



**Co-ordinated Local Aquaculture
Management Systems (C.L.A.M.S.)**
Explanatory Handbook

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Foreword by Mr. John Browne TD, Minister of State at the Department of Communications, Marine and Natural Resources



I would like to take this opportunity to commend both B.I.M. and the Marine Institute for their ongoing practical and technical support for the Co-ordinated Local Aquaculture Management Systems (C.L.A.M.S.) process over the past four years.

I am delighted to take over this task which was initiated by my colleague, Mr. Hugh Byrne, of overseeing the continued development of this unique and progressive management system.

The C.L.A.M.S process, unique to Ireland, has enjoyed great success since its inception, through the promotion of co-ordination, communication and an individualistic approach to area management.

Set up in 1998, the process was initiated to create localised development plans for Irish aquaculture in conjunction with the existing concept of Single Bay Management (S.B.M.). Further than this, C.L.A.M.S. is an innovative and pioneering process which supports the development of Irish aquaculture in a sustainable manner whilst maintaining the most rigorous environmental standards.

Ireland's bays and inshore coastal waters are national, natural resources that need to be managed. These waters and the associated activities are dynamic systems that are continuously evolving. In this respect C.L.A.M.S. has become a living process with local plans being updated and modified as the need arises.

One of the main principles in the establishment of C.L.A.M.S. is that it supersedes yet includes S.B.M. It also has the ability to deal with an individual company's development but with reference to an overall structure and plan and will be easily incorporated into Integrated Coastal Zone Management (I.C.Z.M.) and County Development Plans.

C.L.A.M.S. is working hard at a local level, whilst keeping the relevant national and EU policies in mind, to ensure that the development of Ireland's aquaculture industry is sustainable and will continue to bring wealth and employment to Ireland's coastal communities for generations to come.

What is C.L.A.M.S.?

The unique Co-ordinated Local Aquaculture Management Systems (C.L.A.M.S.) process is a nationwide initiative to manage the development of aquaculture in bays and inshore waters throughout Ireland at a local level. In each case, the plan fully integrates aquaculture interests with relevant national policies, as well as:

- (1) Single Bay Management (S.B.M.) practices, which were initially introduced by salmon farmers to co-operatively tackle a range of issues, and have now been extended to all aquaculture species,
- (2) the interests of other groups using the bays and inshore waters,
- (3) Integrated Coastal Zone Management (I.C.Z.M.) plans, and
- (4) County Development plans.

The process has been widely adopted in bays and inshore waters where fish farming is practiced around the Irish coast, as a further proactive step by fish and shellfish farmers, to encourage public consultation on their current operations and their future plans.

These areas include Bannow Bay, Roaringwater Bay, Castlemaine Harbour, Lough Swilly, Clew Bay, Killary Harbour, the North Shannon Estuary, Dungarvan Harbour and Kilkerrin Bay.



Mission statement

Ireland's bays and inshore waters are a primary natural resource. Their utilisation for the sustainable development of aquaculture requires a dynamic and evolving management system.

The logical management approach is a locally based and all embracing system designed to maximise production and environmental management through the integration of production goals with minimal conflict with other resource users. Ireland is leading the way in the development of such a unique and progressive approach to bay/inshore waters management.

C.L.A.M.S. incorporates the concepts of S.B.M. and an aquaculture development plan for each bay/region. C.L.A.M.S. is rooted in the principles of Integrated Coastal Zone Management (I.C.Z.M.).

This is a constantly evolving process in which a co-ordinated strategy is developed and implemented for the allocation of environmental, socio-cultural and institutional resources to achieve conservation and sustainable multiple use of the coast.



Ireland's aquaculture industry

Since the initial developments in the early 1970s the Irish aquaculture industry has grown to become a significant contributor to the national economy. There has been a steady, and in some cases exponential increase, in both output and value, in job creation, and in the diversity of sites used and species farmed. The sector has grown in output value from €51 million in 1994 to €107 million in 2001 and now employs almost 3,000 people on a full and part time basis.

Irish companies engaged in the cultivation of fish and shellfish have embraced the need for continual change to take account of market, economic and environmental adjustments.

The three core species which now account for the majority of output in Ireland are salmon, mussels and oysters. Each of these species has differing requirements both at the production and marketing stages and from their relative success, lessons for new and emergent species can be learned. New species have entered the sector since the 1970s, including turbot, scallops, abalone, clams, charr, and perch.

