Sanitary Survey- Review

St Austell Bay – 2023

Document No. – *J0591/23/09/12*

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Initial Consultation

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Cornwall Port Health Authority	August 2023
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Consultation on draft report

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A sanitary survey relevant to the bivalve mollusc beds in St Austell Bay was undertaken in 2010 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). This 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.

Recommended Bibliographic Citation:

Carcinus Ltd., 2023. Review of the St Austell Bay 2010 Sanitary Survey. Carcinus report on behalf of the Food Standards Agency, to demonstrate compliance with the requirements for classification of bivalve mollusc production areas in England and Wales under retained EU Law Regulation (EU) 2019/627.

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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 original sanitary survey was 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 St Austell 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 St Austell Bay (Figure 1.1). This review explores any changes to the main microbiological contamination sources that have taken place since the original sanitary survey was conducted. Data for this review was gathered through a desk-based study and consultation with stakeholders.

An **initial consultation** with Local Authorities (LAs), Inshore Fisheries and Conservation Authorities (IFCAs) 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 November and 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 assessment originally conducted in 2010 and sampling plan as necessary and the report should be read in conjunction with the previous survey.

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.

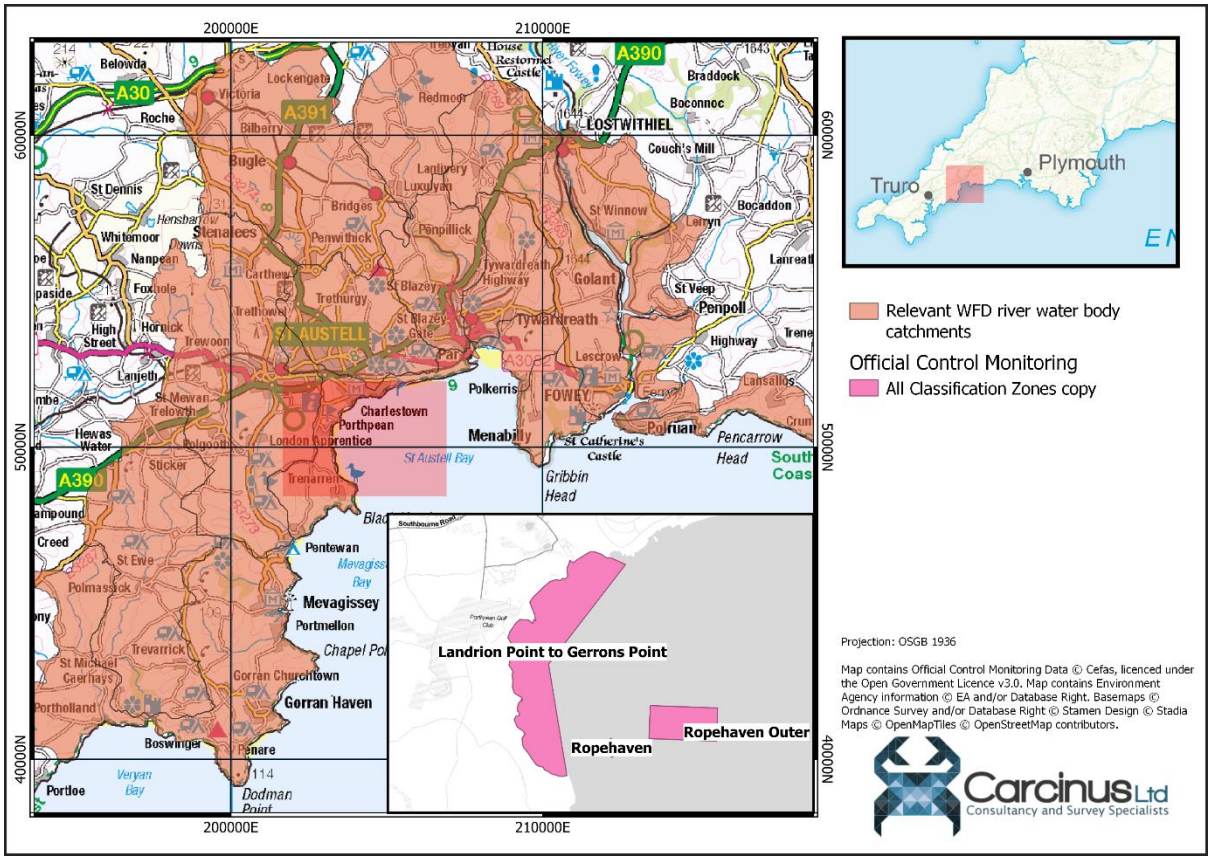

Figure 1.1 Location of the St Austell Bay BMPA in Cornwall. Inset map shows the locations of the Classification Zones within the BMPA.

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 original sanitary survey. 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. 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.

2 Shellfisheries

2.1 Description of Shellfishery

The St Austell 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 Mevagissey Bay BMPA (Cefas Reference M070). There are historic Classification Zones in the Fowey Estuary 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. The fishery 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 aquaculture operation. At the time of writing (September 2023), no information has been received from the Cornwall Inshore Fisheries and Conservation Authority (C-IFCA), but there are no C-IFCA byelaws that apply to the harvest of mussels from within this BMPA.

The 2010 Sanitary Survey gave recommendations for the creation of Classification Zones for mussels, although there are currently active classification zones for both mussels and razor clams (the latter species are classified on the basis of mussel monitoring). A summary of the fishery for each species is provided in the following paragraphs.

2.1.1 Mussels

The 2010 Sanitary Survey indicates that the mussel fishery within the BMPA involves the harvest of rope-grown mussels from two lease areas, *Ropehaven* and *Ropehaven* Outer, each a separate Classification Zone. The current output of this fishery is approximately 500 tonnes per year. It is not clear what proportion of the output originates from which Classification Zone, although as the *Ropehaven Outer* CZ (0.339 km²) is approximately ten times larger than the *Ropehaven* CZ (0.022 km²) it is probable that the majority of the output comes from the *Ropehaven Outer* CZ. The minimum landing size for this species is 50 mm.

2.1.2 Razor clams

There was no active fishery for this species at the time of publication of the 2010 Sanitary survey, although two classification zones (*Ropehaven Outer* and *Landrion Point to Gerrans Point*) are listed on the latest release of the Current Classification List and Sampling Plan

[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/.

published by the FSA (September 2023)[2]. The *Ropehaven Outer* CZ has been classified for this species since 2014 and the *Landrion Point to Gerrans Point* CZ has been classified since 2020, following a pRMP assessment (Carcinus, 2019). During secondary consultation the LEA indicated that they were in discussions with a local fisherman over the potential operation of a razor clam fishery in early 2024, but more details (such as likely output etc.) will be available from March 2024.

2.2 Classification History

There are currently four classification zones (CZs) within this BMPA, two for mussels and two for razor clams. The 2010 Sanitary Survey recommended the creation of the two mussel CZs; the *Ropehaven* CZ has been classified for mussels since 2010, and the *Ropehaven Outer* CZ has been classified since 2012 for mussels. The *Ropehaven Outer* CZ has been classified for razor clams since 2014 and the *Landrion Point to Gerrans Point* CZ has 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 currently active Classification Zones in the St Austell BMPA.

Classification Zone	Species	Current Classification (as of September 2023)	RMP Used
Ropehaven	Mussels	Seasonal A/B (*Class A season 01 June – 31 January inclusive, reverting to Class B at all other times*)	St Austell – B070W
Ropehaven Outer	Mussels	A	Ropehaven Outer (NE Corner) – B70AE
	Razor clams	A	
Landrion Point to Gerrans Point	Razor Clams	B	Landrion Point to Gerrans Point – B70AO

[2] Current classification list and sampling plans. Available at: https://www.food.gov.uk/sites/default/files/media/document/Classification%20list%20and%20sampling%20plans%20-%207%20September%202023.xlsx_0.ods

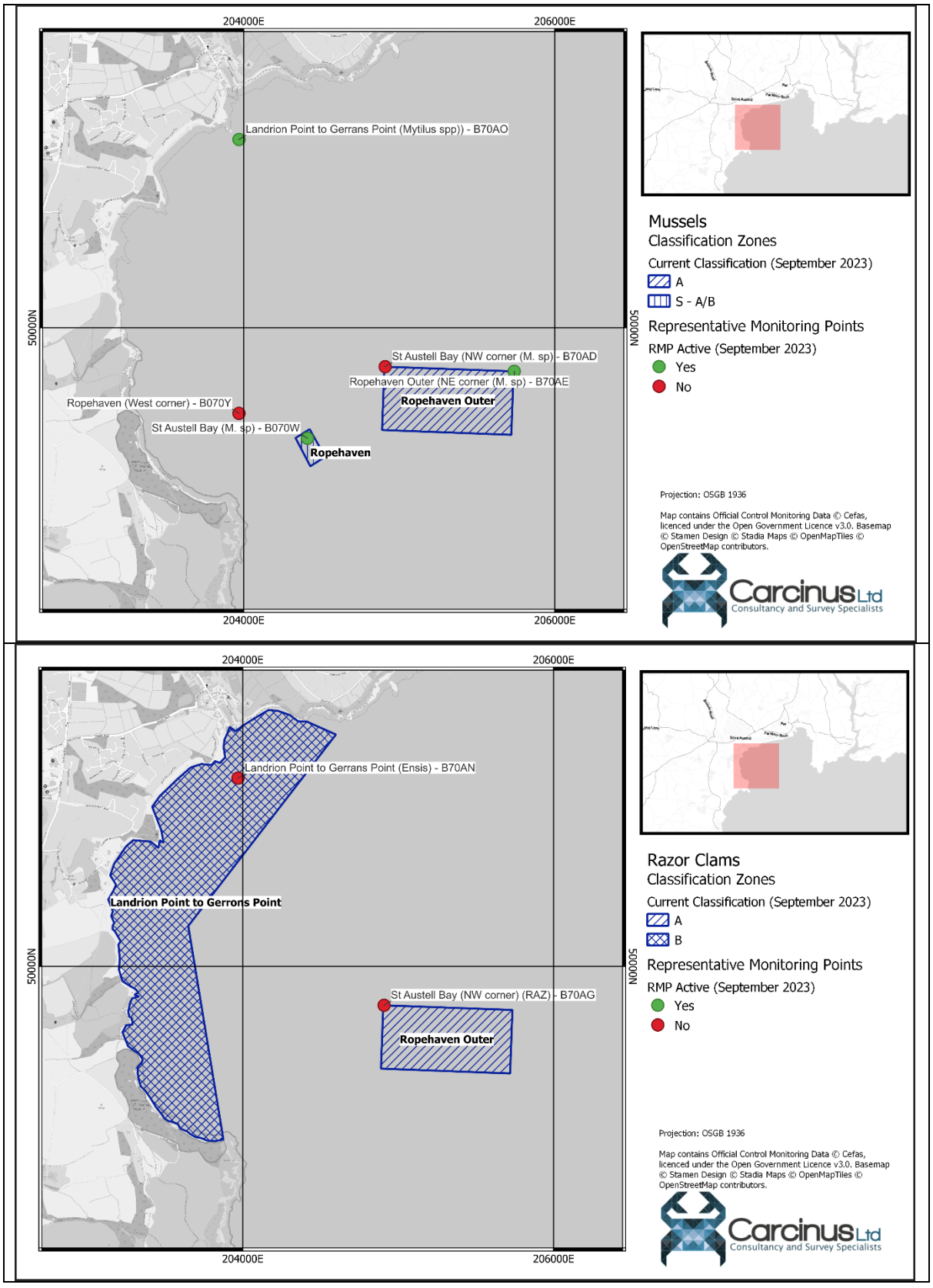

Figure 2.1 Current Classification Zones and Associated Representative Monitoring Points in the St Austell Bay BMPA.

