SECTION 7 – INDUSTRY STRUCTURE

7.1 Introduction

This Section will consider a wide range of subject areas that impact on the way in which existing and any future aquaculture ventures will operate in Jersey. Subjects discussed include the potential for Jersey based aquaculture hatchery production, the status of aquaculture in relation to agriculture in terms of planning and land use, the aquaculture application process, cost recovery by States Departments through to the use of certification, accreditation and quality marks for aquaculture products.

7.2 Structure

7.2.1 Potential Development of Hatchery Infrastructure

The operation and capacity of the existing freshwater trout hatchery located at Handois Reservoir is detailed in Section 2.2.2. Section 2.3.2 describes the potential for the production of freshwater fish for re-stocking of sport fisheries in the Island. The need for the implementation of controlled breeding of freshwater fish is described by the JFAA as being vital within the next 10 years if sport fishing in Jersey's inland waters is to continue (G. Carver, pers. comm.). Section 2.3.2 also describes how this type of hatchery operation could be carried out successfully using glasshouses if the water availability and ability to discharge waste water are both present. There is also the potential in the future for the use of the same type of hatchery systems within glasshouses to house and breed the high value Koi carp for ornamental stocking of fresh waters (see Section 2.3.3). Integrating aquaculture and agriculture through aquaponics is practiced widely in other parts of the world where the 'waste' products of the fish culture are used to fertilise and enhance the production of commercial crops. The use of glasshouses for aquaponics is considered in Section 2.3.4.

The Disease Free status of the Island for notifiable fish diseases and the potential availability of glasshouses have both been highlighted in the recent Issues and Options Paper (Green Paper) as part of the Rural Economy Strategy 2011-15. This Rural Economy Strategy has highlighted the potential for developments in this respect which is also supported by this strategy.

Strategy Option: States of Jersey through the Economic Development Department to consider a review of the costs, practicalities and economic viability of setting up and running a hatchery for (a) restocking of local sport fisheries (b) production of Koi carp for sale locally and for export.

Only one marine finfish producer is located in the Island and as described in Section 2.2.1 Jersey Turbot does not consider the local production of juvenile turbot to be an economic activity for their scale of production. As it seems likely that at present any increase in marine finfish aquaculture will be limited then it is not envisaged that the establishment of a marine finfish hatchery is warranted. The rest of Section 7.2.1 will therefore consider the current capacity and potential for the hatchery production of marine shellfish in the Island.

The development of a number of key aquaculture species could potentially benefit from supporting the development of local aquaculture hatchery production. Pacific oyster seed of disease free origin (either diploid or triploid) may avoid some of the threats highlighted in Section 8 on disease. Scallop ranching and ormer culture (see Section 4) might also be supported although King scallops have proved very difficult to rear in a hatchery environment due to high larval mortality rates, high mortality rates at metamorphosis and variability in growth rates of spat (Syvret, 1997). Section 2.2.3 reviews a recent increase in local hatchery production of ormer and Pacific oyster seed by Ormer & Scallops of Jersey Ltd. (Jersey Ormers). Other trials have also been carried out in the Island in collaboration with the South

West Abalone Growers Association using funding from the Sea Fish Industry Authority (Legg, 2007). Hatcheries for stock enhancement such as the National Lobster Hatchery in Padstow whilst supporting fishery activity are also classed as aquaculture and have proved to be successful in terms of stock enhancement and in terms of their educational and tourism roles. The development of large-scale hatchery facilities of the type that would be required to service the needs of the Island's whole industry would however require significant investment, resources and commitments to specialist support.

Discussions carried out as part of the development of this strategy have highlighted the political will for the concept of local hatchery production (R. Duhamel, pers. comm.) and some Members of the Jersey Aquaculture Association have also acknowledged support for the idea when responding to the SWOT Analysis that was carried out (see Section 11). There is no doubt that the concept of having a local secure method of producing seed shellfish, and Pacific oysters in particular, will have appeal. The questions that arise however are whether or not the establishment or development of such a hatchery is practical and then whether it would be economically viable to run.

JAA Viewpoint- At a meeting with the Jersey Aquaculture Association the potential for hatchery development was discussed and there was general support for the concept although it was stated that any such development would need to be phased in so as to ensure security of seed supplies i.e. to limit risk. Interpretation centre possibilities were discussed although this might raise issues with planning due to possibilities of increased traffic. The use of hybrid facilities as described in Section 2.3.5 is one possible route that might be worth considering in order to try and ensure that any new venture would be economically viable. The 2008 ICZM (Le Claire, 2008) mentions in Strategy Point B5 that it is worth investigating the feasibility and costs of setting up a marine research laboratory and perhaps therefore the potential for a further local hatchery could be considered in line with any such research centre.

Subsequent correspondence with the JAA has however highlighted some concerns that any such development might detract from effort and resources to support the industry with other current Weaknesses and Threats (as described in Section 11). The economic feasibility of running an Island-based hatchery was estimated by one JAA Member and described as being marginal at a steady state production (T. Legg, pers. comm.). Concerns were also raised that any Jersey based hatchery would not have the support and technical back-up of an equivalent establishment in countries such as France (D. Le Masurier, pers. comm.). A further concern is that the viability of a hatchery would most likely be based upon all local producers utilising it for seed supply. Whether or not this could be guaranteed or perhaps even enforced is questionable especially given that there has been a reluctance expressed to break all ties with current seed oyster suppliers.

Following the significant impact of Oyster herpes virus on French and Jersey Pacific oyster production, Jersey Ormers in their efforts to produce Pacific oyster seed have sought to identify broodstock material that appears so far to have been unaffected by this disease. Jersey Ormers report that 7 to 10 year old local wild settled Pacific oysters have been utilised for this purpose e.g. high quality and no signs of mortality on rocks. These oysters it is understood have been used to produce the 10 million seed currently being on-grown sub-tidally. However, one concern is that the main mortality affects experienced in Pacific oysters through Oyster herpes virus are found in seed and juvenile stock and not the mature oysters (see Section 8.2.2). Therefore it remains to be seen if the seed raised from these local wild settled oysters will demonstrate any increased resistance or tolerance of Oyster herpes virus. If it does then this would obviously be of tremendous benefit to the Island's industry but if it does not then large scale mortalities are unfortunately likely to occur upon exposure to the disease. This situation will no doubt be closely monitored by the JAA.

If it turns out that Oyster herpes virus resistant broodstock are not present locally one major concern would certainly be whether or not a local hatchery would have the scope to develop

breeding lines for disease resistance as will undoubtedly be tried in France. Such breeding developments involve major resource commitments and research time in order to achieve results. If for instance French hatcheries, perhaps with State assistance, were able to develop Pacific oysters that were disease resistant then this would give those hatcheries a major competitive advantage when compared to a Jersey based hatchery. If Island growers were then again to source part or all of their seed from France then the operation of a local hatchery may become untenable.

Shellfish Hatchery Overview- The main costs involved in the development and operation of a bivalve hatchery are the provision of a site or premises, cost of labour and production of phytoplankton or microalgae as a food source for the bivalve larvae and spat.

Site/premises - In Jersey it is considered that land availability and planning permission for a new purpose built hatchery may well prove to be problematic. The recent difficulties experienced by the Jersey Oyster Company Ltd. in trying to establish new premises closer to their production site has seemingly highlighted a reluctance to consider the development of premises for shellfish activities. This may in part be due to a misconception that any such site may result in unpleasant odours or excessive noise levels due to operational activities. This viewpoint although incorrect would however potentially seem to present a limiting factor to any proposal for a new hatchery development.

Labour- Possible use of student labour to undertake hatchery production work within a set season has previously been proposed. The advantages of this approach would be the relatively cheap source of manpower; candidates would probably already be involved in some form of marine-based study; the timing of seed production could be geared towards student holidays. The potential disadvantages are that the annual provision of labour would not be guaranteed; sourcing labour would be an annual task; students selected may not prove sufficiently qualified to undertake the work unassisted thus resulting in additional industry input requirements; unqualified staff may potentially pose a risk to continuity of supply of seed due to the many potential areas of failure that may occur in what is considered to be a specialised occupation (especially in relation to early rearing of larvae).

