

**WORK PACKAGE #4:
SPACE PLANNING TO FOSTER
AQUACULTURE ACTIVITIES**

**ACTION 2:
COMPARATION SPATIAL
PLANNING SITUATION.**

REGIONS INVOLVED:

**FINISTÈRE (FRANCE),
GALWAY (IRELAND),
ANDALUSIA (SPAIN),
ALGARVE & PORTO (PORTUGAL),
WALES (UNITED KINGDOM)**

www.access2sea.eu

Project co-financed by the Interreg Atlantic Area Program to through the European Regional Development Fund.

Deliverable: Access2sea methodology and indicators board

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Date: 31 December 2020

WP, Action: WP4, Action 2

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DISCLAIMER

This document has been produced in the context of the Access2Sea Project “New Opportunities for more competitive and sustainable blue growth in the Atlantic Area”.

Project financed by the Interreg Atlantic Area Program to through the European Regional Development Fund (ERDF).

Amendments, comments and suggestions should be sent to the authors.

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2. Introduction



The Atlantic coast is one of the largest seafronts in Europe. In a context of a globalized economy and increased competition between territories, the Atlantic Area must be able to capitalize and highlight its differentiating assets to develop. **The sea, a natural resource that cannot be relocated, is a differentiating and considerable asset for the AA.**

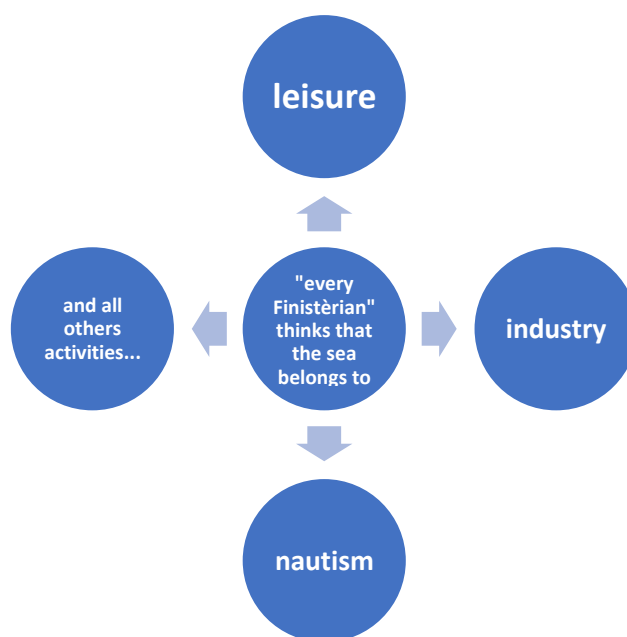
Europe and its member countries consider the economic issues linked to "maritimity" as strategic and have made it their objective of declining and sustained national, regional and local blue growth. Aquaculture is one of the sectors supported by these different policies. Aquaculture is a major food production subsector receiving considerable attention to fill the growing seafood supply gap. **However, in the EU and around the globe, the availability of areas suitable for aquaculture is becoming a major problem for the development and expansion of the sector.**

A production activity needs a physical space to produce, this seems to be obvious but in the case of aquaculture, this space is necessary linked to the sea: aquacultures (shellfish farming, seaweed cultivation,...) occupy **areas on land and at sea which require immediate proximity to the sea**. However, the sea and the coast are the object of many uses and are subject to significant pressures : urbanization, artificialization of soils, maritime and land pollution. Aquacultures are found in competition over space with all coastal activities. The maintenance of shellfish farming and its development face strong competition from real estate pressure, yachting, tourism and other maritime activities.

⇒ *It is therefore essential to perpetuate existing activities and equip oneself with the means to welcome and promote new activities (aquaculture, algoculture, etc.).*

Spatial planning is a means of having clear information on the land and real estate offer on land as well as on concessions and sea zoning, existing or potential, to be able to meet current and future expectations of companies. This also makes it possible to establish an intervention strategy to prioritize the resources of public and / or private operators in these areas.

If we want to develop aquaculture, we must be able to plan the available and potential spaces.



Faced with this challenge, from 2016, Investir en Finistère developed a concerted and federated approach to map existing and potential spaces to have an overview at the Finistère level and define an intervention strategy. IEF piloted the realization of a cartography and a GIS "Access to the sea for production activities", this tool allows to have an audit of the existing situation and a prospective vision on the potentialities.

This methodology was shared with the partners of the Access2Sea project during a dedicated workshop in October 2019 in Brest.

The observation was made during this workshop that each partner region has embarked on planning processes to resolve the issue of space, whether it is related to sharing or finding good locations.

Based on the methodology developed and shared by IEF, the partners defined :

- indicators validated as a group to compare the situations and to establish a state of art (part 1),
- a comparison grid established with the key points and highlight a common methodology (part 2)
- Establish the way of designing the potential map developed in action 4 (part 3).

As a reminder, the development of aquacultures is also strongly dependent: - the acceptability of projects by permanent and seasonal residents and of course the water quality and therefore certain activities within the watersheds (town planning, agriculture, industries, etc.).

It is therefore crucial to consolidate these activities to work on societal acceptability, concerted management of uses, and economic models. These issues are also worked on and shared within the framework of the Access2Sea project.



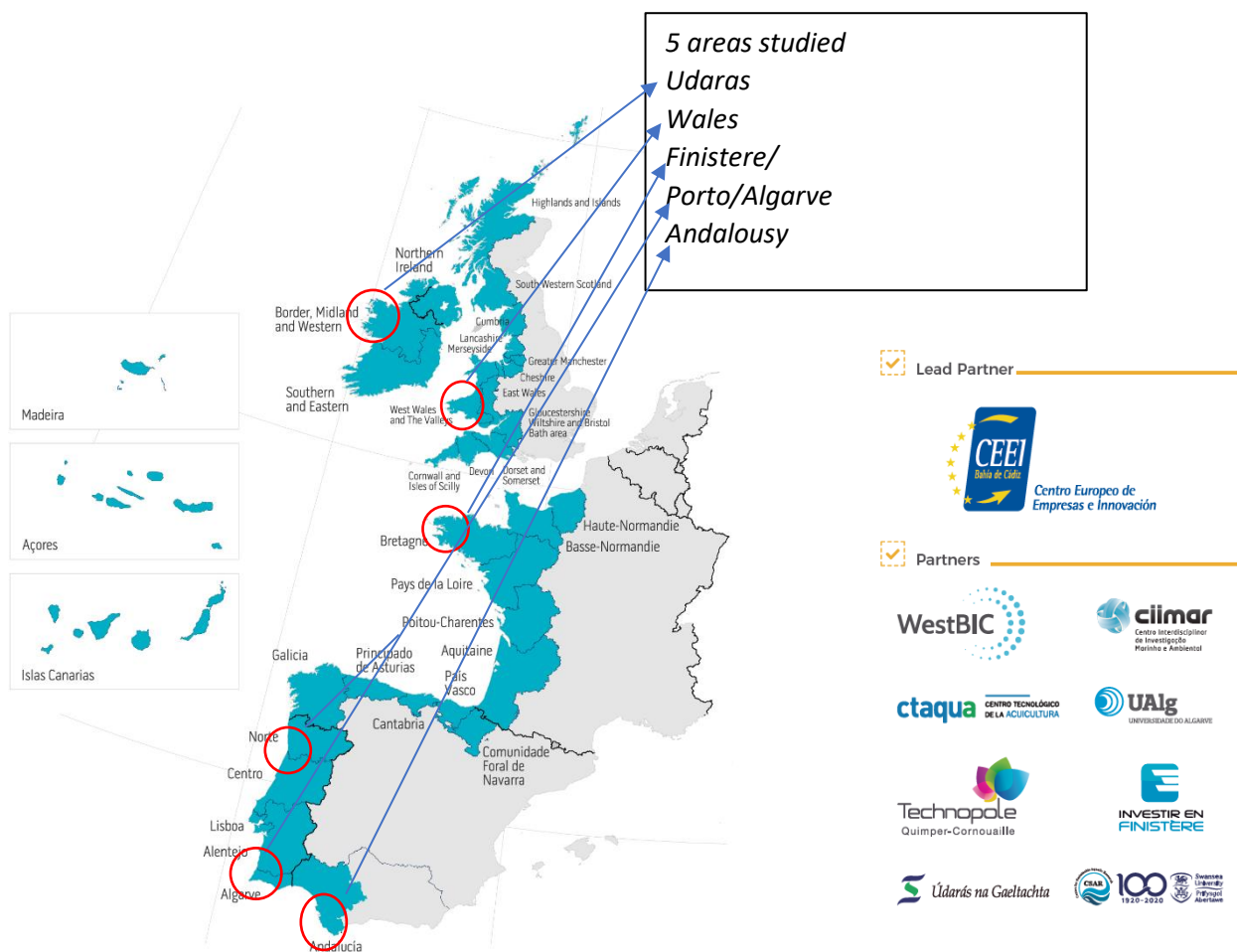
3. Part 1 : State of art of each region and data comparison



We have decided to collect data for each region by following a common framework to compare every partners' regional situation (one per country).

We have retained three main points that for us were essential to evaluate aquaculture situation:

