Common octopus (*Octopus vulgaris*) blooms off the Southwest of the UK: History, trends, causes and consequences

Report on Work Package 1: History, causes and consequences of octopus blooms

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Contents

1 Executive Summary

Biology of the common octopus:

Common octopus, *Octopus vulgaris*, is a native species in the UK, but apart from three notable exceptions of population bloom over the past 125 years (plus in 2025), it is normally uncommon in our waters, with a predominately south-westerly distribution in the UK due to its preference for warmer waters. Its main distribution and fisheries for the species are in southern Europe, the Mediterranean and northern Africa.

Common octopus is a highly adaptable species with fast growth rates, high fecundity and a short life span, generally less than 2 years. Consequently, its populations are often highly variable and strongly influenced by environmental conditions. It is a voracious and adaptable predator with a preference for crustaceans such as crabs and shrimp, followed by bivalves and small fish. It is also preyed upon by species such as Risso's dolphins (*Grampus griseus*), blue sharks (*Prionace glauca*) and conger eels (*Conger conger*).

History and causes of the octopus blooms off southwest UK:

Multiple lines of evidence confirm a bloom in numbers of common octopus off the southwest coast of the UK in 2025, which appears to be at least as extensive as previous blooms in the same area in 1899-1900, 1932-33 and 1950-51. The most comprehensive data on the bloom of octopus in 2025 comes from fisheries landings statistics and observations by commercial fishermen, and from reports by recreational divers. They first alerted both us and the public (through the media) of the bloom in octopus in early 2025. Commercial landings of common octopus in 2025 were almost 65 times higher than the average annual landings from 2017 to 2024. Long-term scientific datasets such as the MBA demersal fish survey and the University of Plymouth Baited Remote Underwater Video (BRUV) surveys, data archives which include citizen science (e.g. DASSH and NBN), and the South West Marine Ecosystems programme have also been crucial for documenting the current octopus bloom and putting it into historical context.

Environmental conditions during both this bloom and all the previously known significant blooms in the UK have been characterised by unusually warm temperatures (sea and atmosphere) during both the peak year and the preceding year. This is thought to have increased breeding during the previous year, increased survival of young octopus over winter, and then led to rapid growth into adults during the main period of the bloom. Salinity off the southwest of the UK has also been lower than usual during these years, possibly indicating the role of sustained easterly winds in bringing young octopus (as larvae) to the UK from the Channel Islands and northern France.

Modelling of ocean currents showed that during these conditions larval octopus can be transported from the Channel Islands to the SW coast of the UK. This is significant because there has been a large bloom of octopus in Guernsey since the middle of 2024 which may have fed into the UK bloom in 2025. Although above average numbers of common octopus were first seen off south Cornwall in 2022, the most recent widespread bloom in numbers in UK waters has only really occurred in 2025. The role of movement in octopus blooms is poorly understood.

Effects of the octopus bloom on the fishing industry off southwest UK:

The current UK octopus bloom has had a very mixed effect on the fishing industry. The largest negative effects have been on those fishing for brown crabs (*Cancer pagurus*), European lobsters (*Homarus gammarus*) and king scallops (*Pecten maximus*) due to high levels of predation by octopus in fishing gear and likely in the natural environment. Some of these fishermen, but not all, were able to adapt to catching octopus instead of crabs and lobsters and therefore did well economically for a period of time. Overall, 57.6% of the crab and lobster fishermen we surveyed said the octopus bloom had a negative effect on their business between January and August 2025. In comparison, 27.3% of those fishermen said the bloom had been positive during that time period, while the other 15.2% said it had a neutral effect.

Landings of brown crabs and king scallops in southwest UK (ICES area 7e) dropped by approximately 50% for the period from January to September in 2025 compared to the same period in 2024, while the decrease for lobsters has been approximately 30%. While these declines will have been caused by a variety of factors, predation by octopus is likely to have played a significant role.

While some of the fishermen we surveyed benefited from the current octopus bloom for a period of time, most are worried about the future. Octopus catches dropped substantially from August to October, although rose in November for some boats before falling again in December. If octopus numbers are low this year, but have significantly reduced stocks of brown crabs, lobsters and scallops, then fishermen fear they will have little left to catch. Likewise, if the octopus do come back strongly this year then fishermen will still be worried about the effects on their traditional fisheries for shellfish.

<u>The Future</u>

The chance of the current octopus bloom either continuing or reoccurring in the near future appears to be high. We have shown good evidence that octopus blooms in the UK are driven by warmer than usual conditions, which have become increasingly common in recent years due to anthropogenic climate change. We also received numerous reports of common octopus breeding in UK waters in 2025 (only ever seen a handful of times in the past) and recent reports of juvenile common octopus becoming abundant in fishermen's catches. However, exactly when the next bloom will occur and how it will compare to the current one is very difficult to predict.

<u>Recommendations</u>:

- Establishing the full effect of the current bloom on other species such as crabs, lobsters and scallops will require further research and monitoring. We recommend the continuation and expansion of monitoring programmes such as the MBA trawl surveys and University of Plymouth Baited Remote Underwater Video (BRUV) surveys, along with enhancement and timely publication of the crab, lobster and scallop stock assessments run by Cefas.
- We also recommend the development of models (such as 'OctoPulse') based on environmental data to help predict future blooms, and increased effort to detect the presence of larval octopus in the plankton, which could ground truth models and provide early warning of future blooms.
- Large-scale movement or migration of common octopus has never been definitively detected, therefore its role in creating blooms is unknown. Acoustic tagging of octopus has not been done previously in UK waters, but could be very revealing, especially given the widespread array of acoustic receivers now present throughout the English channel
- We also recommend developing easier and more efficient ways of gathering observations of octopus catches and effects from fishermen, for example, through a user-friendly App or incorporation into existing catch reporting systems and the use of species ID guides.
- Beyond fisheries effects, there is a further research need to understand how the sudden influx of a previously rare species (in this case common octopus, but you can draw parallels with bluefin

tuna) affects marine ecosystem function and resilience, especially in light of ongoing climate change and other increasing human pressures.

- Should the current octopus bloom continue or re-occur and / or other shellfish fisheries not recover, it is likely that the fishing industry would benefit from support to help adapt fishing gear and methods. Likewise, if the octopus do not return but other shellfish fisheries remain depressed, then the fishing industry would also benefit from support.
- We therefore also recommend an urgent investigation into the social and economic impact of the octopus bloom on the affected fishing industry and communities and how best to respond.

2 Background and goals of project

In early 2025, fishermen working off the south coasts of Devon and Cornwall began reporting an increasing presence of common octopus (*Octopus vulgaris* – hereafter referred to as 'octopus') when hauling their crab and lobster pots. While a significant quantity of octopus has subsequently been landed and sold (particularly at Brixham and Newlyn – the two main markets), there were also widespread reports (and photos) of these octopus causing mortality of crabs and lobsters and even scallops in their pots. Fishermen in the Devon and Severn Inshore Fisheries and Conservation Authority (IFCA) district feared that the compulsory escape gap on parlour pots and creels in that area was allowing many of the octopus to also escape after they had killed and at least partly consumed crabs and lobsters. This was reported to have caused significant loss of earnings among the fishermen affected. Subsequent clarifications around the legislation now highlight that fishermen can close this escape gap and target octopus directly, but only if they agree to release any crabs, lobsters or spiny lobsters they have captured in such modified gear. The effects of this change on fishermen's income have yet to be realised.

Landings data and anecdotal reports indicate that the numbers of octopus have dramatically increased in several places in the Northeast Atlantic in recent years e.g. reports of blooms in Brittany since 2021 and the Channel Islands since the middle of 2024. Given the significant effect of octopus blooms on the fishing industry and presumably the wider ecosystem, and the potential for such blooms to increase in the future due to climate change, we were commissioned to undertake a rapid response project to assess the history of such octopus blooms, recent and evolving trends in abundance, the potential causes, and the current effects.

Our research is guided by a steering group which includes representatives from the fishing industry in Devon and Cornwall, the Devon and Severn IFCA, the Cornwall IFCA, Defra and the MMO. We are meeting with this steering group monthly throughout the project.

We separated our planned work programme into two parts: **Work package 1** was designed to respond rapidly to the current situation and to document reports of octopus occurrences and the challenges being experienced by the fishing industry. **Work package 2** is running concurrently but is a slightly longer-term element designed to produce fisheries-independent estimates of octopus abundance and to monitor how this evolves over time. We will also document octopus behaviour underwater to better understand their interactions with shellfish pots and other species.

This report covers **Work package 1 (WP1): History, causes and consequences of octopus blooms.**

We outlined **four key deliverables** from WP1:

- Synthesis of the biology of *Octopus vulgaris*
- Comparison of the magnitude of the current bloom in a historical context and analysis of the potential causes of both this and previous blooms
- Documentation of the current bloom in terms of timeline and geographical spread
- Documentation of the effects of the current bloom on fishing operations in the SW of the UK and if or how fishermen have adapted

3 Biology of the common octopus (*Octopus vulgaris*)

3.1 Identification

The *Octopus vulgaris* complex is one of the most widely distributed group of octopus species, found in temperate and tropical waters worldwide, with *O. vulgaris* sensu stricto (ss) having notable populations in the Mediterranean Sea and along the Atlantic coasts of Europe and Africa (Amor et al. 2017). It is also the most studied octopus species; a recent review by Rosa et al (2024) found that despite there being approximately 300 octopus species in the world, over half of the published studies are on *O. vulgaris*. Adult individuals typically reach a mantle length of up to 25 cm, with an arm span extending over 1 m and weights from 2 to 3 kg, but they can grow to over 10 kg. The skin is highly variable in colour and texture, allowing for remarkable camouflage abilities. Its body is bulbous with a smooth mantle surface, and it possesses eight long, robust arms equipped with two rows of suckers. The species is renowned for its intelligence, displaying complex behaviours such as problem-solving and tool use (Norman, 2000).

O. vulgaris inhabits rocky substrates, seagrass beds, and sandy areas, often seeking shelter in crevices or burrows. It is primarily nocturnal, feeding on crustaceans, molluscs, and fish. The reproductive cycle includes the laying of hundreds of thousands of eggs, which the female guards and aerates until hatching. Lifespan is generally short, averaging 1–2 years (Boyle & Rodhouse, 2005).

Eledone cirrhosa, commonly known as the curled octopus, is normally much more common in British waters than *O. vulgaris*. It is smaller than *O. vulgaris*, with a mantle length typically reaching 12–20 cm and shorter arms that are often curled at the tips, a key identification feature. The mantle is covered with fine granulations, giving the skin a rough texture. Unlike *O. vulgaris*, *E. cirrhosa* only has a single row of suckers on each arm (Roper, 2005). Despite these differences, *O. vulgaris* and *E. cirrhosa* sometimes get confused or grouped together, including in commercial fisheries landings and statistics. This is problematic for tracking the evolution of fisheries for the two separate species. We have provided a more detailed guide to the differences in Appendix 9.1.

3.2 Distribution

The *O. vulgaris* species group exhibits a broad geographical distribution, inhabiting the Atlantic Ocean, Mediterranean Sea, and parts of the Indian and Pacific Oceans (Norman, 2000). In the northeast Atlantic its range extends from the coastline of southern England and Ireland, throughout the Mediterranean basin, to the coasts of West Africa and the Americas (Boyle & Rodhouse, 2005). The southwest of the United Kingdom represents the northern extent of the species main range, but occasional specimens are found in the Eastern English Channel, The Irish Sea and the North Sea (MarLIN)

3.2.1 Habitats and environmental tolerances

The species is typically found in shallow coastal waters, preferring rocky substrates, seagrass beds, and sandy or muddy bottoms where it can construct dens (Mather, 2012). Depth preference generally ranges from the intertidal zone to approximately 200 metres, though individuals have been recorded at greater depths.

O. vulgaris demonstrates notable adaptability to varying environmental conditions. It thrives in water temperatures ranging from approximately 10°C to 28°C, with optimal physiological performance typically between 16°C and 22°C (Mangold, 1983). This temperature tolerance enables

O. vulgaris to inhabit both temperate and subtropical waters. The species also tolerates a wide range of salinities but is most commonly found in salinity levels between 30 and 38 PSU (Practical Salinity Units). However, *O. vulgaris* can survive short-term fluctuations outside this range, which is advantageous for life in estuarine and coastal environments where salinity can vary due to freshwater influx or tidal movements (Roura *et al., 2023*).

3.3 Trophic ecology

O. vulgaris is an adaptable marine predator with a diverse diet. Its sophisticated hunting techniques and anatomical adaptations enable it to thrive in various marine environments and play a significant ecological role.

Its diet and predatory habits position it as a mesopredator within the marine food web, typically occupying a trophic level between 3.6 and 4.0, depending on local food web structure and prey availability (Navarro & Villanueva, 2000). This intermediate trophic status enables *O. vulgaris* to play a crucial role in linking lower trophic levels, such as herbivorous invertebrates, with apex predators like sharks and marine mammals.

3.3.1 Ecological Role

O. vulgaris serves as both predator and prey, exerting top-down control on invertebrate populations while providing a crucial food source for higher trophic levels, including fish, marine mammals, and seabirds (Ajana *et al*., 2018). Its den-building and foraging activities contribute to habitat complexity and nutrient cycling within benthic ecosystems. The species' ecological flexibility allows it to adapt to variable environmental conditions, underscoring its importance in maintaining the resilience of coastal marine communities.

3.3.2 Opportunistic carnivorous feeding behaviour*:*

O. vulgaris employs a variety of hunting strategies: active pursuit, ambush, and the use of its dexterous arms to extract prey from crevices (Ajana *et al*. 2018.). The beak and salivary papillae are used to penetrate shells and inject paralysing toxins (Legana *et al.* 2018.). Its feeding activities can significantly influence benthic community structure and prey population dynamics in both the plankton life stage (Roura *et al* 2023) and in the adult stage (Papadopoulo, K. *et al*. 2023).

Its diet mainly includes crustaceans such as crabs (*Carcinus maenas, Cancer Pagurus and Necora puber*), lobster (*Homarus gammarus*), bivalves like mussels, clams, and the great scallop (*Pecten maximus*), which it accesses by drilling shells and injecting paralysing saliva (Fingerhut *et al*. 2018; Suyeon *et al.* 2023). Dietary components also include fish species, prawns, other cephalopods and even brittle stars and polychaete worms (Sealifebase).

3.3.3 Quantitative estimates of daily food consumption

Scientific studies indicate that the daily food consumption of *O. vulgaris* varies according to several factors, including age, size, temperature, and prey type. On average, adult octopuses consume between 3% and 6% of their body weight in food per day under natural conditions (Wells and Clark, 1996; Eaton, 2019). Juvenile individuals may exhibit higher relative intake rates, sometimes exceeding 10% of their body weight daily due to their rapid growth requirements (Fingerhut *et al.* 2018;).

In controlled laboratory settings, food intake can be more precisely measured. For example, studies have shown that an adult *O. vulgaris* weighing around 1 kg will typically consume 30–60 g of food per day. However, intake can fluctuate based on the nutritional quality and digestibility of the offered prey (Mangold, 1983; Fiadino and Farina, 2024).

3.3.4 Dietary preferences and nutritional requirements

The diet of *O. vulgaris* is diverse, but there is a clear preference for crustaceans such as crabs and shrimp, followed by bivalves and small fish (Nixon, 1987). The species exhibits selective feeding to optimise nutrient intake, particularly proteins and lipids, which are essential for growth and reproduction (Varo *et al.* ,2017).

Nutritional studies have revealed that *O. vulgaris* requires a diet rich in protein, with optimal growth observed when protein constitutes at least 45–50% of the diet by dry weight. Lipids are also important, though in lower proportions (around 5–10%), serving as a critical energy source, especially during periods of rapid growth or reproduction (Navarro & Villanueva, 2000).

For context only; if a single *O. vulgaris* specimen lived for two years and the sole dietary component was brown crab, *Cancer pagurus* from 150 days after hatching, a female specimen would consume 155.6 kg and a male, 166.8 kg (live weight) of this prey. Evidently in a real-world setting prey consumption would be far more diverse.

3.3.5 Factors affecting food consumption

- Temperature: As ectothermic animals, the metabolic rate and food intake of octopuses increase with rising water temperatures, up to an optimal threshold beyond which consumption declines, this is between 16-21°C for *O. vulgaris* (Gimenez and Garcia, 2002).
- Body Size and Age: Younger octopuses and juveniles consume more food relative to their body weight than adults, reflecting their higher metabolic and growth demands (Navarro & Villanueva, 2000).
- Reproductive Status: Food intake may decrease during brooding or egg-laying phases, as females often cease feeding while guarding eggs (Wang *et al.*, 2022).
- Prey Availability and Diversity: In environments with abundant and diverse prey, octopuses may exhibit greater food intake and dietary breadth (Mather, 2009).

3.3.6 Feeding adaptations:

Anatomical features such as a strong chitinous beak and radula enable breaking and rasping of prey, while suckers equipped with chemoreceptors assist in prey detection. Venomous saliva immobilizes prey and aids digestion, especially of hard-shelled organisms (Fingerhut *et al*. 2018; Suyeon *et al.* 2023).

3.3.7 Diet variations and ecological role:

Dietary preferences vary with age, size, season, and region, with juveniles targeting smaller prey such as brittle stars and polychaete worms and adults larger prey species such as brown crabs, *C. pagurus* and king scallops, *P. maximus*. Octopuses regulate benthic populations through predation, and their dens often contain remains of preferred prey, reflecting their flexible foraging strategies (Whitelaw *et al.*, 2020).

3.4 Predators

O. vulgaris is predated upon by many species, dependent on both location and life stage. Reported predators include squid, *Loligo forbesi,* which preys on smaller specimens, Risso's dolphin, *Grampus griseus,* sea otter*, Lotra felina,* and spurdog, *Squalus acanthias,* along with a high degree of cannibalism (Sealifebase). These predators are common in waters off southwest of the UK, although very few previous reports of predation on *O. vulgaris* in UK waters exist, probably due to both misidentification of octopus and the normal scarcity of the *O. vulgaris* in the UK.

Numerous reports of predation of the common octopus by the conger eel, *Conger conger*, the blue shark, *Prionace glauca* and larger gadoids such as ling, *Molva molva* have been reported during the current UK outbreak (Figure 3.1 as credited, and Dave Uren and Murray Collings *pers. comm.)*. The smaller octopus, *E. cirrhosa* is reported to be a major component of the diet of gadoids such as the cod, *Gadus morhua* and haddock, *Melanogrammus aeglefinus*, conger eel, *C. conger* and ling *M.molva* (Sealifebase). It is likely that these species would also prey on *O. vulgaris* when available.

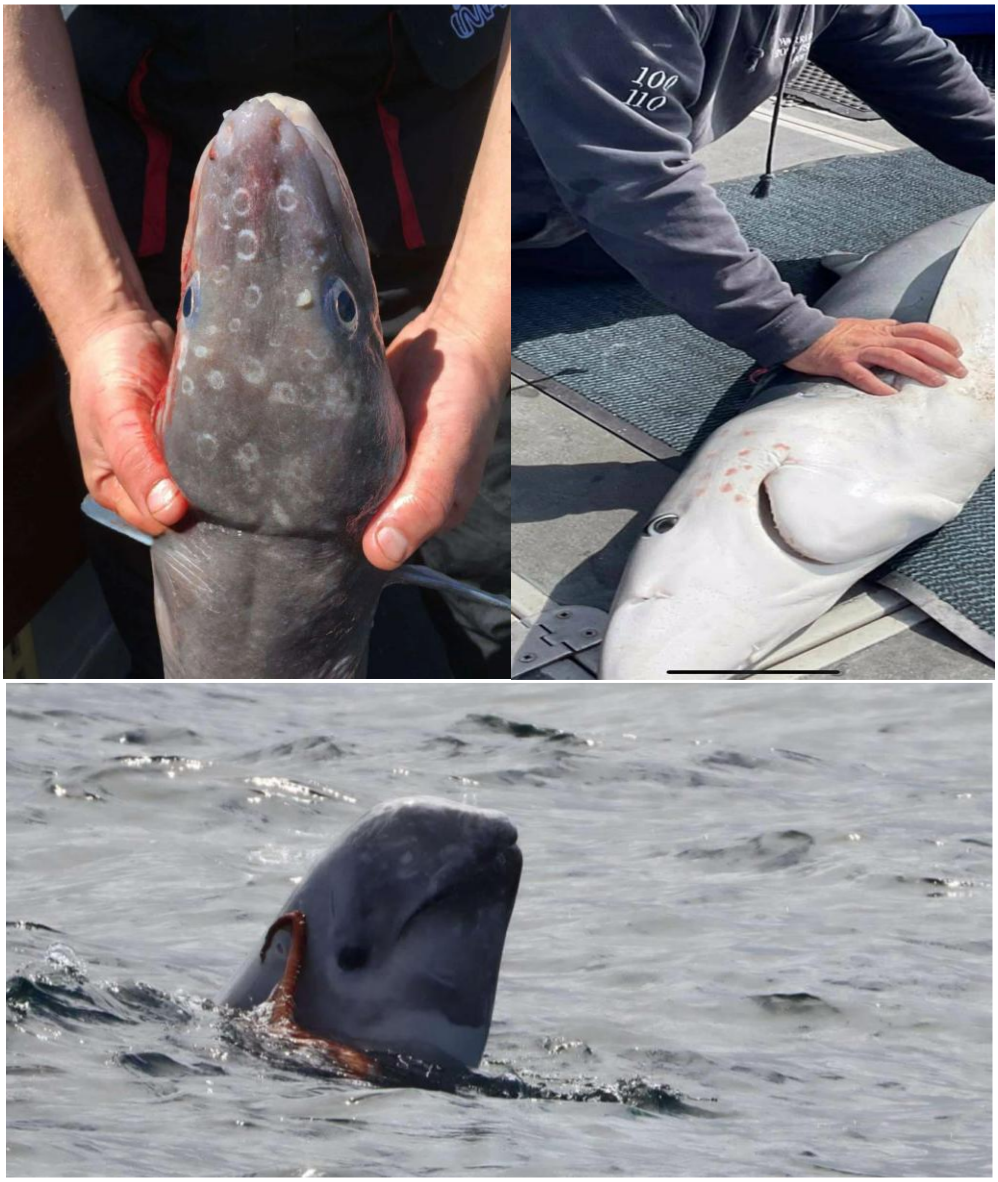

Figure 3.1: Photos taken off the southwest of the UK during 2025 of known predators of octopus, top left Conger eel, *Conger conger* (photo: John Locker), top right blue shark, *Prionace glauca* (photo: Pete Davies) showing clear sucker marks from interactions with octopus, and bottom Risso's dolphin, *Grampus griseus* (photo: AK Wildlife Cruises) with an octopus.

3.5 Evolution and genetics

O. vulgaris exhibits remarkable evolutionary adaptations and genomic features that underpin its complex behaviour and ecological success. Its lineage diverged from other molluscs millions of years ago, leading to distinctive traits such as advanced neural development and sophisticated camouflage. Complex organs such as the eyes evolved separately from those of vertebrates, and example of convergent evolution.

- **Evolutionary lineage and adaptations:** *O. vulgaris* belongs to the class Cephalopoda and evolved during the Cambrian approximately 530 million years ago. This evolution involved loss of an external shell, increased brain size, and development of advanced sensory organs, supporting a benthic lifestyle with complex behaviours like camouflage and jet propulsion (Albertin *et al.*, 2015; Kröger *et al.*, 2011).
- **Genomic complexity and neural innovations:** The octopus genome is large for an invertebrate, approximately 2.8 billion base pairs spread across 30 chromosomes, with abundant repetitive sequences and transposable elements. Notably, gene families related to neural development, such as protocadherins, are expanded, facilitating sophisticated brain functions. Extensive RNA editing in neural tissues further enhances protein diversity and cognitive abilities (Albertin *et al.*, 2015; Albertin and Katz, 2017;).
- **Adaptive genomic traits:** The genome encodes mechanisms for rapid colour change through chromatophores and other pigment cells, venom production, arm regeneration, and environmental sensing. Multiple gene copies linked to immune function and stress response enable *O. vulgaris* to thrive in diverse and changing marine habitats (Albertin *et al.*, 2015; Albertin and Katz, 2017; Rangan & Reck-Peterson, 2023).

O. vulgaris was considered a cosmopolitan species until recently but is now classed as a complex of at least six separate species identified by both mitochondrial and nuclear DNA sequencing. (Avendaño, O. *et al.*, 2020). These species have subtle morphological differences and inhabit different spatial areas. It is currently accepted that *O. vulgaris sensu stricto* (ss) occurs in the Mediterranean Sea as well as the central and northeast Atlantic Ocean (Amor *et al.* 2017).

3.6 Reproduction, life history, age and growth

3.6.1 Reproduction, spawning, and egg production

Reproduction in *O. vulgaris* is semelparous, with individuals engaging in a single reproductive event before death (Boyle & Rodhouse, 2005). Mating is preceded by elaborate courtship displays, and males use a specialised arm (hectocotylus) to transfer spermatophores to the female's mantle cavity. Females lay large numbers of small eggs, (typically between 100,000 and 500,000, dependent on size, age, and environmental conditions) (Mangold & Boletzky, 1973; Boyle & Rodhouse, 2005). Eggs are attached in strings to hard substrates in sheltered underwater locations, the female devotes herself to egg care, constantly cleaning and aerating the eggs until they hatch. During this period, the female does not feed and usually dies shortly after the eggs hatch (Boyle & Rodhouse, 2005, Casalini *et al.* 2020).

Embryonic development lasts several weeks, after which planktonic paralarvae emerge, dispersing in the water column before settling to the benthos. Lifespan is typically 1–2 years, with rapid growth and high mortality post-reproduction spawning.

3.6.2 Overview of life cycle

The life cycle of *O. vulgaris* consists of three main phases: embryonic development, a planktonic (paralarval) stage, and a benthic (juvenile to adult) stage. The transition between these phases is marked by important ontogenetic changes in morphology, physiology, and ecological niche (Boyle & Rodhouse, 2005).

3.6.2.1 The Two-Stage Growth Pattern

The "two-stage growth" concept divides the post-hatching life of *O. vulgaris* into two main periods: the planktonic paralarval stage and the benthic juvenile/adult stage. Each of these stages is characterised by distinct growth rates, feeding strategies, and environmental adaptations (Iglesias et al., 2007). The growth rates during these two stages are discussed further in section 3.6.3.

A: Planktonic Paralarval Stage

Upon hatching, *O. vulgaris* paralarvae remain suspended in the water column, becoming part of the plankton community. This paralarval stage typically lasts from several weeks to a few months, depending on environmental factors such as temperature and food availability (Mangold & Boletzky, 1973). During this time, paralarvae exhibit several key features:

- Small Size: Newly hatched paralarvae are approximately 2–3 mm in mantle length.
- Feeding: Their diet consists of zooplankton, including copepods and other small crustaceans, which they capture using their arms and developing beak.
- Growth Rate: Growth during this stage is relatively slow, attributed to high metabolic rates and limited efficiency in prey capture.
- High Mortality: Paralarvae are particularly susceptible to predation and environmental fluctuations, resulting in significant mortality rates (Roura *et al.* 2023).

B. Benthic Juvenile and Adult Stage

The shift to the benthic stage, often known as "settlement," is a major ontogenetic transition. At this point, young octopuses descend to the sea floor and adopt a demersal lifestyle. This stage is distinguished by several important characteristics (Roura *et al.* 2023).

- Rapid Growth: Growth rates increase considerably as the animal gains access to a broader range of prey and refines its hunting techniques.
- Diet Shift: The diet expands to include benthic crustaceans, molluscs, and fish, which allows for more efficient energy intake.
- Morphological Changes: The development of arms and suckers progresses, and chromatophore patterns become more pronounced, enhancing camouflage and predation abilities.
- Reduced Mortality: Survival rates improve as octopuses become better equipped to evade predators and utilise complex habitats.

Physiological and ecological implications

The two-stage growth strategy of *O. vulgaris* enables exploitation of diverse ecological niches. The planktonic phase facilitates dispersal and gene flow, while the benthic phase supports rapid growth and maturation. Nonetheless, the planktonic stage serves as a bottleneck for population recruitment due to high mortality rates, and environmental changes affecting planktonic prey or ocean currents can have significant effects on recruitment success (Villanueva & Norman, 2008).

Applications and significance

Understanding the two-stage growth of *O. vulgaris* is essential for the development of sustainable fisheries and aquaculture practices. In captivity, survival through the paralarval stage remains a challenge, as replicating natural planktonic diets and conditions is difficult. Research efforts are focussed on optimising early-stage nutrition and husbandry practices, with the aim of improving juvenile yields and supporting stock enhancement programmes (Iglesias et al., 2007).

3.6.3 Growth

O. vulgaris exhibits a distinctive two-stage growth pattern characterized by an initial rapid exponential phase followed by a slower asymptotic phase as it approaches maturity. This growth dynamic plays a vital role in its biology and has important implications for fisheries management and aquaculture (Sanchez *et al.*,2014).

The first phase involves rapid exponential growth driven by high protein synthesis and feeding, while the second phase shows slowed growth approaching a maximum weight, coinciding with reproductive investment. This pattern is linked to metabolic and hormonal changes and is influenced by the species' semelparous life cycle (Guerra *et al.* 2013).

Early growth is modelled using an exponential equation describing body weight increase, whereas the mature phase is represented by a logistic growth equation reflecting asymptotic weight limits. Transition timing is analysed through piecewise regression techniques (Semmens *et al.*, 2004; Guerra *et al.* 2013).

However, growth can be modelled using combined models such as the von Bertalanffy growth function (sealifebase) or a third order polynomial function (Domain *et al*, 2000) (Figure 3.2)

Laboratory and field studies confirm the two-stage growth, showing that environmental factors like temperature, food availability, and population density affect growth duration and intensity. Tagging and recapture methods have validated these findings in natural populations (Guerra *et al*, 2010).

The growth strategy enhances survival by rapidly reaching a size refuge from predation and later reallocates energy to reproduction. Temperature and nutrition significantly influence growth rates and maximum size, with important consequences for fisheries and aquaculture management (Forsythe and Hanlon, 1988; Guerra *et al*, 2010).

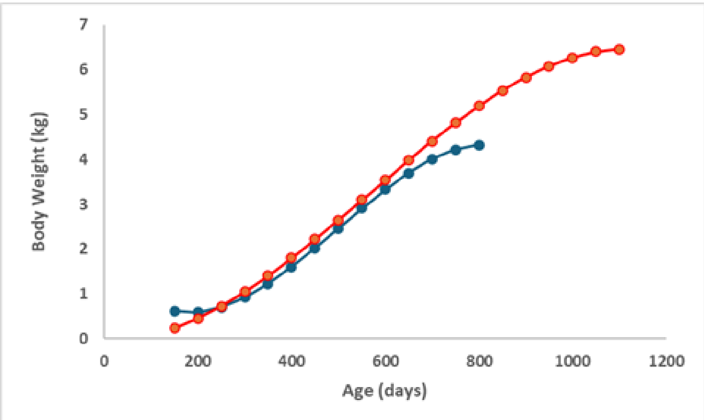

Figure 3.2: The growth curve for male (red) and female (blue) *Octopus vulgaris* using a third order polynomial equation described by Faike *et al.* (2023). The equation was derived from the analysis of the stylets vestigial shells of *O. vulgaris* captured off the coast of Morocco and suggested an extended life cycle for the species in this area.

3.6.4 Life span

Lifespan of *O. vulgaris* is considered by most investigators and reports to be in the region of 1-2 years with males living longer than females (Rosa et al (2024)) and these values agree with the ICES Report of the Study Group on the Life History and Assessment of Cephalopods (1993) and the subsequent report by Sánchez et al. (2015), also by ICES. The authors state that large variation in body size and mass was frequently observed in the species and that diet only explained part of these differences.

However, Faike *et al*. (2023) suggested a lifespan of up to 3 years for the species, through analysis of the stylets vestigial beaks in the species off the coast of Morocco. These values are outliers from other observational studies, so may represent either real increases in lifespan for the species in Moroccan waters or issues with the methodology.

No studies were found for the lifespan of *O. vulgaris* in the English Channel.