3 Pollution sources

3.1 Human Population

The 2010 Sanitary Survey cites population data for the catchment based on the 2001 Census of the United Kingdom. However, the results of the 2011 Census should perhaps be considered more relevant to the distribution of human population within the catchment at the time of that report. A subsequent Census was conducted in March 2021, and so the results of those two surveys have been compared to give an indication of the changes in the distribution of human population across the catchment between 2011 and 2021. Human population density at the 2011 and 2021 Censuses within Census Output Areas wholly or partially contained within the St Austell Bay catchment are presented in Figure 3.1.

The maps presented in Figure 3.1 show that the majority of the land surrounding St Austell Bay is rural, with population densities of fewer than 500 people per square kilometre. There continue to be some areas with significantly higher population densities however, particularly in the towns of St Austell and St Blazey and some small villages in the upper reaches of the catchment. At the 2011 Census, the estimated population within the catchment was 60,282 people. By the 2021 Census, this had increased to 69,183 people, an increase of 14.7%. The Shellfish Water Action Plan for the St Austell Shellfish Water classifies the overall contribution of various sources of contamination to the shellfish water and assesses that the impact of urban associated runoff is 'low'[3]. The greatest potential for urban associated runoff comes from the town of St Austell, as this settlement is located nearest to the Classification Zones of the BMPA, particularly the *Landrion Point to Gerrans Point* razor clam zone. 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. The significant population growth observed to have occurred within the catchment supports this observation. However, as St Austell does not extend as far as the coastline and there are no significant watercourses that flow through it (the mouth of the St Austell River is located at Pentewan, 2.5 km south west of the nearest CZ), there is a limited pathway for connectivity between any urban runoff and the shellfish beds of the St Austell BMPA.

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

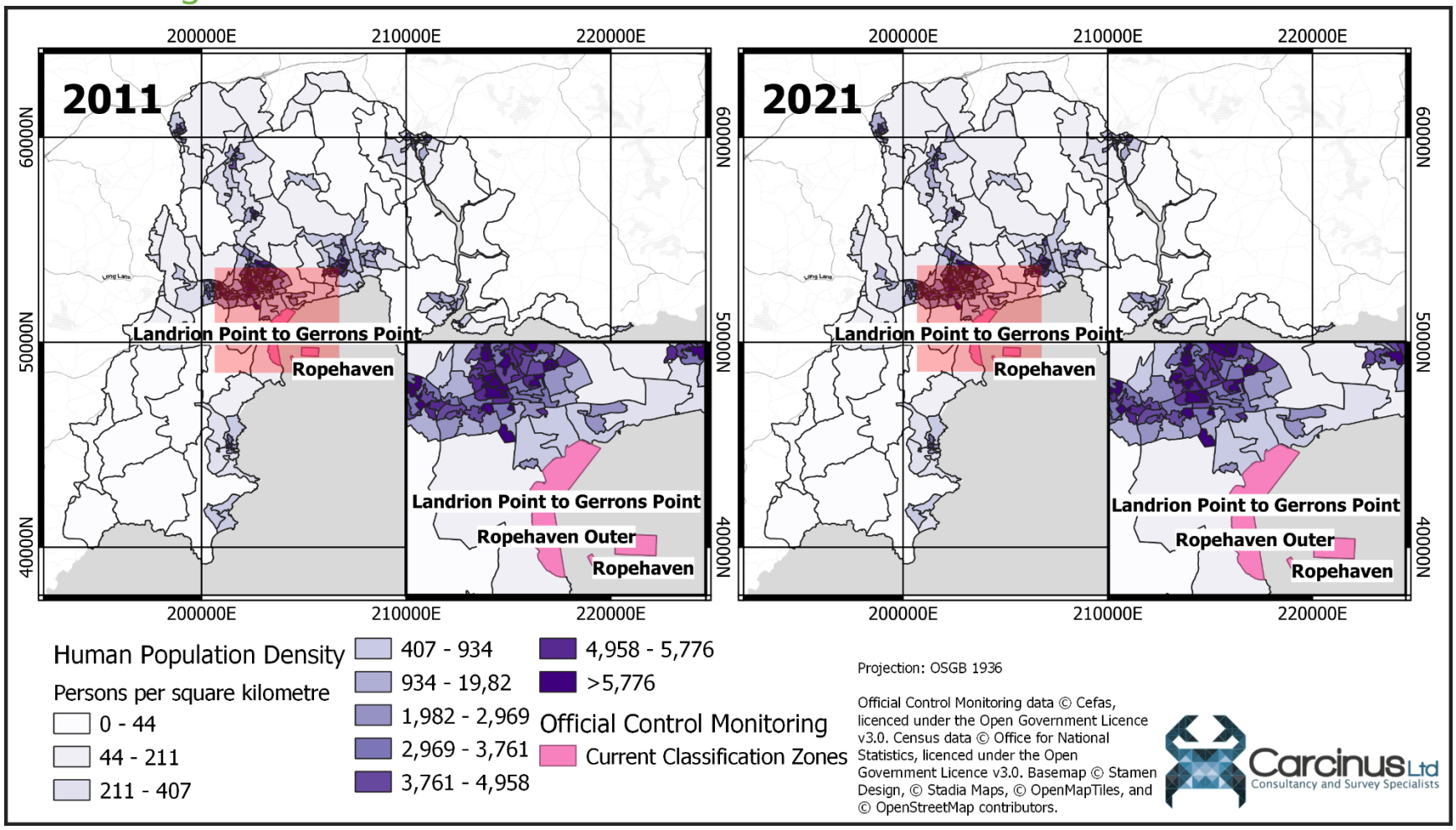

Figure 3.1 Human population density in Census Output Areas wholly or partially contained within the St Austell Catchment at the 2011 and 2021 Censuses.

The 2010 Sanitary Survey states 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 that they had concerns over the adequacy of the existing water treatment network to handle this seasonal increase, particularly considering the additional increase in urban development, these concerns were echoed by the Environment Agency during secondary consultation. Full details of the changes to the wastewater treatment network are discussed in the next section.

Analysis of Census data suggests that the population has seen a 14% increase in population size, but that the majority of the catchment is very rural with population densities of fewer than 500 people per hectare. The main urban centres have not changed significantly since the 2010 Sanitary Survey was published, and the area continues to be a popular tourist destination. Overall, the recommendations made in the 2010 Sanitary Survey to account for the impact of human populations remains valid.

3.2 Sewage

Details of all consented discharges in the vicinity of the St Austell 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.

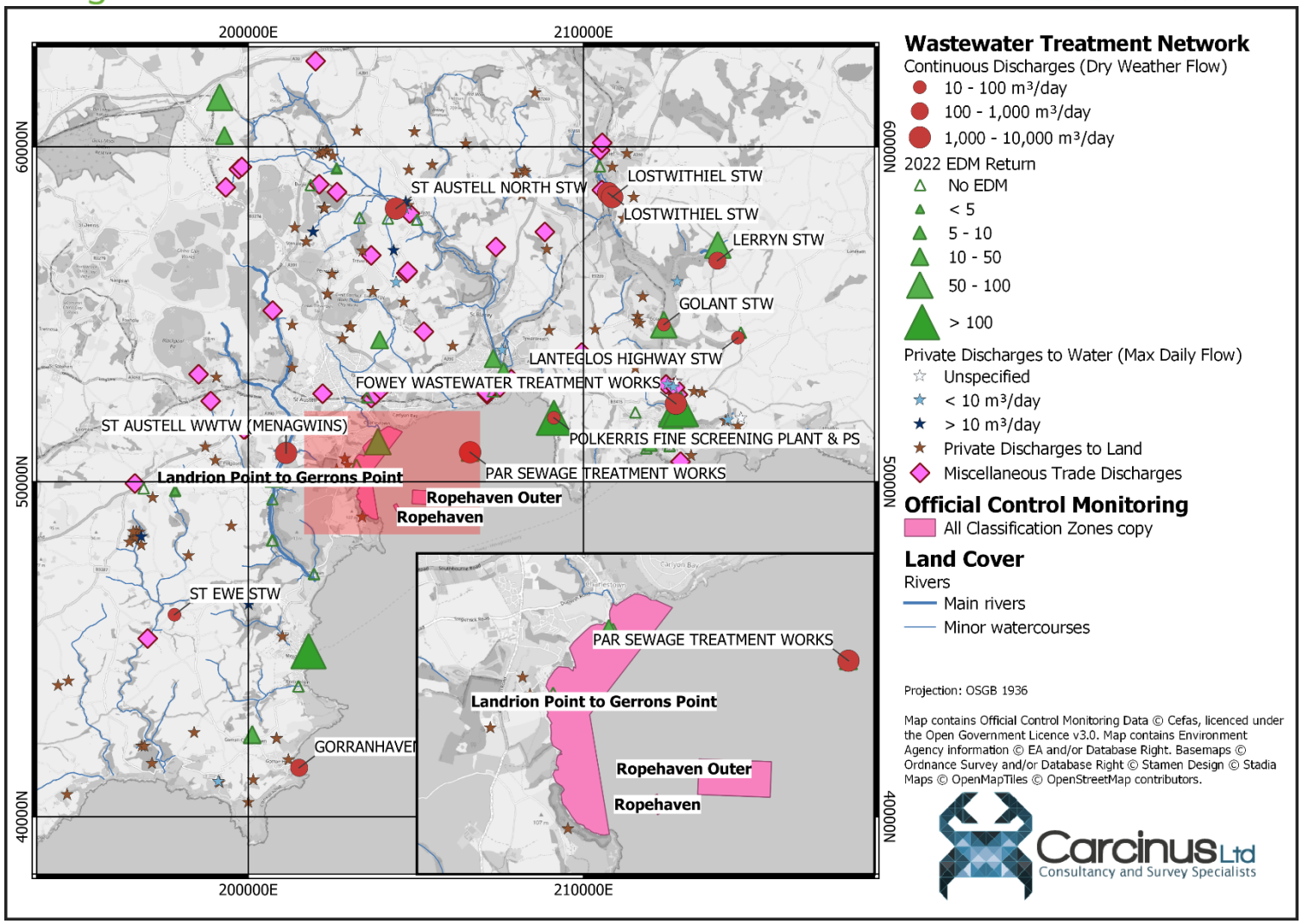

Figure 3.2 Locations of all consented discharges in the St Austell Bay catchment. Details of consented discharges are shown in Table 3.1.

