

Title: Sussex IFCA Hand Gathering Permit Byelaw 2021 IA No: SXIFCA009 Lead department or agency: Sussex Inshore Fisheries and Conservation Authority (IFCA) Other departments or agencies: Department for Environment Food and Rural Affairs (Defra), Marine Management Organisation (MMO)	Impact Assessment (IA)
	Date: 14 th July 2022
	Stage: Final
	Source of intervention: Domestic
	Type of measure: Secondary Legislation
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Summary: Intervention and Options	RPC Opinion: Opinion Status: N/A
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Cost of Preferred (or more likely) Option (in 2019/20 prices)			
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Total Net Present Social Value	Business Net Present Value	Net cost to business per year (EANDCB on 2019 prices)	Business Impact Target Status
£200,000	£20,000	£2,250	n/a

What is the problem under consideration? Why is Government intervention necessary?

Hand gathering activity for marine resources within Sussex's intertidal areas is extensive, occurring across the District and throughout the year. Activities are undertaken for both recreational and commercial purposes. Due to the character of the fisheries often being dispersed across sometimes relatively remote coastlines, many of the fisheries are largely unrecorded and unregulated.

The management of 'hand gathering fisheries' come within the scope of the IFCA's section 153 duties within the Marine and Coastal Access Act 2009 (MaCAA 2009). Following the implementation of Defra's 'Revised Approach' MPA management policy and the MaCAA 2009 section 154 duties the IFCA's have management responsibilities, in respect to the impact of commercial activities upon conservation designations.

The proposed permit byelaw intervention will enable proportionate management of all hand gathering activities within intertidal areas. The regulation protects specific species, introduces spatial controls and introduces limits on the quantities of marine fauna and flora that maybe taken for personal use. A permit system is introduced for higher levels of exploitation and includes the requirement to submit 'catch data' returns to the Authority across the Sussex IFC District for all gatherers and the requirement for a hand gathering permit if gatherers wish to exceed this, including additional bespoke restrictions for relevant MPA sites to protect features. This will support the sustainable management of these fisheries within the Sussex IFC District.

What are the policy objectives and the intended effects?

Through the regulation of hand gathering activities, to:

- i) Enhance the sustainability of fisheries in the Sussex IFC District.
- ii) To enhance ecosystem functioning and provision of goods and services.
- iii) Make a contribution to the achievement of sustainable development.
- iv) Balance the different needs of persons engaged in the exploitation of sea fisheries resources in the District.
- v) Protect features of Marine Protected Areas and sensitive species.

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

0. Do nothing.
1. Voluntary measures.
2. Create a Hand Gathering Permit Byelaw 2021.

All options were compared to Option 0, the preferred option is Option 2, which will promote both sustainable fisheries and enhance the marine environment while ensuring compliance with the MaCAA 2009 and the Habitats Regulations. This option has been chosen as it enables the protection of natural capital assets (bait species and shellfish populations) and contributes to the management of activities that may affect MPA site integrity and lead to deterioration of sites within the Sussex IFC District. It is considered that, on the basis of available evidence, the benefits of this protection outweigh the potential costs of the measures.

1. Voluntary Measures

Voluntary measures were not considered viable to achieve the required management outcomes, based on compliance experience with hand gatherers over many years. This evidence is summarised as follows:

Compliance interactions with hand gathers digging and collecting fishing bait at commercial levels have at times been very challenging. Individuals have on occasions shown a lack of willingness to understand and recognise the conservation needs of the locations, the need to manage activities and the role of the Authority and its Officers in the management and protection of fisheries and marine protected areas. Despite repeated advice and directions activities have continued.

Areas including both Chichester Harbour and the lower river Adur in Shoreham-by-Sea are locations within the Sussex IFC District where the gathering of mollusc bivalves from shellfish beds that are unclassified has proved a particular problem for relevant organisations with a management role including; Sussex IFCA, Chichester District Council, Natural England, Sussex Police and The Gangmasters and Labour Abuse Authority.

Will the policy be reviewed? It will be reviewed. If applicable, set review date: April 2026

Does implementation go beyond minimum EU requirements?		Yes		
Is this measure likely to impact on trade and investment?		No		
Are any of these organisations in scope?	Micro yes	Small yes	Medium yes	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 Strategic Advisor and Clerk



Date:

31st January 2024

Summary: Analysis & Evidence

Policy Option 2

Description:

FULL ECONOMIC ASSESSMENT

Price Base Year 2022	PV Base Year 2023	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: £-200,000	High: £-100,000	Best Estimate: £-200,000

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	n/a	£10,000	£10,000
High	n/a	£30,000	£20,000
Best Estimate	n/a	£20,000	£20,000

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

In broad terms, the value of the combined fisheries is uncertain. In respect to bait collecting a report from Portsmouth University and Cefas (Watson et al., 2016) estimated that 1,600 tonnes of rag worm (*Nereis virens*) per annum, worth £52.31 million, are gathered in the UK.

Monetised costs to commercial gatherers within Sussex, associated with the introduction of the proposed measures, are largely unknown. However, the IA assumes an average of 30 permit holders per year throughout the next 10 years (with a low estimate of 15 and a high estimate of 45). Apart from spatial restrictions within relevant marine protected areas (MPA), if gatherers wish to collect above the proposed District-wide bag limit, a permit for a nominal sum of £75 to cover administration costs will enable them to continue their business as before. Enforcement costs are relatively modest given that this is land based activity not requiring marine assets. We estimate the average cost as £20,000 P/A with a low and high estimates of £10,000 and £30,000 respectively. Administration costs of the permit system (including catch returns) are planned to be covered by the permit fee. Introducing the recommended byelaw including the costs associated with legal review and advertising the new byelaw are assumed to be included in the compliance costs.

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

There is low potential for the displacement of fishing effort to other areas as access to the fisheries remain in most locations

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

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

It is not possible to estimate monetised benefits at this point. *Ecosystem* service and conservation benefits are expected to be realised through the introduction of management.

