

Dans le cadre des projets



EPURVAL 2



# Open Water IMTA The experience from Scotland

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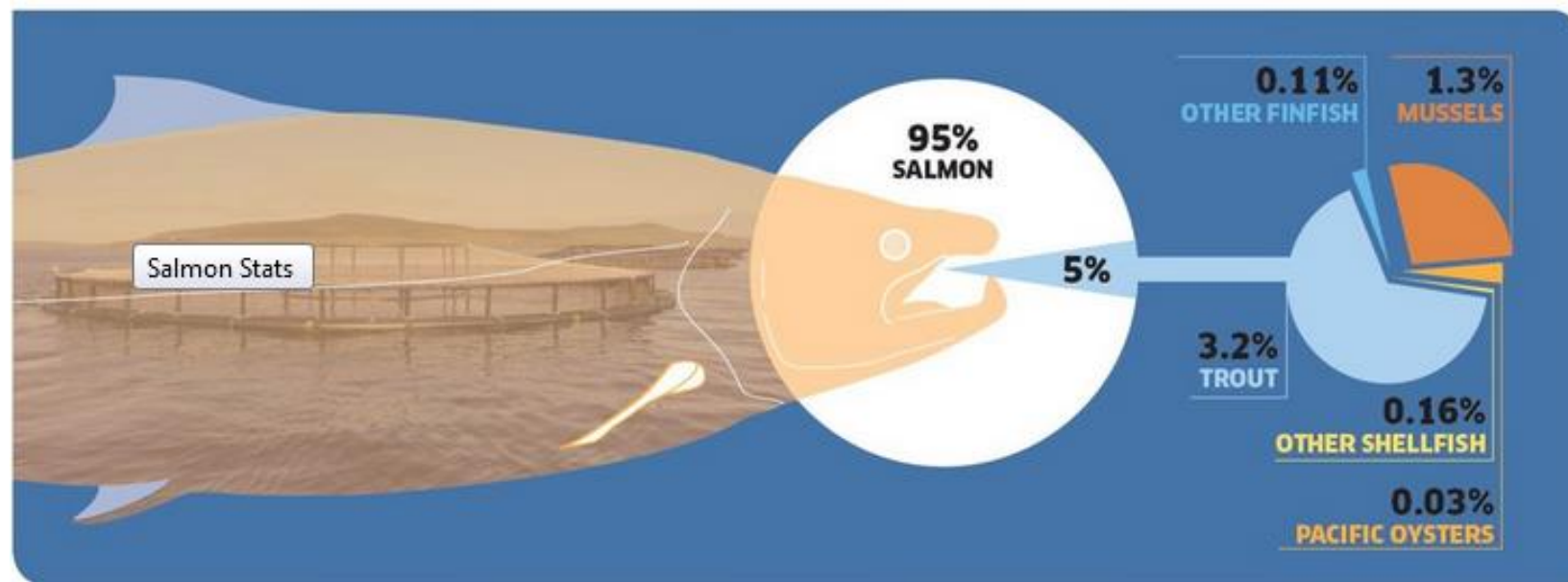


- **Scottish Aquaculture**
- **IMTA development**
- **Legislation and frameworks**
- **Experiences from the IDREEM project**
- **Constraints and future development**



# Scottish Aquaculture – a brief summary

- A Major industry contributing towards the Scottish economy
- Total turnover of the sector is 179,000 tonnes, worth around £797 million at farm gate prices (2016)
- Of this, farmed Atlantic salmon accounts for £765 million, with export sales equating to £600 million





# Scottish Aquaculture, A brief summary

- Scottish Aquaculture faces a positive future, with sales buoyant and support from the Scottish Government in its development
- However, sectors of the industry, in particular the salmon producers, face several issues
- These include
  - a shortage of new sites for development
  - sea lice
  - tighter environmental controls
  - demand from retailers and customers about provenance and welfare
  - disease issues