Table 3.1 Details of continuous discharges within the St Austell BMPA. Discharges that have seen a reduction in consented discharge volume are shaded in green.

Discharge Name	Permit Number	Receiving Water	Outlet NGR	Treatment Methodology	DWF (m^3/day)	Distance to centre of nearest CZ (km)
PAR SEWAGE TREATMENT WORKS	031299/FN/01	(C) ST AUSTELL BAY	SX0662050880	ACTIVATED SLUDGE	8,414	1.88
ST AUSTELL WWTW (MENAGWINS)	031294	ST AUSTELL RIVER	SX0113050860	UV DISINFECTION	6,067	2.80
POLKERRIS PS AND FINE SCREENING PLANT	302706	ST AUSTELL BAY (C)	SX0912051910	SCREENING	23	4.44
ST EWE STW	SWWA 704	CAERHAYES STREAM	SW9780046030	BIOLOGICAL FILTRATION	<50	7.40
ST AUSTELL NORTH STW	SWWA 146	(S) RIVER PAR	SX0440858156	UV DISINFECTION	2,728	7.91
FOWEY WASTEWATER TREATMENT WORKS	302530	FOWEY ESTUARY (E)	SX1276052330	UV DISINFECTION	1,843	7.96
GOLANT STW	303233	RIVER FOWEY ESTUARY (E)	SX1240154690	UV DISINFECTION	99	8.77
GORRANHAVEN STW	300118/FU/01	(C) ENGLISH CHANNEL	SX0152041460	UV DISINFECTION	625	9.11
LANTEGLOS HIGHWAY STW	SWWA 2306	PENPOLL CREEK	SX1461054300	BIOLOGICAL FILTRATION	<50	10.45
LOSTWITHIEL STW	NRA-SW-5293	RIVER FOWEY (ESTUARINE)	SX1086058500	UV DISINFECTION	1,079	10.80

Discharge Name	Permit Number	Receiving Water	Outlet NGR	Treatment Methodology	DWF (m^3/day)	Distance to centre of nearest CZ (km)
LERRYN STW	15/48/174/P/1	(S) RIVER LERRYN	SX1400056600	BIOLOGICAL FILTRATION	115	11.95

The 2010 Sanitary Survey identified that the Par STW was the most significant continuous water company discharge in the vicinity of the St Austell Bay BMPA, discharging via a long sea outfall 1.9 km from the centre of the nearest CZ (*Ropehaven Outer*). No changes to the treatment methodology or consented discharge volume of this asset have occurred since the original sanitary survey was published. It continues to be the most significant continuous sewage discharge within the area. The 2010 Sanitary Survey also identifies a small discharge at Polkerris, although the Environment Agency database queried for this report lists this discharge as an intermittent, rather than continuous discharge. During secondary consultation the EA confirmed that this discharge is actively consented, but only has a small consented discharge volume of 23 m^3/day. St Austell (Menagwins) STW, discharges to the St Austell river and has seen a 37% reduction in its consented discharge volume, meaning that the faecal loading will be reduced. 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 St Austell 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, the 2010 Sanitary Survey identified a number of intermittent discharges with the potential to impact the bacteriological health of the BMPA. Intermittent discharges comprise Combined Storm Overflows (CSOs), Storm Tank Overflows (STOs), Pumping Station Emergency Overflows (PSs), and Sewer Pumping Stations (SPSs). 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 St Austell BMPA is presented in Appendix I.

There are four intermittent discharges that spill directly to St Austell Bay. These are the Charlestown Pumping Station and Porthpean PSCSO/EO (both within the *Landrion Point to Gerrons Point* CZ, the Par STW SSO (1.4 km from the *Ropehaven Outer* CZ and 2.1 km from the *Landrion Point to Gerrons Point* CZ) and the Polkerris Fine Screening Plant & Pumping Station (4.0km from the *Ropehaven Outer* CZ and 4.5 km from the *Landrion Point to Gerrons Point* CZ). No EDM data is presented in the 2010 Sanitary Survey and so no comparison is possible, but the EDM summary for these discharges from 2020 to 2022 is presented in Table 3.2. The data show that the Polkerris Fine Screening Plant is the most active of these discharges, and that all discharges within the bay (except for Porthpean PSCSO/EO) are active and so should be taken into consideration within any updated sampling plan. There are a number of other intermittent discharges throughout the catchment, but their impacts will be significantly less than the discharges discussed above due to the die off that will occur to any *E. coli* released before reaching the shellfish beds.

Table 3.2 Event Duration Monitoring Summary for intermittent discharges within St Austell Bay.

Discharge Name	2020		2021		2022	
	No. Spills	Duration of spills (hrs)	No. Spills	Duration of spills (hrs)	No. Spills	Duration of spills (hrs)
Charlestown Pumping Station	31	153	10	141.1	60.4	20
Par STW	24	317.27	21	37	42.34	8
Polkerris Fine Screening Plant & PS	39	300.28	44	399	220.17	39
Porthpean PSCSO/EO	0	0	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 continues 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.

The Shellfish Water Action Plan for the St Austell shellfish water identifies the contribution of water company owned sewerage infrastructure to overall contamination levels within the area to be 'medium'[4]. The findings of this desktop assessment would support that conclusion with one large secondary treated works discharging 1.9 km from the nearest CZ, and four intermittent discharges spilling to St Austell Bay, including two within the *Landrion Point to Gerrans Point* CZ itself. All these discharges should be taken into consideration in any updated sampling plan.

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

3.3 Agricultural Sources

The 2010 Sanitary Survey cites population data for the St Austell Bay catchment based on the 2008 Livestock Census. To provide an indication of changes in the livestock population of the catchment, 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[5]. 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 St Austell Bay catchment.

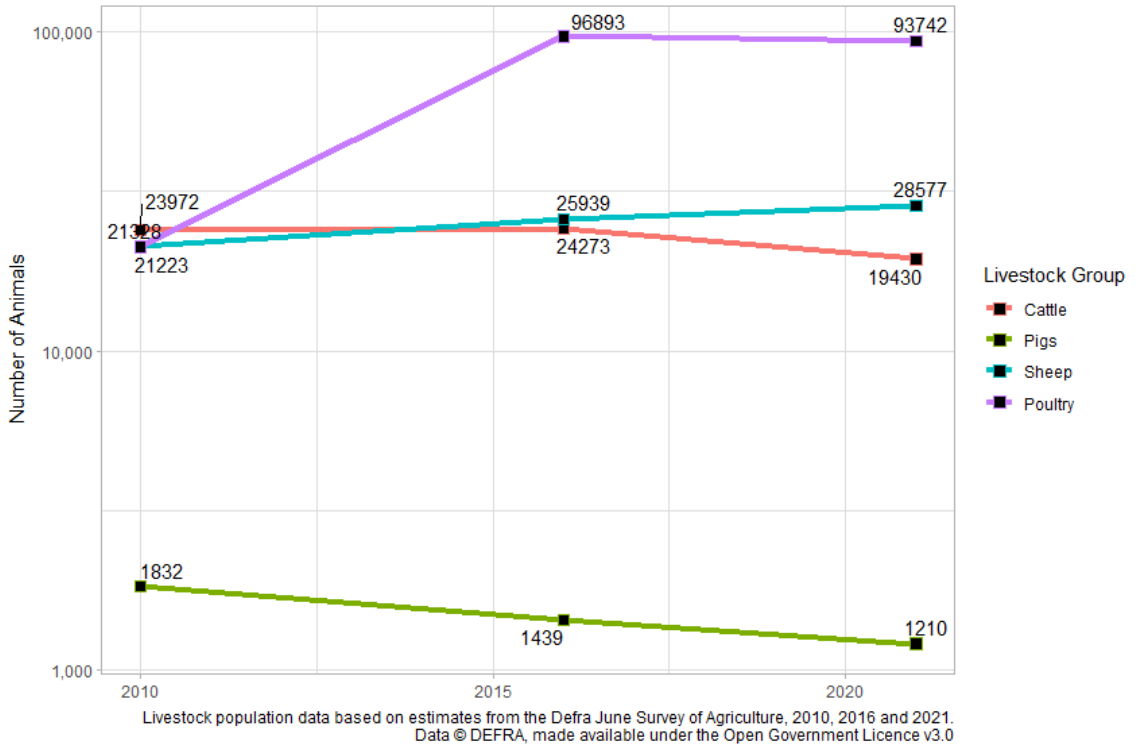

Figure 3.3 Changes in livestock populations within the St Austell catchment.

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. 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 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.

[5] 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.

The principal route of contamination of coastal waters by livestock is surface runoff carrying faecal matter. The land cover of the St Austell catchment between 2012 and 2018 is shown in Figure 3.4. The maps show that the majority of the catchment is rural, dominated by either arable or pastural farmland in both the southern and northern parts. The maps do show that there are significant areas of urban fabric to the north of the CZs. 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. The spreading of slurry to fields is 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. In theory, these legislative changes should have reduced the pollution that this activity causes to shellfish beds.

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), 18 are engaged with Countryside Stewardship (CS). There have been 84 CSF measures to reduce FIO in the catchment, but no more details are provided. During initial consultations, the EA stated there have been a few slurry spills over the past 10 years, but that area has not seen significant agricultural land run off in recent years.

The Shellfish Water Action Plan for the St Austell shellfish water assesses that agricultural contamination has a high contribution to contamination levels in the area. This desktop assessment supports that conclusion a significant proportion of the catchment is farmland, and all rivers and watercourses are likely to be affected by agricultural runoff to varying degrees, particularly following significant rainfall events.

