

A study of the prospects and opportunities for shellfish farming in Scotland



Executive Summary

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Background and objectives

The study was commissioned by the Scottish Government following the recent publication of the renewed “Strategic Framework for Scottish Aquaculture”. The objectives were to:

- provide Ministers with a better understanding of the industry
- develop policy thinking for the new Strategic Framework for Scottish Aquaculture
- provide evidence for the Strategic Framework Shellfish Sub Group
- develop policy priorities for European Fisheries Fund awards
- develop priorities for Research and Development
- assist businesses with their own development efforts

I Prospects for mussel farming

1.1 Background

Mussel farming has been the shellfish sector with the strongest growth in Scotland over the past 10 years, with production increasing from 1,400t in 1999 to 5,800t in 2008, largely as a result of a rapid increase in production in Shetland. Nevertheless production remains low relative to the rest of the European Union (EU) and there is thus substantial scope for increasing production without significantly impacting total market supply. Pricing will however need to be increasingly competitive if higher volumes are to be sold on the market.

1.2 UK market

Annual UK consumption of mussels is less than 0.3kg per capita compared with 2kg in France and 4-5kg in Belgium, and thus has significant potential for further growth. The UK market is divided approximately 80% retail and 20% foodservice.

The higher value retail sector presently accounts for 80-90% of Scottish mussels, with volumes split 50/50 between live and cooked (vacuum packed) product. Retail sales have seen strong recent growth (+28% 2008/09), but have been driven by price promotions and reduced unit prices. Live retail sales are static and mostly to traditional consumers. Cooked sales are increasing, key attributes being convenience and shelf life, and thus most likely to attract new consumers. The cooked product offers the best immediate prospects for Scottish mussels.

The Scottish Shellfish Marketing Group (SSMG) is the main UK supplier to the retail sector and accounts for around 70% of Scottish production. There is competition from other Scottish suppliers especially for live sales, and from overseas producers for cooked product. A key strength of the SSMG is its proximity to market and ability to service customers quickly and efficiently with cooked and live product. Product from overseas e.g. Netherlands and Ireland has further to travel and thus limits competition mainly to the cooked sector, where however there are significant price pressures due to the lower raw material costs of such producers.

The foodservice sector is also growing but is of lower value compared with retail and is thus less attractive for Scottish suppliers, especially in the widely sold frozen format. Product from Shetland dominates the live wholesale sector, having economies of scale in serving markets and strong product attributes. Such dominance is however at the expense of smaller mainland producers who are not SSMG members.



1.3 Continental market

The continental market is considerably larger than in the UK (in excess of 500,000t) and is already well supplied despite the significant decline in domestic production over the past decade, which has been largely made up for by the rapid increase in Chilean imports. The opportunities for Scottish suppliers are by no means clear, although there are indications of a swing towards more sustainable sourcing in Belgium, with rope grown mussels likely to be favoured over bottom grown. The spring market (post bouchot) for bulk supplies from France is likely to remain an important although unpredictable and relatively low value outlet for some Scottish producers. Further information on continental markets is essential to highlight the opportunities for Scottish product.



1.4 Production capacity

Existing Marine Spatial Plans suggest there is limited scope for new development on inshore sites, especially for those of an economically viable scale. Offshore development is considered unlikely in the short term due to planning uncertainties, higher costs, and greater risks, although links with the offshore renewables sector may offer opportunities. There have been few if any recent planning applications for new shellfish sites, suggesting that in any case at the present time there is no major demand for additional capacity.

Growth in production in the short to medium term is considered most likely to come from existing sites, the average production of which in 2008 was the equivalent of only 9t/200m longline, compared with typical industry yields for active sites of around 40t/line. This discrepancy is indicative of both unused capacity and poor production efficiency, both of which if addressed could lead to significant growth in production subject to market demand and other constraints.

1.5 Competitiveness

Any gains in market volume will depend on reduced production costs, which are relatively high in Scotland due to slower growth and higher labour costs. In addition, the production costs of rope culture are significantly greater than bottom culture as widely practised elsewhere in Europe.



The use of New Zealand (NZ) technology could reduce costs significantly, but has yet to be proven in Scottish conditions. Greater cooperation in the use of workboats and on-shore facilities and the harvesting and processing of product could also lead to cost reductions, as in geographically compact areas such as Shetland. However, it is likely that costs of production in Scotland will remain relatively high compared with other industries.

