

The Grower

Newsletter for the Association of Scottish Shellfish Growers

January 2009



New date—new management

Sharp eyed readers will spot that instead of having a December 2008 issue this is headed January 2009. The delay is to take account of new management structures being established for the Association. By now all members and indeed all shellfish farmers in Scotland should have received a letter explaining the new management arrangements for the ASSG. At the conference in October an EGM was held where a unanimous decision of members was to manage the ASSG via a steering group. From December this has become the current Management Committee (MC), Walter Speirs is acting chairman and looks after the day to day running of the Association but is in regular contact with the MC to clear any initiative. To be a representative organisation the ASSG needs a wide membership and to hear from its members if there are problems. The new subscription structure should help and we are extremely grateful for the support from Loch Fyne Oysters Ltd, Scottish Shellfish Marketing Group and Isle of Shuna for their matched funding. With the Scottish Government so clearly supportive of the shellfish industry this is a good time to build on past achievements. But we need your support.

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Conference success



Pictured left; Minister for the Environment, Michael Russell MSP, seen opening the ASSG annual conference and getting it off to a very good start with his positive view on the shellfish industry. This year the conference was held in a new location, the Corran Halls, Oban and under new management, Nicki Holmyard. This year also for the first time presentations from the conference are available directly from the Seafood Information Network website <http://sin.seafish.org>. You need to register to use the site but that is easy and we are very grateful to Craig Burton of Seafish/Seafood Scotland for setting this up for us. Follow the trail, Networking>Collaboration>Non Seafish activities>Scottish Shellfish Association>Conference proceedings but you can also read a brief account on page 2!

Special points of interest

Once again BBC Radio 4's Food Programme (1st February) covered the benefits of seafood, reporting on a visit to Blushell Mussels in Shetland and interviewing Michael Laurenson, and then covering the Seafood and Health conference reported on in this issue (page 7). If you want to hear what they had to say go to <http://www.bbc.co.uk/radio4/factual/foodprogramme.shtml> and follow the links.

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Disclaimer: Views expressed in this publication do not necessarily reflect the official view of the Association

ASSG Conference

The ASSG conference in October was opened by Minister for the Environment, Michael Russell, MSP; what better start could there have been than his upbeat expression of support for the Scottish Shellfish industry and its clear message – tell us what you need - we are here to help. The keynote speaker for the first day, Dr Gavin Burnell also got off to a good start posing the question “what has research ever done for us?” very much in the manner of John Cleese in the Life of Brian, “what have the Romans ever done for us!” Arguably the conference itself answered the question with some excellent speakers from the world of science talking on norovirus, marine toxins and the Spies Detox programme, detecting sources of faecal contamination in the environment and invading tunicates and dealing with *Mytilus trossulus* from respectively Dr James Lowther, Dr Liz Turrell, Dr Guillaume Hermmann, Dr Craig Baker-Austin and Dr Thomas Landry. Our strong links with marine conservation were represented by a presentation from Dominic Counsell SNH and the producers were not overlooked with presentations from Benoit Enderline of Taylor Shellfish and from Dutch representatives Jaap Holstein who highlighted opportunities for Scottish producers in Europe and Wm



Bakker telling us about improvements in growing and harvesting technologies and his new ventures in China.

A highlight of this conference in its new location of the Corran Halls and with Nikki Holmyard as the new convener, was the excellent food – and of course locally produced shellfish particularly featured with an excellent mussel soup warming us on the first day and a mussel stew on the second, both accompanied by delicious sandwiches with mainly sea food fillings as well as home produced tray bakes.

A follow up from Dr Lowther’s talk can be found on page 3 and all the presentations can be accessed from the Seafood Information Network as explained on the front page.



Pictured top right; Roger Thwaites, Ian MacKinnon and Richard Tait discuss issues, Below left; the audience in the Corran halls and right; the line up of speakers. Photos courtesy of Craig Burton

11th International Conference for Shellfish Restoration, Charleston, USA

Janet Brown reports back

Every 2 years the ICSR returns to its roots in South Carolina and for some years this has been to Charleston. Having been lucky enough to be invited to give a plenary talk at this conference I am not surprised that once settled on this beautiful town they don’t want to move; the only snag for my first visit was that it coincided with the coldest weather ever known in the town since records began—so my Scottish geared warm clothing was all that was seen for the week.