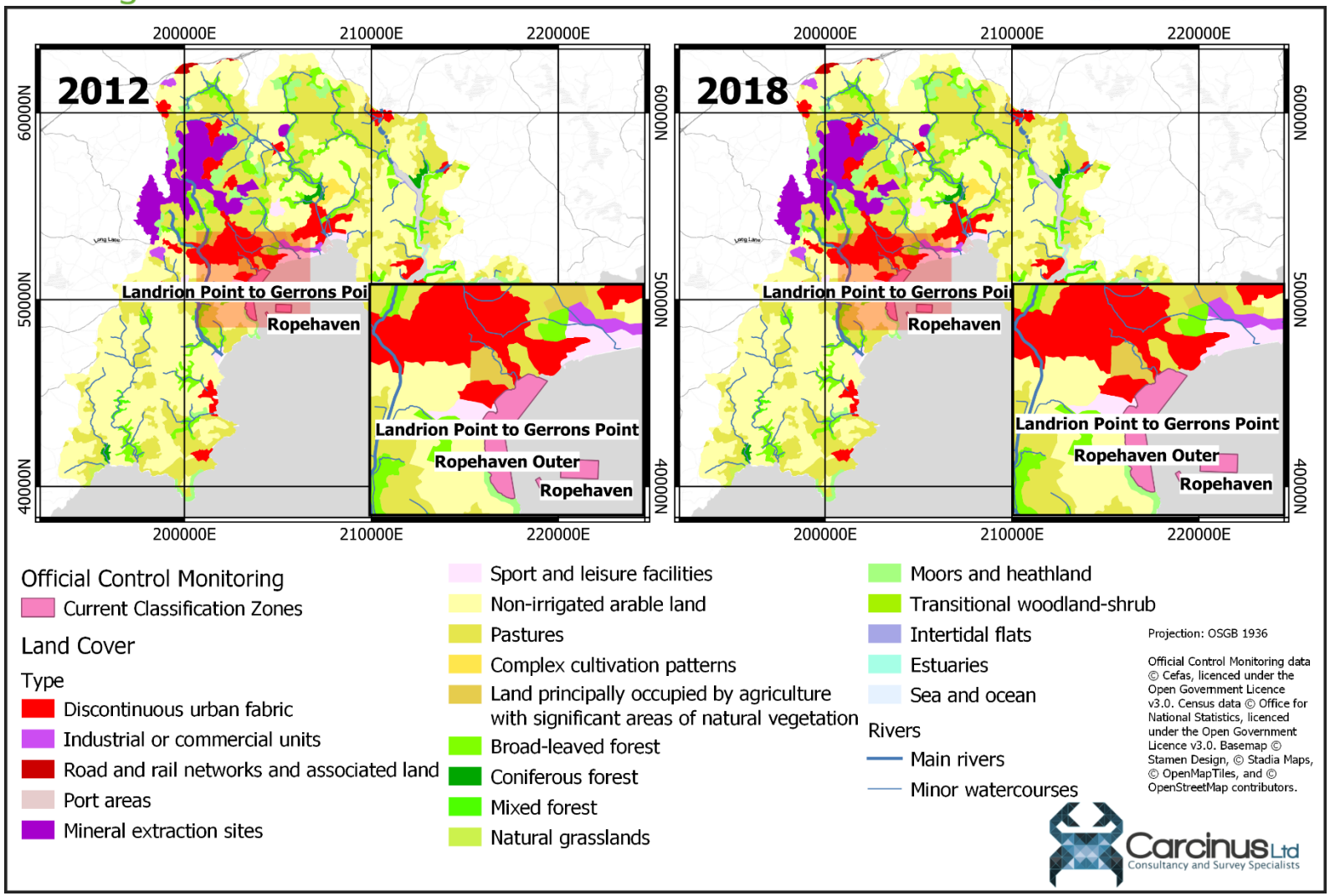

Figure 3.4 Land cover in the St Austell catchment in 2012 and 2018.

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.

The 2010 Sanitary Survey describes that a small population 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 St Austell 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 St Austell 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 2010 Sanitary Survey. Their geographical positions are presented in Figure 3.5.

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). The primary trade is China Clay, but as the port is tidal and vessels take the ground at low water the 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 2010 Sanitary Survey, where vessels are prohibited from making overboard discharges within 3 nautical miles of land.

Analysis of satellite imagery and freely available nautical charts[6] suggests that there continue to be some marked anchorages throughout the area, indicating that recreational

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

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 from time to time, 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.

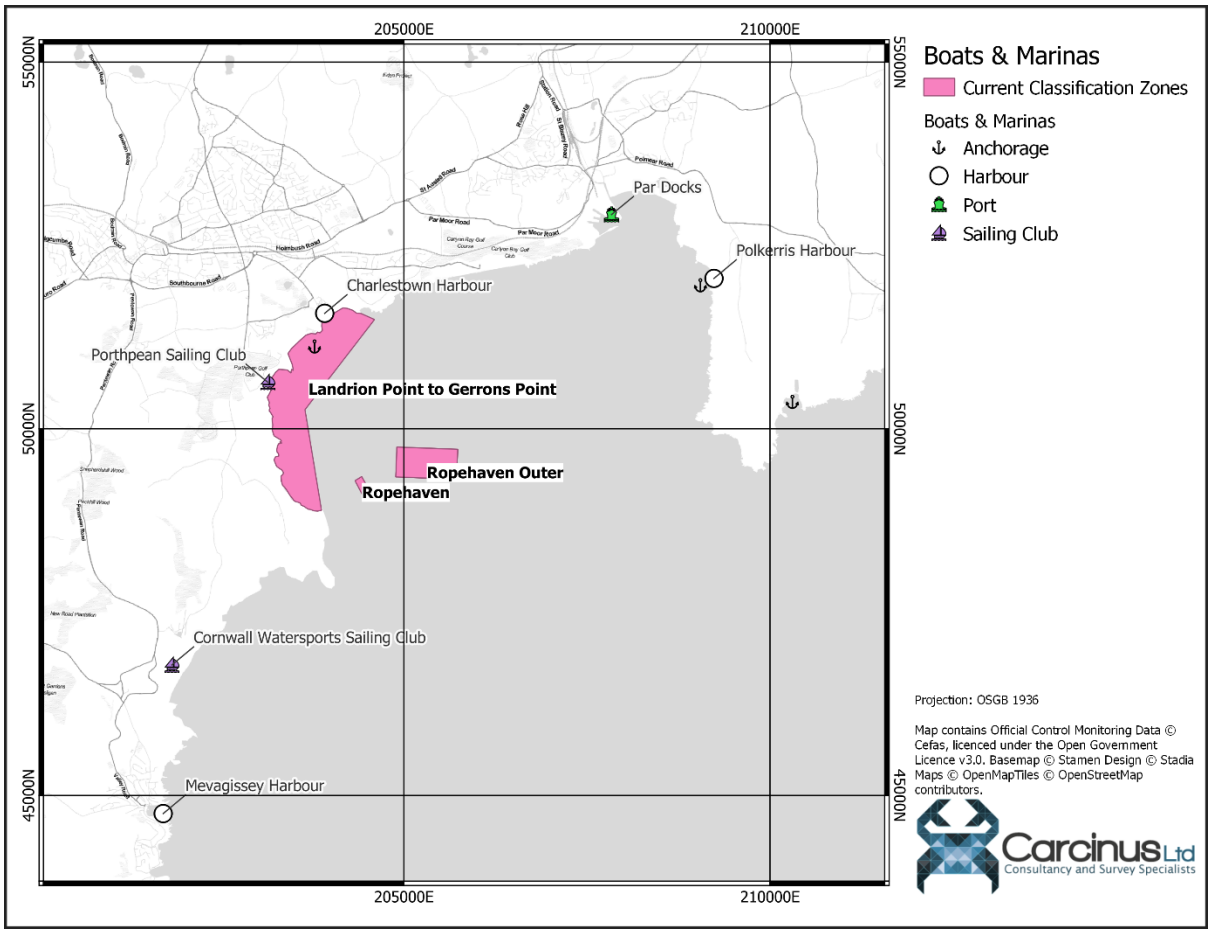

Figure 3.5 Locations of boats, marinas and other boating activities in the vicinity of the St Austell BMPA.

No significant changes to the extent of boating activity within St Austell bay have occurred since the 2010 Sanitary Survey was published, and no update to the sampling plan is necessary on this basis.

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 St Austell 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. 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. These works started in the 2015 – 2021 River Basin management period and will extend through the 2021 – 2027 period.

The 2010 Sanitary Survey also notes that dog walking is very popular in the area, but that because the mussel CZs are located offshore there is minimal risk. There is currently a large razor clam CZ in the intertidal area of Porthpean, 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.

During initial consultations, the EA stated that the operations of Imerys Minerals (who operate Par Docks discussed in Section 3.5) always present a potential risk, although generally any releases relate to the discharge of clay fines rather than organic material, and so no impact on the bacteriological health of the BMPA is expected.

4 Hydrodynamics/Water Circulation

The St Austell BMPA is located within St Austell Bay, an exposed south facing embayment. All active Classification Zones are located on the western side of the BMPA. The *Landrion Point to Gerrans Point* CZ is located partially within the intertidal, whereas the two mussel CZs are located entirely in the subtidal. Analysis of freely available nautical chart data suggests that the water depths and extents of intertidal areas are unchanged from the situation described in the 2010 Sanitary Survey.

The 2010 Sanitary Survey describes that the area sees a relatively large tidal range (4.7 m during spring tides) but that tidal currents are relatively weak, with a prevailing (but minor) easterly flow. This would carry contamination from the Par STW away from the CZs, but would carry shoreline sources of contamination from Porthpean beach across all CZs in the BMPA. Wind and density driven currents are likely to dominate in the absence of significant tidal circulation, but are very variable and challenging to predict. The predominant wind direction is south-westerly, but contamination gradients will not always follow this pattern. During periods of strong easterly wind, contamination from the Par STW is likely to be carried across the shellfish beds.

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.

5 Rainfall

A complete record of the rainfall data from the Luxulyan raingauge at NGR: SX 04376 58174 (ID: 377658) was downloaded Environment Agency's hydrology data explorer[7]. This station was chosen as it is the closest monitoring station to the BMPA with records spanning dates preceding the publication of the 2010 Sanitary Survey. This monitoring station is 5 km southwest of the BMPA. There is a closer monitoring station at St Blazey, but monitoring data are only available at this location from 2016. The data were subdivided into 2006–2010 (pre-sanitary survey) and 2011 – present (post sanitary survey) and processed in R (R Core Team, 2021). These data were used to determine whether any changes in rainfall patterns had occurred since the original sanitary surveys were published. The rainfall levels per month are shown in Figure 5.1 and the data are summarised in Table 5.1.

Archive Daily Rainfall from the Heligan Gardens (377658) at NGR SW 99815 46781
Data accessed from the Environment Agency's Hydrology Data Explorer, licenced under the Open Government Licence v3.0.

Figure 5.1 Mean daily rainfall per month at the Heligan Gardens monitoring station (NGR: SW 99815 46781) for the period (A) 2007 – 2010 and (B) 2011 – 2023.

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

Table 5.1 Summary statistics for rainfall preceding and following the 2010 Sanitary Survey.

Period	Mean Annual Rainfall	Percentage Dry Days	Percentage Days Exceeding 10 mm	Percentage Days Exceeding 20 mm
2006 - 2010	967.38	38.561	33.571	20.804
2011 - 2023	1142.354	36.707	35.942	22.628

The data show that rainfall levels in the area have increased by approximately 175 mm per year, with the percentage of dry days falling and the percentage of days with heavy (>10 mm rainfall) increasing. Two sample t-tests indicated that there was no significant difference ($p > 0.05$) in the mean daily rainfall per month between the 2006 – 2010 and 2011 – 2023 periods, meaning that rainfall levels across the catchment have remained statistically similar.

