Review of Dart Estuary MCZ: Condition Assessment and Compatibility with Small-Scale Pacific Oyster Cultivation

Executive Summary

Natural England's 2022 Condition Assessment for the Dart Estuary MCZ concluded that, due to the presence of Pacific oysters, targets had not been met for several attributes of rocky and mud habitat features. The Condition Assessment also identified active aquaculture under the Waddeton Order as a "significant pathway" for the introduction or spread of this species. However, the same assessment acknowledged uncertainty over actual impacts and called for further monitoring.

This review, conducted by Devon and Severn Inshore Fisheries and Conservation Authority (D&S IFCA) uses a broad range of evidence to address key aspects of the Condition Assessment. D&S IFCA notes the existence of conflicting and uncertain evidence in the Condition Assessment, and suggests that the research cited within the Condition Assessment has significant uncertainties and does not appear to be sufficient to conclude unfavourable status for features, or to attribute unfavourable status to the effects of Pacific oyster farming.

A detailed investigation by D&S IFCA has found that:

- Pacific oysters are already well-established in South West estuaries, including the Dart, likely through natural dispersal from wild populations.
- Larval supply from wild stocks likely far outweighs that of farmed stocks; most settlement in the Dart is likely from outside the estuary.
- Use of sterile (triploid) stock in aquaculture can further reduce reproductive potential of farmed stock.
- Control of wild populations is extremely difficult; oyster farmers could help manage them through harvesting.
- Recent UK research shows minimal environmental harm from oyster farms, with possible biodiversity and nutrient-cycling benefits.

This review also sets D&S IFCA's investigation in the context of Defra policy, which recognises Pacific oysters as established south of 52°N, supports their cultivation subject to site-specific assessment, and advocates mitigation rather than prohibition. Formal site-based assessments by D&S IFCA, supported by Natural England, concluded that current aquaculture in the Dart MCZ and nearby SAC does not hinder conservation objectives or harm site integrity.

Despite this, the Duchy of Cornwall maintains a stance that it will phase out Pacific oyster farming on its estates, citing invasive species concerns. D&S IFCA argues that the evidence, policy position, and formal advice all support the continuation of well-managed Pacific oyster farming in the Dart, and that the Condition Assessment should better reflect the available science and the limited role of aquaculture in any wider spread. This, combined with revised consideration of Pacific oysters as an invasive species, appears likely to benefit small-scale local aquaculture. Well-managed Pacific oyster farming has potential ecological and economic benefits including providing a profitable mechanism for sustained removal of wild Pacific oysters.

Contents

Part 1: Introduction

This document outlines D&S IFCA's review of Natural England's 2022 Condition Assessment of the Dart Estuary MCZ, and how it relates to Pacific oyster (*Magallana (Crassostrea) gigas*) aquaculture in the Dart Estuary, particularly in the Waddeton Order area.

In addition to the literature cited below, this review is supported by the following key documents:

- Natural England's Condition Assessment of the Dart Estuary MCZ, available on the Designated Sites View (DSV) webpage (Natural England, 2022).
- D&S IFCA's summary of information relating to the introduction and spread of Pacific oysters in South West estuaries (D&S IFCA, 2025a).
- D&S IFCA's Dart Estuary MCZ Assessment regarding Waddeton Order aquaculture (D&S IFCA, 2023).
- Natural England's Formal Advice on the above assessment (Natural England, 2023).
- Defra's position on the farming of Pacific oysters (Defra, 2022).

Part 2 of this document considers the rocky habitats designated under the Dart Estuary MCZ. The intertidal mud feature is considered in Part 3, while Part 4 considers aquaculture in the Waddeton Order in relation to designated features of the Dart Estuary MCZ.

The Dart Estuary MCZ is also designated for the tentacled lagoon worm (*Alkmaria rominjii*) and coastal saltmarshes & saline reedbeds. This document does not cover these features, as they are not included in Natural England's 2022 Condition Assessment, and the targets for the feature attributes have been set at 'maintain in favourable condition', in accordance with the MCZ General Management Approach.

