Sanitary Survey - Review

Poole Harbour – 2021

Document No. – *J0591/21/05/24*

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Document QA and Approval

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Initial Consultation

Consultee	Date of consultation	Date of response
BCP Council	05 May 2021	17 May 2021
Environment Agency	05 May 2021	14 May 2021

Consultation on draft report

Consultee	Date of consultation	Date of response
BCP Council	28 June 2021	03 September 2021
Environment Agency	28 June 2021	25 August 2021

Meetings

Date of Meeting	In attendance
22 November 2021	Joshua Baker (Carcinus) Matthew Crabb (Carcinus) FSA colleagues BCP colleagues

A sanitary survey relevant to the bivalve mollusc beds in Poole Harbour was undertaken in 2009 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, Bournemouth, Christchurch & Poole Council. The report is publicly available via the Carcinus Ltd. website.

Recommended Bibliographic Citation:

Carcinus Ltd., 2021. Review of the Poole Harbour 2009 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.

Contents

List of figures

List of tables

1 Introduction

1.1 Background

In line with Article 58 of retained EU Law Regulation (EU) 2019/627 and the EU Good Practice Guide (European Commission, 2017), Carcinus is contracted to undertake reviews of sanitary surveys on behalf of the Food Standards Agency. The FSA undertake targeted sanitary survey reviews to ensure public health protection measures continue to be appropriate.

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 complexity and risk. The desktop assessment is completed through analysis and interpretation of publicly available information, in addition to consultation with stakeholders.

1.2 Poole Harbour Review

This report reviews information and makes recommendations for a revised sampling plan for existing cockle (*Cerastoderma edule*), mussel (*Mytilus edulis*), hard clam (*Mercenaria mercenaria*), native oyster (*Ostrea edulis*), Pacific oyster (*Crassostrea gigas*) and *Tapes* spp. classification zones in Poole Harbour (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) and the Environment Agency (EA) responsible for the production area was undertaken in April and May 2021. 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 LAs and Local Action Group (LAG) members was undertaken in July and August 2021. 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. A further consultation with the LEA was undertaken in November and December 2021 to agree changes to the sampling plan. The draft report is reviewed taking into account the feedback received throughout all consultations.

The review updates the assessment originally conducted in 2009 (including the updated sampling plan of 2012) 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;

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 May 2021;
- Only information that may impact on the microbial contamination was considered for this review;
- Official Control monitoring data have been taken directly from the Cefas data hub[1], with no additional verification of the data undertaken. Results up to and including May 2021 have been used within this study. Any subsequent samples have not been included; and
- Environment Agency Event Duration Monitoring data has been taken at face value, with no additional verification other than linking with the consented discharge database.

[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/.

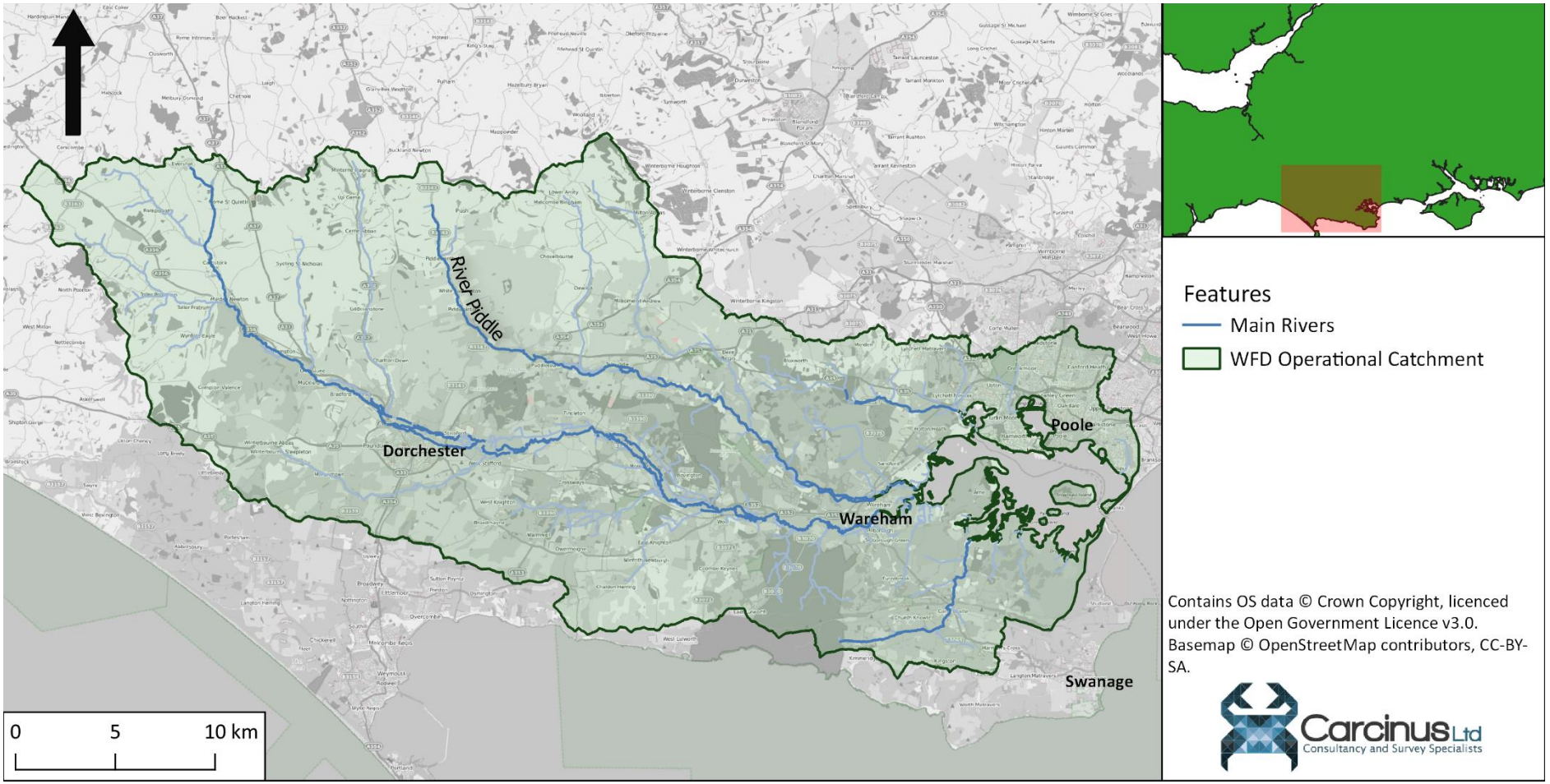


Figure 1.1 Location of Poole Harbour.

2 Shellfisheries

2.1 Description of Shellfishery

Poole Harbour is a large natural harbour located on the south coast of England (Figure 1.1) and covers an area of approximately 38 km². Harvesting of shellfish within the harbour is regulated by the Southern Inshore Fisheries and Conservation Authority (SIFCA) under the Poole Harbour Fishery Order 2015[2] and byelaws including the Poole Harbour Dredge Permit Byelaw[3] (PHDPB). The Order refers to the southern and western parts of the harbour and includes the waters north of Brownsea Island. There are some classified areas not within the Regulated Area, although these are also managed by SIFCA.

The Poole Harbour Bivalve Mollusc Production Area (BMPA) covers the entirety of Poole Harbour, and from time to time includes areas on adjacent coasts when classifications are required. There are no other BMPAs particularly near to Poole Harbour; the Solent estuary lies 47 km to the east and Portland Harbour/Fleet lies about 35 km west. The BMPA involves both wild culture (principally of cockles and clams) and aquaculture (all harvested species) and is under the jurisdiction of Bournemouth, Christchurch & Poole Council for food hygiene purposes (the Local Enforcement Authority (LEA)). The wild fishery is open year-round for hand-gathering but is seasonally restricted from 25th May to 23rd December each year for fishermen using a pump scoop dredge (SIFCA, 2021). The aquaculture fishery operates all year round. The original sanitary survey (conducted in 2009 with a sampling plan updated in 2012) made comprehensive changes to the representative monitoring points (RMPs) and Classification Zones (CZs). The following paragraphs detail the currently active CZs and stock assessments (where data are available) for the species harvested in the Poole Harbour BMPA. The LEA do not hold estimates of current commercial landings for individual classification zones, however they estimate that the value of harvested shellfish from within the BMPA is between 1.5 and 2 million pounds (GBP) per year, although it is not clear what proportion originates from which species. For the 2019/2020 season, the manilla clam (*Tapes* spp.) landings were 277.2 tonnes, the cockle landings were 79.8 tonnes and 21.5 tonnes of the other bivalve species were landed (SIFCA, 2021), although it is not clear what proportion originates from which classification zone.

2.1.1 Cockles

There are currently seven zones classified for cockle harvesting within the Poole Harbour BMPA, as well as one relay area, and the species is subject to both wild harvest and aquaculture. All the CZs were proposed in the original sanitary survey. These zones are *Brands Bay*, *Poole Harbour North*, *Rockley*, *SW Brownsea Island*, *Wareham Channel*, *Whiteley Lake*, *Wych Lake*, and the *West Brownsea Relay Area*. The *Poole Coastal* zone was

[2] The Poole Harbour Fishery Order 2015. Available at: https://www.legislation.gov.uk/uksi/2015/1346/introduction/made

[3] The Poole Harbour Dredge Permit Byelaw. Available at: https://secure.toolkitfiles.co.uk/clients/25364/sitedata/Redesign/Poole_Hrbr_D_Permit/Poole-Hrbr-D-Permit-Byelaw.pdf

declassified in September 2020, due to a lack of commercial activity. Together, these zones effectively create one contiguous zone that covers most of Poole Harbour.

The zones are harvested through a combination of hand gathering and pump scoop dredging, with the latter regulated through permits issued by SIFCA under the PHDPB. SIFCA conducts annual assessments of the cockle stock within Poole Harbour, and reports from recent years (SIFCA 2017; 2018; 2019) indicate that the stock is sizeable and stable, and is greater nearer the mouth of the harbour where sediments are dominated by gravel, rather than muddy sediments near the freshwater inputs to the west. For the 2019/2020 season, the landings of this species were 79.8 tonnes (SIFCA, 2021), although it is not clear which proportion originates from which classification zone.

2.1.2 Hard Clams

Like cockles, hard clams (*M. mercenaria*) are subject to both wild harvest and aquaculture. The CZs with active classifications for this species within Poole Harbour are *Brands Bay*, *Poole Harbour North*, *Rockley*, *SW Brownsea Island*, *Wareham Channel*, *Whitely Lake* and *Wych Lake*. Like cockles, the *M. mercenaria* zones essentially form one large zone that covers the entire BMPA.

The harvesting methods for *M. mercenaria* are the same as for cockles, hand gathering and pump scoop dredging. No stock assessment for this species was available to the authors of this review.

2.1.3 Mussels

All mussel harvesting from Poole Harbour comes from aquaculture, and there are currently only three zones classified for this species. These are *Poole Harbour North*, *Rockley* and *Wareham Channel*, which form one contiguous zone over the northern side of the harbour.

Consultation with the local authority did not indicate any changes to the harvesting method for this species, which is mechanised hand gathering. No estimate of the output of this fishery was available to the authors of this review.

2.1.4 Native oysters

Like mussels, all harvesting of native oysters comes from aquaculture, and there are currently three areas classified for this species (one of which is a relay area). These are *Poole Harbour North*, *SW Brownsea Island* and the *South Deep Relay Area*. The *Poole Coastal* CZ was classified for this species until its declassification in September 2020. Consultation with the LEA indicated that the *South Deep Relay Area* is no longer used and cannot be used as a production area due to environmental protections. The LEA stated they may look to declassify this area.

Consultation with the local authority did not indicate any changes to the harvesting method for this species, which is mechanised hand gathering. No estimate of the output of this fishery was available to the authors of this review.

2.1.5 Pacific oysters

All harvesting of this species is from aquaculture and it, along with mussels, is the most significant aquaculture species in Poole Harbour in terms of output. Furthermore, Poole Harbour is the largest Pacific oyster production area in England (Williams & Davies, 2018). However, there are currently only two zones classified for this species, *Poole Harbour North* and *SW Brownsea Island*.

Consultation with the local authority did not indicate any changes to the harvesting method for this species, which is mechanised hand gathering. No estimate of the output of this fishery was provided by the LEA, however the Williams and Davies (2018) study indicates that the output is between 300 and 400 tonnes per year.

2.1.6 *Tapes* spp.

Like cockles and hard clams, *Tapes* spp. are harvested from both wild and cultured stocks within Poole Harbour. There are currently seven zones classified for this species in the Poole Harbour BMPA, these are *Brands Bay*, *Poole Harbour North*, *Rockley*, *SW Brownsea Island*, *Wareham Channel, Whitley Lake* and *Wych Lake*. Like cockles and *M. mercenaria* clams, these zones form one large contiguous zone that covers much of Poole Harbour.

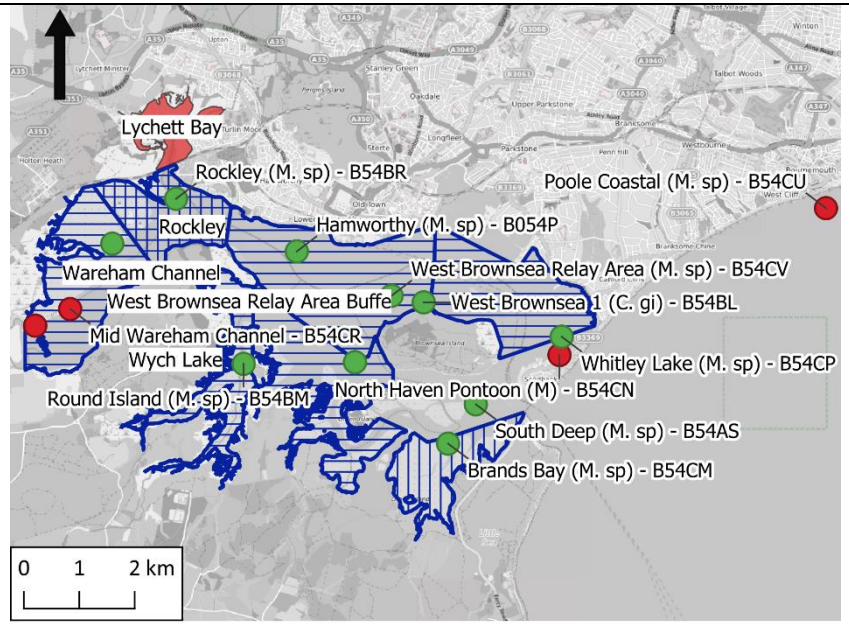
The harvesting methods for this species are hand gathering and pump scoop dredge, which is regulated through permits issued by SIFCA under the PHDPB. SIFCA conducts annual assessments of the manilla clam stock within Poole Harbour, and reports from recent years (SIFCA 2017; 2018; 2019) indicate that the stock is sizeable and stable, and is greater in the western reaches of the harbour, near the riverine inputs where the sediments are more mud-dominated. The main stock areas, around Wareham Channel, were also found to contain a large number of undersized individuals (SIFCA, 2019). The authors of that stock assessment believed this to be due to the high level of fishing activity in that area, particularly during the early part of the mechanical fishing season (which runs from April to December).

2.2 Classification History

The sampling plan recommended by the original sanitary survey in 2012, created a total of 20 zones for the various classified species; seven for cockles, six for *Tapes* spp., three for native oysters and two each for mussels and Pacific oysters. This has increased to 28; seven each for cockles, *M. mercenaria* and *Tapes* spp. clams, three for mussels, three for native oysters and two for Pacific oysters. In addition, there are two designated relay areas, one each for native oysters and cockles.

The location of all active CZs in the Poole Harbour BMPA are shown in Figure 2.1. Most CZs hold Class LT-B classifications, although *Brands Bay* near the mouth of the harbour holds a Seasonal A/B classification, and *Rockley* on the north-western side of the harbour holds a Seasonal B/C classification.

A: Cockles



Representative Monitoring Points

RMP Active?

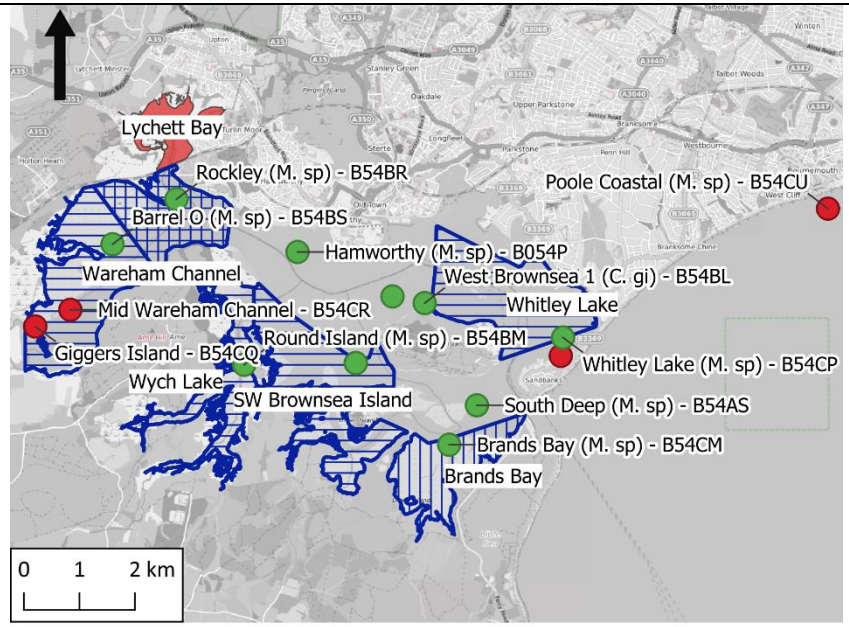
- No
- Yes

Classification Zones

Current Classification

- B
- LT - B
- S - B/C
- S - A/B
- P

B: *M. mercenaria*



Representative Monitoring Points

RMP Active?

