



# Environmental Sustainability Atlas

Driving sustainability in the Irish seafood sector





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# Opening Statement

Environmental Sustainability Atlas



“Improving the environmental performance of the sector is at the heart of everything we do”



## Opening Statement

Over the past decade, Ireland's Seafood Development Agency, Bord Iascaigh Mhara (BIM) has undertaken a considerable amount of work to ensure a sustainable future for the country's fisheries, aquaculture and processing businesses. BIM ensures that good environmental practices are embedded in every activity that we support.

The organisation has been and continues to be involved in many local and international collaborative projects that cover issues related to the marine and coastal environment, responsible fishing and aquaculture, and the sustainability of seafood supplies within the economic, social and environmental dimensions. Environmental sustainability is one area where, in partnership with BIM, the seafood sector has made huge strides across a wide range of aspects.

Improving environmental performance of the sector is at the heart of everything we do and it is accepted that the careful management and conservation of the natural resources, or 'natural capital', upon which the sector relies cannot be compromised.

This Environmental Sustainability Atlas aims to summarise all of the work in this area that is carried out by BIM to support the Irish seafood sector.

Environmental sustainability throughout the report is referred to within the context of the Brundtland definition of sustainable development: 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' This definition is utilised by the United Nations and underpins the 2015 Global Sustainable Development Goals. The



**“ Development that meets the needs of the present without compromising the ability of future generations to meet their own needs**

modern model of sustainable development recognises the limitations of our natural resources and seeks to achieve optimal utilisation for people and nature. The UN indicates that for sustainable development to be achieved, it is crucial to harmonise the three core elements: economic growth, social inclusion and environmental protection. It calls for concerted efforts towards building an inclusive, sustainable and resilient future for people and planet.

While the three elements of sustainability are intrinsically linked, this report focuses primarily on the environmental aspects of sustainability. Along with BIM pillars of Innovation, Competitiveness and Skills, this pillar seeks to drive the sustainability agenda in the sector.

**Jim O’Toole**  
CEO

## Report overview

**This report provides a baseline for the environmental achievements of the seafood sector to date.**

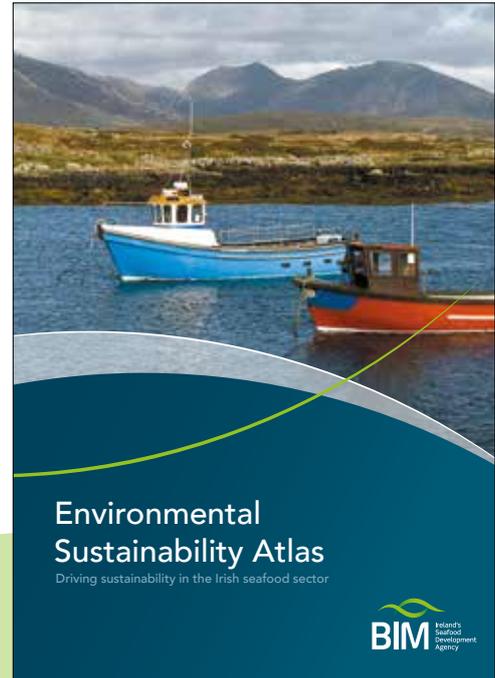
It reviews the tools available for improving overall environmental performance, such as management systems and voluntary standards, and includes linkages to Origin Green, the national programme for demonstrating the environmental sustainability of Irish Food.

The report details the various training and awareness initiatives provided by BIM, and highlights projects and interventions across a number of key environmental aspects where improvements have been, and continue to be, achieved. Measuring environmental performance is vitally important to enable the seafood sector to demonstrate and present its achievements in a range of forums. Some of the current projects in this area are presented.

The report concludes with a look into the future – detailing potential BIM projects already in the early stages of planning, and topics being explored with a view to developing new initiatives to ensure that BIM remains at the forefront of environmental seafood sustainability. These will further enhance the seafood sector's environmental performance and facilitate adaptive management for emerging challenges.

The seafood sector in Ireland is highly regulated and often operates at a high level of environmental performance not accounted for by existing legislation. This report does not focus on BIM support to the seafood sector to achieve regulatory compliance. Additionally, the report does not address international and global seafood sustainability relating to issues that are outside of the direct control of BIM, such as the status of stocks and marine protected areas.

Within this context, the organisation's work focuses on contributing knowledge and scientific research, and in turn working with the sector to understand and achieve compliance.



# Introduction

In response to an ever increasing number of environmental pressures, the seafood sector frequently adopts higher standards than those required by law in an effort to improve product quality, safety and environmental performance. It does this through the support of BIM, the Department of Agriculture, Food and the Marine (DAFM) and its agencies.

Environmental management is embedded within all of the initiatives undertaken by the catching, farming and processing components of the sector, which are supported by BIM. These range from energy and waste management to stewardship of the natural environment, continual improvement measured through the implementation of management systems, and achievement of an array of voluntary standards.

A key role for BIM is assisting the seafood sector to comply with regulatory and licensing requirements. This is vitally important to the basic reputation and continued existence of the sector, and represents a large component of the work carried out by BIM.

The focus of this report, however, is to examine assistance provided by BIM that goes beyond these mandatory requirements: initiatives that look to the future, tackle issues as they emerge, and bring environmental performance to a level over and above that required by the law. These actions help the Irish seafood sector stand out both domestically and internationally as an active, aware and responsible player working towards environmental sustainability.

The fisheries and aquaculture sectors are dependent on the natural environment, or 'natural capital', to secure a sustainable base of raw materials. To be economically viable, the Irish seafood sector recognises the importance of safeguarding the natural resources upon which it depends. Nature is at the heart of seafood production, with clean water and

nutrient sources derived from a suitable physical environment being fundamental to responsible, viable and efficient production of high-quality, safe products.

The seafood sector is not without its environmental impacts, which, uncontrolled, will ultimately deplete the natural capital upon which the sector depends. These are well documented and highly regulated, including initiatives such as the rebuilding of cod stocks in the North Atlantic and the establishment of a closed area in the Irish Sea as part of a general recovery plan.

In addition, the sector has to manage modern environmental challenges such as preparing for, mitigating and managing climate change impacts. Rising sea levels, changes in weather systems, ocean acidification, temperature increases, marine invasive species, and habitat alteration are already tangible issues for the sector. Future-proofing business for energy and fuel supply and justifying the place of the sector within Maritime Spatial Planning requires that action is taken now.

All stages in the seafood supply chain have a role to play in ensuring the sustainability of the sector. Fishers, fish farmers and seafood processors, researchers, regulators and marine agencies are

**“BIM recognises that a more sustainable use of natural resources creates a more resilient seafood sector**



all engaged in managing the natural capital.

These agencies work in tandem, constantly learning, improving their understanding, minimising impacts and improving their environmental performance.

Working with all sectors of the seafood supply chain, BIM recognises that a more sustainable use of natural resources creates a more resilient seafood sector by providing opportunities for

increasing productivity, reducing input costs and mitigating risks.

BIM supports the sector by facilitating sustainable management interventions, and delivering measures for the assessment and improvement of environmental performance. Where relevant, BIM also provides support to achieve verification and certification to environmental, organic and sustainability programmes and standards.

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# Driving Sustainability in the Seafood Sector

## 2016 Organic Certification

>90% Irish Salmon Production

61% rope cultured mussel production

6% seabed grown mussel production



25 vessels and 2 onshore facilities certified to RSS



## Origin Green

BIM has assisted 30+ aquaculture and seafood processors to achieve verification



## Fishing for Litter

To date 46 trawlers in 7 ports have participated (Clogherhead, Castletownbere, Ross A Mhil, Killybegs, Greencastle, Kinsale and Union Hall) collecting 21 Tonnes

## Visual Impact

BIM has supported recycling of more than 25,000 old blue and green barrels and replaced with low visual impact purpose-built barrels



## Marine Invasive Species

17 aquaculture companies with BIM have conducted voluntary Invasive Alien Species Risk Assessment



\* Figures as of May 2017

## Fisheries Local Area Development Groups (FLAGs)

**153** projects funded in 2017 delivering a total investment of **€3.6 million**



€12 million available over the duration of the programme 2014-2020



## Co-ordinated Aquaculture Management System (CLAMS)

**20** active CLAMS groups around the country with **7** CLAMS shore clean operations in 2015



## Profiling

BIM plays an important role in the profiling of fishing and aquaculture activities in and adjacent to protected areas with **27** areas completed to date

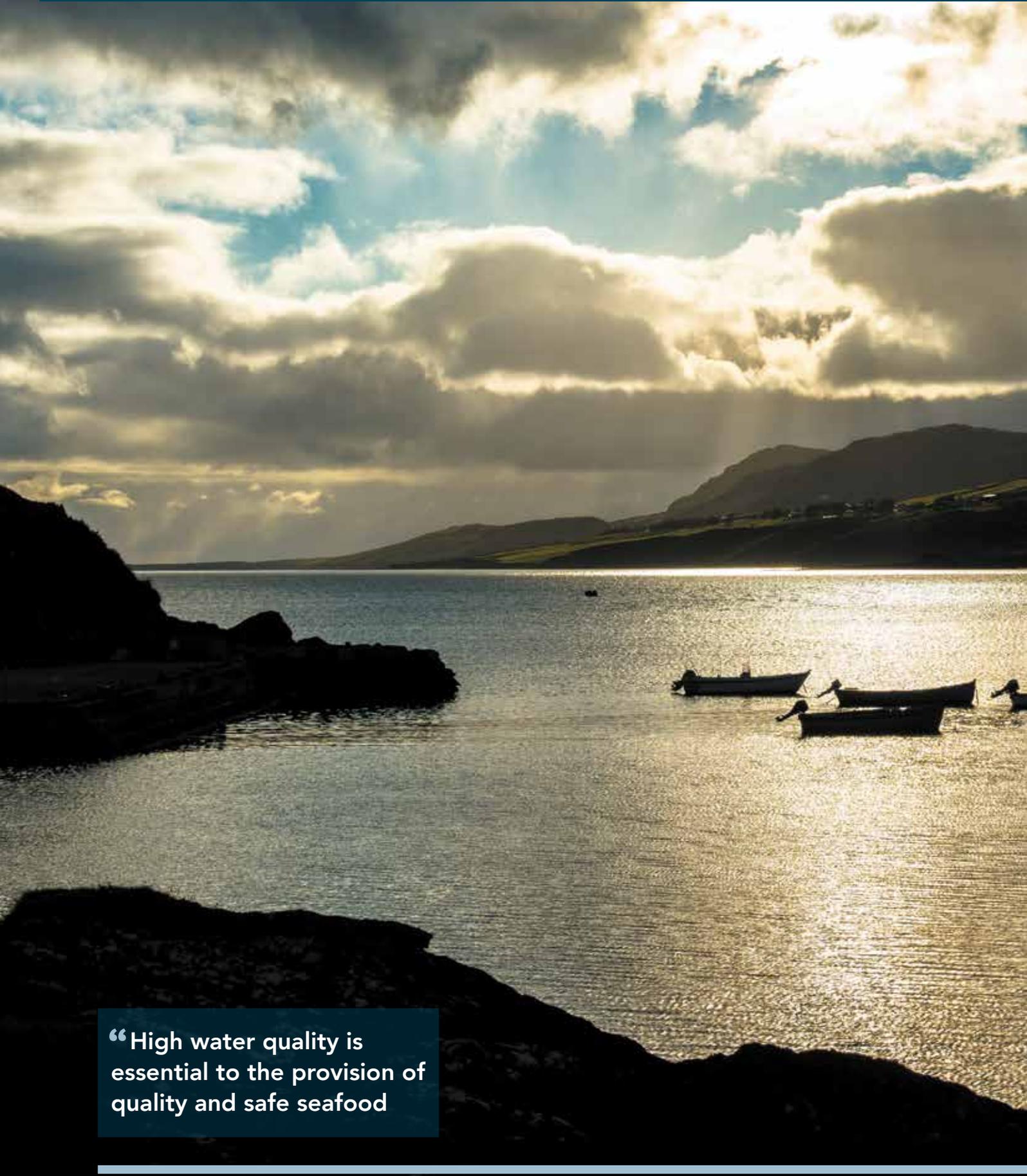


## Green Seafood Business Programme

**€20,000** saved by a seafood processor as part of a Water Reduction project

**€5,000** saved by a seafood processor as a result of a Leak Detection project

# Key Environmental Aspects



“ High water quality is essential to the provision of quality and safe seafood



## Water

A range of environmental aspects under the topic of water are relevant to the seafood sector, and this is an important aspect of the environmental management initiatives that BIM supports and encourages.

High water quality is essential to the provision of quality and safe seafood. Fishers and aquaculture operators are particularly accustomed to this, undergoing both statutory and non-statutory sampling to monitor water quality on an on-going basis.

Water pollution from point sources, such as seafood processing discharges, and diffuse sources, such as finfish culture, are strictly regulated.

Although Ireland's climate means that water shortages are rarely an issue, water conservation is a key issue for freshwater users, such as freshwater aquaculture and seafood processors. Recirculating technology is increasingly being employed in fish culture systems, and in seafood processing various conservation measures are being implemented.