Part 2: Designated Rock Habitats

In this section, D&S IFCA Officers have presented a summary of the information available on Natural England's Designated Sites View (DSV) webpage regarding low energy intertidal rock in the Dart Estuary MCZ. This is followed by specific comments from D&S IFCA Officers in relation to this information.

Note that the low energy intertidal rock attributes, targets, assessment and evidence considered here are essentially equivalent to those presented on DSV for the estuarine rocky habitats feature. Therefore, only the low energy intertidal rock elements have been presented, to avoid duplication.

2.1 Summary of Low Energy Intertidal Rock Attributes, Targets and Rationale for Judgement

Table 1 summarises Natural England's Condition Assessment of the low energy intertidal rock feature (Natural England, 2022).

Table 1. Summary of Dart Estuary MCZ Condition Assessment for low energy intertidal rock (Natural England, 2022), focusing on relevant attributes.

Dart Estuary MCZ - Low energy intertidal rock				
Attribute	**Target**	**Target Assessed As:**	**Confidence**	**Rationale For Judgement**
Extent and distribution	Maintain the total extent and spatial distribution of intertidal rock subject to natural variation in sediment veneer	Met	Medium	"*There is no evidence that any pressures have caused decline in extent and distribution of the estuarine rocky habitats*."
Distribution: presence and spatial distribution of biological communities	Recover the presence and spatial distribution of intertidal rock communities	Not Met †	Medium	Notes "*Current unfavourable status due to presence of feral Pacific oyster*". However, also highlights that "*Research (Morgan et al., 2020), (Herbert et al., 2016) suggests that intertidal rock biotopes can be altered by the abundant presence of Pacific oyster, however it's not clear what the impacts on community structure are. Future monitoring is required to assess the impacts on community structure and distribution at this site*." Also notes that "*Littoral rock data that was collected during the 2013 Phase II survey will provide a baseline for measuring the 'presence and spatial distribution of biological communities on littoral rock' attribute in future years. Monitoring against baseline has not occurred*." †
Structure: species composition of component communities	Recover the species composition of component communities	Not Met †	Medium	
Structure: non-native species and pathogens (habitat)	Reduce the introduction and spread of non-native species and pathogens, and their impacts	Not Met †	Medium	Notes that "*Feral Pacific Oyster recorded common to abundant at Galmpton Creek, Middle Back and Dittisham Creek, Frequent to Common at Duncannon and abundant to superabundant at Greenway & Mill Point. Research (Morgan et al., 2020), (Herbert et al., 2016) suggests that intertidal rock biotopes can be altered by the abundant presence of Pacific oyster, however it's not clear what the impacts on community structure are. Future monitoring is required to assess the impacts on community structure and distribution at this site*." †

†Natural England's rationale for judgement, of all attributes listed as having failed to meet their targets, states that "*Active Pacific oyster aquaculture in the Dart Estuary (2001 Waddeton Order) provides a significant pathway for the introduction/spread of one or more invasive non-native species*".

2.2 D&S IFCA Comments Regarding Low Energy Intertidal Rock (and Estuarine Rocky Habitats)

As noted above, the low energy intertidal rock attributes, targets, assessment and evidence considered here are essentially equivalent to those presented on DSV for the estuarine rocky habitats feature (Natural England, 2022). Therefore, this discussion applies to both features, to avoid duplication.

Table 1 demonstrates that targets for several attributes have been assessed as 'not met', due to the presence of Pacific oysters. However, the rationale for judgement itself outlines that "*it's not clear what the impacts [of Pacific oysters] on community structure are*" and "*Future monitoring [of Pacific oysters] is required to assess the impacts on community structure and distribution at this site*."

It is therefore not clear how the presence of a supposed pressure (Pacific oyster) can be sufficient to assess a target as 'not met' and to grant unfavourable status. Based on the rationale for judgement, it would appear to be too early to assess the impacts of Pacific oysters on these intertidal rock feature attributes (and, by extension, the estuarine rocky habitats feature attributes).

