Sanitary Survey- Review

Mevagissey Bay – 2024

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This is the first full sanitary survey of the Mevagissey Bay bivalve mollusc production area. The current Classification Zones were classified following the recommendations of two distinct sanitary (pRMP) assessments undertaken in 2016 & 2019. Both assessments were undertaken in accordance with Regulation (EC) 854/2004 (which was replaced by retained EU Law Regulation (EU) 2017/625, with sanitary survey requirements now specified in retained EU Law Regulation (EU) 2019/627). These provided appropriate hygiene classification zoning and monitoring plan based on the best available information with detailed supporting evidence. In line with regulatory and EU guidance the Food Standards Agency undertake targeted sanitary survey reviews to ensure public health protection

measures continue to be appropriate. This report provides a review of information and recommendations for a revised sampling plan if required. Carcinus Ltd. (Carcinus) undertook this work on behalf of the FSA. Carcinus Ltd accepts no liability for any costs, losses or liabilities arising from the reliance upon or use of the contents of this report other than by its client.

Dissemination

Food Standards Agency, Cornwall Port Health Authority. The report is publicly available via the Carcinus Ltd. website.

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1 Introduction

1.1 Background

The Food Standards Agency (FSA) is responsible for carrying out sanitary surveys in classified production and relay areas in accordance with Article 58 of retained (EU) Regulation 2019/627 and the EU Good Practice Guide (European Commission, 2021). In line with these requirements, sanitary surveys must be reviewed to ensure public health protection measures continue to be appropriate. Carcinus is contracted to undertake reviews on behalf of the FSA.

The report considers changes to bacterial contamination sources (primarily from faecal origin) and the associated loads of the faecal indicator organism *Escherichia coli* (*E. coli*) that may have taken place since the previous assessments were undertaken. It does not assess chemical contamination, or the risks associated with biotoxins. The assessment also determines the necessity and extent of a shoreline survey based on the outcome of the desktop report and identified risks. The desktop assessment is completed through analysis and interpretation of publicly available information, in addition to consultation with stakeholders.

1.2 Mevagissey Bay Review

This report reviews information and makes recommendations for a revised sampling plan for existing mussel (*Mytilus* spp.) and razor clam (*Ensis* spp.) classification zones in Mevagissey Bay (Figure 1.1). The current Classification Zones were classified following the recommendations of two separate sanitary (pRMP) assessments undertaken in 2016 & 2019 (Cefas, 2016; Carcinus, 2019). This review explores changes to the main microbiological contamination sources that have taken place since the initial assessments were conducted. Data for this review was gathered through a desk-based study and consultation with stakeholders.

An **initial consultation** with Local Authorities (LAs) and the Environment Agency (EA) responsible for the production area was undertaken in August 2023. This supporting local intelligence is valuable to assist with the review and was incorporated in the assessment process.

Following production of a draft report, a wider **external second round of consultation** with responsible Local Enforcement Authorities (LEAs), Industry and other Local Action Group (LAG) members was undertaken in December 2023. It is recognised that dissemination and inclusion of a wider stakeholder group, including local industry, is essential to sense-check findings and strengthen available evidence. The draft report is reviewed taking into account the feedback received.

The review updates the assessments originally conducted in 2016 & 2019 and sampling plans as necessary and the report should be read in conjunction with the previous assessments. Links to the reports are provided in Appendix II.

Specifically, this review considers:
(a) Changes to the shellfishery (if any);
(b) Changes in microbiological monitoring results;
(c) Changes in sources of pollution impacting the production area or new evidence relating to the actual or potential impact of sources;
(d) Changes in land use of the area; and
(e) Change in environmental conditions.

Sections 2 - 6 detail the changes that have occurred to the shellfishery, environmental conditions and pollution sources within the catchment since the publication of the previous sanitary assessments. A summary of the changes is presented in section 7 and recommendations for an updated sampling plan are described in section 8.

1.3 Assumptions and limitations

This desktop assessment is subject to certain limitations and has been made based on several assumptions, namely:

- Accuracy of local intelligence provided by the Local Authorities and Environment Agency
- The findings of this report are based on information and data sources up to and including September 2023;
- Only information that may impact on the microbial contamination was considered for this review; and
- Official Control monitoring data have been obtained through a request to Cefas, with no additional verification of the data undertaken. The data are also available directly from the Cefas data hub[1]. Results up to September 2023 have been used within this study. Any subsequent samples have not been included.

[1] Cefas shellfish bacteriological monitoring data hub. Available at: https://www.cefas.co.uk/data-and-publications/shellfish-classification-and-microbiological-monitoring/england-and-wales/.

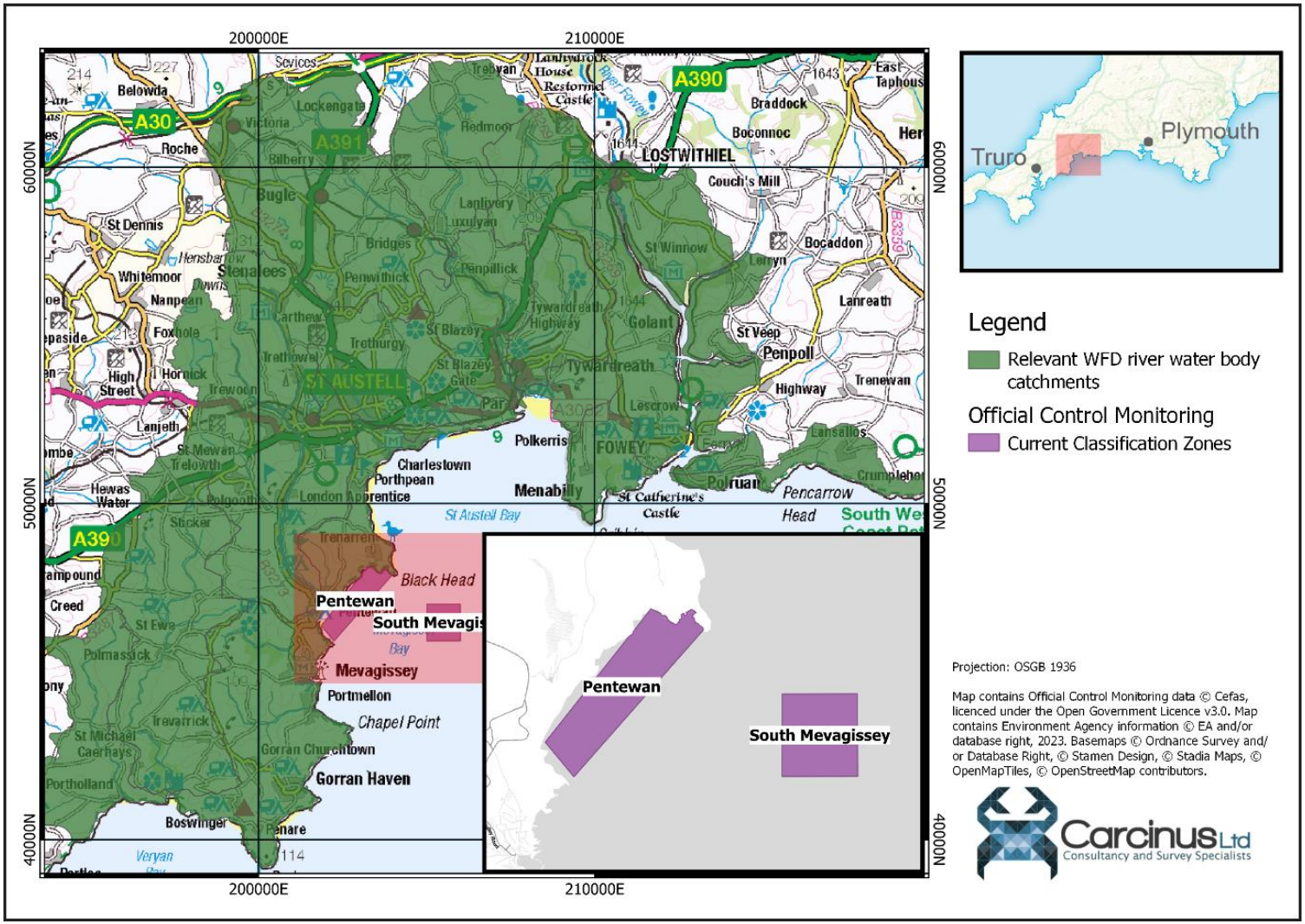


Figure 1.1 Location of the Mevagissey Bay BMPA in Cornwall. Inset map shows the locations of the Classification Zones within the BMPA.

2 Shellfisheries

2.1 Description of Shellfishery

The Mevagissey Bay BMPA is situated within the embayment of the same name, positioned on the south coast of Cornwall (Figure 1.1). The closest BMPA is that of the St Austell BMPA (Cefas Reference M070), 2.5 km north. There are also historic Classification Zones in the Fowey Estuary, 10 km north east, but these do not hold an active classification.

The Local Enforcement Authority for this fishery in terms of food hygiene Official Control purposes (including sampling) is Cornwall Port Health Authority. This is a public fishery, although some level of ownership is conferred from the fact that the Food Business Operator (FBO) holds Crown Estate and Marine Management Organisation (MMO) licences for the mussel aquaculture operation. The razor clam beds are a public fishery. At the time of writing (September 2023), no information had been received from Cornwall Inshore Fisheries and Conservation Authority (C-IFCA), although it should be noted that no C-IFCA byelaws apply to the harvest of mussels or razor clams from within this BMPA.

The 2016 sanitary (pRMP) assessment recommended the creation of the mussel zone in the outer bay (*South Mevagissey*) and the 2019 sanitary (pRMP) assessment recommended the razor clam zone (*Pentewan*) in the inner bay, adjacent to the coastline. A summary of both fisheries is provided in the following paragraphs.

2.1.1 Mussels

The 2016 pRMP assessment indicates the mussel fishery in this BMPA would involve rope-grown harvest of mussels on 225 m double-header long lines with an estimated output of approximately 500 tonnes per year. The mussel lines are approximately 2.5 km from the mouth of the St Austell river. During initial consultations, the LEA confirmed that the current output and growing methodology is approximately the same. The minimum landing size for this species is 50 mm.

2.1.2 Razor clams

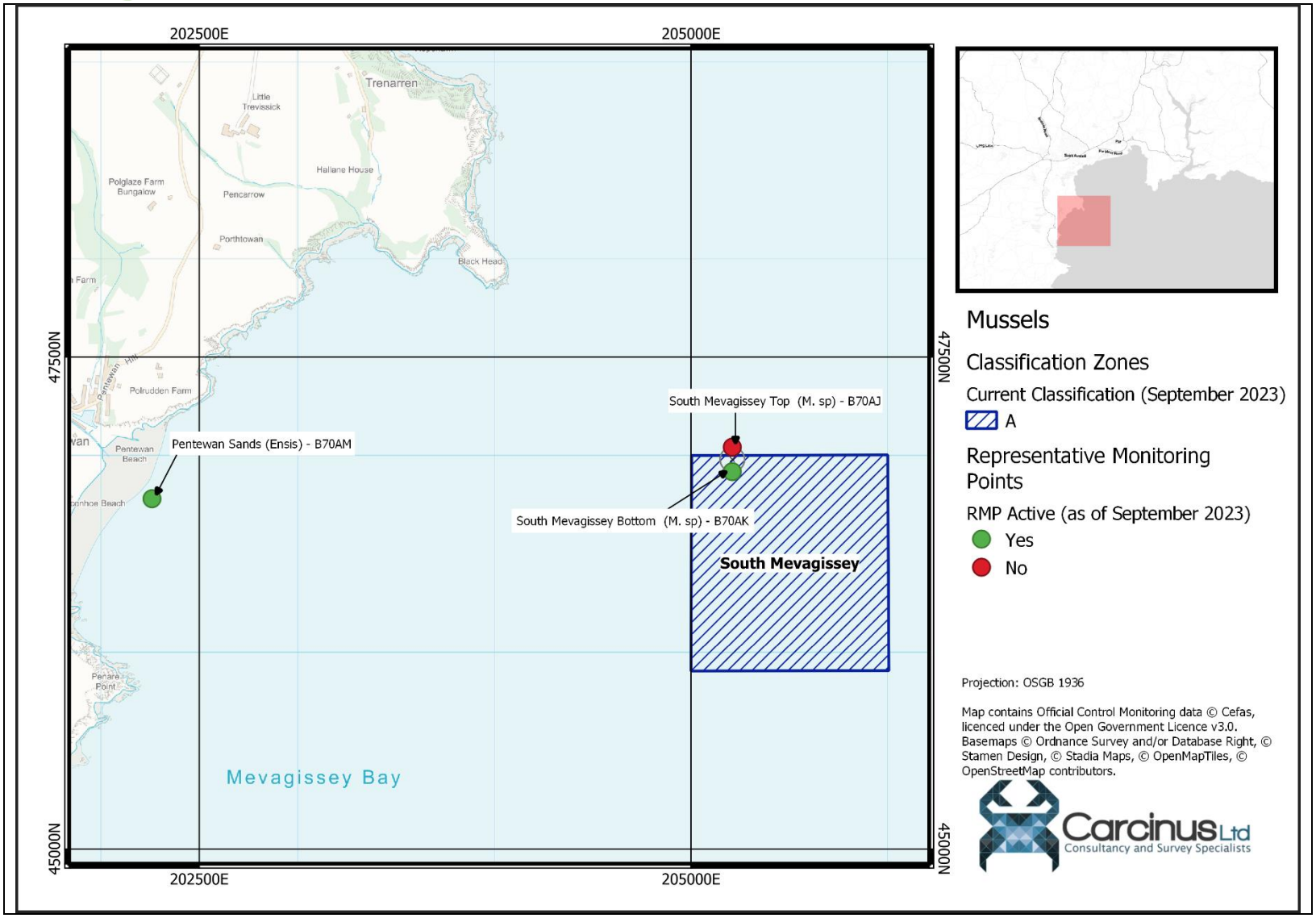
The 2019 sanitary (pRMP) assessment indicates this fishery to involve the harvesting of wild razor clams, collected by hand (by divers). The expected output of this fishery would be 120 tonnes per annum. During secondary consultations, the LEA confirmed there is now commercial interest in the razor clam beds and fishing of these beds is due to start in the first half of 2024.

2.2 Classification History

The 2016 sanitary (pRMP) assessment recommended the creation of a single Classification Zone for mussels. This CZ was classified in 2020. The 2019 sanitary (pRMP) assessment recommended the creation of a single Classification Zone for razor clams, which has also been classified since 2020. The location and classification status of all active CZs, along with all RMPs sampled in the BMPA since 2010, are presented in Table 2.1 and Figure 2.1.

Table 2.1 Summary of all active Classification Zones in the Mevagissey Bay BMPA.