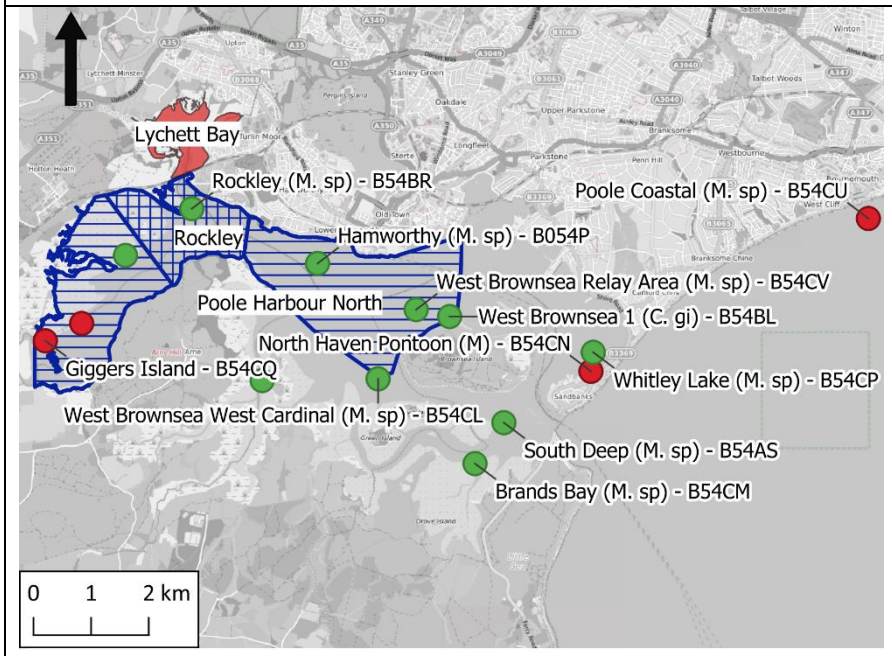
- No
- Yes

Classification Zones

Current Classification

- LT - B
- S - B/C
- S - A/B
- P

C: Mussels



Representative Monitoring Points

RMP Active?

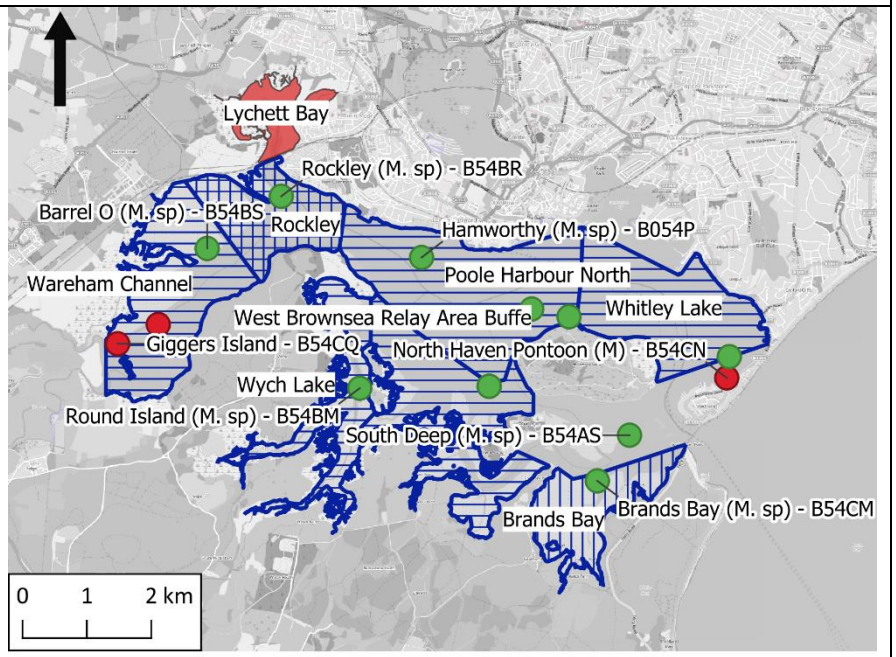
- No
- Yes

Classification Zones

Current Classification

- LT - B
- S - B/C
- P

D: *Tapes* spp.



Representative Monitoring Points

RMP Active?

- No
- Yes

Classification Zones

Current Classification:

- LT - B
- S - B/C
- S - A/B
- P

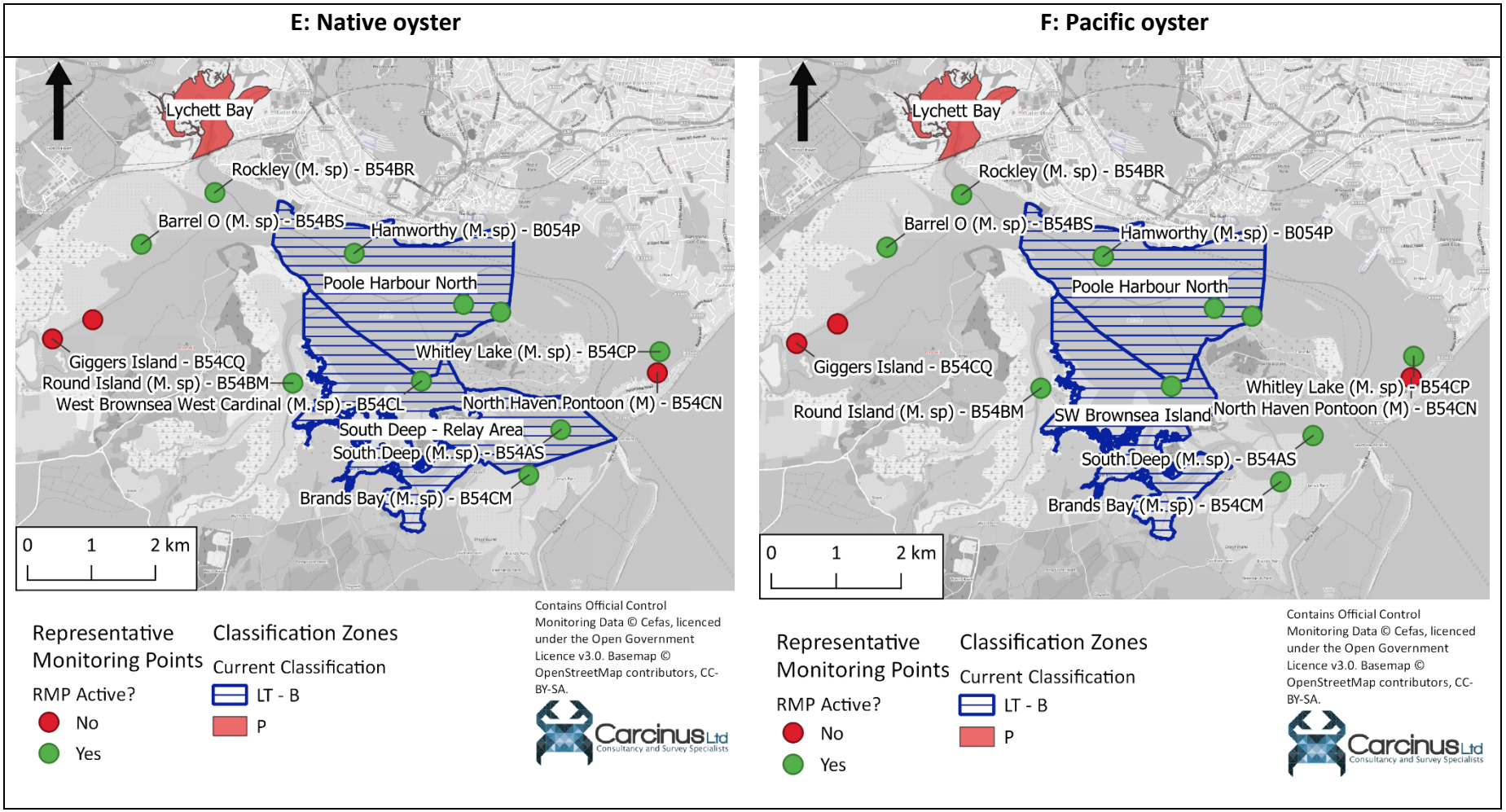


Figure 2.1 Current Classification Zones and associated Representative Monitoring Points for the currently harvested species (A: Cockles; B: M. mercenaria clams; C: Mussels; D: Tapes spp. clams; E: Native oysters and F: Pacific oysters) within the Poole Harbour BMPA.

3 Pollution sources

3.1 Human Population

The original sanitary survey cites population data from the 2001 Census of the United Kingdom. Since the publication of that document, the data from the subsequent full census of 2011 has been made available, and so this data has been compared to that of the 2001 census to give an indication of the changes in human population within the catchment. These censuses have been used as no further population data are freely available[4]. Changes in human population densities in census Super Output Areas (lower layer) and total population within wards wholly or partially contained within the Poole Harbour catchment between the 2001 and 2011 censuses are shown in Figure 3.1 and Figure 3.2.

In general, population density has increased across the entire catchment, with more than two thirds of wards showing an increase in population size (and therefore density). However, population densities in general remains fairly low (12.17 persons/hectare), with more than 50% of wards having a population density of < 5 persons per hectare. The main population centres remain in Poole on the northern side of the harbour, and Dorchester, in the upper reaches of the catchment. At detailed breakdown of population change for individual wards is shown in Appendix I.

At the 2001 census, the total resident population within wards wholly or partially contained within the Poole Harbour catchment was 239,231. By the time of the 2011 census, this had increased to 254,490, an increase of 6.38%. The population data for the 2011 census was collected two years after the original sanitary survey was conducted, and so could be considered more relevant to that document. Whilst the full results of the March 2021 census have not been published, the UK government estimates that the national population will have increased 6.6% between 2011 and 2021 (ONS, 2018). An increase of this proportion would see the approximate population residing within the Poole harbour catchment increase to 271,286 people. The potential for urban runoff remains highest from the town of Poole on the north side of Poole Harbour. Impacts from sewage discharges will depend on the specific nature and locations of such discharges, changes to which are discussed in the next section. Consultation with the LEA indicated that there is a proposed housing development on waterfront sites in Holes Bay, contamination from which would likely drain to the *Poole Harbour North* and *Whitley Lake* zones, were it not captured by the wastewater treatment network (WWTW). Furthermore, without upgrades to the WWTW, any increase in population would almost certainly lead to an increase in the loading to the WWTW and would therefore potentially cause increased bacterial loading to coastal waters.

The original sanitary survey does not present tourism statistics for the catchment, however Poole Harbour is a popular tourist destination. Precise tourism statistics for recent years are not available, although it is likely that the maximum increase in population (and therefore

[4] Note – a full census of the United Kingdom was conducted in March 2021, although the data from this census are not yet available.

loading to the WWTW network will occur during the summer months. It is assumed however that the existing capacity accommodates this increase.

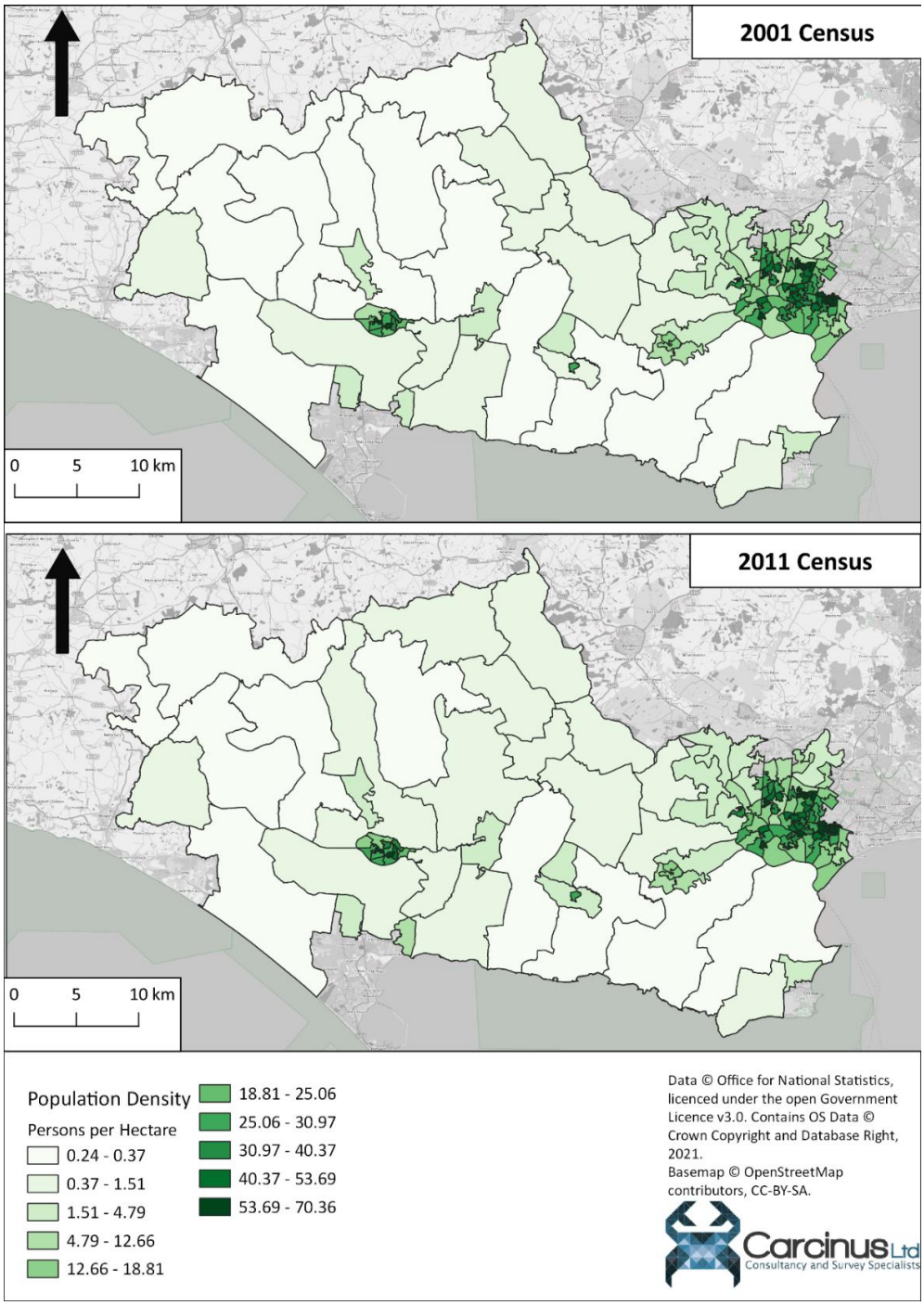


Figure 3.1 Human population density in 2001 and 2011 Census Super Output Areas (lower layer) that intersect the Poole Harbour catchment.

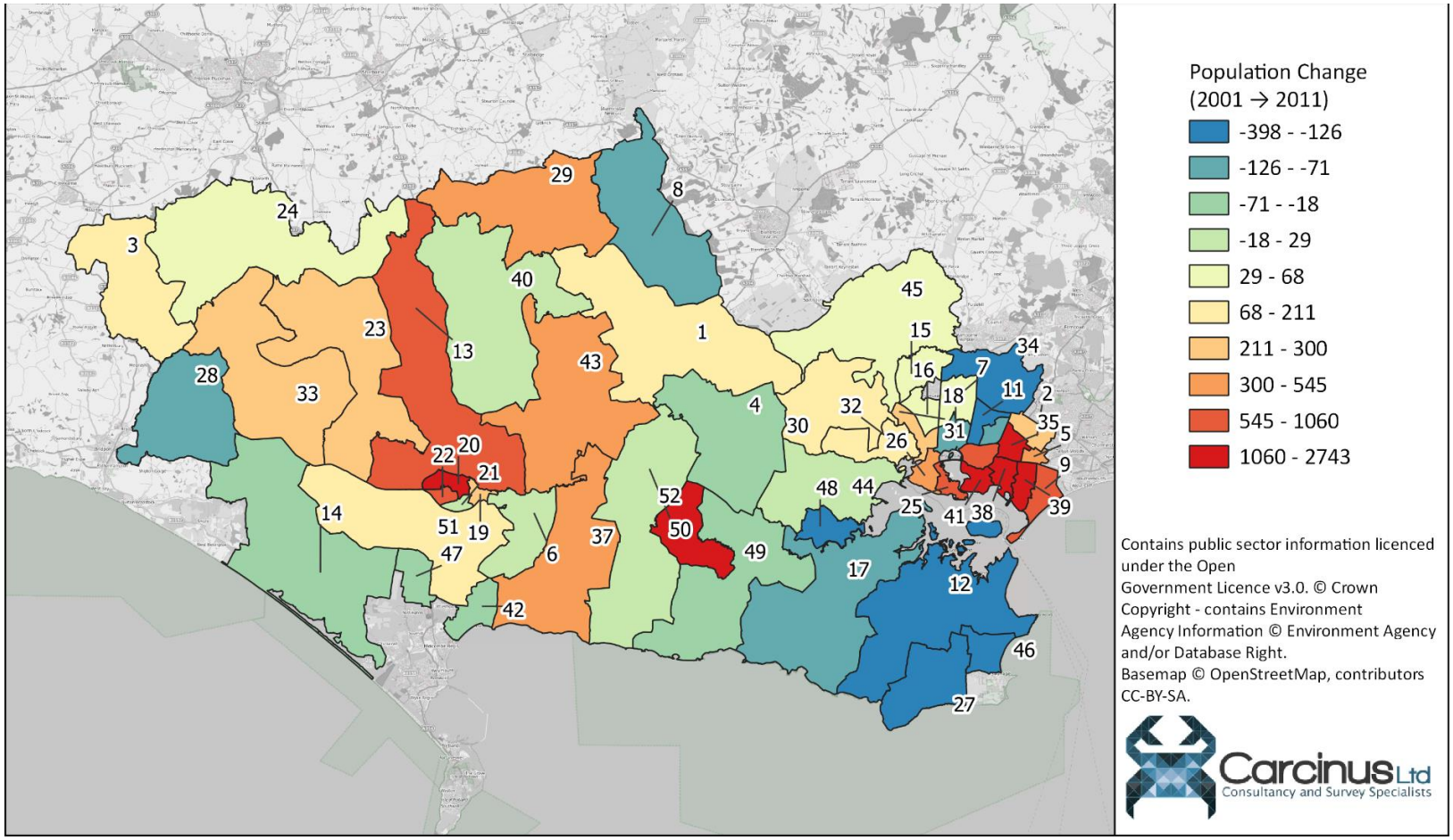


Figure 3.2 *Population change between the 2001 and 2011 censuses for Wards and Electoral divisions (based on 2011 boundaries) that are within or partially within the Poole Harbour catchment. 2001 Census data have been transposed to 2011 wards using the UK Data Service's GeoConvert tool (UK Data Service, 2021) to facilitate comparison. Numbers within wards are identifiers that can be used in combination with Appendix I to provide more detail.*

Whilst there is no recently available population data for the catchment, it is likely that the human population will have increased by a small percentage since the last sanitary survey was conducted. However, the distribution of main population centres within the catchment has not changed, and as such the recommendations for RMP location are still valid.

3.2 Sewage

Details of all consented discharges in the Poole Harbour catchment were taken from the most recent update to the EA's national permit database at the time of this report (April 2021). The locations of these discharges are shown in Figure 3.3.

