

# Native Oyster Workshop 2017

Proceedings from the  
Native Oyster Workshop  
2017



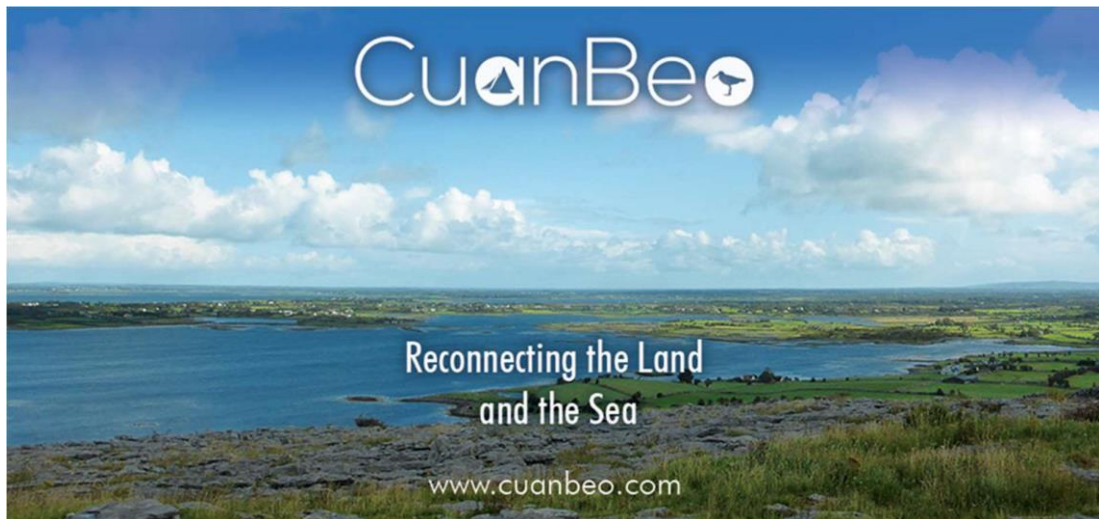
# PROCEEDINGS

FROM THE

# NATIVE OYSTER WORKSHOP

# 2017

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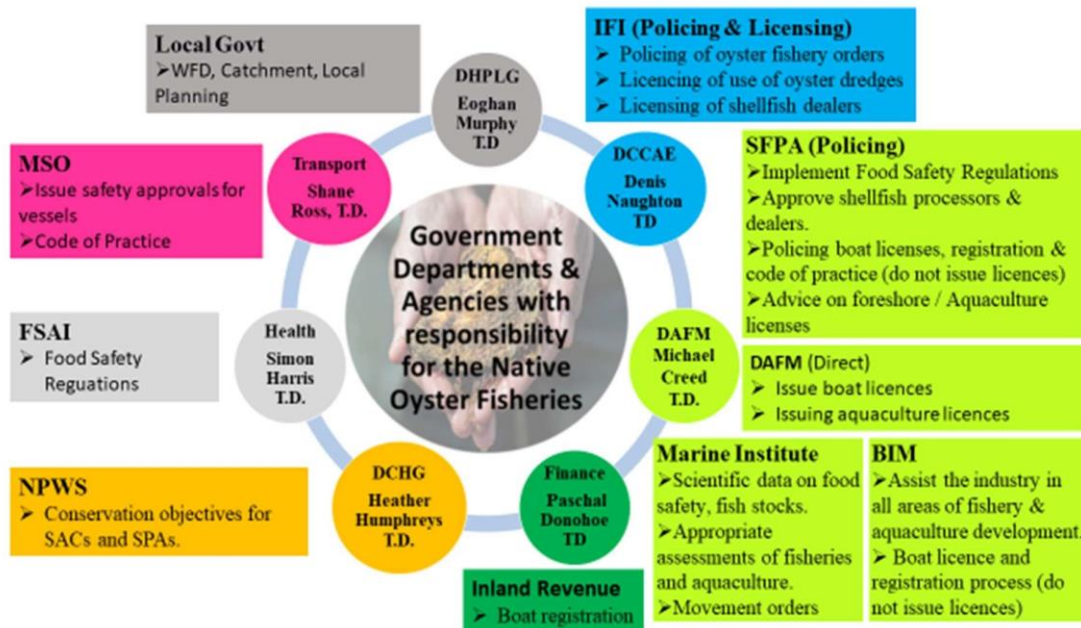
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## Introduction

The Native Oyster Workshop was an initiative of Cuan Beo, a recently formed community-based organization established with a mission of improving the quality of life, environment, economy and heritage around Galway Bay. The aim of Cuan Beo is to raise awareness of importance of water quality to those living in the catchment of Galway Bay and those governing it. The relevant catchment runs from Oranmore in the North to Blackhead in the South. Water quality underpins the economic and social fabric of the district and the recreational amenities available to the community. Life quality and water quality are inextricably linked. To achieve its objective, Cuan Beo wants to help people make the connection between how routine actions on land has consequences at sea. We want to connect those living inland with coastal communities who rely on the sea for their livelihoods. These connections have existed for millennia but have somehow eroded in recent times. Cuan Beo wishes to re-establish this connection between land and sea for the benefit of existing and future generations. While the oyster has been synonymous with Galway Bay for millennia and has played a large part in the economic and cultural development of the communities living around the bay, few are aware of its importance and role in the marine ecosystem.