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 (statistically) 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 St Austell 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.

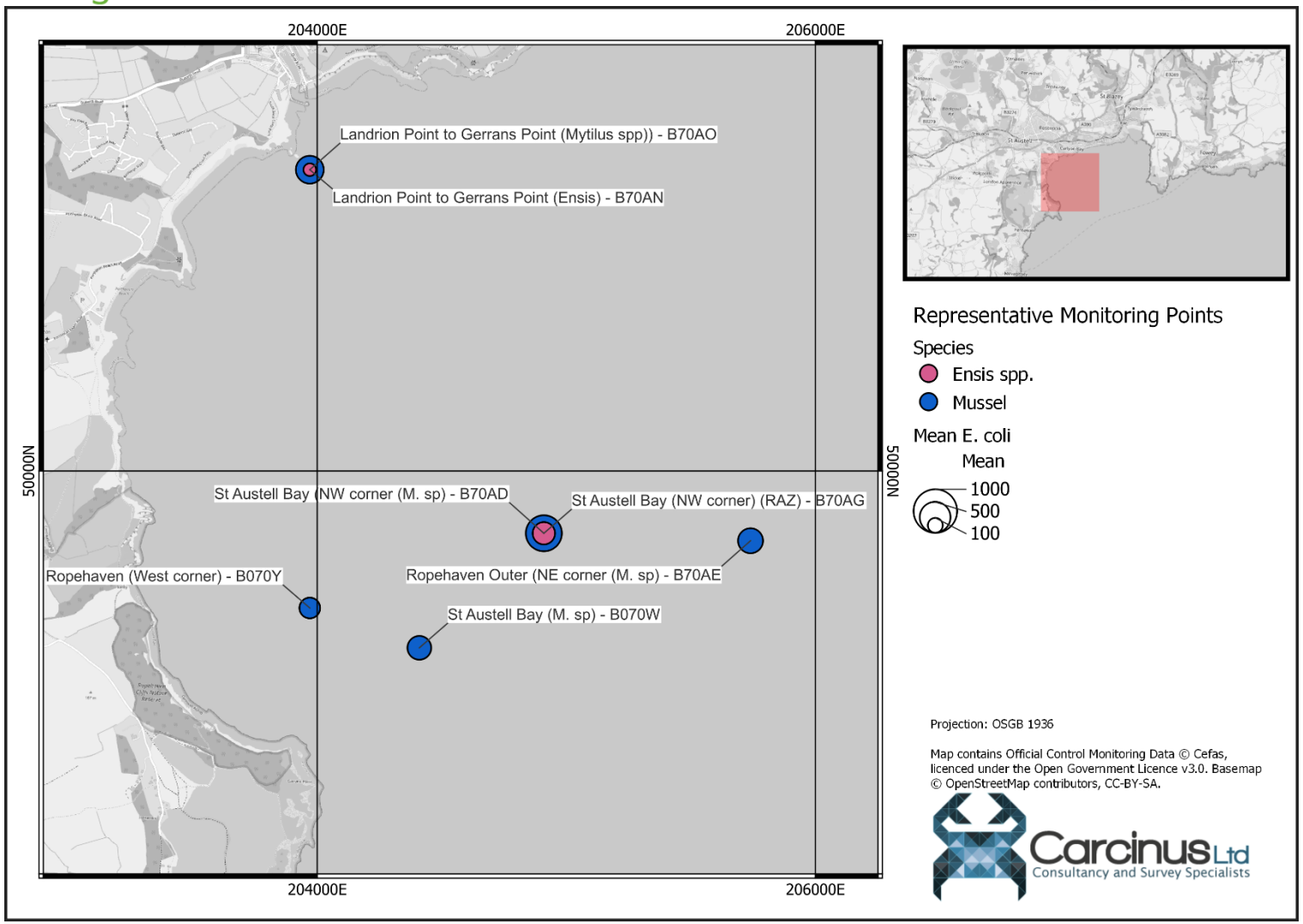

Figure 6.1 Mean E. coli results from Official Control monitoring at bivalve RMPs in the St Austell BMPA.

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

RMP (Species)	NGR	Species	No. Samples Collected	First Sample	Last Sample	Mean	Min Value	Max Value	% > 230	% > 4,600	% > 46,000
Landrion Point to Gerrans Point (Ensis) - B70AN	SX 0397 5121	Ensis spp.	10	29/07/2019	03/12/2019	66.00	18	230	0.00	0.00	0.00
Landrion Point to Gerrans Point (Mytilus spp)) - B70AO	SX 0397 5121	Mussel	37	01/09/2020	06/09/2023	406.14	18	4900	21.62	2.70	0.00
Ropehaven (West corner) - B070Y	SX 0397 4945	Mussel	8	11/04/2011	22/11/2011	216.25	20	790	37.50	0.00	0.00
Ropehaven Outer (NE corner (M. sp) - B70AE	SX 0574 4972	Mussel	151	22/11/2010	06/09/2023	324.20	18	24000	11.92	1.32	0.00

RMP (Species)	NGR	Species	No. Samples Collected	First Sample	Last Sample	Mean	Min Value	Max Value	% > 230	% > 4,600	% > 46,000
St Austell Bay (M. sp) - B070W	SX 0441 4929	Mussel	147	28/01/2010	06/09/2023	291.52	18	13000	19.73	0.68	0.00
St Austell Bay (NW corner (M. sp) - B70AD	SX 0491 4975	Mussel	74	22/11/2010	16/04/2018	687.05	18	35000	16.216	1.35	0.00
St Austell Bay (NW corner) (RAZ) - B70AG	SX 0491 4975	Ensis spp.	2	20/05/2014	11/06/2014	255.00	20	490	50.00	0.00	0.00

A total of seven RMPs have been sampled within the St Austell BMPA since 2010. Of these, only one (St Austell Bay B070W) was sampled prior to the publication of the 2010 Sanitary Survey. Sampling at two further RMPs (St Austell Bay (NW Corner) B70AD and Ropehaven Outer (NE Corner) B70AE) began in November 2010, following the recommendations of the 2010 Sanitary Survey. The *Landrion Point to Gerrans Point* CZ was briefly classified based on samples from the Landrion Point to Gerrans Point (B70AN) Ensis RMP from July 2019 – December 2019, after which time the Landrion Point to Gerrans Point (B70AO) mussel RMP was used. Only three RMPs are currently sampled, Landrion Point to Gerrans Point B7AO, Ropehaven Outer (NE Corner) B70AE and St Austell Bay B070W.

Only one of the RMPs, the Landrion Point to Gerrans Point (B70AN) has never returned a result above 230 *E. coli* MPN/100 g. None of the RMPs have ever returned a result above 46,000 MPN/100 g. There is no clear geographical pattern in the monitoring results, although in instances where an RMP has been co-located for more than one species, results from mussel RMPs have been higher than those from razor clam RMPs.

Figure 6.2 and Figure 6.3 presents box and violin plots of *E. coli* monitoring at RMPs within the St Austell 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[8]. All statistical analysis described in this section was undertaken in R (R Core Team, 2021).

Figure 6.2 shows the monitoring data from mussel RMPs, and shows that the Landrion Point to Gerrans Point (B70AO) has returned the highest median result, with Ropehaven (West Corner) B070Y returning the lowest. Occasional exceptionally high results (monitoring results more than 1.5 times higher than the interquartile range) at the St Austell B070W and St Austell Bay (NW Corner) B70AD are also apparent. However, no statistically significant differences in the monitoring data were found ($p > 0.05$).

Figure 6.3 shows the monitoring data from the razor clam RMPs. The median result at the St Austell Bay (NW Corner) B70AG were notably higher than from the Landrion Point to Gerrans Point B70AN RMP, although the differences were not significant. There is also no temporal overlap between the monitoring that was undertaken at these RMPs, reducing the inference that can be drawn.

It is not appropriate to compare the results of RMPs for different species due to the differences in rates of *E. coli* uptake.

[8] A p-value of <0.05 means that there is a greater than 95% probability that the observed differences between the groups didn't occur by chance.