The original sanitary survey only provides the details of seven continuous discharges that the authors identified as those with the greatest potential to impact the bacteriological health of the BMPA. All these discharges are still active, although the Brownsea Island STW is not water company owned and so is represented in Figure 3.3 as a private discharge to water. Furthermore, the Holton Heath STW which discharged continuously at a rate of 182 m^3/day at the time of the original sanitary survey, is currently listed as an intermittently discharging storm overflow (that did not spill at all during 2020 (Appendix II). The consented discharge rate for the other works have remained the same, except for Corfe Castle STW which now has a consented rate of 285 m^3/day, down from 370 m^3/day. The treatment methodologies have also all remained the same, with the three highest rates (Poole STW, Wareham STW and Lytchett Minster STW) having UV treatment, which significantly reduces the risk that these discharges present to the shellfishery. Initial consultation with the EA indicated that Corfe Castle STW will have UV treatment fitted during AMP7, with a deadline of September 2021. Secondary consultation revealed that as of 30th September 2021, this STW would have UV disinfection in place, which would significantly reduce the bacteriological contamination from this discharge.

In addition to the continuous discharges, the original sanitary survey identified a total of 22 intermittent discharges with the potential to impact the BMPA. Intermittent discharges comprise Combined Storm Overflows (CSOs), Storm Tank Overflows and Pumping Station Emergency Overflows. During AMP6 and AMP7, Event Duration Monitoring (EDM) was installed at the majority of the intermittent discharges within the Harbour, and summary data for 2020 was published by the Environment Agency in March 2021 (Environment Agency, 2021). Details of these data for those discharges in vicinity of the estuary are presented in Appendix II. The permit numbers for each discharge were used to join this dataset to the consented discharge database described in the previous paragraph. These data have been taken at face value, and some locations in the consented discharge database may be erroneous, meaning that the point appears in the wrong location. Some EDM returns had multiple meters on a single discharge activity, in this case we have presented all reported spill counts as individual values, unless the comment indicates that the meters were not working properly in which case the value was nulled. The EDM returns 'Activity Reference' field did not reliably distinguish between emergency overflows and storm overflows, therefore we have included all of these in the intermittent discharge category.

The original sanitary survey presents EDM data for four storm overflows within the Poole Harbour catchment. All four discharges spilled more frequently in 2020 than during the period considered by the authors of the original sanitary survey, indicating that the proximity of intermittent discharges needs to be given greater weighting in the development of a new sampling plan.

Finally, the original sanitary survey does not present the locations of any private (not water company owned) discharges, although it does state that the discharges are small (<5 m^3/day max flow). A number of these discharges remain, although most are still relatively small, and present less risk than the water company owned continuous and intermittent discharges.

Most of the consented discharges in the Poole Harbour catchment remain in the upper reaches of the catchment and will contribute to the background levels of contamination experienced by the shellfishery. Those discharges in closest proximity to the shellfish beds have not altered significantly in terms of the permitted discharge rates, although EDM data indicates that storm overflows are spilling more frequently. As such, the location of an intermittent discharge close to the CZs should be given greater consideration in any updated sampling plan.

Table 3.1 Details of continuous discharges in the Poole Harbour catchment.

ID	Sewage Treatment Works	Permit Number	Permit Version	Consent Active	NGR	Treatment	DWF
1	19 DWELLINGS AT STINSFORD HOUSE	400139/PW/01	3	06/04/2011	SY 70990 90800	PACKAGE TREATMENT PLANT	3
2	BLACKHEATH WWTW	042451	5	20/09/2018	SY 90933 92599	BIOLOGICAL FILTRATION	1200
3	BLACKHEATH WWTW	042451	5	20/09/2018	SY 90943 92658	BIOLOGICAL FILTRATION	1200
4	BROADMAYNE WWTW	040725	5	20/09/2018	SY 73449 86696	BIOLOGICAL FILTRATION	425
5	CERNE ABBAS	040015	4	31/03/2010	SY 66750 99850	BIOLOGICAL FILTRATION	159

ID	Sewage Treatment Works	Permit Number	Permit Version	Consent Active	NGR	Treatment	DWF
6	CORFE CASTLE STW	041324	6	29/06/2015	SY 96096 83153	BIOLOGICAL FILTRATION	285
7	DORCHESTER (LOUDS MILL) STW	401050	5	31/03/2010	SY 70970 90360	CHEMICAL - PHOSPHATE STRIPPING	9450
8	EAST STOKE SEWAGE TREATMENT WORKS	040109	2	01/01/2010	SY 87760 87000	BIOLOGICAL FILTRATION	11
9	EVERSHOT WASTEWATER TREATMENT WORKS	042453	5	31/03/2018	ST 57828 04359	BIOLOGICAL FILTRATION	146
10	GODMANSTONE STW	401521	2	01/04/2009	SY 66590 96430	ACTIVATED SLUDGE	35
11	HARMANS CROSS	040111	4	31/03/2010	SY 97470 80790	TERTIARY BIOLOGICAL	75
12	HIGHER ANSTY SEWAGE TREATMENT WORKS	050921	1	08/09/1983	ST 76740 04140	BIOLOGICAL FILTRATION	Unspecified
13	LYTCHETT MINSTER STW	401242	4	01/04/2010	SY 96850 92300	UV DISINFECTION	1600
14	MAIDEN NEWTON WATER RECYCLING CENTR	041353	6	31/03/2020	SY 60253 97176	BIOLOGICAL FILTRATION	318

ID	Sewage Treatment Works	Permit Number	Permit Version	Consent Active	NGR	Treatment	DWF
15	MILBORNE ST.ANDREW	042116	4	31/03/2010	SY 80250 96490	BIOLOGICAL FILTRATION	423
16	PIDDLEHINTON	040067	4	31/03/2010	SY 72170 96310	TERTIARY BIOLOGICAL	295
17	POOLE E STW	401354	9	14/09/2012	SZ 00710 93560	UV DISINFECTION	47700
18	PUDDLETOWN SEWAGE TREATMENT WORKS	402100	4	30/06/2013	SY 75060 94930	BIOLOGICAL FILTRATION	285
19	STUDLAND STW	041570	4	31/03/2010	SZ 02350 84540	BIOLOGICAL FILTRATION	227
20	SYDLING ST.NICHOLAS WRC	401025	4	14/02/2020	SY 63201 98437	BIOLOGICAL FILTRATION	86
21	TOLLER PORCORUM WRC	400607	6	14/02/2020	SY 56698 97970	BIOLOGICAL FILTRATION	77
22	WAREHAM WASTEWATER TREATMENT WORKS	401336	5	26/01/2017	SY93640 88630	UV DISINFECTION	2502
23	WOOL STW	401747	3	31/03/2010	SY82450 87380	CHEMICAL - PHOSPHATE STRIPPING	2205

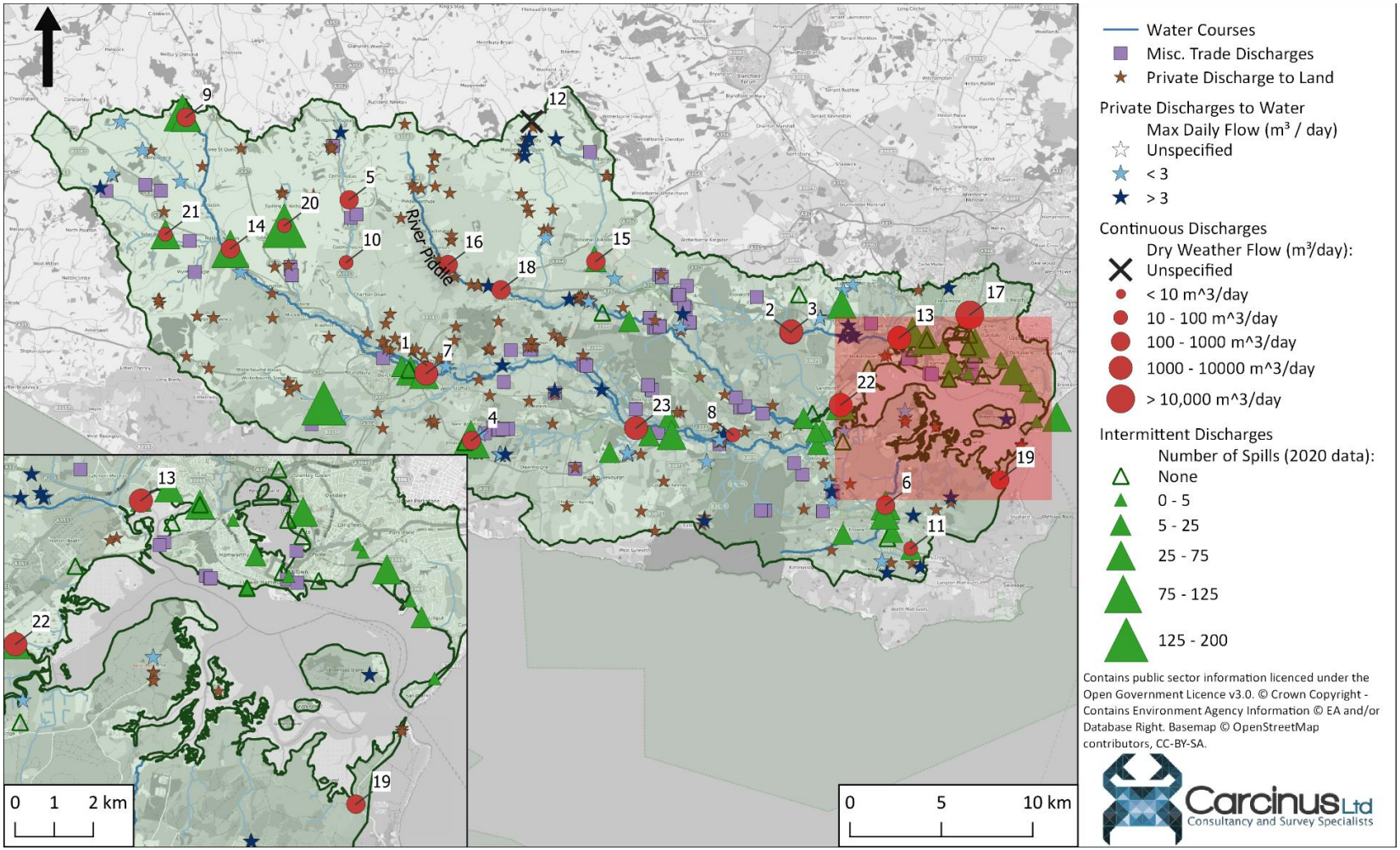


Figure 3.3 Locations of all consented discharges in the Poole Harbour catchment. Labels refer to continuous discharges, details of which can be found in Table 3.1. Details of intermittent discharges can be found in Appendix II.

3.3 Agricultural Sources

The original sanitary survey does not explicitly state livestock population data for the time that the survey was conducted, although it does state that there are areas of pasture to the south and west, comprising several beef and dairy farms. Analysis of land cover data from 2013 and 2018 (Figure 3.4) indicates that these areas of pasture remain in place. Grazing areas immediately adjacent to shorelines represent a potentially significant source of microbiological contamination to shellfisheries. At the time of the original sanitary survey, the Environment Agency was not aware of any issues from these farms and initial consultation for this review did not indicate any.

Livestock data for Local Authority Districts that fall within or partially within the Poole Harbour catchment were available for 2013 and 2016 (DEFRA, 2018). These data have been used to give an indication of livestock population trends in the period since the original sanitary was published. As only a small proportion of some of the districts falls within the catchment, the livestock data have been adjusted to reflect the % of each district that falls within the catchment. This assumes that livestock are distributed uniformly throughout the district, and therefore, some inaccuracies may be present. Aggregate adjusted livestock population change data are shown in Figure 3.5 and Table 3.2.

Overall, livestock populations decreased by 7.87% between 2013 and 2016, though within this overall statistic are notable differences between both districts and species. The East and West Dorset districts saw increases of 41.87% and 33.36% respectively, whereas the Bournemouth, Poole and Christchurch district saw a fall of more than 25%. Across all districts, cattle and sheep populations remained relatively stable, increasing by 1.76% and 5.64% respectively. However, the pig population fell by nearly 29% and the poultry population increased by 24.25%. The poultry population remains the largest by population size, estimated to be at more than 190,000 animals in 2016. Across all groups of animals, the livestock population will vary throughout the year, with the highest numbers occurring during Spring and lowest numbers when animals are sent to market in Autumn and Winter.

Despite the populations of some groups and in some districts increasing dramatically, livestock populations have fallen across the catchment and the density of livestock remains fairly low at just above 4 animals per hectare. However, the probable routes of contamination remain unchanged. As such, the recommendations made in the original sanitary survey to capture this source of pollution remain valid.

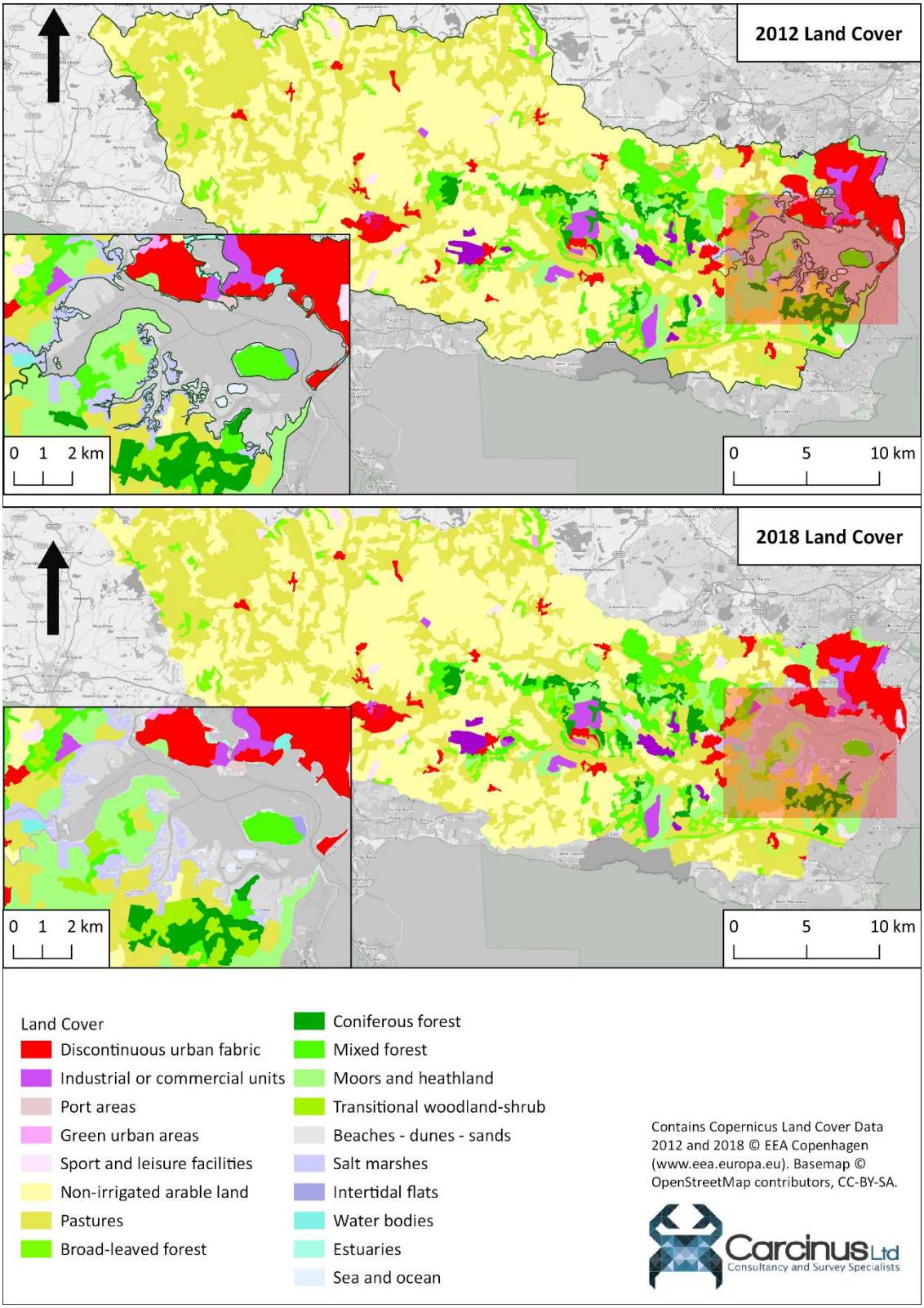


Figure 3.4 Change in the land cover of the Poole Harbour catchment between 2012 and 2018.

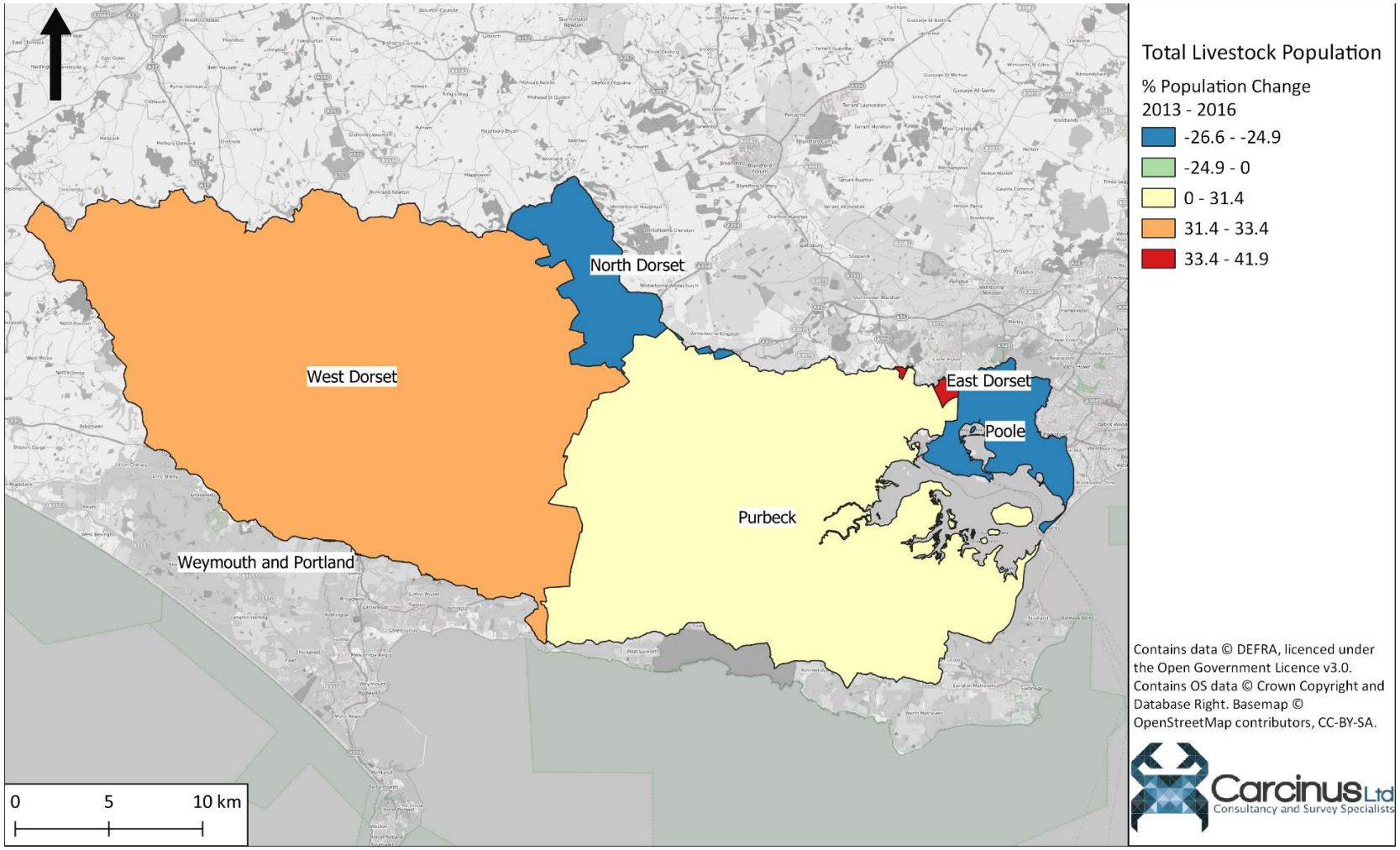


Figure 3.5 Livestock population change between 2013 and 2016 for Local Authority Districts wholly or partially contained within the Poole Harbour Catchment.