The Native oyster is a unique and valuable resource. It is considered a 'keystone species' in the marine ecosystem and creates a physical habitat for other fauna supporting high biodiversity. Recognizing this, the EU has afforded considerable protection to the Native Oyster and other species in coastal environments in the form of a number of EU legislation. In Galway, the absence of a complete understanding of the complex chemical, physical and biological interactions at play in the Inner Bay and in its riverine catchment area and issues relating to licensing and governance has left the historic fishery in a fragile ecological position. While specific challenges may differ across the 8 remaining Native Oyster fisheries in Ireland, all are in decline or at least face significant future challenges. However, experience has shown that native oyster fishery restoration is possible. It requires joined up thinking and action at local community level and at administrative and political level. One of the key issues affecting the restoration of these fisheries is the complex governance structures associated with the fishery. Cuan Beo identified more than 7 government departments and 10 government agencies associated with governance and management of native oyster and its environment as outlined in Figure 1 below. This has evolved over many decades and has hindered development of an integrated approach to the conservation, production, and management of the native oyster resource.



*FIGURE 1: REMIT SLIDE HIGHLIGHTING THE GOVERNMENT DEPARTMENTS AND AGENCIES WITH RESPONSIBILITY FOR ASPECTS OF THE NATIVE OYSTER FISHERIES IN IRELAND.*

The native oyster has occupied a pivotal role in Galway Bay life, environment, economy and heritage. It is in this context that Cuan Beo is focused on its protection and restoration. The aim of the NOW 17 workshop was to bring together key stakeholders in the native oyster industry including fishermen, relevant agencies and businesses to review the current status of the fishery and to develop and action a nationwide movement to restore this valuable resource.

The outcome of the workshop was hugely promising. Significant challenges were presented from both historic and scientific perspectives. However, several speakers highlighted possibilities and examples of restoration through careful, thorough and focused management planning and action. Several recommendations were identified. The next step is to establish a focused working group to implement actions in a joined-up approach. The working group comprises representatives from the co-ops, the Marine Institute, SFPA, Inland Fisheries Ireland, NPWS and local government. BIM has kindly agreed to facilitate this action.



## Recommendations

### Outputs from the Native Oyster Workshop 2017

- Form a working group for native oysters in Ireland to promote and foster relationships and knowledge transfer between managers and stakeholders in Ireland's oyster fisheries.
- Streamline the administration of the shellfish industry while maintaining the high standards of food safety and to develop sustainable fisheries management.
  - i. Aim for one single authority to be given the power to allow a fisherman dredge native oysters instead of the six authorities they currently have to deal with.
  - ii. Aim for one single authority to allow Food Business Operators (FBOs) to purchase and sell native oysters instead of the four authorities they currently have to deal with.
- Fisheries Co-ops should establish a strategic alliance with Irish FBO's to add value to the native oyster here in Ireland to the benefit of the Irish economy.
- Support should be given to Co-ops to individually review their current management / administrative structures so as to avail of future State support for development of those Fisheries. This support should extend to the completion of Fisheries Management Plans. Co-op members are to work with BIMs' Regional staff in bringing this forward. This is key to the relevance and success of all other recommendations.
- The integration of aquaculture into each Fisheries Management Plan, depending on resources and the profile of the Fishery itself should be investigated.
- Research to identify a sustainable source of cultch on behalf of all Fisheries to look at the most cost-effective source, treatment and storage requirements and the most effective methods of deployment or use.
- Key state agencies involved in water quality issues including the EPA and Irish Water continue to engage with stakeholders to identify priority shellfish growing areas for further investigation leading to improvements in wastewater treatment plant processes and water quality in shellfish growing waters.
- Integrated catchment management to bring together scientific and local expertise in a way that will improve both understanding and appreciation of the importance of the Rivers contribution to the shellfish growing waters.



# Restoring/Rehabilitating Natural Stocks of *Ostrea edulis*: Can we learn something from history?

## Noël P. Wilkins

Historical records indicate that there were very many natural oyster beds on the Irish coast, and that the population density on each was quite enormous. Historical landing data from the French coast, and the east and west coasts of Ireland confirm the astonishing magnitude of the pristine natural oyster stocks.

Today, despite over 150 years of cultivation, there are few native oyster beds remaining, and the numbers of oysters on each is only a very small fraction of the numbers in earlier times.

Existing beds can rehabilitate naturally in the absence of deliberate (fishing, dredging, poaching etc.) and unintended (pollution etc.) human actions. This process could take 20 to 40 oyster generations.

The high density of oysters, characteristic of the historical natural beds, suggests that the successful restoration of native oysters to derelict beds by human activity will be a long and demanding process. The nature of the reproductive biology of *edulis* oysters (with 'internal' fertilization and sex change) suggests that very high population density is a pre-requisite for successful reproduction, rather than a mere consequence of it. Historical attempts at restoration may have failed due to inadequate stocking densities and short time frames that did not conform to the distinctive reproductive requirements of the mollusc.

But just because restoration may be difficult and require commitment over many years, is no justification for not starting right away. It is heartening to see from today's programme that you are intent on commencing and progressing this admirable work without any delay. I wish you great success in this venture, this adventure, and I trust the communities around Galway Bay will join you in your endeavours on behalf of one of our natural biological treasures.

# The Current Status of Stocks of the Native Oyster along the Atlantic Coast

## Oliver Tully - Marine Institute

Native oyster stocks in Ireland declined dramatically during the mid-19th century when offshore banks in the Irish Sea were fished down. Overfishing of inshore stocks on the west coast also led to declines in the 19th and early 20th century and in the 1970s infection with *Bonamia* was implicated in a significant increase in mortality rates. Currently 200-300 tonnes are landed from commercially fished beds in Tralee Bay, Galway Bay, Kilkieran Bay, Clew Bay, Blacksod Bay and Lough Swilly. There is also a fishery in Lough Foyle managed by the Loughs Agency.