3.7 Movement

The vast majority of studies on *O. vulgaris* to date suggest that movement of the species is relatively limited. *O. vulgaris* does have the capacity swim at speeds of up to 4.47 m/s for short bursts and uses three main swimming technique, namely jet swimming, headfirst swimming and arm swimming (Kazakidi et al., 2012). However, no movement studies have provided strong evidence that *O. vulgaris* makes large spatial migrations. For example, a mark and recapture study carried out in the Ría de Vigo, Spain, recaptured 80.5% of individuals within 5 km from the release site, with 13.9% between 5 and 20 km away, and only 5.5% more than 20 km (Fuentes & Iglesis, 2010). Likewise, Mereu *et al.* (2015) who used acoustic telemetry, found that 80% of *O. vulgaris* movements were within 1 km of the release point, regardless of the numbers of days of freedom and that the species had a strong preference for rocky substrates.

Papadopoulo *et al*. (2024) found that mean weekly activity space was 0.16 km^2 for acoustically tagged *O. vulgaris* in Galicia, Spain. However, six individuals (four females and two males) dispersed from the study area, towards the edge of the acoustic array followed by a cessation in the detections. Dispersal occurred through the western part (connecting with open ocean) of the array in all six cases, suggesting movements toward the continental shelf. Mather and D'or (1991) suggested that both foraging time and movement were dependent on the presence of predators.

It should be noted that none of the above studies were performed in macro tidal areas or in the north of the range of *O. vulgaris*, for example, in UK waters. The English channel, where both the current and previous UK octopus blooms have occurred is well known for its strong and complex tidal system (Dietrich 1951) which could help facilitate larger scale movement of octopus. Indeed, Rees and Lumby (1954) speculated that cross channel migration played a role in the occasional octopus 'plagues' seen in UK waters, but admitted that there was no definitive evidence for this. However, their observations of fishermen's catches did provide more support for offshore to inshore (deep to shallow water) seasonal movements, in common with the reports from fishermen in this study (see section 6).

3.8 Population dynamics

Populations of *O. vulgaris* show large fluctuations in densities both seasonally (Katsanevakis & Verriopoulos, 2006) and annually (Ciércoles *et al.* (2019)), driven by the variations in life cycle parameters and stage densities and the strong influence of environmental variables.

Sea Surface Temperature (SST) has been found to be an important factor in the distribution, growth and recruitment of *O. vulgaris* with an optimal temperature for growth and reproduction found to be between 15 and 16 °C , but temperatures between 16-22 °C were optimal for feeding in the Gulf of Cadiz (Sanchez *et al.* 2014). Though a higher optimal temperature of 22 °C for larval hatching was found by Rosa *et al* (2024) in the Mediterranean. Both the 1900 and 1950 *O. vulgaris* blooms in the UK (see section 4.1) were initially attributed to high SST in the English Channel (Garstang 1900, Rees, 1950) although Rees & Lumby (1954) doubted these conclusions and believed that hydrographic conditions contributed more to these blooms than temperature. However, the northwards expansion but overall contraction of the geographical range of *O. vulgaris* due to climate change has been predicted due to shortened embryonic developmental time leading to an increase in the percentage of smaller premature paralarvae with a 3°C warming from 18 to 21 °C (Repolho *et al.* 2014). Vargas-Yáñez *et al.* (2009) found that warm SST anomalies can have a detrimental effect on octopus landings in the following year and suggested that decreasing trend in octopus landings in certain areas could be partially linked to the long-term warming observed in the Western Mediterranean. But such findings are likely dependent on the geographical distribution of different octopus populations relative to the upper and lower boundaries of their ideal climatic envelope.

Sabrino *et al*. (2023) found that rainfall in the Gulf of Cadiz was an accurate predictor of the density of *O. vulgaris* in the following year, with a negative effect on adult abundance, but a positive correlation with recruitment. In the Algarve region of Portugal, Sonderblohm *et al.* (2014) found a positive relationship between the rainfall in October with *O. vulgaris* abundance the following year (lag-1), with other important correlations between environmental variables being the Western Mediterranean Oscillation index (lag − 1); Ekman transport; summer river run-off (lag − 1) and the horizontal and vertical component of wind stress. The importance of fishing pressure on *O. vulgaris* population size was also noted as a strong diver of subsequent *O. vulgaris* population densities (see section 3.9 below).

Both Sabrino *et al.* (2023) and Sonderblohm *et al*. 2014 indicated that the environmental variables described above were important factors in *O. vulgaris* recruitment due to the limited overlap of different generations in fisheries, with only one or two cohorts present at one time, short generation times, fast growth rates and high fecundity of the species.

A relaxation in upwelling intensity was found to be a predictor of *O. vulgaris* recruitment in the Iberian coastal regions, which correlated with reduced nutrient and chlorophyll levels (Otero et al. (2009)). This was presumed to be due to an increase in zooplankton levels which favoured paralarvae survival.

3.9 Fisheries

Octopod landings in northern Europe mainly consist of O. *vulgaris, E. cirrhosa*, and musky octopus, *Eledone moschata.* Landings in the European Union (EU) fluctuated between 2009 and 2017, peaking at 24,318 tonnes in 2013 before dropping to 16,464 tonnes in 2017 (Table 3.1). The main EU producing countries are Italy, Spain, Portugal and Greece. These Member States accounted for 90% of EU28 catches of *O. vulgaris* in 2017 (Table 3.1). Catches are highest in ICES area 27.9a (West coast of Portugal) followed by ICES area 27.8 (Southern Bay of Biscay and areas 27.7d, e (English Channel). The main countries exploiting octopods are Spain and Portugal, but additional data from ICES shows that in the last three years of the dataset, France also made a significant contribution to landings and that total EU landings increased in 2021 and 2022 up to 15,587 t, but decreased sharply in 2023 to 11,806 t (ICES, 2024)

Inshore local small-scale fishing fleets, mainly consisting of artisanal fishermen and inshore trawlers, targeting the common octopus in Portugal, Spain, Italy , Morocco, Mauritania and Greece are of considerable socio-economic importance in terms of providing employment and income in coastal fishing communities, with their worth often being underestimated by official landings statistics (Pita *et al,* 2021, Faike *et al* ,2023).

Table 3.1: EU catches of all octopus species combined from 2009 to 2017 (000s tonnes). Source: Case study: Octopus in the EU (2023).

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Croatia	0.146	0.141	0.149	0.166	0.192	0.313	0.331	0.257	0.135
Spain	6.752	4.759	5.317	3.536	6.231	3.914	4.073	5.311	3.531
France	1.191	1.621	1.644	1.629	1.89	1.531	1.39	1.559	1.609
Greece	1.58	1.487	1.426	1.301	1.705	1.835	1.646	3.316	2.741
Italy	4.841	4.063	4.789	3.336	2.787	2.387	2.68	2.37	2.672
Portugal	6.72	10.454	7.199	9.271	11.513	10.945	7.543	9.663	5.776
Other MS	0	0	0	0	0	0	0	0	0
Total EU	21.23	22.525	20.524	19.239	24.318	20.925	17.663	22.476	16.464

4 Abundance of common octopus off the southwest of the UK

4.1 *Literature review*

4.1.1 Historical blooms of *Octopus vulgaris*

1899-1900 bloom

Until 1899, sightings of *O. vulgaris* in the Plymouth area were reported to be rare, with any specimens obtained by fishermen for aquaria fetching 10 shillings (£560 inflation adjusted value as of August 2025) according to Garstang (1900).

The emergence and proliferation of the common octopus (*Octopus vulgaris*) along the south coast of England, particularly around Plymouth, during 1899-1900 was well described by Garstang (1900). Initially rare in the region since 1888, a marked increase in common octopus abundance was observed in 1899, correlating with reports of similar intensities in the Channel Islands and French coasts, where significant damage to shell fisheries had already been reported.

The primary causative factors identified include favourable environmental conditions, notably unusually warm summers and mild winters, which were thought to be conducive to the reproductive success and survival of warm-water species such as *O. vulgaris.* The observed invasion was thought to have originated from the opposite shores of the English Channel, with migration triggered by overcrowding and food scarcity in their original habitats hypothesised to be a key factor.

The ecological impact was thought to have been substantial, with extensive predation on shellfish stocks such as crabs, lobsters, and oysters. Empirical data from fishing experiments indicate a drastic decline in shellfish catch rates; for example, a daily baited pot survey revealed that approximately 70% of crabs and 30% of lobsters captured being victims of octopus attacks, with some bait alone being consumed by octopus entrants into pots. This predation was reported to have resulted in a substantial reduction in shellfish populations, evidenced by the reported "enormous damage" to fisheries and the passage of large numbers of crabs of unusual size, likely driven inshore by predation pressure.

Statistical analysis of total landings of shellfish further substantiates a significant decline in crab and lobster catches during 1900, with a notable sudden decrease following the initial increase in octopus presence. The data indicates that, while the decline appeared abruptly in 1900, the ecological effects had been developing since the previous year, aligning temporally with the reported invasion.

Remedial measures suggested included suspending crab and lobster fisheries temporarily to mitigate further stock depletion, and investigating trapping techniques utilized elsewhere in Europe, such as unbaited earthenware pots designed for octopus capture, which could potentially be adapted to local fisheries to control octopus populations during “the crisis”. The possible demise of the octopus bloom was the cold winter of 1900-1901 (Extreme weather watch.).

The 1899-1900 octopus plague along the south coast was said to epitomize an ecological disturbance driven by environmental conditions favourable to warm-water species, leading to reports of substantial economic and ecological consequences that even in 1900, warranted consideration of targeted management and remedial interventions.

Octopus bloom of 1932-33

During the summer of 1932, an increase in numbers of *O. vulgaris* was noted in the waters off Plymouth resulting in a peak in numbers during the August and September of 1933. However, numbers never appeared to approach those seen during the bloom of 1899-1900 and *O. vulgaris* numbers decreased during the subsequent year [1].

Octopus blooms of 1913, 1922 and 1948

Other increases in the abundance of *O. vulgaris* were observed in 1913, 1922 and 1948 in the waters off Brighton, East Sussex, when they were described as 'plentiful', but not comparable to the 'plague' in 1899-1900 Rees and Lumby (1954). The latter bloom largely consisted of smaller specimens (Rees, 1950). This author concluded that the cause of the 1913 increase in *O. vulgaris* was likely the warm summer of 1911 and favourable hydrographic conditions concentrating paralarvae in this area. He also considered that such factors contributed to subsequent blooms and noted that the 1922 bloom coincided with a large bloom off the coast of Finisterre in France (Rees, 1950).

Octopus bloom of 1950-51

The study of the abundance and distribution of *Octopus vulgaris* in the English Channel, as reported by Rees and Lumby (1954), yields several significant findings. Firstly, the species experienced a peak in abundance during 1950, comparable to the noted 'plague' of 1899-1900, with large numbers observed along both the French and English coasts (Rees & Lumby, 1954). This outbreak was thought to be driven primarily by immigration of adult octopuses from French waters into the Channel, likely influenced by peaks in water temperature during preceding winters, particularly winters where temperatures did not fall below approximately 10°C (Guiart, 1900, Tait, 1951). The bloom stretched as far eastwards as Bexhill in East Sussex, although the full effect of the bloom on shellfish fishermen extended as far as the east of Lyme Bay, where catches of 30 to 40 specimens of *O. vulgaris* a day by pot fishermen led to the temporary abandonment of the crab and lobster fishery (Rees & Lumby, 1954). The extension of large numbers of *O. vulgaris* into the waters of North Cornwall, North Devon and Lundy was not observed during this bloom.

Larval dispersal patterns were believed to indicate that the octopus's main breeding grounds were situated in the southwestern reaches of the Channel, especially along the coast of France from Ushant eastwards, including the Channel Islands (Guiart, 1900, Tait, 1951, Rees & Lumby, 1954). Larvae were thought to hatch predominantly in June on Brittany's north coast, subsequently dispersing through mid-Channel and around the Channel Islands by July, with their presence decreasing by September, suggesting a seasonal breeding cycle confined mainly to coastal waters during spring and early summer (Guiart, 1900, Baal 1953). Significant numbers of *O. vulgaris* larvae were observed by the pilchard egg cruises of the research vessel '*Sir Lancelot*' and the plankton cruises of the '*Manihine*' during 1949, which suggested widespread distribution of larvae in the English Channel with noticeable congregations in the central areas North of Cherbourg and the Channel Islands (Rees & Lumby, 1954).

The presence and abundance of adult octopus was closely correlated with winter sea temperatures, with notable outbreaks following mild winters where temperatures at the English Channel's mouth

[1] *Bull. Lab. Maritime Dinard* (*11-15*), 1938

remained above approximately 10°C. Such conditions were believed to favour reproductive success and juvenile recruitment, either through enhanced larval survival or increased immigration (Guiart 1900; Rees 1950, Rees 1952; Rees & Lumby 1954). Additionally, in 1950 juvenile octopus with arm spans around 70 mm, corresponding to age less than one year, were observed in the English Channel, supporting the hypothesis of recent reproduction and juvenile recruitment within this period [Guiart 1900; Rees 1950; Rees 1952; Rees & Lumby, 1954).

It was noted that the octopus bloom continued locally in areas such as Prawle Point, east of Salcombe until at least the end of 1952, with local crab and lobster fishers having to find alternative employment. The local populations of crab and lobster remained low for subsequent years before recovering to levels equivalent or higher than those observed prior to the octopus bloom (Jack Rendle, *comms.)*. The bloom continued in France during 1951 but was possibly terminated by the severe winter of 1951-52 where SST fell to 8°C near the Eddystone lighthouse (Hawke & Champion 1954; Rees & Lumby 1954).

Summary

Overall, the historical literature suggests that high abundance of *O. vulgaris* only occurs sporadically on the UK side of the English Channel, where its population dynamics seem to be strongly modulated by SST and likely larval dispersal from French and Channel Island spawning grounds, with migration of adults postulated by one author, but yet to be validated. Episodes of population outbreak appear to be predominantly driven by environmental conditions favourable to reproduction and recruitment which lead to periodic increases in abundance across the southwest of the UK. Local (UK) breeding was only recorded a handful of times during these the previously recorded blooms. However, it is possible that the lack of observer coverage on fishing boats during these events, and the occurrence of these blooms prior to widespread scientific or recreational SCUBA diving may also explain these findings.

4.2 Marine Biological Association surveys and databases

4.2.1 Demersal fish trawl surveys

The Marine Biological Association has conducted demersal trawl surveys off the southwest of the UK since 1911. Although survey effort has been rationalised in recent years, three sites; the ICES station known as L4, Whitsand Bay and Bigbury Bay (Figure 4.1) were surveyed at least once a year until 2020 when the Covid 19 pandemic and funding constraints caused a pause in the time series.

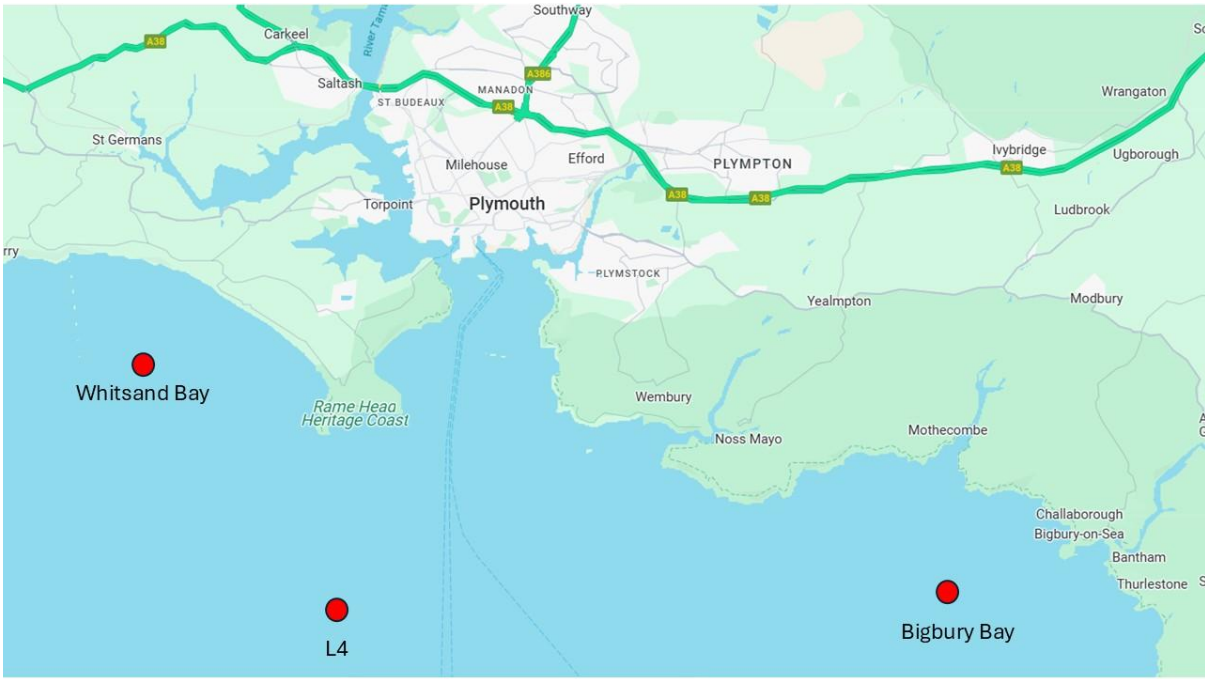

Figure 4.1: The three main sites off Plymouth that have been surveyed consistently by the Marine Biological Association using standard demersal trawls between 1911 and 2020.

These surveys are focused on demersal fishes, but invertebrate species, including cephalopods, are also recorded. The 1899 / 1900 octopus bloom predates these surveys, but the surveys did cover the period of the 1932/3 bloom and the 1950 bloom. We were unable to find any quantitative data on octopus catches from the 1930s but captures of octopus in 1950 and 1951 are described in Rees and Lumby (1954). For example, they note that in March 1950 "an occasional juvenile *O. vulgaris* was caught by the research vessels of the Marine Biological Association", estimated to be 7 to 8 months old. The RV Sabella (the MBA's research vessel at the time) was then reported to catch octopus within 16 miles of the Plymouth Breakwater throughout the winter of 1950-51. Between June 1948 and June 1951, the RV Sabella undertook an average of 11 trawls per month. It didn't catch any *O. vulgaris* during these trawls until September 1950, when it caught 2 specimens. Between then and June 1951 it captured a total of 84 *O. vulgaris*, with the average number of octopus per trawl ranging from lows of 0.1 in September and November 1950, to a peak of 2.2 in February 1951. In contrast, the vessel only caught 11 curled octopus (*Eledone cirrhosa*) during the same period.

Subsequent to those surveys, we obtained a complete dataset of cephalopods captured during trawls by the MBA from 1953 to 2020. During that period, no *O. vulgaris* were captured, although a single specimen was captured during an experimental trawl in June 2023 (Figure 4.2). In contrast, there was a bloom of the smaller octopus species *E. cirrhosa* during the later part of this period, peaking between 2015 and 2018 (Figure 4.3). In total, 2476 *E. cirrhosa* were caught in trawls during that period, with a mean of almost 30 per trawl recorded in 2017. Most of these curled octopus were caught at the offshore site L4.

Figure 4.2: A common octopus (*Octopus vulgaris*) captured during an experimental trawl onboard on the RV MBA Sepia in June 2023 (photo: Rachel Brittain).

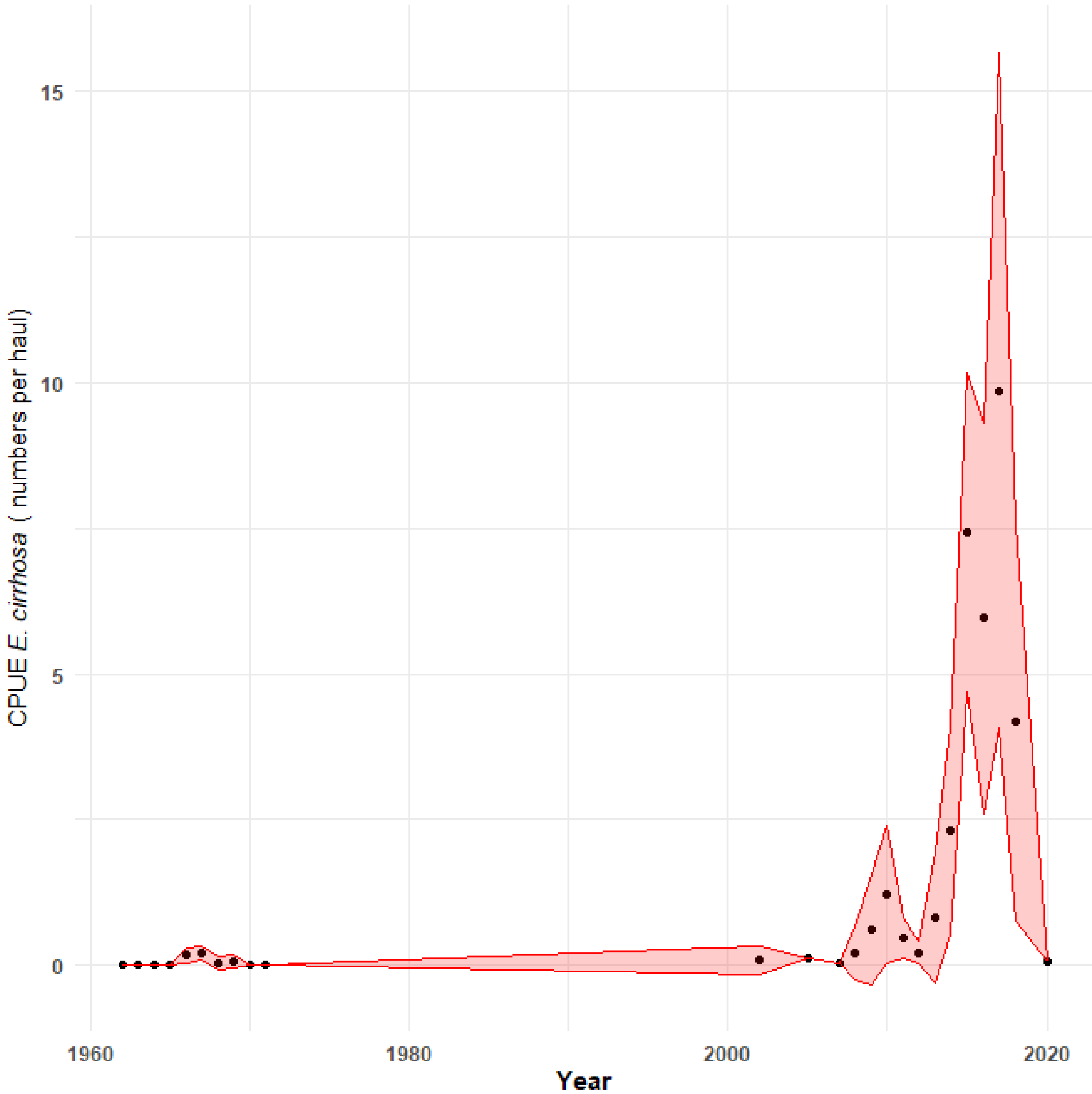

Figure 4.3: Catch per Unit Effort (count per trawl) of Curled octopus (*Eledone cirrhosa*) taken during research trawl surveys done by the MBA between 1963 and 2020. Red shading indicates 95% confidence intervals.

4.2.2 Larval surveys

It was anticipated the records of larval octopus would be available from the 'Young Fish Survey' run by the MBA since 1924. This survey and others in the English Channel were recorded as capturing *O. vulgaris* larvae from 1948 to 1950, prior to and during the 1950-51 octopus bloom (Rees & Lumby, 1954). However, survey material since then does not appear to have been routinely examined for the presence of octopus, with analysis focusing on a select group of fish species instead (McEvoy 2023). Unanalysed samples collected during a number of Young Fish Surveys are believed to still be available (Alix Harvey, *pers. comm*.) but examining them for the presence of *O. vulgaris* was beyond the resources available for this study.

4.2.3 The UK Archive for Marine Species and Habitats Data (DASSH)

A further collection of *O. vulgaris* sightings data are held by the MBA UK Archive for Marine Species and Habitats (DASSH). There are 32 entries for *O. vulgaris* in this database, dating back to the 1800s, most recording single specimens or their abundance as 'Rare' using the SACFOR scale (which runs from Superabundant, Abundant, Common, Frequent, Occasional, to Rare). The only prominent exceptions are in January 1900 and July 1951 when *O. vulgaris* was recorded as "Exceptionally plentiful" (i.e. during the known previous bloom periods). Records came from a variety of sources including formal scientific surveys (e.g. by the MBA, Cefas and JNCC) and Seasearch divers. Sightings are concentrated in the southwest of the UK (17 of the 32 records), but there are also 3 in the Irish Sea, 8 off the west coast of Scotland, and 4 off the northeast coast of Scotland (Figure 4.4). However, it should be noted that 2 of the sightings off the west coast of Scotland (Isle of Islay) and 2 of the sightings in the Irish Sea (Isle of Man) were considered uncertain.

Figure 4.4: Distribution of *Octopus vulgaris* sightings held in the DASSH database maintained by the Marine Biological Association

4.3 National Biodiversity Network (NBN)

A further source of *Octopus vulgaris* sightings is the National Biodiversity Network database. This repository contained 42 records of *O. vulgaris* dating back to 1873. Most records are for individual specimens – and there is a possibility of some overlap with the records in the DASSH database. The spatial distribution is also similar to the DASSH database, with sightings concentrated in the southwest, followed by several around the Isle of Man and off the west coast of Scotland (Figure 4.5). There is a single sighting in the North Sea. There are few chronological patterns in the data, apart from slightly higher than average numbers of records from 1948 to 1949 (4), in 1999 (4), in

2022 (4) and in 2024 (3). At least some of these later increases could well be explained by increased survey effort by SCUBA divers, although see section South West Marine Ecosystems below.

Figure 4.5: Sightings of *Octopus vulgaris* in the National Biodiversity Network database based on 10km grid squares (1873-2024).

4.4 South West Marine Ecosystems

South West Marine Ecosystems is an initiative that has been running since 2007, that aims to report on the annual changes in natural marine systems and their management in the south-west of the UK. It brings together data and information from a wide range of the public, citizen and professional scientists and managers to produce annual reports, hold events and release public communications. Their recent reports indicate a distinct increase in sightings of *O. vulgaris* after 2021. For example, the 2022 annual report states that "*In contrast to 2021 when no sightings of live common octopus Octopus vulgaris were reported (there was a dead one on the Roseland Peninsula), 2022 saw an 'bloom'*." They quote a journalist from the Guardian saying that numbers were the highest they had been seen for 70 years, and report that one day in early June a fishermen caught 260 kg of octopus (150 individuals), compared to about half dozen in total in a normal year. But there were no confirmed sightings of any octopus brooding eggs that year. In contrast, the 2023 annual report includes an observation of (hatched) eggs of a common octopus (*O. vulgaris*) indicating successful breeding of this species in southwest England, possibly the first time this has been confirmed in the wild. In general, sightings of *O. vulgaris* were noted to be continuing in 2023 from the Isles of Scilly and along the coast of south Devon to Dorset at least. The 2024 annual report noted that "*Common Octopus (Octopus vulgaris) continued to be seen/caught along the south coast of Cornwall and Devon but not in the high numbers seen in the previous two years, especially 2022. IA notes very infrequently seen in the Isles of Scilly. Small individuals were being seen late in the year suggesting local recruitment*. This last observation of small individuals could indeed have been the first signs of the bloom that developed and expanded across southwest UK in 2025.

4.5 Baited Remote Underwater Video (BRUV) surveys in southwest UK

Background

To gain an understanding of previous cephalopod abundance along the south coast of England and acquire a baseline dataset for this octopus study the University of Plymouth utilised their previous long term data sets. Baited Remote Underwater Video (BRUV) sampling is a non-destructive technique commonly used to sample mobile populations.

Three long term monitoring projects which have been using BRUV analysis to assess biodiversity were analysed for the presence of cephalopod species such as *O. vulgaris, Eledone cirrhosa, Loligo* sp., and *Sepia officinalis.* The three datasets analysed vary in length and location, but all three projects use the same method to analyse underwater video provided by BRUVs (Rees et al 2021) to assess biodiversity of specified areas.

The three datasets analysed for the presence of cephalopods were; 'The Lyme Bay Reef Recovery: Long Term Monitoring project' that has been conducted at 24 sites since 2009 since the designation of the Lyme Bay Marine Protected Area (MPA) (Renn et al 2024); 'The Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats' that has been conducted at 10 sites since 2023 to assess habitats and biodiversity at depths greater than 70 metres around the Scillies (Turley et al 2025); and finally, the 'Plymouth Sound National Marine Park – Long-term Monitoring Research Project' ('Plymfish') project to assess the health of the Plymouth Sound National Marine Park which has been conducted at 29 sites since 2020 (Longstaff et al 2025). Figure 4.6 illustrates the BRUV survey sites across all three locations.

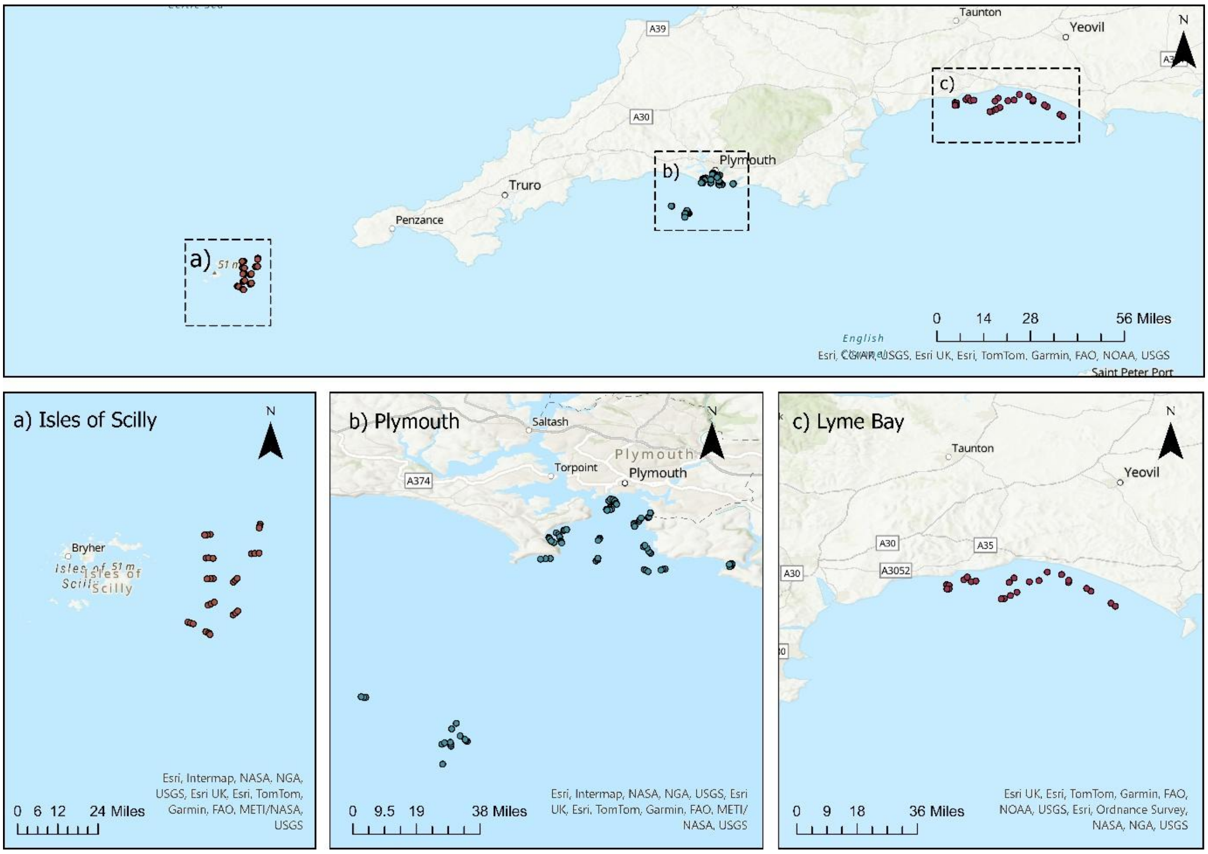

Figure 4.6: Baited Remote Underwater Video (BRUV) survey sites collected by the University of Plymouth **a)** The Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats, **b)** the 'Plymouth Sound National Marine Park – Long-term Monitoring Research Project' ('Plymfish') and **c)** The Lyme Bay Reef Recovery: Long Term Monitoring project.