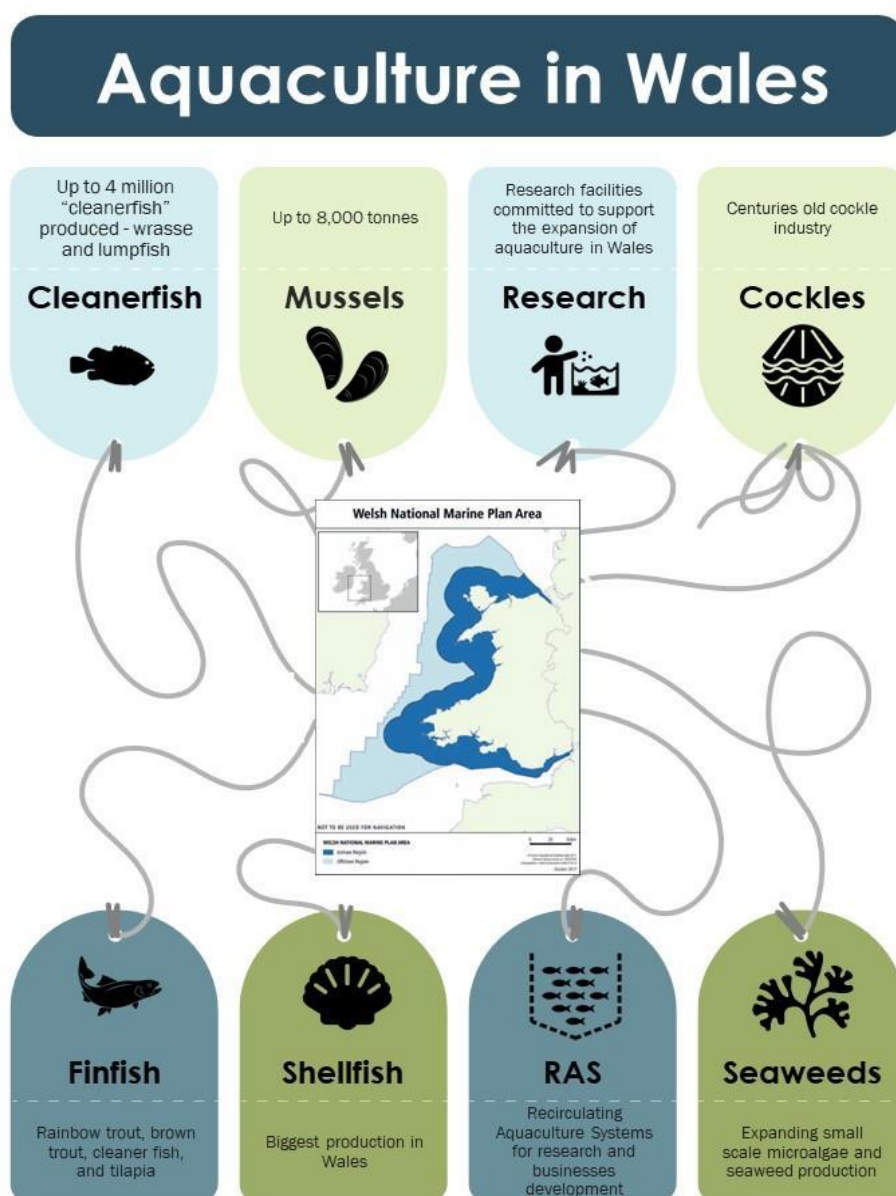
1. State of art of the existing situations: is there a tool listing the existing areas? If yes, does this tool indicate available existing areas?
2. What are the needs of businesses? What do the businesses look for? For which sectors?
3. Focus on potential areas: does an approach exist to cartography or establish the potential areas or those that would be available? We have decided to highlight the projects developing.



ATLANTIC AREA PROGRAMME 2014-2020

1ST TERRITORY: WALES /UNITED KINGDOM

EXISTING SITUATION



WALES IS WORKING ON THE FIRST MARINE PLAN FOR WELSH WATERS WHICH SETS OUT THE WELSH GOVERNMENTS VISION AND OBJECTIVES FOR THE WELSH MARINE AREA FOR THE NEXT 20 YEARS.

The first marine plan for Wales was published in November 2019 (document available [here](#)). The online tool based on GIS is still being developed. Currently CSAR is part of the Marine Planning Expert Panels, we meet regularly to discuss the tool with the developers. The Spatial Marine Expert Panels for Aggregates, Aquaculture and Wave & Tidal Stream Energy was set up back in August 2019 to help the Welsh Government develop the spatial approach. Dr Sara Barrento and Mr Paul Howes are both members of the Expert group. Expert panel members are tasked with providing feedback on the evidence needs, requirements and outputs, associated with the application of a spatial approach for marine natural resource management in the context of the aggregates, aquaculture and marine renewable energy sectors.

Marine Planning Governance Overview

The Welsh Government is the authority responsible (WMPA) for preparing marine plans for Wales. The Welsh marine plan area comprises the inshore and offshore marine planning regions. The inshore region runs from the Mean High Water Spring Tides (MHWST) to 12 nautical miles (12 nm) UK limit of territorial sea, and the offshore region from 12nm UK limit of territorial sea to the limit of the exclusive economic zone (EEZ) (Figure 1).

Overview of Resource Areas

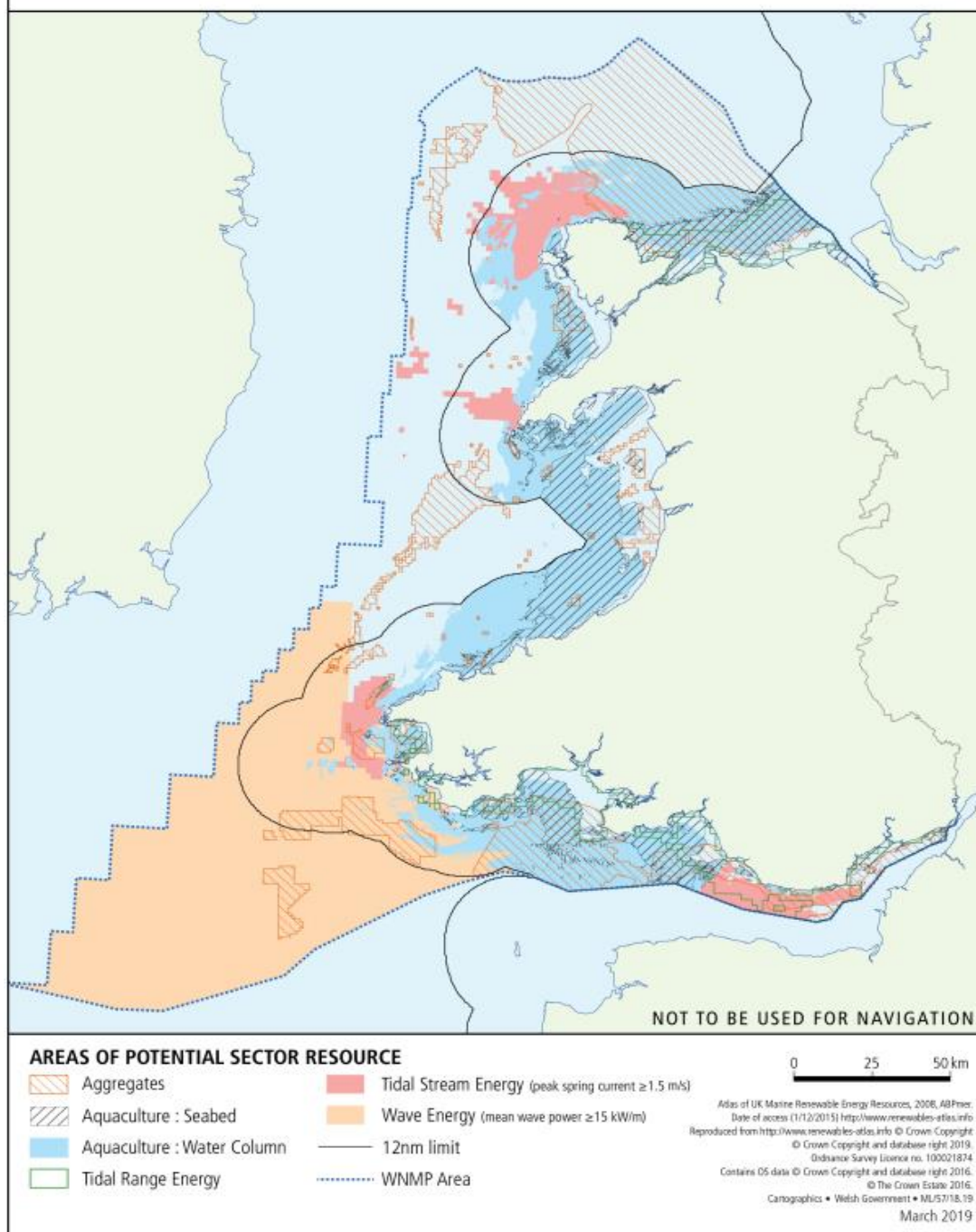


Figure 1: Welsh National Marine Plan: overview of resource areas.
https://gov.wales/sites/default/files/publications/2019-11/welsh-national-marine-plan-document_0.pdf

NEEDS OF BUSINESSES

DO YOU HAVE COMPANIES LOOKING FOR AQUACULTURE SITES?	YES
TYPES OF SITES	ON SHORE AND OFFSHORE
ACTIVITIES CONCERNED	SHELLFISH, MARINE FISH FARMING, SEAWEED
DO THESE COMPANIES HAVE DIFFICULTIES FINDING AREAS	YES FOR BOTH ONSHORE/OFFSHORE
DO YOU HAVE PROBLEMS WITH THE TRANSFER OF EXISTING PREMISES?	No

Finfish (land based)

The production of farmed finfish in Wales is currently limited and is confined to onshore facilities. Finfish aquaculture in Wales currently consists of a cleaner fish industry, trout fisheries and the small-scale production of genetically male tilapia (GMT) - all are produced in land-based facilities. In the past decade companies have tried to produce seabass commercially but this has not proved economically viable.

Seabass land-based recirculation aquaculture systems have now been repurposed to farm cleaner fish (lumpfish and wrasse) for the Scottish salmon farming industry.

There are potentially relatively large areas of ocean suitable for offshore sea cage culture of finfish species (particularly Atlantic salmon and sea trout). However, potential issues for aquaculture production in offshore areas include the lack of economic viability in competing with the Scottish salmon industry and whether such methods would be feasible in the more exposed environment off the Welsh coast. Whilst stakeholder feedback has indicated that sea trout may be a more viable species to cultivate (from a market supply and demand perspective), the areas of potential that were highlighted are likely to be further constrained once more detailed sea temperature data is included (Welsh Government, 2015)

NOTE: GMT are direct offspring of YY-supermales, thus ensuring that greater than 98% of the offspring are males, with zero use of hormones. The use of GMT fry in farming can result in a growth rate to market weight significantly faster than other tilapia strains. Average results show GMT growing to 900g in 6 months when using a high-tech RAS.

Shellfish (onshore)

Commercial aquaculture in Wales has traditionally focused on the managed cultivation of shellfish, mainly blue mussels (*Mytilus edulis*). Potential inshore areas are far more limited (due to existing activities) compared to offshore areas. Inshore areas may be further constrained in relation to water quality issues.

There are companies seeking to revive the production of scallops in Pembrokeshire and the native oyster (*Ostrea edulis*) in Swansea Bay. Swansea Docks is now being used to farm rope grown mussels.

Seaweed (offshore, onshore and land based)

Whilst there is currently no commercial scale sea-based production of macroalgae in Wales, offshore cultivation of macroalgae is being piloted in the Eastern Irish Sea by an Industry/Bangor University partnership and research into macroalgae hatchery technology is undertaken at the Centre for Sustainable Aquatic Research (CSAR) at Swansea University. Several companies have shown interest in farming seaweeds in multi species set ups and the Welsh Government fully supports the integration of seaweeds and shellfish. Community Benefit Societies (CBS), Community Interest Companies (CIC) and Small Social Enterprises (SSE) have been recently set up to farm and exploit seaweeds. Câr-y-Môr has recently managed to secure licensing to farm seaweeds and bivalves, this CBS aims to start harvesting in Spring 2021.

