



aquaculture europe

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**Cockles take
centre stage!**



New species for EU aquaculture

**DIVERSIFY
Grey Mullet**

**Breakthrough:
First DIVERSIFY
wreckfish juveniles
produced**



**PLUS Full minutes of the EAS
2018 General Assembly**

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Cooperation for restoring cockle shellfisheries & their ecosystem services in the Atlantic Area



Cockles are an emblematic resource that provide a wealth of services to coastal communities in the Atlantic Area (AA), including environmental, societal, cultural as well as economic benefits. They are considered a delicacy of Atlantic gastronomy and an asset for tourism. From a social perspective, cockles are traditionally exploited by small associations, often with high rates of female employment. Regarding protected areas, the cockle is a key-species for many top predators (finfish, waders).

However, this emblematic resource – especially the most valued native species, *Cerastoderma edule* – is threatened by disease outbreaks and suboptimal management. An ongoing EU Interreg project is looking to address this.

How do cockles benefit society?

Ecosystem services is a term used to describe the many different benefits that humans get from the natural environment and from healthy biological systems. They are grouped into four broad categories (Fig 1): (1) supporting services, such as providing habitat for other animals, water filtering, bioturbation and supporting food chains; (2) provisioning, such as the production of food and shells; (3) regulating, such as removing nutrients from the sea, and the control of climate and disease; and (4) cultural, such as spiritual and recreational benefits. Thinking about nature in this way can help us understand the wider benefits we get from cockles, which are much more than just the cockle meat. Understanding these wider benefits is useful to decision-makers and will help us manage cockle stocks responsibly and sustainably into the future.

COCKLES project aims to quantify the contribution of cockles at important sites in Portugal, Spain, France, Ireland, and Wales. The work focuses on three aspects:

- Cockles act as an ‘engineer species’. They disturb (bioturbate) large areas of intertidal sandy sediment, which alters the amount and movement of nutrients and microscopic plants and algae that live at the sediment-water interface (SWI) and which form a vital foundation for coastal food webs. Much of this work is being carried out in northern France using laboratory and field experiments with cockles to measure their effects and influence on the environment. A first set of experiments will accurately measure the rates at which cockles bioturbate the sediment column and their subsequent impact on: (1) nutrient fluxes across the SWI and (2) the spatial distribution and production of benthic

microalgae. The influence of different factors such as temperature, cockle size, density and disease will also be investigated.

- More direct benefits of cockles. Detailed information from all countries on the amount and value of the meat taken from cockles and the by-products that come from their empty shells will be collected. The project will work on **regulating services, to see how much carbon is taken from the environment and stored by cockles and how much nutrients they remove from the water column.** This work links up all the countries involved in this project, and works closely with other Work Packages to gain the maximum benefits of the research and to share information. Project partners are using standard methods and adopting a common approach to presenting and summarising their findings.

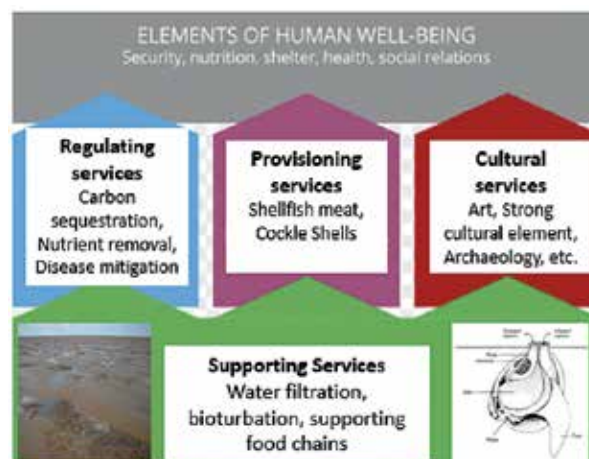


Fig 1. Diagram showing the four broad categories of Ecosystem Services with some specific examples for cockles

- An exciting challenge is to investigate the **cultural services** that people gain from cockles in each of the partner countries. Using a common framework, all the partners can contribute examples of the cultural aspects associated with cockles that occur in their countries. This does not just assess monetary values; there is a strong emphasis on non-monetary value which can be a powerful force to motivate people. A social approach is needed for this work, involving interviews and questionnaires with local people to draw out the stories of those with an interest in cockles. Some of the cultural ecosystem services we are studying include reference



to cockles in archaeology and history, recreation through cockle harvesting, the place of cockles in gastronomy and seafood festivals, the use of cockles in art and for ornaments and jewelry, the role of cockles in defining seascapes and coastal communities, and in instilling a sense of place or identity within individuals and communities.

What will the cockles project achieve?

Within this context, the activities planned in COCKLES project are aimed to restore cockle production and the services it provides by developing resistant strains, improving protocols for aquaculture and for recovering natural stocks, optimizing resource management and upskilling stakeholders, which will aid recovering resources, increase the understanding of ecosystem services and contribute to the good environmental status and boost coastal economies of AA.

Cockles and the ecosystem services they provide have never been targeted under the proposed approach at AA scale.

