

Appropriate Assessment Conclusion Statement by the Licensing Authority for aquaculture activities (with particular reference to applications received subsequent to the original Appropriate Assessment in April 2011) in Castlemaine Harbour SAC (Site Code: 000343) and SPA (Site Code: 004029) (Natura 2000 sites) – August 2018

This Conclusion Statement outlines how it is proposed to determine applications for aquaculture licences and for licence reviews in the Castlemaine Harbour Special Area of Conservation (SAC) and Special Protection Area (SPA) in compliance with the EU Habitats and Birds Directives.

An Appropriate Assessment of proposed aquaculture in the above Natura 2000 sites has been prepared by the Marine Institute in relation to marine habitats and Niras/Marine Institute in relation to bird species, on behalf of the Department of Agriculture, Food and the Marine (available on the Department's website, dated May 2018). This follows the original Appropriate Assessment of the impacts of mussel, oyster and clam aquaculture and mussel fishing on Castlemaine Harbour SAC and SPA which was published in April 2011. The current Article 6(3) Appropriate Assessment considered the potential ecological impacts of aquaculture activities on Natura 2000 features in both the Castlemaine SAC and SPA. The information upon which the Appropriate Assessment is based is the definitive list of applications for aquaculture and licence reviews available at the time of assessment. This information was provided by the Department of Agriculture, Food and the Marine.

Existing and Proposed Aquaculture Activity in the SAC and SPA

In Castlemaine Harbour, existing aquaculture is focused on the cultivation of Pacific oysters on trestles in intertidal areas, the subtidal cultivation of mussels on the seabed and intertidal cultivation of Manilla clams using nursery frames followed by planting on the seabed. The intertidal area along the southern shore of Castlemaine Harbour is the main cultivation area for Pacific oysters while bottom mussel farming also occurs along the southern shore but predominantly along the northern shore. The Fishery Order for mussel seed covers the main navigational channel from Inch Point to Cromane Island. Clam cultivation is confined to the south in Glenbeigh.

There are 98 new applications for aquaculture licences in Castlemaine Harbour comprising 91 applications for oyster cultivation, six applications for mussel cultivation and one application for both oyster and mussel cultivation. In addition, five licensees have applied for licence reviews to add oysters to their existing mussel sites.

Castlemaine Harbour SAC

Castlemaine Harbour SAC (Site Code: 000343) is a large site located on the south-east corner of the Dingle Peninsula, Co. Kerry. It consists of the whole inner section of Dingle Bay, i.e. Castlemaine Harbour, the spits of Inch and White Strand/Rosbehy and some coastline to the west.

Qualifying Interests

An initial screening exercise resulted in a number of habitat features and species being excluded from further consideration. A full assessment was carried out on the likely interactions between existing and proposed culture operations and the feature Annex 1 habitats for:

- (1130) Estuaries and
- (1140) Mudflats and sandflats not covered by seawater at low tide.

There are a number of attributes (with associated targets) relating to these broad habitat features as well as constituent community types including the following:

- Intertidal sand with *Nephtys cirrosa* community, *Zostera* community complex, Fine to muddy sand with polychaetes community, Mixed sediment community and Intertidal muddy fine sand community in (1130) Estuaries;

- Intertidal sand with *Nephtys cirrosa* community, *Zostera* community complex, Fine to muddy sand with polychaetes community and Intertidal muddy fine sand community in (1140) Mudflats and sandflats not covered by seawater at low tide.

A full assessment was also carried out on the likely interactions between the proposed aquaculture activities and the following Annex II Species:

- (1106) Atlantic Salmon (*Salmo salar*),
- (1355) Otter (*Lutra lutra*),
- (1095) Sea Lamprey (*Petromyzon marinus*) and
- (1099) River Lamprey (*Lampetra fluviatilis*).

Screening of Adjacent Natura Sites for *Ex-Situ* Effects

The nearest SACs to the Castlemaine Harbour SAC, which have marine interests, are the Blasket Islands SAC (Site Code: 002172) and the Valentia Harbour/Portmagee Channel SAC (Site Code: 002262). Both of these sites are in excess of 42km from the Castlemaine Harbour SAC and as a result were screened out.

Conservation Objectives for the Castlemaine Harbour SAC

The Conservation Objectives for the Qualifying Interests of the SAC were prepared by the National Parks and Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht (NPWS, 2011a). The natural condition of the designated features should be preserved with respect to their area, distribution, and extent and community distribution. Habitat availability should be maintained for designated species and human disturbance should not adversely affect such species. For the practical purpose of management of sedimentary habitats, a 15% threshold of overlap between a disturbing activity and a habitat is given in the NPWS guidance (NPWS, 2011c). Below this threshold disturbance is deemed to be non-significant.

