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C6278

Porlock Relay

Provisional RMP Assessment

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31 March 2016

Cefas Document Control

Report Title	Porlock Bay Relay
Project Name	Provisional RMP and boundary assessment for new shellfish harvesting areas – England & Wales
Client/Customer	Food Standards Agency
Cefas Project Reference	C6278
Document Number	C6728-2015-E7
Revision	V0.1
Date	30/03/2016

Revision History

Revision number	Date	Pages revised	Reason for revision
0.1	30/03/2016	-	Draft for internal review
1.0	31/03/2016	All	Report for submission to customer

Approvals

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Fishery

Applications were received for two options to classify a relay area for Pacific oysters (*Crassostrea gigas*) in Porlock Bay, Somerset. Under both options, the application notes that "New marketable sized stock [of Pacific oysters] from a class B site will be introduced via the proposed relay area" bounded by lines drawn between 51°13.079'N 03°37.023'W, 51°13.077'N 03°37.021'W, 51°13.082'N 03°37.008'W, and 51°13.079'N 03°37.008'W.

The options identified relate to the relocation of the southern boundary of the Porlock classified production area for Pacific oysters. The classified area is currently described by boundary lines drawn between 51°13.087'N 03°37.115'W, 51°13.700'N 03°37.300'W, 51°13.700'N 03°36.800'W, and 51°13.087'N 03°37.017'W.

Option 1 suggests moving the southern boundary of the production area, currently 51°13.087'N 03°37.115'W to 51°13.087'N 03°37.017'W, to a line approximately 64m further north, between 51°13.116'N 03°37.099'W and 51°13.122'N 03°37.025'W. This leaves a minimum distance of approximately 76m between the relay area and the classified production area.

Option 2 suggests setting a second boundary approximately 50m further north of 51°13.116'N 03°37.099'W and 51°13.122'N 03°37.025'W that would establish a 'hardening area' at the southern extent of the production area to be used only when the relay area is not in use. However, there is no special need to designate a separate area for this, as any harvested stock needs to come from the classified area anyway.

The anticipated harvested yield is estimated to be approximately 1.9 tonnes in 2016 and 4.9 tonnes in 2017. The oysters are currently grown on trestles placed in the intertidal zone and harvested by hand.

Sources of Faecal Contamination

Figure 1 shows the location of potentially significant sources of contamination to the application area, including all sewage discharges within 2 km of the application area and other significant discharges located within the catchment taken from the Environment Agency permit database (March 2016).

Sewage Discharges

Those discharges greater than 5 m^3/day relevant to this assessment are listed in Table 1.

Table 1: Significant continuous sewage discharges of over 5 m^3/day to watercourses

Name	Dry weather flow m3/day	Treatment type	NGR	Receiving environment
Porlock STW	668	Membrane	SS 8859 4740	Porlock Bay/Hawkscombe Stream[1]

Data from the Environment Agency

[1] This information taken directly from EA permit data, however the continuous discharge is noted in the sanitary survey as discharging to Porlock Bay as shown in Figure 1.

In addition to the tertiary treatment works discharge, there two intermittent discharges and one private sewage discharge to the area.