Furthermore, the research cited in the rationales for judgement gives very mixed results as to the alterations to biotopes that are associated with Pacific oyster presence. The key reports referred to are Morgan *et al.* (2020) and Herbert *et al.* (2016).

On this topic, Morgan *et al.* (2020) stated that: "*The effect of Pacific oyster settlement on rocky intertidal communities is potentially very complex and may vary with habitat type, local hydrodynamic conditions, and oyster density (Zwerschke and others 2018; Kochman and others 2013). It is an area that would benefit further research, particularly into the effects at varying densities of Pacific oyster settlement*." D&S IFCA has reviewed these important secondary references.

The Zwerschke *et al.* (2018) paper itself is titled "Limited impact of an invasive oyster on intertidal assemblage structure and biodiversity: the importance of environmental context and functional equivalency with native species".

Zwerschke *et al.* (2018) conducted PERMANOVA analysis testing for the effects of oyster abundance (SACFOR), habitat type and exposure on macrofaunal and epifaunal assemblages. Their results indicated that "*Epifaunal assemblages did not differ between C. gigas and O. edulis […] and their abundance [...]. Moreover, epifaunal assemblages did not differ with an increased abundance of C. gigas or between habitat type or wave exposure*".

The results of Zwerschke *et al.*(2018) also indicated that "*macrofaunal assemblages showed a significant interaction between oyster abundance and habitat type (Table 2a, Fig. 2a, b). Post hoc tests were inconclusive but provided an indication that at muddy, rocky and sites with gravel, densities of oysters > 10/m^2 featured a different macrofaunal assemblage structure than those with lower or no C. gigas abundance*". This could be an important finding if applied to the Dart Estuary MCZ; however, closer inspection of their Table 2 reveals that, while the authors identified an interacting effect of oyster abundance and habitat type (p<0.001), the R^2 value for this effect was only 0.05, indicating that the abundance:habitat interaction explains only around 5% of the detected variation in macrofaunal assemblage. Table 2 suggests that the largest effect on macrofaunal assemblage may have been habitat

type, with an R^2 of 0.13 (explaining 13% of the variation in macrofaunal assemblage), though the authors considered this to be a non-significant effect with a *p* value of 0.019.

Zwerschke *et al.*(2018) also highlight that their analysis "*showed a tendency for kelp [Fucus vesiculosus] abundance to increase with oyster abundance in all habitats except rocky shores where it decreased (Table 3, Online Resource 3)*", and this result is highlighted by Morgan *et al.* (2020). Table 3 in Zwerschke *et al.* (2018) does appear to support this conclusion, but it is also important to consider the supplementary results reported in 'Online Resource 3' and the sites used for this study.

The online resource does show much lower abundance of kelp at sites where Pacific oyster is superabundant, but similar kelp abundance across sites where Pacific oysters were absent, common or abundant, which appears to support the conclusion. However, this study only considered two rocky sites where Pacific oysters were superabundant (both on the Brittany coast). The average height above chart datum of the surveyed areas at these sites was considerably higher than at the comparison rocky sites with lower Pacific oyster abundances, and with different wave exposure regimes. These potentially confounding factors appear not to have been accounted for in the analysis and conclusions.

Given that the specific results regarding areas of rocky shore with superabundant oysters appear to be contrary to the general patterns found in this paper, this suggests that confounding effects may be important yet overlooked. Confidence in the results is further reduced by statements in the paper such as "*The periwinkle Littorina sp., however, was present in high densities when oysters were superabundant, common or absent, but only in lower densities when oysters were abundant*"; this result is referred to by Morgan *et al.* (2020), but such results do not appear to make ecological sense – there does not appear to be an ecological reason for periwinkle densities to only be reduced where oysters are abundant, yet remain high when oysters are common or superabundant. This somewhat reduces confidence in the results overall.

