Note of Aquaculture Common Issues Group meeting held at Friends House, London. Wednesday 18 April 2018

For minutes and further information see: http://www.seafish.org/industry-support/aquaculture/aquaculture-groups/aquaculture-common-issues-group and http://www.seafish.org/industry-support/aquaculture/aquaculture-support/guides-and-information

1. Welcome and apologies

Attendees

Andrew Rowley	ARCH UK
Andy Fitzgerald	Consultant
Ben Metz	Consultant - Greenwave
Carlos Campos	Cefas
Caroline Roberts	ABPmer
Catherine Miller	Food Standards Agency
Catriona Shannon	University of Leeds
Chris Ryder	Lyons Seafoods
Chris Williams	New Economics Foundation
Christopher Sweeting	Marine Management Organisation
Clare Blacklidge	Environment Agency
Colin Charman	Natural Resources Wales
Craig Burton	Seafish
David Jarrad	SAGB
Dawn Purchase	Marine Conservation Society
Helen Duggan	Seafish
Ian Rolmanis	Sustainable Fisheries Partnership
Ines Pimparel	AquaBioTech Group
James Fox-Davies	Fowey Shellfish Co
James Taylor	ARCH UK
Jill Wilson	Food Standards Agency
Jose Constantino	Welsh Government
Karen Green	Seafish (Minutes)
Lee Cocker	Seafish (Chair)
Louis Horsley	Consultant - Greenwave
Martin Sutcliffe	Dorset and East Devon FLAG
Mike Berthet	Global Aquaculture Alliance
Mike Gubbins	Defra
Oliver Robinson	British Trout Association
Oliver Tanqueray	ClientEarth
Paul Howes	Swansea University
Ross Brown	Exeter University
Sara Catahan	Defra
Sean Ashworth	Sussex IFCA
Simon Kershaw	Cefas
Sofia Cota Franco	University of Newcastle
Trevor Jones	Bangor Mussel Producers Ltd

Apologies were received from:

Alex Adrian	Crown Estates
Eleanor Adamson	Fishmongers' Company
David Fletcher	RAS Aquaculture Research Ltd
Jennifer Posstles	NERC
Jodie Mitchell	NERC
John Holmyard	Offshore Shellfish
Jonathan Shepherd	Seafish Board
Katie Miller	ClientEarth
Laura Enthoven	MRAG
Martin Jaffa	Callander McDowell
Mike Warner	SAGB
Neil Auchterlonie	IFFO
Nick Boase	Marine Management Organisation
Peter Tarrant	Maritek
Sam Peacock	RS Standards Ltd
Tania Teixeira	AquaBioTech Group
Tom Pavitt	Marine Management Organisation
Tristan Hugh-Jones	Loch Ryan Oyster Fishery Company Ltd

2. Minutes from previous meeting held on 26 September 2017.

Lee Cocker welcomed everyone to the Aquaculture Common Issues Group (ACIG) meeting. The final minutes were accepted as a true reflection of the meeting and have been added to the ACIG web page. Attendees were asked to take note of the meeting guidelines. In the following minutes Seafish will provide a link to the various presentations given at the meeting but not summarise the whole presentation. In the main we do not attribute the comments made at the meeting. Matters arising: Various links were circulated.

Water quality

3. Intermittent Microbial Water Quality Barriers to Bivalve Shellfish Production: Improvement and Management Options for Change in Relation to Prioritised Aquaculture Areas in England. Seafish commissioned report. Andy Fitzgerald, Consultant.

Industry discussion and Seafish reports all highlight water quality as key barrier to the development of the aquaculture industry in the UK; from both the water industry and agricultural sources. Shellfish classification status is often considered 'Russian Roulette' as to whether sampling events will be unlucky to correspond to rainfall events. The nature of wastewater pollution events differs on a regional basis – some incident types (such as CSOs) are being reduced reduced but these are not pollution incidents. The CSO discharges occur in response to rainfall and are legal if they comply with their long-term design criteria (usually < average of 10 spills/yr. Once released the report will give a number of examples of shellfish management case studies and makes a number of recommendations.

