

Ormer Project 2006 onward .

Jersey Turbot (CI) /ORTAC



ORMER Project 2006

A joint operation to create a working model for the commercial aquaculture of the Ormer *Haliois tuberculata*.

Action Requests

To be allowed to hold Ormers as adult broodstock (c.50) and consequential offspring.

To modify the concession details for A.N.Legg to include ormers and indigenous seaweeds.

Project Description February 2006

ANL

Project Aims:-

To create a complete Ormer *Haliotis tuberculata L* farm that incorporates the following principal approaches,

- **SIMPLE TECHNOLOGY.** That the hatchery is constructed and operated to a minimum standard of technology using domestic plumbing materials and avoiding extensive algal culture operations. That the ongrowing on a beach site uses equipment that is easily manhandled and operated without the need for large boats or hydraulic lifting gear.
- **CURRENT SCIENTIFIC INFORMATION.** Simplicity does not rule out best current information, full and continuing literature searching and liaison with practitioners on a worldwide basis is being undertaken. A workshop is planned for May 2006 and there is a possibility of inclusion into a European 6th Framework technology exchange programme by June 2006.
- **SUSTAINABLE PROCESSES.** The provision of rope grown seaweeds and container grown weeds is integral to the process , this avoids wholesale weed cutting and harvesting which is expensive in labour and equipment and could have environmental ramifications. It is intended to follow the structured ECOPACT * environmental protocols.
- **SCALABILITY.** Unlike a large onshore farm ,this approach allows for a progressive development of equipment volumes up to a maximum of having four year classes in operation simultaneously. This substantially limits financial exposure and allows safe financial retreat should a critical control point (ie storm/disease) prove insurmountable.
- **INTERIM INCOMES.** The expected cycle time for a non-grant aided abalone farm to achieve profitability is between year 5 and year7. The use of the ORTAC3 allows restricted polyculture of seed sized oysters *Crassostrea gigas* on a yearly basis producing 15g oysters each year alongside the contained Ormers. Excess hatchery production can be diverted to part grown sales and perhaps to generate a ranching programme in conjunction with other concession holders with scallop sites.
- **RECORDING AND REPRODUCIBILITY.** To define and record all the process steps to create a visual and written record of operations. This will be in one part to a level to allow inclusion in the SNVQ2 Shellfishfarming qualification and similar and also provide a handbook for the use of ORTAC3s to aid their commercialisation.

The Principals.

ORMER 2006 is a joint operation between

Jersey Turbot (CI) represented by David and Gary Cowburn , successful turbot farmers who utilise the St.Catherines vivier. Their current production is now many thousands of fish all for direct local sale.They both have a considerable fisheries experience ranging from skippering to vivier ownership.

ORTAC is a shellfish farming product manufacturer based in Jersey and owned by Tony Legg a Chartered Biologist. Tony Legg holds a concession for shellfishfarming at Green Island /LeHocq.

The Facilities/Equipment.

St Catherines Vivier is a long established facility that pumps ashore and discharges seawater from St.Catherines Bay through a set of tanks in a tunnel system some 100m long.

The water quality and quantity is excellent and gains a degree of isothermal effect from passage through the structure.

To the right of the bunker entrance is a redundant fridge stand with a plastic tunnel frame attached.This is the hatchery site. Planning permission allows the proposed operation provided that the structures are temporary in nature and can be easily dismantled.

At 20m by 5m it allows a significant hatchery using current techniques that should be capable of rearing small ormers (1.5mm to 20mm) in the million + scale.

The ORTAC3 rearing unit was conceived as a consequence of a European Fourth Framework initiative and designed and manufactured by Tony Legg. Its use has been limited to shellfish farms in Ireland but this year will see significant awareness trials in Jersey,France and Tasmania. (a copy of the CEFAS Shellfish News describing its operation is in the appendix).

The Green Island site is unusual in that it has positions from +2m above datum to +50cm above datum and is sheltered and proven over many years.

Environmental Impact.

The hatchery will have no additional environmental impact . The current discharge from the turbot farming process consists of the water that surrounds the turbot and has a small increase in nutrients, the passage through the ormer arrangement will bind much of this up in algal growth and convert it into ormer biomass. As with all other long established viviers , although the discharge can be interpreted as a 'trade effluent' the Water Pollution(Jersey) Law 2000 does not appear to have been invoked and this usage improves an already unchallenging position.