Classification Zone	Species	Current Classification (as of September 2023)	RMP
South Mevagissey	Mussels	A	South Mevagissey Bottom (M. sp) – B70AK
Pentewan	Razor clams	B	Pentewan (M. sp) – B70AM


202500E
205000E
47500N
45000N
Trenarren
Little Trevissick
Hallane House
Polglaze Farm Bungalow
Pencarrow
Porthtowan
Black Head
Polrudden Farm
Pentewan Beach
Pentewan Sands (Ensis) - B70AM
South Mevagissey Top (M. sp) - B70AJ
South Mevagissey Bottom (M. sp) - B70AK
South Mevagissey
Penare Point
Mevagissey Bay
Mussels
Classification Zones
Current Classification (September 2023)
A
Representative Monitoring Points
RMP Active (as of September 2023)
Yes
No
Projection: OSGB 1936
Map contains Official Control Monitoring data © Cefas, licenced under the Open Government Licence v3.0. Basemaps © Ordnance Survey and/or Database Right, © Stamen Design, © Stadia Maps, © OpenMapTiles, © OpenStreetMap contributors.
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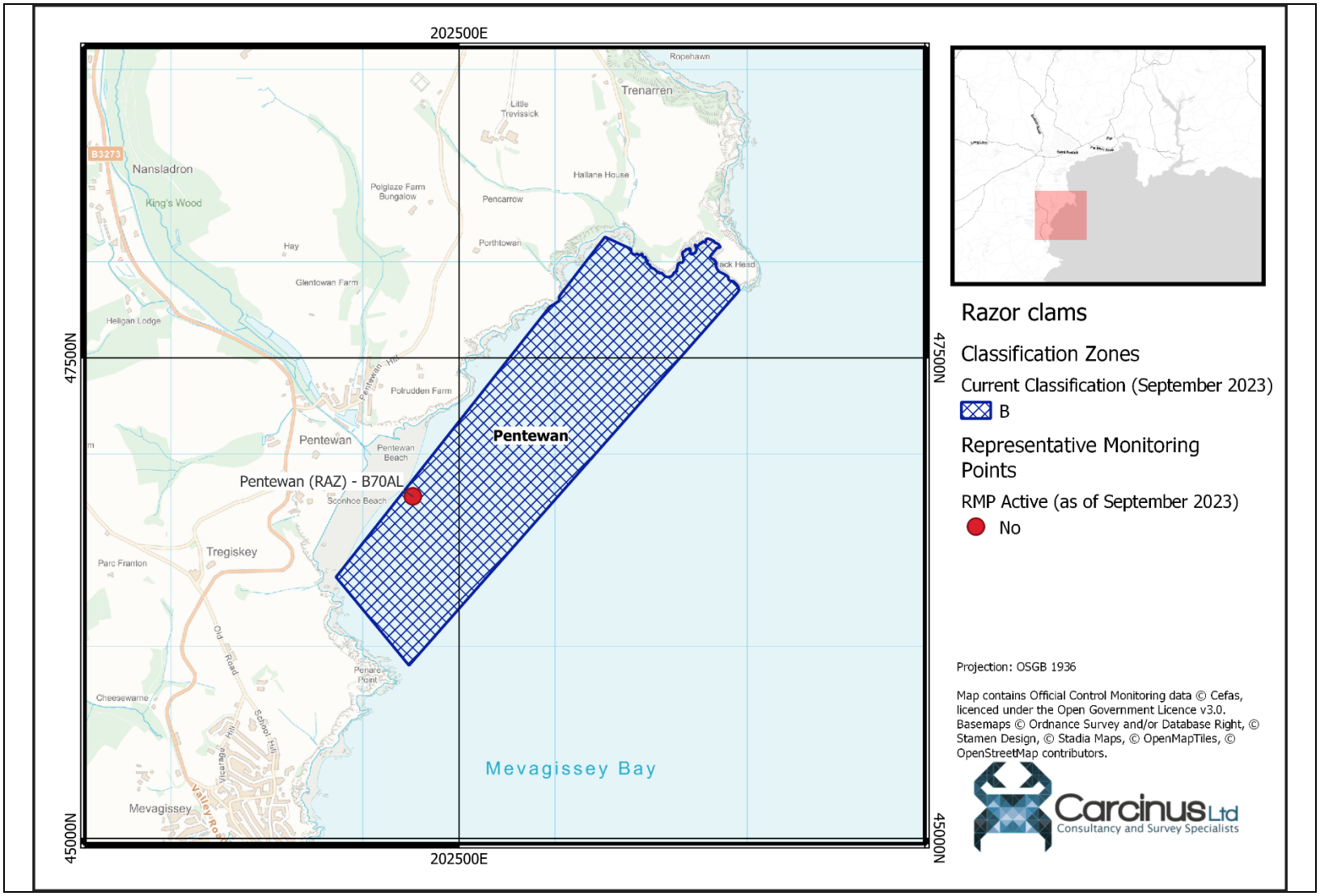

Figure 2.1 Current Classification Zones and associated Representative Monitoring Points in the Mevagissey Bay BMPA.

3 Pollution sources

3.1 Human Population

Neither the 2016 nor 2019 assessments provide an indication of human population within the vicinity of the Mevagissey BMPA. Since urban associated runoff can be a potentially significant contamination source of BMPAs, the distribution of urban centres throughout the catchment has been considered within this report. The 2021 Census of the United Kingdom was used to give an indication of the patterns of human population density across the catchment.

Figure 3.1 presents the human population density in Census Output Areas wholly or partially contained within the Mevagissey Bay catchment at the 2021 Census. It shows that the majority of the land within the wider catchment is very rural, with population densities fewer than 500 people per square kilometre. The highest population densities (and therefore main risks of urban runoff) are found in the towns of St Austell and St Blazey to the north of the Mevagissey Bay CZs, as well as the town of Mevagissey to the south. The estimated population of the catchment at the 2021 Census was 69,183 people. This is an increase of 14.7% on the 2011 Census value.

The 2021 Shellfish Water Action Plan for Mevagissey Bay doesn't provide an assessment of the overall contribution of various sources of contamination to the Mevagissey Bay shellfish water, as the production area was only designated by the Environment Agency that year. The Shellfish Water Action Plan will be updated after the Ofwat final determination of Water Company business plans in December 2024. However, it is worth noting the Action Plan determined the contribution of urban associated run off to the St Austell Shellfish Water (to the north of Mevagissey Bay) as 'low'[2]. During initial consultations, the LEA stated that there had been a significant amount of urban developments in the St Austell area in the last 10 years. This urban runoff reaches the CZs in the Mevagissey Bay via the St Austell river, which runs through St Austell and drains to Pentewan sands on the coastline. As a consequence, the *Pentewan* CZ is considered to be more at risk from urban associated runoff than the offshore South Mevagissey CZ.

[2] 'Low' contribution: considered to account for less than 10% of total contamination to a shellfish water.

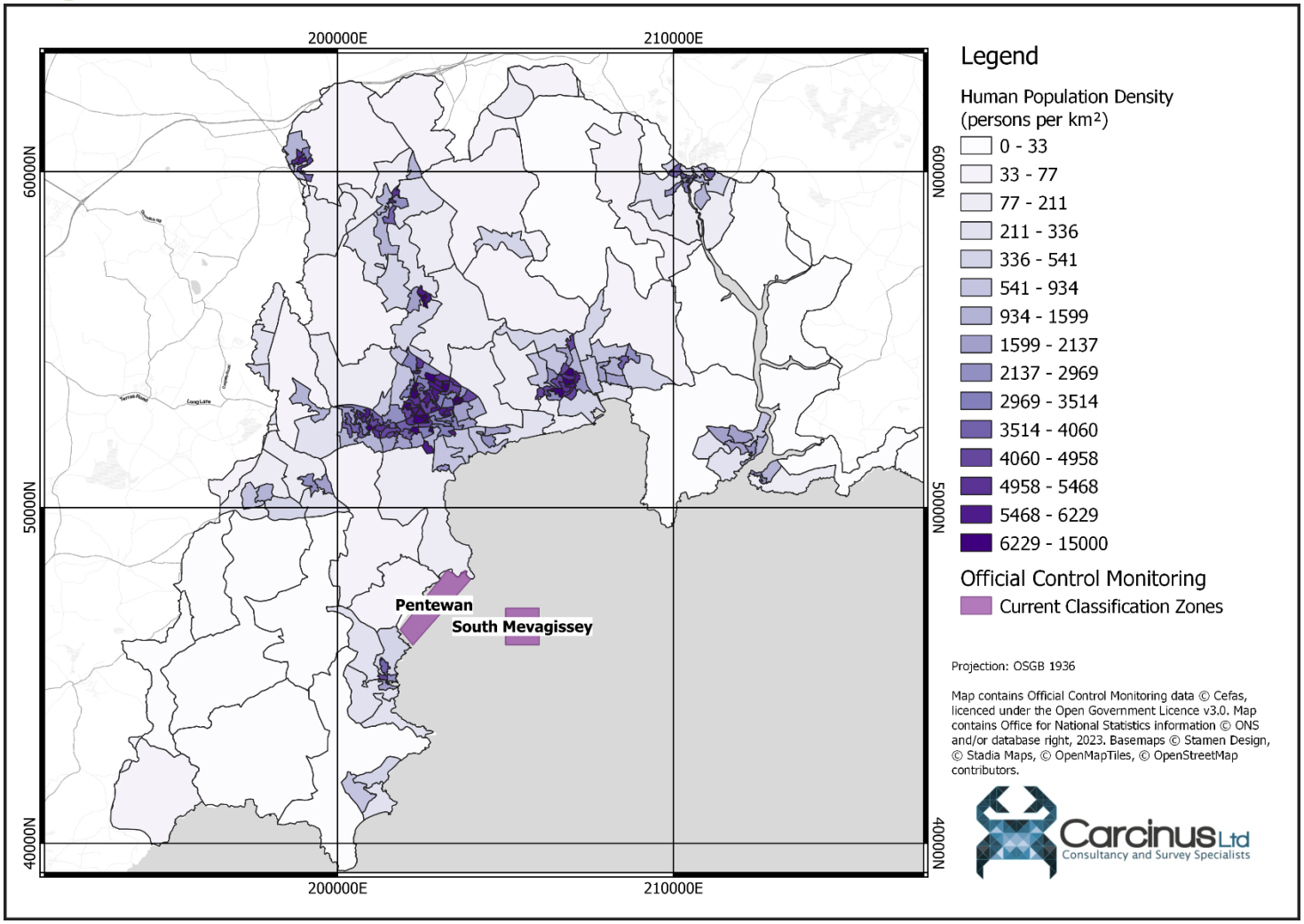

Figure 3.1 Human population density in Census Output Areas wholly or partially contained within the Mevagissey catchment at the 2021 Census.

The 2010 Sanitary Survey of the St Austell BMPA (Cefas, 2010) indicates that the area sees as much as a 50% increase in population during the summer months. The area continues to contain some of the most popular tourist attractions in Cornwall, including the Eden Project. This destination received more than 650,000 visitors in 2022, an increase on 2021 numbers, but a fall compared to pre-Covid numbers of more than 1 million per year (Eyriey, 2023). The peak population within the catchment is likely to occur in the summer months of June – September, and will result in increased loading to the wastewater treatment network. During initial consultations, the LEA stated concerns over the adequacy of the existing water treatment network to handle this seasonal increase, particularly considering the additional increase in urban development. During secondary consultation, the EA advised that developers must have written confirmation from the Water Company that additional flows can be accommodated as part of the planning process. Full details of the changes to the wastewater treatment network are discussed in the next section.

No population data is presented in either the 2016 or 2019 assessments to facilitate comparison. However, analysis of 2021 census data shows that the majority of the catchment is rural, with population densities of fewer than 500 people per square kilometre. The main risk of urban associated runoff will come from the town of St Austell, due to the St Austell river that runs through it and drains to Pentewan Sands, and the town of Mevagissey that is located to the south of the CZs. The *Pentewan* CZ will be most at risk from this source of contamination, although the overall magnitude is less than some other sources of contamination, discussed elsewhere in this report.

3.2 Sewage

Details of all consented discharges in the vicinity of the Mevagissey Bay BMPA were taken from the most recent update to the Environment Agency's national permit database at the time of writing (August 2023 update). The locations of these discharges within the catchment and near the Classification Zones are shown in Figure 3.2.

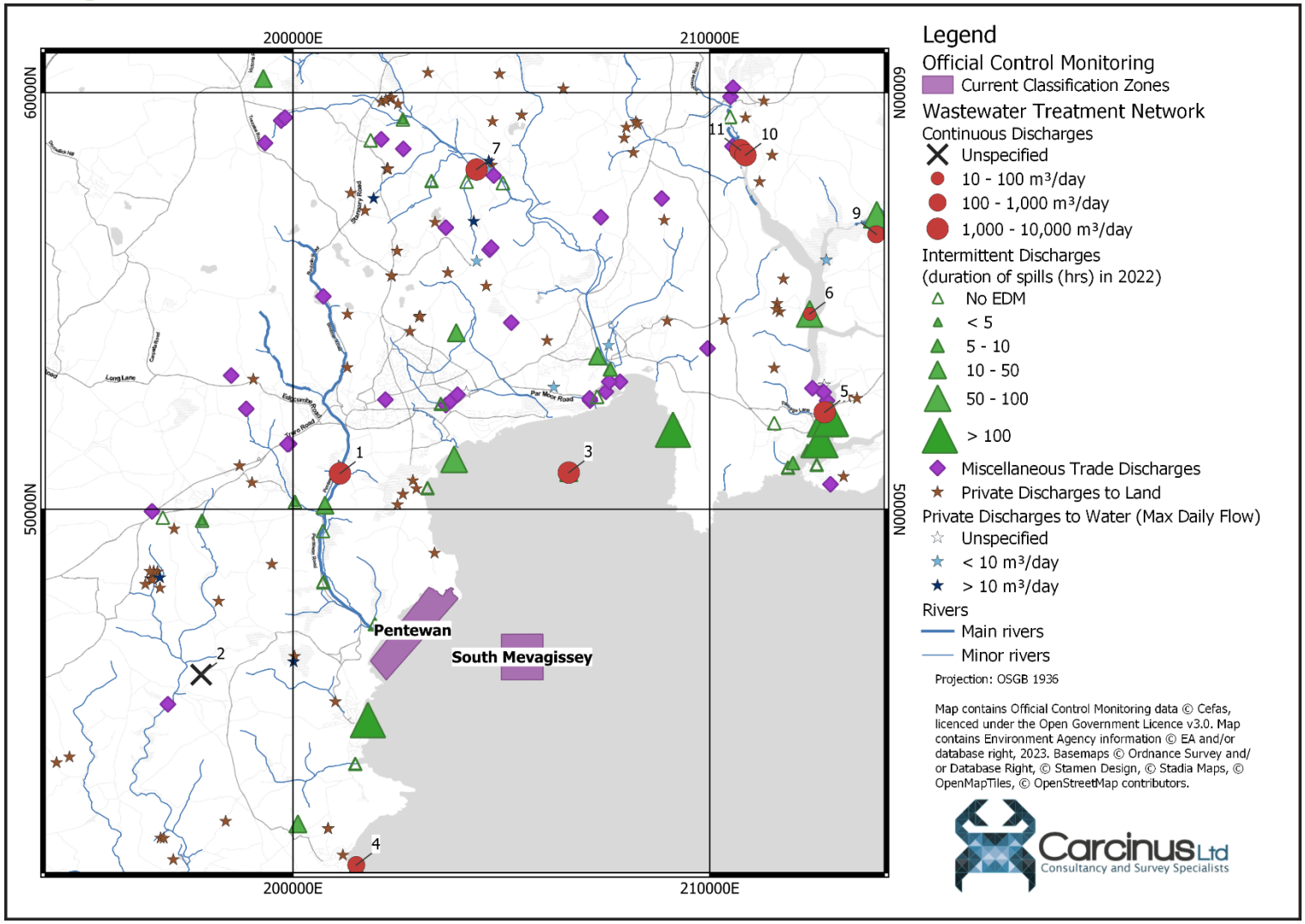

Figure 3.2 Locations of all consented discharges in the Mevagissey Bay catchment. Details of continuous discharges are provided in Table 3.1.