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

It is anticipated that the proposed measures will benefit the sustainability of bait species and shellfish populations through a reduction in fishing mortality. Proposed measures will also enable the IFCA to fulfil its duty to further the conservation objectives of MPAs, including marine conservation zones (MCZs) and European Marine Sites (EMSs). The adoption of hand gathering measures in the Sussex IFC District under a byelaw has the potential to improve the understanding of these activities.

Key assumptions/sensitivities/risks

Discount rate (%) 3.5%

- i) That accurate information has been gathered from stakeholders through stakeholder liaison.
- ii) That there will be compliance with the measures and that the measures will achieve the policy objective.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: £2,250	Benefits: £0	Net: £-2,250	n/a

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1.0 Introduction

1.1 Area in question

This Impact Assessment (IA) is for the Sussex Inshore Fisheries and Conservation Authority (IFCA) 'Hand Gathering Permit Byelaw 2021'. This byelaw will affect all persons involved in hand gathering fisheries in the Sussex IFC District.

1.2 IA purpose

This IA assesses the costs and benefits of the recommended option. It also considers why the recommended option is being recommended, rather than others, and evidence underpinning recommendations.

1.3 IFCA duties

The IFCA must manage the exploitation of sea fisheries resources in their Districts as set out in section 153 of the Marine and Coastal Access Act (MaCAA). The Sussex IFCA governing committee consists of members of West Sussex, East Sussex and Brighton & Hove councils, persons appointed by the Marine Management Organisation (MMO), and employees of the MMO, Environment Agency (EA) and Natural England (NE). The appointed members of the Authority must comprise of those acquainted with the needs and opinions of the fishing community of the District, and those with knowledge of, or expertise in, marine environmental matters. The IFCA principal committee and its subcommittees delegates management functions to the Chief Fisheries and Conservation Officer and Senior Management Team.

Section 153 of the MCAA details the duties of the IFCA, stating that "the authority for an IFC District must:

- (a) seek to ensure that the exploitation of sea fisheries resources is carried out in a sustainable way,

- (b) seek to balance the social and economic benefits of exploiting the sea fisheries resources of the District with the need to protect the marine environment from, or promote its recovery from, the effects of such exploitation,
- (c) take any other steps which in the authority's opinion are necessary or expedient for the purpose of making a contribution to the achievement of sustainable development, and
- (d) seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the District."

Bait gathering or collection, refers to the taking of worms (lugworms and ragworms) and crabs (particularly peeler crabs; those crabs that have just gone through the process of ecdysis and have soft shells) for the use of sea-angling bait. Hand gathering and collection of shellfish (predominantly winkles, cockles and clams in the Sussex IFC District) for human consumption typically occurs by hand using forks and rakes that expose the shellfish for collection. All these activities are regarded as 'fisheries' within the broad meaning of the MaCAA and the definition of 'marine resources'. Subsequently it falls within the Authority's duties to manage these fisheries sustainably under section 153 of the MaCAA. For the purposes of this proposed byelaw the term 'hand gathering' is used to cover all these activities.

In addition, section 154 provides that the authority for an IFC District "must seek to ensure that the conservation objectives of any marine conservation zones in the District are furthered." IFCAs are also required to ensure that all existing and potential commercial fishing activities within European Marine Sites are managed in accordance with Article 6 of Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora. A site-level assessment needs to be conducted to determine whether management of an activity is required to conserve site features. Site level assessments are carried out in a manner that is consistent with the provisions of Article 6(3) of the Habitats Directive.

2.0 Rationale for intervention

2.0 The nationally agreed vision of the IFCAs is that they will:

"Lead, champion and manage a sustainable marine environment and inshore fisheries within their Districts by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry"

2.1 Sussex IFCA has a duty to manage the exploitation of sea fisheries resources in the District to ensure that it is carried out in a sustainable manner, whilst balancing the different needs of persons engaged in the exploitation of sea fisheries resources in the District. The management of 'hand gathering fisheries' come within the scope of the IFCAs section 153 duties within the MaCAA 2009. Under the 'Revised Approach' and the MaCAA 2009 section 154 duties the IFCAs have management responsibilities, in respect to the impact of commercial activities upon conservation designations.

2.2 Fishing 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 occur 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.

2.3 This byelaw aims to redress these sources of market failure in the marine environment through the following ways:

- Management measures will support continued existence of public goods in the marine environment, for example conserving the range of biodiversity in the Sussex IFC District.
- Management measures will also support continued existence of common goods in the marine environment, for example ensuring the long-term sustainability of bait species and shellfish stocks in the Sussex IFC District intertidal areas.

2.4 Hand gathering activity for marine resources within Sussex's intertidal areas is extensive, occurring across the District and throughout the year. Data indicates that activities are undertaken for both recreational and commercial purposes. Due to the character of the fisheries often being dispersed across sometimes relatively remote coastlines, many of the fisheries are largely unrecorded and unregulated.

2.5 Commercial hand gathering in Chichester Harbour and the Adur Estuary is thought to be resulting in shellfish illegally entering the human food chain, which has potentially serious public health concerns from untested shellfish. In order to protect human health, bivalve shellfish (excluding scallops) for human consumption should only be taken from areas designated and classified shellfish beds. Only very limited named areas within Chichester Harbour (under the annual classification system) are currently classified for the collection of native oysters. These fisheries are managed by the Sussex IFCA by means of its 'Oyster Permit Byelaw'.

There is also evidence that some hand gathering activities may have links to modern day slavery criminal activity which falls within the remit of the Gangmasters & Labour Abuse Authority.