Microalgae production- Previous discussions by Syvret with industry in Jersey on this subject highlighted that one major grower needed 5 million oysters to produce 300 tons of stock and this equated to a requirement of between 8 to 10 million seed per year i.e. an almost 1:2 ratio of oysters to seed. As annual production of Pacific oysters in 2008 was ~830 tonnes then using the 1:2 ratio the seed requirement by the Jersey industry as a whole would be in the order of 30 million per annum. If a mortality rate allowance is made of for example 25% then this requirement becomes more like 35 to 40 million seed per annum. In order to provide some idea of the microalgal feed requirements needed to raise this number of seed then the number of litres of two commonly used types of microalgae has been calculated and is presented below.

Microalgal requirements- The microalgal requirements for a 6 week cycle for production of 5mg (2-3mm) spat is described based upon work by Utting and Spencer (1991). Two commonly used microalgal species, *Skeletonema* and *Tetraselmis,* for bivalve production are considered. *Skeletonema costatum* has a cell diameter of 6 microns and is harvested at 6,000-7,000 cells per microlitre. *Tetraselmis suecica* has a cell diameter of 8.5 microns and is harvested at about 1,000 cells per microlitre (Laing, 1991). The estimations of microalgal requirements for each individual species are given below. The full calculations are contained in Appendix 2.

Skeletonema;

Week 1 - 1,875,000 spat weighing ~0.5mg each = 1,674 litres per week
or 239 litres per day

Week 3 – 1,562,500 spat after mortalities @ 2.0mg each = 5,580 litres per week
or 797 litres per day

Week 6 – 1,250,000 spat after mortalities @ 5mg each (2-3mm)
and to achieve 1 million spat at ~6mm = 11,160 litres per week
or 1,594 litres per day

Tetraselmis;

Week 1 - 1,875,000 spat weighing ~0.5mg each = 1,875 litres per week
or 268 litres per day

Week 3 – 1,562,500 spat after mortalities @ 2.0mg each = 6,250 litres per week
or 893 litres per day

Week 6 – 1,250,000 spat after mortalities @ 5mg each (2-3mm)
and to achieve 1 million spat at ~6mm = 12,500 litres per week
or 1,786 litres per day

In order to check these calculations an independent source was used to collaborate the figures stated.

Figure 18. Excerpt from FAO hatchery culture of bivalves (FAO, 2004)

Table 14: Tank water volume and daily food requirements for bivalve spat of different sizes when grown at a biomass of 200 g live weight per 1 000 l (0.2 kg per m^3). Data are for oysters but relate to other bivalves where clam and scallop spat are approximately 70% of the weight of oyster spat for a given shell length.

Length (mm)	Weight (mg per spat)	Number per 200 g	Tank volume (l) per million spat	Daily food (l* per million spat)
0.3	0.01	2.0×10^7	50	2.9
0.5	0.07	2.9×10^6	350	20.0
1.0	0.30	666 700	1 500	85.7
2.0	2.2	90 900	11 000	628.5
3.0	7.0	28 700	34 840	1 999.0
4.0	17.0	11 765	85 000	4 856.0
5.0	32.0	6 270	160 000	9 130.0

*Daily food requirement calculated as l of *Tetraselmis* at 1×10^6 cells per ml

The figures given in Figure 18 are for the microalgae *Tetraselmis* which is also shown here harvested at about 1,000 cells per microlitre (equivalent to 1 million cells per ml as stated). At the 3mm shell length the FAO manual states that 1,999 litres per day are required for 1 million spat whereas the calculations given in this report for *Tetraselmis* indicate that 1,786 litres are required for 1.25 million spat or ~1,429 litres of *Tetraselmis* for 1 million spat. The calculations given in this report based on European hatchery practices would therefore seem to broadly match those figures given by the FAO report.

It is of course accepted that there are some major assumptions within these calculations to give an estimate of microalgal requirements to produce 1 million spat. For instance oyster growth rates may be faster than those stated and so less time for algal production may be required. However these figures for 1 million spat do at least give an insight into the levels of algal production that might be necessary in order to produce between 30 to 40 million seed.

Conclusion- The calculations shown in the previous section indicate that significant resources would be required to produce the levels of microalgae needed to rear 30 to 40 million Pacific oyster seed per season. In reality a dedicated hatchery would not rear all of the algae but would use more extensive systems such as outdoor ponds whereby phytoplankton blooms are 'managed' and then fed to the larvae. These are therefore large scale dedicated facilities. Given this it seems unlikely therefore that given the lack of availability of sites, possible opposition to planning applications and the high running costs of a new dedicated hatchery that this would be likely to be an economically viable venture although it is beyond the scope of this Strategy to confirm this. A similar study currently being concluded for the Scottish shellfish farming sector is believed to have concluded that the scale of Pacific oyster culture in that region does not warrant the resource commitments needed to establish and run a new dedicated shellfish hatchery. It is understood that the Scottish study whilst not supporting a new stand-alone shellfish hatchery, did see some promise in investigating the idea of encouraging an existing finfish hatchery to diversify into some shellfish hatchery production as a sideline.

Jersey Ormers it is understood are trying a different approach in that they are initially feeding the oyster spat with cultured microalgae and are then placing them out to sea on the French coupelle settlement plates in order to let them feed on natural phytoplankton production. It will be interesting to see what growth rates and survival rates are obtained using this extensive-style production technique. Current levels of seed production are believed to be 10 million under culture sub-tidally with a capacity at the hatchery of up to 50 million seed per annum, although this is yet to be demonstrated. Given the estimates in this study of an industry requirement of 30 to 40 million seed per annum then 10 million equates to a quarter of what is needed annually whereas a production level of 50 million seed would meet the total industry requirements. Significant additional investment would however be required in order to produce up to 50 million seed oysters and this must be balanced against producing seed at an economically viable cost either for on-growing or sale. Market availability for excess seed may also be limited somewhat by the presence of Oyster herpes virus in the Island and consequent disease transmission risks. If this development of a hatchery by Jersey Ormers does prove successful then this might certainly be one method through which local Pacific oyster seed supply could become a reality.

Another alternative route may be to consider some supplementation of Pacific oyster seed production, perhaps using the French remote settlement system of telecaptage, together with production also of other species such as the ormer where there may be a reluctance to import seed from outside the Island. The potential for doing this as part of a hybrid facility would seem worthy of further investigation (see also Section 2.3.5). Complementary marine activities could include a marine research laboratory as described in the ICZM Strategy (Le Claire, 2008), or a tourist attraction such as a marine interpretation centre or a marine aquarium neither of which currently exist in the Island.

In summary, a local hatchery for ormer and Pacific oyster seed production is currently being developed and expanded beyond its previous experimental production levels. The growth rates, mortality levels and in particular the costs of seed production need to be clearly defined in order to assess if this will become an economically viable proposition for supplying seed to the Jersey aquaculture industry. If this does not prove to be economically viable then there may be merit in investigating the economic feasibility, and then if thought feasible, the practicalities of operating an Island-based hatchery as part of a hybrid-facility. The Authors do however note the concern raised by industry that this might decrease or deflect effort from other pressing issues.

Strategy Option: If an Island-based stand-alone shellfish hatchery proves economically unviable then investigate the economic feasibility, and then if thought feasible, the practicalities of setting up and running an Island-based hatchery as part of a hybrid-facility e.g. in collaboration with a marine research laboratory or tourist attraction such as a marine interpretation centre or aquarium. Consideration would need to be given to the operational structure under which such a hatchery would be run e.g. as a stand alone commercial venture or as a co-operative venture.

7.2.2 Product Certification and Accreditation

It is recognised that the Minister for Planning and Environment aims to promote sustainable use of the marine resource by "*encouraging better returns for Jersey caught marine species by investigating the possibility of supporting the adoption of an internationally recognised certification programme, which promotes well-managed fisheries*" (ICZM proposition – Le Claire, 2008). It should be recognised that efforts to maximise market potential such as with 'organic' or ecological certification schemes will require additional work to demonstrate the provenance of products.