In their discussion, Zwerschke *et al.* (2018) refer to their other findings regarding similarity of assemblages between areas with native and Pacific oysters. They highlight that "*In the past, most European shores would have included dense populations of native oysters O. edulis […] and their associated benthic assemblages […]. The recent decline of O. edulis populations resulted in altered benthic assemblage structure on these shores. The occurrence of wild C. gigas populations, albeit potentially harmful to O. edulis itself (Zwerschke et al., unpublished data), may help to re-establish coastal benthic communities to a former state. Here, we have increased the scope of previous understanding with regard to functional similarities between C. gigas and O. edulis and show that both oyster species support similar communities under varying environmental context when naturally co-occurring*."

In summary, Zwerschke *et al.* (2018) demonstrate very limited impact of Pacific oyster (with substantial uncertainty) on habitats such as those found in the Dart Estuary, and highlight the potentially beneficial functions that Pacific oysters could play in terms of restoring communities to a pre-degraded state similar to that which may have existed before native oysters were lost from the area.

The Morgan *et al.* (2020) Natural England Pacific oyster research report also relied on a paper published by Kochman *et al.* (2013), titled "*Environmental factors associated with invasion: modelling occurrence data from a coordinated sampling programme for Pacific*

oysters". However, this paper outlines the factors affecting Pacific oyster settlement, not Pacific oyster impact on other species or habitats. Therefore, D&S IFCA has not discussed this paper further here.

As identified by Morgan *et al.* (2020), "*The effect of Pacific oyster settlement on rocky intertidal communities is potentially very complex and […] is an area that would benefit further research, particularly into the effects at varying densities of Pacific oyster settlement*." However, the research presented does not support the conclusions of the Condition Assessment. This is explored further in Part 4.

The other report relied upon in the Condition Assessment's rationales for judgement is Herbert *et al.* (2016), titled "*Ecological impacts of non-native Pacific oysters (Crassostrea gigas) and management measures for protected areas in Europe*". This was discussed in D&S IFCA's MCZ assessment for aquaculture in the Dart Estuary MCZ (D&S IFCA, 2023), though more recent papers (such as those cited in D&S IFCA (2025a)) have also explored the ecological impacts of Pacific oysters and should be considered. In addition to this, MarFishEco Fisheries Consultants Ltd (MarFishEco) and Fishwise Ltd were commissioned by the Office for Environmental Protection (OEP) to develop an independent view of the challenges to achieving Good Environmental Status (GES) that are associated with aquaculture in England and Northern Ireland (MarFishEco and Fishwise Ltd, 2025).

The views provided in that report are those of MarFishEco and Fishwise Ltd and do not represent the opinion or position of the OEP. Their report finds that "aquaculture in England and Northern Ireland does not represent a major barrier to achieving GES. However, certain site-specific impacts, particularly those related to the bioaccumulation of contaminants in aquaculture products, marine litter, and non-native species, warrant ongoing scrutiny. The sector's potential for environmental enhancement—through nutrient removal, habitat creation, and biodiversity support—is an area that deserves further research". They state that "Ensuring that future regulatory decisions are informed by robust, UK-specific data will be critical to achieving GES while also supporting a sustainable aquaculture industry." This aligns with much recent research (explored here and in D&S IFCA, 2025a), which identifies a range of ecosystem benefits of Pacific oysters, and the need to find an appropriate balance between leveraging their ecosystem service benefits, and understanding and managing potential ecological trade-offs in relation to important conservation objectives.

Part 3: Designated Intertidal Mud Habitats

3.1 Summary of Intertidal Mud Attributes, Targets and Rationale for Judgement

Primary attributes of the intertidal mud feature were assessed as having met their targets of 'Maintain'. These include the following attributes:

- "Extent and distribution";
- "Structure: species composition of component communities"; and
- "Structure: sediment composition and distribution".