Microalgae (land based, biofences)

Microalgae (in land-based seawater recirculation systems) are cultivated for both research and commercial purposes.

Jellyfish – there is an interest in farming jellyfish for extracting collagen to be used in the food, cosmetic, medical device and pharmaceutical industries. The best system to farm this species is yet to be found.

Milford Haven Port Authority has shown interest in developing aquaculture on the Haven; and discussed the possibility of designing their own aquaculture spatial planning alongside different business models.

Information compiled from:
Welsh National Marine Plan, 2019
Welsh Government, 2015
Discussions with stakeholders

POTENTIAL SITES

	Landbased	On sea
Are you able to indicate potentially available aquaculture sites?	No	This is available at the Wales Marine Planning Portal http://lle.gov.wales/apps/marineportal/#lat=52.5145&lon=-3.9111&z=8

Do you have ongoing creation or development of aquaculture areas? Yes

The MFSAP (Marine and Fisheries Strategic Action Plan) for Wales (Welsh Government, 2013) provided a framework for clean, healthy, safe, productive, and biologically diverse seas. Specifically, the Marine and Fisheries Strategic Action Plan aimed to safeguard environmental resources, use them as a driver for economic growth and help Wales fully develop a sustainable marine and fisheries industry.

More recently, the Welsh Government (WG) published the first Welsh National Marine Plan (WNMP) on 12 November 2019 (Figure 2). It sets out policy for the next 20 years for the sustainable use of Welsh seas. The Welsh Government has also published the implementation guidance. This ensures the policies within the WNMP are implemented effectively and consistently.

To enable effective implementation of the WNMP the Welsh Government produced several supporting documents available in their [website](#).

To understand more about the plan and reach a wider audience the planning process is explained using different communication medium (Figure 3):

- **Animation video**
https://www.youtube.com/watch?v=rCmlnkXHwWs&ab_channel=WelshGovernment%2FLlywodraethCymru
- **Webinars**
<https://www.youtube.com/playlist?list=PLHBVoCVw4XZRxgeZ-TkfkWuCXNnYKaIva>
- **Newsletter**
<https://gov.wales/subscribe-marine-planning-newsletter>
- **Infographic** considering the link between marine and terrestrial planning
<https://gov.wales/sites/default/files/publications/2021-01/considering-marine-plans-terrestrial-planning-permission-infographic.pdf>

The planning process aims to be transparent and includes stakeholders input in the following ways:

1. Creation of the Statement of public participation which describes how the WG will engage with its citizens <https://gov.wales/statement-public-participation-welsh-national-marine-plan>
2. Creation of the Marine Planning Stakeholder Reference Group <https://gov.wales/marine-planning-stakeholder-reference-group>
3. Consulted marine users to understand the benefits and opportunities of marine planning <https://gov.wales/understanding-benefits-and-opportunities-marine-planning>
4. Consulted on a draft plan in December 2017 and published a summary of responses from stakeholders local drop in sessions which took place in local meetings and at a national conference <https://gov.wales/draft-welsh-national-marine-plan>

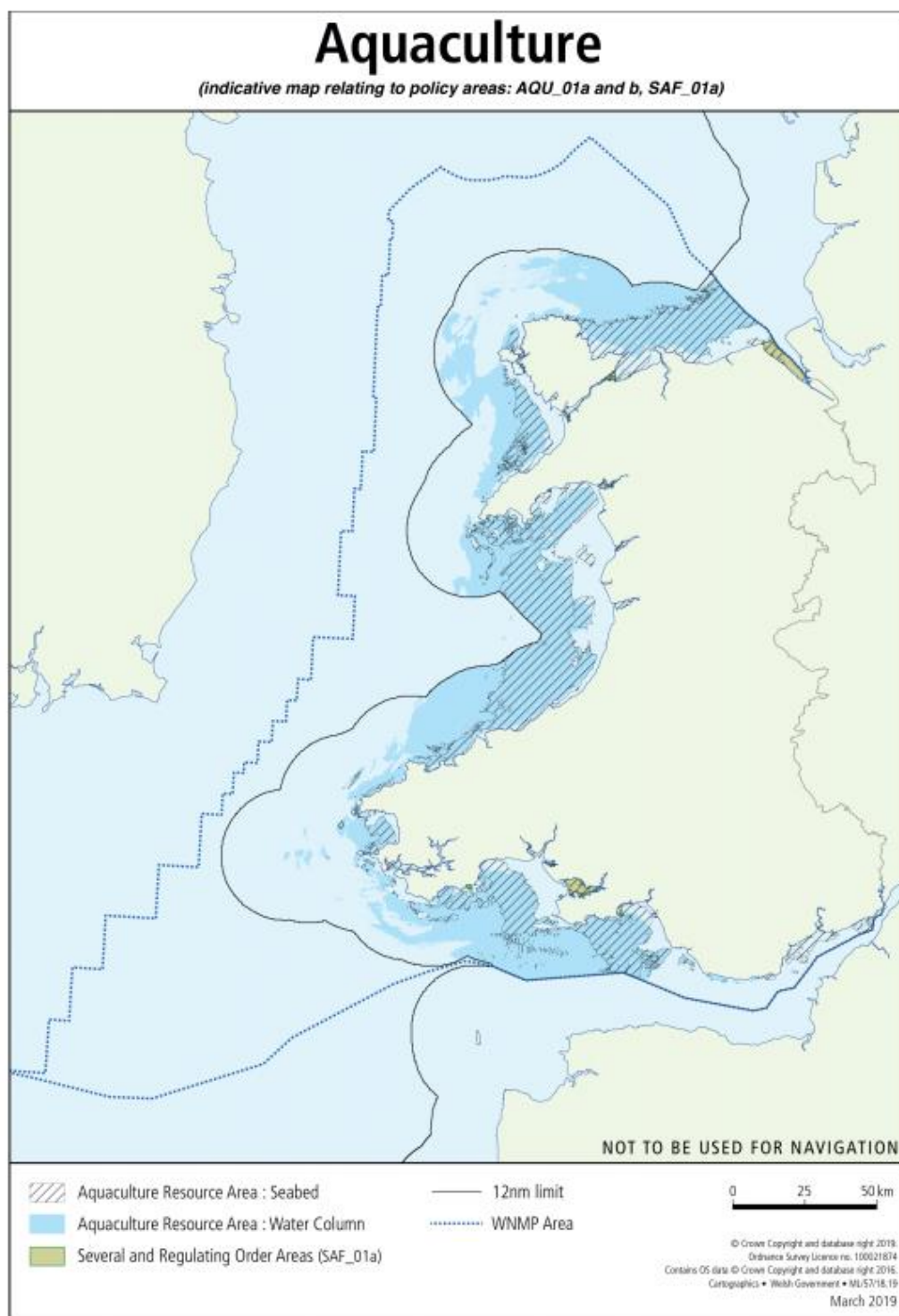


Figure 2. Aquaculture: Indicative map relating to Policy areas.
Source: <https://gov.wales/welsh-national-marine-plan-document>



Figure 3. Overview: Welsh National Marine Plan. Summarises the WNMP in an easy to understand format.
Source: <https://gov.wales/welsh-national-marine-plan-wnmp-overview>

Additionally, the WG also created the marine planning portal for Wales which allows anyone to view maps online showing the distribution of human activities and natural resources in Welsh seas. The portal is an interactive planning tool that is intended to support the marine planning process (Figure 4).

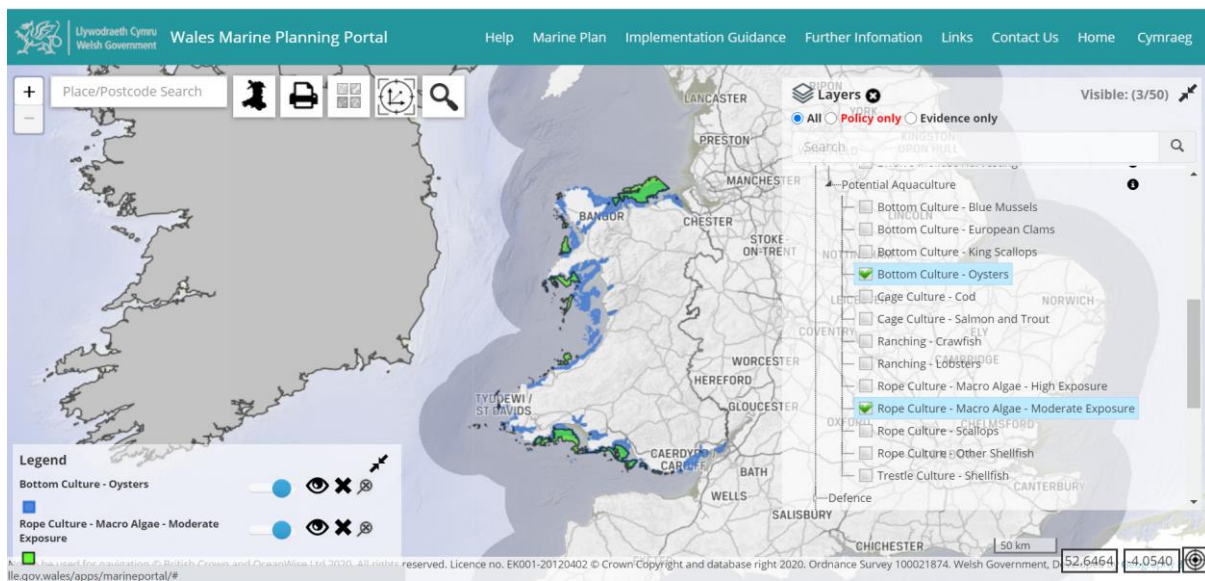
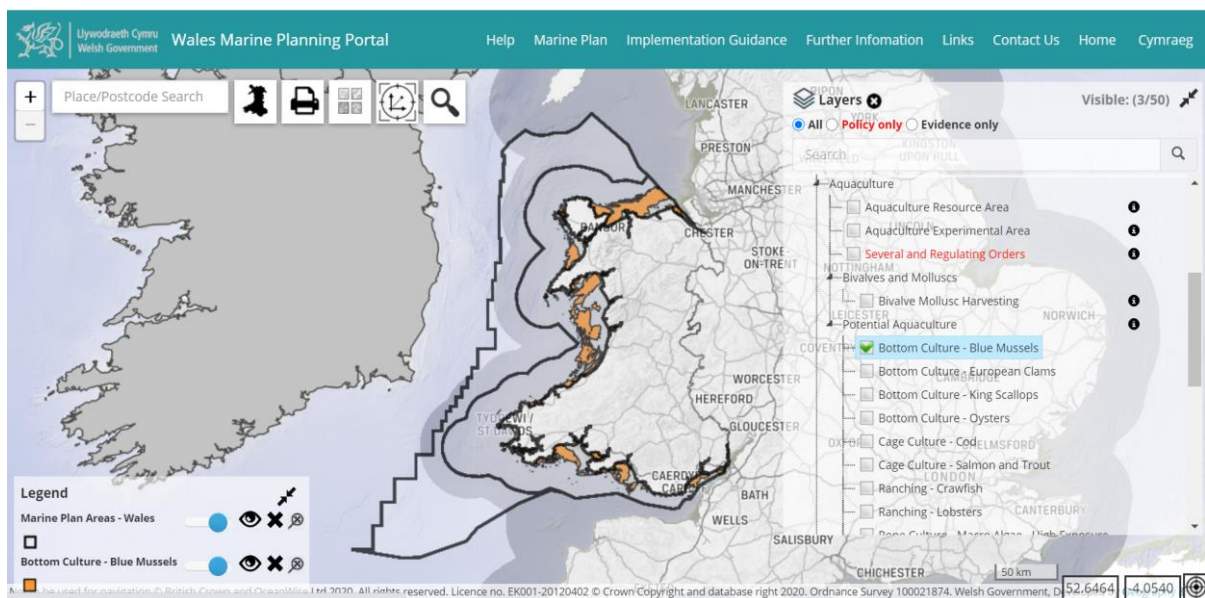


Figure 4. Wales Marine Planning Portal screenshots. Top picture: bottom cultured blue mussels; bottom picture: seaweeds and bottom cultured oysters.