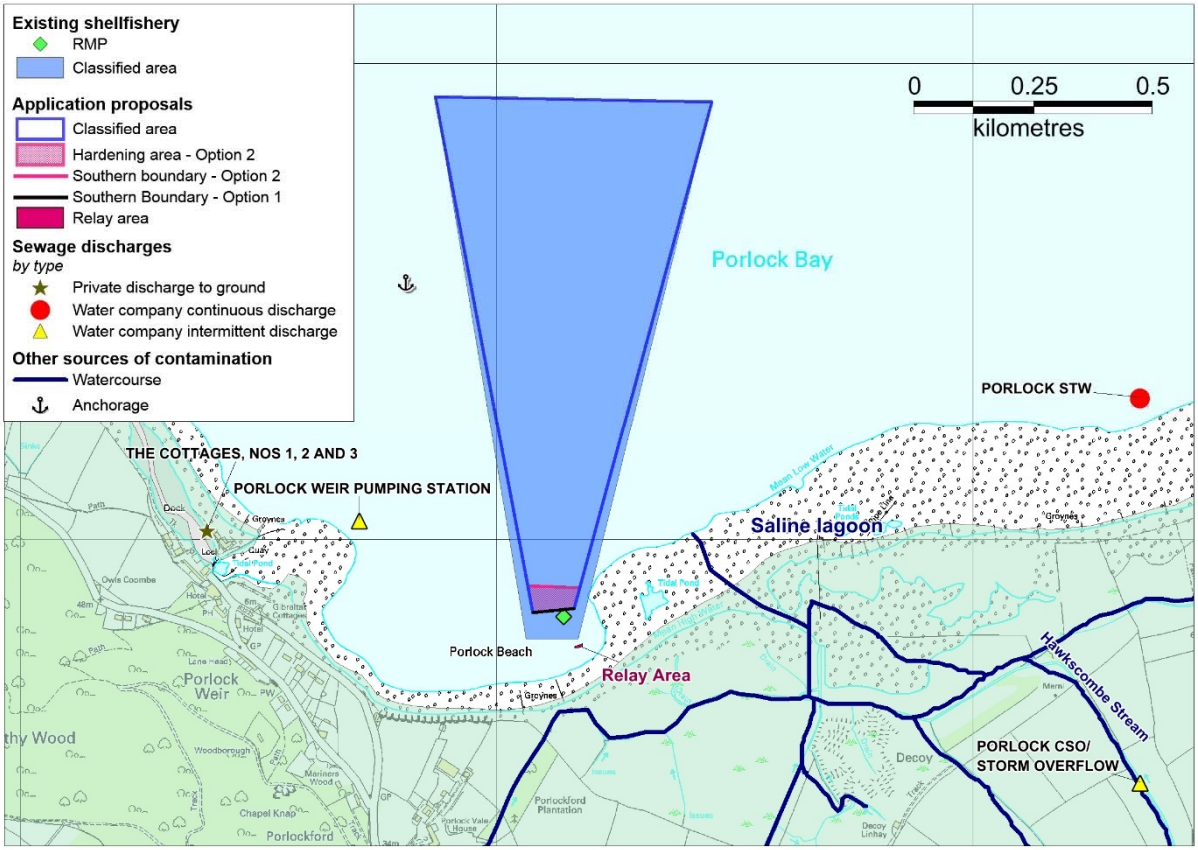

Figure 1: Potential sources of contamination to the application area

There is only one continuous sewage discharge of potential impact on the application area, Porlock Sewage Treatment Works (STW), which provides membrane treatment for a consented Dry Weather Flow of 668 m^3/day. It discharges to Porlock Bay, approximately 1 km east of the eastern boundary of the proposed amended production area and approximately 1.3 km northeast of the proposed relay area. The sanitary survey (Cefas, 2015) undertaken for this area estimated that bacterial loadings arising from the continuous discharge from Porlock STW were low and likely to have little impact on the shellfishery in terms of bacterial contamination (Cefas, 2015). It is not known how efficiently viruses are removed from this effluent, and therefore the potential for impact from human viruses cannot be ruled out.

Intermittent storm overflow discharges can create issues in management of shellfish hygiene however infrequently they spill, as they discharge raw sewage. There are four intermittent discharges within the vicinity of the application area. One of these, Porlock Weir Pumping Station, is currently sealed and will have no impact on the shellfishery. The other three are active and these will contribute to the overall level of faecal contamination reaching the production area during and immediately after any spills.

The three active intermittent discharges are subject to spill monitoring and analysis of spill monitoring data was undertaken for the sanitary survey. Of two discharges to the same location on Hawkcombe Stream, one discharged almost half the time during the autumn and winter and very rarely during the summer (review period 2012-2014). Effluent from this overflow would reach the southern end of the production area and the relay area via the mouth of the tidal lagoon 200-300 meters to the east of these areas. Spills from this location are therefore expected to significantly impact the proposed relay area during the winter months.

The third active intermittent discharge (Bossington Pumping Station) lies over 2km east of the production area and is not shown in Figure 1. It was found to be most active in winter, with no spills recorded in summer from 2012-2014.

One private biological filtration plant serving three cottages discharges to soakaway within 20m of MHWS near the dock and quay approximately 650m west of the proposed production area boundary. This appears to lie on a very low-lying spit of land, and therefore the soakaway may not be as effective as it might be further inland. Therefore, some impact to the adjacent waters is possible, though due to the distance from the shellfishery it is not considered likely to have a significant impact there.

Boats and marinas

A small number of boats use the small tidal harbour at Porlock Weir. Publicly available satellite imagery showed more than thirty small sailboats and pleasure/angling type vessels in and just outside the small tidal harbour. There are no pumpout facilities available at this harbour, and the majority of boats using it are unlikely to have holding tanks for sewage waste. There is a further anchorage further out in the bay and to the west of the production area. Overboard discharges may occur anywhere within the area, however these are most likely to occur in the anchorages and main navigation routes through the area. Although it is not possible to predict when and how these might impact the shellfishery, discharges are more likely to occur during the summer boating season when there are more boats in use on the water.