<u>BRUV methodology</u>

Each BRUV system was equipped with a high-definition camera mounted inside an underwater housing with an LED light. A pole held a wire mesh bait box 1m away from the camera and contained 100g of mackerel (*Scomber scombrus*, replenished for each replicate) as an attractant. Each BRUV was weighted with two 15kg lead weights to provide stability against tidal currents (Figure 4.7).

Figure 4.7: Baited remote underwater video (BRUV) systems in the field.

BRUVs were deployed from local boats at each site. Within each treatment unit, at two randomly predetermined sites, sets of three BRUVs were deployed haphazardly approximately of 100m apart (per site) from each other for 45 min. BRUVs were given 5 min to allow disturbed sediments to settle and to allow an olfactory trail to be established.

From each 30 min sample, data were extracted using normal speed playback, during which all macro-mobile taxa entering the field of view were recorded and identified to the lowest taxonomic level possible. The maximum number of individuals of the same taxon appearing on screen per one-minute slices of video was recorded. The highest value recorded from 30 individual counts was then used as a measure of relative abundance referred to as MaxN (Davies et al. 2021). MaxN ensures repeat counts of individuals re- entering the field of view are avoided.

Results

The results from all three long time monitoring programmes have been combined to present the presence and abundance of cephalopods (Figure 4.8). Between 2009-2024 no common octopus (*O. vulgaris)* were observed on the BRUVs in The Lyme Bay Reef Recovery: Long Term Monitoring project, in 2012 and 2020 one squid (*Loligo* spp.) was recorded, in 2015 three cuttlefish (*Sepia officinalis*) and in 2023 one cuttlefish (*Sepia officinalis*) was recorded. During the Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats, in 2023 we recorded two curled octopus (*Eledone cirrhosa)* and one cuttlefish (*Sepia officinalis*) and in 2024 we recorded one curled octopus (*Eledone cirrhosa*) (Figure 4.9). During the 2021-2024 Plymouth Sound National Marine Park – Long-term Monitoring Research Project we recorded no common octopus (*O. vulgaris)* and two squid (*Loligo* spp.) in 2020. We recorded cuttlefish (*Sepia officinalis*) every year between 2021-2024; three were recorded in 2021 and 2022 and six were recorded in 2023.

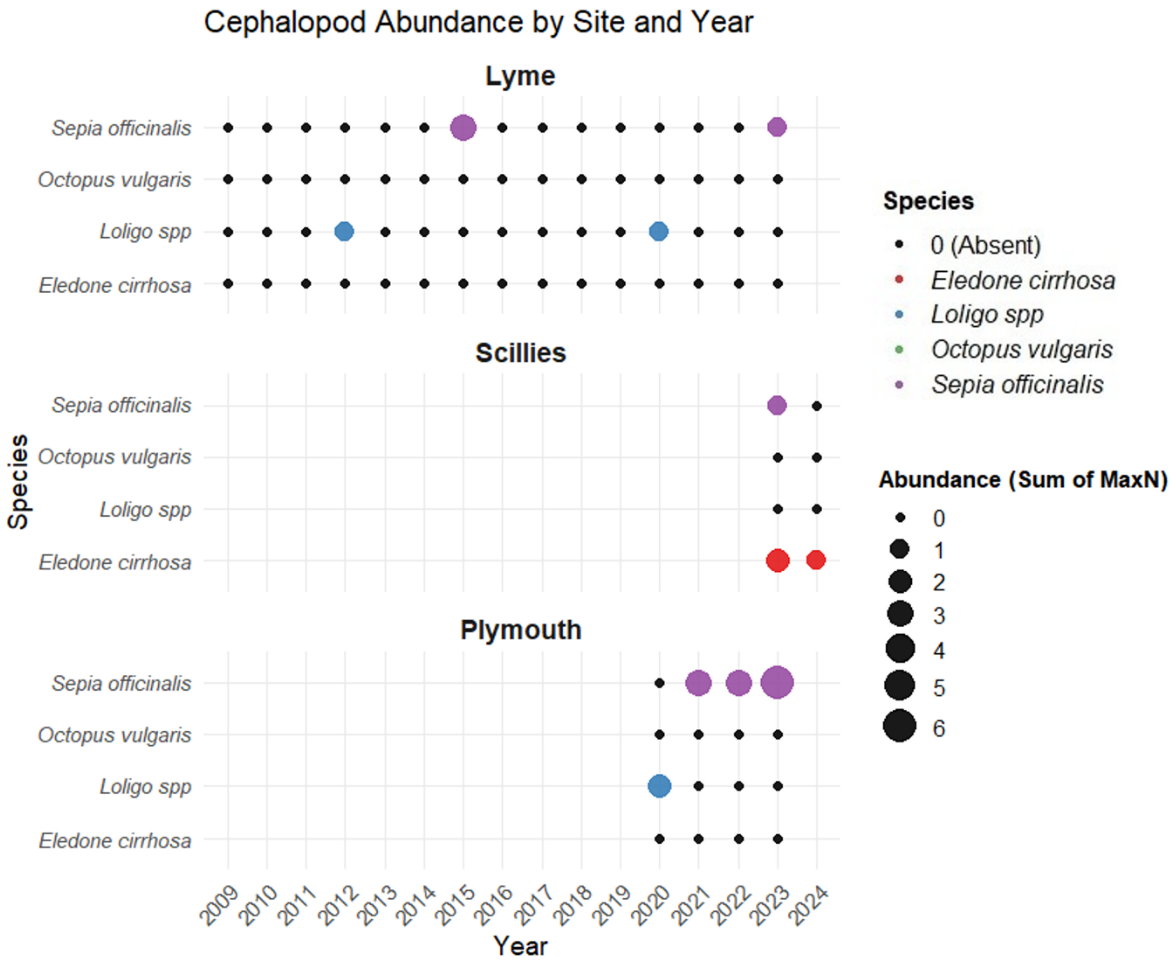

Figure 4.8: Maximum abundance (MaxN) of individual cephalopod species recorded on Baited Remote Underwater Video (BRUV) surveys conducted as part of a) The Lyme Bay Reef Recovery: Long Term Monitoring project, b) the Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats and c) Plymouth Sound National Marine Park – Long-term Monitoring Research Project. Note: surveys commenced at varying time points-dotted line represents when a survey started. Small black dots represent absence.

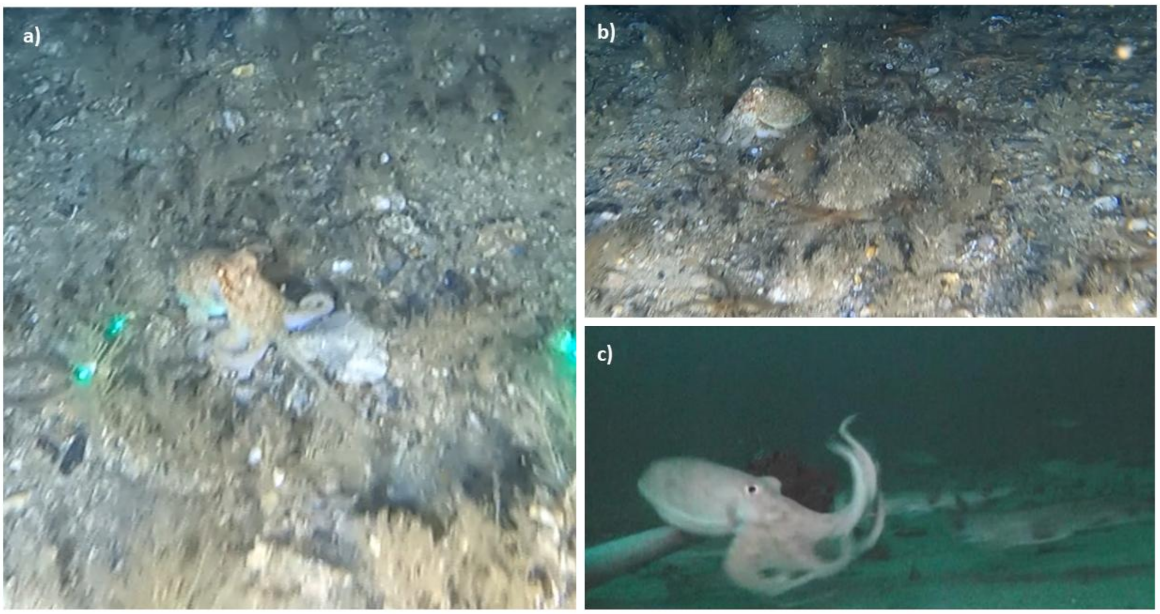

Figure 4.9. Baited remote underwater video (BRUV) images from Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats surveys a) Curled octopus (*Eledone cirrhosa*) in 2024, b) Curled octopus (*Eledone cirrhosa*) in 2024 c) Curled octopus (*Eledone cirrhosa)* in 2023.

Discussion

When the Lyme Bay Reef Recovery: Long Term Monitoring project, the Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats and Plymouth Sound National Marine Park – Long-term Monitoring Research Project data on cephalopod abundance were analysed, relatively low number of cephalopods were recorded across all sites. The common octopus (*O. vulgaris*) was only recorded in the Isles of Scilly BRUV surveys in 2023, they were absent in all other survey areas. All BRUV surveys were conducted in the summer months, and the survey designs cover a wide range of habitats, so if octopus were present there is a high likelihood they would have been observed on the BRUVs.

The monitoring surveys in Lyme, Scillies & Plymouth also conducted a video transect method at each site using a towed flying array. Common octopus (*O. vulgaris*) were observed at five sites in the Isles of Scilly towed dataset in 2024 and 2025. Curled octopus were observed on the towed videos at four sites in 2024 and two sites in 2025. Common octopus (*O. vulgaris*) were observed on the Lyme Bay towed dataset in 2025.

4.6 Commercial landings of octopus in southwest UK

To provide a further insight into the abundance of common octopus off the southwest coast of the UK, we conducted a detailed analysis of commercial fisheries landings data from the Marine Management Organisation (MMO) for the period between January 2022 and August 2025. Although data back to 2009 were available, we confined our detailed analysis to 2022 onwards because until that point total landings of octopus were low and *O. vulgaris* and *E. cirrhosa* were generally combined in landings statistics. From 2022 onwards we restricted our main analysis to landings definitively coded as *O. vulgaris*. Unfortunately, the previous issues around species separation have not been completely resolved, because a significant amount of the octopus landings, particularly in 2025, that were coded as 'Generic octopus' (OCT) are also likely to have been *O. vulgaris.* However, because we couldn't quantify the exact proportion we decided not to include that category in our detailed analysis. If we had included that category as well then total landings of common octopus would have been considerably higher than what is described below. For example, between January and August 2025, an extra 437 tonnes of 'Generic octopus' (potentially worth another £2.7 million) were landed in ICES area 7e (source: MMO), compared to 1087 tonnes of *O. vulgaris* (see below). Likewise, our detailed analysis of octopus landings in 2025 focused on the period from January to August, because this coincided with the time period focused on in our survey of fishermen (see section 6). However, we did also collate total octopus landing figures for all of 2025 for context.

It should also be recognised that recent investigations by the MMO have revealed some small inaccuracies in its landings data from years prior to 2025 for both under 10 m vessels and more widely. But it is important to clarify that we worked with the best data available to us at the time of this study (from fishing logbooks and the catch recording app for over and under 10 m vessels respectively) and that the small scale of the issues to date (under reporting by between 1 and 2.4%) will not have affected the general trends in our analysis or our conclusions.

Regardless of any issues around data resolution, the trend shown in Figure 4.10 below is clear, in 2025 there was an exceptional increase in the landings of *O. vulgaris*, unparalleled in the rest of the data set, with a total of over 1000 tonnes, worth more than £6.7 million landed in the Western channel (ICES area 7e) up until the end of August. There was also a very strong seasonal trend in 2025, with the vast majority of landings occurring from April to July (peaking at nearly 400 tonnes in May), followed by a distinct drop to around 50 tons in August (Figure 4.10. Figure 4.10 also shows that well over half of these landings were brought into the south coast ports of Brixham, Plymouth and Newlyn, with most other landings occurring in other ports in the southwest from Weymouth in Dorset through to St Ives in North Cornwall. Only a very small amount of octopus were landed into ports outside the southwest in 2025, for example into Scarborough in Yorkshire (4 tonnes), Maryport in the northwest of England (4 tonnes), and Fraserburgh on the northeast coast of Scotland (3 tonnes). However, it is unknown where those vessels captured those octopus or if the octopus were *O. vulgaris* or *E. cirrhosa*. Figure 4.11 shows the same data in terms of the value of the catch, again illustrating the exceptional nature of octopus landings in 2025 with the first sale value of landings peaking at over £2 million in both May and June (and not much less in July), compared to relatively negligible levels in previous years. Landings to just Brixham, Plymouth and Newlyn were again worth well over half of the total up to August 2025.

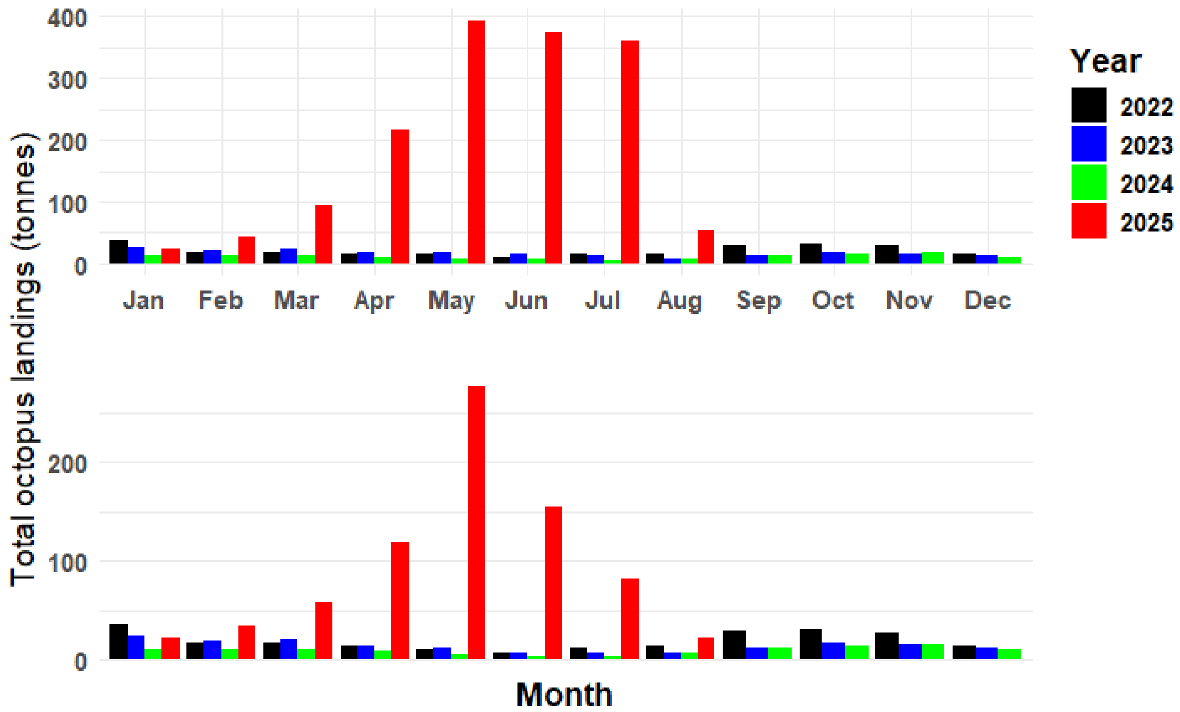

Figure 4.10: Total landings of common octopus per month and year (tonnes) from (top) all UK ports and (bottom) Brixham, Plymouth and Newlyn from January 2022 to August 2025 (Source: MMO).

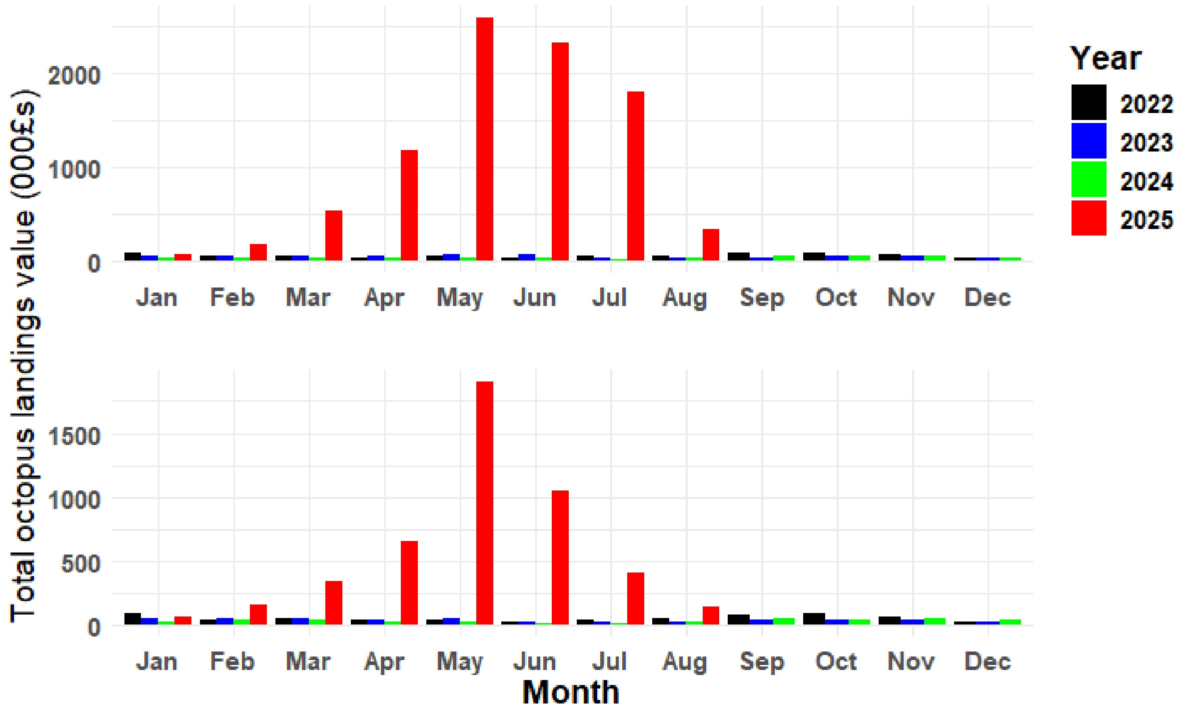

Figure 4.11: Total value of landings of common octopus per month and year (£000s) from (top) all UK ports and (bottom) Brixham, Plymouth and Newlyn from January 2022 to August 2025 (Source: MMO).

Landings of common octopus in ICES area 7e (Western channel) from January to August 2025 are broken down by gear type in table 4.1. This highlights that by far the majority of octopus were caught in pots (695 tons worth over £4.2 million; 68.2% and 62.68% of the total respectively) and beam trawls (367 tons worth over £2.3 million; 33.7% and 34.88% of the total respectively). Collectively, these two gear types have accounted for over 97.6% of both the landings in tonnes and the value in GBP of octopus landed in the Western channel until August 2025.

Table 4.1: Landings of octopus by gear type from January to August 2025 (Data: MMO)

Gear type	Landings (Tonnes)	Value (£)
DREDGES - Boat dredges	4.788	£29,641.03
GILLNETS AND ENTANGLING NETS - Gillnets (not specified)	0.578	£782.72
GILLNETS AND ENTANGLING NETS - Set gillnets (anchored)	0.051	£292.67
GILLNETS AND ENTANGLING NETS - Trammel nets	0.072	£454.74
HOOKS AND LINES - Handlines and pole-lines (hand-operated)	0.043	£54.28
HOOKS AND LINES - Hooks and lines (not specified)3	0.110	£692.18
SEINE NETS - Scottish seines	0.052	£351.51
TRAPS - Pots	694.918	£4,216,455.87
TRAWLS Bottom trawls - beam trawls	366.602	£2,346,120.82
TRAWLS Bottom trawls - otter trawls	16.336	£104,117.10
TRAWLS Bottom trawls - pair trawls	0.190	£1,262.56
TRAWLS Midwater trawls - otter trawls	0.003	£21.76
TRAWLS Midwater trawls - Otter twin trawls	4.218	£26,744.97
Grand Total	**1087.962**	**£6,726,992.21**

Analysis of octopus landings in pots from the above table is broken down by vessel size in Table 4.2. This initially suggests a relatively even spread of total amount and value of octopus landings across vessel sizes, but actually highlights that disproportionately lower amounts were taken by boats under 10m given the majority of fishing vessels (by number) are in that size category (Davies et al. 2018). That could be explained by lower fishing capacity per vessel and / or reduced opportunities.

Table 4.2: Landings of octopus in pots by vessel size from January to August 2025 (Data: MMO)

Size	Landings (Tonnes)	Value (£)
a - under 10m	280.169	£1,621,176.66
b - 10m-12m	45.222	£266,555.29
c - 12m-15m	313.474	£1,971,449.23
d - 15m+	56.054	£357,274.69
Grand Total	**694.918**	**£4,216,455.87**

The spatial distribution of octopus landings can be seen below in figure 4.12. This highlights how octopus catches both increased in spring and summer (illustrated by the brighter green and yellow areas) and moved from offshore to inshore during the same period. A decline in landings in August is also evident. These patterns largely reflect the observations made by fishermen in our survey (see section 6).

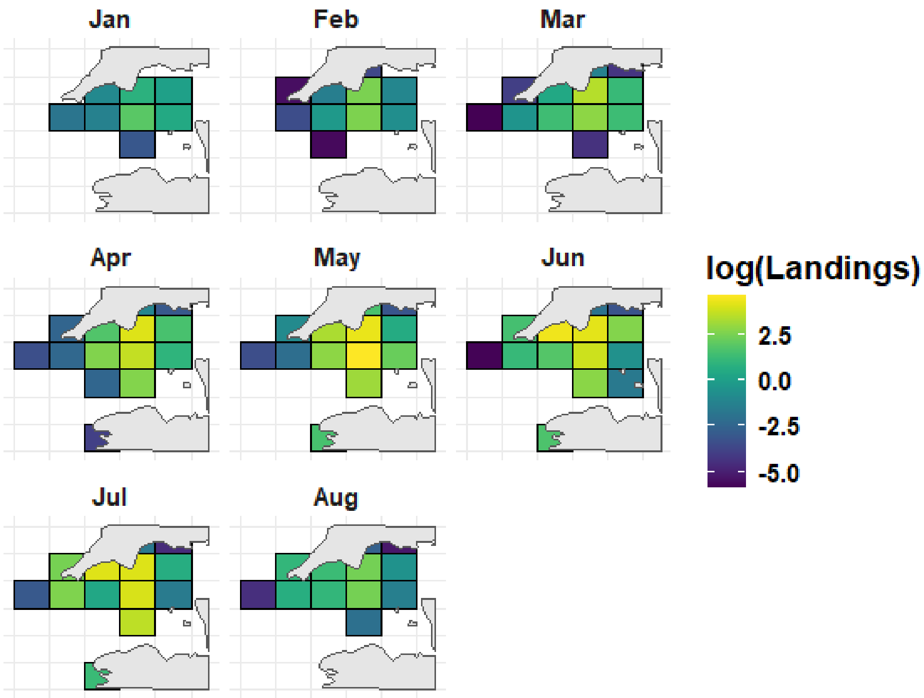

Figure 4.12: Landings of common octopus from January to August 2025 by all gear types. Data are logged to smooth our high variability. As a result some values are negative – but this does not mean negative catches. Darker colours illustrate lower catches, with brighter green and yellow areas illustrating higher catches. Source MMO.

Further analysis of landings data for all of 2025 shows that by the end of the year at least 1921.209 tonnes of *O. vulgaris* had been landed in ICES area 7e (Western channel), worth £11.240 million. If 'generic octopus' (which are likely to also be *O. vulgaris*) are added to these totals then the numbers rise to 2668.839 tonnes worth £14.797 million. Although octopus landings dropped significantly during the period from August to October, very large catches were again taken in November and December which elevated these end of year totals.

4.7 Discussion

To construct a baseline for the abundance of common octopus (*O. vulgaris*) off the southwest coast of the UK, we examined over 125 years of information from historical literature, online sightings databases, scientific surveys and commercial fisheries landings data. Although we can confirm that *O. vulgaris* is a native species to the UK, with a predominately southwest distribution, it is normally uncommon. Many years of both sightings databases and scientific surveys have recorded no observations. The bloom of curled octopus (*Eledone cirrhosa*) from 2015 to 2018, clearly detected by the MBA trawl surveys, indicates that common octopus should have been picked up in that survey if they had been present. Likewise, the BRUV surveys have demonstrated their ability to detect octopus and other cephalopod species. There have been occasional local increases in the abundance of common octopus since 1900, but three periods of dramatic increase clearly stand out: 1899 – 1900, 1950 – 1951, and the current bloom. There are also indications of a substantial but confined bloom in 1932-33, although data is limited. It is difficult to directly compare the octopus bloom in 2025 with others because quantifiable records are not available for the previous blooms and both fishing activity and other forms of monitoring (e.g. by BRUVs and SCUBA divers) is very different from how it was in the past. However, it would appear that this current bloom is at least as substantial as anything previously recorded.

The fisheries landings data dramatically highlight the extraordinary increase in common octopus numbers off southwest UK in 2025. From a very minor fishery in recent years, January to August 2025 saw landings of at least 1087 tonnes worth over £6.7 million tons (and likely considerably more). In fact, the total landings of *O. vulgaris* by the end of 2025 were almost 65 times higher than the annual average between 2017 and 2024. The strong increase in octopus landings in spring and summer 2025 was also very noteworthy. This could be due to the growth and emergence of octopus that recruited to UK waters as juveniles in 2024, or it could represent movement of octopus from offshore to inshore waters where they were more likely to be caught. Likewise it could be the result of increasing numbers of fishermen switching to specifically target octopus as the year progressed. Most likely it is a combination of all of these factors. The contrasting decline in octopus landings from August to October could be due to female octopus retreating into dens to guard their eggs before naturally dying, and male octopus similarly dying after breeding. But there is also likely to have been at least some effect of the fishery on octopus numbers at over same time. That said, the latest data from the MMO shows that some boats again caught very large numbers of common octopus in November and December 2025.

Previous researchers have hypothesized that the favourable environmental conditions for octopus reproduction and larval transport to the UK were behind the previous blooms. We will now examine the evidence for these theories using the latest datasets and methodologies available.

5 Potential causes of octopus blooms

5.1 *Introduction*

There were four underlying hypotheses for what caused the octopus bloom of 2025.

Hypotheses

- Migration / movement of juveniles and adults from elsewhere
- Larval transport from elsewhere
- Breeding in UK waters
- Combination of the above

Strict testing of these hypotheses was not practical. However, past historical blooms from the literature were used as a potential route to determining causality by looking for patterns and similarities in the prevailing environmental conditions. From the literature it is clear there were similar blooms in 1899 – 1900, 1932 – 1933 and 1949 – 1950 (see section 4 above). In the last case 1950 was taken as the peak of the bloom, with 1949 as the preceding year. The most recent bloom was similarly taken to span the period 2024 – 5; 2024 as the preceding year, which possibly had a role in preconditioning particularly when it comes to migration and survival of larval, juvenile and adult stages.

5.2 *Methods*

A combination of observational and modelling datasets were used for this study. Because of the relative rarity of octopus outbreaks along the coastline of Devon and Cornwall, and because there has not been a similar occurrence for over 70 years, there are very few datasets which can span the entire period.

Table 5.1: Environmental datasets used in this study. Red: Unavailable; Green; Available; Amber: Partially available.

Dataset	Obs/Model	1899 - 1900	1932 - 1933	1949 - 1950	2024 - 2025
Meteorology	Observation	Green	Green	Green	Green
Sea-surface temperature	Observation	Red	Green	Green	Green
Sea-surface temperature	Modelled	Green	Green	Green	Green
Sea-surface salinity	Observation	Red	Green	Green	Green
Sea-surface salinity	Modelled	Red	Red	Red	Green
Surface currents	Modelled	Red	Red	Red	Green
River flow data (France)	Observation	Amber	Green	Green	Green

5.2.1 Meteorology (Observations)

The meteorological data used in this study spanned the period from 1874 – 2025. These were observational data from the site of the Marine Biological Association (50.363°N; 4.133°W) for the period 1874 – 1979 and Mountbatten (50.354°N; 4.120°W) for the period 1930 – 2025. The maximum temperature and wind-direction were common to both locations for the entire period at set observational hours (09:00; 15:00; 21:00 typically).

These data were sourced from the National Meteorological Library and Archive (NMLA):

https://digital.nmla.metoffice.gov.uk/index.php?name=SO_b4ebdde0-3755-4f1a-8129-5482fc50afa6

They were kindly digitised by the NMLA for both sites.

Additionally, wind-speed and direction was available from the Rame Head (50.317°N; 4.219°W) meteorological station for 2025. Further details are available here:

https://www.nci-ramehead.org.uk/weather/Current_Monitor.htm

The analysis of daily maximum air-temperatures was carried out for each of the four octopus bloom events by comparing against the 30-year (daily) climatological mean. This is so the impacts of longer-term trends in temperature can be compensated for and events such as atmospheric heat waves more apparent in the dataset. These were:

1899 – 1900 event (#1): 1861 – 1890 climatology

1932 – 1932 event (#2); 1911 – 1930 climatology

1949 – 1950 event (#3); 1921 – 1940 climatology

2024 – 2025 event (#4); 1991 – 2020 climatology

Analysis of wind-direction for events #1 - #3 utilised wind-rose diagrams to determine the dominant wind direction for a given month for each year. These were reported wind-direction at set meteorological hours. For event #4 the wind-speed and direction are reported at 10-minute intervals, so a more comprehensive seasonal picture can be arrived at which also takes into consideration the force of the wind.

5.2.2 Sea-surface temperature and salinity (Observations)

The Western Channel Observatory contains some of the longest oceanographic and biological time-series in the world. Currently operated by the Plymouth Marine Laboratory it also incorporates the long-term series started by the Marine Biological Association under the auspices of ICES. ICES Station E1 (50.044°N; 4.374°W) has depth resolved temperature and salinity records dating back to 1903. These are measured using a research vessel which typically occupies the site for < 1 hr. Early in the series visits were on a seasonal basis; later in the series typically fortnightly in spring and summer and monthly in autumn and winter. Hourly observational data from an automatic data buoy (operated by PML and the UK Met Office) were also available for 2025.

Sea-surface Temperature (SST) averages (mean, standard deviation) were calculated for each month, taking into account the average day of month on which the measurement was taken. By fitting the monthly means and their associated standard deviations as a function of day-of-year this allowed a daily mean SST to be calculated, as well as the standard deviation. From the standard deviation it is possible to arrive at a calculation of the 10th and 90th centiles for each day. The definition of a Marine Heat Wave (MHW) is a sustained period above this 90th centile (Hobday et al., 2016). This methodology allows a ready reckoning to see if a particular observation on any given day of the year is outside the normal envelope of variability; this is particularly relevant, as in the case of the E1 time-series, for sparsely sampled data when the day of year of sampling is irregular (see Berthou et al., 2023)

A similar statistical approach was taken for sea-surface salinity (SSS) to show when the water mass sampled at E1 is notably saline or fresh.

5.2.3 River flow (Observations)

Poole and Atkins (1929) [2] from an analysis of salinity data in the western English Channel concluded that low salinity water (LSW) was an "abnormal condition". They linked this to French Atlantic river runoff by relating years of higher than average (>50%) rainfall in the River Loire basin. More recently the spatial extent of this LSW was mapped by Kelly-Gerreyn et al., (2006).