Assessment of the effects of Aquaculture Activities on the Conservation Objectives for Habitat Features in the Castlemaine Harbour SAC

1. Habitat Area - it is unlikely that the proposed activities will reduce the overall extent of permanent habitat within the feature (1130) Estuaries and (1140) Mudflats and sandflats not covered by seawater at low tide. The habitat area is likely to remain stable.

2. Community Distribution - (conserving a range of community types in a natural condition) -

The likely impacts from existing and proposed intertidal oyster cultivation, subtidal mussel cultivation and intertidal clam aquaculture activities on the broad habitat features of 1130 and 1140 and their constituent community types were considered in isolation and/or cumulatively to the features in question.

Intertidal Oyster Cultivation

While the combined spatial overlap of current and proposed oyster cultivation sites and the constituent marine community types identified for the Qualifying Feature habitats of 1130 and 1140, ranged between 2.95% and 51.48%, published literature (*Forde et al., 2015; O'Carroll et al., 2016*) however, suggests that the presence of bags on trestles is considered non-disturbing. Consequently, adverse impacts of activities occurring at oyster cultivation sites within the Qualifying Interests of 1130 Estuaries and 1140 Mudflats and sandflats not covered by seawater at low tide can be discounted.

The access routes used in intertidal areas, by virtue of persistent compaction of the sedimentary habitats, are considered disturbing. The access routes for aquaculture sites overlap with all identified constituent communities of the Qualifying Interests (1130) Estuaries and (1140) Mudflats and sandflats not covered by seawater at low tide. The spatial overlap of access routes within these community types ranged between 0.02% and 0.9%. One of these constituent habitats is the *Zostera* dominated community which is located within the 1130 and 1140 Qualifying Interests. The spatial overlap between oyster access routes and the *Zostera* community is 0.09% in both habitats. One such access route is required for a number of the proposed oyster application sites in the Glenbeigh area. However, *Zostera* community type cannot tolerate any overlap. The proximity of structures (used in intertidal oyster culture) may impact flow regimes in and around the seagrass bed which could result in a detrimental impact on the overall status of this marine community type.

Subtidal (bottom) Mussel Cultivation

Bottom mussel cultivation, by virtue of dredging activities and the modification of community types is considered disturbing. Current mussel cultivation occurs in two constituent marine community types identified for the Qualifying Feature habitat of (1130) Estuaries. The spatial overlap of licensed mussel culture activities within these community types ranged between 1.3% and 5.47%. Current mussel cultivation occurs in two community types identified within the Qualifying Features of (1140) Mudflats and sandflats not covered by seawater at low tide. The spatial overlap of licensed mussel culture within these community types ranged between 1.3% and 6.17%.

If all applications for mussel cultivation were to be granted the spatial overlap of cultivation sites in four constituent communities within the Qualifying Feature 1130 Estuaries would range from 0.57% to 8.49%. In addition, the spatial overlap within the Qualifying Feature 1140 Mudflats and sandflats not covered by seawater at low tide would range from 1.16% to 10.02%. One of these constituent habitats is the *Zostera* dominated community which is located within the 1130 and 1140 Qualifying Interests. The spatial overlap between proposed mussel sites and *Zostera*, a marine community type which cannot tolerate any overlap, is 2.83% in both habitats.

Longline Mussel Cultivation

The interaction with proposed longline mussel activity was considered in light of the conservation features for which it has direct spatial overlap, i.e. habitat features 1130 and 1140 and one marine community type, Fine to muddy sand with polychaetes community. Given the proposed culture method will have a relatively small biomass and will be carried out for a short duration in each year (i.e. capture of seed and subsequent relaying to separate bottom mussel culture sites), there is unlikely to be any prolonged impact (i.e. organic enrichment) on the seabed. Consequently, adverse impacts of activities occurring at longline mussel sites within the Qualifying Interests of (1130) Estuaries and (1140) Mudflats and sandflats not covered by seawater at low tide can be discounted.

Species

The likely interactions between the proposed aquaculture activities and the following Annex II Species were assessed - Atlantic Salmon *Salmo salar* (1106), Otter (*Lutra lutra*) (1355), *Petromyzon marinus* (Sea Lamprey) (1095) and *Lampetra fluviatilis* (River Lamprey) (1099). The objectives for these species in the SAC focus upon maintaining the good conservation status of populations. The main aspect of the culture activities that could potentially impact the designated species is the physical presence of trestles that may impede migration of fish and restrict otter access to certain habitats. However, given the locations and level of current and proposed activity it was concluded that aquaculture activities would be non-disturbing to these Annex II species.