Combined production from finfish and shellfish is projected to increase from 46,203 tonnes valued at €87.5 million in 1999 to 97,023 tonnes valued at €175.6 million in 2008.

Shellfish farming is carried out in practically all coastal counties while there are currently 20 marine fin-fish farms in operation on the West Coast of Ireland.

Salmon and rainbow trout are the most farmed species of fin-fish.

The sites stretch from North Donegal to West Cork. Farmed Irish salmon were first commercially produced in 1981 when some 100 tonnes were marketed. By 1990 this figure had grown to 6,300 tonnes and reached over 23,000 tonnes in the year 2001.

Rope mussels, bottom mussels, Pacific oysters (*C.gigas*), native oysters (*O.edulis*), clams and scallops are the main shellfish species produced in Ireland. In 2001 almost 23,000 tonnes of bottom mussels were produced in Ireland with the shellfish sector worth some €27 million. Other species, including abalone and purple urchins, are being reared on a smaller scale.



What does C.L.A.M.S. do?

Because C.L.A.M.S. is designed to treat each bay/region as a separate entity, the process involves an individual plan being drawn up for each area. This management plan lays out clearly what fish and shellfish farmers are currently doing in the bay, how they operate and what their future plans are. The plan involves a long consultative process with many interested parties in the relevant area and includes;

- (1) A detailed description of the bay/area in terms of physical characteristics, history, aquaculture operations, future potential, problems etc.
- (2) The integration of a series of codes of practice for current aquaculture operations and translation of those national codes to the specific circumstances of each bay or coastal region.
- (3) The expansion of the concept of S.B.M. to species other than salmon.
- (4) The formation of a development plan for aquaculture in the bay.
- (5) The compilation of information on other activities in the bay.
- (6) The establishment of a local and national communication network with 'bottom up' and 'top down' dialogue capacity.

Once completed the C.L.A.M.S. plan is usually available to view in the local Chambers of Commerce and the public library.



What is Single Bay Management (S.B.M.)?

The concept of S.B.M. was first utilised in Scotland in the late 1980s. The strategy was put in place by a number of salmon farms in a sea loch on the West Coast of Scotland to deal with fish health problems.

As a management strategy it proved very successful and enabled farmers to control or in some cases to eradicate the health problems.

The idea was brought to Ireland by salmon farmers and, with the encouragement of the Department of Communications, Marine and Natural Resources (D.C.M.N.R.), was introduced progressively on a voluntary basis from 1992 to 1994.

Initially the implementation of S.B.M. consisted of a move to single generation sites and the early harvest of two sea winter fish combined with effective lice treatments.

The exchange of information on fish health and relevant management practices was essential for the success of S.B.M., which is rooted in the creation of an integrated approach to management.

S.B.M. was not designed to simply tackle one problem (e.g. lice), rather it has the potential to lead to improvements over a whole range of aquaculture issues.

It is a particularly useful tool in the control, and in some cases elimination, of disease. S.B.M. signifies the gateway to more efficient production by optimising conditions within the bay and laying the foundations for co-operative ventures between hitherto 'rival' operators in the same bay.

The S.B.M. process is essentially a subset of the greater C.L.A.M.S. process. In dealing with S.B.M. matters, the fish farmers in a bay look after internal day-to-day aquaculture management issues, whereas under the C.L.A.M.S. banner, they look outwards to the other stakeholders in the bay.



Where did C.L.A.M.S. come from?

C.L.A.M.S. was officially set up in 1998. This followed a number of years during which various farmers and fishermen and the D.C.M.N.R. had asked Bord Iascaigh Mhara (B.I.M.) and the Marine Institute (M.I.) to provide information on, or to help resolve, licensing or development issues at a local level.

While being involved in these processes, a considerable amount of conflict resolution was undertaken where groups or individuals had different views and as usual there were two sides (if not three) to every story. Fundamental to many of these problems was the fact that most of the aquaculture had developed on a case-by-case basis and apart from S.B.M. agreements for salmon farms, there had been very little input at local level on how aquaculture should have developed in the area.

While solutions to several of the problems were the responsibility of specific sections in the D.C.M.N.R., it was felt by many of those involved (D.C.M.N.R., B.I.M. and the M.I.) that a more structured local system was required that would be proactive rather than reactive.

