Appropriate Assessment Conclusion Statement by the Licensing Authority for proposed aquaculture activities (with particular reference to applications received subsequent to the Appropriate Assessment in 2018) in Castlemaine Harbour SAC (Site Code: 000343) and Castlemaine Harbour SPA (Site Code: 004029) (Natura 2000 sites) – October 2019

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 Castlemaine Harbour 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 June/July 2019). This follows two previous Appropriate Assessments of the impacts of mussel, oyster and clam aquaculture and mussel fishing on Castlemaine Harbour SAC and SPA which were published in 2011 and 2018. The current Article 6(3) Appropriate Assessment considered the potential ecological impacts of aquaculture activities on Natura 2000 features in both the Castlemaine Harbour 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

The initial Appropriate Assessment process and 43 aquaculture licensing determinations (based on the applications available at the time of assessment) were completed for Castlemaine Harbour in 2013. While licences were granted during this process, ecological monitoring and additional research was recommended as a consequence of the Castlemaine Appropriate Assessment process and these were translated into special conditions in the aquaculture licences. The existing aquaculture in Castlemaine Harbour 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.

A significant number of new aquaculture licence applications were received by the Department subsequent to the carrying out of the initial Appropriate Assessment and a second Appropriate Assessment was carried out in 2018. In excess of 100 applications including a number of licence reviews were considered in the 2018 Appropriate Assessment. The licence reviews to add oysters to existing mussel sites were subsequently granted. Negative licensing determinations were made in respect of 98 new applications. Of the determinations made, in the region of 35 have been appealed to the Aquaculture Licences Appeals Board.

There are currently 14 new applications for aquaculture licences in Castlemaine Harbour comprising 12 applications for oyster cultivation (11 bag and trestle and 1 bottom culture cultivation) and two applications for mussel cultivation (1 longline and 1 bottom culture cultivation). In addition, two licensees have applied for licence reviews to add oysters on trestles 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/Rossbehy and a little of the coastline to the west. The likely interaction between aquaculture activity and conservation features (habitats and species) of the site was considered.

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, Fine to muddy sand with Polychaetes community, *Zostera* community complex, 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),*
- (1095) Sea Lamprey (*Petromyzon marinus)*
- (1099) River Lamprey (*Lampetra fluviatilis)* and
- (1355) Otter (*Lutra lutra*).

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 are in excess of 42km from the Castlemaine Harbour SAC and as a result are screened out. Castlemaine Harbour is also a SPA (Site Code: 004029).

There are three SACs which are close to Castlemaine Harbour Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (0365), Lough Yganavan and Lough Nambrackdarrig SAC (0370) and Slieve Mish Mountains SAC (2185).

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

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

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

Based upon the scale of spatial overlap of current and proposed intertidal oyster aquaculture activities (including access route activity) and the relatively high tolerance levels of the habitats and associated species, the general conclusion is that current and proposed intertidal culture activities are non-disturbing to the Qualifying Interests and their constituent community types.

Based upon the (small) scale of spatial overlap of current intertidal clam aquaculture activities (including access route activity) and the relatively high tolerance levels of the habitats and associated species, the general conclusion is that current and proposed intertidal oyster and clam culture activities are non-disturbing to the Qualifying Interests and their constituent community types.

Subtidal (Bottom) Mussel Cultivation

Current and proposed levels of subtidal (bottom) cultivation of mussels do not pose a significant risk to the Conservation Objectives of marine habitat features. However, the current permitted levels of mussel seed dredging and cockle dredging either individually or in-combination with aquaculture activities exceed the spatial overlap threshold (15%) for significant adverse impacts on two estuarine (1130) constituent community types (Intertidal sand with *Nephtys cirrosa* community and Mixed sediment community complex) and one mud and sandflat (1140) constituent type (Intertidal sand with *Nephtys cirrosa* community).

Longline Mussel Cultivation

A proposed site for seed mussel collection occurs outside of the boundaries of the SAC and therefore is excluded from further consideration as it is deemed not to pose a risk to the conservation features of the SAC.

Species

The likely interactions between the proposed aquaculture activities and the following Annex II species were assessed - Atlantic Salmon *Salmo salar* (1106), *Petromyzon marinus* (Sea Lamprey) (1095), *Lampetra fluviatilis* (River Lamprey) (1099) and Otter (Lutra lutra) (1355). 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.

The review of two bottom mussel licence activities to include intertidal oyster production does not present a risk to habitat features. Based upon experience elsewhere, 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. In order to mitigate the risk of introduction of alien species into the SAC as a result of aquaculture activities all movements of stock in and out of the Castlemaine Harbour SAC should adhere to relevant legislation and follow best practice guidelines (e.g. http://invasivespeciesireland.com/cops/aquaculture/).