With regard to the beach situation, the site is currently licensed for oysters and clams using oyster bags and oyster cylinders, and has simultaneously supported 4000 oyster bags and 1.5km of 90cm wide clam netting in the past . The site is also licensed and planning exempt by view of previous usages (pre MPZ) for the use of an unspecified number of rearing cylinders. The proposed ormer rearing is materially identical to the oyster rearing and indeed if ,for any reason is unsuccessful then the same equipment will simply be used exclusively for oyster rearing, in particular seed oysters to 20g.

The ORTAC3 units (which were designed with this site in mind and all prototypes and initial mouldings were first used on this site) are also specifically constructed to produce an environmentally smaller 'footprint' than oyster bags. Firstly they are smaller at c 50cm square as opposed to 90x50cm for oyster bags for the same carrying capacity. Consequently , whereas 4000 oyster bags and the required access, cover 5500m² (as double rows) 4000 ORTAC3s cover only 2250m² (again as double rows). Secondly, the main body of the ORTAC3 is below the standard trestle bars with the main volume 18cm lower than that of bags . Crudely this translates to two less daytime tides that they are visually exposed when placed in the same position as bags. In practice this means half the area covered by the same production capability of bags and for two thirds of the time .Cumulatively this means ,subjectively , a reduction of two thirds in visual impact More importantly they are designed to reduce labour and this translates in oyster, ormer and polyculture (oyster and ormer together)mode, to less machinery and people on the beach and therefore less environmental impact. With oysters alone, one person can turn 10,000 units in a 5 tide session , this compares with 6+ for oyster bags .One person can easily walk down the beach to the site to work , with six, a tractor and trailer makes more economic sense but is more environmentally disruptive. With Ormers the aim is to minimise intervention, low stocking rates and internally generated seaweed growth limits the operations to monitoring and predator control (crabs developing in the cylinders).

At present this project is expected to use 4000 ORTAC3s covering 2250m² (less than a quarter hectare including access areas) or 1000m² of actual units (32mx32m). Seaweed generation will cover an additional 500m² . Access will be mostly on foot by one person unless establishment or harvesting processes are being undertaken.

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All the stock for the project will come from the dedicated hatchery and from broodstock sourced on or near the site . This utilises genetic predisposition for the site , and possibly tolerance/resistance to the *V.cacheriae* /*V.courtier* problem. All the seaweeds reared will be indigenous species . However, one desired species *Alaria eschulenta* has yet to be proven as indigenous. If so trials elsewhere have shown that not only do ormers perform exceptionally well consuming it but it also can produce 3-6kg /m of rope per year ,substantially exceeding Laminarias and giving better conversion ratios. If not , then it cannot be used in this project.



12 ORTAC3s in Ormer Farming configuration in Clew Bay Co.Mayo Ireland


Project Description February 2004

Initial Trial Elements.

1. The establishment of an Ormer hatchery. The size and tankage constraints allow for some 5000 industry standard settling plates. This should produce enough settled juveniles for the operation in one settlement.
2. Sequential broodstock conditioning may allow for three settlements per year if so then the chances of producing the targeted quantities rise threefold. The limiting factors are conditioning time for broodstock, hatchery space at c 90 days per settlement and a temperature above 15C in the tanks.
3. If pre-weaned ormers can survive at commercial numbers after introduction into sea rearing containers at 1.5mm (as is the case with *Haliotis rubra*) then the commerciality of the project will increase significantly. (More usually Ormers are introduced to sea after weaning at 8-10mm and 120-200 days later). There are a number of commercially sensitive trials planned in this area that will potentially change the economics of ormer farming considerably, however, as these have potential for intellectual property rights disclosure is not possible at this stage.
4. The ORTAC3 elements include; Ensuring ease of operation, although easy to open it may be that a secondary flap opening that was designed for the ORTAC1 unit can be fitted and speed up feeding even more. That beach placement at c 1m above datum can give a suitable rearing environment that does not have temperature limitations (c 1hr 15 mins max exposure in either hot or cold conditions) and yet give sufficient time for feeding and harvesting without the need for expensive equipment. To introduce polyculture in the form of seed oysters from 7mm grade to 20g to create a year on year cashflow to mitigate the 4 year ormer cycle.
5. Feeding. Evaluation and development of artificial feeds through Le Gouessant/Redmills mostly at the hatchery level but also as a back-up should weed growth fail or nutritional boosting is required to resist pathogenic bacteria. Development of a mixed diet to match desired palatability of the final product. Culture of weeds on site using natural and artificial sources(subject to import permissions).

Additional Trial Elements .