Source: <http://lle.gov.wales/apps/marineportal/#lat=52.6464&lon=-4.0540&z=7&layers=390,423>

EXAMPLES OF AQUACULTURE COMPANIES IN WALES AND FUTURE PROJECTS

Identifying aquaculture development sites in Wales will allow more bespoke and tailored support from Government and multi species site opportunities need to be identified to facilitate this.

One such site is at the Queens docks in Swansea where Fowey Seafood are producing mussels in ropes, and cleaner fish in a newly built land based recirculating aquaculture system (Figure 5). The company aims to expand its production to include a variety of farmed species including annelids grown in moving bed filters to optimize finfish waste usage and removal.



Figure 5. Three sixty site location, red circle shows the location of mussel ropes.

2TH TERRITORY: ÚDARÁS /IRELAND

EXISTING SITUATION

The non-contiguous dark green areas in the map are collectively known as Gaeltacht na hÉireann, Ireland's Gaeltacht regions, where Irish is nominally the everyday language of administration, culture and work. This is Údarás's geographical area of developmental remit.

At the present time there are 111 onshore and 0 offshore sites in Údarás areas.

We have compiled a list of companies, licenses their location and species. We are working on transposing the details these details to the GIS. We are currently analysing the data area involved, including area.

Greatest challenge: planning.

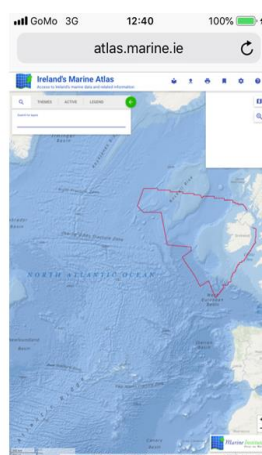
We have access to the aquaculture assets, among many others on the Irish Marine Atlas, <http://atlas.marine.ie/>. We aim avail of training in GIS by the end of 2020 so as to be able to more effectively query the GIS database rather depending on Excel.



GIS: Ireland's Marine Atlas,

<https://atlas.marine.ie/#?c=53.9043;-15.9192;6>

The most popular software appears to be ESRI ArcMap and this is used by most organisations in Ireland. ESRI and Compass informatics run courses on this software. We also have the potential to train in integrated QGIS/GIS and R. Effective GIS usage will allow us to more effectively query the Irish Marine Atlas.



Údaras na Gaeltachta : <https://www.marine.ie/Home/site-area/areas-activity/aquaculture/sea-lice/co-ordinated-local-aquaculture-management-systems>

WestBIC: <http://aquacultureandseafoodireland.com/>

NEEDS OF BUSINESSES

DO YOU HAVE COMPANIES LOOKING FOR AQUACULTURE SITES?	YES
TYPES OF SITES	LANDBASED? ONSHORE OFFSHORE
ACTIVITIES CONCERNED	SHELLFISH, MARINE FISHPOND, SEAWEED, OTHERS
DO THESE COMPANIES HAVE DIFFICULTIES FINDING AREAS	YES
DO YOU HAVE PROBLEMS WITH THE TRANSFER OF EXISTING PREMISES?	YES Aquaculture sites are available, licensing is difficult and there can also be community and other sectoral concerns.

Companies are looking for deep sea and inshore finfish sites and shellfish and algae.

There is no great difficulty in finding sites. The difficulty is largely a regulatory one.

Shellfish and finfish sites are sought after. A number of applications for salmon farms have been with the relevant department since 2005 and the average wait for approval is eight years. By contrast the international average is two years.

About the transfer of existing premises, it is difficult to repurpose licenses including and planning new builds and extensions.

Shellfish

The shellfish sector, unlike the finfish sector is growing in Ireland. Nevertheless, this is constrained by licensing and spatial planning. Shellfish producer and Irish Farmers Association IFA-Aquaculture spokesman Michael Mulloy is one of many producers who's attempts to sell on-location are frustrated by planning laws. He has described a sense of frustration among members, food trucks are filling a gap in the market where local seafood producers are being prevented from selling on or near-location.

There are producers selling abalone and jigs are also widely cultivated. Many of the areas production areas are Category A waters.

An application backlog has been cleared but this is not to the satisfaction of producers because it only represents according to them a fraction of the support they need to produce. Other issues are foreshore planning, local planning and the licensor, the Dept of Agriculture and Marine who have decided not to participate in the National Marine Plan.

Producers such as Connemara Seafoods (mussels) ship almost exclusively to the continent. As context, Belgians eat on average 23 Kg of mussels per annum compared to the Irish per capita consumption of 0.3 kg.

At the time of writing, Ireland's shellfish producers face the perilous situation of being potentially cut off from its continental market due to uncertainty in the use of the UK land bridge as a result of Brexit. Current alternatives do not compare favorably in travel time, a vital to reaching its markets on time. To this end, Rosslare Port have stated that they are trying to get a 6 day a week direct ro-ro ferry to connect the main northern European motorway network, meaning Le Havre, Dunkirk or Dover, in a comparable crossing time to the 20-hour land bridge. Diversifying to the Irish market is difficult because local planning laws restrict off-farm restaurants and premises even when there is an adjacent licensed functioning farm.

CLAMS, Coordinated Local Aquaculture Management System, see the explanatory notebook, is currently under review by a private consultancy RS Standards.

The first CLAMS in Ireland was introduced in Clew Bay in 1999. Clew Bay/Cuan Mó is where two of WP Capitalisation Action 2 LFC members are active. The 2000 CLAMS was comprehensive and is still available online. As it is a large voluntary exercise, it had lost some of its momentum in the intervening years and is now under review in six bays under the stewardship of the national seafood agency BIM along with RS Standards. RS Standards are also working in collaboration with Údarás na Gaeltachta on some of its projects.

Seaweed (offshore, onshore and land-based)

The Seaweed industry is linked to seaweed fishing or harvesting on foreshore.

There are some projects in offshore cultivation and projects in development for land-based cultivation.

There is a great industry linked to the seaweed with 2 major companies (factories) and a lot of international SME in cosmetics, food, nutrition.

Wild seaweed is regulated by Údarás na Gaeltachta; traditional collection is historically and up until today associated with Ireland's Gaeltacht. BIM, the national seafood agency are responsible for regulating farmed seaweed.

Microalgae

Well categorized, <https://www.biodiversityireland.ie/projects/biodiversity-inventory/taxonomic-groups/algae/> and R&D, <https://www.technologygateway.ie/microalgae-cultivation-and-rd-facilities-at-shannon-abc/> little commercially/high Technology Readiness Level, TRL, activity. Bioactive products, Biomed Ireland.

Marine Finfish

There have been no new licenses granted for finfish in two decades. The talk given by Catherine McManus at the Access2Sea event "New Opportunities for Seafood Producers" as part of Mayo Ideas Week and Local Follow-up Committee event of Work Package 3 Capitalisation" was very instructive on this point. A counter-argument to the accusations of inertia within the Dept of the Marine are countered with the fact that many existing licenses remain unused. This argumentation is emblematic of how dysfunctional the licensing situation in Ireland is; as McManus, the Chief Technical Officer at Mowi Ireland explains, advancements in technology and understanding of animal welfare, biosecurity, and hygiene has moved salmon farming farther from the coastline and into deeper waters where the water is deeper and experiences a much higher degree of circulation.

Reasons for difficulties finding areas

The West of Ireland, as told by Michael O'Boyle, Marine Development Officer at Mayo County Council has identified development in the West of Ireland and specifically Connacht as being particularly hindered by the fact that it suffers from the highest degree of regulation and lowest degree of infrastructure and development in the country—from transport networks to digital connectivity. The Programme for Government (PfG) was agreed following national parliamentary election in 2020 as an agreed framework for coalition government. Among the PfG's guidelines are the implementation of the Review of Aquaculture Licensing 2017. A member of the LFC has pointed out that the fact that its implementation is on the PfG is an open admission that it has not been adopted for implementation to date, something that was not admitted by the previous government.

Marine Planning Development Management Bill

From the Dept of Housing, Local Government and Heritage: The General Scheme of the Marine Planning and Development Management (MPDM) Bill was approved by Government in December 2019. The Bill will amend the existing Foreshore Act and create a new regulatory area and a new single state consent regime for the entire maritime area. This means that the development management process will expand to cover the whole of Ireland's exclusive economic zone and continental shelf.

The Bill will also establish a legal basis for An Bord Pleanála and coastal local authorities to consent to development in the maritime area, while retaining existing foreshore and planning permission provisions for

aquaculture and sea fisheries related development. The bill provides for a single environmental impact assessment (EIA) and a single appropriate assessment (AA), where applicable.

You can view the General Scheme of the Bill and FAQ document on the Department of Housing, Planning and Local Government website.

A NOTE ON THE LICENSING SITUATION

The aquaculture industry in Ireland is to a great extent decoupled from local markets. This has to do with licensing and not consumer habits. Demand for Irish salmon massively outstrips supply. Ireland's coastline may not be as amenable to finfish farming as Norway or Scotland but the lack of supply is due to a simple lack of a functioning licensing system.