### Water conservation in seafood processing

#### Leak detection

The first steps in a water efficiency improvement programme are to monitor water use and identify leaks. Leaks are common, but can be hard to detect in wet seafood processing plants. In seafood processors, water is used for many different purposes – including processing, cleaning, thawing, and cooling – and greater efficiency can be achieved using a range of methods. BIM's Green Seafood Business Programme works with seafood processors to implement a water efficiency improvement programme to reduce water usage.

## Cleaning systems

Seafood processing companies consume large quantities of water each year. Water, both hot and cold, is used for a variety of tasks including cooking, cooling, and in processing machines. It is also used in daily cleaning procedures, an important task in the sector.

## Case Study Leak Detection

After a site visit conducted as part of BIM's Green Seafood Business Programme, Atlantis Seafoods installed online water meters to learn more about its water use. These were attached to the council meter and provided live meter readings, which allowed water use to be monitored remotely.

The company found that when the site was closed at the weekend, it was still using 400 litres/hour of water. A leak check was carried out, which uncovered a faulty ball-cock in the holding tanks and a leak in the ice machine. These leaks were repaired, saving the company an estimated €3,000 – €5,000 annually.

While this is a once-off saving, it indicates the potential savings that can be made through basic leak detection. As a result of this project and the water savings made, Atlantis was rewarded for its good work with a finalist nomination for the Small Firms Association's National Small Business Awards in 2012. Atlantis Seafoods is currently looking at how it uses water in different processes and addressing a series of improvement options, with significant potential savings.

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In the past few years there have been significant improvements in this area that have resulted in reduced cleaning costs, while maintaining the highest standards of cleaning. These improvements have reduced the amount of water, chemicals and energy used for site-wide cleaning at many Irish seafood processing plants.

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## Recirculation technology in aquaculture

Recirculation technology allows the reuse of water within aquaculture facilities and often includes treatment systems to ensure that water quality is retained at the highest standards.

BIM has supported the adoption of this technology by the aquaculture sector for a number of species through research, funding and technical support to bring the technology to commercial viability.

## Abalone and sea urchins

BIM provides support to companies farming abalone and sea urchins, and using recirculation technology in their hatcheries and land based tank rearing systems. Here, the ability to control temperature is an added bonus of the recirculation systems. In Ireland, two species of the molluscan shellfish abalone are cultured – the non-native European ormer, *Haliotis tuberculata*, and the Japanese abalone, *Haliotis discus hannai*.

The culture of both species typically begins in land-based hatcheries where broodstock are spawned and subsequent larvae are settled onto growing medium, before being transferred to tanks for on-growing. Sea urchin culture in Ireland is based on a single species, *Paracentrotus lividus*.

– continued page 12



## Case Study Cleaning Systems

Sofrimar Kilmore Quay realised €20,000 in annual savings, while reducing its environmental impact, as part of a project conducted with the Green Seafood Business Programme. As part of the project, Sofrimar installed an online water monitoring system. This identified that large quantities of water were being used each evening for site cleaning. On closer examination of the cleaning practices, it was noted that high pressures and high water volumes were being used for cleaning. Flow rates through the open hoses used were typically 100L/minute.

After the initial site assessment, the flow rates and times for cleaning were measured for all areas in Sofrimar. These figures were then used to estimate the annual amount of water used

for cleaning, and the associated costs. After a detailed cost-benefit analysis, an upgraded centralised cleaning system was installed by EcoLab, with the following main benefits:

- Water flow rates were reduced from, on average 100L/min, to between 30L/min and 40L/min. This was achieved using a centralised system with high-pressure, low-volume hoses with specific cleaning nozzles. These made cleaning much easier and quicker, especially for the first rinse step, than using high water volumes alone.
- Centralised chemical dosing for the foaming step, which resulted in reduced chemical use.
- The improved water sprays

from the nozzles reduced misting throughout the site, which improved the efficiency of the final rinse cleaning step initially, due to uncertainty about the cleaning capability of the lower flow rates 40L/min nozzles that had been introduced. Since then, due to the positive feedback from cleaning staff, these flow rates have been reduced further to 20L/min – 30L/min. The payback on the investment was about 13 months and has resulted in significant annual savings for Sofrimar on its water charges.

Sofrimar reduced its water consumption by 30% per tonne of product processed for the main shellfish products.

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This species is also spawned in land-based hatcheries and the resultant larvae settled onto growing medium, where they feed on microalgae. Water flow requirements at this stage are small, but recirculation technology is still employed in some instances. Ongrowing takes place at sea, although small cohorts of animals have been grown to market size in land-based facilities, using pump-ashore recirculation technology.

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### **Perch culture**

BIM has assisted in the development of rural freshwater farming since its inception. In the 1990s, preliminary work was carried out to assess the suitability of marginalised land for perch farming. Following the establishment of a number of enterprises in the early 2000s, perch farming in Ireland has developed into a modern, high-tech sector. Ireland is at the forefront in perch culture, with advanced multi-season spawning and genetic development.

Irish perch are sold into niche markets in Switzerland and are highly sought after. BIM is currently involved in a number of projects to develop the sector further.

A genetic broodstock programme is being run in partnership with Integrated Aquatic Resource Management between Ireland, Northern Ireland and Scotland (IBIS) and Queen's University Belfast. The process involves the mapping and streamlining of existing broodstock and parental stocks from around Europe.

Such work will deliver improved genetic traits such as disease resistance and faster growth rates. In tandem with this work, BIM is involved in an ambitious new project to develop split-pond culture in Ireland. The project has the

potential to open up large areas of marginalised land to freshwater pond culture. The first step in the process is a trial farm based in Co. Sligo.

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### **Peat AQUA project**

A joint working group between BIM and Bord na Móna has been established to examine aquaculture potential on cutaway bog lands. A freshwater aquaculture farm trial project is proposed at the Mountlucas Windfarm near Tullamore in Co. Offaly. The site consists of 28 wind turbines within a cutaway bog historically used for milled peat production by Bord na Móna.

The aquaculture development will consist of four fish ponds for trout and perch, and a duckweed pond for water treatment (sediment and nutrient removal) within a recirculation system using paddle wheels, via open channels. Water for the ponds will be sourced from a combination of the local surface water drainage system and also from a well proposed as part of the project. The water will be re-used, so once the ponds are filled, the only topping up will be for water that is lost through evapotranspiration.

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## Case Study: Prevent and Reduce Continuous Longline (New Zealand) farming system for mussels

BIM first assisted in the transfer and modification of rope mussel technology from New Zealand in the late 1990s. The aim was to develop more environmentally sustainable practices, as well as to cut down on labour costs. Reusable seed collector ropes and grow ropes are deployed as continuous droppers, allowing mechanisation of husbandry and harvesting.

The outcome has been a reduction in waste from the sector; a rate of uptake such that over 60% of Irish rope mussel production is now harvested from New Zealand rope; and further innovation and adaptation by the seafood sector through the trial and introduction of an automatic harvesting system and the establishment of a cotton manufacturing business to supply indigenous producers, as well as for export.

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## Waste

The principles of Prevent, Reduce, Reuse and Recycle are contained within the various waste initiatives facilitated by BIM for the seafood sector.

All the BIM environmental management systems require the adoption of a waste management policy based upon these principles. Recognising the poor practices of the past, fishing for litter is an important campaign which has knock-on positive effects on the other environmental aspects, including biodiversity and visual effects.

The BIM marine biodegradation poster, highlighting just how long it takes for rubbish disposed at sea to degrade, has been in circulation for almost 15 years and is still relevant and in high demand today.





**“ BIM’s ‘Fishing for Litter’ project is designed to recover marine litter while raising awareness of the detrimental impact such waste can have on the marine environment**

**Fishing for Litter**

The accumulation of marine litter poses a vast and growing threat to marine and coastal environments. Some 20,000 tonnes of litter is dumped into the North Sea alone every year. Most marine litter consists of plastics that degrade very slowly. These can cause entanglement or be ingested by marine mammals and birds, killing 100,000 and 1,000,000 respectively each year. BIM’s ‘Fishing for Litter’ project is designed to recover marine litter while raising awareness of the detrimental impact such waste can have on the marine environment.

Since 2017, BIM assisted the seven fishing ports of Castletownbere, Co Cork; Union Hall, Kinsale, Co. Cork; Clogherhead, Co. Louth; Ross a Mhill, Co. Galway and Killybegs and Killybegs Co. Donegal to identify to identify and implement tailored solutions for waste management for for 46 participating vessels and their crew.

Fishermen are provided, at no cost, with large hardwearing bags in which they can collect marine litter that accumulates in their fishing gear as part of their normal operations, as well as any waste they themselves generate during fishing trips. Filled bags are returned to the quayside in participating ports and moved to secure containers, ready for safe and responsible disposal.

This initiative not only involves the direct removal of litter from the sea, but also raises awareness of the significance of the problem within the fishing community.

As well as marine litter recovery and raising awareness of the problem, the project’s other main aims are: to change working practices to reduce the amount of industry-sourced litter reaching the marine environment in the first place; to provide a vehicle to monitor the types of waste collected by fishermen

at sea and to identify any regional differences; and to recognise the industry's stewardship of the marine environment. The project also aims to conduct a baseline on waste characterisation from fishing vessels which will assist in diverting waste from landfill and reduce disposal costs.

The project works with the port facilities to identify challenges and solutions in running the scheme. Participation can gain recognition for member vessels and their crews, as 'Fishing For Litter' contributes to BIM's certification and sustainability initiatives and Bord Bia's Origin Green sustainability charter. The information gathered will also be fed into international monitoring programmes such as OSPAR's Marine Litter Working Group.

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### **Expanded polystyrene (EPS) fish boxes**

Over the years, BIM has worked with primary producers, co-ops and processors to address this major waste stream. It has facilitated various trials in physical and thermal compaction, primarily to reduce volume, but also to explore options for reuse, and hence divert from landfill.

In 2013, as part of the Green Seafood programme, BIM engaged with Repak to conduct national research into the area of fishbox EPS usage and disposal in Ireland, and to devise business models that could be considered by a company seeking to recycle EPS. There were two elements to be examined: estimating the volume of fish box EPS that would need to be dealt with annually, and the options available for the waste management.

The report concluded that the majority of EPS is going direct to landfill because of the lack of EPS recycling facilities in the country. While it is possible that there is sufficient volume of fish

box EPS to sustain stand-alone EPS recycling plants located strategically around the country, it may make more financial sense for any plant to also get involved in the recycling of EPS. There are a large number of stakeholders that need to be considered when considering the issue of fish box EPS and its management.

As a result of this report, BIM's Green Seafood programme is continuing to investigate alternative methods of recycling EPS and alternative options to EPS for use in the seafood processing sector. The full report is available to download from the BIM website.

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### **Utilisation of fish by-products**

BIM's Seafood Innovation Centre (SDC) has invested in forming and ready-meal technologies, and is involved in trials to utilise recovered meat (following filleting) into reformed and ready-meal concepts. Market-trends are being used to define commercially-relevant concepts and meat from whitefish, salmonids and pelagic fish species are being trialled in numerous formats.

Meat recovery trials to date indicate that a further 120kg per tonne of useable recovered meat can be recovered from head-off fish frames and can be used as base material for further value-added new product development for the Irish seafood sector. Reforming trials to date have focused on binding, breading and frying technologies to develop fish cake and bites. Ready-meal trials are investigating consumer perception of recovered meat versus prime fillet, and the potential blending of these to develop viable concepts.

In 2016, the results were communicated to relevant seafood players with capacity and scale,

and feedback is being used to inform further new product development.

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### **Reuse: Treatment of animal by-products**

BIM continues to engage with the seafood sector on a range of trials for the treatment and reutilisation of seafood by-products. Governed by strict EU regulations, seafood by-products are considered collectively with those from other animal sources. By-products are required to be treated according to risk and to a range of prescribed methods, from rendering and incineration to composting and anaerobic digestion. Member states can approve alternative treatment methods based on risk assessment.

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### **Composting**

BIM engaged in composting trials as far back as 2003, with further trials in 2009 to manage odour problems that threatened to rule out composting as a viable treatment method for crustacean by-products. Composting continues to provide a responsible and environmentally sound treatment solution for the seafood sector, although the service is provided by independent waste companies rather than through in-house composting facilities.

This is due to the strict requirements of the animal by-product (ABP) regulations and the fact that the seafood sector's primary focus is food production, rather than waste treatment.

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### **Anaerobic digestion (AD)**

BIM has studied seafood by-products as a feed stock for anaerobic digestion at various stages, with its Green Programme undertaking a 2016 study entitled 'A Feasibility Report on the Use of Anaerobic Digestion within the Irish Seafood Processing Industry'. The report's main findings were that the uptake of anaerobic digestion in Ireland is low compared with other EU member states, but that it is a treatment option with great growth potential, once regulatory and financial hurdles have been addressed.

Although high nitrogen levels make the sludge from fish waste unsuitable as a single feedstock, it can provide a high-quality product when combined with other feedstocks and, in some cases, dewatered. Digesting fish waste requires a ratio of approximately 30% fish to 70% high carbon waste to operate efficiently. As a result of the report in 2016, BIM's Sustainability Group will



be continuing to investigate various by-product treatment options for the seafood sector.