The theme of the conference was the role shellfish has played in the culture and history of nations, from Maoris in New Zealand, native Americans and in Europe and UK. This proved a fascinating theme, e.g. exploring the history of New Zealand which turned out to have fascinating links to the history of the UK; elements of the highland clearances perhaps feeding into the early settlers lack of interest in anything but land ownership which has in turn

led to the interesting topics covered in previous issues of the Grower. One of the revelations was the discovery of how native Americans had actually shaped sea beds to improve the yields of clams so perhaps the first true mariculture? Gef Flimlin asked what was our muse? I.e. what makes “shellfish people” tick which was both very amusing and moving. Away from the plenary talks there was a tremendous range of presentations on all aspects of restoration and best management practice etc. It was a great opportunity to meet with the East Coast Shellfish Growers Association and with my editorial hat on I took the opportunity to see where we might share articles in future and also see how they organise themselves; always useful but especially in this period when we are rethinking our own organisation.

Photos from the ICSR conference on Page 11

Update on norovirus testing – Oysters

David Attwood, Loch Fyne Oysters Ltd, reports

In the past there have been reports of illness associated with consuming oysters that have been attributed to the presence of norovirus in the oysters. Until recently there has not been a commercially available test for norovirus in oysters that could be used as a Food Safety management strategy to prevent such an incident occurring again. This situation has recently changed and there is now a commercial test for the presence of norovirus – this is available through Integrin Advanced Biosystems Limited based in Oban.

This method uses a real time PCR test that can give a value to the level of norovirus present – this is reported as a Cycle Time (CT) unit. Using this testing method Loch Fyne Oysters Limited in collaboration with The Food Standards Agency, Argyll and Bute Council, CEFAS and Loch Fyne Restaurants have established a Food Safety management strategy to reduce the risk of a food poisoning incident occurring.

This Food Safety management strategy is based on a safety threshold level of 38.00 CT – oysters with a value of 38.00 or higher are considered safe to eat – oysters with a CT value that is below 38.00 should be considered a risk and not be sold for consumption. Each norovirus test gives 3 replicate readings and each of these readings needs to have a CT value of 38.00 or above.

It should be noted that this only applies to the testing method being used by Integrin Advanced Biosystems Limited (CEFAS are using a more sensitive test and are reporting in either PCR units or more recently in the number of copies per gram – this test is not available commercially).

Having a test available and a threshold / action limit allows oyster farmers and companies processing / selling oysters to screen oysters for the presence of norovirus prior to harvest and offers the most practical solution to reduce the risk of a food poisoning incident occurring.

Loch Fyne Oysters Limited would like to point out that this information is for advice only and cannot guarantee that it will prevent any such incident occurring in the future but will hopefully be of the benefit of the oyster farming industry in Scotland.

Loch Fyne Oysters Limited shall not be liable for any action / claim that may arise as result of the use of the information contained in this statement

Norovirus occurrence in UK oyster growing areas – an FSA funded research project

David Lees, Cefas, has provided this follow up of CEFAS's plans as presented at the ASSG conference by Dr James Lowther'

Recent technical developments both in the UK and world-wide have opened up the possibility of monitoring bivalve shellfish for the presence and levels of norovirus contamination using quantitative PCR. Currently a group of European experts is active in producing a standard European reference method and will be performing an extensive validation of this reference method. Given this technical progress it is an opportune time to examine more systematically the extent and distribution of norovirus contamination, as judged by real time quantitative-PCR, in UK oyster production areas. Such information will help all stakeholders to understand better how such tests might be applied in the UK context and the type of data that would be generated. The data will also help inform European debate if the EC decides to propose legal limits on the level of norovirus in bivalve molluscs.

The project, co-ordinated by Cefas Weymouth laboratory, aims to provide comprehensive data on background levels of norovirus in pacific and native oysters from a geographically representative selection of UK shellfisheries over an 18-month period. This selection will include 6 sites from Scottish oyster production areas. The study sites will be characterised using a risk profile matrix and final site selection will take account of this to try and ensure a cross selection of risk profiles. Monthly samples of oysters from each site will be requested with a proposed

start of April 2009. Samples will be tested at the Weymouth laboratory for norovirus (genogroups I and II) using a quantitative real-time PCR method in line with that being proposed at the European level. Samples will also be tested for E.coli using standard MPN methodology to provide additional information. It is hoped that producers will be willing to assist the project. Cefas has included reimbursement for oysters sampled within the project cost and producers will also have access to their own results. However, since this is a research project, results will need to be reviewed and quality assured prior to release hence they will not be available in real-time. All results will be anonymised prior to any release into the public domain. It is hoped this project will give robust data on the distribution and levels of norovirus in UK oyster production areas and will assist the FSA and other stakeholders with regard to possible risk management measures for norovirus.