Oyster biomass surveys have been completed annually by the Marine Institute in Tralee, Galway and Swilly since 2010 using local boats and local dredges. The unknown efficiency of the dredge is the main uncertainty in the estimation of biomass. Approximately 75% of the national biomass of native oyster is in inner Tralee Bay east and southeast of Fenit. Oyster density is low and patchy in most areas and may be limiting fertilisation success. Generally, less than 15% of oysters are above the minimum legal size in autumn of each year in stocks that are fished annually. Spat settlement can be detected in autumn surveys by the presence of oysters at about 10mm which have settled onto adult shell. The surveys provide a means of monitoring changes in biomass, size and age structure, growth rates and the frequency of settlement. As such they are important in assessment of the effectiveness of conservation measures in managed fisheries.

The concentration of the national biomass in inner Tralee Bay combined with the very low densities in many other areas, the absence of any management measures other than minimum landing size in the commercial fishery and the continuing pressures from a range of environmental pressures continue to pose a risk to the commercial viability of oyster fishing in Ireland.

## Licensing & Governance:

### Part I - Planning for Oyster Fisheries in SACs

#### Oliver Tully - Marine Institute

The operational management of oyster fishing in Ireland is delegated to local co-operatives through Fishery Orders (under the 1959 Fisheries Act, Part XIV, Ch. 3) or extensive Aquaculture licences (issued for 10-year periods). These permissions are currently administered by Government Departments DCCAIE and DAFM respectively (Figure 1). Although authority is delegated, fishermen also require a dredge licence from Inland Fisheries Ireland (IFI) and an appropriate primary fishing licence (polyvalent or specific/bivalve) from DAFM. The dredge licence is issued to applicants on an annual basis. Under current arrangements between Ireland and the EU Commission, regarding the implementation of the Habitats Directive, fisheries within SACs that are subject to secondary licencing (in this case the dredge licence) are regarded as projects or plans and come under the scope of Article 6.3 of the Directive. This means that a fishery plan must be prepared (documented) and subject to Appropriate Assessment.

All commercial oyster fisheries in Ireland currently are within SACs. The licence holders (coops) should prepare fishery plans that consider the conservation objectives for habitats in the SAC in which the fishery occurs and submit the plan to the licencing authority for Appropriate Assessment. In other marine fisheries this process has been facilitated by the licencing authority (DAFM) and the marine agencies. A fishery plan would describe the proposed actions in the fishery with respect to the type of fishing to be undertaken and the location, frequency and intensity of fishing and would show how conservation of habitats is considered. In SACs the primary objective is habitat conservation. A fishery is possible in parallel with this if it can be reasoned that the fishery will not lead to deterioration of habitats. The current cap on dredge licences put in place by IFI in recent years is an attempt to limit any escalation in fishing activity in SACs prior to completion of appropriate assessment.

In the case of oyster fisheries, the ambition of a fishery plan would presumably be to restore oyster biomass so that annual production could increase. This is consistent with the objectives for conservation of habitats given that native oyster itself is listed as a habitat or as a characterising species of habitats within the SACs. However, consideration has to be given to the method by which restoration of biomass is achieved so that the character of habitats in the sites are not changed.

## **Licensing & Governance:**

### **Part II - Food Safety Control and Boat Licensing**

#### **James Allison - Sea Fisheries Protection Agency (SFPA)**

The SFPA is the competent authority responsible for sea fisheries protection and sea food safety in the Republic of Ireland and Irish territorial waters. It enforces both European and National Legislation for a range of bodies and departments. In relation to oyster fisheries, the main controls implemented can be split into two distinct areas, Seafood Safety and Fisheries control. The food safety aspect ranges from sanitary surveys of shellfish production areas, through pre harvesting controls (biotoxins, microbiological, phytoplankton), dispatch and purification food safety management systems to health certification of shellfish. This provides boat to fork traceability of the oyster food chain verified by random verification sampling at all points on the distribution network.

From a fisheries control perspective, the target is to inspect each inshore fishery vessels once per annum. The inspection focusses on two main areas, minimum size (76mm) and fishing license compliance. In the local Fisheries, an average of 18 inspection per annum took place since 2014. Two non-compliances were noted, one of which a file has been forwarded for possible further legal action while other was resolved at a local level.

# Issues related to the Restoration and Future Prospects for Native Oyster Stocks:

## Part I - Diseases

### Debbie Cheslett - Marine Institute

The 3 main diseases of significance in native oysters (*Ostrea edulis*) are Bonamiosis, Marteilliosis and Denman Island Disease. These diseases are listed in EU Council Directive 2006/88/EC which provides a framework for their control.

Bonamiosis which is caused by the protistan parasites *Bonamia ostreae* and *Bonamia exitiosa* is perhaps the best known in Ireland where it has been present since the 1980s. *Bonamia ostreae* is largely confined to the northern hemisphere, whilst *Bonamia exitiosa* was considered to be restricted to the southern hemisphere until it was detected in Spain in 2007. *Bonamia ostreae* first appeared in France in the 1970s and is now found widely distributed in Europe. The parasite infects the haemocytes of the oysters leading to physiological disorders and ultimately death. It has caused mass mortalities of up to 90% in native oyster populations.

Marteilliosis caused by the parasite *Marteilia refringens*, was first described in Britany in 1968 where it caused large scale mortalities in native oysters. The parasite infects the digestive gland of the oyster where it leads to blockage of the digestive system resulting in starvation and ultimately death of the animal usually in the second year after initial infection. Several species of clams and mussels can also become infected and potentially act as vectors for the disease. There are some reports of associated mortality in mussels. The disease which is believed to have spread with shellfish transfers is now present in many European countries, however Ireland remains free.