Genuine Jersey- One scheme that is currently run in Jersey is 'Genuine Jersey' operated by the Genuine Jersey Products Association which seeks to raise awareness of local goods and support all those involved in their production. The Genuine Jersey website states that this is achieved in part by educating local people and visitors about the benefits of buying local and informing them about the range and diversity of seasonal produce on offer. The Genuine Jersey scheme currently has three aquaculture producers listed as being members of who two are shellfish producers and one is a finfish producer. The scheme is funded by members' subscriptions and the Economic Development Department. Whilst this scheme offers several benefits to members it is not audited and covers a very wide range of Jersey products from food to artwork and as such it seems unlikely that this would offer a competitive advantage to Jersey Aquaculture Association Members competing against aquaculture producers involved in specialised fisheries-based certification schemes.

Aquaculture Certification Schemes- The Opportunities Section of the SWOT Analysis (see Section 11) indicates that Jersey Aquaculture Association Members feel that they have the ability to fulfil the environmental criteria demanded by international certification schemes. Recently it has been seen that there is increasing consumer and NGO pressure on many retail and foodservice companies to ensure that the products of their seafood suppliers are certified as being responsible or sustainable. The Sea Fish Industry Authority in The Longliner publication (Seafish, 2009) reviewed the rapid proliferation that has occurred in certification bodies and associated labels, a proliferation that it states can provide a problem both for the farmer and the consumer.

The consumer it appears is often willing to abdicate responsibility for responsible or sustainable sourcing to the retailer or foodservice provider and so it is at this level that the drive is emanating for producers to comply with these schemes. Some aquaculture producers when faced with the demands of multiple markets may even decide to adopt several different schemes. It has certainly become increasingly difficult to select the correct

and most appropriate eco-label or certification scheme. The most important factor therefore to be borne in mind when deciding which scheme to follow is achieving a balance between the credibility desired and the overall costs and effort required to participate (Source: Seafood International, 09 February 2009).

Of those schemes available, the more recognised and more reputable include Friend of the Sea (FOS), an international certification scheme for products originating from sustainable fisheries and aquaculture, WWF Aquaculture Dialogues, Global G.A.P., Global Aquaculture Alliance and the International Fishmeal and Fish Oil Organisation (IFFO). By way of an example of the use of these schemes it was recently announced that rope grown mussels produced by the Scottish Shellfish Marketing Group (SSMG) have become the first seafood farmed in the UK to achieve Friend of the Sea certification (Source: Shetland Marine News, 26 March 2010). A review of some of the major schemes currently is operation is described at the end of Section 7.2.2.

There has been a call at a recent aquaculture workshop held in Paris (Workshop on Advancing the Aquaculture Agenda, Paris,15-16 April 2010) for urgent harmonisation of the various certificates and eco-labels as failure to do so will see the various labels rapidly lose meaning or significance (Source: Intrafish, 20 April 2010). It is recommended therefore that a review is carried out of the available aquaculture certification schemes in order to select the most appropriate and cost effective scheme should such an approach be adopted by the aquaculture industry in Jersey. It should be noted that at the Seafish Aquaculture Common Issues Group Meeting held in London on 16 March 2010, Seafish undertook to monitor and update members regularly on aquaculture certification schemes and to engage with the Seafood Choice Alliance to discuss available schemes, with the eventual aim of producing a study comparing the different schemes. However given current funding issues at Seafish it is not known if this study will be carried out. The operation of a Code of Good Practice is considered in Section 10.5.2.

It is generally the case that the producer will be the one who bears the cost of both implementing and then adhering to the selected scheme including the additional production, management and audit costs. Ultimately therefore it must left up to individual members of the local industry to decide for their business whether or not the additional costs and workload justify the possible benefits that may accrue in terms of new markets, market perception, increased market share, improved prices etc. Consideration in making this decision should also be given to the likely impact on the market demand of any increase in price of the product as for instance the Guardian (12th April 2010) has recently reported that sales of organic food, drink and other products slumped by 12.9% in 2009 with the biggest impact felt on organic fruit, vegetables, meat and bread where the price differential with the non-organic equivalent has traditionally been the biggest.

Strategy Option: The States of Jersey through the Economic Development Department and the Jersey Aquaculture Association should work together to identify new and existing market development opportunities (e.g. new markets, value adding, and generic marketing) that may result from the certification and accreditation of responsibly and sustainably cultivated aquaculture species and products.

Strategy Option: A cost-benefit analysis should be considered by the Jersey Aquaculture Association to help describe the likely increase in operating, management and audit costs that would result from industry participation in an aquaculture certification scheme versus the relative benefits that may accrue in terms of new markets, market perception, increased market share, improved prices etc.

Strategy Option: If an aquaculture certification scheme is thought advisable for the industry in Jersey then a review of the available aquaculture certification schemes should be undertaken by the JAA in order to select the most appropriate and cost effective scheme(s)

for adoption.

WWF Aquaculture Dialogues

The Aquaculture Dialogues are a series of multi-stakeholder roundtable discussion groups committed to the development of robust standards for responsible aquaculture, based on metrics and performance data. The eight Dialogues cover twelve of the most important species globally, including tilapia and pangasius. The standards will address and minimise the main environmental and social impacts associated with each species.

Over 2,000 people have been involved in the development of the standards, including over 90 NGO's, in a transparent process meeting International Social and Environmental Accreditation and Labelling (ISEAL) guidelines. Most of the individual standards will be metrics-based and require operators to reach or not exceed certain measured parameters in order to gain or maintain certification.

The completed standards will be held by an independent organisation, the Aquaculture Stewardship Council (ASC), which is an independent non profit organisation founded by WWF and the Dutch Sustainable Trade Initiative (IDH). It will manage the global standards for responsible aquaculture and is expected to be in full operation by mid-2011.

WWF has signed a Memorandum of Understanding with GLOBALGAP, which will offer an expansion to its program ensuring aquaculture producers can be certified in one step.

http://www.worldwildlife.org/what/globalmarkets/aquaculture/aquaculturedialogues.html

GLOBALGAP

GLOBALG.A.P.
The Global Partnership for Good Agricultural Practice

GLOBALGAP is a private sector B2B initiative (without a consumer logo) that sets voluntary standards for the certification of agricultural products around the world. With twelve ISO 65 Accredited Certification Bodies, GLOBALGAP aquaculture standards are currently operating in eleven countries. There are certification standards for shrimp, tilapia and pangasius. GLOBALGAP has also undertaken a revision of its feed standard.

The GLOBALGAP certification process offers a single integrated standard with modular applications for different product groups. With 37 retailer members, many operating globally, the goal is to harmonise retailer requirements. Through an equivalence or benchmarking system it is possible to recognise other schemes.

GLOBALGAP and the GAA have signed an agreement to work co-operatively to provide producers with an opportunity to have a one-stop-shop audit on farm.

Until the launch of the Aquaculture Stewardship Council, GLOBALGAP will be responsible for arranging the certification of farms that comply with the Aquaculture Dialogue standards and issuing certificates of interim compliance.

www.globalgap.org

Global Aquaculture Alliance (GAA)

In 2009, the Best Aquaculture Practices (BAP) program achieved a major breakthrough in the UK as the BAP logo started to appear on packets of farmed prawns in leading supermarkets. The program was launched by the GAA in 1999 with the publication of a Code of Practice for Sustainable Shrimp Farming. When this code was transformed into an auditable standard, major players in the retail and food service sectors saw BAP as a valuable tool for assuring food safety, environmental and social responsibility and traceability in farmed seafood.

As a result, 19 US retailers, including four of the five biggest, now require BAP labelled aquaculture products. In the UK three of the five largest retailers either sell BAP labelled products or require that products are sourced from BAP compliant farms and processors. This is an impressive achievement for GAA, a small, non-profit organisation that has adopted the ambitious byline 'feeding the world through responsible aquaculture'.