Further information on the project is available from:

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WWF Mollusc Dialogue comes to Europe

By Nicki Holmyard

Researchers, producers, regulators and industry representatives from Canada, Spain, Portugal, Scotland, England, Ireland and the Netherlands, met in Santiago de Compostela, Spain, in November 2008 to participate in the European meeting of WWF's Mollusc Aquaculture Dialogue (MAD). WWF currently has seven other Dialogues underway for species including salmon, shrimp and tilapia, with the aim of setting new global eco-standards for production.

WWF acknowledges that in general, mollusc aquaculture has a benign and sometimes beneficial impact on the environment, given that it relies on a high standard of water quality for production. However, the range of species that would be covered by its standard – mussels, clams, oysters and scallops, and the variety of culture methods used throughout the world, make it difficult to come up with one globally acceptable standard that is robust enough to carry weight and still be acceptable to shellfish producers no matter where or what species they farm.

Introducing the meeting, WWF Aquaculture Program Officer Colin Brannen explained that molluscs make up around one-quarter of global aquaculture production, with China responsible for more than 80 percent of the world's farmed molluscs. Other important mollusc producing nations include Japan, the US, France, Thailand, Spain, New Zealand and Italy.

From meetings already held in Australia, New Zealand and the US, WWF had extracted six main issues for discussion, which would ensure that ecosystem integrity, genetic diversity, biosecurity, disease and pest management, farm maintenance and multi-user cooperation, would all be adequately covered in its Mollusc Standard. These had been worked up into eight principles that provided a framework for discussions on specific criteria and indicators necessary for the production of standards for responsible mollusc farming. Criteria will be used to provide direction on how to reduce each impact, while indicators will address how to measure the extent of each impact. Standards will be quantitative performance levels that evaluate whether a principle is achieved.

Whilst the 20-strong group agreed with many of the outcomes and recommendations from previous MAD discussions, it was ecosystem integrity that proved the stumbling block. Delegates found themselves faced with the difficult task of recommending indicators that would allow auditors to accurately assess that a mollusc farm was avoiding, remedying or mitigating any negative effects on habitats and biodiversity. Making progress on this did not prove to be easy and is unlikely to be so in future discussion.

Carrying capacity became a stumbling block in the discussions, with participants arguing variously for and against bay management schemes. WWF's intention is to aim the standard at individual farmers, but the interaction of other local users will have an effect on a

farm - whether positive or negative, and a majority view was that the whole system must be taken into account. Further discussion on all the criteria and indicators is due to take place in Canada in January.

As a precursor to the discussions, presentations were made by Aad Smaal of Wageningen IMARES, on finding resolutions to the current problems with Dutch mollusc farming; Grainne O'Brien of BIM on the development of her organisation's quality and eco standards for mussels; and Celia Rodrigues, Sapalsado, Portugal, on integrating bivalve culture with turbot and seabass in Portugal and the reintroduction of *Crassostrea angulata*, the Portuguese oyster, a species that has been largely wiped out or hybridized across the Iberian Peninsula. These all proved useful in setting the European scene.

Representatives from all the meetings will go on to work on a global steering committee that will help to finalise the standards, and WWF is in discussion with several independent standard providers with a view to handing over responsibility for rolling it out.

This article was prepared for Fish Farming International



Pictured above Colin Brannen of WWF who chaired the session in Santiago

Colin Brannen is a member of WWF's aquaculture team – a team that is developing standards to minimize the environmental and social impacts associated with aquaculture. Colin focuses on molluscs (which, compared to other aquaculture species, have a relatively low impact on the environment. In many regions, these species are actually more helpful than harmful to the environment. At the same time, this type of aquaculture is not without its challenges and Colin is working to address them. Colin brings to the job the marine conservation and aquaculture skills he learned in school, as well as on-the-ground experience. For example, as a Peace Corps volunteer in Madagascar, he introduced people in his village to seaweed farming, marketing it as an economically viable alternative to fishing and agriculture, which are threatening the region's natural resources. After graduating from college, he helped spawn and cultivate oysters, bay scallops and quahog clams at a shellfish hatchery in Martha's Vineyard. [Notes taken from WWF web site]

<http://www.worldwildlife.org/who/experts/colin-brannen.html>

Chairman's Column

As we all know, Doug McLeod is now in sunny Australia, so writing this column has fallen to me for the moment. I have just read his previous contribution for the Grower, and all the issues he has highlighted are still ongoing.