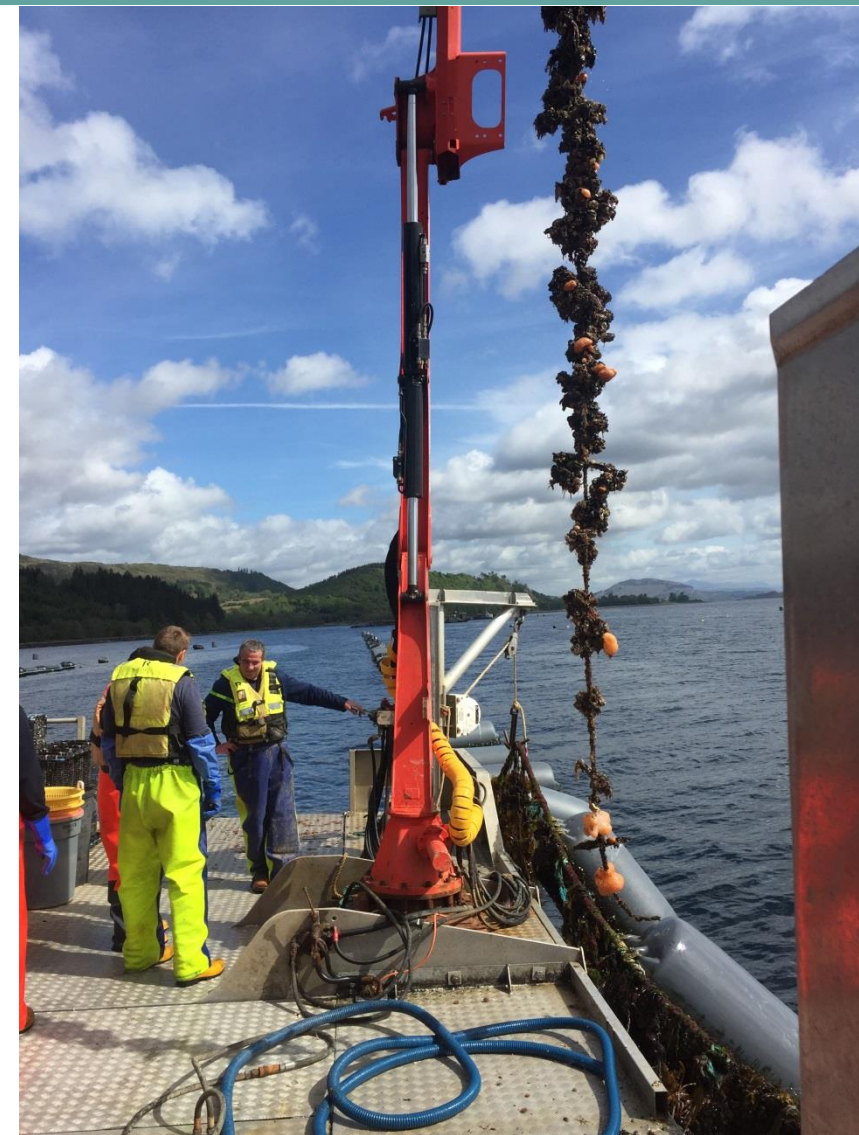
- **IMTA is a late starter to Scotland!**
- Since the 2<sup>nd</sup> WW various initiatives have aimed to either utilise existing products (i.e. seaweed stocks) or encourage research and the cultivation of new species
- This was in response to the decline in traditional industries, as well as the demersal fishing industry
- Effective development of industry was traditionally hampered by the geography of the west of Scotland, as well as failure of early engineering designs
- As the Salmon industry took its early steps in the 1970s and 80s, the focus was on refining and improving the process rather than diversification
- Shellfish farmers were also in the same situation – most farms in this sector are small and lack time/funds for diversification



- **A time for Change!**
- The increased interest around the globe in IMTA has not gone unnoticed in Scotland
- Early research carried out by SAMS in the late 1990s and early 2000s showed that it was both practical and financially feasible to co-culture species on salmon farm sites.
- This was first done by co-culturing *Paracentrotus lividus* with *Saccharina latissima* on a salmon farm in the north west of Scotland
- Results were positive, the seaweed grew successfully and the urchins also removed particulate waste from the water column around the cages
- While the trial was successful, the fish farm did not continue co-culturing due to a change in farm design and operation