In-combination Effects of Aquaculture, Fisheries and other Activities

In assessing in-combination effects, licensed aquaculture activities take priority over other activities (including fisheries) that might have been subsequently approved as well as those activities still at the application stage. It was concluded that oyster trestles and mussel seed collection using longlines are considered non-disturbing to marine habitats on the basis of spatial overlap, therefore there should be no in-combination effect with other activities. Current levels of subtidal (bottom) cultivation of mussels do not pose a significant risk to the Conservation Objectives of marine habitat features on the basis that intertidal cover of mussels is limited to 12% cover in both aquaculture sites and intertidal fishery order areas and taking into account that existing licensed aquaculture activities have previously and continue to be at a level that is considered non-disturbing. On the basis of spatial overlap alone, proposed mussel culture sites (i.e. applications) do potentially risk disturbing conservation features as the 15% threshold is exceeded when considered in-combination with other (fishery) activities. Furthermore, the potential overlap of a proposed mussel cultivation site (T06/428A) will also pose a significant risk to the Conservation Objectives of one marine benthic community type for which the SAC is designated i.e. *Zostera* community complex as this marine community type is not compatible with mussel aquaculture.

Castlemaine Harbour SPA

Castlemaine Harbour SPA (Site Code: 004029) is located in the innermost part of Dingle Bay. The SPA comprises the estuaries of the River Maine and the River Laune and is dominated by extensive areas of sheltered intertidal sand and mud flats with fringing saltmarsh and shallow marine waters. Intertidal eel grass beds are present on the eastern side of Inch dune system and a small patch is present in the far north eastern part of the SPA. A coastal barrier dune system at Inch and Rosbehy provides shelter to the inner part of the SPA. These sand spits protect the key structural and functional relationships that create and maintain the site's integrity. Whilst the Inch barrier system is relatively stable the Rosbehy system has breached in recent times with the potential to change the marine habitats behind the barrier and consequently the associated species communities they support.

Conservation Objectives for the Castlemaine Harbour SPA

The overarching Conservation Objective for the Castlemaine Harbour SPA is to ensure that waterbird populations and their wetland habitats are maintained at, or restored to, favourable conservation condition (NPWS, 2011b). This objective is broken down as follows:

1. To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Castlemaine Harbour SPA.

2. To maintain the favourable conservation condition of the wetland habitat at Castlemaine Harbour SPA as a resource for the regularly occurring migratory waterbirds that utilise it.

Status, Habitats and Distribution of Special Conservation Interests

Status

Castlemaine Harbour SPA is an important site for the conservation of nine Special Conservation Interests (SCIs) (NPWS, 2011a) namely Light bellied Brent Goose, Wigeon, Pintail, Ringed Plover, Bar tailed Godwit, Sanderling, Scoter, Red throated diver and Common Scoter.

Seven additional species of Conservation Interests, namely Mallard, Scaup, Oystercatcher, Cormorant, Turnstone, Greenshank and Redshank also utilise the Castlemaine Harbour SPA.

Based on the most recent five-year period, the populations of three species in Castlemaine Harbour are currently in highly unfavourable conservation status (>50% decline) namely the Common Scoter, Red-throated Diver and Turnstone. Three species are in moderate unfavourable condition (25–49% decline) namely the Ringed Plover, Cormorant and Oystercatcher. One species is in an intermediate unfavourable condition (1–24% decline) i.e. the Light bellied Brent Goose. The remaining bird species are in favourable condition (stable or increasing). Over the longer term (13 years), it was concluded that the Wigeon and Red-throated Diver are in highly unfavourable condition with the Ringed Plover, Mallard, Cormorant and Turnstone in intermediate or moderate unfavourable conditions.

Waterbird Habitats and Distribution

Castlemaine Harbour was divided into 24 subsites for the NPWS Baseline Waterbird Survey (BWS) which took place during the winter of 2009/10. At low tide, higher species diversity was found within subsites dominated by intertidal habitats and all subsites were considered important for at least one SCI. The relative importance of 10 out of the 18 intertidal subsites was considered based on the presence of significant counts or maximum or average densities of SCIs. These sites are critical to maintaining SCIs in favourable condition.

The intertidal area east of the Inch dune system supports the highest number of SCIs (9 species). The eel grass (*Zostera*) beds are particularly important for the Light-bellied Brent Goose moving to other subsites, when the foraging resource is depleted. Subsites where no SCIs are present in such numbers or densities to be noteworthy in relative terms may still support smaller numbers of SCIs and make some contribution to the favourable condition status of the SCIs. All I-WeBS subsites support significant numbers of at least one SCI in the three hours either side of high tide. High tide roosts are located mainly in the inner part of Castlemaine Harbour, with multiple large roosts concentrated on the eastern side of the Inch sand dune system.