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#### **Recycle: Barrel replacement**

Between 2001 and 2010, BIM operated a successful programme to improve the visual impact of aquaculture and simultaneously improve efficiency and reduce waste in the sector. The barrel replacement scheme effected a changeover within the rope mussel sector from blue and green barrels to fit-for-purpose, low visual impact grey floats. More than 25,000 of the old barrels were recycled as part of the initiative.

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#### **Net recycling**

BIM has been working on a pilot project to manufacture commercially-viable products from recycled polyethylene fishing gear, in collaboration with Liverpool-based plastics recycler Centriforce Products, for a number of years.

Polyethylene can take hundreds of years to biodegrade. BIM is striving to find ways of preventing hundreds of tonnes of gillnets and other fishing gear from going to landfill. The problem of 'ghost fishing', in which lost or abandoned nets hundreds of metres long can continue to catch fish in large numbers, is also a serious issue which is under consideration.

Having successfully proven a process for recycling nylon gear, BIM, in liaison with Green Marine Recycling and GEOLINE, joined forces with Centriforce to develop a pilot project for

recycling polyethylene nets and related items, such as rope and twine. Hundreds of tonnes of recycled nets and other gear is collected by BIM from ports around Ireland and stored to avoid sending the waste to landfill.

BIM has been facilitating the extraction of netting from the Irish and Spanish industry for more than seven years. Annually, an average of 50 tonnes of PA6 monofilament nylon is recycled. To date, approximately 320 tonnes of PA6 monofilament nylon and 14 tonnes of polyethylene have gone through the system.

BIM is also focused on addressing the problems with the polyethylene in the industry.

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### **BIM Net Effect**

As part of the circular economy aspects of net manufacturing to divert waste net material from going to landfill BIM is investigating the repurposing of clean net cut offs. Three net manufacturers in Dublin are now directly linked to a social enterprise that collects clean material which is then reused and reworked through arts and crafts workshops.

In Co. Cork, one net manufacturer is supplying

his net cut offs for upcycling to a company producing sustainable and eco-conscious bags. We are also exploring the development of a 'blueprint' approach for net're'working that could be reproduced by community groups or social enterprises around the country to create an additional revenue stream in coastal communities.

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### **CLAMS clean-ups**

Organised through the Co-ordinated Local Aquaculture Management System (CLAMS) groups, BIM co-ordinates events and provides recycling and disposal facilities for collected litter. Clean-ups take place on piers and beaches, and along less accessible parts of the shore, which are accessed by fishing and aquaculture vessels as part of the task. In the 2015-2016 period, seven organised clean-up events took place.

Additionally, as part of their environmental management systems, companies frequently set themselves a target to participate in a set number of shore clean activities annually, often linked with An Taisce or local community groups.

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## Energy

Energy is one of the largest costs associated with seafood processing. Improving energy efficiency reduces emissions and carbon footprint and can also achieve large cost savings. Securing supply is an important long-term goal to future-proof business against volatile pricing and the possibility of shortages in fossil fuels, and BIM supports investment in renewable energy technology.

For fishing operations, fuel costs rank alongside crew salaries and repairs as a leading cost. In periods of high oil prices, fuel prices can become the vessel's highest cost, making up as much as 30% of overall expenditure. Hence, maximising fuel efficiency is an important objective for the seafood sector.

### Energy Management Monitoring Project

BIM's Green Programme collaborated with a web-based energy management software company to monitor energy use in a number of seafood processing companies. These systems provided

real-time energy data, projections of savings, and reporting, offering seafood business owners the perfect tool to identify energy wastage, save money and reduce carbon footprint.

The energy management solutions installed as part of the project allowed significant electricity consumers within the seafood processing facilities to identify their energy costs. This enabled effective planning of energy-efficiency upgrade works, which focused heavily on refrigeration, freezers and lighting.

The use of energy metering systems also enabled the seafood companies to measure and verify the impact of their energy-efficiency works. The systems helped the business owners reduce energy waste and, through this improved energy efficiency, reduce costs.

### Renewable energy

Through research and financial assistance, BIM encourages and supports the adoption of renewable energy technology across the entire seafood sector.

## CASE STUDY

# Energy Management System for seafood processors

A light Energy Management System was trialled in a seafood processing facility in 2014/2015 to determine if this system would be beneficial to the wider seafood processing sector in line with the requirements of ISO50001.

The system was aligned with current factory procedures, such as production and sales targets, and placed energy on

the agenda as an important parameter to be discussed.

The system outlined a metering plan for monitoring and recording of electricity consumption.

It then mapped the full factory site giving a breakdown of energy use, which allowed management at the processing facility to focus on high energy users throughout the site.

Implementing this energy management system aims to put structures in place so that energy use is seen as an important factor in seafood processing facilities, with a view to rolling it out to small and medium seafood processors.

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## Solar

Solar PV (photovoltaic) panels generate electricity and are becoming an increasingly attractive option for seafood processors as technology improves and cost becomes more competitive. The system aims to reduce running costs, protect against energy price increases and reduce the building's carbon footprint.

Solar PV is a good fit for the seafood sector as refrigeration systems tend to consume more electricity in the summer, when solar availability is at its highest. In April 2016, BIM approved funding support for five seafood companies through its Seafood Processing Development Scheme.

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## Wind

It is predicted that wind power will make the most significant contribution to Ireland's renewable energy targets over the next number of years, and wind turbines can be a viable option for seafood processors in some areas. Care should be taken to size the turbine correctly according to the wind availability in the area. Planning permission can be an issue for these installations, but it has already been successfully obtained in a number of locations.

## Fuel Efficiency Guides for Fisheries

BIM produced a user-friendly guide entitled 'Improving Fuel Efficiency on Fishing Vessels' in 2009, which is still relevant to the industry. The guide investigates engine efficiency in terms of the improvements in fuel consumption that result from basic maintenance and fuel monitoring; the effects of excessive drag on the hull caused by fouling; and matching the speed of the vessel to optimum fuel consumption.

Without adjustments to the relationship between



fuel costs and profit, the financial viability of many fishing entities is questionable. However, major investment in new, fuel-efficient vessels is not viable for most fishermen in the current economic climate, nor is the use of alternative fuel sources, because of problems with supply or reduced efficiency. Therefore, it is more appropriate for fishermen to look closely at their fishing operations and take simple steps that collectively give modest reductions in fuel consumption.

The guide highlights 10 simple steps to follow to optimise fuel efficiency. When these measures are followed, average fuel costs can be reduced by 15-20%, or as much as €60,000 a year. Good record-keeping is essential, and using simple Key Performance Indicators – such as fuel costs as a % of landings – on a trip-by-trip basis is a good way to monitor the vessel's performance.

## CASE STUDY

# Transport Fuel Reduction project

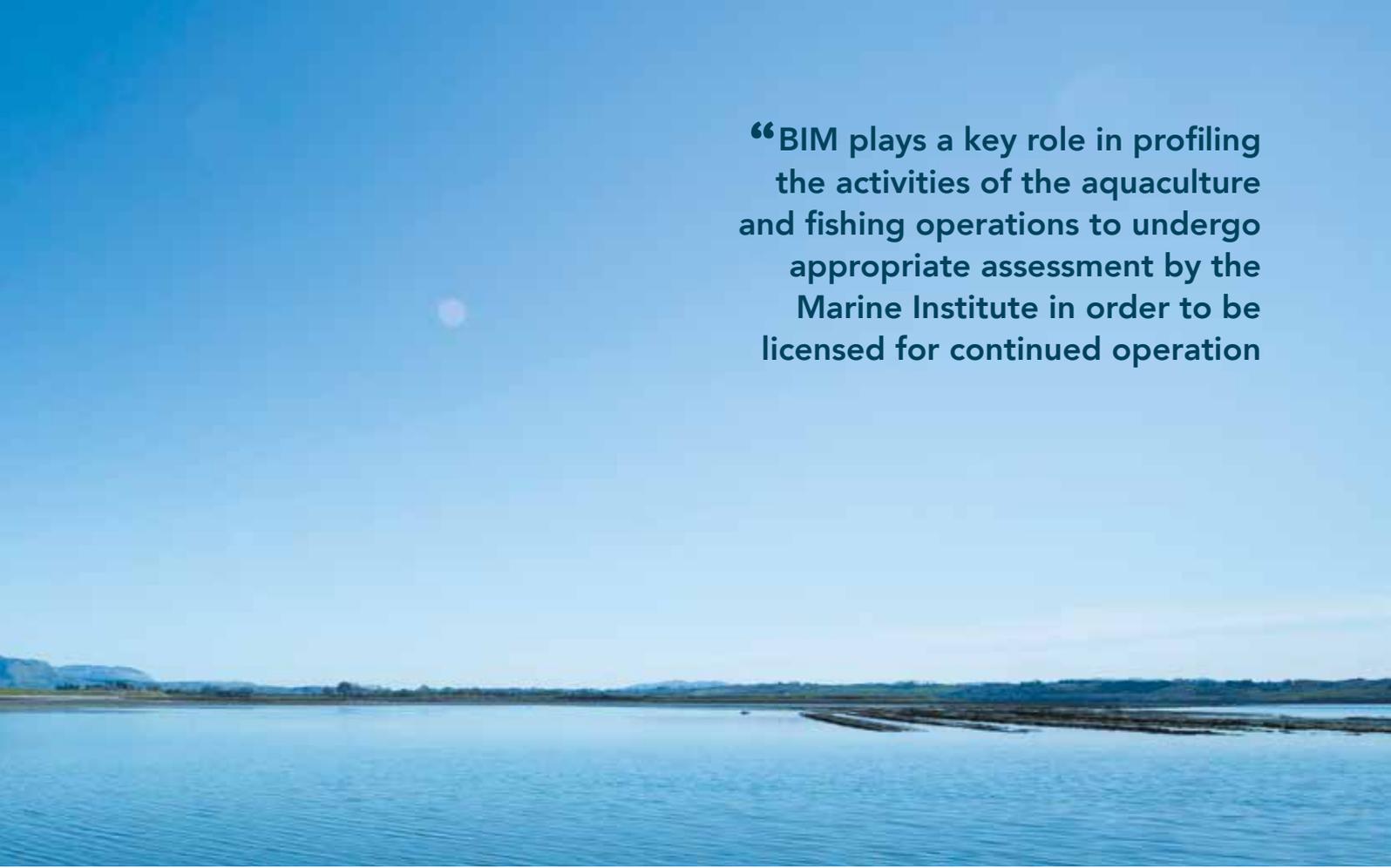
A pilot project was conducted with three seafood processors to investigate potential transport fuel savings. A number of initiatives were implemented as part of the project. By monitoring and recording fuel use, improving maintenance and procurement procedures, and training drivers in eco-driving, a saving of 10% on fleet fuel was achieved. The resulting report identified opportunities for BIM to collaborate with the seafood processing sector to implement further fuel improvements and cost saving projects.

- Group fish processors to allow them build trust in each other and consolidate long distance loads.
- SMEs working in groups helps to create peer pressure, which is more powerful than outside influencers.
- Highlight the potential for profit.
- The profitability of some routes needs to be questioned.
- The solution is not to give up a strategic or important sale, but to use specialist third party logistics providers to consolidate loads, reducing fuel, carbon and labour costs.

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## Transport Fuel Reduction Project

Resource Efficiency Assessments (REAs) conducted by BIM's Green Seafood Business programme showed road transport to be one of the largest uses of energy in the fish processing sector. In some cases, road fuel costs were three times the size of the facility's electricity bill and the largest emitter of CO<sub>2</sub>/GHG. The Green programme identified the opportunity to assist seafood processors reduce costs and emissions whilst increasing profit by reducing transport fuel usage.



**“BIM plays a key role in profiling the activities of the aquaculture and fishing operations to undergo appropriate assessment by the Marine Institute in order to be licensed for continued operation**

## Natural Capital and Biodiversity

Natural capital is a way of defining the wide range of benefits that we derive from nature, underpinning thriving societies and prosperous economies. It is a way of looking at the value of biodiversity to our very existence, rather than examining biodiversity as a separate entity. Biodiversity is the variety of life found on earth and can be measured at the level of genes, species or even ecosystems. Fishing and aquaculture are entirely dependent on this natural capital but, like all human activities, they can impact upon the natural biodiversity.

Overfishing, aquaculture as a monoculture, accessing the shore, and the construction of work facilities can all have negative effects on biodiversity. However, the seafood sector should also be recognised for its positive stewardship in this area. Site level improvements in individual business environmental management systems frequently bring about small changes and offset

any negative impacts. This section reviews other management interventions facilitated by BIM to value natural capital, improve biodiversity and minimise impacts.

### Operating in Natura 2000 areas

The Natura 2000 network is comprised of sites designated under the EU Habitats and Birds Directives. The fishing and aquaculture sectors that operate in these sites are required to do so within the framework of the conservation objectives for that site.

In many cases, the fishing and aquaculture activities pre-dated the site designation process. Ireland has taken a considerable amount of time to achieve Natura 2000 compliance, which has had major consequences for the seafood sector, delaying licensing decisions and having a knock-on effect on support and investment opportunities.