With the proposed Marine Bill, as well as other consultations like River Basin Management Plans, Integrated Coastal Zone Management, plus all the Environmental Designations, we are in danger of being squeezed out of the sea, if we don't attend all these various meetings to ensure our industry is not sidelined. The issue that concerns me most at present is the fact that the protection our industry had under the Shellfish Growing Waters Directive appears to have been omitted from the replacement Water Framework Directive. Communication at EU level says that SGW must be given equivalent protection by the Member State, but I can't find that mentioned in any of the consultations. Hopefully we can address that, because after all that is what consultations are for!

We really have an opportunity under the proposed Marine Bill to improve and protect our industry, but it is taking a lot of effort. It does amaze me that a single sea loch, or coastal area can be covered by so many different Directives, layer upon layer, that are the responsibility of a different Competent Authority, and are discussed in isolation at separate meetings. I feel there is a desire by Government to change this, and if we continue to work together on this, things may become simpler.

I have been representing ASSG at several meetings and would like to highlight certain areas of interest. If any more detail is required I can be contacted directly. The Animal By-products Directive is being revised, and it should include provision for dead and broken shellfish (as a result of on-farm grading) to be disposed of at sea, rather than composting, rendering or incinerating.

FSA are moving forward on chemical testing for toxins, announcing that 90% of PSP testing is now happening this way. Progress is slower with DSP. Discussion continues on the suitability of MPN testing for e-coli, both for classification and end product testing. Other methods are being considered. The whole issue of how Shellfish Harvesting Waters are classified has been going on since 1992, and has not really improved from industry point of view since then. It never was fit for purpose, and never will be. Maybe we have an opportunity to pull it into the Marine Bill? After all, it is the sea.

New turbidity standards are to be introduced for depuration, which may impact on the level of UV required.

Norovirus is still a hot topic, there is a lot of debate around this. There will be an update from David Attwood elsewhere in the Grower. (see page 3 plus update from CEFAS – ed)



Walter Speirs, acting chairman of Association of Scottish Shellfish Growers

The fact that the Pacific oyster has appeared on the "red list" as a potentially invasive non-native species is worrying. SAGB is taking the lead on fighting this, and various projects have been put forward for funding, to help fight our corner.

Finally, could I please ask you to pay your subscription for 2009. We have a new management committee who are putting a lot of effort into ensuring that we have a strong association to deal with all the various issues, but we can't do it without funds.

If you wish to have any input into the running or future direction of ASSG please let me know.

Best Wishes,
Walter Speirs

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First meeting of the Scottish Biotoxin Design Working Group

Lorna Murray reports

In response to comments of ASSG members wishing to have a more proactive role in the design of the Biotoxin Monitoring Programme (MP) in Scotland, FSAS have set up a working group which held its first meeting in Aberdeen in December. The meeting was very well attended with FSAS staff, representatives from CEFAS and from Councils with important shellfish interests such as Shetland Islands Council, South Ayrshire Council, Highland Council and Argyll and Bute Council. Growers were represented by David Attwood, Richard Tait and Ruth Henderson at this meeting but there are others involved in the working groups that will follow on from this.

The results from 7 years of the monitoring programme were presented as the first item which while having some limitations does provide for consistent patterns and emerging themes which are “real” and backed by statistical modeling and applied mathematics.

General discussions followed on

- Use of mussels as a representative species
- Grouping of pods with resultant Representative Monitoring Points and Associated Harvesting Areas
- Methodology and use of harvester own results
- FSAS database development
- Frequency of testing
- Use of phytoplankton as an early warning system and trigger for increased flesh sampling
- Development of rules for use of trigger data and use of representative species in the monitoring programme
- Use of baseline sampling frequency
- Acceptable risk of missing a toxic event
- Potential for grouping pods into risk category (low, medium, high) and applying different sampling strategies to each
- Keeping the system simple and appreciating the knock effect of change in terms of resource from all stakeholders e.g. differing sampling frequencies will require more management at central, local and laboratory level.
- Maintenance of a robust dataset to assist with ongoing risk evaluation

The resolutions from the discussions generally agreed were:-

- a 1% chance of missing a toxic event was accepted as reasonable, safe and proportionate.
- the underlying principles of the design of any monitoring scheme should be that it is simple, effective and easy to implement and manage
- production of ‘rules’ of engagement where use of mussels as an indicator species is accepted as desirable
- an open, transparent and inclusive process is a key objective. With this in mind all members of the working group will engage at local level with Harvesters/Local Authority Officers in their area to ensure they are kept informed and have an opportunity to comment and input into the process
- all members of the working group are content for their details as members to be published

Two workstreams emerged from the 1st meeting:-

1) To develop the monitoring programme with respect to justifiable uses of representative species, methods/use of data and frequency.