The result of the proposed increase in oyster cultivation from 1.51% and 1.95% coverage of Habitats 1130 and 1140 to 2.78% and 3.52%, respectively, will not significantly increase the standing stock biomass of this culture species in the SAC. Therefore, the risk of seston depletion and impact on carrying capacity of the system can be discounted.

The current permitted levels of mussel seed dredging and cockle dredging either individually or in-combination with aquaculture activities exceed the spatial overlap threshold (15%) for significant adverse impacts on two estuarine (1130) constituent community types (Intertidal sand with *Nephtys cirrosa* community and Mixed sediment community complex) and one mud and sandflat (1140) constituent type (Intertidal sand with *Nephtys cirrosa* community).

Aquaculture and fisheries activities combined exceed the 15% threshold for significant adverse impacts on three estuarine (1130) constituent community types (Intertidal sand with *Nephtys cirrosa* community, Fine to muddy fine sand with polychaetes and Mixed sediment community complex) and two mud and sandflat (1140) constituent type (Intertidal sand with *Nephtys cirrosa* community and Fine to muddy fine sand with polychaetes). The risks associated with likely disturbing aquaculture activities (e.g. bottom mussel culture) will need to be considered at the licensing stage.

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 the 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 Rossbehy 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 Rossbehy 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, the Turnstone are in unfavourable condition with Wigeon, Pintail, Ringed Plover and Cormorant in intermediate or moderate unfavourable conditions.

Waterbird Habitats and Distribution
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 were considered to be notable 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 (OK446 - Light-bellied Brent Goose, Wigeon, Pintail, Ringed Plover, Bar-Tailed Godwit, Sanderling, Mallard, Oystercatcher and Turnstone, OK447 - Light-bellied Brent Goose, Wigeon, Pintail, Ringed Plover, Sanderling, Mallard, Oystercatcher and Turnstone and OK445 - Light-bellied Brent Goose, Ringed Plover, Mallard, Oystercatcher and Redshank). The eel grass (*Zostera*) beds are particularly important for Light-bellied Brent Geese moving to other subsites, notably OK447, when the foraging resource is depleted. Sub-sites where no SCIs are present in such numbers or densities to be notable in relative terms may still support smaller numbers of SCIs and make some contribution to the favourable condition status of the SCIs.

Assessment of Impacts on core SPA Conservation Objective
In consideration of the licence applications and licence reviews 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.

For all diving piscivore and molluscivore SCIs (Common Scoter, Red-throated Diver, Scaup and Cormorant) that forage in subtidal habitats, no likely significant effects have been identified.

Whilst taking into account the existing licensed sites as part of baseline conditions, the licence applications and licence reviews 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:

<u>Licence Applications</u>

Predicted impact (alone)
- The new licence applications in the SPA will contribute to an increase in the level of displacement and/or disturbance over baseline conditions.

- The two licence review applications will not result in an increase in spatial extent or intensity of existing licensed sites.

Predicted impact (cumulative)

- All new licence applications are predicted to cumulatively contribute to intertidal habitat loss in two I-WeBS subsites considered to be key areas for maintaining the long term population trends of SCIs. The cumulative loss is 15.8% of the total intertidal habitat within the I-WeBS count sectors.

- The licence applications are predicted to cumulatively occupy 9.2% (0K461) and 19.9% (0K462) of the intertidal habitat in each of the I-WeBS subsites. In the absence of evidence to the contrary, it is assumed that displacement or disturbance may conservatively result in no less than 5% exclusion cumulatively from the licence application and review sites in each I-WeBS subsite. At times, these impacts acting synergistically may result in full exclusion from a licence application or review site.

Predicted impact (in-combination)

- The two licence review sites can be assessed in-combination with recreational disturbance because the predicted impact alone or cumulatively has been excluded.

Access Routes

Predicted Impact (alone)

- Five of the 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. Use of the access tracks 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

- Based upon the scale of spatial overlap of current and proposed intertidal oyster aquaculture activities (including access route activity) and the relatively high tolerance levels of the habitats and associated species, the general conclusion is that current and proposed intertidal culture activities are non-disturbing to the Qualifying Interests and their constituent community types.

- Based upon the (small) scale of spatial overlap of current intertidal clam aquaculture activities (including access route activity) and the relatively high tolerance levels of the habitats and associated species, the general conclusion is that current intertidal clam culture activities are non-disturbing to the Qualifying Interests and their constituent community types.