The suite of available BAP standards, developed by multi-stakeholder committees, now covers prawns, Channel catfish and tilapia, with pangasius (basa) due very shortly, along with salmon and mussels. The total volume of BAP-sourced product is currently around 150,000 tonnes per year, and this figure is growing exponentially as interest in the programme takes off. BAP differs from other certification programs in that it has a much broader scope and is much more than an eco-label or a farm-gate assurance program. It covers the whole of the value chain including hatcheries, farms, feed mills and processors. The US-based Aquaculture Certification Council also applies GAA standards in its certification scheme.

www.gaalliance.org

IFFO Global Responsibility Supply Standard for feed

In 2008, the International Fishmeal and Fish Oil Organisation (IFFO), which represents the majority of producers worldwide, developed a Global Standard for the Responsible Supply of fishmeal and fish oil as the basis of an independently audited business-to-business certification program. The program and Standard were developed by a multi-stakeholder group including retailers, processors, feed suppliers, fish farmers, NGOs and certification experts.

The standard will enable fishmeal and fish oil producers to show that they are offering traceable, high quality marine products, manufactured safely, using fish from responsibly managed fisheries. Compliance will be third-party audited. Raw material sourcing must take place in a country which complies with the Food and Agriculture Organisation's Code of Responsible Fishing.

The IFFO program enables retailers and the whole value chain to demonstrate responsible supply of the fishmeal and fish oil ingredients in both aquaculture feeds and the feed of farmed animals and pets, and to use the IFFO-Assured logo on their products.

The program opened to applications in October 2009. Fifteen companies from four major producing countries, sourcing from ten fisheries, are currently being audited. The scheme aims to create an independently audited system where members are rewarded with distinction within the market.

IFFO has just announced that Tecnológica de Alimentos S.A. (TASA) of Peru, the world's largest fishmeal producer, is the first producer to achieve certification under the new standard.

IFFO anticipates that there will be substantial supplies of IFFO-Assured fishmeal and fish oil on the market within months and that up to one third of global production could be certified by the end of 2010. The introduction of this program for fishmeal and fish oil is the first link in a fully certified aquaculture supply chain.

www.iffo.net

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7.3 Policy and Legislation

7.3.1 Agriculture vs Aquaculture

The specific question of whether aquaculture or its operations were considered a component of agriculture was raised at meetings with members of the Planning and Environment Department. At a meeting with Andrew Scate (Chief Executive Officer) and Deputy Robert Duhamel (Assistant Minister for Environment) the answers received to this question were that "No – from a planning perspective (A. Scate, pers. comm.) and "No- it would be considered as a change of use" (R. Duhamel, pers. comm.).

At both meetings examples were given of aquaculture or aquaponic activities that the Authors felt might warrant consideration as agriculture activities e.g. cardboard to caviar scheme (see Section 2.3 for more details and further examples). In both meetings mentioned above there was an acceptance that practices such as integrated aquaculture with polyculture of freshwater finfish providing fertiliser to hydroponic crops were also clearly agriculture practices. It was accepted that boundaries were not necessarily clear and that definitions were important in terms of planning and land use. Legislative change may be necessary to change this situation. However, when discussing the need for Environmental Impact Assessments as part of the aquaculture application process it was stated that aquaculture was considered a component of agriculture (W. Peggie & S. Le Claire, pers. comm.) and this is clearly shown in the Planning and Building (Environmental Impact) (Jersey) Order 2006 where under Schedule 1 (Article 2(1)), Column 1, Agriculture has listed under it "(4) To develop or construct an installation to rear fish".

In the case of McEwen vs. Planning and Environment Committee (1997 JLR 78) it was held that "there was no doubt that the appellant's worms were "livestock" within the meaning of Art 1(1) of the Agriculture (Guaranteed Prices and Financial Assistance)(Jersey) Law 1965 and accordingly keeping them fell within the definition of "agriculture"". The Agriculture (Guaranteed Prices and Financial Assistance) (Jersey) Law 1965 states that "agriculture" includes "…livestock breeding and keeping". Also, that "livestock" includes "any creature kept for the production of food". Therefore it seems reasonable to assume that were there for instance a pond constructed for trout production for the table or tanks constructed in glasshouses for finfish destined for the table then these would be considered agricultural practices within the definitions stated. The issue is less clear where those fish might be raised for restocking or for ornamental use as described in Sections 2.3.2 and 2.3.3 although in the case of McEwen vs. Planning and Environment Committee (1997 JLR 78) it also seems unlikely that the worms being cultured were destined for consumption.

It is understood that in Jersey there is no planning distinction between terrestrial, intertidal and subtidal areas with planning responsibilities and authority to the edge of the territorial waters resting with the Minister. This is different to the situation in the UK where subtidal authority lies with The Crown Estate. If it were considered that aquaculture could be considered a component of agriculture then it would seem reasonable to assume that planning applications for aquaculture facilities should therefore be treated in the same way, with the same restrictions and allowances, as any other equivalent agricultural application. It is beyond the scope of the Strategy to consider the wider implications that equal treatment of agriculture and aquaculture might encompass but it is clearly an issue that requires clarification and confirmation by the Planning and Environment Departments and also possibly the Economic Development Department.

Strategy Option: The question of whether aquaculture is considered a component of agriculture for both planning and environment purposes requires investigation and clarification by the Planning and Environment Departments as there is presently a disparity in the way the aquaculture sector is treated in this respect.

7.3.2 Aquaculture Application Process

Section 7.3.1 considered whether aquaculture should be considered as a component of agriculture for all purposes including assessments of environmental impact for new concession developments and planning applications for such things as shore-based facilities. If, as the Authors contend, aquaculture is a component of agriculture then this may have relevance with respect to the methodology employed in processing an application for a new aquaculture project. The Authors would recommend therefore that the application process for agricultural developments or installations is compared to that of any 'equivalent' aquaculture developments in order to ensure that with respect to any restrictions, limitations or allowances that agriculture and aquaculture businesses are treated in the same manner.

Strategy Option: Environment and Planning Department to review the current application processes for agriculture and aquaculture developments in order to identify similarities and differences in the way in which each application is processed.

The current application processes for an aquaculture venture from first application to the ability to market a product involves three different States Departments and two different Ministers. The application processes are described briefly as follows:

1. **Application for a Fish Farming Licence to the Environment Department;** Initially under the Sea Fisheries (Establishment and Regulation of Fisheries)(Jersey) Regulations 1998 an applicant must submit a written application and supporting information and documentation to the Environment Department specifying the nature of the aquaculture operation and intended concession location. Fisheries and Marine Resources will then review the application and may undertake a review of any likely environmental impacts that might arise through the proposed application. This application is then passed to the Fisheries and Marine Resources Panel for review by the range of stakeholders that sit on that Panel. If the Panel are in agreement with the recommendation regarding the application then this is passed to the Minister for Planning and Environment who will then allow publication of the application in the Jersey Gazette (Jersey Evening Post) for a period of one month. This then opens the application to public scrutiny and comment. Any comments or objections received through this public consultation are then considered. The application for a Fish Farming License can then be authorised by the Minister for Economic Development who has responsibility in this respect. The actual licence is issued by the Fishery Officers in the Environment Department.

2. **Application for Planning Permission;** The applicant must then also apply in writing to the Planning Department for planning permission to develop or construct an installation to rear fish. This application must be advertised for one night in the Jersey Evening Post and is then open for comment for a period of 21 days. It is then likely that under the Planning and Building (Environmental Impact)(Jersey) Order 2006 that where such a development or installation is greater than 0.5 hectares or is covered by the sea then an Environmental Impact Assessment leading to an Environmental Impact Statement will be required. The review of such an EIS will often be passed back to Fisheries and Marine Resources for comment. Planning permission may then be granted by the Minister for Planning and Environment.

3. **Application for Classification Status;** In the case of a shellfish harvesting application, once the Fish Farming Licence and planning permission have been received the applicant must then apply to the Health Protection Department for sampling of the shellfish beds to take place in order that the concession area can obtain a Classification status for public health protection. The actual testing is normally carried out through the States Veterinary Officer on behalf of Health Protection.