In order to address this issue Dr. David Jackson (M.I.) and Dr. Terence O'Carroll (B.I.M.) were asked by the D.C.M.N.R. to use their combined experience to address various problems.

These initiatives developed the potential for an inclusive approach to the management of aquaculture operations at a local level. However, it became clear that in order to develop the full potential of this management approach these initiatives needed to be integrated and set in a proper policy context.

The establishment of the Aquaculture Industry Forum under the aegis of the Irish Forum for Aquaculture Policy Development (I.F.A.P.D.), comprising the Department, B.I.M., and the M.I., as well as key players from the industry, has facilitated communications and dialogue between the parties on strategic issues facing the industry.

The Forum enables the aquaculture industry to play a leading role in identifying and raising issues of priority and provides a practical mechanism for periodic review and information exchange on market trends and opportunities, investment strategies, environmental issues, international and EU developments as well as policy issues generally.

Following joint presentations to the Aquaculture Forum by the M.I. and B.I.M. a policy was adopted by the D.C.M.N.R. and launched as C.L.A.M.S.

In the Gaeltacht regions, Údarás na Gaeltachta through its marine development subsidiary, Taighde Mara Teo., are involved in the delivery of the C.L.A.M.S. process.



C.L.A.M.S. incorporates the best aspects and relevant information of previous work carried out as well as maintaining S.B.M. in its structure.

But beyond this C.L.A.M.S. incorporates the development plans of local individuals as well as integrating the management practices of the various species sectors that may be operating in the bay/region.

It is envisaged that by the end of the National Development Plan (N.D.P.) in 2006, every major fish farming area in Ireland will have a completed C.L.A.M.S. plan and an active local C.L.A.M.S. group.

C.L.A.M.S. allows for the successful integration of aquaculture into the coastal zone, taking cognisance of the need to improve environmental compliance, product quality and consumer confidence.



As part of its commitment to the sustainable development of the aquaculture industry, the C.L.A.M.S. process facilitates the gathering and analysis of data in relation to fish farming. This data is then made available to the local community.

What is Integrated Coastal Zone Management (I.C.Z.M.)?

As its name suggests Integrated Coastal Zone Management is a process of managing a coastal zone in an integrated and inclusive fashion for the environmental maintenance and economic sustainability of the specific area.

The European Commission list the following main principles which I.C.Z.M. will feature:

- (1) Take a wide-ranging view of inter-related problems
- (2) Base decision on good data and information
- (3) Try to work with natural forces
- (4) Allow for unforeseen developments
- (5) Involve all stakeholders and all relevant parts of the administration
- (6) Make use of a range of instruments (laws, plans, economic instruments, Information campaigns, Local Agenda 21s, voluntary agreements, promotion of good practices, etc.)

From 1996 to 1999, the European Commission operated a Demonstration Programme on I.C.Z.M., designed around a series of 35 demonstration projects and six thematic studies. This programme aimed at providing technical information about sustainable coastal zone management, and stimulating debate among those involved in the planning, management or use of coastal zones.

The programme was intended to lead to a consensus regarding the measures necessary in order to stimulate I.C.Z.M. in Europe.

In 2000, based on the experiences and outputs of the Demonstration Programme, the Commission adopted two documents:

- (1) A Communication from the Commission to the Council and the European Parliament on 'Integrated Coastal Zone Management: A Strategy for Europe' - 17th September 2000. The Communication explains how the Commission will be working to promote I.C.Z.M. through the use of Community instruments and programmes.
- (2) A proposal for a European Parliament and Council Recommendation concerning the implementation of Integrated Coastal Zone Management in Europe, which was adopted by Council and Parliament in May 2002. It outlines steps which the Member States should take to develop national strategies for I.C.Z.M.



C.L.A.M.S and I.C.Z.M.

I.C.Z.M. is fast becoming an applied legislative reality. The EU Recommendation outlines steps which the Member States should take to develop national strategies for I.C.Z.M. The national strategies are due for Spring 2006 and should involve all the coastal stakeholders.

The aquaculture sector will need to ensure that its interests are adequately represented in any future structures. One of the key ways to address this is the development of C.L.A.M.S. and a functioning local representative group geared towards achieving sustainable growth and development hand in hand with environmental protection. This could then form the basis for the aquaculture section of any I.C.Z.M. initiatives and ensure that C.L.A.M.S. slots easily into the I.C.Z.M. system.