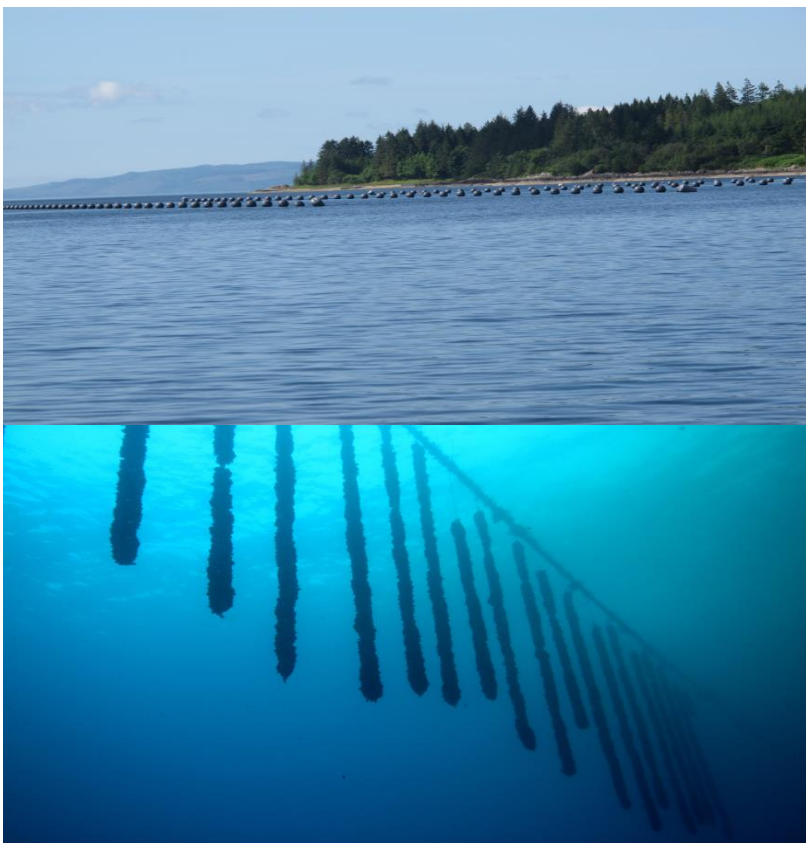


- The Scottish Government is supportive of aquaculture development in general and sees it as a key employer in the rural economy as well as a key export business
- Within a recent aquaculture review, the government has signalled its approval of IMTA in principle, and its desire to see IMTA used within the industry
- The IDREEM site at Loch Fyne (pictured right) was the first IMTA site to be licenced in Scotland
- Any IMTA site development must go through the same statutory procedures, these include;
  - Local Authority planning permission
  - Approval from the Environmental Regulator
  - A Marine Scotland (Government) licence
  - Lease of the seabed area from the Crown Estate





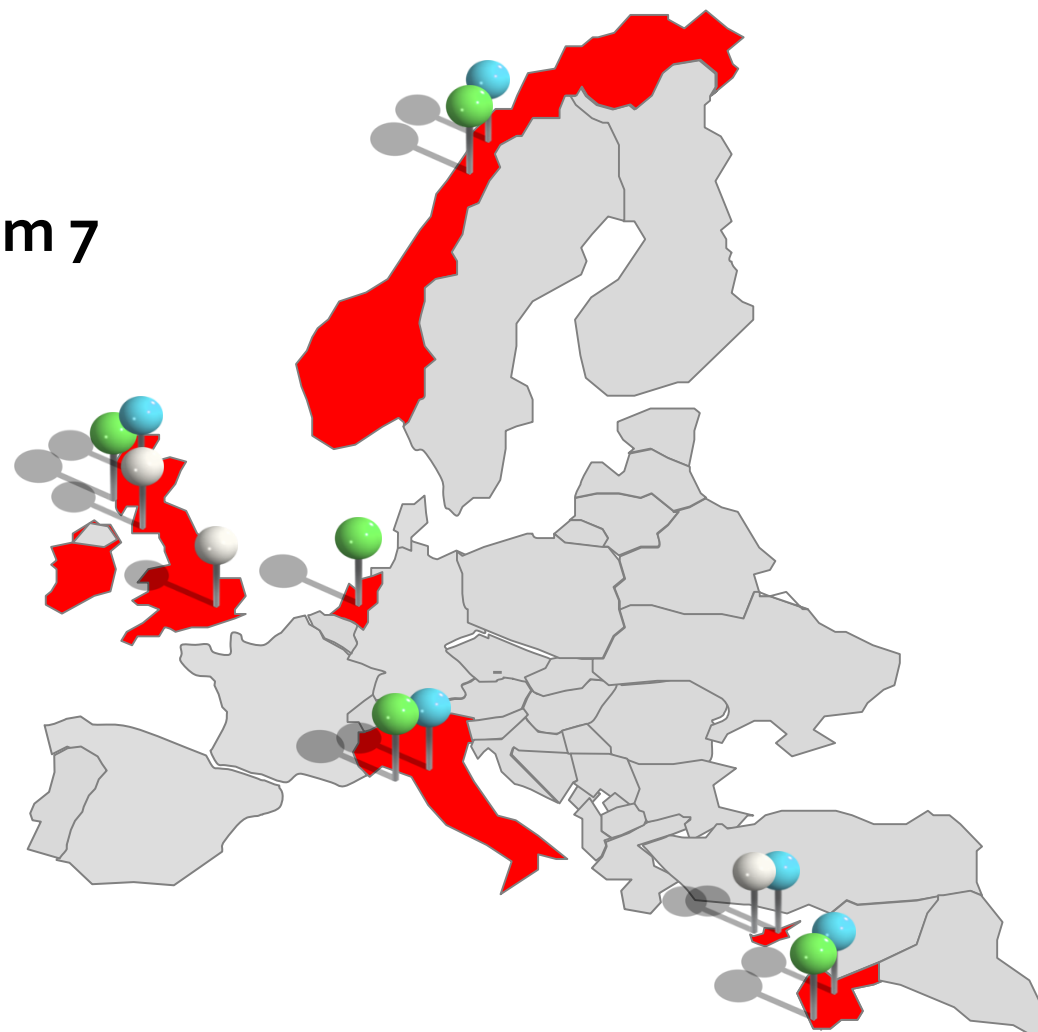
# IDREEM – An Industry led approach to understand the trade offs