Discussion

- There is clearly an issue with water quality and shellfish cultivation but the inference is we can't have clean water in estuaries and so shellfish cultivation should go offshore. These waters are protected and this should be mandated. It is an abject failure of the regulatory system that this has been allowed to go on. We have the classic 'chicken and egg' situation in that there is not enough

estuarine shellfish, and in fact more estuarine shellfish would mean cleaner water.

- Norovirus is the difficult one and this is a key aspiration for the Shellfish Stakeholder Working Group (facilitated by Seafish). The aspiration is for much longer inter-generational planning times to bring about an effective solution. Addressing issues with bathing waters has had much better support. There are historical issues to address with sewerage. Pressure has to be brought to bear on the water companies.

Action: Circulate link to report one it is published.

4. Shellfish water quality monitoring using chemical tracers, environmental microbiology and satellite remote sensing. Carlos Campos, Cefas.

http://www.seafish.org/media/1758327/acig_april2018_shellfishwaterqualitymonitoring.pdf

Carlos explained the transfer of microbiological contaminants to watercourses and the pollutants of concern and the impacts of combined sewer overflows. The economic impacts of CSO discharges on shellfisheries are significant and will depend heavily on tidal activity, and the size, frequency and timing of closures. A physical linkage between sewage inputs and shellfish flesh quality (norovirus and E. coli) in contrasting coastal environments has been demonstrated. There was some discussion about monitoring water quality from space and the ShellEye project which aims to develop satellite Earth observation and simple modelling tools for monitoring and forecasting water quality for shellfish aquaculture (this is directed at industry rather than regulators of Local Authorities), as well as the EU Seafood Tomorrow project which will develop predictive models for norovirus based on virus epidemiology, shellfish physiological status, temperature, hydrography, wastewater treatment and oceanography

Discussion

- **Question.** I can see the benefit of satellite technology but assume this comes at a high price? And who should pay – the Government or shellfish farmers? In the UK the industry is predominantly made up of small companies and there is no funding available. **Answer.** In the UK we are not currently seeing the benefit of investing in satellite technology especially for coastal zone management. In terms of payment it could be a combination of Government and industry on a case by case basis.
- The real message is that we are offering potential management solutions.

Action: Circulate links to relevant reports.

5. Sustainable Shellfish, Water Quality and Partnership: A Chichester Harbour Approach. Sean Ashworth, Sussex IFCA and Chris Williams, New Economics Foundation.

http://www.seafish.org/media/1758333/acig_april2018_chichesterharbour.pdf

Sussex SeaView is a benchmarking exercise to create a benchmark of existing environmental legislation; a detailed, collective vision for Sussex marine environmental quality; and to understand current actions and create a forward look for new required actions. This has created a red, green and amber matrix of environmental indicators. ClearView is an awareness-raising campaign on how to reduce your environmental footprint.

The New Economics Foundation has produced an evaluation of the Chichester Harbour Provisioning Ecosystem Services provided by shellfish for Sussex IFCA and the Environment Agency. There are three designated shellfish areas in Chichester Harbour (Chichester, Thornham and Emsworth Channels). A model was developed to assess the

potential Gross Value Added (GVA) from oyster harvesting under different water quality scenarios in the Chichester Harbour area, both in economic and employment terms. This model calculates the direct and indirect GVA generated for each given scenario under five scenarios: Do nothing; Improvement of all beds to class C; Improvement of all beds to class B; Improvement of all beds to class A; Graded improvements with each bed increasing by one classification. The results show that better water quality leads to a higher direct and indirect GVA as a result of the increases in oyster harvest. Larger harvest and more oysters are sold locally (and local retails make a profit at a greater price) instead of them being exported. Improvements in shellfish waters would also mean Thorney Channel could be re-opened and harvested. Of all the scenarios modelled, scenario 4 (improving all shellfish beds to grade A) presents the greatest increases in GVA and associated benefits.

Discussion

- One table (page 30) shows a lot of fails (in shellfish flesh) and that is really a reflection of the fact we have a lot of rain which causes periods of poor water quality during which shellfish take up contaminants, not that water quality is generally poor. Equally this project, and the cost-benefit analysis, has provided the evidence to guide investment decisions.
- We should not just accept that the standards set are too difficult to achieve. 'Moneytorising' the potential economic benefits is very useful.