French river flow data was obtained from:

https://www.hydro.eaufrance.fr/stationhydro/M530001010/series

From the station: La Loire à Montjean-sur-Loire. Daily data were available from 1900 onwards and an analysis of anomalous river flow carried out to see if the LSW could be linked to historic occurrences of high-river flow.

5.2.4 Sea-surface temperatures (Modelled)

To extend the sea-surface temperature (SST) time-series back to the first documented octopus outbreak of 1899-1900 the Hadley Centre Sea Ice and Sea Surface Temperature data set (HadISST) was used. This can be sourced here:

https://www.metoffice.gov.uk/hadobs/hadisst/data/download.html

A point extraction was made close to the site of E1 (50°N; 4°W) and climatologies for each of the events #1 - #4 reconstructed as described in above. A 30-year climatology was reconstructed for each month and as well as the 10th and 90th centile "envelope".

5.2.5 Sea-surface currents and salinity (Modelled)

Sea-surface currents and SSS for 2025 were extracted for a domain covering the western English Channel and Celtic Seas (48 – 52°N; 8 – 0°W). These were obtained from:

https://data.marine.copernicus.eu/products

and the global physics model at 0.083° resolution was used. Daily data were subsetted over this domain from the global dataset as well as point extractions from 50N, 4W for intercomparison with the E1 in situ time-series.

5.2.6 Particle tracking model

A particle tracking model (OceanPARCELS) was used to test the hypothesis that larval dispersion from the Channel Islands was possible under the prevailing meteorological and oceanographic conditions of Spring 2025. The model was forced using daily averaged CMEMS outputs, with the virtual population seeded to the northwest of Guernsey on 1st March 2025 and tracked for 60 days

[2] H.H. Poole, W.R.G. Atkins
Photo-electric measurements of submarine illumination throughout the year
Journal of the Marine Biological Association of the United Kingdom, 16 (1929), pp. 297-324

to examine potential dispersal. The was undertaken because during the blooms of 1899/1900, and again in the 2025 bloom, outbreaks appear to occur first along the northern coast of France and Channel Islands before being reported in South Devon and Cornwall (see Sections 3 & 4).

In this proof-of-concept experiment, we tracked passive particles constrained to the surface currents and did not include any active swimming or vertical migration behaviour. It should therefore be emphasised that the model output represents just one of many possible dispersal scenarios. In reality, octopus larvae are capable of limited swimming (Villanueva et al., 1997), and may exhibit diel vertical movements that influence retention or dispersal dependent on local hydrodynamic conditions (Roura et al., 2019). Nevertheless, the simulation demonstrates that cross-Channel transport from the Channel Islands to the English coast is physically possible under prevailing current regimes. The results also highlight the potential role of sustained easterly winds and periods of reduced surface salinity as indicators of conditions conducive to such transport events.

5.3 Analysis and results

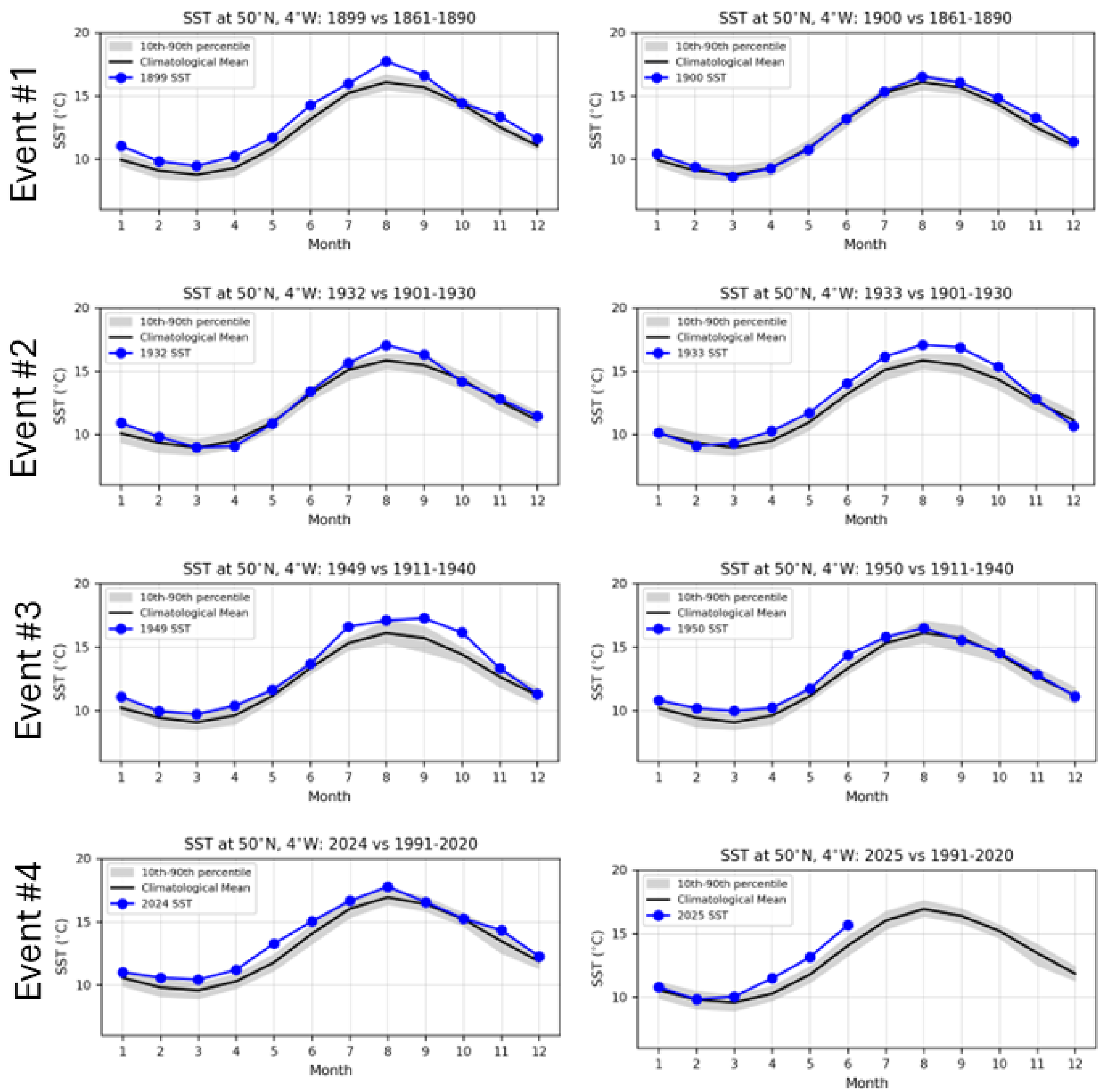

Figure 5.1: Modelled monthly average SST extracted from the HadISST model at point 50N, 4W. Each year is compared with the long-term (preceding 30 year) climatology for that point, together

with the 10th and 90th centiles (shaded grey as an envelope around the mean). Data from each year are shown in the blue dots with connecting lines.

Figure 5.1 shows that all four events are related to a prolonged periods of warmer than average sea-surface temperatures. For Event #1 (1899-1900) the period from April – September 1899 may be categorised as a Marine Heatwave (MHW); 1900 is more marginal but is certainly characterised by an anomalously warm late summer / autumn. For Event #2 (1932 – 1933) July – September 1932 is categorised as MHW, as is the period May – October 1933. For Event #3 (1949 – 1950) July – November 1949 is particularly warm; although warm, only June 1950 exceeds the MHW definition. For Event #4 MHW conditions extend almost continuously for the entire period (2024 – June 2025 [last available data]).

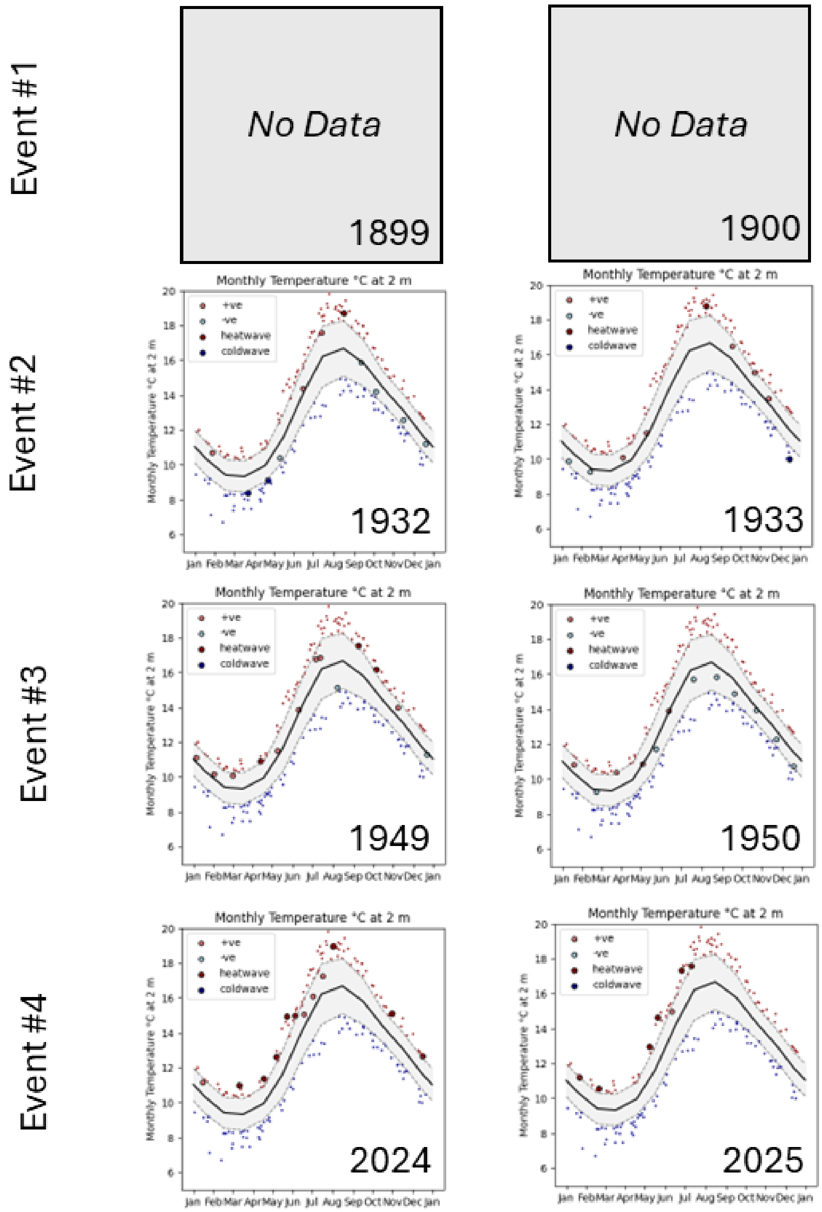

Figure 5.2: Monthly average temperature at 2 m depth (solid black line) for the Western Channel Observatory (WCO) time-series stations at E1 (50°02.6'N; 4°22.5'W) together with the 90th and 10th centile (dashed line) region shaded in grey. Data for each year investigated (1932, 1933; 1949, 1950; 2024, 2025) shown in large symbols with dark red shading depicting heatwave conditions, light red a

positive anomaly, light blue a negative anomaly and dark blue cold wave conditions. Small symbols outside the centile range depict record temperature on a given day of year for years other than that investigated in each panel. Averaging period for E1 is 1903-2025. Sampling frequency is typically bi-weekly or monthly at E1.

Figure 5.2 shows the observed conditions at E1 for Events #2 - #4. The same features can broadly be observed as are highlighted in the model results in Figure 5.1 albeit at a much coarser temporal resolution and plotted over the entire observational period average (1903 – 2025) for each month. The warmth of 2024/5 (Event #4) is particularly notable, as are the summers of 1932 and 1933 (Event #2) and the entire year of 1949 (Event #3).

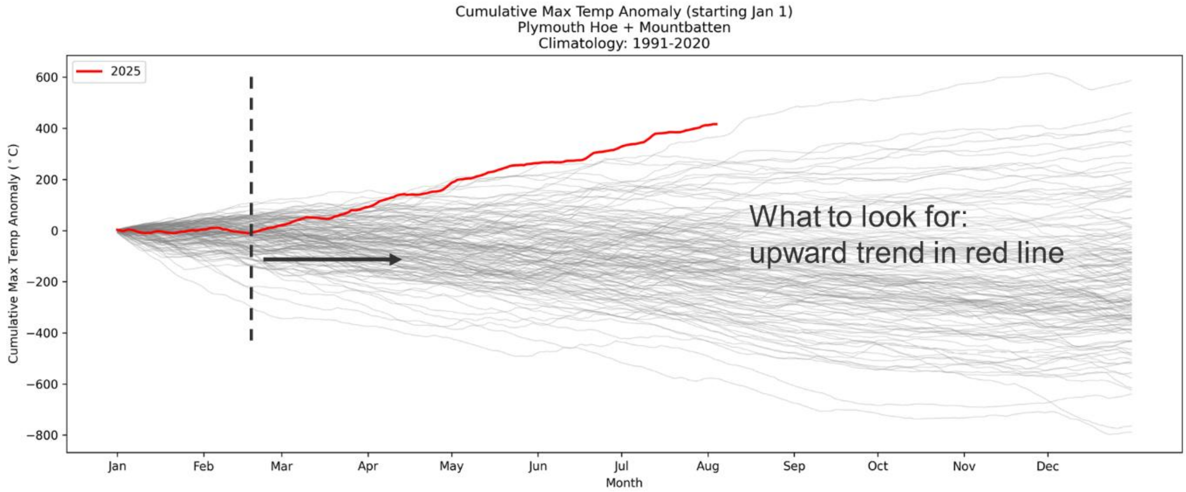

Figure 5.3: A graph to highlight the daily maximum temperature (atmospheric) anomaly compared with the long-term climatological averaging period. Data is from the Mountbatten Observatory (Plymouth) (for 2025) and anomalies calculated on a daily basis from the preceding 30 year climatology (for 2025 this is the period 1991 – 2020). All years in the series (1874 – 2025) are shown as grey lines and 2025 highlighted in red. The cumulative sum is calculated by simply adding each successive day's anomaly.

Figure 5.3 shows that 2025 has been anomalously warm from mid-February onwards. To give an idea of how warm – if a cumulative value of 730°C is arrived at by the end of the year, then each day will have been on average 2°C warmer than the climatological average. It is also worth noting that the period 1991 – 2020 is in itself a warm period compared with the last 150 years of measurements in Plymouth. Analysing each of the events shows that prolonged warm periods lasted:

Event #1: 1899 (mid-July onwards); 1900 (mid-July onwards)

Event #2: 1932 (cold); 1933 (March; Aug - Oct)

Event #3: 1949 (mid-Jun onwards); 1950 (mid-Jan onwards)

Event #4: 2024 (mid-Jan onwards); 2025 (mid-Feb onwards)

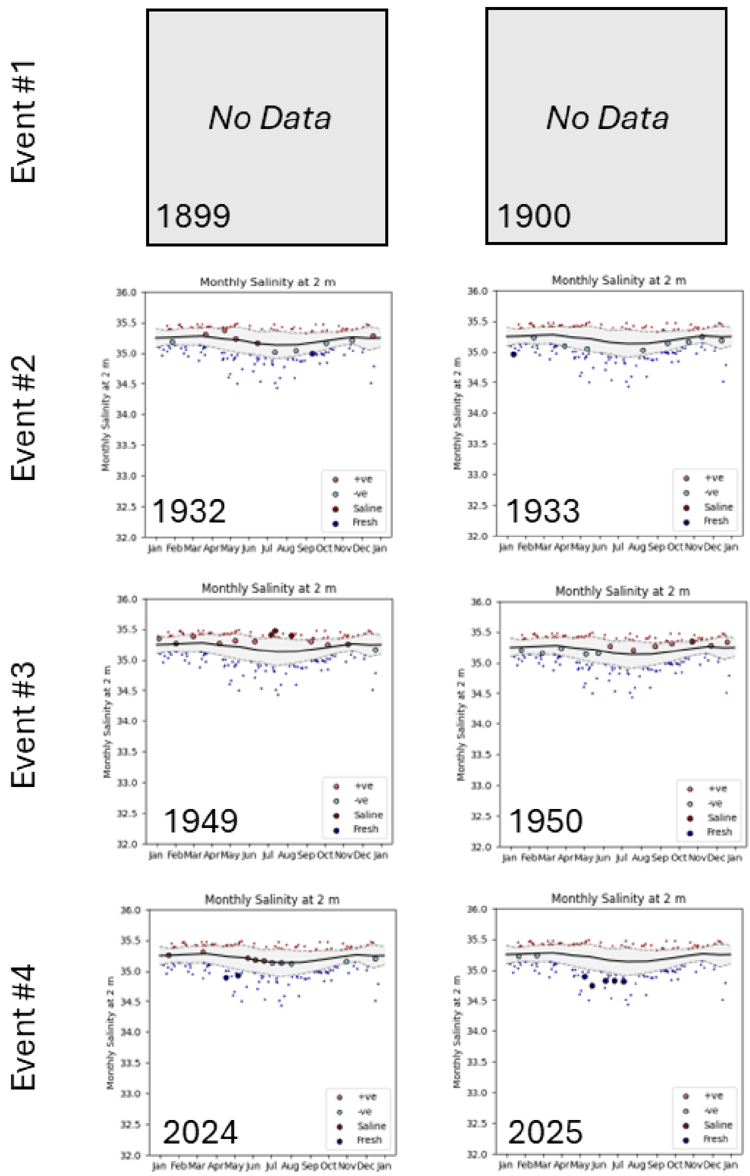

Figure 5.4: Monthly average salinity (PSU) at 2 m depth (solid black line) for the Western Channel Observatory (WCO) time-series stations at E1 (50°02.6’N; 4°22.5’W) together with the 90th and 10th centile (dashed line) region shaded in grey. Data for each year investigated (1932, 1933; 1949, 1950; 2024, 2025) shown in large symbols with dark red shading depicting strongly more saline conditions, light red a positive anomaly, light blue a negative anomaly and dark blue strongly fresher conditions. Small symbols outside the centile range depict record salinity on a given day of year for years other than that investigated in each panel. Averaging period for E1 is 1903-2025. Sampling frequency is typically bi-weekly or monthly at E1.

Figure 5.4 shows that the years 1932 and 1933 (Event #2) had a prolonged period of slightly lower surface salinity between spring 1932 and for the entirety of 1933. Particularly of note is 1933. The Loire river flow (plot not shown) was anomalously high for the period 1 April 1932 – 1 November 1932, with peak flows of 3500 m3/s recorded. Typically, these low salinity waters take around 60 – 100 days (Kelly-Gerreyn et al., 2006) to enter the western English Channel – which could explain why the strong river flow took longer to show in the salinity measurements at E1. Conversely, Loire river flow was anomalously low during 1933. 1949 and 1950 (Event #3) by contrast only had brief low salinity events – indeed 1949 was remarkably dry with low river flow. Finally, 2024 and 2025 (Event #4) had remarkably low salinity events particularly during spring 2025. Loire discharge was almost continuously anomalously high for the period March 2024 – March 2025, which may explain the low salinity intrusions and a possible transport mechanism from further south.

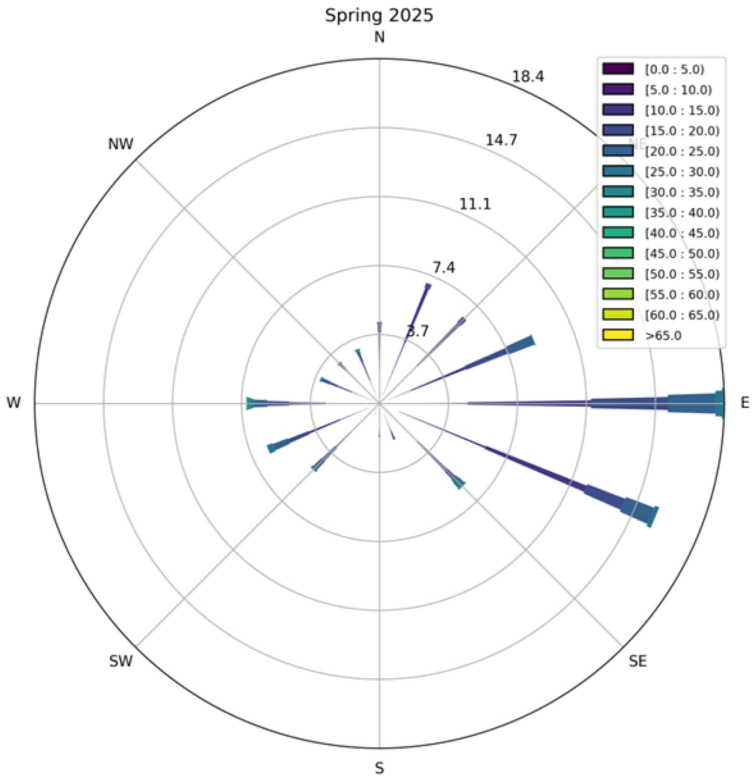

Figure 5.5: Wind-rose plot for the Rame Head meteorological station for the spring (1 March – 31 May 2025).

Figure 5.5 shows that the spring of 2025 (March – May) was dominated by stronger easterlies (18% of all wind from East; 15% from ESE). An analysis of historical wind data from Plymouth shows that during the period of mixed water column (October – April), the various bloom events seem to be linked to increased prevalence of Easterly winds (or roughly from that quadrant). This is true for:

Event #1: 1899 (Jan, Feb, Oct - Dec); 1900 (Feb, Mar)

Event #2: 1932 (Feb, Mar; Nov, Dec); 1933 (Jan - Mar)

Event #3: 1949 (Mar); 1950 (Jan)

Event #4: 2024 (Not prevalent); 2025 (Mar - May)

This pattern was informed by some of the historical accounts

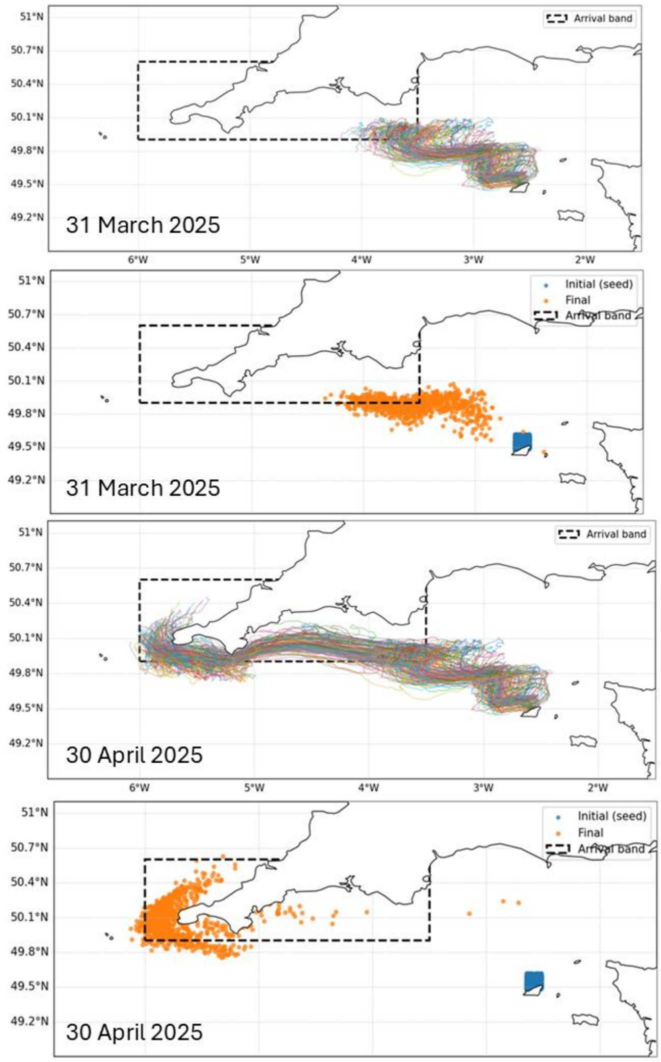

Figure 5.6: Output of the particle tracking model. 30 days after particle release (top two panels) and 60 days after particle release (bottom two panels). The blue box represents where the particles were released from (NW Guernsey) and the orange dots the position of the particles after 30 days (panel 1) and 60 days (panel 3). The trajectories over the entire dispersal window are shown in the first and third panels.

Figure 5.6 shows the output of the particle tracking model. The reason this experiment was carried out was two-fold: (1) the historical accounts and landings evidence from Event #4 seems to show that the south English coast octopus blooms are preceded by increased activity on the coast of northern France and the Channel Islands; (2) the prolonged period of easterly winds during spring 2025 (and in previous historical occurrences). The output from the model is tending to support the feasibility of transport of larvae or individuals across the Channel in realistic (30 – 60 day) timeframes under those oceanographic conditions.

5.4 Conclusions from the environmental data

The environmental data seem to show therefore that octopus blooms along the south coast of Devon and Cornwall are associated with the following characteristics:

- Sustained anomalously warm sea-temperatures
- Sustained anomalously warm atmospheric temperatures

- Sustained anomalously low salinity (fresher water) where salinity is a tracer rather than a driver. The source of lower salinity waters (20 Nm offshore) is:
    - Either - Anomalous river flow: French Atlantic rivers (Loire)?
    - Or - Eastern English Channel? Possible period of sustained easterly winds outside stratified period (Oct – March)
- Sustained period of easterly winds outside the stratified period (Oct – Mar)
- Analysis of currents and particle tracking model for the 2024 – 25 bloom show that transport from the Channel Islands to south coast of Devon and Cornwall (and not Lyme Bay) in 30 – 60 days feasible.

Furthermore, if the population originates further south (Spain, France):

- The larval stage maybe advected by the shelf break (Navidad) current, entering the western English Channel the season before. Anomalous (French Atlantic) river flow, lowering the salinity, acts as a tracer for this water.
- Sustained anomalously warm temperatures give rise to population growth.

If the population is already endemic:

- Sustained anomalously warm temperatures give rise to rapid population growth.

6 Effects of the current bloom on the fishing industry

6.1 Introduction

A common feature of both this current octopus bloom and those off the southwest of the UK in 1900 and 1950, has been reports of negative effects on the local fishing industry, particularly those fishing for shellfish such as edible crabs (*Cancer pagurus*), lobster (*Homarus gammarus*) and king scallops (*Pecten maximus*) (see section 4). Similar concerns have also been raised by fishermen during octopus blooms in other areas such as the Channel Islands and France. However, during such episodes some fishermen have also able to benefit by actively targeting octopus, which can be highly profitable. We therefore decided to investigate these issues in three ways:

- An analysis of media and social media including commentary by fishermen on the effects of current UK octopus bloom
- A questionnaire survey of fishermen across the southwest of the UK to focus on their observations of the octopus bloom, how it has affected them, and their thoughts for the future
- An analysis of the commercial landings of other species known to be predated upon by octopus to determine any potential negative effects

6.2 Methods

6.2.1 Analysis of media and social media

To gain an overview of media and social media (Facebook) coverage of the 2025 UK octopus bloom, we conducted an informal analysis of the dates, content and tone of selected online articles posted in 2025. We also kept a complete record of media interviews done by the project team, and any further coverage that resulted from them, or the press releases issued by us and our funders.

6.2.2 Survey of UK fishermen

To elicit the observations and views of fishermen who experienced and were potentially affected by the current octopus bloom, we developed a structured survey in questionnaire format that could be delivered both online and in person.

6.2.2.1 Design of survey

The survey questionnaire was developed and hosted using Alchemer software. The survey was split into three sections in line with the aims of the study. The first section gathered details on the respondent such as the nature of their fishing business (commercial, recreational charter boat or both), the size of their fishing vessels, and their main port. The second section focused on gathering information about their regular fishing activities such the species they generally target between January and August (the period of the current octopus bloom) and the types of gear they use. The third and most substantial section focused on the impact of the octopus bloom on their fishing activities. Topics covered included the species of octopus they caught, when and where they caught the most octopus and any changes they made to their fishing gear and practices in response to the presence of octopus. We also asked about the habitat types and depths where octopus were most abundant, and whether octopus catches changed over the course of the year and on different tides. The next series of questions asked what percentage of their landings were made up by octopus, how that changed over time and asked for observations of octopus behaviour such as the presence of eggs on pots, and the other species they were observed to have predated upon in crustacean pots. Finally, we asked how 2025 compared with previous years in terms of octopus, the effects of the current octopus bloom on their fishing catches and income, how they might adapt to a future octopus bloom and what they might need to help them do so.

The questionnaire was preceded by a consent form that described the background and aims of the project and explained that by filling in the questionnaire the respondents were giving consent for their replies to be used for research purposes. At the end of the questionnaire, respondents were given the option of providing their boat registration number and email address for further correspondence. These data are to be held securely by the MBA until analysis of the results is complete. Both the consent form and questionnaire were reviewed by a panel at the MBA for ethical approval and to ensure they were compliant with GDPR regulations in the UK.

Prior to finalisation of the questionnaire a draft was circulated to the project steering group, and they were given a week to provide feedback. The questionnaire was modified in response to their comments before being piloted on four local fishermen. It was then altered further to improve the clarity of a small number of questions before being released publicly online on the 21st of August 2025. The questionnaire was kept open for approximately 5 weeks, being closed on the 30th of September.

A full copy of the consent form and questionnaire is available at Appendix 9.2.

6.2.2.2 Distribution of survey

The questionnaire was hosted on the website of the MBA and circulated online using a combination of a press release by the MBA, social media, and direct emails to key stakeholders and fishing industry groups who were asked to share the survey with their members (Table 6.1). We also created a Facebook page: 'Octopus UK: Where, when, why and what to do?' to share the survey and news from the project.

Table 6.1: Organisations and people involved in distributing the fishermen's octopus survey via social media and direct emails.

Social media (Facebook, Instagram, LinkedIn, Bluesky	Marine Biological Association, University of Plymouth (School of Biological and Marine Sciences & central University), Plymouth Marine Laboratory, Steering Group, Project Team
Emails	Southwest Fish Producers Organisation, Western Fish Producers Organisation, Plymouth Fish and Seafood Association Lyme Bay CIC Fishtek Marine

In addition to the online distribution of the survey, 22 fishermen personally agreed to fill it out via interview - 11 in person and 11 by telephone. A further five individuals who were interviewed by phone declined to complete the survey formally but offered information on the timing and location of the octopus bloom.

6.2.3 Commercial landings of non-octopus shellfish in southwest UK

To begin to assess the possible impact of the octopus bloom on other fisheries, we examined commercial landings of the main other shellfish species (brown crab, *Cancer pagurus*; European lobster, *Homarus gammarus*; and king scallops, *Pecten maximus*) known to be preyed upon by the octopus, between 2022 and 2025. We analysed landings data into both all UK ports and just from ICES area 7e, because this is the region where common octopus have been concentrated during 2025. It should be noted that landings data do not necessarily reflect changes in stock abundance as they are also affected by fishing effort. However, a dramatic decline in crab catches (for example) could indicate fishermen both switching away from fishing for these species due to octopus depredation in pots and / or less crabs entering pots due to the presence of octopus, and / or decreases in crab numbers due to octopus predation in the natural environment.

6.3 Results

6.3.1 Analysis of media and social media

The large increase in common octopus (*Octopus vulgaris*) numbers from the Channel Islands to along the southwest coast of England (Devon and Cornwall) in 2025 drew widespread media attention. Coverage spanned local, regional, and national outlets, framed around economic loss and opportunity, ecological disruption, climate change links, and scientific urgency. There was a definite surge of articles in May 2025 (see Appendix 9.3.1), followed by a lull and then extensive coverage of this project from August 2025 onwards (Appendix 9.4). Interestingly, we also noted a similar article in the Guardian from 2022, when above average numbers of common octopus were first recently seen in certain UK areas, but not nearly to the levels seen in 2025.

Social media (Facebook) coverage also peaked in May 2025, followed by similar coverage of our project from August onwards (Appendix 9.3.2; Appendix 9.4). Regular Facebook posts were made by the Devon and Channel Shellfishermen and the Cornwall Wildlife Trust, in particular (Appendix 9.3.2). There was more focus on visuals (spectacular photos) on social media, with content / focus dependent on the specific interests of the group (e.g. fisheries or conservation).