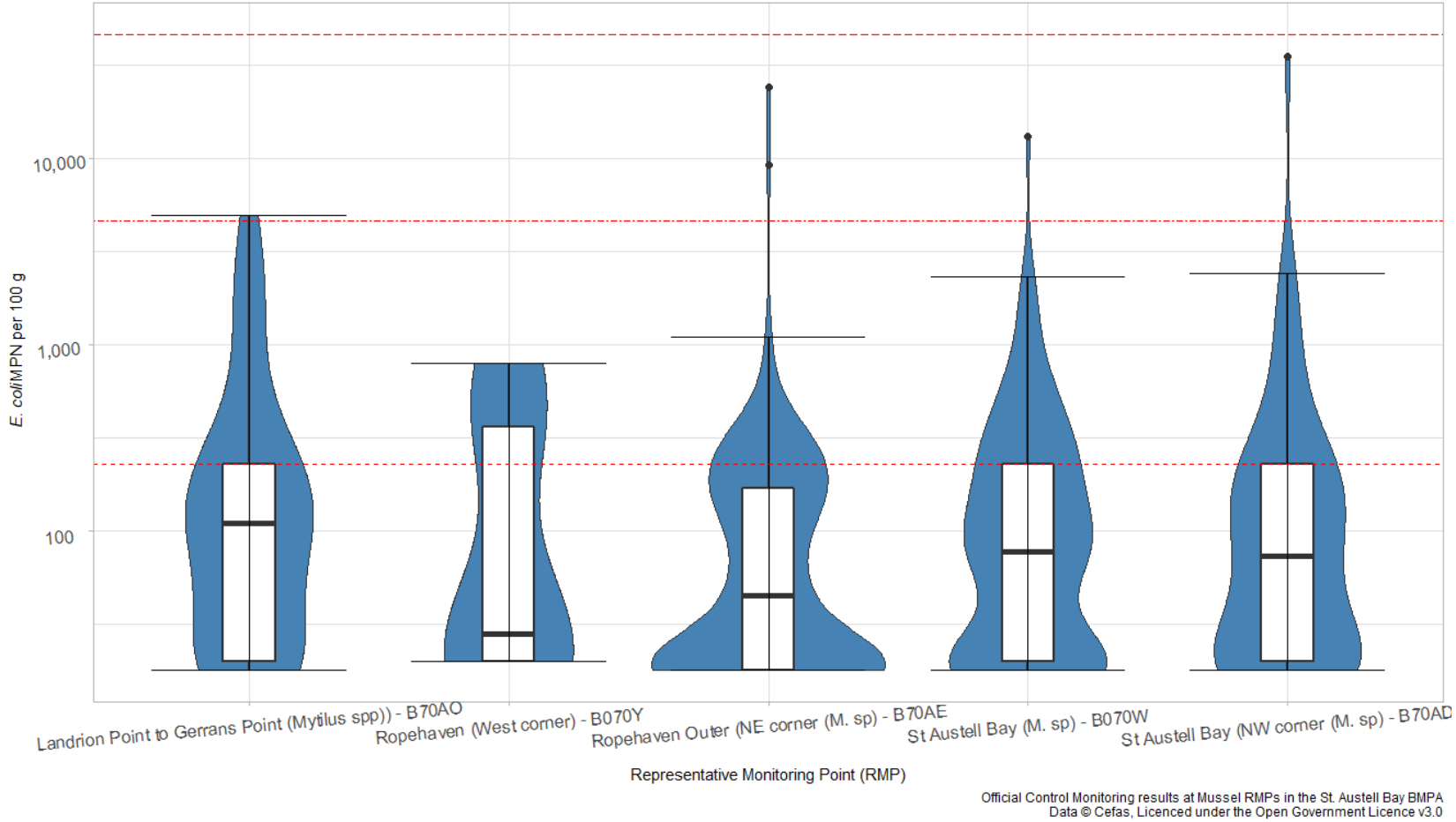

Figure 6.2 Box and violin plots of E. coli monitoring at mussel RMPs in the St Austell BMPA. Central line indicates median value, box indicates lower-upper quartile range and whisker indicates minimum/maximum values, excluding outliers. Boxplots are overlaid on the distribution of the monitoring data. Horizontal dashed lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g.

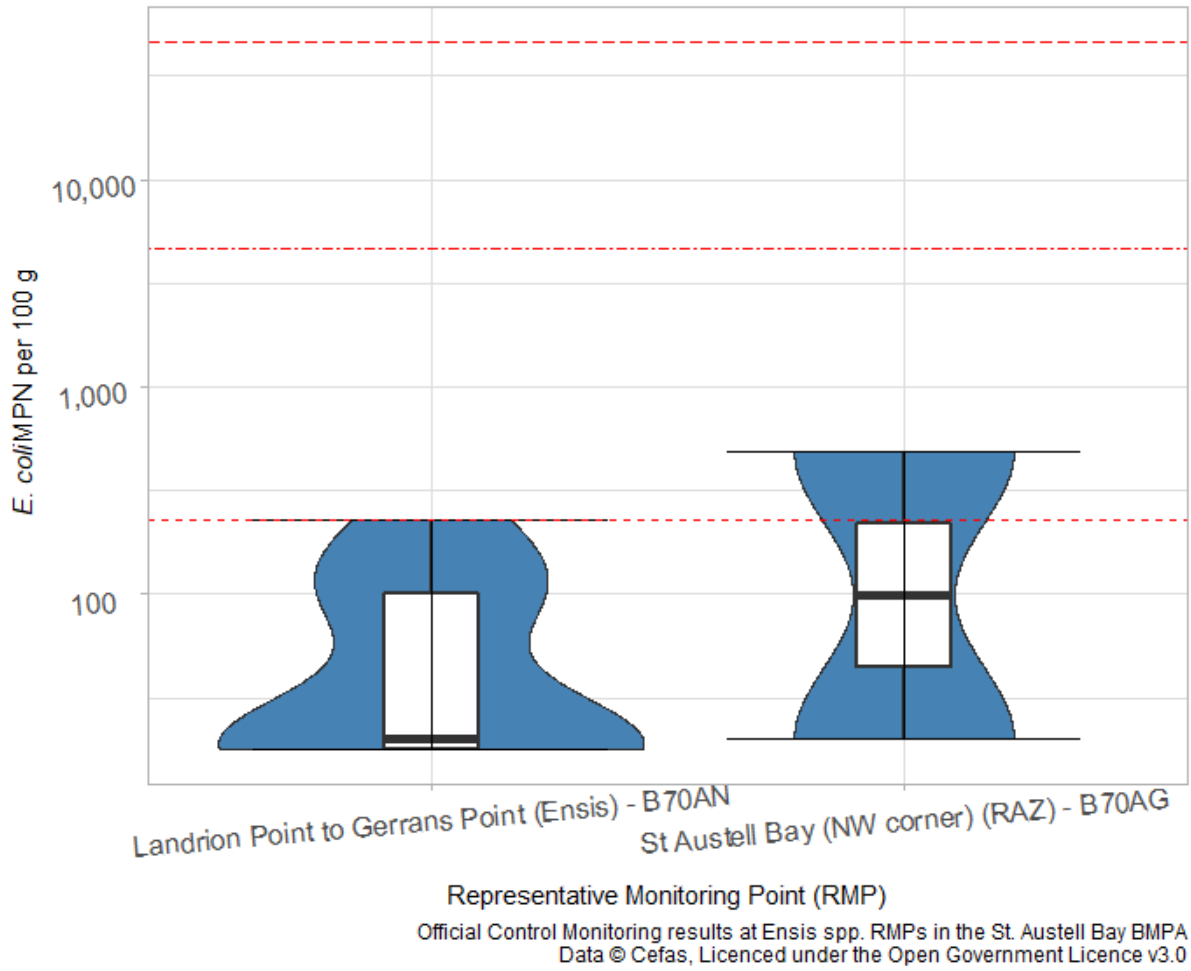

Figure 6.3 Box and violin plots of E. coli monitoring at razor clam RMPs in the St Austell BMPA. Central line indicates median value, box indicates lower-upper quartile range and whisker indicates minimum/maximum values, excluding outliers. Boxplots are overlaid on the distribution of the monitoring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

6.1.2 Overall temporal pattern in results

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

The monitoring data from the mussel RMPs (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. The frequency of extremely high results has also fallen, with only one result above 4,600 *E. coli* MPN/100 g occurring since 2015.

No clear temporal pattern in the monitoring data from razor clam RMPs (Figure 6.5) can be seen, as only ten samples were collected from the Landrion Point to Gerrans Point B70AN RMP and two samples from the St Austell Bay (NW Corner) B70AG RMP.

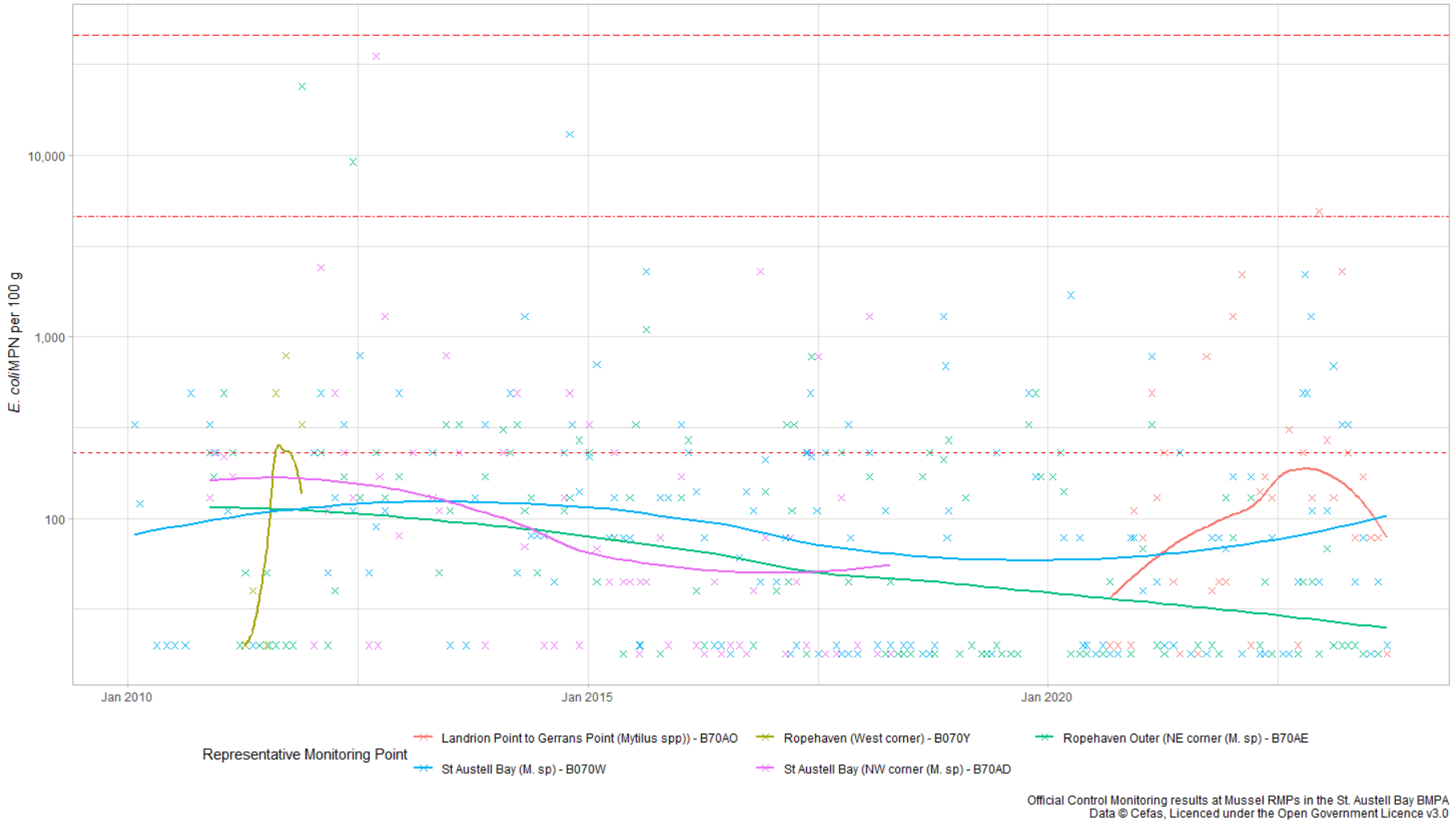

Figure 6.4 Timeseries of E. coli levels at mussel RMPs sampled in the St Austell BMPA since 2010. Scatter plots are overlaid with a loess model fitted to the data. Horizontal lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g respectively.

Figure 6.5 Timeseries of E. coli levels at razor clam RMPs sampled in the St Austell 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 at RMPs in the St Austell BMPA 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 ($p > 0.05$).