To provide ‘rules for use’ of representative species

To provide rationale for frequency of all three toxins with explanations provided where pods with a differing risk are provided with a different sampling plan, to develop the rationale behind use of phytoplankton data and potential use of industry own results to ensure that where official monitoring is less frequent than weekly that adequate trigger data is available.

2) To examine existing pod groups with respect to RMP and AHA and to re-design these into consistent and rational pods where grouped areas have a similar toxicity pattern.

It is agreed that the best starting point is to consider all pods and eliminate from review (with WG and stakeholder agreement) those which are fit for purpose, leaving those which require review to be examined in greater detail.

The next meeting of the group will be in Glasgow on the 12th February 2009

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Readers' Letters

Your chance to air your views especially of things you read here!

17 October 2008

Shellfish Imports

Dear Janet

I am grateful to you for publishing in the September edition of "The Grower" advice from Dave Fraser of FRS to anyone contemplating the importation of shellfish for farming purposes. Clearly, all movements of livestock pose a risk of spread of disease and importers should assess that risk, for their own sake and that of their industry.

I am concerned however that your editorial suggests Fish Health Inspectors feel the legislation on importation is somehow inadequate. This is not the case. The EU fish health regime is based on the principle that trade should be permitted unless there is scientific evidence that the risk of spread of disease is unacceptable. The Scottish Government and FRS fully endorse this principle and we have no grounds for challenging the legality of the trade in oysters from Jersey. I hope you will be able to bring this to the attention of your readers in the next edition.

Regards

Dave Wyman
Aquaculture Health and Welfare Team
Scottish Government

Seafood and Health Conference in London,

Clive Askew reports

The recent Seafood and Health Conference in Fishmongers Hall, London, presented some ground-breaking ideas on the benefits of fish and shellfish in the diet.

The old notion that shellfish should be avoided because of cholesterol was dismissed by a new trial which showed that even eating half a pound (225g) of prawns a day does not raise blood cholesterol. Surprisingly, this is the first time that it has been tested in a controlled way. A team led by Dr. Bruce Griffin at Surrey University Medical School, Guildford, showed that the prawns had no effect on blood cholesterol levels of the subjects in the trial. Other new results show many shellfish, including prawns, have much more omega-3 than previously thought, so they are more likely to benefit heart health.

The benefits of eating more fish and shellfish are so diverse that there is simply not sufficient fish in the sea to provide a healthy diet for the World's population, according to Prof. Michael Crawford, of the Institute of Brain Chemistry and Human Nutrition at London Metropolitan University. Some 219 million metric tonnes per annum would be needed, but only about 100 million tonnes is caught and one third of this is fed to animals. His message was that fishing, as practiced today, is not the answer and agricultural principles need to be applied to farming the sea.

Prof William Lands pointed out that the World's requirement for omega-3s have been greatly increased, because the western diet is now over-saturated with omega-6 fatty acids, coming from seed oils such as sunflower, soy and corn oil. These are converted into hormones-like substances in the body, but the omega-6 ones are too active and are inflammatory, whereas the omega-3 based hormones are anti-inflammatory. He said that maintaining a good balance, high in omega-3s was more important for heart

health than just concentrating on lowering cholesterol.

The way omega-3 act in protecting the arteries and heart was described by Prof Philip Calder, from the Institute of Human Nutrition at the University of Southampton. In particular, they prevent arterial plaques from breaking up, which is a common cause of heart attacks.

Two medical practitioners, Dr. David Levy, a leading diabetes consultant and Dr. Tom Gilhooly from the Essential Health Clinic in Glasgow then described the practical use of omega-3s in treatment and their merits vis-à-vis drug, which often have unwanted side effects.

The benefits of minerals, especially iodine and selenium in seafood, together with vitamin D, were presented by Prof. Barbara Demeneix, from Paris, and Sarah Keogh, a consultant dietician at the Albany Clinic in Dublin. She pointed out that current thinking is towards raising the recommended levels of vitamin D intake, for a whole range of benefits. Oily fish are the best dietary source, but even so, some supplementation was necessary for older people.

