



Shellfish Restoration Clamor

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Shellfish Restoration Network

Native shellfish play vital ecological roles in many estuaries, but are imperiled in many estuaries by habitat loss, over fishing, and pollution. Through a Shellfish Restoration Network, The Nature Conservancy and its partners are working to improve the design and implementation of restoration projects that help to illustrate the ecosystem services that shellfish provide. Through this network, we also hope to demonstrate the elements necessary to expand restoration and conservation to ecosystem scales.

To Join the Network, contact:

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Welcome Bryan DeAngelis!



Bryan DeAngelis. ©TNC

We are pleased to announce that Bryan DeAngelis has joined The Nature Conservancy as the TNC-NOAA Partnership Coordinator. Bryan DeAngelis has been working in marine education, research and restoration in the United States and Caribbean for over a decade. Bryan's

first introduction into marine conservation and education was as the Director of a small non-profit marine aquarium and education center in the Caribbean. Following that, Bryan initiated the first ever shark research conducted in the United States Virgin Islands, with an emphasis on delineating shark nursery habitat for conservation and management - a project that is still ongoing today. His introduction to the bivalve restoration field was with NOAA's Restoration Center as the Coordinator of the *North Cape* Lobster and later the Shellfish Restoration Program; two multi-million dollar Natural Resource Damage Assessment projects designed to restore lobster and bivalve resources and services lost due to a large oil spill on the south coast of Rhode Island. Bryan was also a Technical Monitor for the NOAA Restoration Center Community-based Restoration Program (CRP) and the Damage Assessment Remediation and Restoration Program (DARRP) for over 5 years with NOAA.

In January, Bryan was hired by TNCs North America

Region as the Coordinator for the National Partnership between TNC and NOAA's Community-based Restoration Program. This Partnership has funded nearly 150 restoration projects throughout the US and territories. These projects span the range of habitat types from salmon habitat in the Northwest to coral restoration in Puerto Rico, the US Virgin Islands and Hawaii, with sponge habitat, mangrove, salt marsh, seagrass and plenty of bivalve restoration projects in between.

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Filtration by Olympia Oysters Quantified



Olympia Oyster. © Feet Wet via Creative Commons

Remarkably, little is known about the West Coast native oyster species, the Olympia oyster, *Ostrea lurida*. Much smaller and slower growing than its east coast relative, the Olympia oyster, which was the basis of a large and profitable industry in the mid to late 1800's, has received little attention over the past few decades. Recently, however, the Olympia oyster has seen a resurgence in interest, with numerous ecological restoration projects being undertaken up and down the Pacific coast. Many of these restoration projects are aiming to restore the habitat as well as the species, and with the habitat, the suite of associated ecosystem services. To date, however, there has been a scarcity of knowledge about what those services were before the species' catastrophic decline, and what they could be again following active restoration.

A group of scientists from the University of Cambridge, Oregon State University and The Nature Conservancy have collaborated to address this gap in our knowledge. Based on a laboratory study, the team developed a model that estimates the volume of water filtered by the Olympia oyster under a range of temperature conditions. They then applied this model to historical data to determine whether Olympia oysters provide the same scale of services as the eastern oyster on the Atlantic and Gulf coasts of the US. Their findings suggested that although filtration by the Olympia oyster may be substantial, with a one gram oyster filtering over 3 liters per hour under optimal conditions, they were unlikely to play the same dominating role at large scales within estuaries as the eastern oyster. Nevertheless, filtration by the Olympia oyster may serve critical functions on smaller scales, with mixed beds of seagrass and oyster reported in numerous historical documents. It is possible that on smaller

scales filtration by Olympia oysters can still play a structuring role in supporting seagrass and other valuable habitats.

The resulting publication contributes to The Nature Conservancy's "Oyster Goals Project," a set of work aiming to provide a framework of understanding about the ecosystem services provided by oyster habitats that is designed for use by oyster restoration practitioners and decision makers. More details of the Oyster Goals Project can be found [here](#).

Citation: zu Ermgassen PSE, Gray MW, Langdon CJ, Spalding MD, Brumbaugh RD (2013) Quantifying the historic contribution of Olympia oysters to filtration in Pacific Coast (USA) estuaries and the implications for restoration objectives. *Aquatic Ecology* doi: [10.1007/s10452-013-9431-6](https://doi.org/10.1007/s10452-013-9431-6).

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Investigating Oyster Restoration in the North Sea



Cottages of Bf N's Academy for Nature Conservation (INA) on the Isle of Vilm were used as holiday retreats by the elite of the GDR. © Boze Hancock

The [German Federal Agency for Nature Conservation \(Bf N\)](#) is investigating the potential for European flat oyster, *Ostrea edulis*, restoration in the North Sea. Germany's current interest in restoration comes from a combination of recognizing the ecosystem service benefits of restored oyster habitat and a huge current interest in developing industrial uses of the North Sea (sand and gravel mining, oil and gas extraction and pipelines and offshore wind energy). With Germany's strong conservation laws, this presents the possibility of gaining compensatory funding to support restoration. The planned or existing

industrial uses of the North Sea also provide a refuge from disturbance from the trawl fishery. Currently each m² of trawl ground is fished 1.8 times per year. While industrial uses may present opportunities, uses such as wind farms are currently being proposed in depths of around 40m, a depth which introduces considerable logistical challenges for restoration.