POTENTIAL SITES

	landbased	On sea
Are you able to indicate potentially available aquaculture sites?	yes	yes

This list is partially public.
 Údaras :http://data.marine.ie/geonetwork/srv/eng/catalog.search#/search?resultType=details&sortBy=relevance&from=1&to=20&fast=index&_content_type=json&any=aquaculture

Do you have ongoing creation or development of aquaculture areas? **Yes**

Páirc na Mara MIDC

paírc: field, area, ~ éisc, large shoal of fish, Mara (gen.) = muir (nom.): sea, ocean

Within its current development strategy, Údarás na Gaeltachta has commenced its investment programme in support of the establishment of Páirc na Mara. The development of a Marine Innovation and Development Centre (MIDC) facility has been prioritised for the first-stage development of the campus.

Situated on a 9-hectare site which is owned by Údarás na Gaeltachta, Páirc na Mara will provide a dedicated development campus and will include the necessary infrastructure, facilities and services which are required by private investors to establish and scale marine enterprises across a range of products, species, technologies and applications.

It is located in the town of Cill Chiaráin, Conamara, County Galway.

Site and proposed design of Páirc na Mara MIDC, Cill Chiaráin, Conamara



3TH TERRITORY: FINISTERE /FRANCE

EXISTING SITUATION

The Finistere is a Brittany county, in the western of France.

It is an peninsula and has the largest costline of france métropolitaine with 1.391 km de côtes.

Aquaculture has been present for a long date in Finistère.

The existing areas for the public domain are registered on a public GIS by the local authority that delivers the license.

<https://geobretagne.fr/mapfishapp/>

These data only concern the areas licensed on the public domain but not the premises landbased, the tanks or depurification landbased if they are in the private domain.

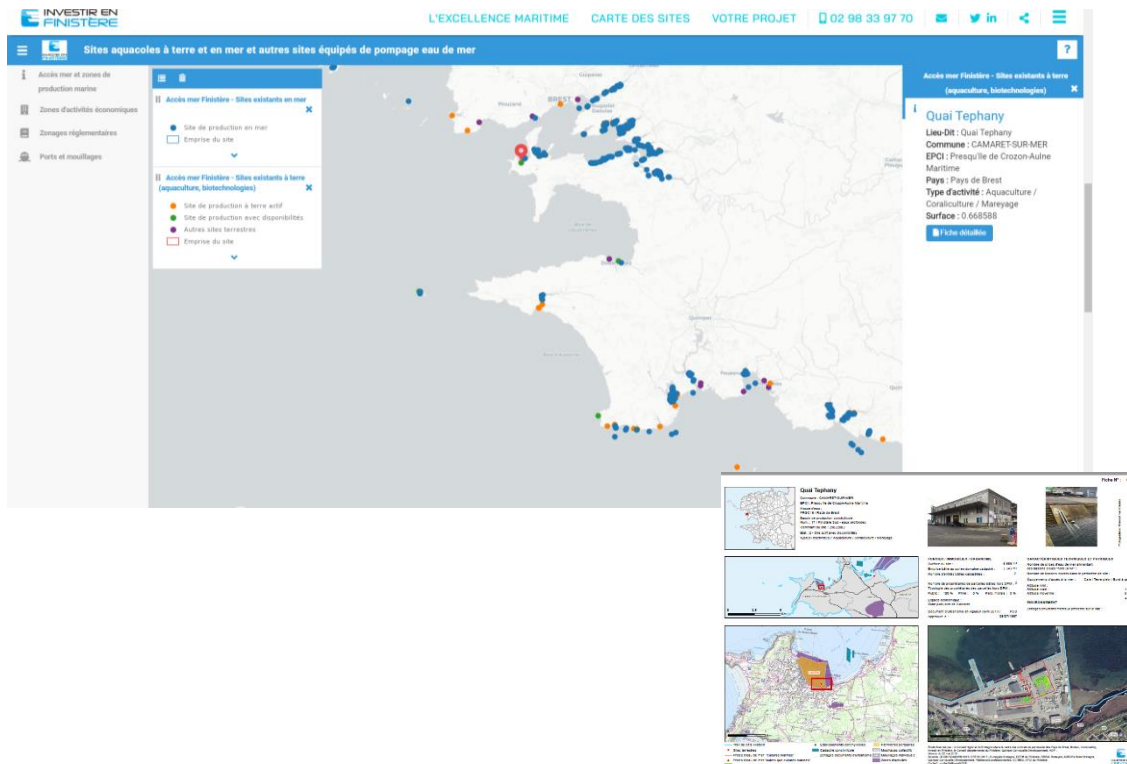
It is the reason why IEF carried in 2016 a work in order to cartography these premises.

The data are public and edited in GIS :

Finistère : <https://www.accesmerenfinistere.fr/Accueil-865-0-0-0.html/>

<https://www.data.gouv.fr/fr/datasets/cadastre-conchylicole-du-finistere/>





NEEDS OF BUSINESSES

DO YOU HAVE COMPANIES LOOKING FOR AQUACULTURE SITES?	YES
TYPES OF SITES	ONSHORE AND OFFSHORE
ACTIVITIES CONCERNED	SHELLFISH, MARINE FISH FARMING, SEAWEED
DO THESE COMPANIES HAVE DIFFICULTIES FINDING AREAS	BOTH ONSHORE OFFSHORE
DO YOU HAVE PROBLEMS WITH THE TRANSFER OF EXISTING PREMISES?	YES

Shellfish

It is the main existing production in Finistère and mainly oyster and mussel. We have a few other species, some with renown such as abalone. The cultivation is done in onshore areas, sheltered bays or rias and dependent on the quality of water linked to land based facilities either for storage or depurification

Seaweed (offshore, onshore and land-based)

The Seaweed industry is linked to seaweed fishing or harvesting on foreshore. There are some projects in offshore cultivation and projects in development for landbased cultivation. There is a great industry linked to the seaweed with 2 major companies (factories) and a lot of international SME in cosmetics, food, nutrition.

Microalgae

Various research projects and some companies that work on microalgae in the biotechnology sector. Some shellfishmen also interested in feeding.

Marine Finfish

In the sea, a few cultivation, only artisanal 2/3 sites. The finfish industry is not linked to marine aquaculture but more with fishery (25% of French fishery) and freshwater aquaculture.

The needs of business are linked to existing cultivation or for developing new ones:

On-shore, enterprises look for sites for various reasons:

Shellfishmen or fishermen on foot who need purification tanks. Usually, they look for on-shore sites near their seashore cultivation farms

Some new projects such as seaweed cultivation or on-shore fish farming, the dimensions vary from little areas (1000m²) to bigger ones (10 000m²). Usually, they are more « mobile »: they look in Finistère and even in Brittany

We have also received a few demands for big projects (>1 ha) from outside companies of Brittany (France or even foreign ones). They search sites along all the Atlantic coastline.

REASONS FOR DIFFICULTIES FINDING AREAS

On-shore, there are many use conflicts between the different activities. There is also a strong touristic and residential pressures.

To find a land, you must deal with all the constraints: legal, regulatory, urban,... And sometimes, finally, there is no possibility to find one because none complies with all the obligations.

On-sea, you have to manage to plan with all the other uses.

In the Finistère, the problems with the transfer of existing production premises is mainly on-shore buildings that are transformed into houses.

POTENTIAL SITES

	landbased	On sea
Are you able to indicate potentially available aquaculture sites?	Yes	On demand a approach is under process for the large facade at a local level you have to contact the DDTM

Do you have ongoing creation or development of aquaculture areas? **Yes**

On-sea, it is not possible to indicate potential areas. The government launched an action to list on sea available areas, however, for the moment, the action is stil under process.

At the local level, the persons who want new sites ask the DDTM (local state officials). They work together to find new on sea areas, case by case.

On-shore, thanks to the work done by IEF and partners, we have listed the potentials possibilities. It is not public. The information is given to projects that ask for.

There is a project concerning an industrial area to be supplied with seawater intake . This project will be to welcome companies with seawater pumping needs such as seaweed cultivation, fish farming... For the moment, the project is still analysing to evaluate the faisability.

DIFFERENT DOCUMENTS IN URBANIM TAKE INTO ACCOUNT THE AREAS IDENTIFIED AND TRANSLATE THEM IN PLANIFICATION TO ORIENTATE / KEEP THE SITES FOR SEA ACTIVITIES.



4TH TERRITORY: PORTO/ALGARVE - PORTUGAL

EXISTING SITUATION

The information is part of the database from DGRM (General Direction for Marine Resources) and the geoportal is currently being updated.

<https://www.dgrm.mm.gov.pt/web/guest/geoportal-dos-estabelecimentos-de-culturas-marinhas>



There is a list of existing areas that concern both onshore and offshore sites.

DGRM as a database in excel format that can be accessed by request to the responsible staff at DGRM.

In 2014, the area allocated to marine aquaculture production was (in hectares):

Total wetland area	30.000 hectares
Area allocated to aquaculture activities	8.049
Area in use	4.495
Area in installations or in analysis	1.100
Area available for new installations	2.454



DECREE LAW NO. 38/2015 (MARCH 12): DEVELOPS THE BASIC LAW FOR MARITIME SPATIAL PLANNING AND MANAGEMENT

- SITUATION PLAN AND ALLOCATION PLAN AT SEA
- AQUACULTURE PLANS IN **TRANSITIONAL WATERS**, SUCH AS ESTUARINE AREAS (RIA DE AVEIRO, ÓBIDOS LAGOON, SADO ESTUARY, RIA DE ALVOR, RIA FORMOSA)
- AQUACULTURE COMPATIBILITY WITH PROTECTED AREAS/NATURA NETWORK

DECREE LAW NON.º 46/2016 (AUGUST 18)

EXTENDS UP TO 2021 THE DEADLINE FOR LICENCES IN TRANSITIONAL AREAS, INCLUDING ESTUARINE AREAS.

LEGAL REGIME OF ESTABLISHMENT AND OPERATION OF ESTABLISHMENTS

ASSIGNMENT OF AQUACULTURE ACTIVITY LICENSE (USE OF WATER RESOURCES OR MARITIME SPACE, ESTABLISHMENT OF THE ESTABLISHMENT AND ITS EXPLOITATION)

- PROCEDURE AND LICENSE ISSUANCE REDUCED FROM 3 ENTITIES TO A **SINGLE ENTITY**:
DGRM FOR MARINE AQUACULTURE LICENSES
ICNF FOR FRESHWATER AQUACULTURE LICENSES
- CREATION OF THE BLUE LICENSING (SIMPLER AND FASTER REGIME, WITH APPLICATIONS FOR PRODUCTION AREAS TO BE OPENED AT THE INITIATIVE OF THE STATE)
- FASTER LICENSE PROCEDURE: FROM 3 YEARS TO 3 MONTHS ON AVERAGE



NEEDS OF BUSINESSES

DO YOU HAVE COMPANIES LOOKING FOR AQUACULTURE SITES?	YES
TYPOLOGIES OF SITES	ONSHORE AND OFFSHORE
ACTIVITIES CONCERNED	SHELLFISH, MARINE FISH FARMING, OTHERS
DO THESE COMPANIES HAVE DIFFICULTIES FINDING AREAS	BOTH ONSHORE OFFSHORE
DO YOU HAVE PROBLEMS WITH THE TRANSFER OF EXISTING PREMISES?	