*Mikrocytos mackini*, the causative agent of Denman Island disease, has been shown to infect all species of oysters challenged to date and can infect all life stages. Infection can be fatal depending on host and environmental conditions. To date the disease remains confined to North America and imports of shellfish from North America to Europe are prohibited under council directive 2006/88/EC. The inadvertent introduction of this disease could have serious implications for the Native oyster fisheries in Ireland.

Currently the greatest disease threat for native oysters in Ireland is *Marteilia refringens* which was detected for the first time in Northern Ireland in the spring of 2017. The parasite was detected in mussels in Dundrum Bay and Belfast Lough in the absence of mortality. Movements of mussels from the infected sites to any other bays in Ireland is strictly prohibited and compliance with this is essential to prevent its spread to native oyster beds where it is likely to have devastating consequences.

# Issues related to the Restoration and Future Prospects for Native Oyster Stocks:

## Part II - The Microbiological Quality of Bivalve Shellfish

### Bill Doré - Marine Institute

Abstract: Bivalve shellfish feed by filtration and can accumulate bacteria and viruses of public health concern when grown in faecally contaminated areas. There are number of key pressures on shellfish growing areas that result in faecal contamination, but the most significant of these from a consumer risk perspective are inputs from wastewater treatment plant discharges. The risks to consumers associated with sewage contaminated shellfish is well documented and extensive EU regulation exists to control them. The most important of these is the classification of shellfish harvest areas on the basis of their sanitary quality determined from the concentration of the faecal indicator organism *E. coli*. These controls have been successful in virtually eliminating the occurrence of bacterial illness associated with shellfish consumption. However, there remains a risk of illness associated with human pathogenic viruses. Principle among these virus risks is gastroenteritis caused by norovirus. This risk is particularly acute in oysters as this is the species of shellfish most commonly consumed raw. There is currently no standard for norovirus in shellfish and extensive efforts are being made to introduce such a standard at a European level. However, norovirus is commonly found in oysters and the introduction of any standard is likely to have a significant impact on the oysters industry. The difficulty going forward is to develop a norovirus standard in oysters that is protective of public health but with causing an acceptable impact on the industry.

The most effective way of eliminating the public health risks associated with viruses in shellfish is to prevent, or at least minimise, sewage contamination of shellfish growing areas. To this end the key state agencies involved in water quality issues including the EPA and Irish Water are engaging with stakeholders to identify priority shellfish growing areas for further investigation. Where appropriate these studies should eventually lead to improvements to wastewater treatment plant processes and water quality in shellfish growing. Although this process may take time, the initiative is to be welcomed and there is an emphasis on all stakeholders to work together to identify problem areas and make develop solutions to water quality issues.

# Issues related to the Restoration and Future Prospects for Native Oyster Stocks:

## Part III - Biotoxins and Native Oysters

### Joe Silke – Marine Institute

Harmful Algal Blooms (HABs) result from noxious and/or toxic algae that cause direct and indirect negative impacts to aquatic ecosystems, coastal resources, and human health. The Marine Institute operates a biotoxin monitoring programme with the SFPA and FSAI to ensure that when toxins are present above regulatory levels, shellfish are not placed on the market. This involves monitoring the presence of naturally occurring marine biotoxins in Irish shellfish and analysing seawater for the presence of biotoxin producing phytoplankton. The programme is designed to detect toxicity in shellfish growing areas before shellfish are harvested to prevent the placement of toxic shellfish on the market. We use a number of highly sensitive and specific analytical instruments for the detection and quantification of all toxins as specified under EU legislative requirements. We are the National Reference Laboratory (NRL) for marine biotoxins and operate within the EU network of NRLs. The objective of these NRLs is to facilitate a high level of expertise, knowledge and communication on the topic throughout Europe. The NRL also provides the scientific framework required to implement appropriate sampling and analytical monitoring programmes. HABs are present in nearly all aquatic environments (freshwater, brackish and marine), as naturally occurring phenomena. They are a worldwide phenomenon requiring an international understanding leading ultimately to local and regional solutions. HABs are recognized as one facet of complex ecosystem interactions with human society. HAB research, monitoring, and management must be closely integrated with policy decisions that affect our shellfish industry. The Marine Institute programme operates year-round analysing shellfish from all production areas. Not all shellfish are equally susceptible to biotoxins, and Native Oysters are considered low risk compared to Mussels and even to Pacific Oysters. This is most likely due to the physiological adaptations the Native Oysters have developed to select microscopic food particles. This selection process tends to favour smaller particles and therefore rejects many of the toxin containing particles. In addition, oysters by the nature of their benthic habitat are not exposed to the same toxic species as for instance mussels that are grown on longlines in the upper layers of the water column. Nevertheless, water samples are required for analysed on a weekly basis and shellfish either weekly or monthly from all production areas. Compliance with these statutory requirements ensures that product is only harvested from areas that are legally open and also ensures consumer safety by reduction of the risk of consuming product that contain dangerous levels of toxins.



## **Issues related to the Restoration and Future Prospects for Native Oyster Stocks:**

### **Part IV - Exploring Integrated Catchment Management (with a special focus on the River Clarin)**

#### **Catherine Seale – Local Authority Waters and Communities Office**

The Local Authority Waters and Communities Office (LAWCO) has been established by Local Authorities to promote public awareness, participation and knowledge-sharing in the development and application of the River Basin Management Plan as required by the EU Water Framework Directive (WFD).