Media coverage of this project

Members of the project team have done 17 interviews on the 2025 UK octopus bloom since our project started; three on TV, four on radio and nine for online articles. Many of these interviews were for national outlets, and three were for international outlets. These interviews, and press releases by both us and our funders, resulted in at least another 15 media articles. In fact, an interview with AFP News resulted in multiple news articles across the world, which we could not fully keep track of. See Appendix 9.4 for full details.

Tone and narrative patterns

Coverage diverged across outlets: tabloids and local press often adopted sensational framing ('invasion', 'swarm'), while broadsheets and scientific magazines favoured measured ecological and socioeconomic analysis. Visual media highlighted the spectacle of dense octopus catches, using underwater and market footage. Most national coverage included a climate change angle, linking the event to warmer seas and marine heatwaves. Although coverage of our project contained many of the same elements as above, there was also a focus on the collaborative and timely nature of our research.

Risks, ethics and communication lessons

While extensive coverage raised public awareness, it also risked sensationalism. Some articles overstated links to climate change and the scale of octopus migration (e.g. from Morocco) without scientific confirmation. Recommendations include more balanced framing, reliance on authoritative data, and ethical language when discussing sentient marine species.

6.3.2 Survey of UK fishermen

6.3.2.1 Details of Respondents

There was a total of 41 responses to the survey, 40 from fishermen and 1 from a seafood processor. Although processors were not the target of the survey, we decided to retain their response. Of the fishermen who responded, 34 described themselves as commercial, 3 as recreational charter boat skippers, and 3 describing themselves as both.

The vessels belonging to respondents ranged from the 6-8 m category to the 15-24 m category, although most were below 10 m (Figure 6.1). Seven respondents didn't provide vessels size.

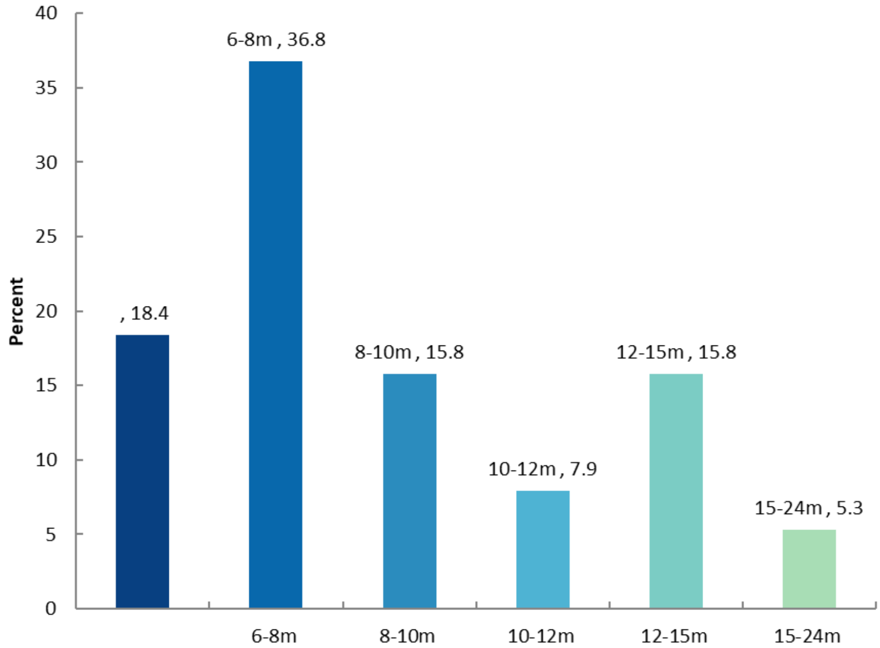

Figure 6.1: Vessel sizes of respondents. The first column represents those who didn't provide a vessel size. Numbers above columns indicate percentage of the total.

Most of the vessels belonging to the respondents to the survey were based at ports in the southwest of the UK (Figure 6.2), however, there were two from Guernsey, one from the Scilly Isles and one from Oban in Scotland.

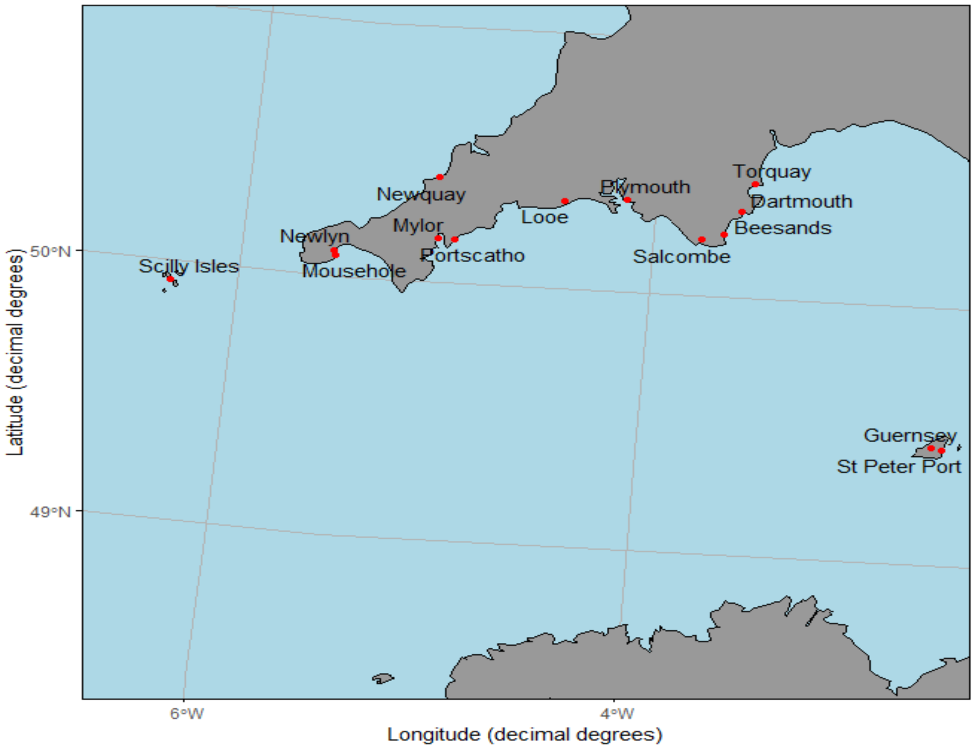

Figure 6.2: Home ports of vessels that took part in the study. For the sake of clarity, Oban in Scotland, where one respondent was from, is not shown on this map.

6.3.2.2 Fishing activities

Participants were asked what species they normally target between January and August (the main period of the octopus bloom and our study in 2025). The vast majority of respondents (82.1%) were crab and lobster fishermen, but nearly half (46.2%) also (or exclusively) targeted fish of various species, with a focus on scallops and mixed shellfish accounting for relatively small percentages of the total (Figure 6.3).

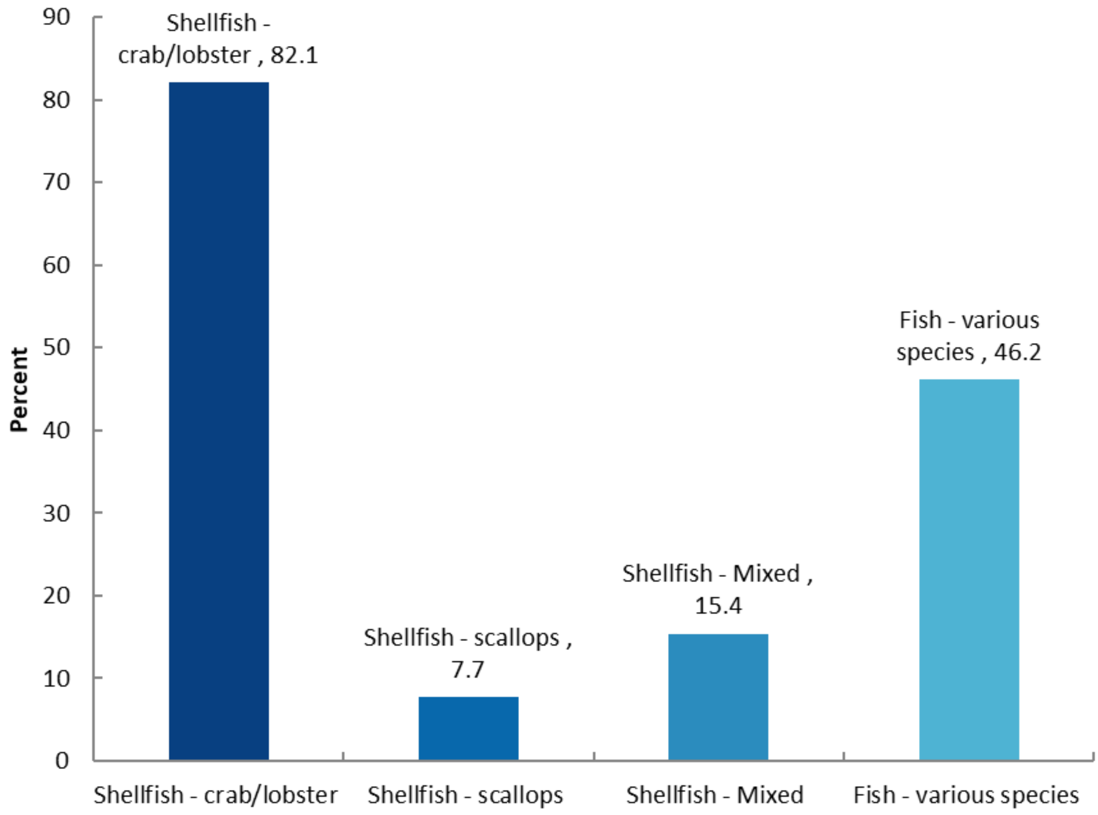

Figure 6.3: Main species categories targeted by respondents between January and August 2025. Numbers above columns indicate percentages of the total.

Corresponding to the above species preferences, most respondents (84.2%) used pots and creels, with a reasonable number using fixed nets and lines (Figure 6.4). There were only 3 trawlers (2 demersal trawlers and 1 beam trawler), while other gear used included cuttlefish traps, spearguns, unbaited shelters and traps (for octopus) and scallop pots with lights. In line with the multiple species targeted by some fishermen (see figure 6.3), it is worth noting that the same fishermen may have used several different gear types – hence why the percentages in figure 6.4 adds up to 150%.

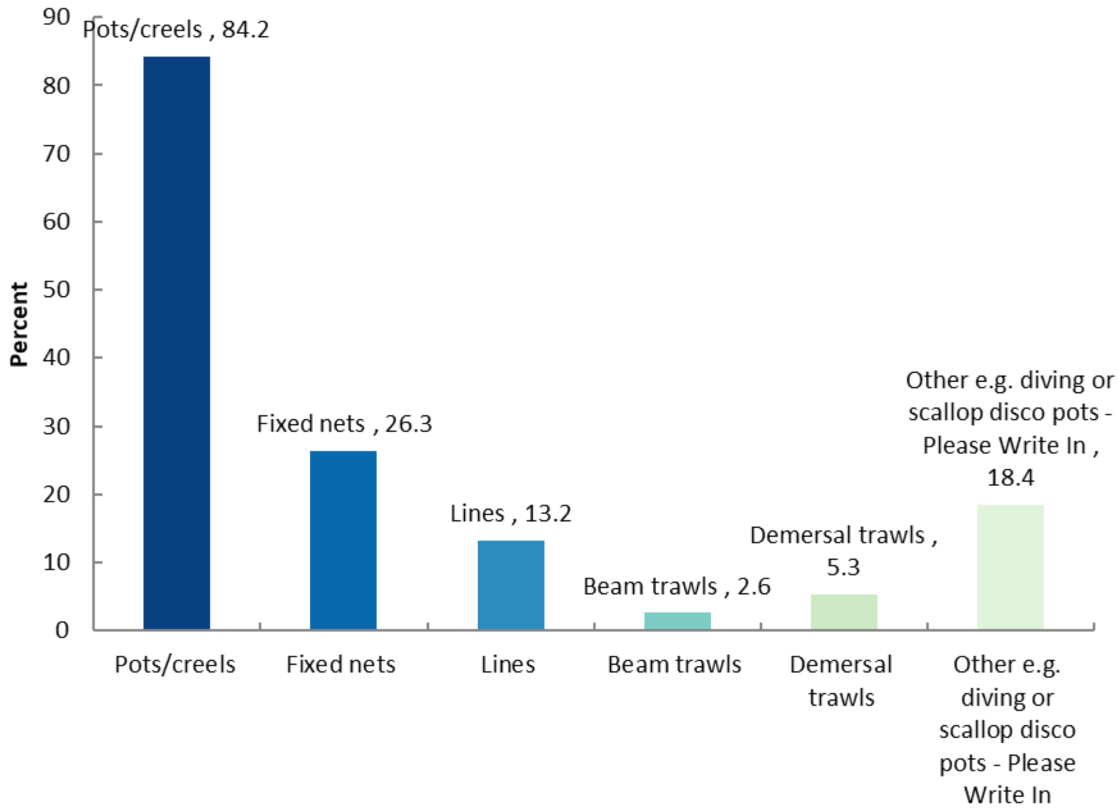

Figure 6.4: Fishing gear types used by respondents. Numbers above columns indicate percentages of the total.

Also related to the above results, respondents reported that on average, 27.3 % of their work was in crab and lobster fisheries, however, estimates ranged from 10% to 100%. Of the 33 people who replied to this question, 19 (57.6%) said that over 80% of their work was in crab and lobster fisheries. Equal amounts (40.6%) of crab and lobster fishermen used parlour pots or a combination of parlour and inkwell pots (Figure 6.5). One fisherman just used inkwell pots, while other fishermen used various other types of pots.

6.3.2.3 Octopus observations and impacts

When respondents were asked when they first saw octopus in their catches in 2025, there was a relatively even spread between January and May (Figure 6.6). Only 1 fisherman said July, and 2 said never. Catches were said to be mostly (82.9%) common octopus (*O. vulgaris*), although 1 fisherman said a mix of octopus species and 5 weren't sure of the species.

Figure 6.5: An inkwell pot retrieved off the southwest coast of the UK during 2025, rammed full of common octopus (*Octopus vulgaris*) (Credit: South Devon and Channel Shellfishermen)

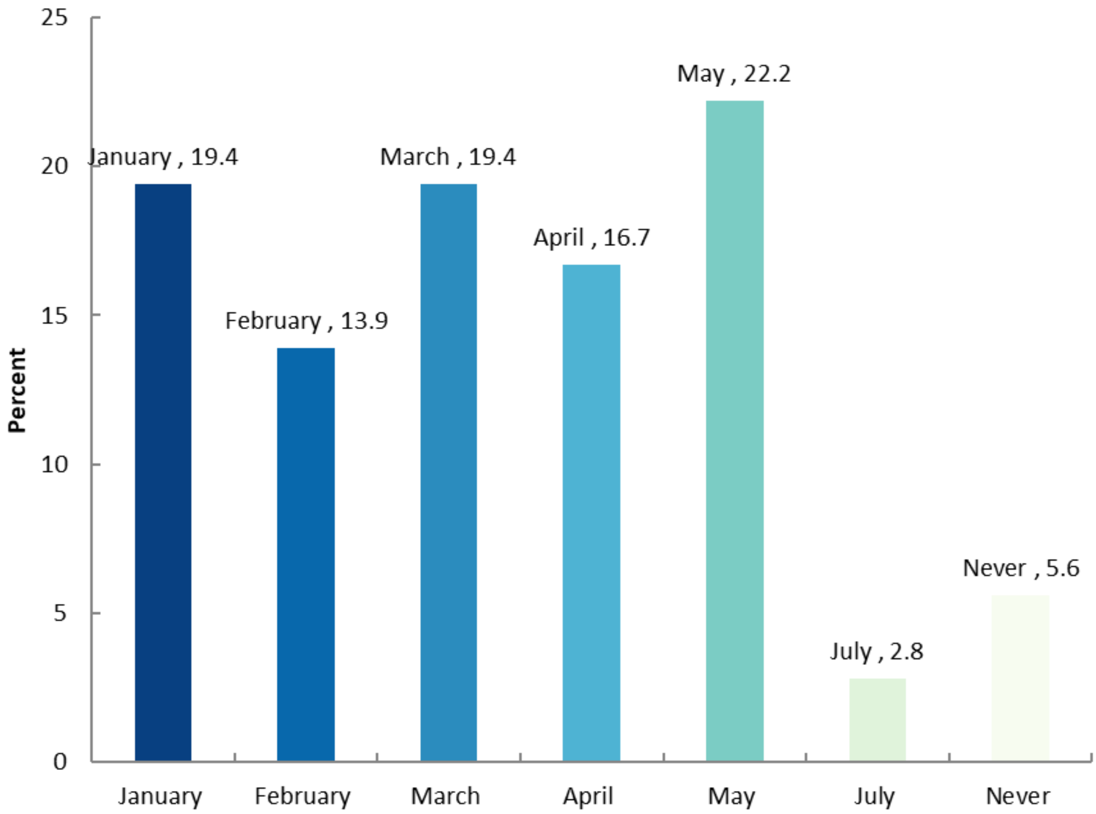

Figure 6.6: Months when octopus were first seen in the catches of respondents. None were first seen in June. Numbers above columns represent percentage of the total.

Fishermen were also asked if they tried to specifically target octopus during a particular month. Just under half (41.7%) said yes, but the rest said no. Of those that said yes, the peak month was June, with 86.7% of those that did so targeting octopus then (Figure 6.7).

Fishermen were asked if they fished with pots the Devon and Severn Inshore Fisheries and Conservation Authority (IFCA) district, and if so, whether they closed the escape gaps to specifically target octopus. Of the 12 respondents who used pots in the area, 7 said they did close gaps, while 5 said they didn't. Two fishermen closed the gaps in May, three in June and one in July. On average, gaps were closed on 63% of pots, but one fisherman only closed gaps on 10% of pots, while another closed them on 90 to 100% of pots.

Approximately half (47%) of the relevant fishermen responded to the octopus boom by changing their gear in other ways, but the others did not. Most of those who reacted moved their gear, but while some moved to avoid the octopus, others moved to target them. One respondent changed from targeting white fish to specifically targeting octopus in 2025, while others trialled different types of gear aiming to catch more octopus. Another hauled their pots more often where the octopus were concentrated. For full details see Appendix 9.5.1.

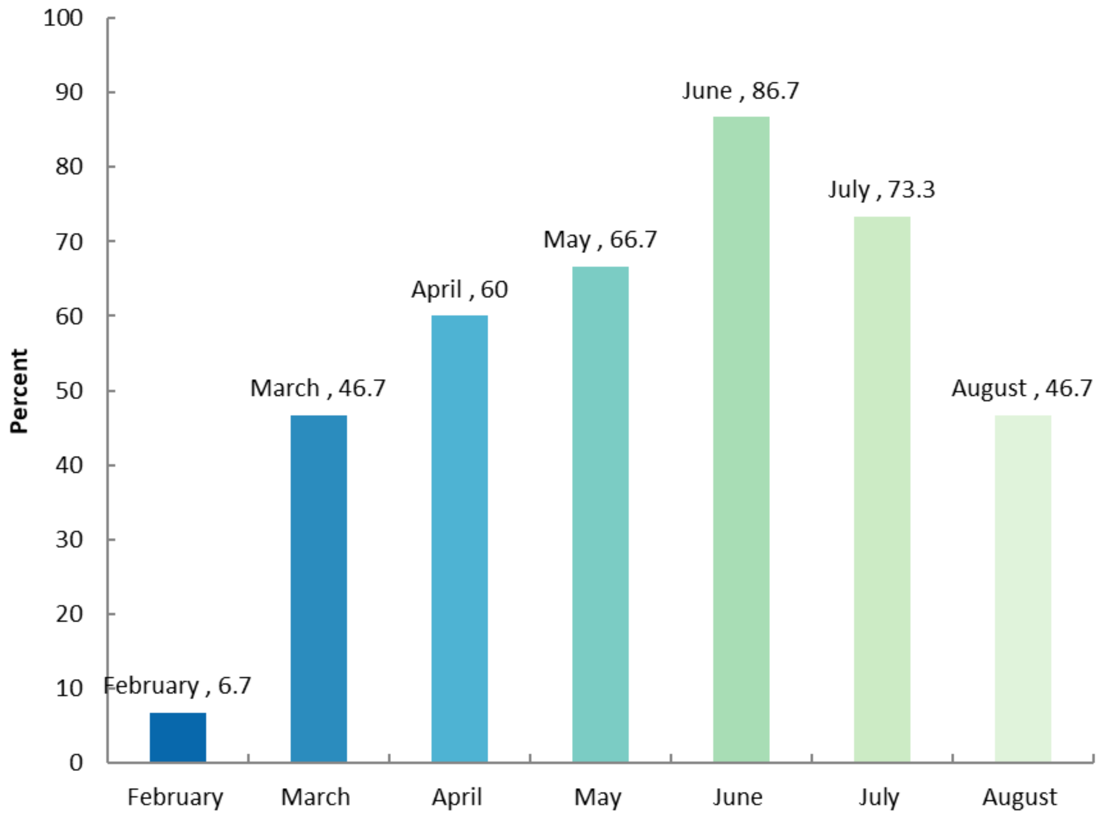

Figure 6.7: Months when octopus were specifically targeted by a selection of respondents. Numbers above columns indicate percentages of the total.

Fishermen were then asked where they saw or caught the most octopus in 2025. In Figure 6.8 we have combined both the answers given formally through the questionnaire and through the 5 ancillary phone interviews. The questionnaire and the interviews asked respondents to give as much detail as they were comfortable with about where they had caught octopus. In some cases, very precise locations (latitude and longitude) were reported, while in other cases specific fishing grounds or seabed features were named. Through local knowledge we were able to geo-locate all of these areas. Those fishermen interviewed from the Channels Islands, particularly Guernsey, said that octopus had been present in large numbers since late 2023 through 2024 and were present throughout the year. The bloom was concentrated around Guernsey, particularly around the west coast with one interviewee suggesting that octopus came inshore under the cliffs of the south coast of the Island during the summer of 2025 (Figure 6.8), although one participant who fished for lobster in this area encountered few octopus during this period.

The fishermen in the English over 10 metre boats first encountered large numbers of large octopus in late January 2025 in the deeper water east of Start Point in Devon, with subsequent discoveries during late February to March in the deeper tidal scours on the eastern flank of the Skerries Bank NNE of Start Point (Figure 6.8). No octopus were observed in the shallow waters on the top of the banks, but crab catches were reported to be very low compared to 2024.

During mid-March 2025, very high concentrations of octopus were encountered to the SE of the Lizard Point in Cornwall, with one skipper of an over 15 metre potting boat reporting average trip landings of 5-6 tonnes of *O. vulgaris* with one 7 tonne landing. These numbers diminished during mid-April, but this skipper then discovered another large congregation of *O. vulgaris* in 55-70 metres of water to the South of the Hurds Deeps to the NW of the Channel Islands (Figure 6.8). This area was then fished by the large beam trawlers from Newlyn and Brixham, resulting in the largest ever landing by value recorded into Newlyn by the beam trawler, Enterprise, of nearly 20 tonnes of octopus worth over £142,000.

The skipper of the over 15 metre potting boat reported that the beam trawlers only caught octopus during the day, whilst his pots worked best at night with only a 1 day lay. This ground to the South of the Hurds Deeps is reasonably hard, with base rock present amongst the sand. This fishery subsided towards the end of April, but *O. vulgaris* was reported in increasing numbers inshore in Start Bay from Thatcher's Rock (north of Brixham) to Freshwater Bay (just north of Start Point) (Figure 6.8). The inshore boats reported that octopus numbers peaked during June and July across the area from Start Point in the East to Lizard Point in the west, with a perceived migration into inshore shallower water. By the end of July, one respondent reported large numbers of octopus in less than two metres of water near Salcombe, whilst octopus catches were high in the area south of Plymouth Breakwater and in Cawsands Bay in depths of around 10 metres or less. Increasing catches of *O. vulgaris* were reported in the inshore water in Cornwall, with one inshore recreational potter reporting up to 8-10 specimens per pot.

One interviewee reported few octopus found in pots on the Eddystone reef until September 2025 and near normal lobster numbers, although brown crab catches were slightly lower than previous years. This fisherman then reported that most of his pots on the Eddystone were raided (presumably by octopus) during September, with the remains of lobster carapaces and claws found. However, few octopus were captured and those seen were mostly smaller specimens ("Palm sized"). However, this skipper found large octopus on the nearby Hands Deeps, Brendon's Rocks and Hatt rock (south of Looe) from the middle of June. Reports from angling boats confirm that *O. vulgaris* were present in these locations during this period, but no specimens were captured from the Eddystone reef as of the end of September.

Octopus catches were reported to dwindle during August across the entire area (Figure 6.8) before increasing again during September, although the size of octopus decreased with smaller specimens predominating and larger specimens showing sign of senescence (lost limbs, lesions and lethargy). However, some healthy large *O. vulgaris* were observed on the east of the Lizard peninsula and in Mounts Bay. One specimen was reported from the North Coast of Cornwall during August.

It should be noted that while the above observations and map below given an excellent overview of where octopus were caught during this 2025, they don't necessarily give a complete picture of exactly all of the places that octopus could have been. Catches by fishermen depend on where people are fishing, who took part in our survey and interviews, and if catchability of the octopus changed over time. For example, once female octopus have bred and are guarding eggs, they are very unlikely to be caught in either pots or trawls. We have also surveyed SCUBA divers and snorkelers in the southwest in 2025 (120 responses), which when analysed should provide even more information on octopus distribution, particularly inshore in shallow waters.

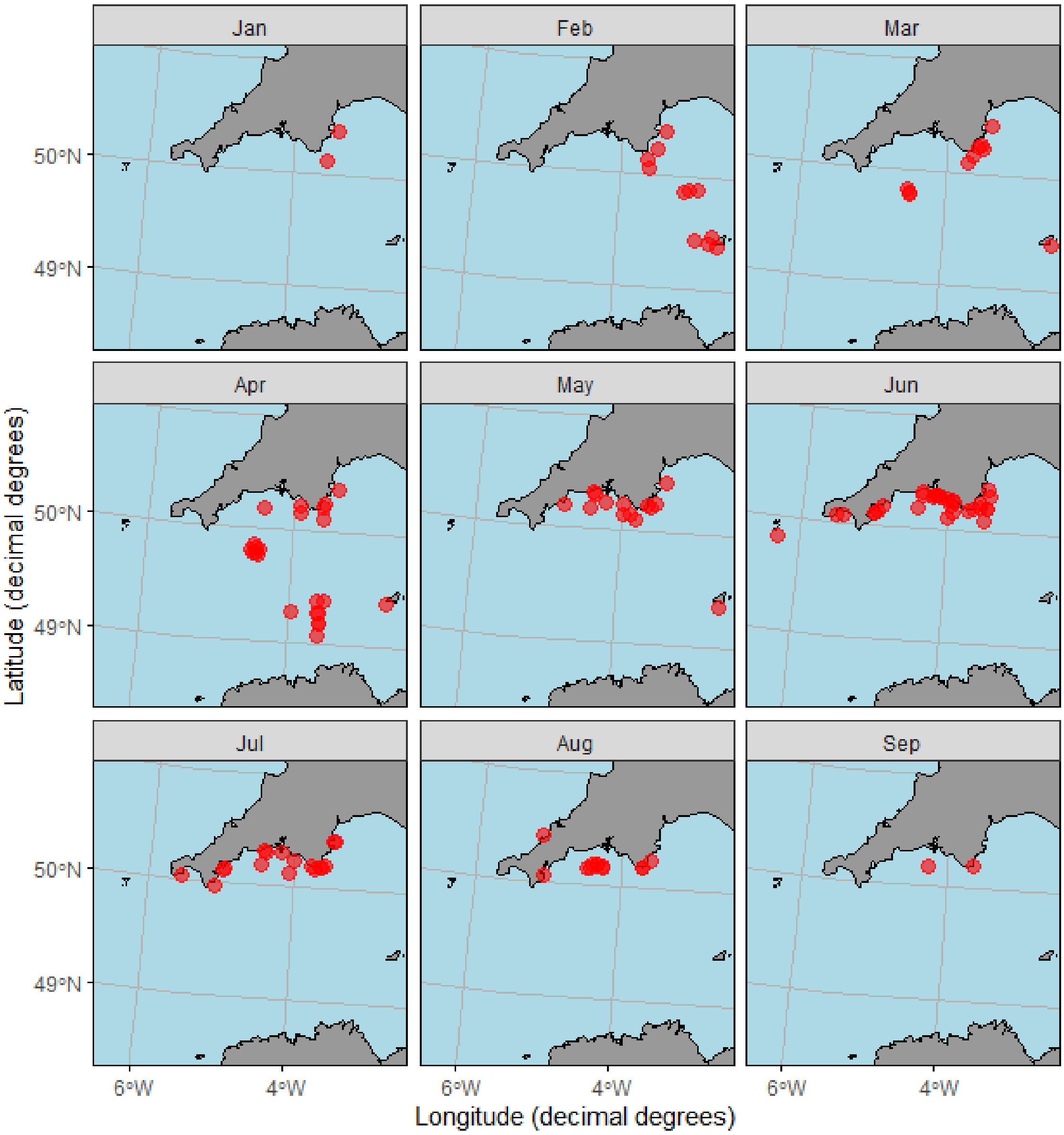

Figure 6.8: Locations of *Octopus vulgaris* catches by month in 2025, as reported by respondents in the fishermen's survey and during informal conservations.

In agreement with the above descriptions and map, most fishermen (59.5%) said that the areas where they saw or caught octopus changed between January and August. A lot of respondents talked about movements, for example, approximately a third of relevant respondents said east to west, a key response being that "*A huge congregation in Start Bay early in the season which spread westwards and inshore as the season progressed*". Others said the octopus moved south to north, potentially the same as offshore to inshore which was another common response. But directionality was not consistent, presumably because fishermen were based in different areas. One fisherman said that octopus moved from "*offshore to on(in)shore and then offshore again*." See Appendix 9.5.2 for full responses.

Respondents were then asked if octopus were more abundant on particular types of seabed. The most common response was hard rocky reef (34.3%), but octopus were also reported to be abundant on coarse sediments (25.7%) and soft sand (8.6%). A significant number of people (31.4%) said other types of sediments. Most of these people said the octopus were found on a mix of sediments (generally a mix of hard reef and soft sand), with some being more specific with answers such as "*edges of ground, sandy gullies*", "*coarse sediment early season, rocky ground later*" and "*hard ground on banks*". One respondent said, "*We caught them wherever we went*".

Answers to the question "Did you notice octopus being more abundant during particular tides or times of the month were quite mixed. Most people (61.5%) said that tide didn't affect their catches, but 29.9% said catches were better on small tides, while 11.5% said catches were better on high or spring tides. Other observations were that octopus seemed to move more on larger tides, and that catches were higher at night, and on cloudy and windy days.

In response to the question "Did you notice octopus being more abundant at any particular depths" there was a wide range of answers from 0-10m to 40m+, however the two most common answers were for water less than 20 m deep (Figure 6.9).