2.6 The proposed permit byelaw intervention will enable the recording and regulation of such activities, introducing a bag limit across the Sussex IFC District for all gatherers and the requirement for a hand gathering permit if gatherers wish to exceed this, including additional bespoke restrictions for relevant MPA sites to protect features. This will support the sustainable management of these fisheries within the Sussex IFC District and also enable the IFCA to fulfil its duty to further the conservation objectives of MPAs, including MCZs and EMSs.

3.0 Policy objectives

3.1 The policy objectives of this byelaw are, through regulating hand gathering within the District, to:

- i) Ensure that the exploitation of sea fisheries resources is carried out in a sustainable way within the Sussex IFC District;
- ii) make a contribution to the achievement of sustainable development;
- iii) balance the social and economic benefits of exploiting the sea fisheries resources of the Sussex IFC District with the need to protect the marine environments from, or promote its recovery from, the effects of such exploitation; and
- iv) balance the different needs of persons engaged in the exploitation of sea fisheries resources in the District.

3.2 These IFCA objectives also support duties under the Habitats Regulations. Since 2012, under Defra's revised approach to fisheries management, IFCAs have implemented a process to assess the impacts of fishing on EMSs, which are sites designated and protected under the Habitats Regulations. This includes the impacts of bait and shellfish hand gathering. Sussex IFCA has undertaken a Habitats Regulations Assessment (HRA) for Chichester Harbour, which is part of the Solent Maritime EMS and Rye Harbour, which is part of the Dungeness, Romney Marsh and Rye Bay EMS.

The HRA is a step-wise process and is first subject to a coarse test of whether a plan or project will cause a likely significant effect on a EMS, known as a test for Likely Significant Effect (tLSE). This assessment is conducted for all the qualifying site features and supporting habitats. If the tLSE concludes the potential scale or magnitude of any effect is likely to be significant the activity/habitat interaction is required to be taken to a full Appropriate Assessment (AA). An AA examines in detail the site condition, potential risks to

features and any mitigation measures in place. Any gaps in understanding are drawn out through this process, helping to target potential evidence collection needs. The aim of these assessments is to determine whether management measures are required in order to ensure that the fishing activity or activities will have no adverse effect on the integrity of the site and lead to its deterioration.

For both sites full AAs were required which have concluded that management is needed in order to control effort and ensure that the designated features of these sites are protected.

3.3 The Sussex IFCA currently has three bait and hand collection regulations as part of its byelaws.

1) Chichester Harbour European Marine Site (Specified Areas) Prohibition of Fishing Method Byelaw (confirmed November 2013)

chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://secure.toolkitfiles.co.uk/clients/34087/sitedata/files/Byelaws/Chi-Harbour-EMS-Byelaw.pdf.

Part of this Byelaw prohibits digging, collection and hand gathering of marine fisheries resources in known seagrass beds within Chichester Harbour to protect Seagrass (*Zostera* species) and therefore prevent damage or deterioration to the Solent European Marine Site.

2) Shore related management measures are also in place within the Beachy Head West MCZ, Schedule 2 of the Marine Protected Areas Byelaw (Confirmed 2017). This states that it is prohibited to remove from the shore from any part of the General Conservation Areas in a single calendar day more than:

- (i) 2 lobsters (*Homarus gammarus*);
- (ii) 5 edible crabs (*Cancer pagurus*);
- (iii) 20 crabs in total of any species other than *Cancer pagurus*;
- (iv) 1 kg of mollusc shellfish except piddock (*Pholadidae*), blue mussels (*Mytilus edulis*) or native oyster (*Ostrea edulis*);
- (v) a total of 1 kg of prawns or shrimps;
- (vi) 1 kg of marine worms (*Annelida*); or
- (vii) 2 kg of intertidal seaweed (algae)

In addition to this there are special management measures in Educational Conservation Areas where a person must not intentionally harm or remove any marine organism by intertidal gathering in the Educational Conservation Areas within the MCZ.

3) Schedule 3 of the Marine Protected Areas Byelaw, Pagham Harbour MCZ and SPA, also includes the aforementioned bag limits for recreational intertidal gathering. In addition, there is a seasonal prohibition on any intertidal gathering from April 1st to August 31st in the Bird Conservation Area to protect breeding terns from disturbance, protection for Eel grass (*Zostera* species) in the General Conservation Area and Bird Conservation Area and a prohibition on depositing any item on the seabed for the purposes of supporting the act of gathering marine resources in the General Conservation Areas or Bird Conservation Area.

3.4 The Authority's present strategic Review of Management has established priorities for the management of fishing activities in the inshore waters in the Sussex IFC District through an agreed four-year plan. Within this plan, hand gathering has been identified as a key theme and work package and it has been agreed that the Authority will formally review its bait and hand collection management. The main role being to avoid the impact of overharvesting and associated species and habitat impacts.

The current management proposals are informed by work that has been undertaken over a number of years to inform the process and provide appropriate evidence.

3.5 Due to the risk posed to the sustainability of fisheries within the Sussex IFC District, there is the need to introduce the proposed byelaw in line with the four-year management plan.

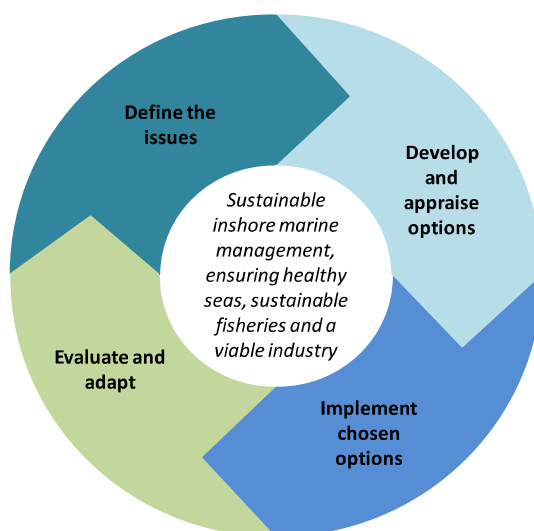
3.6 A number of other legislative drivers may need to be considered, including;

- Natural England legislation and policy

- Countryside and Rights of Way Act 2000
- Wildlife and Countryside Act 1981
- Environment Act 2021
- Existing case law around bait collection
- Other- local authority, Environment Agency, Crown Estate, Area of Outstanding Natural Beauty (AONB) and port byelaws
- Waste legislation (crab tiles)
- Heritage legislation (MaCAA)
- Interaction with Environmental Health (FSA) classifications

4.0 Evidence base

4.1 In line with Defra Guidance the 'Evidence Based Marine Management Cycle' has been utilised, as follows



4.2 A range of evidence has been collated and considered, including activity locations and intensity, species targeted and their value, as well as the impacts the activity has on both the species and the associated habitats. Refer to detailed information contained in the Bait and Hand Collection Evidence Report (Annex I within the Supporting Evidence Pack).

