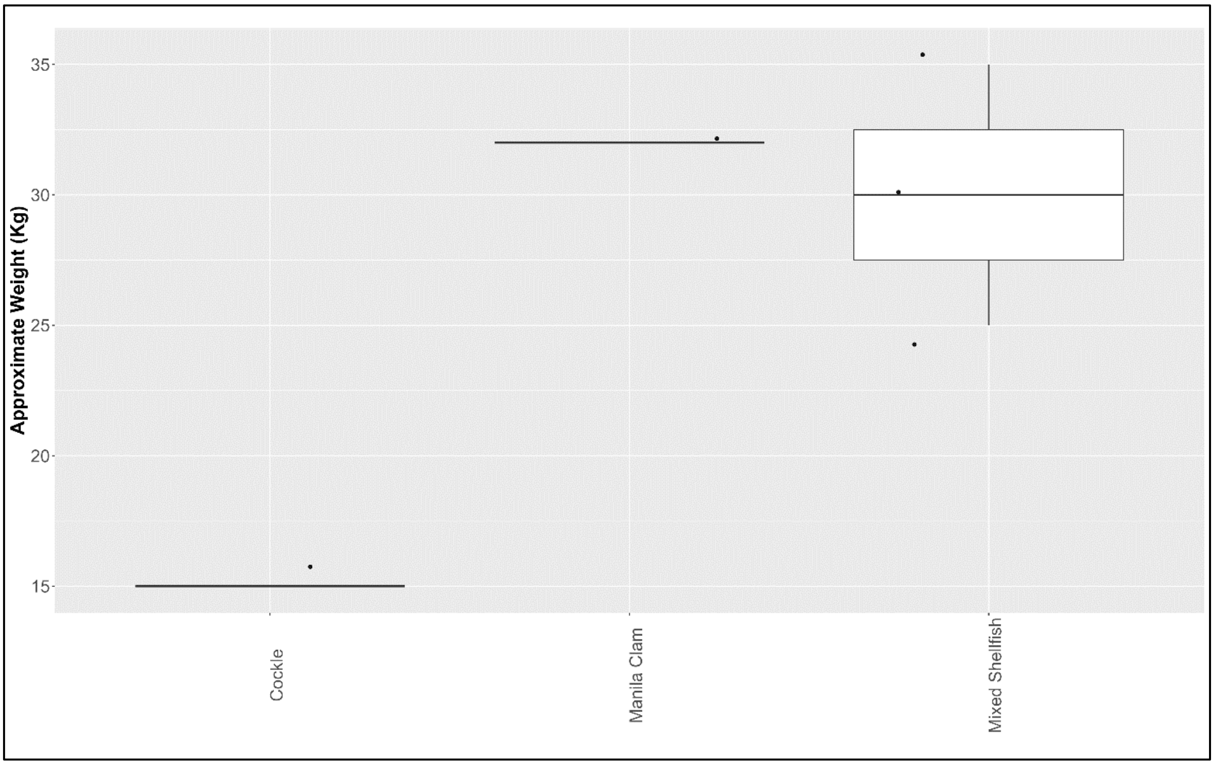

Figure 24 Approximate weight of catch associated with shore gathering activity in the Portsmouth Harbour SPA.

There are limited records on weights of catch from shore gathering activities however the limited records indicate generally higher means than other MPAs. The range of weights and mean weights are displayed in Figure 24 and Table 14 respectively.

Table 14 The mean weight of recorded catches associated with shore gathering activity in the Portsmouth Harbour SPA.

Species	Mean Weight (kg)
Cockle	15.00
Manila Clam	32.00
Mixed Shellfish	30.00

2.3.5 **Recorded Offences within the SPA**

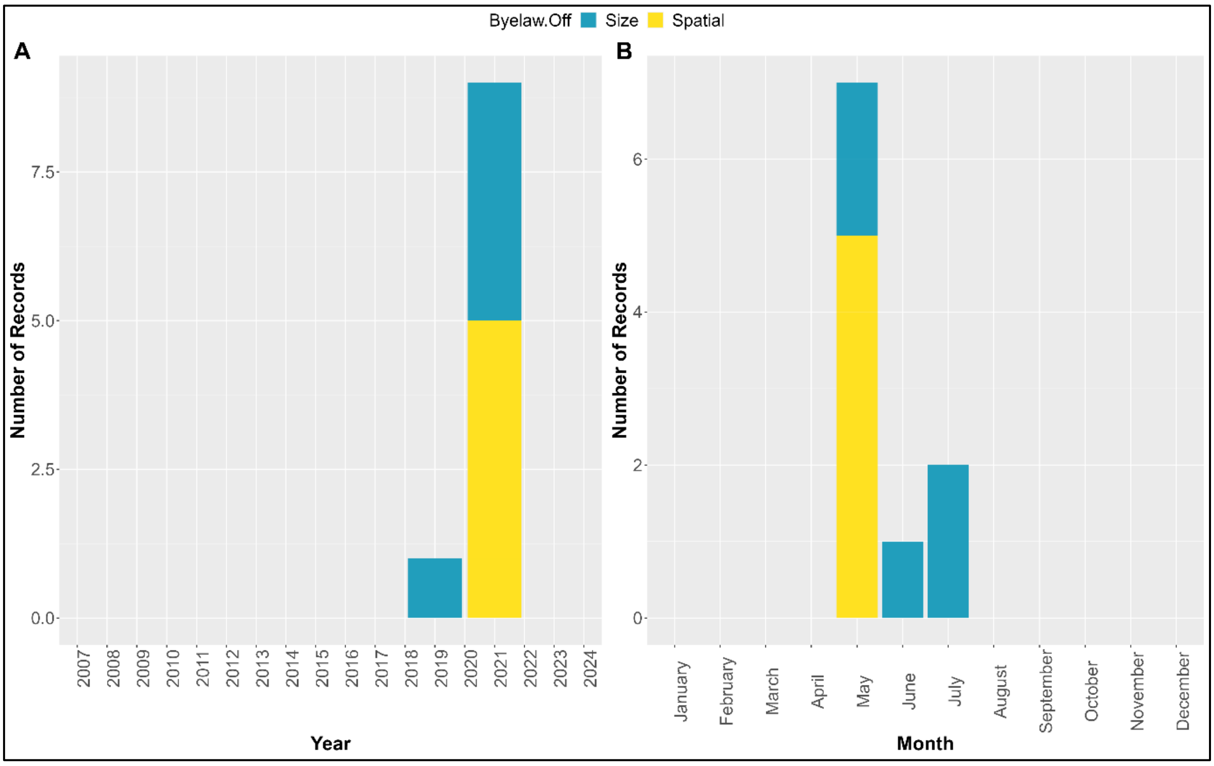

Figure 25 Recorded offences and the theme of infringement in the Portsmouth Harbour SPA.

Figure 25 displays all recorded offences related to shore gathering activity within the Portsmouth Harbour SPA. A peak record of offences occurred in 2021, 5 spatial and 4 MCRS offences. Regulations relating to shore gathering activity in the Portsmouth Harbour SPA are discussed in section 2.3.2 and 5.

2.4 <u>Chichester and Langstone Harbour SPA</u>

2.4.1 **Designated Features of the SPA**

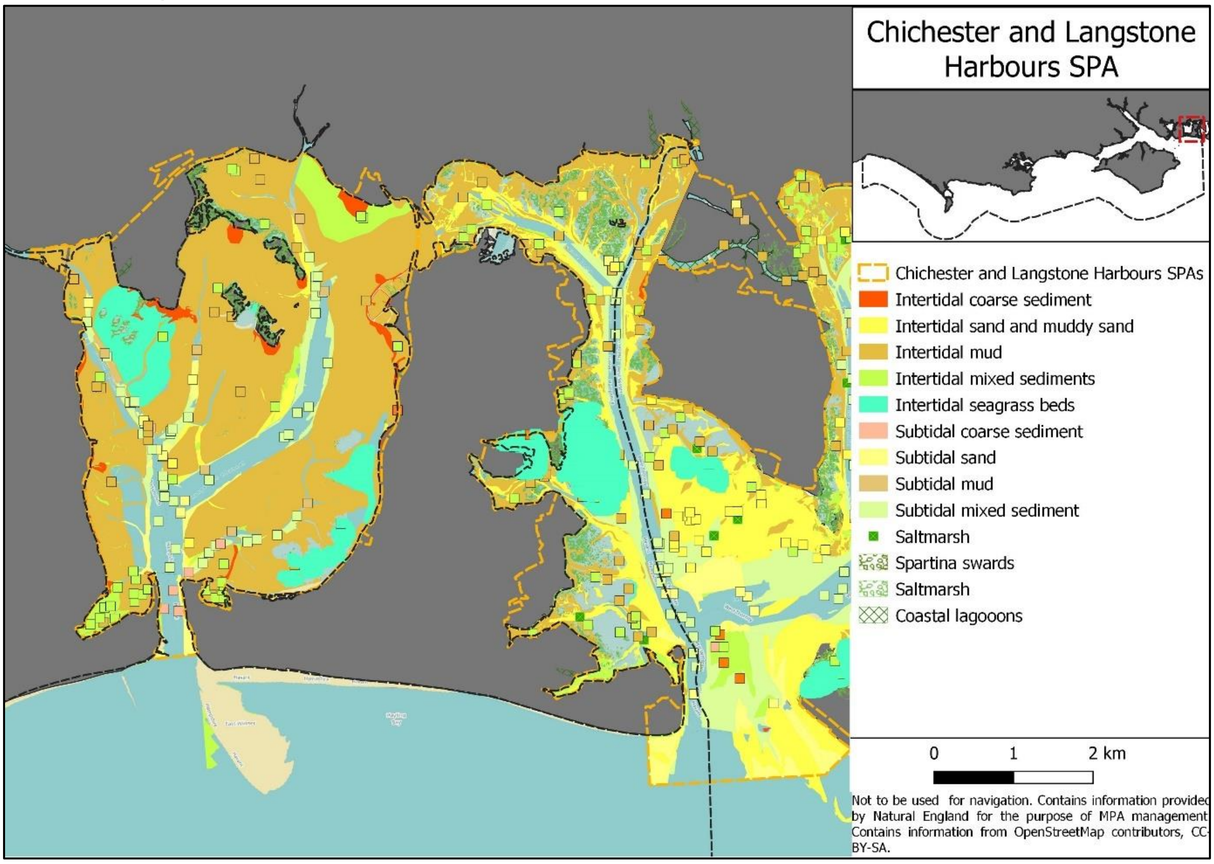

Figure 26 The location and extent of the supporting habitats of the Chichester and Langstone Harbour SPA (boundary shown by the dashed yellow line).

Chichester and Langstone Harbour covers two estuary basins with large mudflats and sandflats. The habitats support large numbers of overwintering birds with the SPA covering an area of 58 km^2. The qualifying features and supporting habitats are displayed in Figure 26 and Table 15.

Table 15 Qualifying habitats and their supporting habitats within Chichester and Langstone SPA.

Qualifying Features	Bar-tailed godwit (*Limosa lapponica*), Non-breeding
	Common tern (*Sterna hirundo*), Breeding
	Curlew (*Numenius arquata*), Non-breeding
	Dark-bellied brent goose (*Branta bernicla bernicla*), Non-breeding
	Dunlin (*Calidris alpina alpina*), Non-breeding
	Grey plover (*Pluvialis squatarola*), Non-breeding
	Little tern (*Sternula albifrons*), Breeding
	Pintail (*Anas acuta*), Non-breeding
	Red-breasted merganser (*Mergus serrator*), Non-breeding
	Redshank (*Tringa totanus*), Non-breeding
	Ringed plover (*Charadrius hiaticula*), Non-breeding
	Sanderling (*Calidris alba*), Non-breeding
	Sandwich tern (*Thalasseus* sandvicensis), Breeding
	Shelduck (*Tadorna tadorna*), Non-breeding
	Shoveler (*Spatula clypeata*), Non-breeding

	Teal (*Anas crecca*), Non-breeding
	Turnstone (*Arenaria interpres*), Non-breeding
	Waterbird assemblage, Non-breeding
	Wigeon (*Mareca penelope*), Non-breeding
	Shoveler (*Spatula clypeata*), Non-breeding
Supporting Habitats	Coastal Lagoon
	Coastal Reedbed
	Freshwater and Coastal Grazing Marsh
	Salicornia and Other Annuals Colonising Mud and Sand
	Atlantic Salt Meadows
	Spartina Swards
	Intertidal Seagrass Beds
	Intertidal Rock
	Intertidal Coarse Sediment
	Intertidal Mixed Sediments
	Intertidal Mud
	Intertidal Sand and Muddy Sand
	Subtidal Coarse Sediment
	Subtidal Mixed Sediment
	Subtidal Mud
	Subtidal Sand
	Water Column

2.4.2 **Existing Shore Gathering Management Specific to the SPA**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of 29 prohibited areas within the district to protect seagrass beds No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork or similar tool. Areas 1-7 are within the Chichester and Langstone Harbours SPA.

2.4.3 **Shore Gathering activity in the SPA**

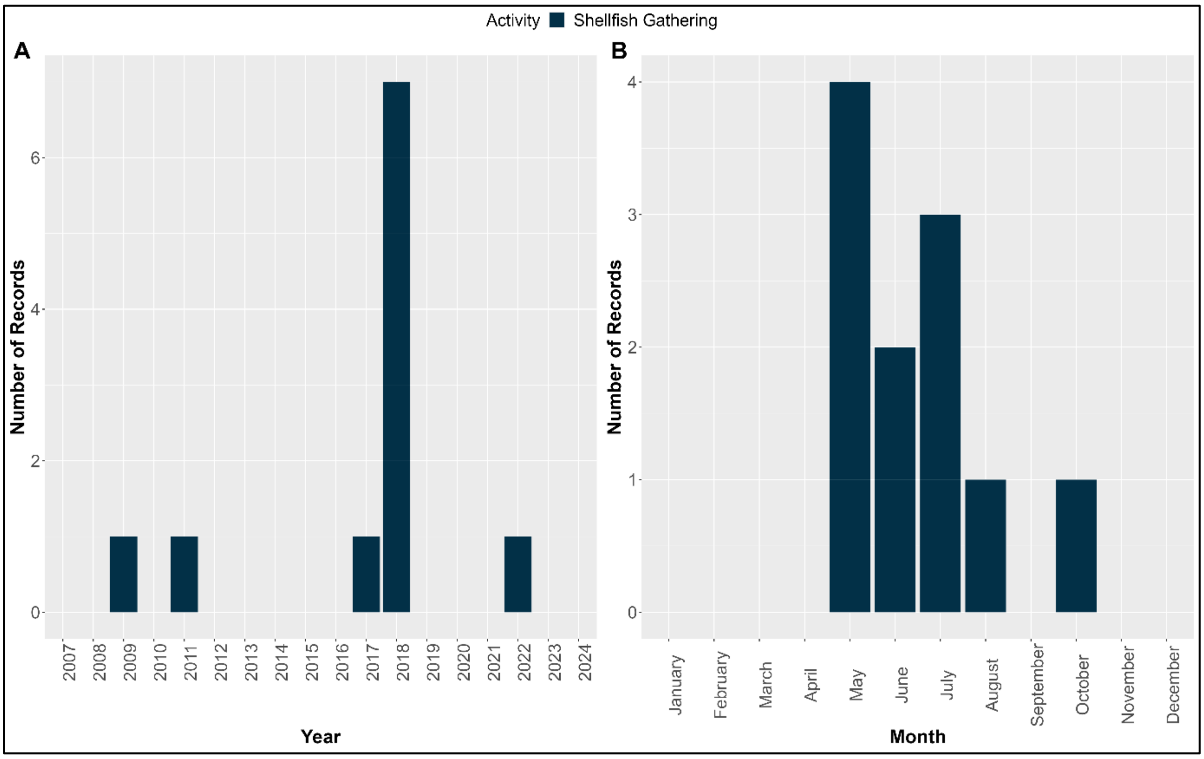

Figure 27 Records of shore gathering activity occurring in the Chichester and Langstone Harbour SPA.

Figure 27 displays all records of shore gathering activity occurring within the Chichester and Langstone Harbour SPA. Activity in the Chichester and Langstone Harbours SPA is limited to shellfish gathering with a peak in 2018 of 6 records.

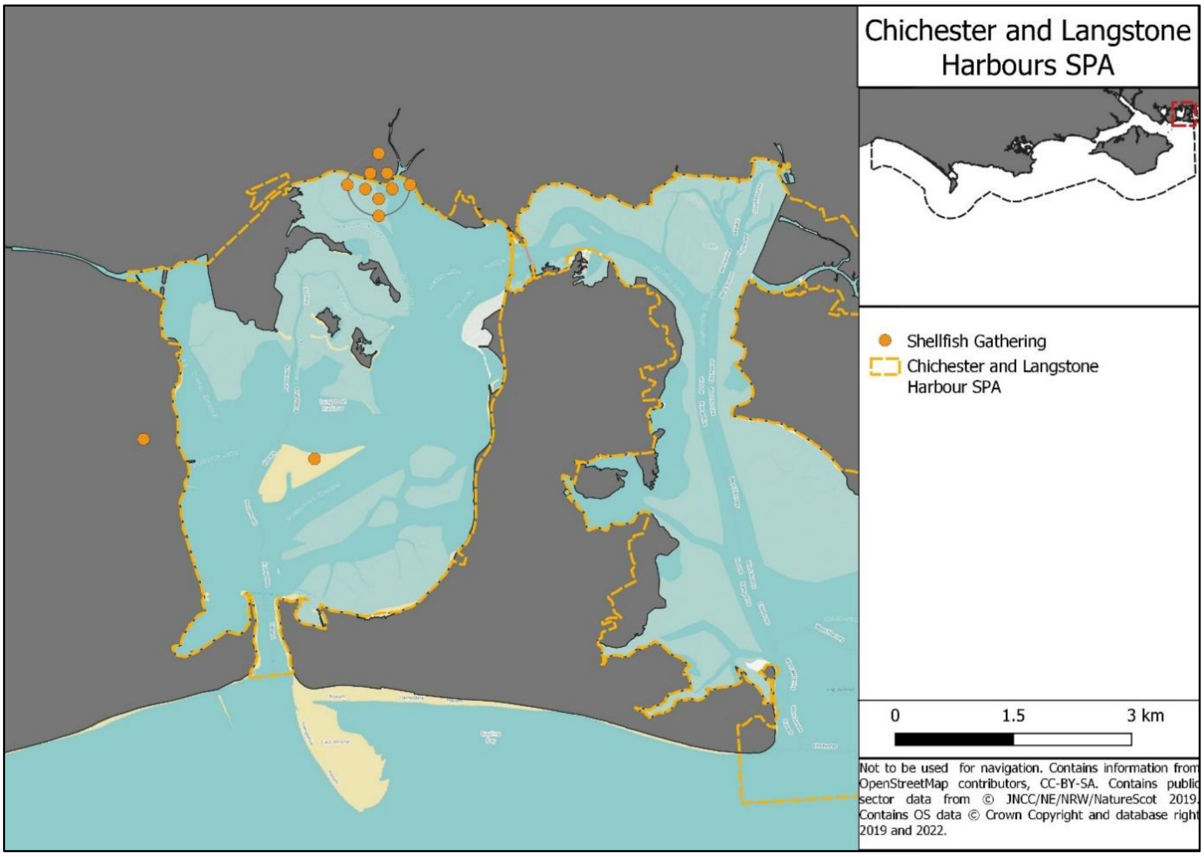

Figure 28 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Chichester and Langstone Harbour SPA (boundary shown by the dashed yellow line) as of October 2023.

Figure 28 displays the Spatial distribution of all shore gathering activity observed by Southern IFCA in the Chichester and Langstone Harbours SPA. The area with the highest density of activity is between Chaldock Lake and Broadmarsh Coastal Park.

2.4.4 **Recorded catches within the SPA**

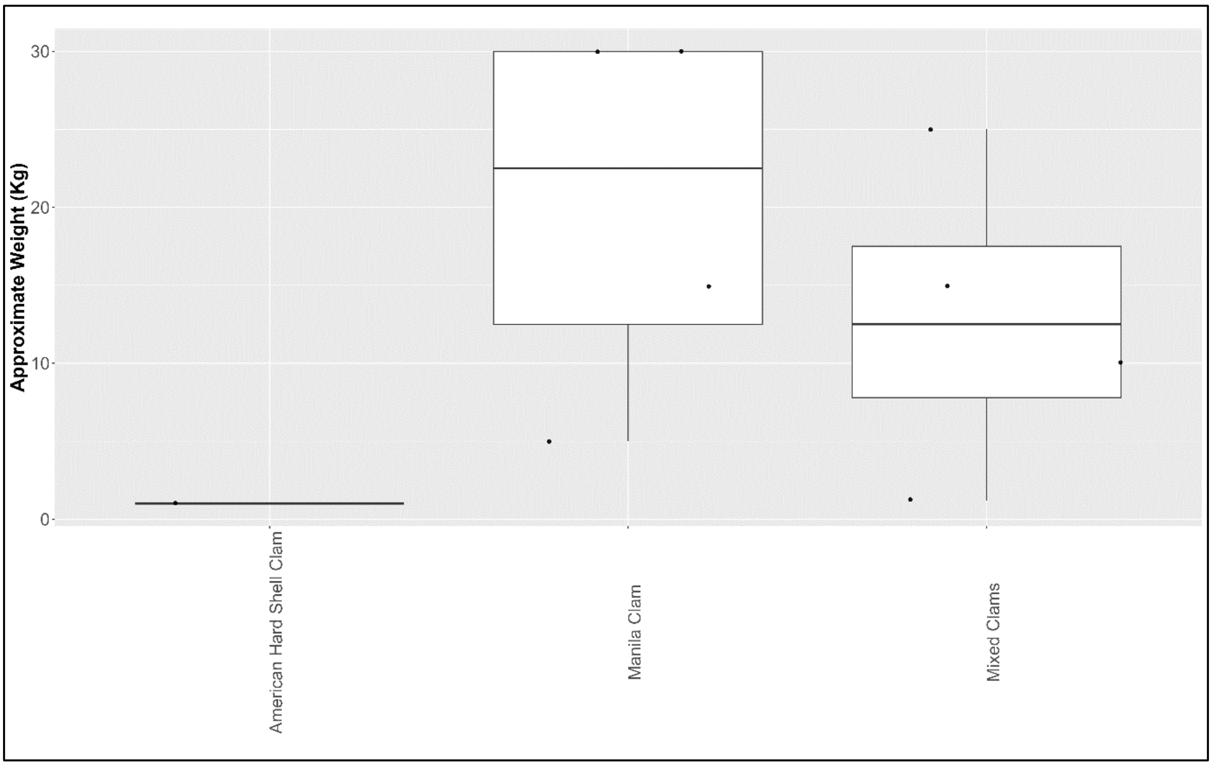

Figure 29 Approximate weight of catch associated with shore gathering activity in the Chichester and Langstone Harbour SPA.

Figure 29 and Table 16 display a summary of recorded catch weights from shore gathering activity within the Chichester and Langstone Harbour SPA.

Table 16 The mean weight of recorded catches associated with shore gathering activity in the Chichester and Langstone Harbour SPA.

Species	Mean Weight (kg)
American Hard-Shell Clam	1.00
Manila Clam	20.00
Mixed Clams	12.80

2.4.5 **Recorded Offences within the SPA**

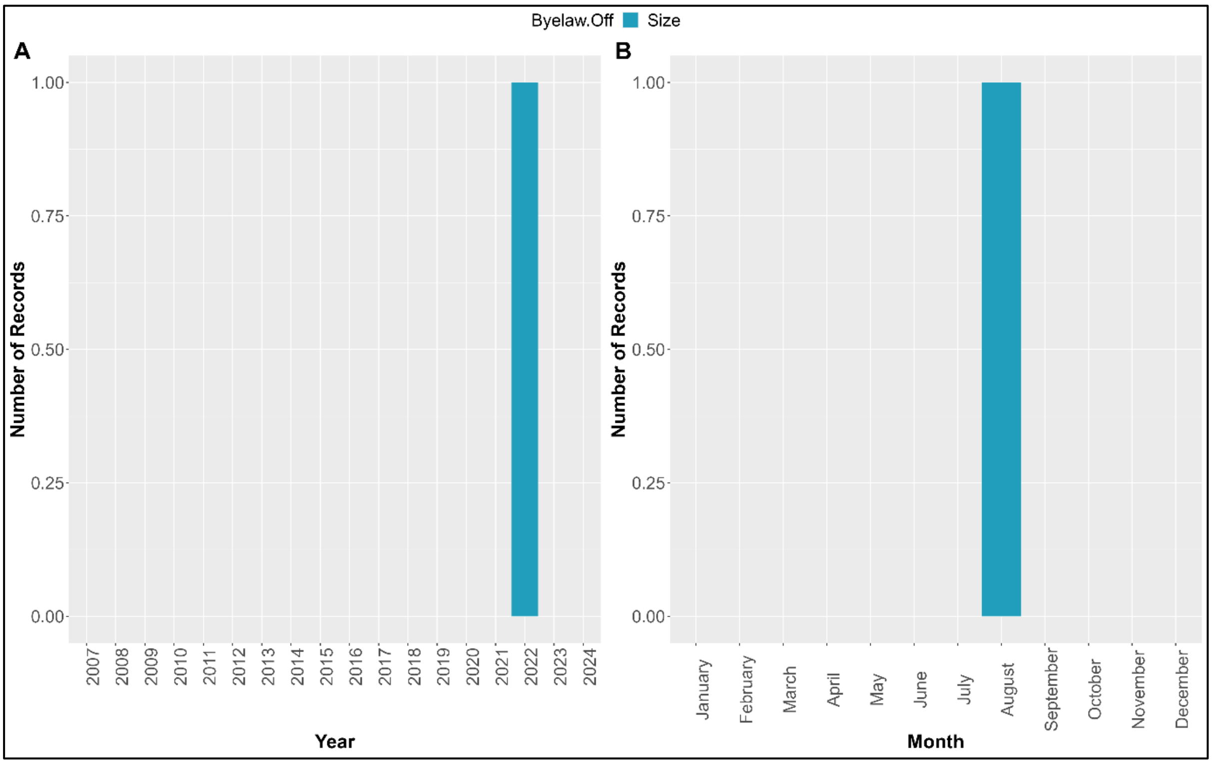

Figure 30 Recorded offences and the theme of infringement in the Chichester and Langstone Harbour SPA.

There has been only one recorded offence associated with shore gathering activity in the Chichester and Langstone Harbour SPA. The offence is displayed in Figure 30 and relates to a MCRS infringement.

3. Special Areas of Conservation (SAC)

3.0 <u>Lyme Bay and Torbay SAC</u>

3.0.1 **Qualifying Features of the SAC**

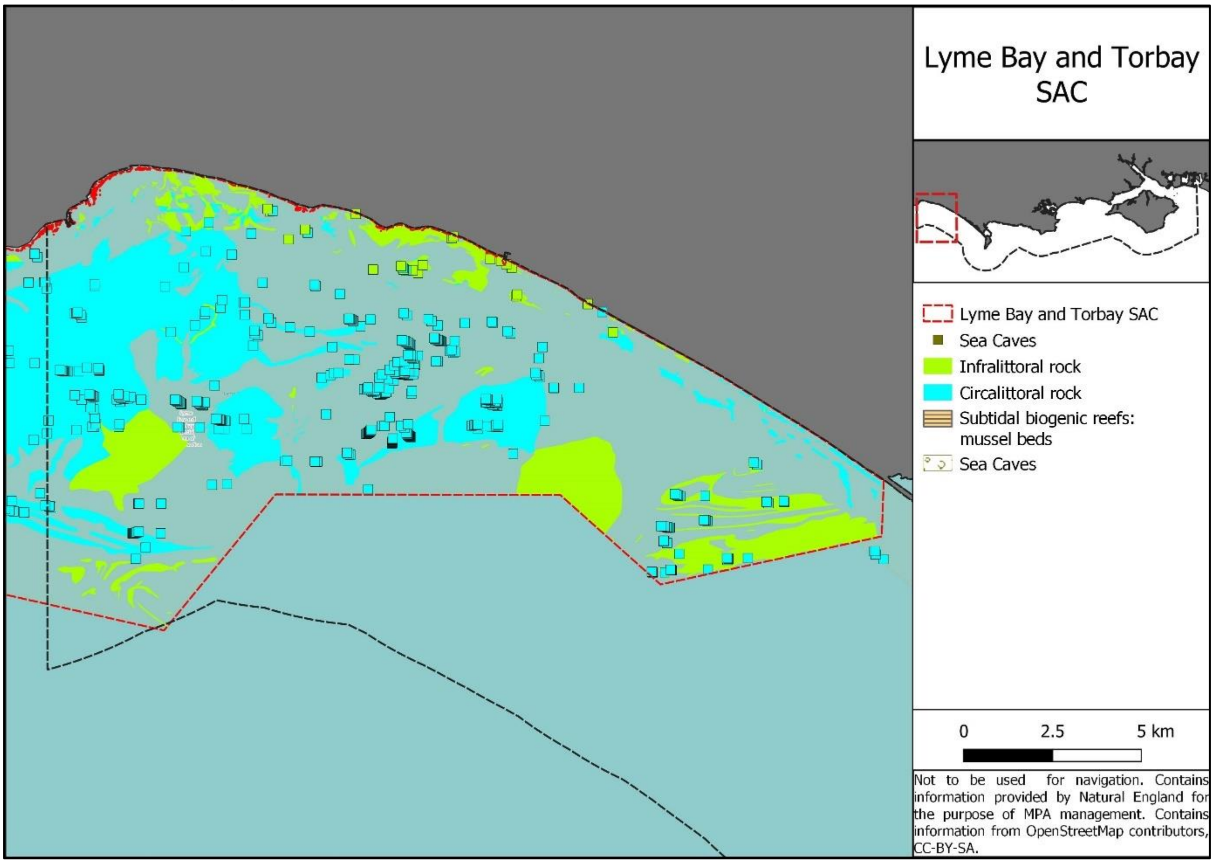

Figure 31 The location and extent of the supporting habitats of the Lyme Bay and Torbay SAC (boundary shown by the dashed red line).

The Lyme Bay and Torbay SAC cover an area of 31 km^2; the SAC overlays the Devon & Severn and Southern IFCA boundary. The area within the Southern IFCA district encloses the Lyme Bay Reefs[9]. The qualifying features of the SAC are displayed in Figure 31 and Table 17.

Table 17 Qualifying Features of the Lyme Bay and Torbay SAC.

Qualifying Features	Reefs
	Submerged or Partially submerged sea caves

3.0.2 **Shore Gathering activity in the SAC**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Lyme Bay and Torbay SAC.

[9] https://designatedsites.naturalengland.org.uk/

3.0.3 **Recorded catches within the SAC**

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Lyme Bay and Torbay SAC.

3.0.4 **Recorded Offences within the SAC**

As of October 2023, there has been no recorded offences linked to shore gathering activities occurring in Lyme Bay and Torbay SAC.

3.1 Chesil and the Fleet SAC

3.1.1 **Qualifying Features of the SAC**

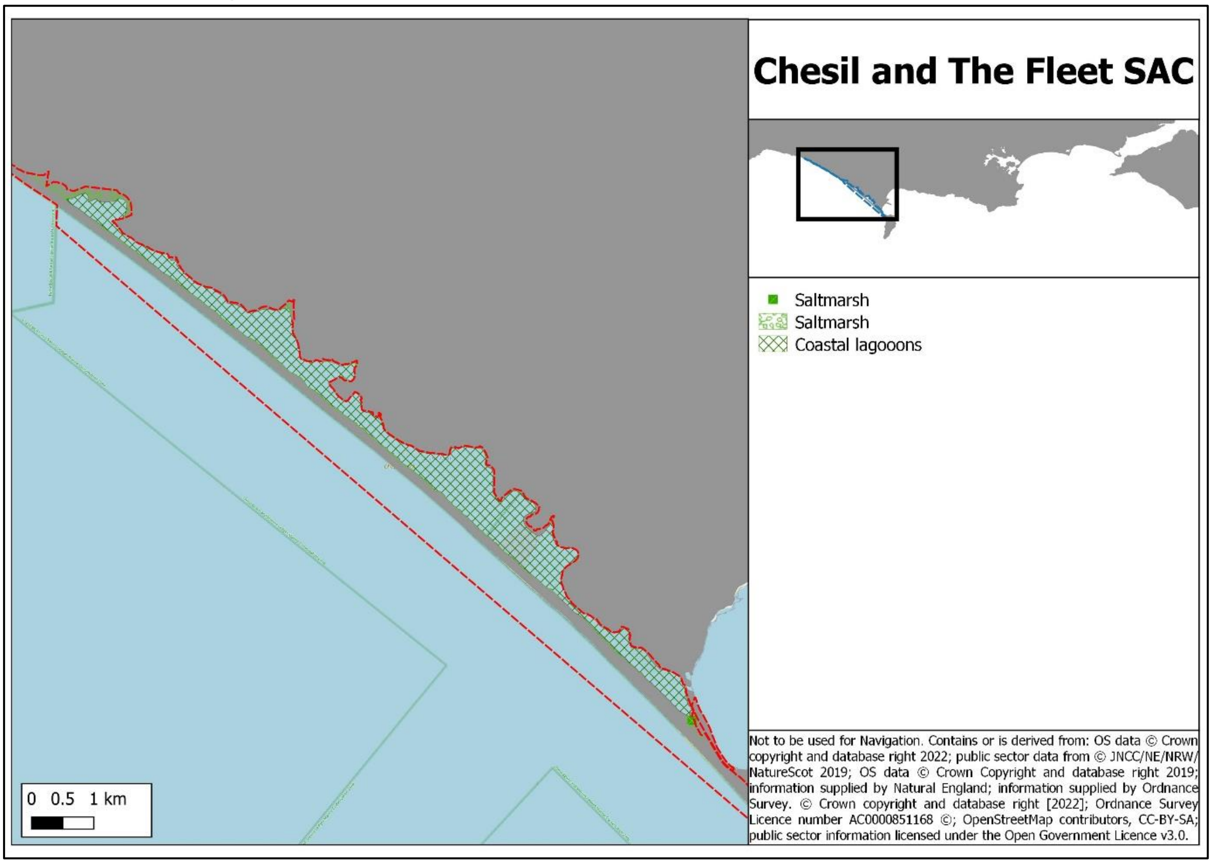

Figure 32 The location and extent of the supporting habitats of the Chesil and The Fleet SAC (boundary shown by the dashed red line).

The Chesil and the Fleet SAC covers an area of 16 km^2. The Fleet supports the largest diversity of species and habitat of any coastal lagoon in the UK [10] and aside from the entrance at the southeastern end, The Fleet is largely sheltered from waves and tidal processes[11]. The qualifying features and their supporting habitats are displayed in Figure 32 and Table 18.

[10] Bamber, R. N. 1997. Assessment of saline lagoons within Special Areas of Conservation (SACs). Peterborough: English Nature.
[11] https://designatedsites.naturalengland.org.uk/

Table 18 The qualifying features of Chesil and the Fleet SAC.

Qualifying Features	Annual vegetation of drift lines
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
	Coastal lagoons
	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)
	Perennial vegetation of stony banks

3.1.2 **Existing Shore Gathering Management Specific to the SAC**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of 29 prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 29 are within the Chesil and the Fleet SAC.

3.1.3 **Shore Gathering activity in the SAC**

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Chesil and The Fleet SAC.

Information provided by Natural England indicates that bait digging, cockle raking, and crab tiling have taken place within the site. No information is provided on the specific location or date when this activity was observed.

3.1.4 **Recorded catches within the SAC**

As of October 2023, there has been no evidence available on the level of catch associated with shore gathering activities occurring in the Chesil and The Fleet SAC.

3.1.5 **Recorded Offences within the SAC**

As of October 2023, there have been no recorded offences related to shore gathering activities in the Chesil and The Fleet SAC.

3.2 Studland to Portland SAC

3.2.1 Qualifying Features of the SAC

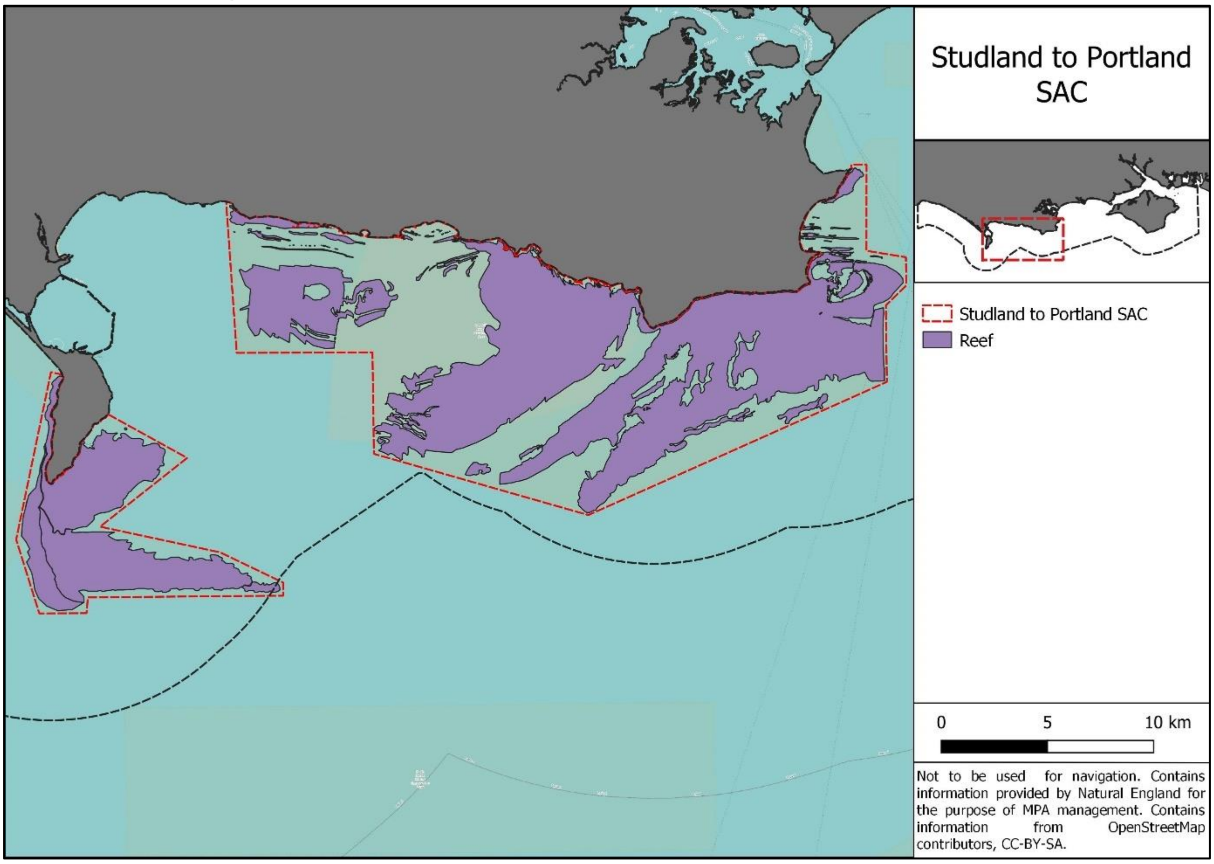

Figure 33 The location and extent of the supporting habitats of the Studland to Portland SAC (boundary shown by the dashed red line).

The Studland to Portland SAC has covers the area from Studland Bay to Ringstead Bay as well as the area covering the Portland Reefs[12]. The total area covered by the SAC is 332 km^2 and the qualifying features are displayed in Figure 33 and Table 19.

Table 19 Qualifying features of the Studland to Portland SAC.

Qualifying Features	Reefs

3.2.2 Shore Gathering activity in the SAC

As of October 2023, there has been no evidence available on the location of shore gathering activities occurring in the Lyme Bay and Torbay SAC.

3.2.3 Recorded catches within the SAC

As of October 2023, there has been no evidence available on the catch composition of shore gathering activities occurring in the Studland to Portland SAC.

3.2.4 Recorded Offences within the SAC

As of October 2023, there has been no recorded offences linked to shore gathering activities occurring in Studland to Portland SAC.

[12] https://designatedsites.naturalengland.org.uk/

3.3 Solent Maritime SAC

3.3.1 Qualifying Features of the SAC

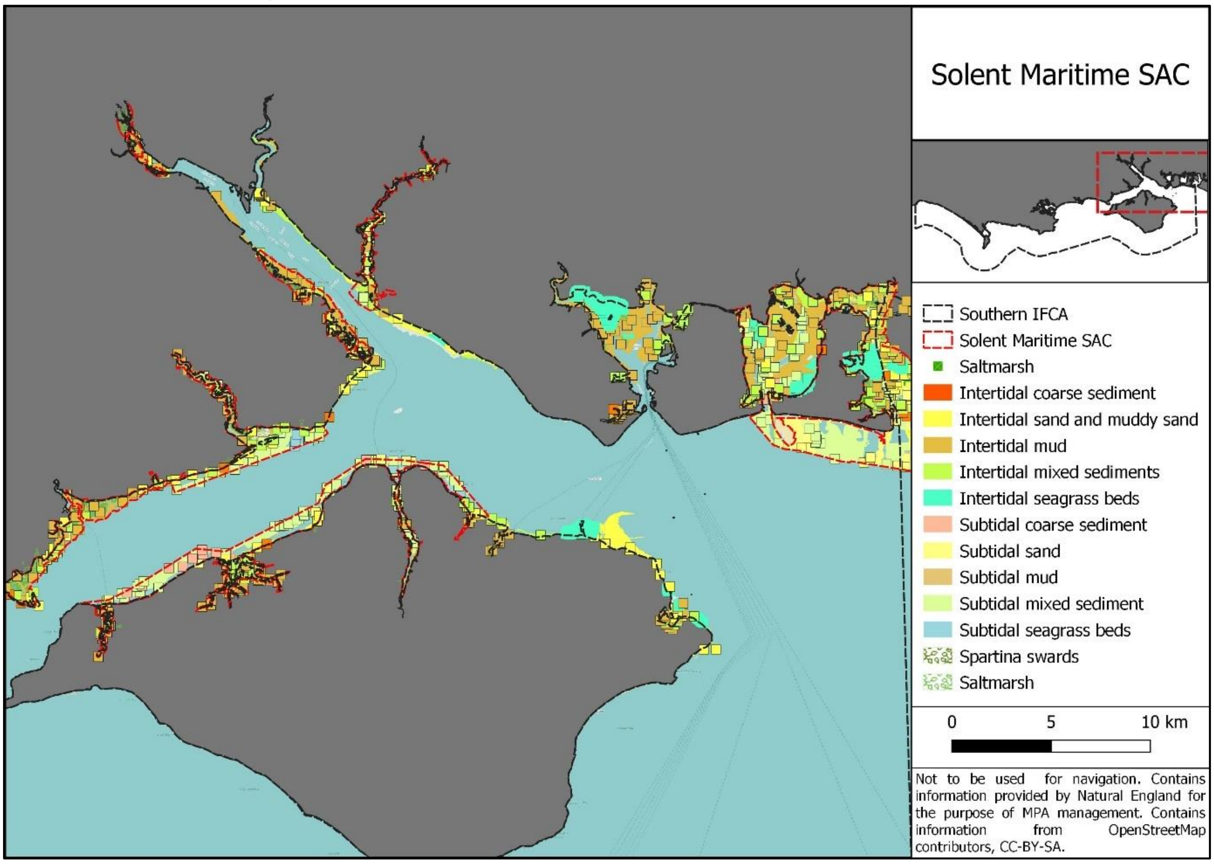

Figure 34 The location and extent of the supporting habitats of the Solent Maritime SAC (boundary shown by the dashed red line).

The Solent Maritime SAC covers a broad range of estuarine and marine habitats and an area of 113 km^2 [13]. The qualifying features are displayed in Figure 34 and Table 20.

Table 20 Qualifying features of the Solent Maritime SAC.

Qualifying Features	Annual Vegetation Of Drift Lines
	Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)
	Coastal Lagoons
	Desmoulin's Whorl Snail (*Vertigo moulinsiana*)
	Estuaries
	Mudflats And Sandflats Not Covered By Seawater At Low Tide
	Perennial Vegetation Of Stony Banks
	Salicornia And Other Annuals Colonising Mud And Sand
	Sandbanks Which Are Slightly Covered By Sea Water All The Time

[13] https://designatedsites.naturalengland.org.uk/

	Shifting Dunes Along The Shoreline With *Ammophila arenaria* ("White Dunes")
	Spartina Swards (*Spartinion maritimae*)

3.3.2 **Existing Shore Gathering Management Specific to the SAC**

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No person shall dig for or take sea fisheries resources from any prohibited area nor be in the prohibited areas with a rake, spade, fork, or similar tool. Areas 23-25 are within or overlap the Solent Maritime SAC.

3.3.3 **Shore Gathering activity in the SAC**

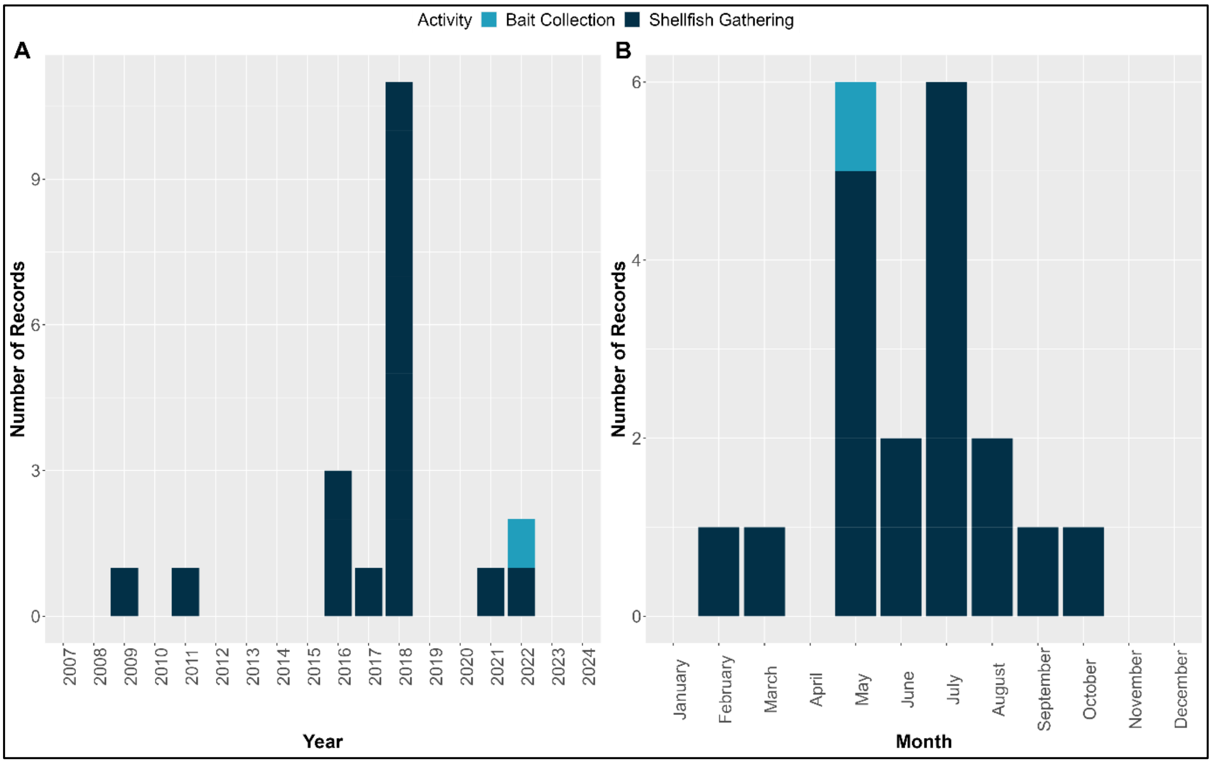

Figure 35 Records of shore gathering activity occurring in the Solent Maritime SAC.

Figure 35 displayed the annual and monthly trends in shore gathering activity. The most popular activity is shellfish gathering with peak in 2018 and the month of July.

Figure 36 displays the spatial distribution of all shore gathering activity observed by Southern IFCA in the Solent Maritime SAC as of October 2023. The SAC overlaps with the Solent and Southampton Water SPA as well as the Chichester and Langstone Harbours SPA, therefore the areas with highest density of activity are the same; Hill Head and between Chaldock Lake and Broadmarsh Coastal Park.

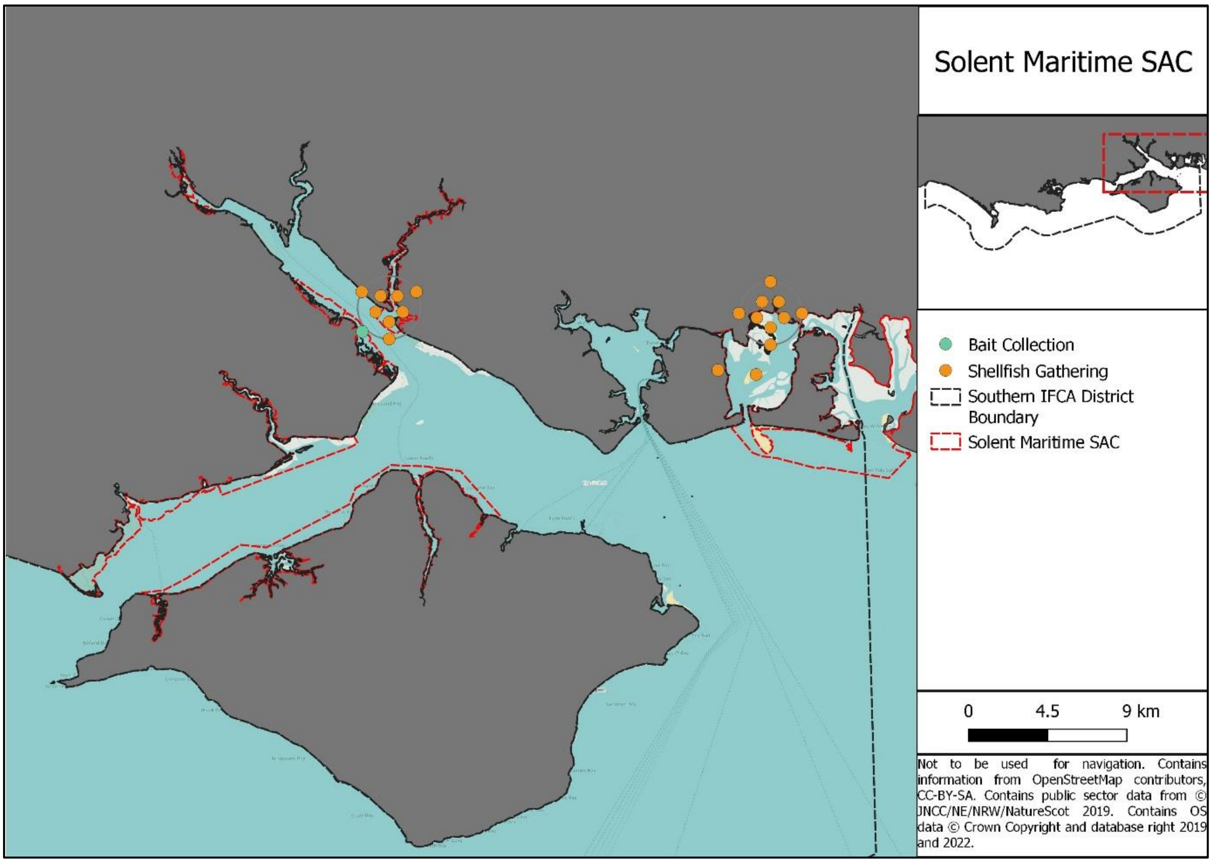

Figure 36 Spatial distribution of all shore gathering activity observed by Southern IFCA in the Solent Maritime SAC (boundary shown by the dashed red line) as of October 2023.