It seems obvious when reviewing the above application processes that there are elements of duplication in the information and documentation that will be submitted by the applicant, review work by the different States Departments and requirements for public consultation. This would appear to be an unsatisfactory position for all parties involved in the processes and the Strategy would strongly recommend that the current applications are streamlined into one coordinated application system requiring a single public consultation phase. It is not within the scope of the Strategy to investigate this issue in depth but it would seem that the most obvious method of streamlining the application processes would be for the powers granted to the Minister for Economic Development to authorise the issuing of a Fish Farming Licence to be passed or delegated to the Minister for Planning and Environment. This would then mean that the granting of a Fish Farming Licence and the ability to grant planning permission would rest with the same Minister. Once the Licence and planning permission have been granted then the application should be automatically passed to the Health Protection Department in order to commence, in the case of shellfish applications, sampling for Classification purposes.

It is not known whether this would require a change in full legislation or just an amendment to enabling legislation whereby powers can be delegated. The Strategy Option will therefore state that the exact legislative, structural and administrative changes required in order to streamline the current aquaculture application process should be investigated and defined.

Strategy Option: The Strategy considers that the current aquaculture licence application system is unnecessarily onerous for both industry and the relevant States Departments and requires streamlining into one coordinated application. An investigation should therefore be carried out in order to ascertain the exact legislative, structural and administrative changes required in order to streamline the current aquaculture application process to a single application through one States Department and one Minister.

7.3.3 Legislative Changes

Law Officer time for drafting any new legislation or amendments to existing legislation is a limited resource and must be bid for by States Departments on a competitive basis. As such there is a real possibility that the aquaculture sector's needs in terms of legislative changes, may not be achieved when faced with competition from dominant industries such as Finance. If this is the case then it is likely that changes to the aquaculture application process, as described in Section 7.3.2, may not be forthcoming in the near future and as such the industry will have to live with the extra administrative burdens involved in the present application processes.

A current example of this issue with regard to legislative changes is the seaweed harvesting laws (Loi 1894 Sur La Coupe Et La Pêche Des Vraics) that require updating if ormer farming is to become commercially feasible. Requests have been made by industry over several years for this legislation to be updated but with no progress to date. The situation may arise therefore in the future where Law Officer time is required for two or more issues affecting the aquaculture sector. In this scenario the Strategy would recommend that the relative benefits and impacts of the various legislative changes being considered are discussed with industry through the Jersey Aquaculture Association in order that prioritisation might be given where Law officer time continues to be a limited resource.

Strategy Option: Where Law Officer time is a limited resource in drafting new legislation that impacts or effects the aquaculture sector then the industry through the Jersey Aquaculture Association should be allowed to recommend the order of priority that should be given to legislative updates. An example might be legislative changes to streamline the planning application process versus updating of the current seaweed harvesting legislation.

7.3.4 Cost Recovery

The Scoping Document for the Strategy requires an assessment of the costs of providing services to the aquaculture industry and then a recommendation on whether the fee structure and cost recovery is appropriate. The Issues and Options Paper (Green Paper) – Rural Economy Strategy 2011-15 states that the Environment Division of the Planning and Environment Department provides two types of services which are firstly the statutory services which have to be provided and non-statutory services which are discretionary. These services are currently either charged at full cost, partial cost or provided free of charge.

Statutory Services are stated to include the following:

- Issuing export health certificates.
- Bovine semen.
- Issuing shellfish and fish movement documents.
- Inspection or examination of animals and animal products (food hygiene).
- Animal health and welfare and public health regulation in the abattoir.
- Meat inspection services in the abattoir.
- Issuing Plant passports & phytosanitary certificates.
- Land Transactions in accordance with the Agricultural Land (Control of Sales and Leases) (Jersey) Law 1974.
- Issuing Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) licences (legislation impending).
- EU legislation requirements.
- Pesticide Legislation.
- Monitoring Statutory Pests and Diseases.

Non-Statutory Services are stated to include the following:

- Analysis of soil/water/tissue, manure and potato cyst nematode (PCN).
- Diagnostic services.
- Pest monitoring.
- Independent technical advice to the agricultural industry.
- Advice to developer.

Discussions with the States Veterinary Officer showed that the services currently provided to the aquaculture industry are all statutory services for which no charge is currently made:

1. Issuing shellfish and fish movement documentation.
2. Shellfish flesh tests for Classifications.
3. Toxin testing for DSP/ASP/PSP
4. Water testing.

The estimated annual cost of shellfish testing for toxins, area classification and water testing is £20,000. This includes laboratory fees, sampling, collection and dispatch, collation and transmission of results. It does not however include vehicle depreciation for the Land Rover used on the beach (L. Lowseck, pers. comm.). By way of an example of the type of costs involved, a recent application for a Fish Farming License quotes the cost of monthly sampling for classification for human consumption purposes as £36.85 per sample which is incurred by the Planning and Environment Department with shipment costs paid by Health Protection. It can be seen that the majority of the charges currently relate to the shellfish culture sector of the Island's aquaculture industry in terms of EU Regulations relating to the protection of public health.

The question as to whether or not it is appropriate or reasonable to expect cost recovery of these services which are not currently charged for is difficult to assess. Certainly at present in the UK no charge whether partial or full is levied on industry in this respect. The argument for cost recovery as described in the Green Paper is that one section of the community is receiving a service which has a cost or value from the States which is subsidised by taxpayers. The counter argument is that the shellfish culture industry in particular is subject to the legislation that requires the monitoring of water quality, flesh quality for classifications etc. which has generally been implemented to protect public health and not to benefit the industry directly, although in protecting public health both the industry and wider community ultimately both benefit.

In terms of whether or not to charge for cost recovery it would seem most reasonable to the Authors that a policy is adopted that matches that of the competitors of the local industry. To do otherwise would place local producers at a competitive disadvantage to other EU shellfish producers who, whilst they are of course subject to the EU Regulations underpinning the testing requirements, are also eligible for far wider grant assistance through such schemes as the current European Fisheries Fund. The most appropriate comparison would probably be with UK growers as the Jersey producers are subject to the same controls in this respect whereas French public health protection etc. is carried out differently. As stated previously at this time no charge is levied on industry in the UK for these statutory services. Were this situation to change then it would be seem reasonable at that stage to implement the same levels of cost recovery in Jersey.

Strategy Option: An annual review should be undertaken by the States Veterinary Officer to ascertain the current status of cost recovery in the UK for the equivalent statutory services provided to the aquaculture industry in Jersey.

7.3.5 Limitations on Foreign Ownership

Legislation has recently been introduced that gives the Minister responsible for Economic Development the right to refuse applications for Fish Farming Licenses from companies with no strong links to Jersey. In effect this gives the Minister the power to veto the sale of a business where this would mean a change of hands into foreign ownership, or where no benefit would be seen to accrue to the Island. A counter argument to this would be that any employees of such a business would still be living and working in Jersey and so would still be liable to pay income tax and other contributions in Jersey.

This move to introduce legislation is it appears in response to a previous sale to French buyers of a Jersey company which held a concession on the south east coast of the Island. The subject of ownership in this respect was one that was raised by the Jersey Fishermen's Association in a meeting to discuss the development of the Aquaculture Strategy. The JFA felt that the marine resource of Jersey is unique and so should not be placed under foreign ownership although there was an acknowledgement that any restrictions or limitations in this respect may place the owners of those businesses at a disadvantage when compared to other businesses in the Island (D. Thompson, pers. comm.).

Leaving aside the rights or wrongs of foreign ownership of the marine resource, the practical effect of such legislation or regulation is to remove a potential market for the sale of any Jersey aquaculture businesses. In effect there will be a limitation on the right of an owner of a business to sell that asset in the widest possible market which would almost certainly lead to a potentially lower return on the sale of that business. The question raised therefore is does this type of restriction apply to any other type of business in the Island? The Strategy would recommend therefore that the relative effect on the Jersey aquaculture sector when compared to other Jersey businesses of the legislation in this respect should be clearly defined.

Strategy Option: The Jersey Aquaculture Association should seek to clarify and confirm what other Jersey based businesses have the potential for limitations to be placed upon them should any such business be offered for sale to foreign owners. Specifically, comparisons with the agriculture sector should be undertaken.