Recent detailed baseline data collection and the establishment of comprehensive



## Case study

# Invasive Species in aquaculture

BIM project work on alien species has focused on the control of *Didemnum vexillum* in Irish aquaculture, carried out in partnership with University College Dublin. *Didemnum vexillum* is a colonial sea-squirt (tunicate) native to Japan, which over the past decade has spread rapidly outside of its native range.

Once established, this species can grow rapidly, extensively coating living and non-living underwater surfaces with the potential to alter marine ecosystems and, in the case of aquaculture, smother and kill stocks.

It was first documented in Ireland in June 2005, when it was discovered fouling immersed man-made structures within Malahide marina. Since then it has been found in Carlingford Marina, Clew Bay, Galway Bay and, most recently, in Strangford Lough. The project actions include research, raising awareness within the aquaculture sector, and control experiments. These aim to develop environmentally sustainable, cost effective and time efficient methods for managing *Didemnum vexillum* to protect stock and reduce the future spread of the species in the natural environment.

conservation objectives have led to a clear understanding of the management requirements for each designated site.

BIM plays a key role in profiling the activities of the aquaculture and fishing operations to undergo appropriate assessment (AA) by the Marine Institute in order to be licensed for continued operation.

While time consuming and at times returning unfavourable outcomes, the appropriate assessment of aquaculture and fishing activities in Ireland is now one of the most comprehensive in Europe.

Operators can be assured that their activities are being carried out with the utmost respect for biodiversity and in parallel with the conservation of the natural capital upon which the seafood sector ultimately relies.

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### Marine invasive species

BIM is a partner in UK/Ireland project Marine Pathways, which examines the management of a range of marine non-native species. This platform has proved invaluable for carrying out research with limited resources and for the exchange of information.

BIM has focused its work on the control of *Didemnum vexillum* on aquaculture facilities. Other members of the Pathways group focus on different species and sectors, and all findings are shared in order to improve the knowledge base and allow appropriate action to be taken.

BIM is currently working on generic risk assessment and biosecurity guidelines for aquaculture businesses, with the aim of bringing awareness to, and encouraging voluntary action by, as many growers as possible. To date, 13 farms have conducted invasive species risk assessments linked to actions within their Organic, ECOPACT and Origin Green management programmes.

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### Sustainable Irish oyster seed

BIM has been working with the sector and the Marine Institute to secure a supply of disease-free triploid oysters of Irish origin. The programme has primarily focused on producing a supply of tetraploid oysters, using patented technology, which may then be crossed with diploid broodstock to produce triploids.

The successful application of this technology will be central to any future broodstock selection programme for the Irish oyster sector. In tandem with this work, BIM has identified a need

for increased nursery capacity within Ireland to bring seed from a 3mm size to 8-10mm.

Trials have been run using land- and sea-based technology, and there are plans to expand on the results of this work.

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### Sustainable Irish mussel seed

Seed mussel surveys have taken place around the coast since the early 1970s. For the past seven years, the surveys have been carried out using the BIM coastal survey boat MV T.Burke, covering an area from Dunany Point (south of Dundalk Bay) to Dingle Bay, including the east coast of County Wexford and the Wicklow coast. The number of survey days per year varies from 40 to 70 days and is highly dependent on weather conditions.



Every survey is followed by a report available to the sector; these give detailed accounts of settlement locations, tonnage estimation, seed quality (size, waste, etc.) and recommendations concerning the fishing. This task is essential for the management of the seed mussel fishery.

Since 2009, a large amount of data has been collected, including thousands of hectares of side scan sonar imagery; over 1300 dredge tows detailing position, water depth, content, tide, and sea conditions; and hundreds of grabs and hours of underwater footage, all of which contribute to the sustainable management of the fishery.

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### **Seaweed aquaculture**

BIM's recent technical work on seaweed has focused on developing and perfecting culture techniques for *Alaria esculenta* (Atlantic wakame) and *Saccharina latissima* (Kombu), which are the varieties of brown seaweeds for human consumption currently demanded by the sea-site operators. The techniques to manipulate these species in the marine hatchery are now relatively well understood and mastered.

BIM is now in a position to produce seeded collector string on demand in large amounts of up to 20kms in a year. It is possible to stagger production to allow for staged deployments, to see which is helpful from a logistics point of view, and in the event of adverse weather conditions in autumn.

Currently, there are six licensed aquaculture grow-out sites and 23 applications for seaweed



grow-out sites with the Department of Agriculture, Food and the Marine.

The other species of interest are the red varieties *Palmaria palmata* (Dulse) and *Porphyra* (Nori). These species are more technically challenging and progress is slower in the marine hatchery. These species have a more complex lifecycle requiring delicate manipulation.

BIM is linking up with other agencies in an effort to tackle some of the challenges presented. The four species Atlantic Wakame, Kombu, Dulse and Nori are of interest because of their importance for human food in Europe.

A recent report commissioned by BIM on the EU market for these four species shows a favourable niche market opportunity.

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### **Natural sea lice prevention: lumpfish and wrasse**

The native species of sea lice, *Lepeophtheirus salmonis*, is a serious pest to farmed salmon. While a few lice on a large salmon may not cause severe damage, large numbers of lice on that same fish, or just a couple of lice on a juvenile salmon, can be harmful or fatal.

The feeding activity of sea lice can cause serious fin damage, skin erosion, bleeding and open wounds, creating a pathway for other pathogens.

'Cleaner fish' such as wrasse, family Labridae; and lumpfish, family Cyclopteridae, are used as a natural parasite control mechanism on farmed fish. Cleaner fish are being used as a supplement to veterinary treatments in Norway and Scotland, and now in Ireland. Wrasse fishing started in earnest in Ireland in 2014 and in 2015.

BIM organised two workshops for fishermen and fish farmers to learn about wrasse fishing and husbandry in cages with salmon. Lumpfish are not as abundant in the wild as wrasse, and farming of lumpfish is underway in Norway, Scotland and also in Ireland.

In 2015, NUIG Carna successfully tendered for a contract to produce 200,000 lumpfish for the salmon industry.

The fish produced have been successfully deployed at sea sites. In 2016, BIM has once again gone to tender to produce 200,000 lumpfish and it is anticipated that the contract will be awarded shortly.

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#### Environmentally friendly fishing methods

BIM works with the sector to develop, test and monitor environmentally friendly fishing gear that minimises the bycatch of discards (unwanted or juvenile fish) and improves the selectivity of fishing gear.

Its continual development of these new technologies helps address the EU's long term management plans for fisheries, and EU and Irish legislation on protected marine species. The following section summarises some of the most recent work in this area.

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## CASE STUDY

### By-catch reduction: an assessment of square mesh cod-ends in an Irish *Nephrops* fishery

Worth around €45 million annually at first point of sale, *Nephrops* is Ireland's most commercially important demersal species. Numerous gear modifications have been developed over the years to reduce fish discards in the *Nephrops* fishery, with a particular emphasis on cod in response to management plans for that species. Until recently, however, remarkably little work had been carried out on reducing catches of small *Nephrops*. This raised a key challenge for industry, given relatively high discard rates of small *Nephrops* and the fact that this species was phased in under the landing obligation from 2016.

BIM set about testing three different gear options to effectively reduce the quantities of *Nephrops* retained of less than 25 mm carapace length (CL) – the minimum conservation reference size (MCRS) in Irish waters outside the Irish Sea and the size at which discarding commences in the

Irish Sea (MI, 2015). A 45% reduction by weight of *Nephrops* less than 25 mm CL was achieved by increasing the size of the diamond mesh in the cod-end from 70 mm to 80 mm, leading to improvements in the length composition and value of catches over the course of a season. A 30% reduction in the quantity of mixed flatfish was an additional benefit of this increase in diamond cod-end mesh size (Cosgrove et al., 2015).

This work led to a public consultation by the Department of Agriculture, Food and the Marine on a national increase in minimum cod-end mesh size from 70 mm to 80 mm. A *Nephrops* sorting grid consisting of a relatively small 15 mm spacing in the bottom half to allow small *Nephrops* to escape, and a reinforced gap in the top half to allow fish and large *Nephrops* to pass into the cod-end was also tested.

A 35% reduction in *Nephrops* less than 25 mm CL was obtained using the *Nephrops* sorting grid compared with a standard 70 mm diamond mesh cod-end without a grid (Cosgrove et al., 2016). Following these trials, a range of different square mesh sizes (45 mm, 55 mm, 65 mm and 70 mm) were tested in an

Irish *Nephrops* fishery. The smallest, 45 mm mesh performed the best of the three square mesh cod-ends tested in terms of improving the catch profile of *Nephrops*.

Smaller scale reductions in undersize *Nephrops* and increased catches of undersize whitefish were observed in the 45 mm square mesh cod-end compared with a previous assessment of an increase in diamond cod-end mesh size from 70 mm to 80 mm. This suggests that an increase in diamond cod-end mesh is a better option for reducing catches of undersize *Nephrops* in the Irish fishery. A substantial reductions of undersize whiting and haddock with marginal losses of marketable fish in the 65 mm square mesh cod suggests that larger square mesh cod-ends have major potential to improve the selectivity of these species in trawl fisheries.

#### Interactions with protected species – seals

Aside from discard reduction, the Fisheries Conservation team has also developed solutions to reduce the damage caused by seals to fish catches and the capture of seals in fishing nets. This work follows on from an extensive BIM study that documented, analysed and proposed candidate solutions to interactions between seals and Irish fisheries. In collaboration with Marine Renewable Energy Ireland in Cork, and the Sea Mammal Research Unit in Scotland, BIM tested a smart seal deterrent system specifically developed for aquaculture operations, which doesn't harm seals and doesn't affect cetaceans such as the harbour porpoise. BIM carried out the first ever fisheries trials of the system in summer 2015.

The device effectively eradicated damage to catches in a hook and line, inshore jigging fishery for top-quality, high-value pollack. Very promising results were also obtained in an offshore gillnet fishery for hake, and further testing and development are planned.

**45% reduction**  
by weight of nephrops less than 25 mm CL was achieved by increasing the size of the diamond mesh in the cod-end from 70 mm to 80 mm

## Lobster V-Notching

The Inshore Fisheries Conservation Scheme - V-Notching Support established under the Inshore Fisheries Development and Management Measure (EMFF Operational Programme 2014-2020) aims to build on the work carried out under the previous Lobster V-Notching



**“The enthusiasm demonstrated by industry in participating in previous schemes shows their commitment to ensuring the sustainability of the lobster stock**



Scheme under the NDP 2007-2013, NDP 2000-2006 and begun under the PESCA programme. The Lobster V-Notching, shellfish discard and live return reduction scheme under the NDP 2007-2013 was responsible for approximately 125,000 lobsters being v-notched and returned to the sea to breed, making a major contribution to the spawning potential of the Irish lobster stock. In 2016 over 40,000 lobsters were v-notched and returned to the sea.

The enthusiasm demonstrated by industry in participating in previous schemes shows their commitment to ensuring the sustainability of the lobster stock, a stock which remains the bedrock of the Irish inshore fishery. The scheme has also facilitated the collection of valuable data that contributes to the scientific assessment of the stock. The Inshore Fisheries Conservation Scheme - Lobster V-Notching Support is established under Union Priority 1, Sustainable Development of Fisheries, of the EMFF Operational Programme 2014-2020 and is co-funded through the European Maritime Fisheries Fund (EMFF) Council REGULATION (EU) No 508/2014.

The Scheme is introduced pursuant to Article 40 of the EMFF: The overall objectives of the V-Notching Support will be to:

1) Increase the reproductive potential of the Irish Lobster stock through the protection of mature female lobsters.

2) Collect data to inform stock assessments.

The V-notching programme includes grant aid to approved groups (and in exceptional cases, individuals) that want to implement local lobster V-notching programmes.

**“The barrel replacement scheme is an initiative to encourage mussel longline farmers to replace non-standard bright blue barrels with visually neutral grey barrels, intended to blend with the marine environment and reduce visual impact**





## Visual Impact

Visual impact is an environmental aspect particularly relevant to the aquaculture sector. As a comparatively new component of the seafood sector and carried out in nearshore environs, aquaculture operations have been the subject of much scrutiny. BIM has carried out various work with aquaculture operators, particularly through the CLAMS groups, to manage the visual impacts of their operations.

### Special Unified Marking Schemes (SUMS)

Primarily a safety scheme to aid navigation, this brings together adjacent aquaculture operators to establish the most efficient system for marking their sites. SUMS are group marking schemes for aquaculture sites that are used in bays or inshore areas where there is more than one aquaculture operation, i.e. the establishment of a SUM will only be considered where there are clusters of sites and where the SUM approach makes more navigational sense than having each site individually lit.

All SUMS must be planned and deployed with the full approval and prior knowledge of the Commissioner of Irish Lights and the Marine Survey Office.

As all aquaculture marine sites are required to have their sites marked, these schemes facilitate the producers in that a reduced number of markers are required per area, which in turn reduce the cost of maintenance. Fewer markers have a reduced visual impact, are less confusing to other marine users in the marked area, and assist with navigation.

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### Barrel replacement scheme

The barrel replacement scheme is an initiative to encourage mussel longline farmers to replace non-standard bright blue barrels with visually neutral grey barrels. The barrels are specifically developed for longline farming and are intended to blend with the marine environment and reduce visual impact. They are also easier to manoeuvre from a site management perspective.