- Current levels of subtidal (bottom) cultivation of mussels do not pose a significant risk to the Conservation Objectives of marine habitat 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 result of the proposed increase in oyster cultivation from 1.51% and 1.95% coverage of Habitats 1130 and 1140 to 2.78% and 3.52% respectively will not significantly increase the standing stock biomass of this culture species in the SAC. Therefore, the risk of seston depletion and impact on carrying capacity of the system can be discounted.

- The current permitted levels of mussel seed dredging and cockle dredging either individually or in-combination with aquaculture activities exceed the spatial overlap threshold (15%) for significant adverse impacts on two estuarine (1130) constituent community types (Intertidal sand with *Nephtys cirrosa* community and Mixed sediment community complex) and one mud and sandflat (1140) constituent type (Intertidal sand with *Nephtys cirrosa* community).

- Aquaculture and fisheries activities combined exceed the 15% threshold for significant adverse impacts on three estuarine (1130) constituent community types (Intertidal sand with *Nephtys cirrosa* community, Fine to muddy fine sand with polychaetes and Mixed sediment community complex) and two mud and sandflat (1140) constituent type (Intertidal sand with *Nephtys cirrosa* community and Fine to muddy fine sand with polychaetes).

- In consideration of the new licence applications and licence reviews alone and cumulatively, likely significant effects have been identified, i.e. noise/visual disturbance for all intertidal SCIs and Cormorant and displacement for all intertidal foraging SCIs except Greenshank and Redshank.

- For all diving piscivore and molluscivore SCIs (Common Scoter, Red-throated Diver, Scaup and Cormorant) that forage in subtidal habitats, no likely significant effects have been identified.

- The assessment of the impacts against the Conservation Objectives of the Castlemaine Harbour SPA concluded that no adverse effect on site integrity, alone, cumulatively or in-combination will occur for two review licence applications and one new application for subtidal mussel rope culture.

- The likely interactions between the proposed aquaculture activities and the Annex II species of Atlantic Salmon, Otter, Sea Lamprey and River Lamprey are considered to 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. The cumulative loss is 15.8% of the total intertidal habitat within the I-WeBS count sectors.

Observations received during the Statutory and Public Consultation Process

A number of issues arose during the aquaculture licensing process for sites in Castlemaine Harbour. The Department of Culture, Heritage and the Gaeltacht observed that eleven coastal terrestrial habitats listed as qualifying interests at the Castlemaine Harbour SAC including beaches and dunes, saltmarsh and seacliff habitats were screened out of the current Appropriate Assessment. It was noted that the aquaculture applications outlined in the Appropriate Assessment take place very close to salt marsh habitats in the SAC and these habitats should be taken into account in the Appropriate Assessment as they are vulnerable to damage resulting from aquaculture activities such as use of vehicles to access aquaculture sites, storage of materials and disposal of waste.

The Licensing Authority and its scientific advisers noted the concerns raised but maintain that no applications were received to carry out aquaculture activity on these habitat types. Consequently, no spatial overlap occurs and these coastal terrestrial habitats were screened out. In addition, aquaculture licence conditions cover the issues raised such as adhering to designated access routes in order to minimise habitat disturbance and stipulating that the storage of aquaculture materials and disposal of waste is off-site and not on the foreshore.

It was also noted that should licensing occur at Site T06/493A, the conditions as outlined in the SPA Appropriate Assessment would need to be included in the licence conditions, i.e. that collecting seed mussel would be very infrequent, low intensity, localised and short-term in duration.

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

There is insufficient evidence to suggest that the affected areas within Castlemaine Harbour would maintain a comparable level of ecological functionality if licensing were permitted.

Whilst taking into account the existing licensed sites as part of baseline conditions, two licence review applications and one new application for subtidal mussel rope culture can be considered for licensing at this time. No further consenting of licence applications can take place until such time as additional studies are completed and further mitigation approaches are considered.

It is proposed that the majority of the proposed aquaculture activity cannot be authorised as in-combination adverse effects could result, as follows:

- Cause delays and interrupt progress towards achieving the Conservation Objectives of the sites for those species in long term population decline;
- Disrupt those factors that help to maintain the favourable conditions of the sites (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 sites (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 sites function 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;
- Result in loss or reduction of key features (i.e. an absence of obstructions to sight lines).

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.

Taking the existing aquaculture activities into account as part of baseline conditions and from a Natura 2000 perspective, consideration can be given to the proposed licensing of two licence reviews (existing bottom culture mussels with the addition of oysters on trestles) and one new application for subtidal mussel rope culture (at the boundary of the SPA and outside the SAC) in accordance with existing licensing conditions for Castlemaine Harbour and subject to other licensing criteria and considerations.

For the remaining new licence applications in Castlemaine Harbour it is proposed that these 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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