Solent Manila Clam Management Plan

Southern IFCA
Inshore Fisheries and Conservation Authority

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Purpose of the Document

This document sets out to provide both a general framework and specific guidance for implementing a strategic, coordinated, multi-partner management effort to manage clams in the Solent.

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Section 1. Manila Clams in the Solent

1.1 Background

The Manila clam is one of the top 5 most commercially valuable bivalve species worldwide. It was first brought to Britain in 1980 by the then UK government's Ministry of Agriculture, Fisheries and Food (MAFF). In due course, the species was made available to commercial hatcheries and growers. At introduction there was an assumption that the species would not naturalise (because of water temperatures restricting reproduction) however this proved incorrect and manila clams are now ordinarily resident in the Solent and many other English estuaries.

Today the species provides an important socio and economic fishery, however, in part as the fishery is relatively new (as the species in 'non-native') and often exists within areas designated for marine environmental protection the policy relating to the management of the fishery has evolved and emerged, in particular more recently so as to balance the needs of the fishery, in particular the economic considerations, with the protection of the wider marine environment. This reactive management has not been without some controversy. It is important to recognise this context, but also the opportunity this presents to set out a long-term vision, and objectives to the manage the fishery for its future sustainable development.

1.2 Purpose

The purpose of the plan is to set out a longer-term vision which balances the socio, economic and environmental considerations of the fishery with a view to increasing yields and value whilst protecting the marine environment. As such the purpose of the plan is to provide both a general framework and specific guidance for implementing a strategic, coordinated, multi-partner management effort that ensures healthy seas, sustainable fisheries and a viable industry.

1.3 Role of Manila Clams in the Ecology of The Solent

The management of clams is important in both environmental and economic terms. Manila clams are "filter feeders", taking microscopic organic particles, especially plankton, from the water passing above their burrows. The Manila clam is highly efficient at filtering food particles out of the water column. Under laboratory conditions clams are able to filter out 96% of available food within two hours (Magni et al., 2000). Malila clams must ingest 0.2g of wet food biomass per day to ensure that clams do not enter metabolic debt (Sorokin & Giovanardi, 1995).

Manila clams are well adapted to estuarine habitats, such as the mudflats of Southampton Water as they tolerant of periodic exposure by receding tides and resistant to seawater diluted by river inputs. Although they have successfully naturalised they do not appear to be aggressively invasive in the sense of competitive displacement of indigenous species or damaging ecosystem function. Rather they integrated within British estuarine ecosystems which gives them a significant role in various food chains. For example, computer modelling of food chain energy flows indicates that they are an asset to important bird populations such as the Oystercatchers that spend the winter feeding on estuarine mudflats (Caldow et al 2007). By virtue of their ability to feed on very small particles in the water (Nakamura 2001), Manila clams may also play a beneficial role in urban locations by filtering out and assimilating organic particulates from sewage discharges. For such reasons, any unsustainable over-fishing of resident naturalised Manila clam populations is problematic, not least where the habitats of the species fall under statutory conservation measures, typically as protection for listed wader populations.

Dredging for clams and the types of dredges used will have an impact on the seabed and associated animals and plants. Carefully managed however this impact can be reduced. The fishery is also pursued by hand collection. The collection of shellfish by hand can also have an impact and can disturb, for example birds for which the Solent is nationally and internationally recognised as important; again, with planning these impacts can be minimised. In 2016 Southern IFCA assessed clam fisheries against the conservation objectives of the features for which the Solent is designated. This resulted in the introduction of management measures which are described in the management section of the report.

1.4 Status of the fishery

Clam dredging takes place extensively throughout intertidal and subtidal sections of the Solent, predominantly from under-10 metre vessels often operating in very shallow waters. At its peak in 2007/08, the clam and cockle fishery supported approximately 15 full-time fishing vessels. Since 2012, the number of vessels operating within the fishery has decreased to approximately 7. This decline in vessel numbers is consistent with the UK trend for under-10 metre fishing vessels, which has experienced a 27.5% decline over the same period. In 2015 Marine Management Organisation landings data indicates that the landings for clam and cockle species in the Solent area totalled 247.81 tonnes at an approximate value of £521,435.89. The Solent clam fishery has experienced a 59% decline in catches from 602.5 tonnes in 2010 to 247.7 tonnes in 2015.