The ergonomic floats are UV treated and weather resistant, and are made from high density polyethylene (HDPE), which is recyclable.

The lifespan of these floats is extendable through repair, which is not possible with the blue barrels. The initiative also promotes the removal and recycling of redundant barrels, thus further reducing environmental impact.

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# Improving Environmental Performance

A close-up photograph of a person's hands wearing blue nitrile gloves, holding a dark mussel shell. The background is a blurred beach scene with dark rocks, light-colored pebbles, and yellow seaweed.

“CLAMS is a longstanding nationwide initiative to manage the development of aquaculture in bays and inshore waters throughout Ireland at a local level



Improving environmental performance is an on-going objective for BIM across the seafood sector, and it uses a variety of tools to minimise environmental impact, achieve cost savings, improve reputation and stand out as a leader for environmental sustainability. Some seafood companies have shown a high level of dedication in this area and have made outstanding achievements. These are often the pioneers of the BIM initiatives and the subject of many of the case studies in this report.

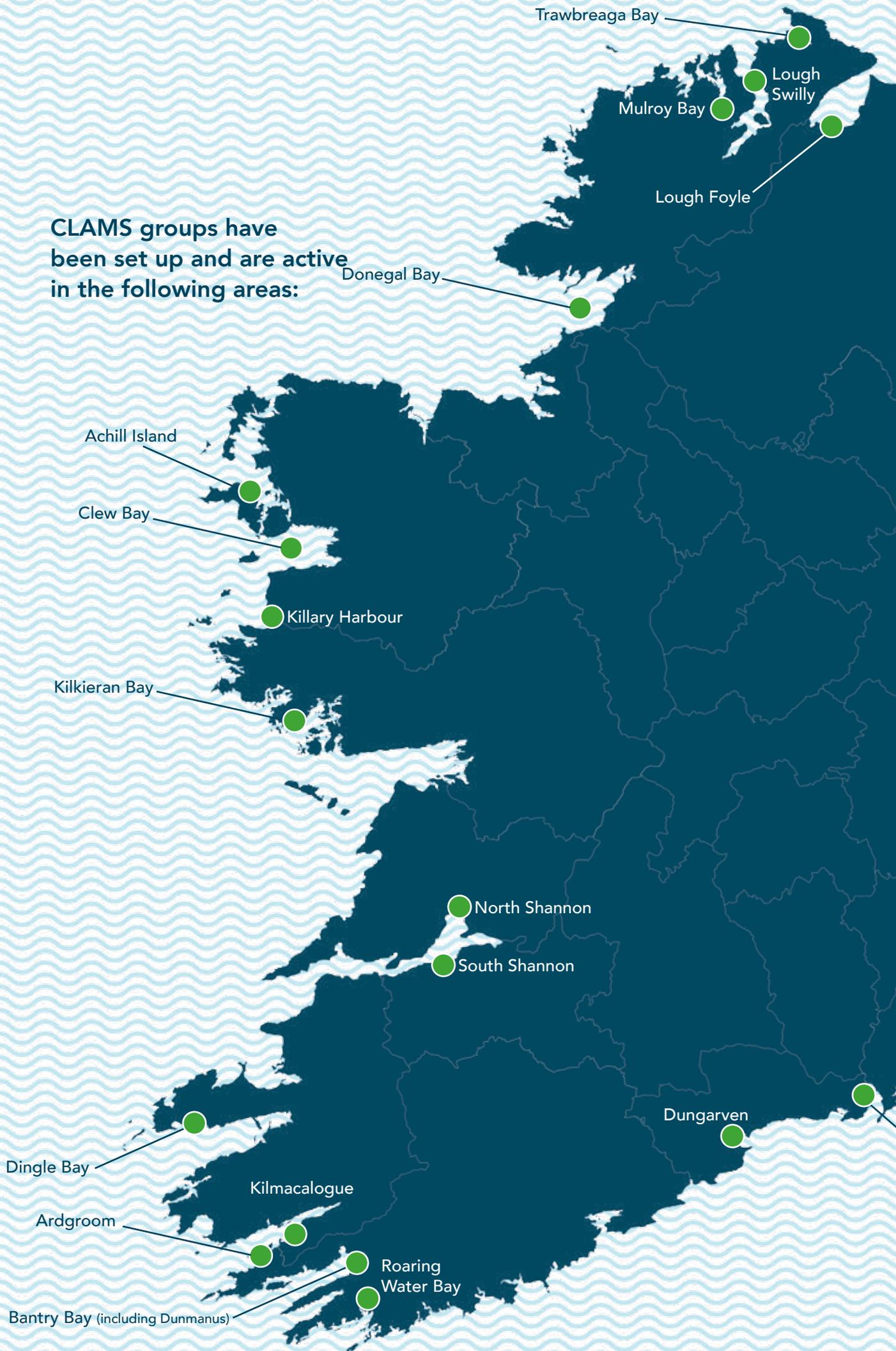
## **Co-ordinated Aquaculture Management System (CLAMS)**

The unique CLAMS process is a longstanding nationwide initiative to manage the development of aquaculture in bays and inshore waters throughout Ireland at a local level.

The process has been widely adopted by fish and shellfish farmers in Irish bays and inshore waters as a proactive step to encourage public consultation on their current operations and future plans. The logical management approach is a locally based and all-embracing system designed to maximise production and environmental management through the integration of production goals with minimal conflict with other resource users.

An individual management plan is drawn up for each area, which clearly lays out what fish and shellfish farmers are currently doing in the bay, how they operate and what their future plans are. There is also an in-depth consultation process with interested parties in the relevant area.

**CLAMS groups have been set up and are active in the following areas:**





## Fisheries Local Area Development Groups (FLAGs)

FLAGs are made up of public and private partners from defined geographical areas.

These include representatives from different sectors of the local economy / community that broadly reflect the socioeconomic composition of the area through a balanced representation of the main stakeholders, including private sector, public sector and civil society, and ensure a significant representation of the fisheries and aquaculture sectors.

The scheme provides support for community-led local development. A multi-stage process develops and implements local development strategies designed to create growth and jobs, in particular by adding value to fishery products and diversifying the local economy towards new economic activities.

Groups carry out a range of work, often with a focus on the environment. Many local projects were conducted as part of the first round of FLAGs from 2012 to 2015, with six FLAGs established to cover the entire coast. Overall, FLAG invested more than €900,000 in 186 projects.

Fisheries Local Action Groups and the implementation of Local Development Strategy are now in their second iteration under the Seafood OP 2014-2020.

**Within the CLAMS groups, BIM Regional Officers co-ordinate and manage projects, including:**

- Navigation plans;
- Deployment of navigation markers;
- Beach and pier clean-ups;
- Schools Projects;
- Re-alignment and rationalisation of mussel lines;
- Oyster trestle recycling;
- Improvement of mussel training areas.

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## CASE STUDY

Foyle Fishermen's Co-Op – working with Donegal County Council – aimed to improve the infrastructure and increase the multi-use value of Greencastle harbour. It did this by moving existing net and gear pens further over the harbour, and by handing back the existing site to the council to be used to improve the harbour facilities.

The project increased the multi-use facilities at Greencastle harbour and enabled the council to continue to provide a mixed-use facility for fishermen, pleasure craft users and the marine tourism sector, while improving the visual impact of the harbour. Another strand of the project

was a best practice guide developed by the council and Ancaire (the Donegal Small Islands Development Co-operative) to address concerns about the rising number of visitor to Donegal's islands. While it was noted that many visitors appreciated the unspoilt scenery, wildlife and solitude on offer, there were also concerns that not all visitors were fully respectful of the islands.

An increase in littering, damage to flora, and impact on fauna could affect the warm welcome afforded to visitors, impact on the SAC / SPA / NHA status of the islands, and act as a deterrent to other visitors. Through the FLAGs it was proposed to have the

ferry companies operating to and from the islands raise the visitors' code of practice with their passengers through advertising, posters and fliers.

The bi-lingual code included best practice advice, such as;

- Where possible, ask permission before crossing farmland.
- Take all litter home, even biodegradable items.
- Do not bring dogs onto lands off a lead.
- Avoid damage to fences, hedges and walls.
- Walk on the centre of paths and protect vegetation on the edges.
- Be certain any campfires and BBQs are put out.
- Observe wildlife from a distance. Respect their space.

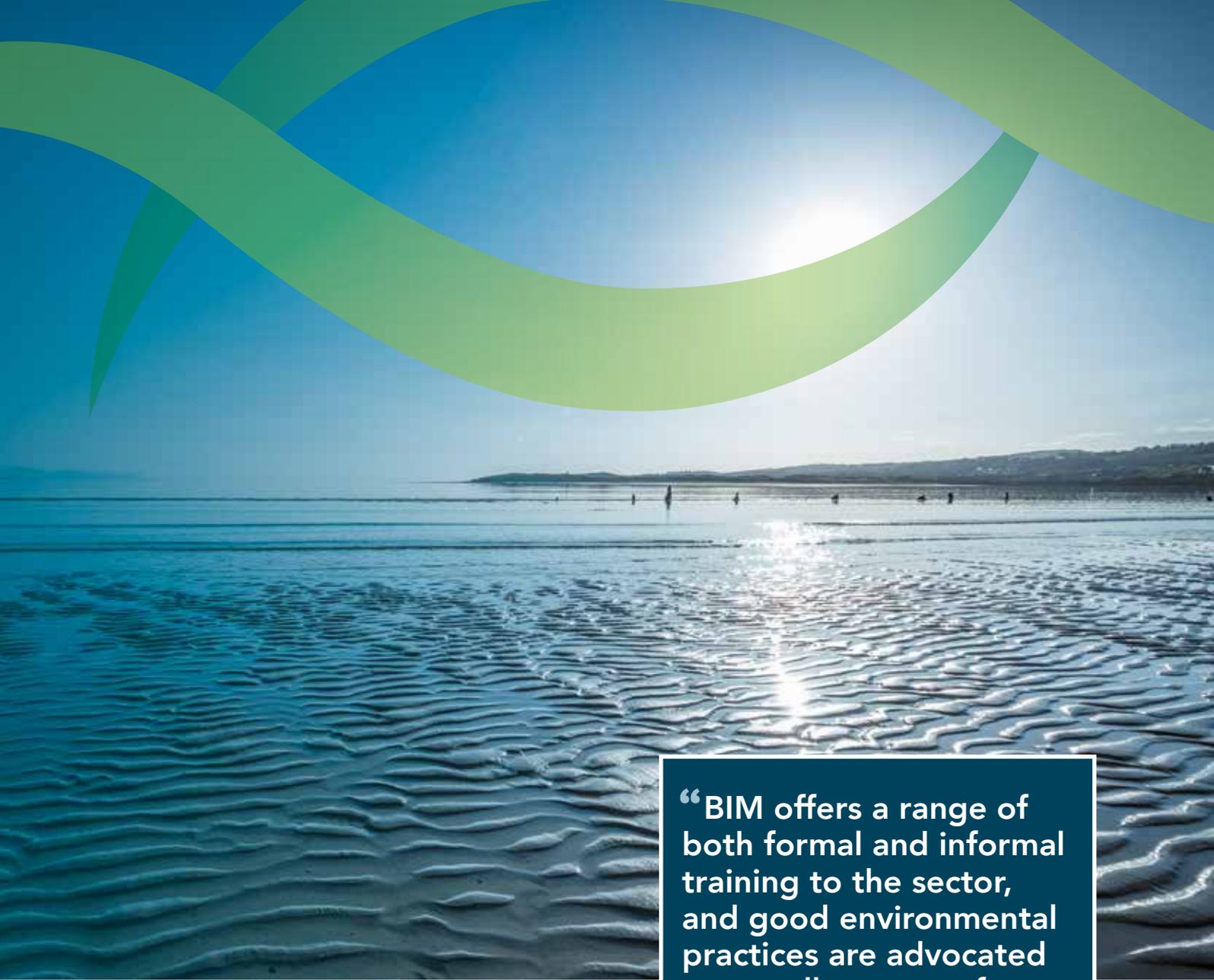
## Green Seafood Business Programme

The Green Seafood Business Programme launched in 2012 to assist Irish seafood processors to reduce their environmental impacts and to reduce their costs through improvements in water usage, energy consumption, transport costs and waste management.

The programme encourages the sector to become 'clean, green and sustainable' by delivering services and projects under five pillars: Resource Efficiency Assessment (REA), Origin Green support, innovation sustainability projects, measurements of environmental credentials, and technical development.

As part of the programme, a free and confidential REA service is offered to seafood processors:

- An on-site REA is carried out by the Green Programme team to identify target areas for improvement, concentrating on energy, transport, water and waste streams:
- A report is generated, which recommends resource efficiency improvements and identifies potential cost savings actions;
- The improvements identified can form the basis for completion of the company's Origin Green sustainability charter;
- Continued assistance to improve efficiencies with the implementation of low-cost and innovative technologies;
- On-site green awareness training for management and staff, delivered by the Green



**“BIM offers a range of both formal and informal training to the sector, and good environmental practices are advocated across all aspects of training”**

Programme team. A committed and informed workforce can be a key driver in achieving and sustaining a positive impact on the firm’s bottom-line and reducing its environmental footprint.