Table 3.1 Details of continuous discharges within the vicinity of the Mevagissey BMPA.

ID	Discharge Name	Permit Number	Receiving Water	Outlet NGR	Treatment Methodology	DWF (m^3/day)	Distance to centre of nearest CZ (km)
1	ST AUSTELL WWTW (MENAGWINS)	031294	ST AUSTELL RIVER	SX0113050860	UV DISINFECTION	6,067	4.24
2	ST EWE STW	SWWA 704	CAERHAYES STREAM	SW9780046030	BIOLOGICAL FILTRATION	Unspecified	5.20
3	PAR SEWAGE TREATMENT WORKS	031299/FN/01	(C) ST AUSTELL BAY	SX0662050880	ACTIVATED SLUDGE	8,414	5.36
4	GORRANHAVEN STW	300118/FU/01	(C) ENGLISH CHANNEL	SX0152041460	UV DISINFECTION	625	5.73
5	FOWEY WASTEWATER TREATMENT WORKS	302530	FOWEY ESTUARY (E)	SX1276052330	UV DISINFECTION	1,843	9.34
6	GOLANT STW	303233	RIVER FOWEY ESTUARY (E)	SX1240154690	UV DISINFECTION	99	10.74
7	ST AUSTELL NORTH STW	SWWA 146	(S) RIVER PAR	SX0440858156	UV DISINFECTION	2,728	11.24
8	LANTEGLOS HIGHWAY STW	SWWA 2306	PENPOLL CREEK	SX1461054300	BIOLOGICAL FILTRATION	Unspecified	12.02
9	LERRYN STW	15/48/174/P/1	(S) RIVER LERRYN	SX1400056600	BIOLOGICAL FILTRATION	115	13.23

ID	Discharge Name	Permit Number	Receiving Water	Outlet NGR	Treatment Methodology	DWF (m^3/day)	Distance to centre of nearest CZ (km)
10	LOSTWITHIEL STW	NRA-SW-5293	RIVER FOWEY (ESTUARINE)	SX1086058500	UV DISINFECTION	1,079	13.97
11	LOSTWITHIEL STW	NRA-SW-5293	RIVER FOWEY (ESTUARINE)	SX1074058620	UV DISINFECTION	1,079	14.00

The 2016 and 2019 pRMP assessments both identify that the St Austell WWTW (Menagwins) (ID 1 in Table 3.1 and Figure 3.2) and Par STW (ID 3) are the main water company owned continuous discharges with the potential to negatively impact the bacteriological health of the BMPA. These discharges are 4.24 and 5.36 km from the centre of the nearest CZs respectively, and the treatment methodologies and consented discharge volumes are unchanged from that described in the 2016 and 2019 pRMP assessments. There are a number of other continuous discharges within the catchment, although none are considered to have a significant impact on the bacteriological health of the BMPA due to either their consented discharge volume, treatment methodology or lack of connectivity to the shellfish water. No upgrades to continuous discharges within the vicinity of Mevagissey Bay BMPA are planned for either the current (AMP7 2020-2025) or next (AMP8 2025 – 2030) Asset Management Periods (AMPs).

In addition to the continuous discharges, intermittent discharges (comprising Combined Storm Overflows (CSOs), Storm Tank Overflows (STOs), Pumping Station Emergency Overflows (PSs), and Sewer Pumping Stations (SPSs)) also have the potential to impact the bacteriological health of the BMPA. Neither the 2016 nor 2019 pRMP assessments provide the details of the intermittent discharges present in the vicinity of the Mevagissey BMPA, but they do provide their locations in maps (Figure 1; page 2 and Figure 1; page 4 respectively). The lack of specific details about the intermittent discharges active at the time of publication of those assessments limits comparison with the current situation. During AMP6 and AMP7, Event Duration Monitoring (EDM) was installed at several of the discharges within the catchment. Summary data for 2020, 2021 and 2022 was published by the Environment Agency in March 2021, March 2022 and March 2023 respectively (Environment Agency, 2023). A summary of the EDM return for discharges in the vicinity of the Mevagissey BMPA is presented in Appendix I.

There are three intermittent discharges within 3 km of the centre of a CZ in the Mevagissey BMPA. These are Pentewan PS/CSO/EO (0.97 km), Mevagissey PS/CSO/EO (2.35 km) and Nanslardon PS/CSO/EO (2.52 km). *Pentewan* is the closest CZ to all three discharges. No EDM data is presented in either the 2016 or 2019 pRMP assessments. The EDM summary for these discharges from 2020 – 2022 is presented in Table 3.2. The data show that the Mevagissey PS/CSO/EO is the most active discharge, but that all three are active and so should be taken into consideration in any updated sampling plan. There are a number of other discharges in the catchment and within the northern part of St Austell Bay (such as the Par STW SSO and Charlestown PS/CSO/EO), but their impacts will be less than the discharges discussed above due to their distance from the Mevagissey Bay BMPA and *E.coli* die off prior to reaching the shellfish CZ.

Table 3.2 Event Duration Monitoring summary for intermittent discharges within 3 km of the Mevagissey BMPA.

Discharge Name	2020		2021		2022	
	No. Spills	Duration of spills (hrs)	No. Spills	Duration of spills (hrs)	No. Spills	Duration of spills (hrs)
Pentewan PS/CSO/EO	1	0.47	8	145.3	0	0
Mevagissey PS/CSO/EO	183	45.1	127	90.88	121	124.78
Nanslardon PS/CSO/EO	4	5.43	0	0	0	0

During initial consultations, the EA stated that there have been improvements to CSOs in the area, with some being aggregated and others removed. The Shellfish Water Action Plan for the St Austell Shellfish Water states that an investigation into the performance of all water company assets found that the Par STW SO, Menagwins STW SSO Charlestown SPS, Charlestown Harbour SPS and St Austell (Luxulyan) STW SSO can all impact the shellfish water under certain varying conditions, and that upgrades to these discharges are all proposed to be completed before the end of AMP8 (2025 – 2030).

In addition to the water company owned infrastructure, there continue to be many privately owned discharges throughout the catchment, but the majority have consented discharge volumes of less than 10 m^3/day. Limited details of these discharges can be provided due to data protection requirements, but the assessment of the impact from these discharges is considered to be small compared to other sources of contamination discussed elsewhere in this report.

No assessment of the relative contribution of water company discharges to the Mevagissey Shellfish Water is provided in the Action Plan published by the EA (as the area was only designated in 2021). The Shellfish Water Action Plan for the St Austell shellfish water (2 km north of the Mevagissey shellfish water) classifies the contribution of water company owned sewerage infrastructure to overall contamination levels within the area to be 'medium'[3]. This desktop assessment supports that conclusion; under certain environmental conditions (see Section 4 for details) the Par STW may contribute significant contamination to the Mevagissey Bay BMPA. There are also two regularly active intermittent discharges within Mevagissey Bay itself (Pentewan PS/CSO/EO and Mevagissey PS/CSO/EO), as well as a major watercourse of the catchment that will act as a point source of contamination carrying faecal loading from discharges farther up the catchment. All these discharges should be taken into consideration in any updated sampling plan.

[3] 'Medium' contribution: accounting for 10 – 39% of overall contamination levels within a shellfish water.

3.3 Agricultural Sources

No livestock population data is provided in either the 2016 or 2019 pRMP assessments. To provide an indication of changes in livestock populations within the catchment in recent years, a data request was made to the Farming Statistics Office for the Department for Environment, Food and Rural Affairs (DEFRA) for livestock populations within the catchment presented in Figure 1.1 for 2010, 2016 and 2021 based on the June Survey of Agriculture and Horticulture[4]. The data could not be broken down into the various sub catchments to prevent disclosure of information about individual holdings. Figure 3.3 presents the changes in livestock populations within the catchment from 2010 to 2021.

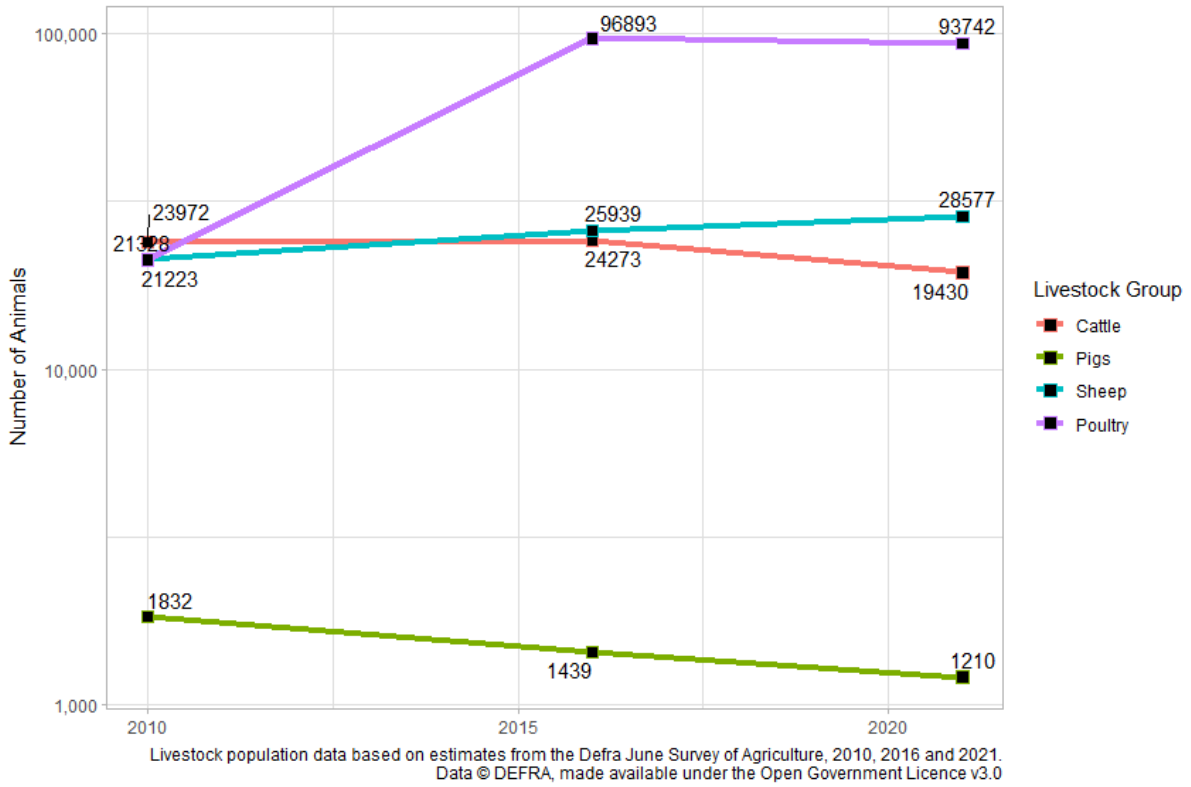

Figure 3.3 Changes in livestock populations within the Mevagissey Bay catchment.

The data presented in Figure 3.3 shows that in 2010, the population of poultry, sheep and cattle were all fairly similar, but there was a large increase in poultry populations between 2010 and 2016, and poultry continues to be the dominant group in terms of population size. Pig populations are markedly smaller than all other groups. Total livestock population in 2021 was more than twice as large as in 2010, although much of this was driven by a large increase in poultry populations. It should be noted that the June Survey represents a snapshot of livestock populations in a single day, but populations will vary throughout the

[4] June Survey of Agriculture and Horticulture. Further information available at: https://www.gov.uk/guidance/structure-of-the-agricultural-industry-survey-notes-and-guidance#june-survey-of-agriculture-and-horticulture-in-england.

year. Highest numbers of animals will occur in spring, following the birthing season, and the lowest in autumn and winter when animals are sent to market.

The principal route of contamination of coastal waters by livestock is surface runoff carrying faecal matter. Figure 3.4 presents the land cover data of the land surrounding the Mevagissey BMPA in 2018. No more recent data are available.

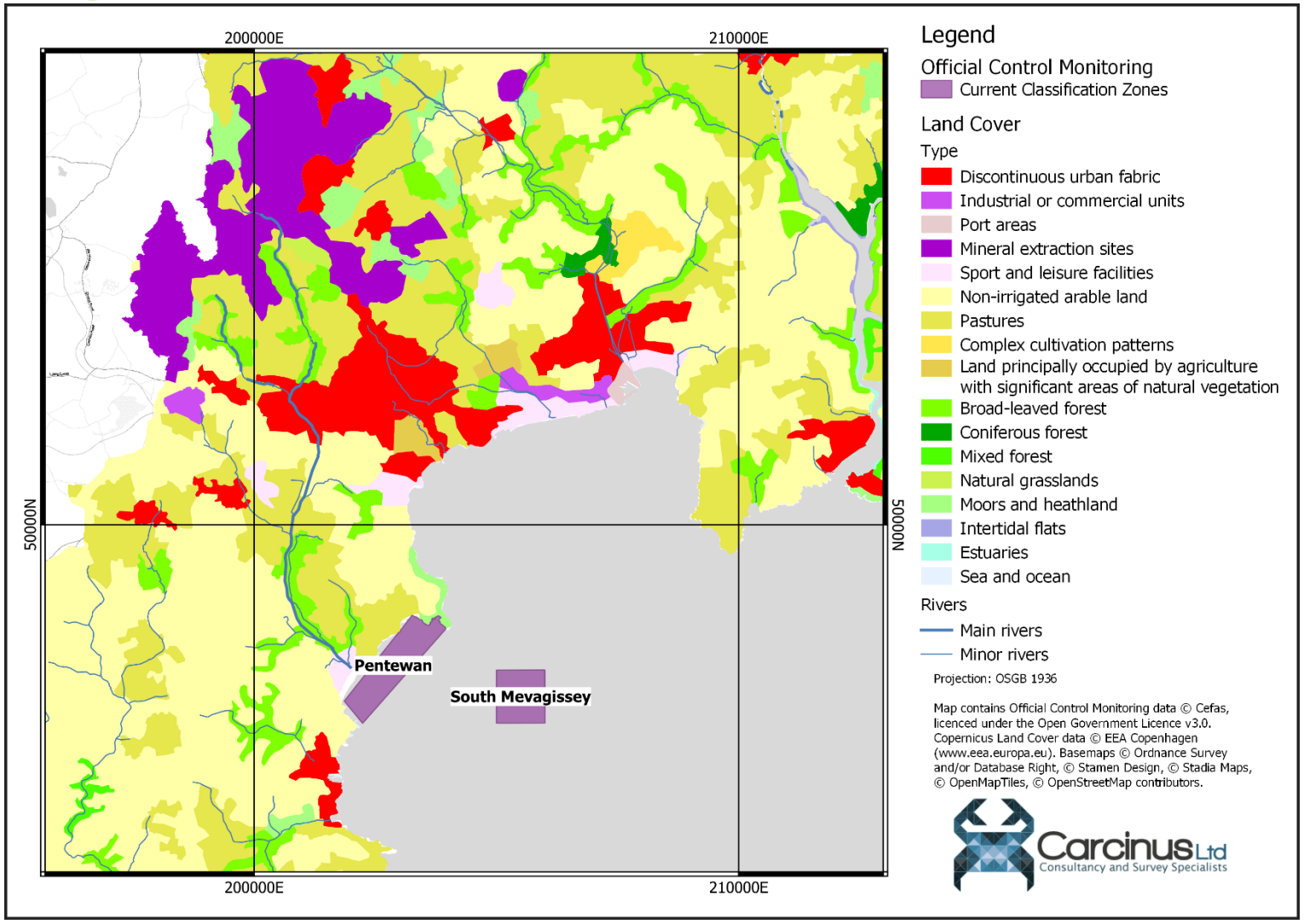

Figure 3.4 Land cover in the vicinity of the Mevagissey BMPA in 2018.