# 15 Partners from 7 countries



- 6 Finfish Producers
- 4 SMEs
- 5 RTO's



# Highlights of the IDREEM Project

- The first IMTA licence for Norway
- The largest seaweed licence in Ireland
- The first commercially produced and marketed open water IMTA seaweed product in the UK
- The first IMTA shellfish to be sold in the UK
- The application for the first offshore oyster licence in the *Ligurian Sea*



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## Experiences from a large scale , open sea, IMTA facility.....(1)

- LFO found the planning and construction of the site fairly trouble free – the planning process was straightforward, and this may have been helped as most bodies were interested to see a full scale IMTA system set up
- The initial stocking of the site was routine, but the scale of the site meant that as time progressed, routine tasks such as grading and cleaning required more and more staff time
- Liaison with the adjacent salmon farm was very cordial, but extra expense was made on the IMTA site infrastructure due to worries about damage it may cause to the salmon farm from loose material broken off by bad weather
- The correct timing for the harvest of each species was often difficult to coordinate with other work on site
- The introduction of (comparatively) new species onto the market such as the Queenie Scallops, caused issues with the existing production lines





## Experiences from a large scale , open sea, IMTA facility.....(2)

- On a positive note, the products from the site (seaweed, scallops, queenies, mussels) easily found a market
- There was a huge amount of interest from the local and national media, and LFO had over 60 site visits from food producers, other farmers, academics and other interested parties
- The general thought that came back from visitors was of great interest, and many national retailers were interested in the method of production
- The staff of LFO and SSC were both enthusiastic about the project, and the challenges that arose from running a site.



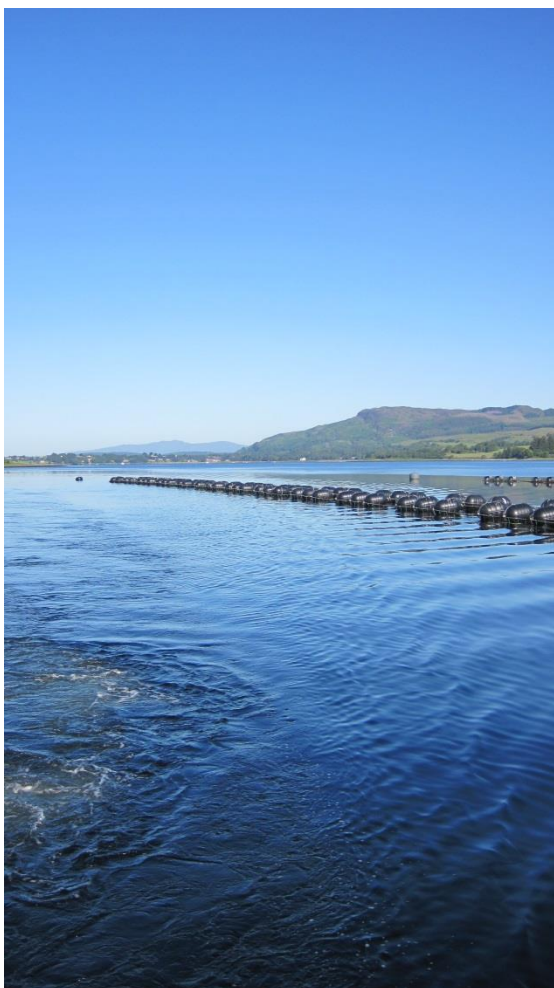
# IMTA leads to new products and diversification





- Where is IMTA in Scotland now?
- What is constraining its development?
- Where can IMTA be most beneficial to existing farms?
- Can IMTA adapt to the future developments of the industry?