Section 7. Strategy Option(s)

Section	Strategy Option(s)	Benefit / Importance	Output or Outcome	Cost or Funding Requirement	Timeframe for Implementation
7.1	States of Jersey through the Economic Development Department to consider a review of the costs, practicalities and economic viability of setting up and running a hatchery for (a) restocking of local sport fisheries (b) production of Koi carp for sale locally and for export.	**Moderate**	Feasibility study regarding the establishment of a local freshwater finfish hatchery for restocking of sport fisheries or export.	**Minimal** to **Moderate**	Short Term – less than 5 years
7.2	If an Island-based stand-alone shellfish hatchery proves economically unviable then investigate the economic feasibility, and then if thought feasible, the practicalities of setting up and running an Island-based hatchery as part of a hybrid-facility e.g. in collaboration with a marine research laboratory or tourist attraction such as a marine interpretation centre or aquarium. Consideration would need to be given to the operational structure under which such a hatchery would be run e.g. as a stand alone commercial venture or as a co-operative venture.	**Moderate**	Cost-benefit analysis regarding an Island-based shellfish hatchery as part of a hybrid facility.	**Moderate**	Short Term – less than 5 years
7.3	The States of Jersey through the Economic Development Department and the Jersey Aquaculture Association should work together to identify new and existing market development opportunities that may result from the accreditation of responsibly and sustainably cultivated aquaculture species and products.	**High**	New market opportunities for Island produce.	**Minimal** to **Moderate**	Short Term – less than 5 years + Medium Term – 5 to 10 years

7.4	A cost-benefit analysis should be considered by the Jersey Aquaculture Association to help describe the likely increase in operating, management and audit costs that would result from industry participation in an aquaculture certification scheme versus the relative benefits that may accrue in terms of new markets, market perception, increased market share, improved prices etc.	**High**	Quantification of the costs of establishing and running a certification scheme vs. likely benefits.	**Minimal** to **Moderate**	Short Term – less than 5 years
7.5	If an aquaculture certification scheme is thought advisable for the industry in Jersey then a review of the available aquaculture certification schemes should be undertaken by the Jersey Aquaculture Association in order to select the most appropriate and cost effective scheme(s) for adoption.	**High**	Identification of suitable certification schemes for Jersey aquaculture products.	**Minimal** to **Moderate**	Short Term – less than 5 years
7.6	The question of whether aquaculture is considered a component of agriculture for both planning and environment purposes requires investigation and clarification by the Planning and Environment Departments as there is presently a disparity in the way the aquaculture sector is treated in this respect.	**High**	Considered to be crucial to the continued development of the industry on a level playing field with other Island industries.	**Minimal**	Short Term – less than 5 years
7.7	Environment and Planning Department to review the current application processes for agriculture and aquaculture developments in order to identify similarities and differences in the way in which each application is processed.	**Moderate**	Highlights approach of States Departments to similar industrial sectors.	**Minimal**	Short Term – less than 5 years

7.8	The Strategy considers that the current aquaculture licence application system is unnecessarily onerous for both industry and the relevant States Departments and requires streamlining into one coordinated application. An investigation should therefore be carried out in order to ascertain the exact legislative, structural and administrative changes required in order to streamline the current aquaculture application process to a single application through one States Department and one Minister.	**Moderate**	Rationalised system for aquaculture applications resulting in reduced resource requirements for industry and relevant States Departments.	**Minimal** or **Moderate** (depending on the need for legislative change)	Short Term – less than 5 years
7.9	Industry, through the Jersey Aquaculture Association, to be given the chance to comment on and prioritise legislative changes that impact or effect the sector.	**Moderate**	Priority list for legislative changes. Industry can decide what legislative changes will have the greatest benefit to the industry.	**Minimal**	Short Term – less than 5 years
7.10	An annual review should be undertaken by the States Veterinary Officer to ascertain the current status of cost recovery in the UK for the equivalent statutory services provided to the aquaculture industry in Jersey.	**Low**	Level playing field with competitors.	**Minimal**	Annually
7.11	The Jersey Aquaculture Association should seek to clarify and confirm what other Jersey based businesses have the potential for limitations to be placed upon them should any such business be offered for sale to foreign owners. Specifically, comparisons with the agriculture sector should be undertaken.	**Moderate**	Clarification of methods of treatment by the States of Jersey of different industries with respect to ownership and control.	**Minimal**	Short Term – less than 5 years

SECTION 8 – DISEASE MANAGEMENT

8.1 Introduction

Up until recently disease issues have not been a major consideration for either the shellfish or finfish farming sectors. Jersey is considered as being 'Disease Free' for *Bonamia ostreae* and *Marteilia refringens* and as being free of all notifiable finfish diseases. However the emergence of the new Oyster herpes virus (OsHV-1 µvar) has had a significant impact on shellfish production recently with mortality rates of up to 80% in juvenile and small Pacific oysters. It seems likely that Oyster herpes virus will continue to cause problems for producers at least in the near future as reports are being received of new outbreaks of this emerging disease during 2010 (see link below).
http://www.oie.int/wahis/public.php?page=single_report&pop=1&reportid=9179

With respect to legislation, Jersey regulations in relation to animal health and food produce follow UK practice as the UK is still the responsible Member State under EU (Article 299(6)(c). Protocol 3 allows for the free movement of goods within the customs union. In practice this means that Jersey must comply with EU Directives which normally means adopting the appropriate legislation to enact the corresponding EU Directive.

Law Officers' time has been granted to enable the new Aquatic Animal Health Directive (Council Directive 2006/88/EC) to be brought into force through legislation in Jersey (A. Pinel, pers. comm.). This new legislation will be enacted shortly in Jersey and will therefore replace the existing legislation covering disease control. Council Directive 2006/88/EC has already been enacted in the UK under The Aquatic Animal Health (England and Wales) Regulations 2009. It is understood that the Jersey legislation will mirror that of the UK legislation. This section will therefore consider the implications of the new legislation.

8.2 Disease Management

8.2.1 Measures by the Competent Authority

The role and activities of a Competent Authority in Jersey are carried out through the States Veterinary Officer. Discussions with the States Vet highlighted that currently for the aquaculture sector Oyster herpes disease (OsHV-1 µvar) is recognised as the most serious issue to the industry in Jersey. A discussion took place as to whether the resources were available to fund increased surveillance testing for this emerging disease and it was stated that the States Vet was unable to provide additional resources for research and cannot support non-statuary testing. It is understood that official Surveillance Areas have additional testing requirements placed upon them which of course requires additional resources to fund the laboratory tests required. The preferred approach therefore of the States Vet would be to see additional non-statutory testing for an identified end objective with some sharing of costs. The States of Jersey have therefore offered to provide 25% support towards testing and it is possible that this work might be eligible for support for 'economic development' purposes (L. Lowseck, pers. comm.).

8.2.2 Shellfish Diseases and Management Measures

Oyster herpes virus - The Pacific oyster production of France has been decimated by summer mortality events over recent years and this has now also reached Jersey. Although the basis of the condition would appear to be multi-factorial with a combination of disease, environmental and genetic aspects the potential impact of sea temperature warming is likely to exasperate the impact. OsHV-1 µvar was stated by the JAA as being a major threat to the industry at present. Mortality levels of up to 80% in juveniles/small oysters have been

recorded for both triploid and diploid stock. To date only 110g+ animals do not seem to have been significantly affected (see Figure 19). The economic impacts of this disease are not limited to loss of stock as restrictions on imports of Jersey oysters into the UK for relaying together with the new Containment status of Jersey (see Section 8.3.3) means that markets have been lost for half-ware oysters that are unlikely to be regained for the foreseeable future.

Figure 19. Mortality effects of Oyster herpes virus on Pacific oysters in Jersey
Left-hand oysters showing mortality effects whilst right-hand oysters were alive
(Source: Aquafish Solutions Ltd.)