Figure 3.4 shows that in 2018, the majority of the land surrounding the Mevagissey BMPA was rural, with very little urban fabric near to the CZs. After draining through St Austell, the St Austell river runs through large areas of arable and pastural farmland and is likely to carry contamination from these areas into the BMPA. The *Pentewan* CZ is at greatest risk of this source of contamination. Pasture areas adjacent to shorelines represent the greatest contamination risk to the classification zones. This is due to run-off from the land travelling less distance before reaching the CZs, resulting in less dilution and *E. coli* die off. Run-off from rivers further up the catchment will have a lower risk of contamination to the CZs, because the increased distance will result in further dilution and *E. coli* die off. These may however contribute to background levels of contamination in the CZs, particularly following significant rainfall events.

Arable farmland can also represent a risk to the bacteriological health of a shellfishery, particularly where slurry is applied to fields. During initial consultations, the EA advised that a farm 1.2 km from a watercourse near the shellfishery had repeated slurry spills in 2018, but that changes to legislation surrounding the storage and usage of slurry should have prevented further spills. The spreading of slurry to fields is now controlled under the Reduction and Prevention of Agricultural Diffuse Pollution (England) Regulations 2018, known as the Farming Rules for Water, which came into force in April 2018. This legislation lays out a set of rules that require good farming practice, so that farmers manage their land both to avoid water pollution and benefit their business. Rules include requiring farmers to judge when it is best to apply fertilisers, where to store manures and how to avoid pollution from soil erosion. Furthermore, silage and slurry storage for agricultural purposes is subject to The Water Resources (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010 (SSAFO). All farmers must comply with the SSAFO regulations when building new slurry stores, or substantially altering (e.g., enlarging) existing ones. All stores must be built at least 10 m from any watercourse, including field drains or ditches, and be built or altered to last for at least 20 years with proper maintenance. Since 2021, the EA now has ART (Agricultural Regulatory Taskforce) Officers that have all been assigned a catchment and will engage, inspect, advise and if necessary, enforce the Silage, Slurry and Agricultural Fuel Oil regulations and the new (2018) Farming Rules for Water. The Shellfish Water Action Plan for this catchment notes that there are over 200 farms within the catchment. 10 are engaged with Catchment Sensitive Farming (CSF), and 18 are engaged with Countryside Stewardship (CS). There have been 84 CSF measures to reduce the concentration of Faecal Indicator Organisms (FIO) in the catchment, but no more details are provided. In theory, these legislative changes should have reduced the pollution that this activity causes to shellfish beds.

Both the 2016 and 2019 pRMP assessments note that agricultural contamination is a potentially significant source of contamination to CZs in the Mevagissey BMPA, and the findings of this review support that assessment. All rivers and watercourses are likely to be affected by agricultural runoff, particularly following significant rainfall events.

3.4 Wildlife

Overwintering and wading birds often represent a potentially significant source of microbiological contamination to shellfisheries because avian species frequently forage (and therefore defecate) on areas of shellfish beds.

Neither the 2016 nor 2019 pRMP assessments identify that avian species are likely to contribute significant levels of faecal contamination to CZs in the Mevagissey Bay BMPA. The 2010 Sanitary Survey of St Austell Bay describes that a small population of various seabird species are present within the Ropehaven Cliffs Nature Reserve. The Wetland Bird Survey (WeBS) provides waterbird counts for two areas within the vicinity of the Mevagissey BMPA, Charlestown and Porthpean. Neither site contains either internationally or nationally significant populations of any species. Monitoring at the Porthpean site was only undertaken in the winter of 2021/2022, recording 198 birds (Austin *et al.*, 2023), and monitoring at the Charlestown site has only been undertaken since 2017/2018, with an average of 35 birds per year. Some occasional contamination may occur, and is likely to be highest in winter months, but does not need to be taken into consideration in the placement of RMPs for this BMPA.

Marine mammals such as seals may also contribute some contamination, particularly when foraging in the area. However, the area is not considered to be a significant habitat for this group and so any contamination will be occasional and minimal, and does not need to be taken into consideration in the placement of RMPs for this BMPA.

3.5 Boats and Marinas

The discharge of sewage from boats is a potentially significant source of contamination to the shellfish beds of the Mevagissey Bay BMPA. Boating activities in the area have been derived through analysis of satellite imagery and various internet sources and compared to that described in the 2016 and 2019 pRMP assessments. Their geographical positions are presented in Figure 3.5.

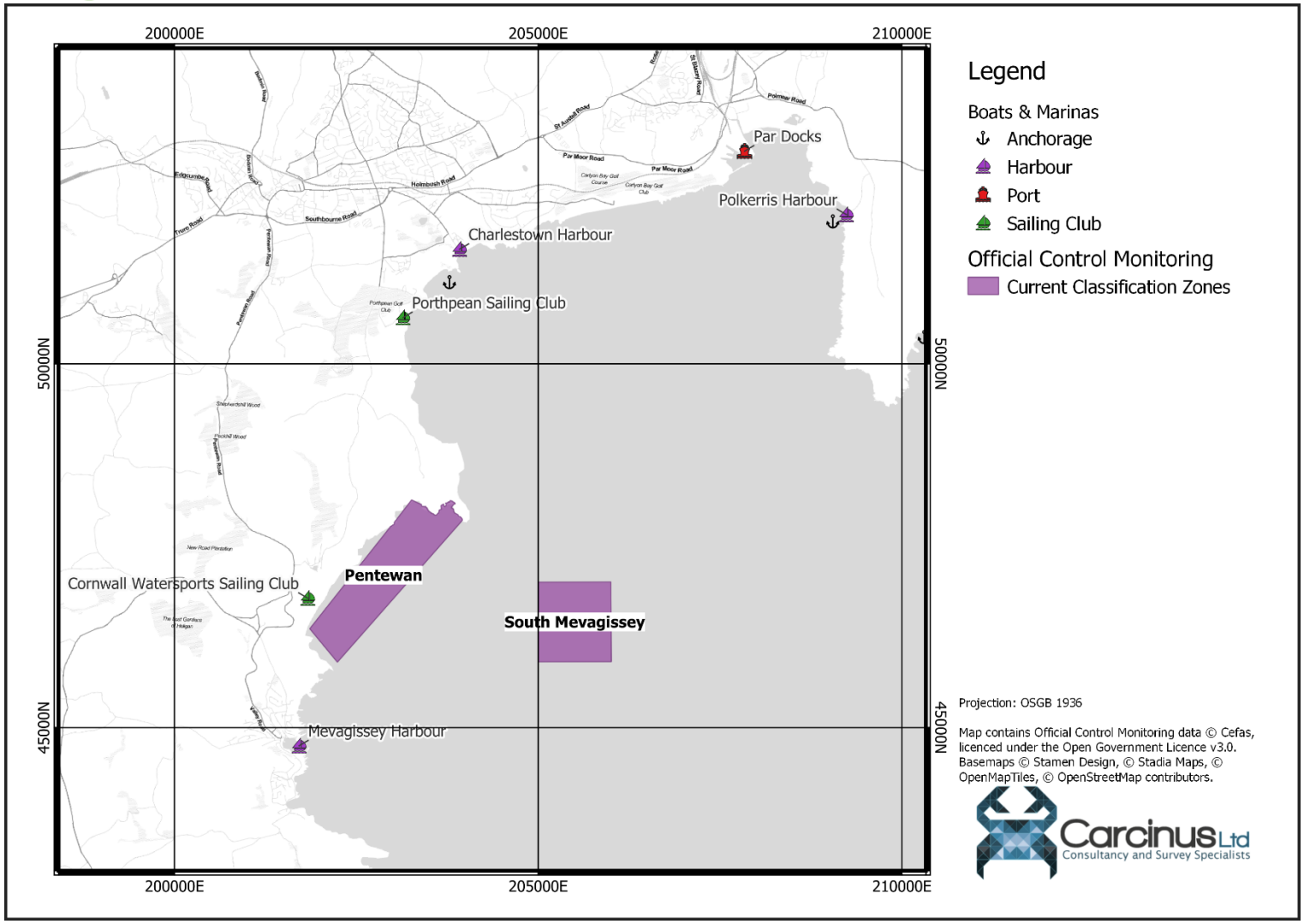

Figure 3.5 Locations of boats, marinas and other boating activities in the vicinity of the Mevagissey BMPA.

A fishing fleet comprising 42 vessels under 10 m and four vessels over 10 m list Mevagissey Harbour as their home port (gov.uk, 2023). This is a slight reduction on the 63 vessels reported in the 2010 Sanitary Survey. There are also smaller harbours at Charlestown and Polkerris. It is likely that fishing vessels will spend the majority of their time at sea outside of St Austell Bay and so no contamination from this source is expected.

There is a small, private commercial port at Par Docks, which has eight berths (though not all are used for commercial traffic) and the primary trade is China Clay. The port is tidal and vessels rest on the seabed at low water. The maximum permissible draft of vessels entering the port is restricted by the height of tide. The legislation governing the release of overboard discharges from merchant vessels is unchanged since the publication of the original assessments, where vessels are prohibited from making overboard discharges within 3 nautical miles of land.

Analysis of satellite imagery and freely available nautical charts[5] suggests that there continue to be some marked anchorages throughout the area, suggesting that recreational vessels will visit the area from time to time. Some minor impacts from recreational vessels of a sufficient size to contain onboard toilets may make overboard discharges, particularly when moored overnight outside of the main harbours or when moving through the main navigational channels. The greatest impacts are likely to occur in summer months, when vessel numbers are at their highest, but the impacts are likely to be minor in comparison to other sources of contamination to this BMPA, as there are no significant marinas and yacht havens for recreational vessels in the area.

No significant changes to the extent of boating activity within Mevagissey Bay and the surrounding waters have occurred since the 2016 and 2019 pRMP assessments were published. No update to the sampling plan is required.

3.6 Other Sources of Contamination

Utility misconnections are when foul water pipes are wrongly connected and enter surface waters without treatment, potentially putting raw sewage directly into watercourses via surface water drains. During initial consultations, the EA stated that there have been some minor issues with misconnections in this area, but that the impacts were low.

The Shellfish Water Action Plan for the Mevagissey Bay Shellfish Water notes that heavy rainfall can often collect pollutants from roads, paths and fields containing faecal indicator organisms (such as *E. coli*) and deposit them into waterways. The Environment Agency are working on the STARR project to intercept rainwater from Par Lane, reducing the number of CSO spills into the northern part of St Austell Bay. These works have also involved installing rain gardens and have led to an improvement in water quality and a reduction in sediment runoff into Par Bay. The improvements started in the 2015 – 2021 River Basin management period extending through the 2021 – 2027 period. The works may also have reduced the

[5] Navionics chart viewer. Available at: https://webapp.navionics.com/#boating@6&key=sfjyHvseC

faecal contamination affecting the Mevagissey Bay BMPA from CSOs in St Austell Bay, as the frequency of spills from CSOs will be reduced.

The 2019 pRMP assessment notes that dog walking is very popular in the area. There is currently a large razor clam CZ in the intertidal area of Pentewan Sands, and this CZ is therefore exposed to more risk than the offshore mussel beds. The overall contamination is however likely to be much lower than other sources of contamination discussed in previous sections.

4 Hydrodynamics/Water Circulation

The Mevagissey Bay BMPA is located within Mevagissey Bay, a south-easterly facing embayment. The *Pentewan* CZ is located partially within the intertidal, whereas the *South Mevagissey* CZ is located entirely within the subtidal. It is considered very unlikely that water depths and the extents of intertidal areas have changed significantly from the time of publication of the previous pRMP assessments.

The 2019 pRMP assessment states that the area sees a spring tidal range of 4.7 m, but that tidal currents in the area are small and do not have a significant bearing on the placement of RMPs within this BMPA. In the absence of strong tidal or riverine circulation, wind and density driven currents are likely to dominate, although they are variable and challenging to predict. The predominant wind direction is south-westerly, but contamination gradients will not always follow this pattern if the wind direction changes for a prolonged period. Contamination from shoreline sources within Pentewan Sands will be carried outwards over the CZs, and under prolonged and/or strong northerly wind conditions, contamination sources from within St Austell Bay (such as Par STW) will be carried southwards over the BMPA.

The dilution potential will be much higher in the deeper subtidal areas nearer the centre of the embayment rather than the shallow subtidal or intertidal areas. The concentration of *E. coli* is therefore more likely to persist in the intertidal *Pentewan* CZ than in the *South Mevagissey* CZ.

5 Rainfall

A complete record of the rainfall data from the Heligan Gardens rain gauge at NGR SW 99815 46781 (ID: 377658) was downloaded from the Environment Agency's hydrology data explorer[6]. This monitoring station is 2.5 km west of the BMPA. The data processed in R (R Core Team, 2021). The rainfall levels per month between 2015 and 2023 are shown in Figure 5.1 and the total annual rainfall between 2015 and 2023 are shown in Figure 5.2.

[6] Environment Agency's Hydrology Data Explorer. Available at: https://environment.data.gov.uk/hydrology/explore#/landing.