The objectives of this directive are to protect all high-status waters, to prevent further deterioration of all waters and to restore degraded surface and ground waters to good status. The WFD requires EU governments to take a new holistic approach to managing their waters. It applies to rivers, lakes, groundwater, estuaries and coastal waters and is now in its 2nd cycle which runs from 2016-2021.

My presentation used as an example, the Clarin River which flows through Clarinbridge (the home of the oyster) but which begins life in the internationally famed Fields of Athenry. The river journeys through the market town, taking in the historical 13th century Castle and Dominican Abbey, before leaving to meander a limestone path through the green lands of Mulpit and Coldwood. The river takes a quick detour into the unique geological feature of Pollnacirca, re-emerging to flow through Kilcornan Woods and Clarinbrige Village before reaching its final destination, the majestic Galway Bay.

From its source to the sea, the Clarin River is a giver of life. It is part of the living heritage of the rich agricultural lands of Clarinbridge and Athenry and a key ingredient in providing Merroir (the taste of the sea) to our native Galway oysters. It is therefore so important that we seek to restore and protect the waters of the Clarin so that they meet the requirements of the WFD.

This task requires integrating scientific and local expertise. Indeed, the primary goal of integrated catchment management (in my view) is to bring together such expertise in a way that will improve both understanding and appreciation of the importance of the River Clarin in its own right and also in its contribution to the Bay. This mobilisation of goodwill towards the Clarin arising from an increased focus on its importance should in turn lead to positive and proactive attitudes amongst all those all those who live, work and enjoy the catchment.

## Issues related to the Restoration and Future Prospects for Native Oyster Stocks:

### Part V - Interactions between the native oyster, *Ostrea edulis* and the Pacific Oyster, *Magallana gigas*

**Francis O'Beirn<sup>1</sup>, Nadescha Zwerschke<sup>2</sup>**

<sup>1</sup> Marine Institute, Galway; <sup>2</sup> Queens University, Belfast

Since its introduction to Ireland in the 1970's, the Pacific oyster, *Magallana gigas*, has become an important contributor to aquaculture production in terms of value (€41 million in 2016) and employment in coastal communities (n=800+ in 2016). At the time of its introduction the conventional wisdom was that it would not successfully reproduce in Ireland due to low ambient water temperatures. However, successful recruitment has been observed in a number of bays in the last 10 years. The Pacific oyster has been recruiting naturally along seaboard in Europe for longer than this and has been defined as invasive in a number of areas. In Ireland, research has demonstrated that, while it has not attained invasive status, it is self-sustaining in a number of bays, e.g. Lough Foyle. Furthermore, a number of factors that govern successful recruitment have been identified, such as, bay residence time, extent of intertidal area, habitat type (biogenic and hard substrates), along with the presence of aquaculture. In addition, other research efforts have identified that the presence of oysters in the seabed will result in shifting microbial communities and nutrient dynamics. More recent outputs have quantified the benthic communities associated with non-native oysters and the native oyster, *Ostrea edulis*. It has concluded that *M. gigas* reefs and *O. edulis* reefs are functionally similar in terms of biodiversity facilitation. Co-occurrence of the two species has been observed intertidally (and to limited degree sub-tidally) thus increasing the likelihood of spatial competition. In addition, recent isotopic analysis of food sources has identified that both species seem to occupy similar isotopic niches, thus increasing the likelihood of potential resource competition. Given the ability of *M. gigas* to have higher fecundity and greater settlement rates and earlier age at reproduction (i.e. r-selected) than *O. edulis* (K-selected), the potential for the Pacific oyster to out-compete the native oyster would seem possible, particularly if resources are limiting. In conclusion, the proliferation of the Pacific oyster in Ireland, as it currently relates to the native oyster, might be considered from two perspectives:

- 1) If biodiversity associated with oyster reefs is the goal of any programme, then the presence of *M. gigas*, might be considered comparable to the presence of *O. edulis* and does not appear to pose a negative risk.
- 2) If Native oyster restoration is a goal, then the presence of the Pacific oyster might present a risk of competitive exclusion and any intervention might focus upon the removal of *M. gigas*.

## **Case Study I: Lough Foyle Native Oyster Fishery – Management, Development & Conservation**

### **Cass Bromley & Ciarán McGonigle – Loughs Agency**

Our presentation to the NOW 2017 Workshop provides an overview of the Lough Foyle native oyster fishery. The earliest documented reference to oyster fishing in the lough we have found to-date is in 1832 government papers, when a closed season, minimum landing size and a coastguard were introduced. Oysters were mainly taken via steamship to Liverpool for the UK market. The fishery as it is today has been active since the 1950s. with co-ops, buyers and fishers funding and supporting research and enhancement activities. From 2008 onwards, The Loughs Agency has been regulating and managing the fishery. Regulations include an 80mm landing size, vessel licensing, quota tags allocated to each vessel and logbook reporting of catch. A precautionary approach enables the fishery to be postponed or closed to conserve stocks. Total landings for the 2016/ 2017 fishing season were 185 tonnes – the 2017/ 2018 season is now underway, having started on 3<sup>rd</sup> October 2017. Our talk discusses current approaches to stock management; research, enhancement and conservation initiatives, and future aims to promote the economic and environmental sustainability of the Foyle fishery and continue to highlight the fishery's local, national and international importance.

## Case Study II: Tralee Bay

### Denis O'Shea

Tralee Bay has a long history of harvesting native oysters. There is mention of oyster dredging in the 1800s and listed in literature in the 1850s. Oyster middens are also present in Tralee Bay. Up until the 1970s, oyster dredging was continuous and in the mid to late 1970s, over 180 boats were involved. Production of up to 1400 t was recorded at that time. This period was followed by a steep decline. In the mid-1980s production was recorded at 70 t with 70 boats reporting. The fishery was closed for one year about this time.