Targets for these were to:

- "Maintain the species composition of component communities",

- “Maintain the distribution of sediment composition types across the feature”, and
- “[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat”.

However, two secondary attributes of the intertidal mud feature were judged to have failed to meet their targets. This failure was attributed to the presence of invasive non-native species (INNS) specifically Pacific oyster. The relevant secondary attributes were:

- Distribution: presence and spatial distribution of biological communities
- Structure: non-native species and pathogens

3.2 D&S IFCA Comments Regarding Intertidal Mud Assessment

It is not clear how the secondary attributes can have failed to meet their targets, yet very similar primary attributes have simultaneously met their targets. These are explored in turn below.

Secondary attribute: Distribution: presence and spatial distribution of biological communities

Regarding the secondary attribute “Distribution: presence and spatial distribution of biological communities”, Natural England’s rationale for judgement states that the “*common abundance of Pacific oysters can smother sediments, changing habitat types from sediment to biogenic reef and disturbing or blocking the sediment surface that may be used as foraging habitat by birds and fish*”.

However, the related primary attribute for extent and distribution of intertidal mud was judged with medium confidence to have met its target (to “Maintain the total extent and spatial distribution of intertidal mud”), with the cited evidence stating that “*There is no evidence that any pressures have caused decline in extent and distribution of intertidal mud*”. This suggests that the presence of Pacific oysters has not converted the habitat type in the way suggested in the rationale for judgement for the secondary attribute.

Similarly, the related primary attribute for “Structure: species composition of component communities” was judged with low confidence to have met its target (to “Maintain the species composition of component communities.”). This suggests that the presence of Pacific oysters has not affected the presence and spatial distribution of biological communities, so it is unclear why this secondary attribute was judged to have failed to meet its target.

Secondary attribute: Structure: non-native species and pathogens

The secondary attribute “Structure: non-native species and pathogens (habitat)” has the target to “Reduce the introduction and spread of non-native species and pathogens, and their impacts.” The rationale for judgement here states that “*For sediment habitats common abundance of Pacific oyster can result in habitat change (Morgan et al., 2020), (Herbert et al., 2016).*” However, the evidence for the primary attribute has indicated with medium confidence that this habitat change has not occurred. Furthermore, as outlined in section 2.2, D&S IFCA has outlined significant uncertainty in the reports relied upon by the Morgan *et al.* (2020) report. These uncertainties also undermine the conclusions in respect of intertidal mud.

Part 4: MCZ Features and Aquaculture

For the features discussed in Parts 2 and 3, Pacific oysters are identified as a significant risk to achievement of the features' Conservation Objectives. For all attributes of rocky and mud features that were deemed not to have met their targets, Natural England's rationales for judgement state that "*Active Pacific oyster aquaculture in the Dart Estuary (2001 Waddeton Order) provides a significant pathway for the introduction/spread of one or more invasive non-native species*."

In addition, for the secondary attributes discussed in Part 3, aquaculture was identified as the driver for adverse condition. Natural England (2022) listed the remedy to this as 'investigation': "*Further investigation required by regulatory and advisory bodies including Natural England, Devon & Severn IFCA, Duchy of Cornwall, Cefas and Defra*" (Natural England, 2022).

D&S IFCA has conducted a thorough recent investigation of the potential impacts of aquaculture at the Waddeton Order on features of the Dart Estuary MCZ. The evidence obtained in this investigation is detailed in the attached document (D&S IFCA, 2025a), which should be read alongside this review. The broad headlines are summarised in text box 1 (overleaf), though it is important to consider the detail in the full document (D&S IFCA, 2025a).

Information gathered as part of this investigation has also been used to inform MPA assessments submitted to Natural England for their formal advice (D&S IFCA, 2023; Natural England, 2023).

In August 2023, D&S IFCA undertook an MCZ Assessment on Pacific oyster cultivation within the Dart Estuary MCZ, in particular relating to an additional plot to be worked within the Waddeton Order area. An HRA was also completed which assesses the aquaculture activities that are occurring the Dart Estuary under the 2001 Waddeton Order on the Torbay part of the Lyme Bay and Torbay SAC.