What C.L.A.M.S. is not

C.L.A.M.S. is not a licensing or regulatory process. This function is vested on a statutory basis with the Coastal Zone Administration section of the D.C.M.N.R. It provides a policy backdrop which helps in the formation of a detailed evaluation of individual licence conditions.

C.L.A.M.S. can inform those tasked with compliance monitoring with regard to general issues such as bay carrying capacity, but cannot be used on an individual basis.



National Administration of C.L.A.M.S.

At a national level C.L.A.M.S. is co-ordinated by a group comprising of the Aquaculture Development Manager, B.I.M. (Chair), Marine Food Programme Manager, M.I. (representing the Minister of State's Aquaculture Development Forum), Dr. Terence O'Carroll, B.I.M., Dr. David Jackson, M.I. (C.L.A.M.S. facilitators), Helen Cooper, head of B.I.M.'s Environment and Quality section, Mark Norman of Taighde Mara Teo. and Michael Murphy of Aquaculture Initiative. This group oversees the implementation and quality control of the initiative.

Geographic Information System (G.I.S.)

Central to the proper running and implementation of C.L.A.M.S. has been the Geographic Information System (G.I.S.) database run by B.I.M.'s Aquaculture Development Division. This G.I.S. database contains detailed production and licence information, which can be downloaded for each area. Locally additional relevant positional and technical data has been recorded and the positions of aquaculture structures verified.



Establishing the C.L.A.M.S. process

The C.L.A.M.S. process is established through a number of steps:

- (1) The aquaculture producers of an area make a request to the National C.L.A.M.S. group to initiate the C.L.A.M.S. process in their area.
- (2) A specific area must be defined.
- (3) The D.C.M.N.R. is consulted on the relevant policy and licensing issues for the area.
- (4) Then the relevant information on existing production and licensing is downloaded from the G.I.S. database. Additional relevant positional data is inputted and locations verified etc.
- (5) All existing producers operating in the area are then met with individually to discuss C.L.A.M.S.
- (6) In each locality third parties are consulted for an input into the C.L.A.M.S.
- (7) These include D.C.M.N.R. engineers and area officers, B.I.M./Taighde Mara Teo. area officers, regional fisheries boards, potential new entrants, fishing co-ops, county councils, regional development bodies etc., harbour boards and any other relevant parties.
- (8) An agenda is then prepared to address the major issues raised in preliminary meetings.
- (9) A C.L.A.M.S. group is then officially formed in the area with an initial meeting including all producers and co-ordinators as well as relevant regional B.I.M. and D.C.M.N.R. personnel to discuss the summary of major issues and to outline a development strategy.
- (10) A local liaison officer is then appointed.
- (11) A work group is then agreed upon to deal with the matters relating to proper management of the bay.
- (12) An initial C.L.A.M.S. document is then drafted and circulated to all involved.
- (13) The group meets in order to discuss the document and proposed amendments to it.
- (14) A schedule of future meetings is set out in order to review issues on an ongoing basis and continually modify the C.L.A.M.S. plan.
- (15) An information presentation on the plan is then made to relevant local bodies, councils and state agencies.
- (16) The C.L.A.M.S. document is then launched and an interpretive sign placed in the bay to serve as an information point, for the local community and visitors, about aquaculture activities in the bay. Through text and photographs, the signs detail the development of aquaculture in the specific area as well as its history. The interpretive signs also detail other activities in the bay, such as inshore fishing and marine tourism.



What's in a C.L.A.M.S. document?