4.3 Identifying fisheries activities

Hand gathering and bait collection métiers (fisheries activities targeting specific species using specific methods) are categorised in the table 1 to 4 below. These categories were developed by a strategic internal IFCA Working Group – the 'Future Inshore Strategic Hand Gathering Implementation Group' can be used to help define the range of activities (and risks) in any given District. Note that many of these activities are observed in designated MPA sites.

Table 1, Typical hand gathering metiers.

Annelid worms

Metier	Species	Commercial Y/N	Recreational Y/N	Bait Y/N	Human consumption Y/N	Habitat
Digging (Fork or Spade) for rag and lug worm	King Rag – <i>Alitta virens</i>	Y	Y	Y	N	Mussel Bed, Coarse and mixed sediment
	Common Rag - <i>Perinereis cultrifera</i>	Y	Y	Y	N	Intertidal mud and mixed sediments
	Habour / Maddies / Creeper – <i>Hediste diversicolor</i>	Y	Y	Y	N	Intertidal mud usually in estuaries
	White Rag – <i>Nephtys spp.</i>	Y	Y	Y	N	Intertidal Sand
	Black Lug – <i>Arenicola defodiens</i>	Y	Y	Y	N	Intertidal mud and sand
	Blow Lug – <i>Arenicola marina</i>	Y	Y	Y	N	Intertidal mud and sand
Suction pump for lug and rag worm	Black Lug – <i>Arenicola defodiens</i>	Y	Y	Y	N	Intertidal mud and sand
	Blow Lug – <i>Arenicola marina</i>	Y	Y	Y	N	Intertidal mud and sand
	Blow Lug – <i>Arenicola marina</i>	Y	Y	Y	N	Intertidal mud and sand
Dragging for rag/lug worms from a vessel	<i>Nereis spp.</i> and <i>Arenicola spp.</i>	Y	N	Y	N	Intertidal sand

Table 2. Typical hand gathering metiers.

Molluscs

Metier	Species	Commercial Y/N	Recreational Y/N	Bait Y/N	Human consumption Y/N	Habitat
Raking for Bivalves	Cockle - <i>Cerastoderma edule</i>	Y	Y	N	Y	Intertidal mud and sand
	Mussel – <i>Mytilus edulis</i>	Y	Y	Y	Y	Mussel Bed
Hand gathering Bivalves	Cockle - <i>Cerastoderma edule</i>	Y	Y	N	Y	Intertidal mud and sand
	Mussel – <i>Mytilus edulis</i>	Y	Y	Y	Y	Mussel Bed
	Otter Clams and Sand Gaper	Y	Y	Y	Y	Intertidal mud and sand
	Razor Clams	Y	Y	Y	Y	Intertidal Sand
	Razor clam salting	Y	Y	Y	Y	Intertidal Sand
	Oyster		Y	N	Y	intertidal mud
	Other occasional clams	N	Y	Y	Y	Intertidal sand and mud
Winkle suction collection	Winkle Species - <i>Littorina spp.</i>	Y	N	N	Y	Hard substrate
Hand gathering gastropods	Winkle species - <i>Littorina spp</i>	Y	Y	N	Y	Hard substrate
Limpet chiselling	Limpet – <i>Patella vulgata</i>	N	Y	N	Y	Hard substrate
Piddock chiselling	<i>Pholadidae spp.</i>	N	Y	N	Y	rocky shore (chalk)

Table 3. Typical hand gathering metiers.

Crustacea

Metier	Species	Commercial Y/N	Recreational Y/N	Bait Y/N	Human consumption Y/N	Habitat
Shore crab collection using cover device (fish aggregation devices FADs)	Shore Crab - <i>Carcinus maenas</i>	Y	Y	Y	N	Intertidal mud
Hand gathering including hooking / cleeking for crabs and lobsters	Shore Crab - <i>Carcinus maenas</i>	Y	Y	Y	Y	Hard substrate and around hard structures
	Velvet swimmer crab - <i>Necora puber</i>	N	Y	Y	Y	Hard substrate
	Brown Crab - <i>Cancer pagurus</i>	N	Y	Y	Y	Hard substrate
	Spider Crab – <i>Maia squinado</i>	Y	Y	Y	Y	Hard substrate
	Lobster – <i>Homarus gammarus</i>	N	Y	Y	Y	Hard Substrate

Table 4. Typical hand gathering metiers.

Other species

Metier	Species	Commercial Y/N	Recreational Y/N	Bait Y/N	Human consumption Y/N	Habitat
Seaweed harvesting	<i>Fucoid spp.</i>	Y	Y	N	Y	Rocky shore

4.4 Sussex IFC District Activity

A summary of activity understanding from Information Reports and patrols is contained in the Bait and Hand Collection Evidence Report within the Supporting Evidence Pack. The data indicates that activity is widespread throughout the District. Concentrated areas of reported shellfish handgathering activity occur within Chichester Harbour and the Adur Estuary, with the highest numbers of bait collection IRs concerning Chichester Harbour and Rye. The number of IRs relating to handgathering have increased over time, particularly relating to shellfish.