1.6 Finance and investment

The business poses significant barriers to new entrants, especially at a larger scale, being characterised by high capital costs and extended working capital requirements due to the three year production cycle. Other difficulties include the lack of suitable assets to act as security for loan finance, and the questionable viability of stock insurance. With regard to regional variations, the investment climate in Shetland has been more favourable than in other areas of Scotland, partly due to the influence of oil funds, and this appears likely to continue.

The return on investment for a potential traditional new farm appears to be poor given the risks and uncertainties associated with production, and business plans are barely viable without EFF grant on capital expenditure. The best prospects for improved viability lie with greater economies of scale, and the adoption of new technologies and production strategies to shorten production cycles and improve labour efficiency.

With regard to future investment in the business, it is not thought to be attractive to salmon farming companies other than to gain multi-trophic benefits on certain sites. Investment by Dutch mussel processors is also considered unlikely in the short term, despite their extensive ownership of production operations outwith the Netherlands. Such ownership is almost exclusively in bottom culture, which produces a more robust product than rope culture at lower cost, and is better suited to their highly mechanised processing operations. The investment case for other large scale new entrants with no sector experience is also far from clear, and past cases of venture capital investment have met with limited success.

Future investors in the industry are thus considered most likely to be existing growers, especially those with proven business models and strong track records, and having the experience, site capacity, facilities, and market access. There is further scope for the optimisation of operations within specific regions through

consolidation of smaller growers and/or the setting up of contract harvesting and marketing arrangements between larger and smaller farms.

The prospects for smaller growers outwith Shetland who do not belong to the SSMG appear to be poor, given their reliance on wholesale markets which are increasingly dominated by Shetland product. Such growers will need to cooperate wherever possible in both production and marketing if they are to have any chance of surviving on an independent basis.

1.7 Regulation



Regulation of the industry is focussed on two main issues, site availability and water quality. As discussed, site availability is not considered a constraint in the short to medium term given the potential capacity of existing sites. However, it will be essential for the industry to play a full part in the new marine planning process to ensure that new capacity of adequate scale is allocated in any new Marine Spatial Plans. Existing plans, especially in Argyll and Highland, do not give grounds for optimism, with presumptions in favour of development, if at all, being mostly for small and medium scale sites. Visual impact remains a major issue.

With regard to water quality issues, the industry has major concerns regarding the interpretation and implementation of legislation by regulators, although they are mostly an irritation rather than an overriding constraint. There is a need to achieve a balance acceptable to both industry and regulators, and to iron out anomalies between the UK and other countries on issues such as classification. The establishment of the Shellfish Forum has been a welcome development and there are encouraging signs of progress e.g. proposals for the Shellfish Hygiene System.

1.8 Summary of prospects

There is ample capacity for increased production from existing sites, and from potential new sites assuming favourable recognition in the planning process. Concentration of production is likely in areas with the best characteristics for viability, and it is probable that Shetland will continue to dominate production at least in the short to medium term.

The uncertainties of production however continue to be a major challenge, with irregular spatfall, tubeworm, predation, and water quality issues all posing significant threats. Prospects for the industry depend to a large extent on how growers are able to overcome such uncertainties, and to improve the consistency of production from year to year.

Development of production capacity will need to go hand in hand with market development, which is considered to offer good potential given the positive outlook for seafood consumption generally and the present low consumption of mussels in the UK. Carefully targeted efforts will however be needed to continue to secure premium outlets matching the higher production cost and particular attributes of Scottish rope grown mussels. As production grows, further price erosion is likely and it will need an equivalent response in the reduction of the cost base, through consolidation, economies of scale, and the adoption of new production technologies. Improvements to the regulatory environment will also need to remain a top priority.

2 Prospects for oyster farming

2.1 Market

Scotland is a minor producer of oysters in global and EU terms, producing 300t (3.8 million shells) in 2008, and the industry has grown only slightly during the past ten years. Overall UK production of Pacific oysters fluctuates between 800 and 1,400t, with Scottish supply in 2008 representing around 25%. Market prospects for Scottish oysters are positive, with strong demand reported throughout the industry and prices having risen by around 20% over the past 5 years, due in part to disease problems in France and Ireland. Scottish distributors of oysters presently have to import around 2 million shells per year from outwith Scotland to meet demand, stock that would preferentially be sourced from Scottish growers if available. The greatest demand is from the upmarket foodservice sector, with more limited retail sales.



2.2 Production capacity

Existing sites are at or near capacity, and there is limited scope to develop new sites especially on the West Coast, due to planning constraints and lack of suitable foreshore. Ideal sites with large areas of foreshore e.g. as found in the Solway appear to be constrained by conservation interests.