3.3.4 Recorded catches within the SAC

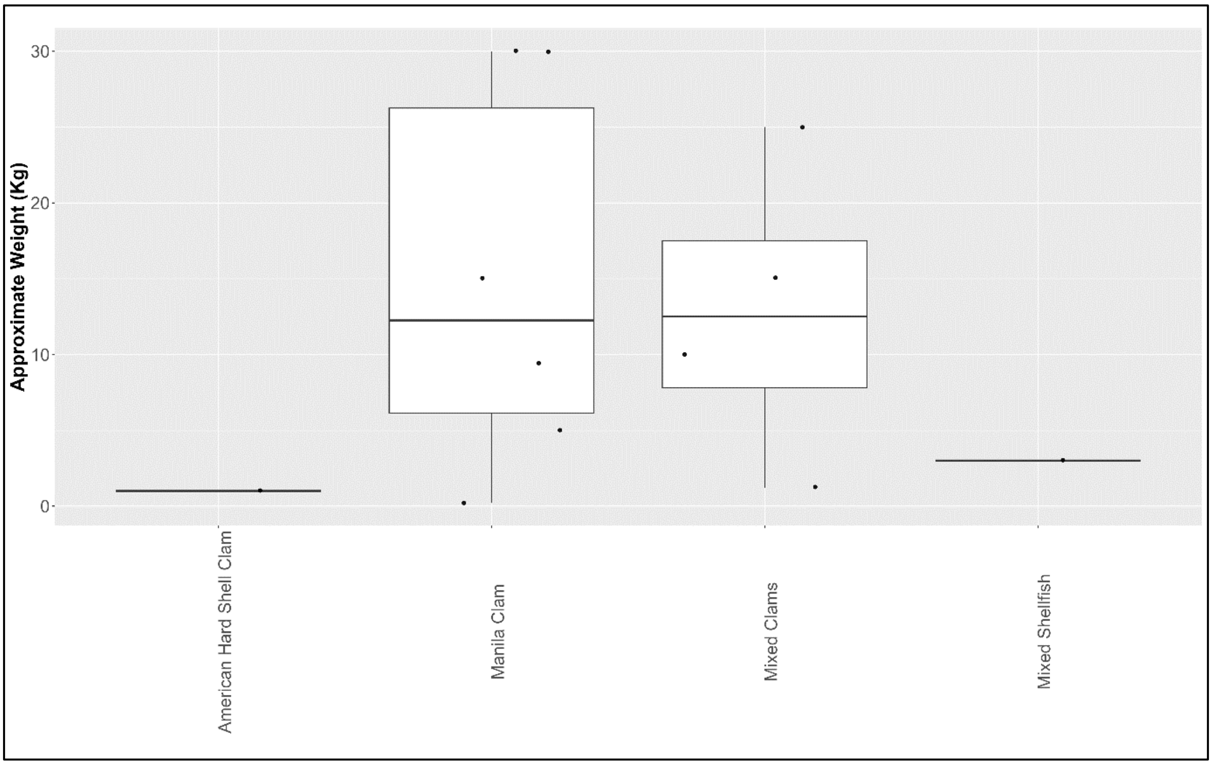

Figure 37 Approximate weight of catch associated with shore gathering activity in the Solent Maritime SAC.

Figure 37 and Table 21 display a summary of catch weights recorded in the Solent Maritime SAC.

Table 21 The mean weight of recorded catches associated with shore gathering activity in the Solent Maritime SAC.

Species	Mean Weight (kg)
American Hard-Shell Clam	1.00
Manila Clam	14.95
Mixed Clams	12.80
Mixed Shellfish	3.00

3.3.5 Recorded Offences within the SAC

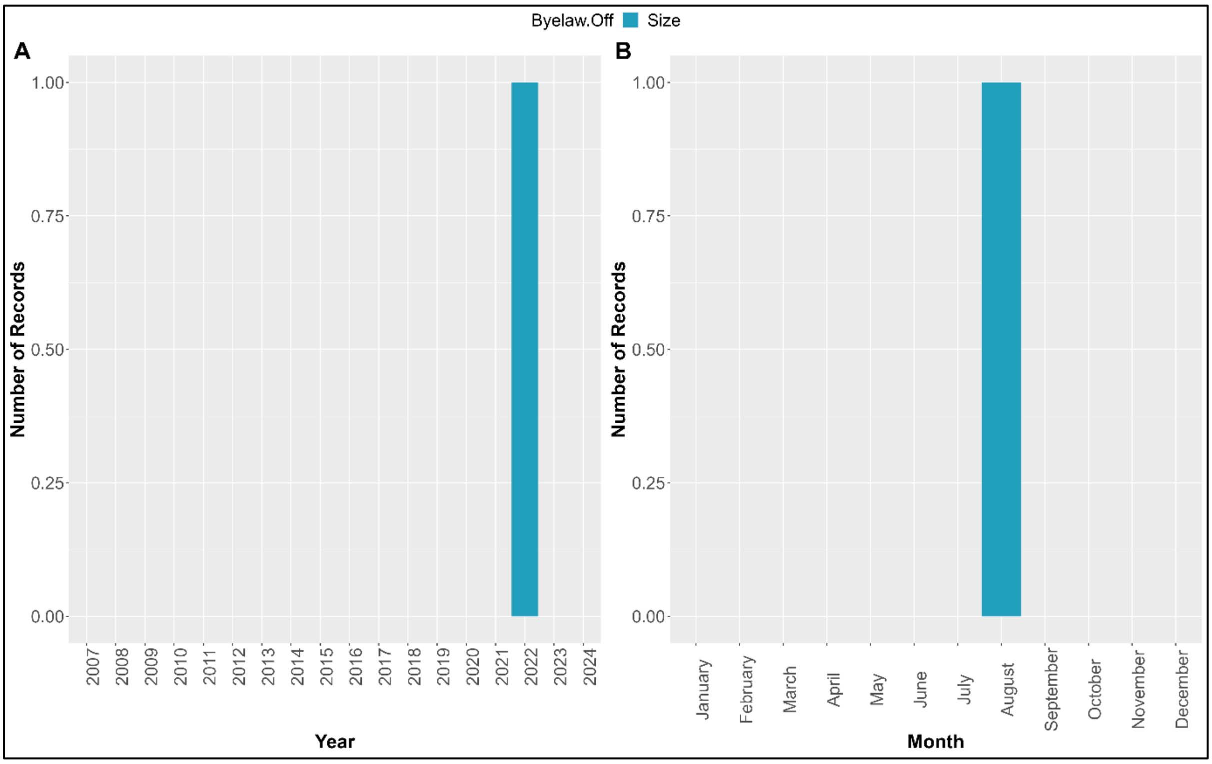

Figure 38 Recorded offences and the theme of infringement in the Solent Maritime SAC.

There has been one recorded offence in the Solent Maritime SAC (Figure 38). This occurred in August 2022 and was a MCRS related infringement related to shore gathering activity.

3.4 South Wight Maritime SAC

3.4.1 Qualifying Features of the SAC

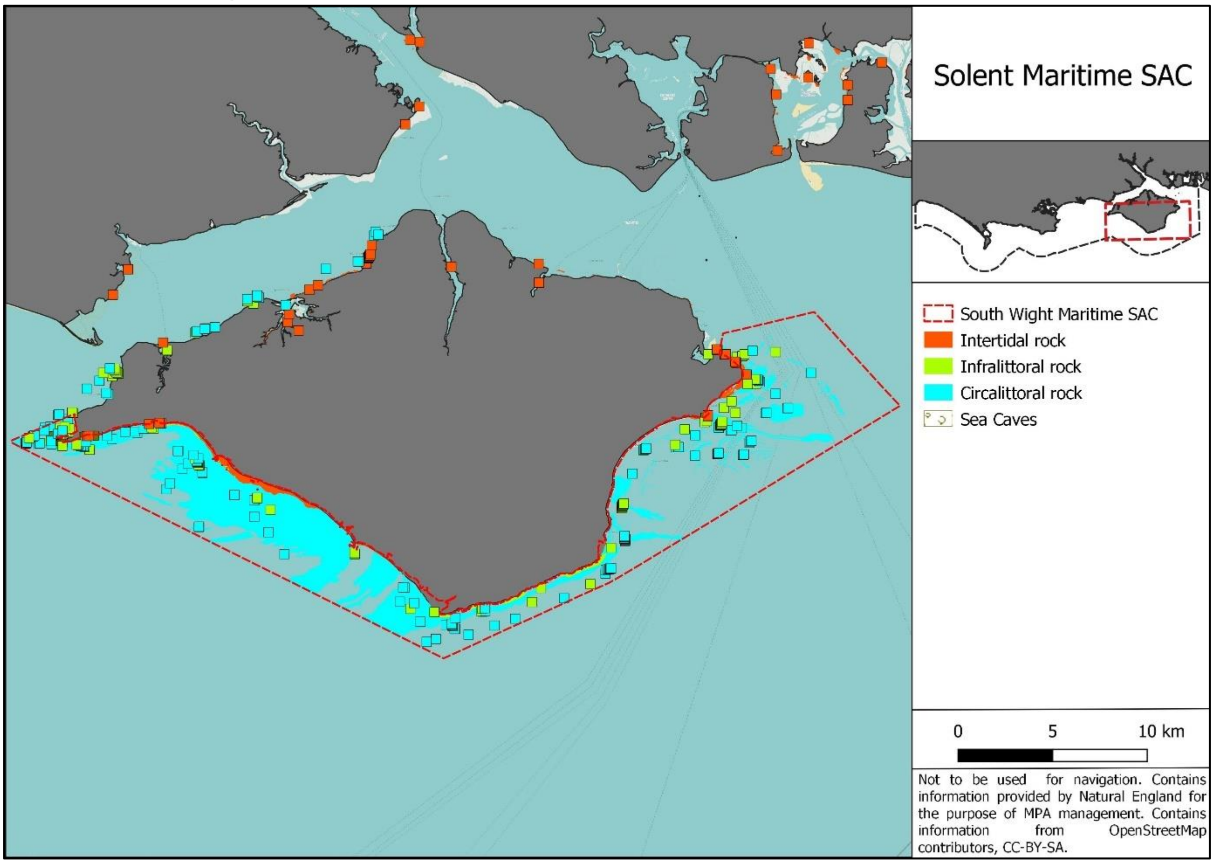

Figure 39 The location and extent of the supporting habitats of the South Wight Maritime SAC (boundary shown by the dashed red line).

The South Wight Maritime SAC covers an area of 199 km^2, running the full length of the south coast of the Isle of Wight from The Needles to Bembridge. The area covers extensive reef and sea cave systems[14]. The qualifying features of the SAC are displayed in Figure 39 and Table 22.

Table 22 Qualifying features of the South Wight Maritime SAC

Qualifying Features	Submerged or partially submerged sea caves
	Vegetated sea cliffs of the Atlantic and Baltic coasts
	Circalittoral Rock
	Infralittoral Rock
	Intertidal Rock
	Subtidal Stony Reef

3.4.2 Existing Shore Gathering Management Specific to the SAC

The Prohibition of Gathering (Sea Fisheries Resources) in Seagrass Beds Byelaw defines a schedule of twenty-nine prohibited areas within the district to protect seagrass beds. No

[14] https://designatedsites.naturalengland.org.uk/

person shall dig for or take sea fisheries resources from any prohibited area. Areas 17-19 are within or overlap the South Wight Maritime SAC.

3.4.3 Shore Gathering activity in the SAC

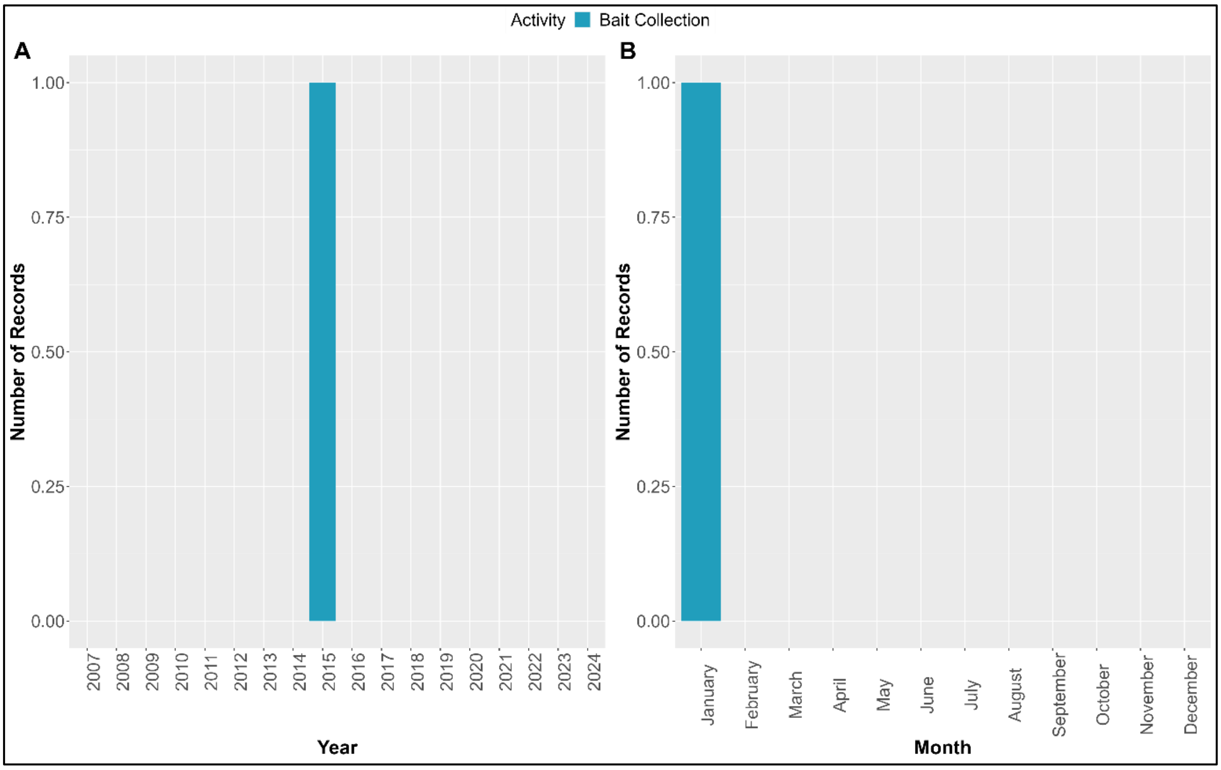

Figure 40 Records of shore gathering activity occurring in the South Wight Maritime SAC.

Figure 40 displays the only recorded occurrence of shore gathering activity in the South Wight Maritime SAC. This was bait digging and occurred in January 2015. Figure 41 displays the location of this activity.

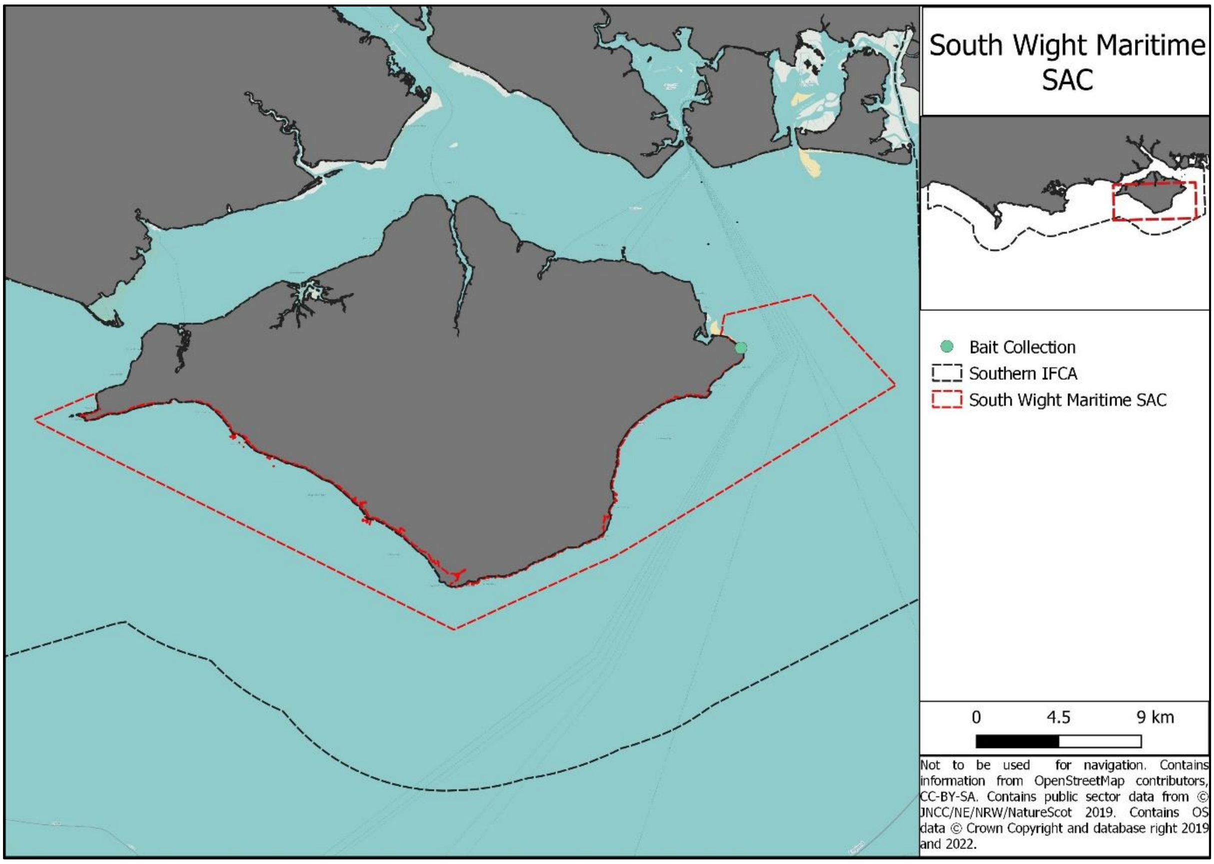

Figure 41 Spatial distribution of all shore gathering activity observed by Southern IFCA in the South Wight Maritime SAC (boundary shown by the dashed red line) as of October 2023.

3.4.4 **Recorded catches within the SAC**

As of October 2023, there has been no evidence available on the level of catch associated with shore gathering activities occurring in the South Wight Maritime SAC.

3.4.5 **Recorded Offences within the SAC**

As of October 2023, there have been no recorded offences related to shore gathering activities in the South Wight Maritime SAC.

4. Combined MPA Summary of Activity, Catch and Offences

4.0 Shore Gathering activity in all relevant MPAs

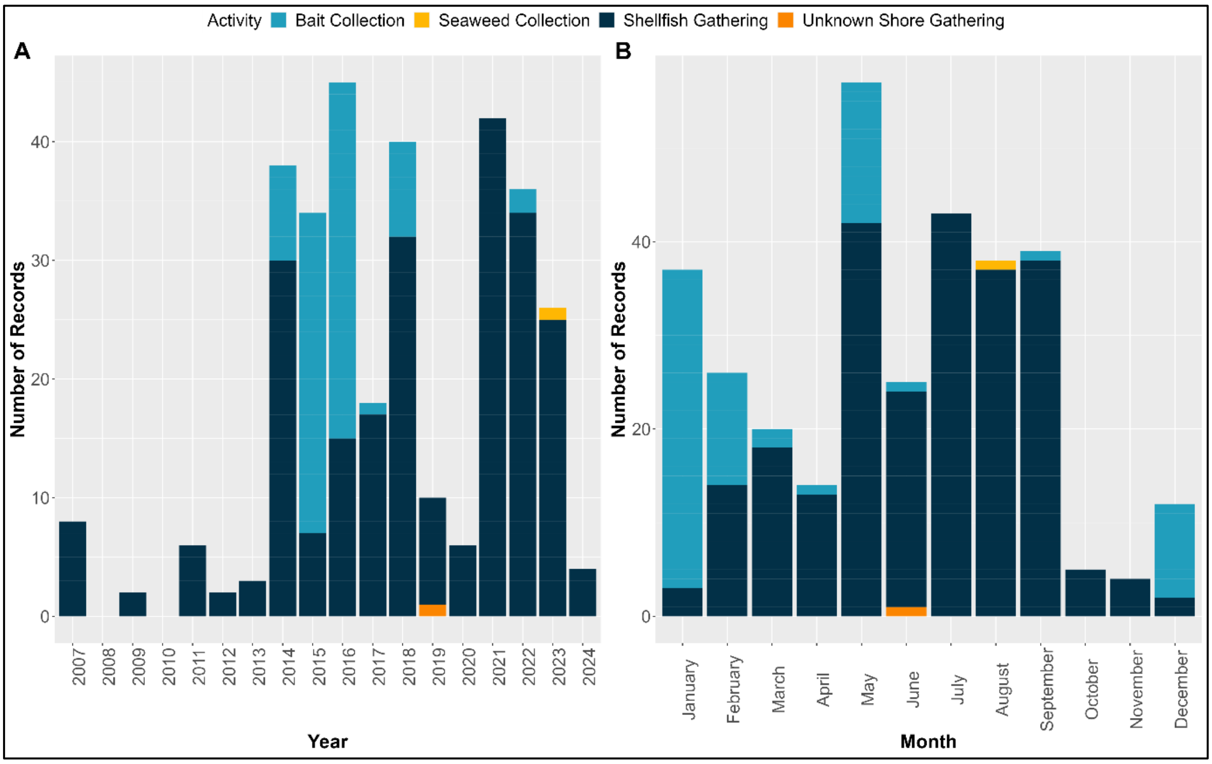

Figure 42 Information on shore gathering activity across the district.

Error! Reference source not found.contains information on all shore gathering activity occurring within National Site Network Sites across the Southern IFCA District. Shore Gathering activity appears to peak in 2016 and 2021, with shellfish gathering being the most popular activity, followed by bait digging. Shore gathering activity most commonly occurs in the summer months from May to September.

4.1 Recorded catches in all relevant MPAs

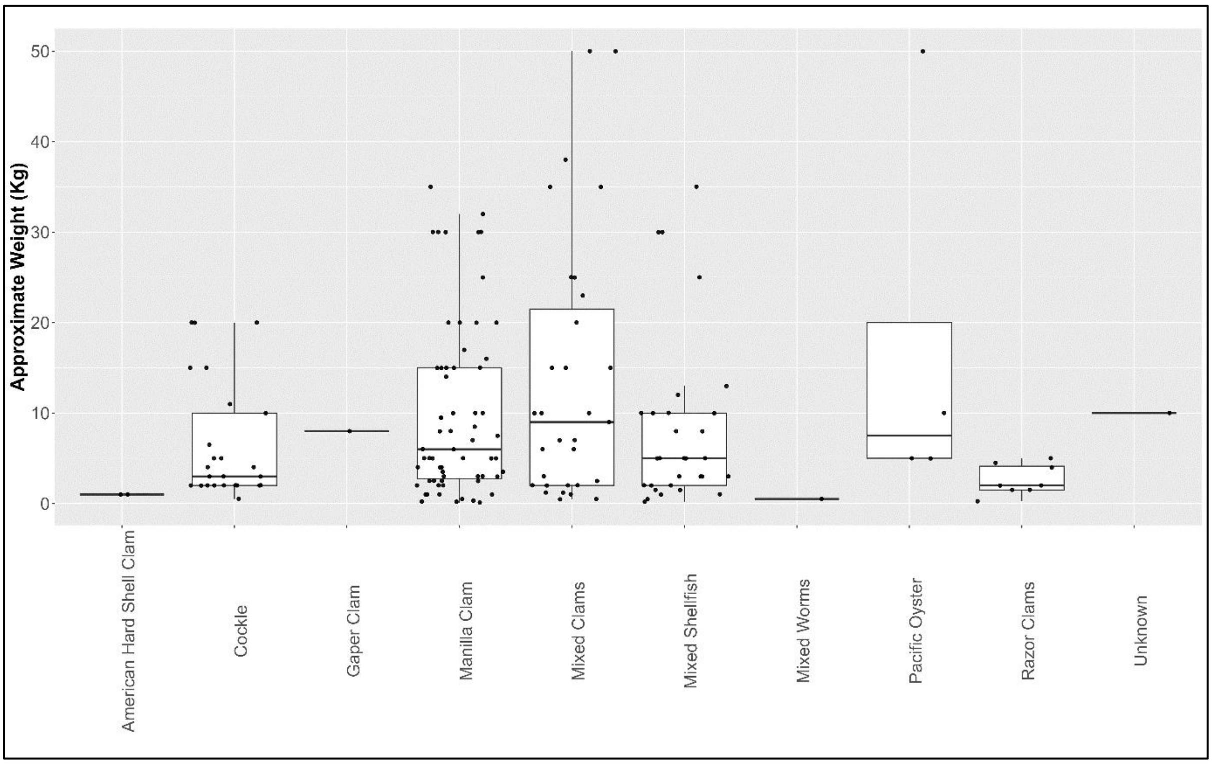

Figure 43 Approximate weight of catch associated with shore gathering activity across all MPAs in the district.

Figure 43 and Table 23 display a summary of catch weights recorded across all MPAs in the district.

Table 23 The mean weight of recorded catches associated with shore gathering activity in the Solent Maritime SAC.

Species	Mean Weight (kg)
American Hard-Shell Clam	1.00
Cockle	6.52
Gaper Clam	8.00
Manilla Clam	9.94
Mixed Clams	13.83
Mixed Shellfish	8.32
Mixed Worms	0.50
Pacific Oyster	17.50
Razor Clams	2.59
Unknown	10.00

4.2 Recorded Offences in all MPAs

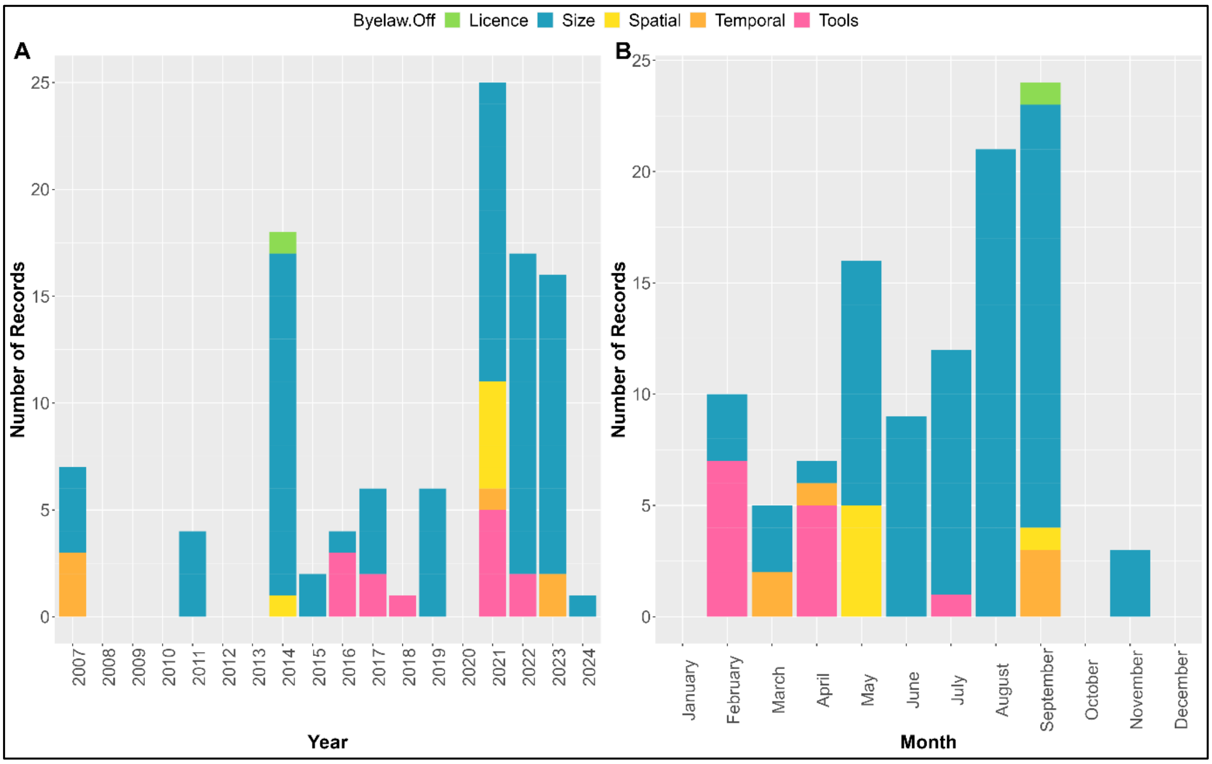

Figure 44 Recorded offences and the theme of infringement across all MPAs in the district.

Figure 44 displays a summary of shore gathering related offences within the district. The most common offences relate to MCRS. Peaks in offences occurred in 2021 increase through the summer months from July to September.

5. District Wide Management Relating to Shore Gathering

Table 24 Current district wide Management relating to Shore Gathering as of October 2023

Byelaw	**Description**
Minimum Conservation Reference Size Byelaw	*A person must not take, retain on board, tranship, land, transport, store, sell, display, or offer for sale from a fishery within the District, any fish or shellfish species specified in the schedules which measure less than the minimum conservation reference size specified in the schedule. Any such fish or shellfish must be returned to the sea immediately.*
Periwinkles Byelaw	*No person shall take from a fishery any periwinkles between the 15th May and 15th September inclusive. No person shall take periwinkles except by hand picking.*
Oysters Close Season Byelaw	*No person shall take oysters from a fishery from 1st March to 31st October in any year, both days inclusive. Oyster cultivation exceptions apply. This applies to Native Oysters only.*

Temporary Closure of Shellfish Beds Byelaw	*Where any shellfish bed is depleted and requires closure to recover, the Committee may establish a temporary shellfish bed closure, wherein no person may take shellfish from the defined shellfish bed*
Fishing for Cockles	*A person must not take from a fishery a cockle between 1st February and 30th April inclusive. A person must not remove a cockle from a fishery, unless complying with the gear restrictions and minimum size requirements.*
Fishing for Oysters, Mussels, and Clams Byelaw	*Oysters, Mussels, and Clams may only be fished for by handpicking or dredging.*
Scallop Fishing Byelaw 2019	*No person may fish for or take any scallop from a fishery before 0700 and after 1900 local time. This does not apply in The Solent, where a person must not fish for or take any scallop from any fishery on any day before 0600 local time or after 1800 local time.*
Oysters	*No person shall remove an oyster (other than Portuguese or Pacific Oysters) that will pass through a circular ring of 70mm diameter or any cultch for young Oysters to grow on.*
Mussels	*No person shall remove from a fishery a mussel measuring less than 50mm in length. Mussel cultivation exceptions apply with permission from Southern IFCA.*
Redeposit of Shellfish	*Any person who takes shellfish from a fishery within the Southern IFCA district where the removal or possession of it is prohibited, should return the shellfish to the fishery, as near as possible to the place it was taken.*

MARKED B_ANNEX 7

Southern Inshore Fisheries and Conservation Authority

Shore Gathering Literature Review

Supporting Document for the Shore Gathering Byelaw

Contents

Section A: Introduction to the Literature Review

This Literature Review is a supporting document for the development of management for shore gathering activities in the Southern IFCA district.

This document uses best available evidence, namely peer-reviewed papers and reports, to ensure that sound scientific evidence is used to inform assessments of relevant activities. The Literature Review is provided in two sections, general impacts which relate to multiple activities and potential impacts which relate to a specific shore gathering activity. Under the sections for specific activities, an overview is also provided of how that activity is carried out. The document also highlights where specific studies have been carried out and whether these have been conducted in the UK or outside the UK.

Summary boxes have been provided at the end of each section to give an overview of the section's content and key points.

This Literature Review is to be read in conjunction with the Southern IFCA Shore Gathering Review Conservation Assessment Package and Site Specific Evidence Package.

Section B: Literature Review

1. Potential Impacts from Shore Gathering Activities - General

1.1 Overview

- The gathering of fish and shellfish species has been carried out commercially and recreationally along the Dorset, Hampshire and Isle of Wight coasts for centuries.
- Harvesting consists of the removal of target species at low tide, either in selective collection such as hand gathering or collective harvesting using rakes or mechanical power.
- Frequently gathered species within the Southern IFCA District include the Manila Clam (*Ruditapes philippinarum),* the common cockle (*Cerastoderma edule),* Pacific oysters (*Magallana gigas)* and the bait worm species King ragworm (*Alitta virens*) and lugworm (*Arenicola marina*).
- Shore gathering activities which occur or have the potential to occur in the district are; bait digging/gathering, shellfish gathering, crab tiling, push netting, seaweed collection and mechanical harvesting (commonly for bait species but also potentially for shellfish species).

1.2 Removal of Target Species

- The removal of target species in shore gathering techniques reduces the target species population in the area. Species recoverability is determined by a number of characteristics including magnitude of pressure, species fecundity, environmental conditions, human interaction and life cycle (Hutchings, 2000; Kaiser *et al.,* 2006; Lotze, 2011).

- Similarly, removal of species can disrupt ecosystem balance and impact community structure. As a result, other species display fluctuations, dominant species may alter and habitat structure may change (Turner *et al.,* 1999; Rice, 2000; Kaiser *et al.,* 2000; Dernie *et al.,* 2003; Rossi *et al.,* 2007).
- Harvesting structurally significant species, such as kelps, causes habitat structural changes which may alter light availability throughout the water column and affect potential nursing and breeding sites. (Connolly, 1994; Auster and Langton, 1999; Turner *et al.,* 1999).
- Removal of target species has the potential to affect prey availability for predatory species, such as birds. This affects higher trophic levels via non-targeted removal (Tasker *et al.,* 2000; Sieben *et al.,* 2011; Montevecchi, 2023) and through the disruption of predator-prey interactions which may impact community compositions. For example, the removal of small bivalves and crustaceans can reduce foraging opportunities for shorebirds and fish (Navedo *et al.,* 2008).
- Changes in prey availability can cause shifts in the location of populations of predator species. For example, bird species may move to areas where harvesting of prey species does not take place which could then lead to increased bird densities in these areas (Sutherland & Goss-Custard 1991; Goss-Custard and Verboven, 1993).
- A meta-analysis of studies on hand gathering techniques (and other fishing methods) found that data from the first 10 days following a disturbance showed a significant reduction in the abundance of annelids, however it was also noted that annelid worms and crustaceans appear to recover more quickly in comparison to molluscs (Clarke *et al.,* 2017). This was postulated to be related to sediment preferences and the relatively sedentary nature of molluscs compared to annelids and crustaceans where there is the potential for recolonisation of an area through adult migration as well as larval dispersal (Clarke *et al.,* 2017). It was noted that the localised nature of hand gathering activities would create an impact over a much smaller scale than other fishing activities but that the initial impact may be observed deeper within the sediment as hand worked equipment will often penetrate deeper than dredges (Clarke *et al.,* 2017).

Summary

- Direct removal of target species has the potential to lead to population declines of those species, in which recoverability is based on a number of conditions including magnitude of pressure, species fecundity, life cycle, human interactions and environmental conditions.
- Removal of target species may disrupt ecosystem balance and lead to impacts to other species populations, habitat changes and impact community structure. For example, predatory prey interactions may change, resulting in a change in behaviour of the predator species.
- Removal of structural species as seaweeds can alter habitat structure, which may impact the distribution of light throughout the water column and affect potential nursery and breeding sites.
- Impacts are species specific both in terms of the target species itself and the impact on any predatory species. Recovery is also species specific and is likely related to habitat type and methods of recolonisation by each species.

References for Sections 1.1 and 1.2

Auster, P.J. and Langton, R.W., 1999. The effects of fishing on fish habitat. In *American Fisheries Society Symposium* 22, pp: 150-187

Clarke L.J., Hughes K.M., Esteves L.S., Herbert R.J.H. and Stilman R.A. 2017. Intertidal invertebrate harvesting: a meta-analysis of impacts and recovery in an important waterbird prey resource. *Marine Ecology Progress Series*. Vol 584: 229-244.

Connolly, R.M., 1994. Removal of seagrass canopy: effects on small fish and their prey. *Journal of Experimental Marine Biology and Ecology*, *184*(1), pp.99-110.

Dernie, K.M., Kaiser, M.J., Richardson, E.A. & Warwick, R.M. 2003. Recovery of soft sediment communities and habitats following physical disturbance. *Journal of Experimental Marine Biology and Ecology*. 285-286: pp 415-434.

Ferns, P.N., Rostron, D.M. & Sima, H.Y. 2000. Effects of mechanical cockle harvesting on intertidal communities. *J. Appl. Ecol*., 37. Pp 464-474.

Goss-Custard, J. D. & Verboven, N., 1993. Disturbance and feeding shorebirds on the Exe estuary. *Wader Study Group Bull,* 68 pp:59-66.

Hutchings, J.A., 2000. Collapse and recovery of marine fishes. *Nature, 406(6798)*, pp.882-885.

Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C., Somerfield. P.J. and Karakassis, I., 2006. Global analysis of response and recovery of benthic biota to fishing. *Marine Ecology Progress Series, 311,* pp. 1-14.

Kaiser, M.J., Ramsay, K., Richardson, C.A., Spence, F.E. and Brand, A.R., 2000. Chronic fishing disturbance has changed shelf sea benthic community structure. *Journal of Animal Ecology*, *69*(3), pp.494-503.

Lotze, H.K., Coll, M., Magera, A.M., Ward-Paige, C. and Airoldi, L., 2011. Recovery of marine animal populations and ecosystems. *Trends in ecology & evolution*, *26*(11), pp.595-605.

Montevecchi, W.A., 2023. Interactions between fisheries and seabirds: Prey modification, discards, and bycatch. In *Conservation of Marine Birds* (pp. 57-95). Academic Press.

Navedo, J.G. & Masero, J.A. 2008. Effects of traditional clam harvesting on the foraging ecology of migrating curlews (*Numenius arquata*). *J. Exp. Mar. Biol. Ecol*., 355 (1) pp: 59-65.

Rice, J.C., 2000. Evaluating fishery impacts using metrics of community structure. *ICES Journal of marine Science*, *57*(3), pp.682-688.

Rossi, F., Forster, R.M., Montserrat, F., Ponti, M., Terlizzi, A., Ysebaert, T. & Middleburg, J.J. 2007. Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. *Mar. Bio*l. 151: 2077-2090.

Sieben, K., Rippen, A.D. and Eriksson, B.K., 2011. Cascading effects from predator removal depend on resource availability in a benthic food web. *Marine Biology*, *158*, pp.391-400.

Sutherland, W.J. & Goss-Custard, J.D. 1991. Predicting the consequences of habitat loss on shorebird populations. *Acta Congressus Internationalis Ornithologica*, 20, 2199-2207

Tasker, M.L., Camphuysen, C.J., Cooper, J., Garthe, S., Montevecchi, W.A. and Blaber, S.J., 2000. The impacts of fishing on marine birds. *ICES journal of Marine Science*, *57*(3), pp.531-547.

Turner, S.J., Thrush, S.F., Hewitt, J.E., Cummings, V.J. and Funnell, G., 1999. Fishing impacts and the degradation or loss of habitat structure. *Fisheries Management and Ecology*, *6*(5), pp.401-420.

Turner, S.J., Thrush, S.F., Hewitt, J.E., Cummings, V.J. and Funnell, G., 1999. Fishing impacts and the degradation or loss of habitat structure. *Fisheries Management and Ecology*, *6*(5), pp.401-420.

1.3 Removal of non-target species

- Certain methods of shore-gathering have the potential to remove or disrupt non-target species, which play roles in intertidal food webs and support ecosystem biodiversity (Nunes *et al*., 2011).
- Harvesting can cause sediment disturbance, resulting in the removal, damage, or mortality of epifauna and infauna in the surrounding sediment (Dernie *et al.,* 2003; Rossi *et al.,* 2007). This also applies to the exposure and excavation of individuals that are found below the surface of the substratum (Clarke *et al.,* 2017).
- Some species may not be returned to the sediment following harvesting. For example, small species such as those in the larval phase may be attached to species such as kelps (McAllen, 1999).
- The timescale of recovery for benthic communities is largely dependent on sediment type, associated fauna and the rate of natural disturbance (Roberts *et al.,* 2010).
- In locations where natural disturbance levels are high, the associated fauna is characterised by species adapted to withstand and recover from disturbance (Collie *et al.,* 2000; Roberts *et al.,* 2010).
- Non-target species found in more stable habitats, which are often distinguished by high diversity and epifauna, are likely to take a greater time to recover (Roberts *et al.,* 2010).
- Many studies have found that meiofauna exhibit a different response to disturbance than macrofauna. Some meiofauna show very little, or short-term effects of disturbance, whilst others can utilise increases in resources and benefit from disturbance (Wynberg & Branch 1994; Sherman *et al*., 1980; Wynberg & Branch, 1997; Johnson *et al*., 2007). Turbellarians significantly increased after digging and remained above control levels for 35 days (Wynberg & Branch, 1994). However, copepods and polychaetes were significantly reduced immediately after digging, and whilst numbers did bounce back approximately 10 days after the disturbance, they did not return to control levels for more than 70 days (Wynberg & Branch, 1994).
- Population recovery rates are known to be species-specific (Roberts *et al*., 2010). Long-lived bivalves will undoubtedly take longer to recover from disturbance than other species (Roberts *et al*., 2010). Megafaunal species such as molluscs and shrimp over 10 mm in size, especially sessile species, are more vulnerable to impacts of fishing gear than macrofaunal species as a result of their slower growth and therefore are likely to have long recovery periods (Roberts *et al*., 2010). Short-lived and small benthic organisms on the other hand have rapid generation times, high fecundities and therefore excellent recolonization capacities (Coen, 1995).
- Meiofauna has been found to recover quickly, within just one tidal cycle after mud had been turned over (Sherman *et al*., 1980). Some groups, such as foraminifera, even benefited from the disturbance and increased in number after digging (Sherman *et al*., 1980). Wynberg & Branch (1994) also found that meiofauna react positively to disturbance after initial declines, but they then return to control levels. On the other hand, Johnson *et al*., (2007) found that meiofauna reacted negatively to trampling on an English Mudflat. Similarly, though the recovery period for this group of species was short, between 36 and 144 hours (Johnson *et al*., 2007). Hand raking for clams led to a significantly lower nematode assemblage 12h after disturbance, however the meiofaunal community had once again recovered within 48 hours (Mistri *et al*., 2009).

- For example, the use of mechanical dredging or rakes has the potential to impact non-target with the potential for a significant removal. Despite returning non-target species, the risk of mortality is increased. It is noted that some studies on this have shown high recoverability rates of non-target species (Hall and Harding, 1997).
- Gastropods, such as *Peringia* (formally *Hydrobia*) *ulvae*, have been found to be positively affected by the presence of disturbance including digging (Carvalho *et al*., 2013; Watson *et al*., 2007).
- Effects are difficult to quantify, marine ecosystems are complicated and subject to large natural fluctuations caused by changes in parameters including temperature and tidal/current action (Gislason *et al.*, 2002). This is in addition to other human-caused impacts, for example, changes in nutrient levels. This combination of effects makes the impact of a particular fishing activity on marine species communities hard to isolate (Gislason *et al.*, 2002).

There are specific species which are designated species within the MPAs covered by the Shore Gathering Review which may be impacted as non-target species. Where general evidence on these species is available it is reported in Sections 1.3.1 and 1.3.2 below, specific evidence relating to certain pressures is presented in relevant sections.

1.3.1 Seahorse Species

- No direct evidence is available on the impact of shore gathering activities on seahorse populations.
- Seahorses spend the majority of their time attached to the substrata for example, seaweed, rock and artificial surfaces (Lorrie *et al.,* 1999; Curtis and Vincent, 2005). Seahorses are also associated with eelgrass and seagrass beds which may be impacted by shore gathering activities (see Section 1.4.1). The species is therefore most likely to be impacted through impacts to associated habitats.
- Seahorse species can be affected by physical degradation and destruction of their habitats resulting in population decline in the most extreme circumstances (Vincent *et al.,* 2011).
- Abrasion and disturbance to the surface of the substratum could result in the direct removal of seahorses attached to substrata or a decrease in populations as a result of the removal of habitat (Foster and Vincent, 2004).
- Similarly, individuals are sensitive to crushing such as during trampling in access to harvesting sites (Nash *et al.,* 2021).
- Short generation times, rapid growth rate and early maturity suggest recovery may be rapid (Harasti, 2016; Woodall, 2017), however, this is contradicted by their limited mobility, small home range and limited dispersal. It is suggested that complete removal of individuals from a population would result in poor recovery rates, otherwise it is thought that resistance and recovery to disturbance events may be high.

1.3.2 Stalked Jellyfish

- No direct evidence is available on the effect of shore gathering activities on stalked jellyfish species.
- The species is found attached to algae in pools/the low water line on rocky shores and therefore, could be exposed to abrasion pressure used in harvesting techniques and during access to sites.

- Removal of target species such as seaweeds could lead to a reduction in the abundance of individual stalked jellyfish and available substrate reducing stalked jellyfish populations (Tyler-Walters and Head, 2017).
- Stauromedusae are soft-bodied and therefore unlikely to be able to withstand direct crushing/ abrasive pressure used in shore gathering activities themselves of trampling via access to sites (Miranda, *et al.,* 2012; 2016).
- Stauromedusae are likely to be lost if their supporting habitat the algae is lost due to abrasion or physical change (Corbin, 1979; Miranda *et al.,* 2010).
- It is difficult to determine recoverability, although the short life span and potential for asexual reproduction suggests rapid recovery. However, if over 75% population is lost, recovery is limited (Tyler-Walters and Head, 2017).

1.3.3 Peacocks tail (*Padina pavonica*)

- No direct evidence is available on the effect of shore gathering on *P. pavonica*.
- The species occurs on the rock surface and therefore, would be exposed to any present abrasion pressure.
- Disturbance of the seabed and trampling in accessing sites may deplete populations of peacock's tails and in harvested areas and may lead to the smothering of individuals.
- If abrasion of *P. pavonica* were to occur damage to individuals' fronds is likely, but holdfasts should remain. The species has a high recovery potential from regrowth of fronds from rhizoids/holdfasts and also, through its high reproductive potential with both sexual and asexual reproduction possible, so long as some rhizoids/fronds remain (Schiel and Taylor, 1999). Recolonisation can also occur from propagules (Schiel and Taylor, 1999).
- It is suggested that in areas of unfavourable conditions, asexual reproduction may maintain populations (Price *et al.,* 1979).
- Dislodges and drifting fronds with spores may support dispersal and colonization of shores that are isolated from other populations although recovery through this method could be slow (Herbert *et al.,* 2016).
- The species is therefore considered to have a low sensitivity to the abrasion pressure.

Summary

- Non-target species have the potential to be disrupted or removed through shore gathering activities, which in turn can impact food webs and ecosystem biodiversity.
- Where levels of natural disturbance are higher, associated fauna is often characterised by species adapted to a certain level of disturbance.
- Timescales for recovery are largely dependent on sediment type, associated fauna and the rate of natural disturbance.
- Recovery rates are also species specific, mollusc species often take longer to recover than annelid worms and crustacean species.
- Effects are difficult to quantify as effects from a specific activity are difficult to isolate from any impacts caused by variation in environmental variables and additional anthropogenic impacts such as water quality.
- Seahorse species do not have any direct evidence of impacts related to shore gathering activity. Impacts are likely to result from impacts to their associated habitats such as seagrass and seaweeds. The species is also vulnerable to crushing from trampling or direct removal from abrasion. It is postulated that direct removal of a significant proportion of the population would be required to cause a large negative effect.
- Stalked jellyfish species do not have any direct evidence of impacts related to shore gathering activity. Impacts are likely to relate to impacts to their associated habitats such as seaweeds. The species' are soft bodied and unlikely to withstand abrasion or trampling.
- Peacocks tail does not have any direct evidence of impacts related to shore gathering activity. The species would be exposed to any potential abrasion pressures in associated rocky habitats. Impacts are likely to be the fronds whilst the holdfast should remain. This increases the potential for recovery.

References for Section 1.3

Carvalho, S., Constantino, R., Cerqueira, M., Pereira, F., Subida, M. D., Drake, P., & Gaspar, M.B. 2013. Short term impact of bait digging on intertidal microbenthic assemblages of two south Iberian Atlantic systems. *Estuarine, Coastal and shelf science*. 132: 65-76

Clarke L.J., Hughes K.M., Esteves L.S., Herbert R.J.H. and Stilman R.A. 2017. Intertidal invertebrate harvesting: a meta-analysis of impacts and recovery in an important waterbird prey resource. *Marine Ecology Progress Series*. Vol 584: 229-244.

Corbin, P.G., 1979. The seasonal abundance of four species of Stauromedusae (Coelenterata: Schyphomedusae) in Plymouth*. Journal of the Marine Biological Association of the United Kingdom*, 59, 385-391

Curtis, J.M.R. & Vincent, A.C.J., 2005. Distribution of sympatric seahorse species along a gradient of habitat complexity in a seagrass dominated community. *Marine Ecology Progress Series*, 291, 81-91. DOI https://doi.org/10.3354/meps291081

Dernie, K.M., Kaiser, M.J., Richardson, E.A. & Warwick, R.M. 2003b. Recovery of soft sediment communities and habitats following physical disturbance. J. Exp. Mar. Biol. Ecol. **285-286**: 415-434.

Foster S, Vincent ACJ (2004) The life history and ecology of seahorses, Hippocampus spp.: implications for conservation and management. *J Fish Biol* 65:1–61

Gislason, H., Sinclair, M., Valdimarsson, G. & Wallingford CAB International. 2002. The effects of fishing on non-target species and ecosystem structure and function. Wallingford (United Kingdom) FAO/CABI, pp. 21

Harasti, D., 2016. Declining seahorse populations linked to loss of essential marine habitats. *Marine Ecology Progress Series*, 546: 173-181.

Johnson, G. E. L., Attrill, M.J., Sheehan, E.V. & Somerfield, P.J. 2007. Recovery of meiofauna communities following mudflat disturbance by trampling associated with crab tiling. *Mar Env. Res*. 64: 409-416.

Miranda, L.S., Collins, A.G., and Marques, A. C., 2010. Molecules clarify a Cnidarian Life Cycle- The "Hydrozoan" *Microhydrula limposicola* is an early life stage of the Staurozoan *Haliclystus antacticus. PLoS ONE,* 5(4), e10182.
Miranda, L.S., Collins, A.G., Hirano, Y.M., Mills, C.E. & Marques, A.C., 2016. Comparative internal anatomy of Staurozoa (Cnidaria), with functional and evolutionary inferences. *PeerJ*, 4, e2594. DOI 10.7717/peerj.2594
Miranda, L.S., Morandini, A.C. & Marques, A.C., 2012. Do Staurozoa bloom? A review of stauromedusan population biology. *Hydrobiologia*, 690 (1), 57-67
Nash, R.A.,, Sabatini, M. & Ballerstedt, S. 2021. *Hippocampus hippocampus* Short snouted seahorse. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 28-02-2024]. Available from: https://www.marlin.ac.uk/species/detail/1788.
Roberts, C., Smith, C., Tillin, H. & Tyler-Walters, H. 2010. Review of existing approaches to evaluate marine habitat vulnerability to commercial fishing activities. Report SC080016/R3, Environment Agency, Bristol, pp. 150
Rossi, F., Forster, R.M., Montserrat, F., Ponti, M., Terlizzi, A., Ysebaert, T. & Middleburg, J.J. 2007. Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. *Mar. Biol*. 151: 2077-2090.
Sherman K.M. & Coull, B.C. 1980. The response of meiofauna to sediment disturbance. *Journal of Experimental Marine Biological Ecology*.46: 59-71.
Tyler-Walters, H., & Heard, J.R. 2017. Calvadosia campanulata A stalked jellyfish. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 28-02-2024]. Available from: https://www.marlin.ac.uk/species/detail/2101
Vincent, A. C. J., Foster, S. J., Koldewey, H. J. 2011. Conservation and management of seahorses and other Syngnathidae. *Journal of Fish Biology*, 78, 1681-1724
Watson, G.J., Farrell, P., Stanton, S. & Skidmore, L.C. 2007. Effects of bait collection on Nereis virens populations and macrofaunal communities in the Solent. UK. *Journal of Marine Biological Association*. 87: 703-716
Woodall, L. 2017. Hippocampus hippocampus. The IUCN Red List of Threatened Species 2017: e.T10069A67618259. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T10069A67618259.en
Wynberg, R.P. and Branch, G.M. 1994. Disturbance associated with bait-collection for sandprawns (*Callianassa kraussi*) and mudprawns (*Upogebia africana*): long-term effects on the biota of intertidal sandflats, *Journal of Marine Research*, 52: 523-558
Wynberg, R.P. and Branch, G.M. 1997. Trampling associated with bait-collection for sand prawns Callianassakraussi Stebbing: effects on the biota of an intertidal sandflat. *Environmental Conservation*. 24(2): 139–148

1.4 Sediment Impacts

This section covers general impacts relating to the pressures:

- Abrasion/disturbance of the substrate on the surface of the seabed
- Penetration and/or disturbance of the substratum below the surface of the seabed including abrasion
- Habitat structure changes – removal of substratum (extraction)

- Abrasion and disturbance are generally related to the direct and physical effects of handwork activity including digging and trampling. Such impacts include the creation of basins and mounds, burial and removal of the substratum, sediment disturbance, changes in vertical distribution of sediment layers and changes in the properties of the sediment (McLusky *et al*., 1983; Watson *et al*., 2017).