Table 3.2 Livestock population data for the Poole Harbour catchment between 2013 and 2016.

Local Authority District	Area Within Catchment (Ha)	% Within Catchment	% Of Catchment Area	Cattle Population			Sheep Population			Pig Population			Poultry Population		
				2013	2016	% Change	2013	2016	% Change	2013	2016	% Change	2013	2016	% Change
Poole (as Poole, Christchurch & Bournemouth)	3,047.17	18.89%	3.69%	342	312	-8.81%	0	0	0.00%	0	0	0.00%	83	0	-100.00%
East Dorset	152.15	0.43%	0.18%	39	38	-4.89%	36	41	13.98%	5	25	412.06%	590	847	43.59%
North Dorset	3,737.81	6.13%	4.53%	3,131	2,920	-6.72%	2,728	3,056	12.06%	377	455	20.82%	81,518	59,425	-27.10%

Local Authority District	Area Within Catchment (Ha)	% Within Catchment	% Of Catchment Area	Cattle Population			Sheep Population			Pig Population			Poultry Population		
				2013	2016	% Change	2013	2016	% Change	2013	2016	% Change	2013	2016	% Change
Purbeck	31,773.46	78.57%	38.49%	16,163	17,450	7.96%	20,198	22,374	10.77%	1,436	631	-56.06%	40,910	50,058	22.36%
West Dorset	43,826.61	39.01%	53.09%	38,977	38,967	-0.03%	46,904	48,337	3.05%	20,675	14,909	-27.89%	29,816	79,662	167.18%
Weymouth and Portland	11.12	0.01%	0.01%	10	10	-0.03%	12	12	3.05%	5	4	-27.89%	8	20	167.18%
TOTAL	**82,548.32**	**31.12%**	**100.00%**	**58,662**	**59,696**	**1.76%**	**69,878**	**73,820**	**5.64%**	**22,498**	**16,024**	**-28.78%**	**152,924**	**190,011**	**24.25%**

3.4 Wildlife

As a result of its variety of natural habitats and the wildlife these habitats support, Poole Harbour and surrounding areas are conferred protection under a variety of statutory and non-statutory designations, including as a Special Protection Area (SPA) under the EU Birds Directive and as a Site of Special Scientific Interest (SSSI).

These designations are in part due to the significant populations of overwintering waterbirds. Waterbirds represent a potentially significant source of faecal contamination to BMPAs as they typically forage for food (and defecate) on shellfish beds. The original sanitary survey does not report a five-year average of overwintering birds, however the Wetland Bird Survey of 2009/10 (Holt *et al.*, 2011) gives a five-year average of 22,847 birds, including large populations of Brent Goose, Shelduck and Avocets. The most recently available survey, (2019/20, (Frost *et al.*, 2021)) gives a five-year average of 25,042 birds, an increase of 9.6% on the 2009/10 five-year average, although the dominant species remain the same. Owing to the importance of Poole Harbour for these species and the areas' designation as an SPA, SIFCA conduct an annual assessment of the interaction between shellfish dredging activity and important habitats for waterbirds with a view to informing the issuing of permits under the Poole Harbour Dredge Permit Byelaw (PHDPB). As a result of these assessments, dredging is prohibited in a number of bird sensitive areas, mainly in the channels and lakes on the north and south side of the harbour (SIFCA, 2020[5]). Whilst there are hotspots of bird activity within the BMPA, the precise distributions of the birds will vary year-on-year as they forage for prey. As such, it is difficult to define RMP positions to accurately capture this source of pollution, except for Barrel O (B54BS), which was deliberately located due to the proximity of black-headed gull nests on the small saltmarsh islands in Wareham Channel.

There is no major grey or harbour seal colony in Poole Harbour, and although grey seals are occasionally observed foraging, they are unlikely to be a significant source of contamination and do not require consideration in any updated sampling plan. There remains a large population of feral sika deer (*Cervus nippon*) in Purbeck, which may contribute to background levels of faecal contamination, given that their grazing areas often extends to the shoreline.

Waterbird populations are the main group likely to contribute significant amounts of bacteriological contamination to the BMPA, although it remains challenging to account for the pollution from wildlife in any updated sampling plan, due to the spatial and temporal variability of the pollution source. Dredging in the priority habitat areas for this species is prohibited under the PHDPB, reducing the risk of contaminated shellfish, but no further recommendations can be made to account for this source of pollution.

[5] Map cannot be reproduced for copyright purposes but can be found on p72 of the SIFCA report cited.

3.5 Boats and Marinas

The discharge of sewage from boats is a potentially significant source of bacterial contamination of shellfisheries within the Poole Harbour BMPA. Boating activities within the harbour have been derived through analysis of satellite imagery and various internet sources and compared to that described in the original sanitary survey. Their geographical positions are presented in Figure 3.6.

Poole Harbour is extremely popular with recreational boat users/owners; the original sanitary survey describes that there are 2500 swinging moorings, and whilst the current number is around 2000 (PHC, 2021b), this still represents a very large number of yachts using the waters of the BMPA each year and the moorings are still in the same areas. The original sanitary survey describes a local byelaw prohibiting marine toilet disposal within the harbour. No details of this byelaw could be found, although Poole Harbour Commissioners (PHC) discourage the practice (PHC, 2021a). Furthermore, pump out facilities are located at Poole Harbour and Poole Quay Boat Haven, which should reduce the risk of contamination originating from recreational boat users.

In addition to the recreational boating activity, there is a significant amount of commercial shipping within Poole Harbour. The most recent update to the UK Governments Fishing Vessel Lists (gov.uk, 2021) lists Poole as the home port for a total of 63 vessels (60 <10 m, 3 >10 m) and the administrative port for 220 vessels (210 <10 m, 10 >10 m). Furthermore, the Port of Poole can receive vessels of up to 210 m in length and handles a variety of freight as well as passenger ferries and cruise ships. The deep-water facilities at Poole were opened in 2018 (PHC, 2021c), which may have increased the commercial shipping traffic operating moving in and out of the harbour, however commercial vessels are prohibited from making overboard discharges within 3 nm of land[6], limiting the risk of this source of contamination.

No changes have occurred to either the main areas of shipping activity, or the probable magnitude of any overboard discharges, given that release of sewage by vessels is either still prohibited (in the case of commercial vessels) or strongly discouraged (in the case of recreational boats). The original sanitary survey did not make recommendations for its sampling plan to capture this source of pollution, and given the lack of changes likely to increase the risk, no additional weighting is warranted from this review.

[6] The Merchant Shipping (Prevention of Pollution by Sewage and Garbage) Regulations 2008.

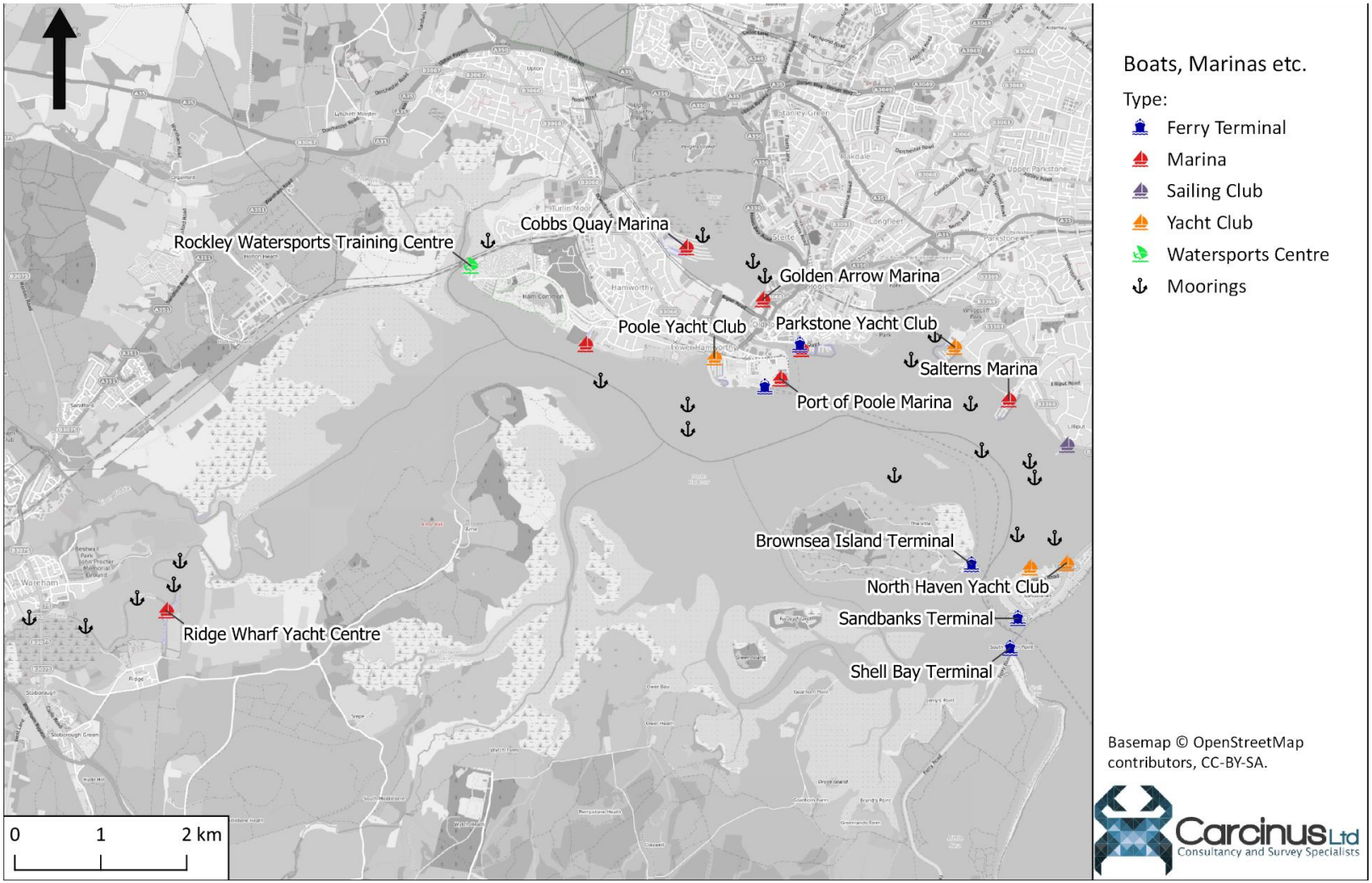


Figure 3.6 Locations of moorings, marinas, and other boating activities within Poole Harbour.

3.6 Other Sources of Contamination

Urban fabric within the catchment remains centred on the northern side of Poole Harbour in the form of Poole. Another urban centre, Dorchester, is located in the upper reaches of the catchment. The settlements nearer to waterbodies remain a greater risk of diffuse microbiological contamination through utility misconnections and dog fouling. The geographical extent of urban settlements within the catchment have not increased significantly since the original sanitary survey was published (Figure 3.43.4), despite new housing developments near Holes Bay as indicated by the LEA, and therefore the risk that these settlements pose remains broadly similar.

Poole Harbour has several signposted walks that circumnavigate the BMPA, whilst the paths run some distance from the shoreline on the south side, the pass along the coastline on the north side (pooleharbourtrails.org.uk, 2021), and so there may be some impact from dog fouling in the nearshore zone. The extent of this source of pollution is not assessed to have changed significantly since the original survey was published.

No evidence of significant changes to these sources of contamination exists. Therefore, it can be assumed that the RMP location recommendations made in the original sanitary survey will still capture the influence of these sources.

4 Hydrodynamics/Water Circulation

The original sanitary survey does not present any bathymetric data or admiralty charts for the BMPA. Briefly, the Harbour contains a deeper channel on the northern side of Brownsea island which facilitates access to the marinas and ports located around Poole. On the southern side of the harbour, water depths are shallower and sand banks are common. Poole Harbour Commissioners conduct maintenance dredging to maintain the depths of navigation channels.

Tidal circulation is the main force controlling water circulation in the Harbour, with strongest flows (and therefore dispersal of contamination) near the Harbour entrance and main channels. In the periphery of the harbour flows are much lower, less than 0.2 m/s. Contamination from shoreline sources nearer the entrance will be dispersed fairly rapidly, although contamination from sources nearer the riverine inputs will be dispersed more slowly.

It is considered unlikely that the hydrodynamics of Poole Harbour will have changed significantly and as such, the recommendations made in the original sanitary to account for water circulation remain valid.

5 Rainfall

Rainfall data for the Frome at East Stoke Total monitoring station (NGR: SY867868) from 2001 – 2009 (pre sanitary survey) and 2010 – 2017 (post sanitary survey) were taken from

the National River Flow Archives (NRFA)[7] (NRFA, 2021) and processed in R (R Core Team, 2020) usin the 'rnrfa' package (Vitolo, 2016). These data were used to determine whether any changes in rainfall patterns had occurred since the original sanitary survey. The monitoring results are summarised in Table 5.1, and Figure 5.1Figure 5.15.1 shows the average daily rainfall totals each month at the East Stoke Total monitoring station.

Whilst rainfall has increased slightly since the original sanitary survey was published, two sample t-tests indicated that there was no significant difference (p = 0.785) between the mean daily rainfall per month between the 2001 – 2009 and the 2010 – 2017 periods.

Table 5.1 Summary statistics for rainfall before and after the original sanitary survey.

Period	Mean Annual Rainfall (mm)	% Dry Days	% Days > 10 mm	% Days > 20 mm
2001 - 2009	1052.20	42.96	29.24	17.61
2010 - 2017	1055.29	39.49	30.18	17.71

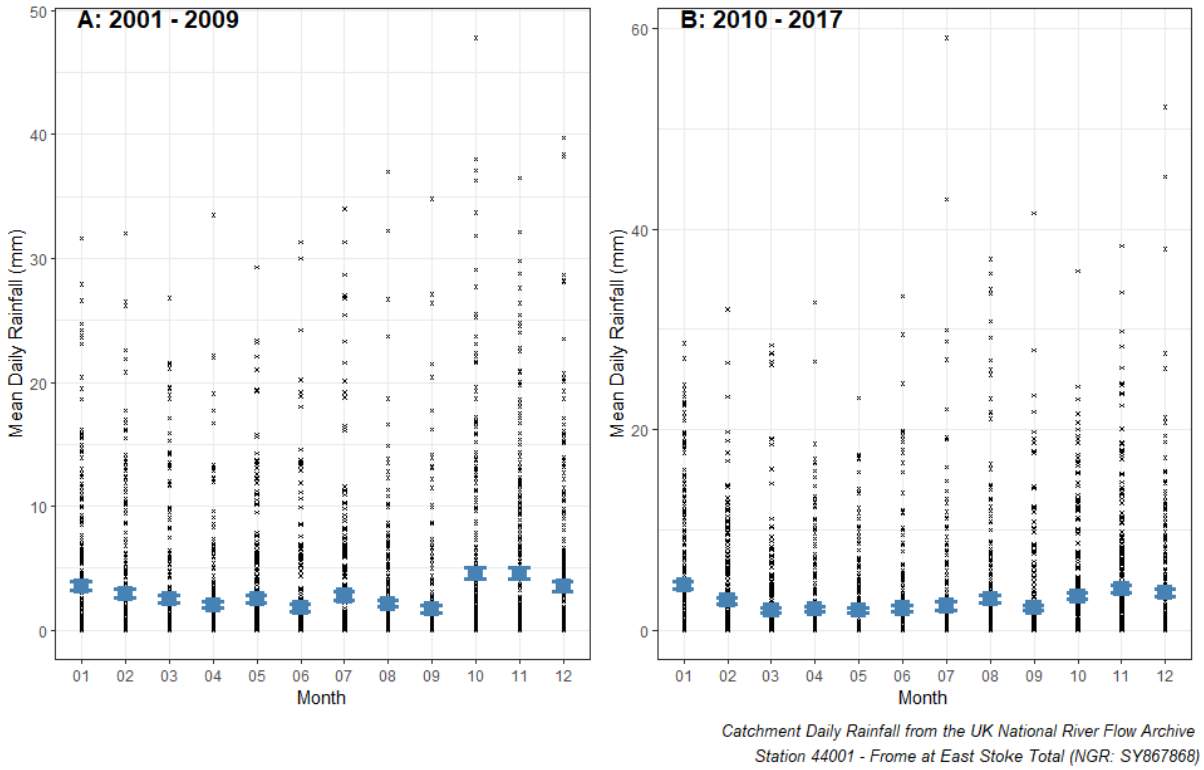


Figure 5.1 Mean daily rainfall (mm) per month for the Frome at East Stoke Total (NGR: SY867868) for the period (A) 2001 – 2009 and (B) 2010 – 2017.