6. Assessing and mitigating the future risks of harmful algal blooms (HABs) to wild fisheries and aquaculture. Ross Brown, Exeter University.

http://www.seafish.org/media/1758354/acig_april2018_mitigatingharmfulalgalblooms.pdf

HABs are increasing in frequency in UK coastal waters, they produce biotoxins or deplete dissolved oxygen and cost UK marine industries >£20 million annually so threatening the growth of aquaculture in the UK. They are predictive, unlike 'real-time' monitoring 'remote' sensing and can identify key environmental drivers, as well as inform mitigation. The project (looking at three sites over the summer and will run to March 2019) aims to: define environmental conditions/rules that promote selected HAB species which cannot be detected by satellite; develop site-specific HAB models; and develop and test a regional HAB model.

7. EnviGuard project and AquaBioTech Group. Ines Pimparel, AquaBioTech Group.

http://www.seafish.org/media/1758336/acig_april2018_aquabiotech.pdf

EnviGuard includes the development of biosensor technology for environmental modelling and disease prevention in aquaculture to ensure food safety. The EnviGuard sensor has three different modules that are able to detect and quantify in situ with a single sample, which provides an early environmental warning system. The algae sensor module is a semi-automated nucleic acid biosensor that will analyse the RNAs to get the harmful algae's species and cell numbers. The chemical sensor module is capable to read selective bioreceptors (antibodies) linked to photonic structures released during a previous ultrasonic process shared with the algae sensor module. The pathogen sensor module is able to reads the signal emitted by the florescent dye hence connected to immobilized specific catching molecules, called aptamers.

Discussion

- **Question.** Could this be extended to heavy metals? **Answer.** That is a possibility in the future.

- **Q.** What are the costs for this service? **A.** Once the field trials start we can determine costs. There should be a lot of data by June/July 2018.

Action: Circulate links to the EnviGuard finfish and shellfish surveys to understand the main problems encountered with seawater aquaculture due to fish diseases, algal blooms and chemical pollutants.

Planning

8. The identification of potential aquaculture sites though modelling. Christopher Sweeting, Marine Management Organisation.
http://www.seafish.org/media/1758339/acig_april2018_aquaplanning.pdf
The MMO has a number of marine plans (NE, SE, NW and SW) which are being developed concurrently and are all due to be published by 2021. There are different response types and all plans have a conceivable application to aquaculture and are supportive of its development. There are generally four underpinning requirement: an issue to address; a driver to initiate action: a remit which allows action; and evidence to inform. The MMO is looking more specifically at aquaculture potential – potentially a lot of parameters are missing and there are planning constraints.
Action: Circulate links to MMO pages.

9. Improving the assessment of aquaculture suitability for marine spatial planning. Sofia Cota Franco. University of Newcastle.
http://www.seafish.org/media/1758345/acig_april2018_aquaassessment_marineplanning.pdf
This project looks at what can enable aquaculture development and considers: the area geographically available and physically adequate to accommodate aquaculture; the optimised level of aquaculture production; the maximum production that can be supported without unacceptable impacts to the ecosystem; and the amount of aquaculture that can be developed without causing unacceptable socio-economic impacts. As the next stage a project application has been made to develop the aquaculture suitability decision tool to effectively map areas of aquaculture potential, validated with stakeholders and existing culture areas; to determine the current and future potential for aquaculture development in England and deliver maps of the areas of highest suitability to the culture of established and emerging species; and to explore the development of a value-based decision-support system, which takes into consideration environmental and socio-economic impacts associated with aquaculture.
Overall discussion

- **Question.** What is the future for aquaculture development within the marine plans? **Answer.** There are many data layers within the plans and these will pick up areas of existing aquaculture activity. But there is a requirement to consider aquaculture activities and a buffer zone around them. Once published the plans are renewed every three years. The policy used to produce the plans is spatially explicit.
- This is fantastic to see and a very forward looking view but the constraints are still Several Regulating Orders and this whole process. It is widely accepted that there is the potential to develop shellfish aquaculture around the UK coast but marine planning is not the issue. The issue is Government not allowing expansion to occur. We need to know there are areas where we can cultivate shellfish and have the presumption that we will be able to. Response. We can see that bureaucratic red tape is one of the barriers to development.