- Waves and tides can wash away finer sediment and associated organic content that has been dissociated through turning over of sediment (Watson *et al.,* 2017). The effects of this can lead to increased turbidity, pollutants within the water column and potential eutrophication (Watson *et al.,* 2017).
- The upturning of large sections of substrate to access buried invertebrates below the surface can result in layering disruptions and changes in chemical concentrations in the sediment surface layer (Fowler, 1999).
- The physical marks associated with activity may persist over a number of weeks. Where tide and wave action is low or there is limited water exchange within an estuary, the time taken for depressions to be filled following activity increases, potentially resulting in slower rates of sediment recovery than in higher energy sites (Birchenough, 2013).
- Impacts resulting from anthropogenic activity are most evident where the level of disturbance causes differences in sediment structure that are elevated above natural background changes caused by biotic and abiotic factors including changes caused by the benthic community through burrow formation and deposition of faecal material (Probert, 1984).
- A meta-analysis of global studies on hand gathering (and other gear type) impacts found that the magnitude of the response of fauna to fishing varied with the degree of abrasion to the surface of the substratum and changes to habitat (including sediment type) (Clarke *et al*., 2017).
- Studies on bait pumping for shrimp and bait digging showed an increase in finer sediment accumulation where depressions caused by the activity persist after the activity has taken place (McLusky *et al.,* 1983; Wynberg and Branch, 1994; Contessa and Bird, 2004).

1.4.1 Effects on Seagrass Beds

- Shore gathering activities have the potential to remove, uproot and bury seagrass shoots and rhizomes (Barañano *et al.,* 2018).
- Seagrass is highly sensitive to burial at just 2-16cm depth (Cabaço & Santos, 2007). Burial results in the reduction of leaf and rhizome carbon and starch content, the occurrence of dead shoots and reductions in leaf and sheath lengths (Cabaço & Santos, 2007).
- Impacts are noted to be variable with activity. The sedimentary carbon stock of *Zostera marina* beds was noted to be reduced by 50% in areas subject to clam harvesting, reflecting levels found in unvegetated areas (Barañano *et al.,* 2018), however low-intensity digging activity in *Zostera noltii* beds was noted not to cause any changes in sediment variables or photosynthetic efficiency (Branco *et al.,* 2018).
- Seagrass species can respond in several ways to hand work activity. In response to disturbance, seagrass beds often increase their reproductive effort (Cabaço & Santos, 2012).
- Mechanical disturbances such as clam harvesting have resulted in a nine and four-fold increase in plant reproductive effort (Cabaço & Santos, 2012; Alexandre *et al*., 2005; Suonan *et al*., 2017).
- Reproductive effort is a measure of parameters such as; the number of flowering shoots, the number of spathes per flowering shoot, and flowering period (Alexandre *et al*., 2005; Suonan *et al*., 2017; Park *et al*., 2011). However, the response of reproductive effort is species-specific, with a strong positive correlation apparent between rhizome diameter and increased reproductive effort (Cabaço & Santos, 2012). The correlation indicates that species with a higher storage capacity (*Z. marina*) have a higher capacity for investing in

sexual reproduction (Cabaço & Santos, 2012). Those with lower storage capacity such as *Z. noltii* may not be able to recover through reproduction (Cabaço & Santos, 2012).

- On the other hand, research has found that seedlings do not contribute to the recovery of *Z. marina* and therefore increased reproductive effort may not be an effective recovery strategy (Qin *et al*., 2016). When shoots and rhizomes were removed/buried by clam harvesting in China, seedlings were observed almost as soon as the disturbance had ceased. However, seedlings in both disturbed and control areas did not survive the following winter, unlike the perennial beds in the control site (Qin *et al*., 2016).
- Recovery time varies considerably between species and location. Boese *et al*., (2009) stimulated disturbance to a *Z. marina* bed by removing the shoots. Disturbed areas recovered through the growth of rhizomes from perennial seagrass beds. Recovery of an area disturbed within a well-established seagrass bed took 24 months, however in a disturbed area located in the transition zone of seagrass beds (where the bed ends and bare sediment begins) seagrass took 32 months to recover (Boese *et al*., 2009). The estimated rhizome growth rate was 0.5m per year. Meanwhile, *Zoster noltii* has been found to take approximately five years to recover in Wales, although there is strong variability in seagrass beds from year to year (Bertelli *et al*., 2018).
- Zostera japonica in Korea can recover from clam harvesting vehicles within 5 months of the immediate elimination of shoots (Park *et al*., 2011). Post recovery the bed had higher above and below ground biomass and rhizome internode length than the control (Park *et al*., 2011).
- Where seagrass declines the habitat can be recolonised by other species. However, research has shown that *A. marina* may colonize a declining seagrass bed and the presence of the annelid prevented the recovery of the *Z. marina*. Sediment reworking by the worm led to rapid burial of eelgrass seeds below critical depth where they could not develop (Valdemarsen *et al*., 2011).

1.4.2 Trampling

- In some harvesting methods, abrasion is not caused by the direct impact of the activity itself, but, by the indirect impact of the access required to access resources. The damage occurs when human footsteps interact with the communities residing in the intertidal area, known as trampling.
- Trampling leads to direct and indirect effects. Direct impacts include the immediate damage, crushing or removal of algae and invertebrates, and indirect impacts include changes in community assemblages, due to loss of habitat and changes to environmental variables.
- While the intensity of the trampling has been found to be the key factor in governing the level of impact caused it is also correlated to the recovery time (Araujo *et al*., 2009; Milazo *et al*., 2002; Povey & Keough, 1991). Typically, the relationship between trampling intensity and recovery is negative, with more intensely trampled areas requiring longer time frames to recover (Povey & Keough 1991; Araujo *et al*., 2009; Rita 2011).
- After one year following impact Araujo *et al*. (2009) found the communities of medium and high intensity trampled areas remained significantly different to controls and low trampled sites. Rita (2011) studied recovery over a longer term of five years and found that 36 months following trampling, *A. nodosum* (algae) had recovered in low intensity areas only. 54 months following disturbance, *A. nodosum* had recovered in medium-intensity sites but had not achieved full recovery in high-intensity sites (Rita, 2011).

1.4.2.1 Reefs

- Trampling abrasion during access to sites may lead to crushing/ dislodging or damage to ecologically significant species within reef habitats (Tyler-Walters and Arnold, 2008; Plicanti *et al.,* 2016).
- The extent of damage is dependent on the species and exposure. For example, species with hard exteriors such as mussels or barnacles, may be less impacted than softer bodies individuals within the reef habitats (Tyler-Walters and Arnold, 2008; Plicanti *et al.,* 2016).
- Studies suggest disrupted areas do not recover in highly exposed areas, due to wave action. This therefore suggests that the ability for reefs to recover following trampling is dependent on exposure to wave action and tides (Tyler-Walters and Arnold, 2008; Plicanti *et al.,* 2016).
- Differences in impact vary, studies have found large declines in *Mytilus californianus* after trampling in mussel beds, with up to 54% loss in experimental plots after 1 day of trampling (Brosnan and Crumrine, 1994). However, Smith and Murray (2005) found only 15% of loss as a direct result of trampling, during experimental exposure to mussel bed reefs.

1.4.2.2 Mud and Sand Flats

- Trampling intensity has been shown to be a crucial factor in the level of impact caused to sandy beach macrofauna on the Eastern Cape coast (Moffett *et al*., 1998).
- In soft intertidal mud, clear footprints have been found to remain four days after trampling and disturbance is still visible 21 days later (Rossi *et al*., 2007), however, it was concluded this does not affect abiotic characteristics of the sediments.
- Johnson *et al.,* (2007) found no significant differences between the grain size, total organic content and penetrability following six trampling events on an intertidal mudflat habitat in Southwest England.
- Rossi *et al*. (2007) also found no difference in inorganic nitrogen content in the top centimetre of surface water, however higher trampling intensities have been found to impact chlorophyll levels (Wynberg and Branch 1997).
- Research on the effects of trampling on sediment habitats has mostly focused on the impacts on the communities living below the surface of the sediment, with general decreases in tube-dwelling, sub-surface deposit feeders and deep burrowing species (Wynberg and Branch, 1994).
- In one specific study from SW England, twelve hours following trampling, nematode abundance and species number significantly declined but were seen to recover within 36 hours (Johnson *et al*., 2007).
- It is understood that meiofauna bury themselves deeper into the sediment in response to trampling and therefore the community can recover quickly once the impact has ceased (Johnson *et al*., 2007).
- Mobile species, such as annelids have shown no changes from trampling, although adult bivalve species, *Cerastoderma edule* and *Macoma balthica*, significantly declined in abundance at trampled sites (Rossi *et al*., 2007).
- In contradiction, trampling enhanced the recruitment rate of juvenile *M. balthica* and did not impact juvenile *C. edule* (Rossi *et al*., 2007).
- On sandy beaches, often visited by tourists rather than shellfish collectors, trampling in the supralittoral zone has been shown to lead to mortality and declines in sand hopper (*Talitrus saltator*) density (Ugolini *et al.,* 2007).
- Between the high tide and swash zone clear negative impacts of trampling on sand communities have been demonstrated during the summer season in southern Spain (Reyes-Martinez *et al.,* 2015). Over time, trampling changes the density and taxonomic

structure of the macrofauna compared to a protected site. The sand shrimp *Bathyporeia pelagica* was severely affected in the most trampled area reducing to zero individuals per m^2 (Reyes-Martinez *et al*., 2015). Crustaceans can decrease by more than 60% in trampled areas, meanwhile polychaetes increase by more than 60%. In a protected area, microbenthic density increased compared to a significant decrease in disturbed areas (Reyes-Martinez *et al*., 2015).

- A study of a number of animals in enclosures found that at low trampling intensities few of the macrofauna were damaged, but the level of damage was substantial (mean 70% and 63%) for *Gastrosaccus psammodytes and D. serra respectively,* under intense trampling (Moffett *et al*., 1998).

1.4.2.3 Saltmarsh

- Low-level trampling was not found to affect the redox discontinuity layer, organic matter content, silt-clay content and soil pH of saltmarsh in the UK in winter or summer (Chandrasekara and Frid, 1996). Trampled areas versus untrampled areas showed no difference in winter and summer.
- Chandrasekara and Frid (1996) concluded that the saltmarsh vegetation cushions the impact of trampling and therefore prevents impacts to the sediment infauna.
- In Wales, a study of long-term (48 years) trampling on saltmarsh found that it did not affect the physical characteristics of the sediments, water content or bulk density (Headley and Sale, 1999).
- However, the penetration resistance (sediment compaction) increased significantly in trampled areas. As with short-term disturbance, long-term trampling reduced the abundance and vegetation height by 14cm on average, of *Halimione portulacoides* and four other species, resulting in higher bare ground cover (Headley and Sale, 1999). This led to increased abundances of typically lower-growing halophyte species in the midmarsh zone, which were significantly more present in trampled areas including; *Armeria maritima, Aster tripolium, Glaux maritima, Salicornia europeaea, Spergularia marginata* and *Suaeda maritima*. Overall, trampling anthropogenically increased the species diversity of the saltmarsh communities and led to new plant communities (Headley and Sale, 1999).
- Natural saltmarshes in Denmark were found to be relatively resistant to trampling, showing limited changes in species abundance and diversity (Andersen, 1995).
- However, other habitat types, such as uncut grassland, artificial dunes and dunes, had clear negative impacts of trampling. Andersen (1995) concluded that saltmarsh is resistant to a low trampling level of approximately five visitors per day.
- Intensity of trampling studies on Californian saltmarsh (*Salicornia virginica)* found all trampling led to a decrease in intensity and frequency of saltmarsh height and flower production over a six-month period. However, heavy trampling led to 90% cover of bare ground (Woolfolk, 1999).
- In one area lightly trampled plots did not initially show signs of damage, but six months later *S. virginica* canopy declined by around ten percent whilst controls did not, showing a delayed response to trampling. Overall, trampling can decrease saltmarsh abundance, change community structure and promote invasion of introduced species all contributing to the loss of marsh habitat (Woolfolk, 1999).
- Trampling and other disturbances have also been found to affect the reproductive potential of saltmarsh *(Plantago maritima)* in Poland (Lazarus *et al., 2020*). Although intensive grazing had the largest impact on saltmarsh, intensive human trampling had a similar effect, decreasing fruit seed abundance and size.

- Recovery studies in California reported that heights did not reach the height of controls within two and a half years after trampling (Woolfolk, 1999). Significant differences between insects and arachnid communities were still present between trampled and controls (Woolfolk, 1999).
- Martone, & Wasson (2008) found that after nine months of recovery trampled plots still had significantly lower percent cover of native plants. For tidally flushed sites, by 12 months native plants had recovered, however, for tidally restricted sites, recovery of native plants took between 12 and 22 months and was still lower (not significantly) at the end of the 22-month study period (Martone, & Wasson, 2008).

1.4.2.4 Seagrass Beds

- Access to seagrass beds for shore gathering activities results in trampling of the substratum. The higher the activity level the worse the effects of the trampling might be (Eckrich & Holmquist, 2000).
- Intensive trampling from tourist visitors over *Zostera marina* beds, resulted in a significant reduction of seagrass cover (Travaille *et al*., 2015).
- Seagrass (*Thalassia testudinum*) biomass was noted to directly relate to trampling intensity and duration (Eckrich & Holmquist, 2000; Major *et al*., 2004). As well as trampling intensity, the substrate type plays an important role in the severity of trampling impacts on seagrass beds; with softer substrates more vulnerable to significant biomass reductions (Eckrich & Holmquist, 2000).
- Different types of footwear can also lead to significant effect levels (Major *et al*., 2004).

Summary

- Abrasion impacts may include the creation of basins and mounds, burial and removal of the substratum, sediment disturbance, changes in vertical distribution of sediment layers and changes in the properties of the sediment.
- Impacts resulting from anthropogenic activity are most evident where the level of disturbance causes differences to sediment structure that are elevated above natural background changes caused by biotic and abiotic factors including changes caused by the benthic community through burrow formation and deposition of faecal material.
- A meta-analysis of global studies on hand gathering (and other gear type) impacts found that the magnitude of the response of fauna to fishing varied with the degree of abrasion to the surface of the substratum and changes to habitat (including sediment type).
- Shore gathering activities have the potential to remove, uproot and bury seagrass shoots and rhizomes.
- Impacts to seagrass are noted to be variable with activity and different species can respond in different ways. This includes increasing reproductive effort, potential related to the storage capacity of the particular species. However, seedlings have been noted not to survive to produce a full adult plant in some cases, offsetting the increased reproductive effort.
- In some harvesting methods, abrasion is not caused by the direct impact of the activity itself, but, by the indirect impact of the access required to access resources.
- Trampling leads to direct and indirect effects. Direct impacts include the immediate damage, crushing or removal of algae and invertebrates, and indirect impacts include changes in community assemblages, due to loss of habitat and changes to environmental variables.
- Typically, the relationship between trampling intensity and recovery is negative, with more intensely trampled areas requiring longer time frames to recover.
- Reefs, mud & sand flats, saltmarsh and seagrass beds may all be subject to impacts from trampling. Different habitats will be subject to different levels of impact and recovery times.

References for Section 1.4

Alexandre, A, Santos, R, Serrã, E. 2005. Effects of clam harvesting on sexual reproduction of the seagrass Zostera noltii. *Marine Ecology Progress Series*. 298: 115-122.

Andersen, U.V. 1995. Resistance of Danish coastal vegetation types to human trampling. Biological Conservation. 71 (3): 223-230pp. https://doi.org/10.1016/0006-3207(94)00031-K

Araujo, R., Vaselli, S., Almeida, M., Serrao and Sousa-Pinto, I. 2009. Effects of disturbance on marginal populations: human trampling on *Ascophyllum nodosum* assemblages at its southern distribution limit. *Marine Ecology Progress Series*. 378: 81-92.

Araujo, R., Vaselli, S., Almeida, M., Serrao and Sousa-Pinto, I. 2009. Effects of disturbance on marginal populations: human trampling on *Ascophyllum nodosum* assemblages at its southern distribution limit. *Marine Ecology Progress Series*. 378: 81-92.

Barañano, C. Fernández, E. & Méndez, G. 2018. Clam Harvesting decreases the sedimentary carbon stock of a Zostera marina meadow. *Aquatic Botany*. 146: 48-57

Bertelli, C.M., Robinson, M.T., Mendzil, A.F., Pratt, L.R. & Unsworth, R.K.F. 2018. Finding some seagrass optimism in Wales, the case of Zostera noltii. *Marine Pollution Bulletin*. 134:216-222.

Birchenough, S. E. 2013. Impact of bait collecting in Poole Harbour and other estuaries within the Southern IFCA District. Project FES 286 Report, MMO Fisheries Challenge Fund Report for Southern Inshore Fisheries and Conservation Authority, pp. 117

Boese, B., Kaldy, J.E., Clinton, P.J., Eldridge, P.M. & Folger, C.L. 2009. Recolonization of intertidal Zostera marina L. (eelgrass) following experimental shoot removal. J*. Exp. Mar. Biol. Ecol*. 347: 69-77.

Branco, J., Pedro, S., Alves, A.S., Ribeiro, C., Materatski, P., Pires, R,. Caçador, I., Adão, H., 2018. Natural recovery of Zostera noltii seagrass beds and benthic nematode assemblage responses to physical disturbance caused by traditional harvesting activities. *Journal of Experimental Marine Biology and Ecology*. 502: 191-2020

Brosnan, D.M. and Crumrine, L.L. 1994. Effects of human trampling on marine rocky shore communities. J*. Exp. Mar. Biol. Ecol*. 177 : 79-97pp

Brown, P. J., and R. B. Taylor. 1999. Effects of trampling by humans on animals inhabiting coralline algal turf in the rocky intertidal. Journal of Experimental Marine Biology and Ecology 235:45-53.

Cabaço, S. & Santos, R. 2007. Effects of burial and erosion on the seagrass Zostera noltii. *Journal of experimental marine biology*. 340:204-212.

Cabaço, S. & Santos, R. 2012. Seagrass reproductive effort as an ecological indicator of disturbance. *Ecological Indicators*. 23:116-122.

Casu, D. Ceccherellib, G., Curini-Gallettic, M., Castellia, A. 2006. Human exclusion from rocky shores in a mediterranean marine protected area (MPA):An opportunity to investigate the effects of trampling. *Marine Environmental Research* 62: 15–32

Chandrasekara, W.U. and Frid, C.L.J. 1996. Effects of human trampling on tidal flat infauna. *Aquatic Conservation: Marine and Freshwater Ecosystems*. 6: 299-311

Clarke L.J., Hughes K.M., Esteves L.S., Herbert R.J.H. and Stilman R.A. 2017. Intertidal invertebrate harvesting: a meta-analysis of impacts and recovery in an important waterbird prey resource. *Marine Ecology Progress Series*. Vol 584: 229-244.

Contessa, L. and Bird, F.L. 2004. The impact of bait-pumping on populations of the ghost shrimp Trypaea australiensis Dana (Decapoda: Callianassidae) and the sediment environment, *Journal of Experimental Marine Biology and Ecology*, 304: 75-97

Eckrich C, Holmquist J 2000. Trampling in a seagrass assemblage: direct effects, response of associated fauna, and the role of substrate characteristics. *Mar Ecol Prog Ser* 201: 199–209

Erickson, A. 2003. Integrating Law, Science, and Regulation in Public Lands Management: An Application of Policy Science to Manage Impacts from Human Trampling on the Rocky Shore of Olympic National Park, Washington, USA. Thesis. University of Washington

Fowler, S. L. 1999. Guidelines for managing the collection of bait and other shoreline animals within UK European Marine Sites. Report to English Nature UK Marine SACs Project, pp.132

Headley, A.D. and Sale, F. 1999. The impacts of trampling by students on saltmarsh vegetation. *Field Studies*. 9: 513-530pp.

Herbert, R. J. H., Ma, L., Marston, A., Farnham, W. F., Tittley, I. & Cornes R. C., 2016. The calcareous brown alga Padina pavonica in southern Britain: population change and tenacity over 300 years. *Mar Biol*, 163 (3), 1-15.

Jenkins, C., M. E. Haas, A. Olson, and J. L. Ruesink. 2002. Impacts of trampling on a rocky shoreline of San Juan Island, Washington. *Natural Areas Journal* 22:260-269.

Johnson, G.E.L., Attril l, M.J., Sheehan, E.V ., Somerfiel d, P.J., 2007. Recovery of meiofauna communities following mudflat disturbance by trampling associated with crab-tiling, *Marine Environmental Research*. doi : 10.1016/j .marenvres.2007.03.002

Lazarus, M., Mazur, J., Wszałek-Rożek, K., Zwolicki, A. 2020. How environmental stressors affect reproductive potential in a saltmarsh plant species *Plantago maritima*. Ecology and Evolution. 11:3274 – 3285. DOI: 10.1002/ece3.7277

Long, J.D., Cochrane, E., Dolecal, R.E. 2011. Previous disturbance enhances the negative effects of trampling on barnacles. *Marine Ecology Progress Series*. 437: 165–173

Major, W.W., Grue, C.E., Grassley, J.M., & Conquest, L.L. 2004. Non- target impacts to eelgrass from treatments to control spartina in Willapa Bay, Washington. *Journal of Aquatic Plant Management*. 42:11-17.

Martone, R.G., Wasson, K. 2008. Impacts and interactions of multiple human perturbations in a California salt marsh. *Oecologia* 158: 151–163pp. https://doi.org/10.1007/s00442-008-1129-4

McLusky, D.S., Anderson, F.E. and Wolfe-Murphy, S. 1983. Distribution and population recovery of Arenicola marina and other benthic fauna after bait digging, *Marine Ecology Progress Series*, 11: 173-179

Micheli, F Kimberly W. Heiman, Carrie V. Kappel, Rebecca G. Martone, Suresh A. Sethi, Giacomo C. Osio, Simonetta Fraschetti, Andrew O. Shelton, Jacqui M. Tanner. 2016. Combined impacts of natural and human disturbances on rocky shore communities, *Ocean & Coastal Management*, 126: Pages 42-50.,

Michinton, T.E. and Fels, K.J. 2013. Sediment disturbance associated with trampling byhumans alters species assemblages on a rocky intertidal seashore. *Marine Ecology Progress Series*. 472: 129–140pp.

Milazo, M., Chemello, R., Badalamenti, F., and Riggio, S. 2002. Short-term effect of human trampling on the upper infralittoral macroalgae of Ustica Island MPA(western Mediterranean, Italy*). J. Mar. Biol. Ass. U.K.* 82: 745-748
Milazo, M., Chemello, R., Badalamenti, F., and Riggio, S. 2002. Short-term effect of human trampling on the upper infralittoral macroalgae of Ustica Island MPA(western Mediterranean, Italy). *J. Mar. Biol. Ass. U.K*. 82: 745-748
Mistri. M., Cason, E., Munari, C., Rossi, R. 2009. Disturbance of a soft-sediment meiobenthic community by clam hand raking. *Italian Journal of Zoology*. 71(2): 131-133.

Moffett MD, McLachlan A, Winter PED, De Ruyck AMC.1988 Impact of trampling on sandy beach macrofauna. Journal of Coastal Conservation. 1998; 4(1):87–90. *Environ Monit Assess.* 152: 413–424pp

Montevecchi, W.A., 2023. Interactions between fisheries and seabirds: Prey modification, discards, and bycatch. In *Conservation of Marine Birds* (pp. 57-95). Academic Press.

Park, S.R., Kim, Y. K., Kim, J-H., Kang, C-K., Lee, K-S. 2011. Rapid recovery of the intertidal seagrass Zostera japonica following intense Manila clam (*Ruditapes philippinarum*) harvesting activity in Korea. *Journal of Experimental Marine Biology and Ecology*. 407:275-283

Plicanti, A., Domínguez, R., Dubois, S.F. and Bertocci, I., 2016. Human impacts on biogenic habitats: Effects of experimental trampling on Sabellaria alveolata (Linnaeus, 1767) reefs. *Journal of Experimental Marine Biology and Ecology*, *478*, pp.34-44.

Pour, F.A. 2013. Visitor impact on rocky shore communities of Qeshm Island, the Persian Gulf, Iran. *Environ Monit Assess*. 185: 1859–1871pp

Povey, A. and Keough, M. J. 1991. Effects of trampling on plant and animal populations on rocky shores. *Oikos* 61: 355-368pp.
Povey, A. and Keough, M. J. 1991. Effects of trampling on plant and animal populations on rocky shores. *Oikos* 61: 355-368pp.
Price, J.H., Tittley, I. & Richardson, W.D., 1979. The distribution of Padina pavonica (L.) Lamour. (Phaeophyta: Dictyotales) on British and adjacent European shores. *Brit Mus (Natural History) Bot Ser*, 7, 1-67.

Probert, P.K. 1984. Disturbance, sediment stability, and trophic structure of soft-bottom communities, *Journal of Marine Research*, 42: 893-921

Qin, L-Z., Li, W-T., Zhang, X., Zhang, P., Qiao, W. 2016. Recovery of the eelgrass Zostera marina following intense Manila clam (*Ruditapes philippinarum*) harvesting disturbance in China: The role and fate of seedlings. *Aquatic Botany*. 130 :27-36.

Reyes-Martinez, M.J. Ruíz-Delgadoa, M., Sanchez-Moyanob, J.E. García-García, F.J. 2015. Response of intertidal sandy-beach macrofauna to human trampling:An urban vs. natural beach system approach. *Marine Environmental Research* 103: 36-45pp

Rita, A. Isabel, S-P. Serra˜o, E.A. and Per. A. 2011. Recovery after trampling disturbance in a canopy-forming seaweed population. *Mar Biol.* 159(3): 697-707pp
Rita, A. Isabel, S-P. Serra˜o, E.A. and Per. A. 2011. Recovery after trampling disturbance in a canopy-forming seaweed population. *Mar Biol.* 159(3): 697-707pp
Rossi, F., Forster, R.M., Montserrat, F., Ponti, M., Terlizzi, A., Ysebaert, T. & Middleburg, J.J. 2007. Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. *Mar. Biol.* 151: 2077-2090.

Schiel, D.R. & Taylor, D.I., 1999. Effects of trampling on a rocky intertidal algal assemblage in southern New Zealand*. Journal of Experimental Marine Biology and Ecology, 235*, 213-235.

Smith, J.R. and Murray, S.N., 2005. The effects of experimental bait collection and trampling on a Mytilus californianus mussel bed in southern California. *Marine Biology*, 147, 699- 706.

Suonan, Z., Kim, S.H., Qin, L-Z., Lee, K-S. 2017. Reproductive strategy of the intertidal seagrass Zostera japonica under different levels of disturbance and tidal inundation. *Estuarine, Coastal and Shelf Science*. 197:185-193

Travaille, K.L., Salinas-de-Leon, P., Bell, J.J. 2015. Indication of visitor trampling impacts on intertidal seagrass beds in a New Zealand marine reserve. *Ocean & coastal Management*. 114: 145-150.

Tyler-Walters, H. and Arnold, C., 2008. Sensitivity of Intertidal Benthic Habitats to Impacts Caused by Access to Fishing Grounds. CCW Policy Research Report No. 08/13, pp.48

Ugolini, A. Giuseppe Ungherese, Silvia Somigli, Giuditta Galanti, Davide Baroni, *et al*. Theamphipod as a bioindicator of human trampling on sandy beaches. Marine Environmental Research. 65 (4), pp.349. 10.1016/j.marenvres.2007.12.002.hal-00501933

Valdemarsen, T., Wendelboe, K., Egelund, J.T., Kristensen, E. & Flindt, M.R. 2011. Burial of seeds and seedlings by the lugworm Arenicola marina hampers eelgrass (Zostera marina) recovery. *Experimental Marine Biology and Ecology*. 410:45-52

Watson, G. J. *et al*., 2017. Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: The importance of appropriate spatial scales. *Marine Environmental Research,* Volume 130: 112-133.

Woolfolk, A.M. 1999. Effects of human trampling and cattle grazing on salt marsh assemblages in Elkhorn Slough, California. Master's Thesis. California State University, Sacramento. Available at: http://hdl.handle.net/20.500.12680/7h149v603

Wynberg, R.P. and Branch, G.M. 1994. Disturbance associated with bait-collection for sandprawns (*Callianassa kraussi*) and mudprawns (*Upogebia africana*): long-term effects on the biota of intertidal sandflats, *Journal of Marine Research*, 52: 523-558

Wynberg, R.P. and Branch, G.M. 1997. Trampling associated with bait-collection for sand prawns Callianassakraussi Stebbing: effects on the biota of an intertidal sandflat. *Environmental Conservation.* 24(2): 139–148

1.5 Protected bird species: visual disturbance

- Anthropogenic disturbance can affect an animal's behaviour and rate of survival (Liley, *et al*, 2012a; 2012b).
- In this context, disturbance is defined as any human activity that has the potential to affect the behaviour of an animal. The disturbance may be audible or visual and where possible, these disturbances are distinguished.

1.5.1 Levels of Disturbance and Immediate Response

- Immediate results of disturbance range from birds becoming alert to taking major flights (>50m) to alternative suitable habitats (Liley *et al.,* 2010; Liley *et al.,* 2012a).
- Water-based and mechanically fuelled human activity are likely to cause higher levels of disturbance in bird populations whereas slower moving activities such as bird watching and hand picking of clams do not usually cause birds to flush or take flight (Burger, 1981).
- Furthermore, activities in the intertidal area are more likely to cause a disturbance event than activities occurring further up the shore due to the closer proximity to feeding intertidal birds (Riddington *et al.,* 1996; Liley *et al.,* 2010; Liley and Fearnley, 2012).
- The local level of disturbance intensity varies with ease of access to the location, habitat, and activity type (Goss-Custard and Verboven, 1993; Liley and Fearnley, 2012).
- The level of response to a disturbance is species-specific for shorebirds with individuals spending up to a third of their time displaying disturbance-related behaviours (Blumstein *et al.,* 2003; Schlacher *et al.,* 2013).
- Studies suggest the likelihood of a bird to respond to an anthropogenic disturbance can be indicated by the body size and quantity of food consumed by a species, with larger species becoming alert at extended distances (Blumstein *et al.,* 2005; Palacios *et al., 2*022).
- An earlier response time is necessary for larger species due to a lack of agility, in comparison to smaller species, making predator avoidance more difficult (Witter *et al.,* 1994).
- Other factors influencing the level of disturbance include flock size, distance to the disturbance and noise levels (Rees *et al.,* 2005; Wright *et al.,* 2010).
- Scan rates increase with the speed at which a visual disturbance is occurring, and the likelihood of an energetically expensive behavioural response increases with noise level (Fitzpatrick and Bouchez, 1998; Wright, *et al.,* 2010).

- Birds are reported to display both decreased nest attentiveness and increased vigilance when exposed to higher levels of disturbance (Riddington, *et al.,* 1996; Baudains and Lloyd, 2007).
- Research within Poole Harbour suggests that sites with higher levels of access lead to a lower level of bird response due to the type of activity. Sites in Baiter Park and Holes Bay showed the highest levels of access however, the activities were mostly limited to slower and quieter activities, such as walking and cycling. Areas with more frequent disturbance events were concentrated on the Studland side of Poole Harbour (Arne, Pilots Point, Bramble Bush Bay) and were predominantly the result of unpredictable and loud activities, such as unleashed dogs and water sports (Liley and Fearnley, 2012).
- Other models suggest the complete removal of human disturbance could increase bird (in this case, Ringed Plovers) populations by up to 85% (Liley and Sutherland, 2007) and to 100% survival in the Solent (Stillman *et al.,* 2012).
- In a study in South Africa, birds displayed a greater tolerance to the distance humans could approach the nest before taking flight and returned faster after frequent disturbance (Baudains and Lloyd, 2007).

- Literature on the effects of disturbance on feeding behaviours found contrasting positive, negative and no affect results with increased disturbance (Riddington, *et al.,* 1996; Fitzpatrick and Bouchez, 1998; Navedo and Masero, 2008; Verhulst, *et al.,* 2001).
- Although, Fitzpatrick and Bouchez (1998) describe a decrease in the amount of food redistributed to chicks as disturbance increased.
- Other changes in feeding behaviour include an increased concentration of wading shore birds feeding around crab tiles and geese altering feeding patterns to feed for an extra hour at night to balance their daily energy expenditure (Rees, *et al.,* 2005; Sheehan, 2007).

1.5.2 Longer Term Response

- The majority of the literature reviewed described habituation and redistribution/loss of habitat as a long-term impact of anthropogenic disturbance of bird populations. Habituation is defined as the alteration of an instinctual behaviour of birds as a result of frequent anthropogenic disturbance.
- Redistribution and a temporary loss of habitat as a result of disturbance occurs at a range of temporal and spatial scales and varies with species depending on the level of disturbance (Burger, 1981).
- There is evidence to suggest birds opt not to use areas of suitable habitat that experience disturbance; this evidence discusses roads, shipping, offshore wind farms and organized scaring (Gill, 1996; Klassen *et al.,* 2005).
- Oystercatchers have been reported to alter their feeding schedule within a tidal cycle to avoid coinciding with humans in the mussel beds of the Exe Estuary (Goss-Custard and Verboven, 1993).
- Similar results have been displayed with Redshank, Curlew and Oystercatchers, altering their arrival and departure from sites in Belfast Lough, depending on the levels of recreational activity (Fitzpatrick and Bouchez, 1998).
- Studies in Glasgow found whooper swans displayed a short-term decrease in sensitivity to disturbance when daily disturbance levels were high (Rees *et al.,* 2005). There was no evidence to suggest these short-term habituations remain on a longer time scale.

- Literature suggests an increase in anthropogenic disturbance causes a reduction in egg incubation time and parental care, leading to a decrease in reproductive success (Verhulst *et al.,* 2001; Baudains and Lloyd, 2007).
- However, it has been stated that there is no guarantee behavioural responses (as a result of disturbance) are related to changes in reproduction or mortality and, species should be assessed on an individual basis (Stillman, *et al* 2007).

1.5.3 Shore gathering and disturbance

- There is little research focused on areas within the Southern IFC District (five out of 62 papers reviewed). A significant amount of the research relies on models and is species-specific.
- Of the 22 pieces of literature reviewed that discussed an interaction between birds and intertidal fisheries only six discussed disturbances by shore gatherers, the remainder discussed the implications of removing a food source.
- Two out of the six discussed the disturbance or change of behaviour caused by the structures used in the fishery (crab tiles and oyster culture trestle tables) (Higherloh *et al.,* 2001; Sheehan, 2007).
- Of the remaining four articles, only one discussed hand gathering of clams as a potential disturbance causing activity and the remaining three referred to bait digging.
- No information was found regarding birds being disturbed by seaweed gathering or shrimp push netting.
- As these activities also occur in the intertidal zone and are carried out at a relatively slow pace when compared to jogging or water sports, we can assume the potential for bird disturbance is likely similar to bait digging and hand gathering of clams.
- Shellfish hand gatherers are reported unlikely to cause a disturbance to birds as a result of the slow-moving behaviour of the activity (Burger, 1981).

Studies from the Southern IFCA District

- A report focusing on Poole Harbour described an observed 1558 potential disturbance events by bait diggers over an 11-day period. Only seven percent of these observations resulted in a disturbance. The disturbances ranged from birds walking or swimming away to taking a major flight (Liley *et al.,* 2012).
- In the Solent, during more than 70% of bait digging, crab tilling and shellfish gathering events, no bird disturbance was caused, although most events where disturbance did occur led to major flights by birds (Liley *et al.,* 2010*).* Data collected did not suggest that sites with higher access levels (e.g. more people) do not experience significantly higher disturbance events which could indicate that some level of habituation occurs within bird populations (Liley *et al.,* 2010).
- Bird disturbance in general declined with distance, where events occur 100m or more away from birds rarely led to disturbance (Liley *et al.,* 2010).
- Developing on this work, Stillman *et al.* (2012b) used a model to understand the likely impact of disturbance to bird survivability in the Solent. Due to the assumed relative infrequence of bait digging activity (1.2% of visits), removal of the activity from the model did not lead to higher survivability of birds, although the model did not factor in the effect on bird prey availability.

Studies from the wider UK

- In contrast, other evidence discusses a negative correlation between the number of bait diggers and wader and gull abundance, and the reduction in the extent of uses of a refuge area by waterfowl species in the Northeast of England. These results are suggested to be due to the larger body mass of waders and an increased vulnerability to predators. The decreased abundance of gulls was not expected as they are thought to be a more tolerant species, however, this is likely due to a lower level of access and hence decrease habituations of the gulls in the study area (Townshend and O'Connor, 1993; Watson *et al.,* 2017).

Summary

- Anthropogenic disturbance causes a range of species-specific responses to bird species, which scale from increased vigilance and scan rates to longer term redistribution of a species.
- Disturbance can result in changes to the fitness of bird species and has the potential to cause changes in population size through increased mortality.
- The information relating directly to intertidal fisheries and shore gathering activities is minimal; however, due to the slow moving and quiet nature of shore gathering, the majority of interactions are not likely to result in disturbance, unless the activity begins to occur in areas with previously very low levels of access and decreased levels of habituation as a result.

References for Section 1.5

Baudains, T. P. & Lloyd, P., 2007. Habituation and habitat changes can moderate the impacts of human disturbance on shorebird breeding performance. *Animal Conservaton,* 10(3), pp. 400-407.

Blumstein, D. T., Anthony, L. L., Harcourt, R. & Ross, G., 2003. Testing a key assumption of wildlife buffer zones: is flight initiation distance a species-specific trait?. *Biological Conservation,* 110(1), pp. 97-100.

Blumstein, D. T., Fernández-Juricic, E., Zollner, P. A. & Garity, S. C., 2005. Inter-specific variation in avian responses to human disturbance. *Journal of Applied Ecology,* 42(5), pp. 943-953.

Burger, J., 1981. The effect of human activity on birds at a coastal bay. *Biological Conservation,* 21(3), pp. 231-241.

Fitzpatrick, S. & Bouchez, B., 1998. Effects of recreational disturbance on the foraging behaviour of waders on a rocky beach. *Bird Study,* 45(2), pp. 157-171.

Gill, J. A., 1996. Habitat Choice in Pink-Footed Geese: Quantifying the Constraints Determining Winter Site Use. *Journal of Applied Ecology,* 33(4), pp. 884-92.

Goss-Custard, J. D. & Verboven, N., 1993. Disturbance and feeding shorebirds on the Exe estuary. *Wader Study Group Bull,* pp. 68:59-66.

Higherloh, G., Halloran, J. O., Kelly, T. C. & Burnell, G. M., 2001. A preliminary study on the effects of oyster culturing structures on birds in a sheltered Irish estuary. *Hydrobiologia,* Volume 465, pp. 175-180.

Klassen, M., Bauer, S., Madsen, J. & Tombre, I., 2005. Modelling behavioural and fitness consequences of disturbance for geese along their spring flyway. *Journal of Applied Ecology,* 43(1), pp. 92-100.

Liley, D. & Fearnley, H., 2012. *Poole Harbour Disturbance Study. Report for Natural England,* Wareham, Dorset: Footprint Ecology Ltd.

Liley, D. *et al*., 2012a. *Identifying best practice in management of activities on Marine Protected Areas.* S.l.:Footprint Ecology/Bright Angel Consultants/MARINElife.

Liley, D., Cruikshanks, K., Fearnley, H. & Lake, S., 2012b. *The effect of bait collection on waterfowl foraging behaviour in Holes Bay, Poole Harbour. Report for Natural England,* Wareham, Dorset: Footprint Ecology Ltd..

Navedo, J.G. & Masero, J.A. 2008. Effects of traditional clam harvesting on the foraging ecology of migrating curlews (*Numenius arquata*). *J. Exp. Mar. Biol. Ecol*., **355**, 1, 59-65.
Palacios, E. P., Vargas, J., Fernández, G. & Reiter, M. E., 2022. Impact of human disturbance on the abundance of non-breeding shorebirds in a subtropical wetland. *Biotropica,* 54(5), pp. 1160-1169.
Rees, E. C., Bruce, J. H. & White, G. T., 2005. Factors affeccting the behavioral response of whooper swans (Cygnus c. cygnus) to various human activities. *Biological Conservation,* 121(3), pp. 369-382.
Richardson, W. J., Greene, Jr, C. R. & Thomson, D. H., 1995. *Marine Mammals and Noise.* San Diego: Academic Press.
Riddington, R. *et al*., 1996. The impact of disturbance onn the behaviour and energy budgets of Brent Geese Branta b. bernicla. *Bird Study,* 43(3), pp. 269-279.
Schlacher, T. A., Nielsen, T. & Weston, M. A., 2013. Human recreation alters behaviour profiles of non-breeding birds on open-coast sandy shores. *Estuarine, Coastal and Shelf Science,* Volume 118, pp. 31-42.
Sheehan, E. V., 2007. *Ecological impact of the Carcinus maenas (L.) fishery 'crab-tiling' on estuarine fauna, PhD Thesis,* s.l.: University of Plymouth.
Stillman, S., West, A. D., Caldow, R. W. G. & Dit Durell, S. E. A. L. V., 2007. Predicting the effect of disturbance on coastal birds. *International Journal of Avian Science,* 149(s1), pp. 73-81.
Townshend, D. J. & O'Connor, D. A., 1993. Some effects of disturbance to waterfowl from bait-digging and wildfowling at Lindisfarne National Nature Reserve, north-east England. *Wader Study Group Bulletin,* Volume 68, pp. 47-52.
Veprauskas, A., Ackleh, A. S. & Tang, T., 2018. Examining the effect of reoccurring disturbances on population persistence with application to marine mammals. *Journal of Theoretical Biology,* pp. 109-117.
Verhulst, S., Oosterbeek, K. & Ens, B. J., 2001. Experimental evidence for effects of human disturbance on foraging and parental care in oystercatchers. *Biological Conservation,* 101(3), pp. 375-380.
Wale, M. A., Briers, R. A. & Diele, K., 2021. Marine invertebrate anthropogenic noise research – Trends in methods and future directions. *Marine Pollution Bulletin,* p. 112958.
Watson, G. J. *et al*., 2017. Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: The importance of appropriate spatial scales. *Marine Environmental Research,* Volume 130, pp. 112-133.
Witter, M. S., Cuthill, I. C. & Bonser, H. C., 1994. Experimental investigations of mass-dependent predation risk in the European starling, Sturnus vulgaris. *Animal Behaviour,* 48(1), pp. 201-222.
Wright, M. D., Goodman, P. & Cameron, T. C., 2010. Exploring behavioural responses of shorebirds to impulsive noise.. *Wildfowl Journal,* Volume 60, pp. 150-167.

1.6 Protected bird species: food availability

1.6.1 Removal of target species

- Shellfisheries can provide a potential source of conflict by competing with the same food resources as certain bird species (Atkinson *et al*., 2003).
- The removal of food resources by shellfish fishing therefore has the potential to have detrimental effects on the amount of food available per bird and subsequently increases the chance of a threshold being reached where mortality from starvation begins to increase (West *et al*., 2005; Navedo *et al*., 2008).
- The removal of shellfish from productive beds, along with associated disturbance, can drive birds from preferred feeding grounds to areas of poorer quality. This can lead to an increase in bird densities and a subsequent intensification of interference and exploitation competition for food, which can reduce intake rate and probability of starvation, particularly in winter (Goss-Custard & Verboven, 1993; Clark, 1993; Goss-Custard *et al*., 1996).

- It is important to understand to what degree bird species can switch to other food resources, if their target species (that may also be the target species of the fishery) is reduced (Schmechel, 2001).
- It was reported by Zwarts *et al*. (1996a) that along the north-west European coast there are limited possibilities of alternative prey items for certain bird species, especially in winter due to changes in availability.
- Using individual behaviour-based models, it has been shown that shellfish stocks should not fall below 2.5 to 8 times the biomass that shorebird populations require to survive (Stillman *et al*. 2003; Goss-Custard *et al*. 2004; Stillman *et al*. 2010).
- Stillman *et al*. (2001) used a behaviour-based model to investigate the effects of present-day management regimes of the Exe estuary mussel fishery and Burry Inlet cockle fishery on the survival and numbers of overwintering oystercatchers. Results of the study concluded that at present intensities (for cockle hand raking: 50 persons, max 100kg per day) the fisheries do not cause oystercatcher mortality to be higher than it would be in absence of the activity (Stillman *et al*., 2001).
- Hand raking cockles had negligible effect on how much time oyster catchers spent feeding because it only removed cockles >22mm (Stillman *et al*., 2001). Increased fishing effort up to 500 persons hand raking cockles did not affect the mortality rate, mean mass of birds, or bird time spent in fields, whereas increased dredging did. The difference was caused by the significantly higher rate of depletion of the stocks seen in dredge fisheries (Stillman *et al*., 2001).
- However, for mussel hand raking, the effects on oystercatchers were greater than dredging because the activity removed mussel beds and caused disturbance and so these impacts combined (Stillman *et al*., 2001).
- In a study by Ferns *et al*. (2000), bird feed activity increased shortly after cockle harvesting (mechanical), particularly in areas of muddy sand rather than in areas of clean sand. However, following the increase in feeding activity, the level of bird activity declined for more than 80 days (curlew and gulls) and for more than 50 days (oystercatcher) following harvesting when compared to control areas. It was noted that the initial net benefit of harvesting was matched by decreased feeding opportunities in the winter (Ferns *et al.,* 2000).

1.6.2 Size of prey species

- The exact role of the fishery and its effect on bird population, because of direct competition, will largely depend on the distinct size fractions of the stock that may be exploited by fishers and birds (Schmechel, 2001).
- Whilst there may be an overlap in the size of cockles taken by both fishers and birds, most bird predation is of a smaller size class than fishers take (Norris *et al*., 1998).
- If sizes overlap, there can be a genuine conflict of interest between the birds and the fishery, therefore larger minimum sizes are more favourable to birds (Lambeck *et al*., 1996).
- Bowgen *et al*., (2015) used an individual-based model to investigate how invertebrate species regime shifts would affect wading bird populations across Poole Harbour. Shifts were considered in terms of size class changes and complete removal, which represent similar effects of intertidal fishing activity. Curlew, black-tailed godwit and redshank numbers were most reduced when the abundance of the largest marine worms was removed (Bowgen *et al*., 2015). The strongest effect was on curlew, with modelled numbers reduced to zero percent if worm sizes above 75mm were removed, whilst for godwits, removal of worms above 60mm had the same effect. Curlew and black-tailed

godwits were not able to compensate with other marine invertebrates and could switch only to earthworms (Bowgen *et al*., 2015). Contrastingly, for a reduction in bivalve size classes an effect was seen when only the very smallest bivalve size classes remained at <19mm and <15mm respectively for oystercatchers and curlew and black-tailed godwits (Bowgen *et al*., 2015).

- Overall, the curlew was found to be most sensitive to regime shifts due to its large size, and specific feeding strategy, whilst generalists such as oyster catchers are likely to survive during invertebrate species shifts. However, because birds adapt to changes by switching to alternative prey species, size classes and feeding areas, it was concluded that changes in invertebrate size and species distribution do not affect the number of birds the Harbour can support (Bowgen *et al*., 2015).
- Caldow *et al*. (in Jensen *et al.* 2005) demonstrated that the non-native Manila clam, forms a prey item of the oystercatcher population in Poole Harbour. The size of individuals targeted by oystercatcher's range in length from 16 to 50mm. Between late summer and the following spring, a significant increase in the proportion of the population (up to 40 to 50%) consumes this target species. Using an individual's-based simulation model, the study predicts the presence of Manila clams, at low densities of 5 clams per m^2 (mean density when the study was undertaken), has reduced over-winter mortality rates of oystercatchers by 3.5% in Poole Harbour (Caldow *et al.,* 2005). The impacts in this study were related to the dredge fishery rather than shore gathering activity.
- Oystercatchers have shown a preference for older cockles, 20 to 40 mm, and will not take cockles less than 10 mm when these larger size classes are available (Hulscher, 1982; Zwarts *et al*., 1996a). However, oystercatchers do not necessarily choose the largest cockles as they are difficult to handle, with studies reporting that larger cockles were refused more often than small ones (Zwarts *et al*. 1996a). Oystercatchers are known to refuse small prey due to low profitability and the size of cockles left after fishing may therefore have an impact on feeding rate of the oystercatcher (Zwarts *et al*. 1996b; Wheeler *et al*., 2014).

Summary

- The removal of food resources during shore gathering such as shellfish collection has the potential to impact the amount of food available per bird inhabiting a particular area.
- The removal of target species may lead to changes in feeding behaviours, modification in feeding grounds to areas of poorer quality, increased density of feeding birds in areas with resources and increased competition for food.
- Increased impacts increase the chances of a threshold being reached where mortality from starvation begins to increase. Although this is dependent on the extent of removal, alongside the likelihood of species switching to other food sources in the even that their target food species is removed.
- Studies have shown that certain levels of activity, for example 50 cockle gatherers at a maximum of 100kg cockle harvested per day did not cause mortality of specific species to be higher than it would be in the absence of that activity.
- The extent of impact from fishing is also related to the size of prey species taken by fishers in comparison to the size taken by bird species. If there is an overlap between the required size ranges the impact is likely to be greater.

References for Section 1.6

Atkinson, P.W., Clark, N.A., Bell, M.C., Dare, P.J., Clark, J.A. & Ireland, P.L. 2003. Changes in commercially fished shellfish stocks and shorebird populations in the Wash, England. *Biol. Cons*., 114, 127-141.

Bowgen, K.M., Stillman, R.A., Herbert, R.J.H. 2015. Predicting the effect of invertebrate regime shifts on wading birds: Insights from Poole Harbour, UK. *Biological Conservation*, 186: 60-68

Clark, N.A. 1993. Wash oystercatchers starving. *BTO News*, 185, 1, 24.

Hulscher, J.B. 1982. The oystercatcher *Haematopus ostralegus* as a predator of the bivalve *Macoma balthica* in the Dutch Wadden Sea. *Ardea*, 70, 89–152.

Lambeck, R., Goss-Custard, J.D. & Triplet, P. 1996. Oystercatchers and man in the coastal zone. In Goss-Custard, J.D. (Ed). The Oystercatcher: From Individuals to Populations. Oxford, Oxford University Press. pp. 289-326

Navedo, J.G. & Masero, J.A. 2008. Effects of traditional clam harvesting on the foraging ecology of migrating curlews (*Numenius arquata*). *J. Exp. Mar. Biol. Ecol*., 355, 1, 59-65.

Norris, K., Bannister, R.C.A. & Walker, P.W. 1998: Changes In the number of oystercatchers, *Haematopus ostralegus* wintering in the Burry Inlet in relation to the biomass of cockles *Cerastoderma edule* and its commercial exploitation. *J. Appl. Ecol.*, 35, 75–85.

Goss-Custard, J. D. & Verboven, N., 1993. Disturbance and feeding shorebirds on the Exe estuary. *Wader Study Group Bull,* pp. 68:59-66.

Goss-Custard, J.D., Durell, S.E.A. le V. dit, Goater, C.P., Hulscher, J.B., Lambeck, R.H.D., Meininger, P.L. & Urfi, J. 1996. How oystercatchers survive the winter. In Goss-Custard, J.D. (Ed). *The Oystercatcher: From Individuals to Populations*. Oxford, UK, Oxford University Press. pp. 133–154.

Goss-Custard, J.D., Stillman, R., West, A.D., Caldow, R.W.G., Triplet, P., Durell, S.E.A. Le V.dit. & McGrorty, S. 2004. When enough is not enough: Shorebirds and shellfishing. *Proc. R. Soc. Lond. B*., 271, 233-237.

Jensen, A & Humphreys, John & Caldow, Richard & Cesar, Christopher. (2005). 13. The Manila Clam in Poole Harbour. Proceedings in Marine Science. 7. 10.1016/S1568-2692(05)80018-X.

Schmechel, F. 2001. Potential impacts of mechanical cockle harvesting on shorebirds in Golden and Tasman Bays, New Zealand. DOC Science Internal Series 19. New Zealand Department of Conservation. 51 pp

Stillman, R., West, A.D., Goss-Custard, J.D., Caldow, R.W.G., McGrorty, S., Durrel, S.E.A. Le V.dit., Yates, M.C., Atkinson, P.W., Clark, N.A., Bell, M.C., Drare, P.J. & Mander, M. 2003. An individual behaviour-based model can predict shorebird mortality using routinely collected shellfishery data, *J. Appl. Ecol.*, 6, 1090-1101.