2.3 Competitiveness

The production cost of oysters in Scotland is relatively high due to slow growth and limited scale economies. Competition on the basis of quality attributes related to the environment such as cooler waters, slower growth, and the higher energy environment is thus considered the best option. There is scope to make better use of provenance and quality as a promotional tool, and to improve the role of oysters in local food and drink initiatives.

2.4 Threats

The industry is faced with a number of major threats. Seed supply presently comes from only two hatcheries and availability can be a problem. The business case for a Scottish hatchery is not clear given the small size of the Scottish industry and the likely need to also service the wider European market to achieve a viable economy of scale. A better option might be to encourage production through an existing Scottish marine hatchery facility. A second threat is that the disease causing widespread losses in France and Ireland could find its way to Scotland. Of further concern is the non-native status of Pacific oysters and their increasing propensity to spawn in the UK, albeit not yet in Scotland, which may in future limit their acceptance for culture.

2.5 Finance and investment

Existing production is mostly from small and medium size growers exhibiting marginal financial viability, despite an ex-farm price that is around 20% higher than volume producers in England and Ireland. The activity covers the labour costs of owners but leaves little scope for a return on investment. The scope for developing larger sites with better economies is limited, whilst new technologies which could reduce costs have not yet been proven in Scottish conditions. However, oyster farming does provide a valuable source of income in rural areas especially if linked to local food initiatives or other compatible enterprises.



2.6 Native oysters

The production of native oysters in Scotland is limited to the Loch Ryan fishery (20t production in 2008), and is targeted at high value foodservice outlets. Whilst stock numbers are increasing, management emphasis is on stock preservation and production is likely to remain low. Elsewhere in Scotland, the emphasis is on conservation and enhancement of existing stocks.

2.7 Summary of prospects

There appears to be limited site capacity for increased oyster production, business viability at the smaller scale is marginal, and the industry is subject to a number of ongoing threats. However, despite these limitations, there is clearly a strong market demand for Scottish oysters which will help support smaller business models, and if such limitations can be addressed, further growth in the industry should be possible.

3 Prospects for scallop farming

3.1 Market

The EU market is dominated by supplies from the wild fishery and imports from South America and Asia. Farmed production in Scotland is insignificant at 27t of queen and 2t of king scallops in 2008, although the country is the only European producer of farmed queen scallop. There are niche markets for the farmed product, mainly upmarket foodservice outlets, based on a highly differentiated product form e.g. fresh whole or IQF frozen on the half-shell queen scallops, and hand-dived, in-shell king scallops.

3.2 Production

Production in Scotland is limited to one Argyll grower of queen scallops and one Highland grower of king scallops. A major constraint on the industry is limited seed supply due to poor spatfall in recent years, the reasons for which are unknown. There are 11 Several Orders in Scotland for scallops but only one of these is actively producing, with theft being a major problem.

3.3 Summary of prospects

Overall the scallop sector does not appear to have sufficient critical mass for it to be a major focus for further development. This could pick up if some of the fundamentals change, such as the development of one or more shellfish hatcheries in Scotland, greater priority for integrated aquaculture operations, innovations in culture technology, or greater willingness by the authorities to protect Several Orders.

4 Prospects for alternative shellfish species



Although there is interest in the cultivation of alternative shellfish species, and indeed already culture activity for some e.g. sea urchins and lobsters, there are no obvious prospects for the culture of an alternative species on the same scale as mussels or oysters. Lobsters will continue to be an important candidate for restocking programmes as in Orkney and Shetland, and sea urchins have potential, either cultured in combination with other species or on a stand-alone basis.

5 Opportunities

The opportunities for shellfish farming in Scotland are seen mainly as building on industry strengths and addressing the needs and constraints that have been identified throughout the study. Around 60 opportunities have been summarised in tabular form for individual species and for the sector as a whole. For each opportunity, the relevant Strategic Framework thematic objective has been identified, together with the suggested participation of key industry stakeholders. The main areas of opportunity are summarised as follows:

5.1 Mussels



- Development of the UK market with the primary focus on cooked convenience products for the retail market aimed at the “grey pound” consumer
- Research to better understand the wants of consumers in UK and European markets
- Research among non-consumers, especially young people, to establish whether they might be receptive to mussel consumption given appropriate products and promotion
- Development of mechanisms to allow a better match between supply and demand and avoid under/over supply situations
- Product development in relation to packaging and tubeworm affected mussels
- Adoption and refinement of new technologies to reduce costs, increase site productivity and maximise return on investment
- Development of contract services and equipment sharing to minimise capital investment
- Identify optimal areas for new development and ensure recognition in Marine Spatial Plans, and consolidate existing smaller sites