The assessments concluded that Pacific oyster aquaculture activities do not pose a risk of hindering the conservation objectives of the MCZ nor have an adverse effect on the site integrity either alone or in combination with other plans or projects in the Lyme Bay and Torbay SAC.

Natural England provided their formal advice on these assessments in October 2023. This stated that: "*It is Natural England's view that through their assessments, Devon and Severn IFCA appear to have appropriately identified any activities likely to have a significant effect in view of the sites' conservation objectives, as well as any mitigation or management required in order to ensure no adverse effect on the integrity of the Marine Protected Areas.***"** No mitigating measures were confirmed by D&S IFCA, though the use of triploid stock where possible was suggested.

In their Formal Advice, Natural England also noted that **"***Natural England would encourage the use of triploid stock to minimise any future impacts on the Dart Estuary MCZ as although the local aquaculture practice will not be causing the introduction of the Pacific oyster to the site due to feral populations already being established, the practice does have the potential to exacerbate and compound the problem*."

Text Box 1

In summary, D&S IFCA's investigation into the introduction and Spread of Pacific Oysters in South West Estuaries found the following:

Pacific oysters are already well-established in South West estuaries, including the Dart and Devon Avon, with wild populations present even in areas where no farming has taken place. Their spread is thought to be driven mainly by natural dispersal from existing wild stocks, not by aquaculture.

Government policy recognises that south of 52°N (which includes South Devon) the species cannot realistically be eradicated or prevented from establishing. **Policy supports cultivation** subject to site-specific environmental assessments, and if risks to Marine Protected Areas (MPAs) are identified, regulators can require mitigation such as using sterile (triploid) stock or monitoring.

Scientific evidence and modelling show that:

- Wild populations produce far more larvae than farmed stocks, so farming likely makes little difference to overall spread.
- Larvae can disperse widely via currents, with most settlement likely coming from outside the local estuary.
- Triploid oysters used in farming have very low reproductive potential.

Assessments for the Dart and Devon Avon MCZs (and the nearby SAC) have concluded that current aquaculture has no significant adverse effect on conservation objectives. Natural England has agreed with these findings.

Control of wild Pacific oysters is extremely challenging; removal success in the Dart has been minimal. Oyster farmers could help manage wild stocks through harvesting.

Potential benefits include water filtration, nutrient removal, habitat provision for other species, and supporting biodiversity. Recent UK research found minimal environmental harm from oyster farms, which can have important roles in nutrient cycling and may improve seabed diversity. Wild oyster settlements have been suggested to restore ecosystems to a state similar to that which existed before native oysters declined.

Overall: In South West estuaries, farming Pacific oysters is not considered to worsen their spread or harm MPAs, and may offer ecological and economic benefits if managed carefully.

The evidence obtained in the thorough investigation conducted by D&S IFCA, combined with these assessments and Natural England's Formal Advice are at odds with the following:

- Natural England's identification of aquaculture as a "si*gnificant pathway for the introduction/spread of one or more invasive non-native species"*;
- Natural England's assessment that several feature attributes are in unfavourable condition specifically due to the presence of Pacific oyster; and
- Natural England's identification of aquaculture as a driver for adverse condition of features of the Dart Estuary MCZ.

These discrepancies have material implications for the feasibility of local aquaculture businesses in Devon, particularly those that operate in areas owned by the Duchy of Cornwall, including the Waddeton Order. It is well known that since 2023, the Duchy of Cornwall has announced its intention to phase out the cultivation of Pacific oysters from Duchy-owned areas. The primary reason for this is that Pacific oysters are classified as invasive non-native species, and there are concerns around the potential implications of Pacific oysters in Marine Protected Areas (Hansard HC Deb., 2023).