Rainfall leads to increased faecal loading through two factors; elevated levels of surface runoff and spill events from intermittent discharges. However, as the rainfall patterns have

[7] Note – Catchment Daily Rainfall data is only available up to 2017 for monitoring stations on the NRFA.

remained consistent across the two time periods, significantly increased bacterial loading due to these factors are 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 Summary Statistics and geographical variation

There is a total of 15 RMPs that have been sampled within the Poole Harbour BMPA since the original sanitary survey was published. Thirteen of these are for mussel (*Mytilus edulis*) and two are for Pacific oyster (*Crassostrea gigas*). These two species are used to classify CZs for all the harvested species. Of these RMPs, six were sampled prior to the original sanitary survey, sampling at four began in 2012 (following the agreement of the sampling plan from the original sanitary survey), at one point in 2015, 2018 and 2019 and at two more in 2016. Only four of these RMPs are no longer sampled, Poole Coastal (B54CU) is no longer sampled due to the areas declassification in September 2020, and the other RMPs are no longer used due to a lack of stock. The geometric mean results of Official Control Monitoring for all RMPs sampled since 2003 (that have had a sample taken in the last 5 years) are presented in Figure 6.1 and summary statistics are presented in Table 6.1. All data have been taken directly from the Cefas datahub[1] and have been taken at face value.

There are sizable differences in geometric mean *E. coli* levels at RMPs within the BMPA, with most having a fairly low mean, and one (West Brownsea Relay Area (B54CV)) falling below the Class A threshold of 230 MPN/100 g. However, a few RMPs have notably higher mean results, with four RMPs (Rockley (B54BR), Barrel 'O' (B54BS), Gigger's Island (B54CQ) and North Haven Pontoon (B54CN)) have mean *E. coli* results of approximately 2,000 MPN/100 g or above. There does appear to be some geographical trend to the pattern of mean *E. coli* observed, with RMPs closer to the periphery of the Harbour, particularly at the western end, returning higher mean *E. coli*. There is only one example of a RMP co-located for both sampled species (West Brownsea Relay Area (B54CK & B54CL)), and in that instance the mean results are very similar (375.57 and 350.94 respectively).

Figure 6.2 and Figure 6.3 present boxplots of *E. coli* monitoring results from mussel and Pacific oyster RMPs respectively. One-way analyses of variance (ANOVA) tests were performed on the data to investigate the statistical significance of any differences between monitoring results from the various RMPs. All statistical analysis described in this section was undertaken in R (R Core Team, 2020). These tests revealed that Barrel 'O' (B54BS) returned significantly higher monitoring results than Hamworthy (B054P) ($p < 0.00001$), South Deep (B54AS) ($p < 0.00001$), Round island (B54BM) ($p < 0.0001$), Rockley (B54BR) ($p = 0.034$), West Brownsea West Cardinal (B54CL) ($p < 0.001$), Brands Bay (B54CM) ($p < 0.001$) and Whitley Lake (B54CP) ($p = 0.028$). Results from all RMPs show large variance, which could explain why no further significant differences were found in the data despite some visual differences in both the geometric means (Figure 6.1) and medians (Figure 6.2). No significant difference was found between the two Pacific oyster RMPs ($p = 0.8$).

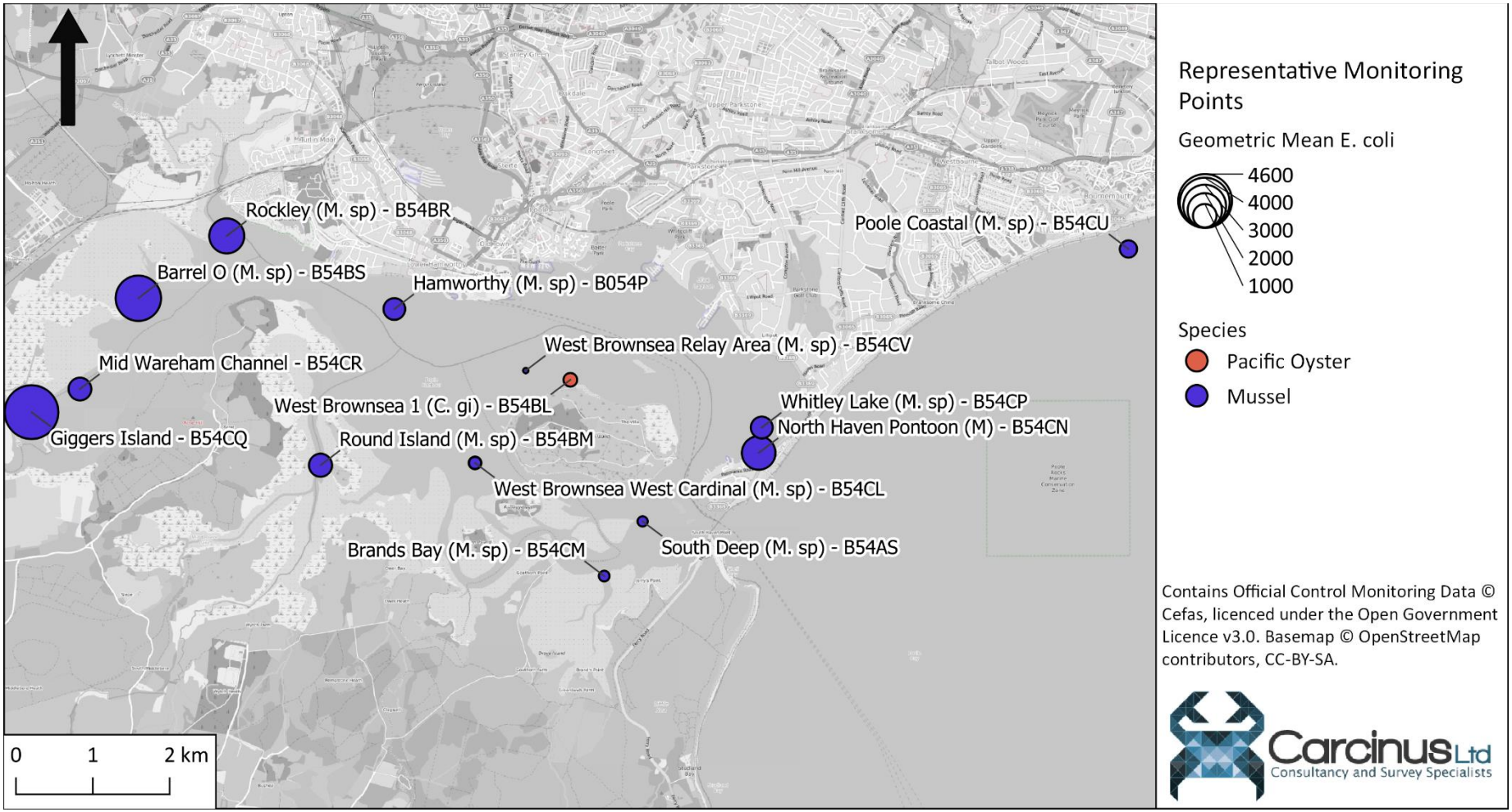


Figure 6.1 Geometric mean E. coli results from Official Control Monitoring at bivalve RMPs within the Poole Harbour BMPA.

Table 6.1 Summary statistics of E. coli (MPN/100 g) from RMPs sampled since the original sanitary survey. Data was cut off at May 2021.

ID	Site (Species)	NGR	Species	No.	First Sample	Last Sample	E. coli (MPN/100 g) Geometric Mean	Min Value	Max Value	% > 230	% > 4,600	% > 46,000
1	Hamworthy (M. sp) - B054P	SY99528963	Mussel	211	14/01/2003	11/05/2021	868.43	18	35,000	48.82	2.84	0.00
2	South Deep (M. sp) - B54AS	SZ02758687	Mussel	194	08/04/2003	11/05/2021	292.57	18	9,200	19.59	1.55	0.00
3	West Brownsea 1 (C. gi) - B54BL	SZ01818871	Pacific Oyster	185	16/11/2005	11/05/2021	413.47	18	9,200	32.43	2.16	0.00
4	Round Island (M. sp) - B54BM	SY98568760	Mussel	213	11/02/2003	11/05/2021	970.40	18	16,000	58.22	5.16	0.00
5	Rockley (M. sp) - B54BR	SY97349058	Mussel	197	29/01/2003	13/04/2021	2068.72	20	54,000	73.10	7.61	1.02
6	Barrel O (M. sp) - B54BS	SY96198977	Mussel	199	29/01/2003	11/05/2021	3359.34	18	160,000	83.42	13.07	1.01
7	West Brownsea West Cardinal (C. gi) - B54CK	SZ00578763	Pacific Oyster	107	04/04/2012	11/05/2021	375.57	18	9,200	32.71	0.93	0.00
8	West Brownsea West Cardinal (M. sp) - B54CL	SZ00578763	Mussel	106	04/04/2012	11/05/2021	350.94	18	3,500	32.08	0.00	0.00
9	Brands Bay (M. sp) - B54CM	SZ02258616	Mussel	102	16/05/2012	13/04/2021	307.76	18	5,400	24.51	0.98	0.00
10	North Haven Pontoon (M) - B54CN	SZ04268776	Mussel	55	04/04/2012	02/08/2016	1920.18	130	17,000	80.00	12.73	0.00

ID	Site (Species)	NGR	Species	No.	First Sample	Last Sample	E. coli (MPN/100 g) Geometric Mean	Min Value	Max Value	% > 230	% > 4,600	% > 46,000
11	Whitley Lake (M. sp) - B54CP	SZ04308809	Mussel	68	04/06/2015	11/05/2021	878.13	18	24,000	26.47	2.94	0.00
12	Giggers Island - B54CQ	SY94808829	Mussel	2	01/11/2016	07/02/2017	4600.00	1300	7,900	100.00	50.00	0.00
13	Mid Wareham Channel - B54CR	SY95438859	Mussel	2	01/11/2016	07/02/2017	945.00	490	1,400	100.00	0.00	0.00
14	Poole Coastal (M. sp) - B54CU	SZ09079041	Mussel	19	11/10/2018	10/12/2019	589.68	18	2,700	63.16	0.00	0.00
15	West Brownsea Relay Area (M. sp) - B54CV	SZ01238883	Mussel	24	05/02/2019	13/04/2021	215.00	18	780	25.00	0.00	0.00

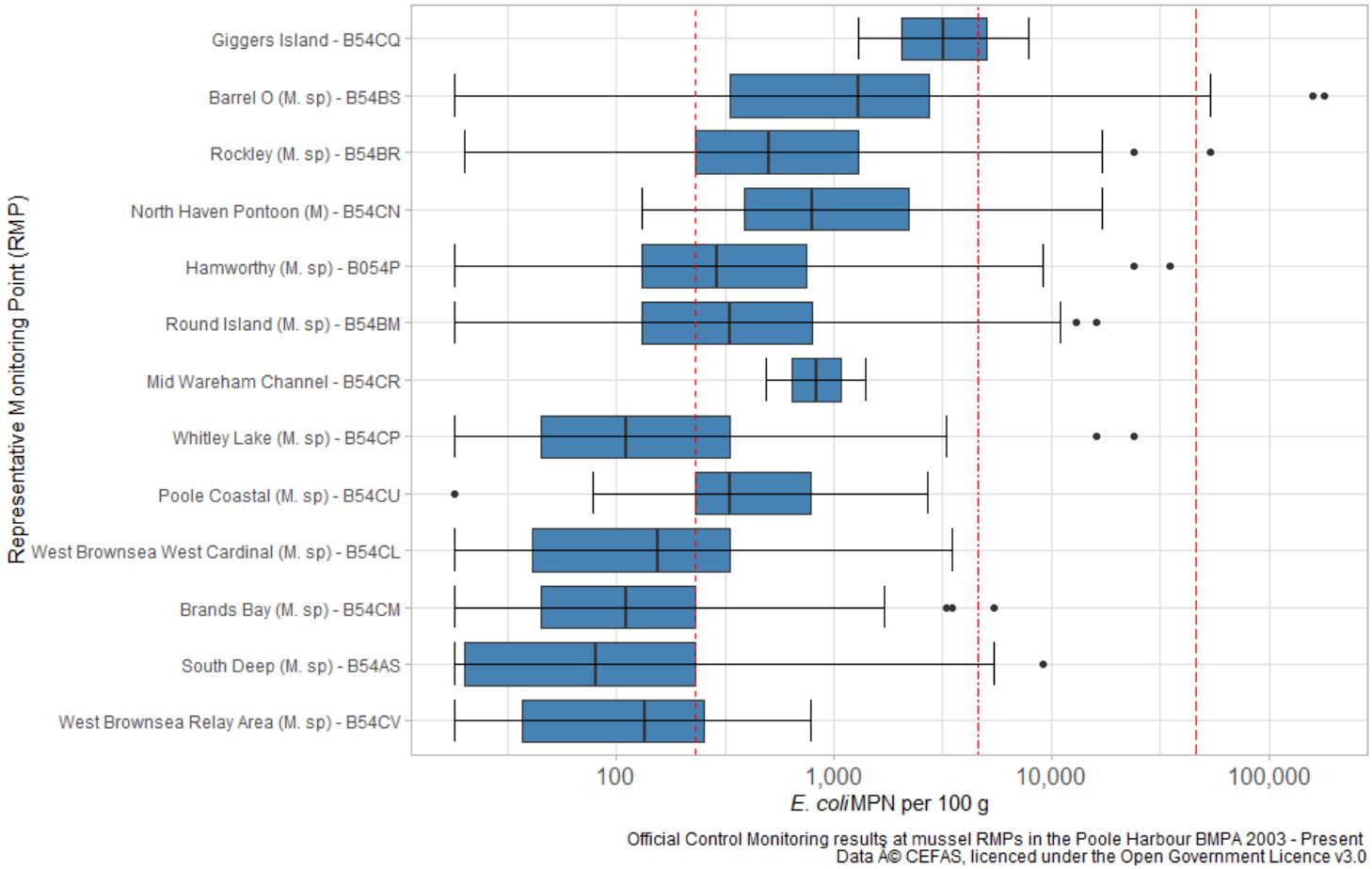


Figure 6.2 Boxplots of E. coli levels at mussel RMPs sampled within the Poole Harbour BMPA 2003 – Present. Central line indicates median value, box indicates lower – upper quartile range and whisker indicates minimum / maximum values excluding outliers (points > 1.5x the interquartile range).

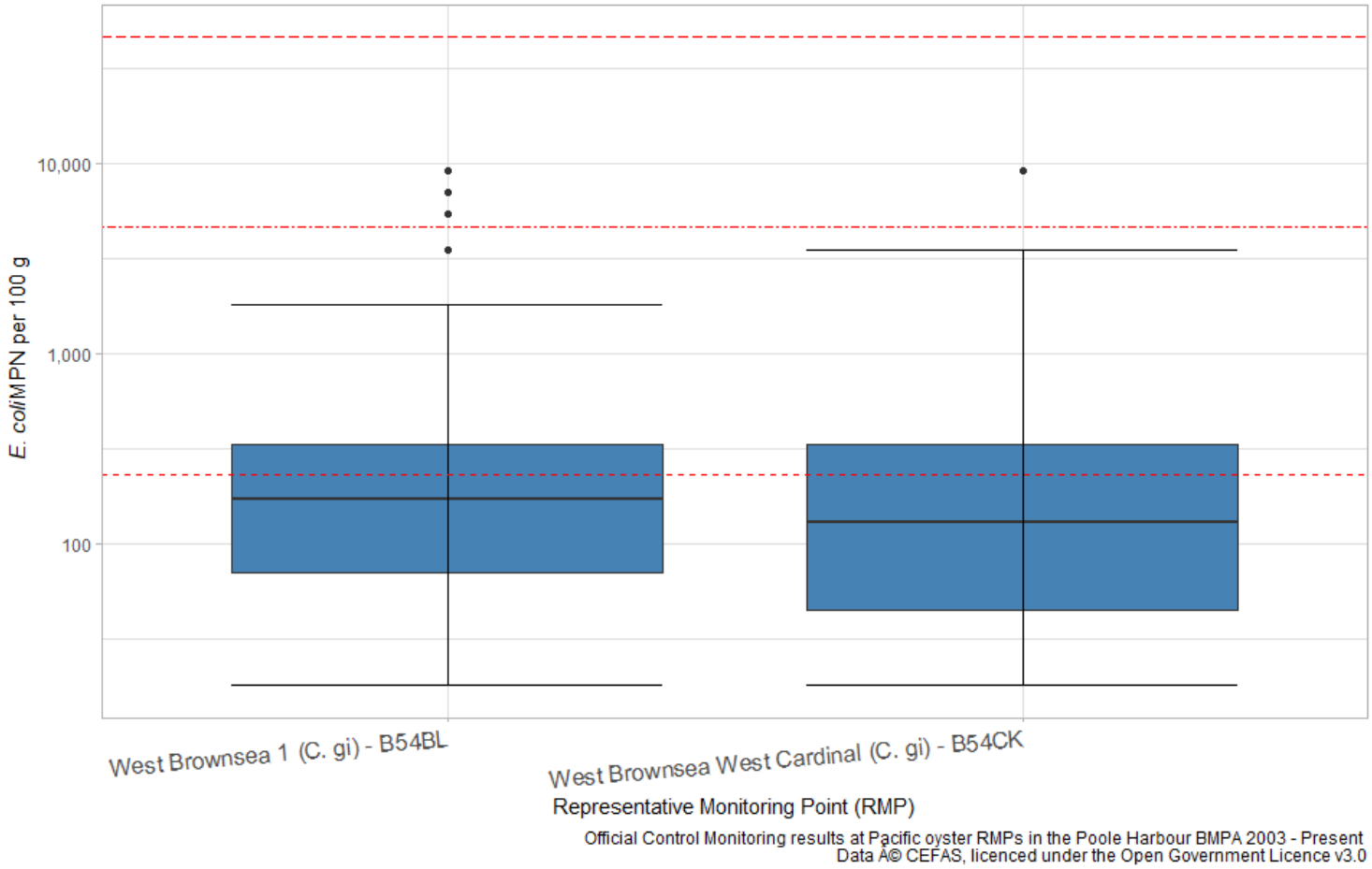


Figure 6.3 Boxplots of E. coli levels at Pacific oyster RMPs sampled within the Poole Harbour BMPA 2003 – Present. Central line indicates median value, box indicates lower – upper quartile range and whisker indicates minimum / maximum values excluding outliers (points > 1.5x the interquartile range).

6.2 Overall temporal pattern in results

The overall temporal pattern in shellfish flesh monitoring results for mussel and Pacific oyster RMPs are shown in Figure 6.4Figure 6.46.4 and Figure 6.5 respectively.

The loess models fitted to the *E. coli* monitoring results from mussel RMPs indicate that, where RMPs have been sampled for multiple years, results are relatively stable, falling either just below, or just above the lower threshold of 230 MPN/100 g, which is required for Class A. Most RMPs show a gradual increase from 2009 (or whenever sampling began at a particular RMP) up to a peak in 2015, before showing a gradual decline. There is no obvious change that occurred at this time that would cause this pattern across the entire BMPA. Whilst it was sampled, the trend line from North Haven Pontoon (B54CN) was high, relative to other RMPs. Despite the fact that it has been sampled for the shortest time of any currently active RMP, the scatter plot of results from West Brownsea Relay Area (B54CV) indicates that the trend line, is likely to be lower than other RMPs, likely due to its position in the middle of the Harbour, away from shoreline contamination sources.