In a response to the demise of the native oyster, a culching programme, as a substrate for settlement, was put in place from 1983. This continued until the mid-1990's. This included about 1300t of mussel shell distributed sub-tidally and 15,000 bags of mussel shell spread on intertidal trestles. Subsequently, up to 60% of oyster landings had settled initially on mussel shell. Production increased to a max of just 300t in 2010.

Due to the unavailability of mussel shell at a reasonable cost, French Coupelle collectors on sub-tidal steel frames have been trialed. In addition, a multi species shellfish hatchery has been established with a spatting pond. It is hoped to enhance the recruitment from the hatchery, the spatting pond and the spat collection programmes. Additional species have also been considered including scallop and Pacific oyster.

Tralee Oyster Fisheries Society (TOFS) was established in the late 1970's as a direct result of the decline in production. In 1981, TOFS was allocated an oyster fishery order covering the bays from Brandon Head to Kerry Head. TOFS is composed of a Board of Directors and a management committee with one full-time manager, one part-time secretary and six seasonal workers. The co-op is composed of 112 members, 78 of whom hold licenses to dredge for oysters. The fishery involves about 65-70 boats and over 200 fishermen. The fishery is an important source of income in the region.

While Tralee Bay is disease free, TOFS coordinate regular monitoring for bacteria, Norovirus, DSP and extensive biological assessments of the oysters. An annual stock survey in September is used to determine the TAC. Dredging is restricted in days, time and by quota. All oysters are landed through a central store for checking, cleaning and dispatch. The premises and equipment are currently being upgraded for handling oysters. Challenges exist in relation to the shortage of cultch in the bay and the occurrence of Norovirus in the winter.

## Theme Session on Restoration:

### Part I - The role of Aquaculture in Restoration

#### Trish Daly - Bord Iascaigh Mhara

The majority of the active native oyster beds around the coast of Ireland are located within Fishery Orders granted by the State to Co-operatives. These Fishery Orders present the Grantee with the opportunity to use aquaculture practices, within the limits of the fishery and in the interests of maintaining the stocks into the future. All such practices are subject to an appropriate assessment where the Order is in a Natura 2000 area and may require an Aquaculture Licence depending on the type of activity.

Relevant Aquaculture practices can be either extensive or intensive. Extensive aquaculture includes the introduction of cultch to areas of the Fishery where settlement is likely to occur and the use of spatting ponds. To maximise effectiveness of broadcasting cultch directly into the Fishery it may be necessary to increase concentration of brood stock in a given area and close it off to fishing. Monitoring water temperatures, brood stock condition and larval numbers in the water column are all required to ensure that cultch is added at the appropriate time. Traditionally cooked mussel shell has been the most successful cultch in terms of maximising recruitment. The shell must be weathered for at least one year and must be clean. However, mussel shell is no longer readily available in Ireland therefore limed coupelles and crushed oyster shell should be investigated. Broadcasting cultch in a Fishery has proved successful in the past and is well documented by Tralee Oyster Fisheries Society Ltd and Comharcumann Sliogeisc Chonamara Teo. Spatting ponds have also been successful.

Intensive aquaculture practices include the use of hatchery produced juveniles or spatting cultch from spatting ponds, reared in a nursery within the limits of the Fishery Order. Currently trials are underway in Clew Bay using spatting cultch in an integrated aquaculture system which offers rearing structures for every stage of the growth cycle. Juveniles are reared in Ortac baskets suspended on trestles up to 20g and thereafter can be recruited into the Fishery or transferred to a purpose built "micro reef". Other baskets are also available for rearing juveniles. Whilst production costs are higher survival rates and shell quality are also higher and crop can be sold outside the fishing season.

## Theme Session on Restoration:

### Part II - Methods to improve Recruitment in the Native Oyster Fishery

#### Oliver Tully - Marine Institute

Abstract: The overall objective of restoration is to increase the biomass of oysters available for commercial production. This could have knock on benefits to biodiversity, ecosystem services and water quality, commercial value, and employment.

If stocks are depleted and restoration is required, the first consideration is to consider the causes of that decline. If these causes are still present it is unlikely that any restoration can be achieved. The scale or ambition for restoration should be considered at the outset. Is the objective to restore high density, self-sustaining oyster beds throughout an area where they once existed, to develop a limited put and take fishery similar to an extensive aquaculture operation in a given area or to develop intensive restoration over small areas for individual operators? In the first case a fishery management plan with appropriate conservation measures is a basic requirement. In the second case some fishery management would be needed to optimise the yield from a given input (spat relay). In the third example methods for intensive small scale production using aquaculture methods would be used.

The characteristics of the site should be considered when setting objectives for restoration. It may be useful to map and model particular conditions and characteristics at the site. Is the temperature regime likely to give conditions for annual settlement or is spat fall likely to be less regular? Are larvae retained within the system over the adult beds or is this very dependent on having exact wind and tidal conditions during the larval season? If the answers to these questions suggest low potential, then consideration should be given to relocating the spawning stock or by passing the larval phase and introducing spat. Is the spawning stock sufficient to give high larval production? If not, then existing stock could be aggregated or additional stock imported. Is suitable habitat available for settlement? If not, then suitable habitat should be made available during settlement. The method by which this is done and where it is done is important; harrowing, dredging and cultch relaying are the usual methods. The effectiveness of these needs to be verified at the site and effects on habitats should be considered given that all current fisheries are in SACs.