The Bf N has commissioned a feasibility study of oyster restoration in German waters. The study is being conducted by The Institute of Applied Ecology (IFAO). The feasibility study includes a literature review, documentation of the historical distribution of the oyster, an expert workshop, a genetic study to understand regional differences, investigation of hatchery capacity, the feasibility of deep water restoration, and development of preliminary monitoring plans that might be applied to deeper restoration sites.

In November 2012, Henning von Nordheim, Scientific Director and Head of Marine and

Coastal Nature Conservation at Bf N chaired the workshop of oyster scientists and restoration practitioners at the headquarters of Bf N's International Academy for Nature Conservation (INA) on the Isle of Vilm in the Baltic Sea. The workshop was attended by experts from Germany, the UK, Denmark, Holland, France, Spain and the US. The workshop opened with a briefing by the IFAO scientists on the history of the flat oyster in the North Sea and Wadden Sea. The oyster beds on the tidal flats of the Wadden Sea may have been the first managed fisheries in Europe. In the 1500's, the Danish monarchy, then ruling over the German Bight, decreed that all oysters belonged to the crown. In 1587, a permit was introduced for the harvest of oysters by those not fishing on behalf of the King. By 1652, fishing rights had been established and stock assessment introduced, but by the late 1600's, the nearshore beds had been fished out. The deeper, and very extensive, oyster grounds in the North Sea and English Channel were fished out with the introduction of unrestricted industrial dredging in the second half of the 1800's. The flat oyster is now functionally extinct in the Wadden Sea and the deeper grounds of the North Sea and English Channels.

Topics presented included recruitment variation in the Limfjord fishery in Denmark (Jens Petersen, Danish Shellfish Centre), UK stock status including the dense reefs that once occupied the English Channel in depths of 40m to 75m (Janet Brown, Head of Shellfish Unit, University of Stirling), the impact of disease, genetic diversity and the development of disease resistant stocks (Delphine Lallias, Bangor University and Christine Martinez Castro, CETMAR) and the development of *C. gigas* reefs in Holland (Christiaan van Sluis, IMARES).

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Thousands of Pearl Oysters Produced to Aid Restoration in Eastern Venezuela



The GIBM-UDO pearl oyster restoration team preparing to release oysters. Dr. Lodeiros is on the right. © Mollusan Biology Research Group, Universidad de Oriente (GIBM-UDO)

In Eastern Venezuela, restoration work on the Atlantic pearl oyster, *Pinctada imbricate*, has begun on the bank of Chacopatica, on the northern coast of the Gulf of Cariaco. The goal of this project is the recuperation of the natural banks of these bivalve mollusks, through the incorporation of 120,000 pearl oysters, after overexploitation caused species to become "extinct" as a fishery. These restoration activities are part of the Research Group on Mollusks Biology of Universidad de Oriente (GIBM-UDO), with the financial support from Fondo Nacional de Ciencia, Tecnología e Innovación (FONACIT). The overall

goal is to establish a *Center for Environmental Monitoring and Production of Shellfish seeds* in the Gulf of Cariaco. The GIBM-UDO is an important academic group in Venezuela which, in association with The Nature Conservancy, trusts in the use of aquaculture to diminish poverty and to conserve natural renewable resources, by means of restoration of the

natural banks of mollusks, which are very important ecological, social and economically in the Caribbean Sea region.

The GIBM-UDO researcher's strategy is to collect young-of-the-year pearl oysters from the wild and cultivate them to a stage where they can reproduce. This way, after 5 months of cultivation at the Turpialito Hydrobiological Station, researchers would have individual oysters able to release 3-4 million eggs each, which means a large increase in egg production (potential oysters in the natural environment) - in theory, about 300 billion.

Dr. Cesar Lodeiros, project manager and Coordinator of the GIBM-UDO commented, "This has been a great event and we feel happy to be part of it. These activities should be improved in a short time when the facilities for the production of mollusk seeds are in operation, thanks to the project financed by FONACIT. When the mollusc production facility becomes operational it would not be thousands, but millions and millions of oysters and other species that could be "sowed" into the banks, for their restoration, recuperation and sustainability." This is also a social reason for the maintenance and economic use of natural resources. Dr. Lodeiros explained that October 12th was chosen for deployment, to commemorate the indigenous resistance, and the ill-treatment under slavery conditions that local indigenous people suffered from the 1600's during the exploration and exploitation for this species and their pearls. He further commented, "Today, after 6 centuries, we want to get involved in strategies of sustainability and to begin to indemnify for the overexploitation of this species, which is an icon of our identity as Venezuelans."

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Upcoming Events and Conferences

[National Shellfisheries Association 106th Annual Meeting](#)

Jacksonville, Florida

March 29 - April 2, 2014

[2013 World Conference on Ecological Restoration \(SER\)](#)

Madison, Wisconsin

October 6-11, 2013

[22nd Biennial Conference of the Coastal and Estuarine Research Federation \(CERF\)](#)

San Diego, California

November 3-7, 2013

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Oyster Restoration Publications and Resources

[Oyster Restoration Working Group Research and Reports](#)

[The Practitioner's Guide to Shellfish Restoration: An Ecosystem Services Approach](#), as well as back issues of the *Shellfish Restoration Clamor* are available online.

Cool Video!

["Sink Your Shucks" Shell Recycling Program](#)

Harte Research Institute, Texas A & M University
Corpus Christi, Texas

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