Due to challenges surrounding the evidence gathering process, it is difficult to accurately assess the true number of bait and hand gatherers who work on a recreational or commercial scale within the District. As part of the Authority's evidence collection process, new methods have been explored for gathering widespread spatio-temporal data on hand gathering, as follows.

4.5 Evidence from Total Ecosystem Management of the Intertidal Habitat (TEMITH) commissioned work

The TEMITH project aimed to design and prototype a solution to monitor pressures in the intertidal habitat in the Solent region using Earth Observation data in addition to existing sources of information. For example, sediment scarring resulting from different activities can be readily observed using aerial imagery. The mapping of sediment disturbance attributed to digging disturbance enables the utilisation of this method to further understanding of bait and hand collection activity within areas.

Visualising the distribution and extent of digging disturbance over broad geographic scales can help to characterise the potential impacts of the associated activities, particularly in relation to protected

features of conservation concern. The utility of this method to better monitor this activity over large spatial scales and complement the existing activity evidence base within Chichester Harbour was recognised by the Authority, thus further development of the model and associated analyses were commissioned.

Outputs from the commissioned work have provided additional evidence in support of Sussex IFCAs own information gathered on the location of bait collection and hand gathering, providing a more robust evidence base on activity location and extent within Chichester Harbour. Refinement and development of the model has helped overcome 'false positives', making this a potential key tool for future activity monitoring rather than solely relying on more resource-intensive ground data collection.

The inclusion of temporal comparisons (2016, 2020 whole harbour; 2013, 2016, 2020 Dell Quay only) within the project were essential to reveal temporal changes in exploitation across the whole harbour. Maps for single timepoints provide a snapshot of activity, however there remain questions of the representativeness of that timepoint. For this project the harbour-wide distribution of digging disturbance was mapped for two years to build an understanding of its spatio-temporal extent.

Refer to the full report within Annex V of the Supporting Evidence Pack.

4.6 Impacts

Bait and hand collection can impact the habitat, target species, and non-target species, through the collection method itself and accessing the shore. For a full description of potential impacts refer to detailed impacts information contained within the Supporting Evidence Pack. There do, however, remain gaps in national level understanding of what constitutes low, medium or high levels of activity and associated impact thresholds. The need to address these evidence gaps has been identified by government and national scale projects explored. In the absence of such threshold information a precautionary approach should be adopted, in particular with regards to ensuring no adverse effect on MPA site integrity.

Key documented impacts include:

Habitat impacts

- A key impact is changes in sediment topography through dug holes/trenches and mounds of spoil. At a low energy site in the Solent, for example, experimental 1m² digging scars were observable for 83 ± 30 days S (Watson *et al.*, 2017b). Trampling of soft sediments can also result in changes in topography. Rossi *et al.* (2007) observed a higher average percentage depressions in a trampled mudflat site than controls at 18 days following trampling, but not at 40 days. The authors highlighted the potential for standing pools and sediment compaction to influence biogeochemical processes.
- Statistically significant changes (Anderson and Meyer, 1986; Carvalho *et al.*, 2013) and indications (McLusky *et al.*, 1983; Edwards *et al.*, 1992; Watson *et al.* 2017b) of sediment coarsening have been identified previously in relation to digging.
- Reduced organic content of sediments has been observed (Anderson and Meyer, 1986; Watson *et al.* 2017b).
- Increase in metal concentration (lead at the sediment surface) and bioavailability (cadmium in porewater) has also been linked to bait digging (Howell, 1985).

Target species impacts

- Evidence of overexploitation of *Arenicola marina* leading to population crash (Olive 1993).
- Higher densities, but lower average weight have been observed for king ragworm *Alitta virens* at dug sites compared to undug sites (Watson *et al.*, 2007).

Non-target impacts

- Reduced number of macrofaunal taxa (e.g. Brown and Herbert Wilson Jr., 1997; Carvalho *et al.*, 2013) and changes in assemblage heterogeneity (e.g. Carvalho *et al.*, 2013; Watson *et al.*, 2017b) have been identified in relation to digging. Trampling-induced changes in total macrofaunal numbers (Wynberg and Branch, 1997) and measures of community composition have also been identified (Chandrasekara and Frid, 1996; Rossi *et al.*, 2007).

- There is evidence for negative impacts of both digging and trampling on invertebrate bird prey species (e.g. Shepherd and Boates, 1999), including commercially targeted *Cerastoderma edule* (e.g. Jackson and James 1979; Watson et al., 2007; Rossi et al., 2007).
- A reduced foraging efficiency by 68.5% for semipalmated sandpipers has been found, potentially related to reduced prey by bait harvesting and interference with prey cues caused by the disturbed sediments (Shepherd and Boates, 1999).
- The presence of hand gatherers on the shore can cause disturbance to birds (Townshend and O'Connor, 1993; Morrison, 2006; Ravenscroft et al., 2007; Cox and Ravenscroft, 2009; Liley et al., 2012; Fearnley et al., 2013). A significant negative correlation between number of waders and number of bait collectors has been identified (Watson et al., 2017b) as well as significant effects of harvester presence on curlew foraging activity (percentage of birds foraging), but not on other curlew foraging variables (Navedo and Masero, 2007).
- Disturbance caused by hand gatherers and noise near seal haul-outs may increase seal alertness and cause them to swim away (Gaspari, 1994).

4.7 Designated sites

Condition assessments and general management approaches for each of the designated site features provide an indication as to whether sediment disturbance through hand gathering is likely to have a negative impact on the overall condition of the site. These have been considered in Section 4 of the Bait and Hand Gathering Evidence Report within Annex I of the Supporting Evidence Pack.