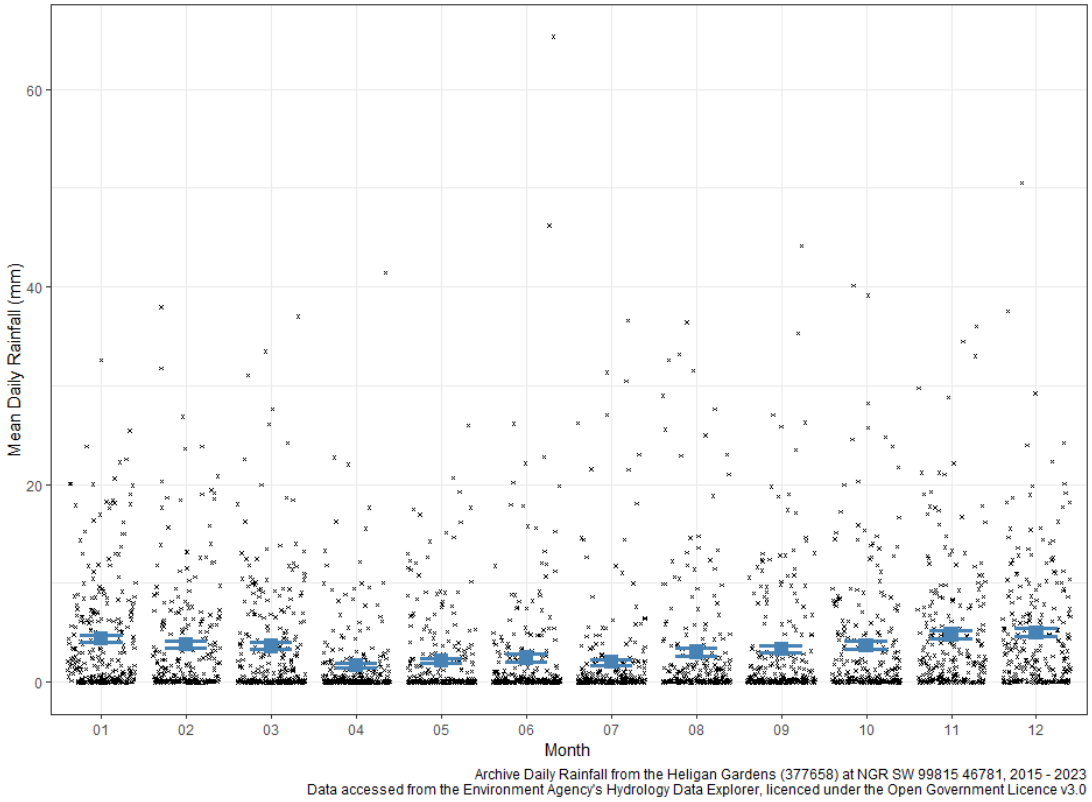

Figure 5.1 Rainfall levels per month at the Heligan Gardens (ID 377658) monitoring station.

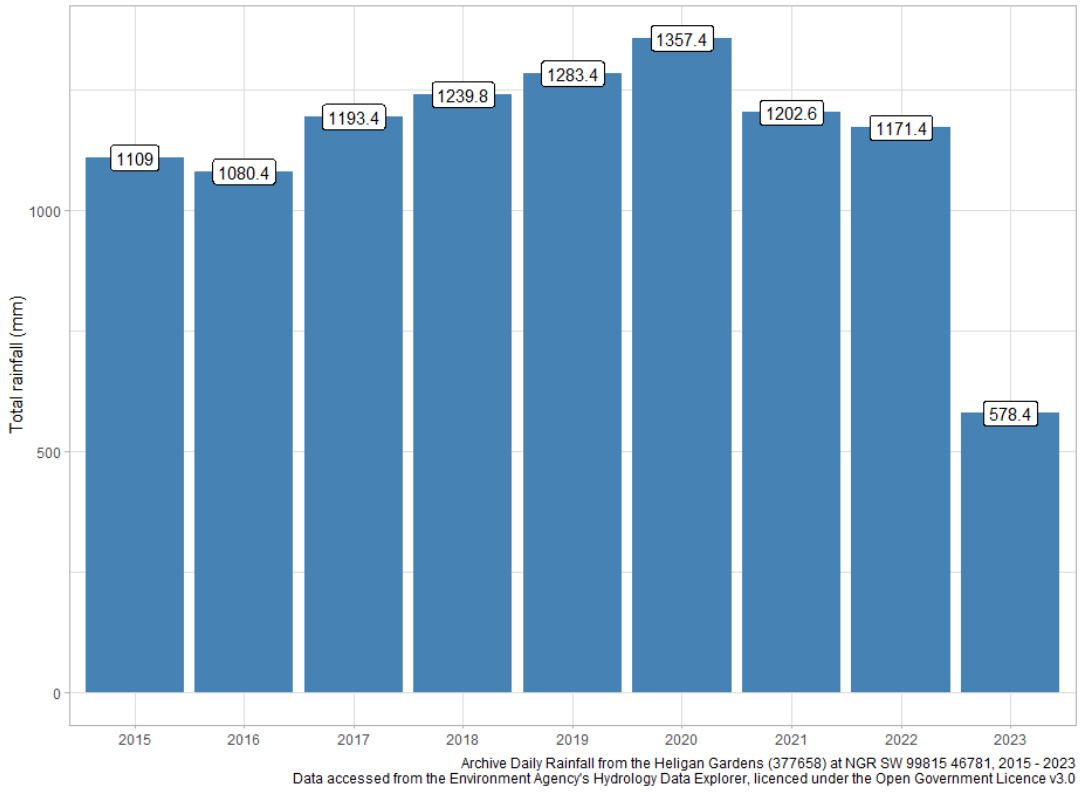

Figure 5.2 Total annual rainfall recorded at the Heligan gardens monitoring station each year between 2015 and 2023.

The data show that the highest total annual rainfall was recorded in 2020, with 1357.4 mm rainfall falling, following a period of five years with a year-on-year increase in rainfall. 578 mm of rain fell at this monitoring station up to July 2023. The monthly summaries presented in Figure 5.1 show that winter months tend to have the most rainfall and so it is likely that the total annual rainfall in 2023 will be broadly similar to previous years.

Rainfall leads to increased faecal loading through two factors: elevated levels of surface runoff and increased spill events from intermittent discharges, particularly during periods of heavy rain. Rainfall levels during both periods were greatest in winter months (November – February), and so levels of runoff etc. would be expected to be greatest during this time. However, as the rainfall patterns have remained similar across the two time periods, significantly altered bacterial loading due to these factors is unlikely and as such RMP recommendations made in the original sanitary survey to capture the influence of runoff and spill events remain valid.

6 Microbial Monitoring Results

6.1 Official Control Monitoring

6.1.1 Summary Statistics and geographical variation

Mean Official Control monitoring results for *E. coli* concentrations at RMPs sampled in the Mevagissey BMPA since 2010 are presented spatially in Figure 6.1 and summary statistics are presented in Table 6.1. This data was obtained through a request to Cefas, but is freely available on the datahub.

A total of four RMPs have been sampled within the Mevagissey BMPA since 2010. Sampling at the Pentewan B70AL and B70AM RMPs started in May 2019, following the recommendations of the 2019 pRMP assessment. A period of concurrent sampling of both mussels (B70AM) and razor clams (B70AL) was recommended in the pRMP assessment and monitoring at the razor clam (B70AL) RMP was stopped in May 2020. The mussel RMP (B70AM) has been monitored continually since then. The 2016 pRMP assessment recommended a period of concurrent monitoring at two RMPs in the same location, but one from 2 m water depth (South Mevagissey Top B70AJ) and one from 10 m water depth (South Mevagissey Bottom B70AK). Monitoring at these RMPs only commenced in 2020, and sampling at the South Mevagissey Top B70AJ RMP stopped in August 2020, after 10 samples had been collected. The South Mevagissey Bottom B70AK RMP has been sampled continually since June 2020.

All four of the RMPs have returned at least one result above 230 *E. coli* MPN/100 g but none have returned a result above 4,600 MPN/100 g. Monitoring at the Pentewan mussel RMP (B70AM) returned higher *E. coli* concentrations than from the co-located razor clam RMP (B70AL), which is why the mussel RMP is currently used as an indicator for the *Pentewan* razor clam CZ. Monitoring at the South Mevagissey Bottom (B70AK) RMP returned higher *E. coli* concentrations than at the South Mevagissey Top (B70AJ) RMP, which is why the B70AK RMP is currently used to classify the *South Mevagissey* CZ.

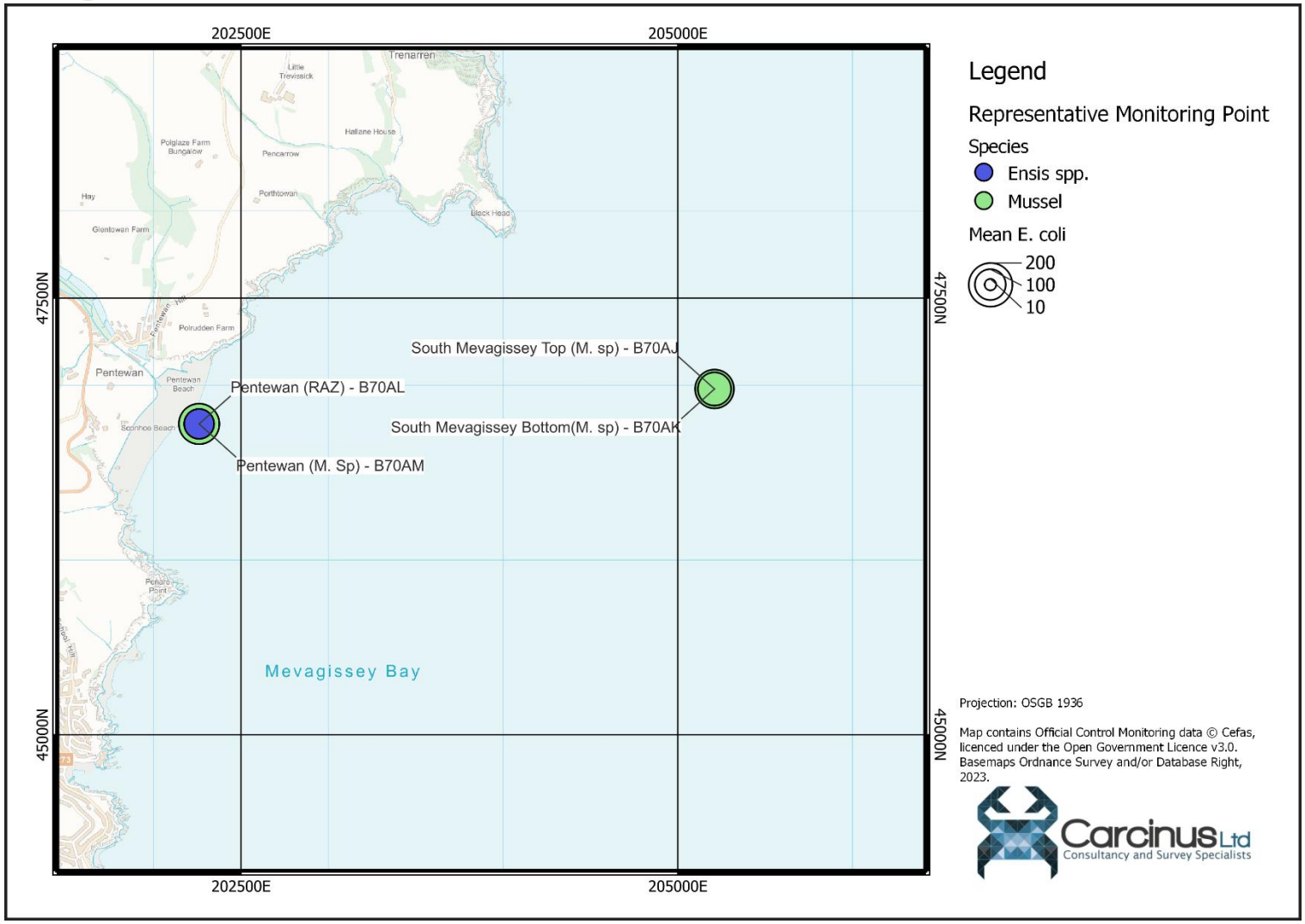

Figure 6.1 Mean E. coli results from Official control monitoring at bivalve RMPs in the Mevagissey BMPA.

Table 6.1 Summary statistics of Official Control monitoring at bivalve RMPs in the Mevagissey BMPA.

RMP (Species)	NGR	Species	No.	First Sample	Last Sample	Mean	Min Value	Max Value	% > 230	% > 4,600	% > 46,000
Pentewan (M. Sp) - B70AM	SX02264678	Mussel	47	02/05/2019	06/09/2023	172.70	18	3300	8.512	0	0
Pentewan (RAZ) - B70AL	SX02264678	Ensis spp.	15	02/05/2019	19/05/2020	93.93	18	690	13.333	0	0
South Mevagissey Bottom(M. sp) - B70AK	SX05214698	Mussel	46	09/06/2020	06/09/2023	116.52	18	3300	6.522	0	0
South Mevagissey Top (M. sp) - B70AJ	SX05214698	Mussel	10	01/04/2020	04/08/2020	158.60	18	1300	10	0	0

Figure 6.2 and Figure 6.3 presents box and violin plots of *E. coli* monitoring at RMPs within the Mevagissey BMPA. One-way analyses of variance (ANOVA) tests were performed on the data to investigate the statistical significance of any differences between the monitoring results from the two RMPs. Significance was taken at the 0.05 level[7]. All statistical analysis described in this section was undertaken in R (R Core Team, 2021).

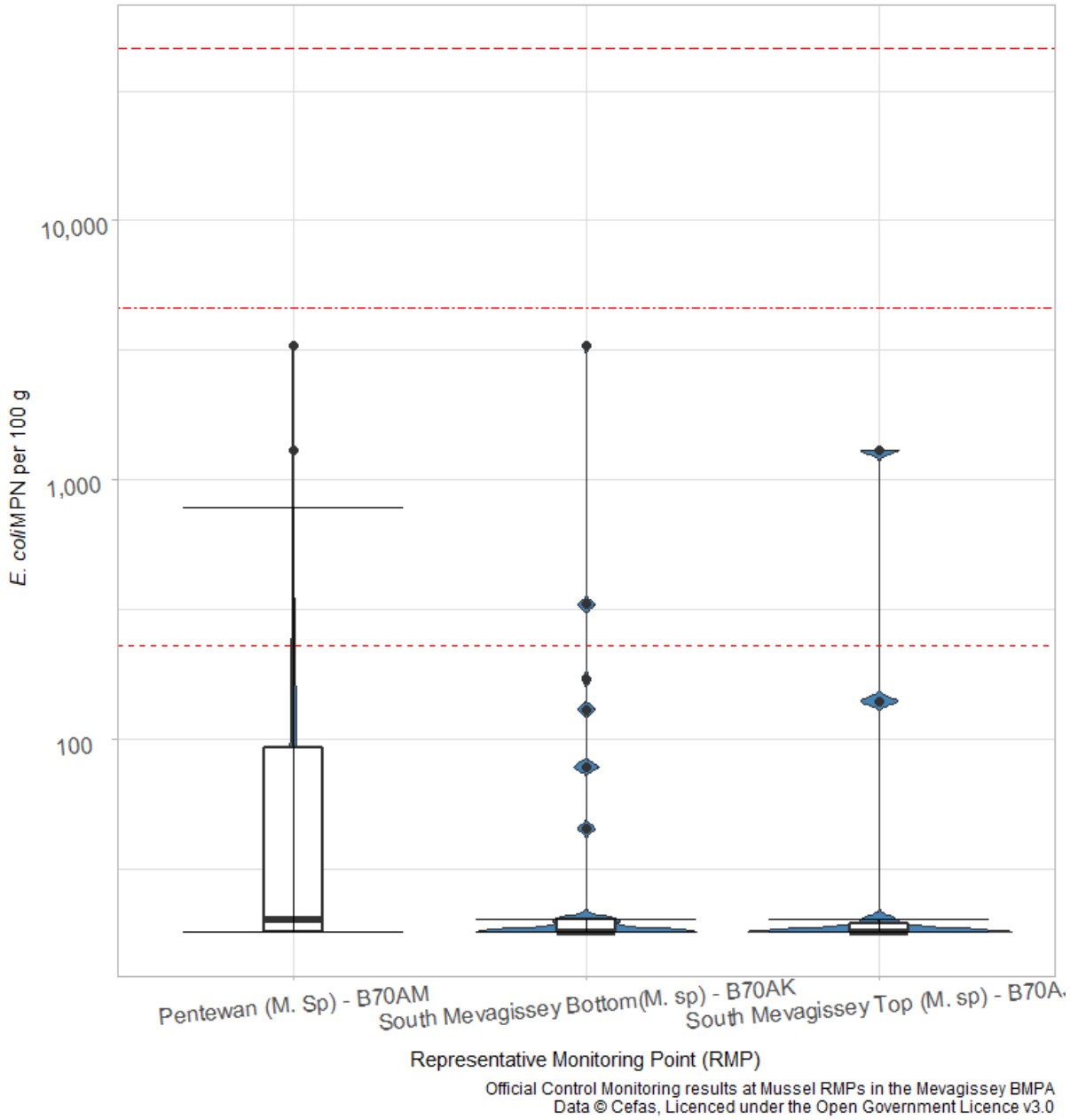

Figure 6.2 Box and violin plots of E. coli monitoring at mussel RMPs in the Mevagissey BMPA. Central line indicates median value, box indicates lower-upper quartile range and whisker indicates minimum/maximum values, excluding outliers. Boxplots are overlaid on the

[7] A p-value of less than 0.05 means that there is a greater than 95% probability that the observed differences between the groups being compared hasn't occurred by chance alone.

distribution of the monitoring data. Horizontal dashed lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g.

