



Environmental Impact Assessment (Eia) Thresholds For Marine Fish Farms

SARF040A



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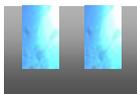
**ENVIRONMENTAL IMPACT
ASSESSMENT (EIA) THRESHOLDS
FOR MARINE FISH FARMS**



PROJECT SARF040a

FINAL REPORT

March 2010



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EXECUTIVE SUMMARY

This part of the project is to determine whether the screening thresholds in the EIA Regulations relevant to marine fish farms are still appropriate and, if not, to recommend changes. The current marine aquaculture regulatory structure is briefly described, and compared with relevant regulations in other countries that also farm finfish species in marine pens. The history of regulatory transactions in Scotland over the last ten years is considered in some detail, together with a range of issues that are, or might be, relevant to the EIA process.

Within this project, the evidence and background context reviewed in order to consider potential changes to existing EIA screening thresholds suggested that:

- Planning (or equivalent) application success rate is 91% (excluding withdrawals) which is comparable with other industry sectors
- The length of time for determination is much longer than other industry sectors: averaging over 40 weeks for all cases examined in the study, but extending to an average of well over 60 weeks for applications where a full environmental statement (ES) was requested
- An ES was requested in 39% of the 138 cases examined between 1998 and 2007, and some form of equivalent dossier of environmental information, effectively an ES, might have been submitted (or additional information requested) in some of the 17% of cases where EIA status was unclear
- Planning applications, especially when an ES is requested, appear to be an order of magnitude more expensive per unit final turnover for marine fish farming than they are for major retail developments for example
- Planning determinations have been made for changes ('extensions') that were larger than the current screening thresholds, without the apparent need for an ES to be produced – although some additional information or non-scoped ES may have been submitted with the planning application
- For existing farms, extensions of biomass consent in the order of 500 tonnes (equating to an industry-standard pen surface area of some 3,000 m²) have been commonplace in the last few years – 74 cases between 2006 and 2009
- Out of 45 Non Technical Summaries of ESs considered in detail, none were found to have identified significant environmental effects, and although many impacts were identified, they were all amenable to mitigation by way of other regulatory regimes, agreements or planning conditions
- Despite all this case-history evidence and background context, it remains impossible to suggest that there is a 'scale' of marine pen finfish below which there is absolute certainty that a significant environmental effect will never occur, taking into account the wide range of possible 'locations' where projects might be considered. The study is advised by Scottish Government that certainty would be required if a case were to be made for an amendment to the current EIA screening thresholds, both on a national scale and in terms of endorsement by the European Commission.

The study concludes that it cannot make any recommendations with respect to proposed amendments to the EIA screening thresholds for this industry.

DISCLAIMER

The contents of this Report are offered in good faith and after due consideration. The author, as an individual or Epsilon Resource Management (ERM), cannot be held responsible for any consequences arising from the use of this Report. Opinions expressed in this Report are those of the author and anonymous consultees.

The Sponsor of this study does not necessarily agree with, or endorse, the contents, conclusions or recommendations of this independent report.

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SARF has agreed that references in this document may be cited as web links as appropriate.

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1 INTRODUCTION

1.1 Project Aims and Objectives

1.1 The **aim of the project** is to gather, review and assess evidence and other appropriate context that may or may not support future amendment to the thresholds that are contained in the EIA Regulations, and to present this evidence with conclusions and recommendations in a report that can be used by Scottish Government for the purpose of consulting on possible amendments.

1.2 The **objectives of the project** are to:

- Undertake an assessment and consolidation of existing evidence
- Search for additional evidence
- Report on findings

1.2 EIA

1.3 The subject area of this project is complex, requiring consideration of the details of:

- The Environmental Impact Assessment (Scotland) Regulations 1999 (as amended)
 - Formerly the Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations 1999
 - In either case, referred to hereafter in this report as “**The EIA Regulations**”

1.4 The relevant current thresholds (there are others) for triggering EIA screening are a development or extension to a development taking the combined new development to a scale greater than 100 tonnes of biomass of fish or 1,000 m² of farm area. The marine aquaculture industry has grown significantly since 1999, and it is likely that the majority¹ of future applications for a development or extension will exceed these thresholds.