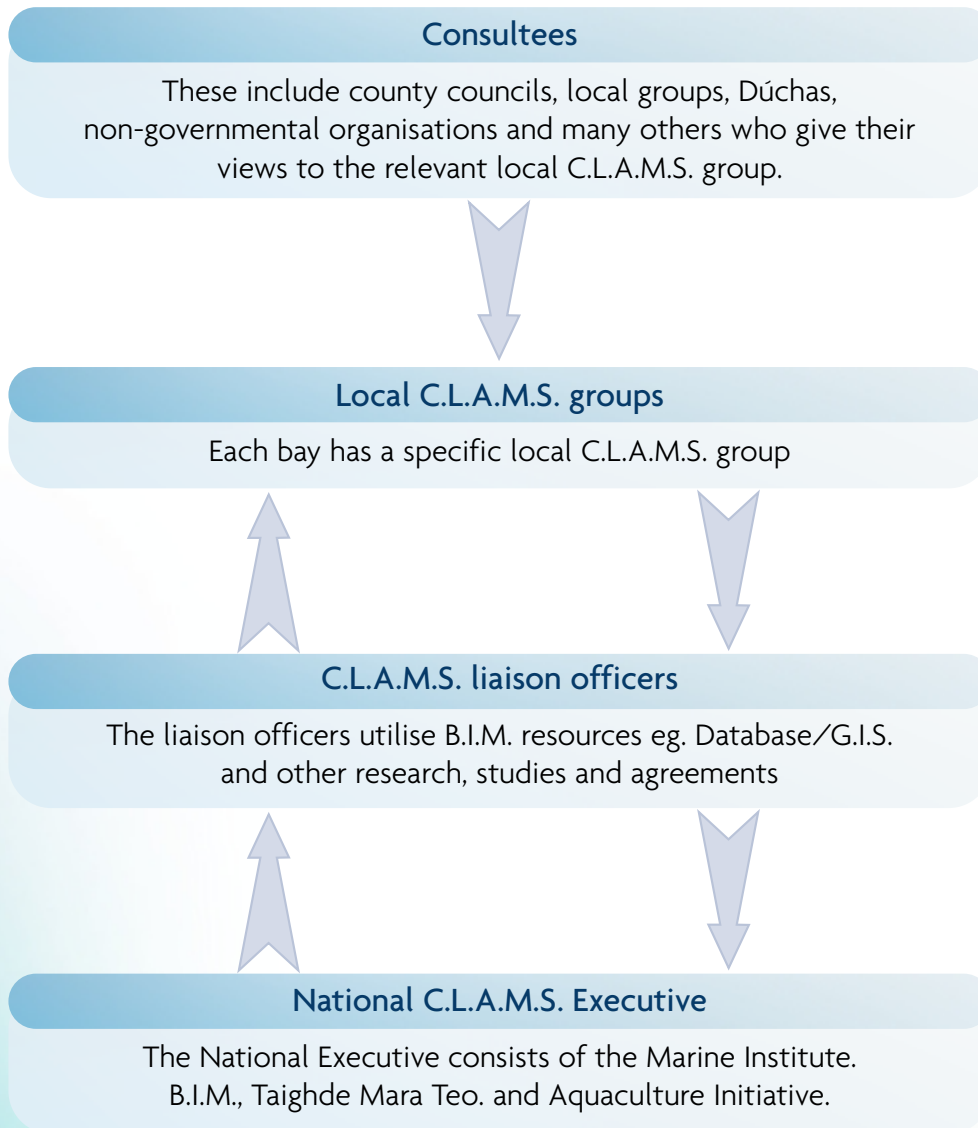
Each C.L.A.M.S. document contains the following information:

- Baseline information. This is a collection of measurements, calculations, and other data which are used as a basis for comparison.
- The integration and local translation of the national codes of practice covering each species farmed in the area.
- The relevant details of the local C.L.A.M.S. group and liaison officer.
- A list of future developments in order of priority.
- Details of potential areas for development.

The C.L.A.M.S. documents are designed to be easily integrated into County Development Plans or other plans being developed for the management of Ireland's valuable coastal resource in particular I.C.Z.M.



C.L.A.M.S. structure



C.L.A.M.S. and the locality

C.L.A.M.S. is a management system founded on the basis of essential local participation. The C.L.A.M.S. groups are formed by representatives from the various companies and farms and the C.L.A.M.S. facilitators.

The C.L.A.M.S. groups are comprised of representatives of all bona fide aquaculture interests only. Eligible members include; producers and their representatives (technical and association), liaison officers, B.I.M., D.C.M.N.R, Taighde Mara Teo., County Council and M.I.

In terms of consultation with parties not involved in aquaculture, these consultees are invited to meetings where they may express any concerns they might have. Though their comments will be heard, it is not policy to address all of their concerns in C.L.A.M.S.

It must be stressed that one of the main purposes of C.L.A.M.S. is to provide a framework for the development of the industry and not a document that lists all objections to it. Where it fits into the scheme of things, the concerns of other sectors will be addressed in C.L.A.M.S.

C.L.A.M.S. should incorporate a strategy to encourage further integration of associated activities i.e. fisheries, enhancement/management programmes (including river systems), marine tourism and angling etc.