The median result at all three mussel RMPs (Figure 6.3) are very similar, being at or slightly above the limit of detection (18 *E. coli* MPN/100 g). No statistically significant differences in the monitoring data were observed ($p > 0.05$).

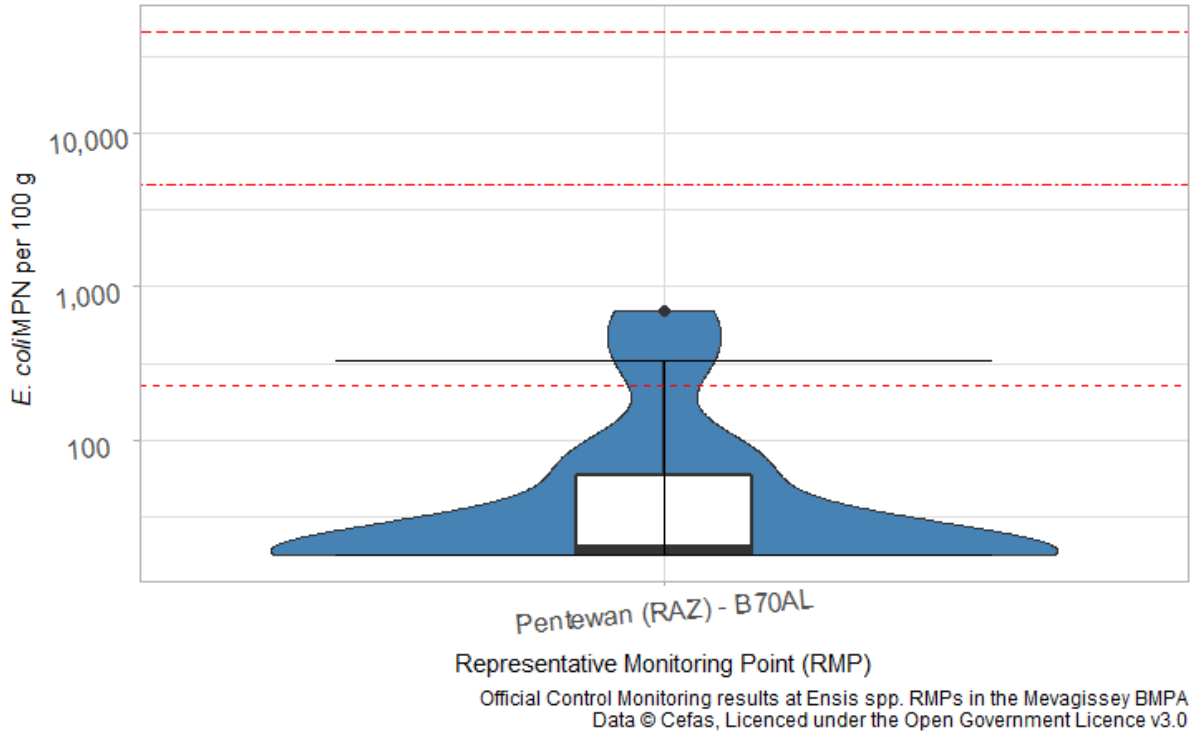

Figure 6.3 Box and violin plots of E. coli monitoring at razor clam RMPs in the Mevagissey BMPA. Central line indicates median value, box indicates lower-upper quartile range and whisker indicates minimum/maximum values, excluding outliers. Boxplots are overlaid on the distribution of the monitoring data. Horizontal dashed lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g.

The median result at the Pentewan B70AL RMP is 20 *E. coli* MPN/100 g. It is not appropriate to compare monitoring results between different species due to the differences in rates of *E. coli* uptake.

6.1.2 Overall temporal pattern in results

The overall temporal pattern in shellfish flesh monitoring results within the Mevagissey BMPA is shown for mussels in Figure 6.4 and razor clams in Figure 6.5.

The mussel data presented in Figure 6.4 indicates that generally concentrations of *E. coli* in shellfish flesh are low, with the loess models for all RMPs falling below the 230 MPN/100 g threshold. It also suggests that shellfish flesh quality is improving, as the loess models are trending downward. Limited inference can be drawn from the razor clam data presented in Figure 6.5 as only 15 samples were collected over the period of one year, although it is evident that *E. coli* concentrations were also low.

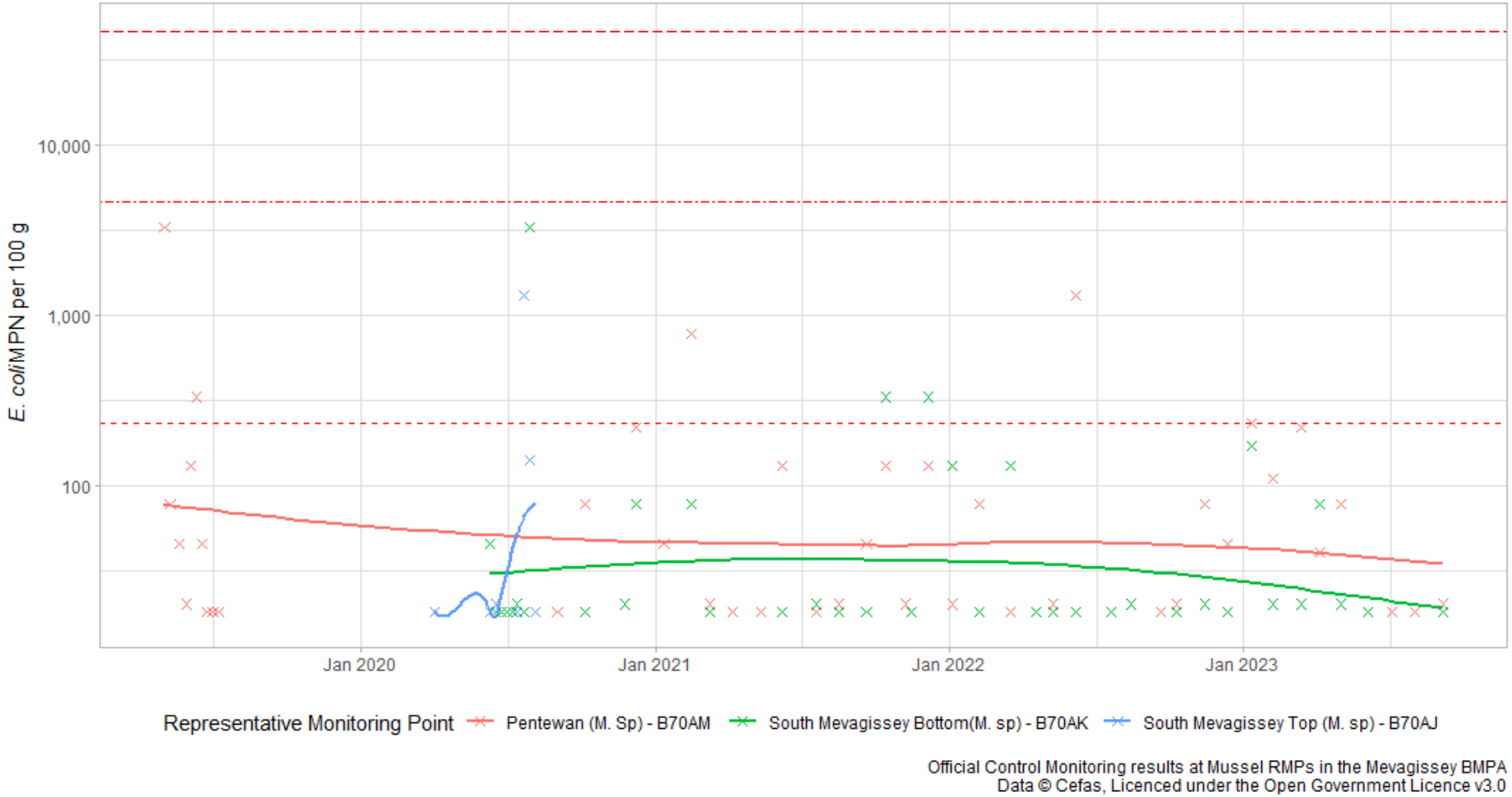

Figure 6.4 Timeseries of E. coli levels at mussel RMPs sampled in the Mevagissey Bay BMPA since 2010. Scatter plots are overlaid with a loess model fitted to the data. Horizontal lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g respectively.

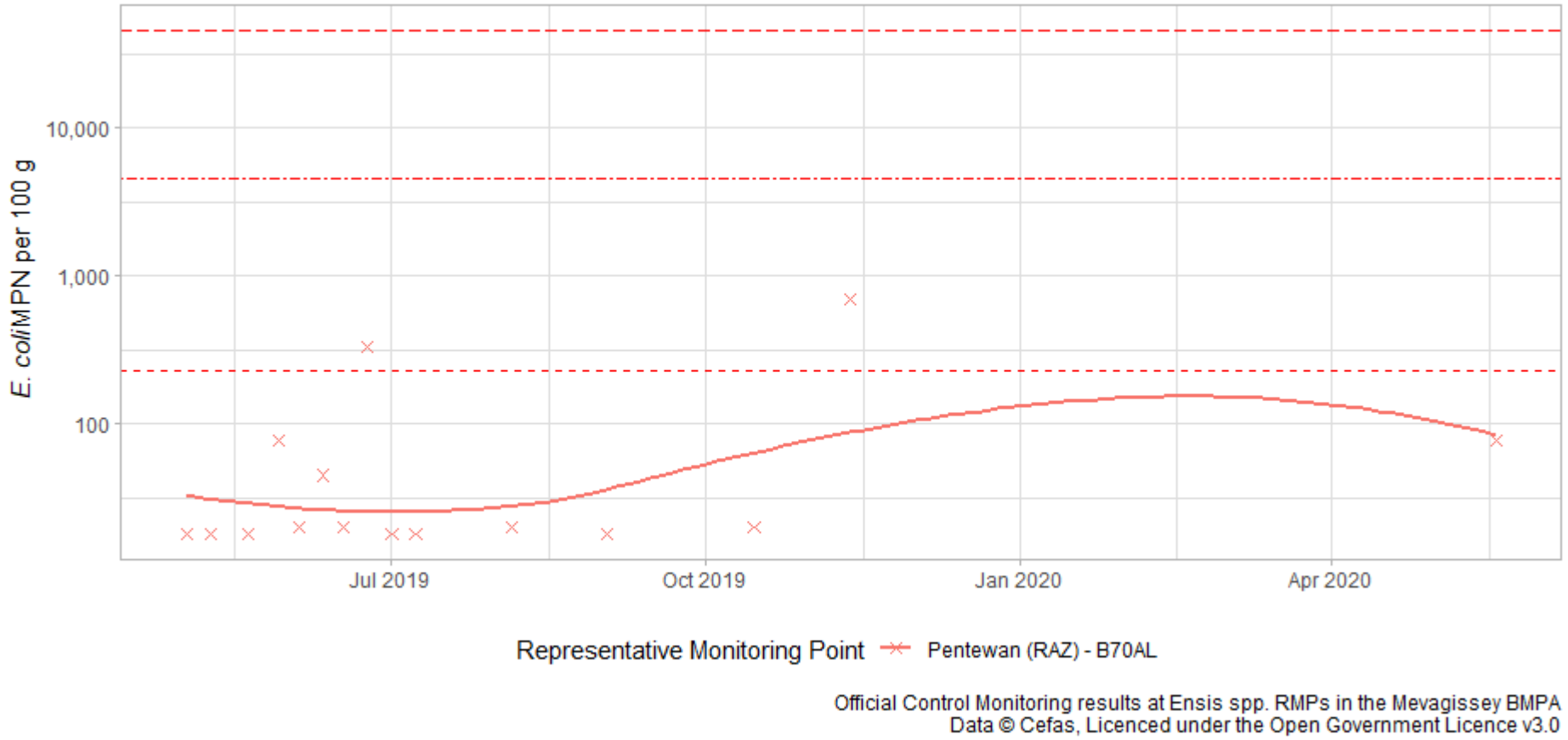

Figure 6.5 Timeseries of E. coli levels at razor clam RMPs sampled in the Mevagissey Bay BMPA since 2010. Scatter plots are overlaid with a loess model fitted to the data. Horizontal lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g respectively.

6.1.3 Seasonal patterns of results

Seasonal patterns of *E. coli* concentrations of *E. coli* concentrations at RMPs in the Mevagissey Bay were investigated and are shown for mussels in Figure 6.6. The data for each year were averaged into the four seasons, with, spring from March – May, summer from June – August, autumn from September – November and winter comprising data from December – February the following year. Two-way ANOVA testing was used to look for significant differences in the data, using both season and RMP (if there is more than one RMP for a given species) as independent factors (i.e., pooling the data across season and RMP respectively), as well as the interaction between them (i.e., exploring seasonal differences within the results for a given RMP). Significance was taken at the 0.05 level. No seasonal comparison of the razor clam data is possible as an insufficient number of samples were collected.

Monitoring results from winter months are higher at all RMPs, but no significant differences in the monitoring data were found ($p > 0.05$).