West, A.D., Goss-Custard, J.D., Durell, S.E.A. Le V.dit. & Stillman, R.A. 2005. Maintaining estuary quality for shorebirds: towards simple guidelines. *Biol. Cons*., 123, 211-224.

Wheeler, R., Stillman, R.A.S. & Herbert, R.J.H. 2014. Ecological impacts of clam and cockle harvesting on benthic habitats and waterfowl. Report to Natural England. Bournemouth University. 42pp.

Zwarts, L., Cayford, J.T., Hulscher, J.B., Kersten, M. & Meire, P.M. 1996a. Prey size selection and intake rate. In Goss-Custard, J.D. (Ed). *The Oystercatcher: From Individuals to Populations*. Oxford, Oxford University Press.

2. Potential Impacts from Shore Gathering – Activity Specific

This section covers evidence relating to specific shore gathering activities, the evidence in this regard is less comprehensive than general impacts. The majority of the potential impacts from shore gathering activity apply generally and are not specific to a particular gear type, these more widely applicable impacts are covered through the review of evidence in Section 1.

2.1 Bait digging

- Bait digging plays a significant role in the cultural and economic sectors of coastal communities. The blow worm (*Arenicola defodiens*) is one of the five most expensive marine species on the global fisheries market (retail price per kg), according to a recent assessment of the polychaete bait industry, which revealed that 121,000 t are collected annually, valued at £5.9 billion (Watson *et al.,* 2017a).

2.1.1 Ecological impacts

2.1.1.1 Removal of target species

- *A. virens* (King ragworm) is often one of the most dominant macroinvertebrates within estuarine sediment communities providing an important prey species for many species of bird, fish and crustacean as well as being a key predator and scavenger Removal may therefore impact benthic communities (Giangrande *et al*., 2005; Watson *et al*., 2007).
- Individuals of *A. virens* subject to bait digging activity showed a significantly lower average mean weight than those in areas not subject to activity (Watson *et al.,* 2007).
- There is the potential for continued disturbance to alter the proportion of sexually mature individuals within a population with bait dragging selectively removing those individuals of a marketable size which are commonly those that are also sexually mature. Previous studies support this, with areas routinely used for bait digging showing that while the overall population numbers are greater, the number of reproductively mature individuals is lower than in areas where the activity does not occur (Watson *et al*., 2007). However, this may result in a shift in population dynamics rather than an overall detrimental impact.
- Studies have shown that other commercially exploited species exhibit a shift toward earlier onset of sexual maturity at a smaller size (Jennings *et al*., 2001). A. virens is known to be able to become sexually mature between 1 and 8 years old (Last and Olive, 1999) with the exact age (and therefore size) affected by environmental conditions (Breton *et al*., 2003), it could be therefore that A. virens are also able to shift toward achieving sexual maturity at a smaller size to compensate for the removal of larger individuals, thus reducing the impact on the overall population.
- Another potential impact is the loss of segments from damage caused during the bait dragging process. Damaged individuals are often immediately returned to the fishery as they have low market value; however the survival rate of these individuals is thought to be high provided that they are able to re-burrow quickly to avoid predation (Fowler, 1999). The ability of an individual to regenerate lost caudal segments is dependent on a number of factors including the position in the body at which the damage occurred (Golding, 1967; Olive, 1974), however the proportion of individuals returned damaged is thought to be low and the associated levels of predation not above what is seen naturally.
- Preferential removal of larger lugworms has resulted in changes in lugworm population structure, such as smaller individual sizes (Shahid, 1982) and increased mortality in the Solent (Beukema, 1995; Volkenborn and Reise, 2007).
- Decreases in lugworm can have significant impacts on the environment as they play a vital role in sediment stability and bioturbation (the reworking of soils and sediments by animals or plants through burrowing, ingesting and defecation). Bioturbation is believed to be a main driver of biodiversity (Tinlin-Mackenzie *et al.,* 2022).

2.1.1.2 Removal of non-target species

- Where impacts of bait digging have been observed, the recovery rates of infauna communities can range from several months up to five years for most vulnerable species (van den Heiligenberg, 1987; Beukema, 1995; Blake, 1979; Cryer *et al*., 1987; Fowler, 1999; Klunder *et al*., 2021, Cravalho *et al.,* 2013).

- Digging for the lugworm *Arenicola marina* has been shown to deplete the population of the cockle *Cerastoderma edule* on the North Norfolk Coast as the turning over of the sediment resulted in the cockles being re-buried too deep to survive (Jackson and James, 1979; McLusky *et al*., 1983).
- A study on bait digging in Fareham Creek, UK found that changes in sediment from the activity did not result in significant changes to the macrofaunal community although there was a significant increase in the variability of dispersion of species (Watson *et al.,* 2017). However, significant changes were seen in a neighbouring estuary site (Dell Quay) where it was noted that digging occurred for the majority of the time in areas which had already been dug (Watson *et al.,* 2017). It was postulated that the cumulative impacts of repeated digging prevent the recovery of small macrofauna species (Watson *et al.,* 2017). The overall conclusion of the study was that digging alters the macrofaunal community and associated sediment characteristics across large spatial scales but that the strength and type of response is site specific (Watson *et al.,* 2017).
- A study in an MPA in Northumberland, UK found that there was a significant negative impact on wider sediment communities from lugworm digging in the short-term with reductions in total infaunal abundance, taxonomic richness and alterations in community structure (Tinlin-Mackenzie *et al.,* 2022). Recovery was noted to occur within a few months suggesting that sites have the potential for substantial recovery if disturbance is ceased (Tinlin-Mackenzie *et al.,* 2022).
- Effects on macrofauna are also species specific. 11 days after digging in Norfolk, mortality had occurred in 85% of cockles (*Cerastoderma edule*) (Jackson & James 1979). The effect was observed to be greater on juvenile cockles, and laboratory experiments suggested that burial of cockles beneath the depth at which they can regain their near surface positions, leads to mortality (Jackson & James, 1979).
- Macrofaunal biomass has been noted to be significantly reduced after digging (Wynberg & Branch, 1994) although it is not always the case in all studies (Wynberg & Branch, 1997).
- Digging to 10 and 20 cm depth, where sediment was removed from an area, led to immediate declines in total abundance and species richness (Dernie *et al*., 2003).
- A study from two south Iberian Atlantic coastal systems found that the effects of bait digging were site specific and related to biological and sediment composition of the area prior to digging taking place (Carvalho *et al.,* 2013). Macrobenthic assemblages in areas with less mud, initially presenting the greatest infaunal diversity and eveness values, showed minor effects from digging with recovery within 7 days (Carvalho *et al.,* 2013). Areas with the greatest mud content and assemblages dominated by only a few species were the most affected and recovery occurred over a longer timescale (Carvalho *et al.,* 2013). The abundance of sedentary polychaetes was noted to decline whilst gastropod species increased. Differences in response to the disturbance by benthic assemblages were notes to vary when subjected to the same intensity, frequency and nature of disturbance both between and within different coastal ecosystems (Carvalho *et al.,* 2013). On this basis it was concluded that generalisations of activity impacts on non-target species are not possible (Carvalho *et al.,* 2013).

2.1.1.3 Sediment Impacts

- Studies on bait digging indicate that the organic content of the sediment changed following digging as organic matter was trapped in the holes dug and that the resulting lower concentration of organic matter in the immediate area surrounding the hole resulted in the inhibition of colonisation by sedentary species (Grant, 1981).

- A study in Portsmouth Harbour and Chichester Harbour in the UK found that significant differences between dug and undug sediment were limited to changes in organic content (Watson *et al.,* 2017). It was stated that, as organic matter, binds many contaminants, and sediment disturbance leads to desorption of pollutants that an increase in bioavailability of certain contaminants is a likely impact from bait collection (Watson *et al.,* 2017).
- At a low energy site in the Solent, experimental 1m^2 digging scares were observed on foot for 83 ± 30 days after the activity had taken place (Watson *et al.,* 2017).
- A number of studies have identified significant changes of sediment as a result of digging with the activity causing an increased coarsening of grains (McLusky *et al.,* 1983; Edwards *et al.,* 1992; Watson *et al.,* 2017). However, there are also studies where no significant changes in relation to grain size have been seen (Sherman and Coull, 1980; Dernie *et al.,* 2003).

2.1.1.4 Impacts to bird species

- A study on bird disturbance from digging activity in the Solent, UK, found a significant negative correlation in Chichester Harbour between the number of waders and the number of bait collectors (Watson *et al.,* 2017). A significant negative correlation with gulls was also noted (Watson *et al.,* 2017). Both species were noted to move away from areas when bait diggers were presented. There was however, no significant relationship at the site in Portsmouth Harbour, postulated to be due to the area being a highly disturbed site where birds may be habituated to the presence of collectors (Watson *et al.,* 2017).
- There are contrasting results in specific studies of bait digging on bird species foraging behaviours. It has been found that curlew demonstrated no impacts to foraging in areas which had been bait dug (Liley *et al.,* 2012) but semilpated sandpipers showed a reduction of 68.5% in foraging efficiency from bait harvesting, postulated to be related to reduced prey availability and interference with prey cues due to disturbed sediments (Shepherd and Boates, 1999).
- A study in Spain found that digging by hand impacted the bird prey species *Hydrobia ulvae* in terms of density and biomass when the top 5cm of the sediment were compared between dug and undug areas (Masero *et al.,* 2008). It was determined that this part of the sediment was most likely to be used by shorebirds, therefore the documented decrease could have potential impacts to the bird species utilising it as a prey source (Masero *et al.,* 2008).

Summary

- Removal of target species for bait digging may impact benthic communities as target species are often dominant within the sediment community and provide prey species for many species of birds, fish and crustacean.
- Potential impacts to target species include individuals' weight and the proportion of sexually mature individuals in a population.
- Impacts to non-target species are noted to be varied, along with recovery rates. Differences in impact have been seen over relatively small spatial scales, with the suggestion that cumulative impacts of regular activity may exacerbate effects.
- Impacts from abrasion directly attributed to bait digging activity are primarily related to organic content of the sediment which may lead to other effects such as increased bioavailability of pollutants. There is also a suggestion that sediment becomes more dominated by coarser grains as a result of digging but this is not seen in all studies.
- Bait digging has the potential to cause disturbance to bird species and impacts to foraging. However, these impacts are seen to be site specific and potentially related to species being more habituated to disturbance.

References for Section 2.1

Beukema, J.J., 1995. Long-term effects of mechanical harvesting of lugworms Arenicola marina on the zoobenthic community of a tidal flat in the Wadden Sea. *Netherlands Journal of Sea Research*, *33*(2), pp.219-227.

Blake, R.W., 1979. Exploitation of a natural population of Arenicola marina (L.) from the north-east coast of England. *Journal of Applied Ecology*, pp.663-670.

Carvalho, S., Constantino, R., Cerqueira, M., Pereira, F., Subida, M.D., Drake, P. and Gaspar, M.B., 2013. Short-term impact of bait digging on intertidal macrobenthic assemblages of two south Iberian Atlantic systems. *Estuarine, Coastal and Shelf Science*, *132*, pp.65-76.

Chandrasekara, W.U. and Frid, C.L.J., 1998. A laboratory assessment of the survival and vertical movement of two epibenthic gastropod species, Hydrobia ulvae (Pennant) and Littorina littorea (Linnaeus), after burial in sediment. *Journal of Experimental Marine Biology and Ecology*, *221*(2), pp.191-207.

Coleman, F.C. and Williams, S.L., 2002. Overexploiting marine ecosystem engineers: potential consequences for biodiversity. *Trends in Ecology & Evolution*, *17*(1), pp.40-44.

Collie, J.S., Hall, S.J., Kaiser, M.J. and Poiner, I.R., 2000. A quantitative analysis of fishing impacts on shelf-sea benthos. *Journal of Animal Ecology*, *69*(5), pp.785-798.

Cryer, M., Whittle, G.N. and Williams, R., 1987. The impact of bait collection by anglers on marine intertidal invertebrates. *Biological Conservation*, *42*(2), pp.83-93.

Davidson, N.C. and Rothwell, P.I., 1993. Human disturbance to waterfowl on estuaries: conservation and coastal management implications of current knowledge. *Wader study group bulletin*, *68*, pp.97-105.

Dayton, P.K., Thrush, S.F., Agardy, M.T. and Hofman, R.J., 1995. Environmental effects of marine fishing. *Aquatic conservation: marine and freshwater ecosystems*, *5*(3), pp.205-232.

De Cubber, L., Lefebvre, S., FISSEAU, c., Cornille, V., Gaudron, S. M. (2018) 'Linking life-history traits, spatial distribution and abundance of two species of lugworrm to bait collection: A case study for sustainable management plan'. *Marine Environmental Research,* 140, pp. 433-443. doi: 10.1016/j.marenvres.2018.07.009.

Dernie, K. M., Kaiser, M. J., Richardson, E. A. & Warwick, R. M. 2003. Recovery of soft sediment communities and habitats following physical disturbance. *Journal of Experiment Marine Biology and Ecology*, 285: 415-434.

Edwards, A., Garwood, P. & Kendall, M. 1992. The Gann Flat, Dale: thirty years on. *Field Studies*, 8: 59-75.

Fowler, S.L., 1999. Guidelines for managing the collection of bait and other shoreline animals within UK European marine sites. English Nature (UK Marine SACs Project). 132 pages. *Guidelines for managing the collection of bait and other shoreline animals within UK European marine sites*, *3*, p.3.

Howell, R., 1985. The effect of bait-digging on the bioavailability of heavy metals from surficial intertidal marine sediments. *Marine Pollution Bulletin*, *16*(7), pp.292-295.

Jackson, M. J. & James, R. 1979. The influence of bait digging on cockle, *Cerastoderma edule*, Populations in North Norfolk. *Journal of Applied Ecology*. 16(3):671-679.

Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C., Somerfield, P.J. and Karakassis, I., 2006. Global analysis of response and recovery of benthic biota to fishing. *Marine Ecology Progress Series*, *311*, pp.1-14.

Klunder, L., van Bleijswijk, J.D., Schaars, L.K., van der Veer, H.W. and Luttikhuizen, P.C., 2021. Impact of mechanical Arenicola dredging on the benthic fauna communities: assessed by a morphological and molecular approach. *Marine Ecology Progress Series*, *673*, pp.17-28.

Masero, J. A., Castro, M., Estrella, S. M. & Perez-Hurtado, A. 2008. Evaluating impacts of shellfish and baitworm digging on bird populations: short-term negative effects on the availability of the mudsnail *Hydrobia algae* to shorebirds. *Biodiversity Conservation*, 17: 691-701.

McLusky, D.S., Anderson, F.E. and Wolfe-Murphy, S. 1983. Distribution and population recovery of Arenicola marina and other benthic fauna after bait digging, *Marine Ecology Progress Series*, 11: 173-179

Navedo, J.G. & Masero, J.A. 2008. Effects of traditional clam harvesting on the foraging ecology of migrating curlews (Numenius arquata). J. Exp. Mar. Biol. Ecol., 355, 1, 59-65.Sheehan, E.V., Coleman,R.A., Thompson, R.C. and Attrill, M.J. 2010. Crab-tiling reduces the diversity of estuarine infauna. *Marine Ecology Progress Series*, 411, 137-148.

Shahid, M.H.S., 1982. *The reproductive biology, population genetics and population dynamics of the lugworm, Arenicola marina, in relation to bait digging on the Northumberland coast* (Doctoral dissertation, University of Newcastle upon Tyne).

Sherman, K. M., & Coull, B. C. (1980). The response of meiofauna to sediment disturbance. *Journal of Experimental Marine Biology and Ecology*, 46: 59-71.

Thrush, S.F., Hewitt, J.E., Cummings, V.J., Dayton, P.K., Cryer, M., Turner, S.J., Funnell, G.A., Budd, R.G., Milburn, C.J. and Wilkinson, M.R., 1998. Disturbance of the marine benthic habitat by commercial fishing: impacts at the scale of the fishery. *Ecological applications*, *8*(3), pp.866-879.

Tinlin-Mackenzie, A. Rowland, B. W., Delany, J., Scott, C. L., Fitzsimmons, C. (2022) 'The lugworm fishery in Northumberland, UK: Bait digging impacts in a marine protected area', *Journal of Experimental Marine Biology and Ecology*, 552, p. 151736. doi:10.1016/j.jembe.2022.151736.

van den Heiligenberg, T., 1987. Effects of mechanical and manual harvesting of lugworms Arenicola marina L. on the benthic fauna of tidal flats in the Dutch Wadden Sea. *Biological Conservation*, *39*(3), pp.165-177.

Volkenborn, N. and Reise, K., 2007. Effects of Arenicola marina on polychaete functional diversity revealed by large-scale experimental lugworm exclusion. *Journal of Sea Research*, *57*(1), pp.78-88.

Volkenborn, N., Hedtkamp, S.I.C., Van Beusekom, J.E.E. and Reise, K.J.E.C., 2007. Effects of bioturbation and bioirrigation by lugworms (Arenicola marina) on physical and chemical sediment properties and implications for intertidal habitat succession. *Estuarine, Coastal and Shelf Science*, *74*(1-2), pp.331-343.

Watson, G.J., Murray, J.M., Schaefer, M. and Bonner, A., 2017. Bait worms: a valuable and important fishery with implications for fisheries and conservation management. *Fish and fisheries*, *18*(2), pp.374-388.

Watson, G. J., Murray, J. M., Schaefer, M., Bonner, A. and Gillingham, M. 2017. Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: the importance of appropriate spatial scales. *Marine Environmental Research*, 130, 122-133.

Wynberg, R.P. & Branch, G.M. 1994. Disturbance associated with bait collection for sand prawns (*Callianassa kraussi*) and mudprawns (*Upogebia africana*): Long term effects in the biota of intertidal sandflats. *Journal of Marine Research*. 52:523-558.

Wynberg, R.P. & Branch, G.M. 1997. Trampling associated with bait collection from sand prawns *Callianassa kraussi* Stebbing: effects on the biota of an intertidal sandflat. *Environmental Conservation* 2:139-148

2.2 Shrimp Push Netting

2.2.1 Overview

- Push net gear is usually operated on intertidal mud and muddy sand substrates during low tide. Due to the tidal conditions in the UK, fishers can usually operate for one to two hours (Temple, 2015).

2.2.2 Ecological impact

- The ecological impact of shrimp push netting is thought to be relatively small, where impacts do occur, these are related to trampling and removal of target species. Push netting in the UK is generally operated at low frequencies within temporal and spatial limitations (weather conditions, sea state, tide, substrate type and topography).
- Some push nets in the North of the UK have a wooden bar along the bottom that enables the net to bounce along the substrate without digging into it (Haines, 2016).
- Other forms of push net have skis fitted on the end of the frame in contact with the seabed to prevent it from getting stuck on finer substrates (Fisheries and Aquaculture Department (FAO), 2023).

2.2.2.1 Removal of target species

- Nurul Amin *et al*. (2008) describes in a Malaysian estuarine study that the average push net fisher catches 3.54 kg/hour of *Acetes* shrimp. However, the total catch will vary depending on the strength of the operator, their experience, and season.
- Regardless of whether this gear is operated commercially or recreationally, the operation of this gear is known to cause little stress to caught prawn individuals when hand operated (Broadhurst *et al*., 2004).
- In a study in Australia, it was found that the low concentration of Lactate released from stress during and after catch had a minimal effect on the condition and survival rate of the target species. The relatively small size of the gear and the area it can cover in one operation has a limited impact on the population of shrimp in terms of removal of caught individuals (Temple, 2015).

2.2.2.2 Removal of non-target species

- Push nets have a fine mesh for catching prawns and shrimp, because of this fine mesh there is also the potential for catches of juvenile prawns and other small species (Hinz, 1989).
- The ratio of bycatch to targeted species caught depends on the catch capability of the fisher operating the push net (Nurual Amin *et al*, 2008). This includes the strength of the operator, their experience operating this gear for the species they're targeting, and the season this gear is being operated in (Nurul Amin *et al*., 2008).
- Even though push netting is a small-scale fishing operation compared to other gears, continued catch of juvenile fish species could result in stock declines and trophic shifts (Jones *et al*., 2009).
- Various studies conflict over the selectivity of push nets, with some quoting at least 90 % selectivity for shrimp and prawns (Jeyabaskaran, *et al*., 2018; Suebpala *et al*., 2017) and others a minimum of 70 % non-selectivity (Davies *et al*., 2009; Macer, 1967).

- In a study in Wales, it was found that 70 % of the total catch from push net activity consisted of juvenile fish, including Plaice and Dab, and some decapod species (Macer, 1967). Dependent on the frequency the gear is operated, continued catch of juvenile fish could have an impact on their recruitment to adult stocks (Macer, 1967).

2.2.2.3 Sediment Impacts

- Contact with the substrate from this gear is low compared to some other gear due to its small footprint, however due to this type of gear requiring manpower, there is a risk of trampling from the fisher during operation (Rossi *et al*., 2007).
- The impact of this gear both directly and indirectly from trampling from fishers when in operation or to gain access to the operation site can disrupt sediment on the surface of the seabed, damage fragile features, and bury or crush epibenthic species (Rossi, *et al*., 2007).
- Hand operated push nets are designed to be light weight so that they can glide across substrate without penetrating the seabed or damaging fragile features including seagrass and Mearl beds.
- A study in India found there was evidence of burrowing fauna being caught as well as fragments of seagrass and other seaweed (Rajan *et al*., 2017).
- A study in Thailand also found that the activity had the potential to dislodge or remove sessile species (Janekarn & Chullasorn, 1997). Extending this impact, it is postulated that the gear could cause damage to habitats such as seagrass by cutting or uprooting plants.

2.2.2.4 Impacts to bird species

- North Western IFCA assessments of push netting activities (Haines, 2016; Temple, 2015) determined that the operation of this gear within SPAs has no significant impact on nesting or feeding birds. The small scale and non-motorised operation of this activity is unlikely to exceed ambient noise levels and is limited spatially and temporally in terms of operation (tide restriction).
- A study in Thailand (Galbraith *et al*., 1999) found that fishers operating hand-held push nets were generally ignored by resident bird populations. However, when there was a large group of push net fishers, or if fishers were present at the site for an extended period of time, then there was a temporary decline in bird foraging activity (Galbraith *et al*., 1999). There was also an impact on breeding birds when there was a large gathering of people, excessive noise being produced, or fishers getting too close to the nesting sites (Galbraith *et al*., 1999).

Summary

- Push netting usually occurs on intertidal mud and muddy sand substrates during low tide for 1-2 hours at a time.
- The ecological impact is thought to be small, related primarily to trampling and removal of the target species.
- Mitigative measures are often already applied to push nets to reduce impact on the seabed.
- Impacts to target species have been found to be minimal with stress responses observed during and following catch to have a minimal affect on condition and survival rate.
- There is the potential for bycatch of juvenile prawns or other small species, the degree to which bycatch is observed is primarily based on fisher behaviour when operating the gear. Gear selectivity is documented at between 30%-90%.
- Two studies have shown that sessile species can be impacted by push netting, with one study documenting seagrass being removed by the activity.
- Bird disturbance from push netting is documented to be not significant, the number of operators and fishers getting too close to nesting sites were exacerbating factors where any impact was noted to occur.

References for Section 2.2

Broadhurst, M. K., Millar, R. B., Young, D. J., Wooden, M. E., & Rowland, S. (2004). Atypical size selection of captive school prawns, Metapenaeus macleayi, by three recreational fishing gears in south-eastern Australia. *New Zealand Journal of Marine and Freshwater Research*, 38, 755-766.

Davies, R. W., Cripps, S. J., Nickson, A., & Porter, G. (2009). Defining and estimating global marine fisheries bycatch. Marine Policy. doi:10.1016/j.marpol.2009.01.003

Fisheries and Aquaculture Department (FAO). (2023). Fishing Techniques: Shrimp Push Net Fishing. Rome: Fisheries and Aquaculture Division [online]. Retrieved from https://www.fao.org/fishery/en/fishtech/1023

Galbraith, C. A., Pierce, G. J., Spray, C. J. and Robinson, I. H. 1999. The diurnal movement pattern of waterbirds in the Kukut area of Lake Songkla, southern Thailand. *Diurnal Movement Pattern of waterbirds*, 163-179.

Haines, J. (2016). Fisheries in EMS Habitats Regulations Assessment for Amber and Green risk categories: NWIFCA-MB-EMS-013. Carnforth: North Western Inshore Fisheries and Conservation Authority (NW-IFCA). Retrieved from https://nw-ifca.gov.uk/app/uploads/NWIFCA-MB-EMS-013_Shrimp-Push-Nets.pdf

Hinz, V. (1989). Monitoring the fish fauna in the Wadden Sea with special reference to different fishing methods and effects of wind and light on catches. *Helgoländer Meeresuntersuchungen*, 43, 447-459. doi:10.1007/BF02365903

Janekarn, V. and Cullasorn, S. 1997. Environmental impacts on coastal fisheries along the west coast of Thailand. In: Asia-Pacific Fishery Commission (APFIC): Environmental Aspects of Responsible Fisheries. Proceedings of the APFIC Symposium, Seoul, the Republic of Korea, 15-18 October 1996. FAO Bangkok. RAP Publication 32/1997: 222-233.

Jeyabaskaran, R., Jayasankar, J., Ambrose, T. V., Valsalan, K. C., Divya, N. D., Raji, N., . . . Kripa, V. (2018). Conservation of seagrass beds with special reference to associated species and fishery resources. *Journal of Marine Biological Association of India*, 60(1). doi:10.6024/jmbai.2018.60.1.2038-10

Jones, E., Gray, T., & Umponstira, C. (2009). The impact of artisanal fishing on coral reef fish health in Hat Thai Mueang, Phang-nga Province, Southern Thailand. *Marine Policy*, 33(4), 544-552. doi:10.1016/j.marpol.2008.12.003

Macer, C. T. (1967). The food web in Red Wharf Bay (North Wales) with particular reference to young plaice (Pleuronectes platessa). *Helgoländer wissenschaftliche Meeresuntersuchungen*, 15, 560-573. doi:10.1007/BF01618651

Nurul Amin, S. M., Arshad, A., Shamsudin, S. B., Bujang, J. S., & Siraj, S. S. (2008). Catch Per Unit Effort of Estuarine Push Net with Emphasis on Occurrence and Abundance of Acetes Shrimps in the Coastal Waters of Malacca, Peninsular Malaysia. *Pertanika Journal of Science and Technology*, 16(2), 281-289. Retrieved from https://core.ac.uk/download/pdf/153798442.pdf

Rossi, F., Forster, R. M., Montserrat, F., Ponti, M., Terlizzi, A., Ysebaert, T., & Middelburg, J. J. (2007). Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. Marine Biology, 151(6), 2077-2090. doi:10.1007/s00227-007-0641-0

Rajan, R., Paramasivam, K., Shrinivaasu, S., Venkatraman, C., Venkataraman, K., Padmanaban, P., Surendar, C., Kumar, R., Vanishree, J. (2017). Fauna (Epibenthic and Epifauna) associated with sea grass ecosystems in Palk Bay and Gulf of Mannar. *Zoological Survey of India, Occasional Paper*, 387, 1-96.

Suebpala, W., Chuenpagdee, R., Nitithamyong, C., & Yeemin, T. (2017). Ecological Impacts of Fishing Gears in Thailand: Knowledge and Gaps. *Asian Fisheries Science*, 30, 284-305. doi:10.33997/j.afs.2017.30.4.006

Temple, S. (2015). Fisheries in EMS Habitats Regulations Assessment for Amber and Green risk categories: NWIFCA-RA-SPA-010. Carnforth: North Western Inshore Fisheries and Conservation Authority (NW-IFCA). Retrieved from https://nw-ifca.gov.uk/app/uploads/NWIFCA-RA-SPA-010_Shrimp-Push-Nets.pdf

2.3 Crab tilling and collection

- Crab tiling is the collection of shore crab (*Carcinarus maenas*) for the purpose of being used as angling bait. The crab tiling fishery operates within estuarine mudflats at a commercial scale and the process involves laying crab tiles, also referred to as crab shelters (hard man-made structures such as roof tiles, half round guttering and vehicle tyres) on the shore. Shore crabs are harvested from underneath the tiles periodically at low tide (Sheehan *et al*, 2010).
- There are areas where crab tilers only remove crabs over 40mm carapace width, avoid berried females and only harvest crabs which are in the stage of pre-ecdysis (moulting) (Sheehan *et al*., 2008).
- Over 1 million shore crabs are removed from south-west UK shores annually to be sold as bait (Sheehan *et al*., 2008). The mild climate in the south of the UK allows crabs to moult all year round, providing a year-round fishery. In other parts of the UK, crabs may only moult in summer months, leading to a seasonal fishery (Russel *et al.* 1999).
- The location at which crab tilers can place crab shelters is limited due to the requirements of landowner’s permission. This is because, crab-tiling does not follow the standard right to lay fishing gear as it does not “entrap” species.

2.3.1 Ecological Impact

2.3.1.1 <u>Removal of target species</u>

- *C. maenas* reach maturity within two years at a size of 25-30mm (Neal & Pizzolla 2008). Therefore, crab tilling does not target juvenile individuals and all crabs removed are likely to have had the opportunity to reproduce.
- Sheehan *et al.* (2008) found that when compared to non-tilled estuaries, tilled estuaries support a significantly greater abundance of crabs (63% more), particularly juvenile individuals 20 to 39mm. This was believed to be due to the provision of additional habitat.

- However, the same study found more reproductively active crabs and crabs greater than 60cm in non-tiled estuaries (Sheehan *et al.,* 2008). Similarly, removal of species may lead to reduction of local populations.
- The impact of greater crab abundance in tiled estuaries is unknown. Devon and Severn IFCA (2019) highlighted that estuaries are important nursery areas for many fishes, such as plaice (*Pleuronectes platessa),* bass (*Dicentrarchus labrax)* and turbot (*Scophthalmus maximus). C. maenas* is an important food source for several predatory fish, and therefore an increase in crab abundance may lead to increased abundance of adult predatory fish species (Devon and Severn IFCA, 2019). However, *C. maenas* is also a predator in intertidal systems and predates upon juvenile fishes, and therefore greater abundance of the species may have negative consequences on fish populations (Devon & Severn IFCA, 2019).

2.3.1.2 Impacts to non-target species

- Abundance of aquatic fauna has been noted to be lower around crab tiles compared to non-tiled areas. It is postulated that the congregation of *C. maenas* around crab tiles increases the level of predation on non-target species as tiled areas showed an abundance of the target species over other aquatic fauna (Sheehan, 2007).
- A study in the UK found that the abundance of mobile fauna including benthic gobies, mysids, crabs and pelagic fishes was greater in control sites that in tiled sites during the month of July (Sheehan *et al*., 2010a). This was also observed in March but results were not significant, equally there was a greater diversity of taxa in control sites observed but this was also not significant (Sheehan *et al*., 2010a). Crabs were observed to occupy the tiles during submersion and had a tendency to be aggressive to other species in defending the tile (Sheehan *et al*., 2010a).
- A similar study in the same area of the UK found that mean infaunal abundance declined with increasing mean penetrability of the sediment (Sheehan *et al*., 2008). Control and 'tile only' sites showed similar abundance scores to each other whilst 'trampling only' sites were least stable and showed the lowest infaunal abundance (Sheehan *et al*., 2008).

2.3.1.3 Sediment Impacts

- Sheehan *et al*. (2010b) studied several sediment parameters in relation to the effects of crab tiling and associated trampling. Impacts to the sediment were though to be mostly related to trampling with the extent of changes to the sediment related to relatively small changes in sediment composition (Sheehan *et al*., 2010b).
- The same study observed no effect of crab-tiling on organic content or grain size, it was determined that existing differences from among-estuary variation masked any impacts from the activity in isolation (Sheehan *et al*, 2010b).
- The effects of year and difference between sites were stronger than effects of disturbances from treatments. Sheehan *et al*. (2010b) concluded that crab tiling modifies sediment stability and measures of infaunal diversity, with muddy habitats more susceptible to disturbance than those which are sandy.

2.3.1.4 Disturbance to bird species

- The estuaries in which the shore crab is harvested act as key feeding habitats for wading birds, some of which prey on *C. maenas.*

- The presence of crab tiles were found to have no impact on bird abundances in Devon estuaries, however curlew and redshank were seen using the crab tiles as a resources for food and spending a significant amount of time around crab tiles (Sheehan, 2007).
- Observations of foraging birds in tiled and non-tiled sites were used to test a model that the fishery modified diversity, distribution and behaviour of shorebirds (Sheehan *et al*., 2012). No evidence was found for a relationship between shorebird species richness, abundance or assemblage composition and the presence of tiles (Sheehan *et al*., 2012).
- It is suggested that crab-tiles could influence the distribution of potential prey species and as such aggregate shorebirds, relieving predation pressure in other areas (Sheehan *et al*., 2012). Bird species such as curlew and redshank were also observed next to crab-tiles without engaging in feeding behaviour suggesting that the tiles may also provide a shelter for shorebirds against negative effects of wind on thermoregulation (Sheehan *et al*., 2012).

Summary

- Some mitigation measures are already employed by crab-tilers including targeting crabs over 40mm carapace width, avoiding berried females and only harvesting crabs which are in the stage of pre-ecdysis.
- Estuaries subject to crab-tiling are found to support a significantly greater abundance of crabs, particularly juveniles, believed to be due to additional habitat provision. However, more reproductively active crabs were found in non-tiled estuaries.
- The impact of greater crab numbers in estuaries is mixed, providing both a food source to predatory adult fish but also a predator species for juvenile fish.
- Abundance of other aquatic fauna has been noted to be lower around crab tiles, potentially due to aggressive defending of the tiles by the crabs. In other studies changes in abundance of non-target species has been found to be seasonal.
- The effects of trampling are noted to be the most prevalent abrasion impact, compounding effects of faunal change. Muddy habitats were more susceptible to disturbance than sandy habitats.
- No impacts to organic content or grain size of sediments in crab-tiled areas have been noted.
- The presence of crab-tiles is noted not to have an impact on bird species, certain species have even been noted to use crab tiles for feeding and shelter.

References for Section 2.3

Devon & Severn IFCA. 2019. Managing Hand Working Fishing Activity. A focus on Crab Tiles. May 2019. Available at: BPSCHandgatheringreport30thJuly2019.pdf (devonandsevernifca.gov.uk)

Neal, K.J. and Pizzolla, P.F., 2008. Carcinus maenas. Common shore crab.

Russet I, T. (1999). "A study of peeler crab collection on estuaries in the south west of England." Dissertation tor the Coastal and Marine Resource management degree at Portsmouth.

Sheehan, E.V. 2007. Ecological impact of the Carcinus maenas (L.) fishery 'crab-tiling' on estuarine fauna. Thesis. University of Plymouth. March 2007.

Sheehan, E.V., Thompson, R.C., Coleman, R.A. and Attrill, M.J. 2008. Positive feedback fishery: Population consequences of crab-tiling on the green crab *Carcinus maenas. Journal of sea Research.* 60: 303 to 309pp.

Sheehan, E. V., Coleman, R. A., Attrill, M. J. and Thompson, R. C. 2010a. A quantitative assessment of the response of mobile estuarine fauna to crab-tiles during tidal immersion using remote underwater video cameras. *Journal of Experimental Marine Biology and Ecology*, 387: 68-74.

Sheehan, E.V., Coleman,R.A., Thompson, R.C. and Attrill, M.J. 2010. Crab-tiling reduces the diversity of estuarine infauna. *Marine Ecology Progress Series*, 411, 137-148.

2.4 Shellfish collection

- Shellfish gathering involves the removal of bivalve species such as cockles, native oysters and periwinkles from the surface of the substrate using methods such as digging, raking or hand picking (McLusky *et al*., 1983; Travaille *et al.,* 2015; Watson *et al.,* 2017).

2.4.1 Ecological Impacts

2.4.1.1 Removal of target species

- A study in the Western English Channel considered the impact of clam raking in different habitat types and concluded that high energy environments transfer clams and macrofauna, minimising the effect of rake harvesting (Beck *et al.,* 2015). Results showed that experimental clam raking of *R. philippinarum and R. decussatus* significantly decreased the number of clams on gravelly compared to sandy habitats (Beck *et al.,* 2015).
- Research conducted in the Strangford Lough SAC (Northern Ireland) found that previous disturbance to sediment where cockles were returned (i.e. collection via hand rake) had no influence on burial rate of cockles, however larger cockles had a slower burial speed (McLaughlin *et al.,*2007).
- Research by Leitao and Gaspar (2011) in the south of Portugal concluded that neither hand knife nor dredge methods used to collect cockles affected the subsequent burrowing rate of the target species. Regarding the burrowing rate of two groups of cockles, 83% burrowed within 15 minutes and only 10% remained on the surface after an hour (Leitao and Gaspar, 2011).
- However, Crespo *et al.* (2010) found large-scale collection of the common cockle (*Cerastoderma edule*) in Portugal may cause considerable changes in population structure over an 18-month period (Crespo *et al.,* 2010). Population abundance and biomass reduced by 80% and 94%, respectively, with implications for population dynamics and secondary production. The abundance of cockles above 15.25mm decreased significantly, whereas the density of cockles over 20.25mm did not recover within a year (Crespo *et al.,* 2010).
- The same study found that large-scale harvesting caused seasonal variations in recruitment dates, from May to year-round, however production values remained low during the 12-month research. Overall, overharvesting resulted in the disappearance of adult cockles and subsequent lower production values (Crespo *et al*., 2010).
- Investigations into management of cockle harvesting outside of Europe concluded that management of highly variable and unknown species in not possible due to the unpredictable nature of recreational harvest and shellfish population dynamics (Beck *et al.,* 2015).
- Precautionary minimum size limits were deemed the best management solutions, with bag limits and closed areas playing a less vital role where there is an absence of intensive monitoring and management (Hartill *et al.,* 2005).
- Crawford *et al*., (2010) demonstrated that small scale no take zones led to significant increased densities of cockles (*Anadara spp.*), both inside and out of the protected areas.
- In Washington USA, Griffiths *et al.* (2006) studied the effects of clam (*Venerupis philippinarum* and *Protothaca staminea*) digging on several open beaches compared to marine reserve beaches. Clam abundance was greater on reserve beaches compared to non-reserve beaches (Griffiths *et al.,* 2006).
- Similarly, Gray (2016) compared the impact of clam harvesting on two commercially hand-fished beaches compared to two un-fished beaches in Australia, before and during harvesting of 4,300 and 17,800kg of clams. No effect of clam harvesting was found

however, populations of clams were highly variable across the four sites. Under local management measures, fishers were limited to a 40kg catch per day, so it was considered that this level of harvesting may not be impacting the populations of clams in the area, or that the natural spatial variation observed between beaches and sites is greater than that which is caused by fishing at its current level (Gray, 2016).

2.4.1.2 Removal of non-target species

- The method by which this is achieved e.g., digging, raking or hand picking can also lead to the removal of non-target species through indirect mortality, damage and disturbance (Dernie *et al.,* 2003; Rossi *et al.,* 2007).
- Kaiser *et al.* (2001) examined the effects of hand raking of a small and large area without removing the target species on non-target species and undersized cockles (*Cerastoderma edule*). Initially, raking led to three times more damaged undersized cockles in the experimental plot. Unexpectedly, there was significantly lower mean abundance of individual organisms in the control plot, which demonstrated there were differences in community structure between the experimental and control plots irrespective of treatment. Fourteen days following raking there was a decrease in abundance relative to immediately after raking. After 56 days the small-raked areas had recovered, however for the large-raked areas, whilst the abundance of individuals had increased, it had not fully recovered 447 days following analysis (Kaiser *et al.,* 2001).
- Leitao and Gaspar (2007) compared the impact of *C. edule* collection using a knife versus a hand dredge. Macrofaunal mortality was low in both methods (mean: harvesting knife 1.64% and dredge 0.98%), but unexpectedly harvesting using the hand knife led to a higher (although not significant) mortality of macrofauna. As predicted, the harvesting dredge led to a five-fold increase in both the area fished and catch collected. When the target species were removed from the analysis, no significant difference between the communities exposed to the different fishing methods was observed, indicating both methods had remarkably similar overall impacts to the community, other than the target species (Leitao and Gaspar, 2007).
- Experimental clam raking (*R. philippinarum and R.* decussatus) in the Western English Channel uncovered no significant change in sediment characteristics or macrofauna on sandy, gravelly or mixed gravelly rocky habitats studied (Beck *et al.,* 2015).
- A study on the removal of razor clams by salting in southern Portugal found that there were no effects on the associated benthic community and that similar patterns of fluctuations in abundance were observed in control and experimental areas, attributed to natural variability (Constantino *et al*., 2009).
- Investigation into Manila clam (*Ruditpaes philippinarum)* collection in Italy found hand raking led to significantly lower meiofaunal abundance, particularly Harpacticoids (Mistri *et al.,* 2004).
- Other research has considered the differences between beaches which are fished and those which are protected in some way from the activities. In Washington USA, Griffiths *et al.* (2006) studied the effects of clam (*Venerupis philippinarum* and *Protothaca staminea*) digging on several open beaches compared to marine reserve beaches. Species richness and total polychaete family richness were greater on reserve beaches compared to non-reserve beaches. Non-reserve sites had greater abundances of the un-harvested clam species, limpets and *Nereis* polychaetes.
- Experimental digging led to significantly reduced species richness within the 'holes', compared with the dug-out 'fill' and controls. There was no significant effect of placing cages over experimentally dug plots showing that on this beach predation was not a key factor affecting the community following digging (Griffiths *et al*., 2006).

2.4.1.3 Sediment Impacts

- A study on razor clam harvesting using salt in southern Portugal found that there was no significant impact on the sediment (Constantino *et al*., 2009). The main observed effect was an increase in salinity, however this decreased rapidly with the flood tide and returned to pre-activity levels within a few hours (Constantino *et al*., 2009).
- A study on recreational clam harvesting by raking and digging in the USA found that raking did not impact any of the measured parameters, however clam digging resulted in reduced seagrass coverage and reductions in above-ground and below-ground biomass associated with the seagrass bed 1 month after the last of three-monthly treatments (Boese, 2002). Differences were noted to persist up to 10 months after treatment although were not significant. It was noted that full impacts could only be explore through multi-year studies and that differences in sediment characteristics and clam abundance would affect the level of impact (Boese, 2002).
- A study in Washington in the USA found that digging for clams altered the dug area, affecting grain size, organic matter and oxygen content (Griffiths *et al.,* 2006).

Summary

- Impacts to target species from shellfish gathering have been noted to be dependent on sediment type, season and the method of harvesting use.
- For some species, like common cockle, impacts relating to population abundance and biomass have been observed with implications for population dynamics and secondary production.
- Management measures including MCRS and small closed areas have been shown to minimize target species impacts. Low levels of harvesting have also been demonstrated to have a low level of impact.
- Decreased in abundance of non-target species have been noted following shellfish harvesting although this is also dependent on sediment characteristics and method of harvesting with mixed results from studies.
- Changes to species richness have been observed where holes remain from activity compared to holes filled in and control areas.
- Impacts to sediment are not widely studied specifically for shellfish harvesting where sediment effects are separated out from infaunal community effects. Studies which have looked specifically at sediment have found mixed results, some no effect and another showing affects to grain size, organic matter and organic content.
- Impacts to seagrass beds have been noted from clam digging with impacts (not significant) persisting up to 10 months post-treatment.

References for Section 2.4

Beck, F., Pezy, J-P., Baffreau, A., Dauvin, J-C. 2015. Effects of clam rake harvesting on the intertidal *Ruditapes* habitat of the English Channel, *ICES Journal of Marine Science*, 72 (9):2663–2673pp, https://doi.org/10.1093/icesjms/fsv137

Boese, B. L. 2002. Effects of recreational clam harvesting on eelgrass (*Zostera marina*) and associated infaunal invertebrates: in situ manipulative experiments. *Aquatic Botany*, 73(1): 63-74

Constantino, R., Gaspar, M. B., Pereira, F., Carvalho, S., Curdia, J., Matias, D. and Monteiro, C. C. 2009. Environmental impact of razor clam harvesting using salt in Ria Formosa lagoon (Southern

Portugal) and subsequent recovery of associated benthic communities. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 19:542-533

Crawford, B., Herrera, M. D., Hernandez, N., Leclair, C.R., Jiddawi, N., Masumbuko, S., Haws, M. 2010. Small Scale Fisheries Management: Lessons from Cockle Harvesters in Nicaragua and Tanzania. *Coastal Management*. 38(3):195-215.

Crespo, D., Verdelhos, T., Dolbeth, M., Pardel, M. Â. 2010. Effects Of The Over Harvesting On An Edible Cockle (Cerastoderma Edule Linaeus, 1758) Population On A Southern European Estuary. *Fresenius Environmental Bulletin*. 19 (12): 2801-2811

Dernie, K.M., Kaiser, M.J., Richardson, E.A. & Warwick, R.M. 2003b. Recovery of soft sediment communities and habitats following physical disturbance. *J. Exp. Mar. Biol. Ecol*. 285-286: 415-434.

Gray, C.A. 2016. Effects of Fishing and Fishing Closures on Beach Clams: Experimental Evaluation across Commercially Fished and Non-Fished Beaches before and during Harvesting. *PLoSONE* 11(1): e0146122. doi:10.1371/journal.pone.0146122

Griffiths, J., Dethier, M.N., Newsom, A. *et al.* (2006) Invertebrate community responses to recreational clam digging. *Mar Biol* 149, 1489–1497. https://doi.org/10.1007/s00227-006-0289-1

Hartill, B.W. Cryer, M. Morrison, M.A. 2005. Estimates of biomass, sustainable yield, and harvest: neither necessary nor sufficient for the management of non-commercial urban intertidal shellfish fisheries. *Fisheries Research*. 71 (2): 209-222pp https://doi.org/10.1016/j.fishres.2004.08.032.

Jackson, M. J. & James, R. 1979. The influence of bait digging on cockle, Cerastoderma edule, Populations in North Norfolk. *Journal of Applied Ecology*. 16(3):671-679.

Kaiser, M.J. Broad, G., Hall, S.J. 2001. Disturbance of intertidal soft-sediment benthic communities by cockle hand raking. *Journal of Sea Research* 45: 119-130.

Leitão, F.M.S. And Gaspar, M.B. 2007. Immediate Effect of Intertidal Non-Mechanised Cockle Harvesting On Macrobenthic Communities: A Comparative Study. *Scientia Marina* 71(4): 723-733pp.

Leitão, F.M.S. And Gaspar, M.B. 2011. Comparison of the burrowing response of undersized cockles (Cerastoderma edule) after fishing disturbance caused by hand dredge and harvesting knife, *Marine Biology Research*, 7:5, 509-514pp.

McLaughlin, E., Portig, A. and Johnson, M.P. 2007. Can traditional harvesting methods for cockles be accommodated in a Special Area of Conservation? *ICES Journal of Marine Science*, 64: 309–317pp.

McLusky, D.S., Anderson, F.E. and Wolfe-Murphy, S. 1983. Distribution and population recovery of Arenicola marina and other benthic fauna after bait digging, *Marine Ecology Progress Series*, 11: 173-179

Mistri, M. Cason, E. Munari, C. & Rossi, R. 2004. Disturbance of a soft-sediment meiobenthic community by clam hand raking, Italian *Journal of Zoology*, 71:2, 131-133, DOI: 10.1080/11250000409356563

Rossi, F., Forster, R.M., Montserrat, F., Ponti, M., Terlizzi, A., Ysebaert, T. & Middleburg, J.J. 2007. Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. *Mar. Biol*. 151: 2077-2090.

Travaille, K.L., Salinas-de-Leon, P., Bell, J.J. 2015. Indication of visitor trampling impacts on intertidal seagrass beds in a New Zealand marine reserve. *Ocean & coastal Management*. 114: 145-150.

Volkenborn N, Hedtkamp SIC, van Beusekom JEE, Reise K. (2007). Effects of bioturbation and bio irrigation by lugworms (Arenicola marina) on physical and chemical sediment properties and implications for intertidal habitat succession. *Estuar Coast Shelf Sci* 74: 331−343

Watson, G. J., Murray, J. M., Schaefer, M., Bonner, A. and Gillingham, M. 2017. Assessing the impacts of bait collection on inter-tidal sediment and the associated macrofaunal and bird communities: the importance of appropriate spatial scales. *Marine Environmental Research*, 130, 122-133.

2.5 Seaweed collection

- Seaweed harvesting targets a variety of brown, red and green seaweeds in the intertidal zone, by hand collection.

- Biological characteristics of key targeted species are summarised in Table 1.
- The process involves selective cutting from monospecific strands of seaweed such as rockweed and kelps or alternatively collection of the storm-cast fronds, which result in mixed species harvest (Mac Monagail *et al*., 2017).
- Seaweed harvesting has a large economic value and is harvested for commercial and recreational uses such as food, cosmetics, pharmaceuticals, or creation of materials.
- Key seaweed species targeted within the commercial industry include Sea spaghetti (*Himanthalia elongate),* dulse (*Palmaria palmata)*, carrageen (*Chondrus crispus),* sea lettuce (*Ulva spp.),* red algae (*Porphyra spp.),* serrated wrack (*Fucus serratus) and* bladder wrack *(Fucus vesiculosus).* Other kelps include oarweed (*Laminaria digitata)* and sugar kelp (*Saccharina latissimi)* (Wilding *et al.,* 2021).

2.5.1 Ecological Impacts

2.5.1.1 <u>Removal of Target Species</u>

- Seaweeds are a key source of primary production and dissolved inorganic matter, therefore playing a key role as a food source both when dead and alive (Kelly, 2005).
- For each species, the holdfast, stipe and fronds provide substratum for other flora and fauna to attach (Kelly, 2005).
- Studies have shown that seaweeds mediate environmental conditions of the substrate, therefore, if harvested, have the capability to cause cascade affects to the surrounding ecology (Pocklington, 2017). These effects on the community have been seen to last for decades (Ingolfsson and Hawkings, 2008).
- The three-dimensional structure created by seaweed functions as habitats to mobile invertebrates such as fish, birds and seals, and also act as important nesting and breeding grounds (Mineur *et al.,* 2015). Harvesting eliminates the structure to attach eggs to or build nests within and is certain to impact communities living within the surrounding area harvested (Kelly, 2005).
- Removal of *Ascophyllum* led to significantly more *Fucus and Ulva spp.* and an increase in *Cirratulus* biomass (Boaden and Dring, 1980; Jenkins *et al.,* 2004).
- Removal of 100% and 75% of seaweed fronds led to understorey substratum temperatures three degrees Celsius higher than if only 0-50% of fronds were removed, due to a double in light intensity reaching these levels (Pocklington, 2017).
- Jenkins *et al*., (1999) found that removal of *Ascophyllum* in the Isle of Man directly resulted in the bleaching and death of turf species. This led to an increase in the area grazed by limpets, a subsequent increase in limpet recruitment and increased bare substratum (Jenkins *et al*., 1999). Eighteen months following removal, *Fucus* species had become dominant, partly restoring the understorey algal turf and interactions between limpets (Jenkins *et al*., 1999). Five years later, the algal turf had not fully recovered, showing long-term effects on the communities (Jenkins *et al*., 1999).
- In Nova Scotia, no effect of *Ascophyllum* removal was found on the use of the intertidal by small fishes (Black and Miller, 1991), although Rangeley (1994) critiqued this research, due to sampling biases and experimental design.
- In contradiction, in the sublittoral, removal of *Laminaria hyperborea* led to decrease in abundance of gadid fish by 92%. Furthermore, cormorants were reported completing significantly more dives in harvested areas, thereby expending more energy to find the same number of resources (Loentsen *et al*., 2010).
- The increase in light penetrating the substratum following canopy forming algae removal in Australia, led to the bleaching of encrusting coralline algae, with their photosynthetic activity reducing to half that observed under canopies (Irving *et al*., 2004).

- Expansion in space as a result of the removal of *Laminairia* led to the increase in blade and stripe length of annual species such as *Saccorhiza polyschides* in Britanny (Engelen *et al.,* 2011).