D&S IFCA has highlighted to the Duchy that it is recognised in Defra policy (Defra, 2022) that Pacific oysters are well established south of 52°N latitude and that, "*with current technology, Pacific oyster cannot be prevented from establishing in, or be successfully or economically eradicated from, this area."* The Pacific oyster aquaculture activities on the Dart estuary (and Avon estuary) are south of 52°N (between 50°N and 51°N) latitude. Therefore, Defra is clearly in support of Pacific oyster aquaculture in these areas, having stated that "*authorisations for farms within 5km of MPAs will continue to be granted only after the regulator has considered the outcome of site based environmental impact assessments. These assessments will take into account the impact of Pacific oysters on the current condition of local MPAs".*

Natural England's advice on D&S IFCA's Dart Estuary MCZ assessment shows that both the regulator (D&S IFCA) and SNCB have considered the outcome of site-based assessments, which concluded that the activities would not hinder the achievement of the site's Conservation Objectives.

Even if an adverse impact had been identified, Defra's policy is clear that "*If Pacific oysters are likely to have an adverse impact on these sites, Defra supports regulators to introduce mitigating authorisation conditions, such as triploidy or monitoring."* Clearly, these actions stop short of ceasing aquaculture of Pacific oysters, which are identified by Defra as "*an important species for the aquaculture industry with potential for growth*".

Broadly, policy is supportive of Pacific oyster aquaculture in sites such as the Dart Estuary. Defra has recently gone further than this by granting Pacific oysters in Pembrokeshire 'Protected Geographical Indication' (PGI) status. The PGI schemes "*support UK food and drink businesses by protecting the reputation of regional products, promoting traditional and agricultural activity while boosting growth in local economies*". This scheme covers other products like Melton Mowbray pork pies, Stilton blue cheese, and Cornish clotted cream.

In relation to the Pembrokeshire oysters, UK Government Minister for Food Security, Farming and Rural Affairs, Daniel Zeichner said: "*By giving these products unique status, we're helping local businesses grow while ensuring consumers can enjoy authentic regional specialities for generations to come*."

The Pacific oysters in Pembrokeshire are the same species as those grown in the Dart - and other southwest estuaries - but are marketed in Pembrokeshire as 'Pembrokeshire Rock Oysters'. The PGI status in Pembrokeshire would not impinge on the ability of local growers in the Dart and Avon to sell their produce, but this PGI recognition highlights that not only does Defra support farming of Pacific oysters in waters south of 52°N, but also recognises the real value of the product and how it supports local economies.

The announcement of the PGI status is here: https://www.gov.uk/government/news/welsh-food-and-drink-delicacies-earn-protected-status. More information on the Pembrokeshire oyster designation specifically is here.

Repeated interactions with a range of stakeholders have highlighted that sustained removal of wild-growing Pacific oysters is only possible with long-term and relatively intensive removal activities. This is supported by Morgan *et al* (2021), who also highlight that difficulties with sustaining removal efforts (for example due to a lack of volunteers) can lead to project failure. Clearly, sustained local effort is required for effective removal of wild populations, and this requires an appropriate funding model. D&S IFCA is collaborating with a consultant and Devon-based aquaculture operators to explore the potential for removal of wild-growing Pacific oysters from a protected area, and how this can be achieved in a way that (i) is mindful of benthic impacts of the removal process, (ii) is a viable component of a thriving aquaculture business model, and (iii) can reinvest profits and reuse materials from both farmed and wild-gathered Pacific oysters to support restoration of native species. This project is subject to external funding, as outlined in D&S IFCA (2025b).

Conclusions

Overall, D&S IFCA finds that:

(a) the policy environment clearly supports the cultivation of Pacific oysters in Devon;

(b) the scientific evidence supports a conclusion of no adverse effect of this activity on features of the Dart Estuary MCZ (and the Lyme Bay and Torbay SAC); and

(c) control of 'feral' populations is not likely to be achievable or sustainable without the contribution of oyster farmers with profitable business models that are able to utilise the wild resource alongside a cultivated resource.

