Sector Fiche:

Marine Aquaculture

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1 Basic Facts

Gross Value added	State of the sector	Presence across sea basins
€ 3.357 billion European (EU) marine aquaculture in 2014[1].	Mature and decreasing (overall EU production, excluding Norway)[2].	Established, with different potential for development, specific for each sea basin[3].

Land-sea interaction	Temporal aspect	Lifetime of installations
• Through access to ports. • When developed in coastal waters, two-ways interaction through the quality of waters.	• Seasonality of production. • Variable development time, depending on production cycles of different species.	Variable between 5 – 30 years.

Interaction with other uses
Conflicts for access to space mostly occur with beach tourism, shipping, oil and gas extraction and marine aggregates and marine mining sectors. Synergies can be developed with tourism, renewable energy production and environmental protection[4].

[1] DCF (2014).
[2] AQUASPACE project (2016a).
[3] STECF (2016).
[4] See Section 4 of this sector fiche for further information

2 Composition of the marine aquaculture sector

The marine aquaculture sector can be broken down by: i) main farmed species and ii) technology deployed

Main farmed species	Finfish		Atlantic salmon (UK as main producer); Seabream, Seabass (Greece as main producer).
	Shellfish	Molluscs	Oysters (France as main producer); Mussels production (Spain as main producer); Clams (Italy as main producer); Scallops.
		Crustaceans	Shrimp; Lobster.
		Equinoderms	Sea urchin
	Algae	Microalgae	Algae aquaculture activities are currently at a very low scale in Europe although some algae products are widely used in the food industry (i.e. agar, carrageenan and alginates)[5].
		Macroalgae	*Laminaria digitata*
Technology deployed	Marine fish farming		
	Extensive brackish water farming		Traditional extensive fish farming in lagoons and coastal ponds is one of the most ancient aquaculture methods. Depending on their geographical situation, lagoons and coastal ponds provide seabass, eels and different species of seabream, mullets, sturgeons, crayfishes and shellfish. Production in extensive farms is generally low (less than 1 t/ha/y).
	Intensive sea farming	Sea cages	Sea cages hold fish captive in a large net anchored to the bottom and maintained on the surface by floating framework. They are used for rearing salmon, sea bass and sea bream, and to a lesser extent trout, in coastal and open waters, in areas sheltered from excessive wave action, with sufficiently deep water and relatively low current speeds.
		Recirculation systems	Recirculation systems on land can also be used for the farming of marine species.
	Shellfish farming		
	Bottom farming		It is practised in shallow coastal or estuarine areas, up to ten metres deep
	Inter-tidal shellfish farming		It is practiced in areas between high and low tide
	Floating systems		They are used in open sea or estuarine environments. They can be • rafts (solid floating platforms supporting the farmed shellfish) • floating lines (anchored at both ends, on which shellfish are suspended - either directly or on dropper lines).
	Algae farming		
	Seaweed can be cultivated on big ropes or nets in coastal area, protected from the winds and strong currents where they can be constantly immerged underwater.		
	Microalgae or cyanobacteria can be cultivated in photobioreactor. A variety of methods are available with various materials (plastic, glass, PVC, etc.) and shapes (vertical, horizontal, Christmas tree, etc.)		
	Integrated aquaculture		
	Integrated multi-trophic aquaculture (IMTA) includes organisms from different trophic levels of an ecosystem (e.g. fish, shellfish, algae), so that the by-products of one become the inputs of another. MTA may reduce the environmental impacts directly through the uptake of dissolved nutrients by primary producers (e.g. macroalgae) and of particulate nutrients by suspension feeders (e.g. mussels), and through removing the nutrients from the location.		

Figure 1: Composition of the marine aquaculture sector

[5] DG MARE (2012).