Assessment of Impacts on core SPA Conservation Objective

In consideration of the licence applications and licence variations alone and cumulatively, likely significant effects have been identified for:

- Noise/visual disturbance for all intertidal SCIs and Cormorant;
- Displacement for all intertidal foraging SCIs except Greenshank and Redshank.

The foraging range of Cormorant overlaps with the activities related to a subtidal mussel rope culture application site and therefore a likely significant effect for noise/visual disturbance has been identified. For

all other piscivore and molluscivore SCIs that forage in subtidal habitats no likely significant effects are predicted.

Whilst taking into account the existing licensed sites as part of baseline conditions, the licence applications and licence variations are likely to result in a reduction of functional foraging habitat area, disturbance to key species and a reduction in species density. The predicted impacts are outlined in further detail below:

Licence Applications

Predicted impact (alone)

- One application for subtidal mussel rope culture (T06/457A) is predicted to have no impact on intertidal SCIs because the operational requirement for boat access means that activities will not take place at times of low water. The I-WeBS subsite in which this licence application site is located covers 86.2 ha of which 8.2 ha is intertidal habitat covered by seawater at high tide and 77.4 ha is subtidal habitat. The area of subtidal habitat is equivalent to 0.9% of the total habitat extent within Castlemaine Harbour SPA (8847.8 ha). No appreciable habitat loss is considered likely to occur because of the extent of alternative subtidal foraging habitat available within the wider SPA.
- Five licence variation applications (T06/301A, T06/340A, T06/340B, T06/305A and T06/306A) will not result in the increase in spatial extent or intensity for these existing licensed sites, therefore, no appreciable habitat loss is likely to occur in these cases.

Predicted impact (cumulative)

- All licence applications are predicted to cumulatively occupy at least 4.8% of the intertidal habitat in each of the I-WeBS subsites. It is assumed that displacement or disturbance may conservatively result in no less than 5% exclusion cumulatively from the licence application or variation sites in each I-WeBS subsite. At times, these impacts acting synergistically may result in full exclusion from a licence application or variation site.
- All licence applications are predicted to cumulatively contribute to intertidal habitat loss in all I-WeBS subsites considered to be key areas for maintaining the long-term population trends of SCIs. This cumulative loss is 33.5% of the total intertidal habitat (4284.8 ha) within the Castlemaine Harbour SPA. The full exclusion of waterbirds from licence application or variation sites is not expected to be a universal response for either displacement from trestle areas or disturbance for the identified species.

Predicted impact (in combination)

- Only one licence application site (T06/457A) and five licence variation sites (T06/301A, T06/340A, T06/340B, T06/305A and T06/306A) can be assessed in combination with recreational disturbance because the predicted impact alone or cumulatively have been excluded.
- The licence application for subtidal mussel culture (T06/457A) will not act in combination with recreational disturbance or other shellfish culture activities that have previously been identified as sources of disturbance in the application site area. The activities of subtidal mussel culture will likely be temporary segregated from those sources occurring at low tide (i.e. dog walking, vehicle

movements and intertidal shellfish husbandry). Those species likely to be disturbed in the intertidal zone will be absent from the licensed site at periods of high water.

Access Routes

Predicted Impact (alone)

- Seven of the eleven access routes are located within 500m of a high tide roost. Intertidal shellfish cultures will be accessed within two to three hours either side of low tide and therefore the use of these access routes will not coincide with the formation of high tide roosts. The use of access routes within two hours either side of high tide should be restricted.

Predicted Impact (in combination)

- Disturbance of high tide roosts from the use of access routes will not occur and therefore no in combination impacts are anticipated.

Findings of the Article 6(3) Appropriate Assessment of Castlemaine Harbour SAC and Castlemaine Harbour SPA