Sector 1 - Finfish

Freshwater – mainly rainbow trout

Marine waters – mainly turbot, sea bass, sea bream

Sector 2 Shellfish

Mainly clams and oysters.

Ria Formosa (in the Algarve) is responsible for the production of 90% of the national shellfish production

Sector 3 - Seaweed (offshore, onshore and land based)

A few companies land based that produce macroalgae

Sector 4 – Microalgae

Various research projects and some companies that work on microalgae, mainly in the biotechnology sector.

Reasons for difficulties finding areas

There is the need to simplify administrative procedures in order to reduce the administrative deadlines and procedures required to obtain licenses, making the process less penalizing for the investor; facilitate access to space and water that aims to identify spaces with water resources with greater potential for aquaculture and which have less environmental impacts, ensuring their compatibility with other uses of those resources; strengthen the competitiveness of aquaculture and promote a level playing field for EU operators, with the aim of increasing, diversifying and enhancing national aquaculture production.

POTENTIAL SITES

	landbased	On sea
Are you able to indicate potentially available aquaculture sites?	Yes On shore (building or land that could be equipped with seawater pumping for example or in which aquaculture could establish their facilities)	No

This information is private.

Do you have ongoing creation or development of aquaculture areas? Yes

University of Algarve: Projects submitted to get funding for new aquaculture sites onshore and offshore: PerformFISH project focuses on the development of consumer-oriented aquaculture production, integrating innovative approaches that help to ensure the competitiveness and sustainability of the bream and sea bass production sector. MedAID project (Mediterranean Aquaculture Integrated Development), is considered a sister project of PerformFISH, started in May and aims to improve aquaculture production in the Mediterranean.

Several studies were led on the Portuguese estuaries. During the preceding studies, it was notified that the time to get a license could last up to 3 years. Progress were made to diminish this time drastically as it is now possible to get a license within 3 months. A detailed map on the possibilities for aquaculture development will be available soon.

5TH TERRITORY: ANDALOUSIA /SPAIN

EXISTING SITUATION



Andalusia has a tool listing the existing sites. The inventory concerns both onshore and offshore sites.

This is a public information, available about GIS :

Law 1/2002 of 4 April, Planning, Promotion and Control of Maritime Fisheries, Seafood and Marine Aquaculture in Title VII Regulation and Promotion of Marine Aquaculture, in Chapter I, in Article 46 sets out the powers of the Ministry of Agriculture, Fisheries and Rural Development including: "Declaring areas of interest for marine crops" and "Developing and approving comprehensive harvesting plans for certain geographical areas for marine aquaculture". Chapter III measures for the promotion and development of marine aquaculture set out Articles 55 and Article 56 on Areas of Interest for Marine Crops and Comprehensive Harvesting Plans, respectively.

That is why in Andalusia we have been working for the last decade on the identification of suitable areas for the orderly development of aquaculture on the Andalusian coast, taking into account basic technical criteria of aquaculture activity, the existence of established uses, activities and occupations and respect for the environmental values of the identified areas.

Framed in these lines of work was recently developed the document called "Location of suitable areas for the development of marine aquaculture in Andalusia, 2014" (*), last updated from previous work (* *). All of them as pre-declaration steps of areas of interest. This is a very useful instrument for administration and offers a guarantee to investors in the aquaculture sector.

REGULATION (EU) No. 1380/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on the Common Fisheries Policy, in Article 34, devoted to the Promotion of Sustainable Aquaculture, in paragraph 2, urges Member States to establish a national multiannual strategic plan for the development of aquaculture activities in their territory. Therefore, the Ministry of Agriculture, Fisheries and Rural Development that same year developed the Andalusian Strategy for the Development of Marine Aquaculture 2014-2020, including in the 2nd Strategic Line: "Sectoral planning and site selection" a series of concrete actions that include technical, environmental, social and economic studies to be able to declare areas of interest (ZIA) for the development of marine aquaculture in the Andalusian region, as well as the sizing and types of facilities suitable for the sustainable use of declared areas.

With the information obtained in the aforementioned work of Location of suitable areas for the development of marine aquaculture in Andalusia (*) have been obtained located different areas administratively suitable for the location of marine aquaculture establishments, mainly in the maritime strip. In fact, the suitable area is defined as the maritime and maritime-terrestrial strip where aquaculture activity would be viable by: no administrative use or activity in the same space, or in case of coincidence, the coexistence of both activities does not constitute an incompatibility.

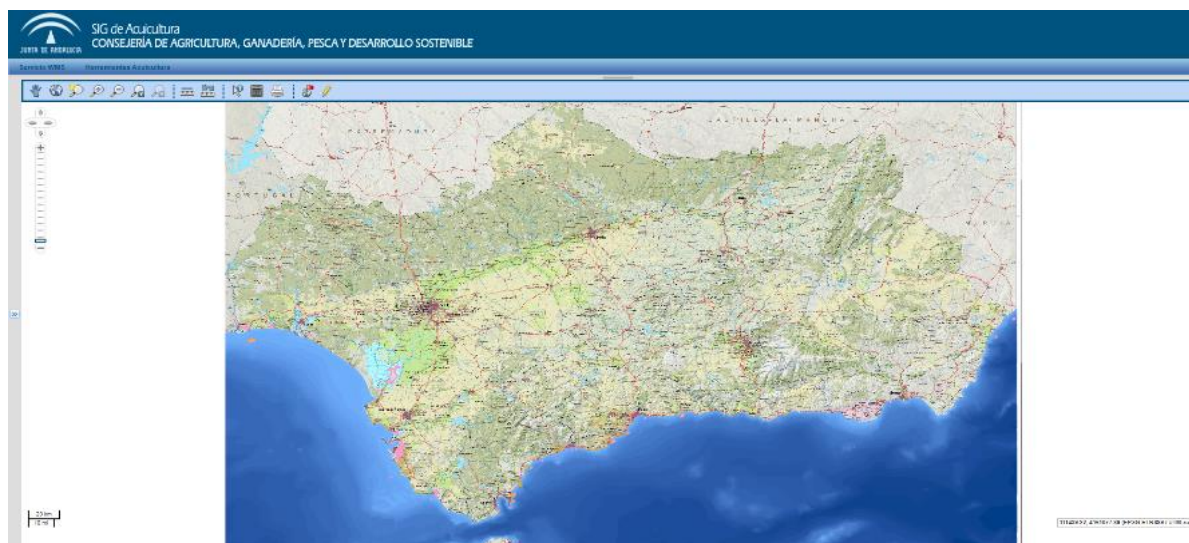
Thus, once the available space has been known and therefore the spatial scale has been reduced, it is necessary to examine whether this space, in addition to being administratively compatible with aquaculture activity, meets the optimal environmental and oceanographic conditions for the viability of aquaculture crops. That is, if it is a declarable area as an area of interest for marine crops.

Therefore, a new phase of study is currently being developed, the first time this type of experience will be implemented in Andalusia. Areas have been established such as "pilot polygons", in which water samples, sediment, benthic fauna, phytoplankton, zooplankton and records of oceanographic conditions (currents, waves and tide) are being collected and analyzed for further study, so as to determine aquaculture harvesting plans (species likely to be cultivated, load capacity, crop systems and sizing) of these polygons, as a pre-step to the proposals for the declaration of an area of interest for aquaculture. In this way it is intended to enhance this productive sector of high potential on our coast, facilitating the procedure to potential entrepreneurs, also ensuring their sustainable development and compatible with the environment.

Location of suitable areas for the development of marine aquaculture in Andalusia (2014). (Legal deposit SE 1335-2014) Updated study, which represents the 5th stage of the line of work that has been carried out so far. In the following links you can download the entire document by parts and provinces:

- [Presentation - Location of Ideal Areas for the Development of Marine Aquaculture in Andalusia.](#)
- [Huelva - Location of Ideal Areas for the Development of Marine Aquaculture in Andalusia](#)
- [Seville - Location of Ideal Zones for the Development of Marine Aquaculture in Andalusia](#)
- [Cadiz - Location of Ideal Zones for the Development of Marine Aquaculture in Andalusia](#)
- [Malaga - Location of Ideal Zones for the Development of Marine Aquaculture in Andalusia](#)
- [Grenada - Location of Ideal Areas for the Development of Marine Aquaculture in Andalusia](#)
- [Almeria - Location of Ideal Areas for the Development of Marine Aquaculture in Andalusia](#)
- [Description of the parameters - Location of Suitable Areas for the Development of Marine Aquaculture in Andalusia](#)

<http://www.juntadeandalucia.es/agriculturaypesca/sia/index.xhtmll>



NEEDS OF BUSINESSES

DO YOU HAVE COMPANIES LOOKING FOR AQUACULTURE SITES?	YES
TYPES OF SITES	ONSHORE AND OFFSHORE
ACTIVITIES CONCERNED	SHELLFISH, MARINE FISH FARMING, SEAWEED, OTHERS
DO THESE COMPANIES HAVE DIFFICULTIES FINDING AREAS	NO
DO YOU HAVE PROBLEMS WITH THE TRANSFER OF EXISTING PREMISES?	YES It depends on the degree of protection of the area. For instance, there are locations where marine aquaculture is allowed, however the development of other activities (housing, hotel business, etc.) are not permitted.

In Andalusia, three types of **production models** have been defined based on the regulatory compliance of the aquaculture culture carried out:

1. Ecological Model: one that complying with the mandatory regulations for aquaculture production, is covered by the organic production regulations.

- With regard to the regulatory framework that regulates it, in addition to the mandatory regional regulation, there is a specific European standard, Regulation (EC) No. 710/2009 of the COMMISSION of August 5, 2009. Thus, it remains defined among others: characteristics in reproduction and techniques used, origin of seeds and fingerlings, species that can be accommodated, feed, drugs, cultivation densities, cultivation systems, etc ...
- With regard to the establishments and cultivation phases, those defined in the previous sections can be used.

2. Conventional Model: One that complies with the mandatory regulations for aquaculture production.

- With regard to the regulatory framework, and the technical issues of cultivation, they must comply with what is stated in the previous sections.

3. Mixed Model: One that integrates technical cultivation units with the ecological model and the conventional model in the same marine culture facility.

- Regarding the regulatory framework that regulates it and the technical issues of cultivation, in addition to the compulsory regional regulation, the aforementioned Regulation (EC) No. 710/2009 of the COMMISSION of August 5, 2009 is applicable. Thus, it is defined, among others, that there must always be a clear physical separation between the units and that there is an independent water distribution system.