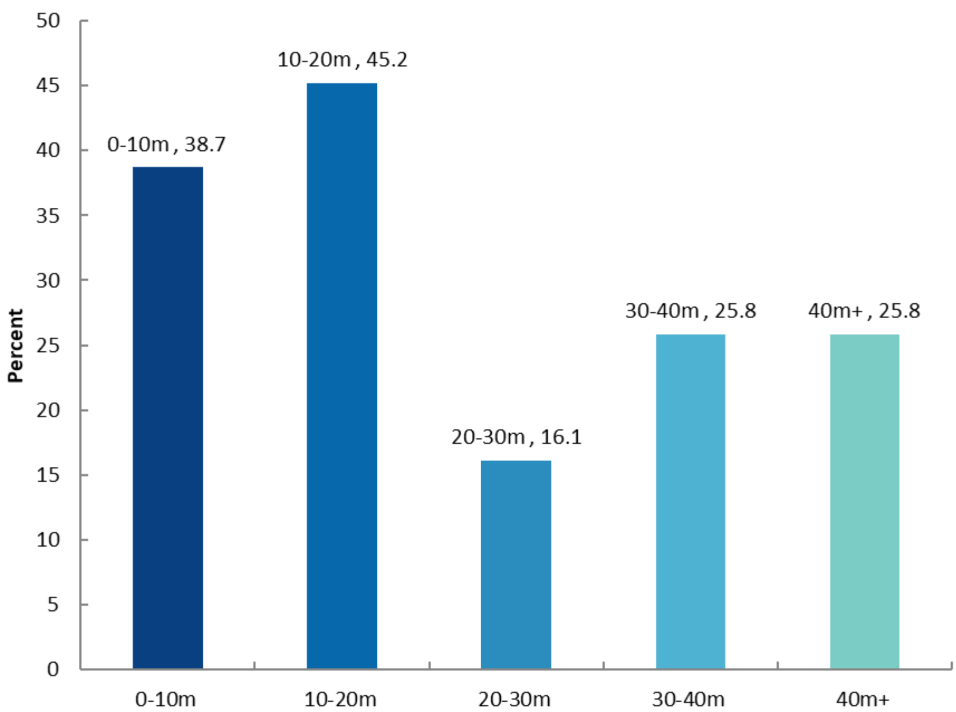

Figure 6.9: Reported abundance of octopus at different depths. Numbers above columns indicate percentages of the total.

The next question was “Have you noticed any particularly unusual behaviour of octopus (e.g. octopus taking rocks or scallops into pots) or anything else noteworthy?” This produced a wide range of responses (Appendix 9.5.3). Many respondents said that octopus had put both rocks and stones (56.7%) and shells, mostly scallops (60%), into the pots. Some fishermen have reported seeing over 40 scallop shells in a single pot (Beshlie Pool, pers. comm.). It is difficult to be completely sure if these shells were from scallops that were already dead or if octopus brought live scallops into pots to be consumed later. Given the sheer volume and number of shells it seems likely to have been the later. Figure 6.10 below shows shells (mostly scallops) retrieved from lobster pots. Remnants of flesh are still attached to several shells, strong evidence of recent predation. See below for further results and discussion around the predatory impact of octopus on other commercially valuable species.

Figure 6.10: King scallop (*Pecten maximus*) shells, a cuttlefish bone (*Sepia spp.*) and a spider crab (*Maja spp.*) carcass retrieved from lobster pots (credit: South Devon and Channel Shellfishermen). Some of the scallop shells near the bottom of the frame show remnants of scallop flesh, indicating recent predation.

Only 10% (3 of 30) fishermen said they hadn’t noticed anything unusual. Several others mentioned shells of crabs and lobsters, although that will be covered in a subsequent question. Further interesting observations were that conger eels seemed to be following octopuses into pots to eat them, with congers also appearing to have eaten octopus arms that were protruding from the pots. Another mentioned that the small octopuses that have appeared late in the season are pulling lobsters out of the pots to eat them. One observed that octopus stomachs were full of scallop roe while another said that scallop shells were used by octopus as a ‘front door' on the traps he was using. One respondent also mentioned octopus cannibalism during late summer, although this was much more widely reported in the section below and during the phone interviews.

On average, octopus were reported to make up nearly half (46.76%) of respondents landings during the bloom (January to August), but there was a large amount of variation, with relatively even spread of answers in categories from 0-10% up to 90 to 10%. Most respondents (55.9%) said this percentage changed over the period of the bloom, but a significant number (44.1%) said it didn't change. Many of those who had observed a change reported peaks in May and June, followed by a decline in July and August, but this was not consistent (Appendix 9.5.4). Two reported a decline from March to August, with some very large landings during March and April e.g. "*Big landings in March, April: 5 to 6 tonnes from a 1 to 2 day lay, with biggest (catch) 7 tonnes*". Another reported a "*Peak in June: 345kg... from 35 pots*." A number (17.6%) of people mentioned small octopus appearing in August, one noting that they are too small to sell.

Many respondents (67.6%) said they had caught dead or damaged octopus. The most common observation (50%) was that octopus were dead or dying (damaged limbs, low energy), particularly later in the season. Cannibalism was also reported frequently (37.5%) with observations such as "*If there were more than one octopus in a pot there would always be a dead one, eaten by the others*". Predation was also mentioned by 20.8% of respondents, with the most common culprit thought to conger eels, along with dogfish and bull huss. One fisherman noted that he had caught a lot more of those species in 2025. See Appendix 9.5.5 for full responses.

Twenty five percent of respondents also said they had seen octopus eggs during their fishing activities (Figure 6.11). The peak month when this was seen to occur was July (44.4%), but some fishermen (11.1%) had seen egg laying as early as February. Sixty percent of those who saw eggs said they were on both the insides and outsides of pots, while two fishermen reported female octopus guarding their eggs in traps.

Figure 6.11: Octopus eggs (almost certainly *Octopus vulgaris*) laid on a crab and lobster pot in 2025 (photo: South Devon and Channel Shellfishermen)

One of the key aspects we wanted to investigate was the effects of octopus predation on other species in crab and lobster pots. Almost all applicable fishermen (94%) said they had seen evidence of octopuses eating other species in pots. Crabs (presumably the edible crab, *Cancer pagurus*) and lobsters were by far the most common victims, seen by 89.7% and 93.1% of fishermen, while scallops (65.5%), crawfish (44.8%) and whelks (20.7%) were also often seen to have been killed and / or consumed (Figure 6.12). Just over half of the relevant fishermen also saw other predated species; these included various species of clams (6 fishermen) and wrasse (4 fishermen). Surprisingly, only one fisherman had seen a predated spider crab, matching comments elsewhere by several fishermen that "*octopus don't eat spider crabs*". Other predated species included gurnard, cuttlefish, pout, velvet crabs and various other fish (Figure 6.13).

Many of the fishermen surveyed (61.1%) had also caught octopus in 2024 but most of them said they had caught either much more (63.6%) or more (13.6%) in 2025. One fisherman said he had caught similar numbers across the two years, but surprisingly four fishermen said they had caught much more octopus in 2024.

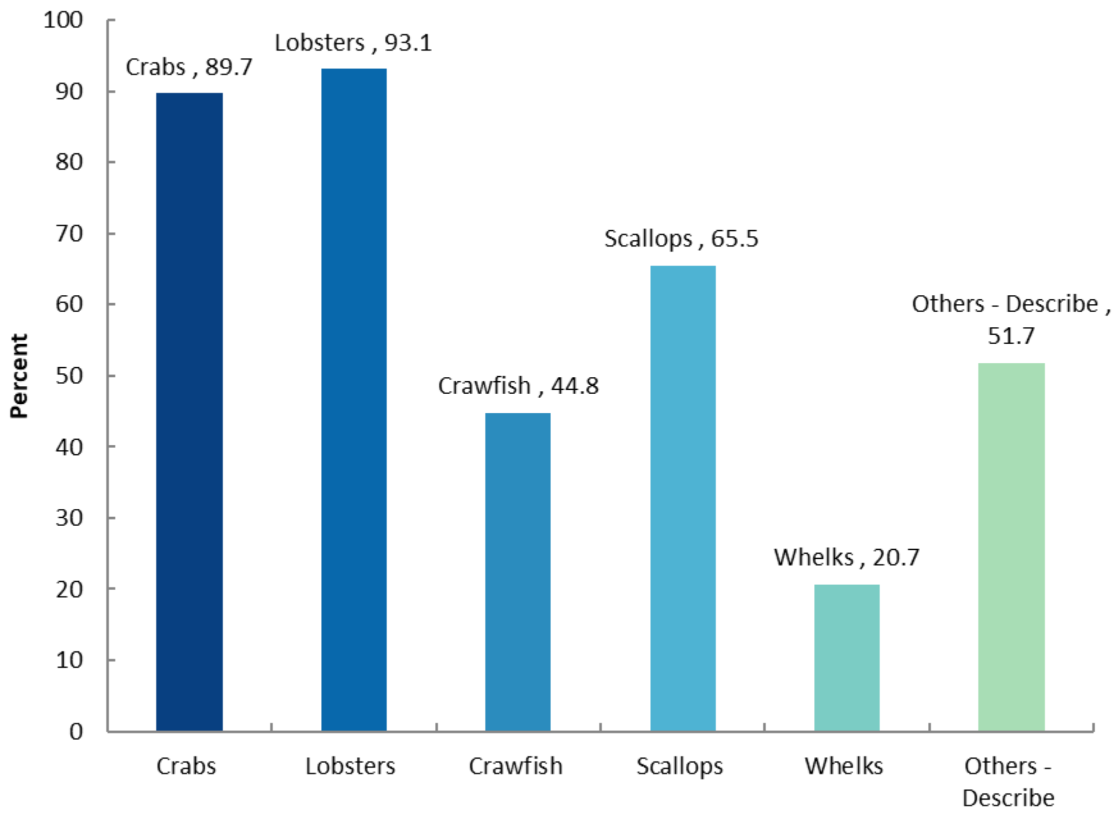

Figure 6.12: Species seen by fishermen to have been predated upon by octopus in pots. Numbers above columns indicated percentages of the total.

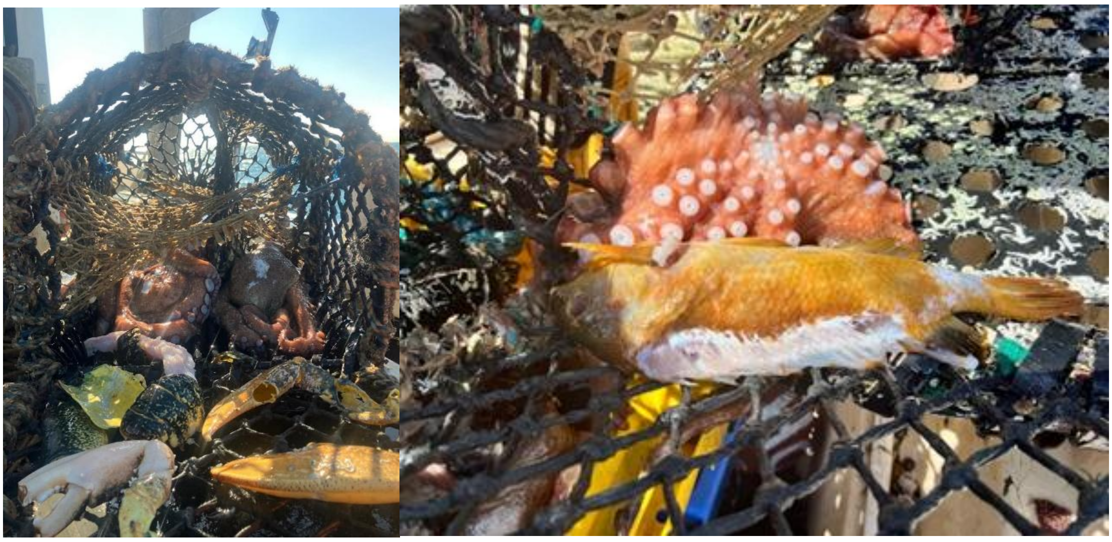

Figure 6.13: Examples of species depredated by octopus in crab and lobster pots. Left – European lobster, *Homarus gammarus*, Right – wrasse, Labridae (photos: South Devon and Channel Shellfishermen).

The final crucial question in this section was to ask fishermen if the increase in octopus in 2025 had a positive, negative or neutral effect on their fishing operations, catch or income between January and August 2025. We focused our analysis on fishermen who normally target crabs and lobsters because they made up the vast majority of our respondents and were most likely to have been affected by the increase in octopus numbers. Of these 33 fishermen, 57.6% said the octopus bloom had been negative, while 27.3% said it had been positive and 15.2% said it had a neutral effect over the specified time period (Figure 6.14). All three trawl fishermen who responded said the octopus had a positive effect on their fishing operations, but this sample size is too small to draw strong conclusions.

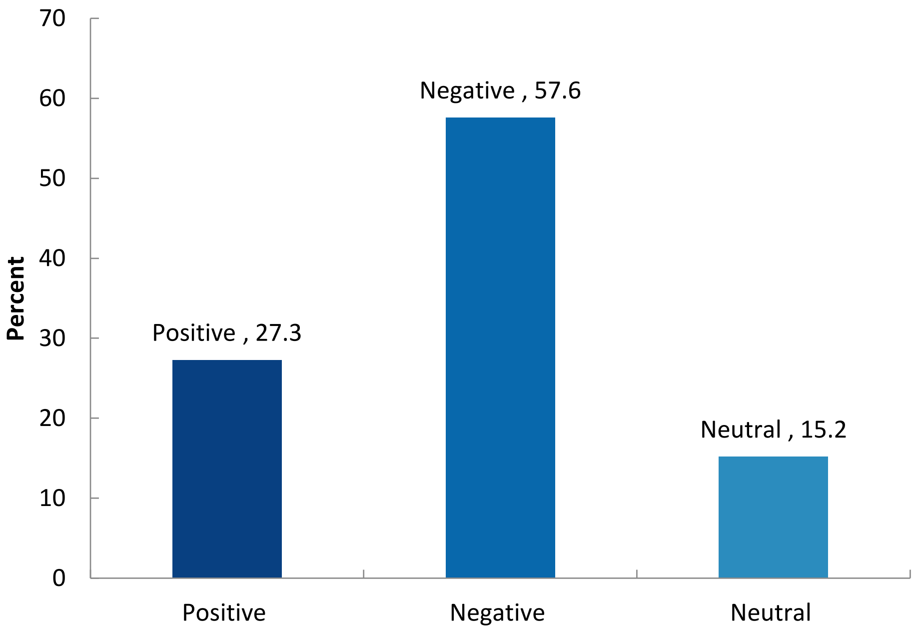

Figure 6.14: The percentage of crab and lobster fishermen who said the octopus bloom had a positive, negative or neutral effects on their fishing operations, catch or income between January and August 2025)

6.3.2.4 Future Planning

Looking into the future, fishermen were then asked if they would adapt their fishing operations if there was another octopus bloom. Nearly all (37 of 41) respondents answered this question, with just over half (51.4%) saying yes, and another 13.5% saying probably or maybe. However, 32.4% of respondents said no. Of those who said yes, several said "*we will have to*" while several of those who replied '*maybe*' said it would depend on the market. A fisherman from Guernsey said there was "*No need yet and very little sales in Guernsey for octopus and what you can sell is only £3 per kilo*". Many of those who said yes talked about adapting their gear, for example using more inkwells as "*they were the best catchers*", *improving existing* (octopus) *shelters and expanding season fished for octopus*", while another said he would keep escape hatches closed (presumably in the Devon and Severn IFCA district).

Following on from the above question, fishermen were asked what they would need to help adapt their fishing boat gear and business if there is another octopus bloom. This question also received a good response, with answers from 36 of the 41 respondents. Nine of those respondents said either nothing (6), not applicable (2) or not sure (1), but the majority (26 or 72.2%) said they would benefit from support. The most requested support was for new and different gear, particularly pots or traps specifically designed to catch octopus (Table 6.2). The next most common request was for better market access, mostly for selling octopus, but crab was also mentioned due to the closure of their regular processor. Further requests were for more fish / ice boxes designed for octopus, more adaptable management regulations and more science to better understand octopus behaviour. Full responses are given in Appendix 9.5.6.

Table 6.2: Support requested by fishermen if there is another octopus bloom in the future.

Type of Support	Count (%)
New / different gear (particularly octopus pots)	13 (46.4)
New / better markets	5 (17.9)
Financial (non-specific)	4 (14.3)
Ice bins and (personalised) fish boxes	4 (14.3)
More adaptable regulations	3 (10.7)
More science	2 (7.1)

A further future looking question asked, "What would improve your ability to land quality octopus (e.g. ice, stunners etc.)?" This question also received a good response, with 33 of 41 respondents taking part. The most common answer was more ice and ice boxes (45.5%), followed by stunners (21.1%), although several people were unsure of the effectiveness of stunners and two others were actively against stunners, saying they were impractical or not useful at sea. While some respondents promoted keeping octopus alive to achieve better prices, others were concerned about the welfare and quality of octopus if they were not dispatched effectively. One respondent said, "*It is important* *that the fishers are taught how to humanely kill octopus. There is a sense that the more alive an animal is when it reaches the processor the fresher and better, when in fact a less stressed and dead octopus will taste better*." Following on from that topic, fishermen were asked if a code of conduct for handling and dispatching octopus would be useful. While 16 of the 35 respondents (45.7%) said yes, the remainder (54.3%) of respondents said no. Full responses to these questions can be seen in Appendix 5.5.7.

The final question asked if there were any other thoughts or comments that respondents would like to add. Considering this question was at the end of a relatively long questionnaire it received an excellent response with answers from 28 of the 41 respondents. While two people actively said they didn't want to add anything, many of the remaining answers provided detailed and extremely useful information and perspectives. To fully appreciate the quality of this information, please see full details in Appendix 9.5.8. It is challenging to summarise the multitude of views and variety of information, but many fishers wanted to highlight declines in local shellfish stocks, for example "*I would rather have the old shellfish fishery back, it was steady on you knew what was likely next year, my lobster catch is down by half and crab by 90%. We haul 135 pots now and you'll be lucky to see a brown crab, next year is not going to be good, or probably the next five for shell fishing without octopus.*" Some also mentioned factory closures, the selling of boats, and job losses. Several respondents reported that many vessels without shellfish licenses joined the octopus fishery, also catching lobsters, displacing other boats and putting additional strain on already pressured stocks. Many fishers were frustrated, especially those working hard to sustain local stocks, feeling their conservation efforts have been undone. The bloom appears to have triggered a cascade of ecological and economic consequences.

There were mixed views on how to respond. Some argue it is a natural, cyclical event that has occurred for centuries, while others warn of lasting damage if octopus continue to return in such numbers. Calls have been made for better management strategies, including dispatch guidance and limits on pot usage, but there's concern that regulatory changes could exclude small-scale fishers already on the edge of viability. The unexpected increase in predators like conger eels and bull huss, which feed on octopus, also signals significant ecological shifts. Despite a brief economic lifeline from high octopus prices, the outlook remains highly uncertain - many fishers fear total collapse of the shellfish fishery if neither crabs nor octopus return in viable numbers in 2026, for example, "*I fear for the future of the industry, the crabbing fleet only survived this year due to high price of octopus*."

6.4 Commercial landings of non-octopus shellfish in southwest UK

Commercial landings of brown crab (*Cancer pagurus*) into all UK ports between 2009 and 2024 peaked at 33,819 tonnes in 2016, before decreasing steadily and dramatically to 20,300 tonnes in 2024 (Figure 6.15). Landings of European lobster (*Homarus gammarus)* and king scallops (*Pecten maximus)* into the UK over the same period showed fluctuating trends but overall remained relatively steady (Figure 6.15). Most recently, lobster landings increased slightly from 3287 tonnes in 2019 to 3473 tonnes in 2024, while king scallop landings increased from 18,636 tonnes to 30,575 tonnes over the same period (Figure 6.15). In ICES sea area 7e specifically (i.e. where the octopus bloom is concentrated), brown crab landings decreased from 3463 tonnes in 2019 to 2673.6 tonnes in 2024, mirroring the decline seen on a national scale (Figure 6.16). Both lobster (209 to 281 tonnes) and *P. maximu*s (4007 to 8651 tonnes) landings increased in ICES area 7e during the same period (Figure 6.16). Data from 2025 were not included in this analysis because records from the whole year were not available at the time of writing, meaning a comparison of yearly totals would have been misleading. We therefore conducted a separate analysis for 2025 below.

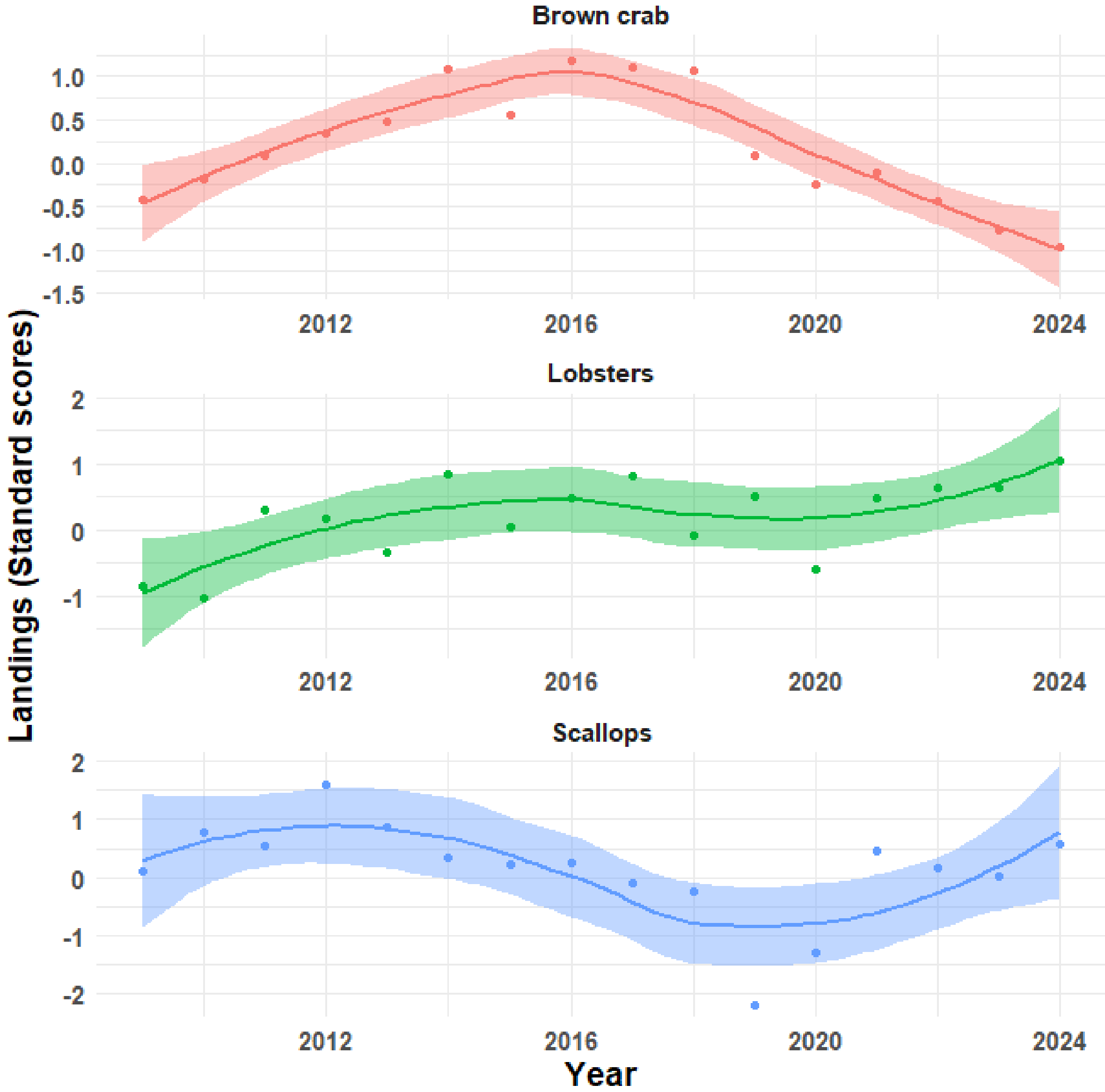

Figure 6.15: Trends in landings of brown crab (*Cancer pagurus*), Lobster (*Homarus gammarus)* and scallops (*Pecten maximus)* into the UK from 2009-2024. Points indicate standardised (z score) and lines denote the trend determined by the Locally Estimated Scatterplot Smooth (LOESS) method described in the link. Shading indicates 95% confidence intervals for trends. Figures are in tonnes. (Data from the MMO).

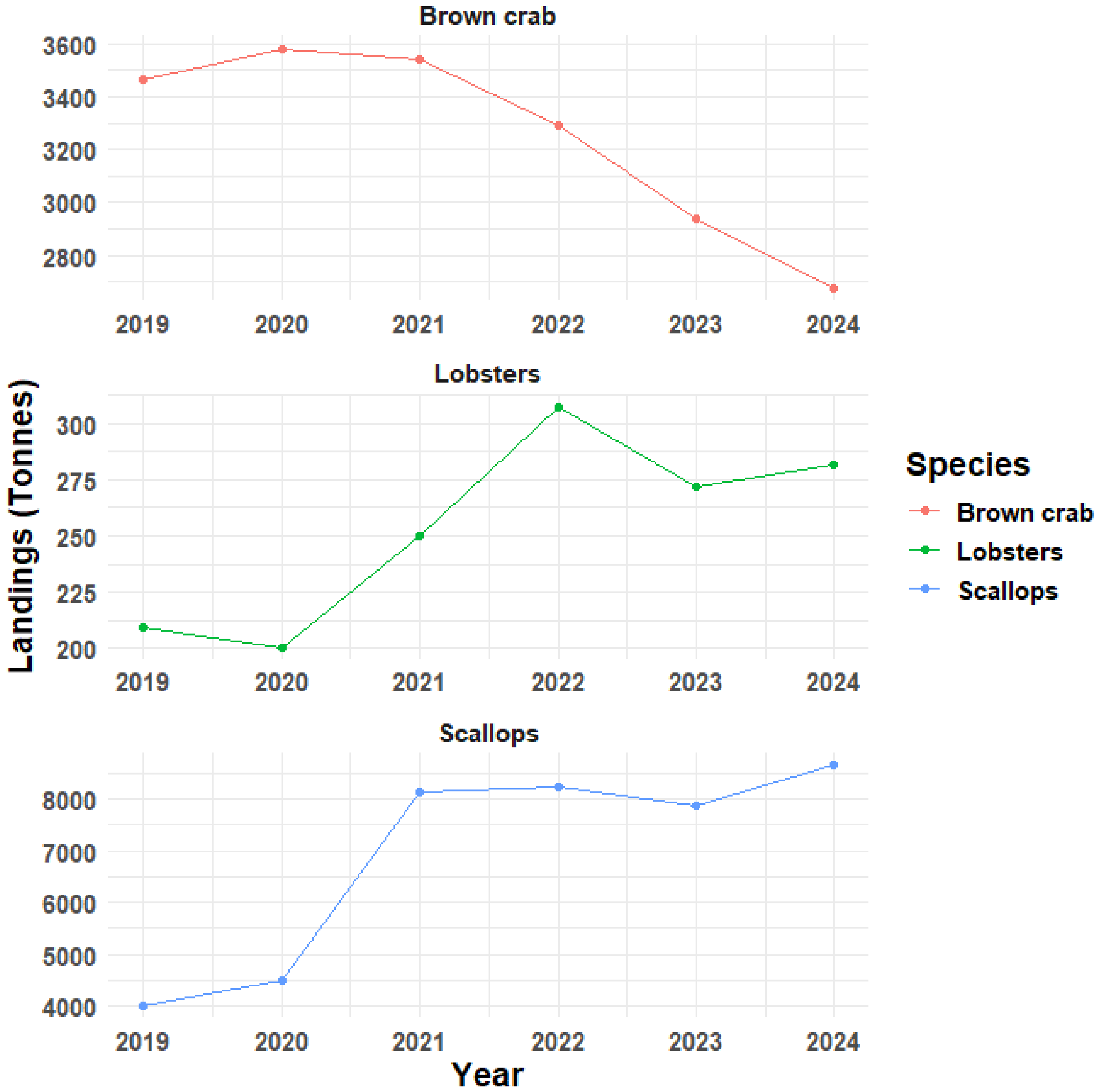

Figure 6.16: MMO landings data from ICES Sea Area 7e from 2019-2024 (January to August). Adapted from MMO (2025). Brown crab (*Cancer Pagurus*), Lobster (*Homarus gammarus)* and Scallops (*Pecten maximus)*

When comparing the landings of brown crab from January to August in 2025 to the average from January to August in 2021-24 in all UK areas other than ICES area 7e, there was an additional decline (Figure 6.17). However, the same comparison for lobster showed landings to be relatively stable, while there was a marked increase for scallops from January to August 2025 (Figure 6.17).

In contrast, when the same comparison was made just in ICES sea area 7e, landings of brown crab had declined even more (by 52%), while lobster landings had dropped by 30% and scallops by 52% (Figure 6.18).