1. To define a set of start conditions in the containers that allow maximum growth with minimum intervention, by adjusting stocking density with available full weeds that grow in excess of consumption. Pre-trials suggest that two 'openings' in year one are required as a minimum, mainly to remove opportunistic crab development, rising to four 'openings' in year four to supplement feeds at the same time as maxising the carrying capacity of the capital equipment. Already significant new information has been derived in the pre-trials that

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1. show that the slight reduction in light reaching the Laminaria in the ORTACs during mid-summer 'fools' the thallus into continuous growth whereas in the open it ceases for nearly two months .
 2. The potential to develop triploid Ormers exists but is to the best of our knowledge untried. With other abalone species the use of 6DMAP induces triploidy . The one paper published indicates unexpected early growth (normally it only has effect when gonads are being made) with weights to 4 months nearly twice the controls.

Additional Risk Factors.

1. Security, The hatchery will be protected by physical barriers and CCTV from an adjacent property. It will not carry any commercially valuable stock . The beach site is protected by identical oyster structures, is immersed for majority of the time, contains 'undersize' Ormers, and comprises of many thousand individual containers that would take considerable time and effort to access.
Bio-Security. The passage of the vibrio induced mortalities in the period 1999-2002 was initiated according to FAO and ICES by the illegal introduction of *Haliois discus-hanni* into southern Brittany on or before 1997. The causative organism has been identified as *Vibrio carchariae* (J.Nicholas et al) or perhaps *V. courtier* (ICES). It is suggested that any third party imports from France come from sources proven to be free from the vibrio and in the case of Ireland ,from hatcheries without stocks of *H. discus-hanni* which are strongly suspected to have been asymptomatic carriers .

Commercialisation.

The sale of the products of this project are being approached from many directions.

Element 1. The polyculture of seed oysters alongside developing ormers. The sale of 20g oysters at 2kg per cylinder per year will easily cover all the capital and running costs of the hatchery and ongrowing arrangement year on year for the first four years. Additionally, a 'wagon train' of cylinders with oysters alone will circle the polyculture cylinders to provide a physical security against casual theft or damage. The product of these at 8.5kg/pa of 20g oysters far exceeds the envisaged costs.

Element 2. The sale of part grown orniers. This has two elements. Firstly, the sale to Jersey based third parties. If excess production is achieved then the redundant stock could be used to develop 'ranching', whereby a concession holder (scallop and then by extension perhaps orniers) seeding an isolated outcrop of rock at suitable densities and harvesting at 65-90mm an appropriate time later. Secondly, provided the Jersey disease free status is maintained and the issue of the pathogenic vibrio is resolved then the excess stock can be sold to Irish farms with appropriate sites for ongrowing. These Irish farms are already trialling all aspects of ongrowing and orniers have been grown in the immediate vicinity for more than fifteen years. These are TL related operations.

Element 3. Finished product sale. The market may be changing over the initial production period (sources Fishtech, Martin Syvret, BIM) from 60-80mm to 110+mm with a concomitant raise in value (YEN 8000 to 15,000+ /Kg speculatively based on current Tokyo figures) so flexibility in operations must be maintained to the last. Also, a single operator may struggle to achieve best prices without significant volume and therefore strategic relationships with bodies such as Fishtech/ BIM/SWAGA are essential to form co-operative marketing, we have such linkages. (This is one of the desired outcomes of the JAA Ormer Workshop on 17th May 2006)

The local market is unlikely to provide volumes or prices of significant value to even a small producer of orniers .

Element 4. The sale of ORTAC3s This product has not been promoted actively in any arena since inception. A primary reason for this was that it was substantially beyond the bag and trestle technology that persists in a conservative commercial environment with regard to oysters and the ormer approach is still 'radical'. With regard to oysters an Australian company BST oysters <http://www.bstoysters.net> has recently tried to patent the innovations contained in the ORTAC3/1 but inadvertently has successfully promoted many aspects of its operation thereby generating a marketplace (the ORTAC system is 'prior art' and negates the worldwide patents). TL owns substantial stocks /copyright/design right/ mould and can produce additional desired quantities through a Chinese moulder who currently houses the 3T. mould. All information and training documentation that can be derived from this operation and parallel operations in Tasmania, France and Ireland will enhance sales. Further, any ORTAC3 Ormer customer could be an ormer seed customer. Also oyster trials being held this year in conjunction with Jersey Oyster will be fully documented and aimed at the French bag replacement market.

Current Constraints.

The project has all the physical and technical materials in hand to commence immediately. It is fully funded and has no expectation of any institutional funding or States funding whatsoever.

There are a legal issues that require resolution in both the short term and the long term.