2.5.1.2 <u>Removal of non-target species</u>

- Bycatch is seen primarily for trawling or dredging of seaweed, however hand-raking can remove a certain amount of epiphytes and slow-moving animals if they are attached to fronds or if a holdfast has its own species community (Lotze *et al*., 2019).
- Examples of species particularly at risk are Peacocks tail, bearded red seaweed and stalked jellyfish species due to their small size thus being overlooked by harvesters (Wilding *et al*., 2021).
- Species which are attached securely to seaweeds may have to be removed by hand, there is the potential that, if done in situ, these species may relocate and survive but few epifauna and epiphytes will be able to reattach (Wilding *et al*., 2021). Processing away from the shore will remove the bycatch from the ecosystem (Wilding *et al*., 2021).
- In Atlantic Canada harbour, monospecific strands of Irish moss have been noted to host up to 36 animal and 19 major algal species which are vulnerable to removal as bycatch (Lotze *et al*, 2019).
- A study in South Africa noted that harvesting should be restricted to the distal portion of fronds as this would result in only a 50% reduction of epiphytes (Anderson *et al*., 2006).

2.5.1.3 <u>Sediment Impacts</u>

- Removal of seaweeds may affect fluid dynamics of the water column and lead to changes in sediment. Coarser sediment prevalence has been reported for harvested areas of the UK, following *Ascophyllum* collection (Boaden and Dring, 1980).
- Similarly, mortality of turf species as a result of *Ascophyllum* removal in the Isle of Man led loss of entrapped silt (Jenkins *et al.,* 1999).
- In contrast, a study conducted in the Unites States of America found removal of *Ascophyllum* in both experimentally and harvested sites had no impact to sediment type (Phillippi *et al.,* 2014).

- Brown seaweed species are noted to be particularly intolerant and sensitive to trampling impacts (Wilding *et al*., 2021). Understorey algae may suffer indirectly due to increased desiccation, however robust algal turf species, opportunists and gastropod grazers may increase in abundance as an indirect effect of trampling (Wilding *et al*., 2021).

Summary

- Studies have shown that seaweeds mediate environmental conditions of the substrate, therefore, if harvested, have the capability to cause cascade affects to the surrounding ecology. The three-dimensional structure created by seaweed functions as habitats to mobile invertebrates such as fish, birds and seals, and also act as important nesting and breeding grounds.
- Impacts from seaweed removal range from changes in light intensity, composition of understorey communities, interactions between species and changes in species composition.
- Peacocks tail, bearded red seaweed and stalked jellyfish species are noted to be vulnerable as bycatch from seaweed harvesting.
- If bycatch species are removed in situ they may be able to reattach and survive but this will be species specific.
- Mixed impacts to sediments have been reported with a prevalence of coarser grains post-harvesting noted in one study and no effect on sediment type in another.
- Brown seaweed species are noted to be particularly vulnerable to trampling. Impacts of trampling to associated species is noted to be species specific.

Table 1. The life history characteristics of common edible seaweeds found on United Kingdom rocky shores.

Common name	**Species**	**Zone**	**Lifespan (Years)**	**Maximum length (cm)**	**Max. Growth Rate cm/day ***	**Size at maturity (cm)**	**Age at maturity (years)**	**Reproduction**	**References**
Gut weed	*Ulva intestinalis*	All	<1	30	0.25	Unk	Unk	Spores (sexual/ asexual) >10m dispersal (BIOTIC)	Budd & Pizzola (2008)
Sea lettuce	*Ulva lactuca*	All & free growing	Unk	30	Unk	Unk	Unk		Pizzolla (2008)
Channelled wrack	*Pelvetia caniculata*	High intertidal	4	15	0.01	4	1-2	Gametes (sexual)	White (2008a)
Spiral wrack	*Fucus spiralis*	High intertidal	4	40	0.04	3	2	Hermaphrodite (Gametes)	White (2008b)
Bladder wrack	*Fucus vesiculosus*	Mid intertidal	5	150	0.07	15-20	Unk	Gonochoristic (Gametes)	White (2008c)
Knotted wrack	*Ascophyllum nodosum*	Mid intertidal	10-20	200	0.04	Unk	5	Gonochoristic (Gametes)	Hill & White (2008)
Carrageen	*Chondrus crispus*	Mid intertidal to 24m	2-3	22	0.03	12	2	Spores (sexual/ asexual)	Rayment & Pizzola (2008)
Toothed wrack	*Fucus serratus*	Low intertidal	5	60	0.2	Unk	Unk	Gonochoristic (Gametes) (>10km)	Jackson (2008)
Thongweed	*Himenthalia elongata*	Low intertidal	2-3	200	0.16	0.15	2	Gonochoristic	White (2008d)
Oarweed	*Laminaria digitata*	Low intertidal to 20m	6-10	200	1.3	Unk	~1.5	Gonochoristic (Gametes)	Hill (2008)
Tangle weed	*Laminaria hyperborea*	Low intertidal to 30m	11-20	100	0.94	Unk	2-6	Spores (sexual/ asexual)	Tyler-Walters, 2007
Sugar Kelp	*Saccharina latissima*	Sublittoral fringe to 30m	2-4	400	1.1	100-200	~1.5	Spores (sexual/ asexual) (>100m)	White (2007)

* Max. growth rate has been converted to cm per day.

References for Section 2.5

Anderson, R. J., Rothman, M. D., Share, A. and Drummond, H. 2006. Harvesting of the kelp *Echlonia maxima* in South Africa affects its three obligate, red algal epiphytes. *Journal of Applied Phycology*, 18:343-349.

Birkett, D.A., Maggs, C.A., Dring, M.J., Boaden, P.J.S. and Seed, R., 1998. Infralittoral Reef Biotopes with Kelp Species (volume VII). An overview of dynamic and sensitivity characteristics for conservation management of marine SACs (Special Area of Conservation). Scottish Association of Marine Science (UK Marine SACs Project). 174p.

Black, R., Miller, R.J. Use of the intertidal zone by fish in Nova Scotia. *Environ Biol Fish* **31**, 109–121 (1991). https://doi.org/10.1007/BF00001010

Boaden, P.J. and Dring, M.J., 1980. A quantitative evaluation of the effects of *Ascophyllum* harvesting on the littoral ecosystem. *Helgoländer Meeresuntersuchungen* 33: 700-710.

Budd, G.C. & Pizzola, P. 2008. Ulva intestinalis Gut weed. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 12-01-2023]. Available from: https://www.marlin.ac.uk/species/detail/1469

Cousens, R. (1985) 'Frond size distributions and the effects of the algal canopy on the behaviour of Ascophyllum nodosum (L.) Le jolis', *Journal of Experimental Marine Biology and Ecology*, 92(2–3), pp. 231–249. doi:10.1016/0022-0981(85)90097-8.

Engelen, A.H., Lévèque, L., Destombe, C. And Valero, M. 2011. Spatial and temporal patterns of recovery of low intertidal Laminaria digitata after experimental spring and autumn removal. *Cah. Biol. Mar*. 52 : 441-453pp.

Gelcich, S., Defeo, O., Iribarne, O., Del Carpio, G., DuBois, R., Horta, S., Isaach, J.P., Godoy, N., Peñaloza, P.C., Castilla, J.C. (2009) 'Marine ecosystem-based management in the Southern Cone of south America: Stakeholder perceptions and lessons for implementation', *Marine Policy*, 33(5), pp. 801–806. doi:10.1016/j.marpol.2009.03.002.

González-Roca, F., Gelcich, S., Pérez-Ruzafa, Á., Alonso Vega, J.M., Vásquez, J.A. (2021) 'Exploring the role of access regimes over an economically important intertidal kelp species', *Ocean & Coastal Management*, 212, p. 105811. doi:10.1016/j.ocecoaman.2021.105811.

Gunnarson, K., 1991. Populations de *Laminaria hyperborea* et *Laminaria digitata* (Pheophycees) dans la Baie de Breidifjrdur, Islande. *Rit Fiskideildar*, 12: 1-148.

Hawkins, S. J. and Harkin, E., 1985: Primary canopy removal experiments in algal dominated communities low on the shore and in the shallows subtidal of the Isle of Man. *Botanica Marina*, XXVIII: 223-230.

Hayward, P. J. and Ryland, J. S. (ed.), 1995. The marine fauna of the British Isles and north-west Europe. Volume 2. Molluscs to Chordates. Oxford Science Publications. Oxford: Clarendon Press.

Hill, J.M. and White, N., 2008. *Ascophyllum nodosum*. Knotted wrack. Marine Life Information Network: Biology and Sensitivity Key Information Sub-programme [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: http://www.marlin.ac.uk/species/detail/1336

Hill, J.M., 2008. *Laminaria digitata* Oarweed. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: http://www.marlin.ac.uk/species/detail/1386 [Accessed 11/02/16]

Holt, T.J., Hartnoll, R.G. and Hawkins, S.J., 1997. The sensitivity and vulnerability to man-induced change of selected communities: intertidal brown algal shrubs, *Zostera* beds and *Sabellaria spinulosa* reefs. English Nature, Peterborough.

Ingólfsson, A. and Hawkins, S.J. 2008. Slow recovery from disturbance: a 20-year study of *Ascophyllum* canopy clearances. *Journal of the Marine Biological Association of the United Kingdom*. 88(4), 689–691pp.

Irving. A.D., Connell, S.D., Elsdon, T.S. 2004. Effects of kelp canopies on bleaching and photosynthetic activity of encrusting coralline algae. *Journal of Experimental Marine Biology and Ecology*. 310(1): Pages 1-12, https://doi.org/10.1016/j.jembe.2004.03.020.

Jackson. A., 2008. *Fucus serratus* Toothed wrack. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom.
Available from: http://www.marlin.ac.uk/species/detail/1326
[accessed on 23/02/2016]

Jenkins, S.R., Hawkins, S.J., Norton, T.A. 1999. Direct and indirect effects of a macroalgal canopy and limpet grazing in structuring a sheltered inter-tidal community. *Marine Ecological Progress Series*. 188: 81- 92pp

Jenkins, S.R., Norton, T.A. and Hawkins, S.J., 2004. Long term effects of *Ascophyllum nodosum* canopy removal on mid shore community structure. *Journal of the Marine Biological Association of the United Kingdom* 84: 327-329.

Kelly, E. (ed.), 2005. The role of kelp in the marine environment. Irish Wildlife Manuals, No. 17. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Knight, M. and Parke, M., 1950. A biological study of *Fucus vesiculosus* L. and *Fucus serratus* L. *Journal of the Marine Biological Association of the United Kingdom*, 29, 439-514.

Lauzon-Guay, J.-S, Ugarte, R. A., Morse, B. L., Robertson, C. A., (2021). 'Biomass and height of Ascophyllum nodosum after two decades of continuous commercial harvesting in eastern Canada', *Journal of Applied Phycology*, 33(3), pp. 1695–1708. doi:10.1007/s10811-021-02427-x.

Lazo, L. and Chapman, A.R. (1996) 'Effects of harvesting on *Ascophyllum nodosum* (L.) Le Jol. (fucales, Phaeophyta): A demographic approach', *Journal of Applied Phycology*, 8(2), pp. 87–103. doi:10.1007/bf02186311.

Lorentsen SH, Sjøtun K, Grémillet D. 2010. Multi-trophic consequences of kelp harvest. *Biological Conservation* 143: 2054–2062.

Lotze, H. K., Milewski, I., Fast, J., Kay, L. and Worm, B. 2019. Ecosystem-based management of seaweed harvesting. *Botanica Marina*, 62(5): 395-409.

Mac Monagail, M., Cornish, L., Morrison, L., Araújo, R. and Critchley, A.T., 2017. Sustainable harvesting of wild seaweed resources. *European Journal of Phycology*, *52*(4), pp.371-390.

McAllen, R., 1999. Enteromorpha intestinalis - a refuge for the supralittoral rockpool harpacticoid copepod Tigriopus brevicornis. *Journal of the Marine Biological Association of the United Kingdom*, 79, 1125-1126.

McArthur, D.M. & Moss, B.L., 1979. Gametogenesis and gamete structure of Enteromorpha intestinalis (L.) Link. *British Phycological Journal*, 14, 43-57.

Mineur, F., Arenas, F., Assis, J., Davies, A.J., Engelen, A.H., Fernandes, F., Malta, E.J., Thibaut, T., Van Nguyen, T.U., Vaz-Pinto, F. and Vranken, S., 2015. European seaweeds under pressure: Consequences for communities and ecosystem functioning. *Journal of sea research*, *98*, pp.91-108.

Phillippi, A., Tran, K., Perna, A. 2014. Does intertidal canopy removal of *Ascophyllum nodosum* alter the community structure beneath? *Journal of Experimental Marine Biology and Ecology*. 461: Pages 53-60, https://doi.org/10.1016/j.jembe.2014.07.018

Pocklington, J.B., Jenkins, S.R., Bellgrove, A., Keough, M.J., O'hara, T.D., Masterson-algar, P.E., and Hawkin, S.J. 2018. Disturbance alters ecosystem engineering by a canopy-forming alga. *Journal of the Marine Biological Association of the United Kingdom.* 98(4), 687–698pp

Rangeley, R.W. The effects of seaweed harvesting on fishes: a critique. *Environ Biol Fish* **39**, 319–323 (1994). https://doi.org/10.1007/BF00005133

Rayment, W.J. & Pizzola, P.F. 2008. *Chondrus crispus* Carrageen. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 12-01-2023]. Available from: https://www.marlin.ac.uk/species/detail/1444

Sjøtun, K., Christie, H. and Fosså, J.H., 2000. Resource base for kelp trawling and regrowth after test trawling in Sør-Trøndelag.

Steen, H., Bodvin, T., Moy, F., Sannæs, H. and Hansen, H.Ø., 2015. Surveys of giant kelp harvesting in Nordland in 2015.

Stengel, D., Wilkes, R. and Guiry, M. 1999. Seasonal growth and recruitment of *Himanthalia elongata* Fucales, Phaeophycota) in different habitats on the Irish west coast. *European Journal of Phycology*. 34:3, 213-221, DOI: 10.1080/09670269910001736272

Tyler-Walters, H. 2007. *Laminaria hyperborea* Tangle or cuvie. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 03-02-2023]. Available from: https://www.marlin.ac.uk/species/detail/1309

White, N. & Marshall, C.E. 2007. *Saccharina latissima* Sugar kelp. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 12-01-2023]. Available from: https://www.marlin.ac.uk/species/detail/1375

White, N. 2008d. *Himanthalia elongata* Thongweed. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 04-11-2022]. Available from: https://www.marlin.ac.uk/species/detail/1358

White, N., 2008a. *Pelvetia canaliculata* Channelled wrack. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: http://www.marlin.ac.uk/species/detail/1342 [accessed 11/02/16]

White, N., 2008b. *Fucus spiralis* Spiral wrack. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 11/02/16] Available from: http://www.marlin.ac.uk/species/detail/1337

White, N., 2008c. *Fucus vesiculosus* Bladder wrack. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 11/02/16] Available from: http://www.marlin.ac.uk/species/detail/1330

Wilding, C., Tillin, H.M., Stewart, E.J., Burrows, M. and Smale, D.A., 2021. Hand harvesting of seaweed: evidence review to support sustainable management. NRW Report Series No. 573, pp.275

2.6 Mechanical collection

- Mechanical collection refers to the use of machines or basic mechanics to gather or extract shore-based resources, such as animals or plants, from their natural environment.
- This method is often used to increase efficiency and productivity compared to manual collection which typically use simple tools (e.g., a rake, spade, etc.).
- This review primarily focuses on the utilisation of ‘bait pumps’ and tractor dredges; the only mechanical devices where evidence was available.

2.6.1.1 Bait Pumping

- A specialised pump that collects sand or mud from the exposed shoreline at low tide and filters it to collect target species such as lugworm (*Arenicola defodiens*). Cubbera *et al.* (2018) highlighted that prior bait digging studies had failed to catch lugworm (*A. Defodiens*) because the species burrows deep beneath the surface dirt. As a result, using mechanical bait pumps allows for more effective and efficient collecting below the surface of the seabed at a reduced effort for gatherers.
- Bait pumping originated in the 1800s with British fishermen using a hand-operated mechanism to extract bait from the sand. This evolved into the first mechanical pump in the early 1900s.

2.6.1.2 Mechanical dredging

- Mechanical dredging involves the use of a tractor to pull trailer mounted dredges across low tide sandy bottom shores, in order to harvest target species. Various designs of dredge are used and blades varying between 70 and 100cm wide, which penetrate between 20 to 40cm into the sediment (Hall and harding., 1997; Cotter *et.a.,* 2000; Klunder *et.al.,* 2021).
- Dredged sediment is mixed with water and sieved to harvest the larger/targeted organisms; the smaller organisms are discarded in and around the gullies (van den Heiligen-berg 1987, Beukema 1995, Leopold & Bos 2009).

2.6.2 Ecological Impacts

2.6.2.1 Removal of target species

- Bait pumps are more effective than bait digging for removal target species of lugworm with little effort.
- Fowler (199) reported that there was no evidential support to suggest the use of bait pumps depletes populations.
- Fowler (1999) also demonstrated the limited impact the act of bait pumping had on the sediment, highlighting that bait pumping causes far less disruption than traditional bait digging. However, this has been contradicted by more recent studies (Contessa and Bird, 2004).
- A study of Bury Inlet, South Wales, found that the removal of cockles using tractor dredges resulted in significant decline in spawning populations and juvenile cockles, 30-33% and 9-19% reduction in abundance respectively (Cotter *et al.,* 1997).
- A 3-month study by Contessa and Bird (2004) highlighted the negative influence on shrimp abundance while bait pumping for ghost shrimp. These results displayed a decline in abundance, porosity of sediment, organic carbon content and redox potential of intertidal sediment. Ghost shrimp feeding and burrowing activity influence sediment properties that the species inhabit, meaning its biochemical nature can only be restored when shrimp are repopulated. Deeper investigation found that the act of intense bait pumping prevented favourable conditions for shrimp to reinhabit, such as sediment porosity and redox, which in turn created a negative feedback loop (Contessa and Bird, 2004).
- In contradiction, Wynberg and Branch (2002) found full recovery in sand prawn (*Cakkuabass kruassi)* populations 32 weeks after bait pumping. This was following a decline in populations 6 weeks after collection, which mirrored the results of Contessa and Bird (2004).
- A study by Hall and Harding (1997) concluded that the effects of tractor dredges have no significant effect on target species structure, after showing recovery to the same faunal structure of an undisturbed community within 56 days. Hall and Harding (1997) determined the immigration of adults into disturbed areas resulted in the recovery of the target species.
- Studies have shown that the presence target species such as lugworm and ghost shrimp, are essential for long term sustainability of communities (Contessa and Bird, 2006; Volkenborn & Reise 2006, Volkenborn *et al.* 2007).

2.6.2.2 Removal of non-target species

- Although, mechanical dredging can lead to high mortality of discarded organisms, the decaying organisms are considered to increase sediment oxidation and nutrient availability in these fished areas, which in turn, increased abundance of opportunistic species, such as those targeted in shore gathering (Klunder *et.al.,* 2021).

- Species with a longer life cycle recover at slower rates following dredging, while the abundance of opportunistic feeders, such as polychaete worms, increase in quick succession following collection (Klunder *et.al.* 2021).
- Arntz & Rumohr (1982) showed this pattern of community succession within the first 2 years after recolonisation, which is then normalised by the third year.
- Reports have shown 'rapid' recovery rates and low overall effects to non-target benthic fauna (Hall and Harding, 1997).
- However, this was contradicted a later study in 2000 by Ferns *et.al.* which highlighted that the effect of tractor dredging on non-target species was widely detrimental, resulting in 31% to 83% loss of the population of polychaetes (Ferns *et.al.* 2000). The populations of non-targeted invertebrates took several months to recover, which consequently has the ability to reduce bird feeding activity (Ferns *et.al.* 2000).
- Wynberg and Branch (2002) highlighted that indirect impacts associated with the physical disturbance in bait pumping were more harmful that the removal of target species itself. As a result of the activity, macrofaunal numbers declined in most gathered areas and showed clear distinct community compositions to other areas.
- When dredging for lugworms in the Dutch Wadden Sea, Volken-born & Reise (2006) demonstrated a positive effect on the biomass of several benthic species shortly after their removal.
- A study in the Netherlands reported no differences in benthic organisms between dredged areas and reference areas (Drenthe, 2013), however this was contradicted by Beukema (1995), stating biomass in dredged areas only recovered after several years.

2.6.2.3 Sediment Impacts

- A study in southern Australia found that bait pumping for shrimp showed initial destruction of target species burrows and compaction of sediment from both the pumping and trampling of the mudflat (Contessa and Bird, 2004). This reduced porosity and created reducing conditions to depths of 20cm (Contessa and Bird, 2004). The proportion of smaller grain sizes also increased in surface sediments and organic carbon content decreased (Contessa and Bird, 2004).
- A study in South Africa of the removal of sand and mud prawns including using a pump found that areas where sandprawns were harvested showed finer grained sediments (Wynberg and Branch, 1994). There were no obvious differences in sorting coefficient but the organic fraction was lower in experimental areas 18 days post-activity, a trend which had reversed by the end of the first month where the organic content was then higher than in control areas up to 4 months (Wynberg and Branch, 1994).
- The same study noted that in experimental areas for sandprawns the sediment surface was depressed about 10cm below the surrounding area and penetrability declined following activity as well as the accumulation of a black layer approximately 4cm from the surface (Wynberg and Branch, 1994).
- The same effects were not fully observed for mudprawn harvesting suggesting sediment characteristics influence the degree of impact (Wynberg and Branch, 1994).

Summary

- Evidence on mechanical harvesting is limited, primarily relating to two activities; bait pumping and tractor dredging
- Impacts to target species are mixed; for tractor dredging a significant decline in common cockle as a target species was noted in South Wales, however impacts from bait pumping are more variable with some studies suggesting impacts are much lower than traditional digging while others show significant effects resulting from the creation of unfavourable conditions for recolonisation.
- Impacts to non-target species are similarly mixed with some studies suggesting rapid recovery following activity whilst others found significant declines in polychaete species following tractor dredging.
- Sediment impacts are noted to include compaction from both the activity and associated trampling, reduced porosity, increases in fine grain sediments and changes to organic content.
- The nature of the sediment prior to activity was noted to potentially influence the degree of impact.

References for Section 2.6

Arntz WE, Rumohr H (1982) An experimental study of macro - benthic colonization and succession, and the importance of seasonal variation in temperate latitudes. *J Exp Mar Biol Ecol* 64: 17−45

Beukema . J. (1995). Long-term effects of mechanical harvesting of lugworms *Arenicola marina* on the zoobenthic community of a tidal flat in the Wadden Sea. *Netherlands Journal of Sea Research.* Vol 33, issue 2, Pages 219-227

Contessa. L. and Bird .F. L. (2004). The impact of bait-pumping on populations of the ghost shrimp *Trypaea australiensis* Dana (Decapoda: *Callianassidae*) and the sediment environment. *Journal of Experimental Marine Biology and Ecolog*y. Volume 304, pages 75 - 97

Drenthe J (2013) Monitoring van effecten op de bodemfauna door wadpierenvisserij op de Vlakte van Kerken in de periode 2008−2011. NIOZ, Texel

Cotter. A. J. R., Walker. P., Coates. P., Cook. W., Dare. P. J. (1997). Trial of a tractor dredger for cockles in Burry Inlet, South Wales, *ICES Journal of Marine Science*, Volume 54, Issue 1, Pages 72–83, https://doi.org/10.1006/jmsc.1996.0182

Ferns, P. N., Rostron, D. M., & Siman, H. Y. (2000). Effects of Mechanical Cockle Harvesting on Intertidal Communities. *Journal of Applied Ecology*, 37(3), 464–474. http://www.jstor.org/stable/2655784

Fowler, S.L. 1999. Guidelines for managing the collection of bait and other shoreline animals within UK European marine sites. English Nature (UK Marine SACs Project). 132 pages

Hall, S. J., & Melanie J. C. Harding. (1997). Physical Disturbance and Marine Benthic Communities: The Effects of Mechanical Harvesting of Cockles on Non-Target Benthic Infauna. *Journal of Applied Ecology*, 34(2), 497–517. https://doi.org/10.2307/2404893

Heiligenberg. T. (1987). Effects of mechanical and manual harvesting of lugworms Arenicola marina L. on the benthic fauna of tidal flats in the Dutch Wadden sea. Biological Conservation, Volume 39, Issue 3, Pages 165-177, https://doi.org/10.1016/0006-3207(87)90032-2.

Klunder L, van Bleijswijk JDL, Kleine Schaars L, van der Veer HW, Luttikhuizen PC (2021) Impact of mechanical Arenicola dredging on the benthic fauna communities: assessed by a morphological and molecular approach. *Mar Ecol Prog Ser* 673:17-28. https://doi.org/10.3354/meps13816

Leopold MF, Bos OG (2009) Duurzaamheid van de mechanische wadpierenvisserij in de Waddenzee. Rapport C013/09. IMARES, Texel

Volkenborn N, Reise K (2006) Lugworm exclusion experiment: responses by deposit feeding worms to biogenic habitat transformations. *J Exp Mar Biol Eco*l 330: 169−179

Volkenborn N, Hedtkamp SIC, van Beusekom JEE, Reise K. (2007). Effects of bioturbation and bio irrigation by lugworms (Arenicola marina) on physical and chemical sediment properties and implications for intertidal habitat succession. *Estuar Coast Shelf Sci* 74: 331−343

Wynberg, R.P. & Branch, G.M. 1994. Disturbance associated with bait collection for sand prawns (*Callianassa kraussi*) and mudprawns (*Upogebia africana*): Long term effects in the biota of intertidal sandflats. *Journal of Marine Research*. 52:523-558.

Date: 26 July 2024
Our ref: 479252
Your ref: Shore Gathering Byelaw 2024

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BY EMAIL ONLY

Dear Sarah

Conservation Assessment Package for the proposed Southern IFCA Shore Gathering Byelaw 2024

Thank you for your consultation on the above which was received on 13 June 2024. The following constitutes Natural England's formal statutory response.

In 2012, the Department for Environment, Food and Rural Affairs (Defra) announced a revised approach to the management of commercial fisheries in European Marine Sites. The objective of this revised approach is to ensure that all existing and potential commercial fishing activities are managed in accordance with Article 6 of the Habitats Directive. Defra stated their expectations regarding site level assessments and implementation of management in order to conserve site features. The Department's strong preference is that site level assessments be carried out in a manner that is consistent with the provisions of Article 6(3) of the Habitats Directive. Appropriate management measures should be put in place to ensure that the fishing activity or activities either (a) have no likely significant effect on a site in view of its conservation objectives; or (b) following assessment, can be concluded to have no adverse effect on the integrity of the site. The revised approach was subsequently extended to ensure fishing activities in Marine Conservation Zones (MCZs) are managed in accordance with the provisions of the Marine and Coastal Access Act 2009.

During 2022, the Southern Inshore Fisheries and Conservation Authority (SIFCA) commenced a review of management for shore gathering activities in the district, to consider where management may be required within designated sites. As a result of this review, we understand that SIFCA is proposing to introduce a byelaw and accompanying Code of Conduct to manage the following shore gathering activities:

- Bait digging/collection
- Shellfish gathering
- Crab tiling/collection
- Shrimp push-netting
- Harvesting of seaweed by hand from the shore

Natural England has previously provided SIFCA with initial comments on the screening and assessment of activities (email dated 16 February 2023), followed by more detailed comments for sites in the Solent and Dorset (letters dated 20 April 2023 and 20 June 2023 respectively). To inform the development of the proposed byelaw, SIFCA has recently provided Natural England with the following documents to review:

- Shore Gathering_Site Activity Screening Document
- Shore Gathering_Part A Assessment Package
- Shore Gathering_TLSE Package
- Conservation Assessment Package_June 24
- SIFCA_SG_Supporting Document_Site Specific Evidence Package_June 24_Final
- SIFCA_SG_Supporting Document_Literature Review_June 24_Final

As requested, we have reviewed these documents with respect to their content and conclusions. Please find our advice detailed below, together with some further minor comments/suggested amendments in Annex 1.

1. General comments

1.1 Natural England supports SIFCA's commitment to review shore gathering activities within Marine Protected Areas (MPAs) across the district – comprising Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Marine Conservation Zones (MCZs). It is our view that the introduction of a byelaw and accompanying Code of Conduct is an appropriate mechanism to manage activities in line with the conservation objectives of these sites.

1.2 We understand that the mapping of site features is based on 'best available evidence' comprising the following:

- The Natural England (NE) designated features layer provided to Southern IFCA in 2023
- The National Seagrass Layer obtained from the Defra Government Website
- NE (quality assured) commissioned Hampshire and Isle of Wight Wildlife Trust (HIWWT) seagrass data provided to Southern IFCA in 2024

While we support the use of these data sources, it should be noted that they do not represent a complete picture of seagrass location and extent within the SIFCA district. This is due in part to the resource required to regularly survey/re-survey seagrass beds to ensure that data is both recent and robust. For example, Natural England is aware of a seagrass bed in Sword Sands in Langstone Harbour that we have been unable to get formally mapped and therefore included within our advice. It should also be noted that while Natural England has a statutory duty to report on the condition of designated features, it does not have an explicit duty to collect monitoring data. Therefore, we recommend that SIFCA liaise with other organisations who may hold such data. We are aware that both the Hampshire & Isle of Wight Wildlife Trust and Project Seagrass hold data from the Isle of Wight and eastern Solent (collected in part via the Solent Seascape Project) that could be used to increase the protection of this feature.

1.3 We note that the scope of the Shore Gathering Review was defined by SIFCA in line with the targets of the Government's Environmental Improvement Plan 2023 to focus upon feature-based management interventions for MPAs; namely sites designated under the National Site Network comprising SACs, SPAs and MCZs. For this reason, the potential impacts of shore gathering activities upon Sites of Special Scientific Interest (SSSIs) and Wetlands of International Importance under the Ramsar Convention (Ramsar sites) are not included in this review. While the spatial boundaries and protected features of these sites are often consistent with SPAs and SACs, there may be instances where this is not the case. Therefore, Natural England recommends that SIFCA undertake a separate exercise to cross-reference these sites/features to ensure there are no outstanding risks.

2. Site Activity Screening Document

2.1 We note that the assessment of shore gathering activities is restricted to activities operating from the shore, resulting in Poole Rocks MCZ, Southbourne Rough MCZ and South of Portland MCZ being screened out of assessment on the basis that they are entirely subtidal. In contrast, the assessment of seaweed harvesting does consider impacts upon subtidal habitats. In Natural England's previous response of 20 April 2023, we recommended that the pressures highlighted for shore-based activities be considered against shallow subtidal features. One such activity is shrimp push-netting which occurs within designated sites. While we accept that interactions with subtidal features fall outside the scope of this review and the proposed byelaw, it would be beneficial to discuss with SICFA how such interactions can be best managed.

2.2 Similarly, we note that the assessment of shore-based activities has screened out impacts upon designated infralittoral rock features within MCZs due to their being no potential interaction. It is Natural England's view that activities such as the collection of bivalves could occur within the upper infralittoral zone and should be screened in accordingly.

2.3 Seaweed harvesting within the Chesil & the Fleet SAC, Chesil Beach & the Fleet SPA and Solent Maritime SAC has been screened out on the basis of 'unsuitable habitat'. It would be useful to provide further explanation of this term to clarify why it has been applied to these scenarios (e.g. whether they have been screened out due to the absence of target seaweed species). It is Natural England's view that seaweed harvesting is certainly possible within the Chesil & the Fleet SAC and Chesil Beach & the Fleet SPA. Desirable species for harvesting occur throughout the Fleet lagoon, including *Fucus* spp., *Saccharina latissima* and *Chondrus crispus*. These species support the tide-swept and subtidal coarse sediment communities afforded protection by the coastal lagoon feature.

3. Part A Assessment Package

3.1 Assessment of impacts upon stalked jellyfish (*Haliclystus* spp. and *Calvadosia campanulata*): Stalked jellyfish are found in the lower shore and shallow sublittoral and are commonly associated with both macroalgae and seagrass. We welcome the decision to screen in the 'Abrasion/disturbance of the substrate on the surface of the seabed' pressure upon these species resulting from shore-based activities and seaweed harvesting in the Purbeck Coast MCZ, The Needles MCZ and Bembridge MCZ. However, we note that the 'Removal of non-target species' and 'Penetration and/or disturbance of the substratum below the surface of the seabed' pressures have been screened out – despite these pressures being screened in for seagrass beds. Given the association between stalked jellyfish and seagrass beds, we recommend that these two pressures are screened into the assessments for Bembridge MCZ and The Needles MCZ for consistency.

3.2 Assessment of impacts upon peacock's tail (*Padina pavonica*): Peacock's tail is predominately located within pools containing soft substrate such as clay, silt or sand on rocky shores such as those found within Bembridge MCZ and The Needles MCZ (Herbert et al., 2016[1]). A risk is therefore posed from shore-based activities which target soft sediment species. We recommend that consideration is given to screening this feature in or providing further detail to justify its exclusion.

3.3 Assessment of impacts upon native oyster (*Ostrea edulis*): We note that impacts upon native oyster are screened out for shore-based activities in The Needles MCZ, Bembridge MCZ, Yarmouth to Cowes MCZ and Chesil Beach and Stennis Ledges MCZ. Given that this species could be directly targeted via shore gathering, we recommend that consideration is given to screening this feature in or providing further detail to justify its exclusion

3.4 Bembridge MCZ – Seaweed harvesting: The assessment of the Removal of non-target species for short-snouted seahorse states that: *"the target species is seaweed harvesting by hand, the activity is very selective and seaweeds can be harvested without the accidental harvest of the feature by nature of the ability to see the location of any <u>native oysters</u> present in the site."* It is our view that this rationale does not apply to seahorses and this feature should be screened in given its association with seaweed habitats.

3.5 Bembridge MCZ – Seaweed harvesting; The assessment of Visual disturbance for short-snouted seahorse states that: *"seaweed harvesting is unlikely to occur below the water level and therefore would not overlap with the presence of the feature."* Given that seaweed harvesting may occur in subtidal areas, we recommend that this pressure is screened in due to potential interaction.

3.6 Chesil Beach & Stennis Ledges MCZ – Shore-based activities: We note that impacts upon high-energy intertidal rock have been screened out on the basis that target species will not be located on rock habitats. Given that blue mussel (*Mytilus edulis*) is found on this substrate, we recommend that potential pressures upon this feature are considered for completeness.

3.7 Purbeck Coast MCZ – Shore-based activities: For the moderate energy and high energy intertidal rock features, impacts have been screened out on the basis that target species will not be located on rock habitats. Given that blue mussel (*Mytilus edulis*) is found on these substrates, we recommend that potential pressures upon these features are considered for completeness.

3.8 Studland Bay MCZ – Seaweed harvesting: The assessment of the Removal of non-target species for long-snouted seahorse states that: *"the target species is seaweed harvesting by hand, the activity is very selective and seaweeds can be harvested without the accidental harvest of the feature by nature of the ability to see the location of any <u>native oysters</u> present in the site."* It is our view that this rationale does not apply to seahorses and this feature should be screened in given its association with seaweed habitats.

3.9 Studland Bay MCZ – Seaweed harvesting; The assessment of Visual disturbance for long-snouted seahorse states that: *"seaweed harvesting is unlikely to occur below the water level and therefore would not overlap with the presence of the feature."* Given that seaweed harvesting may occur in subtidal areas, we recommend that this pressure is screened in due to potential interaction.

[1] Herbert, R. J. H., Ma, L., Marston, A., Farnham, W. F., Tittley, I. & Cornes R. C. (2016). The calcareous brown alga Padina pavonica in southern Britain: population change and tenacity over 300 years. *Marine Biology 163 (3)*, 1-15.

4. TLSE Package

4.1 All SPAs – Removal of target and non-target species: The Removal of target species and Removal of non-target species pressures have been screened out for all SPAs, on the basis that designated features will not be removed. However, these two pressures also encompass the removal of prey species for designated bird species – as per Natural England's Advice on Operations. We therefore recommend that these pressures are screened into the Appropriate Assessment.

4.2 Solent Maritime SAC – shore-based activities: The Abrasion/disturbance of the substrate on the surface of the seabed pressure has been screened out for Annual vegetation of drift lines and Perennial vegetation of stony banks, on the basis that these features sit above mean high water, are not located within the intertidal area and therefore do not interact with shore gathering activities. Whilst these features are typically located above Mean High Water, these habitats could be trampled in order for the intertidal area to be accessed. Therefore, we recommend that they are screened into the Appropriate Assessment for completeness.

4.3 Chesil & The Fleet SAC – shore-based activities: The Abrasion/disturbance of the substrate on the surface of the seabed pressure has been screened out for Annual vegetation of drift lines and Perennial vegetation of stony banks, on the basis that these features sit above mean high water, are not located within the intertidal area and therefore do not interact with shore gathering activities. Whilst these features are located above Mean High Water, in many places around the Fleet lagoon, these habitats could be trampled in order for the intertidal area to be accessed. Therefore, we recommend that they are screened into the Appropriate Assessment for completeness.

4.4 Chesil & The Fleet SAC – shore-based activities: The Removal of non-target species pressure has been screened out for Coastal lagoons, on the basis that: *"shore gathering activities will only be occurring at low tide with the exception of push netting. All methods are very selective with only the target species removed. Impacts to communities from digging activity is considered under the abrasion pressure."* Natural England recommends that this pressure is screened in as bait digging has the potential to remove species from the communities that make up the coastal lagoon feature, including *Armandia cirrhosa*, which cannot survive compaction or being buried deeper than the top 1-2cm of sediment.

4.5 Chesil Beach & The Fleet SPA – shore-based activities: The Visual disturbance pressure has been screened out for little tern on the basis that: *"the area where the species is breeding is covered by a closure during the nesting period by another authority therefore there would be no access for shore gathering activity at the key seasonal time."* It should be noted that this area is not covered by a statutory closure, but rather fenced off by the RSPB for the duration of the breeding period. Natural England is aware that disturbance by anglers occurs relatively frequently so the potential for individuals carrying out shore-based activities is very high. Therefore, we recommend that this pressure is screened into the Appropriate Assessment.

4.6 Poole Harbour SPA – shore-based activities: We note that the Habitat Structure Change – Removal of Substratum (Extraction) pressure has been screened out for intertidal seagrass, intertidal mixed sediments, intertidal mud, and intertidal sand and muddy sand. The rationale states that: *"shore gathering activities do not remove substratum. Activities are localised and at a small scale, individual operations would be at the level of a single fork or rake. Codes of Conduct in place for activities such as bait digging promote backfilling holes to replace any disturbed substratum."* It is Natural England's view that bait digging in Poole Harbour is not localised and small scale but happens at a level that it has the potential to lead to habitat structure changes (hence the decision to set up an MOA for bait digging). We therefore recommend that this pressure is screened into the Appropriate Assessment.

5. Conservation Assessment Document

5.1 Mapping: Due to the resolution of the maps provided in Annex 1 of the Conservation Assessment Document, it is difficult to interpret the boundary of proposed closed areas with respect to the location of sensitive features. SIFCA has agreed to provide Natural England with more detailed mapping, and we recommend that these maps are appended to the Conservation Assessment Document to assist interpretation.

5.2 Management – GPS buffer: Natural England supports the application of a GPS buffer to increase the protection of relevant features from accidental incursions and trampling. While we would recommend that the buffer is maximised to enable features such as seagrass beds to increase their natural range, we acknowledge that a 10m buffer remains consistent with other management measures within the district.

5.3 Management – Langstone Harbour: We support the proposal to implement a year-round closure in Langstone Harbour, which will mitigate disturbance and impacts to supporting habitats for protected bird species that utilise the harbour for summer nesting (March to August) and winter roosting/feeding.

5.4 Management – Chichester Harbour and Portsmouth Harbour: We note that there are no additional areas identified for protection in these harbours beyond the permanent closures associated with seagrass beds. This approach is based on the premise that these closed areas will provide additional protection to sediment habitats, in addition to mitigating bird disturbance. Outside of these areas, shore gathering activity is limited by access and is assumed to be low (based on SIFCA observations). We believe this approach is appropriate providing the seagrass beds are adequately protected. In addition, the condition assessment for the four designated features of Portsmouth Harbour SPA indicates that all four features of the site are in unfavourable condition with red-breasted merganser and dunlin in unfavourable-declining condition, dark-bellied Brent goose in unfavourable-no change condition and black-tailed godwit in unfavourable-recovering condition. Several reasons are provided for this condition which include, declining abundance, loss of supporting habitat and disturbance. On this basis, we recommend that an appropriate review process is implemented should new seagrass data become available; or evidence come to light that activity levels and related impacts are higher than assumed.

5.5 Management – Solent and Southampton Water SPA: We note that a number of key areas for overwintering bird species (e.g. Newtown Harbour, Lymington to Keyhaven Marshes, Eling and Bury Marshes) are only being proposed for closures during the summer months (1st March – 31st August). Given the importance of this SPA to overwintering species, we recommend that year-round closures are implemented in areas of greatest sensitivity. In addition to using Wetland Bird Survey (WeBS) data to identify such areas, we recommend that advice is also sought from the RSPB and Bird Aware Solent. Natural England would also be happy to provide further advice on this aspect.

5.6 Management – Solent and Southampton Water SPA: We note that no closures are proposed for the area of shoreline at the mouth of the Beaulieu River which falls within both the North Solent National Nature Reserve (NNR) and Solent and Southampton Water SPA. Given that this area is in part subject to a bird sanctuary order to protect designated species, we recommend that consideration is given to implementing a year-round closure here for consistency.

5.7 Management – Solent and Southampton Water SPA: While Natural England has not formally defined Bird Sensitive Areas in Hampshire and Dorset, an exercise to identify such areas was previously undertaken in 2015 in conjunction with SIFCA. This exercise involved collating WeBS Low Tide Count data which was subsequently sense-checked by local ornithological stakeholders. It is our view that much of this work remains valid and we would be happy to provide it to SIFCA to inform this process.

5.8 Management – Studland Bay MCZ: Natural England supports the proposal to implement a permanent closure around the seagrass beds in this site up to the 2m contour.

5.9 Management – Chesil & The Fleet SAC and Chesil Beach & The Fleet SPA: Natural England supports the proposal to implement permanent closures within these sites. However, it is unclear why the whole of the Fleet lagoon has not been included. As stated previously, we are aware that bait digging and cockle-raking occur on the mudflats at Ferrybridge and cause disturbance and damage.

5.10 Management – Poole Harbour SPA: Natural England supports the permanent closure of seagrass beds and the area of Holes Bay north of the railway line. However, it is unclear from the map in Annex 1 how proposed management corresponds with the Bird Sensitive Areas identified in the Poole Harbour Aquatic Management Plan 2024 and the current seasonal/spatial management of bait digging in other areas of the harbour.

5.11 Seaweed Harvesting Code of Conduct: Natural England supports the proposal to implement a code of conduct for seaweed harvesting in the SIFCA district. We have reviewed the draft code in Annex 2 and have the following comments:

- Point 1: To maintain consistency with Natural England's own Code of Conduct for seaweed harvesting, we request that this point is re-worded as follows: *"Ensure you obtain any relevant permissions before undertaking gathering activities, including landowner permission. Natural England should be consulted before harvesting seaweed in a protected site in England".*

- Point 12: It may be helpful to clarify that it is an offence to cause the spread of INNS. We would also be happy for a sentence to be added with respect to seeking advice from Natural England for INNS (please refer to Natural England's Code of Conduct for further information).

- Point 14: We recommend clarifying that the volume of each species collected should be recorded as wet weight. It would also be useful to state that records should be kept should they be requested by a regulatory body.

- We would recommend adding an additional point requesting that collectors replace any rocks that are moved (please refer to Natural England's Code of Conduct for further information).

5.12 Part B Assessments and Appropriate Assessments: We note that SIFCA has applied a different approach to presenting the results of these assessment, which summarises how proposed management principles will mitigate the impacts of shore-based activities and seaweed harvesting. However, it is not clear how the individual feature-pressure interactions screened in during the Part A and TLSE stages have been assessed. In accordance with the Conservation of Habitats and Species Regulations 2017, Natural England is a statutory consultee on the Appropriate Assessment stage. Therefore, for the purpose of reviewing these assessments we request that this information is presented in a tabular format – provided separately or appended to the Conservation Assessment Document.

5.13 Conclusion: The conclusion states that management under the Shore Gathering Byelaw 2024, in combination with the Southern IFCA Seaweed Harvesting Code of Practice and existing or amended Southern IFCA Byelaws will provide suitable and appropriate mitigation to ensure that the Conservation Objectives of relevant MCZs can be furthered and that there will be no adverse effect on designated features of relevant SACs or SPAs. As noted above, Natural England has requested further information on the spatial/seasonal coverage of proposed closures that will be introduced via the Shore Gathering Byelaw 2024, together with their underlying assessments. Therefore, we would like to review this requested information before commenting on the conclusion.

5.14 In-Combination Assessment: Natural England has reviewed this section and agrees with the conclusion. We have no further comments.

5.15 Integrity Test: Please refer to our comments under paragraph 5.11.

6. Site Specific Evidence Package

6.1 Shore gathering activity in Studland Bay MCZ (paragraph 1.2.2): Natural England was made aware during the Marine Management Organisation (MMO) non-licensable activities call for evidence consultation in 2020/21 that there was push-netting for prawn occurring within this site, specifically within the seagrass beds, which we flagged to SIFCA at the time.

6.2 Shore gathering activity in Chesil Beach & The Fleet SPA (paragraph 2.0.3): As noted previously we are aware that bait digging occurs on the mudflats at Ferrybridge, together with cockle-raking. Crab tiles have also been observed along the low intertidal areas in this site. Dorset Wildlife Trust and the Chesil Beach Wardens collate information on these activities and their impacts.

6.3 Shore-gathering activity in the Chesil & The Fleet SAC (paragraph 3.1.3): Consistent with Chesil Beach & The Fleet SPA (paragraph 6.2), bait digging, cockle-raking and crab tiling have been observed within this site.

6.4 Solent and Southampton Water SPA – Natural England was recently made aware of reports of people harvesting shellfish within Fareham Borough Council jurisdiction (with specific reference made to Hill Head) by the senior environmental health officer at Fareham Borough Council on 22 July (received by our local team on 24 July).

7. Literature Review

7.1 Natural England welcomes the inclusion of this supporting information. We have reviewed this document and have no further comments.

8. Concluding remarks

Natural England welcomes the commitment by SIFCA to assess the impact of shore gathering and seaweed harvesting activities and manage potentially damaging interactions via the introduction of a district-wide byelaw and accompanying Code of Conduct. We are supportive of this approach but have identified several areas where we believe the assessments and spatial/seasonal management measures could be clarified or improved. We would be happy to provide further advice to SIFCA on these aspects if that would be helpful.

I trust that the advice contained within this letter is helpful. Should you have any queries, please contact me using the details provided below.

Yours sincerely

R.D. Morgan.

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Annex 1: Additional comments

1. Part A Assessment Package

Chesil Beach and Stennis Ledges MCZ – Seaweed harvesting. The Abrasion/disturbance of the substrate on the surface of the seabed pressure has been screened in for pink sea-fan on the basis that: *"This species is found in the intertidal in area where seaweeds may be collected and so the activity could lead to the abrasion of the feature. Further assessment is therefore required."* We agree with screening this interaction in, but this is a subtidal species not found in the intertidal.

2. Conservation Assessment Package

Section F, page 59: Peacocks tail is not associated with seagrass but with pools containing soft substrate such as clay, silt or sand on rocky shores as found in places like Bembridge Ledges and Totland Bay.

Paragraph 1.2, page 13: Chesil Beach & The Fleet SPA and Chesil & The Fleet SAC have been taken thought to TLSE assessments for seaweed harvesting in addition to shore-based activities.

Paragraph 2.1.3, table 3: The General Management Approach (GMA) for long-snouted seahorse in Studland Bay MCZ should be 'Recover' not 'Maintain'.

MARKED B_ANNEX 9

Natural England Formal Advice on *'Conservation Assessment Package for the proposed Southern IFCA Shore Gathering Byelaw'*

Southern IFCA has reviewed the Formal Advice received from Natural England (NE) on 26th July 2024.

NE's overall concluding remarks in the Formal Advice are ***"NE welcomes the commitment by SIFCA to assess the impact of shore gathering and seaweed harvesting activities and manage potentially damaging interactions via the introduction of a district-wide byelaw and accompanying Code of Conduct. We are supportive of this approach but have identified several areas where we believe the assessments and spatial/seasonal management measures could be clarified or improved".***

Southern IFCA welcomes the following points made by NE in relation to the proposed Shore Gathering Byelaw and supporting documentation:

- **Support for the introduction of a byelaw and accompanying Code of Conduct being an appropriate mechanism to manage activities in line with the conservation objectives of the sites.**
- Support for the application of a GPS buffer to increase the protection of relevant features from accidental incursions and trampling. Whilst is stated that NE would recommend that the buffer is maximised to enable features such as seagrass beds to increase their natural range, NE acknowledge that a 10m buffer remains consistent with other management measures within the district.
- Support for the proposal to implement a year-round closure in Langstone Harbour.
- Support for the proposals for Chichester and Portsmouth Harbours based on adequate protection of seagrass beds.
- Support for the permanent closure in Studland Bay around seagrass beds up to the 2m contour.
- Support the permanent closure areas for Chesil and the Fleet designated sites.
- Support for the permanent closure of seagrass beds and the area of Holes Bay north of the railway line in Poole Harbour.
- Agreement with the in-combination assessment.
- Support for the Literature Review as a supporting document to the Conservation Assessment Document.

The areas identified by NE in their Formal Advice for clarity of improvement have been considered and the Southern IFCA response to each point is given in the table below. As a result of this consideration, **one change has been made to the proposed management measures**:

- In line with Management Principle 7 for the SG review, namely consideration of aligning Bird Sensitive Areas in The Chesil and The Fleet SPA with directions relating to access and shore gathering activities given by other bodies, for example harbour authorities and conservation bodies, Southern IFCA has reviewed the placement of the existing restrictions to access for bird sensitivity and has identified that an extension to the prohibited area defined in Schedule 1 of the Byelaw as 'The Fleet: Area 43' is required to ensure that the pressure of disturbance to the relevant features is mitigated.

Table 1: Detail of points identified through NE Formal Advice for Southern IFCA consideration and the associated Southern IFCA response outlining where and if any action is required.

(*) Note that references to 'shore-based activities' reflect bait digging, shellfish harvesting, push-netting, mechanical harvesting and crab tiling.

Paragraph No. in NE Formal Advice	NE Point Raised	Southern IFCA Response
General Points		
1.2	**Refers to the best available evidence:** While NE support the use of these data sources [*as named in the Management Principles for the SG Review*], it should be noted that they do not represent a complete picture of seagrass location and extent within the SIFCA district. NE recommend that SIFCA liaise with other organisations who may hold such data	• Management Principles (1) and (2) outline the sources of best available evidence used to inform the review and how any additional evidence will be considered; namely during the period of Formal Consultation and then (subject to byelaw ratification) in subsequent byelaw reviews, as determined by the provisions of the byelaw. • If there are other organisations who wish to provide data for Southern IFCA's consideration, this can be done through the Formal Consultation.
1.3	**Refers to the scope of the project being feature-based MPA management for MCZs, SACs and SPAs:** NE note the scope of the SG Review, and that this is the reason SSSIs and Ramsar sites are not included. NE notes that while spatial boundaries and protected features of these sites are often consistent with SPAs and SACs there may be instances where this is not the case, therefore NE recommends that SIFCA undertake a separate exercise to cross-reference these sites/features to ensure there are no outstanding risks.	• As correctly noted by NE, the SG Review considered feature-based management within MCZs and within or adjacent to SACs/SPAs. Whilst some SSSI features will by default be offered protection through the Shore Gathering Byelaw, assessment and management on the basis of SSSI or Ramsar features are outside the scope of this review and therefore a cross-referencing exercise for SSSI or Ramsar sites is not required to fulfil the legal duties of Southern IFCA under the Marine and Coastal Access Act 2009 (MCZs) or the

		Conservation Regulations 2017 & 2019 (SACs and SPAs).
Site Activity Screening Document		
2.1	**Refers to screening out of entirely subtidal MPAs in the Site Activity Screening Document:** In NE's previous response of 20 April 2023 [*note this refers to advice received on an initial iteration of Part A/TLSE assessments developed prior to the reframing of the review and the introduction of Seaweed Harvesting as a separate Advice on Operations activity by NE*], NE recommended that the pressures highlighted for shore-based activities be considered against shallow subtidal features. One such activity is shrimp push-netting which occurs within designated sites. While NE accept that interactions with subtidal features fall outside the scope of this review and the proposed byelaw, it would be beneficial to discuss with SICFA how such interactions can be best managed.	• Southern IFCA have considered shallow subtidal features up to a depth of 2m to take into account activities that could occur in shallow subtidal areas able to be access by shore gathering activities such as shrimp push netting and seaweed harvesting. Sites which are entirely subtidal are not able to be accessed by shore gathering activities, in order to carry out harvesting activities in the MPAs referenced, the sites would need to be accessed by vessel, placing them out of scope of this review. • Interactions within the subtidal for sites which can be accessed by shore gathering activities are subject to proposed management through the provisions in the Byelaw and the Code of Conduct for Seaweed Harvesting, adapted from an existing NE Code of Practice.