Monitoring results from Pacific oyster RMPs (Figure 6.5) also indicate a general stability in the levels of *E. coli* recorded in shellfish flesh samples. The trend lines indicate a pattern of slowly decreasing *E. coli* results (i.e., improving water quality) from approximately 2015, similar to the mussel RMPs.

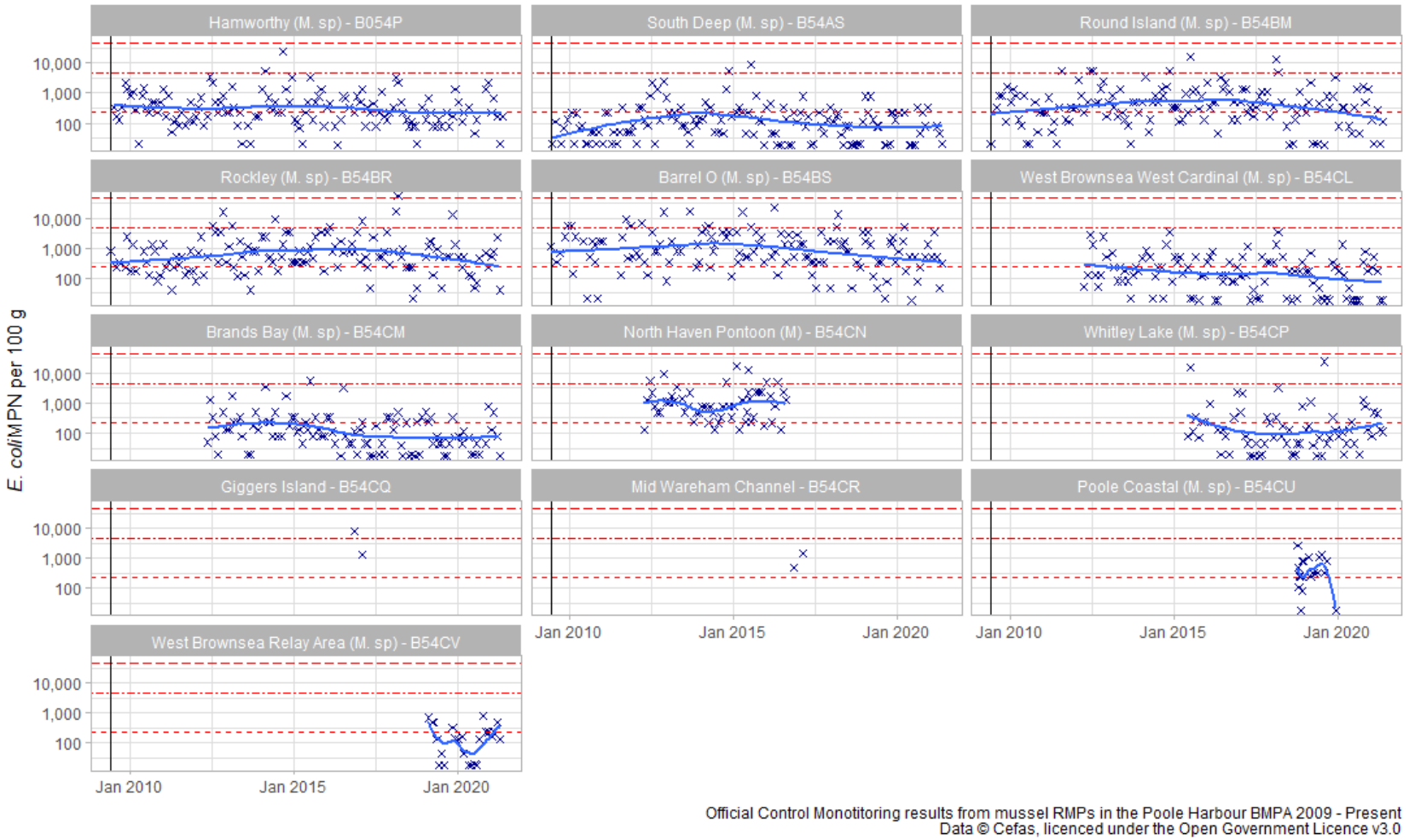


Figure 6.4 Timeseries of E. coli levels at mussel RMPs sampled in the Poole Harbour BMPA 2009 – Present. Scatter plots are overlaid with a loess model fitted to the data.

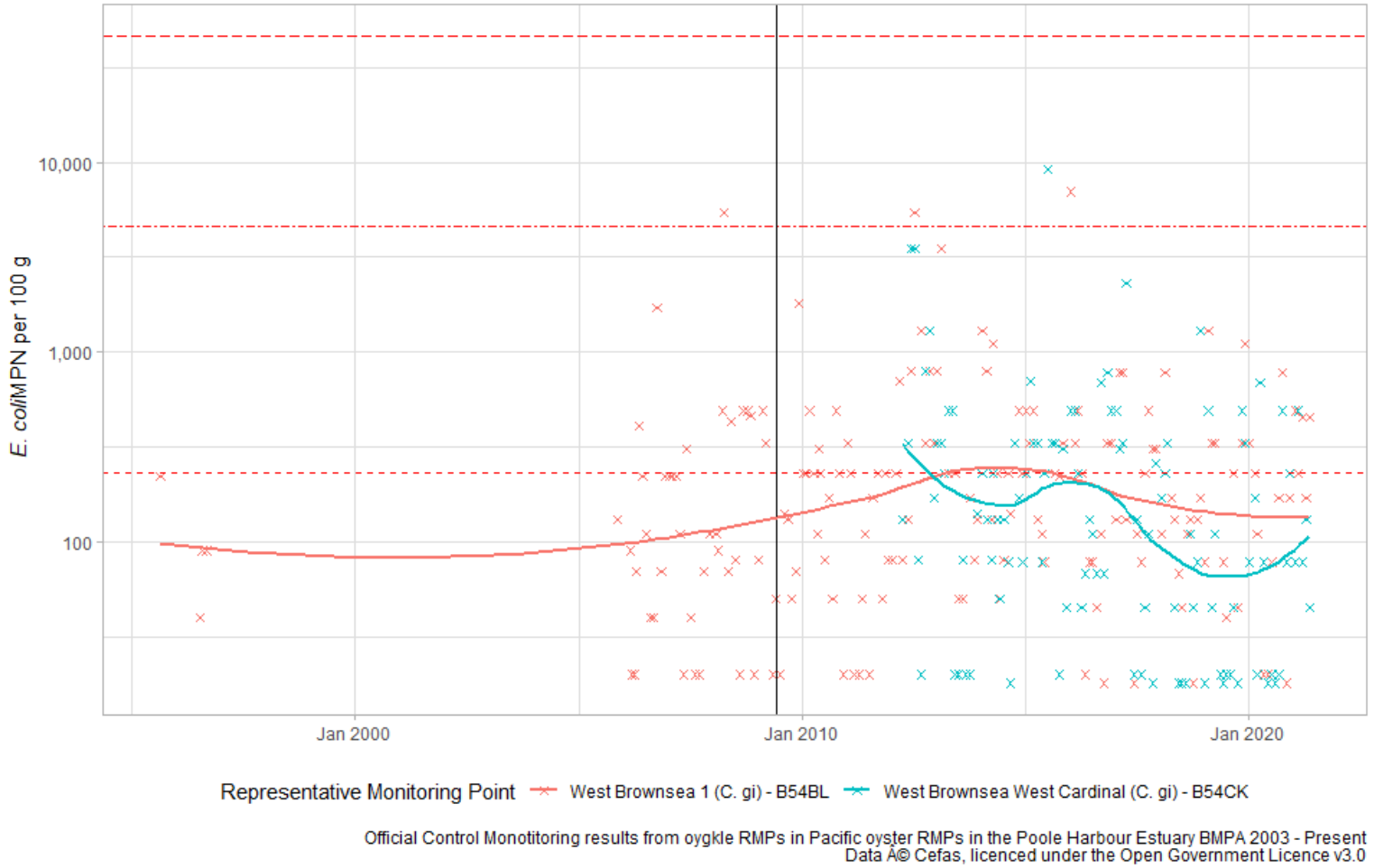


Figure 6.5 Timeseries of E. coli levels at Pacific oyster RMPs sampled in the Poole Harbour BMPA 2003 – Present. Scatter plots are overlaid with a loess model fitted to the data.

6.3 Seasonal patterns of results

The seasonal patterns of *E. coli* levels at the various RMPs within the Poole Harbour BMPA were investigated and are presented in Figure 6.6 (mussel RMPs) and Figure 6.7Figure 6.76.7 (Pacific oyster RMPs). The data for each year were averaged into the four seasons, with Winter comprising data from January – March, Spring from April – June, Summer from July – September and Autumn from October – December. Two-way ANOVA testing was used to look for significant differences in the data, using both season and RMP as independent factors (i.e. pooling the database across RMP and season respectively), as well as the interaction between them (i.e. exploring seasonal differences within a given RMP). Significance was taken at the 0.05 level.

Two-way ANOVA tests did not indicate any statistically significant seasonal differences in the levels of *E. coli* when data were pooled between RMPs, or when seasonal differences for a specific RMP were considered ($p > 0.05$)..

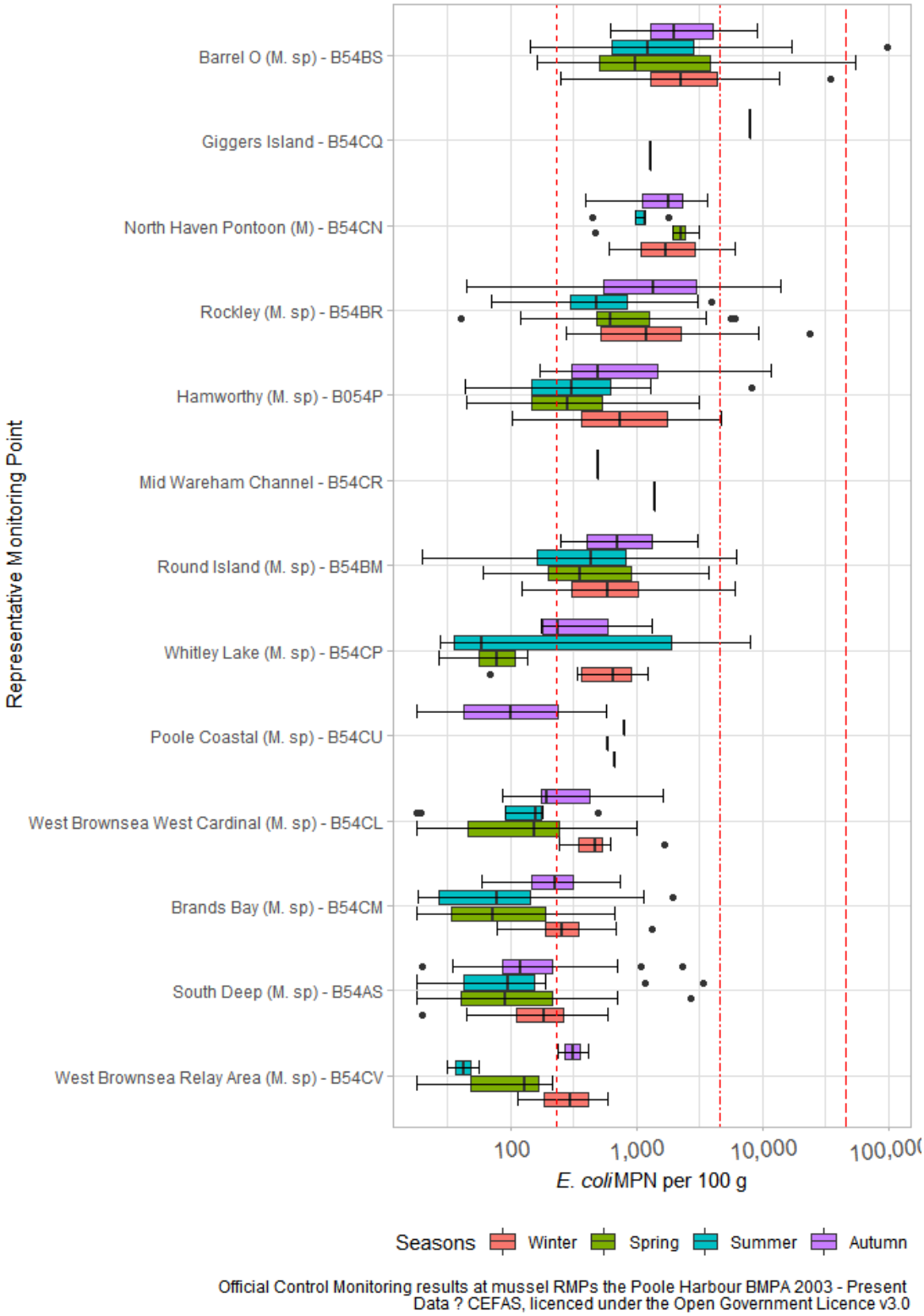


Figure 6.6 Boxplots of E. coli levels per season at mussel RMPs sampled within the Poole Harbour BMPA 2003 – Present.

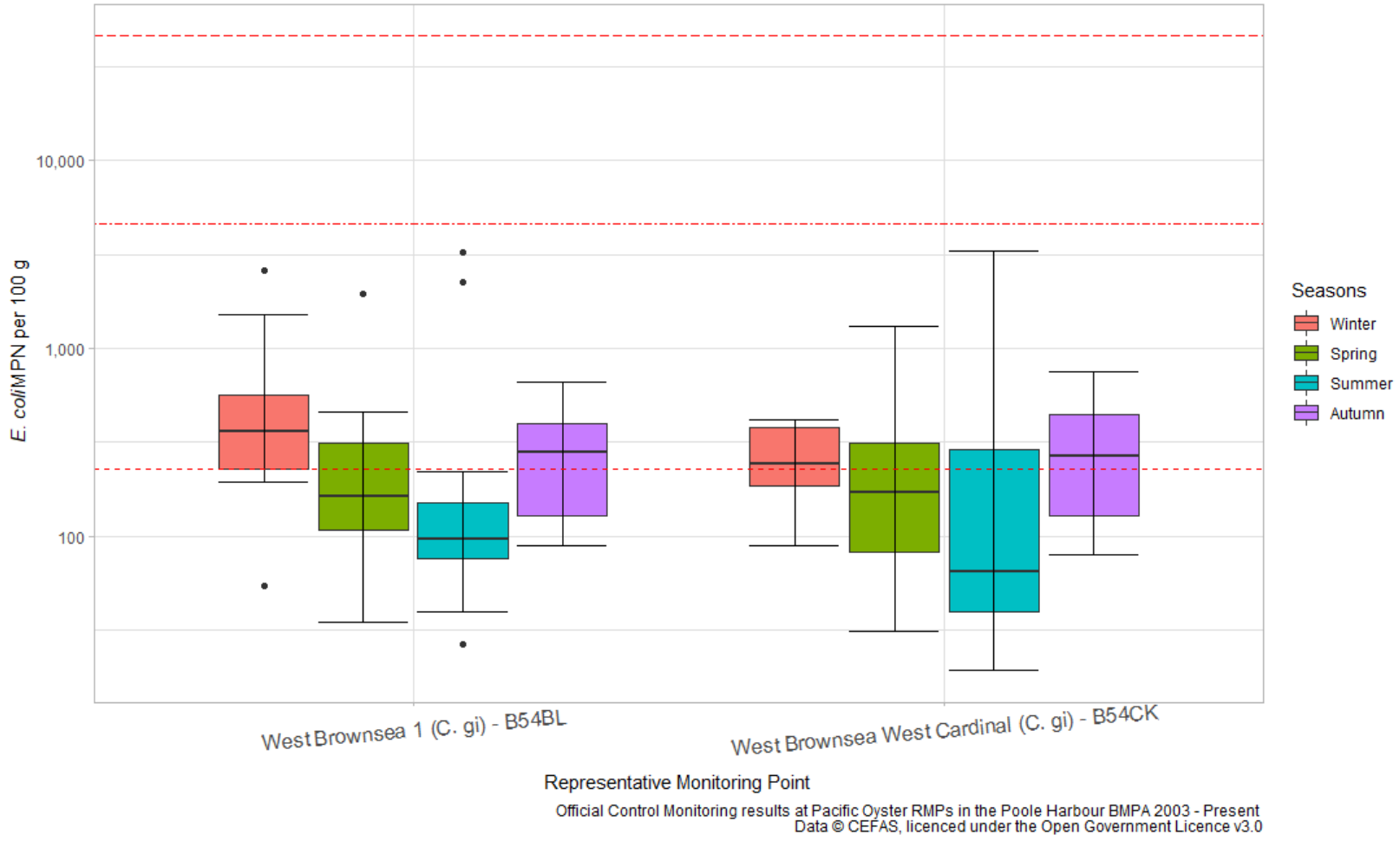


Figure 6.7 Boxplots of E. coli levels per season at Pacific oyster RMPs sampled within the Poole Harbour BMPA 2003 – Present.

7 Conclusion and overall assessment

Poole Harbour is a large, naturally occurring harbour on the south coast of England that supports a thriving wild cockle and manila clam fishery, as well as a productive aquaculture fishery, including the largest Pacific oyster fishery in England. Most of the waters of the BMPA are classified for the various species.

The total population in Electoral Wards contained within or partially within the Poole Harbour catchment increased by 6.38% between the 2001 and 2011 censuses (the most recent for which data available). The population increase has been relatively consistent across the catchment, with more than two thirds of wards showing a population increase. Population density remains low across the catchment, with over 50% of wards having a density of less than 5 persons per hectare. Consultation with the LEA indicated that a new housing development is underway near Holes Bay, and any increase in population without upgrades to the wastewater treatment network would result in an increase in faecal loading to the estuary. Tourism is a key part of the economy in the region, and population numbers increase significantly during summer months which will further increase the load on the sewerage network.

The original sanitary survey only presented details of those discharges, both continuous and intermittent, that were considered most likely to significantly affect the BMPA. All those discharges are currently active, and whilst no changes to treatment methodologies have occurred at the time of writing, one of the main sewage treatment works (Corfe Castle) was due to be fitted with UV disinfection by September 2021, reducing the risk it poses to the bacteriological health of the Harbour. Spill event monitoring indicates that intermittent discharges are spilling more frequently than when analysed in the original survey, indicating that greater weighting should be given to these discharges in determining the positions of RMPs in any updated sampling plan.