Agricultural sources

The catchment area adjacent to the shellfishery is largely in agricultural use, with pasture dominating the western side and arable fields the eastern side. Approximately 200 sheep were observed on the low-lying grassland around the saline lagoon during the shoreline survey in 2015. Therefore, significant impacts from grazing livestock are anticipated. Application of animal slurry to fields around the catchment is also likely to contribute to faecal contaminant loads carried to the bay via watercourses after rainfall. Peak levels of contamination are expected to occur following high rainfall events in summer, particularly when these follow periods of dry weather.

Wildlife and domestic animal sources

Although some seabirds and waterbirds are known to be present in the area, it does not appear to be known for particularly high concentrations of these. Other small animals are likely to present throughout the catchment area, including various small mammals, foxes, badgers, and deer. No information is available on the concentrations and distribution of these animals or on their potential impacts on faecal indicator concentrations.

Dog walking takes place on the coastal paths and beaches around Porlock Bay. The sanitary survey identified that this is likely to represent a source of diffuse contamination to the near-shore zone. It may therefore contribute to faecal impacts at the proposed relay area, which lies nearer to shore than the current production area.

Classification and monitoring history

Porlock was first classified in 2015 and is currently Class A for Pacific oysters. It has been monitored at two locations: Porlock Beach and Porlock East. The Porlock Beach monitoring point is located approximately 75m northwest of the current RMP at Porlock East, which is shown in Figure 1.

Table 2 shows the summary statistics for the shellfish flesh monitoring results for Porlock East and Figure 1 shows the ocation of the RMP.

Table 2: Summary statistics for *E. coli* classification monitoring results (MPN/100g) by RMP – 2015 to 2016

Sampling Site	Nominal sample location	Species	No.	Date of first sample	Date of last sample	Geometric mean	Min.	Max.	% over 230	% over 4,600	% over 46,000
Porlock Beach	SS87084788	Pacific oyster	16	23/09/2014	14/10/2015	40.7	<18	230	0	0	0
Porlock East	SS87144784	Pacific oyster	5	11/11/2015	09/03/2016	*	<18	45	0	0	0

* Geometric mean not calculated due to insufficient results

Very few samples have been submitted to date under the classification monitoring programme. Results from those samples have so far been low, though only the winter period is currently represented.

Water circulation

Porlock Bay is a relatively open embayment on the south side of the Bristol Channel and subject to a large tidal range. Therefore, the potential for dilution and water exchange within the bay is high. Contamination from shoreline sources is predicted to travel parallel to the coast along with the flood and ebb tides, thereby impacting areas both up and down channel of the release location. The ebb plume from Hawkcombe Stream and tidal lagoon, as well as the effluent plume from Porlock STW, will be carried toward the shellfishery on the ebb tide.

Recommendations regarding the relay and production areas

Production area

It is recommended that the production area (classification zone) for Pacific oysters be amended as proposed in the application option 1, to form the area bounded by lines drawn from 51°13.122'N 03°37.025'W to 51°13.116N 03°37.100'W to 51°13.699'N 03°37.296'W to 51°13.699'N 03°36.797'W to 51°13.122'N 03°37.025'W. (NGR: SS 8716 4785 to SS 8707 4784 to SS 8687 4893 to SS 8745 4892 to SS 8716 4785).

Provisional relay area

It is recommended that the boundaries of the provisional relay area be established as the area requested in the application plus a buffer of 20 metres to allow scope for movement of the trestles as conditions warrant. The recommended relay area boundary is therefore the area bounded by lines drawn from 51°13.066'N 03°36.990'W to 51°13.065'N 03°37.042'W to 51°13.092'N 03°37.042'W to 51°13.093'N 03°36.991'W to 51°13.066'N 03°36.990'W. (NGR: SS 8720 4775 to SS 8714 4775 to SS 8714 4780 to SS 8720 4780 to SS 8720 4775).

This leaves a separation of at least 50m between the relay area and the production area. In light of the predicted along-shore movement of water flow in the area, this is anticipated to be sufficient to avoid contamination of the production area from stock placed in relay.

RMPs

As the southern boundary of the existing production area is being revised northward, it is recommended that the RMP be moved northward as well in order to retain it within the classified area. The recommended location is 51°13.130'N 03°37.044'W (SS 8714 4787) which should still reflect contamination arising from sources to the east of the fishery as well as any potential contamination coming from other sources and the relay area to the south.

It is recommended that the pRMP for the relay area be established on the east side of the relay trestles. This is estimated to be at 51°13.082'N 03°37.008'W (SS 8718 4778). The sampling tolerance for both points should be 10m and sampling should be conducted monthly.