2.2	**Refers to screening assessment of infralittoral rock features:** NE note that the assessment of shore-based activities has screened out impacts upon designated infralittoral rock features within MCZs due to their being no potential interaction. It is NE's view that activities such as the collection of bivalves could occur within the upper infralittoral zone and should be screened in accordingly.	• The Advice on Operations for 'shore-based activities' provided by NE for the three relevant sites that have a feature of infralittoral rock; Chesil Beach and Stennis Ledges, The Needles and Yarmouth to Cowes in all cases classes this feature as *"Not Relevant: the evidence base suggests that there is no interaction of concern between the pressure and the feature OR the activity and the feature could not interact"* therefore this feature has been screened out on this basis. • Included as rationale on screening tabs for Part A Assessments for clarity.
2.3	**Refers to the use of the term 'Unsuitable habitat' for seaweed harvesting in the screening document for the Chesil & the Fleet SAC, Chesil Beach & the Fleet SPA and Solent Maritime SAC:** NE state it would be useful to provide further explanation of this term to clarify why it has been applied to these scenarios (e.g. whether they have been screened out due to the absence of target seaweed species) desirable species for harvesting occur throughout The Fleet lagoon, including *Fucus* spp., *Saccharina latissima* and *Chondrus crispus*. These species support tide-swept and subtidal coarse sediment communities afforded protection by the coastal lagoon features.	• Screening document updated to include potential for seaweed harvesting in Solent Maritime SAC, Chesil and The Fleet SAC and Chesil Beach and The Fleet SPA. • Updates to include TLSE Assessment for seaweed harvesting for Chesil and The Fleet SAC and Chesil Beach and The Fleet SPA for relevant features. • For the Solent Maritime SAC, rationale is given in the Part A Assessment as follows – *"It is recognised that the Solent Maritime SAC overlaps with other designated sites which may have features that are suitable for seaweed gathering. However, there are no features designated under the Solent Maritime SAC itself which would support the target species for seaweed harvesting therefore when assessing this site on its own this activity can be screened out as not requiring a Part A Assessment, risks to habitats within designated sites where*

		seaweed harvesting could occur that may overlap with the Solent Maritime SAC will be considered under the Part A Assessment for each relevant other site" – the coastal lagoons feature of the site are encompassed in other sites and are also both located on private land and are therefore not accessible for seaweed harvesting. • **There is no resulting change to management required as a result of updates to the assessments.**
Part A Assessments		
3.1	**Refers to the assessment of stalked jellyfish in the Part A Assessments for Bembridge MCZ and The Needles MCZ for shore-based activties:** NE note that the 'Removal of non-target species' and 'Penetration and/or disturbance of the substratum below the surface of the seabed' pressures have been screened out – despite these pressures being screened in for seagrass beds. Given the association between stalked jellyfish and seagrass beds, NE recommend that these two pressures are screened into the assessments for Bembridge MCZ and The Needles MCZ for consistency	• The two relevant pressures have been screened into Part A Assessments for shore-based activities for Bembridge MCZ and The Needles MCZ on the basis of the potential association between the feature and seagrass beds which may be impacted by shore-based activities. • **There is no resulting change to management required as a result of updates to the assessments.**
3.2	**Refers to the assessment of impacts upon peacock's tail (*Padina pavonica*) in the Part A Assessments for relevant MCZs for shore-based activities:** NE state that Peacock's tail is predominately located within pools containing soft substrate such as clay, silt or sand on rocky shores such as those found within Bembridge MCZ and The Needles MCZ (Herbert et al., 2016). A risk is therefore posed from shore-based activities which target soft sediment species. NE recommend that consideration is given to screening this feature in or providing further detail to justify its exclusion.	• Peacock's tail has been screened in through the Part A Assessments for shore-based activities for the pressure of abrasion/disturbance on the surface of the seabed (updated as a result of points 3.6 &3 3.7). • Whilst there may be pools within rock habitats which contain soft substrates these are not known to be used for shore-based activities. There is therefore no evidence to support the need to screen in any pressures other than the abrasion pressure

		for this feature in the Bembridge or The Needles MCZ Part A Assessments for shore-based activities targeting soft sediment species. • **There is no resulting change to management required as a result of updates to the assessments.**
3.3	**Refers to the assessment of impacts upon native oyster (*Ostrea edulis*) in the Part A Assessment for relevant MCZs:** NE note that impacts upon native oyster are screened out for shore-based activities in The Needles MCZ, Bembridge MCZ, Yarmouth to Cowes MCZ and Chesil Beach and Stennis Ledges MCZ. Given that this species could be directly targeted via shore gathering, NE recommend that consideration is given to screening this feature in or providing further detail to justify its exclusion	• The Advice on Operations for 'shore-based activities' provided by NE for the four relevant sites that have a feature of native oyster classes this feature as *"Not Relevant: the evidence base suggests that there is no interaction of concern between the pressure and the feature OR the activity and the feature could not interact"* therefore this feature has been screened out on this basis. • Included as rationale on screening tabs for Part A Assessments for clarity.
3.4 & 3.5	**Refers to the assessment of short-snouted seahorse in the Part A Assessment for Bembridge MCZ for seaweed harvesting:** The assessment of the Removal of non-target species for short-snouted seahorse states that: "the target species is seaweed harvesting by hand, the activity is very selective and seaweeds can be harvested without the accidental harvest of the feature by nature of the ability to see the location of any native oysters present in the site." It is our view that this rationale does not apply to seahorses and this feature should be screened in given its association with seaweed habitats.	• An error in the text has been corrected to replace 'native oysters' with 'short snouted seahorses'. • The rationale for screening out this pressure for seaweed harvesting remains as given.
	The assessment of Visual disturbance for short-snouted seahorse states that: "seaweed harvesting is unlikely to occur below the water level and therefore would not overlap with the presence of the feature." Given that seaweed harvesting may occur in subtidal areas, we recommend that this pressure is screened in due to potential interaction.	• Pressure of visual disturbance screened in for short-snouted seahorse for seaweed harvesting in Bembridge MCZ given the potential for activity to occur in the shallow subtidal.

		• **There is no resulting change to management required as a result of updates to the assessments.**
3.6 & 3.7	**Refers to the assessment of intertidal rock in the Part A Assessment for Chesil Beach & Stennis Ledges and Purbeck Coast MCZS for shore-based activities:** NE note that impacts upon high-energy intertidal rock have been screened out on the basis that target species will not be located on rock habitats. Given that blue mussel (Mytilus edulis) is found on this substrate, we recommend that potential pressures upon this feature are considered for completeness	• Updates made to Part A Assessments for sites listed and, for consistency, to the relevant features for the Yarmouth to Cowes MCZ, to reference the potential for shellfish gathering for mussels as a shore-based activity. • Relevant pressures screened in, assessment of which pressures to screen in has been made on the basis of the nature of hand picking for mussels and the current absence of any recorded activity for this taking place in the Southern IFCA District. On this basis abrasion is identified as the only relevant pressure, this pressure was already screened in for trampling, explanation for screening in updated to reference mussel harvesting but no change overall to pressures screened in from the assessment. • Assessments in relevant MCZs updated for designated species which may be associated with rock habitats to reflect inclusion of potential for mussel harvesting – no resulting change to the pressures screen in through the relevant Part A Assessments as abrasion pressure already screened in. • **There is no resulting change to management required as a result of updates to the assessments.**

3.8 & 3.9	**Refers to the assessment of long-snouted seahorse in the Part A Assessment for Studland Bay MCZ for seaweed harvesting:** The assessment of the Removal of non-target species for long-snouted seahorse states that: "the target species is seaweed harvesting by hand, the activity is very selective, and seaweeds can be harvested without the accidental harvest of the feature by nature of the ability to see the location of any native oysters present in the site." It is NE's view that this rationale does not apply to seahorses and this feature should be screened in given its association with seaweed habitats.	• An error in the text has been corrected to replace 'native oysters' with 'long snouted seahorses'. • The rationale for screening out this pressure for seaweed harvesting remains as given.
	The assessment of Visual disturbance for long snouted seahorse states that: "seaweed harvesting is unlikely to occur below the water level and therefore would not overlap with the presence of the feature." Given that seaweed harvesting may occur in subtidal areas, NE recommend that this pressure is screened in due to potential interaction.	• Pressure of visual disturbance screened in for long-snouted seahorse for seaweed harvesting in Studland Bay MCZ given the potential for activity to occur in the shallow subtidal. • **There is no resulting change to management required as a result of updates to the assessments.**
TLSE Assessments		
4.1	**Refers to all TLSEs for SPAs for shore-based activities:** NE states that the two pressures of 'removal of target species' and 'removal of non target species' also encompass the removal of prey species for designated bird species – as per NE's Advice on Operations. NE therefore recommend that these pressures are screened into the Appropriate Assessment.	• For the pressure 'removal of target species' for shore-based activities under NE Advice on Operations, for all SPAs, for all bird species, the advice for this pressure is *"Not Relevant: the evidence base suggests that there is no interaction of concern between the pressure and the feature OR the activity and the feature could not interact"* • For the pressure 'removal of non-target species' for shore-based activities under NE Advice on Operations, the explanatory advice is related to bycatch of the bird species themselves and entanglement in fishing gear, neither of which are possible with the activities under consideration. • Impacts to non-target species which may be prey items for bird species have been

		considered under the removal of non-target species pressure for supporting habitats.
4.2 & 4.3	**Referring to the assessment of annual vegetation of drift lines and perennial vegetation of stony banks in Solent Maritime SAC and the Chesil & The Fleet SAC:** NE states that whilst these features are typically located above Mean High Water, these habitats could be trampled in order for the intertidal area to be accessed. Therefore, NE recommends that they are screened into the Appropriate Assessment for completeness.	• Features have been screened in for TLSE Assessments for the Solent Maritime SAC and the Chesil & The Fleet SAC for shore-based activities. The only relevant pressure identified was abrasion. • Given the inclusion of seaweed harvesting for Chesil & The Fleet SAC on the basis of point 2.3, relevant pressures have also been screened in for these features for seaweed harvesting. • **There is no resulting change to management required as a result of updates to the assessments.**
4.4	**Referring to the assessment of the pressure 'removal of non-target species', specifically *Armandia cirrohosa* in Chesil and The Fleet SAC:** NE recommends that this pressure is screened in as bait digging has the potential to remove species from the communities that make up the coastal lagoon feature, including *Armandia cirrhosa*, which cannot survive compaction or being buried deeper than the top 1-2cm of sediment.	• This pressure is relevant only to the feature 'Coastal Lagoons' within the Chesil and The Fleet SAC, all other designated features are not habitats where shore-based activities would take place. The feature 'Coastal Lagoons' has been assessed for the removal of non-target species with the rationale provided that *"all methods are very selective with only the target species removed. Impacts to communities from digging activity is considered under the abrasion pressure'*. Whilst there may be impacts to associated sediment communities (under abrasion) the selectivity means that species other than the target species will not be directly removed by the activity. • The specific species referenced is a sandworm species, removal by bait digging would only occur as a target species,

		although is not known to be a target species in this site. NE Advice on Operations for shore-based activities under the 'removal of target species' for this site is given as *"Not Relevant: the evidence base suggests that there is no interaction of concern between the pressure and the feature OR the activity and the feature could not interact"*.
4.5	**Referring to the assessment of visual disturbance of shore-based activities on Little Tern in the Chesil Beach & The Fleet SPA:** NE state it should be noted that this area is not covered by a statutory closure, but rather fenced off by the RSPB for the duration of the breeding period. NE is aware that disturbance by anglers occurs relatively frequently so the potential for individuals carrying out shore-based activities is very high. Therefore, NE recommend that this pressure is screened into the Appropriate Assessment.	• Update made to the TLSE Assessment for Chesil Beach & The Fleet SPA to reflect potential for visual disturbance of Little Tern on the basis of existing exclusion areas being voluntary and other activities breaching those voluntary areas. • In line with Principle 7 for the SG review, namely consideration of aligning Bird Sensitive Areas in The Chesil and The Fleet SPA with directions relating to access and shore gathering activities given by other bodies, for example harbour authorities and conservation bodies, Southern IFCA has reviewed the placement of the existing restrictions to access for bird sensitivity and has identified that **an extension to the prohibited area defined in Schedule 1 of the Byelaw as 'The Fleet: Area 43' is required to ensure that the pressure of disturbance to the relevant features is mitigated.** • The current draft of the SG Byelaw reflects this extension to Area 43.
4.6	**Referring to references in the TLSE assessment to the scale of bait digging operations in Poole Harbour:**	• Both Southern IFCA data (sightings, patrol reports) and anecdotal information (observations by officers, reports from

	It is NE's view that bait digging in Poole Harbour is not localised and small scale but happens at a level that it has the potential to lead to habitat structure changes (hence the decision to set up an MOA for bait digging). We therefore recommend that this pressure is screened into the Appropriate Assessment.	stakeholders) indicate that levels of bait digging in Poole Harbour have seen a large decrease in the past 10 years. • The MoA was established in 2013 on the basis of current levels of activity at the time. At the present time no large groups of bait diggers have been recorded or observed in the Harbour for at least the last 2-3 years and where digging is noted to occur it is most commonly a single operator. • The rationale therefore provided in the TLSE for Poole Harbour which is based on levels of activity remains valid.
Conservation Assessment Document		
5.1	**Referring to maps provided for the Solent and Southampton Water SPA:** NE requested (via email) more detailed maps for this site to better interpret the boundary of proposed closed areas with respect to the location of sensitive features. SIFCA has agreed to provide Natural England with more detailed mapping, and we recommend that these maps are appended to the Conservation Assessment Document to assist interpretation.	• Maps included in Annex 1 of the Conservation Assessment Document have been updated for the Solent and Southampton Water SPA to provide an 'east' and 'west' map to improve the resolution of proposed management and sensitive features. • These maps were emailed to NE during their consideration of the document.
5.4	**Referring to proposed management for Portsmouth Harbour:** NE note that on the basis that the four species of bird designated for the Portsmouth Harbour SPA are in unfavourable condition based on reasons including declining abundance, loss of supporting habitat and disturbance. That Southern IFCA implement an appropriate review process should new seagrass data become available; or evidence come to light that activity levels are related impacts are higher than assumed.	• Southern IFCA note the condition assessments which have been conducted for the four designated bird species in the Portsmouth Harbour SPA. In reviewing the identified pressures causing adverse condition and the associated drivers, fishing is not referenced as one of the drivers for any of the designated species. Drivers are given as coastal squeeze, freshwater pollution, recreation (which as

		per NE Advice on Operations is recreational activities other than fishing) and ports & harbours operations. Southern IFCA understands its responsibility to ensure that activities for which it has a remit are managed appropriately within protected sites but, at present, there is no indication that fishing activity is contributing to the unfavourable condition of the features. • A review process for the Byelaw is given in paragraph (10).
5.5	**Referring to seasonal closures in the Solent and Southampton Water SPA:** NE state that given the importance of this SPA to overwintering species, NE recommend that year-round closures are implemented in areas of greatest sensitivity. In addition to using Wetland Bird Survey (WeBS) data to identify such areas, NE recommend that advice is also sought from the RSPB and Bird Aware Solent.	• The seasonal measures for Bird Sensitive Areas in the Solent and Southampton Water SPA, with a summer closure between 1st March to 31st August was developed in accordance with Principle (7)(c) and reflects 100% of the period when >50% of the designated bird species are present in the site. • There are two bird species: Dark-Bellied Brent Goose and Teal which, based on seasonality information provided by NE, would have only one month of overlap with the closed season (seasonality October to March). • Considering the specific species, dark-bellied brent goose is noted to roost on the water overnight and during the day will roost close to preferred feeding areas, given as seagrass beds and areas of green algae. ○ Under the Byelaw, all seagrass beds will be protected as year-round prohibited areas providing protection

		to these species when they are feeding and roosting during the day. ○ Roosting overnight on the water removes the potential for interaction with the activities being assessed and managed through this Byelaw. • For Teal, the species roosts on the open water and feeds in saltmarsh, creeks and mudflats with Southampton Water and Newtown Creek highlighted as important areas. ○ Roosting on the open water removes the potential for interaction with the activities being assessed and managed through this Byelaw. ○ Saltmarsh is not a target habitat for shore-based activities or seaweed harvesting and therefore whilst there may be access, the levels of activity observed and the fact that operations will not be taking place in this habitat limiting the time a person would be there is deemed to not significantly affect the ability to feed in this habitat. ○ The greatest number of records observed in a single month for shore-based activities is less than 20, with large areas of the site having no observed shore-based activities recorded (data up to 2023 – presented in section 2.2 of the Site Specific Evidence Packages supporting document for the Byelaw). Newtown Creek has no recorded occurrences of shore-based activities.

		• The proposal for summer closure areas in line with the Principles for the SG Review allows Southern IFCA to meet its legal duties for designated sites, considering the specifics of the behaviours of relevant designated features, whilst being proportionate to the risk posed by shore-based activities based on levels of activity and how those activities are conducted. • Any other bodies which may wish to put forward evidence in relation to the SG Byelaw have the opportunity to do so through the Formal Consultation, in line with Principle (2). • **No changes are required to management measures under the Byelaw.**
5.6	**Referring to management for BSAs in the mouth of Beaulieu River:** NE state that given that this area is in part subject to a bird sanctuary order to protect designated species, NE recommend that consideration is given to implementing a year-round closure here for consistency.	• In accordance with the Management Principles for the Review, namely Principle (7) regarding the definition of BSAs, the area around the mouth of the Beaulieu River was not identified as an area proposed for management as a good example of estuarine habitat for the BTFG Byelaw 2023 (Principle 7(b)(i)). • The area does also, to the best of Southern IFCA's knowledge, not have any directions relating to access and shore gathering activities given by other bodies (Principle 7(b)(ii)). • On this basis the area does not meet the criteria set out in the Management Principles for defining a BSA within the Solent Maritime SAC and district wide SPAs.

		• **No changes are required to management measures under the Byelaw.**
5.7	**Referring to defining Bird Sensitive Areas in the Solent and Southampton Water SPA:** NE state that while NE has not formally defined BSAs in Hampshire and Dorset, an exercise to identify such areas was previously undertaken in 2015 in conjunction with SIFCA involving collating WeBS Low Tide Count data which was subsequently sense-checked by local ornithological stakeholders. It is NE's view that much of this work remains valid and NE would be happy to provide it to SIFCA to inform this process.	• Southern IFCA have no record of any outputs from this process and are unable to confirm if the work was completed. • Any outputs from this work held by NE have not been supplied to Southern IFCA at any point during the management development process and have not been raised through any relevant Member Working Group. • Any further evidence can be submitted through the Formal Consultation at which point it will be considered by Southern IFCA.
5.9	**Referring to management within the Chesil & The Fleet SAC and Chesil Beach & The Fleet SPA:** NE queried why the whole of The Fleet lagoon has not been included, NE are aware that bait digging and cockle raking occur on the mudflats at Ferrybridge and cause disturbance and damage.	• In line with the Management Principles for the Review, prohibition areas have been defined in accordance with Principle (4) and further measures for SPAs have been defined in accordance with Principle (7). • An update has been made to the prohibited area for The Fleet, defined under Schedule 1 of the Byelaw, Area 43 to ensure that all the area subject to existing directions for access and shore gathering activities (Principle (7)) is included in the prohibition – see point 4.5 in this response document. • Based on management meeting Southern IFCA's legal duties for designated sites whilst being proportionate to the level of risk, the spatial extent of the prohibited area within The Fleet ensures that

		designated features will be managed to avoid an impact to site integrity. • **In line with point 4.5, an extension to the prohibited area defined in Schedule 1 of the Byelaw as 'The Fleet: Area 43' is required to ensure that the pressure of disturbance to the relevant features is mitigated.**
5.10	**Referring to management within Poole Harbour SPA:** NE queried how proposed management corresponds with the BSAs identified in the Poole Harbour Aquatic Management Plan 2024 and the current seasonal/spatial management of bait digging in other areas of the Harbour.	• The BSAs in Poole Harbour align with those used by Southern IFCA for management of other fishing activities, namely dredge fishing under the 'Poole Harbour Dredge Permit Byelaw' and shellfish hand gathering under the 'Poole Harbour Shellfish Hand Gathering Byelaw'. The spatial extent of these BSAs was developed in conjunction with NE during the development of these byelaws and have been agreed by NE to be appropriate in relation to designated features. • The BSAs proposed for Poole Harbour in the SG Byelaw have been developed in accordance with Management Principle (5) by combining existing management approaches. This results in the spatial extent from existing byelaws being applied, as agreed by NE in the development of those byelaws, with the addition of Blue Lagoon, as covered under the current Memorandum of Agreement for Bait Digging in Poole Harbour and the creation of a permanent closed area in Holes Bay North, an additional measure to that currently applied for shellfish gathering (seasonal restriction).

5.11	**Referring to the Seaweed Code of Conduct:** Point 1: To maintain consistency with NE's own Code of Conduct for seaweed harvesting, NE request that this point is re-worded as follows: *"Ensure you obtain any relevant permissions before undertaking gathering activities, including landowner permission. Natural England should be consulted before harvesting seaweed in a protected site in England".* Point 12: It may be helpful to clarify that it is an offence to cause the spread of INNS. NE would also be happy for a sentence to be added with respect to seeking advice from Natural England for INNS (please refer to Natural England's Code of Conduct for further information). Point 14: NE recommend clarifying that the volume of each species collected should be recorded as wet weight. It would also be useful to state that records should be kept should they be requested by a regulatory body. NE would recommend adding an additional point requesting that collectors replace any rocks that are moved (please refer to Natural England's Code of Conduct for further information).	• Southern IFCA requested a copy of the NE CoC referenced in the Formal Advice and a copy was provided on 12.08.24. NE has stated that the CoC has been finalised and signed off but is not yet published, however it represents NE Formal Advice. • **Point 1 has been addressed and the proposed text included in the CoC.** • **Reference to contact NE for further information/advice has been added to Point 12. The website link has also been updated to reference the Non-Native Species Secretariat.** • **Reference has been added under Point 14 to recording weight as well as volume.** The point already indicates that records should be kept. How a regulatory body would request such data is not required as a provision under the CoC but will be dependent on the individual procedures of the appropriate regulatory body. • **Point 7 has been updated to relate to the replacement of rocks**. The original text under Point 7 has been included as part of Point 1.
5.12 & 5.13	**Referring to Part B and Appropriate Assessments:** NE noted that SIFCA has applied a different approach to presenting the results of the Part B and Appropriate Assessments which summarises how proposed management principles will mitigate the impacts of shore-based activities and seaweed harvesting. However, it is not clear how the individual feature-pressure interactions screened in during the Part A and TLSE stages have been addressed. Therefore, for the purpose of reviewing these assessments NE request that this information is presented in a tabular format – provided separately or appended to the Conservation Assessment Document.	• Southern IFCA is developing the tables requested by NE. These will be provided to NE as part of the response to the Formal Advice and will sit as an annex to the Conservation Assessment Document. • In reviewing points made in the NE Formal Advice on specific elements of the assessments or management under the

	Natural England has requested further information on the spatial/seasonal coverage of proposed closures that will be introduced via the Shore Gathering Byelaw, together with their underlying assessments. Therefore, NE would like to review this requested information before commenting on the conclusion.	SG Byelaw, other than any changes outlined in this document, **the production of these tables will not change the proposed management under the SG Byelaw.**
5.15	**Referring to the Integrity Test:** Please refer to NE comments under paragraph 5.13.	
Site Specific Evidence Package		
6.1	**Referring to shore gathering activity in Studland Bay MCZ:** Natural England was made aware during the Marine Management Organisation (MMO) non-licensable activities call for evidence consultation in 2020/21 that there was push-netting for prawn occurring within this site, specifically within the seagrass beds, which NE flagged to SIFCA at the time.	• The relevant section of the Site Specific Evidence Package refers to data gathered by Southern IFCA on the occurrence of shore gathering activities within the site. • However, a sentence has been added to reflect the information provided in this point (Section 1.2.2).
6.2 & 6.3	**Referring to shore gathering activity in Chesil Beach & The Fleet SPA and SAC:** As noted previously NE are aware that bait digging occurs on the mudflats at Ferrybridge, together with cockle-raking. Crab tiles have also been observed along the low intertidal areas in this site. Dorset Wildlife Trust and the Chesil Beach Wardens collate information on these activities and their impacts.	• The relevant section of the Site Specific Evidence Package refers to data gathered by Southern IFCA on the occurrence of shore gathering activities within the site. • However, a sentence has been added to reflect the information provided in this point (Section 2.0.3). • Any information other bodies wish to submit to Southern IFCA is subject to the Formal Consultation process as outlined under Management Principle (2) relating to the provision of evidence.
6.4	**Referring to shore gathering activity in the Solent and Southampton Water SPA:** NE was recently made aware of reports of people harvesting shellfish within Fareham Borough Council jurisdiction (with specific reference made to Hill Head) by the senior environmental health officer at Fareham Borough Council on 22 July (received by our local team on 24 July).	• The collation of evidence to inform the Site Specific Evidence Package is up to October 2023 as the best available evidence at the time the document was developed. • Hill Head is already document as being subject to shore gathering activity through the evidence supplied for the Solent and

		Southampton Water SPA (Section 2.2.3 of the Site Specific Evidence Package). • Any information other bodies wish to submit to Southern IFCA is subject to the Formal Consultation process as outlined under Management Principle (2) relating to the provision of evidence.
Annex 1: Additional comments		
1	**Referring to the location of Pink Sea-fans for the Part A Assessment of Chesil Beach and Stennis Ledges MCZ:** NE agree with screening in the interaction of abrasion/disturbance but identify that this is a subtidal species not found in the intertidal.	• Southern IFCA have identified that some of the mapped occurrences of this feature sit within drying areas, an update to the text in the relevant Part A Assessment has been made to reflect NE comments and mapped occurrences of this species - "*Whilst this species is predominantly subtidal, there are some instances occurring in the intertidal areas".*
2	Referring to the Conservation Assessment Document: Section F, page 59: Peacocks tail is not associated with seagrass but with pools containing soft substrate such as clay, silt or sand on rocky shores as found in places like Bembridge Ledges and Totland Bay.	• Southern IFCA have removed the erroneous reference to Peacock's tail in the relevant section.
	Paragraph 1.2, page 13: Chesil Beach & The Fleet SPA and Chesil & The Fleet SAC have been taken thought to TLSE assessments for seaweed harvesting in addition to shore-based activities.	• See Southern IFCA response to point 2.3.
	Paragraph 2.1.3, table 3: The General Management Approach (GMA) for long-snouted seahorse in Studland Bay MCZ should be 'Recover' not 'Maintain'	• The factsheet for the Studland Bay MCZ which accompanied the designation of the site in 2019 lists 'long-snouted seahorse' as having a 'Maintain' General Management Approach, Southern IFCA is unaware of subsequent updates to this designation.

EXECUTIVE SUMMARY

Solent Oyster Survey Report 2024 & Solent Dredge Permit Category B Permits Decision Paper

Report by IFCO Churchouse

A. Purpose

For Members to consider the outcomes of the Solent Native Oyster Survey 2024 and how the results inform management of the Solent native oyster fishery under the Solent Dredge Permit Byelaw (SDPB).

B. Recommendation(s)

1. That Members approve The Solent Native Oyster Survey 2024 report.
2. That Members maintain a closure of all BMAs for the harvesting of native oysters for the 2024/25 and 2025/26 seasons.

C. Supporting Documentation for Further Information

- Annex I – Solent Native Oyster Survey Report 2024

1 Introduction

- The Solent native oyster (*Ostrea edulis*) fishery is managed under The Solent Dredge Permit Byelaw (SDPB). Fishers are required to hold a valid Category B permit in order to harvest native oyster in The Solent.
- Management decisions regarding the harvesting of native oysters is underpinned primarily by the outcomes of The Solent Native Oyster Survey, as listed under Section 3.1 and Section 4.0 of the Management Intentions Document (MID).
- In accordance with the MID, the following thresholds are defined for Catch per Unit Effort (CPUE) of oysters ≥70mm:
  - 5.00 kg m^{-1} hr^{-1} for CPUE average across a Bivalve Management Area (BMA),
  - 15.00 kg m^{-1} hr^{-1} for CPUE averaged across an individual oyster bed.
- In addition to CPUE thresholds, the Authority may also consider any other evidence when considering the need for management intervention.
- Category B permits under the SPDB have not been issued for any fishing season since the introduction of the SDPB in 2021 based on stock levels of native oyster in the Solent. Prior to this the fishery for native oyster was shut for a number of years under the Southern IFCA 'Temporary Closure of Shellfish Beds Byelaw' on the basis of native oyster beds being 'severely depleted'.
- Due to consistently depleted levels of stock, The Solent Native Oyster Survey was changed from an annual to biennial survey from 2022.

2 Summary of Key Points

- The 2024 survey took place over 3 days from the 22^{nd} – 24^{th} July, using a local fishing vessel. A total of 16 shellfish beds were sampled with 72 tows completed across the 6 BMAs. A total of 42 oysters ≥70mm (the Minimum Conservation Reference Size – MCMS) were caught, measured and weighed, while 56 oysters <70mm were recorded.
- The Eastern Solent (BMA 3) had the highest average CPUE, at 5.63 kg m^{-1} hr^{-1}, followed by the Northern Solent (BMA 2) with an average of 5.48 kg m^{-1} hr^{-1}. These are the only two BMAs that have a CPUE above the threshold value.
  - The Eastern Solent CPUE value is generated from oysters ≥70mm sampled in 2 of 3 of the beds sampled in this BMA, corresponding to **13 oysters over 9 tows.**
  - The Northern Solent CPUE value is generated from oysters ≥70mm sampled in 4

out of the 7 beds sampled in this BMA, corresponding to **20 oysters over 18 tows.**

- The individual shellfish bed with the highest CPUE value was North Channel (Northern Solent – BMA 2) at 17.55 kg m^{-1} hr^{-1}, corresponding to **6 oysters over 3 tow**s. This is the only individual bed to cross the threshold value.
- Of the 16 sampled beds, 6 returned no oysters ≥70mm, and 3 returned no oysters of any size.
- A majority of oysters < 70mm were seen in Southampton Water (BMA 4) (100%), Langstone Harbour (BMA 6) (100%), Eastern Solent (BMA 3) (69.8%), Portsmouth Harbour (BMA 5) (62.5%) and Northern Solent (BMA 2) (59.4%).
- When compared to the 2022 survey, the average CPUE for oysters ≥70mm in 2024 increased for 7 of the 16 beds sampled. Browndown and North Channel (both Northern Solent – BMA2) saw the largest increase between 2022 and 2024, from 2.01 kg m^{-1} hr^{-1} (**2 oysters over 4 tows**) to 14.46 kg m^{-1} hr^{-1} (**10 oysters over 2 tows**) for Browndown and 5.28 kg m^{-1} hr^{-1} (**3 oysters over 9 tows**) to 17.55 kg m^{-1} hr^{-1} (**6 oysters over 3 tows**) for North Channel.
- Three beds (Stanswood, Calshot Spit, and Chilling) maintained an average CPUE of 0.00 kg m^{-1} hr^{-1} from 2022 to 2024.
- Six sites saw a decrease in average CPUE for oysters ≥70mm from 2022 to 2024, all recorded values of 0.00 kg m^{-1} hr^{-1}, the lowest value to date for 4 of the sites (Spit Sands, Hamble, Fareham, & Langstone).
- None of the BMA CPUE trends documented through the Solent Oyster timeseries have been found to be statistically significant (Kruskal Wallis test, $p > 0.05$).

3 Key Considerations

- CPUE remains low across all the Solent Oyster beds sampled in 2024.
- Only 2 BMAs (Northern Solent – BMA2 and Eastern Solent BMA3) and 1 individual bed (North Channel) had an average CPUE above the threshold values set in the MID.
- When analysing survey outcomes, it is important to consider other data available for consideration alongside CPUE values. In this case, the CPUE values for individual beds should be viewed alongside the count data for oysters over 70mm as although weight data is the most suitable for informing CPUE, a few larger, heavier oysters have the potential to increase the overall weight, thus increasing the average CPUE whilst the number of oysters harvested remains low. For the Northern Solent and Eastern Solent BMAs, and the North Channel bed, the CPUE values are dominated by large oysters > 100mm.
- **On the basis of consideration of CPUE and additional data, the data indicates that the native oyster population in the Solent continues to show a fluctuating pattern of stock abundance with the general trend being low CPUE and/or low oyster numbers, both over and under the MCRS of 70mm.**

MARKED C_ANNEX 1

Southern IFCA Survey Report

Solent Native Oyster Survey 2024

1. Introduction

As part of Southern IFCA's management of Bivalve species in the Solent, a survey is carried out to provide data on the population and range of native oyster (*Ostrea edulis*) within its traditional beds in the Solent. The survey was previously undertaken by CEFAS until 2011, with Southern IFCA commencing the survey again in 2014 following a requirement for data to inform local management of the fishery. From 2014 to 2022 the survey occurred annually (asides from 2020 due to COVID-19 restrictions) and became a biennial survey from 2022 due to consistently low stock levels across the Solent.

Survey data adds to an ongoing time series and provides a data source, as Catch Per Unit Effort (CPUE), which may be used, in conjunction with any other available evidence, to inform management of the Solent oyster fishery through the provisions of the Solent Dredge Permit Byelaw, as described in the Management Intentions Document[1]. The Solent is separated into 6 Bivalve Management Areas (BMA), and data is collected from each.

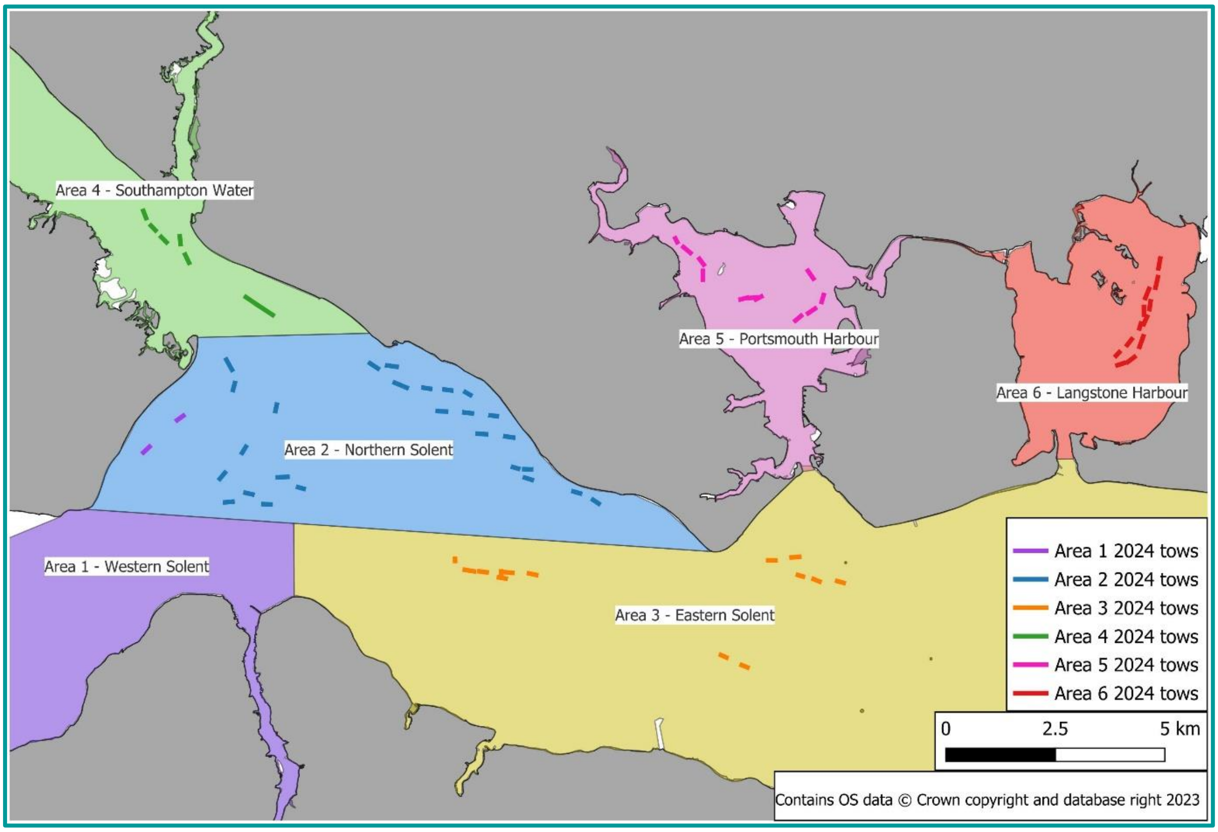

Figure 1: Map portraying the Solent Bivalve Management Areas and the locations of the tows undertaken in the 2024 Solent Oyster survey.

[1] Solent Dredge Permit Byelaw Management Intentions document: https://secure.toolkitfiles.co.uk/clients/25364/sitedata/Redesign/Solent-Dredge-Fisheries/Management-Intentions-Document-SDPB.pdf

2. Method

Beds currently surveyed reflect adaptations from the historic CEFAS survey, combined with additional survey sites determined by Southern IFCA at the point at which the survey was re-commenced in 2014. Sampling stations are distributed across these shellfish beds.

Sampling involves the chartering of a local fishing vessel to provide local knowledge and engage and involve stakeholders in the process of evidence collection. A 1.2m ladder dredge is used to undertake sampling, similar to those traditionally used within the fishery.

The Minimum Conservation Reference Size (MCMS) for Native Oyster is 70mm.

In 2024 the survey took place over 3 days between the 22nd and 24th of July.

At each station:

- The ladder dredge is towed for 2 minutes with the skipper choosing the direction/speed of the tow depending on conditions.
- The following metadata is collected:
    - Start and end time,
    - Start and end location,
    - Depth,
    - Speed.
- On completion of the tow the dredge is emptied onto the sorting table and the contents sorted removing oysters and any other bycatch of interest.
- Oysters are measured across their widest edge, split into ≥70mm and <70mm (MCRS).
- Oysters ≥70mm were weighed before being returned to the fishery.
- Oysters <70mm were weighed where possible, though were often attached to rock or shell making accurate measurements difficult (note that the weight of oysters <70mm is not required for CPUE calculations).
- CPUE was calculated for each tow by dividing the weight of oysters ≥70mm sampled by the area of the dredge, then multiplying that figure by the duration of the tow (kg m^{-1} hr^{-1}). CPUE values for beds/BMAs were then calculated by averaging all the tow/bed CPUE values from within that bed/BMA.
- As required other commercial bycatch may be measured, and additional data on associated species in the dredge recorded.

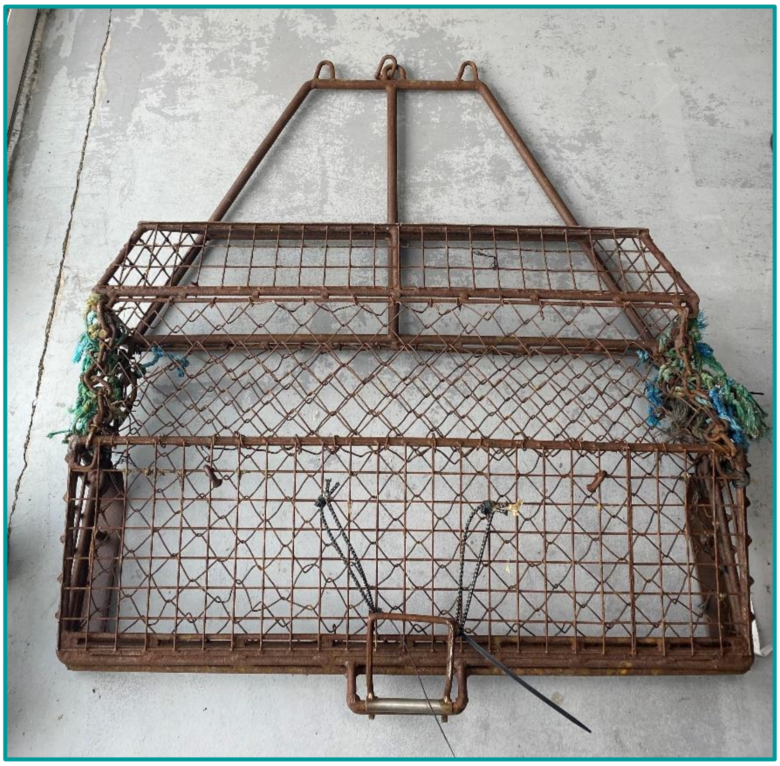

Figure 2: The Ladder Dredge.

3. Results

Across the 6 BMAs in the Solent, 16 shellfish beds were surveyed completing 72 tows. In total, 42 oysters ≥70mm were caught, measured, and weighed, and 56 oysters <70mm were recorded. The CPUE values are calculated only for oysters ≥70mm.

Area 1 - Western Solent				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Stanswood	2	0	N/A	0.00
BMA Total	**2**	**0**	**N/A**	**0.00**
Area 2 - Northern Solent				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Browndown	2	10	100.0	14.46
Lee-On-Solent	8	3	33.3	1.38
North Channel	3	12	50.0	17.55
Chilling	2	10	0.0	0.00
Thorn Knoll	3	0	N/A	0.00
Bramble Bank	5	5	60.0	4.97
Calshot Spit	2	4	0.0	0.00
BMA Total	**22**	**44**	**40.6**	**5.48**
Area 3 - Eastern Solent				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Ryde Middle	7	27	40.7	6.68
Spit Sand	5	1	0.0	0.00
Sturbridge	2	4	50.0	10.22
BMA Total	**14**	**32**	**30.3**	**5.63**
Area 4 - Southampton Water				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Hamble	5	5	0.0	0.00
BMA Total	**5**	**5**	**0.0**	**0.00**
Area 5 - Portsmouth Harbour				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Fareham	4	0	N/A	0.00
Bomb Ketch	3	12	75.0	8.00
Portchester	4	1	0.0	0.00
BMA Total	**11**	**13**	**37.5**	**2.67**
Area 6 - Langstone Harbour				
Shellfish Bed	No. Tows	Total No. Oysters	%>70mm	Average CPUE
Langstone	12	4	0.0	0.00
BMA Total	**12**	**4**	**0.0**	**0.00**

Table 1: Results summary of the Solent native oyster survey split into Bivalve Management Area (BMA) and shellfish bed. Average CPUE values are recorded in kg m^{-1} hr^{-1} (kg per metre of dredge per hour) of oysters over 70mm.

3.1 CPUE

The average CPUE for each BMA was calculated by averaging the kg m^{-1} hr^{-1} of oysters caught in all of the beds within that BMA. Section 4.3 of the Solent Dredge Permit Management Intentions Document sets baseline CPUE thresholds which indicate either a closure if CPUE is below the threshold, or the consideration of management intervention if CPUE is above the threshold. The threshold for individual beds is 15.00kg m^{-1} hr^{-1} and for individual BMAs is 5.00 kg m^{-1} hr^{-1}. It should be noted that CPUE values are one source of evidence that the Authority may consider in guiding management.

The Eastern Solent (BMA 3) had the highest average CPUE, at 5.63 kg m^{-1} hr^{-1}, followed by the Northern Solent (BMA 2) with an average of 5.48 kg m^{-1} hr^{-1}. These are the only two BMAs that have a CPUE value above the threshold value of 5.00 kg m^{-1} hr^{-1}. Considering the individual beds within these BMAs, for Eastern Solent, there were 2 beds which showed CPUE values, Ryde Middle at 6.68 kg m^{-1} hr^{-1} and Sturbridge at 10.22 kg m^{-1} hr^{-1}, corresponding to 11 oysters over 7 tows and 2 oysters over 2 tows respectively. For the individual beds within Northern Solent, four out of the seven beds showed CPUE values, North Channel at 17.55 kg m^{-1} hr^{-1} (6 oysters over 3 tows), Browndown at kg m^{-1} hr^{-1} (10 oysters over 2 tows), Bramble Bank at kg m^{-1} hr^{-1} (3 oysters over 5 tows) and Lee-On-Solent at 1.38 kg m^{-1} hr^{-1} (1 oyster over 8 tows).

For the other three BMAs, average CPUE ranged from 2.67 kg m^{-1} hr^{-1} (Portsmouth Harbour [BMA 5]) to 0.00 kg m^{-1} hr^{-1} (Western Solent [Area 1], Southampton Water [Area 4], and Langstone Harbour [Area 6]).

The individual shellfish bed with the highest average CPUE was North Channel (Northern Solent – BMA2) at 17.55 kg m^{-1} hr^{-1}, and is the only bed to cross the threshold value. As noted above this corresponded to 6 oysters over 3 tows.

The Chilling, Calshot Spit, Spit Sand, Hamble, Portchester, and Langstone beds returned oysters, however there were no oysters ≥70mm across 30 tows returning a value of 0.00 kg m^{-1} hr^{-1}. Stations at Stanswood, Thorn Knoll, and Fareham returned no oysters.

Ryde Middle (Eastern Solent – BMA3) returned the greatest number of oysters with 27 caught, however 59.3% of these were <70mm. Both North Channel and Bomb Ketch stations recorded 12 oysters in total, with 50% and 75% being ≥70mm respectively.

3.2 Length

Northern Solent (BMA 2), Eastern Solent (BMA 3), and Portsmouth Harbour (BMA 5) displayed a majority of undersized oysters, with 59.44%, 69.75%, and 62.50% of oysters sampled >70mm. In Southampton Water (BMA 4) and Langstone Harbour (BMA 6) only undersized oysters were sampled.

Figure 3 highlights the frequent occurrence of large oysters over the size of 100mm within Northern Solent (BMA 2), which will have contributed to the high CPUE values seen within this BMA.

Figure 3 also reveals that for the BMAs with the highest average CPUE values (Northern Solent – BMA 2 and Eastern Solent – BMA 3), the most frequent size class sampled was oysters 25 – 30mm, under the MCRS of 70mm thus these oysters would not have contributed to CPUE calcualtions.

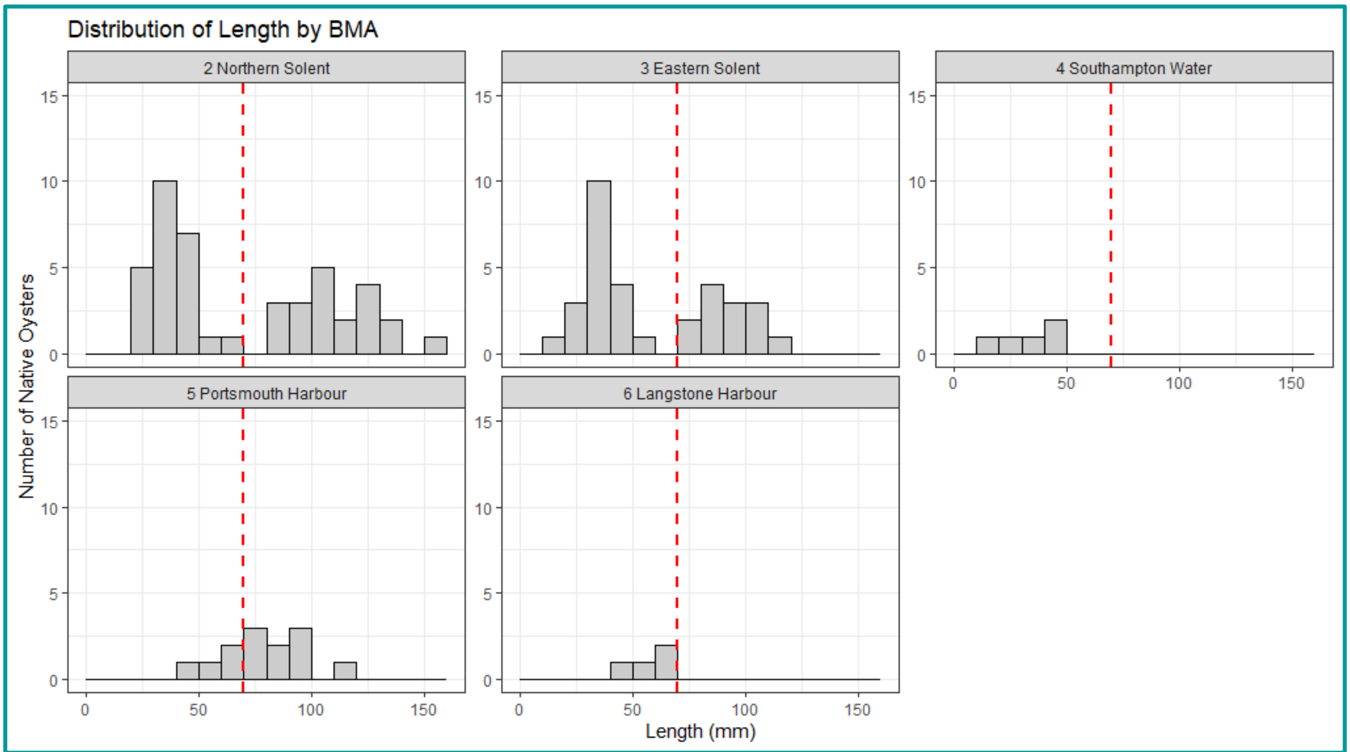

Figure 3: Length histograms by Bivalve Management Area of all Native Oysters sampled during the 2024 Solent Native Oyster Survey. The red dashed line indicated 70mm, the Minimum Conservation Reference size for native oysters.

3.2.1 Limitations

Saddle Oysters (*Anomia sp.*) are present in waters around the UK coast (Neal, 2004) and are visually similar to Native Oysters, especially at smaller sizes. This similarity can lead to misidentification and a distortion in count data. Saddle Oysters were regularly identified during this survey and excluded from the count when noted. Weight data is based on oysters over 70mm and is therefore not affected.

4. Time Series

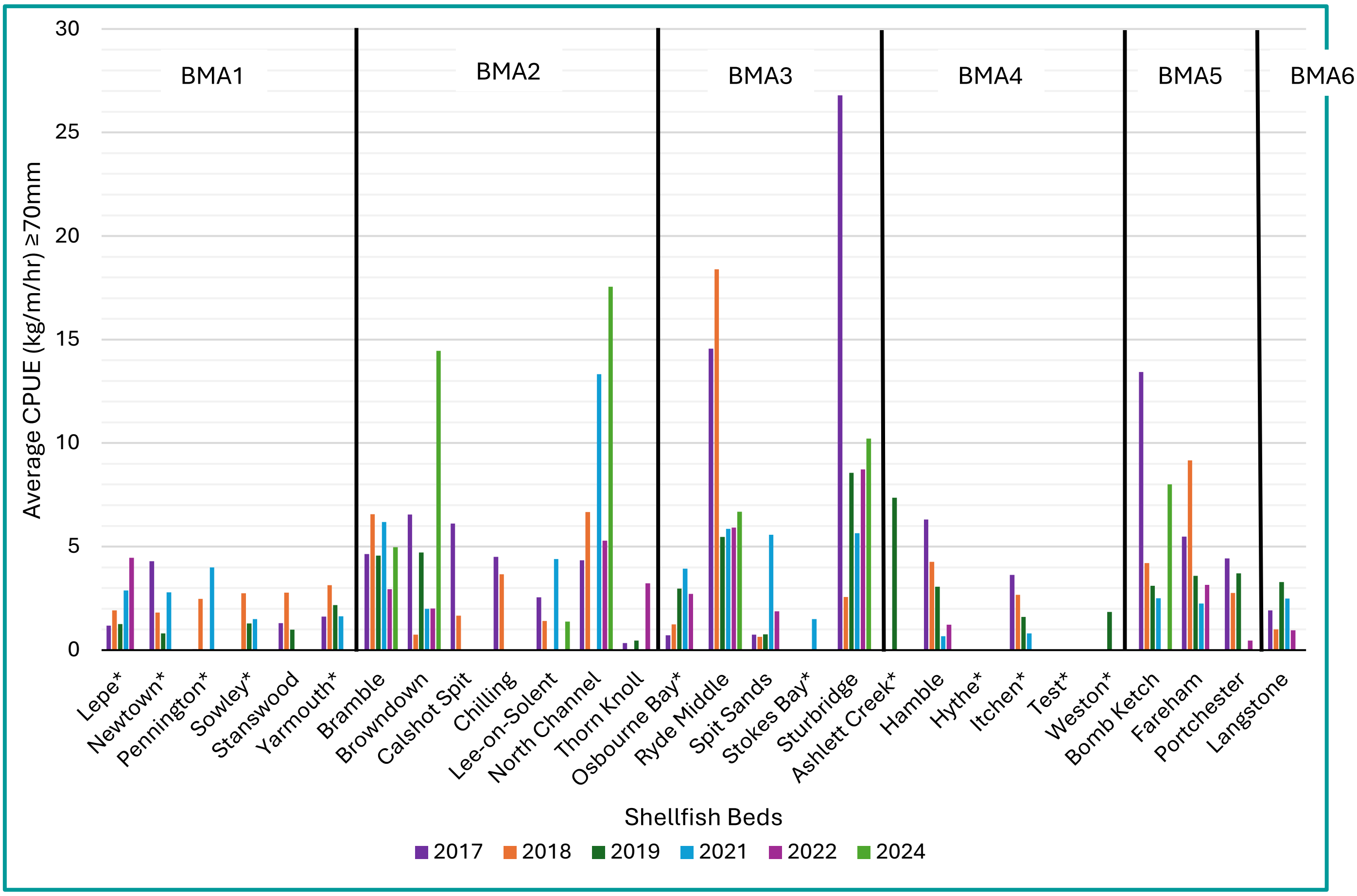

Figure 4: Timeseries of the Average Catch per Unit Effort (CPUE) (kg m^{-1} hr^{-1}) values for oysters ≥70mm from each shellfish bed in the Solent from 2017 – 2022, excluding 2020, when no sampling took place due to COVID-19 restrictions, and 2023, when no sampling occurred due to a change to survey occurrence, moving to every two years. * Represents shellfish beds that were not sampled in 2024. BMAs: 1 – Western Solent, 2 – Northern Solent, 3 – Eastern Solent, 4 – Southampton Water, 5 – Portsmouth Harbour, 6 – Langstone Harbour.