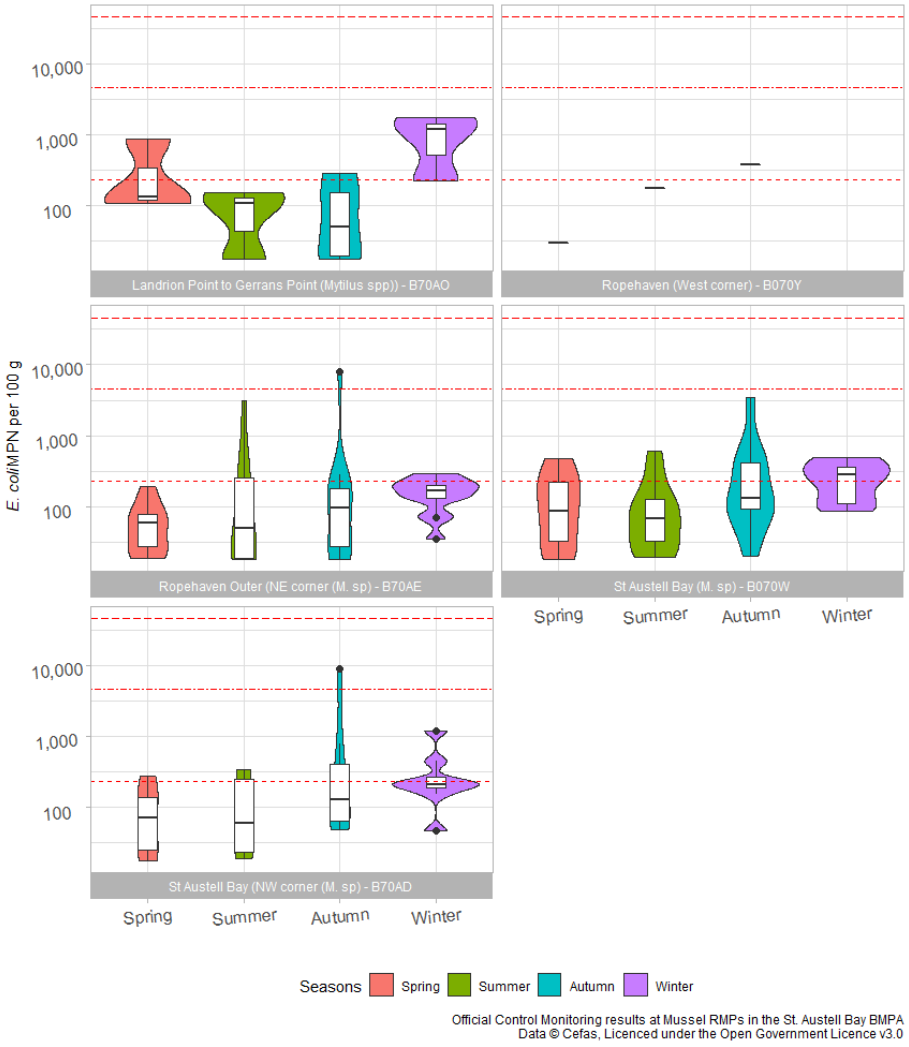

Figure 6.6 Box and violin plots of E. coli levels per season at mussel RMPs sampled within the St Austell BMPA since 2010. Horizontal lines indicate classification thresholds at 230, 4,600 and 46,000 E. coli MPN/100 g.

6.2 Action States

Since the publication of the 2010 Sanitary Survey of St Austell Bay, the following Action States have been triggered within the BMPA.

- On 22 November 2011, a result of 24,000 *E. coli* MPN/100 g was recorded at Ropehaven Outer (NE corner) B70AE. No other high results were recorded in the area, and no subsequent action state or monthly sampling had been undertaken. There were no grounds to waive the result in accordance with the required waiver criteria.
- On 12 November 2018, a result of 1,300 *E. coli* MPN/100 g was recorded at Ropehaven B070W. No other high results were recorded in the area. Subsequent action sate sampling on 21 November 2018 and 26 November 2018 returned results of 690 and 78 MPN *E. coli* MPN/100 g respectively. No subsequent monthly results had been recorded at the time of the Action State Report. There were no grounds for waiving the result in accordance with the required waiver criteria..
- On 10 October 2022, a result of 490 *E. coli* MPN/100 g was recorded at Ropehaven B070W. No other high results were recorded in the area on this date. Although this was not an action state (since it was less than 700 *E.coli* MPN/100g), a follow up sample collected by the LEA returned a result of 2,200 *E. coli* MPN/100 g. Subsequent investigative samples on 24 October 2022 and 09 November 2022 returned results of 490 *E. coli* MPN/100 g and 1,300 *E. coli* MPN/100 g respectively. Subsequent monthly samples on 14 November 2022, 12 December 2022 and 11 January 2023 returned results of 110, 45 and 110 *E. coli* MPN/100 g.

The investigations that followed the action state events that are described above did not identify significant (above the 1-in-5 year threshold) rainfall or significant releases from water company assets. This reflects complex patterns of water circulation described in Section 4 and provide evidence for the occurrence of results above the lower and upper class A limits at these RMPs. Consideration should therefore be given to significant point sources of contamination (such as sewage discharges or riverine inputs carrying potential agricultural pollution) in any updated sampling plan.

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 seven designated bathing water quality monitoring points within St Austell Bay. The location and 2022 bathing water classification status of these points is shown in Figure 6.7. The recent bathing water classification status is shown in Table 6.2. It should be noted that bathing water sampling only occurs during the bathing water season, which falls within 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 St Austell Bay is good, with low *E. coli* concentrations.

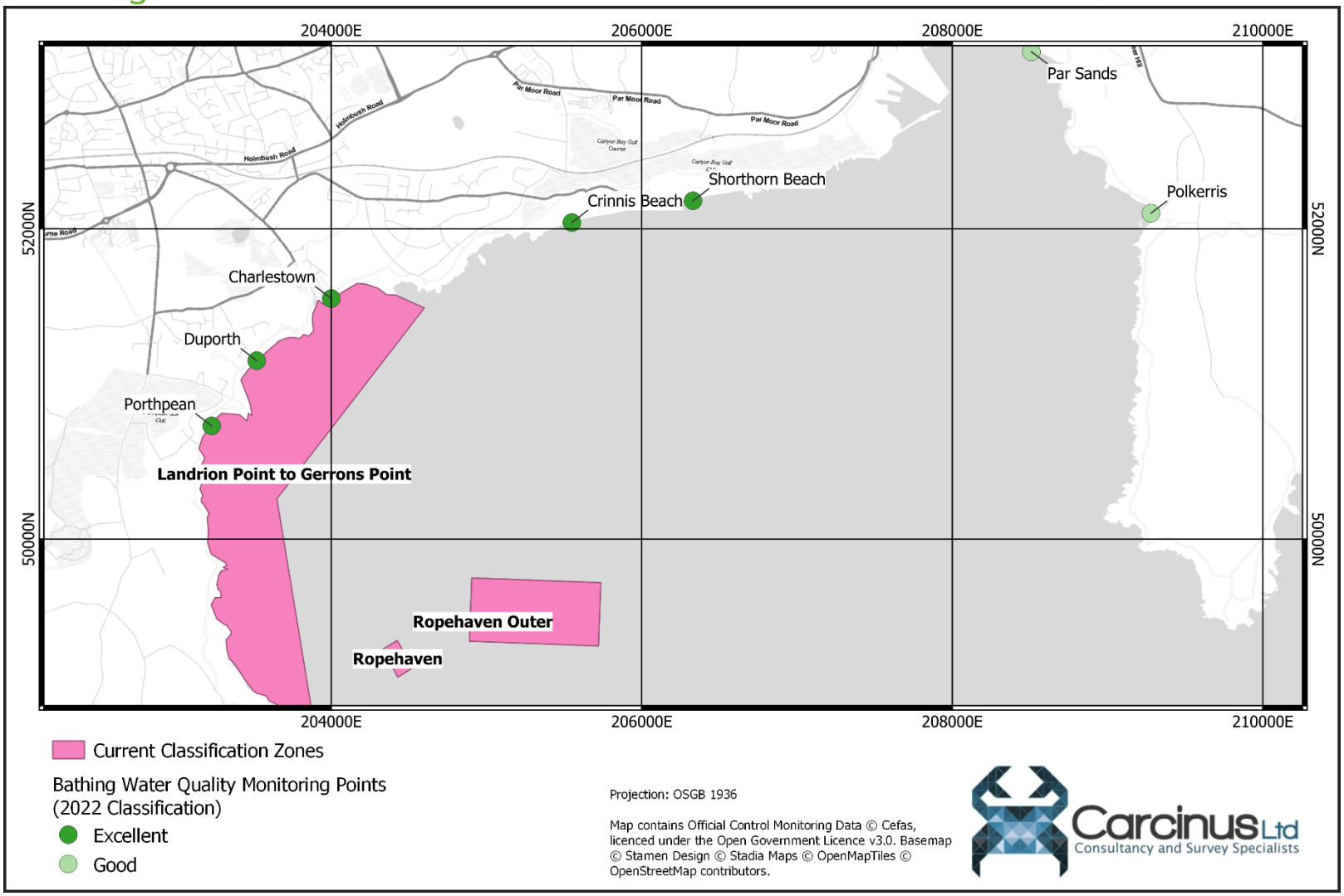

Figure 6.7 Status of EC Bathing Water Quality Designations at Monitoring Points in 2022.

Table 6.2 Summary of EA bathing water quality designations at monitoring locations within St Austell BMPA.

Bathing Water Monitoring Point	2015	2016	2017	2018	2019	2020	2021	2022
Polkerris	Excellent	Excellent	Good	Good	Good	Un-Assessed	Good	Good
Par Sands	Good	Good	Good	Good	Good	Un-Assessed	Sufficient	Good
Shorthorn Beach	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Crinnis Beach	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Charlestown	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Duporth	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent
Porthpean	Excellent	Excellent	Excellent	Excellent	Excellent	Un-Assessed	Excellent	Excellent

7 Conclusion and overall assessment

St Austell Bay is a large south facing embayment on the south coast of Cornwall. The BMPA is currently 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. During initial consultations the LEA stated that the razor clam fishery is currently inactive and that commercial activity is unlikely to resume.

The results of the 2021 Census were compared to that of the 2011 Census to give an indication of changes in human population within the catchment since the publication of the 2010 Sanitary Survey. These data suggest that the population of the catchment increased by approximately 14% between 2011 and 2021. The main population centres of the catchment continue to be the towns of St Austell and St Blazey, as well as some smaller villages in the upper reaches of the catchment. The majority of the catchment is rural, and generally urban associated runoff is not considered to be a significant source of contamination within this area. The area does receive 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.

There is one significant continuous discharge within St Austell Bay, that of Par STW, 1.88 km east of the centre of the *Ropehaven Outer* CZ. This discharge employs secondary (Activated Sludge) treatment, and during strong easterly winds could cause significant contamination of the shellfish beds on a gradient from east to west. There are several other continuous discharges within the catchment. No upgrades to the treatment methodologies have occurred since the original sanitary survey, although the St Austell (Menagwins) WWTW has seen a 37% reduction in consented discharge volume. There are four intermittent discharges that spill directly to St Austell Bay, including two within the *Landrion Point to Gerrans Point* CZ (see Section 3.2 for details). Improvements to the Par STW SO, Menagwins STW SSO Charlestown SPS, Charlestown Harbour SPS and St Austell (Luxulyan) STW SSO are planned for AMP8 (2025 – 3030). The Shellfish Water Action plan identifies these assets as impacting the shellfish water under varying conditions. These discharges should therefore be taken into consideration in any updated sampling plan.