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## Training and awareness

BIM’s staff engagement with the seafood sector continually delivers the message that sound environmental practices are needed for a sustainable sector.

BIM offers a range of both formal and informal

training to the sector, and good environmental practices are advocated across all aspects of training.

For those companies who operate environmental management systems or who hold certification to an environmental standard, staff training is frequently facilitated and delivered by BIM.

Aquaculture companies and fishing vessels holding environmental accreditations typically have a small number of staff and in this instance targeted training tailored to the business’s individual environmental management system is delivered on site by BIM staff.

For larger companies and the processing sector, training is delivered in a more formalised manner, and BIM's Green Programme has developed a range of resource efficiency training material specifically tailored for the seafood sector.

BIM also hosts targeted conferences and training workshops to address key areas of need, such as invasive alien species and energy management.

### **Training and awareness for staff in seafood processing facilities**

As part of the technical development pillar of BIM's Green Programme, a green awareness training programme has been developed for seafood processors.

The programme aims to achieve energy, water and waste reduction through staff engagement. The key to the success of the green awareness training is to deliver the message in a engaging and interactive way, through information stands, presentations and other methods, such as an energy quiz.

### **Workshops and Conferences**

BIM hosts targeted workshops, training courses and conferences to inform the seafood sector about emerging topics and new challenges.



### **Resource Efficiency Handbook**

In February 2017, the 'Resource Efficiency Guide for Seafood Processors' was launched. This

guide aims to demonstrate how the seafood processing sector can achieve significant monetary savings by maximising the efficient and sustainable use of resources such as energy, water, waste and transport. Hard copies are available for all seafood processors or the guide can be downloaded from the BIM website.

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### **Ecodriving**

As part of a pilot transport project, BIM's Green Programme implemented an ecodriving aspect for a seafood company. Ecodriving is a style of driving that emphasises fuel efficiency. Training drivers in ecodriving can save approximately 8% in fuel consumption and demonstrate shorter delivery times.

The project highlighted that small and medium seafood businesses often have their own fleet of vans and their fuel use is often not monitored. After drivers were trained in ecodriving, and providing weekly drive feedback was maintained, fuel savings of approximately 5% were made. The programme plans to provide further driver training to the sector in 2017

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## CASE STUDY

# Invasive species training

In July 2016, 16 of Ireland's leading mussel dredger skippers and operators took part in a two-day course focusing on invasive alien species in Irish waters. The workshop was hosted by BIM, in association with GiMaRIS institution, the Netherlands' leading applied fisheries research organisation, which specialises in the biology of bivalve shellfish and related seafood products.

The aim of the course was to assist the industry to spot and accurately describe unusual species that they come across, in order to alert the experts in the Irish marine scientific institutions of the possible occurrence of the species in Irish waters.

# Demonstrating Environmental Performance



“Consumers are more environmentally aware than ever before, so it is important that the sector demonstrates its achievements in this area



The Irish seafood sector is involved in many initiatives that have brought environmental performance to a level over and above the baseline required by legislation. In today's competitive business environment, with consumers more environmentally aware than ever before, it is important that the sector demonstrates its achievements and builds a reputation, both nationally and internationally, for the good work it has carried out.

It is not enough to simply improve environmental performance—demonstrating and measuring progress and achievements is a priority for securing markets and managing reputation, while also assisting with licensing and compliance issues.

BIM assists seafood companies to set up the systems and meet the criteria required for certification, and also provides an on-going support role, e.g. annual audit preparation.

Depending on their customers, seafood companies are sometimes asked to obtain certification to a particular label or standard, e.g. Global Gap or BioSuisse, and in these cases BIM also offers assistance.

Until recently, the Irish seafood sector has been weak at measuring its other key environmental performance achievements, something that BIM is now working on in partnership with seafood companies through a number of projects, such as Life Cycle Analysis.

# Environmental Code of Practice for Irish Aquaculture Companies and Traders (ECOPACT)

ECOPACT was developed to help Irish fish farmers to set up and operate an environmental management system, a tailored approach suited to even the smallest primary aquaculture producer operations.

Supported by BIM, it is free to set up but contains all the elements of the internationally accredited ISO14001 standard, such as an environmental policy, involvement by top management and setting of targets to enable continual improvement.

The system is not only effective in improving environmental performance at farm level, but also provides a stepping stone to a higher level of independent certification. Since it was first developed in 2003, Ecopact has been adopted by more than 60 aquaculture businesses.

Many have gone on to obtain higher levels of independent certification such as ISO14001,

Organic Certification, one of BIM's independently accredited standards, or other seafood standards which are increasingly being demanded by retailers and consumers.

Today, it is used more as a tool to facilitate these higher levels of certification, rather than as a stand-alone management system.

Most recently, Ecopact was used as part of the preparation for Origin Green certification.

Ecopact's requirement for a baseline assessment of all environmental aspects affecting aquaculture businesses has been very effective in helping companies to focus on relevant measurable targets that underpin Origin Green Sustainability certification, and which make a difference to the environmental performance of their operations.

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## Seafood Environment Management System

Seafood Environment Management Systems (EMS) assist fishers to implement practices on board their vessel that help minimise the impact of fishing effort on the marine environment. BIM works primarily through collectives to assist the development of an EMS onboard individual vessels.

Responsible fishing practices include:

- Facilitating increased revenue through good fish handling and fuel efficiencies,
- Improving the safety of crew members,
- Contributing to the sustainability of the resource through improved discard reduction and fish selectivity, and
- Demonstrating good stewardship of the marine environment through responsible waste management practices, such as the disposal of old nets and fishing gear

The Fisheries Seafood EMS is a pre-requisite for any vessel applying for the BIM Responsibly Sourced standard, an internationally accredited product certification and labelling for wild capture fisheries that gives fishers greater access to domestic and export markets.

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## Certified quality Eco-Standard

BIM, together with a technical advisory committee and certification body (SAI Global), developed and supports the implementation of a range of standards accredited to EN45011/ISO65 for the aquaculture sector.

The BIM Eco-Standard exists as an annex to the



existing accredited quality standards and aims to assist members of Certified Quality Shellfish and Finfish schemes to demonstrate and prove their commitment to environmental sustainable development and conservation through independent audit.

Certification is awarded to aquaculture producers and processors achieving the highest levels of quality and environmental performance over and above what is required by legislation. The independent international accreditation is globally recognised.

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## Responsibly Sourced Seafood (RSS) standard

The BIM Responsibly Sourced Seafood (RSS) standard is a third-party accredited product certification system for first point of sale entities and small fish processors. It consists of a fishing vessel standard and an onshore handling and quality standard, and is one of several quality



assurance schemes that support the production of Irish farmed and wild-caught seafood under BIM's Quality Seafood Programme.

The RSS allows the fishing industry to document its performance, while also promoting responsible fishing practices and improved fish handling on board vessels. It has been successfully used as a stepping stone to achieving MSC accrediting for several Irish pelagic fisheries.

Participation peaked in 2014, when around 100 vessels and 10 onshore entities were certified under the scheme. The objective is for all Irish wild seafood products marketed under Origin Green to be sourced from vessels or onshore entities certified under the RSS.

Ensuring that fish stocks are fished sustainably has received much attention in recent years, particularly since the introduction of the new Common Fisheries Policy in 2014. This contains a legal commitment (Article 2 paragraph 2) to fishing all stocks at maximum sustainable yield (MSY) by 2015 where possible and 2020 at the latest.

The European Commission's Scientific, Technical and Economic Committee for Fisheries (STECF) has reported progress in the area of sustainability, with the rate of fishing above MSY decreasing considerably in the North-east Atlantic, where most Irish fishing activity takes place. There has been a gradual decline in the number of overfished stocks in these waters, with an increase in the number of stocks now fished at MSY – six stocks in 2007 compared to 16 in 2014, out of 27 stocks for which MSY estimates are available.

Several stocks – including cod, whiting and sole in the West of Scotland and Irish Sea – are still being fished at a rate above MSY, but these are caught by Irish fishermen at very low levels. The most important demersal stock for Irish fishermen – neophrops – and most of the pelagic stocks – herring, mackerel, horse mackerel and blue whiting – are being fished at MSY.

Of course, ensuring stocks are fished sustainably at MSY is not only down to Irish fishing vessels, with the same stocks being exploited by the vessels of many other EU states, as well as Norwegian, Icelandic and Faroese vessels. However,



**“ The objective is for all Irish wild seafood products marketed under Origin Green to be sourced from vessels or onshore entities certified under the RSS**

recognising improvements in stock sustainability and improved management, Irish vessels certified under RSS have committed to responsible fishing practices, along with high standards of fish quality and traceability. Vessels in the demersal, pelagic and shellfish fisheries have been certified under this scheme.

In addition, Irish vessels operating in the pelagic fisheries – Celtic Sea herring, North-east mackerel, Atlanto-scandian herring and North-east blue whiting – have been certified as sustainable under the Marine Stewardship Council (MSC). In all cases, these vessels are certified under RSS and have used BIM’s seafood environmental management system to document that their activities are legal, environmentally responsible. The SEMS also allows vessels consider and define their own on-board procedures for minimizing environmental impact, including additional reporting requirements of events

such as slippage, endangered, threatened and protected (ETP) species capture, seabed contact or lost nets. Although these obligations are non-statutory, they are a compulsory requirement for MSC assessment. Compliance with the RSS is independently audited on an annual basis.

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## Organic Aquaculture

The expansion of organic farming has been a positive development for the sector, focusing on production of a high quality, environmentally sustainable product that fosters a respect for nature. Organic certification is carried out in accordance to strict standards, e.g. BIM’s Certified Quality Organic, Naturland, Organic Trust or IOFGA, which all must meet the requirements of the EU organic regulations. Organic aquaculture in Ireland began with the certification of a salmon farm off Clare Island more than 25 years ago.

Since then, organic aquaculture has developed to be the mainstay of the Irish salmon sector and Ireland has become a global leader in organic salmon production. BIM offers support to aquaculture companies to achieve organic certification. In 2014, over 90% of Irish farmed salmon was produced in accordance with organic standards. In the past few years the market for organic shellfish has developed, and there are now a number of rope- and bottom-grown mussel farms producing organically.

In 2015, 61% of rope-grown and 6% of seabed-grown mussels were certified organic. Most recently, a number of oyster farms have begun the process of organic conversion with the aim of obtaining certification by the end of 2016.

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## Marine Stewardship Council (MSC)

The MSC is an international non-profit organisation set up to help transform the seafood market to a sustainable basis. The MSC runs the only certification and ecolabelling programme for wild-capture fisheries consistent with the ISEAL code of good practice for setting social and environmental standards and the United Nations Food and Agricultural Organisation guidelines for the eco-labelling of fish and fishery products from marine capture fisheries.

The MSC standard has three overarching principles that every certified fishery must prove that it meets: sustainable fish stocks; minimising environmental impact; and effective management.

In July 2013, BIM supported the Irish bottom-grown mussel sector to obtain, and since then retain, MSC certification. The certification covers all sections of the culture activity, including seed fishing and on-growing at licensed aquaculture sites.

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## Aquaculture Stewardship Council

The Aquaculture Stewardship Council (ASC) is an independent not for profit organisation with global influence that was founded in 2010 by the World Wide Fund for Nature (WWF) and the Sustainable Trade Initiative (IDH Netherlands). The ASC seeks to be a globally recognised, market-oriented programme that promotes meaningful improvements in aquaculture production in a credible and cost-efficient way, adding real value to producers and buyers of certified products.

BIM played an important role in the development



of ASC standards for salmon, bivalves and abalone through participation in the aquaculture dialogues meetings alongside aquaculture producers, seafood processors, retail and foodservice companies, scientists, conservation groups and consumers.

In spring 2015, the first salmon farm at Deenish Island in Ballinskelligs Bay, Co. Kerry, was awarded ASC certification – other salmon farms are currently working towards certification.

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## BIM support for Origin Green

Origin Green is a Bord Bia (the Irish Food Board) programme designed to market Ireland internationally as a sustainable source of food and drink products. It is the only sustainability programme in the world that operates on a national scale, uniting government, the private sector and food producers.

Independently verified, it enables Ireland's farmers and producers to set and achieve measurable sustainability targets – reducing environmental impact, serving local communities

more effectively, and protecting our country's rich natural resources.

At the heart of the programme is the Origin Green charter, a guideline document to the workings of the programme. Once a business has signed up to this charter, clear objectives are agreed across three key areas: raw material sourcing, manufacturing processes, and social sustainability.

A comprehensive and challenging five-year plan is agreed, committing to sustainability improvements relevant to the individual business. These plans are independently verified by a third party agency and monitored on an annual basis.

The Irish seafood sector has embraced the Origin Green sustainability initiative, with the first processing company verified in December 2012. In 2015, the first primary aquaculture producers became verified, with interest and involvement gaining momentum across the entire sector. As of February 2017, a total of 51 seafood companies have become verified within the Origin Green programme. Of these, BIM has directly assisted 8 seafood companies to become verified members of Origin Green and is working with an additional 22 companies to prepare for membership.