Population characterisation and food-web models will assess the impact of biological interactions between trophic levels in coastal habitats but also in cockle individuals. We will estimate how an impact on cockles, as a key ecosystem species, affects other organisms and the coastal biodiversity and ecology. Novel operational tools, based upon modelling and genetic data to figure out cockle larval dispersal in different environmental scenarios, will be tested. Efficient culture procedures, including hatchery protocols, and refined genetic tools to produce fast-growing and resistant strains will reinforce natural populations and improve, sustainably, the socio-economic performance of coastal communities. Outreach and awareness raised on the value of cockles will increase legitimacy for management decisions and the likelihood of compliance by all stakeholders. This will enhance the value of cockles as a natural asset for all stakeholders, including young generations. Sharing best practices for cockle enhancement

CORE OBJECTIVES:

- To assess the health, diversity and interrelationships of cockle populations across the AA by characterizing population dynamics, genetic diversity and larval transport, threats from disease, pollution, invasive species and climate;
- To quantify the wider economic, societal and cultural benefits from ecosystem services provided by cockles (fishery, aquaculture, biodiversity, food for birds, tourism, cultural services), by surveys, interviews and socio-economic analysis;
- To provide new techniques for cockle management by developing new technology and procedures for cockle bed restoration, hatchery technology for seed production, selective breeding programmes to produce disease-resistant and fast growing strains, and conservation of genetic structure/diversity;
- To provide guidance on best practice for producers, administrations, environmental agencies, and NGOs, by evaluating and sharing best practice across the AA and optimizing management through mutual learning. This will result in improved cockle production, a strong, viable and sustainable industry, with recognized societal and biodiversity benefits.

and transferring knowledge will facilitate the standardisation of key procedures and spread benefits across the AA. Pioneer collaboration among stakeholders to generate and test the innovative tools and information will provide a sound basis for efficient protection and management policies and decisions, and to anticipate future scenarios.

What's been done so far?

Work has started in most of the work packages, although the first project results are expected to be available from middle-2019 on.

- Assessment of the cockle's health, populations' status and diversity, threats from disease, invasive species and climate change: sampling protocols have been set up and sampling efforts coordinated for a more efficient accomplishment. The elaboration of the census of parasites cohabiting with cockles in the Atlantic Area, has been started. When ready, it will present the overall situation of cockles' diseases with guidance towards best practice for producers, administrations and environmental agencies.
- The genetics work, which will provide the basis for resistant strains, and for the conservation of the genetic diversity of the populations has also been launched.
- The development and optimisation of particle tracking models that couple to appropriate ocean models covering the AA and for a better understanding of larvae dispersal, has also started. The AA scale approach will allow simulating area-wide connectivity but also to address regional-scale models in the Irish and Celtic seas and for the Galician coast. Moreover, experiments and models to understand the role of cockles in the environment have been started together with the experimental designs to better understand larvae behaviour of cockles.



- The quantification of the ecosystem services for a more sustainable management of the cockles and to enhance the appreciation of this resource within the coastal communities of the AA has been launched and experimental designs and methodological bases agreed.

All the above has been achieved with joint research efforts of the partners who have been actively sharing best practices and knowledge across the AA. Moreover, it needs to be emphasized that many of these targets are also being addressed with the support and engagement of the Associate Partners in all the project areas, which are supporting modelling and sampling work, facilitating data as well as offering a wide perspective of the stakeholders' expectations and priorities about the project. They will also contribute to disseminate the project towards their networks during its whole life-time and beyond.

Involvement of stakeholders

Interaction and engagement with stakeholders beyond associate partners during and after the project is a major commitment of COCKLES consortium. A strong effort is being made in order to identify their main interests and expectations from the planned work and hearing their concerns about the identified issues affecting cockles. Five local stakeholders' meetings have been accomplished in Spain (2), France, Portugal and UK. Furthermore, a programme of stakeholder workshops is being carried out. It includes a number of preliminary local workshops (Spain accomplished in July; planned in France and Portugal, foreseen after the summer break) are being organised to pave the way towards the 1st stakeholder workshop to be held in Cork (Ireland) next October 16th. This meeting will focus on cockles' population status, major threats and management approaches in the dif-

ferent regions, in order to concentrate in those aspects where more information is already available. It is being organized as an interactive workshop to foster the exchange of perspectives about how the project can better address expectations of different stakeholder representatives. External stakeholders from the different participating regions will be invited.

How can I find out more?

Communication and dissemination is another pillar, not only for stakeholder involvement but also to spread the word about relevance of this emblematic resource among the coastal communities and society as a whole. In this regard, the COCKLES website www.cockles-project.eu was launched at the early stages of the project as a multilingual platform to spread to up-to-date knowledge provided in an accessible language and user-friendly way. The on-line community is also being boosted through Twitter (@cockles_project) and Facebook (<https://goo.gl/DNmT6F>). Moreover, press releases on relevant project activities have been issued and published in more than 10 regional newspapers in France, Portugal and Spain.

Join the COCKLES stakeholders' meeting in Cork, Ireland on October 16, 2018.

More at www.cockles-project.eu

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