Figure 3 displays the average CPUE for oysters ≥70mm for each shellfish bed from 2017 – 2024. No surveys occurred in 2020 due to COVID-19 restrictions or 2023 as the decision was made for the survey to become biennial.

The general data pattern is inconsistent between survey years. Since 2018, only North Channel bed (Northern Solent – BMA2) has reached the threshold CPUE value of 15.00 kg m^{-1} hr^{-1}. Previously, the threshold was only reached at Sturbridge in 2017 (26.80 kg m^{-1} hr^{-1}, 11 oysters over 3 tows) and Ryde Middle in 2018 (18.40 kg m^{-1} hr^{-1}, 63 oysters over 18 tows) (both Eastern Solent – BM3).

When compared to the 2022 survey, the average CPUE for oysters ≥70mm in 2024 increased for 7 of the 16 beds sampled. Browndown and North Channel (both Northern Solent – BMA2) saw the largest increase between 2022 and 2024, from 2.01 kg m^{-1} hr^{-1} (2 oysters over 4 tows) to 14.46 kg m^{-1} hr^{-1} (10 oysters over 2 tows) for Browndown and 5.28 kg m^{-1} (3 oysters over 9 tows) hr^{-1} to 17.55 kg m^{-1} hr^{-1} (6 oysters over 3 tows) for North Channel.

Of the 7 beds that saw an increase in average CPUE from 2022 to 2024, 3 increased for a second successive survey - Browndown, Ryde Middle and Strubridge. However, only the 2024 values for Browndown (14.00 kg m^{-1} hr^{-1}) (Northern Solent – BMA2) are higher than those values recorded in 2017 with CPUE fluctuating between 2017 and 2021.

3 beds (Stanswood, Calshot Spit, and Chilling) maintained an average CPUE of 0.00 kg m^{-1} hr^{-1} from 2022 to 2024.

The 6 sites that saw a decrease in average CPUE for oysters ≥70mm from 2022 to 2024, all recorded values of 0.00 kg m^{-1} hr^{-1}, the lowest value to date for 4 of the sites (Spit Sands, Hamble, Fareham, & Langstone).

The largest decrease in CPUE from 2022 to 2024 was seen at Thorn Knoll (3.23 kg m^{-1} hr^{-1} to 0.00 kg m^{-1} hr^{-1}) and Fareham (3.16 kg m^{-1} hr^{-1} to 0.00 kg m^{-1} hr^{-1}).

None of the BMA CPUE trends documented through the Solent Oyster timeseries have been found to be statistically significant (Kruskal Wallis test, $p < 0.05$).

5. Conclusions

- As displayed in Table 1 and Figure 3, CPUE remains low across all the Solent Oyster beds sampled.
- Only the North Channel oyster bed (Northern Solent – BMA2) and the Northern Solent and Eastern Solent BMAs reached the respective CPUE threshold levels for consideration of management as set out in the Management Intensions Document (15.00 kg m^{-1} hr^{-1} and 5.00 kg m^{-1} hr^{-1} respectively).
- For individual shellfish beds, North Channel (Northern Solent – BMA2) had the highest average CPUE for oysters ≥70mm (17.55 kg m^{-1} hr^{-1})
- The Eastern Solent BMA had the highest average CPUE for the 2024 survey (5.63 kg m^{-1} hr^{-1}), which is consistent throughout the survey timeseries.

- The results of the Solent Oyster Survey provide data on the catch rate of bivalves (CPUE), the proportion of bivalves which are immature or below MCRS and the proportion of mature bivalves intended to promote recruitment (over MCRS).
- When analysing survey outcomes, it is important to consider other data available for consideration alongside CPUE values. In this case, the CPUE values for individual beds should be viewed alongside the count data for oysters over 70mm as although weight data is the most suitable for informing CPUE, a few larger, heavier oysters have the potential to increase the overall weight, thus increasing the average CPUE whilst the number of oysters harvested remains low. For the Northern Solent, the CPUE value above the threshold of 15.00 kg m^{-1} hr^{-1}, corresponds to 6 oysters over 3 tows. Of those 6 oysters, all were above 100mm, one above 150mm which will increase the weight relative to the number of oysters sampled.
- For the two BMAs over the threshold level of 5.00 kg m^{-1} hr^{-1}, average BMA CPUE values were influenced by high bed CPUE values in some of the shellfish beds. The Northern Solent (BMA 2) was influenced by higher bed values for Northern Channel (6 ≥70mm oysters over 3 tows) and Browndown (10 ≥70mm oysters over 2 tows) and the Eastern Solent by beds at Ryde Middle (11 ≥70mm oysters over 7 tows) and Sturbridge (2 ≥70mm oysters over 2 tows, one of which measured over 100mm). As for Northern Channel, the CPUE values may have been

affected by the weight of individual oysters and therefore it is important that CPUE values are viewed alongside the count and tow numbers for oysters over 70mm.

- The findings from the 2024 survey show no consistent improvement in average CPUE across the Solent. Whilst there are demonstrated increases in some areas, these are not consistent between years for all but three sites (looking at 2021-2024), suggesting a fluctuating pattern rather than a general increase across the Solent. There are also decreases, which, where observed showed the lowest values in 2024 compared to all previous survey years, and a consistency in certain areas of 0.00 kg m^{-1} hr^{-1}. Whilst one oyster bed and two BMAs are above defined CPUE threshold levels, the values for the BMAs are only slightly over the threshold of 5.00 kg $m^{-}1$ hr^{-1} (by 0.48 and 0.63 kg $m^{-}1$ hr^{-1}) and the site showing an above threshold level is in isolation from all other areas surveyed in being the only site above 15.00 kg m^{-1} hr^{-1}. In addition, in all cases the number of oysters providing weight data for CPUE calculations is very low. On the basis of consideration of CPUE and additional data underpinning the CPUE values, the data indicates that the native oyster population in the Solent continues to show a fluctuating pattern of stock abundance with the general trend being low CPUE and/or low oyster numbers, both over and under the MCRS of 70mm.
- There are ongoing restoration efforts for native oyster in the Solent with the species subject to research and active restoration work. The data produced through this survey and made available through this report will be able to be utilised by such projects to provide information on stocks and changes over time within the Solent.

References

Neal, K.J. 2004. *Anomia ephippium* Saddle oyster. In Tyler-Walters H. and Hiscock K. *Marine Life Information Network: Biology and Sensitivity Key Information Reviews*, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 05-08-2022]. Available from: https://www.marlin.ac.uk/species/detail/2053

SIFCA, 2021. Solent Dredge Permit Byelaw - Management intentions document. SIFCA, 2021. Solent Dredge Permit Byelaw - Management intentions document. https://secure.toolkitfiles.co.uk/clients/25364/sitedata/Redesign/Solent-Dredge-Fisheries/Management-Intentions-Document-SDPB.pdf

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EXECUTIVE SUMMARY

Poole Harbour Bivalve Survey Report 2024
Paper For Information

Report by IFCO Mullen

A. Purpose

To provide members with the survey report from the Poole Harbour Bivalve Survey 2024 and information on catch data for the fishery for the 2024/25 season from 25th May to 30th June.

B. Annex

1. The Southern IFCA Poole Harbour Bivalve Survey Report 2024

1.0 Introduction

- The Poole Harbour Bivalve Survey is carried out annually in the spring, prior to the opening of the dredge fishery under the Poole Harbour Dredge Permit byelaw. The survey collects data on the size (length) and catch per unit effort (CPUE) for the two most commonly harvested species, the Manila clam (*Ruditapes philippinarum*) and the common cockle (*Cerastoderma edule*).
- The aim is to repeat the methodology each year to build a time series of data which can be used, in combination with other data sources such as catch data from the fishery, to assess the sustainability of the Manila clam and common cockle fisheries in Poole Harbour and inform any reviews of management measures under the Poole Harbour Dredge Permit Byelaw (PHDPB).
- The Poole Harbour Clam & Cockle Fishery is certified under the Marine Stewardship Council (MSC), the certification having been in place since 2018 and recently renewed for another five-year period in 2023. Part of the requirements under the Principles of this certification is to demonstrate robust stocks and sustainable fishing practices. The data collected during this survey contributes to evidencing this for the Clam & Cockle Fishery.

2.0 Summary of Key Points

- The attached report (Annex 1) provides an overview of the dataset collected in the 2024 survey. The survey was carried out over the period of the 8th-11th April 2024.
- The report analyses length frequency data, Catch Per Unit Effort (CPUE) data and catch data of Manila clam and common cockle (as landings data provided by permit holders), as the two main commercially harvested species, between survey sites, corresponding catch reporting zones and years (2022-2024).
- Analysis of the survey data indicates that stocks of both species remain stable based on all parameters (CPUE, length frequency and catch rate) therefore, at this time the combined data sources indicate that management is appropriate for maintaining a sustainable stock of target species in the Poole Harbour dredge permit fishery.

<u>Catch Per Unit Effort & Catch Data Results</u>

- Higher CPUE outputs reflect environmental stimuli driving habitation for both species. Higher CPUE of Manila clam are seen in muddy and fine-grounded sedimental areas, whereas high CPUE of cockles are found in sandy and coarse sediments. The preferred locations for dredging within the fishery reflect those areas which show the higher CPUE outputs.
- Where statistical differences were observed between zones for Manila clam, this is likely related to the prevalence of preferred habitat type.
- The last three years' fluctuations in landings data and CPUE for Manila clam do not show any statistical variations, indicating that clam dredging for Manila within the Poole Harbour Dredge

Fishery is consistent and Manila stocks remain stable.

- Harvestable populations of common cockle show either no significant differences in CPUE and landings between years, or an increase in CPUE in the last two survey years. Although no statistical difference, there is a comparable increase in landing and survey CPUE in zone 3.
- Holes Bay displayed increased CPUE compared to other catch zones, this suggests that the permanent closure of this area to dredge fishing is affording some benefit to stock levels.
- The quantities of cockle landed each season are consistently lower than Manila clam landings. This is due to market preferences and economic value of each species where Manila clam is the favoured species.
- Peak landings of Manila clam were in July of 2022, which is consistent with previous year trends showing highest harvesting in mid-summer months before a steady decline in landings to the end of the season. For common cockle, there was a clear spike in landings in October 2023 compared to previous seasons. Although landings peaked in October 2023 at 10.8t, there were no significant differences in monthly catch between 2021-2023.

<u>Length data results</u>

- Length distribution of Manila clam within the most fished zones showed a move towards a smaller average size since 2022, however, there were no statistical differences between years. This is also similar when analyzing Zone 3 for common cockle, however, the size changes are not consistent across all locations, and for some sites varies between years. This suggests that this is a trend to monitor but does not indicate a significant change that requires further investigation.
- The sampling method and the manner in which these species grow are likely to influence the differences in patterns in average size between the Manila clam (more varied) and common cockle compared to their respective landing sizes seen this study. While the majority of the cockle population were above the MCRS for the species, the Manila clam sample populations were more varied in size, this may be due to growth allometry of this species which is more varied than that of the common cockle.

3.0 2024/25 Fishing Season

- Southern IFCA have received reports from permit holders in the PHDP fishery that there has been an observable decline in catches of Manila clam at the start of the 2024/25 season.
- Southern IFCA review data submitted by permit holders for the fishery on a monthly basis, initial analysis of this data against the concerns raised by fishers has returned the following results:
    - Landed weight of Manila clam (kg) has been converted to a CPUE value of kg/hour/fisher to remove influence of changes in hours fished or the number of active fishers.
    - For May 2024, the total CPUE was 0.7 kg/hour/fisher
        - This is a decrease compared to May 2023 of 39.1% (May 2023 = 1.15 kg/hour/fisher)
        - Compared to 2016-2019, the CPUE for May 2024 is between a 29.6% increase (0.54 kg/hour/fisher for 2017) and 48.9% increase (0.47 kg/hour/fisher for 2016).
        - Values showed consistency between 2016-2019 followed by an increase in 2020. CPUE has fluctuated between 2020 and 2024 with a decrease from 2020 to 2022 and then an increase to 2023 before a decrease in 2024.
        - Data shown in Figure 1.
    - For June 2024, the total CPUE was 0.45 kg/hour/fisher
        - This is a decrease compared to June 2023 of 31.8% (June 2023 = 0.66 kg/hour/fisher)
        - Compared to 2016-2019, the CPUE for June 2024 is between a 2% decrease (0.46 kg/hour/fisher for 2017) and a 12.5% increase (0.40 kg/hour/fisher).
        - Values showed consistency between 2016-2019 before a large increase in 2020, a steady decline in CPUE back towards pre-2020 levels has been seen from 2021 onwards.
        - Data shown in Figure 1.

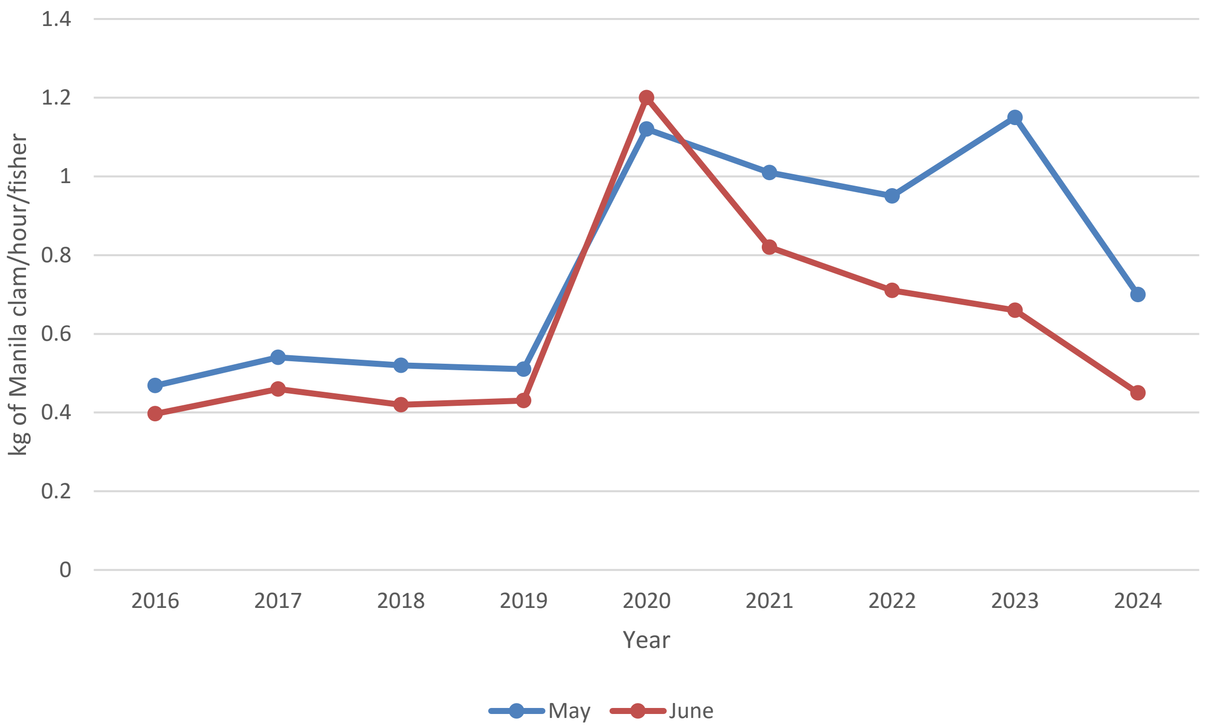

Figure 1: kg of Manila clam per hour per fisher for the months of May and June for 2016-2024 based on data supplied by permit holders in the PHDP fishery through monthly catch return submissions.

- Whilst the data reflects declines in CPUE of Manila clam landings for the start of the 2024 season compared to the previous 4 years, the CPUE values for 2024 remain above those for 2016-2019 for May and for 2016, 2018-2019 for June with the 2017 value being similar to the 2024 value (difference of 0.01 kg/fisher/hour).
- The reasons for any decline in fishers' landings for the start of the 2024 season are unknown at this time. Southern IFCA have engaged with key stakeholders and fishery experts regarding the PDHP fishery and there is a suggestion, although this cannot be confirmed, that a spring mortality may have taken place post the Southern IFCA stock survey (late April), potentially due to warmer winter temperatures affecting the energy expenditure of Manila clams in the Harbour.

4.0 Next Steps

- That Members note the survey report for 2024.
- The report will be published on the Authority's website.
- Southern IFCA will continue to monitor monthly catch data for the fishery through permit holder data submissions and officers will continue to engage with permit holders on the coast.

MARKED D_ANNEX 1

Southern IFCA Poole Harbour Bivalve Survey-2024

This report has been produced by Southern Inshore Fisheries and Conservation Authority.
Reported by IFCO Celie Mullen

A copy of the report is available on our website at www.southern-ifca.gov.uk or from Southern IFCA Office at:

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Tel: 01202721773, email: enquiries@southern-ifca.gov.uk

Table of Contents

1.0 Introduction

This paper outlines the 2024 Poole Harbour Bivalve Survey, which is undertaken annually to monitor commercially viable shellfish beds in Poole Harbour, UK. The survey began in 2015 and results are used as a baseline against which to monitor trends in stock levels and potential changes in the population of commercial bivalve species, to support Southern IFCA's management decisions and aid in the evaluation of the sustainability of the Poole Harbour Dredge Fishery.

The survey evaluates length frequency and Catch per Unit Effort (CPUE) data from 27 commercially fished shellfish beds in Poole Harbour (see Section 1.5) over 11 catch zones. The survey focuses on the primary commercially harvested species, the common cockle (*Cerastoderma edule)* and Manila clam (*Ruditapes philippinarum)* (length frequency and CPUE)*,* with length frequency information only collected for other bivalve species.

1.1 The fishery

Shellfish dredging in Poole Harbour originated using hand-ranking techniques to gather cockles. This was followed by the introduction of Manila clams in the 1980s, with the intent of establishing commercial aquaculture. The fishery transferred to the use of mechanical dredging as infrastructure advanced, which lead to the development of the pump-scoop dredge, which is currently seen in the modern-day fishery (*Figure 1)*. The Manila clam and common cockle are the primary species harvested however, American Hard-Shelled clams (*Mercenaria mercenaria*) and the native clam (*Ruditapes decussatus*) are also harvested in smaller quantities.

The Poole Harbour clam and cockle fishery was awarded dual certification under the Marine Stewardship Council's Sustainability Standard and the Seafish Responsible Fishing Scheme in 2018, the MSC Standard maintained through re-certification in 2023. The fishery runs from 25th May to 23rd December annually.

Figure 1. *An example of the pump-scoop dredge which is used within the modern-day Poole Harbour Dredge Fishery to fish for clam and cockle species.*

1.2 Pump-Scoop Dredge

The pump-scoop dredge was engineered to minimise ecological damage while maximising efficiency. Water jets are pressured towards the back of the dredge basket, directing sediment movement through the basket. Dredge type and construction are restricted under the permit conditions of the Poole Harbour Dredge Permit Byelaw. The horsepower of the dredge may not exceed 15 and the basket size may not exceed 460mm in width by 460mm in depth by 300mm high (excluding poles or attachments). Dredge bars must have no less than 18mm between them and cross pieces used to strengthen the dredge basked must have a minimum space of 40mm between them. Dredges must have a mandatory riddle (secondary sorting system) with bar spacing of 18mm for sorting shellfish. Figure 2 shows an example pump-scoop-dredge.

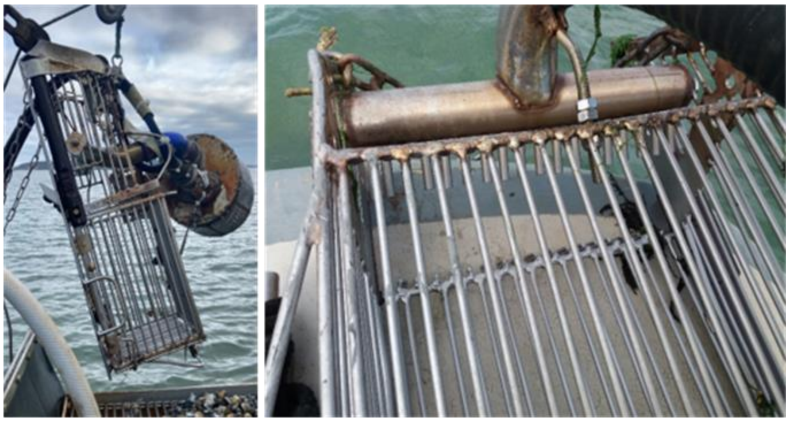

***Figure 2**. An example of the pump-scoop dredge used within the Poole Harbour Dredge Permit fishery.*

1.3 Manila clam *(Ruditapes philippinarum)*

The Manila clam (*Figure 3*) was introduced to Poole Harbour in 1988 for the purpose of aquaculture and became a self-sustaining population (Jensen *et al.,* 2004; Jensen *et al.,* 2005; Humphreys *et al.,* 2007). Manila clams inhabit muddy and fine sediments in the intertidal zone and shallows (Jensen *et al.,* 2005). They dwell in the top 40mm of the substratum, but can bury as deep as 100mm, and filter phytoplankton and sedimentary organic matter from the water (Lee, 1966; Dang *et al.,* 2009). Poole Harbour provides a relatively sheltered, nutrient rich, shallow water habitat with extensive intertidal mud flats, and temperatures up to 27°C in the summer. This provides optimum reproductive conditions for the species (Toba and Miyama, 1995; Jensen *et al.,* 2004; Jensen *et al.,* 2005; Chung *et al.,* 2005; Humphreys *et al.,* 2007).

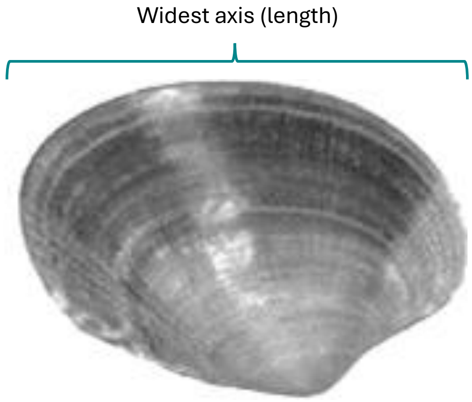

***Figure 3.** A diagram of the Manila clam. The widest point (length) was used to obtain length data within the Poole Bivalve Survey 2024.*

In Poole Harbour the Manila clam spawning season occurs from July to September (Grisley, 2003; Jensen *et al.,* 2005; Tumnoi, 2012). Water temperature between 8°C and 27°C provides suitable conditions for larval development (Chung *et al.,* 2005; Drummond *et al.* 2006; Moura *et al.,* 2018). Below this threshold Manila clams are thought to be sexually inactive. In Poole Harbour, Manila clam are capable of spawning more than once throughout the summer depending on environmental conditions with peak activity in September (Jensen *et al.,* 2004; Humphreys *et al.,* 2007). Similarly, in this area, juveniles grow up to 20 mm in their first 24 months (Jensen *et al.,* 2004). The rate of growth then reduces once individuals have reached sexual maturity.

1.4 Common cockle *(Cerastoderma edule)*

The common cockle (*Figure 4*) is commonly found to inhabit sandy bays and estuaries throughout the Southern IFCA District. Individuals burrow up to 50mm below the surface of sandy and fine gravel seabed from middle to lower intertidal zones. Cockles grow to up to 38mm for males, 20mm for females and are known for their distinct shell with 22-28 ribs (Tyler Walters, 2007). In the UK, spawning occurs between March and August and gametogenesis is initiated in the previous winter months (October to March) (Seed and Brown, 1977; Newell & Bayne, 1980).

Growth rate decreases with increasing tidal height, due to lack of immersion time and limited food availability and opportunity (Richardson *et al.,* 1980; Jensen, 1993; Montaudouin, 1996; Montaudouin & Bachelet, 1996). Similarly, in winter months, metabolic rate is slowed due to decreasing temperatures and cockles' inability to acclimatise. Cockles are filter feeders and individuals have the capability to filter half a litre of water per hour. The cockle fishery within Poole Harbour has commercial importance and populations densities of up to 10,000 per square metre have been recorded.

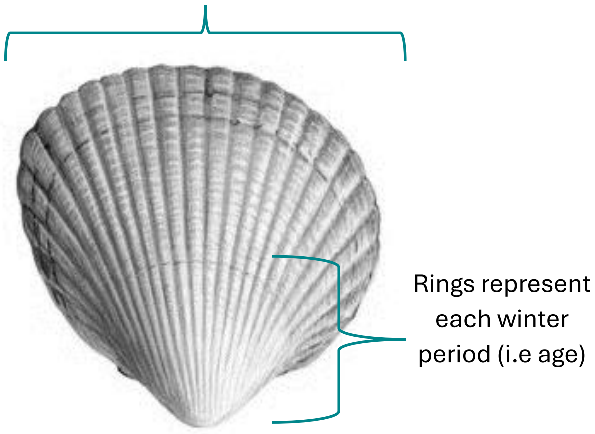

Figure 4*. A diagram of the common cockle. Dark rings represent the number of wintering months which is used to decipher age. The widest axis (length) is highlighted, which was used to obtain length frequency data within the Poole Bivalve Survey 2024.*

1.5 Southern IFCA Management

The fishery is managed under the Poole Harbour Dredge Permit Byelaw 2015[1]. The byelaw manages the use of the pump-scoop dredge through a permit system, with up to 45 permits issued each year, where the permit is required to use, store, retain on board and transport the pump-scoop dredge equipment within Poole Harbour. The byelaw regulates a number of elements of the fishing operation including:

- Gear types, construction and restriction
- Spatial and temporal restrictions
- Catch restrictions
- Reporting

As part of catch reporting requirements, fishers must submit a monthly catch return indicating, for each day fished, the hours fished, the quantities of species caught and the buyer(s). Fishers must also indicate which of 11 catch zones the catch has come from to allow for catch data to be related to the annual stock survey.

[1] Poole-Harbourr-Dredge-Permit-Byelaw.pdf

The fishery is located within the boundaries of the Poole Harbour Special Protection Area (SPA), Site of Special Scientific Interest (SSSI) and Ramsar Site, the Southern IFCA undertakes a Habitats Regulations Assessment to ensure that in permitting this fishery, Southern IFCA are operating in line with their legal duties under relevant legislations and there is no adverse effect on the SPA, SSSI or Ramsar Site from the fishery[23].

2.0 Methodology

The survey took place between 8th-11th April 2024 and used local fishing vessel, FV David's Dream. A pump-scoop dredge was used in line with normal fishing practice and management measures (see Section 1.5). The pump-scoop dredge is inherently size selective as fishers want to reduce the amount of post-capture measuring required to ensure compliance with MCRS. It is recognised therefore that the survey methodology will not fully sample the population below MCRS, although every effort is made to capture all shellfish from the dredge before it passes through the riddle. However, the sampling is carried out the same way each year therefore whilst the samples are not fully representative of the below MCRS part of the population there is the ability to make comparisons between years for under MCRS CPUE and length frequency due to the consistency in methodology.

The following methodology was followed:

1. Three dredge tows were conducted within a radius of 20m from a predetermined central point of each site. This central point is consistent across all survey years (*Table 1*).
2. After 2 minutes the dredge was brought inboard and bivalves were retained and labelled to the corresponding site and dredge tow (e.g. Site 1 Dredge 1).
3. Each species was identified, and the first 50 individuals were measured at their widest axis to the nearest millimetre (please refer to Figure 3 and Figure 4, which illustrates the measurement parameters).
4. Manila clams and common cockles were separated into above and below their relative Minimum Conservation Reference Size (MCRS) (35mm and 23.8mm respectively) and weighed.
5. Following measurement, all samples were returned to shellfish production areas within the same classification.

[2] Poole Harbour HR 2024-2025 season

__Table 1__ identifies the sites surveyed within the Poole Harbour Bivalve survey 2024 and their corresponding shellfish catch zones and reference points.

Site Number	Site Name	Zone	Latitude		Longitude	
1	Middle Ground	1	50	42.147	1	57.205
2	Whitley Lake	2	50	41.875	1	56.337
3	Aunt Betty	1	50	41.959	1	57.813
4	Blood Alley	3	50	40.900	1	58.023
5	Jerry's Point	3	50	40.498	1	57.717
6	Brands Bay South	4	50	40.040	1	58.569
7	Brands Bay West	4	50	40.362	1	58.837
8	Furzey Island	8	50	41.110	1	59.384
10	Newtons Bay	5	50	40.286	1	59.671
11	Ower Bay	6	50	40.617	2	00.282
11(2)	Wards	8	50	40.943	2	00.272
12	Round Island	8	50	41.027	2	01.053
13	Wych and Middlebere Lake	7	50	40.804	2	01.653
14	Long Island	8	50	41.457	2	00.803
15	Arne	9	50	41.914	2	01.425
15(2)	Inner Arne	9	50	42.006	2	01.621
16	Patchins Point	1	50	42.224	2	01.180
17	Giggers	11	50	41.575	2	03.996
18	Keysworth	11	50	42.175	2	03.894
18(2)	Inner Keysworth	11	50	42.215	2	04.181
19	Holton Mere	10	50	42.499	2	03.488
19(2)	Inner Holton Mere	10	50	42.629	2	03.965
20	Seagull	10	50	42.660	2	02.964
21	Rockley Spit	10	50	42.931	2	02.501
22	Hamworthy	1	50	42.494	2	00.437
23	Upton Lake	HB	50	43.546	2	00.267
24	Creekmore Lake	HB	50	43.610	1	59.738

3.0 Results

Results focus on the predominant commercial species within the harbour, Manila clam and common cockle. Other species found during the survey and harvested at a smaller scale include American Hard-Shelled clam *(Mercenaria mercenaria*), the Native *clam (Ruditapes decussatus*), the native oyster (*Ostrea edulis*), the Pacific oyster *(Magallana gigas*), the spiny cockle (*Acanthocardia aculeata)* and the blue mussel (*Mytilus edulis)*.

Length frequency data was analysed in reference to site, whereas Catch Per Unit Effort Data was applied to the 11 shellfish catch reporting zones under the Poole Harbour Dredge Permit Byelaw (Figure 5).

Length frequency data and Catch Per Unit Effort Data (CPUE) were examined using Excel and R Studio. CPUE was determined using the weight data while factoring the size of the dredge and length of tows. Units of CPUE are kilograms per metre of dredge per hour (kg/m/hr).

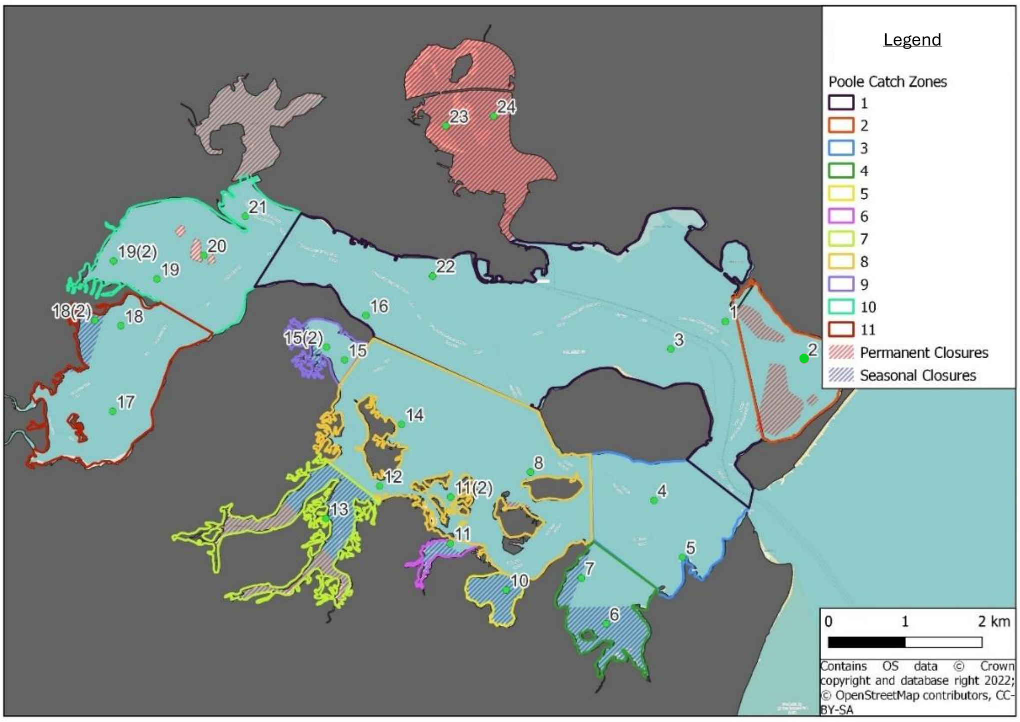

Figure 5. *A visual representation of the sites within the Poole Harbour Bivalve Survey 2024. Sites are located with 11 shellfish catch zones. Seasonal and permanent closures included within the Poole Harbour Dredge Permit Byelaw have also been included.*

3.1 Length Frequency Data

Statistical analysis of length data within the 2024 dataset and comparisons of length data within the last three years showed statistical differences ($p<0.01$ for both Manila clam and cockle), however this was expected due to the range of sizes observed across the 81 dredges within the 27 sites of the harbour in each survey.

3.1.1 Manila Clam

- The average size of Manila clam in 2024 varied from 44mm at site 4 (n=29) to 33mm at site 19(2) (n= 150) (*Figure 6)*.
- All sites had an average length above the MCRS (35mm), except sites 18(2) and 19(2).

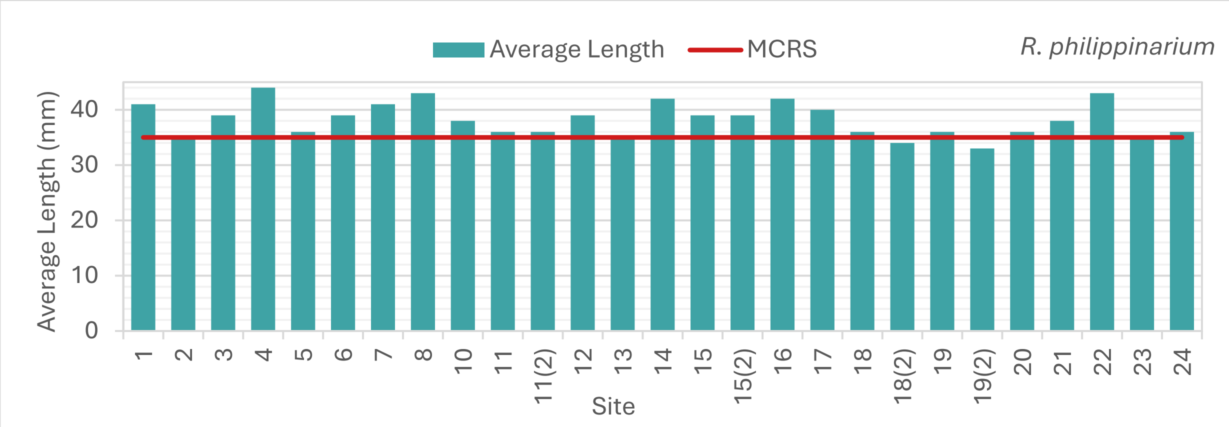

***Figure 6**. The average length of Manila clam in each of the surveyed sites in the Poole Harbour Dredge Bivalve Survey 2024. The corresponding Minimum Conservation Reference Size (MCRS) is represented as a red line to provide comparison (35mm).*

- Figure 7 shows the length distribution of the Manila clam population survey in Poole Harbour in 2024 compared to 2023 and 2022. The average size of Manila clam has stayed consistently above MCRS (35mm and represented by a dashed red line) for the last 3 years of surveys at 37.2mm (2024), 38.15mm (2023) and 36.55mm (2022).

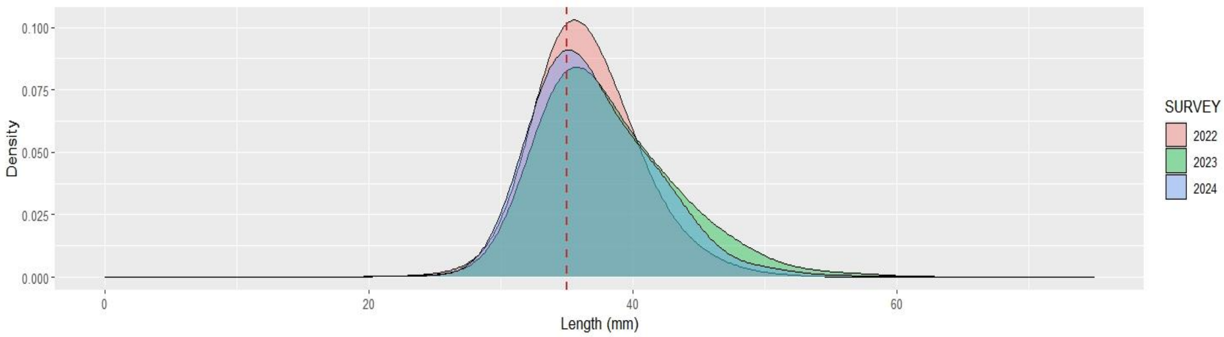

***Figure 7.** The length distribution of Manila clam in 2024 (blue) compared to the 2023 dataset (green) and 2022 dataset (red). The corresponding Minimum Conservation References Size (MCRS) has been included (35mm), represented by a red dashed line.*

3.1.2 Common cockle

- For 2024, the average size of cockle varied from 36mm at site 22 (n=47) to 25mm at site 19(2) (n=42) (*Figure 8*).
- All sites had an average length above the MCRS length (23.8mm).
- There was no common cockle obtained from Site 18(2) during the 2024 survey.

***Figure 8**. The average length of common cockle in each of the surveyed sites in the Poole Harbour Dredge Bivalve Survey 2024. The corresponding Minimum Conservation Reference Size (MCRS) is represented as a red line to provide comparison (23.8mm)*

- Figure 9 shows the length distribution of common cockle within 2024 dataset in comparison to 2022 and 2023. The average size of common cockle has stayed consistently above MCRS (23.8mm and represented by a red dashed line) for the last three surveys at 29.8mm (2024), 29.3mm (2023) and 29.0mm (2022).

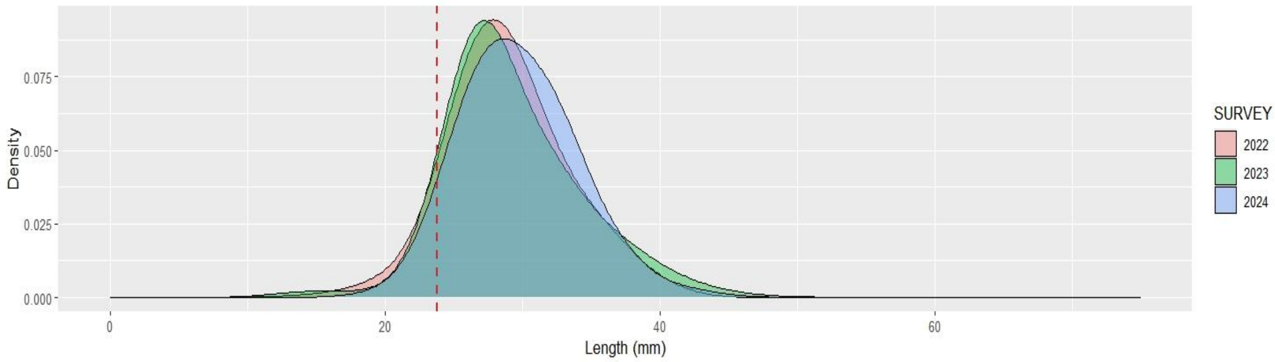

***Figure 9.** The length distribution of the common cockle sample population in 2024 (blue) compared to the 2023 dataset (green) and 2022 dataset (red). The corresponding Minimum Conservation References Size (MCRS) has been included (23.8mm), represented by a red dashed line.*

3.2 Catch Per Unit Effort (CPUE)

The 2024 dataset has been analysed for any statistical differences between sites, while also to compare to data from the previous two survey years, 2022 and 2023. Statistical analyses were performed using a non-parametric Kruskal-Wallis test with subsequent Dunn's test.

3.2.1 Manila Clam

- Catch zones 7, 6 and Holes Bay showed the highest average total Catch Per Unit Effort in the 2024 survey (185kg/m/hr, 183kg/m/hr and 213kg/m/hr, respectively).
- Holes Bay and zone 6 showed the highest average CPUE of above MCRS Manila clam (164kg/m/hr and 138kg/m/hr). All zones showed a greater CPUE of above MCRS Manila clam in comparison to

below MCRS CPUE, with the exception of Zone 7, 86.9kg/m/hr and 97.65kg/m/hr, respectively which was also the highest value for CPUE below MCRS across all catch zones (*Figure 10*).

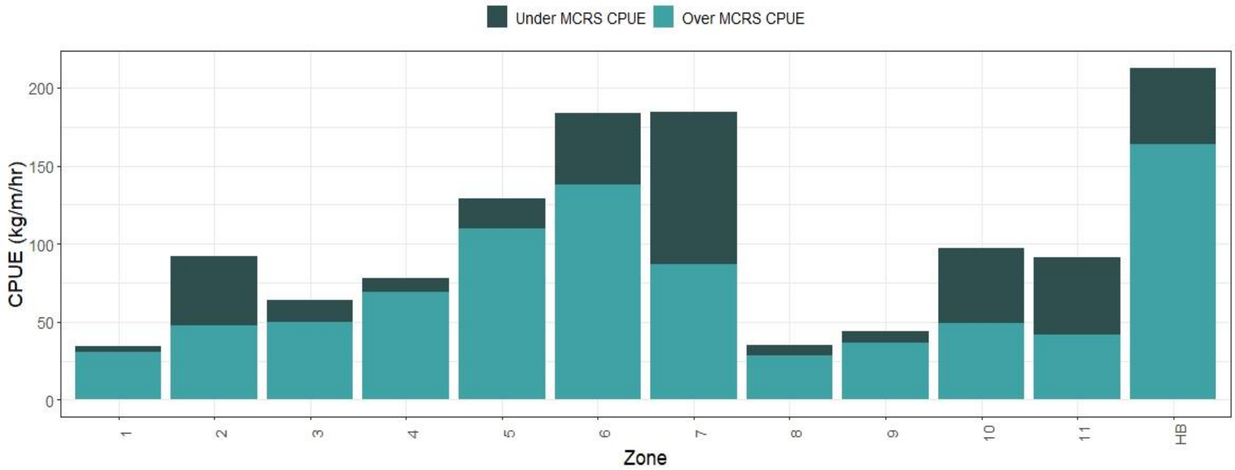

Figure 10. *The average Catch Per Unit Effort for Manila clam in each zone surveyed within the Poole Harbour Bivalve Survey 2024. Bars represented average total CPUE which is also divided into above and below MCRS CPUE (light and dark blue representatively).*

- Statistical analysis showed no significant differences between catch zones for total CPUE, above MCRS CPUE and below MCRS CPUE within the 2024 dataset ($p>0.05$).
- Although there was some variation across years, statistical comparisons between the last three survey years for each zone (2022- 2024) showed no significant difference for total CPUE between years ($p>0.05$) (*Figure 11*).
- CPUE above MCRS also showed no significant difference between years ($p>0.05$). This suggests that over the last 3 surveys, the Manila clam CPUE has remained stable.
- Analysis of CPUE in Zone 1 showed the 2024 dataset to have greater below MCRS CPUE when compared to both 2022 and 2023 (both p values were $p<0.05$). Although, all other comparisons of CPUE under MCRS showed no significant differences between years ($p>0.05$).

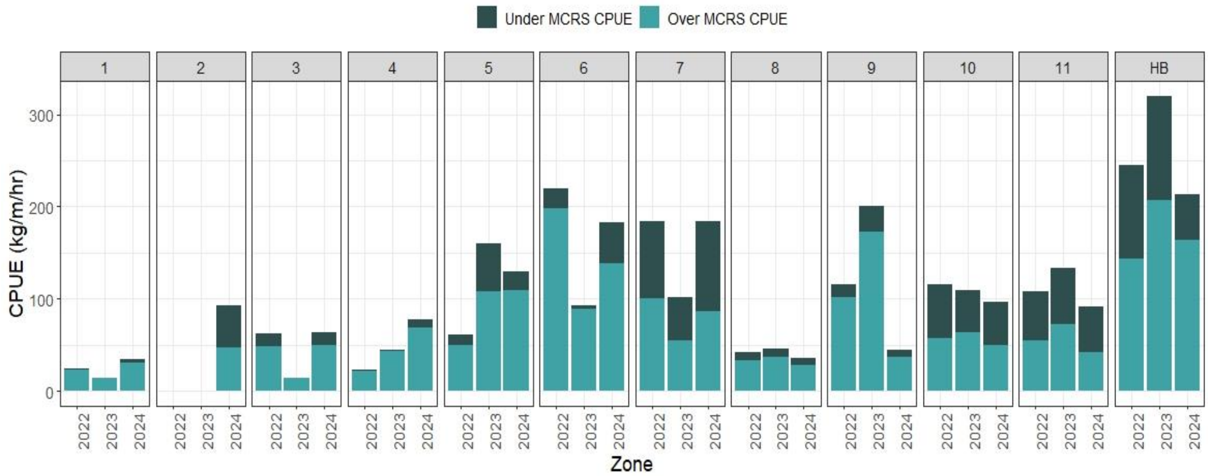

Figure 11. *Average Catch per Unit Effort (CPUE) of Manila clam, expressed as kg of shellfish per metre of dredge per hour. Dark blue bars represent CPUE under MCRS for Manila clam (35mm), and light blue bars represent the CPUE above MCRS. Data has been grouped into the catch zones 1-11 and Holes Bay (HB) and shows data for the three most recent years of the survey (2022-24).*

3.2.2 Common cockle

- Within the 2024 dataset, catch zone 3 showed the highest average total CPUE, followed by Zone 8 and Zone 4 (346kg/m/hr, 48kg/m/hr and 48kg/m/hr, respectively). Zone 3 also showed the highest average CPUE of above MCRS cockle (341kg/m/hr).
- All zones had a greater average CPUE of above MCRS compared to under MCRS *(Figure 12)*.

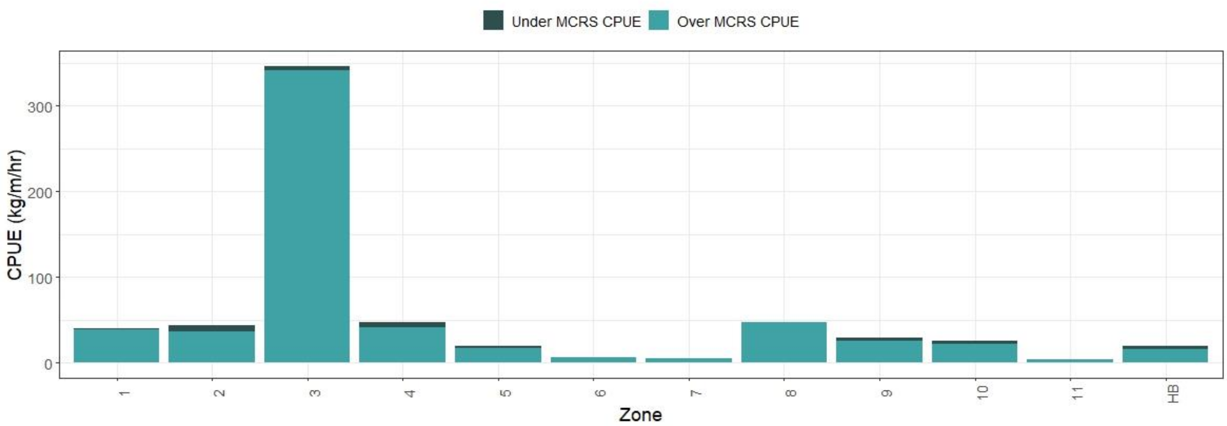

Figure 12. *The average Catch Per Unit Effort for common cockle in each zone surveyed within the Poole Harbour Bivalve Survey 2024. Bars represented average total CPUE which is also divided into above and below MCRS CPUE (light and dark blue representatively).*

- There was no significant difference between total CPUE or CPUE below MCRS between sites for 2024 (p>0.05).
- Statistical analysis showed Zone 3 to have a significantly higher average CPUE of above MCRS when compared with zones 6,7,10,11 and HB (all p values <0.05). Zone 11 had significantly lower CPUE above MCRS than zones 1,3,4 and 8 (all p values <0.05).
- Statistical comparison over the last 3 surveys (2022-2024) found no significant differences between total CPUE or above MCRS cockle CPUE between years (*Figure 13)*.

- Holes Bay showed a significantly higher CPUE under MCRS in 2024 than in 2023 ($p<0.05$) and there was a significantly lower CPUE under MCRS for cockles in zone 11 in the 2024 survey compared to 2023 ($p<0.05$).

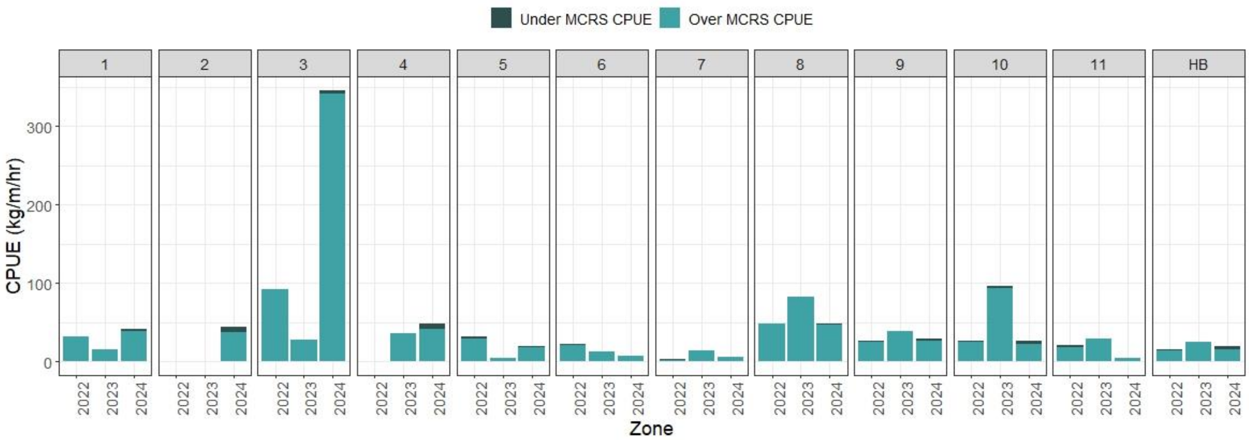

Figure 13. *Average Catch per Unit Effort (CPUE) of common cockle, expressed as kg of shellfish per metre of dredge per hour. Dark blue bars represent CPUE under MCRS for common cockle (23.8mmmm), and light blue bars represent the CPUE above MCRS. Data has been grouped into the catch zones 1-11 and Holes Bay (HB) and shows data for the three most recent years of the survey (2022-24).*

3.3 Seasonal Catch Data

Quantities of Manila clam and common cockle caught each month by the fishery for the 2021, 2022 and 2023 fishing seasons are shown in Figure 14 and Figure 15, respectively. The fishing season runs from 25th May to 23rd December each year, therefore it should be noted than catch weight (kg) for May represents only a 5-day fishing period and December a 23-day fishing period.