3 Relationship between marine aquaculture and MSP

3.1 What are present spatial needs of the marine aquaculture sector?

Depending on the type of finfish or shellfish cultivated, marine aquaculture activities need areas with specific features (water depth, water quality, currents, etc.); in addition operational activities require easy access to ports and to other coastal facilities.. The selection of the spatial area designated for aquaculture development and careful selection of farm sites are essential first steps to ensure the success and sustainability of aquaculture[6].

From a quantitative point of view, only limited analyses have been carried out to evaluate the present spatial demand of European marine aquaculture[7]. Based on information available from FAO, as little as 630ha have been estimated to be used in the production of 95% of European marine aquaculture[8-9] . Given that most marine aquaculture occurs in inshore waters, the amount of coastline impacted by marine aquaculture has been estimated to range between 0.5% and 3% of national coastlines (10 EU countries evaluated), although is higher for small island states (e.g. Malta) or those with very short coastlines (e.g. Slovenia); and that production most often occurred in distinct clusters or areas[10].

Considering the very low figures of occupied surface, it seems difficult to imagine that the expansion of marine aquaculture in the EU would be constrained by a lack of space in absolute terms[11]. Limitations to growth may be better explained by the competition for space which takes place at the local level with more established coastal economic activities and by possible conflicts with environmental protection needs[12].

3.2 Which anticipated future developments of the industry are relevant to MSP?

Future market demands	New tools
European aquaculture production has declined over the last 10-15 years, but there is almost universal acceptance that, at a strategic level, aquaculture production must increase within Europe[13]. in order to satisfy the increasing demand for sea food, couple with reduced catches, decrease the dependence from importation, boost economic development and job creation, reduce pressure on fish stocks, As a consequence, in the context of spatial planning, most EU Member States need to improve spatial planning for aquaculture, and some propose how this might be achieved, e.g. through better mapping, use of technologies, such as GIS, or through undertaking studies to identify potential new areas. Few (if any) countries commit to increasing the amount of space allocated to aquaculture in any definitive way[14].	New tools for siting, analysis of spatial interactions, cost-benefit analysis, environmental impact analysis[15]. New aquaculture national plans will be able to identify most suitable areas for this sector developments. Presently, inappropriate spatial site selection of aquaculture is a major constraint to sustainable development and expansion of the industry. A poor location of an aquaculture farm or zone results in poor production and might create environmental problems; it may also generate a broader impact on environmental, social and economic aspects, such as conflicts with other human activities over the use of inland and coastal zone resources[16].

New cultivated species	Co-existence	Moving offshore
Increasing demands are calling for an expansion of the European aquaculture industry and therefore pushing for the introduction of new cultivated species. The biological and socio-economic potential of new/emerging candidate fish species are being explored[17]. Their cultivation will demand new, specifically suitable areas.	Growing maritime activities in coastal seas[18] will definitively increase the need for this sector to solve the conflicts with other activities and define options for co-existence[19].	The opportunity to move offshore is challenging the sector[20] and will generate modifications in its spatial requirements, in some cases leaving free space in coastal waters, in others expanding the activities also offshore[21]. Offshore expansion could be facilitated by synergies with other offshore maritime sectors, in a Multi-Use context [22-23], but also could possible profit from synergies between coastal and offshore aquaculture (e.g. by sharing services or inland infrastructures)[24].

[6] FAO & World Bank (2017).
[7] AQUASPACE project (2016a).
[8] Ibid.
[9] Hofherr, J., Natale, F. Trujillo, P. (2015).
[10] Ibid.
[11] Hofherr et al. (2015).
[12] Ibid.
[13] AQUASPACE project (2016a).
[14] Ibid.
[15] AQUASPACE project (2016b).
[16] IUCN (2009).
[17] DIVERSIFYFISH project (2013-2018).
[18] SOER (2015).
[19] Stelzenmüller et al. (2013).
[20] Gentry et al. (2017).
[21] EU MSP Platform (2017).
[22] Jansen et al. (2016).
[23] Buck, B. H., Langan. R. (2017).
[24] EU MSP Platform (2017).