The choice of methods needs to be identified at a local level. Restoration projects are ambitious, and it is critical to consider if the management and governance structures locally are sufficient to deliver such projects. Where it is clear that this is the case and where the proposed methods have been critically evaluated and evidenced supports from Marine Agencies and funding bodies is more likely.

# Shore to table - The market potential for Native Oysters

## Diarmuid Kelly - Kelly Oysters

The purpose of this talk was to highlight the complexities and number of agencies involved in getting the native wild oyster from the shore to the table and in this particular case the counter of the oyster bar at the Clarinbridge Oyster festival with a short discussion on the wider market potential of the Native wild oyster (*Ostrea edulis*).

The first stage involves harvesting the oysters so the co/op that has control over the fishery or the fisherman that has the right to fish a wild fishery must ensure the following are in place; Boat licence, Dredge licence, Vessel Code of Practice up to date, they must then ensure the production area is on Open status from Marine Institute and are aware of the Classification status from SFPA (Sea Fishery protection Authority) – A, or B, and must have Fish Health Clearance from the Fish Health Unit at the Marine Institute if they propose to move the oysters to another laying. Harvesting can then commence, and the fishermen must observe the bylaws or management plans in place for each fishery as they are set down by the controlling co/op or by IFI (Inland Fisheries Ireland) governing length of time fishing, quota and legal size to be taken.

When the oysters are dredged and landed, they are then made available for sale and must be accompanied by a Gathers registration Document issued by the fisherman or controlling co/op. At this stage the Shellfish dealer or FBO (Food Business Operator) purchase the oysters. Both types of buyers have to be registered as “Shellfish Dealers” with IFI and must have their annual “Shellfish dealers licence” up to date. In the case of the Irish FBO they must also be registered with the SFPA as a Food Business Operator and also have FHA certification (Fish Health Authorisation) if they intend relaying in Irish waters. Ninety percent of the current production in Ireland is exported in bulk at this stage to FBO’s across Europe. The remaining ten percent is purchased by Irish FBO’s.

Primary responsibility for food safety under European Law is given to the food business operator and they have to verify that the product they have purchased meets all the requirements including bacteriological, viral, and biotoxin. The oysters are then graded by weight and stored in areas of the sea or tanks for conditioning or in some cases further growth and fattening. Before being offered to the market the FBO’s have again to ensure the oysters meet the criteria laid down for bacteriological, viral and biotoxin quality and in some case’s the oysters are purified before sale. All shellfish dealers have to record the purchase and then the sale in their Shellfish dealer’s register, FBO’s have to record the receipt and sale for traceability obligations and those with FHA certification must record intake and sale for Fish health obligations. In many cases these three registrations are by the same operator.

The vast majority of final oyster sales are through foodservice with FBO’s allowed to sell all over Europe without further certification, sales outside of Europe require Health Certification from the SFPA specific to each importing countries requirements. For sale to the public at an event like the Clarinbridge Oyster Festival the FBO must register its oyster bar with the HSE (Health Service Executive) as a “Food Business Establishment” Finally people can delight in the flavour and taste of the wild native oyster.



**Market Potential:**

While there is growing demand in Ireland price and availability provide many restrictions. European bulk export will continue to be the main outlet for the native oyster unless the fisheries can establish a strategic alliance with the Irish FBO's to provide a regular supply throughout the season allowing the FBO to offer the foodservice market across the world a continuous supply of graded oysters.

# Industry (Oyster co-ops) Discussion of Issues limiting Native Oyster Production in different Regions

## Rapporteur: Seamus Breathnach - Bord Iascaigh Mhara

The oyster fishing industry was represented by the Co-ops from the various fisheries including Tralee Oyster Co-op, Clarinbridge Co-op, Comharchumann Sliogeisc Chonmara, Clew Bay Coop, Achill Co-op, Lough Swilly co-op. There was general agreement that the oyster stocks are in poor condition bar Tralee. As this section of the NOW17 was exclusively devoted to fishers and the co-ops, all were asked to express / highlight what they believed to be the biggest challenges facing their industry.

### **Cultch/Spat Collection:**

The coop representatives were in agreement that cultch or the lack of it is a major barrier to the development and future growth of the oyster fisheries. Mussel shell is the preferred option for relaying, but the availability of mussel shell is a problem with high prices and availability issues. Other sources of cultch were discussed, such as Pacific oyster shell, clam/cockle shells, scallop shells and crushed lime. It was agreed the innovative ways should be looked at to address the cultch issue. Tralee is using limed FRENCH collectors in addition to cultch.

### **Licensing/ Dredge licensing:**

The difficulty in obtaining licenses was highlighted by some of the Co-op members. There is currently a restriction on the number of dredge license being issued. This is an interim measure and is linked to the absence of appropriate assessments and fishery management plans being submitted for those fisheries. Appropriate assessments and fishery management plans are required for all activities conducted in Special Areas of Conservation (SACs) and Natura 2000 sites.

### **SAC's/Natura 2000:**

As all commercial oyster fisheries are in SACs and are licenced annually by IFI they are, as per agreement between Ireland the EU Commission, subject to appropriate assessment as per article 6.3 of the Habitats Directive. The assessment assesses the impact of a documented account of the fishery i.e. a fishery plan. A fishery plan was assessed in Lough Swilly in 2015 but its findings have not been implemented. These delays in the Department of Agriculture Food and the Marine are the source of much frustration with the Swilly oyster fishermen.