- The better we can get the maps to work, where we could potentially move towards exclusion zones, the better it will be for aquaculture planning.

10. Aquaculture within the National Marine Plan. Jose Constantino, Welsh Government.
http://www.seafish.org/media/1758342/acig_april2018_welshgovernment.pdf
Aquaculture in Wales is a small but growing business. The industry is predominantly blue mussels, native oysters, cleaner fish and rainbow trout. Proposals for SRAs are intended to: guide developers on plan-level locations; safeguard resources for use by appropriate sector; require project level consideration of individual projects; and provide focus for further work on likely constraints and opportunities.
Discussion

- **Question.** Where does land-based aquaculture feature in either the MMO plans or Welsh Government? **Answer.** The MMO marine plans would not cover land-based aquaculture. Welsh Government is ahead on this by having an Aquaculture Action Plan and it is trying to address the bureaucratic challenges.
- The Seafood 2040 strategy is very forward-looking and includes land-based aquaculture. Seafood 2040 is a Strategic Framework for England. It identifies actions for how the industry can grow to the Government recommended consumption level of two servings of fish per person per week, whilst ensuring continued sustainability of supply in both the wild caught and aquaculture sectors. The framework, with support from Defra & Seafish, has been created by an expert panel of members from across the seafood value chain. In order to drive SF2040 forward, it is necessary to firstly establish a Seafood Industry Leadership (SILG) of key industry leaders and Defra, to lead and support the work set out in the plan. SILG members will be accountable to both the UK Minister of State for Agriculture, Fisheries & Food and the seafood supply chain they represent. Seafish will provide secretariat and project management.

General updates
11. Seafish Aquaculture update. Lee Cocker.
http://www.seafish.org/media/1758348/acig_april2018_seafishactivities.pdf
This covered:

- Seafish activities and progress in the year 2017-18.
- The development and evolution of the Seafish Domestic Aquaculture Advisory Committee. The development of an English Aquaculture Leadership Group is recommended by Seafood 2040, and Seafish will ensure alignment between this new group and SDAACs evolution.
- A comprehensive, foundational piece of work has been produced on 'Intermittent Microbial Water Quality Barriers to Bivalve Production'. This provides valuable context to help establish future discussion and guide our future work.
- Phase 1 of the Aquaculture Regulatory Toolbox for England has been completed. Phase 2 will provide guidance for regulators with the aim of making more consistent the way that aquaculture is treated and considered by regulators
- Six Seafish Depuration Standard Design Operating manuals have been independently reviewed and updated in March 2018.
- Aquaculture profiles have been produced with replace/expand on the popular Seafish Aquaculture RSGs. This web tool will be showcased at the Brussels Seafood Expo next week and officially launched soon after.

- The Seafish Corporate Plan 2018-21 has been published. This focusses on five challenges…framed in the context of the wider geopolitical uncertainties in which the seafood sector must operate. There are a number of aquaculture provisions.

Action: Circulate links.

12. ARCH-UK update. Andrew Rowley.

http://www.seafish.org/media/1758351/aciq_april2018_archuk.pdf

Andrew explained the role of ARCH-UK as an integrated aquaculture network that aims to solve the shared and specific issues preventing the sustainable growth in all sectors of the UK aquaculture industry. A number of workshops are planned in 2018:

- Workshop 1: Innovative approaches to the detection and remediation of human health issues relating to shellfish consumption. 6 July 2018. Cardiff or London.
- Workshop 2: Shellfish and fish microbiomes in aquaculture – innovative approaches and applications. November 2018 in Aberdeen.
- Annual Science Event. The first of our ASEs will be a showcase of current and previous BBSRC/NERC funded projects under the Aquaculture Initiative. 4-5 September 2018 at AFBI, Belfast.

Action: Circulate links.

13. Date of next meeting.

The next meeting will be on Tuesday 18 September 2018 at Friends House, London.