A major turning point in the way we think about seafood in the diet was the presentation by Dr. Anna Karin Lindroos, from the Medical Research Council Human Nutrition Research Laboratory in Cambridge. She talked about the evidence, currently only available for white-fish, such as cod and ling, that these can satisfy appetite better than any other protein foods. This may be because they are low in 'energy density', that is they contain fewer calories per gram than other foods. It is early days yet in this difficult area of study, but this new thinking could hold the key to obesity. The value of seafood is not just in the beneficial things it contains, but in the things it does not, especially calories and saturated fat.

Pilot scale re-establishment of native oysters in Scotland

Dr Liz Ashton

The Scottish Aquaculture Research Forum (SARF) in July 2008 put forward a proposal to fund a project specifically to “develop and deliver a funding application to re-establish, on a pilot scale, a native oyster population in Scotland, with a view to assessing the potential to derive a sustainable harvest from the re-established population”. Dr Janet Brown from the University of Stirling and her team consisting of David Scott and myself, Dr Liz Ashton will undertake this work from January to June 2009. We are funded £10,000 from SARF, £5000 from Crown Estates and £5000 from Scottish Natural Heritage. We would like to introduce ourselves and get your support for this new venture.

Janet as the project leader I am sure doesn't need much introduction to you all. David the sub contractor is acting as economic and financial consultant to the project and may be known to many of you as the former owner/manager of Loch Striven Mussels. He also managed Loch Ryan Oyster Fishery from 1985 to 1987 (and is a long time ASSG member – ed). This is me in the photo that was taken at the Native Oyster Steering Group Meeting held at the University of Stirling on Thursday 5th February. At the meeting we outlined the objectives of the project and presented our ideas.

We are currently in phase 1 of the project and undertaking four key tasks. They are:

1. Collating and updating information on oyster restoration work,
2. Reviewing the technical requirements, approaches and regulatory framework required,
3. Researching potential funding bodies, their requirements and time frames and
4. Identifying suitable sites.

Phase 2 April to June 2009 after the site(s), strategies and financial evaluation have been prepared, will be the completion and submission of application(s) for funding.

We would like this project to be participatory as significant stakeholder cooperation and will is needed to get the level of funding required for a pilot scale re-establishment of native oysters. Protection of stocks and public ownership are also crucial for the long term sustainable future of this valuable species for both biodiversity protection and commercial potential.

If you have any suggestions or information that could help us with these tasks, or you would like to be involved in any manner (practical, technical or financial) or you just want to know more information



Liz graduated from the University of Birmingham with a degree in Biological Sciences in 1994 and from the University of York in 1999 with a DPhil on the biodiversity and community ecology of mangrove plants, molluscs and crustaceans in two mangrove forests in Peninsular Malaysia in relation to local management practices. Her first position was as mangrove biodiversity specialist working for the Network of Aquaculture Centres in Asia-Pacific, Bangkok, Thailand. She has also worked as an Adjunct Professor at the Asian Institute of Technology, Bangkok, Thailand teaching and collaborating on e-learning Masters Courses. After a post doctoral position at the University of Aarhus in Denmark for a year, and working as a research fellow at the Institute of Aquaculture, University of Stirling for two years she moved to Vietnam for two years to manage a Masters Course in Environmental Science and Management at Cantho University. After a year in Italy and 6 months in Spain she has now returned to Scotland.

we would be very happy to hear from you. To contact us either email Liz on la17@stir.ac.uk or call Janet on 01786 467894.

Dates for your diary:

AQUACULTURE AMERICA 2009

Seattle, Washington, USA - February 15-18, 2009

Scottish Aquaculture—A sustainable future

21-22nd April, 2009 Heriot Watt University, Edinburgh

SAGB Shellfish Conference May 19th –20th

May, Fishmonger's Hall, London

ICMSS Nantes June 2009

WORLD AQUACULTURE 2009

Veracruz, Mexico - May 25-29, 2009

AQUACULTURE 2010

San Diego, California, USA - March 1-5, 2010

Aquaculture Europe in **August 17 - 21, 2009 in Trondheim**

Impacts of “unregulated harvesting” on a recovering stock of native oysters

Dr. David Smyth

Strangford Lough is located on the north east coast of Northern Ireland in County Down, an area approximately 150km². Early documented evidence shows that the Lough once had large numbers of native oysters which supported a productive *Ostrea edulis* fishery. Harris (1744) in his review entitled *The Ancient and Present State of County Down* wrote, “On the west of Strangford Lough is Ringhaddy a place to be noted for its bounty of oysters and those who gather them”. There was a dramatic decline in the oyster fishery in Strangford Lough between 1845 and 1855 with local fishermen claiming landings had dropped to an all time low. The Inspector of Irish Fisheries, Mr. J.A. Blake, attributed the dwindling returns to intensive year round fishing. Landing records suggest that the native oyster fishery must have been commercially extinct in Strangford Lough prior to 1903.