The number of livestock living in Local Authority Districts wholly or partially contained within the Poole Harbour fell by 7.87% between 2013 and 2016 (the most recent for which data are available), though within this are significant differences both between districts and species. Livestock densities remain low relative to other areas of the country, at just above 4 animals per hectare. Run off areas of pasture are located immediately adjacent to the estuary, particularly following significant rainfall events, may constitute a significant point source of bacteriological contamination. However, the overall risk from this source of contamination remains low.

Poole Harbour is designated as a SPA for the protection of internationally important populations of waterbirds. The five-year county of overwintering birds to 2019/20 increased by 9.6% on the average of the five winters to 2009/10. Dredging in some areas of the BMPA is prohibited under local byelaws to protect these waterbirds, which will obviously also go some way to preventing *E. coli* outbreaks from contaminated shellfish in these areas.

Poole Harbour is exceptionally popular with recreational boat users and supports a small but significant commercial shipping and fishing operation. No changes to permitted discharges from commercial vessels have occurred since the original sanitary survey, and Poole Harbour Commissioners advise against yacht owners dumping marine toilet waste within the Harbour. Two marinas within the Harbour contain pump-out facilities, which should also reduce the risk of this source of contamination.

A total of 15 RMPs have been sampled in the Poole Harbour BMPA since the original sanitary survey was published, of which six were sampled prior. There appears to be a trend of increasing *E. coli* levels as you move toward the periphery of the Harbour, particularly in the western reaches. Some RMPs have high geometric mean *E. coli* levels, although many have low values relative to other BMPAs around the country. Given the spatial trend and location of many of the point sources identified, a general trend of locating RMPs near shore should be taken.

No statistically significant seasonal variation in *E. coli* levels was found at any of the RMPs, both within a given RMP and between RMPs of a certain species. Additional seasonal classifications may therefore not be appropriate in the longer term for RMPs in this BMPA,.

Based on the information available, including that provided during secondary consultation, there do not appear to have been any significant changes to the sources of contamination to this BMPA since the original sanitary survey was published. The authors of this review have not identified any knowledge gaps that would justify a full shoreline survey.

Having reviewed and compared the desk-based study with the findings of the initial sanitary survey in 2009 and following information received during the secondary consultation, the FSA are also content that a shoreline assessment is not required.

8 Recommendations

8.1 Sampling Plan

The Poole Harbour BMPA has 11 currently active RMPs, with each RMP being used to represent a CZ that is classified for several different species. With the exception of the West Brownsea Island Relay Area RMP (B54CV), all the RMPs use bagged samples (eight using mussels, two using Pacific oysters). In many cases, bagged samples of mussels are used to classify cockle CZs. The Cefas report on the suitability of indicator species (Cefas, 2014) states that the uptake of *E. coli* by cockles exceeds that of mussels (and most other species), and so other species should generally not be used as indicators for cockles. This was stated in the original sanitary survey, however it is understood that there would be significant difficulties in using cockles as the sampling species for CZs in this BMPA. It is recommended that the boundaries of all zones be kept as they are, provided they are still indicative of the current stock locations (i.e. a zone is not classified if no harvesting/stock exists there). The subsequent paragraphs detail recommended changes to the RMPs used for CZs within Poole Harbour. The changes are summarised in Table 8.1.

Wareham Channel

The *Wareham Channel* zone is currently classified for mussels, *Tapes* and *M. mercenaria* clams, and cockles, using the Barrel 'O' (B54BS) RMP. The suitability of this RMP compared to one at the confluence of the Rivers Frome and Piddle was determined (as recommended by the original sanitary survey) by collecting samples from both locations, and retaining the monitoring point that returned higher results. This review has identified that intermittent discharges tend to be spilling more frequently than at the time of the original sanitary survey. As such, it is recommended that a new period of concurrent sampling at Barrel 'O' and a location such as that of the historic Giggers Island (B54CQ) should be undertaken for a period of at least 8 samples, to determine the continued representativeness of the Barrel 'O' RMP. Consultation with the LEA indicated that it would not be practicable to sample from the Giggers Island (B54CQ) RMP, the nearest suitable location was given as the Port Marker at SY 9475 8819. Following discussions with the Local Authority, it was decided that a period of temporary sampling should be undertaken at Upton Lake (50° 41' 56" N, 02° 03' 29" W), and whichever RMP returns higher results over that period should be taken forward.

Rockley

The *Rockley* CZ is currently classified for mussels, *Tapes* and *M. mercenaria* clams, and cockles, using the Rockley (B54BR) RMP. This RMP was recommended in the original sanitary survey to capture contamination draining through Lytchett Bay from the River Sherford. It is recommended that this RMP should be retained as the main contamination sources to this zone have not changed significantly.

Poole Harbour North

The *Poole Harbour North* zone is classified for mussels, *Tapes* and *M. mercenaria* clams, and cockles, using the Hamworthy (B054P) RMP. It is recommended that this RMP be retained as it is still representative of the main contamination sources to this zone; diffuse contamination originating from the freshwater inputs to the Harbour and shoreline sources from Poole. The zone is also classified using the West Brownsea 1 (B54BL) RMP for Pacific and native oyster. As monitoring results from mussel RMPs are considered to be representative of those from both oyster species (Cefas, 2014), the Hamworthy (B054P) RMP could be used to represent these species if desired by the LEA. Subsequent consultation has indicated that the LEA would prefer to retain both RMPs, as oysters are only taken from the vicinity of the West Brownsea 1 RMP. It is proposed that a new, smaller zone, classified for both oyster species, is created, This new zone should be classified using samples from the West Brownsea 1 RMP. This zone should cover the area north of Brownsea Island, around SIFCA lease beds 2, 4 & 12 (Figure 8.1). The zone boundaries for the mussel, *Tapes* and *M. mercenaria* clam CZs should remain unchanged.

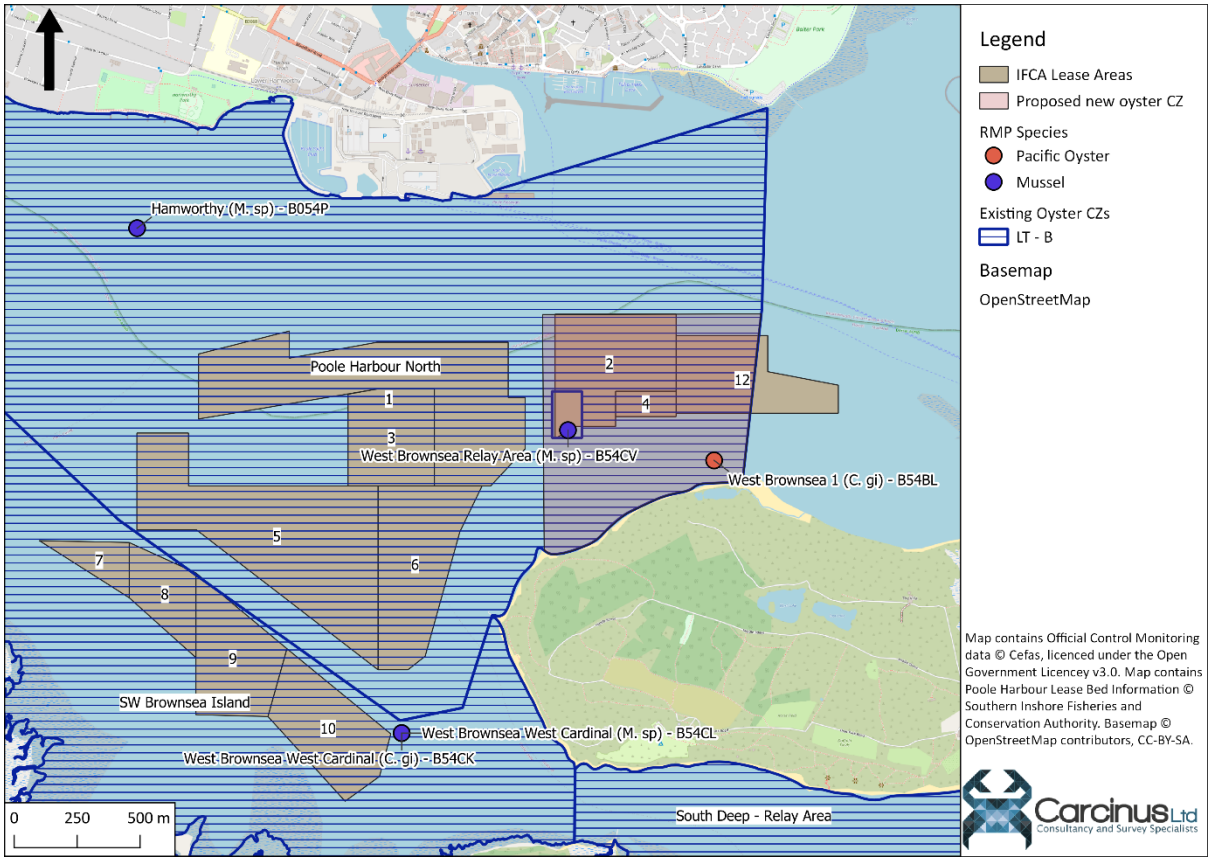


Figure 8.1 Proposed new oyster classification zone to replace the existing Poole Harbour North zone for both oyster species.

Whitley Lake

This zone is classified for cockles, *Tapes* and *M. mercenaria* clams, using bagged mussel samples from the Whitley Lake (B54CP) RMP. This is a different RMP to that recommended in the original sanitary survey (North Haven Pontoon, B54CN), as the area around the North Haven Pontoon was declassified and so the B54CN RMP was not representative of the area harvested. Whilst this RMP is representative of the shoreline sources near the mouth of Poole Harbour, the proximity of the Salterns Way and Elgins Road Pumping Stations to the zone are a cause for concern. A separate bagged sample point should be created near to these locations (40402N, 08931E) and concurrent monitoring conducted for a period of 8 samples. Whichever point returns the higher monitoring results should be retained as the RMP for this zone. Following discussions with the LEA, it has been decided that temporary sampling should be undertaken from an RMP at Sailing Club Pontoon (50° 42.03'N, 01° 56.60'W) and results compared with the current RMP.

Wych Lake

This zone is also classified for cockles, *Tapes* and *M. mercenaria* clams, using bagged mussel samples from the Round Island (B54BM) RMP. This RMP was recommended in the original sanitary survey as it was considered representative of the main contamination sources –

from the Corfe River and Corfe STW. The locations of the main contamination sources have not changed significantly and as such the RMP should be retained.

SW Brownsea Island

This zone is located to the west of the *Wych Lake* zone, and is currently classified for both native and Pacific oysters using the West Brownsea West Cardinal (B54CK) RMP, and for cockles, *Tapes* and *M. mercenaria* clams using the West Brownsea West Cardinal (B54CL) RMP. Both RMPs were established following the original sanitary survey. Given that these RMPs are co-located, and monitoring results have been very similar, it is recommended that the mussel (B54CL) RMP be retained as this species is representative of the others (except for cockles, but it is understood that species cannot be reliably used as a RMP species in this area). The LEA indicated during secondary consultation that they would prefer to retain both sampling points.

South Deep Relay Area

The LEA advised during initial consultation that this zone is no longer used. As such, the zone should be declassified. It is recommended that monitoring should be retained on a quarterly basis for ease of reclassification, should industry require it. The current RMP (South Deep Relay Area, B54AS) should be retained as it is well placed to capture contamination sources to this zone.

Brands Bay

This zone is classified for cockles, *Tapes* and *M. mercenaria* clams using the Brands Bay (B54CM) RMP. The RMP was recommended in the original sanitary survey to capture contamination from the Studland STW, however its present location is too far from the outfall to be considered representative. We would recommend moving the sample bag as close as is practicable, ideally around 402222N, 084897E, as this position would be more representative of contamination from this discharge. The LEA indicated that this position would be inaccessible. Following subsequent discussions, it was agreed that the RMP for this zone should be moved to one at Redhorn Quay (50° 40.51’ N, 1° 58.17’ W) as soon as practicable.

West Brownsea Island Relay Area

This zone is located within the *Poole Harbour North* CZ, and is used for relaying area for cockles. It is currently classified using the West Brownsea Island Relay Area (B54CV) RMP. The relay area is relatively small, and so the RMP is considered representative of the contamination sources to this zone and should be retained.

8.2 General Information

8.2.1 Location Reference

Production Area	**Poole Harbour**
Cefas Main Site Reference	M054
Ordnance survey 1:25,000	Explorer OL15 Purbeck and South Dorset
Admiralty Chart	2611 Poole Harbour and Approaches

8.2.2 Shellfishery

Species	Culture Method	Seasonality of Harvest
Cockles	Wild & farmed	May – January (wild – mechanical harvest & hand gathered); Year round (farmed)
***Tapes* clams**	Wild & farmed	October - March (wild – mechanical harvest); Year round (farmed; wild – hand gathered)
M. mercenaria	Wild & farmed	–May - December (wild – mechanical harvest); Year round (farmed; wild – hand gathered)
Mussels	Farmed	Year round
Native oyster	Farmed	Year round
Pacific oyster	Farmed	Year round

8.2.3 Local Enforcement Authority(s)

Name	**Bournemouth, Christchurch & Poole Council** Civic Centre Poole BH15 2RU
Website	https://www.poole.gov.uk/environmental-problems/port-health/
Telephone number	01202 128782
E-mail address	porthealth@bcpcouncil.gov.uk

*Table 8.1 Proposed sampling plan for the Poole Harbour BMPA. Suggested changes are given in **bold red** type. ~~Struck through text~~ indicates a zone has been superseded by another.*

Classification Zone	RMP	RMP Name	NGR (OSGB 1936)	Lat / Lon (WGS 1984)	Species Represented	Harvesting Technique	Sampling Method	Sampling Species	Tolerance	Frequency
Wareham Channel (*Mytilus spp.*, *Tapes* spp., *M. mercenaria* & C. edule)	B54BS / **TBC**	Barrel 'O' / **Upton Lake**	SY 9619 8977 / **SY 9560 8881**	50°42.45'N 2°03.32'W / **(50° 41' 56" N, 02° 03' 29" W**	Mussels, *Tapes* & ***M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly
Rockley (*Mytilus spp.*, *Tapes* spp., *M. mercenaria* & C. edule)	B54BR	Rockley	SY 9734 9058	50°42.89'N 2°02.34'W	Mussels, *Tapes* & ***M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly
Poole Harbour North (*Mytilus spp.*, *Tapes* spp., *M. mercenaria*, C. edule)	B054P	Hamworthy	SY 9952 8963	50°42.38'N 2°00.49'W	Mussels, *Tapes* **& *M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly

Classification Zone	RMP	RMP Name	NGR (OSGB 1936)	Lat / Lon (WGS 1984)	Species Represented	Harvesting Technique	Sampling Method	Sampling Species	Tolerance	Frequency
Poole Harbour North (*O. edulis* & *C. gigas*)	B54BL	West Brownsea 1	SZ 0181 8871	50°41.88'N 1°58.54'W	N & P oysters	Farmed / wild	Sampling Bag	*C. gigas*	10 m	Monthly
Whitley Lake (*C. edule*, *Tapes* spp. & *M. mercenaria*)	B54CP / **TBC**	Whitley Lake / **Sailing Club Pontoon**	SZ 0430 8809/ **SZ 0410 8899**	50°41.55N 1°56.43W/ **50° 42.03'N, 01° 56.60'W**	Mussels, *Tapes* **& *M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly
Wych Lake (*C. edule*, *Tapes* spp. & *M. mercenaria*)	B54BM	Round Island	SY 9856 8760	50°41.28'N 2°01.30'W	Mussels, *Tapes* & ***M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly
SW Brownsea Island (*Mytilus spp.*, *Tapes* spp., *M.*	B54CK	West Brownsea Cardinal	SZ 0057 8763	50°41.30'N 1°59.60'W	Mussels, *Tapes* & *M. mercenaria* clams, cockles.	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly

Classification Zone	RMP	RMP Name	NGR (OSGB 1936)	Lat / Lon (WGS 1984)	Species Represented	Harvesting Technique	Sampling Method	Sampling Species	Tolerance	Frequency
***mercenaria*, C. edule)**										
SW Brownsea Island (*C. gigas, O. edulis*)	B54CK	West Brownsea Cardinal	SZ 0057 8763	50°41.30'N 1°59.60'W	N & P Oysters	Dredge	Sampling Bag	*C. gigas*	10 m	Monthly
South Deep Relay Area (*O. edulis*)	B54AS	South Deep Relay Area	SZ 0275 8687	50°40.89'N 1°57.75'W	N oyster	Dredge	Sampling Bag	*M. edulis*	10 m	**Quarterly**
Brands Bay (*C. edule*, *Tapes* spp. & *M. mercenaria*)	**TBC**	**Redhorn Quay**	**SZ 0225 8617**	**50° 40.51' N, 1° 58.17' W**	Mussels, *Tapes* & ***M. mercenaria*** clams, cockles	Dredge	Sampling Bag	*M. edulis*	10 m	Monthly
West Brownsea Island Relay Area (*C. edule*)	B54CV	West Brownsea Island Relay Area	SZ 0123 8883	50° 41.95'N 1° 59.04'W	Cockles	Relayed	Sampling Bag	*M. edulis*	10 m	Monthly

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Appendices

Appendix I. Breakdown of Population Change

		Total Usual Residents				Population Density (persons / hectare)		
ID	Electoral Ward	2001 Census	2011 Census	Absolute Change	% Change	2001 Census	2011 Census	Absolute Change
1	Abbey	3,817	3,897	80	2.10%	0.52	0.5	-0.02
2	Alderney	11,196	11,423	227	2.03%	30.93	31.6	0.67
3	Beaminster	3,919	4,107	188	4.80%	1.04	1.1	0.06
4	Bere Regis	1,984	1,945	-39	-1.97%	0.45	0.4	-0.05
5	Branksome West	7,035	7,415	380	5.40%	53.24	56.1	2.86
6	Broadmayne	1,864	1,870	6	0.32%	1.10	1.1	0.00
7	Broadstone	10,256	10,303	47	0.46%	16.73	16.8	0.07
8	Bulbarrow	1,974	1,850	-124	-6.28%	0.42	0.4	-0.02
9	Canford Cliffs	7,622	8,620	998	13.09%	14.87	16.8	1.93
10	Canford Heath East	7,375	7,264	-111	-1.51%	38.44	37.9	-0.54
11	Canford Heath West	7,043	6,815	-228	-3.24%	22.02	21.3	-0.72
12	Castle	1,969	1,780	-189	-9.60%	0.34	0.3	-0.04
13	Charminster and Cerne Valley	3,731	4,768	1037	27.79%	0.48	0.6	0.12
14	Chesil Bank	2,118	2,094	-24	-1.13%	0.27	0.3	0.03
15	Corfe Mullen North	2,408	2,457	49	2.03%	3.41	3.5	0.09