4 Interaction with other sectors

Shipping and ports	Tourism and recreation	Oil and gas
• Aquaculture devices pose risk to navigation and therefore their installation is forbidden in the vicinity of commercial or military shipping lanes[25]. • Recreational sailing and boating activities challenge aquaculture for coastal space, particularly in areas where both operate from local ports[26]. • Possible spillage of hazardous products from ships pose environmental and health risks to coastal aquaculture[27].	• Aquaculture could contribute to eutrophication of coastal waters, thus indirectly impacting beach tourism[28]. • Aquaculture installations (including land based facilities) could impact aesthetics of seascapes and coastal territories. Thus, tourism, with the desire for uninterrupted ocean views, may block aquaculture development[29]. • Synergies can be developed by including aquaculture-related activities as part of the touristic offer in coastal areas[30-31].	• Possible spillage of hazardous products from oil extraction sites could pose environmental and health risks to farmed organisms (mortality) and human health (contamination). On-shore devices can also be impacted by dispersed oil. Damage may also result from measures taken to combat an oil spill (chemical dispersant)[32].

Pipelines and cables	Fishing	Marine aquaculture
• Their laying could have potential impacts on aquaculture: re-suspension of sediments, release of contaminants (associated with disturbance of sediments). Interdiction of other maritime activities (including aquaculture) are generally imposed in the vicinity of the area where cables and pipelines are located[33].	• Aquaculture can negatively impact the health of fish stocks[34] by introducing diseases and escapees that can interbreed with wild stocks[35-36] , by affecting food webs[37], and by degrading water quality and habitats via farm effluents[38]. • Aquaculture can potentially benefit wild fisheries[39] by creating structures that could be utilized as habitat by target species or their prey, and by adding food and nutrients to the ecosystem, which could increase productivity or be consumed directly by target fishes[40-41-42-43] .	• Synergies between different aquaculture productions are available through Integrated Multi-Trophic Aquaculture, with potential for increasing the production and reducing the environmental impact[44].

Offshore wind and marine renewables	Marine aggregates	Conservation
• Opportunities for developing aquaculture activities in combination with offshore wind farms, provided the existing barriers are overcome [45-46-47].	• Potential impacts: obstruction of routes to licensed aggregates extraction sites, increased vessel traffic (coinciding when and where dredging operations are taking place), re-suspension and physical abrasion of seabed sediments, releases of contaminants (associated with disturbance of sediments)[48].	• Measures targeting nature conservation can impact the sector by constraining the expansion of existing farms, the establishment of new farms or through applying restrictions on types of farmed species[49]. • Opportunities for developing sustainable aquaculture activities within or in the vicinity of marine protected areas[50].

[25] Dempster, T., Sanchez-Jerez, P. (2008).
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] MARIBE project (2015-2016a).
[31] MUSES project (2017).
[32] ITOPF (2014
[33] NIRAS (2015).
[34] Gentry et al. (2017).
[35] Hoagland, P., Jin, D.I., Kite-Powell, H. (2003).
[36] Tisdell, C. (2003).
[37] Gibbs, M.T (2004).
[38] Naylor et al. (2000).
[39] Gentry et al. (2017).
[40] Arechavala-Lopez et al. (2011).
[41] Hehre, E.J., Meeuwig, J.J. (2016).
[42] Pitta et al. (2009).
[43] Bacher, K., Gordoa, A. (2016).
[44] Hughes et al. (2016)
[45] Buck & Langan Eds. (2017).
[46] MARIBE project (2015-2016b).
[47] MUSES project (2017).
[48] MMO (2014).
[49] Ibid.
[50] IUCN (2017).

5 Recommendations for MSP processes in support of the sector[51]

Identify high potential areas

Within MSP process, identification of the areas with higher potential for aquaculture development should be considered, thus supporting better siting and expansion of the aquaculture sector to new areas (also offshore), including those areas suitable for introduction of new cultivated species, at present and also looking to future commercial trends.