The C.L.A.M.S. group should form a focus or contact point for other local groups to contact. In this way it will be easier for aquaculture interests to be represented properly in things such as I.C.Z.M., County Council development plans and regional development.

Information on stock numbers, health status, origin etc. will need to be provided by the parties to this agreement along with general future development plans.

The local C.L.A.M.S. group should meet regularly to discuss issues and exchange relevant information. When the various local groups are established, regular meetings should be held with the local liaison officers and the national co-ordinators.



Clew Bay C.L.A.M.S. - A case study

The Clew Bay C.L.A.M.S. process began in 1999 when the Clew Bay C.L.A.M.S. group was established. The C.L.A.M.S. process in Clew Bay, as detailed below, exemplifies the putting into practice of the principles of sustainable development through consultation and discussion. It also ensure the maintenance of the highest environmental standards.

The Clew Bay Marine Forum (C.B.M.F.)

The C.B.M.F. is a local initiative which grew out of the Clew Bay Oyster Co-op (C.B.O.C.). In 1998 the C.B.O.C. recognised the need to encompass a broader range of views and activities than were covered by the Co-op's remit. Building on the Co-op's work of conserving and rejuvenating commercially fished species, a forum was established to initiate links with other sectors operating independently within the bay.

The forum identified a number of projects which had the potential to stimulate innovation within the bay and through more diverse and dynamic fisheries and aquaculture sectors resulting in the creation of wealth and employment in the region.

The forum has a range of objectives including;

- the continued monitoring of water quality in the bay to ensure retention of 'A' classification water,
- to facilitate a broad based range of marine activities and act upon sustainable development opportunities,
- to support safety and training, and
- to encourage the local input of fishing, aquaculture, tourism, leisure and marine groups into I.C.Z.M. policy for the area.

The C.B.M.F. aims to expand its membership to include the leisure sector, charter operators, adventure operators, island groups and other fishing interests.

The forum represents the first local initiative to encompass the whole of Clew Bay from a variety of user perspectives. This approach has provided a focus for information that has been able to contribute to the preparation of such documents as harbour studies, integrated area action plans, environmental impact studies, water sewage treatment outflow studies and pier development submissions.



As Mayo County Council carries out improvements to piers, the C.B.M.F. are able to identify local user knowledge to assist and to contribute to the formation of Codes of Practice. C.B.M.F. anticipate that the strengthening ties with Mayo County Council will encourage the inter-agency support that will be required to ensure that much needed navigation aids can be installed throughout Clew Bay.

A Mayo County Development Plan is underway and C.B.M.F. will be preparing a marine submission for inclusion in the plan.

The C.B.M.F. is liaising with the County Development Board and other agencies in Mayo to establish a Mayo Marine Forum.

The Clew Bay C.L.A.M.S. group

The Clew Bay C.L.A.M.S. group was formed as a sub-group of the forum in December 1999 for the specific purpose of preparing a C.L.A.M.S. document for the bay, outlining current aquaculture activities, management practices and development proposals whilst inviting comment and consultation from other interested parties.

Working together

The C.B.M.F. contributed to the C.L.A.M.S. process in the following ways;

- identifying interested parties for the formation of the group,
- providing descriptive baseline information as required by the C.L.A.M.S. document,
- assisting in the preparation of a GPS survey of all aquaculture sites,
- liaising with agencies during the preparation of the document, and
- participation in the on-going process.

C.L.A.M.S. and national aquaculture policy

The various C.L.A.M.S. plans formulated at local level must conform to certain general national policy guidelines including stocking densities per hectare, distance between farms etc.

If decisions are taken at a national level these are taken on board at the local level and the relevant changes are made to the C.L.A.M.S. document and any associated codes of practices etc.

C.L.A.M.S. allows for such policy issues to be disseminated and adopted uniformly in the local areas. Via the liaison officers and in the C.L.A.M.S. documents themselves there is a potential for feedback into the national processes.



You can contact your local Aquaculture Liaison Officer at the following number/address:

Members of the National C.L.A.M.S. group	
Chairman: Donal Maguire	Tel: 01 214 4282 Email: maguire@bim.ie
The Marine Institute Dr. Dave Jackson	Tel: 091 730 400 Email: dave.jackson@marine.ie
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B.I.M Regional Staff Wexford/Waterford Brian O'Loan	Tel: 087 205 8832 Email: oloan@bim.ie
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Bord Iascaigh Mhara
Irish Sea Fisheries Board