1.3 Approach

1.3.1 Analysis of Marine Aquaculture EIA Casework Since 1999

1.5 EIA, by its very nature, is dependent on case-by-case consideration of nature, scale and location². In marine finfish aquaculture, the ‘nature’ is always the same (a finfish farm), but the variables are ‘scale’ (size of the proposed development) and ‘location’ (particularly with regard to presence/absence of recognised sensitive environmental receptors). EIA thresholds are a recognition that, for the relevant sector, there is a pragmatic level of ‘scale’, which given the ‘nature’ of the sector is unlikely to give rise to a significant negative environmental impact, irrespective of ‘location’. **The challenge is to be able to decide what that scale could safely be, for the sector in question.**

1.6 For some specific aquaculture impact assessments, such as benthic impacts, it is possible to use a modelling approach. SEPA does this for Controlled Activities Regulations (CAR)³ licences, using tools such as AutoDEPOMOD⁴. Unfortunately there is no equivalent objective tool or approach to cover all possible EIA-relevant interactions.

¹ Personal communication: SSPO. Although ‘minor modifications’ might not exceed the thresholds, they would still need to be considered under planning regulations – and are properly a matter for future work on PDR

² See: <http://www.snh.org.uk/publications/on-line/heritagemanagement/EIA/b.4.shtml>

³ See: <http://www.opsi.gov.uk/legislation/scotland/ssi2005/20050348.htm>

⁴ See, for example:

http://www.sepa.org.uk/water/water_regulation/regimes/aquaculture/marine_aquaculture/idoc.ashx?docid=c4661a49-56d3-4f19-b2f8-8a9c1784c453&version=-1

- 1.7 There may be no universal modelling tools, but EIA screening (see Section 2) judgments have been made on numerous occasions, based on expert advice from statutory consultees. Since 1999, a large body of ‘expert’ opinion has amassed on whether or not an aquaculture project should be required to proceed to scoping and therefore preparation of a full Environmental Statement (ES) – or whether other alternatives for supplying necessary environmental information were possible. Detailed analysis of a representative sample of these case histories offers the potential to assess what ‘experts’ judged to be an important scale of application in terms of a positive or negative EIA screening opinion. It is also possible that, by analysing the qualitative feedback on all the casework, further insights might be available into why particular judgments were made – which might have a bearing on how EIA screening threshold changes, if recommended, would be perceived by stakeholders and regulators. Many ESs have now been produced for this industry and it would be interesting to ascertain how many of them identified evidence of the risk of a significant environmental effect.

1.3.2 Assessment And Consolidation Of Existing Evidence

- 1.8 This project has reviewed the evidence provided in unpublished reports produced by Xodus Aurora as part of their undertaking for project SARF040, together with other available sources of information that relate directly to aquaculture EIA thresholds, or indirectly by way of context that is applicable to aquaculture EIA. The Crown Estate and SEPA have also provided access to original planning and licence applications for the purposes of this research.

1.4 Exclusions

- 1.9 Reference has already been made to several regulatory regimes that have relevance to marine finfish aquaculture in Scotland, and other references will appear later in this report. In some cases, such as planning and EIA, they are very closely intertwined in terms of content and processes. It would be impossible and unwise to exclude consideration of these various regulations when examining the history of use of the EIA Regulations since 1999.
- 1.10 It is possible that when considering options for change, ideas for guidance or change with respect to some of these other regulatory regimes will emerge. If relevant, these ideas will be noted, but it is important to stress that this report will **only make clear and detailed recommendations with respect to thresholds relating to the EIA Regulations.**
- 1.11 Whilst this project is concerned with all relevant EIA thresholds, analysis of available information has revealed little information with respect to ‘minor modifications’ or ‘ancillary equipment’ such as feed barges.

1.5 Definitions

- 1.12 Section 2 provides the text of the current EIA Regulations, and with respect to the marine aquaculture component, this is the text that was originally in the EIA (Fish Farming in Marine Waters) Regulations 1999. Although not specifically defined in the regulations, it has been customary to assume that ‘area’ refers to the surface area of the pens or cages holding the fish, and ‘biomass’ refers to the maximum standing biomass present during the production cycle. This study **follows that approach**, on the basis that:

- It is the **surface area of the pens** that is visible and that offers the most obvious impediment to navigation or to access by other users of the marine environment⁵
- It is the **maximum standing biomass** on the farm that is responsible for the maximum output of biological or production-related material at any point in time

1.13 The term '**intensive fish farming**' is used in the 1997 EIA Directive and in the EIA Regulations, and the interpretation of pen-based marine finfish farming as being included in the term intensive is why this part of the industry in Scotland is brought into the purview of Schedule 2. Annex 3 presents some work undertaken by Xodus AURORA to investigate this situation, and it primarily focuses on opinions from key Scottish Government officials.