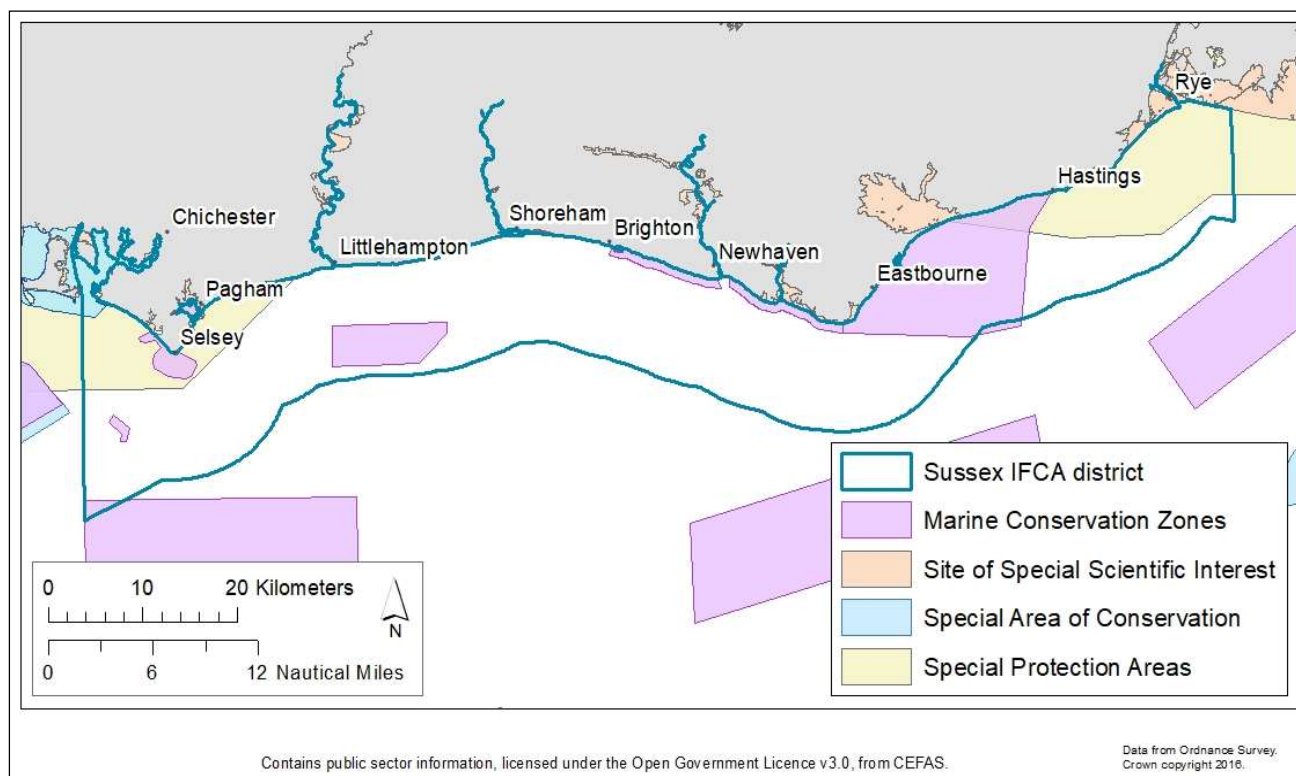


Figure 1 Marine Protected Areas within the Sussex IFC District

4.8 Evidence from the informal public consultation

Online survey

An online survey was carried out using the Survey Monkey platform over seven weeks, from November 16th 2020 to January 6th 2021. A total of 102 stakeholders completed the survey. 17 questions were posed covering a range of topics including the primary reason for bait collection and hand gathering, information on location, frequency, methods, target species and quantities, as well as questions relating to the sustainability of their activity and current fisheries legislation.

All but two participants indicated they collect for personal use in recreational angling. Twenty-five participants specified that they collect for personal consumption. Four participants indicated they collect for commercial bait and one for commercial human consumption. Results from the consultation provided valuable information to further inform the Authority's understanding of the fishery, although not enough to quantify economic commercial activity. For full details see the Bait Collection and Hand Gathering Evidence Report within Annex I of the Supporting Evidence Pack.

5.0 Options

Management Options are derived from considering the best available evidence, Authority Committee discussions and consultation with stakeholders.

5.1 Option 0: Do nothing

Under this option it is likely that Sussex IFCA would not fully meet its duties under the Marine and Coastal Access Act, 2009 as bait species and shellfish would be potentially vulnerable to over-exploitation. The Authority would also not fulfil its duty to further the conservation objectives of MPAs within the District.

5.2 Option 1: Voluntary agreement

The principles of Better Regulation require that statutory regulation is introduced only as a last resort. Due to the range of species that the proposed measures serve to protect and the potential financial value of these populations it is unlikely that voluntary measures would be successful in achieving compliance in this situation. Furthermore, the risk posed to the sustainability of fish and shellfish populations in the event of non-compliance with voluntary measures could be high and the effects potentially considerable to the sustainability of the District's fisheries, the health of the marine environment and the economy of the local society.

It is evident from existing compliance activities, and the response to advisory information provided to fishery participants that voluntary measures for the hand gathering of bivalve mollusc is not effective.

Sussex IFCA's voluntary bait collectors code of conduct already in place, adapted from the Angling Trust's code, applies District-wide. These measures will continue to support the regulatory framework proposed.

5.3 Option 2: Proposed management

5.3.1 Prompted by an increase in reported commercial activity within designated European Marine Sites and the completion of Habitats Regulation Assessments for these sites, Sussex IFCA proposed the introduction of management measures to regulate this activity throughout the District.

5.3.2 The recommended option for management is a whole District approach, with additional spatial management where evidence demonstrates that this is required in, i.e. designated sites. Mechanisms for delivery include a District-wide bag limit, the requirement for a hand gathering permit for gathering quantities above the stipulated recreational bag limit and additional restrictions for relevant MPA sites to protect designated features.