The lack of stock recovery in the Lough after fishing ceased was probably due to fragmented broodstock which resulted in low fertilisation rates (Allee Effect) and consequently low recruitment. Although no significant oyster populations were reported in Strangford Lough between the 1900s and the 1970s small numbers must have remained in the more inaccessible regions of the Lough. The once abundant historic oyster fishery was the driver for successful trials in the 1970s which demonstrated the favourable growth of both *Crassostrea gigas* and *O. edulis* and provided the incentive for the development of oyster culture in Strangford Lough.

In 1998 the E.U. funded a Fishermen’s Co-operative development project to re-establish a sustainable native oyster fishery in the Lough. As a result 75 tonnes of cultch, mostly comprising of *Pecten maximus* and *C. gigas*, was laid to provide a suitable setting substratum for oyster larvae on five licensed areas in the north of the Lough. These were seeded with an estimated 3,000 broodstock oysters and 250,000 oyster spat between 1998 and 1999.

In 1998 the standing stock of *O. edulis* in Strangford Lough was estimated to be 100,000 individuals. The current study recorded a ten-fold increase to approximately 1 million in 2002 and 1.2 million in 2003. The increase in *O. edulis* stocks over this period was probably a result of concentrated spawning of commercial oyster stocks held in Strangford Lough by Cuan Sea Fisheries[©] at densities >82m⁻² during the 1990s together with larval retention as a result of hydrographic conditions in the Lough. Population increase is unlikely to have been a result of recruitment from wild stock as no densely populated wild stocks were known to have existed before 2002. However, after the initial recorded increase, the estimated stock of native oysters declined to about 900,000 in 2004 and to about 600,000 individuals in 2005. Stocks were not surveyed in 2006 but were estimated to have increased to over 1 million by 2007. Temporal changes in the population structure of the total stock showed gradual increases in smaller individuals and concomitant decreases in the proportion of larger individuals between 2002 and 2005 which are generally atypical of wild bivalve populations. The absence of medium and large oysters which was recorded is a well-



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established indicator of fishing pressure. The shift towards a greater proportion of smaller individuals was very marked during 2007.

We believe that these broad demographic changes in the estimated total oyster stocks in Strangford Lough reflect interactions between recruitment, local environmental conditions and unregulated harvesting. Hand gathering of shellfish, mainly the edible periwinkle, *Littorina littorea*, is widespread in Strangford Lough. During the study period numerous shellfish gatherers were also observed collecting native oysters (Figure 2—see back page). Sites where declines in oyster numbers were recorded did not have large numbers of empty oyster shells which would have been expected had mortalities been due to natural causes.

The present study, is the most comprehensive survey of native oysters in Strangford Lough to date, and has demonstrated a considerable expansion of *O. edulis* and a tenfold increase in the standing stock of oysters between 1998 and 2002.

The study has confirmed the importance of broodstock sanctuaries in the recovery of *O. edulis* and demonstrated that small-scale *O. edulis* restoration is possible with a minimum financial outlay. The intersite differences in demographic trends in oyster populations discovered during the survey were attributed to the combined effects of recruitment, environmental conditions and unregulated harvesting. The survey concluded that protected assemblages of broodstock like the over-summering mats of natives (Figure 3) can enhance oyster recruitment in surrounding areas that are many times the size of the refuge itself.

However, the lessons of the past have clearly not been learnt and recovery which can be stimulated by areas of high densities of broodstock and sustainable management of native oyster resources in Strangford Lough and elsewhere will be impossible without rigorous legislation and enforcement.

Notes from Down Under

Doug McLeod

Australia is a huge country, with an extensive coastline, however the molluscan cultivation industry is surprisingly limited in scale (albeit larger than the Scottish equivalent - but then we have a long way to go before our production reflects even 20% of our capability!). Mussel production is limited to some 3,000 tons/year, while national oyster output ('Sydney Rock Oysters' and 'Pacifics') totals around 14,000 tons. In fact, the most valuable molluscan crop is the Pearl Oyster, which provided 52% of the total mollusc sector value of AU\$240 million in 2006-07.

I'm based in South Australia, which is currently the largest mollusc producing State, with around 50% of total national edible production, mostly oysters, mussels and abalone. So in my new 'incarnation', I'm close to a lot of the Australian action in terms of producer issues and policy concerns. And, as in Scotland, the sector is characterised by small scale operators with character, and who are fascinated by the production side and less interested in marketing aspects of the industry!