Guarantee marine data availability

MSP should guarantee the availability of relevant marine data, available for the MSP process, to aquaculture practitioners. Availability of regularly up-dated spatial oceanographic data and data concerning other maritime activities is crucial for the sector, in order to define the location and the type of different productions. Given the small size of aquaculture companies and the fragmentation of the sector, the opportunity to access to collected data, systematized and elaborated, would be a great contribution to the development of the sector.

Solve critical issues

In the framework of the aquaculture strategies developed at national level, MSP should contribute to solve critical issues at local and transnational levels (cross-border) through the identification of conflicts and suggesting co-location strategies with other maritime uses. In doing this MSP can make available to the sector its specifically developed tools.

Support cyclic assessments

MSP should support in the longer term the spatial planning of the sector, through the introduction of cyclic assessments that could modify the spatial characteristics of the sector. In such a way major challenges like those due to new emergences of diseases in the marine environment and potential changes in environmental parameters due to climate change (temperature, ocean acidification, etc.) could be better faced. All of which will have consequences on future aquaculture production and on the economic results.

Stimulate farm clusters

MSP can support the aquaculture sector by stimulating the creation of clusters of farms, each within a management area (Aquaculture Management Areas – AMAs; or Allocated Zones for Aquaculture - AZAs[52]), which look at the specificities (social, economic and environmental) of their spatial area and manage to reduce those risks that might happen whilst optimizing farm production.

Streamline licensing procedures

MSP can represent a way to encourage national governments to overcome licensing barriers through providing clarifications, shortening and harmonizing procedures for licensing. In fact, limited success in obtaining licenses and time required for licensing procedure are perceived by the operators as major barriers to the sector's development.

Improve social acceptance

MSP can support the aquaculture sector by improving its social licensing. By bringing the sector into a multi-stakeholder debate, including the civil society, MSP can bring significant benefits to aquaculture, improving public perception and social acceptability. Key aspects for public perception are environmental impacts, especially those associated with marine fish farming, and access to and use of coastal resources. Specifically:

- improving public perception by highlighting placement decisions in relation to possible environmental concerns, such as migrating fish routes, currents circulation alterations, degradation around aquaculture sites, eutrophication, and fisheries and other coastal uses displacement, etc. is to be encouraged.
- in order to secure better possibilities of success for potential new licences, the possibility of earmarking suitable spaces for aquaculture activities (decided amongst all stakeholders) should be encouraged.

Communicate potential MSP benefits

Since MSP can provide several benefits to the sector, when appropriately taking up some critical points during the plan preparation/revision process, it is crucial to communicate these potential benefits to the sector and get it fully engaged into MSP processes at national and sub-national level.

[51] EU MSP Platform (2017).
[52] Sanchez-Jerez et al. (2016).

6 Resources[53]

6.1 Legal framework

Organistion	Title	Link	Short explanation
European Parliament and Council	Regulation (EU) No 1380/2013 of the European Parliament and the Council of 11 December 2013 on the Common Fisheries Policy	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1380	Contains the basic provisions of the EU's new Common Fisheries Policy (CFP). The CFP shall ensure that fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies (Article 1) EU countries must prepare multi-annual plans to boost aquaculture and ensure compliance with environmental, social and economic standards in this sector (Article 34)
European Commission	Strategic Guidelines for the sustainable development of EU aquaculture (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the regions -2013)	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1477555805378&uri=CELEX:52013DC0229	Presents common priorities and general objectives at EU level for the aquaculture sector. Four priority areas are identified in order to unlock the potential of EU aquaculture: administrative procedures, coordinated spatial planning, competitiveness and a level playing field.
European Parliament and Council	Regulation (EU) No 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund (EMFF)	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.149.01.0001.01.ENG	Establishes the European Maritime and Fisheries Fund contributing to the Europe 2020 strategy and supporting the implementation of CFP. Support is given to the development of environmentally sustainable, resource-efficient, innovative, competitive and knowledge-based aquaculture (priority 2).
European Parliament and Council	Regulation (EU) No 708/2007 of the European Parliament and of the Council amended by Regulation (EU) 304/2011 of 9 March 2011 concerning use of alien and locally absent species in aquaculture	http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32011R0304	Establishes a framework governing aquaculture practices in relation to alien and locally absent species to assess and minimise the possible impact of those species and of associated non-target species on aquatic habitats.