Additional measures will include:

- Protection of species of interest – Piddock (*Pholadidae*), Native oyster (*Ostrea edulis*), seagrass (*Zostera* species), intertidal kelp species (*Laminaria digitata* and *Sacchorina latissimi*)
- The prohibition of marine organism aggregation devices (i.e. crab tiles) at specific sites
- The prohibition of potentially polluting chemicals, materials and substances used for the purposes of hand gathering (e.g. asbestos crab tiles and irritants such as detergents injected into burrows).

5.3.2 Rationale for proposed bag limit management tool

A byelaw containing specific bag limits for species recognises the need to seek to balance the different needs of persons engaged in the exploitation of sea fisheries resources in the District. It is a species-based approach, rather than an activity-based model. Its framework centres around defining quantities that can be collected over a given period and enables differentiation between recreational and commercial hand gatherers.

A bag limit approach allows hobby or occasional fishers (the recreational sector) to conduct different hand working activities and remove a determined quantity of resource for their own use without the need to be faced with more defined restrictions of use that may be suitable for commercial operators. This approach separates the needs of different users and has involved categorising different species (or other taxa) that would be either prohibited for removal or have a determined quantity (bag limit) authorised for removal for personal use only. Gathering resources below a bag limit threshold are allowed without a permit and are therefore not bound by flexible permit conditions that could be placed within a permit.

Although the level of activity, in terms of total numbers of persons conducting an activity, will remain unknown, the advantage is that it reduces the burden to issue and manage a potentially large number of recreational permits. It would also reduce the monetised and non-monetised impact on those recreational fishers that would still be able to operate without a permit.

Examples of this type of approach already exist and include:

1. Cornwall IFCA Lobster, Crawfish and Crab Fishing Permit byelaw 2016.

This byelaw applies to the whole Cornwall District. It limits a take of species for any person, that does not have a permit, to a specific level. This Byelaw allows for a combined total of five lobster, crawfish, edible crab and spider crab to be retained on board per calendar day and limits the combined total number of lobster and crawfish (amongst the total catch) to two.

2. Sussex IFCA Marine Protected Areas Byelaw 2017

As mentioned above, this Byelaw applies within different MPA areas which are defined for fixed management measures to apply. The Beachy Head West Marine Conservation Zone, which is schedule 2 of this Byelaw, restricts gear type and catch. Within the conservation areas, shore related management measures include a catch prohibition on piddock, seahorse, native oyster and blue mussel. In addition; within any calendar day it is prohibited to remove from the shore and any part of the conservation area more than: 2 lobsters, 5 edible crabs, 20 crabs in total of any species other than *Cancer pagurus* (brown crab), 1 Kg of mollusc shellfish except piddock (*Pholadidae*), blue mussel (*Mytilus edulis*) or native oyster (*Ostrea edulis*) and a total of 1Kg of prawns or shrimps.

The existing established hand gathering bag limit for selected MPAs were utilised as the basis for the whole District limits, and subsequently adapted following consultation as follows:

A person must not remove from a fishery in any calendar day more than:

- (i) 2 lobsters (*Homarus gammarus*);
- (ii) 5 edible crabs (*Cancer pagurus*);
- (iii) 30 crabs in total of any species other than *Cancer pagurus*;
- (iv) 5 kg of mollusc shellfish except those defined in paragraph 2(a);
- (v) 1 kg of prawns or shrimps;
- (vi) 1.5 kg and 1.5 litres and 150 individual marine worms (*Annelida*);
- (vii) 5 kg of intertidal seaweed (algae);
- (viii) 0.5kg of Glasswort (*Salicornia species*); or
- (ix) 0.5kg of Sea-blite (*Suaeda species*).

5.3.3 Rationale for proposed additional spatial conditions

Fixed spatial conditions have been used to place conditions on activities in MPA sites within the District to ensure the conservation objectives for sites are furthered. Fixed spatial management also enables incorporation of the content of legacy measures, namely Sussex IFCA's existing prohibitions over sea grass beds in the Chichester Harbour MPA.

6.0 Costs and Benefits of Preferred Option

6.1 Key monetised and non-monetised costs

The implementation of the proposed byelaw may result in the following costs:

- direct costs to the hand gathering industry as a result of bag limits and permit fees (£75 per year for a single permit). However, there is insufficient evidence to accurately quantify the costs to the commercial hand gathering sector. Estimates of potential costs to participants in the fisheries have therefore been based on an estimate of 30 permits being issued annually, and high and low estimates between 45 and 15 (within 50% of the average figure). The introduction of a permit system, with catch return requirements, will fill this data gap into the future.
- Costs to Sussex IFCA are associated with the introduction of the Byelaw in respect to administration and compliance. Permit Byelaws incur the Authority an administration burden, with costs associated with a possible need to develop on-line permit application facility and administrator/officer time to document reviews of permit conditions and more frequent decision making. The Byelaw and associated permit requirement for those gathering quantities associated with commercial activities is judged as a proportionate response to the present management need given available resources. Compliance costs will result, although they are expected to be far lower than those associated with the use of marine assets and teams of officers operating together. An estimate of £20,000 per annum is attributed to annual enforcement and incorporates the start up costs. Low and high figures are estimated at £10,000 and £30,000 respectively.

6.2 Benefits

It is anticipated that the proposed measures will benefit bait species and shellfish populations through controlling the numbers that can be harvested and regulating commercial gathering.

Benefits of the management measures are summarised as follows:

- environmental benefits from an increase in fish and shellfish populations;
- direct benefits to the fishing industry as a result of increased catches and the increased size of fish and shellfish caught;
- direct benefits to the fishing industry as a result of increased values of species;
- direct benefits to recreational fishers as a result of an increase in species population sizes and the size of individual fish;
- social benefits related to increased participation in recreational angling and diving;
- social benefits related to an increase in the reputation of the fishing industry; and
- social benefits related to an increased understanding and compliance of regulations.