- Current and proposed intertidal oyster and clam aquaculture activities individually and in combination do not pose a risk of significant disturbance to the conservation habitats in the Castlemaine Harbour SAC on a spatial overlap and sensitivity analysis basis.
- Current levels of subtidal (bottom) cultivation of mussels and intertidal clam cultivation do not pose a significant risk to the Conservation Objectives of the majority of marine benthic habitat features for which the SAC is designated. One exception relates to proposed mussel cultivation at site T06/428A which will pose a significant risk to the Conservation Objectives of one marine benthic habitat feature for which the SAC is designated - *Zostera* community complex which is not compatible with mussel aquaculture. In addition, the overlap of *Zostera* is not compatible with access routes to aquaculture sites.
- The review of five existing licences to vary licences from mussel culture to include oyster culture does not present a risk to habitat conservation features.
- The introduction of '½ grown' or 'wild' oyster or mussel seed stock into aquaculture plots (both within and proximate to the SAC) from outside of Ireland does pose a clear risk of establishment of non-native species in the SAC which cannot be discounted.
- The impact of the proposed increase in the standing stock biomass of oyster culture in the harbour from 1.54% and 2% coverage of Habitats 1130 and 1140 to 31.26% and 34.69 % respectively in relation to seston (i.e. living and non-living matter in water) depletion and subsequent impacts on conservation features cannot be discounted. This increase is considered substantial and the impact of this quantity of oysters on the seston levels in the harbour is likely to be considerable. The indirect impact of reduced plankton levels may have an impact on the constituent communities associated with the habitats. On the basis of the applications and the proposed increase in spatial area of

licensing, the risk of seston depletion and impacts on the carrying capacity of the system cannot be discounted.

- The likely interactions between the proposed aquaculture activities and the Annex II Species of Atlantic Salmon, Otter, Sea Lamprey and River Lamprey would be non-disturbing.
- The licence applications are predicted to cumulatively contribute to intertidal habitat loss in all I-WeBS subsites considered to be key areas for maintaining the long-term population trends of SCIs. This cumulative loss is 33.5% of the total intertidal habitat (4284.8 ha) within the Castlemaine Harbour SPA.
- The risk of the licence applications (cumulatively) impacting significantly on the numbers or range of areas used by waterbird species cannot be excluded.
- The licence applications (cumulatively) would reduce the permanent area occupied by functional intertidal habitat (for foraging waterbirds) to 2847.6 ha.

Mitigation Measures and Proposed Licensing arising from the Findings of the Appropriate Assessment

Taking the existing licensed sites into account as part of baseline conditions, the combination of existing licences and licence variation application sites, in addition to the new licence application T06/457A for subtidal mussel rope cultivation should not result in adverse effects in site integrity alone, cumulatively or in combination. This is due to the spatial extent of the existing and variation sites not changing and the predicted impact for T06/457A not being appreciable as it is spatially and temporally separated from other sources of disturbance.

An adverse effect on site integrity cannot be excluded alone, cumulatively or in combination for all the new application sites as the cumulative spatial extent of these sites is such a large proportion of the Castlemaine Harbour SPA (33.5% of the intertidal habitat alone).

Detailed information on intertidal aquaculture activities such as trestle density and recent information on tidal dynamics were not available for this Appropriate Assessment. In general, there is insufficient data to determine a threshold whereby the cumulative impact of application sites could be 'built-up' by consenting applications to a point before an adverse effect on site integrity was beyond reasonable scientific doubt.

It is proposed not to grant the new licence application sites with the exception of T06/457A as in combination adverse effects could result, as follows:

- interrupting the progress towards achieving the Conservation Objectives of the SPA for those species in long term population decline;
- disrupt those factors that help to maintain the favourable conditions of the SPA (i.e. spatial extent of functional habitat);
- interfere with the distribution and density of SCIs that are the indicators of the favourable condition of the SPA (i.e. caused by displacement);

- cause changes to the vital defining aspects (i.e. undisturbed foraging areas and an absence of obstructions to sight lines) that determine how the site functions as a supporting habitat for waterbirds;
- reduce the area of key habitats;
- result in disturbance that could affect population size or density or the balance between key species;
- result in habitat fragmentation;
- noise/visual disturbance for all intertidal SCIs and Cormorant; and
- the displacement for all intertidal foraging SCIs except Greenshank and Redshank.

Conclusion

The Licensing Authority concludes that in general from a Natura 2000 perspective, given the conclusions and recommendations of the Appropriate Assessment process, the risk of significant disturbance from the proposed aquaculture activities cannot be discounted. In addition, the proposed increase in the spatial area arising from the new licence applications would pose a risk of seston depletion and impact on the carrying capacity of the harbour.

Taking the existing aquaculture activities into account as part of baseline conditions, it is proposed to consider the five licence variation applications in accordance with existing licence conditions for the harbour as there will be no increase in spatial extent or intensity for these existing licensed sites and therefore no risk is predicted for habitat conservation features in these cases.

One new application for subtidal mussel rope culture can be considered for licensing purposes as it is unlikely to have any impact on intertidal SCIs or on appreciable habitat loss. The remaining new licence applications for Castlemaine Harbour cannot be authorised as it is not possible to measure the magnitude of the impact of individual licences which could adversely affect the integrity of the Natura 2000 sites.

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