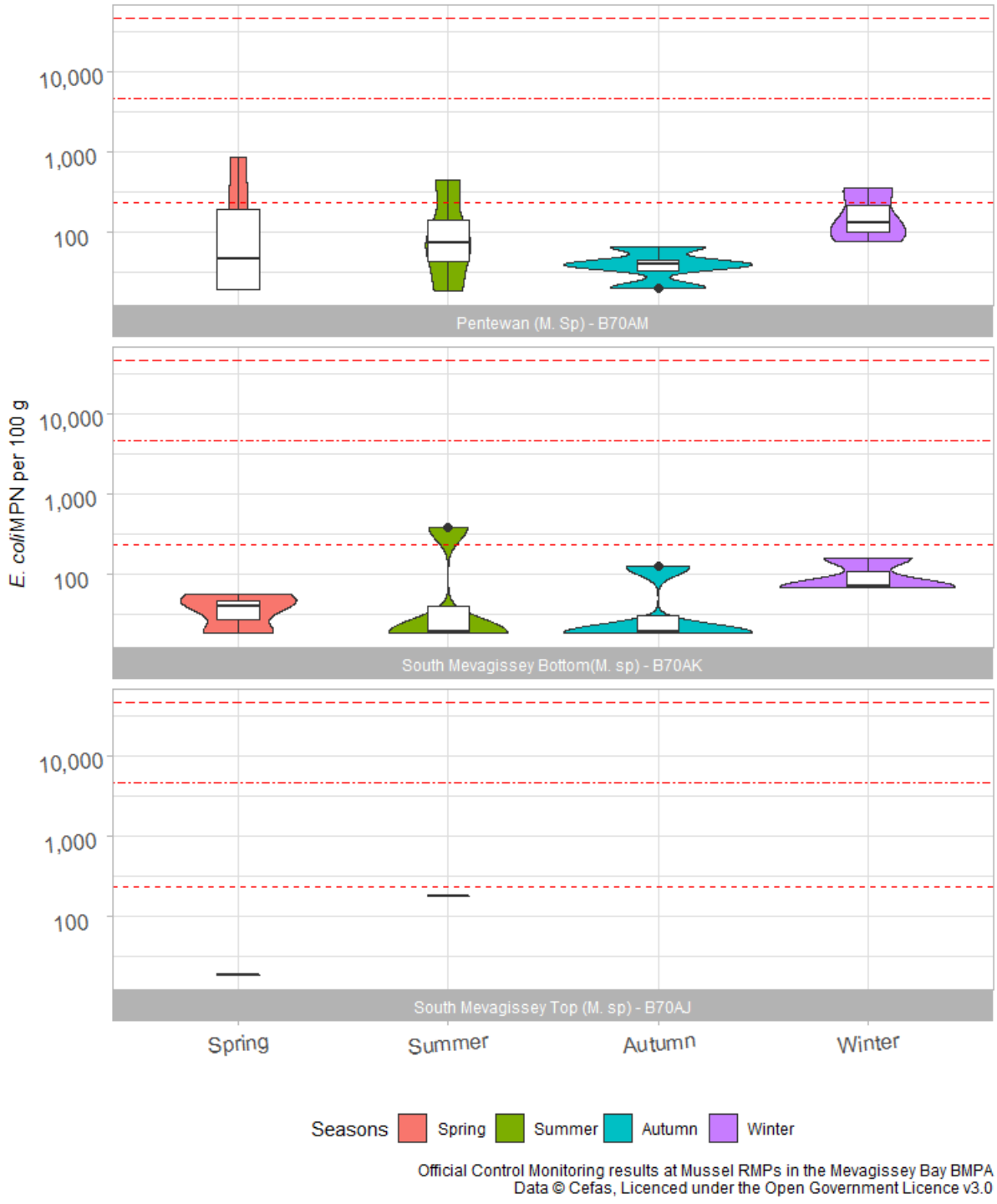

Figure 6.6 Box and violin plots of E. coli levels per season at mussel RMPs sampled within the Mevagissey Bay BMPA since 2010. Horizontal lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g.

6.2 Action States

No Action States have been triggered within the Mevagissey Bay BMPA since the 2016 or 2019 pRMP assessments were published.

6.3 Bathing Water Quality Monitoring

The status of EC bathing waters near to and within the BMPA is also of relevance to this assessment. There are three designated bathing water quality monitoring points within Mevagissey Bay. The location and 2022 categorisation of these points is shown in Figure 6.7 and. Recent categorisation status is shown in Table 2.1.

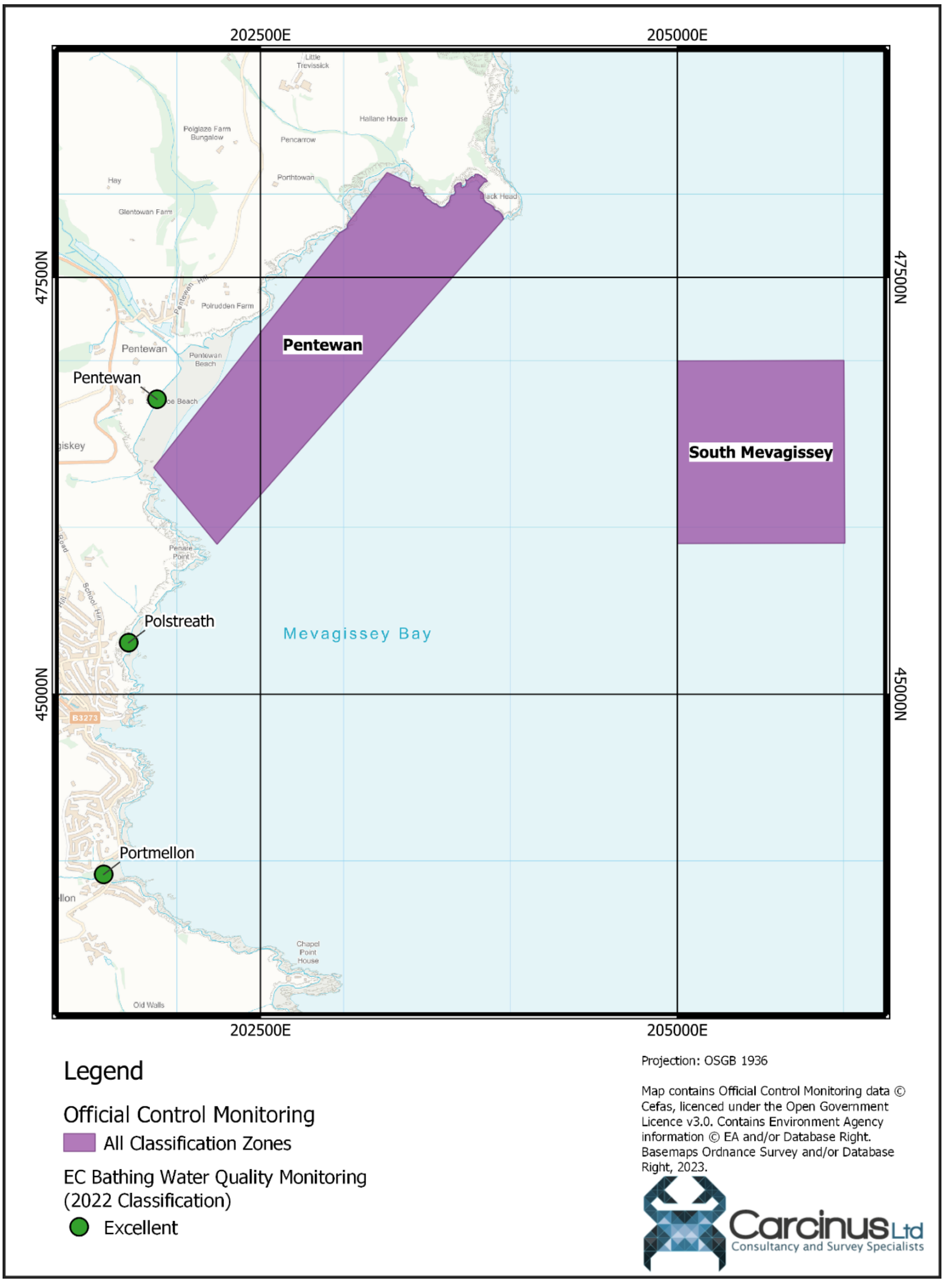

Figure 6.7 Classification status of EC Bathing Water Quality Monitoring Points in 2022.

Table 6.2 Summary of EC bathing water quality monitoring at locations within Mevagissey Bay.

Bathing Water Monitoring Point	2015	2016	2017	2018	2019	2020	2021	2022
Pentewan	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Polstreath	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Portmellon	Good	Excellent	Good	Good	Excellent	Un-Assessed	Excellent	Excellent

It should be noted that bathing water sampling only occurs during the summer period (May to September inclusive) and therefore may not represent the potential for increased faecal loading during winter months. However, bathing water quality results do provide an indication of water quality in the area during the bathing water season, and suggest that generally water within Mevagissey is good, with low *E. coli* concentrations. This supports the information provided by the EA during initial consultations, that there are no known issues at the bathing waters in the vicinity of Mevagissey Bay.

7 Conclusion and overall assessment

Mevagissey Bay is a south-east facing embayment on the south coast of Cornwall. The BMPA within the embayment is classified for two species, mussels and razor clams. The former is subject to a rope-grown aquaculture operation, and the latter is subject to hand gathering of a wild fishery, although during initial consultations the LEA stated that the razor clam fishery is currently inactive. Two separate pRMP assessments, one conducted in 2016 and one in 2019 provide the recommendations for the currently classified CZs.

No population data is presented in the pRMP assessments, and so the 2021 Census has been used to give an indication of the patterns of human population across the catchment. The data show that the estimated population within the catchment is approximately 60,000 people, and that this has increased by approximately 14% since the 2011 Census. The main population centres of the catchment continue to be the towns of St Austell and St Blazey, as well the town of Mevagissey at the south of the CZs. The main risk of urban associated runoff will come from the town of St Austell, due to the St Austell river that runs through it and drains to Pentewan Sands, and the town of Mevagissey. The area receives a significant increase in population each year with tourism, predominantly in summer months. The LEA expressed concerns during initial consultations that the existing wastewater treatment network is insufficient to handle this increase. During secondary consultations, the EA stated that all new developments must have written confirmation from the water company that the additional flows can be accommodated as part of the planning/consenting process.

The main water company owned continuous discharges with the potential to impact the bacteriological health of the Mevagissey Bay BMPA are the Par STW and St Austell (Menagwins) WWTW. The latter discharges to the St Austell river which drains through the *Pentewan* CZ. There are several other continuous discharges within the catchment, although none are considered to have a significant impact on the bacteriological health of the BMPA due to either their consented discharge volume, treatment methodology or lack of connectivity to the shellfish water. No upgrades to continuous discharges within the vicinity of Mevagissey Bay BMPA are planned for either the current (AMP7 2020-2025) or next (AMP8 2025 – 2030) Asset Management Periods (AMPs). There are three intermittent discharges that are located within 3 km of the Mevagissey BMPA. Improvements to continuous storm overflows (CSOs) within the catchment are planned for AMP8 and this should reduce the faecal loading that shellfish beds in the BMPA are exposed to.

Intermittent discharges should continue to be taken into consideration in any updated sampling plan.

No details of livestock populations within the catchment are presented in either the 2016 or 2019 pRMP assessments. Comparison of livestock population data from the 2010, 2016 and 2021 livestock censuses shows that the dominant group in terms of population size are poultry, but there continue to be significant populations of both sheep and cattle. Land cover maps show that much of the catchment remains reserved for either arable or pastural farmland, and the Shellfish Water Action Plan published by the Environment Agency considers agricultural contamination to be a significant source of contamination within this shellfishery. The mouths of watercourses (such as the St Austell river) throughout the bay can be considered point sources of this source of contamination.

Waterbird counts suggest that the area does not support either internationally or internationally significant populations of waterbird species. Some minor impacts from either avian species or marine mammals may occur, but these are impossible to reliably predict and are therefore challenging to account for in any updated sampling plan.

There is a small (approximately 45 vessels) fishing fleet that operates from Mevagissey Harbour. No impacts from any merchant vessels transiting to and from Par Docks (6 km north of the BMPA) are expected as merchant vessels are prohibited from making overboard discharges within 3 nm of land. There are some small anchorages marked on navigational charts, and some occasional discharges from recreational vessels of a sufficient size to contain on board toilets may occur from time to time. The highest risk of this source of pollution will occur during summer months.

There is monitoring data from four RMPs sampled within the Mevagissey BMPA, although two are no longer sampled. No significant differences between the monitoring data were found, although samples collected in winter months tended to return higher results, though not significantly higher. This suggests that pollution sources associated with winter – high rainfall generated agricultural runoff or releases from intermittent discharges, are the main sources of pollution within this area.

Based on the information available, there do not appear to be any significant knowledge gaps that would justify a shoreline survey. There have been no notable changes to sources of pollution or deterioration in classifications since the 2016 and 2019 pRMP assessments were published.

Having reviewed the findings of the desk-based study, the FSA is content that a shoreline assessment is not required.

8 Recommendations

Recommendations for the various classification zones within the Mevagissey Bay BMPA are summarised and a recommended sampling plan is provided in Table 9.1.

8.1 Mussels

8.1.1.1 South Mevagissey

This CZ covers an area of 1.10 km² in the outer part of Mevagissey Bay. The sampling plan arrangements for this CZ were recommended in the 2016 pRMP assessment but the CZ has only been classified since 2020. That report identified that the main contamination sources originated from the north and west of the area and recommended placing an RMP at the north-western corner of the mussel lines at NGR SX 0521 4698. Provided that the location of the mussel lines within the CZ are unchanged since the publication of the 2016 pRMP assessment, the RMP should be retained as the main contamination sources are unchanged. If the mussel lines have shifted, the RMP should be moved to the north-western extreme of the lines' current location.

8.2 Razor clams

8.2.1.1 Pentewan

This CZ covers an area of 3.19 km² in the inner part of Mevagissey Bay. The sampling plan arrangements for this CZ were recommended in the 2019 pRMP assessment. That report identified that the main sources of contamination would originate from the St Austell river, and that the RMP should be placed at NGR SX 0226 4678. This position continues to be representative. During secondary consultation, the LEA confirmed that continued classification for this species as commercial activity on the bed is due to commence in the first half of 2024.