Comparison of livestock population data from the 2010, 2016 and 2021 livestock censuses shows that the dominant group in terms of population size is poultry, but there continue to be significant populations of both pigs 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 (runoff) to be a significant source of contamination within this shellfishery, particularly after significant rainfall events. This is supported by higher monitoring results in the winter months, during when rainfall and the number of grazing animals is likely to be greater. The mouths of watercourses throughout the bay, such as the St Austell River, can be considered point sources of this source of contamination.

Waterbird counts suggest that the area does not support either nationally 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, 5 km south of the BMPA. No impacts from any merchant vessels transiting to and from Par Docks 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 available for seven RMPs sampled within the St Austell BMPA, although ten or fewer samples were collected at three of these. Only three RMPs are currently 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 and high rainfall generate 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 be any significant knowledge gaps that would justify a shoreline survey. There have been no notable changes to sources of pollution since the 2010 Sanitary Survey was published. Having reviewed the sanitary survey, the FSA agree that a shoreline survey is not required.

8 Recommendations

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

8.1 Mussels

8.1.1.1 Ropehaven

This zone covers an area of 0.022 km² on the western part of St Austell Bay, and is the more inshore of the two mussel lease areas. The 2010 Sanitary Survey identified that the main sources of contamination affecting this zone were the Par STW and shoreline sources of contamination. A consideration of the original report was whether the *Ropehaven CZ* would be expanded to its entire lease area, and the newly proposed RMP (B070Y) was placed to capture the contamination sources affecting the larger zone. This expansion did not occur, and whilst eight samples were collected at the B070Y RMP from April 2011 to November 2011, the B070W RMP has been used to classify this area since then. The current RMP remains representative of these sources of contamination and should be retained.

8.1.1.2 *Ropehaven Outer*

This zone covers an area of 0.339 km² and is the outermost and larger of the two mussel lease areas. The 2010 Sanitary Survey identified that the main sources of contamination to the zone would be that of the Par STW and the Par river, and recommended placing the RMP at the north eastern corner of the CZ to best capture this contamination. This position continues to be representative of these sources of contamination and should be retained.

8.2 Razor clams

8.2.1.1 *Ropehaven outer*

This zone is listed on the latest release of the Current Classification List and Sampling Plan published by the FSA (September 2023)[9], but was not included in the list of current Classified Zones supplied by the LEA during initial consultation. Continued classification is required for this CZ, and it is recommended that the current RMP be retained as it is representative of the main sources of contamination affecting the zone, namely that of Par STW and the Par river.

8.2.1.2 *Landrion Point to Gerrans Point*

This CZ covers an area of 1.53 km², on the western part of St Austell Bay. The pRMP assessment recommended placing the RMP near to the Charleston PS, that is located within the zone. The species recommended for sampling for classification purposes in this zone was razor clams, and samples from the B70AN RMP were collected from July to December 2019, although since September 2020 bagged mussel samples have been collected from this position (NGR SX 0397 5121) for classification purposes. This position continues to be representative, although during initial consultations the LEA stated that the CZ had been inactive for some time. Continued classification is required for this zone and a recommendation for sampling this CZ has been included in the sampling plan presented at the end of this report (Table 9.1).

[9] Current classification list and sampling plans. Available at: https://www.food.gov.uk/sites/default/files/media/document/Classification%20list%20and%20sampling%20plans%20-%207%20September%202023.xlsx_0.ods

9 General Information

9.1 Location Reference

Production Area	**St Austell 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 Recommended Sampling Plan

*Table 9.1 Proposed sampling plan for the St Austell 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
Ropehaven (mussels)	B070W	St Austell	SX 2044 4929	50°18.66'N 4°44.90'W	Mussels	Hand	Hand (bagged)	*Mytilus* spp.	10 m	Monthly
Ropehaven Outer (mussels)	B70AE	Ropehaven outer (NE Corner)	SX 0574 4972	50°18.92'N 4°43.80'W	Mussels	Hand	Hand (bagged)	*Mytilus* spp.	10 m	Monthly
Landrion Point to Gerrans Point (*Ensis*)	B70AO	Landrion Point to Gerrans Point	SX 0397 5121	50°19.68'N 4°45.33'W	Razor clams	Hand	Hand (bagged)	*Mytilus* spp.	10 m	Monthly

10 References

Austin, G.E. *et al.* (2023) *Waterbirds in the UK 2021/22: The Wetland Bird Survey.* Thetford: BTO/RSPB/JNCC.

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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)
PORTHPEAN SPS_PSCSOEO_PORTHPEAN	301670	Storm discharge at pumping station	SX03235051	0	0	0.68
CHARLESTOWN SPS_PSCSOEO_CHARLESTOWN	032051/PC/01	Storm discharge at pumping station	SX03875120	60.4	20	0.94
PAR STW_SSO_ST AUSTELL	031299/SS/01	Storm tank at WwTW	SX06625088	42.34	8	1.88
DANIELS LN_CSO_ST AUSTELL	032052/SF/01	SO on sewer network	SX03555253	No EDM	NA	2.29
MENAGWINS STW_SSO_ST AUSTELL	31294	Storm tank at WwTW	SX01175096	1210.02	74	2.79
MENAGWINS STW_SO_ST AUSTELL	#TBC	Inlet SO at WwTW	SX0115850953	576.98	31	2.80
LONDON APPRENTICE SPST_PSCSOEO_ST AUSTEL	303234	Storm discharge at pumping station	SX0077050100	16.21	3	3.10
PENTEWAN SPS_PSCSOEO_ST AUSTELL	302113	Storm discharge at pumping station	SX01964725	0	0	3.56
NANSLADRON SPST_PSCSOEO_ST AUSTELL	302111	Storm discharge at pumping station	SX00714825	0	0	3.74
POLGOOTH_CSO_ST AUSTELL	303594	SO on sewer network	SX00055018	1.31	3	3.82
CHARLESTN REMOTE SPS_PSCSOEO_ST AUSTELL	301635	Storm discharge at pumping station	SX03925424	39.45	24	3.98

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)
POLKERRIS SPST_PSCSOEO_POLKERRIS	302706	Storm discharge at pumping station	SX09125191	220.17	39	4.49
TREDENHAM CLOSE_CSO_PAR	EPRYB3993NQ	SO on sewer network	SX07315368	11.56	6	4.85
HARBOUR ROAD NO2 SPS_PSCSOEO_PAR	031750/PC/01	Storm discharge at pumping station	SX07625336	8.73	5	4.87
MEVAGISSEY SPST_PSCSOEO_MEVAGISSEY	300238/PC/01	Storm discharge at pumping station	SX01804494	124.78	121	5.71
LOWER STICKER SPS_PSCSOEO_ST AUSTELL	301610	Storm discharge at pumping station	SW97824973	4.25	2	6.07
READY MONEY COVE SPS_PSCSOEO_FOWEY	302771	Storm discharge at pumping station	SX11885100	0	0	6.73
PORTMELLON SPS_PSCSOEO_MEVAGISSEY	302115	Storm discharge at pumping station	SX01504389	0	0	6.80
READYMONEY ROAD_CSO_FOWEY	302770	SO on sewer network	SX12005111	7.19	5	6.87
WHITEHSE SLIP POINT_CSO_FOWEY	302773	SO on sewer network	SX12355140	1	2	7.28
POLRUAN QUAY SPS_PSCSOEO_POLRUAN	302772	Storm discharge at pumping station	SX12575107	0	0	7.42
RESCORLA_CSO_LUXULYAN	301681	SO on sewer network	SX03325788	0	0	7.64
TOWN QUAY SPST_PSCSOEO_FOWEY	302775	Storm discharge at pumping station	SX12665166	115.25	199	7.65

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)
CAFFA MILL SPS_PSCSOEO_FOWEY	302774	Storm discharge at pumping station	SX12765216	223.65	70	7.90
LUXULYAN STW_SSO_ST AUSTELL	SWWA 146	Storm tank at WwTW	SX04325820	574.84	36	7.95
FOWEY STW_SSO_FOWEY	302530	Storm tank at WwTW	SX12765233	477.11	80	7.96
BODINNICK_CSO_FOWEY	303432	SO on sewer network	SX12915217	118.85	6	8.04
GORRAN CHURCHTOWN SPST_PSCSOEO_GORRAN	303580	Storm discharge at pumping station	SX00124245	28.38	28	8.66
GOLANT SPST_PSCSOEO_GOLANT	303327	Storm discharge at pumping station	SX12405469	58.95	150	8.77
MOLINNIS_CSO_BUGLE	301683	SO on sewer network	SX02645936	3.4	7	9.18
LANTEGLOS SPST_PSEO_LANTEGLOS	301662	Storm discharge at pumping station	SX1470054450	0	0	10.60
ROCHE_CSO_ROCHE	301682	SO on sewer network	SW99296034	24.39	42	11.07
COULSONS PARK SPST_PSCSOEO_LOSTWITHIEL	NRA-SW-5460	Storm discharge at pumping station	SX10495942	1177.35	73	11.30
VICTORIA SPS_PSCSOEO_ROCHE	301631	Storm discharge at pumping station	SW99156148	59	60	12.17
LERRYN CAR PARK SPS_PSCSOEO_LOSTWITHIEL	2895/92	Storm discharge at pumping station	SX14015707	95.3	47	12.21

Cefas

EC Regulation 854/2004

CLASSIFICATION OF BIVALVE MOLLUSC PRODUCTION AREAS IN ENGLAND AND WALES

SANITARY SURVEY REPORT

St Austell Bay

2010

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About Carcinus Ltd

Carcinus Ltd is a leading provider of aquatic environmental consultancy and survey services in the UK.

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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Environmental Consultancy

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.

Ecological and Geophysical Surveys

Carcinus delivers ecology surveys in both marine and freshwater environments. Our staff are experienced in the design and implementation of ecological surveys, including marine subtidal and intertidal fish ecology and benthic ecology, freshwater fisheries, macro invertebrate sampling, macrophytes, marine mammals, birds, habitat mapping, River Habitat Surveys (RHS), phase 1 habitat surveys, catchment studies, water quality and sediment sampling and analysis, ichthyoplankton, zooplankton and phytoplankton.

In addition, we provide aerial, topographic, bathymetric and laser scan surveys for nearshore, coastal and riverine environments.

Our Vision

"*To be a dependable partner to our clients, providing robust and reliable environmental advice, services and support, enabling them to achieve project aims whilst taking due care of the sensitivity of the environment*"