2.0 Vision

The vision for the fishery is to overturn the declines in landings, to promote sustainable harvesting through the introduction of;

A well-managed clam fishery in the Solent

A well-managed clam fishery in the Solent can be described as abundant and self-sustaining, occurring over a wide area throughout the Solent, whilst performing important ecological roles and supporting the fishing industry.

2.1 Desired Benefits

A well-managed clam fishery in the Solent;

- Will produce more clams than are removed each year by natural mortality and harvest;
- Provide important ecosystems services in terms of filtration and food for other marine organisms;
- Provide income for families and communities;
- Operate alongside other fisheries in the Solent in a coordinated manner, and;

A note on cooperation and the challenges of competing demands; in order to attain both ecological and socioeconomic objectives, compromises will be necessary, since these two objectives can work in opposition to one another. So as to overcome these challenges dialogue and cooperation will be essential.

2.2 Objectives

Objective 1.

Manage manila clam populations to levels that restore important ecological functions, including water filtration and nutrient cycling and food availability for birds; and adequate brood stock to sustain regional populations.

1a): manage manila clam biomass.

1b): maintain sanctuaries.

Objective 2.

Achieve a sustainable manila clam fishery and support jobs in the fishery sector through the introduction of effective systems of managing harvest.

Objective 3.

Support awareness of the importance of the fishery.

3.0 Current Management

Closed Areas and Closed Period

A closed season introduced, through Southern IFCA byelaw in 2016 and this will have effect in 2018 onwards. In part this byelaw, in combination with spatial closures which create a network of closed areas (Southern IFCA Bottom Towed Fishing Gear Byelaw, 2016 – see figure 2.), is designed to address the declines in the fishery. The origins of these byelaws are also in response to governments commitments to protect the species and habitats for which the Solent is protected. The development of these byelaw in response to The Governments Revised Approach to the Management of Commercial Fisheries in European Marine Sites[1] did not achieve buyin from some of the participants in the fishery due to the competing demands of conservation and fisheries sustainability.

Minimum Legal Size

The minimum size for clams is 35mm. The minimum conservation reference size is designed for the conservation of fishery resources through technical measures for the protection of juveniles The minimum size has its origins in European Law. The size and age of the breeding stock of bivalve molluscs in general is known to be an important factor affecting fecundity[2]. Put simply Manila clam egg production increases with size. This is why Manila clam hatcheries typically use broodstock of 35-40mm, which given optimal conditions can spawn 5-8 million eggs (Spencer, 2002). In this context the current minimum landing size represents a rational policy in terms of ensuring a sustainable wild fishery resource and a properly functioning eco-system. The minimum conservation reference size also recognises that natural mortality, in particular as it is associated with predation on juveniles, is likely to be significant.

Dredge design

The Solent European Marine Site (Prohibition of Method of Dredging) Order 2004 (2004 No 2696) prohibits the use of a “dredge”, in conjunction with any means of injecting water into the dredge or into the vicinity of the dredge, within the Solent European Marine Site. The purpose of this Statutory Instrument is to protect the Solent European Marine Site from dredging and was introduced prior to the introduction of the Southern IFCA Bottom Towed Fishing Gear Byelaw and the Solent Dredge Fishing Byelaw 2016. The continuation of the Statutory Instrument, in contrast to the management of the Poole Harbour fishery, which requires only ‘pump scoop’ dredges (which incorporate the injection of water to aid the clearance of dredges), warrants further investigation to support the objectives of this plan.

1.3 Disambiguation

The Manila clam, *Ruditapes philippinarum* (Adams and Reeve 1850) is a bivalve mollusc that belongs to the family *Veneridae* (Humphreys et al., 2007). Since it was first described by Adams and Reeve in 1850 it has been assigned a variety of scientific names, a selection of which include: *Amygdala japonica, Amygdala philippinarum, Paphia philippinarum, Ruditapes semidecussatus, Tapes japonica, Venerupis japonica and Venus japonica* (Goulletquer, 1997). The currently recognised taxonomic name is *Ruditapes philippinarum* and this is how it will be referred to in the plan. As with scientific names, the Manila clam is also known under a variety of names distinct to areas in which is found, these include: The Japanese littleneck clam, Japanese carpet shell the asari clam, the baby necked clam, the short-necked clam, palourde japonaise and almeja japonesa.