⁵ There are also clearly issues of access in terms of mooring ropes and buoys, and of visual impact depending upon design, orientation and the presence/absence of ancillary structures such as feed barges. However, since the subject is so complex, it seems appropriate in the first instance to remain with the traditional interpretation for the sake of simplicity and familiarity.

2 REGULATION OF MARINE FISH FARMING IN SCOTLAND

2.1 Introduction

2.1 Section 2 provides an overview of the policy and regulatory framework within Scotland for marine fish farm developments, based on work undertaken by Xodus AURORA for SARF040. It also details the environmental impact assessment (EIA) regulatory process with regard to marine fish farming. The **screening thresholds** applicable to this industry sector are also examined. The role statutory and non-statutory bodies have in regulating the industry, and some of the environmental impacts associated with the sector, are described in Annex 1.

2.2 Policy and Regulatory Framework

2.2 The development of the marine fish farming industry in Scotland is governed by several pieces of national legislation as well as those which implement various EC Directives. Key policy and regulatory requirements are illustrated in Table 2.1.

Table 2.1 Policy and regulation which governs Scottish marine fish farming

Policy/Regulation	Requirements
<i>The Town and Country Planning (Marine Fish Farming) (Scotland) Order 2007</i>	<ul style="list-style-type: none"> ▪ Recent amendments by Article 11(4) of the Town and Country Planning (Marine Fish Farming) (Scotland) Order 2007 (referred to in this report as the MMF Order 2007) brought the requirements for EIA with respect to 'marine fish farming' in line with EIA planning Regulations. ▪ Came into force on the 1st of April 2007. ▪ Planning applications for fish farms are now processed through the appropriate local authority planning departments, rather than by the Crown Estate⁶. ▪ Planning permission for any fish farm is now without time limits – doing away with the necessity to renew works licences every fifteen years. <p><i>Note:</i> Prior to the Town and Country Planning (Marine Fish Farming) (Scotland) Order 2007, EIA for marine fish farms in Scotland was implemented through the Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations 1999. Scotland is now excluded from these Regulations¹ with equivalent provisions now contained within the amended EIA (Scotland) Regulations 1999.</p>
Town and Country Planning (Scotland) Act 1997	<ul style="list-style-type: none"> ▪ Amended by The Planning etc. (Scotland) Act 2006 extending planning controls to marine fish farms.
<i>The Environmental Impact Assessment (Scotland) Regulations 1999</i>	<ul style="list-style-type: none"> ▪ Implements the requirements of EC Directive 85/337/EEC (as amended) on environmental impact assessment (EIA). ▪ EIA is mandatory for projects listed under Schedule 1 of the Regulations while EIA <u>may</u> be required for projects listed in Schedule 2. ▪ 'Intensive fish farming' (see Appendix A for explanation of 'intensive fish farming') comes under Schedule 2. ▪ Section 4(5) of the Regulations make it clear that a Schedule 2 project is <u>not</u> an 'EIA Project' unless it has been deemed to be so by the local planning authority or the Secretary of State – i.e. by them having given a positive screening opinion – or unless a developer submits a

⁶ Crown Estate was previously the planning authority for all aquaculture developments in Scottish waters with the exception of certain areas in Orkney and Shetland under the Orkney County Council Act and Zetland County Council Act.