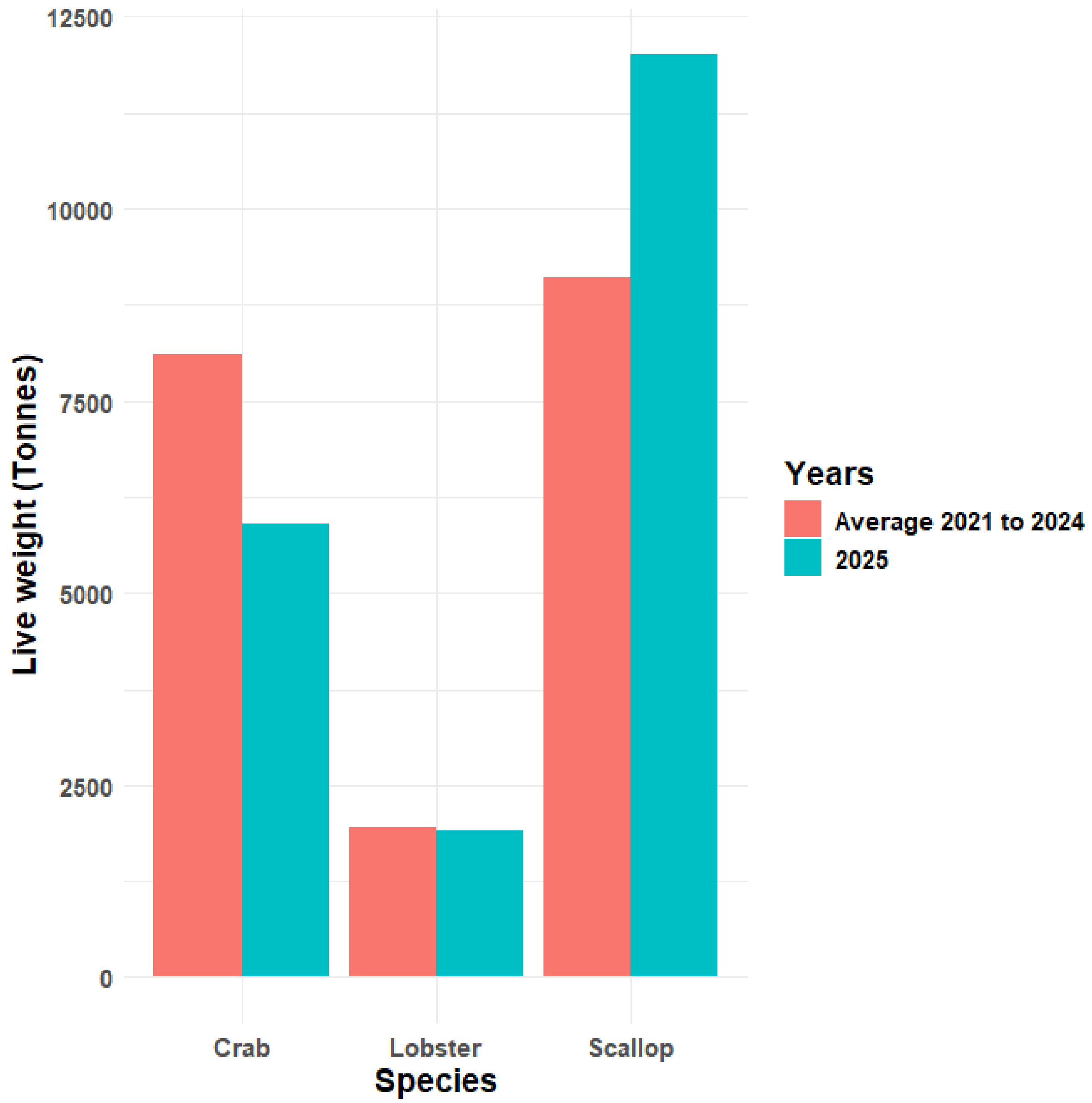

Figure 6.17: MMO landings data. A comparison of ICES areas 4b, 4c, 7a, 7d, 7f, 7g, 7h, 7j, and 8a live weight (tonnes) from a collective average up to September 2021-2024 (Red) compared with up to September 2025 (Cyano) shellfish landings by UK vessels. Adapted from MMO (2025). Crab=Brown crab (*Cancer Pagurus*), Lobster (*Homarus gammarus)* and Scallops (*Pecten maximus)*

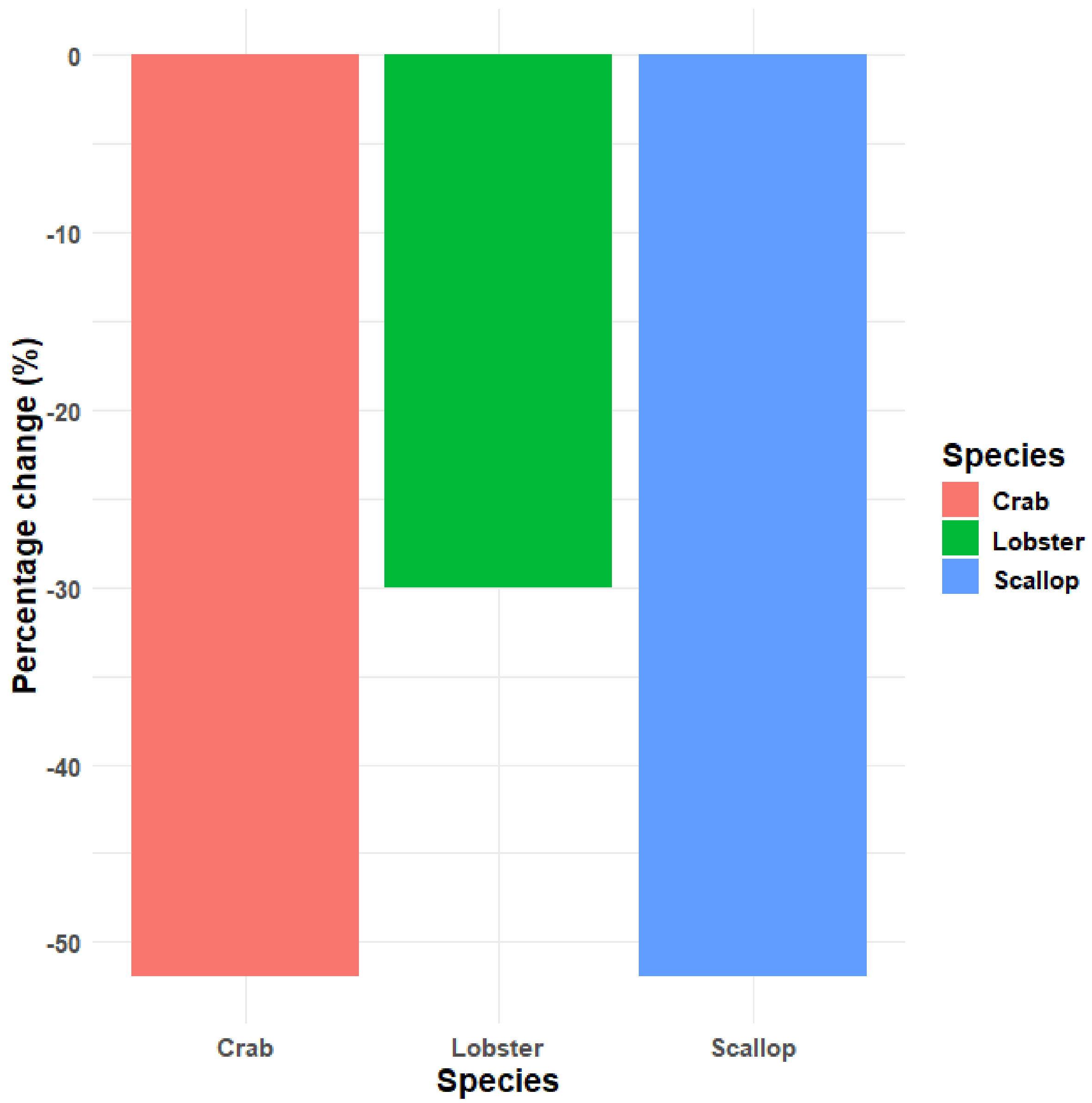

Figure 6.18: MMO landings data. A comparison of landings from ICES area 7e, (expressed as a percentage change %) for selected species from a collective average up to September 2021-2024 compared with up to September 2025 of shellfish landings by UK vessels. Adapted from MMO (2025). Crab=Brown crab (*Cancer Pagurus*), Lobster= (*Homarus gammarus)* and Scallops (*Pecten maximus)*

Table 6.3 breaks down the above percentage changes into landings and value for each of the key non-octopus shellfish species (brown crabs, lobsters and king scallops) and in total. It is noteworthy that the total decline in the value of crab and lobster catches was approximately £4.593 million, compared to at least £4.217 million worth of common octopus landed by the same fleet over roughly the same period (see Section 4). In contrast, the decline in the value of scallop landings (over £6 million) was barely offset by any landings of octopus at all (see Section 4).

Table 6.3: Change in landings and value of brown crab, lobster and scallop from ports in the 7e area fishing in ICES Sea Area 7e up to the end of August compared to the same period in 2024.

Species	Change in landings (t)	Change in value (£)
Brown crabs	-1206.44	-£3,187,230
European lobster	-87.57	-£1,405,506
King scallops	-3164.58	-£6,040,646
TOTAL DEFICIT	**- 4440.59**	**-£10,633,382**

It is also worth highlighting the declines in landings of the above species were very patchy across different fishing ports in the southwest. We present the changes in landings data by species, value and port in Appendix 9.6. Although this highlights some small increases in landings of some species in some ports, the vast majority of ports saw large declines in tonnes and value which were particularly significant for crabs in Salcombe (a decrease of £1.212 million), for lobsters in Dartmouth (a decrease of £242,011) and for scallops in Plymouth and Brixham (decreases of £3.219 million and £1,732 million respectively). Further information in the patchiness of declines can be seen in figure 6.19 below. This shows that over the same time period the areas of declines in crab and lobster catches were very similar (partly because the two species are often fished for together), while for scallops the largest declines were offshore and to the east of the area.

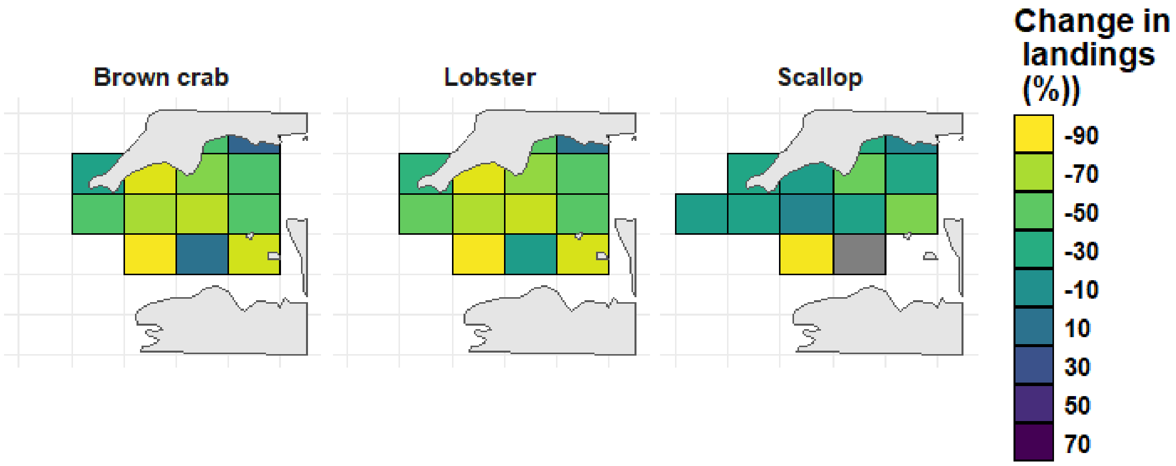

Figure 6.19: The spatial distribution of percentage changes in landings of brown crab (*Cancer Pagurus*), European lobster (*Homarus gammarus*) and king scallops (*Pecten maximus*) comparing totals from January to August 2025 to the average of the same period in 2024. (Data MMO)

6.5 Discussion

Our analysis of media and social media, a survey of fishermen, and the landings data of non-octopus shellfish species has provided an excellent overview of the complex effects of the 2025 octopus bloom on the fishing industry in the southwest of the UK. One of the key questions in our survey was to ask fishermen about the effect of the bloom on their businesses from January to August 2025. While 57.6% of crab and lobster fishermen surveyed said it had been negative, 27.3% said it had been positive with the remainder saying it had a neutral effect. There was also a temporal element to these effects. Early in 2025 the increased abundance of octopus was having devastating effects on crab and lobster fishermen, with many catches being destroyed by depredation. Some fishermen were then able to adapt by either moving location, or by adapting their gear (e.g. by closing escape gaps in the Devon and Severn IFCA district, or by using specific gear designed to catch octopus). However, other fishermen did not have the ability to adapt in this way (e.g. because of spatial restrictions on where they could fish, and / or the small size of their boats). Analysis of octopus landings by vessel size indicates that proportionally less octopus were captured by vessels under 10 m. Crab and lobster fishermen who were not able to start catching octopus instead of their regular target species are therefore likely to have suffered the most financial loss.

Despite the above complexity, large landings of common octopus in southwest UK between January and August 2025 (at least 1087 tonnes worth over £6.7 million – and possibly as much as 1524 tonnes worth £9.4 million), from a very low level in previous years, will have provided at least a temporary overall offset to declines in other shellfish fisheries. It is worth noting that the majority of these octopus landings were taken in pots which normally target species such as crabs and lobsters, given the large decline in catches of those species in 2025. This likely explains why some crab and lobster fishermen said the octopus bloom had had a positive effect on their businesses between January and August 2025. However, from August to October octopus landings dropped to low levels compared to the spring / summer peak, while landings of other shellfish species have remained low. Large landings of octopus were again taken in November and December 2025, but these catches are thought to have been limited to a few large vessels. Therefore, if our survey was repeated now (January 2026) the response of many fishermen may well be more negative than it was previously. It is also noteworthy that large declines in scallop landings in 2025 will not have been offset by octopus landings because up to August 2025 less than 5 tonnes (0.5% of the total) had been taken in scallop dredges.

A further important point to highlight is the value of the information and observations provided by fishermen. They first alerted us, and the public in general, to the increased presence of octopus in 2025. Through both speaking to the media and completing our survey they have also provided an unprecedented overview of how the abundance and distribution of octopus developed and changed along the southwest coast of the UK during 2025. This has provided a far more complete picture than any existing scientific surveys. Beyond providing the location of their catches, fishermen have also provided us with a wealth of information about octopus behaviour (e.g. the species they are preying on and their practice of bringing rocks and shells into pots) along with widespread reports of octopus egg laying. To put this into context, common octopus breeding had only once ever been recorded a handful of times in UK waters before 2025.

The longer-term effect of this octopus bloom on UK fisheries, particularly those for brown crab, European lobster and king scallops along the southwest coast of the UK, is more difficult to ascertain. The commercial landings data show declines in crab, lobster and scallop landings in the Western channel (ICES area 7e) where the octopus bloom was concentrated during 2025, and many respondents to our survey also reported dramatic drops in their catch rates, particularly of brown crabs. In the case of crab, declines in landings have been seen across the whole of the UK since 2016, but the decline in the southwest UK does appear to have been particularly dramatic in 2025. In terms of the decline in scallops, it is important to consider some recent some changes in regulations. For example, there was a closure for the removal of king scallops from 15th May to 30th September 2025 in parts of 7e – in the Lyme Bay area (ICES rectangles 29E6, 29E7, 30E6 and 30E7) for over 12m vessels but not offshore 7e. But this closure has been in place for several years; 2024 - 15th May to 30th September 2024 (same area as above), and 2023 - 1st July to 30 September 2023 (same area as above). Plus, scallop landings in area 7e were relatively stable from 2021 to 2024 but appear to have declined significantly in 2025. Furthermore, early analysis of Cefas scallop stock surveys done in May 2025 and presented at the ICES scallop working group meeting in October 2025 indicated that on several important scallop grounds offshore from South Devon, scallop biomass had dropped by ~90% compared to 2024 surveys. These declines were in the same areas where large numbers of octopus had been caught early in 2025, but before octopus numbers peaked through June and July.

Reports on the previous common octopus blooms (e.g. in 1899-1900 and 1950) also described widespread negative effects on crab and lobster fisheries, however, limited quantitative on catch per unit effort at the fishery scale was available. Landings of king scallops in the French Bay of Biscay recently declined by 36% after a resurgence in 2025 of the octopus bloom that previously peaked in 2022. However, at the same time this area also experienced an extreme marine heatwave and algal blooms (Eric Foucher, IFREMER, *pers. comm*.). Both of those factors are likely to have also had negative effects on scallop stocks. The key question around how fisheries landings change after octopus numbers subside is the degree to which octopus have been consuming important commercial species outside pots and other fishing gear. For example, if octopus were only killing crabs and lobsters in pots, then they may not have been having much of a greater impact on stocks than the fishery would have, because those crabs and lobsters would have otherwise been caught by the fishery. But none of this is to downplay the serious negative effect that octopus depredation has had on the catches and income of many fishermen in the southwest of the UK in 2025 or the uncertain future they face.

At this stage we just don't know the full extent to which crabs and lobsters are being consumed by octopus outside pots, although we do know that common octopus have voracious appetites and that they naturally prey on a wide range of shellfish species, including crabs and lobsters (see section 3). We also know from divers (e.g. Olivia Langmead *pers. comm.*) that octopus have been observed and filmed feeding on lobsters in the wild off the southwest of the UK in 2025 (Figure 6.15). There is even more direct evidence for the effect of octopus on scallops and other bivalve species, because we know that octopus are catching scallops on the seabed and then bringing them into the pots to eat them (see above). We also have photos from divers of what appear to be shell middens of other bivalve species created by octopus (Figure 6.16). The evolution of commercial landings for shellfish species in the southwest UK over the next 12 months will shed a lot more light on the effects of the octopus bloom on fisheries, and we will also know then whether the current octopus bloom has continued to subside or accelerates again this year. In terms of better understanding the effects of octopus on shellfish stocks and the wider ecosystem, future analysis of the trawl surveys run by the MBA, and the BRUV surveys run by the University of Plymouth (see above) will provide more of an

Figure 6.15: Screenshot from a video taken off Plymouth, clearly showing a common octopus consuming a European lobster. Note the lobster claw and antennae (Credit: Olivia Langmead).

insight. Likewise, stock assessments done for crabs, lobsters and scallops by Cefas will provide a more independent view of any effects at a population level, but these will not be available until at least latter in 2026.

In terms of the longer term future of shellfisheries along the southwest of the UK, much will depend on whether the octopus bloom continues, and the extent of the effects it has had on natural populations of crabs, lobsters, scallops and other commercially valuable shellfish species. Many fishermen reported fear of a future in which octopus numbers subside but leave much depleted populations of shellfish. Only time will tell if this eventuates. If the octopus bloom does continue or return, then many of the fishermen we surveyed expressed a willingness to adapt to focus more on octopus fisheries in the future. To do this, many fishermen requested further support to enable the purchase of specialised octopus fishing gear, increased provision of ice and specific fish boxes for octopus, along with reasonable support for stunners and codes of practice for handling and dispatching octopus. Previous work done by the Marine Management Organisation on the feasibility of a potentially emergent octopus fishery, provides much valuable further guidance on how this might be done.

Figure 6.16: An apparent midden of otter shells (*Lutraria lutraria*) and other bivalve species created by octopus predation (photo: Keith Hiscock).

7 Conclusions and Recommendations

This report has highlighted that common octopus, *Octopus vulgaris*, is a native species in the UK, but that apart from three notable exceptions of population bloom over the past 125 years (plus 2025), it is normally uncommon off our shores, with a predominately south-westerly distribution in the UK due to its preference for warmer waters. Its main distribution and the fisheries for the species are in southern Europe, the Mediterranean and northern Africa. Common octopus is a highly adaptable species with fast growth rates, high fecundity and a short life span, generally less than 2 years. Consequently, its populations are often highly variable and strongly influenced by environmental conditions. It is a voracious and adaptable predator with a preference for crustaceans such as crabs and shrimp, followed by bivalves and small fish. It is also preyed up on species such as Risso's dolphins (*Grampus griseus*), blue sharks (*Prionace glauca*) and conger eels (*Conger conger*). As a meso-predator it therefore plays an important role in ecosystem function and dynamics by transferring nutrients and energy from the near the bottom to the top of the food chain.

The current UK bloom of common octopus appears to be at least as extensive as the previously known blooms in 1899-1900, 1932-33 and 1950-51 and is now much better documented. Although above average numbers of common octopus were first seen off south Cornwall in 2022, the recent widespread bloom in UK waters has only really occurred in 2025. The full range of mechanisms behind these particular dynamics are still unclear. For example, many of the octopus caught off the southwest UK in January and February 2025 were very large, and therefore well over a year old. Common octopus have not been documented to undertake large migrations, but where these octopus had been in 2024 is a mystery. We can only assume they were in deeper waters offshore which were not regularly fished.

A recent collection of studies on 21 different octopus species across the world demonstrates that seasonal movements of octopus from deeper offshore to shallower inshore waters are relatively common, including for the curled octopus (*Eledone cirrhosa*), normally the most common species in UK waters. Conventional tagging of octopus using external tags is not usually effective because octopus can quickly remove them. Most previous movement studies have therefore used internal acoustic tags. Although the results of these studies have been very revealing, they have been somewhat limited by the small spatial coverage of acoustic receivers. In contrast, there is now an extensive array of acoustic receivers right across the English channel which has already allowed the monitoring of half a dozen fish and shellfish species. Acoustic tagging of octopus in this area would therefore undoubtedly provide new insights.

Long-term scientific datasets such as the MBA demersal fish survey and the growing University of Plymouth BRUV surveys, data archives which include citizen science reports (e.g. DASSH and NBN), the South West Marine Ecosystems programme and observations by fishermen (see below) and divers have been crucial for documenting the current octopus bloom and putting it into historical context. It is therefore imperative that they continue.

Environmental conditions during both the current UK bloom and all the previously known significant ones have been characterised by unusually warm temperatures (sea and atmosphere) during both the peak year in question and the preceding year. We hypothesise that this increased breeding during the previous year, increased survival of young octopus over winter, and then led to rapid growth into adults during the main period of the bloom. Salinity off the southwest of the UK has also been lower than usual during these years, possibly indicating the role sustained easterly winds in bringing young octopus (as larvae) from the Channel Islands and northern France. Modelling of ocean currents showed that during these conditions octopus larvae could be transported from the

Channel Islands to the southwest coast of the UK. This is significant because there has been a large bloom of octopus in Guernsey since the middle of 2024. Breeding off Guernsey at that time could therefore have potentially provided young octopus to the UK south coast, which subsequently bloomed in numbers and size during 2025.

As part of the Blue-Cloud Hackathon 2025, a team from Plymouth Marine Laboratory (PML), including several authors of this report, developed 'OctoPulse', a prototype tool that integrates Earth observation data, ocean models, and research datasets to identify environmental conditions associated with octopus population blooms. The system uses cloud-based data access and processing to explore how variables such as temperature, salinity, and current patterns relate to observed octopus distributions. The project also explores how collective intelligence can enhance marine science by bringing together different ways of knowing. Fishermen and recreational divers can contribute daily, fine-scale observations from the water, while scientists can contribute systematic data and modelling expertise. Combining these perspectives helps fill gaps in spatial and temporal coverage, providing a fuller picture of changing ocean conditions. By designing 'OctoPulse' to integrate both scientific and community-based information, the team aims to demonstrate how shared intelligence can improve the detection and interpretation of episodic events such as octopus blooms. The PML team were successful in winning the hackathon and received €25,000 in funding to continue developing and testing the tool, with plans to expand its data sources and refine its predictive components for use in marine ecology and resource management.

The current UK octopus bloom has had a very mixed effect on the fishing industry. The largest negative effects were on those fishing for brown crabs (*Cancer pagurus*), lobsters (*Homarus gammarus*) and king scallops (*Pecten maximus*) due to high levels of predation by octopus in fishing gear and likely also in the natural environment. Some of these fishermen, but not all, were able to adapt to catching octopus instead of crabs and lobsters and therefore do well economically for a period of time. But overall, 57.6% of the crab and lobster fishermen we surveyed said the octopus bloom has had a negative effect on their business from January to August 2025. In comparison, only 27.3% said it had been positive, and the other 15.2% said it had a neutral effect. While some of the fishermen we surveyed had benefited from the octopus bloom, most were worried about the future. Octopus catches dropped off dramatically from August to October, peaked again in November, but then started to decline again. If octopus catches continue to decline this year, but have damaged stocks of crabs, lobsters and scallops (*Pecten maximus*), as it appears, then fishermen fear they will have little left to catch.

The chance of the current octopus bloom either continuing or reoccurring in the near future appears to be high. We have shown good evidence that octopus blooms in the UK are driven by warmer than usual conditions, which have become increasingly common in recent years due to anthropogenic climate change. We also received numerous reports of common octopus breeding in UK waters in 2025 (which has only once ever been seen on a handful of occasions in the past) and recent reports of juvenile common octopus (Figure 7.1) becoming abundant in fishermen's catches.

Figure 7.1: A juvenile common octopus captured by a fisherman in late July 2025. The two rows of suckers on the tentacles, characteristic of *Octopus vulgaris*, can clearly be seen (photo: South Devon and Channel Shellfishermen).

7.1 Summary of recommendations

Predicting and detecting future octopus blooms and establishing the full effects of them on other species such as crabs, lobsters and scallops will require further research and monitoring. We recommend the following priorities and actions:

- Continuation and expansion of the MBA trawl surveys and University of Plymouth Baited Remote Underwater Video (BRUV) surveys to monitor the current and future octopus blooms. Both surveys have demonstrated the ability to detect a range of cephalopod species, including common octopus. Further information on the effectiveness of these surveys will be delivered in our report on Work Package 2.
- Enhancement and earliest possible publication of the crab, lobster and scallop stock assessments run by Cefas to gain a better understanding of the effects of common octopus on those species.
- Ongoing support for the continued collection of the environmental data used in this study to understand the current and previous octopus blooms.
- Development and support for predictive models based on the above data and larval dispersal modelling (such as 'OctoPulse') to better forecast future octopus blooms.
- Increased efforts to detect larval octopus off UK coasts to ground truth the above models and serve as an early warning system. Methods could include analysis of existing survey material, increased plankton / small fish surveys and the use of eDNA analysis.

- Increased collaboration between scientists and other stakeholders working on octopus population dynamics in the UK, Channel Islands and France to better understand connectivity between regions and to share scientific methods and understanding
- Acoustic tagging of common octopus. Large-scale movement or migration of common octopus has never been definitively detected, therefore its role in creating blooms is unknown. However, fishermen's observations indicate that movement was an important factor in the evolution of the 2025 UK octopus bloom. Acoustic tagging of octopus has not been done previously in UK waters, but could be very revealing, especially given the widespread array of acoustic receivers now present throughout the English channel
- We also recommend developing easier and more efficient ways of gathering observations of octopus catches and effects from fishermen, for example, through a user-friendly App or incorporation into existing catch reporting systems and the use of species ID guides.
- Beyond fisheries effects, there is a further research need to understand how the sudden influx of a previously rare species (in this case octopus, but you can draw parallels with bluefin tuna) affects marine ecosystem function and resilience, especially in light of ongoing climate change and other increasing human pressures.
- Should the current octopus bloom continue or re-occur and / or other shellfish fisheries not recover, it is likely that the fishing industry would benefit from support to help adapt fishing gear and methods. Likewise, if the octopus do not return and other shellfish fisheries remain depressed, then the fishing industry would also benefit from support.
- We therefore also recommend an urgent investigation into the social and economic impact of the 2025 UK octopus bloom on the affected fishing industry and communities

8 Acknowledgements

Huge gratitude to our funders – Plymouth City Council, Devon County Council and Defra, without whom this project would clearly never have been possible. Special thanks to Tudor Evans whose leadership helped bring together this diverse group of funders.

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Special thanks to all the fishermen who piloted and filled in our survey, and agreed to be interviewed. Your observations and perspectives have formed the backbone of this study.

Particular thanks to the members of the South Devon and Channel Shellfishermen for providing many of the images used in this report.

Well done and thank you to Steve Hawkins for finding evidence of the 1932-33 octopus bloom in obscure historical literature in the MBA library!

Massive thanks to the Comms team at the MBA - Amy Schofield, Maya Plass and Pierre Ehmann who have provided ongoing support, helping to develop the surveys and sharing them widely, liaising with the media, and generally promoting the project. Similar thanks extends to the Comms teams at the Plymouth Marine Laboratory (particularly Ari Winfield), the School of Marine and Biological Science at the University of Plymouth and the central Comms team at the University of Plymouth.

Many thanks to the Southwest Fish Producers Organisation, Western Fish Producers Organisation, Plymouth Seafood and Fishermen's Association, Fishtek Marine, Tamar Estuaries Consultative Forum and Port of Plymouth Marine Liaison Committee for distributing the fishermen's survey

Dr Keith Hiscock has proved to be a font of knowledge on all things octopus and marine ecosystems in the southwest. He provided insights into the SW Marine Ecosystems initiative, DASSH and the NBN, and supplied several of the spectacular photos used in this report.

Many thanks to the Marine Management Organisation for provision of commercial landings data.

Special thanks to the late Professor Paul Somerfield for previous collation of almost 70 years of cephalopod data from the MBA trawl surveys. Rachel Brittain likewise helped with tracking down various datasets at the MBA and sharing observations from fish markets.

Thanks also to everyone involved with the MBA trawl surveys over many, many years

Finally, we would like to thank everyone involved in the long term monitoring data collection and analysis of the BRUV surveys, particularly Rebecca Turley for the Isles of Scilly Trawling Impact Study on Reef Sediment Veneer Habitats data, and Matilda Longstaff, Frith Dunkley and Jean-Luc Solandt for the Plymouth Sound National Marine Park – Long-term Monitoring Research Project data.

9 Appendices

9.1 Differences between common and curled octopus

Key differences between common (*Octopus vulgaris*) and curled (*Eledone cirrhosa*) octopus:

- Arm Suckers: *O. vulgaris* has two rows of suckers per arm, while *E. cirrhosa* has only one. However, when the arms of E. cirrhosa are contracted this single row might look like two, so caution should be applied when using this as a distinguishing feature.
- Mantle Texture: The mantle of *O. vulgaris* is smooth, whereas *E. cirrhosa* features a granulated texture.
- Size: *O. vulgaris* is generally larger, with longer arms and a greater overall body size. Longer and robust arms (4 to 5.5 times mantle length) in *O. vulgaris* compared to twice shorter arms (2.5 to 3 times mantle length) in *E. cirrhosa*.
- Habitat Preferences: *O. vulgaris* favours rocky and coastal habitats, while *E. cirrhosa* prefers deeper, muddy or sandy environments.
- Behaviour: *O. vulgaris* is more active and exhibits advanced problem-solving skills. *E. cirrhosa* tends to be more sedentary and secretive.
- Distribution: *O. vulgaris* has a broader geographic range, whereas *E. cirrhosa* is more restricted to northern European waters.

Above left: *Octopus vulgaris* top of photo, *Eledone cirrhosa* below. **Above right**: Comparison of arms and suckers with *O. vulgaris* on the left and *E. cirrhosa* on the right (photos: Ramon Benedet).

9.2 Survey of fishermen

Marine Biological Association

2025 Octopus Bloom:

Effects on the fishing industry and your thoughts for the future

Background

Since early 2025, there has been a significant increase in sightings and landings of common octopus (*Octopus vulgaris*) off the Southwest coast of the UK. Concerns have been raised by the commercial fishing industry about the impact this is having on crab, lobster, and scallop fisheries across the Southwest region.

The Marine Biological Association, along with the University of Plymouth, the Plymouth Marine Laboratory and an independent consultant, have been commissioned to investigate the history and potential environmental causes of such blooms, the effects they are having on the fishing industry, and the potential for such blooms to happen again in the future. This work is funded by Defra, Plymouth City Council and Devon County Council. We are guided by a Steering Group which includes local fishermen, IFCAs, Cefas, the MMO and Defra.

We have designed the following survey to gather information about how the octopus bloom has affected fishermen since it started earlier this year, including both the negative and positive effects and your thoughts for the future. Results of this survey will be fed back to Defra to help guide how they can best support the fishing industry. We will not be providing any fisheries management recommendations. We will produce a publicly available report and also hold a public webinar in October to share our results more widely. If you wish to be contacted about these outputs please provide your contact details at the end of this survey.

You have the right to not answer any question if you do not feel it is appropriate. You are welcome to remain anonymous, but if you do provide your name and / or vessel details, these will be kept confidential and will not be used in any reports or presentations. If you would like to respond to this survey over the phone, please contact Dr Simon Thomas (bluedogfishing.simon@aol.co.uk). If you have any other queries, please contact either Simon (as above) or Dr Bryce Stewart (bryste@mba.ac.uk). The data collected will be held confidentially and protected appropriately. Data will be held until the results have been analysed and disseminated appropriately.

By taking part in this survey, you give your consent for the answers you provide to be used as described above.

The survey closes **at midnight on Sunday 14 September 2025**

Questions

Section 1: Your Details

1. What type of fisherman are you?
   - Commercial
   - Recreational Charter Boat
   - Both
2. What size is your boat?
   - <6m
   - 6-8m
   - 8-10m
   - 10-12m
   - 12-15m
   - 15-24m
   - 24m+
3. What is your main port?

Section 2: Fishing Activity

4. What species do you usually target between January and August? Tick all that are applicable
   - Shellfish - crab/lobster
   - Shellfish – scallops
   - Shellfish – mixed
   - Fish – various species
5. What type of gear do you usually fish with between January and August? Tick all that are applicable
   - Pots / creels
   - Fixed nets
   - Lines
   - Dredges
   - Beam trawls
   - Demersal trawls
   - Pelagic trawls
   - Other – e.g. diving or scallop disco pots, please write in below.
6. Do you normally fish for crabs and lobsters between January and August?
   a. If yes, what percentage of your work is normally in crab and lobster fisheries?
   b. If yes, what types of pots or gear do you use?
      - Parlour
      - Inkwell
      - Parlour & Inkwell
      - Other – Please specify below.

Section 3: Impact of Octopus Bloom

7. Which month did you first see octopus in your catch this year?

8. What species of octopus were you catching?
   - Mostly common
   - Mostly curled
   - Mix of species
   - Not sure
9. In which month did octopus make up the highest proportion of your total catch?
   - January
   - February
   - March
   - April
   - May
   - June
   - July
   - August
   - None
10. If using pots to fish in the Devon and Severn IFCA district, did you close gaps to target octopus?
    - Yes
    - No
    - N/A
11. In which month did you close the gap?
12. On what percentage of pots did you close the escape gap?
13. Did you change your fishing activity in any other ways? (E.g. gear and/or location) in response to the octopus boom this year?
    - Yes
    - No
    - N/A
14. What changes did you make? Please specify below.
15. In which areas did you see or catch the most octopus? Please give as much detail as you are comfortable with e.g. coordinates or nearest charted feature and give ICES rectangle.
16. Did the areas where you saw or caught octopus change between January and August? - - Yes
    - No
    If yes, please describe how below.
17. Did you notice octopus being more abundant on any particular types of seabed?
    - Rocky reef (hard)
    - Sand (soft)
    - Coarse sediment
    - Seagrass
    - Other – please describe below.
18. Did you notice octopus being more abundant during any particular tides or times of the month? Please describe below.
19. Did you notice octopus being more abundant at any particular depths?
    - 0-10m
20. - 10-20m
    - 20-30m
    - 30-40m
    - 40m+
21. Have you noticed any particularly unusual behaviour of octopus (e.g. octopus taking rocks or scallops into pots) or anything else noteworthy? Please describe below.

22. What percentage of your landings were made up of octopus on average over the period of the bloom (January to August)?
23. Did this percentage change over the period of the bloom?
    - Yes
    - No

    If yes, please describe how below.
24. Have you caught any dead or damaged octopus?
    - Yes
    - No

If yes, in which month did this start to occur?