[1] https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery

[2] fecundity is the actual reproductive rate of an organism or population

The Solent

Figure 2. Bottom Towed Fishing Gear closed areas in the Solent[3] (Southern Inshore Fisheries and Conservation Authority, Bottom Towed Fishing Gear Byelaw, 2016).

[3] Management of fisheries in Marine Protected areas in accordance with DEFRAs policy approach to ensure that all existing and potential commercial fishing operations are managed in accordance with Article 6 of the Habitats Directive
https://www.gov.uk/government/publications/revised-approach-to-the-management-of-commercial-fisheries-in-european-marine-sites-overarching-policy-and-delivery

SECTION 2 ACTIVITIES

1) **the use of harvest reserves / active dredge areas to obtain optimum ecological and economic benefits;**

a) Under proposals established for the protection of the marine environment shellfish harvest is prohibited in certain areas within the Solent and these may function as harvest reserves (see figure 2). By protecting clams from harvest there is the potential to increase their biomass, i.e., brood stock (spawning adults) and subsequent larval production. Current areas have not been selected or optimised for the purpose of clam management, but they provide a valuable resource and coincide with areas of clam beds.

b) Establish active dredge areas to enhance habitat suitability for the harvest of clams.

Action Table

1a	Investigate the value of shellfish prohibited areas as shellfish harvest reserves and, where consistent with wider environmental objectives, seek to maximise these areas potential for increasing clam biomass.	Southern IFCA – Fishing Industry
1e	Establish zonal plan of Solent for Shellfish Harvest for The Solent.	Southern IFCA – Fishermen's Groups - Blue Marine Foundation – Local Authorities – CEFAS – Environment Agency

Key Performance Indicators:

Estimate the biomass of clams in protected areas, within acceptable confidence limits

A zonal plan for Solent Clam production is produced, informed by relevant evidence.

Production plans are shared for the purpose of bivalve mollusc (shellfish) harvesting area classification.

2) harvest strategies;

Clam dredges are used to exploit a range of bivalve shellfish species across the Solent. Species of clams and cockles are found in close proximity within the district's waters and are exploited using similar dredging methods. Given the similarities between fisheries there is an opportunity to review existing regulations and harmonise the development of new management for these dredge fisheries under a Dredge Permit Byelaw.

Current trends and historic patterns indicate that intervention is necessary to control fishing mortality (F) and protect the spawning stock biomass of bivalve shellfish populations in the district thus enhancing the sustainability and economic viability of these fisheries. Furthermore, a flexible approach to the management of the exploitation of shellfish will enable areas of active management, protected zones. In order to establish the appropriate level of Fishing mortality, understanding the interaction between F and natural mortality[4] needs to be considered, especially how the interaction relates to achieving the increase in biomass.

Action Table

2a	Work with stakeholders to develop a flexible system of harvest control to enable adaptive co-management of the fishery.	all stakeholders
2b	Develop the Solent Clam survey to establish biomass estimates and biological reference points	Southern IFCA – Science Partnership.
2c	Identify mortality rates associated with different densities of Clams.	Science Partnership - CEFAS

Key Performance Indicators:

Number of vessels active in fishery stable or increasing within 5 years

Number of vessel days increases within 5 years

Value of fishery increases relative to production within 5 years

Mortality in the fishery is quantified, harvest control rules account for mortality

Biological reference points established

[4] It is asserted that densities of clams in the Solent can reach critical levels causing mortality and although there is not analysis of this phenomenon its further investigation is warranted to ensure effective management.

3) to track progress, monitor results and communicate and engage local communities in the value and importance of the fishery.