5.2 Oysters

- Production of up to 2 million additional oysters p.a. to satisfy market demand
- Encourage additional seed supply from existing Scottish marine hatchery operators
- Expansion/rationalisation of existing sites where possible and production is economically viable
- Identify potential new sites and ensure recognition in Marine Spatial Plans

5.3 Scallops

- Ensure greater protection of Several Orders by the relevant authorities
- Development of an easily applied non-harmful “tag” to allow identification of stolen stock

5.4 Shellfish sector as a whole

- Recognition of, and support for, shellfish farming in the Marine Bill
- Recognition by Local Authorities of the need for site rationalisation/consolidation in accordance with carrying capacity and economic viability constraints
- Improved mechanism for classification of shellfish harvesting waters to ensure a level playing field with the rest of the EU and that food safety risks are realistically assessed
- Development and adoption of a better method for measuring norovirus in shellfish, with a view to replacement of *E. coli* as an indicator species - this could give a significant marketing advantage to Scottish growers given Scottish waters are amongst the least polluted in Europe with regard to human pathogens
- Development of clear and unambiguous criteria for depuration with agreement between all interested parties
- Improvement of the biotoxin monitoring regime with greater industry participation, and replacement of the official reference method
- Optimisation of the uptake of EFF support for industry development, and highlighting the availability of the Enterprise Finance Guarantee for loan security
- Better characterisation of different business models and associated business plans to highlight investment potential (mussels and oysters)
- Improve industry performance through adoption of knowledge exchange



- programmes e.g. monitor farms, benchmarking, farm visits, study tours, advice to new entrants
- Revision of the annual Marine Scotland shellfish survey to give improved level of production information
 - Support for research and development (R&D), in particular with regard to improvements in production efficiency and reducing production costs
 - Strengthen existing industry representative bodies and widen remit to deal with marketing initiatives, funded by a combination of industry levy and government/EU support
 - Further develop cooperation between industry and regulators through the Shellfish Forum



6 Recommendations

6.1 To government

The Scottish shellfish industry is small and operates in the most economically fragile rural coastal regions of Scotland. Despite its present relatively small size, the industry has significant scope for growth especially in mussel farming, although such growth will only be achieved with the continued backing of government at national and local level. The need for supporting services and especially for simplification of the regulatory burdens is considerable.

The key opportunities for government and associated agencies to support the development of the industry relate mainly to policy, planning, water quality, financing, and R&D.

The Strategic Framework for Aquaculture and associated working groups including the Shellfish Forum are all positive developments, but much further work needs to be done to ensure that regulatory issues particularly those relating to planning and water quality do not hold the sector back. There needs to be greater recognition in policy development of the ecosystem goods and services provided by shellfish culture, and less emphasis on perceived negative traits such as visual impact.

There is an overriding need to secure ongoing funding support for industry representation. Whilst this is partly met in Shetland through local funding, it continues to be a major issue for the rest of Scotland. The small size of the industry makes it difficult to generate sufficient funding from growers alone, and given the disproportionate and often complex volume of legislative and other matters that have to be dealt with, emanating from government at local, national and EU levels, there would appear to be a strong case for ongoing funding support from government.

6.2 To industry

The study findings suggest that the industry will need to develop a more coherent and strategic market focus coupled with a drive to improve production efficiency and competitiveness if it is to continue to grow and play an important role in the Scottish coastal economy. It is therefore recommended that the industry prepare an over-arching development strategy based on the findings of this study covering both marketing and production and tying in with the Strategic Framework for Scottish Aquaculture, the UK Shellfish Industry Development Strategy (SIDS), and other relevant initiatives. Within such a strategy, there is a specific need to carry out further research on markets, both in the UK and on the continent.

The key opportunities for growers to participate in the development of the industry relate mainly to market and product development, production capacity, production efficiency, regulation, financing, and R&D.

There is scope for the Scottish industry to learn from practices in other shellfish industries relating to representation, biotoxin monitoring, processor/grower links, marketing, and production methods, as highlighted by the benchmarking exercise carried out in the study.

The recently established Shellfish Forum is a major advance in bringing together industry and regulators and should continue to be actively supported.

With regard to industry representation, there is a clear need for a more substantial staffing input, with a high degree of core funding. Achievement of ongoing funding at the required scale will need a firm financial commitment from industry participants.