I've always enjoyed visiting shellfish growing situations in different countries, to assess how much similarity there is to Scottish practices (along with the scale of any difference!), and during the past 4 months I've had a relatively extensive introduction to Australian growing systems. There are variations between States and estuaries (of which more in later articles), from 'stick' culture to BST suspended bags for oysters, to varieties of longline systems for mussels.

But perhaps the greatest difference I've observed in Australia is in the management of the marine biotoxin monitoring regime (which also varies between the States). In the limited number of growing areas which wish to have export capability for the EU, the system is as mandated by the relevant legislation – so no difference from the Scottish regime. However, the vast majority of the growers have no interest at present in exporting, with the result that the monitoring programmes for these 'domestic' sites have developed a different set of characteristics, reflecting the perception that biotoxins are a relatively minor issue.

In New South Wales shellfish samples are only tested when there is evidence of plankton blooms in the growing areas, when Jellett kits are used to test for PSP and ASP. In South Australia, Victoria and Western Australia samples are air freighted to New Zealand for testing if toxic phytoplankton are detected in seawater samples, while Tasmanian authorities utilise a laboratory in Adelaide for PSP testing following evidence of a bloom.

The infrequent incidence of biotoxin events, which supports this apparent 'laid back' approach to the issue of the various toxins, is indicated by some example statistics from the State monitoring programmes:

South Australia (2000 – 06):

DSP : No. of samples : 408; Positives > Action Level (AL) : 2

PSP : No. of samples : 368; Positives > AL : 1

ASP : No. of samples : 382; Positives > AL : -

Victoria (Port Philip) (1999 – 2008):

PSP : No. of samples : 580; Positives > AL : -

ASP : No. of samples : 272; Positives > AL : -

While not wishing to suggest the creation of higher costs for industry (and industry funds the monitoring programmes), the situation appears eerily reminiscent of the situation in New Zealand up until the early '90s, when there was a general perception that biotoxins were not an issue for their waters. There was a rude awakening in 1992/1993 when a massive bloom occurred and several hundred people were ill from eating shellfish. This event shut down the majority of both recreational and commercial harvesting for a number of months. Now New Zealand enjoys a comprehensive and efficient monitoring programme!

I hope that the Australian molluscan sector doesn't suffer a similar rude awakening, at least while I'm here! In the meantime I shall continue to enjoy eating fresh SA oysters, produced in Coffin Bay, and supplied to my local fishmonger by 'Oyster Bob'!





Coffin Bay, South Australia

Pictured left; Doug McLeod looks as if the sun suits him “down under” pictured here holding samples of *Ostrea angasi* found on the beach.
Pictured above; View of major oyster growing area in South Australia, Coffin bay. *photo courtesy of* Brendan Guidera, 'Pristine Oysters'.

Pictures from Charleston

One highlight of the ICSR conference in Charleston is the oyster bake where huge vats of oysters are boiled. Normally I understand the guests shuck the oysters wearing shorts and T shirts—it was different this year with bobble hats essential to fight the bitter cold. But then one

Employment sought

Over the past few months I have been working on an abalone (equivalent of ormer) farm, Roman Bay, which is just past the town of Gansbay in South Africa. They produce about 120 tons of abalone a year, almost all of which is exported to the East. I worked in their hatchery most of the time I was there. I



have also recently finished an MPhil in Aquaculture at Stellenbosch, South Africa. I did my thesis on Rainbow Trout Breeding/Growth Rate but the course covered a number of other aspects of aquaculture including water ecology, recirculation systems, site selection, nutrition and so on. Before the MPhil I finished a general Bachelor of Science (Biotechnology) degree. I am in the UK on a 2 year working holiday visa from February and would be interested in any work and experience in oysters, mussels or any other form of aquaculture. Please feel free to contact me.

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could warm up afterwards with a hectic bop accompanied by many of the shellfish conference delegates playing along with the professional band. What a talented bunch. What is different about the South Carolina oysters is they are served as they come out the sea in huge clumps—makes shucking them a task I preferred to leave to the experts!



Photo above courtesy of Dot Leonard



Strangford Lough native oysters

Illustrations from David Smyth's article on page 9.

Figure 1 above; Examples of wild *O. edulis* and *C. gigas* found intertidally at Strangford Lough.

Figure 2 above right; Shellfish gatherer at Boretree Island

Figure 3 right; Native oysters over-summering on the low shore at Strangford Lough 1997



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