Despite this, there remains a reluctance to allow cultivation of Pacific oysters on Duchy-owned estuaries. To overcome this, D&S IFCA believes it is important that:

(a) the Condition Assessment of the Dart Estuary MCZ more accurately reflects the evidence presented in this review and D&S IFCA's investigation (D&S IFCA, 2025a); and

(b) that the status of Pacific oysters as an invasive species is reviewed at a national level, in line with policy and scientific evidence.

References

Defra (2022). Letter to Simon Fell MP from the Minister of State for Farming. Fisheries and Food, reference MC2022/17240, setting out Defra's position on the farming of Pacific oysters in English waters. 31 August 2022.

D&S IFCA (2023) Dart Estuary MCZ Assessment DAR-MCZ-006: Waddeton Aquaculture.

D&S IFCA (2025a). Summary of information relating to the introduction and spread of Pacific oysters in South West estuaries Apr 2025. Devon and Severn IFCA, Brixham.

D&S IFCA (2025b). Full Authority Meeting 18th September 2025, Agenda Item 10: Invasive to Native Project report. Devon and Severn IFCA, Brixham. Available at: https://www.devonandsevernifca.gov.uk/wp-content/uploads/2025/09/Agenda-Item-10-Invasive-to-Native-Project.pdf (Accessed 19 September 2025).

Hansard HC Deb. (2023). House of Commons Westminster Hall Debate; vol. 729: Shellfish Aquaculture, debated on 15 March 2023, col. 331WH. Available at: https://hansard.parliament.uk/Commons/2023-03-15/debates/1BE2E674-2592-49B4-B233-5F8F9D263277/ShellfishAquaculture (Accessed: 11 September 2025).

Herbert, R. J. H., Humphreys, J., Davies, C. J., Roberts, C., Fletcher, S. and Crowe, T. P. (2016). Ecological impacts of non-native Pacific oysters (*Crassostrea gigas*) and management measures for protected areas in Europe. Biodiversity and Conservation, 25, 2835-2865.

Kochman, J., O'beirm, F., Yearsley, J., & Crowe, T.P. (2013). Environmental factors associated with invasion: modelling occurrence data from a coordinated sampling programme for Pacific oysters. Biological Invasions, 15, 2265-2279.

MarFishEco Fisheries Consultants and Fishwise Ltd (2025). Aquaculture & Good Environmental Status: Assessing Impacts in England & Northern Ireland. Report for the OEP. Available at: https://www.theoep.org.uk/sites/default/files/investigations-files/Baseline%20Evidence%20Review%20of%20the%20Effects%20of%20Aquaculture%20on%20the%20Achievement%20of%20GES.pdf (Accessed 19 September 2025).

Morgan, A., Slater, M., Mortimer, N., McNie, F., Singfield, C., Bailey, L., Covey, R., McNair, S., Waddell, C., Crundwell, R., Gall, A., Selley, H. and Packer, N. 2020. Partnership led strategy to monitor and manage spread of Pacific oyster populations. Natural England. (As cited by Natural England, 2022).

Morgan, A., Slater, M., Mortimer, N., McNie, F., Singfield, C., Bailey, L., Covey, R., McNair, S., Waddell, C., Crundwell, R., Gall, A., Selley, H. and Packer, N. 2021. Partnership led strategy to monitor and manage spread of Pacific oyster populations. Natural England. Available at https://publications.naturalengland.org.uk/publication/4889256448491520

Natural England (2022). Condition Assessment of the Dart Estuary MCZ, available on the Designated Sites View (DSV) webpage.

Natural England (2023). Formal Advice on D&S IFCA (2023) DAR-MCZ-006.

Zwerschke, N., Hollyman, P.R., Wild, R., Srigner, R., Turner, R.J., & King, J.W. (2018). Limited impact of an invasive oyster on intertidal assemblage structure and biodiversity: the importance of environmental context and functional equivalency with native species. Marine Biology, 165 (5), 89.