BIM has increased direct engagement with and support offered to seafood companies developing sustainability plans in order to achieve the target FoodWise 2025 verified members target. In the area of primary production, which typically comprises businesses with a small number of employees, BIM's Aquaculture section has been working with their client companies on a one-to-one basis to develop their Origin Green sustainability charters alongside other management systems

BIM's Green Programme offers assistance to guide seafood processors through the Origin Green sustainability plan template, visiting the site and giving practical advice on how to finalise a company's sustainability plan for submission to Bord Bia. This engagement has leveraged Origin Green to drive concrete improvements in relation to energy usage, waste water, and waste, ultimately improving the environmental performance of the seafood processing sector. To date, the Green Programme has directly assisted 17 seafood companies become fully verified by the Origin Green programme.

In 2016, BIM's Green Programme delivered a series of Origin Green workshops, in collaboration with Bord Bia and specifically tailored for seafood processors.

The workshops were held in Sligo, Dublin and Cork from March – May, acting as an important first step in the development of the Origin Green sustainability plan for seafood processors and setting many companies on the path to full membership of the programme.



BIM Fisheries Development Division is working with their clients on all aspects of raw material supply including raw material mapping, certification (linked to RSS) and a variety of sustainability initiatives including Fisheries Improvement Programmes (FIPs).

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## Awards for Environmental Performance

BIM has sponsored awards to recognise and acknowledge the environmental performance achievements of the seafood sector. These include the Green Awards, the Maritime Industry Awards and launched in November 2016, the inaugural BIM Awards – Celebrating the Best in the Irish Seafood Sector.

The aim of the BIM Awards is to create an awareness of the excellent work that goes on behind the scenes in the seafood industry.

Sustainability is a key theme, with environmental performance being recognised across the three main sections of the sector – fishing, aquaculture and seafood.

Of the 12 awards, three are dedicated to sustainability: responsible fisherman of the year; aquaculture environmental and social responsibility award; and green processor of the year.

The annual Green Awards are a prestigious national awards ceremony that celebrate excellence in sustainability and environmental awareness across all sectors in Ireland. BIM's Green Programme sponsored the 'Green Seafood Business Award' at the annual Green Awards since 2015.

In developing and sponsoring environmental sustainability awards, BIM hopes to reward the seafood companies which have excelled in this area and give recognition for the environmental initiatives they have undertaken

## Life cycle analysis

BIM's Green Programme conducted a carbon-footprint-following life cycle analysis (LCA) methodology in order to better understand the methods, applications, and business value of data-driven sustainability assessments of Irish seafood companies.

LCA is a cradle-to-gate approach for assessing the environmental impacts of a product's life

cycle, from raw material sourcing through production, use, end-of-life treatment, recycling, and final disposal.

By including the impacts throughout the entire life cycle, LCA provides a comprehensive view of the environmental aspects of a product or service, and a more accurate picture of the environmental trade-offs in product and service selection.

The study carried out a cradle-to-gate carbon footprint assessment of a mussel producer including all stages – from mussel growing, through transportation, cooking, freezing, further processing, packaging, storage, and distribution. The results revealed a number of opportunities for carbon impact reduction. This study also served as a first step for the Irish seafood sector in holistically analysing seafood production and processing with data-driven life-cycle assessments, which provides an effective baseline for more detailed analyses.

The study was undertaken to support strategic decision-making to better understand and ultimately reduce the environmental impacts of a seafood processor. It adhered to the assessment of the life cycle greenhouse gas emissions of goods and services standard (PAS2050:2011). The information generated from the study will be used to support internal business decision-making, provide a basis for business communication to relevant stakeholders who request information on seafood products, and provide insights for BIM on the value of life-cycle thinking and assessment for the Irish seafood sector.

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## CASE STUDY

# Green Awards

Island Seafoods is one of a number of companies that has worked closely with BIM's Green Seafood Business Programme over the years. Named 'Green Seafood Business' at the 2015 Green Awards, Island Seafoods went on to beat intense competition from multinationals and high tech companies to win the overall Green Business of the Year award.

Castletownbere Fisherman's Co-operative Society won the top accolade 'Green Business of the Year' at the 2017 Green Awards. Castletownbere Fishermen's Co-operative is at the forefront of developing measures to improve environmental performance. During the first quarter of 2016, the co-op who have a successful contract with Spanish retailer Mercadona, ran a pilot project to reduce product packaging. This project which essentially reduced the use of plastic lids on polystyrene boxes saved the company direct packing costs, transport costs and space on trucks to mainland Europe. This storage method has now been rolled out across product exports to the value of 10 million euro during 2016.

Considering this is the second time in only three years, an Irish Seafood company has won the overall Green Award; there is no disputing the Irish Seafood Sector's achievements and leadership in this field.

Along with Castletownbere Co-op, the following seafood companies were nominated for 'Green Seafood Business of the Year' sponsored by BIM; Burren Smokehouse, Woodstown Bay Shellfish and Irish Fish Cannery.

## Looking to the Future



“ BIM staff are continually horizon scanning to identify areas where future work may be required



This report highlights the achievements of the seafood sector, as supported by BIM. A large body of work has identified the Irish seafood sector as a serious player in the field of environmental sustainability, with innovative ideas being produced in response to newly emerging challenges. These can be turned into action through research and collaboration directly with seafood sector clients, and also by taking inspiration from what is being done further afield.

A number of initiatives are in the research and planning phase to assess their potential to deliver further improvements in the sector's environmental performance. BIM staff are continually horizon scanning to identify areas where future work may be required. Actions taken are guided by major global policy such as the UN Sustainable Development Goals and the Global Climate Change agreement.

## **BIM-Teagasc Initiative - Maximise value of seafood products and by-products**

As part of Food Wise 2025, BIM will develop a virtual centre of excellence, in collaboration with Teagasc and relevant third level institutes. This longer term strategy will also deliver on a related Food Wise 2025 action: 'Give renewed priority to research and development into seafood-based new product development, food ingredients and functional foods. This research should also include both harvested wild and farmed seaweeds and their by-products. This initiative will increase the potential to maximise the value of both seafood products and by-products through enhanced knowledge transfer and technical innovations.

In November 2015 a terms of reference was agreed

between BIM and Teagasc, and four meetings have taken place to date. A working group has been set up to define and facilitate the progression of high-potential, sector-focused projects (e.g. crab chitin / chitosan, whitefish by-products, betaine / glycine) through tailored funding and appropriate research and development technical support. This approach should yield a pipeline of projects that will maximise value and research and development innovation for the sector.

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## Sustainability reporting

The Global Reporting Initiative (GRI) provides internationally recognised guidelines for sustainability reporting that have been adopted by major corporations and government agencies / sectoral representative bodies the world over. GRI sustainability reporting standards are used by more than 5,000 organisations across 90 countries.

The newest revision of the standards was launched in October 2016. The guidelines provide a focus, ensuring that all aspects of sustainability are adequately addressed and that all relevant personnel are engaged to help deliver and present the sector's performance in the wider context of sustainability. They also provide a benchmark for comparison and monitoring progress.

Sustainability reporting could provide a useful tool to BIM, not only to report but also to analyse how we currently and will contribute to the improvement or deterioration of economic, environmental and social conditions, developments, and trends at the local, regional or global level. Taken a step further, it could be applied to the Irish seafood sector as a whole. The environmental sustainability report presented can be viewed as a first step in this process, as it

identifies a range of environmental aspects upon which we can start to measure performance. This measurement is not just against ourselves or within the seafood sector, but also in the context of the limits and demands placed on environmental resources at local, regional and global scale. This could be further expanded to include social and economic resources.

## Fishery Improvement Projects

Fishery Improvement Projects (FIP) provide a platform for fishermen, seafood buyers and suppliers to develop a strategy to improve a specific fishery by considering better policies and management over a given time period. Engagement in a FIP allows producers and processors access markets which demand sustainability and environmental credentials. The aim of a FIP is to improve sustainability within a fishery and progress to certification under the Marine Stewardship Council (MSC).

BIM have linked the participation of registered FIPs to BIM's RSS standard (Responsibly Sourced Seafood), under its 1st pillar: Responsible Fishing Practices. This link provides the opportunity for actions and participation in a FIP to be independently third party verified and certified.

Fisheries need a high level of organisation and funding to meet the rigor of international fishery sustainability standards. A FIP provides a starting point to organise participants in a fishery to ultimately achieve certification to international fishery based sustainability standards. Working with industry and Bord Bia (The Irish Food Board), BIM have identified 4 pilot FIPs.

These are:

- Brown Crab
- Whitefish (Hake, Monkfish and Megrim)
- *Nephrops*
- Albacore Tuna

A close-up photograph of a person's hands holding several fresh oysters. The person is wearing a bright red life vest over a dark, textured sweater. The background is slightly blurred, showing what appears to be a body of water. The oysters are dark and glistening, with some showing their white interiors. The text is overlaid on the right side of the image.

BIM and industry are working closely with Sustainable Fisheries Partnership (SFP) one of the recognised NGOs that operate globally in the FIP arena. The organisation engages fishery stakeholders and seafood businesses throughout the supply chain to promote the sustainable production of seafood. SFP, sits on the advisory committee of [www.FisheryProgress.org](http://www.FisheryProgress.org), with other conservation and business representatives with expertise in developing and evaluating fishery improvement projects. While [FisheryProgress.org](http://FisheryProgress.org) is overseen by the advisory committee it's managed day to day by FishChoice. [FisheryProgress.org](http://FisheryProgress.org), in conjunction with global FIP

experts, has created a collection of publically available resources to track progress, maintain a global database on FIPs and provide tools to the FIP stakeholders to help them on their journey. These resources help collate and communicate information and improvement.

Science is at the core of all FIPs at [FisheryProgress.org](http://FisheryProgress.org). The science programme is based on an MSC pre-assessment. The pre assessment identifies the gaps that need to be addressed and informs the third party reviewed plan to improve the fishery. Basic FIP objectives address a specific

set of the environmental challenges identified in the needs assessment to improve the fishery's performance against the MSC standard. Comprehensive FIP objectives address all of the fishery's environmental challenges necessary to achieve a level of sustainability consistent with an unconditional pass of the MSC standard.

FIPs encourage and expect stakeholders to use objective scientific information identified in the pre assessment, convene pre-competitive supply chain roundtables, identify practical action and set realistic timeframes to achieve improvements. The Conservation Alliance's updated guidelines for fishery improvement projects, including the criteria for basic and comprehensive FIPs, serve as the foundation for FisheryProgress.org FIP progress is tracked throughout the period of the plan and improvement information is publically available at fisheryprogress.org.

Other topics BIM is focusing on for the future include: life cycle analysis for all components of the seafood sector; natural capital accounting to optimise use of natural resources and assist with attracting new investment to the sector; and development of a circular seafood economy, ensuring that all components of the sector are linked in a way the minimises resource use and maximises environment performance.

To do this, BIM staff will monitor developments in these and other emerging areas, and become involved in or develop projects and key relationships to explore their applications to the seafood sector.

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## CASE STUDY

# The Brown Crab Fishery Improvement Project

The Brown Crab Fishery Improvement Project brings together government, industry and NGOs to address common challenges in securing a sustainable future for our crab fishery in a pre-competitive partnership. There is now a coordinated industry group that will drive sustainability ensure our fishermen and processors will be rewarded for responding to market demands. This is an exciting development and is the first of four FIPs that BIM are supporting this in 2017. The Brown Crab FIP is aligned to BIM's Responsibly Sourced Standard, a key driver of seafood sustainability objectives outlined in the Government's Food Wise 2025 report.

The Brown Crab FIP has been independently accepted by the NGO Fishery Progress. Three more FIPs are scheduled for support by BIM in 2017 covering the Nephrops, whitefish and albacore tuna sectors. BIM have linked the participation in registered FIPs to BIM's Responsibly Sourced Seafood Scheme, the agency's accreditation standard for the sector.

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Nephrops  
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Albacore Tuna  
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This link provides the opportunity for actions and participation in a FIP to be independently third party verified and certified.

The FIP will focus on key areas of sustainable sourcing – healthy fish stocks, effective fisheries management, improved quality and market performance. The activities of the FIP will be regularly tracked by Fishery Progress and

performance measured against the activities and outcomes identified in the agreed work plan. Participation in the FIP is voluntary and open to any fisherman or processor, once they agree to implement the rules jointly set out by the FIP stakeholders.

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## Improved Utilisation of Whitefish and its by-products

The Food Heroes Project , funded through the Interreg North West Europe Programme, aims to reduce food waste throughout the food chain and create value from waste by the development of innovative products, services and processes.