[53] The information provided under this section is non-exhaustive. The intention is to provide the reader with basic information on the sector.

6.2 Actors

Name	Link	Short explanation
EAS - European Aquaculture Society	http://www.aquaeas.eu	EAS has four principal objectives: To promote contacts between all involved or interested in marine and freshwater aquaculture; To facilitate the circulation of aquaculture related information; To promote the sponsorship of multi-disciplinary research concerning aquaculture; To enhance cooperation among governmental, scientific and commercial organizations and individuals on all matters dealing with aquaculture.
EATiP - European Aquaculture Technology and Innovation Platform	http://www.eatip.eu	It aims to develop measures and structures that will improve the research, development and innovation conditions so as to support the sustainable development of European aquaculture. The activities of EATIP will provide the foundations for technical and economic excellence which will be the basis of the leadership potential of European aquaculture at the global level.
Aquaculture Advisory Council	https://ec.europa.eu/fisheries/cfp/aquaculture/aquaculture-advisory-council_en	In the framework of the Common Fisheries Policy, an Aquaculture Advisory Council (AAC) has been established. This stakeholder-led organisation has as main objective to provide the European institutions and the Member States with recommendations and advice on issues related to the sustainable development of this sector
AquaTT - The European Network for Training and Technology Transfer in Aquaculture	http://www.aquatt.ie	AquaTT is an SME, with a not-for-profit mandate. It was founded in 1992 under the EU COMETT programme as the University Enterprise Training Partnership (UETP) for the European aquaculture industry, to coordinate the training requirements of the industry through a single body.
GFCM - General Fishery Commission for the Mediterranean	http://www.fao.org/gfcm/en/	The General Fisheries Commission for the Mediterranean (GFCM) is a regional fisheries management organization (RFMO) established under the provisions of Article XIV of the FAO Constitution. The GFCM is currently composed of 24 members (23 member countries and the European Union) who contribute to its autonomous budget to finance its functioning and 3 Cooperating non Contracting Parties (Bosnia and Herzegovina, Georgia and Ukraine). Among its committee the Scientific Advisory Committee on Aquaculture (CAQ) is comprised.