3.3.1 Manila clam

- Total landings of Manila clam within the 2021 season was 493.1 tonnes. There was a slight decline in the 2022 season to 337.3 tonnes, which has shown to increased again in the most recent 2023 season, to 474.7 tonnes.
- Statistical analysis revealed no significant differences in the total landings of Manila clam between the 2021, 2022 and 2023 seasons ($p>0.05$).
- Seasonal trends followed previous years', which showed an increase in landings in the mid-summer months followed by a slow decline towards the end of the fishing season in December.
- In the 2023 season, Manila clam landings peaked in July, at 95.9 tonnes.
- Statistical testing revealed no significant differences in the monthly landings of Manila clam between 2021 and 2023 (all p values>0.05).

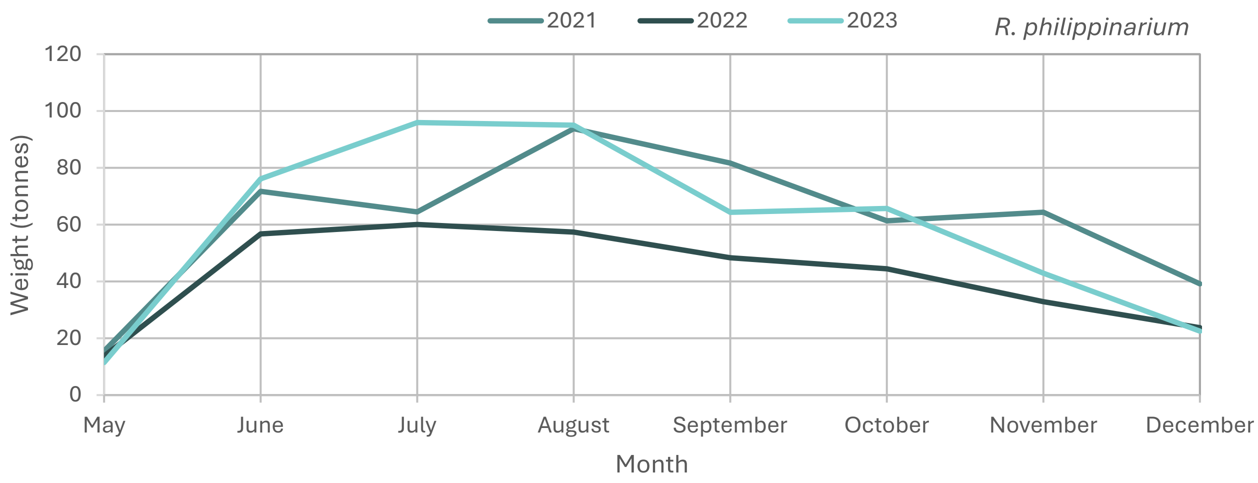

Figure 14. *The monthly total catch (tonnes) of Manila clam submitted in catch returns from permit holders in the Poole Harbour Dredge Fishery for the 2021, 2022 and 2023 seasons.*

3.3.2 Common cockle

- The total weight of common cockle landed in 2024 was greater than the previous two seasons; 44.6t in 2023, compared to 34.2t in 2022 and 34.7t in 2021.
- However, statistical analysis showed no significant differences in total landings of cockles between the 2021, 2022 and 2023 seasons ($p>0.05$).
- Seasonal trends followed previous years' trends of increased landings in the mid-summer months, however there is a clear spike in landings in October of 2023 compared to previous seasons. Although, cockle landings peaked in October 2023 at 10.8t, there was no significant difference in monthly catch between 2021-2023 (all p values >0.05).

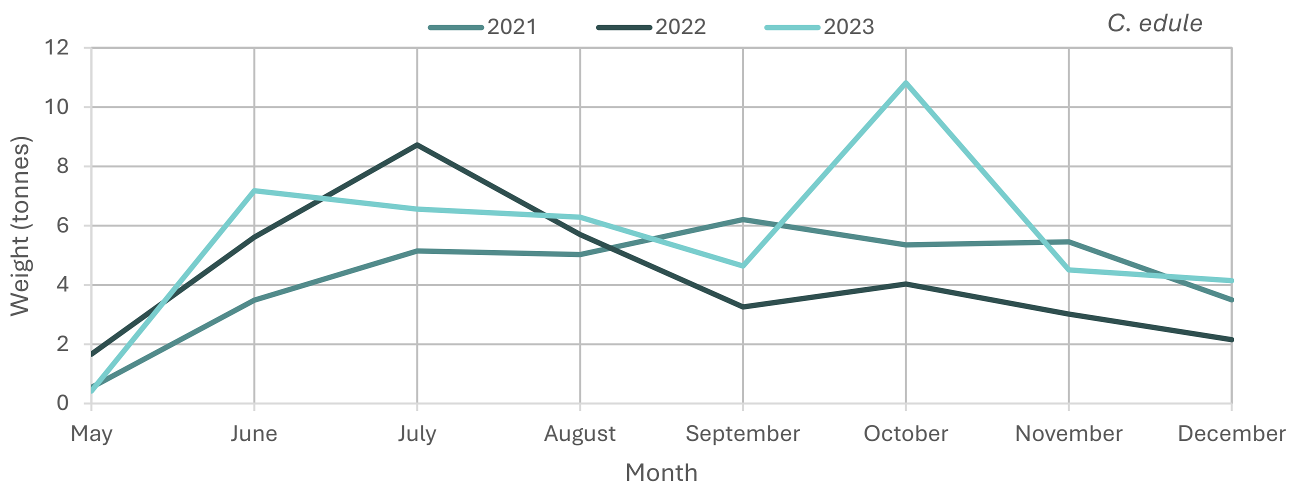

Figure 15. *The monthly total catch (tonnes) of common cockle submitted in catch returns from permit holders in the Poole Harbour Dredge Fishery for the 2021, 2022 and 2023 seasons.*

3.4 Zonal Catch Data

Since 2019, fishers have been required to report which fishing zones have been fished each day. This provides zonal application to catch data that can then be related to the catch zone analysis of the survey CPUE data where required. Note that there is no catch data for the Holes Bay as this is a prohibited area year-round for the dredge fishery.

3.4.1 Manila clam

- Zones 8,10 and 11 have consistently been favourable fishing grounds for Manila clam over the last three seasons (*Figure 16*).
- After a decline in quantities in these zones in the 2022 season, landings in 2023 increased for zones 8, 10 and 11 (total landings for 2023 at 182.5t, 162.8t and 46.4t, respectively).
- Statistical analysis showed significant differences in landings data between 2021-2023 in zones 1 and 8 ($p>0.05$). A Dunns test revealed quantity landed in zone 8 was significantly lower in 2022 than in 2021, however there was a significant increase between 2022 and 2023 ($p<0.05$). There was also a significant increase in quantity landed in zone 1 between 2022 and 2023 ($p<0.01$).

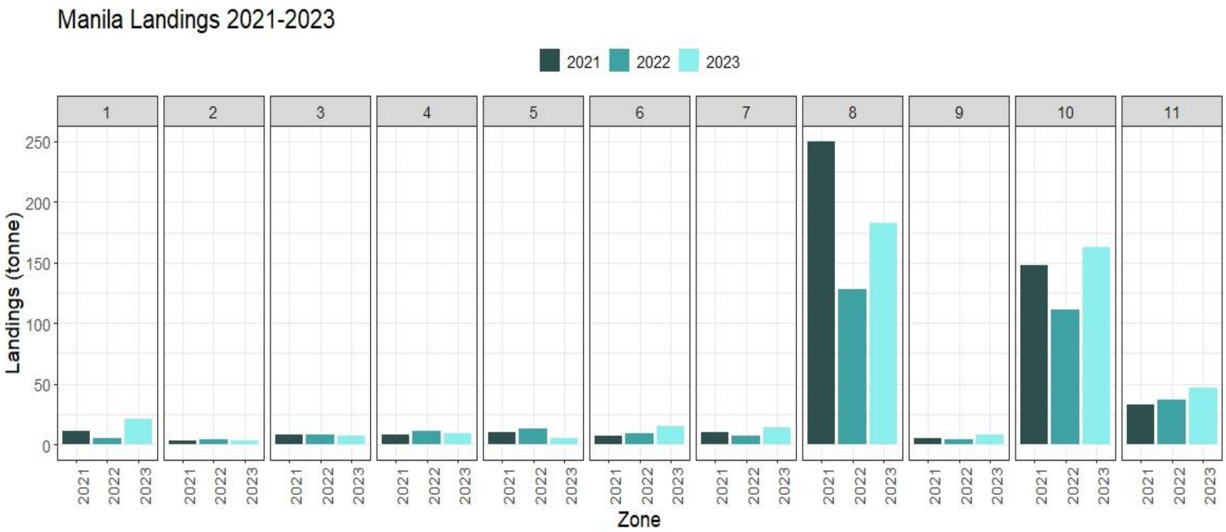

Figure 16. *Landings of Manila clam between 2021-2023. Information was gathered by submitted catch returned from permit holders in the Poole Harbour Dredge Fishery. Zonal distribution of catch has been categorised by year.*

3.4.2 Common cockle

- Zones 3, 4 and 8 were the favourable fishing grounds for common cockle within the 2023 fishing season (17.7 t, 4t and 13.5t, respectively) *(Figure 17)*.
- Landings in zone 3 increased in 2023 compared to previous years, overtaking zone 8 as the favourable catch zone, however statistical analysis showed no significant differences in landings across the 2021-2023 fishing seasons ($p>0.05$).

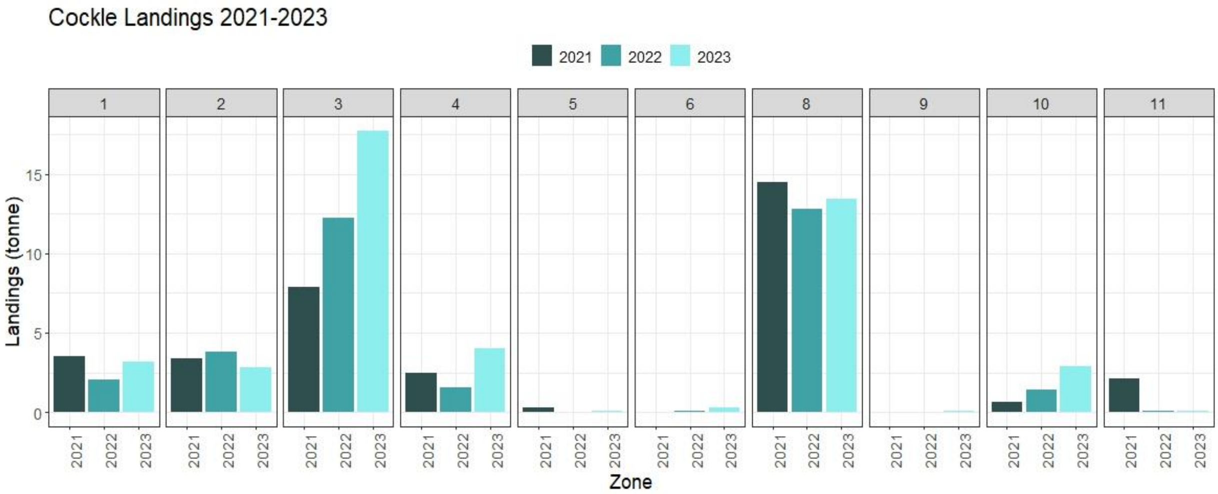

__Figure 17__. Landings of common cockle from the Poole Harbour Dredge fishery between the years 2021-2023. Information was gathered by submitted catch returns from permit holders in the Poole Harbour Dredge Fishery. Zonal distribution of catch has been categorised by year.

4.0 Discussion

- Quantifying CPUE from survey results and quantifying landings data provided by fishers allows the results to be analysed against level of fishing. Applying this to the 11 catch zones, introduced since 2019, allows identification of any zonal changes which could be used to inform management.
- Higher CPUE outputs reflect environmental stimuli driving habitation for both species. Higher CPUE of Manila clam are seen in muddy and fine-grounded sediment areas of Inner Keysworth, Wych and Middlebere Lake and Holton Mere, whereas high CPUE of cockles are found in sandy and coarse sediments displayed in sites such as Blood Alley, Jerry's Point and Whitley Lake. The preferred locations for dredging within the fishery reflect those areas which show the higher CPUE outputs.
- The quantities of cockle landed each season are consistently lower than Manila clam landings. This is due to market preferences and economic value of each species where Manila clam is the favoured species.
- Sites 23 and 24 in Holes Bay display high CPUE of Manila clams. The combination of a permanent fishing closure within Holes Bay since 2015, alongside preferred conditions for Manila clam growth, may be causing the results seen.
- The last three years' landings data and CPUE for Manila do not show any statistical variations, indicating that clam dredging for Manila within the Poole Harbour Dredge Fishery is consistent and Manila stocks remain stable. It has been observed that the site with the highest landings also shows some of the lowest CPUE levels (Zone 8). However, it is important to note that the survey is undertaken in April, only three months post the season closing and following cold months where growth of individuals is limited. The lack of significant difference between years suggests that, at present, the fishery is able to support similar (although fluctuating) levels of fishing each year. Southern IFCA monitor trends in the data to

determine any changes in stock levels seen between years at a catch zone level, which can help inform the management of the fishery to ensure continued sustainable practice.

- Figure 18 A, B and C shows that the length distribution of Manila clam within the most fished zones (8, 10 and 11) has also declined slightly since 2022, towards a smaller average size, however there is no significant difference between length distribution across years (p>0.05) suggesting that this a trend to monitor but does not indicate a significant change which requires further investigation. At this point, it is not possible to link the trend observed to fishing pressure, but fishing pressure is a component that can still be tracked through the yearly surveys. The shift in size is not consistent across all locations, and for some sites, it varies more between years.

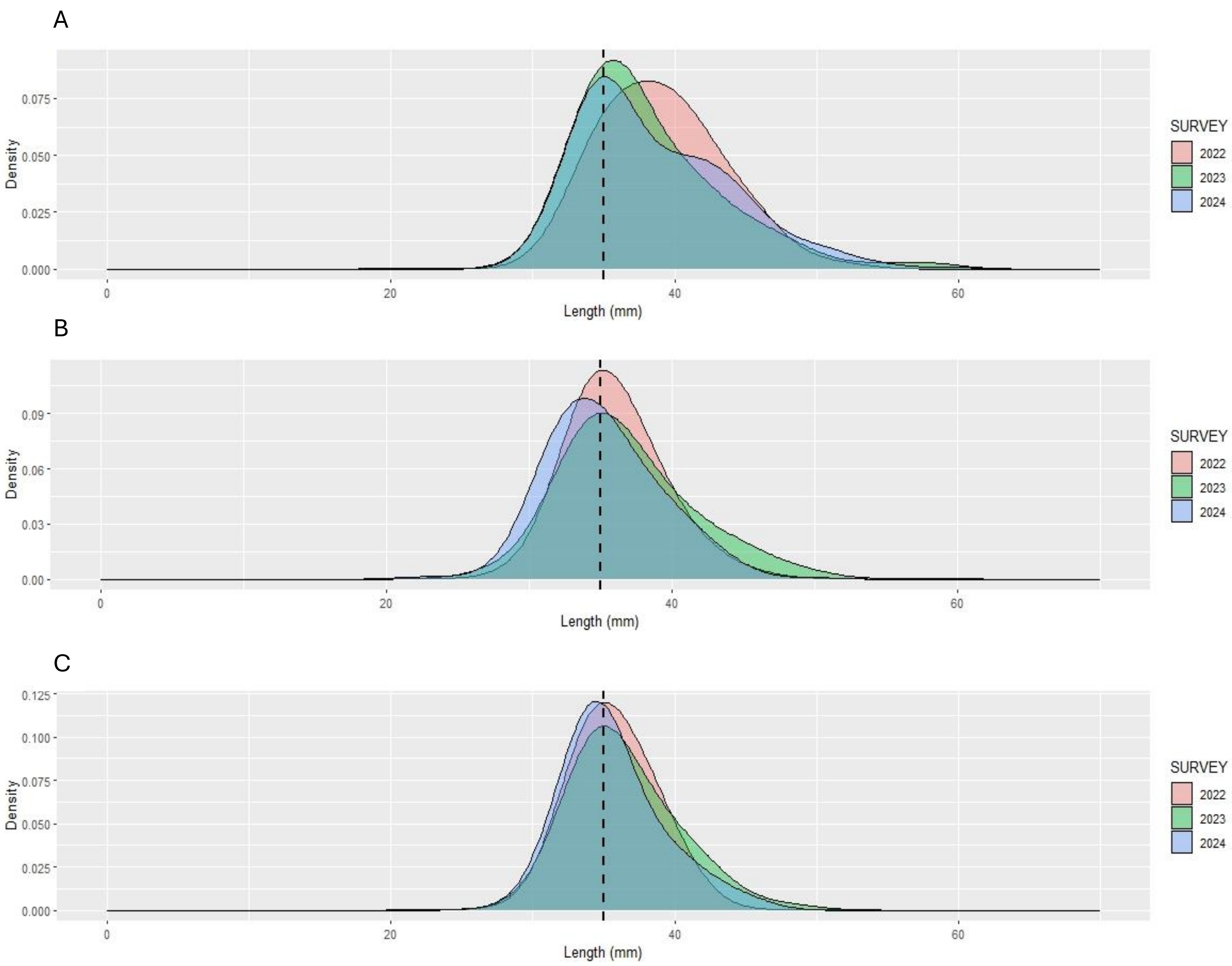

Figure 18 A, B and C*. The length distribution of Manila clam at zone 8 (A), zone 10 (B) and zone 11(C) over the last three years. 2022 is represented in red, 2023 in green and the 2024 dataset in blue.*

- Statistical analysis of cockle landing data showed no significant changes in landings over the last three fishing seasons, meanwhile increase in landings of 10 tonnes during the 2023 season suggests the state of cockle population remains stable. Comparably, landings from Zone 3 have gradually increased over the last 3 years, making it the most popular fishing ground of the 2023 fishing season. Although a zonal analysis of the 2023 dataset reveals a substantial variation in zone 3 when compared to other zones, a comparison of landings or CPUE over the previous three years does not reveal any significant variances. Both CPUE and landings in other productive fishing areas continue to be consistent.

- While the CPUE and landings within zone 3 has increased, the length of cockles examined in the 2024 survey showed a shift towards a smaller average size since 2022. Figure 19 A, B and C shows the length distribution of common cockle collected in the most popular fishing grounds of the 2023 season, compared to the last 2 years. The shift in size is not consistent between all sites and for some sites is more varied across years, therefore at this stage it is not possible to attribute the pattern seen to fishing pressure but is a factor that can continue to be monitored through the annual surveys.

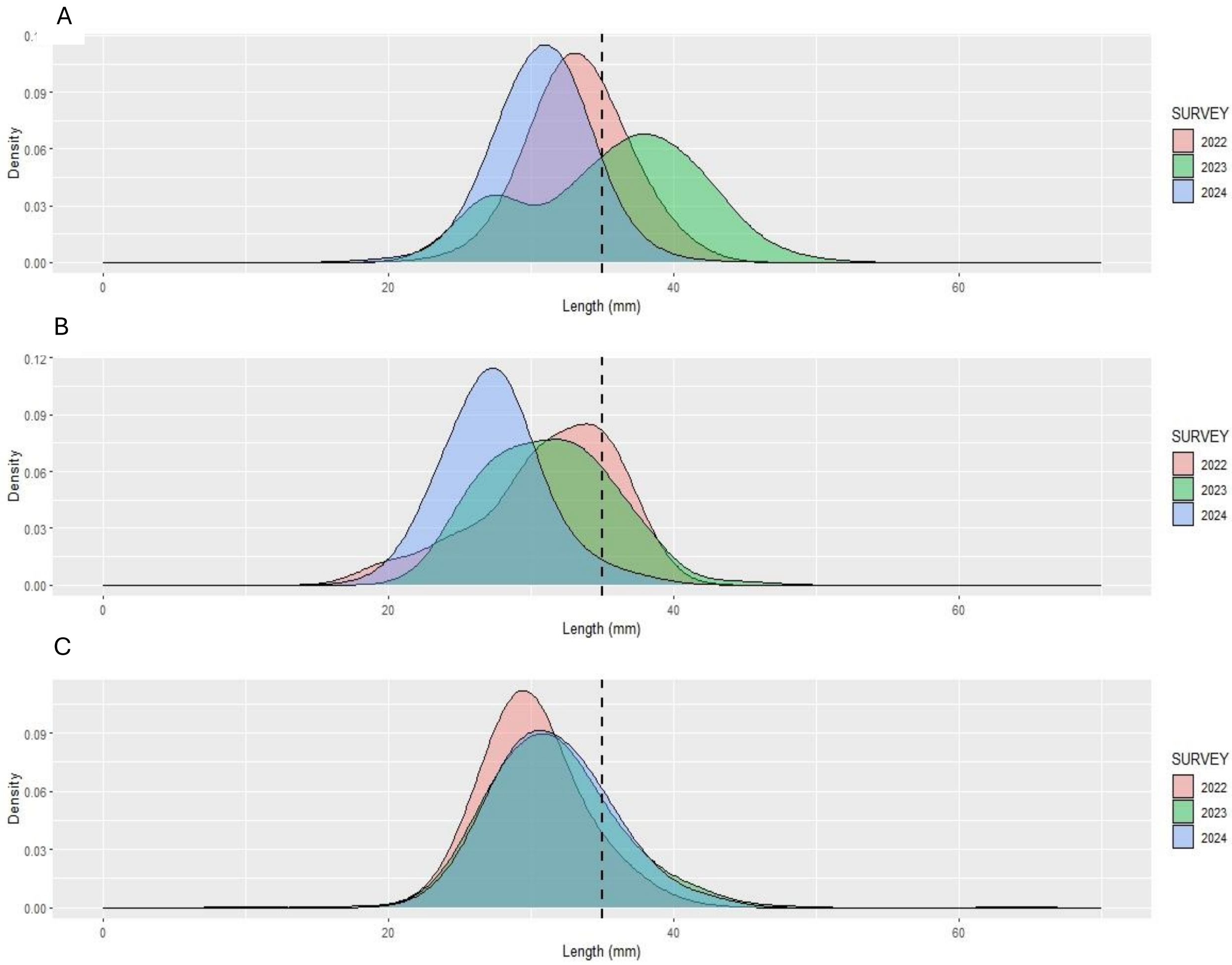

Figure 18 A, B and C. *The length distribution of common cockle in Zone 3 (A), zone 4 (B) and Zone 8 (C) over the last three survey years, 2022 (red), 2023 (green) and 2024 (blue).*

- The discrepancies in average size patterns between the Manila clam and common cockle compared to their respective landing sizes seen in this study are likely to be influenced by the sampling strategy and growth habits of both species.
- The size of the Manila clam sample populations varied more than the cockle population, which was mostly above the MCRS for the species. Previous studies and zonal observations have showed that Manila clam grow differently depending on the region it inhabits within the Harbour; some individuals are seen to grow along the widest axis and remain thin, whereas other subpopulations grow in depth but remain narrow in length. Therefore, thicker Manila clams will be retained by the dredge regardless of if the length is above or below the MCRS. In contradiction, cockles are seen to grow more equally throughout their structure, meaning less undersized individuals are unintentionally caught in the dredge. This, alongside potential impacts from the differences in fishing pressures between species may

therefore affect the species' relative size distributions. Therefore, a higher proportion of undersize Manila clams can be seen in the CPUE outputs.

5. Conclusion

- The 2024 Poole Harbour Bivalve Survey has provided data which enables an assessment to be made of the stocks of the main commercially harvested species, Manila clam and common cockle, and for data to be compared to previous survey years.
- The results indicate that the harvestable populations of both species remain stable with CPUE showing either no significant differences between years or, for common cockle, an increase in CPUE in the last two survey years.
- Catch levels also remain consistent with no significant differences between years and no specific effects of catch levels can be discerned in the survey results.
- Length frequency also remains stable with the majority of sites showing an average size at or above the species MCRS. The exceptions to this are likely explained in the majority by environmental variables and growth allometry, although there may be an influence of fishing activity in the areas with the highest effort during the season. However, this cannot be quantified and the variation in results suggest this would on be the main influencing factor at this stage.
- The populations of Manila clam and common cockle in Poole Harbour appear to be robust to the current level of fishing pressure with harvesting remaining sustainable in respect to stock levels.
- The survey will continue to be undertaken annually to extend the timeseries dataset which will facilitate being able to work towards identifying potential empirical reference points for stocks of Manila clam and common cockle, to further develop the work on this fishery in terms of monitoring stock levels and fishing effort to ensure sustainable practice.

6. References

Chung, E.Y., Chung, J.S., and Lee, K.Y., 2013. Gametogenic cycle, the spawning season, first sexual maturity, and the biological minimum size in male Ruditapes philippinarum (Bivalvia:Veneridae) in Western Korea. Journal of Life Sciences, 7(6): 613-622

Chung, E.Y., Hur, Y.B., Shin, M.S., and Kim, Y.M., 2005. Reproductive biology of the female Manila clam, Ruditapes philippinarum (Bivalvia: Veneridae) on the West Coast of Korea. Korean Journal of Malacology, 21(1): 1-11

Dang, C., Sauriau, P.G., Savoye, N., Caill-Milly, N., Martinez, P., Millaret, C., Haure, J. and De Montaudouin, X., 2009. Determination of diet in Manila clams by spatial analysis of stable isotopes. Marine Ecology-Progress Series, 387:167- 177

Humphreys, J., Richard, W., Caldow, G., McGrorty, S., West, A.D., and Jensen, A.C., 2007. Population dynamics of naturalized Manila clams Ruditapes philippinarum in British coastal waters. Marine Biology 151, 2255–2270

Jensen, A., Humphreys, J., Caldow, R., and Cesar, C., 2005. The Manila clam in Poole Harbour. In: Humphreys J, May V (eds) The ecology of Poole Harbour. Elsevier, Amsterdam, pp 163–173

Jensen, A.C., Humphreys, J., Caldow, R.W.G., Grisley, C., and Dyrynda, P.E.J., 2004. Naturalization of the Manila clam (Tapes philippinarum), an alien species, and establishment of a clam fishery within Poole Harbour, Dorset. Journal of the Marine Biological Association of the United Kingdom 84, 1069–1073

Jensen, K.T., 1993. Density dependant growth in cockles (Cerastoderma edule): evidence from interannual comparisons. Journal of the Marine Biological Association of the United Kingdom, 73, 333-342.

Lee, S.Y., 1996. Distribution pattern and interaction of two infaunal bivalves, Tapes philippinarum (Adams and Reeve) and Anomalocardia squamosa (Linnaeus) (Bivalvia: Veneridae). J Exp Mar Biol Ecol 201:253–273

Montaudouin de X. & Bachelet, G., 1996. Experimental evidence of complex interactions between biotic and abiotic factors in the dynamics of an intertidal population of the bivalve Cerastoderma edule. Oceanologica Acta, 19, 449-463.

Montaudouin de X., 1996. Factors involved in growth plasticity of cockles Cerastoderma edule (L.), identified by field survey and transplant experiments. Journal of Sea Research, 36, 251-265.

Newell, R.I.E. & Bayne, B.L, 1980. Seasonal changes in the physiology, reproductive condition and carbohydrate content of the cockle Cardium (=Cerastoderma) edule (Bivalvia: Cardidae). Marine Biology, 56, 11-19.

Richardson, C.A., Crisp, D.J., Runham, N.W. & Gruffydd, Ll. D., 1980. The use of tidal growth bands in the shell of Cerastoderma edule to measure seasonal growth rates under cool temperate and sub-arctic conditions. Journal of the Marine Biological Association of the United Kingdom, 60, 977-989.

Tyler-Walters, H., 2007. Cerastoderma edule Common cockle. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 23-07-2024]. Available from: https://www.marlin.ac.uk/species/detail/1384.

EXECUTIVE SUMMARY

Marked E

Fisheries Management Plans Updates
Paper For Information

Report by PO Wright

A. Purpose

For Members to receive updates on the development of Fisheries Management Plans (FMPs)

1.0 Introduction

- FMPs, developed under the Joint Fisheries Statement (JFS) aim to carry out the objectives of the Fisheries Act 2020 by ensuring the continued provision of a shared natural resource for future generations, through the management of fish stocks, geographic area and fishing methods.
- Each FMP is developed by a delivery partner which, to date, includes Defra, the MMO, Seafish, the AIFCA and industry bodies.
- The development process includes collaborative engagement between delivery partners and stakeholders and each FMP will be monitored, reviewed and adapted every 6 years.

2.0 Summary of Key Points

- During the previous quarter the announcement of the General Election and resulting period of heightened sensitivity resulted in the majority of FMP work being paused at a national level. This has resulted in fewer updates/outputs in relation to FMP work this quarter.

- **Tranche 1 and Tranche 2 FMPs**
  - DCO Birchenough and the CEO attended a series of online meetings between IFCAs and MMO to further discussions on the implementation of published FMPs, with each IFCA giving a presentation for each relevant FMP on current management and research. Southern IFCA attended 4 out of the 5 meetings and shared a presentation with the MMO & other IFCAs for the NQS FMP meeting.
  - Seafish held an IFCA Workshop: English Whelk Permit Proposal to discuss an initial management proposal, identified in the FMP as a short-term deliverable, to develop a whelk-specific permit / entitlement for English waters. This was attended by DCO Birchenough and PO Wright. There are no reportable outcomes of this workshop at this time.
  - A meeting of the Whelk Management Group Science Group was held to understand research which is planned to be undertaken as a result of the evidence gaps identified through the Whelk FMP. This was attended by PDCO Dell, DCO Birchenough and PO Wright.
  - Southern IFCA received a draft paper on evidence gathered in relation to whelk MCRS for comment.

- **Tranche 4 FMPs**
  - An initial scoping meeting was held by the MMO for the Celtic Sea and Western Channel Demersal FMP on Friday 9th May. This was attended by DCO Birchenough and PO Wright.
  - A data request was made on Tuesday 30th July by MRAG who are currently working with RPA on behalf of the MMO to gather evidence to inform the Wrasses Complex and Bream FMPs.

3.0 Next Steps

- That Members note the report.

Southern IFCA Inshore Fisheries and Conservation Authority

EXECUTIVE SUMMARY

Marked F

Marine Licencing Update
Paper For Information

Report by IFCO H. Churchouse

A. Purpose

To provide a quarterly update on Southern IFCA's input into the marine licencing process between May 2024 to July 2024

B. Annex

1. Southern IFCA response to consultation on MLA/2024/00169: IFA 2 Cable Protection

1.0 Introduction

- Marine licencing is one of the principal responsibilities of the Marine Management Organisation (MMO) to facilitate the sustainable use of the UK marine environment whilst minimising negative environmental effects and avoiding interference with navigation.
- Southern IFCA is a consultee on Marine Licence Applications (MLAs). For MLAs relevant to the Southern IFCA District, the IFCA is given 21 days to review the application and determine if a response is required to aid the MMO in it's decision making and to further inform the applicant of any relevant fisheries information or considerations.
- The South Marine Plan introduces a strategic approach to planning within the inshore and offshore waters between Folkestone in Kent and the River Dart in Devon. The aim is to provide a clear, evidence-based approach, to inform marine users and regulators on where activities might take place within the Marine Plan area, allowing for national policies to be applied in a local context.
- In responding to MLAs, the IFCA must consider any advice relevant to its remit as a fisheries regulator and with regard to the South Marine Plan, taking account of the objectives and policies listed which are related to that remit. The objectives and policies of the South Marine Plan can be viewed in the plan document online - South_Marine_Plan_2018.pdf (publishing.service.gov.uk).

2.0 Summary of Key Points

- A summary table is provided indicating the detail of any MLAs which required a response during the last quarter, outlining the nature of the MLA and the points included in the Southern IFCA response.
- There were 12 MLAs requiring a response between May 2024 and July 2024
- There were 16 additional MLAs received by Southern IFCA where it was determined that no comment was required.
- One of the MLAs requiring a response was for proposed cable protection works to the IFA 2 Cable which runs through the eastern Solent. The application is to lay rock protection along 0.7km of the IFA 2 Cable in the Solent between North Sturbridge cardinal buoy and Mother's Bank. The application required a detailed response from Southern IFCA, provided as Annex 1 to this report. The response provided detail on important fisheries within the area of the proposed works, reiterated and emphasised comments made by Southern IFCA in response to the original application for the IFA 2 Cable in 2016 and supported a response provided by members of the fishing industry in Portsmouth to the current licence application reflecting concerns raised in relation to the proposed works.
- Southern IFCA engaged with the industry representatives providing the response to the

licence application and were given permission to directly reference their response and its contents in the Southern IFCA response.
- Southern IFCA will continue to monitor any further developments in relation to this licence application and will provide any further input/response as required.

3.0 Review of Marine Consents Work: pre-2022 to date

- Southern IFCA's work under Marine Consents focuses on the marine licencing system and the role of the IFCA as a consultee for relevant MLAs.
- Work on marine consents has increased over the past 3 years and is observed to increase year on year in terms of the number of relevant MLAs which Southern IFCA receive and the number requiring comment.
- At the mid-point of the current financial year, this report provides an update on the MLA work to date for the 2024/25 financial year and how this compares to previous years.

Marine Licence application timeseries:

Time Period	Comment Required	No Comment Required	% Requiring Comment	% change on MLAs requiring comment to previous year
Apr 2022 – Mar 2023	7	18	28	
Apr 2023 – Mar 2024	13	18	42	+86
Apr 2024 – Jul 2024	17	19	47	+31

Note data for the 2024-2025 year only reflects MLAs received from 1st April to end of July as the current available data.

- For the number of MLAs received per month which require a response, this equates to 0.6 per month for 2022-23, 1.1 per month for 2023-24 and 4.25 per month for 2024-2025 to date (April to July).
- Where an MLA is identified as requiring a response, the time taken to review documentation associated with the MLA, compile any required data to inform the response, which may include engagement with industry and/or other bodies, and draft the response can be up to approximately 2 days of Officer time per response dependent on the complexity of the application and the level of detail required for the response.
- Figure 1 shows some of the key themes which Southern IFCA are routinely required to cover in responses to MLA consultations.

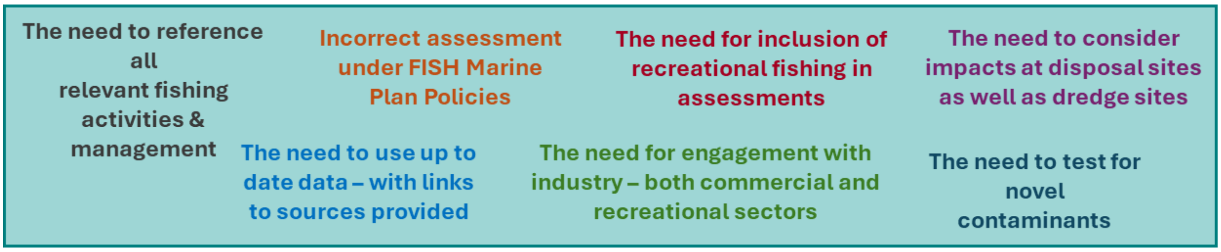

Figure 1: key recurring themes required to be covered in Southern IFCA consultation responses to MLAs

4.0 Next Steps

- That Members receive the report.

EXECUTIVE SUMMARY

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Summary of MLA consultation requests submitted to Southern IFCA where a response was issued					
Project Name	**Application No.**	**Application Type**	**Applicant**	**Summary of MLA**	**Response Points**
Lymington Harbour maintenance dredging and disposal	MLA/2023/00549	MLA	Lymington Harbour Commissioners	• Application for a 10-year extension of the current dredging licence within Lymington River. • Updated work plan sees a higher proportion of sediment deposited at Lymington saltmarsh and a lower proportion at Hurst Fort disposal site than previous licence.	• Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within the Solent on local fisheries. • Suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works • Recommended engagement with local fishers be undertaken by the applicant to best inform assessments and mitigation.
Hengistbury Head Ecological Scheme	MLA/2024/00014	MLA	BCP Council	• Installation of three areas of artificial reef blocks to the east of the Hengistbury Head Long Groyne as part of the Poole Bay Coastal Defence Scheme. • Reef blocks to be placed in one intertidal and two subtidal locations.	• Highlighted the potential for displacement of fishing activity if the works were to occur during June and July, as was highlighted in the response to a variation request for the Long Groyne itself. • Response expressed concerns over the potential impact of works on fishing effort for cuttlefish, sole, and black seabream if works were undertaken during Spring and early summer. • Recommended engagement with local fishers be undertaken by the applicant to

					best inform assessments and mitigation.
Discharge of surface water and rainwater from Havant Thickett Reservoir site	EPR/JB3651TP/A001	Environmental Permit Application	Future Water	• Application for a three-year permit for the discharge of surface water runoff and discharge from a vehicle wash from the Havant Thickett Reservoir construction site. • Discharge will be via 5 outlets into Riders Lane Stream.	• Provided the applicant with information on the fishing activity that occurs with Langstone Harbour, the final receiving environment for discharges made from the construction site. • Information provided covered the commercial dredge permit fishery, commercial and recreational hand-gathering activity, net fishing activity, and rod and line activity.
Hamworthy Barracks Jetty Works	MLA/2023/00510	MLA	Defence Infrastructure Organisation	• Application to undertake works to improve marine facilities in the boatyard. • Includes construction of finger piers, a refuelling pontoon, and wave screens.	• Response raised concerns over the impact of increased suspended sediment concentrations on bivalve fisheries within Poole Harbour. **Update from Applicant:** • A response was received from the applicant containing a full assessment of the potential impact of increased localised suspended sediment concentration, which concluded no adverse impact on the short-term or long-term viability of the bivalve fisheries within Poole Harbour. • Southern IFCA was in agreement with this assessment.
Gosport Marina maintenance dredging	MLA/2024/00022	MLA	Premier Marinas LTD	• Application for renewal of a 10-year dredging licence within Gosport Marina.	• Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within

				• Disposal to be at Nab Tower and Hurst Fort.	the Solent on local fisheries. • Suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works, especially given the presence of chemicals on the Environmetal Quality Standards Directive list within the sediment to be dredged. • Recommended engagement with local fishers be undertaken by the applicant to best inform assessments and mitigation.
Stone Pier Yard maintenance dredging	MLA/2024/00125	MLA	Victoria Rampart Limited	• Application for a 10-year licence for maintenance dredging within Stone Pier Yard (River Hamble). • Dredging to occur in two phases, navigational dredging removing 1m sediment, then maintenance dredging 5 years post completion of first stage.	• Raised concerns over the exclusion of nearby fisheries from the applicant's assessment on the basis of 'no direct overlap', including net fishing activity within the River Hamble and Southampton Water and the commercial dredge fishing activity that occurs within Southampton Water. • Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within the Solent on local fisheries, and suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works. • Recommended engagement

					with local fishers be undertaken by the applicant to best inform assessments and mitigation.
Shamrock Quay maintenance dredging and disposal	MLA	MLA/2024/00158	Marina Developments Limited	• Application for the renewal of a 10-year licence for maintenance dredging within Shamrock Quay Marina (River Itchen).	• Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within the Solent on local fisheries, and suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works. • Recommended engagement with local fishers be undertaken by the applicant to best inform assessments and mitigation.
HMNB Portsmouth maintenance dredging and disposal	MLA	MLA/2017/00478/5	Defence Infrastructure Organisation	• Variation request on the dredging licence L/2018/00293/5 to allow maintenance dredging within the licence of two berths and their approach.	• Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within the Solent on local fisheries, and suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works. • Recommended engagement with local fishers be undertaken by the applicant to best inform assessments and mitigation.
IFA 2 Cable Protection (Annex 1)	MLA	MLA/2024/00169	National Grid Ventures LTD	• Application to lay rock protection along 0.7km of the IFA 2 Cable in the Solent between	• Information provided to the applicant on the fisheries operating in the area of the proposed works.

				North Sturbridge cardinal buoy and Mother's Bank	• Reiteration and emphasis of comments raised by Southern IFCA in the response to the original application for the IFA 2 Cable in 2016. • Provided support and emphasis to concerns raised by members of the fishing industry in Portsmouth in relation to the proposed works.
Navigational dredging of Victoria Quay	MLA	MLA/2024/00142	UK Docks Royal Clarence Yard LTD	• Application for a 10-year dredging licence to undertaken navigational dredging (first 3 years) and then maintenance dredging (after 5 years).	• Highlighted anecdotal evidence provided by local fishers on impact of the use of dredge disposal sites within the Solent on local fisheries, and suggested in-combination assessments are undertaken for disposal sites to assess any potential impacts from use by multiple works. • Provided applicant with information on dredge and net fisheries within Portsmouth Harbour. • Recommended engagement with local fishers be undertaken by the applicant to best inform assessments and mitigation.
The following two applications were received by Southern IFCA from local councils through consultations required for planning regulations, initial comment and information provided where required with indication that a full review of proposed works would take place at the point the consultation on the required Marine Licence takes place through the MMO.					
Bournemouth Pier Repair Works	N/A	Initial Fisheries Advice Request	BCP Council	• BCP is looking to undertake repair works to Bournemouth Pier. • SIFCA was asked to provide information on fish populations and	• Provided information on the species targeted by recreational anglers from the pier and their seasonality. • Provided information on wider commercial fishing activity

				seasonality around the pier.	occurring in proximity to Bournemouth Pier, including netting, potting, and trawling. • Highlighted the key tools used to manage recreational and commercial fishing around Bournemouth Pier. • Provided the applicant with suggestions as to where data on the fish populations around Bournemouth Pier could be obtained.
Proposed Mixed-use Development, Newton's Road, Weymouth	EIA	N/A	Juno MMIXX	• Initial scoping assessment into the environmental impact of the redevelopment of a vacant site on the edge of Newtown's Road, Weymouth. • Development to include residential-led mixed use scheme with commercial spare, leisure facilities, and flood defences.	• As the development will require a marine licence, Southern IFCA will send a full response when the application comes through the MMO system. • The lack of consideration of commercial fisheries within proposed assessments was raised, as was the exclusion of consideration of several commercially important species within assessments.

Note that references to recommendations for engagement with local fishers in responses includes both commercial and recreational sectors as required dependent on the specifics of the proposed works.

Southern Inshore Fisheries and Conservation Authority

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5th July 2024

MARKED F_ANNEX 1

Ref: MLA/2024/00169

Dear Sir or Madam,

MLA/2024/00169: IFA 2 Cable Protection

Thank you for the opportunity to respond to the application for protection of the IFA 2 Cable in the Solent.

The role of Southern IFCA is primarily defined in the Marine and Coastal Act, 2009. The Southern IFCA District includes the inshore regions of Dorset, Hampshire, and the Isle of Wight from the coastal baselines out to 6 nautical miles. The collective vision of the ten IFCAs around England is to lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental, and economic benefits to ensure healthy seas, sustainable fisheries, and a viable industry.

In responding to this application, Southern IFCA wishes to highlight; a) fisheries operating in the area of the proposed works, b) comments made through the Southern IFCA response to the original application for the IFA 2 Cable and c) concerns that have been raised by members of the fishing industry in Portsmouth in relation to the proposed works.

Fisheries operating in the area of the proposed works

The area in which the works are proposed to take place hosts a variety of fishing activities spanning both commercial and recreational sectors and a variety of gear types. This includes a dredge fishery for King scallop (*Pecten maximus*), pot fishing for whelk (*Buccinum undatum*) and cuttlefish (*Sepia officinalis*), trawling for plaice, skate and ray species, static net fishing for sole and bass primarily and rod & line fishing (both commercial and recreational) for a variety of fish species.

Information on all fisheries can be found on the Southern IFCA website at www.southern-ifca.gov.uk.

The primary fishery identified as having the potential to be impacted by the proposed works is the dredge fishery for King scallop which utilises shellfish beds on the north and south sides of the Eastern Approaches from St Helen's Fort up to Southampton Water. The fishery is managed under a permit system (Solent-Dredge-Permit-Byelaw.pdf (toolkitfiles.co.uk)) with a fishing season from 1st November to 31st March each year. Under the regulations the Solent is split into a series of Bivalve Management Areas, of which Area 3 Eastern Solent, the area primarily used for targeting King scallop, overlaps with the area of the proposed works.

The permitted fishery has been in place since 2021, supporting between 25-32 permit holders each year (to date) at a cost to the industry of £215 per permit per year. Whilst a Category A Permit provides the ability for permit holders to fish for all bivalves except native oysters, the preferred target species within the fishery is the King scallop.

Southern IFCA obtain catch data from permitted fishers throughout the season at the level of the BMA, for Area 3, catch levels of King scallop have increased from 292.4 tonne during the 2021-2022 season to 559.1 tonne during the 2023-2024 season emphasising the increasing importance of this species in supporting this seasonal fishery. Based on the most recent catch data of 559.1 tonne landed in a season, considering the value of £/kg for King scallop into Solent ports obtained from 2023 MMO landings data (available online) which was an average of £1.93 per kg and

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maximum of £3.00 per kg, the value of the King scallop fishery at the point of first sale during the 2023-2024 season could be on average £1,078,420.89 up to a maximum of approximately £1,675,063.60 (note that the monetary values for £ per kg are based on data compiled by other agencies and therefore are given as an estimation). Whilst data is not recorded down to the level of individual beds, it is known from patrol work and engagement with the industry that the beds between Sturbridge Shoal and Mothers Bank, which are in proximity to the proposed works, receive high levels of fishing effort during the season.

In addition, Southern IFCA undertake a tri-annual survey (January, April, September) of King scallop beds within the permitted fishery, the most recent data being available from 2023 (prior to introduction of January survey in 2024). The proposed works overlap with two areas surveyed at their northern end, Mothers Bank and Sturbridge Shoal. The most recent data shows a Catch Per Unit Effort (CPUE) of 58.75 kg/m/hr for Mothers Bank and 57.71 kg/m/hr for Sturbridge Shoal. During 2023 a decline in CPUE was observed in the Mothers Bank site, the cause of this decline is not known at this time. The King scallop population will continue to be subject to annual monitoring under the Southern IFCA survey program, but the applicant should be aware of the decline observed in the relevant site and that all efforts should be taken to ensure that the King scallop population is not unduly affected by any other influences.

As highlighted above, other fisheries operate within the area of the proposed works, regulations for these fisheries are covered under District wide management measures including the Southern IFCA Net Fishing Byelaw[1], the Southern IFCA Minimum Conservation Reference Size Byelaw[2] and the Bottom Towed Fishing Gear 2016 Byelaw[3].

<u>Comments made through the Southern IFCA response to the original application for the IFA 2 Cable</u>

In a response to MLA/2016/00209 dated 16th June 2016 Southern IFCA highlighted points relating to a request for further comment on the application for the IFA 2 cable project.

In the 2016 response the following points were raised which remain of relevance to local fisheries and the potential impacts that may arise from further works in this area to the IFA 2 cable:

- That the consultation which had taken place between the applicant and the fishing industry through meetings was of benefit and that it was a positive step that the applicant had indicated they would form a liaison group for the fishing industry.
    - It is noted that in the current application, under Marine Plan Policy S-FISH-2, a Fisheries Liaison Officer (FLO) is referenced and the maintenance of regular communication with the fishing industry through Notice to Mariners and Kingfisher Bulletins. Southern IFCA welcomes the use of an FLO but suggests that a high level of engagement is required prior to works taking place in addition to during any licenced works. The concerns raised by the fishing industry, see relevant section of this letter below, require further engagement to understand how potential identified impacts could be mitigated prior to any works taking place.
- The environmental statement detailed temporary loss or displacement of fishing activity, and it was flagged by Southern IFCA that for many fisheries, such as the static

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[1] Southern-IFCA-Net-Fishing-Byelaw.pdf (toolkitfiles.co.uk)
[2] SIFCA-MCRS-Byelaw.pdf (toolkitfiles.co.uk)
[3] Southern-IFCA-BTFG2106-Byelaw.pdf (toolkitfiles.co.uk)

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gear whelk fishery, movement of gear into adjacent areas is often not possible due to the level of static gear already placed on the limited areas where fishing is suitable. In addition, it was also highlighted that although some vessels in the inshore fleet are multipurpose, vessels will vary in their ability to switch between gear types and the amount of time and expense required to switch between fisheries.

  - In order to fully understand the potential displacement of fishing activity and whether the relocation of activity is possible, whether that be on a temporary or more permanent basis, it is key that the applicant engages directly with the fishing industry across all sectors as detailed in the point above.
  - It is noted that there has been no new environmental statement drafted for these proposed works, it would be useful to understand how any points flagged during the original application process had been considered through any updated ES.
- It was noted that the assessment of native oyster populations was not fully correct in that although stocks are recognised to be depleted, native oysters are still found in the relevant survey area to the proposed works (Area 3: Eastern Solent).
  - The most recent survey data from 2022 showed a CPUE of 4.6kg of oysters per metre of dredge per hour in Area 3: Eastern Solent (note that this survey site is a different sized area to the BMA 3 Eastern Solent), a further survey is planned for August 2024 to provide the most up to date data on native oyster populations. Whilst not a currently active fishery, the native oyster population in the Solent is subject to extensive restoration efforts.
- It was noted that the inclusion of engagement with the recreational angling sector may require further consideration by the applicant due to the importance of the wider Solent and mid-channel areas for this sector, it was recommended that liaison is also undertaken with this sector through local angling clubs and charter associations.
  - Whilst it is recognised that the current proposal references an FLO under S-FISH-2, it is important that this extends to the recreational sector in addition to the commercial sector and that, as outlined above, any potential issues for the recreational sector are discussed with appropriate representatives before any works take place.

<u>Concerns raised by members of the fishing industry in Portsmouth in relation to the proposed works</u>

Southern IFCA wish to support concerns raised by the local fishing industry in Portsmouth in relation to the proposed works. These concerns have been highlighted in a response to the application from Mr Bill Brock of Brighton and Newhaven Fish Sales, representing views of the local industry. Southern IFCA have engaged with Mr Brock and have permission to directly reference his response and its content in this letter.

The response from the industry highlights several concerns relating to potential impacts, please note that the concerns in the response referenced in this letter are those that relate directly to fishing activity or populations of sea fisheries resources and thus the Southern IFCA remit:

- That the original marine licence for these works included a condition requiring the cable to be buried under the seabed and a question as to why this has not been considered under the current application.
- That introducing rock in a linear formation will create an inability to operate towed gears and undertake dredging operations.

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- That introducing the rock will create a scouring effect which may affect tidal flow rates and sediment composition around the proposed area resulting in increased siltation within the water column and surrounding sediments. It is felt that the latter may impact commercially important species across a range of fisheries and the former could alter larval flow, distribution and transport patterns impacting species such as the King scallop.
- That the introduction of a new habitat type may impact commercial species which are native to the area by reducing the amount of natural habitat available.
- That commercially important species may be impacted by the separation of habitat caused by the introduction of a 0.7km barrier through the placing of the rock.

Southern IFCA wish to support the fishing industry by reinforcing the concerns that have been raised and recommend strongly that either through the appointed FLO or other engagement means that all sectors are consulted with directly by the applicant to fully understand and discuss these concerns and any mitigating measures which may assist in reducing the potential impact. It is key, given the proximity of the proposed works to important fisheries that support local ports and communities, that these issues are addressed prior to any works taking place. From Southern IFCA's understanding, should the condition previously applied to works on the IFA 2 cable, namely to require the cable to be buried under the seabed rather than protected using rock protection, be included as a condition for this application then many of the potential impacts to fisheries could be mitigated against.

If any further information is required in relation to the Southern IFCA response to the application, or if either the MMO or the applicant wish to discuss this response in more detail please contact either Sarah Birchenough, Deputy Chief Officer for the Research & Policy Team (sarah.birchenough@southern-ifca.gov.uk) or Hester Churchouse, Inshore Fisheries and Conservation Officer (hester.churchouse@southern-ifca.gov.uk).

Yours sincerely,

Sarah Birchenough

Deputy Chief Officer
Southern Inshore Fisheries and Conservation Authority