The onus is on the Co-ops to produce a fishery management plan. The meeting was informed that MI and BIM can assist Co-ops in the formulation of fishery management plans, and this has been done already - but there is need of buy-in from Co-ops and all members need to be in agreement of the strategy. There is a fear amongst the co-ops that the tradition of oyster fishing will be lost as a result of these restrictions. Action is necessary to complete the appropriate assessments and fishery management plans. There is a perceived disconnect between the coops and IFI, BIM and the MI.

**Do Co-ops need help to manage fisheries?**

The consensus was that the Co-ops need assistance in managing their fisheries as Co-op boards are voluntary. The way forward for co-ops is to have paid staff responsible for delivering well managed fisheries so as to ensure that oyster fisheries can become sustainable in the future.

**Markets:**

There was agreement that the marketing of oysters is satisfactory but from the exporters point of view the development of strategic alliances are required to provide a regular steady supply of oysters.

**What can the state side do?**

There was a feeling that BIM, MI could assist in the purchase of cultch and in enhancing stock but there may be legal barriers to this. There may be possibilities under the FLAG programme in assisting with developing fishery management plans and other joint projects between coops. BIM and the MI are on hand to help in developing fisheries management plans and in assisting coops in stock surveys and advice on management.

**Cooperation between Co-ops:**

It was agreed that there would be positive benefits if the coops were to work together. A strategic plan is needed to rejuvenate the native oyster fishery but the process of formulating a strategic plan must have buy in from the co-ops. By having one voice from the coops there is a better chance for progress in dealing with the State Agencies and Local Authorities and to address common problems.

**Way forward:**

It was agreed that there would an initial meeting of representatives of all the oyster coops to scope the possibility of forming a working group in the near future. The co-ops were asked to consult with their members on this issue. BIM agreed to facilitate the initial meeting to establish a focused working group to implement actions in a joined-up approach. The working group should comprise representatives from the co-ops, the Marine Institute, SFPA, Inland Fisheries Ireland, NPWS and local government.

## Appendix:

### Native Oyster Workshop Programme 5th October 2017 Clarinbridge Oyster Festival Marquee Clarinbridge, Co. Galway

Time	Event Title / Speaker
<b>THURSDAY 5<sup>th</sup> October</b>	
<b>9:00</b>	<b>Registration and Coffee</b>
<b>9:30</b>	<b>Welcome &amp; Opening Introduction</b> Diarmuid Kelly – Chairman of Cuan Beo <b>Rapporteur: Dr Michael O’Toole (Marine Ecosystems Management)</b>
<b>9:45</b>	<b>The Importance and Heritage of the Oyster in Ireland</b> Prof. Noel Wilkins – NUI Galway
<b>10:15</b>	<b>The current status of stocks of the native oyster along the Atlantic Coast</b> Oliver Tully - Marine Institute
<b>10:30</b>	<b>Licensing &amp; Governance</b>  <b>Part I - Planning for Oyster Fisheries in SACs</b> Oliver Tully - Marine Institute  <b>Part II - Food safety control and boat licensing</b> James Allison – SFPA
<b>11:00</b>	Issues related to the restoration and future prospects for native oyster stocks <b>Part I - Diseases</b> Debbie Cheslett - Marine Institute  <b>Part II - Water quality (e-coli) / Norovirus</b> Bill Dore - Marine Institute  <b>Part III – Biotoxins</b> Joe Silke – Marine Institute  <b>Part IV - Water Management in the Catchment</b> Catherine Seale – Water and Communities  <b>Part V - Interactions with Pacific Oysters - Risks</b> Francis O’Beirn - Marine Institute
<b>12:30</b>	<b>Lunch</b>

<b>Time</b>	<b>Event Title / Speaker</b>
<b>1:00</b>	<p><b>Case Studies</b></p> <p><b>Case Study I: Loughs Agency</b> Cass Bromley – Loughs Agency</p> <p><b>Case Study II: Tralee Bay</b> Denis O Shea</p>
<b>1:45</b>	<p><b>Theme session on restoration</b></p> <p><b>Part I: The role of aquaculture in restoration</b> Trish Daly – Bord Iascaigh Mhara</p> <p><b>Theme session on restoration</b></p> <p><b>Part II: Methods to improve recruitment in the native oyster fishery</b> Oliver Tully – Marine Institute</p>
<b>2:30</b>	<p><b>Shore to table – The market potential for Native Oysters.</b> Diarmuid Kelly – Kelly Oysters</p>
<b>2:45</b>	<p><b>Industry (Oyster co-ops) discussion of issues limiting native oyster production in different regions. Rapporteur: Seamus Breathnach BIM</b> The co-ops from Lough Swilly, Blacksod, Achill, Clew Bay, Kilkieran Bay, Galway Bay and Tralee Bay may all have different issues and experiences in management and development of oyster fisheries. This session will be an informal discussion of the issues they identify.</p> <p>The rapporteur will sum up the issues which together with the earlier presentations will form the basis for the round table discussion in the next session on action planning .</p>
<b>3:45</b>	<p><b>Round Table Discussion: Rapporteur: Seamus Breathnach BIM Action planning, cohesive working group / sub groups formation and implementation planning &amp; next steps.</b></p>
<b>5:00</b>	<p><b>Close of Workshop</b></p>
<b>5:30</b>	<p><b>Launch of Cuan Beo</b></p>
<b>6:00</b>	<p><b>All Ireland Oyster Tasting Event – Developing the ‘Meroir’ Concept for Oysters</b> Niall Sabongi (KLaw Restaurant, Dublin)</p>
<b>7:00</b>	<p><b>Oysters from pre-historic times to about 1700 in Ireland</b> Michael Gibbons - Archaeology Travel</p>
<b>8:00</b>	<p><b>ENDS</b></p>