6.3 Initiatives

Name	Link	Short explanation
PERFORMFISH	performfish.eu	On-going (2017-2022) H2020 project aiming at ensuring sustainable growth of the Mediterranean aquaculture industry, based on consumer perceptions and real market requirements. Aiming also to support fish farms that operate not only in ideal economic and environmental conditions but also in a socially and culturally responsible manner.
MedAID	http://www.medaid-h2020.eu	On-going (2017-2021) H2020 project aiming at increasing the overall competitiveness and sustainability of the Mediterranean marine fish-farming sector, throughout the whole value chain. Its objectives will be achieved: • through a holistic assessment to identify the main technical, environmental, economic and social challenges which may condition the sustainability of the sector, • by addressing those technical, environmental, economic and social challenges that the sector currently faces, • by developing innovative knowledge and tools to improve the performance of the production systems, creating and fostering added-value products and socially acceptable business plans. • by developing innovative knowledge and tools to improve the performance of the production systems, creating and fostering added-value products and socially acceptable business plans.
TAPAS	tapas-h2020.eu	On-going (2016-2020) H2020 project aiming at promoting and consolidating the environmental sustainability of the European aquaculture.
CLIMEFISH	http://climefish.eu	On-going (2016-2020) H2020 aiming at supporting sustainable fisheries, enabling an increase in European aquaculture production, facilitating employment and regional development in the sectors, and developing forecasting and management tools for adapting to climate change; all in co-creation with stakeholders.
AQUAEXCEL2020	http://www.aquaexcel2020.eu/	This on-going (2015-2020) H2020 Research and Infrastructure project aims to further support the sustainable growth of the European aquaculture sector. AQUAEXCEL2020 will integrate a large group of leading European aquaculture research facilities and aims to advance aquaculture research and innovation in Europe. One of its key aspects will be to provide subsidized access to top-class aquaculture facilities, as well as numerous highly pertinent services for researchers from academia and industry.
AQUASPACE (Making Space for Aquaculture)	http://www.aquaspace-h2020.eu	On-going (2015-2018) H2020 project aiming at providing increase space for aquaculture by identifying key constraints limiting development. It uses a case study approach in order to identify constraints to aquaculture in a wide range of contexts, scales and production types.
Bluemed Research and innovation initiative for blue jobs and growth in the Mediterranean area	http://www.bluemed-project.eu/wp-content/uploads/2016/12/Bluemed-SRIA_A4.pdf	The BLUEMED initiative offers a shared strategic framework for working towards a healthy, productive and resilient Mediterranean Sea. It is designed to tap the full potential of the marine and maritime sectors, structuring transnational cooperation to create new 'blue' jobs and to promote and improve social wellbeing, sustainable prosperity and the environmental status of the region and its surroundings. Ecosystem-based management of Mediterranean aquaculture and fisheries is included among the key sectoral enablers in the Mediterranean.
Baltic Blue Growth	http://www.balticbluegrowth.eu	On-going (2016-2019) Interreg Baltic Sea Region project examining siting criteria for mussel aquaculture
SUBMARINER	http://www.submariner-project.eu	Public-private network examining different types of maricultures and other uses of sea resources in the Baltic Sea region

6.4 Selected literature

Author	Title	Link	Short explanation
EU Commission –Scientific Advice Mechanism	Food from the Oceans - How can more food and biomass be obtained from the oceans in a way that does not deprive future generations of their benefits? (2017)	http://ec.europa.eu/research/sam/pdf/sam_food-from-oceans_report.pdf	This report provides a number of evidence-based policy recommendations on increasing the amount of food harvested from the ocean while maintaining healthy marine and coastal ecosystems.
IUCN	Aquaculture and marine protected areas: exploring potential opportunities and synergies (2017)	https://portals.iucn.org/library/node/46692	In order to feed the world's growing human population, attention will need to increasingly focus on where the protein needs of the world will be supplied from. In addition, there is a need for increased ocean protection and the preservation and/or restoration of marine ecosystem health. The establishment of Marine Protected Areas (MPAs) is a key tool essential to meeting the Aichi targets. Acknowledging that both aquaculture and MPA may benefit from each other in striving for global sustainable development, the report explores synergies and joint opportunities.
IUCN	Guide for the Sustainable Development of Mediterranean Aquaculture - Interaction between Aquaculture and the Environment (2004-2005)	https://www.iucn.org/content/guide-sustainable-development-mediterranean-aquaculture	Most of the potential environmental impacts of aquaculture can be managed and minimized through the understanding of the processes, responsible management and the effective siting of farms. Therefore, sustainable management guidelines are essential tools for policy makers, administrators, aquaculture producers and other stakeholders. The guide deals with domestication, introduced marine species, capture of wild stocks, feed ingredients, pathogens, effects on local flora and fauna etc.
Scientific, Technical and Economic Committee for Fisheries - STECF	Economic Report of the EU Aquaculture Sector (EWG-16-19); Publications Office of the European Union, Luxembourg (2016)	http://publications.jrc.ec.europa.eu/repository/handle/JRC104210	Aquaculture data for 2008-2014 are analyzed and summarized in the report. Beside the updated description of the data the report provides also an evaluation of the effect of public support to the aquaculture sector under the EFF programme 2007-2014 using the DCF data collected from 2018-2014