		Total Usual Residents				Population Density (persons / hectare)		
ID	Electoral Ward	2001 Census	2011 Census	Absolute Change	% Change	2001 Census	2011 Census	Absolute Change
16	Corfe Mullen South	2,579	2,638	59	2.29%	6.54	6.7	0.16
17	Creech Barrow	1,851	1,764	-87	-4.70%	0.28	0.3	0.02
18	Creekmoor	9,257	9,180	-77	-0.83%	24.29	25	0.71
19	Dorchester East	4,429	4,721	292	6.59%	30.98	33	2.02
20	Dorchester North	3,490	5,456	1966	56.33%	11.77	18.4	6.63
21	Dorchester South	4,054	4,049	-5	-0.12%	32.33	32.3	-0.03
22	Dorchester West	4,198	4,834	636	15.15%	28.54	32.9	4.36
23	Frome Valley	1,936	2,210	274	14.15%	0.31	0.4	0.09
24	Halstock	1,782	1,848	66	3.70%	0.24	0.2	-0.04
25	Hamworthy East	5,456	6,042	586	10.74%	25.61	28.4	2.79
26	Hamworthy West	6,749	7,099	350	5.19%	20.61	21.7	1.09
27	Langton	1,617	1,491	-126	-7.79%	0.81	0.7	-0.11
28	Loders	1,813	1,697	-116	-6.40%	0.48	0.5	0.02
29	Lydden Vale	1,655	1,967	312	18.85%	0.34	0.4	0.06
30	Lytchett Matravers	3,634	3,747	113	3.11%	1.27	1.3	0.03
31	Lytchett Minster and Upton East	3,989	4,244	255	6.39%	10.59	11.3	0.71

		Total Usual Residents				Population Density (persons / hectare)		
ID	Electoral Ward	2001 Census	2011 Census	Absolute Change	% Change	2001 Census	2011 Census	Absolute Change
32	Lytchett Minster and Upton West	3,584	3,739	155	4.32%	3.34	3.5	0.16
33	Maiden Newton	1,844	2,081	237	12.85%	0.30	0.3	0.00
34	Merley and Bearwood	10,629	10,392	-237	-2.23%	6.46	6.3	-0.16
35	Newtown	11,132	12,515	1383	12.42%	36.92	41.5	4.58
36	Oakdale	10,949	11,554	605	5.53%	37.49	39.6	2.11
37	Owermoigne	3,431	3,804	373	10.87%	0.71	0.8	0.09
38	Parkstone	9,593	10,779	1186	12.36%	30.93	34.8	3.87
39	Penn Hill	10,293	11,355	1062	10.32%	29.36	32.4	3.04
40	Piddle Valley	1,974	1,988	14	0.71%	0.27	0.3	0.03
41	Poole Town	7,940	10,683	2743	34.55%	27.76	37.4	9.64
42	Preston	4,863	4,830	-33	-0.68%	6.85	6.8	-0.05
43	Puddletown	2,133	2,437	304	14.25%	0.34	0.4	0.06
44	St. Martin	2,752	2,774	22	0.80%	0.93	0.9	-0.03
45	Stour	2,542	2,582	40	1.57%	0.46	0.5	0.04
46	Swanage North	4,169	3,771	-398	-9.55%	6.92	6.3	-0.62

		Total Usual Residents				Population Density (persons / hectare)		
ID	Electoral Ward	2001 Census	2011 Census	Absolute Change	% Change	2001 Census	2011 Census	Absolute Change
47	Upwey and Broadwey	3,665	3,628	-37	-1.01%	5.69	5.6	-0.09
48	Wareham	5,665	5,496	-169	-2.98%	8.92	8.7	-0.22
49	West Purbeck	1,513	1,464	-49	-3.24%	0.30	0.3	0.00
50	Winfrith	1,616	1,618	2	0.12%	0.27	0.3	0.03
51	Winterborne St Martin	2,026	2,095	69	3.41%	0.38	0.4	0.02
52	Wool	4,118	5,310	1192	28.95%	2.80	3.6	0.80

Appendix II. Details of intermittent discharge Event Duration Monitoring (EDM) data for 2020

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
16 HIGH STREET CSO	DORCHESTER MILL STREAM	21/03/2017	SY6963090750	SCREENING	36.65	17	99.8	
35 KINGS ROAD	MILL STREAM VIA SWS	15/03/2017	SY7012290514	SCREENING	48.8	29	99.9	
AFFPUDDLE PUMPING STATION	TRIBUTARY OF RIVER PIDDLE	25/11/2020	SY8060793678	NONE	0	0	100	
BLACKHEATH WWTW	SHERFORD RIVER	20/09/2018	SY9093392599	SCREENING	0	0	100	
BLACKHEATH WWTW	SHERFORD RIVER	20/09/2018	SY9094392658	SCREENING	0	0	100	
BLACKNOLL	RIVER WIN (S)	26/03/2002	SY8100086050	SCREENING	46.5	11	99.74684264	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
BLANDFORD ROAD PUMPING STATION	POOLE HARBOUR (ESTUARINE)	16/06/2016	SZ0046890469	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	0	0	100	
BOVINGTON TERMINAL PUMPING STATION	A TRIBUTARY OF THE RIVER FROME	15/01/2021	SY8345888000	NONE				
BRIANTSPUDDLE SEWAGE	TRIBUTARY OF RIVER PIDDLE (S)	24/09/1991	SY8207093220	SCREENING	171.5991667	14	99.94311071	
BROADMAYNE WWTW	TADNOLL BROOK	20/09/2018	SY7341086760	SCREENING	905.3	77	99.6	
BULBURY LANE PUMPING STATION	TRIB OF SHERFORD RIVER (S)	02/07/2003	SY9370094150	SCREENING	982.55	64	99.9	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
CANFORD HEATH PUMPING STATION	HATCH POND STREAM	15/12/2020	SZ0165294124	SCREENING				
CHURCH KNOWLE ANIMAL SANCTUARY PS	A TRIBUTARY OF THE CORFE RIVER	30/09/2020	SY9376781585	SCREENING	17.17	11	81.4	AMP7 early installation - Data available from 9/3
COCK AND BOTTLE PUMPING STATION	TRIB OF THE SHERFORD RIVER	27/07/2020	SY9135494678	SCREENING	0	0	100	
CORFE CASTLE STW	CORFE RIVER (S)	29/06/2015	SY9609683153	SCREENING	386.0425	44	99.94231937	
COWSLIP ROAD PUMPING STATION	UNNAMED STREAM	08/10/2008	SY9934094390	SCREENING				

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
CREEKMOOR LANE PUMPING STATION	HOLES BAY VIA SWS (ESTUARINE)	05/05/2017	SZ0037393096	SCREENING	0	0	100	
CSO AT 97 HIGH STREET	(S) MILL STREAM	04/06/1999	SY7005090550	NONE	0	0	100	
CSO AT PRINCES BRIDGE	(S) MILL STREAM	29/06/1999	SY7001090590	NONE	2.5	3	99.94879964	
CSO AT SCOUT HUT	(S) MILL STREAM	04/06/1999	SY7085090330	NONE	356.5	31	99.57048583	
CSO AT TOP OF SOUTH WALKS	RIVER FROME VIA SWS	24/09/2020	SY6954890767	SCREENING				
DORCHESTER (LOUDS MILL) STW	RIVER FROME(S)	16/10/2009	SY7097090360	SCREENING				
DORCHESTER (LOUDS MILL) STW	RIVER FROME(S)	16/10/2009	SY7116090340	SCREENING				

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
DORCHESTER ROAD PS	THE SOUTH WINTERBOURNE(S)	30/11/2005	SY7251089760	SCREENING				
DUNCAN CRESCENT PUMPING STATION	TRIBUTARY OF THE RIVER FROME	15/01/2021	SY8397488935	SCREENING				
EAST BURTON CROSS ROAD PS	RIVER WIN	31/01/2020	SY8316386974	NONE	52.17	12	99.9	
EAST BURTON CROSS ROAD PS	RIVER WIN	31/01/2020	SY8316686975	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	52.17	12	99.9	
EAST CHALDON PUMPING STATION	A TRIBUTARY OF THE RIVER WIN	29/10/2007	SY7948083470	NONE				

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
EAST KNIGHTON PUMPING STATION	TRIBUTARY OF THE RIVER FROME	29/10/2007	SY8140085590	NONE				
EAST QUAY PUMPING STATION	POOLE HARBOUR (ESTAURINE)	16/03/2016	SZ0139890251	SCREENING	0	0	100	
EGMONT ROAD PS	LYTCHETT BAY (SWS) ESTUARINE	14/09/2016	SY9764791734	SCREENING	0	0	98.5	Data missing 15/11-17/11, and 30/12
ELGIN ROAD PS OVERFLOW	POOLE HARBOUR	25/03/2010	SZ0402989322	SAND FILTRATION	6.25	10	100	
ESPLANADE PUMPING STATION	HOLES BAY (SWS) ESTUARINE	14/09/2016	SZ0097991390	NONE	0	0	99	
EVERSHOT COMBINED SEWER OVERFLOW	RIVER FROME	15/03/2017	ST5762704625	SCREENING	132.9333333	83	99.85693685	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
EVERSHOT WASTEWATER TREATMENT WORKS	RIVER FROME	29/03/2019	ST5781104386	SCREENING	565.25	66	99.87484355	
GLEBE FARM PUMPING STATION	TRIBUTARY OF CORFE RIVER	17/10/2007	SY9508081660	SCREENING				
GLEBE ROAD PUMPING STATION	TRIB OF SHERFORD RIVER	03/06/2016	SY9460994244	SAND FILTRATION				
GODMANSTONE STW	RIVER CERNE	14/10/2008	SY6659096430	SCREENING				
HALVES COTTAGE PUMPING STATION	A TRIBUTARY OF THE CORFE RIVER	30/09/2020	SY9620181348	NONE	0	0	81.5	AMP7 early installation - Data available from 13/2

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
HARMANS CROSS P. STN.(SWANAGE)	CORFE RIVER,TRIB OF THE		SY9750080760	MACERATION	142.1	21	88.3	AMP7 early installation - Data available from 13/2
HEWITT ROAD PUMPING STATION	HOLES BAY (VIA SWS) ESTUARINE	14/09/2016	SY9920791809	SCREENING	5.33	2	99.8	
HINCHCLIFFE ROAD CSO	HOLES BAY ESTUARINE	14/09/2016	SY9978590898	NONE	32.93	11	98.5	
HOLBAEK CLOSE	GROUNDWATER VIA INFILT SYSTEM	09/06/2016	SY6990089400	NONE				
HOLTON HEATH WW PUMPING STATION	TRIB OF POOLE HARBOUR	28/03/2013	SY9517290626	SCREENING	0	0	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
KENNART ROAD PUMPING STATION	HOLES BAY VIA SWS (ESTUARINE)	08/01/2019	SZ0036893124	NONE				
KINGS ARMS PS, STOBOROUGH	TRIB OF RIVER FROME (S)	24/04/2002	SY9240086500	SCREENING	36.67	9	99.9	
KNIGHTON LANE CSO	TADNOLL BROOK(S)	26/02/2004	SY7308086600	SCREENING	0	0	99.94311071	
LYTCHETT LANE PUMPING STATION	TRIBUTARY OF RIVER FROME	09/10/2020	SY8424687947	SCREENING	62.91666667	15	100	
LYTCHETT MINSTER STW	LYTCHETT BAY(E)	01/04/2010	SY9685092300	SCREENING	263	23	100	
MAIDEN NEWTON WATER RECYCLING CENTR	RIVER FROME	26/11/2019	SY6025397176	SCREENING	2182.93	108	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
MARTINSTOWN PS	THE SOUTH WINTERBOURNE(S)	04/12/2003	SY6536088740	SCREENING	2257.28	145	100	
MILBORNE ST ANDREW PS	TRIBUTARY OF BERE STREAM	27/03/2018	SY8017096980	SCREENING	5.25	2	100	
MILBORNE ST.ANDREW	BERE STREAM(S)	31/03/2010	SY8025096490	SCREENING	262	12	70	No data before 23/4 - first year of reporting
MOORLAND WAY PUMPING STATION	LYTCHETT BAY(C)	01/04/2010	SY9757092640	SCREENING	175	26	100	
MORRIS ROAD PUMPING STATION	TRIBUTARY OF THE RIVER FROME	15/01/2021	SY8406988509	NONE				
NORTH STREET PS	THE RIVER FROME	21/09/2007	SY6665092620	SCREENING				

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
POOLE BRIDGE PUMPING STATION	BACKWATER CHANNEL,POOLE HARB.	25/03/2010	SZ0063090370	SCREENING	6.566666667	1	95.02125076	
POOLE E STW	TRIBUTARY OF HOLES BAY(E)	03/04/2012	SZ0071093560	SCREENING	111.8061111	17	100	
POOLE E STW	TRIBUTARY OF HOLES BAY(E)	03/04/2012	SZ0071093560	SCREENING	5.677777778	3	100	
POOLE PARK CSO	POOLE PARK BOATING LAKE	16/06/2016	SZ0252890989	SCREENING	11	5	100	
POOLE PARK PUMPING STATION	POOLE PARK BOATING LAKE	16/06/2016	SZ0239691188	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	6.083333333	3	99.94307832	
PUDDLETOWN PUMPING STATION	RIVER PIDDLE(S)	30/11/2005	SY7576094730	SCREENING				

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
PUMPING STATION ADJACENT RIVENDELL	THE RIVER PIDDLE	08/04/2011	ST7027900119	SCREENING				
PUMPING STN ADJACENT THE PIDDLE INN	THE RIVER PIDDLE	08/04/2011	SY7048099756	SCREENING				
RAILWAY COTTAGES PUMPING STATION	TRIB OF RIVER FROME(S)	28/01/2002	SY8430086970	SCREENING	110.75	18	100	
RED LANE PUMPING STATION	TRIB OF CORFE RIVER (S)	15/04/2002	SY9647081690	SCREENING	37	13	92.30003413	
ROCKLEY ROAD PUMPING STATION	POOLE HARBOUR	25/03/2010	SY9957090060	SCREENING	3.5	2	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
SALTERNS WAY PUMPING STATION	POOLE HARBOUR (ESTUARINE)	05/05/2017	SZ0375089744	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	27.96666667	2	99.79773831	
SANDBANKS PAVILION PUMPING STATION	POOLE HARBOUR	03/06/2016	SZ0436287753	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	9	1	89.33894641	Telemetry loss since 8/12. Job raised to correct.
SANDBANKS PAVILION PUMPING STATION	POOLE HARBOUR	03/06/2016	SZ0436287753	SCREENING	9	1	89.33894641	Telemetry loss since 8/12. Job raised to correct.
SANDFORD LANE PUMPING STATION	TRIB OF RIVER PIDDLE(S)	31/03/2016	SY9209988177	SCREENING	0	0	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
SANDY LANE PS	LYTCHETT BAY(E)	03/07/2006	SY9836092200	NONE	166.5	36	100	
SHORE ROAD PS OVERFLOW	ENGLISH CHANNEL	01/09/2017	SZ0547787983	SAND FILTRATION	83	53	100	
SOUTH EAST PUMPING STATION	RIVER FROME (ESTUARINE)	31/03/2016	SY92678724	SCREENING	13.58333333	7	99.94307832	
STANLEY GREEN ROAD CSO	CREEKMOOR LAKE(VIA SWS)	14/09/2016	SZ0100192019	NONE	276.5	44	99.9	
STATION ROAD CSO	TRIB OF RIVER FROME	05/03/2018	SY8440086990	SCREENING	233.2	28	99.99981026	
STERTE FOUL PUMPING STATION	HOLES BAY (ESTUARINE)	14/09/2016	SZ0061391804	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	0	0	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
STOBOROUGH RIDGE PUMPING STATION	TRIBUTARY OF RIVER FROME	05/05/2017	SY9376086635	NONE	0	0	100	
STUDLAND ROAD PUMPING STATION	CORFE RIVER	31/01/2020	SY9605782638	NONE	83.25	28	80.9	Data unavailable from 27/1 to 21/2 and from 21/8 to 4/10
SYDLING ST NICHOLAS PUMPING STATION	TRIBUTARY OF SYDLING WATER	09/10/2020	SY6322798911	SCREENING	431.7072222	25	99.94595517	
SYDLING ST.NICHOLAS WRC	SYDLING WATER	14/02/2020	SY6320198437	SCREENING	3121.066667	142	100	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
THE OLD RECTORY PUMPING STATION	POOLE HARBOUR (ESTAURINE)	16/06/2016	SY9956490066	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	0	0	100	
TOLLER PORCORUM WRC	RIVER HOOKE	14/02/2020	SY5669897970	SCREENING	261.9	39	100	
TURLIN MAIN CSO	ROCK LEA RIVER, LYTCHETT BAY	14/02/2000	SY9836092200	SCREENING	0	0	100	
VICTORIA ROAD CSO	THE MILL STREAM VIA SWS	29/03/2018	SY6954890767	NONE				
WAREHAM COMBINED SEWER OVERFLOW	RIVER FROME (ESTUARINE)	05/05/2017	SY9229887168	SCREENING	7.75	6	99.9	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
WAREHAM WASTEWATER TREATMENT WORKS	TIDAL RIVER PIDDLE	26/01/2017	SY9364088630	SCREENING	405.3463889	32	100	
WARMWELL LEISURE RESORT PS	TADNOLL BROOK (S)	02/08/2004	SY7616087440	SCREENING				
WEST MILL CRESCENT PUMPING STATION	TRIB OF RIVER PIDDLE	31/03/2016	SY9161687923	SCREENING	69.13333333	10	99.99468731	
WHITECLIFF RECREATION GROUND PS	PARKSTONE BAY (ESTUARINE)	05/05/2017	SZ0314590544	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	171.7666667	30	99.3	

DISCHARGE NAME	RECEIVING ENVIRONMENT	PERMIT ISSUED	NGR	Treatment (if any)	**Total Duration (hours) of all spills prior to processing through 12-24 hour counting method**	**Counted spills using 12-24hr counting method**	**% of reporting period EDM operational**	**Comments**
WILLIS WAY PUMPING STATION	HOLES BAY (ESTUARINE)	05/05/2017	SZ0068192477	NO TREATMENT REQUIRED - GOOD ENGINEERING DESIGN	0	0	100	
WINFRITH CHURCH	RIVER WIN (S)	31/03/2002	SY8052084450	SCREENING				

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*"