Due to the significant impact that this emerging disease is having on those growers involved in Pacific oyster cultivation a range of management plans have been voluntarily put in place by growers in order to try and limit future mortality levels. These measures and approaches being tried include avoiding seed imports between certain high risk periods; reducing stocking density and moving oysters further up the beach during high risk periods in order to try and limit the build up of viral levels. One other approach that is being tried is to increase stress on the oysters through frequent turning of the culture containers based on the theory that this will limit certain growth patterns that also favour the build up of the virus.

Goulletquer *et al.* (1998) in a wide ranging review of summer mortality issues in French Pacific oyster producing areas concluded that every year during the study mortality occurred concomitantly to a peak in oyster meat weight, a minimum glycogen concentration and a maximal sexual maturity. However no density effect on mortality rate was shown as being significant in the 1997 study, and likely resulted from a physical constraint (i.e. oyster stability) in spite of the large variability of stocking densities studied (3 to 24kg/m^2). Later work by Pernet *et al*. (2010) assessing mass mortalities in the Thau lagoon in 2009 showed that in contrast to the well known summer mortality model from the Morest project, mortality in 2009 was observed whilst oysters were at the onset of gametogenesis which suggests that reproductive effort is not pivotal. Mortality in this example coincided with an elevated viral load of OsHV-1 µvar in the oysters. The main factor influencing mortality in this study was shown to be the size of the oyster with larger animals surviving better than smaller ones, which is most likely related to the higher levels of energy reserves in the bigger oysters. Density was not cited as being a factor in mortality levels. Work by Sauvage *et al.* (2009) showed that significant correlations are found between water temperature, gametogenesis, physiological and immunological weakening, prevalence of pathogens, and oyster mortality.

Again stocking density is not cited as a significant factor in mortality events associated with OsHV-1 µvar. This work also supported the previously reported high genetic basis underlying the variance of resistance of Pacific oyster to summer mortality, suggesting that there might be a possibility to improve resistance to OsHV-1 µvar by selective breeding. See also Section 9.4 regarding the potential effects of Climate Change

Vibrio harveyi – this *Vibrio* bacterium is considered to be the main disease issue for ormers and is the subject of research under the EU SUDEVAB Project (www.sudevab.eu) which aims to develop a manual covering pathogens for abalone growers. See also Section 9.4 regarding the potential effects of Climate Change

Bonamia – *Bonamia ostreae* has had a major negative impact on UK native oyster production for many years and has been a principal driver for much of the movement restrictions for native oyster stock. The recent occurrence in France of the new exotic *Bonamia exitiosa* is now a source of concern to the Jersey industry as there is some evidence emerging that Pacific oysters may be a possible vector for this disease (Lynch *et al.*, 2010). This would have major implications for transfers of Pacific oysters from *Bonamia* positive areas to areas which are free of this disease.

8.2.3 Finfish Farming Sector

Jersey has the following disease status (A. Pinel, pers. comm.):

- Commission Decision 2004/453/EC of 29 April 2004 implementing Council Directive 91/67/EC and measures against certain diseases in aquaculture animals continues to apply. The Island therefore has disease free status for Spring viraemia of carp (SVC), Bacterial kidney disease (BKD) and *Gyrodactylus salaris*.

- Commission Decision 2002/308/EC of 22 April 2002 establishing lists of approved zones and approved farms with regard to one or more of the fish diseases viral haemorrhagic septicaemia (VHS) and infectious haematopoietic necrosis (IHN). Annex 1 8A and 8B (as amended) lists Jersey as being approved with regard to VHS and IHN.

- Brown trout testing ('disease free') for Jersey Water stock.

- As Jersey is considered Disease Free for the notifiable finfish diseases then any import of carp must comply with the current legislation whereby imports of carp are allowed from countries with the same health status, such as Japan, so long as the consignment is accompanied by a correctly completed health certificate and is imported via a border inspection post.

It is understood that there has only been one mass mortality of finfish in the last 50 years and this related to imported carp that had supposedly been health tested and certified as being free of disease (G. Carver, pers. comm.). The JFAA undertake careful monitoring of stock movements in order to identify any possible unexplained mortalities or disease incidents. There have however been unauthorised releases of fish from private dwellings etc. into the wild and these fish will not therefore have been health checked. Examples include gudgeon, which are now found in Millbrook Reservoir, and catfish into the waters at St. Catherines. The implications, advantages and disadvantages of Disease Free status with respect to the main notifiable finfish diseases are discussed in Section 2.

8.3 Policy and Legislation

8.3.1 The Aquatic Animal Health Directive

The advantage to industry of Council Directive 2006/88/EC is that it allows more transparent regulation and control systems and provides a risk-based approach to surveillance for disease. This latter point marks a shift in emphasis for controls away from non-susceptible species and has resulted in a more proportionate burden of evidence requirement between protecting animal health and allowing animal trade.

Authorisation of APBs - Under Council Directive 2006/88/EC all aquaculture production businesses (APBs) must be authorised by the competent authority which for Jersey would be carried out through the States Veterinary Officer. The definition of APBs includes, but is not limited to, all finfish farms, traders in live aquatic animals, shellfish farms, molluscan purification and dispatch centres, some processors and small scale producers for the local market. Molluscan shellfish farms can be authorised as mollusc farming areas so that a single authorisation can be issued for multiple sites within an area (Cefas, 2008).

Conditions of Authorisation - Records must be kept of all animal and product movements and mortality events. APBs must also participate in risk-based surveillance; operate in accordance with a documented biosecurity measures plan; inform the competent authority of any material changes to business or farming practices.

Biosecurity Measures Plan – Cefas (2008) outlined what they would expect to see contained within a biosecurity measures plan which includes the following:

- A review of disease risk from suppliers of live shellfish;
- A review of the risks from management practices;
- Risk mitigation to prevent the spread of disease;
- Training and development of personnel, including awareness of increased mortality and signs of disease.

Section 4.4 reviews The Aquatic Animal Health Directive in terms of offshore culture and the possibility of importing ormer seed into Jersey. The enacting legislation in the UK has allowed the South West Abalone Growers Association to import ormer seed from a French hatchery in 2009 as *Haliotis tuberculata* has not been proved to be a susceptible species or vector for the diseases covered under the legislation (listed in Part II of Annex IV of Council Directive 2006/88/EC). Imports into Spain also took place in 2009 under the new legislation. However it was stated that there is the possibility that this legislation enacted in Jersey will prevent the import of potentially 'risky' seed in order to limit the chance of new ormer diseases being introduced. The preferred approach would therefore be to raise animals locally (L. Lowseck & A. Pinel, pers. comm.s). See Section 4.4 for further details. In order for the culture of ormers to expand in Jersey then the availability of seed must be guaranteed and so the issue of whether or not ormer seed imports from hatchery producers outside Jersey will be allowed under the new Aquatic Animal health regulations needs to be clarified.

Strategy Option: Clarify under the new Aquatic Animal Health Regulations the position with respect to the importation of ormer seed from hatchery producers outside of the Island.

8.3.2 Approved Zone Status

Commission Decision 2002/300/EC of 18 April 2002 established the list of Approved Zones with regard to *Bonamia ostreae* and/or *Marteilia refringens*. The Annex lists Jersey as being approved for both diseases whereas the adjacent French zones are not approved. This therefore means that imports of shellfish seed for species such as the King scallop (*Pecten maximus*) or the blue mussel (*Mytilus edulis*) are prohibited from these adjacent French

zones (see also Sections 3.3.2 and 4.4.2). It is understood that the enactment in Jersey of the new Aquatic Animal Health Directive will not change the position with respect to imports of scallop or mussel seed from France (L. Lowseck, pers. comm.). However there is considerable uncertainty over whether or not ormer seed imports will be allowed in to Jersey from hatchery producers such as France Haliotis in Brittany (see Section 8.3.1).

It appears that there are mixed views within the Jersey Aquaculture Association as to the relative disadvantages or advantages of Jersey's 'Disease Free' status. The Jersey aquaculture industry's position with respect to Approved Zone status is discussed further in Section 11.

Strategy Option: Jersey Aquaculture Association to define and agree what 'Disease Free' status with respect to *Bonamia* and *Marteilia* means to the industry and what the benefits, drawbacks and implications are as there are differing opinions and perceptions of the relative benefits of Approved Zone status within the Jersey Aquaculture Association.