The development of the Solent Manila clam fishery in the Solent which peaked in 2007/8 has been characterised by a reactive management system, this can be attributed to the novel nature of the fishery (as a function of the non-native status of the species), the management structure of the fishery (pre Marine and Coastal Act, 2009) and the fisheries colocation with habitats which are protected for conservation purposes. More recently management strategies have emerged to reconcile the harvesting of clams with the management of protected sites and shellfish beds are increasingly classified for the purpose of shellfish production. In simple terms the fishery is becoming more regularised and patterns of management are emerging which reconcile the competing policy objectives relevant to the fishery. In the absence of a plan led system however there remain challenges not least in developing shared and commonly understood objectives for the region. Perhaps as a symptom of this, the harvest of clams below the minimum legal size remains a key risk to the stock, both in terms of the sustainability of the stock, but also in the ability to promote the fishery on its sustainability credentials; a key requirement of many markets. This challenge is also a function of the high economic value of the species and the lack of alternative fisheries (as a consequence of the collapse of oysters in the Solent and the wider challenges of access to quota for other fin fish fisheries more generally). To overcome this challenge to the development and sustainability of the fishery it is highly desirable to support legitimate fishing operations and markets, promote the fishery and develop operations which will enable a viable industry. Already the value per kilogram of the fishery has responded to such measures; the price paid to fishermen for clams originating from Poole and Solent has doubled in the past 3 years. This can be seen in part as a response to the reduction in supply but also because of reduced competition from irregular markets (i.e. those which are not traceable through the supply chain).

There is a need to develop further our understanding of the status of the stock and population dynamics of then fishery; by building on existing surveys and coordinating research efforts between academics, regulators and the fishing industry.

There is a need to ensure that fishing participants are engaged in surveys, so as develop a shared understanding with the fishing community of the status of stocks.

There is a need to raise awareness of the importance of the fishery to the local fishing communities and support awareness of the fish to local communities to a point where the fishery is recognised and valued locally.

There is a need to provide economic assessments of the fishery and to make these available to local planning and development authorities so that this value and significance can be recognised in regional development plans.

There is a need to promote the management and, where necessary develop management of the fishery to demonstrate that it is conducted in a manner that is compatible with the conservation of the marine environment in the Solent.

5a	To support and continue to facilitate a science and evidence collaboration forum	Southern IFCA Blue Marine Foundation – Science Partnership. Solent European Marine Site management Group.

5b	To continue to monitor clam populations and to refine stock assessment techniques, and too involve the community in this process.	Southern IFCA, commercial Fishermen, Science Partnership.
5c	To evaluate the economic benefits of a healthy clam stocks	Southern IFCA

Key Performance Indicators:

A regular stock assessment for clams is developed.

Stock assessment represents best available data and is widely understood / accessible.

Information on the fishery is publicised and is widely available and positive information is provided about how the fishery is managed to support wider economic regeneration of the fishery.

References

Caldow, R.W.G., Stillman, R.A., Durrell, S., West, A.D., McGrorty, S., Goss-Custard, J.D., Wood P.J. and J. Humphreys. 2007. Benefits to shorebirds from invasion of a non-native shellfish. Proc. R. Soc. Lond. Ser. B 274: 1449-1455. Nakamura 2001

Adams A & Reeve L 1850. The Zoology of the Voyage of HMS Samarang. Mollusca London. i-ix, 87pp.

Humphreys, J., R. W. G. Caldow, S. McGrorty, A. D. West & A. C. Jensen, 2007. Population dynamics of naturalised Manila clams Ruditapes philippinarum in British coastal waters. Marine Biology 151: 2255–2270

Philippe, Goulletquer. (1997). A Bibliography of the Manila Clam Tapes philippinarum. https://www.researchgate.net/publication/29492240_A_Bibliography_of_the_Manila_Clam_Tapes_philippinarum

Ponurovsky & Yakovlev, 1992. The reproductive biology of the Japanese littleneck Tapes phillipinarum, Journal of Shellfish Research, 11(2), 265-277.C Campos & Cachola, 2006

Tezuka, Naoaki & Kanematsu, Masaei & Asami, Kimio & Sakiyama, Kazutaka & Hamaguchi, Masami & Usuki, Hironori. (2015). Tezuka et al. - 2013 - Effect of salinity and substrate grain size on larval settlement of the asari clam (Manila clam, Ruditapes philippinarum). https://www.researchgate.net/publication/270572360_Tezuka_et_al_-_2013_-_Effect_of_salinity_and_substrate_grain_size_on_larval_settlement_of_the_asari_clam_Manila_clam_Ruditapes_philippinarum

Goulletquer, P. 1997 A bibliography of the Manila clam Tapes philippinarum RIDRV-97.02/RA. La Tremblade, France: Institute française pour recherche de l'exlpoitation de la mer