In Andalusia, three **types of trophic relationships** have been defined based on the interactions between crop species:

1. Monoculture: cultivation of a single species per technical cultivation unit, using the same cultivation methods.

2. Polyculture: cultivation of more than one species per technical unit of cultivation of the same or different trophic levels, being able to use different cultivation methods.

3. Multitrophic: cultivation of more than one species of different trophic levels in the same or different technical cultivation units, whose objective is to make better use of resources, removing the possible excess of organic matter generated in the main aquaculture culture by incorporating secondary crops.

Note: Technical cultivation unit understood as that independent and individual space for the development of marine cultures, located in a type of environment, with a type of culture and a specific type of installation.

In Andalusia, five **types of crops** have been defined based on the processes carried out in aquaculture farming:

1. Experimental cultivation: Those projects that deal with new cultivation species, innovative projects, and / or cultivation techniques for which there are no experiences in the Andalusian Autonomous Community in conditions close to productive ones.

2. Extensive Cultivation: those that maintain low cultivation densities in the type of environment and facility where it is developed (up to 1 Kg / m³ or m²). Being minimal human intervention, so that there is no external feeding provided, or introduction of larvae / fingerlings / seeds / postlarvae, from hatcheries, or support equipment for aquaculture production.

3. Extensive Improved Cultivation: those that maintain low cultivation densities in the type of environment and facility where it is developed (between 1 and 2 Kg / m³ or m²). Human intervention is moderate, with specific contributions of larvae, fingerlings, seeds, and postlarvae, external feeding, and use of equipment to support aquaculture production.

4. Semi-intensive cultivation: those that maintain medium cultivation densities in the type of environment and facility where it is developed (between 2 and 4 Kg / m³ or m²). Human intervention will be necessary to have greater control in the production and culture medium, with the introduction of larvae / fingerlings / seeds / postlarvae, external feeding inputs, and support equipment for aquaculture production.

5. Intensive Cultivation: those that contain high cultivation densities in the type of environment and facility where it is developed (greater than 4 Kg / m³ or m²). Human intervention is necessary to have greater control over production and culture medium, with the introduction of larvae / fingerlings / seeds / postlarvae, external feeding inputs, and support equipment for aquaculture production.

Andalusian marine aquaculture stands out for its great diversity with respect to the species it cultivates. Within the different groups of species, the most significant productions are:

- *Fish: sea bass, sea bream, sole and bluefin tuna.*
- *Mollusks: mussel and curly oyster or oyster.*
- *Crustaceans: shrimp.*
- *Others: in the group of microalgae, the species Nannochloropsis gaditana stands out.*

Fish production is the most important activity in Andalusian marine aquaculture, around 80%. In second place is the production of molluscs, approximately 20%, followed by crustaceans, with a percentage less than 5%. Algae account for a small percentage of less than 0.1%.

The transformed marshes host a large number of aquaculture establishments, and in them the culture in ponds is developed under the tidal influence, which originates residual productions of typical species of estuaries such as baila, sargo, etc. which in turn represent an extra food, together with small mollusks, crustaceans or algae, for species of the main crop, which gives them a distinctive flavor and quality.

The shellfish culture is represented by four species: mussel, oyster, Japanese clam and fine clam. The species with the highest production and which also shows a clear upward trend for the future is the mussel, which covers more than 90%, followed by the production of oyster and Japanese clam.

In the group of crustaceans, shrimp farming accounts for more than 90% of the volume produced and is proving to be a very interesting species from a commercial point of view since it is a product of great acceptance throughout the Andalusian coast. The productions obtained come from natural catchment, through totally extensive systems in estuarine and marsh areas, of companies that are mainly concentrated in the Suratlantic region. The Japanese or tiger shrimp account for less than 5% of the production volume and are obtained through intensive fattening systems.

The industrial production of microalgae is mainly formed by the species Nannochloropsis gaditana, Tetraselmis chuii and Phaeodactylum tricornutum, the former being the one that accounts for most of the production. This production is mainly destined for the aquaculture industry and comes from a company located in the province of Cádiz, which has been in operation for five years. There is an important production of other species at an experimental level for the production of biofuel and water purification.

Regarding the group of annelids, 355 kg of bloodworm (*Marphysa sanguinea*) were produced which maintain a good average price.

These species have traditionally been produced through monocultures , although given the characteristics of the beginning of aquaculture in Andalusia, mainly in the South Atlantic region, polycultures have occurred frequently. The system of the estuaries itself, as part of the saline where a pure extensive culture was developed, gave rise to small productions of a great variety of species. In the most advanced facilities in transformed marshes, although the trend has been for monocultures, we continue to find polycultures, where a species of fish has been combined with some species of bivalve mollusk or with shrimp or shrimp.

Currently there is great interest in the development of crops in multitrophic systems where species are combined that make the crop more efficient and sustainable. This is achieved by combining species of different trophic levels, so that the surpluses of the main production can be used by other secondary species.

POTENTIAL SITES

	<i>landbased</i>	<i>On sea</i>
<i>Are you able to indicate potentially available aquaculture sites?</i>	<i>Yes</i>	<i>Yes</i>

This information is public.

<http://www.juntadeandalucia.es/agriculturaypesca/sia/index.shtml>

The regional government of Andalucía is working on the selection of AREAS OF INTEREST FOR MARINE AQUACULTURE. At the moment, it is focused on the Mediterranean costa line and will be also developed in the Atlantic area of Andalucía. An area of interest for marine aquaculture it is defined by the regional government of Andalucía as an area where marine aquaculture activities are administrative compatible with the uses assigned to this area and the development of this activity is also compatible with the ecosystem, socially accepted and technical and economically viable.

ANDALUSIAN DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERY AND SUSTAINABLE DEVELOPMENT.

Identification of **IDEAL LOCATIONS** for the development of marine aquaculture: Administrative-technical process through which a sectoral and spatial analysis is carried out to determine the **areas of interest** for marine aquaculture.

PHASE 1: Delimitation of the field of study ➡ City limits, Industrial estates, etc.

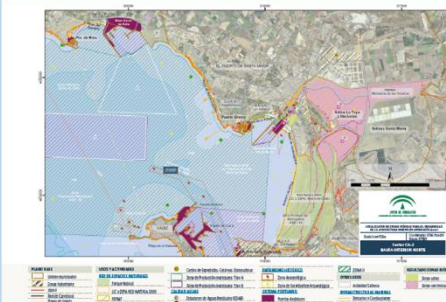
PHASE 2: Technical parameters (basic) ➡ Depth, Bathymetry, Terrain, etc.

PHASE 3: Administrative parameters ➡ Administrative uses and current activities developed within the maritime-terrestrial zone

PHASE 4: Compatibility analysis ➡ Legislation, administrative criteria, etc.

RESULTS:

■ **Ideal locations: 50 (approx.)**
■ **Ideal locations with limitations: 90 (approx.)**



ANDALUSIAN DEPARTMENT OF AGRICULTURE, LIVESTOCK, FISHERY AND SUSTAINABLE DEVELOPMENT.

Based on the previous spatial planning carried out in 2014 ➡ the selection of regulated **LOCATIONS OF INTEREST** for the development of marine aquaculture is under development.

A location of interest is an area within which the development of marine aquaculture must meet the following conditions:

- Compatible with the administrative uses of the area
- Compatible with the ecosystem
- Socially accepted
- Technical and economically viable

At the moment, this selection is being carried out along the Mediterranean coastline of Andalusia

➡ It will be evaluated in the Atlantic coastline

Port of Cádiz :

The existence of port activity in the Bay of Cadiz dates back to 1104 A.C. Since then the concept of the port and maritime traffic has greatly evolved, but the essence is still the same: a maritime fishing bay that was born and has grown rocked by the to-ing and fro-ing of the sea.

Cádiz, Puerto Real and El Puerto de Santa María are the three municipal districts in which the four commercial docks and two fishing ports that rely on the Port Authority are located, and which are complemented by repair centres and naval construction, off-shore and aeronautics, as well as water sport complexes.

Due to its geographical position, between the two main maritime routes Europe-Africa and the Americas-Mediterranean, “THE PORT OF CADIZ BAY HAS BECOME EUROPE’S SOUTHERN GATEWAY AND THE AXIS OF THREE CONTINENTS”. Connected by land through road and rail access and only twenty-five minutes from Jerez airport and fifty from Seville, the port infrastructure of Cadiz bay offers excellent connectivity.

The offer is completed with a free trade tax-free Industrial zone, a passenger Maritime Station, a Border Inspection Point, a Traffic Control Centre and an Integrated Communication Centre, among other infrastructures and services.

The public port area of El Puerto de Santa Maria has become an important centre for companies specializing in aquaculture production and research, which have opted for innovation, technology and development, becoming a national reference.

Fitoplancton Marino, S.L., specialist in the production of marine microalgae, was the first to establish itself in this space where it occupies ten thousand square metres dedicated to the development of marine cultures.

Another company that operates in the aquaculture cluster is Futuna Blue España, S.L., which also has an administrative concession of 31,000 squares metres for the farming of bluefin tuna, amongst other species.

The call effect produced by these two important companies also attracted the Aquaculture Technology Centre of Andalusia, CTAQUA, where they work to respond to the needs of the aquaculture and seafood sectors, developing customized solutions for their different technical and productive procedures.

The last to join the complex was Epic Aqua Solea Aquaculture, S.L., which is negotiating a new administrative concession for the construction of an intensive sole fish farm. In short, a breeding ground for businesses where the Port Authority continues to work on other contracts that will complement this important aquaculture cluster.

Latest additions :

Last August (2020), the Port Authority of the Bay of Cádiz started the process, with the publication in the BOE, of the application of the company Acuicultura Cádiz EME-450.1, S.L. for the administrative concession for the occupation of land on the left bank of the River Guadalete, in El Puerto de Santa María, for the construction of a multi-fattening module of seriola (lemon fish).

The plot, located in the aquaculture cluster of the port's dock, has an area of 10,000 square meters and the term for which the concession is requested is 30 years.

The project provides for an annual production of 450 tons, based on the use of seawater recirculation technology (RAS), a clean and non-polluting procedure that guarantees the industrial production of this species.

The fattening module will have a built area of 4,541 square meters on the ground floor and almost 2,000 on the mezzanine floor. The facilities will have fattening tanks, offices, water treatment areas, work and classification areas, a control and surveillance area, a warehouse, a cold chamber, a laboratory, a workshop, warehouses, changing rooms, a waste storage area, a reserve tank and a decanter.

The total investment amounts to 2.3 million euros.