25. Have you seen any octopus eggs on pots or anywhere else?
    - Yes
    - No
    - N/A

If yes, in which month this year did this start to occur?

26. Have you seen evidence of octopuses eating other species in pots?
    - Yes
    - No
    - N/A

If yes, what species? Tick all that are applicable.

- Crabs
- Lobsters
- Crawfish
- Scallops
- Whelks
- Others – please describe below.

27. Did you see or catch any octopus last year?
    - Yes
    - No

If yes, how did this year compare to last year?

- Much more
- More
- Similar
- Less
- Much less

28. Did the increase in octopus this year have a positive, negative or neutral effect on your fishing, catch, or income?
    - Positive
    - Negative
    - Neutral
29. Will you adapt your fishing operations if there is another octopus bloom?
    - Yes

- No
- N/A

30. What would you need to help you adapt your fishing boat, gear and business if there is another octopus bloom in the future? Please describe below.
31. What would improve your ability to land quality octopus (e.g. availability of ice, stunners etc)? Please describe below.
32. Would a code of conduct for handling and dispatching octopus be useful?
    - Yes
    - No
33. Are there any other thoughts or comments you would like to add? Please add below.
34. If you have any photos of octopus or their effects that you would like to share, please email to Bryce Stewart at bryste@mba.ac.uk. Photos may be used in our report and for publicity and will be credited as requested.

Contact Details (Optional)

You are welcome to remain anonymous, but if you provide the name of your boat and your email address below we will be able to match your responses to landings data from your area and keep you updated as this project progresses.

If you wish to unsubscribe from email updates at any time, please contact Bryce Stewart: @bryste@mba.ac.uk

35. What is your vessel PLN & Name?
36. If you would like to be contacted about the outputs of this project (report and webinar) please leave your email address below.

Many thanks for taking part!

9.3 Social media and media

9.3.1 Selected media coverage of the 2025 UK octopus bloom

Outlet / Title	Date	Key angle(s)
Jersey Evening Post - 'Octopuses doing a lot of damage'	18 February 2025	Jersey and Guernsey focus, negative economic effects on fisheries
The Times — 'Rising sea temperature is causing an octopus invasion in the UK'	01 May 2025	Climate change driven migration narrative, dramatic framing
BBC News, Devon - 'Octopus invasion is ruining our livelihoods'	19 May 2025	Effects on fisheries – mostly negative, some positive
BBC England – Why are octopus number rising off the South West?	20 May 2025	Climate change driven narrative, species biology interest, fisheries costs and benefits
Devon Live - Supersized octopuses cause chaos as fishermen left fuming	20 May 2025	Dramatic framing, focus on fisheries costs with climate change mention
The Guardian — 'The seabed is full of them: English fishers enjoy surprise octopus boom'	26 May 2025	Human interest, economic boom and climate change
Sky News – Boom or bust for fishing industry as octopuses swarm in UK waters	27th May 2025	Dramatic framing, fisheries costs and benefits
Ivybridge and South Brent Gazette - 'Bloom' turns South Hams's waters into an octopuses garden	30th May 2025	Local (southwest) focus. Fisheries costs and benefits
Voice Newspaper - Stunning photographs show rare octopus 'bloom' off the lizard peninsula	6th June 2025	Aesthetic / species wonder framing. Focus on photos
The Times — 'How a flood of cheap British octopus is changing restaurant menus'	01 August 2025	Consumer side, market shift, gastronomic angle

9.3.2 Selected social media (Facebook) coverage of the 2025 UK octopus bloom.

Source post	Date posted	Content
A1 Crab supplies Guernsey	26 Jan 2025	Reports of extremely large landings of octopus in Guernsey in January 2025

South Devon and Channel Shellfishermen	14 May 2025	Raising awareness of southwest UK bloom and negative effects on fisheries. Encouraging consumers to try octopus
South Devon and Channel Shellfishermen	16 May 2025	Information on previous UK octopus blooms in 1900, 1950, in France in 2021, and the increase seen in south Cornish waters in 2022, and the bloom seen in the Channel Islands since 2024
Cornwall Wildlife Trust	26 May 2025	Unusual nature of bloom, and the positive and negative effects on fisheries. Unique nature of species
Anglo Dawn charter vessel	28 May 2025	Focus on negative effects on fisheries. Encouraging consumers to try octopus
Lewis Jeffries – Photographer and Filmmaker	30 May 2025	Focus on visuals (spectacular photos) and the unique and beautiful nature of the species
South Devon and Channel Shellfishermen	19 Sept 2025	UK fishing industry visit to the octopus fishery and scientists in northern France. Focus on collaboration and learning
Cornwall Wildlife Trust	8 Oct 2025	Focus on World Octopus Day, highlighting the bloom and the richness and fragility of UK seas

9.4 Media coverage of the project

9.4.1 Press releases

Both Plymouth and Devon County Councils issued press releases about the launch of the project, followed by the Marine Biological Association. All resulted in significant media coverage (see sections 10.2.2 and 10.2.3)

Plymouth City Council	Unprecedented alliance launches major study into octopus bloom | PLYMOUTH.GOV.UK
Devon County Council	https://www.devon.gov.uk/news/unprecedented-alliance-launches-major-study-into-octopus-bloom/
Marine Biological Association	Public surveys launched to investigate extraordinary 'octopus bloom' in South West waters | Marine Biological Association

9.4.2 Media interviews

Media interviews focused on the octopus project. Green shading indicates TV coverage while yellow shading indicates radio coverage.

Date	**Outlet**	**Link**
23/07/2025	BBC TV - Spotlight	Climate driving octopus surge, says scientist

23/07/2025	BBC News (Online)	Climate change driving octopus surge, says Plymouth scientist - BBC News
11/08/2025	BBC Radio 4	Marine heatwaves and octopus outbreaks - Plymouth Marine Laboratory
11/08/2025	BBC News	Record warm seas help to bring extraordinary species to UK waters - BBC News
11/08/2025	BBC Radio 5	N/A
11/08/2025	BBC Radio 5 Live - Naga Munchety	N/A
11/08/2025	Times Radio	N/A
13/08/2025	The i Paper	Global warming has brought Mediterranean octopus to the UK's shores
13/08/2025	ARD TV, Germany	In production
14/08/2025	The Sunday Times	How a flood of cheap British octopus is changing restaurant menus
15/08/2025	BBC TV - Spotlight	Spotlight - Evening News: 16/08/2025 - BBC iPlayer
19/08/2025	BBC News	Octopus scientists seek fishing community stories - BBC News
19/08/2025	The Times - Jersey	https://www.thetimesjersey.com/post/scientists-studying-octopus-reach-out-to-fishers-for-insights
19/08/2025	Oceanographic Magazine	Hard copy available
20/08/2025	Fishing News	Hard copy available
22/08/2025	AFP News (this news release resulted in news stories all around the world	https://www.yahoo.com/news/articles/perfect-storm-uk-fishermen-reel-011325130.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAAAygUIxu6bF2rK6R2ZJKoViVktgOImIr8PAvM2aAz7xZoZvminzVNX9ZpG1PP3zeZiz4sShRvfdVsbYEIldNyqn7PZXfUpiRICkSQJo8_OQbViIGEjJd_NeHKzC0VUMA2Ko64u0AHTnpBpG9JM5Uhg1Hioa9YzFk0powrwGvuqIt
07/09/2025	3RRR Radio Marinara, Australia	Programs: Radio Marinara – 7 September 2025, Radio Marinara — Triple R 102.7FM, Melbourne Independent Radio

9.4.3 Further media coverage

Date	Outlet	Link	Source

14/08/2025	ITVX	The octopus boom: 'Urgent' study launched to understand surge in sightings | ITV News West Country	PCC press release
14/08/2025	Oceanographic Magazine	"Extraordinary" investigation into UK octopus bloom launches - Oceanographic	PCC press release
15/08/2025	Fisker Forum	Alliance launches octopus bloom study - FiskerForum	PCC press release
15/08/2025	Plymouth Live	Investigation launched over rise in octopus along South West coast	PCC press release
15/08/2025	Devon Live	https://www.devonlive.com/news/devon-news/investigation-launched-over-rise-octopus-10428329?int_source=nba	PCC press release
18/08/2025	Baird Maritime	https://www.bairdmaritime.com/work-boat-world/research-environment-training/uk-research-project-launched-to-investigate-rare-octopus-bloom	PCC press release
19/08/2025	Western Daily Press	https://www.pressreader.com/uk/western-daily-press/20250819/281590951658346?srsltid=AfmBOoqKb6yxo5hmk1WIgN9xVIGzw-mQuP1iD3cl4CruWJX_NxbXRW9R	PCC press release
20/08/2025	BBC News	Guernsey chef may look to England for crab - BBC News	Previous interviews with Emma and Bryce
21/08/2025	Eco Magazine	Public Surveys Launched to Investigate Extraordinary Octopus Bloom - environment coastal & offshore	MBA press release
26/08/2025	OCF News	Public surveys launched to study South West ‘octopus bloom’ - Ocean and Coastal Futures	MBA & PCC press releases
27/08/2025	FIS	https://www.seafood.media/fis/worldnews/worldnews.asp?monthyear=&day=27&id=135593&l=e&special=0&ndb=0	MBA & PCC press releases
28/08/2025	France 24	https://www.france24.com/en/live-news/20250828-perfect-storm-uk-fishermen-reel-from-octopus-invasion	AP News press release
29/08/2025	The New Zealand Herald	https://www.nzherald.co.nz/world/octopus-bloom-devastates-uk-crab-industry-amid-	AP News press release

		marine-heatwave/LB5SD7LORJAA3DDUG4YLCIZ67I/	
31/08/2025	South China Morning Post	https://www.scmp.com/lifestyle/food-drink/article/3323651/octopus-plague-has-left-uk-shellfish-industry-reeling	AP News press release
03/09/2025	Devon Live	https://www.devonlive.com/news/devon-news/octopus-explosion-devon-baffles-experts-10466603	MBA & PCC press releases

9.5 Fishermen's survey – Full responses to open questions

9.5.1 Changes made in response to the octopus bloom

Moved grounds
Moved areas
Bait, areas
Stopped potting, not catching anything, I think the lobster have mastered escaping
Hauled the gear more often where the octopus were more concentrated
Moved gear to areas on edge of reefs where we were seeing most octopus in pots
Moving gear to location of highest octopus density
Moved pots away from areas with most octopus
Target octopus
Normally a white fish fisherman, changed to target octopus this year
We had to move the net shoots as they were attacking the fish and shellfish in the net
Location
Steel pots
Aquamesh pots caught more octopus

Tried unbaited traps, only one octopus / trap compared to 6-10
Followed the biomass

9.5.2 How the areas where octopus were seen or caught changed?

My lobster catches are down by half and our cuttle fishery was non-existent and I'm putting that down to the octopus
Slowed down they seen to be in deeper water since late June
Offshore then onshore then offshore again
Yes, the lobsters and crabs were eaten by the octopus
Crab catches never improved just got worse
Catches reduced
Moved in a westward direction as the season progressed
The octopus appeared to initially move west, then into deeper water
Moved closer inshore onto rocky ground during August
Moved closer inshore onto rocky ground during August
They moved north
moved east to west
moved east to west
They moved offshore we think to breed
Moved closer inshore during summer
Moved North to south, from clean to rocky ground
Moved south during the season

Huge congregation in Start Bay early in the season which spread westwards and inshore as the season progressed
Spread North and west into the shallow inshore waters. We fish exclusively deep, so couldn't follow them
I didn't catch any in January
Started about 49.86, -4.51 then found new bloom at 49.30, -3.61

9.5.3 Have you noticed any particularly unusual behaviour of octopus (e.g. rocks or scallops in pots)?

Scallops & rocks into pots
Scallops, rocks, shells etc.
Also clams and feed on rockfish that get caught in the pots
Yes had a few scallop shells put into pots in deeper water
No
No octopuses in my pots
NA
Yes, they were carrying stones into the pots.
Just shells of predated brown crab and lobster
Yes, and now the small ones get the lobster pull them to the top of the pot kill and eat it from outside the pot 🙄
No
Stomach of them full of scallop roe. They are sitting on the kelp in the reefs or under rocky ledges in lobster holes.
Certainly more rocks in the pots, also highest numbers of conger in pots, think lobster go in first, then octopus feast on these, then conger go in after the octopus. Many octopus have missing arms, think as they look for escape through mesh of pots, conger feast on the protruding arms.

NO
Yes, scallops and rocks
Rocks, scallop and whelk shells in pots. Seemed to be using pots as lair. Cannibalism during late summer.
Octopus were taking small rocks, scallop shells and large clam shells into pots
Yes, lots of shell and carcasses of lobster, scallops, crab etc.
Rocks, shells, small crabs, clams, used scallop shells as a front door in the traps I used
Stones. used scallop shells to attract octopus
Stones and rocks
Rocks and shellfish taken into pots
Shells and small and large rocks. Block inkwell with rock
Scallop shells and small and large rocks. nesting in pots
Shells and stones
Shells, crab remains
Rocks and shells
lots of scallop shells and rocks
Take in rocks (I think it's for defending themselves). They'll eat shellfish through a pot instead of going in.
Increased presence of scallop and clam shells evident towards the latter part of our main season (August/September)
Some scallop shells

9.5.4 How did octopus catches change over the period of the bloom?

Peak in June, dropped off in August, picked up again in September

Caught more each week then stopped almost instantly
Decreased from March to august, now many small octopus that are too small to sell
Highest in March, decreased as they spread inshore
If we never caught the octopus we would have gone bankrupt as the shellfish fishing was ruined
Less during Early august, increased again before disappearing at the end of August
Lobsters were very poor when octopus were at their peak manly only caught octopus
March
Over 80% on some weeks
Went up
At peak during May and June, decreased in July august. Small octopus appeared in late august
Big landings in March April 5-6 tonnes on 1-2 day lay, biggest 7 tonnes. Decreased in summer now smaller octopus
Decreased during May-August, increased afterward
Dropped off in end of July
once able to block escapes it was easier to target them
peak in June 345 kg on 26th of june from 35 pots
Peak in May, June July dropped off in august. Some cock crabs caught to south of Start point in August
Peaks and troughs

9.5.5 Describe what you saw in terms of dead or damaged octopus

Octopus eating others conger dogfish damage
Tentacles missing and 3 octopus in 1 pot 1 was dead

Missing legs
Lots of dead fish inshore in July
Eaten ones and legs missing the conger and bull Huss eat them
Missing limbs
Limbs missing particularly in later part of season
Dead octopus in pot with others, lots of octopus missing ends of tentacles.
Octopus with tentacles missing and some missing heads
Conger were eating them and some cannibalism
Legs missing and carcasses
Damaged females late in season, presumably after spawning
Heads bitten off
They seemed to eat each other in the pots if gear left to long
Cannibalised octopus in most pots
Eaten octopus in most pots
Cannibalism in pots with multiple octopus
Damaged late in season
If there were more than one octopus in a pot there would always be one dead one, eaten by the others
always a dead one in pots with lots of octopus. Dead male?
The mature ones that are ready to die give up pretty easily. I've caught a lot more dogfish, congers and husks this year which are hunting the octopus I believe.
Four octopus in pots plus there was always one cannibalised

9.5.6 What would you need to help adapt your fishing boat, gear and business if there is another octopus bloom in the future?

Response
Not sure
Government Support/Subsidy
The rite pots
Better market sales
Nothing, if it effected my fishing, I'd get my nets out and target wet fish
Would need a different larger pot as they seem to like lots of room
N/A
Opportunity to participate in science-based studies. Gear grants.
New pots. It seems the new pots fished better for octopus.
As we only use 100mm net most of the octopus escape through the mesh
More pots
re making tube / traps
New pots and new ice bins
Nothing
No, and wouldn't expect the government to fund this for others. If Fishing is a commercial enterprise it should remain just that without subsidies
We have started selling locally landed octopus, pot caught only from the Under 10m boats we worked with. The difficulty for us was when Cracking Crab closed and we had to find a new supplier of handpicked crab.
Better understanding of octopus behaviour, more willingness for Devon IFCA to adapt quickly in changing bye-laws, so you can now dual fish for octopus and shellfish with same pot. We have tried to develop

escapes that I believe meet the current open escape rules and retain octopus. work stopped as octopus moved off grounds now.
Personalised fish boxes as octopus have to go through Newlyn, unlike lobsters which sell locally.
FINANCIAL HELP!!!!! COMPLETELY DIFFERENT SET UP OF TRANSPORT ,BEACH OPERATION ,ICE ,BOXES ETC OR SIMPLY GIVE UP FISHING!!!
N/A
Different pots
Octopus pots would help.
Better market access.
New markets
No
We will need to be able to pot for them as they are attacking all of the crawfish, crab and lobster as well as the rays and monkfish that we are targeting. Costing us a fortune
A different pot with more room in them
No
Yes, grants for new pots and ice
Grants for new pots
No
Need help to survive, effects the crab processers and many others if we go under
Need help to save business if the octopus and crab don't appear. Improved market as fear that price will drop for octopus next year
12 mile limit
Access (and financial support?) to purchase gear that directly targets octopus

No

9.5.7 What would improve your ability to land quality octopus (e.g. availability of ice, stunners etc.)?

Not sure
Ice
I've worked out how to keep them alive in numbers
Ice bins
N/A
We always took ice to sea and ice bins don't think we could improve on the quality
We only land top quality fish
Ice storage
Stunners maybe, and draw nets to store them in
Ice bins and new pots
Nothing
Wanting to eat them, I leave them alone.
It is important that the fishers are taught how to humanely kill octopus. There is a sense that the more alive an animal is when it reaches the processor the fresher and better, when in fact a less stressed and dead octopus will taste better. Consumers would also want to know that octopus didn't suffer unnecessarily. There is already a great number of them who won't eat octopus owing to their high intelligence.
Understanding a better way to "dispatch" an octopus, stunners or whatever, it’s a wrestle at best to get them into a cool box
Personalised fish boxes and a stunner if this is deemed the most humane method of dispatch.
NO MARKET ON SCILLY

PICK UP TRUCK STUNNERS EVERYTHING
N/A
Access to ice would be an advantage as currently have to go to Brixham
Stunners are impractical, exporting of live octopus more profitable
Ice, stunners not useful at sea
Ice and more port facilities. Having to land in Brixham depresses the price
Yes, being able to kill them to control them, ice bins, ice etc.
Ice bins
Availability of ice
Availability of ice
Ice
No
No
Access to different pots more suited to octopus
New ice bins. Possibly a stun gun if it'd efficient
Already have plentiful supply of ice, stunners?
Ice and new freezer

9.5.8 Are there any other thoughts or comments you would like to add?

Living in the Channel islands with restricted markets makes it hard to make if profitable
The octopus have totally finished the shellfish industry off Plymouth resulting in factory closure boats being sold and men losing their jobs

No
Yes. Boats jumped on the octopus with no shellfish licence and were catching lobsters. Didn't think that was very fair.   As they obviously were landing more lobsters then there catch limit
I would be very surprised if we get another bloom
advice of targeting Octopus
The last two weeks fishing I have seen damage in the pots as bad as it's ever been and only landed a small amount of octopus and seen signs of octopus at the Eddystone, Hands Deeps, Brentons, Hatt Rock, Whitsand bay Rame head all over.
Having spoken to French and Dutch, this bloom started several year ago in Morocco,then entered southern Portugal and has worked up to our waters this year. And obviously wiping out shellfish stocks on the way. I don't see it staying here to lay eggs, but we will see
It's a seasonal bloom; it's been happening for centuries. Stop pandering to the moaning commercial fishermen and wasting money on this rubbish. A quick chat to any 'old boy' will tell you all you need to know.
I would rather have the old shellfish fishery back, it was steady on you knew what was likely next year, my lobster catch is down by half and crab by 90%. We haul 135 pots now and you'll be lucky to see a brown crab, next year is not going to be good, or probably the next five for shell fishing without octopus. If they keep coming back then there will be some fishery on them, but with the future is bleak on shellfish, but equally they will continue to wreck the crab, lobster stocks if they come back. Its a murderous situation and they may move to new areas looking for food, now they have ravaged this bit of coast, and not return leaving only a devastated shell fishery.
A guide for dispatch would be useful but I am aware that a broader code of conduct may risk excluding smaller under 6m vessels from the fishery if large handling gear is made mandatory. This must not happen, as the octopus bloom has pushed us to the brink of viability and we must be able to recoup some lost lobster revenue through selling the octopus.
I have suffered from the displacement of vessels from west Cornwall fishing in my traditional area (I am limited by fishing area due to the size of my vessel 4.42m and weather conditions). This has put unsustainable pressure on the local stocks of lobsters and will have caused my future to be put in doubt! It is not just the impact on the grounds where there is a bloom but the displacement of those vessels that then impact on other finely balanced fisheries!!
I hate octopus! Having done a lot of work with NLH Padstow, along with 2 other Mylor boats, to maintain and enhance the lobster stocks locally, I'm really concerned that the octopus bloom has or will undo that work. Most, but not all, of the lobsters eaten by octopus are below legal size, our future catch. I also think the octopus have affected the behavior of brown crab, as I'm not catching any in areas that I caught some

last year and previous years, but I've caught quite a bit in a small area where I wouldn't expect hardly any brown crab in the summer months.
Conger and Bull Huss numbers increased this year with both predating octopus. Many tiny octopus around during late August
We are 80 per cent down on our crab and lobster landing. We are facing a very uncertain future without any help.
Conger often try to raid traps
Do not impose quota. Octopus from pots should only be those with existing shellfish quota. Pot limits of 500 pots inside 6 miles as competition for space is intense.
Too many boats without a shellfish entitlement setting pots for octopus, which also effects lobster fishing
Compensation measures, after being stopped from pollack fishing I have changed to netting for shellfish and ground fish and now the octopus has ruined that too.
No
Parlour and inkwell caught most crabs. Lobster creels caught very few. Clean pots worked better. The number of bullhuss and conger increased in the deepwater areas where octopus were.
Octopus nesting in pots. Octopus didnt eat spider crabs. others reported more octopus in Lannacombe Bay maybe due to getting more sunlight
2 hen crabs all year and 7 cock crabs. Normally 1 lobster per pots only a few small ones
Octopus didn't eat spider crabs. 2 tonne of octopus last year 40 tonnes this year. Crabbing was better off Start Point; they appeared in early April. By the end of September we were getting two trays of octopus, but smaller
Lots of crab shells in pots late in the season, the initial bloom was south of the Hurds and Start Bay, they spread out from these huge numbers, but crab numbers didn't recover
I fear for the future of the industry, the crabbing fleet only survived this year due to high price of octopus, if they don't appear nor crabs, we will go out of business next year
Data on the densities and direction of spread of the bloom might be useful

The octopus seem to move across ground whilst feeding in large groups, different strings had octopus on different days. Enormous numbers of conger on the ground predating on octopus, this hasn't been seen before

9.6 Landings of non-octopus shellfish species by port in 2025 compared to 2024

9.6.1 Brown crab landings into ports in ICES area 7e in 2025 until August, compared with landings from 2024 for the same period. Red shading represents a decline, green an increase and yellow a negligible change.

Port	Change in landings (%)	Change in value (%)	Change in landings (tonnes)	Change in value (£)
Axmouth	-38.08%	-21.92%	-0.17	-£605
Beer	-50.70%	-46.03%	-1.45	-£6,987
Beesands	-79.41%	-72.54%	-0.03	-£152
Brixham	30.88%	65.49%	14.72	£117,724
Cadgwith	-66.35%	-58.51%	-74.43	-£129,615
Coverack	-66.31%	-59.21%	-26.09	-£75,366
Dartmouth	-60.05%	-59.09%	-162.39	-£577,644
Exeter	-50.48%	-36.56%	-0.11	-£153
Exmouth	-56.48%	-53.60%	-4.01	-£20,690
Falmouth	-81.13%	-75.50%	-10.5	-£27,515
Fowey	-42.11%	-23.47%	-0.04	-£48
Gorran Haven	100.00%	107.62%	0	£2
Guernsey	-88.46%	-95.19%	-46.07	-£244,530
Helford River	-64.47%	-56.05%	-2.39	-£5,983
Hope Cove	-78.26%	-81.04%	-0.04	-£85
Isles of Scilly	74.45%	1235.85%	8.29	£201,410
Kimmeridge	-13.36%	-17.89%	-0.12	-£377
Kingswear	-35.18%	-22.37%	-8.7	-£17,254
Looe	-43.05%	-2.20%	-1.46	-£184
Lulworth Cove	-2.59%	-12.43%	-0.02	-£282
Lyme Regis	-46.41%	-40.07%	-2.91	-£13,579
Mevagissey	-85.76%	-78.94%	-39.98	-£97,126
Mullion	-85.86%	-85.58%	-0.07	-£189
Mylor	17.37%	13.02%	2.37	£3,817
Newlyn	-35.86%	-57.86%	-205.27	-£690,452
Paignton	-68.18%	-66.22%	-1.65	-£3,742
Penzance	73.62%	124.84%	0.63	£2,976
Plymouth	-83.67%	-72.01%	-73.12	-£213,304
Polperro	-99.43%	-99.68%	-0.18	-£814
Poole	78.19%	125.16%	0.2	£982

Port Isaac	77.14%	40.22%	0.19	£218
Porthoustock	-73.69%	-68.50%	-0.35	-£776
Portland	4.05%	1.59%	0.1	£134
Portloe	-89.14%	-85.87%	-0.62	-£1,364
Portscatho	50.00%	27.15%	0	£1
River Dart	-71.07%	-60.67%	-26.62	-£75,850
River Fowey	-65.65%	-67.34%	-2.43	-£6,884
Saint Mawes	-85.10%	-88.19%	-2.27	-£4,459
Salcombe	-84.54%	-71.80%	-477.55	-£1,211,602
Swanage	-56.27%	-59.45%	-0.63	-£3,193
Teignmouth	-57.85%	-58.00%	-0.56	-£2,813
Torquay	-84.06%	-75.60%	-0.31	-£1,210
West Bay	-27.10%	-2.88%	-0.5	-£238
Weymouth	-45.85%	-16.68%	-59.9	-£79,430
Total			**-1206.44**	**-£3,187,230**

9.6.2 European lobster landings into ports in ICES area 7e in 2025 until August, compared with landings from 2024 for the same period. Red shading represents a decline, green an increase and yellow a negligible change.

Port	Change in landings (%)	Change in value (%)	Change in landings (tonnes)	Change in value (£)
Axmouth	-32.80%	-22.91%	-0.28	-£3,266
Beer	-42.76%	-49.46%	-0.91	-£20,944
Beesands	-79.44%	-72.77%	-0.4	-£4,247
Brixham	-22.59%	-8.35%	-2.84	-£16,784
Cadgwith	-44.40%	-42.64%	-4.87	-£51,461
Coverack	-23.01%	-12.56%	-0.42	-£3,424
Dartmouth	-57.05%	-56.55%	-11.62	-£242,011
Exeter	-54.51%	-52.24%	-0.3	-£3,585
Exmouth	-26.51%	-30.25%	-2.28	-£50,449
Falmouth	-38.87%	-32.94%	-1.22	-£16,844
Fowey	8.40%	12.50%	0.02	£384
Gorran Haven	-57.53%	-59.25%	-0.04	-£547
Guernsey	-91.83%	-94.16%	-4.71	-£91,983
Helford River	-30.25%	-16.54%	-0.34	-£2,132
Hope Cove	-65.32%	-60.72%	-0.94	-£11,092
Isles of Scilly	-32.42%	-19.92%	-8.51	-£56,002
Kimmeridge	-11.39%	-9.15%	-0.09	-£1,045
Kingswear	47.32%	52.51%	0.07	£1,137
Looe	8.42%	31.23%	0.48	£26,709
Lulworth Cove	-4.26%	17.13%	-0.03	£1,499

Lyme Regis	-29.36%	-37.47%	-2.17	-£54,482
Mevagissey	-43.85%	-51.20%	-1.47	-£26,871
Mullion	-57.11%	-61.61%	-0.3	-£4,332
Mylor	18.07%	-13.97%	0.37	-£4,573
Newlyn	-18.15%	-42.25%	-5.29	-£145,493
Paignton	-65.61%	-63.49%	-1.51	-£20,960
Par	121.05%	112.05%	0.23	£3,529
Penzance	48.74%	54.33%	0.03	£611
Plymouth	-26.05%	-26.25%	-4.8	-£80,438
Polperro	-40.60%	-58.36%	-0.64	-£13,361
Poole	142.96%	805.77%	0.26	£6,651
Port Isaac	22.12%	-53.39%	0.09	-£3,744
Porthleven	-95.25%	-90.12%	-0.64	-£5,394
Porthoustock	-51.73%	-44.81%	-0.61	-£7,489
Portland	-41.83%	-31.68%	-0.42	-£4,414
Portloe	-43.12%	-26.12%	-0.66	-£5,240
Portscatho	48.24%	76.40%	0.08	£1,818
River Dart	-83.72%	-83.93%	-0.97	-£17,483
River Fowey	-25.27%	-9.41%	-2	-£11,575
Saint Mawes	-29.98%	-32.32%	-0.2	-£2,967
Salcombe	-62.51%	-49.86%	-17.36	-£185,433
Sennen Cove	80.00%	74.40%	0	£52
Swanage	-19.11%	-29.90%	-0.24	-£10,131
Teignmouth	-43.27%	-54.15%	-0.32	-£8,416
Torquay	-27.97%	-29.74%	-0.38	-£8,226
West Bay	-7.77%	-5.13%	-0.17	-£1,866
Weymouth	-43.82%	-58.34%	-9.25	-£249,194
Total			**-87.57**	**-£1,405,506**

9.6.3 King scallop landings into ports in ICES area 7e in 2025 until August, compared with landings from 2024 for the same period. Red shading represents a decline, green an increase and yellow a negligible change

Port	Change in landings (%)	Change in value (%)	Change in landings (tonnes)	Change in value (£)
Axmouth	118.00%	134.58%	0.03	£64
Beer	542.86%	550.40%	0.04	£54
Brixham	-38.15%	-41.13%	-896.41	-£1,732,293
Dartmouth	55.50%	117.41%	15.99	£68,156
Exmouth	-1.97%	-19.56%	-4.6	-£92,584
Falmouth	-69.88%	-68.49%	-51.21	-£86,636
Guernsey	-52.08%	-71.70%	-120.69	-£237,877

Helford River	182.05%	240.63%	0.07	£175
Looe	-5.77%	-28.53%	-0.03	-£283
Lyme Regis	-42.25%	-89.08%	-18.74	-£153,438
Mevagissey	-3.69%	-5.50%	-0.52	-£1,560
Mylor	156.93%	208.93%	4.28	£8,880
Newlyn	-71.45%	-75.99%	-121.71	-£412,486
Penzance	-24.36%	-20.91%	-1.17	-£1,294
Plymouth	-74.99%	-75.16%	-1957.78	-£3,218,518
Polperro	105.00%	27.50%	0.02	£18
Saint Mawes	-65.64%	-14.13%	-0.15	-£25
Salcombe	-14.72%	-58.44%	-0.45	-£4,631
States Apt, Jersey	78.45%	6.25%	105.86	£10,826
Teignmouth	-99.99%	-99.99%	-10.17	-£17,756
TorQuay	297.09%	209.18%	7.5	£11,997
West Bay	-35.82%	-43.68%	-16.04	-£44,801
Weymouth	-87.02%	-83.18%	-98.7	-£136,637
Total			**-3164.58**	**-£6,040,646**

9.7 Presentations of the project

- Marine Management Organisation, Octopus Bloom update (Stakeholder workshop) – presentation by Bryce Stewart (Overview of project) – 6th August, 2025.
- SAGB Crustacea Committee meeting – presentation by Bryce Stewart (Overview of project) – 17th September, 2025.
- Meeting with Baptiste Le Bourg (Station Marine de Concarneau, France) & Angela Larivain (University of Caen Normandy, France) – presentations by Bryce Stewart (Fishermen’s survey) and Tim Smyth (Environmental causes of the UK octopus bloom) – 10th October 2025.
- Seafish Shellfish Industry Advisory Group – presentation by Bryce Stewart (Overview of research into the octopus bloom) – 17th December 2025.