## Where are we now?

Mismatch in scale between fin-fish culture and extractive organisms for water column impacts – mussels and seaweed require a large spatial extent to take up meaningful nutrients

- *1 hectare (1000 tonnes salmon) requires 10 hectares of seaweed to remove 10% of N emissions*

The business model is difficult

- *In Scotland there is little to no crossover between the finfish and shellfish sectors, both in terms of practical experience or funding*

Returns for co-cultured products are uncertain or undefined

- *A large and sudden change in input to the market from large IMTA sites, without planning, could change the market conditions and cause problems for smaller producers*



# What we need to do to make IMTA a commercial reality?

- A definition of IMTA that the industry can adopt
- The flexibility to deal with the spatial mismatch in scales
- Technical and biological constraints of benthic IMTA need to be overcome.
- The development of a market for aquacultured seaweed in Europe

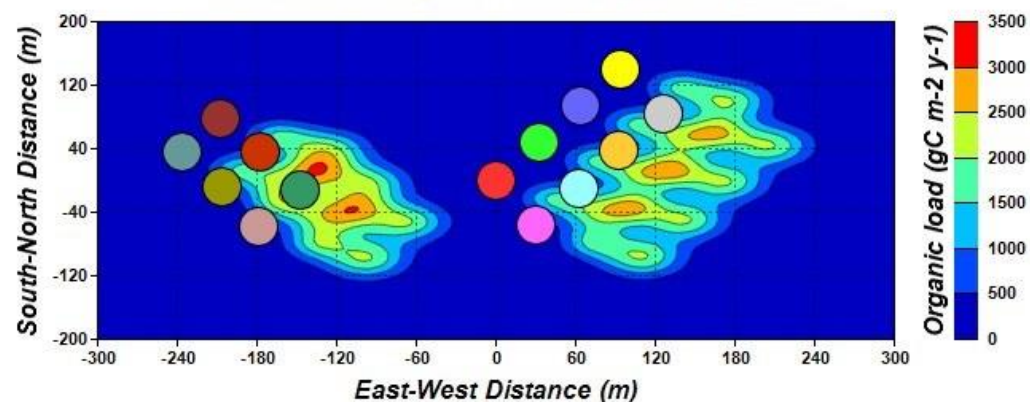


## A new service to farms? - Benthic IMTA (1)

- Increased production of detritivores under fish cages
- Reduction of particulate loading to the benthos
- Currently no engineering solution for benthic IMTA
- Implications for consenting based licencing consents



Annualized organic loading to the bottom



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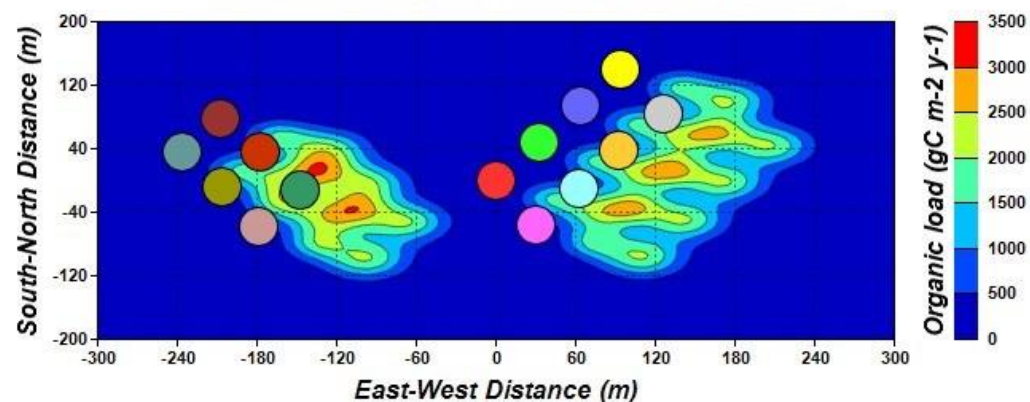


## A new service to farms? - Benthic IMTA (2)

- Could a reduction in benthic impact through use of detritivores lead to increased carrying capacity?
- Resuspension into immediate water column by bottom feeders likely to be very limited and localised
- What form could benthic holding systems take? No systems available at present – a new design challenge?



Annualized organic loading to the bottom



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