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

Recreational sea angling is a popular pastime in the Sussex IFC District. It is estimated that there are 884,000 sea anglers in England, with 2% of all adults going sea angling. These anglers make a significant contribution to the economy. In 2012, sea anglers resident in England spent £1.23 billion on the sport, equivalent to £831 million direct spend once imports and taxes had been excluded. This supported 10,400 full-time equivalent jobs and almost £360 million of gross value added (GVA). Taking indirect and induced effects into account, sea angling supported £2.1 billion of total spending, a total of over 23,600 jobs, and almost £980 million of GVA. Sea angling also has important social and well-being benefits including providing relaxation, physical exercise, and a route for socialising.

6.3 Small firms impact test and competition assessment

No firms are exempt from this byelaw as it applies to all firms who use the area, therefore it does not have a disproportionate impact on small firms. It also has no impact on competition as it applies equally to all businesses that utilise the area.

6.4 Risks and assumptions

Table 5 Risks associated with bait collection and hand gathering activities. Action needed to address risks and the desired outcomes.

The risk	The required action point	Desired outcome
Lack of clarity in the difference between commercial and recreational activity	Understanding the difference between commercial and recreational activity	Assessment of the impacts of any management on socio economic activity
Intensity of effort	Understanding the intensity of effort at sites (quantity and frequency)	Proportionate management measures
Effort/method impacts on stocks	Understanding effort impacts on populations/stocks	Sustainable fisheries stock supported
Effort/method impact on ecosystem	Understanding effort impacts on ecosystems	Protect wider environment and ecosystem function
Effort/method impacts on designated sites	Understanding effort impacts on conservation site features	Designated sites achieve their targets
Clarity on sustainable effort	Understanding what level of harvesting is sustainable	Support sustainable fisheries in the community
Lack of clarity on regulator roles	Having clarity on regulators roles and responsibilities	IFCA duties fulfilled
Lack of clarity around metrics describing the situation	Understanding what metrics best describe the situation	Levels of activity, sites affected, economic impacts, ecosystem impacts status and trends clearly communicated
Lack of clarity on management tools	Understanding the tools at our disposal	Optimal management delivered
Not knowing the stakeholders	Understanding who are the key stakeholders	Engagement with the correct audience
Not knowing the stakeholders needs	Balancing stakeholder needs correctly	Stakeholder needs accounted for
Not knowing the most effective stakeholder engagement methods	Understanding how best to engage stakeholders	Effective engagement with a maximum number of stakeholders

The umbrella of bait collection and hand gathering encompasses a number of activities as set out in table 1 to 4 above. In prioritising work, and the associated risk of each activity, a priority scoring system, such as the matrix assessor below, can be used.

Table 6 Risk assessor matrix

Commercial activity observed in District			
Activity observed in District. No commercial activity observed			
Activity not observed in District. Maybe observed in neighbouring District			
	No impact on stock/population or ecosystem	Impact on stock/population or ecosystem. Reputation damage likely.	Impact on MPA or human health (entering the human food chain)

Potential displacement of hand gathering effort is difficult to quantify, and impossible to predict where exactly activities will be displaced to. However, given that collection would still be permitted across the District within stipulated bag limits, negligible displacement is anticipated.

7.0 Conclusion

- 7.1 Sussex IFCA has a duty to manage the exploitation of sea fisheries resources in the District to ensure that it is carried out in a sustainable manner, whilst balancing the different needs of persons engaged in the exploitation of sea fisheries resources in the District.
- 7.2 The new Sussex IFCA Hand Gathering Permit Byelaw 2021 is proposed to support management. These recommendations have in part been developed as a result of the HRA process and the assessment of evidence, which also further highlighted evidence gaps and the need to utilise management to help fill these gaps.
- 7.3 Although there exists an absence of information on extent and nature of hand gathering, the Authority's officers have used estimates on the annual number of potential permit holders expected and the associated compliance costs. Estimated monetised costs are low in comparison to other fisheries. However, the introduction the management regime will allow a much better understanding of the activities taking place and enable future changes if needed..
- 7.4 It is anticipated that the proposed bag limits, additional spatial measures and requirement for a permit will benefit bait species and shellfish populations through a reduction in gathering pressure, thus contributing towards the sustainable development of fisheries within the Sussex IFC District. Restrictions will also help fulfil Sussex IFCA's duties with regards to furthering the conservation objectives within MPA sites.

Recommended option:

The creation of a Sussex IFCA Hand Gathering Permit Byelaw with associated site-based restrictions and a commitment to a review in four years.

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Supporting Evidence Pack

Annex 1 – [Bait and Hand gathering evidence report](#). A summary of all evidence obtained by Sussex IFCA to support the byelaw making process.

Annex 2 – Chichester and Langstone Harbour SPA (Chichester Harbour only) [Habitats Regulation Assessment](#). An assessment for Bait collection and Hand gathering activity within Chichester Harbour. Taken to the appropriate assessment stage of the HRA process due to the IFCA deciding it could not be ruled out that the activity (bait collection and hand gathering) would not have a significant impact on the supporting habitats for protected bird species within Chichester Harbour.

Annex 3 - Solent Maritime SAC (Chichester Harbour only) bait and hand collection [Habitat Regulations Assessment](#)

Annex 4 - Dungeness, Romney Marsh and Rye Bay Special Protection Area – Intertidal hand gathering & bait collection [Habitats Regulation Assessment](#). As above, for the Rye bay area.

Annex 5 – TEMITH [Sediment disturbance report](#). A summary of the work undertaken by the University of Portsmouth, in partnership with the European Space Agency, which used satellite imagery to train a model to recognise scarring on the mudflats of Chichester Harbour from sediment disturbance caused by bait collecting and hand gathering. This document helped bolster our own evidence base in favour of management.

Reports are available upon request – contact: admin@sussex-ifca.gov.uk