Author	Title	Link	Short explanation
Stelzenmüller et al. - COEXIST project	Guidance of Better Integration of Aquaculture, Fisheries, and other Activities in the Coastal Zone (2013)	http://www.coexistproject.eu/images/COEXIST/Guidance_Document/Best%20practices%20guidelines_FINAL.pdf	The purpose of this guidance document is to promote the better integration of aquaculture, fisheries and other activities in the coastal zone by the identification and application of appropriate spatial management tools. The conclusions drawn and the recommendations in this document are largely based on the experience of applying a set of methods and technical tools to address a number of key questions in spatial management in six COEXIST case studies (Hardangerford, NO; Atlantic Coast, IE; Atlantic Coast, FR; Algarve Coast, PT; Adriatic Sea Coast, IT; Coastal North Sea, DE, NL, DK; Baltic Sea, FI)
GFCM	Developing site selection and carrying capacity guidelines for Mediterranean aquaculture within aquaculture appropriate areas" (SHoCMed)	http://www.fao.org/gfcm/activities/aquaculture/projects/shocmed/en/	The objectives of SHoCMed were to: i) produce site selection criteria in order to enhance the integration of aquaculture in coastal zone management through the use of allocated zones for aquaculture (AZA); and ii) to provide a basis for the harmonization of standards, aquaculture policies and legal frameworks across the Mediterranean region to ensure equal terms of competition and minimal environmental impact.
European Commission	Guidelines on the integration of Aquaculture in Natura 2000 sites	http://ec.europa.eu/environment/nature/natura2000/management/docs/Aqua-N2000%20guide.pdf	The guidelines aim to facilitate the knowledge and implementation of EU legislation underpinning Natura 2000 in relation to aquaculture activities. They are designed to contribute to a better understanding of the conservation objectives of the sites, promoting best practices which illustrate how nature protection provisions can be compatible with sustainable aquaculture development.
European Commission	Commission Staff working document on the application of the Water Framework Directive (WFD) and the Marine Strategy Framework Directive in relation to aquaculture	http://ec.europa.eu/environment/marine/pdf/SWD_2016_178.pdf	The document is intended as a practical guidance which would facilitate the implementation of the Water Framework Directive and Marine Strategy Framework Directive in the context of the development of sustainable aquaculture. It provides good practices, suggestions and information about sustainability of EU aquaculture production and its compliance with relevant EU environmental legislation.

7 List of acronyms

Acronym	Full title
AAC	Aquaculture Advisory Council
AMAs	Aquaculture Management Areas
AQUATT	The European Network for Training and Technology Transfer in Aquaculture
AZAs	Allocated Zones for Aquaculture
EAS	European Aquaculture Society
EATIP	European Aquaculture Technology and Innovation Platform
EMFF	European Maritime and Fisheries Funds
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GFCM	General Fishery Commission for the Mediterranean
GIS	Geographic Information System
ha	hectare
IUCN	International Union for Conservation of Nature
ITOPF	The International Tanker Owners Pollution Federation limited
MSP	Maritime Spatial Planning
SAPEA	Science Advice for Policy by European Academies.
UK	United Kingdom

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AQUASPACE project (2016b). AQUASPACE Ecosystem Approach to making Space for Aquaculture. EU Horizon 2020 project grant no. 633476. Deliverable 3.1 Tools and methods supporting EAA: Finding the gap towards an environmental Cost Benefit Analysis.	http://www.aquaspace-h2020.eu/wp-content/uploads/2017/10/Tools-and-methods-supporting-EAA.pdf
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DCF - Data Collection Framework (2014). *Joint Research Centre - Scientific, Technical and Economic Committee for Fisheries.*	https://stecf.jrc.ec.europa.eu/reports/dcf-dcr
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