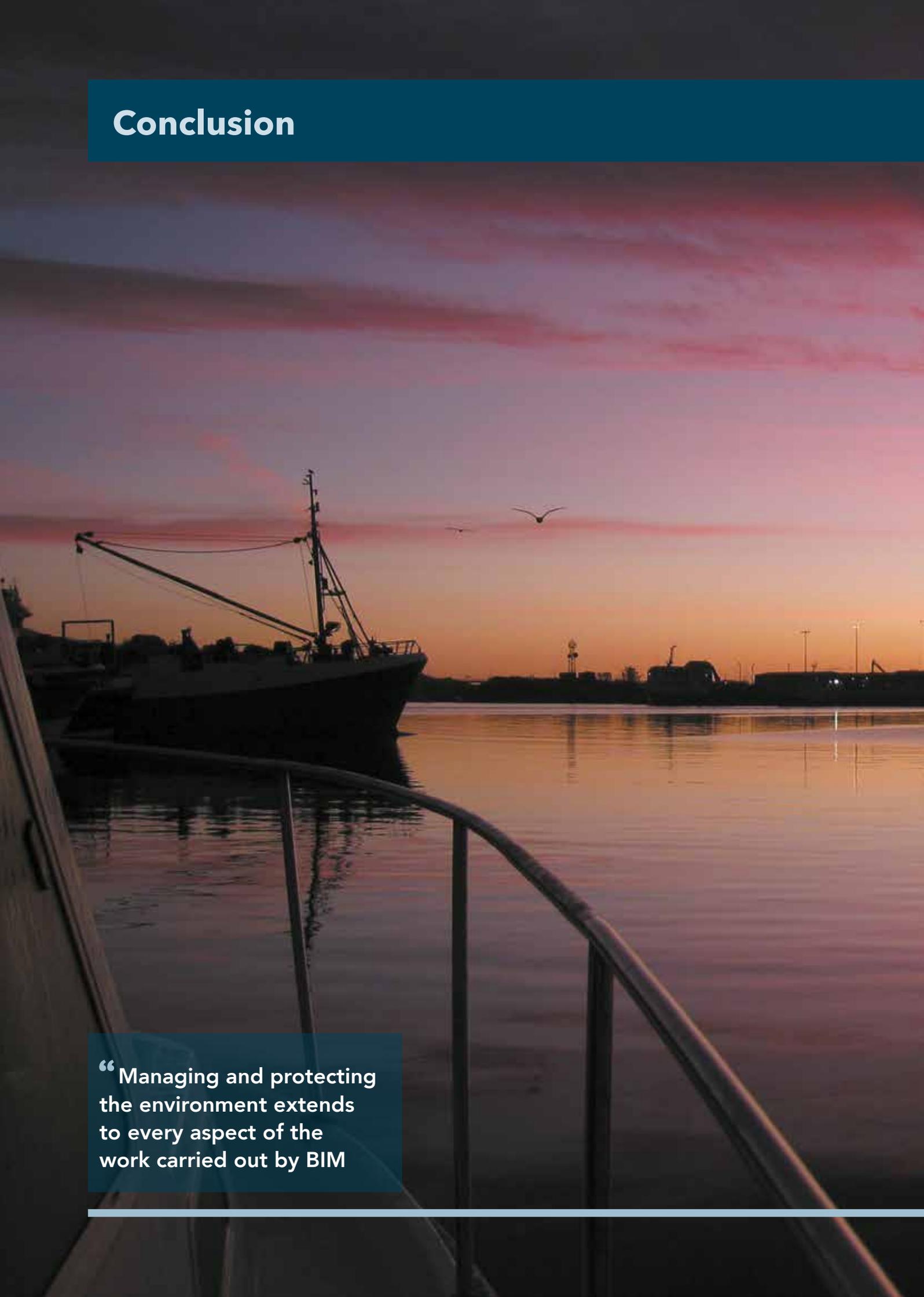
As a partner in this project, BIM will be focusing on the whitefish sector with an emphasis on recovery of whitefish meat from carcasses post filleting

and identifying uses for other less used parts of the fish in order to maximize the raw material and minimize waste. BIM has begun work on this project in 2017 and it will run until 2020.

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# Conclusion



“Managing and protecting the environment extends to every aspect of the work carried out by BIM



This report has provided a brief synopsis of the vast and varied work that BIM is engaged in within the context of Environmental Sustainability.

Managing and protecting the environment extends to every aspect of the work carried out and will continue to be a prominent feature of work programmes into the future helping to ensure a sustainable future for the country's fisheries, aquaculture and processing businesses.

As it evolves this Sustainability Atlas will continue to provide a comprehensive overview of our work in this area and help to identify and steer future initiatives.

# Annex



“Environmental regulation in Ireland is strong and the application of European legislation frequently uses a precautionary approach



## Policy context

This report deliberately excludes environmental initiatives required by law and which therefore exist as a minimum level of performance. It should be acknowledged, however, that environmental regulation in Ireland is strong and the application of European legislation frequently uses a precautionary approach, e.g. the screening of every single aquaculture licence application in Ireland for EIA, while the European EIA directive requires mandatory screening only for finfish culture.

This is in part related to the large number of environmental infraction proceedings taken against Ireland. The outcome of this is a very environmentally aware seafood sector, which can only be viewed as positive in the long term.

While omitting detailed legislative requirements, it is important to consider the environmental policy context at international, European and national level. This plays an important role in guiding the environmental improvement initiatives taken by the Irish seafood sector, and supported by BIM, especially in the context of looking to the future.

### **Global**

At the pinnacle of sustainability objectives are the United Nations Sustainable Development goals. The 2030 global sustainable development agenda with the taglines of 'Transforming our world' and 'Time for global action for people and planet' contains 17 goals, accompanied by 169 targets. While Goal 14, 'Life below water', has direct relevance to the seafood sector in its aim to 'Conserve and sustainably use the oceans, seas and



marine resources for sustainable development', a number of the other goals are also relevant.

- Goal 2: Zero hunger
- Goal 8: Decent work and economic growth
- Goal 9: Industry innovation and infrastructure
- Goal 15: Life on land
- Goal 17: Partnerships for the goals

Indeed, each one of the 17 goals can probably be linked to the Irish seafood sector in some way or other.

#### Climate change: COP 21

In December 2015, the Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Paris Agreement, a new internationally coordinated effort to tackle climate change. This is the first global legally binding climate agreement and is one which will challenge many current practices and operational norms across a range of sectors. The overarching goal is to limit global warming to less than 2 degrees Celsius, with concerted efforts to limit temperature increase to 1.5 degrees Celsius. Limits to greenhouse gas emissions will be necessary to achieve this.

Secondly, the agreement seeks to enhance adaptive capacity in order to become more resilient to climate change. Finally, it seeks to enable transition through a requirement to support policies and investments that support low emissions activities and technologies. The agreement is about to enter its implementation phase involving practical solutions, concrete policies, investments and partnerships.

In October 2016, the European Commission ratified the agreement, pushing the treaty past the tipping point required for it to become legally binding (i.e. 55 countries accounting for at least 55% of all GHG emissions). Ireland has yet to complete its domestic ratification process, but

the Irish seafood sector, in reducing emissions and improving efficiency, is already playing a role in working towards achieving the targets.

#### Circular economy

In December 2015, the Commission adopted an ambitious circular economy package to stimulate Europe's transition towards a circular economy. In order to ensure sustainable growth for the EU, we must use our resources in a more efficient, sustainable way.

The circular economy offers an opportunity to reinvent our economy, making it more sustainable and competitive. This will bring benefits for European businesses, industries and citizens to make Europe cleaner and more competitive by cutting resource use, reducing waste and increasing recycling. This transition to a more circular economy will have a huge impact on the Irish seafood sector, in particular in addressing the areas of production processes, waste management, and plastics and food waste.

#### European

##### Vision of the 7th European Environment Action Programme

'In 2050, we live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low carbon growth has long been decoupled from resource use, setting the pace for a global safe and sustainable society.'

#### Common Fisheries Policy

The Common Fisheries Policy (CFP) aims to ensure that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens. Its goal is to foster a dynamic fishing industry



and ensure a fair standard of living for fishing communities. It provides rules for managing fishing fleets and conserving fish stocks.

### Maritime Spatial Planning

Maritime Spatial Planning (MSP) is about planning when and where human activities take place at sea, to ensure these are as efficient and sustainable as possible. Maritime spatial planning involves stakeholders in a transparent way in the planning of maritime activities. The MSP directive 2014/89/EU establishes a framework which seeks to implement MSP in order to improve environmental protection while enhancing investment, improving co-operation and reducing conflict.

### Marine Strategy Framework Directive

While MSP covers all aspects of the marine, the Marine Strategy Framework Directive (MSFD) has a sole environmental focus aiming to more effectively protect the marine environment across Europe. It aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. It is the first EU legislative instrument related to the protection of marine biodiversity, as it contains the explicit regulatory objective that 'Biodiversity is maintained by 2020', as the cornerstone for achieving GES.

### EU Biodiversity Strategy

The EU Biodiversity Strategy aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity.

### National

#### Foodwise 2025

Food Wise 2025, sets out a cohesive, strategic plan for the development of the Irish agri-

food sector over the next decade. The long-term vision as set out in the report is of 'Local roots, global reach' based on the continued development of the sector where efficient and environmentally-friendly production delivers sustainable export growth on global markets. It includes a number of growth projections supported by recommendations to achieve sustainable growth.

The Food Wise implementation plan includes a number of sustainability actions in response to the environmental analysis. The seafood sector environmental initiatives described in this report are firmly rooted in these sustainability actions, giving policy support to their continued implementation.

### Harnessing our ocean wealth

The integrated marine plan for Ireland is an initiative of an inter-departmental marine co-ordination group established due to the fact that marine responsibilities are spread across a number of departments. The plan sets out a pathway for developing the blue economy, recognising that the marine environment is a valuable national asset. It includes the government's vision, high-level goals, and key 'enabling' actions to put in place the appropriate policy, governance and business climate to enable our marine potential to be realised.

### Seafood Operational Programme

The Operational Programme (OP) supported by the European Maritime and Fisheries Fund (EMFF) in Ireland aims at achieving key national development priorities along with the EU's 'Europe 2020' objectives. The OP supports the general reform of the EU's Common Fisheries Policy (CFP) and the development of its Integrated Maritime Policy (IMP) in Ireland. The Seafood operational programme is organised around a number of priorities.



### National Strategic Plan for Sustainable Aquaculture Development

This national plan is intended to inform investment priorities for aquaculture under the European Maritime and Fisheries Fund (EMFF), although the scope, in reality, is broader. The plan contains 24 actions across five policy areas: aiming for growth; knowledge innovation and technology; ensuring sustainability; co-ordinated spatial planning; and aquaculture licensing.

### National Climate Change Mitigation and Adaptation Frameworks

Climate change mitigation and adaptation are being addressed through parallel national framework plans which include inputs from all sectors. The extent of the climate change challenge to reduce greenhouse gas emissions, in line with our EU and international commitments, is well understood by government, as reflected in the National Policy Position on Climate Action and Low Carbon Development, published in April 2014, and in the Climate Action and Low Carbon Development Act 2015, as well as the recently appointed minister for this area. The National Policy Position provides a high-level policy direction for the adoption and implementation by government of plans to enable the State to move to a low carbon economy by 2050.

### National energy targets

EU countries have agreed on a 2030 framework for climate and energy, including EU-wide targets and policy objectives for the period between 2020 and 2030. These targets aim to help the EU achieve a more competitive, secure and sustainable energy system and to meet its long-term 2050 greenhouse gas reductions target. Ireland has set a national target to reduce energy demand by 20% through energy efficiency measures and a binding EU target for renewable energy use is also established.

Through successive action plans, Ireland has

maintained its commitment to a 20% energy savings target in 2020 and to achieving a 33% reduction in public sector energy use. These remain the central pillars of our national energy efficiency policy. BIM will continue to encourage and support through research and financial assistance the adoption of renewable energy technology across the entire seafood sector, and to work with seafood companies to reduce their overall energy consumption in order to meet these targets.

### New National Planning Framework

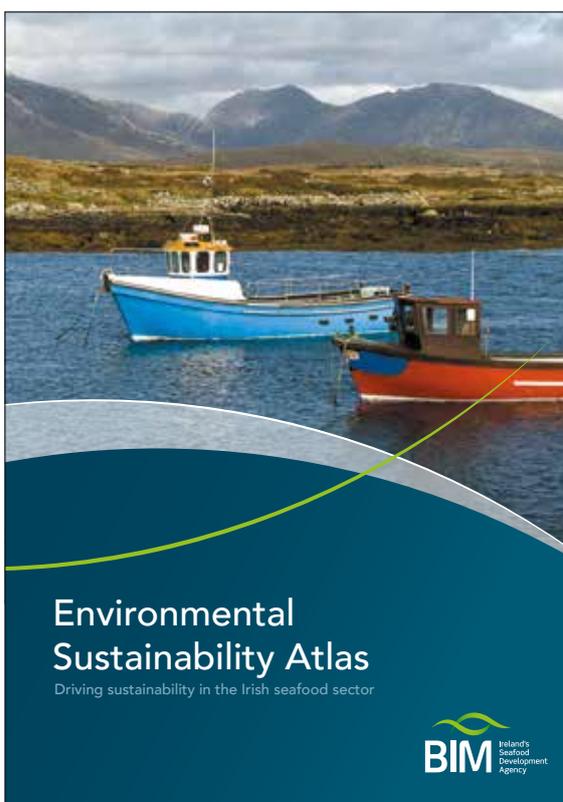
The above synopsis shows how environmental policy supports sustainability initiatives across all environmental aspects relevant to the seafood sector in Ireland.





# Environmental Sustainability Atlas

Driving sustainability in the Irish seafood sector



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