8.3.3 Containment Areas

Commission Regulation (EU) No. 175/2010 was introduced on the 2nd March 2010 regarding measures to control increased mortality in Pacific oysters through the emerging Oyster herpes virus (OsHV-1 µvar) which has had a significant impact both in France and Jersey. In the UK where OsHV-1 µvar has not so far been detected, a UK Declaration of a Programme for the Early Detection of OsHV-1 µvar in England and Wales has been implemented which establishes a sampling and testing programme in accordance with SANCO 6463/2009 to ensure early detection of any occurrence of this emerging disease.

Under Regulation (EU) No. 175/2010, which applies directly to the Channel Islands, measures already put in place by Member States affected by OsHV-1 µvar were extended primarily through the establishment of containment areas where this disease is confirmed as being present. Restrictions then apply to movements of Pacific oysters out of the containment areas in order to limit the risk of spread of the disease. Derogations are provided for example where oysters are being moved to another containment area or are intended for human consumption. The measures under this Regulation are subject to review at the end of December 2010.

A flow chart describing the actions that might be taken with respect to under Regulation No. 175/2010 together with a supporting explanation are contained in Appendix 3.

8.3.4 SCoFCAH

Jersey is represented in the Standing Committee on Food Chain and Animal Health (SCoFCAH) which is a European group of State Veterinary Officers which meet to advise on 'farm to fork' animal health issues. The Committee's mandate covers the entire food supply chain, ranging from animal health issues on the farm to the product that arrives on the consumer's table, therefore significantly enhancing its ability to target risks to health wherever they arise in the production of food. It is chaired by a European Commission representative (L. Lowseck, pers. comm.).

8.3.5 Animal By-product Regulations

Regulation (EC) No. 1774/2002 laying down health rules concerning animal by-products not intended for human consumption applies to Jersey but has not yet had the appropriate legislative measures enacted in Jersey legislation in order to allow enforcement (L. Lowseck, pers. comm.). The recent emergence of Oyster herpes virus in the Island's Pacific oysters leads to two main issues. Firstly there is the question of whether dead shellfish retained in the culture containers provide a reservoir or vector for further transmission of the shellfish disease, and secondly, any dead shell under these Regulations will require incineration. The

Island does have facilities for the incineration and safe disposal of Category 1 material and this can be arranged through Transport and Technical Services. Other disposal means for dead shell have been reported such as spreading on agricultural land (see Figure 20).

Figure 20. Waste Pacific oyster shell spread on agricultural land (Source: Societe Jersiaise)

Biosecurity of this method of disposal has been mentioned as a concern as birds have been seen feeding on the shells thus indicating that some flesh must still be attached (Societe Jersiaise, pers. comm.).

Strategy Option: Disposal methods for shell waste or dead oysters need to be assessed and costed in order to comply with Animal By-product Regulations (No. 1774/2002).

8.4 Future Measures for Disease Management

The level of impact that Oyster herpes virus has had on Pacific oyster production in Jersey is significant in terms of levels of mortalities, lost production and lost markets for products such as half-ware oysters for relaying where the disease is not already present. It seems likely given the start of mortality issues for 2010 that until disease resistant strains of oysters are discovered or developed, or perhaps until effective management techniques are successfully developed, that this disease could well continue to be an issue for the foreseeable future. This is also now an issue that has spread to mainland Britain with the presence confirmed of Oyster herpes virus in the south east of England.

It has been recognised that the French organisation Ifremer have a high level of expertise in this area of investigation and research due to the severe effects that this emergent disease has had on their Pacific oyster cultivation sector and contacts have been made in this respect by the States Vet to discuss this issue (L. Lowseck, pers. comm.). It also seems likely that it will therefore be through an organisation like Ifremer that the development of any effective strategies for dealing with Oyster herpes virus will be developed. As this disease has not impacted on the UK then their current approach is centred on a Programme for the Early Detection of OsHV-1 µvar. The Strategy therefore considers that given the likelihood of continuing impacts on the Jersey shellfish cultivation sector through Oyster herpes virus that the States Vet, Jersey Aquaculture Association and Cefas should establish stronger more formal links with Ifremer in terms of tackling this particular emergent disease. It is recommended therefore that the possibility of setting up a cross-Channel Working Group be considered with respect to Oyster herpes virus.

Strategy Option: Jersey Aquaculture Association and the States Veterinary Officer to investigate the potential for establishing a cross-Channel Working Group with Cefas and Ifremer to tackle the emergent disease Oyster herpes virus (OsHV-1 µvar).

Given that disease issues have previously had relatively little impact on the shellfish or finfish growing sectors in Jersey then the main drivers for disease management have up until recently generally been legislative in nature. The emergence of the Oyster herpes virus within cultivated Pacific oysters has however led the shellfish sector to undertake their own management measures to limit the introduction of diseased oysters into the Island, to help contain the spread of the disease within the Island and to try and limit mortality levels by certain husbandry practices. With an emergent disease such as Oyster herpes virus it can be seen therefore that the Jersey industry has an ability to react faster and in more diverse site-specific ways than can be covered by legislation that generally applies at an EU level. Up-to-date advice from organisations such as Cefas, Ifremer or a specific Working Group on disease management (see Strategy Option 8.4) could add to the benefits that might be achieved through industry measures.

In summary a combination of legislation incorporating risk-based controls and self-imposed industry measures seems most likely to offer the best defence against new disease introductions and for managing existing or emerging diseases. Given the Island's trading status with the EU then legislative control is unavoidable whereas industry measures are not necessarily enforceable even if they are desirable. Section 10.5 describes the potential for the development of a Code of Good Practice (CoGP) with respect to mitigating or limiting environmental impacts through aquaculture practices. In terms of disease management it is therefore recommended that any CoGP should incorporate best practice advice for disease management including an undertaking by industry that any management or husbandry measures that are agreed by the Jersey Aquaculture Association will be implemented by Association Members. Members should then be encouraged to sign up to the CoGP.

Strategy Option: Develop a Disease Management section of a Code of Good Practice for the Jersey aquaculture industry including an undertaking whereby agreed industry measures by the Jersey Aquaculture Association are implemented by Association Members.

Section 8. Strategy Option(s)

Section	Strategy Option(s)	Benefit / Importance	Output or Outcome	Cost or Funding Requirement	Timeframe for Implementation
8.1	Clarify under the new Aquatic Animal Health Regulations the position with respect to the importation of ormer seed from hatchery producers outside of the Island.	**High**	Clarification of position with respect to ormer seed imports under the Aquatic Animal Health Regulations.	**Minimal**	Short Term – less than 5 years
8.2	Jersey Aquaculture Association to define and agree what 'Disease Free' status with respect to *Bonamia* and *Marteilia* means to the industry and what the benefits, drawbacks and implications are as there are differing opinions and perceptions of the relative benefits of Approved Zone status within the Jersey Aquaculture Association.	**Moderate**	Clarification for JAA of Disease Free status.	**Minimal**	Short Term – less than 5 years
8.3	Disposal methods for shell waste or dead oysters need to be assessed and costed in order to comply with Animal By-product Regulations (No. 1774/2002).	**Moderate**	Agreed disposal method for shell waste due to mortalities.	**Minimal** (for assessment); **Moderate** (possibly for implementation)	Short Term – less than 5 years
8.4	Jersey Aquaculture Association and the States Veterinary Officer to investigate the potential for establishing a cross-Channel Working Group with Cefas and Ifremer to tackle the emergent disease Oyster herpes virus (OsHV-1 µvar).	**Moderate**	Expert advice and contacts with respect to the emergent disease Oyster herpes virus.	**Moderate**	Short Term – less than 5 years

8.5	Develop a Disease Management section of a Code of Good Practice for the Jersey aquaculture industry including an undertaking whereby agreed industry measures by the Jersey Aquaculture Association are implemented by Association Members.	**High**	Code of Good Practice (CoGP).	**Minimal** to **Moderate**	Medium Term – 5 to 10 years