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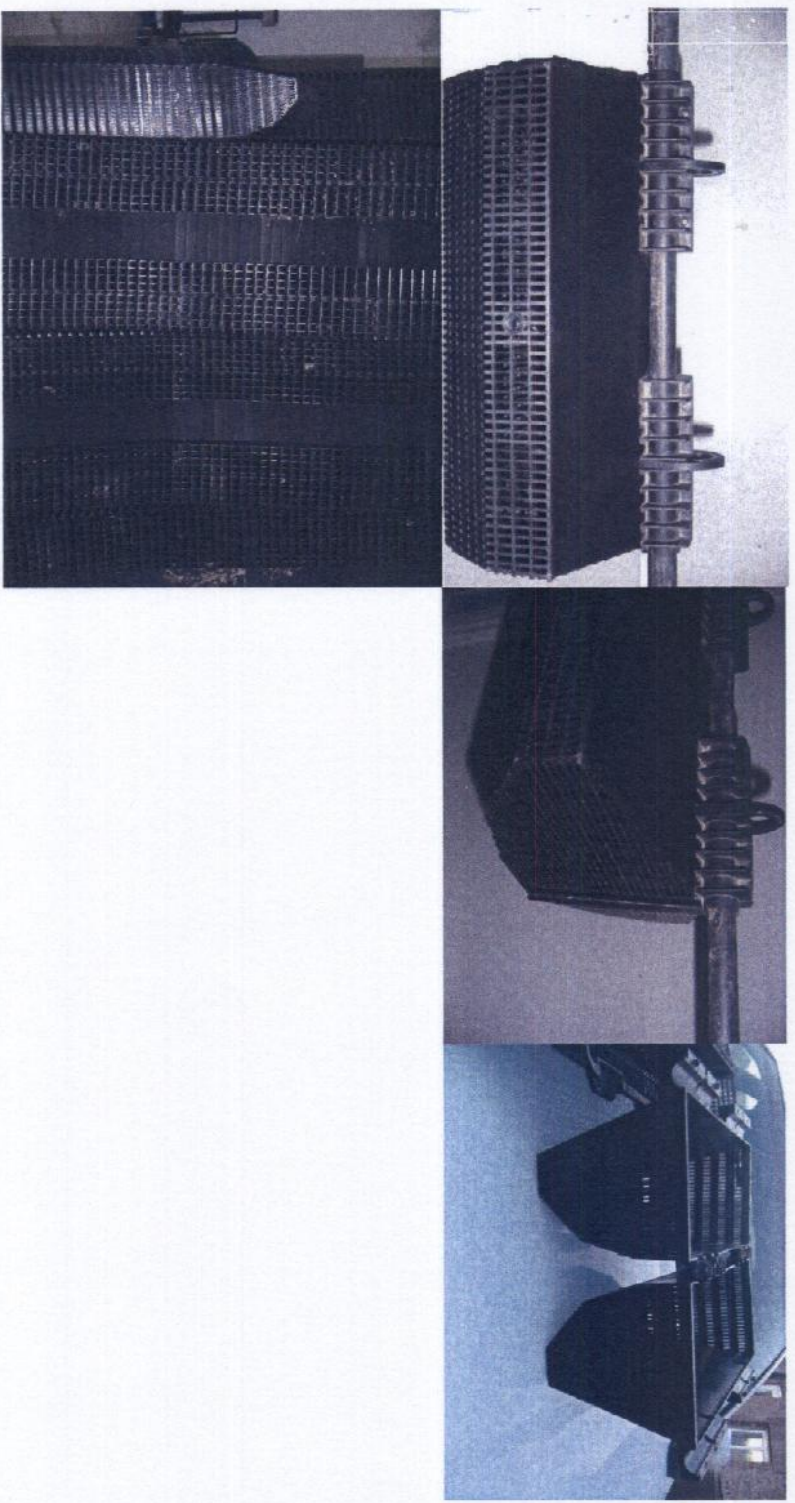
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Sea Fisheries (Miscellaneous Provisions) (Jersey) Regulations 1998, regarding the holding of ormers. The trials require the holding of broodstock for conditioning c100 animals of both sexes (mostly female) these can be marked and identified clearly if required. The holding of the progeny, these will range from freshly fertilised eggs (the regulations give no dispensation for the planktonic stage) to ,eventually market sized individuals at c 70mm that will still be smaller than the minimum size limit.

1. **It is requested that permission to hold these ormers be given on a trial basis in the first instance.**
2. **Sea Fisheries (Establishment of Fisheries) (Jersey) Regulations concession details for the A,N,Legg site at Green Island be modified to include Ormers and seaweeds (various indigenous species).**

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ORTAC3 views