Table 3: Provisional Sampling Plan: native oysters

Production Area	pRMP name	NGR	Latitude & Longitude	Classification Species	Sampling species	Collection Method	Sampling tolerance	Sampling frequency	Boundary
Porlock	Porlock East	SS 8714 4787	51°13.130'N 03°37.044'W	Pacific oysters	Pacific oysters	Hand	10m	Monthly	Area bounded by lines drawn from 51°13.122'N 03°37.025'W to 51°13.116N 03°37.100'W to 51°13.699'N 03°37.296'W to 51°13.699'N 03°36.797'W to 51°13.122'N 03°37.025'W
Porlock Relay	Porlock Relay	SS 8718 4778	51°13.082'N 03°37.008'W	Pacific oysters	Pacific oysters	Hand	10m	Monthly	Area bounded by lines drawn from 51°13.066'N 03°36.990'W to 51°13.065'N 03°37.042'W to 51°13.092'N 03°37.042'W to 51°13.093'N 03°36.991'W to 51°13.066'N 03°36.990'W

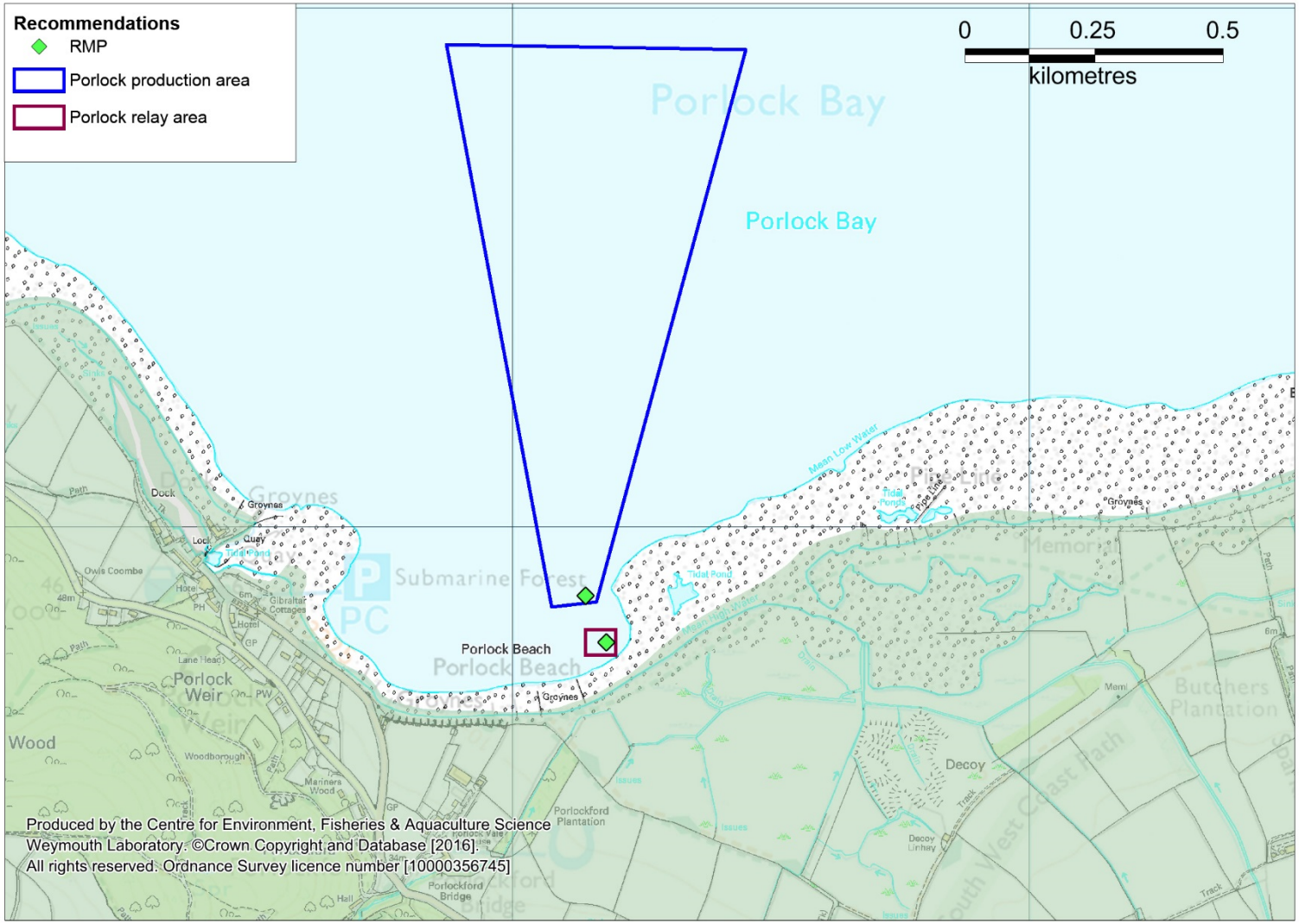

Figure 2: Recommended production and relay areas and RMPs

References

Cefas, 2015. Sanitary survey of Porlock Bay. Cefas 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 EC regulation No. 854/2004.

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