9 General Information

9.1 Location Reference

Production Area	**Mevagissey Bay**
Cefas Main Site Reference	M070
Ordnance survey 1:25,000	OS Explorer 105
Admiralty Chart	Admiralty 148 Admiralty 442

9.2 Shellfishery

Species	Culture Method	Seasonality of Harvest
Mussels (*Mytilus* spp)	Cultured	Year round
Razor clams (*Ensis* spp)	Wild	Year round

9.3 Local Enforcement Authority(s)

Name	Cornwall Port Health Authority The Docks Falmouth TR11 4NR
Website	https://www.cornwall.gov.uk/environment/cornwall-port-heath-authority

Telephone number	01872 323090
E-mail address	porthealth@cornwall.gov.uk

9.4 Sampling Plan

*Table 9.1 Proposed sampling plan for the Mevagissey Bay BMPA. Suggested changes are given in **bold red** type.*

Classification Zone	RMP	RMP Name	NGR (OSGB 1936)	Lat / Lon (WGS 1984)	Species Represented	Harvesting Technique	Sampling Method	Sampling Species	Tolerance	Frequency
Mevagissey South (mussels)	B70AK	South Mevagissey Bottom	SX 0521 4698	50° 17.433'N, 04° 44,158'W	Mussels	Hand	Hand	*Mytilus* spp.	50 m	Monthly
Pentewan (razor clams)	B70AM	Pentewan	SX 0226 4678	50° 17.266'N, 04° 46.633'W	Razor clams	Hand	Hand	*Mytilus* spp.	50 m	Monthly

10 References

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11 Appendices

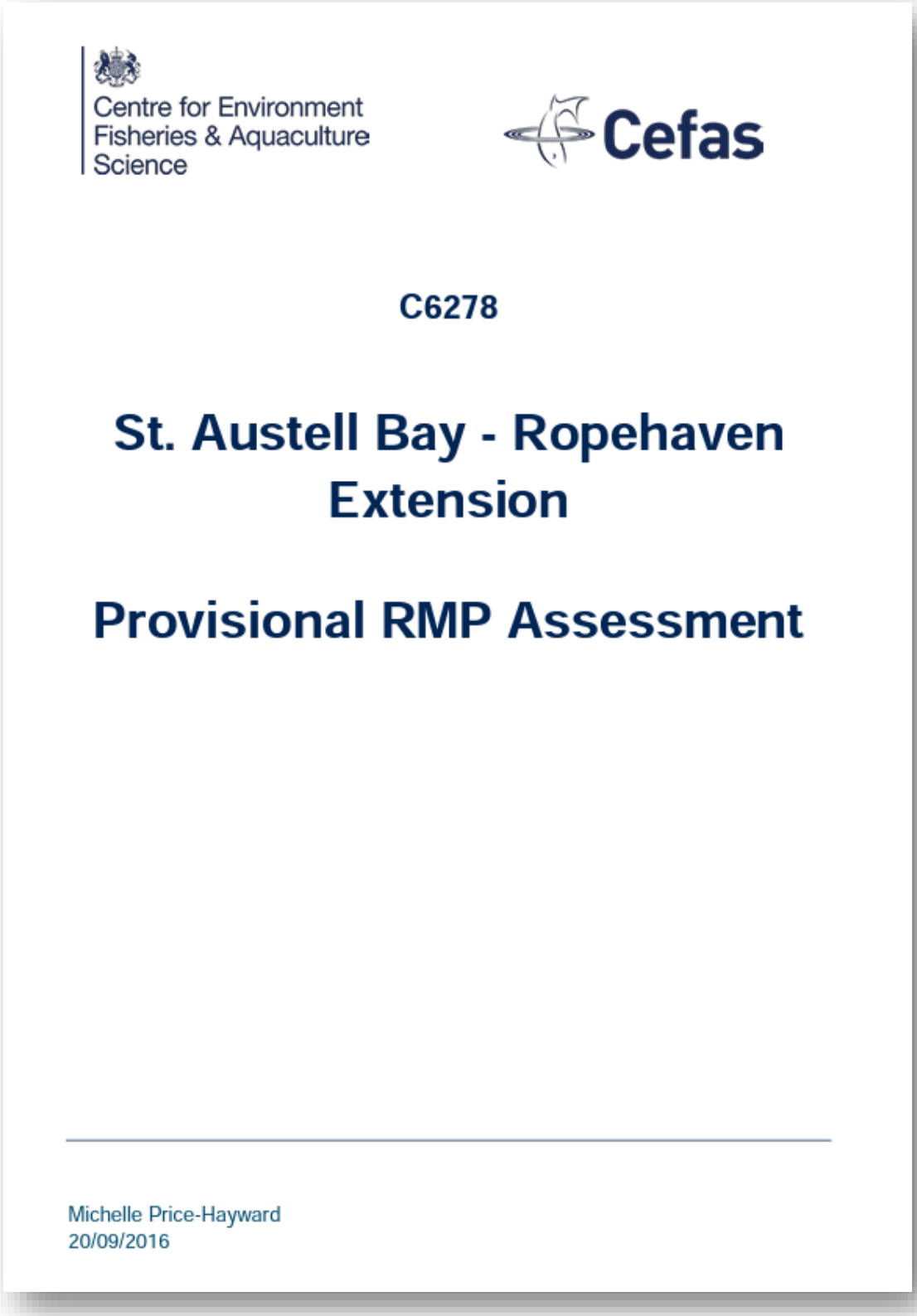
Appendix I. Event Duration Monitoring Summary for 2022

Site Name	Permit Number	Discharge Description	Outlet NGR	Total Duration (hrs) of spills in 2022	Number of Spills in 2022	Distance from centre of nearest CZ (km)
PENTEWAN SPS_PSCSOEO_ST AUSTELL	302113	Storm discharge at pumping station	SX01964725	0	0	0.98
MEVAGISSEY SPST_PSCSOEO_MEVAGISSEY	300238/PC/01	Storm discharge at pumping station	SX01804494	124.78	121	2.35
NANSLADRON SPST_PSCSOEO_ST AUSTELL	302111	Storm discharge at pumping station	SX00714825	0	0	2.52
PORTMELLON SPS_PSCSOEO_MEVAGISSEY	302115	Storm discharge at pumping station	SX01504389	0	0	3.43
PORTHPEAN SPS_PSCSOEO_PORTHPEAN	301670	Storm discharge at pumping station	SX03235051	0	0	3.51
LONDON APPRENTICE SPST_PSCSOEO_ST AUSTEL	303234	Storm discharge at pumping station	SX0077050100	16.21	3	3.75
POLGOOTH_CSO_ST AUSTELL	303594	SO on sewer network	SX00055018	1.31	3	4.27
CHARLESTOWN SPS_PSCSOEO_CHARLESTOWN	032051/PC/01	Storm discharge at pumping station	SX03875120	60.4	20	4.29
MENAGWINS STW_SO_ST AUSTELL	#TBC	Inlet SO at WwTW	SX0115850953	576.98	31	4.31

Site Name	Permit Number	Discharge Description	Outlet NGR	Total Duration (hrs) of spills in 2022	Number of Spills in 2022	Distance from centre of nearest CZ (km)
MENAGWINS STW_SSO_ST AUSTELL	31294	Storm tank at WwTW	SX01175096	1210.02	74	4.31
GORRAN CHURCHTOWN SPST_PSCSOEO_GORRAN	303580	Storm discharge at pumping station	SX00124245	28.38	28	5.35
PAR STW_SSO_ST AUSTELL	031299/SS/01	Storm tank at WwTW	SX06625088	42.34	8	5.36
DANIELS LN_CSO_ST AUSTELL	032052/SF/01	SO on sewer network	SX03555253	-1	NA	5.55
LOWER STICKER SPS_PSCSOEO_ST AUSTELL	301610	Storm discharge at pumping station	SW97824973	4.25	2	5.77
POLKERRIS SPST_PSCSOEO_POLKERRIS	302706	Storm discharge at pumping station	SX09125191	220.17	39	6.55
CHARLESTN REMOTE SPS_PSCSOEO_ST AUSTELL	301635	Storm discharge at pumping station	SX03925424	39.45	24	7.29
READY MONEY COVE SPS_PSCSOEO_FOWEY	302771	Storm discharge at pumping station	SX11885100	0	0	7.83
HARBOUR ROAD NO2 SPS_PSCSOEO_PAR	031750/PC/01	Storm discharge at pumping station	SX07625336	8.73	5	7.90
TREDENHAM CLOSE_CSO_PAR	EPRYB3993NQ	SO on sewer network	SX07315368	11.56	6	7.99
READYMONEY ROAD_CSO_FOWEY	302770	SO on sewer network	SX12005111	7.19	5	7.99

Site Name	Permit Number	Discharge Description	Outlet NGR	Total Duration (hrs) of spills in 2022	Number of Spills in 2022	Distance from centre of nearest CZ (km)
POLRUAN QUAY SPS_PSCSOEO_POLRUAN	302772	Storm discharge at pumping station	SX12575107	0	0	8.44
WHITEHSE SLIP POINT_CSO_FOWEY	302773	SO on sewer network	SX12355140	1	2	8.45
TOWN QUAY SPST_PSCSOEO_FOWEY	302775	Storm discharge at pumping station	SX12665166	115.25	199	8.85
CAFFA MILL SPS_PSCSOEO_FOWEY	302774	Storm discharge at pumping station	SX12765216	223.65	70	9.23
FOWEY STW_SSO_FOWEY	302530	Storm tank at WwTW	SX12765233	477.11	80	9.34
BODINNICK_CSO_FOWEY	303432	SO on sewer network	SX12915217	118.85	6	9.36
GOLANT SPST_PSCSOEO_GOLANT	303327	Storm discharge at pumping station	SX12405469	58.95	150	10.74
RESCORLA_CSO_LUXULYAN	301681	SO on sewer network	SX03325788	0	0	10.87
LUXULYAN STW_SSO_ST AUSTELL	SWWA 146	Storm tank at WwTW	SX04325820	574.84	36	11.27
LANTEGLOS SPST_PSEO_LANTEGLOS	301662	Storm discharge at pumping station	SX1470054450	0	0	12.19
MOLINNIS_CSO_BUGLE	301683	SO on sewer network	SX02645936	3.4	7	12.35
LERRYN CAR PARK SPS_PSCSOEO_LOSTWITHIEL	2895/92	Storm discharge at pumping station	SX14015707	95.3	47	13.60
ROCHE_CSO_ROCHE	301682	SO on sewer network	SW99296034	24.39	42	13.81

Site Name	Permit Number	Discharge Description	Outlet NGR	Total Duration (hrs) of spills in 2022	Number of Spills in 2022	Distance from centre of nearest CZ (km)
COULSONS PARK SPST_PSCSOEO_LOSTWITHIEL	NRA-SW-5460	Storm discharge at pumping station	SX10495942	1177.35	73	14.54
VICTORIA SPS_PSCSOEO_ROCHE	301631	Storm discharge at pumping station	SW99156148	59	60	14.94



Centre for Environment Fisheries & Aquaculture Science

Cefas

C6278

St. Austell Bay - Ropehaven Extension

Provisional RMP Assessment

Michelle Price-Hayward
20/09/2016

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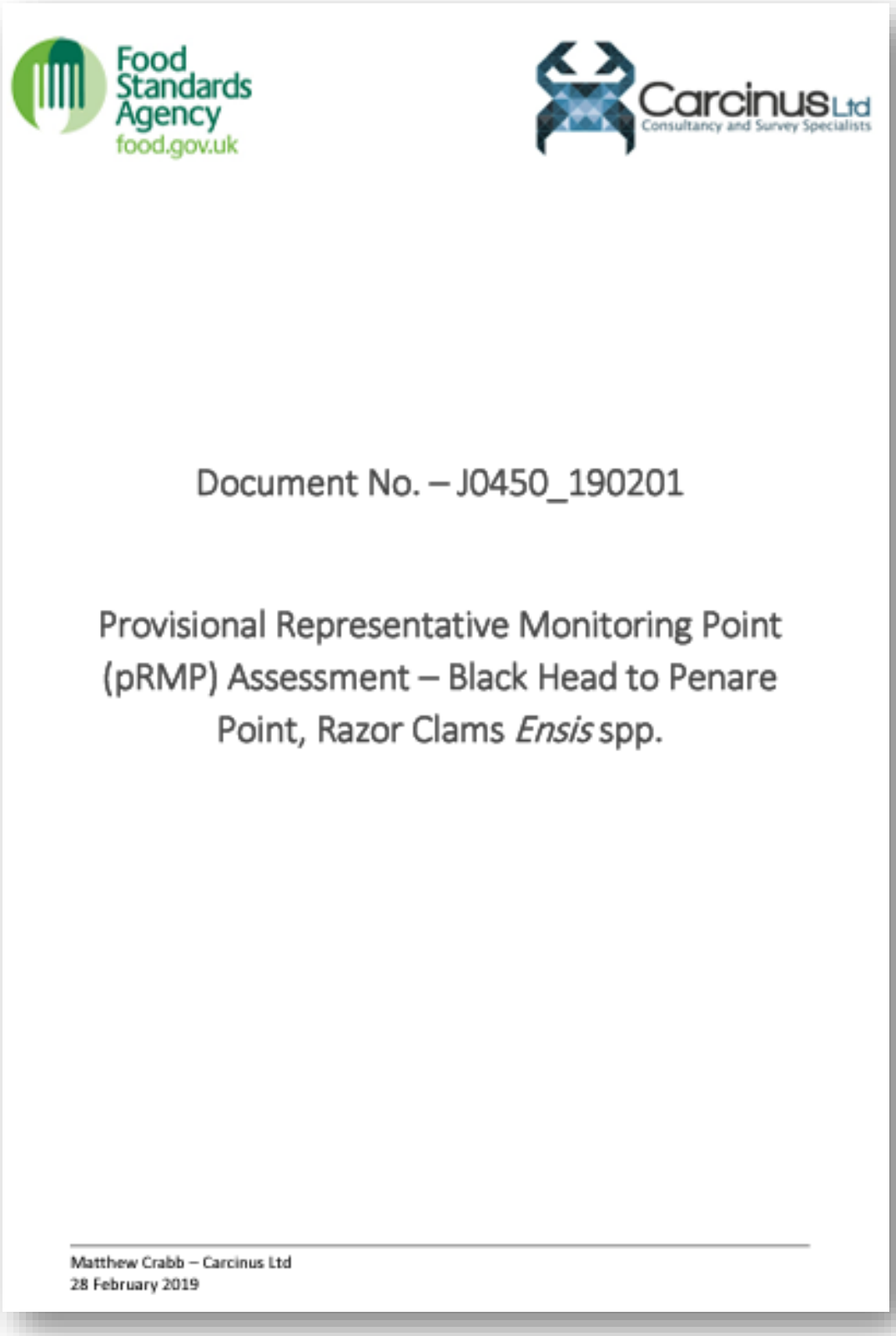

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Carcinus was established in 2016 by its directors after over 30 years combined experience of working within the marine and freshwater environment sector. From our base in Southampton, we provide environmental consultancy advice and support as well as ecological, topographic and hydrographic survey services to clients throughout the UK and overseas.

Our clients operate in a range of industry sectors including civil engineering and construction, ports and harbours, new and existing nuclear power, renewable energy (including offshore wind, tidal energy and wave energy), public sector, government, NGOs, transport and water.

Our aim is to offer professional, high quality and robust solutions to our clients, using the latest techniques, innovation and recognised best practice.

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Carcinus provides environmental consultancy services for both freshwater and marine environments. Our freshwater and marine environmental consultants provide services that include scoping studies, Environmental Impact Assessment (EIA) for ecological and human receptors, Habitats Regulations Appraisal (HRA), Water Framework Directive (WFD) assessments, project management, licensing and consent support, pre-dredge sediment assessments and options appraisal, stakeholder and regulator engagement, survey design and management and site selection and feasibility studies.

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