As is known, on the left bank of the Guadalete River, in a public port area, there is an important cluster of aquaculture exploitation industries that are pioneers in the sector and have made a strong commitment to innovation, technology, research and development. International and also local companies have set their sights on this space, due to its special characteristics (of the river water), for aquaculture breeding and production.

4. Part 2 : Common indicators boards and methodology



2.1 GRID OF COMPARISON

	Andalusia (Spain)	Algarve-Porto (Portugal)	Finistere (France)	Wales (United Kingdom)	Ireland
Who carries the approach	Government of Andalousia	Portuguese Government / Ministry of Agriculture and Sea	Private approach led by IEF for land areas	Welsh Government	Dept of Housing, Planning and Local Government
Other initiative	Interreg Project on a little zone on the border with Portugal	Stategic Plan for the Portuguese Aquiculture	Governmental approach for on sea but not edited yet		Dept of Agriculture, Marine and Natural Resources
Date	2014 – 2018 In 2018 the POCTEP AQUA & AMBI Interreg was updated by AGAPA (Junta de Andalucia and CTAQUA)	2014-2020	2015	2020	2018—
Duration of the work	In 2003, the first study on the location of suitable areas was published. Since then, work has been done on updates and development of complementary studies in the Andalusian Mediterranean as a location for areas of interest. Likewise, the POCTEP AQUA & AMBI project has worked on an update of the information and a case study of the Bay of Cadiz	7 year plan	updated each 2 years informative documents	20 years plan	indeterminate
Is there a diagnostic of the current situation?	Yes	Yes	Yes	Yes (Constrains and Opportunities analysis)	Yes

Main facts of the current existing situation (species...)	<p>Fish production is the most important activity in Andalusian marine aquaculture, around 80%. In second place is the production of molluscs, approximately 20%, followed by crustaceans, with a percentage less than 5%. Algae account for a small percentage of less than 0.1%.</p> <p>The transformed marshes host a large number of aquaculture establishments, and in them the culture in ponds is developed under the tidal influence.</p> <p>These species have traditionally been produced through monocultures , polycultures multitrophic</p>	<p>The cultivation of marine and brackish species in Portugal began in coastal waters, in estuaries and coastal lagoons, using extensive production regimes, reusing, in particular, the infrastructure of the salt industry.</p> <p>With regard to the evolution of the exploited species, there are three different periods. Until the 70s, aquaculture production was dominated by mugilids, typically forage species and of low commercial value, which represented about 80% of fish production. The 1980s were characterized by the large increase of fish farms in inland waters (particularly rainbow trout), accompanied by bivalves (especially clams) in brackish and marine waters. The 90's are characterized by the strong growth and modernization of marine species aquaculture, initially centered on sea bass and sea bream and, more recently, on turbot and sole.</p>	<p>On-shore : shell fish buildings or facilities without or with seawater intakes, anonymous data (no names of owners). On-sea, areas without indications about species</p>	<p>The production of farmed finfish in Wales is currently limited and is confined to on-shore facilities.</p> <p>Most production in Wales focus on shellfish (blue mussels), some intention to expand to the native oyster and scallops. Seaweeds generate a lot of interest. Microalgae had a big push in the last 5 years. (Page 80, Welsh National Marine Plan)</p>	<p>Legacy of species-specific licensing.</p> <p>Lag in planning decisions</p>
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	Andalusia (Spain)	Algarve-Porto (Portugal)	Finistere (France)	Wales (United Kingdom)	Ireland
Potential areas Yes or no	Yes		Yes	Yes	Yes
Key elements of methodology	4 phases: 1 / Delimitation of the study perimeter 2 / technical parameters 3 / Administrative parameters 4 / Analyze compatibility	Main axes of strategic intervention: the interventions necessary to achieve the strategic objective for the aquaculture sector in Portugal are grouped into three axes. One of those axes is related to spatial planning	The approach allowed to – define the parameters - list the constraints - to compare data from GIS with technical interviews - to list the existing areas/to define on-shore potential ones/ to define large areas on sea	The methodology included a detailed work plan: Data collection and processing ☑ Constraints and opportunities analysis ☑ Production of evidence packages (page 6; SMMNR report)	Planning Funding Stakeholders Investment
Results - potential Please specify for Onshore and offshore	Cádiz: 3 areas (Bahía de Cádiz, Marismas del Barbate, Doñana). Total: 10 sectors studied Huelva: 3 areas (Marismas del Odiel, Marismas del Río Piedras and Flecha del Rompido, Marismas de Isla Cristina). Total: 9 sectors studied in the south-Atlantic region of Andalusia	Facilitate access to space and water that aims to identify spaces with water resources with greater potential for aquaculture and which have lesser environmental impacts, ensuring their compatibility with other uses of those resources	57 areas on shore// on sea, couldn't obtain areas only large zones	Offshore: seaweeds, and sea cages with shellfish. Inshore: sea-cage installations for seaweeds (page 80, Welsh National Marine Plan)	Zero offshore at present, 111 licensed business and 19 of those current clients of Údarás
Public or private information	Public	Public for existing sites Private for potential sites	Public for existing sites Private for potential		Licenses are in public domain, applications in process are strictly confidential
Key success	Representation of administrative information that affects the space provided by all public bodies with powers on the ground (DPMT) Active participation of stakeholders	Potential to increase production of high quality and highly valued species; Possibility of installing new sites in the open sea and even, in association with other activities	A federated approach with all the stakeholders		Very high level of stakeholder engagement and support

Lack	Representation of the most appropriate type of crop according to environmental characteristics (it has only been worked from an administrative point of view) Loading capacity.	Incipient planning with consequent difficulty in identifying areas for aquaculture activity	No nominative data , potential areas not detailed by species or type of project		Planning which was refused upon initial application; reapplication is in process
Next steps/comments	Development of studies that allow the integration of production models according to administrative, environmental and location characteristics.	The existence of a significant potential for increasing aquaculture production can be an attractive factor for larger and more competitive companies that can induce greater entrepreneurship , the dynamization of research and the development of new technologies	On-shore : define suitable areas by types of project// on sea : we wait for the governmental approach		Current objective is to map our data to the GIS Marine Atlas

2.2 METHODOLOGY

The state of art and comparison grid make us realize that most partners' regions are engaged in spatial planning. So it is not relevant to design a new methodology.

We have decided to use these data to highlight some relevant points of spatial planning methodology. The common points are detailed after.

> **Aquaculture is considered a key economic sector** for the development of each territory concerned, especially because employment is local and not relocatable.

> However, if we want to support the development of new projects, it is compulsory to detect possible or available sites. This objective is really shared by all territories and consists in **developing a spatial model to identify coastal and marine areas potentially suitable for future marine aquaculture developments to support the sustainable development of aquaculture.**

In general, the approach is involved in a more global one (such as a maritime plan for example) and inform or feed those other marine plans.

> **The commitment of stakeholders** is essential and present in each spatial planning work.

> **About the way of doing**

One of the 1st common steps is to delimitate the geographical area concerned, define the objectives and terms employed, and **to establish a state of the art of existing situation.**

Then, criteria are selected to work with data layers.

The spatial model generally considered the core components related to

- Natural resource constraints (e.g. water depth, substratum, temperature, bathymetry etc.)
- Marine Spatial Planning (MSP) constraints (e.g. nature conservation designated sites, areas of former marine industry activity, infrastructure and exclusion zones, recreational activity, urbanism, legal constraints, ...)

Some also consider investment-dependent constraints (e.g. proximity to landing ports, depuration facilities, logistics facilities...).

Data collected and aggregated come from multiple data layers. It is the reason why it is a complex and long time work.

The GIS treatment is often completed by feedback from stakeholders. This information complete data.

=> It takes several years to establish the 1st version considering all the stakeholders and data.

> **Some common limits :**

- It should be noted that some spatial model has limitations relating to spatial data availability. Some reports make recommendations for future developments of the model to address these issues.

- Furthermore, areas of opportunity for aquaculture development are likely to be influenced by available technology, biosecurity, site-specific natural resource and/or planning factors, and expert knowledge regarding how these factors are likely to affect the viability of any aquaculture development.

A time considered, the comparison of criteria one by one was finally discarded. Risk of being long and of no interest because the steps are well advanced everywhere and in any case, the projections are linked to physical criteria that differ from a region to another one (geology, topology, swell, temperature....).

Simplified methodology diagram/common points of spatial planning



5. Part 3 : relevancy of a shared tool for onshore and offshore sites

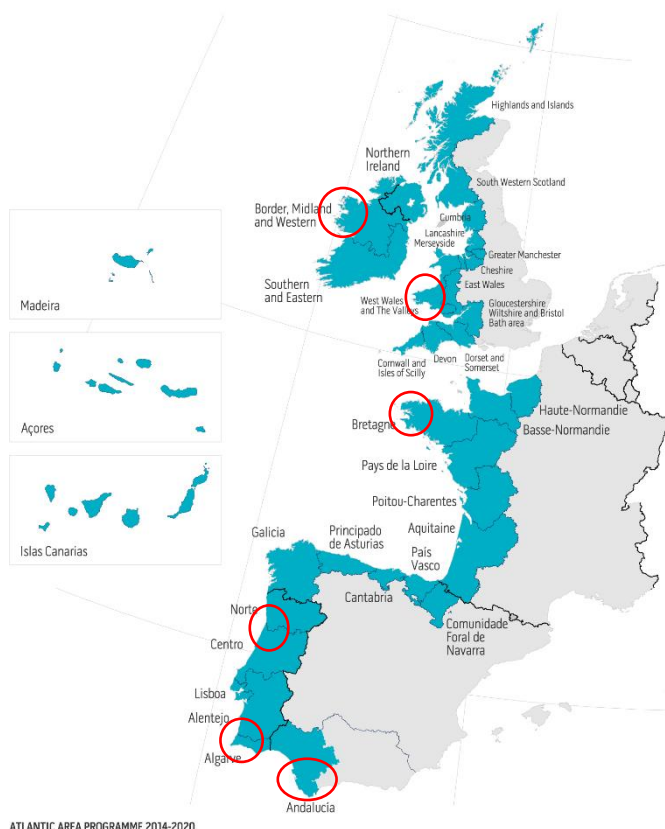


The partners gathered in Steering committee in Faro worked about the way of designing a tool to have a shared one for onshore and offshore aquaculture sites.

The presentation of each spatial planning approach highlights the numerous data analysed and gathered for each country.

One 1st hypothesis was to aggregate all our layers in a one single GIS but it is going to be quite complex, take a lot of time and be very expansive. All the partners don't have a GIS, some are still developing one. And for those who have already one, it is not useful to have another one.

So we worked on a 2nd hypothese and we have chosen to have a common map that indicates the link with the tools and states of art of each country. This map is going to promote the potential sites of each country. This map will be edited in the action 4.





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