Policy/Regulation	Requirements
	<p>document which they refer to as an environmental statement</p> <ul style="list-style-type: none"> The requirements for EIA for marine fish farming are discussed in further detail in Section 2.3.
<i>The Coast Protection Act (1969)</i>	<ul style="list-style-type: none"> Requires written consent from the Scottish Government for the “<i>construction, alteration or improvement of any works on, under or over any part of the seashore lying below the level of mean high water springs</i>” and applies to all marine fish farms, particularly where concerns are raised regarding the issues of navigation.
<i>The Aquaculture and Fisheries (Scotland) Act 2007</i>	<ul style="list-style-type: none"> Regulation of aquaculture particularly with regard to disease control and prevention of fish escapes.
<i>Conservation (Natural Habitats &c.) Amendment (Scotland) Regulations (2007)</i>	<ul style="list-style-type: none"> Implement the requirements of EC Directives 92/43/EEC (“The Habitats Directive”) and 79/409/EEC (the “Wild Birds Directive”). Concerned with nature conservation and the protection of species and habitats. Relevant authorities (e.g. local authorities and SEPA) are responsible for marine conservation and in particular the protection of European marine sites (e.g. special areas of conservation (SACs) and special protected areas (SPAs)).
<i>The National Scenic Areas (Scotland) Regulations 2008</i>	<ul style="list-style-type: none"> Stipulates that an EIA is required if a proposed development is likely to have significant impacts on the environment within a sensitive area, including a national scenic area.
<i>Water Environment (Controlled Activities) (Scotland) Regulations 2005</i>	<ul style="list-style-type: none"> Enacted by the Water Environment and Water Services (Scotland) Act. A fish farm development (including all fin fish farm cage groups) requires a discharge licence.
<i>The Dangerous Substances Directive (76/464/EEC)</i>	<ul style="list-style-type: none"> Controls the release of dangerous substances to water. Requires regulators to limit and reduce certain substances, some of which are used by aquaculture sites e.g. some sea lice treatments, copper and zinc.

2.3 Environmental Impact Assessment (EIA) Regulation of Marine Fish Farming

2.3.1 Definition of EIA

2.3 Environmental impact assessment (EIA) is a method of providing information on the environmental impacts of a proposed development project to relevant planning authorities. The results of the EIA are presented to planning authorities in an environmental statement (ES). The planning authorities use information relating to environmental impact to help them determine whether a project should be authorised. All projects likely to have a significant impact on the environment should be picked up by the EIA Regulations and assessed accordingly. **It should be noted that:**

- A planning authority can grant planning permission even if an accompanying ES has demonstrated a high risk of a significant effect on the environment
- Conversely, a planning authority can refuse planning permission, even if the ES has demonstrated no significant environmental effect arising from the proposed development
- A planning authority may also grant planning permission with conditions

2.3.2 Legislative Requirement for EIA in Scotland

- 2.4 As mentioned in Section 2.2 the requirement for EIA in Scotland (as defined by EC Directive 85/337/EEC as amended⁷) is implemented through the Environmental Impact Assessment (Scotland) Regulations 1999 as amended⁸. Planning legislation with regard to ‘marine fish farming’ only came into force in 2007 (see Table 2.1 for an overview of the legislative process). Text Box 1 refers to new information concerning EIA, which has come to light during the course of the study.
- 2.5 Fish farm developers, who wish to establish new fish farms or make modifications to existing infrastructure, must now make a planning application to the relevant local planning department and not to The Crown Estate (or Shetland and Orkney Islands Councils) as previously required. All marine pen sites that will use foreshore or seabed which is owned by The Crown Estate, must still obtain a Crown Estate Lease as appropriate.

Text Box 1 The Baker Case
<p>During the course of undertaking this project, Scottish Government Directorate for the Built Environment issued an advisory note relating to a recent UK court ruling on expansions or modifications to EIA developments. (For details, see: http://www.bailii.org/ew/cases/EWHC/Admin/2009/595.html)</p> <p>The Scottish Government notes “<i>It is clear that in due course we will have to amend our regulations to address this ruling and to update the guidance contained in Circular 8/2007. Over the coming months Scottish Government officials and our colleagues across the UK administrations will be working with lawyers to discuss how best to take account of this judgment.</i>”</p> <p>Notwithstanding the final outcome of these considerations, it does appear clear that the ruling is intended to ensure at least EIA screening of any addition (modification/extension) to an existing Schedule 2 installation if the complete development, as changed or extended, would meet or exceed any thresholds that might apply to the industry sector.</p>

2.3.3 Government Guidance on EIA – Planning Advice Note 58

- 2.6 The Scottish Government provides extensive guidance on the use of the EIA Regulations in Circular 8/2007, as amended and its relevant Planning Advice Note (PAN), Number 58. Some of the key elements of that guidance are relevant to this project, and these are highlighted in Table 2.2 and are discussed in more detail in Section 6.

Table 2.2 Extracts from PAN 58

Extract from PAN 58
3. The types of project for which an EIA has been undertaken are typically complex, with a wide range of environmental effects. They often occupy extensive sites and are in sensitive locations. They are likely to raise issues which are not always easy to resolve and which often attract contentious representations.
4. EIA is only required for a Schedule 2 project if it is judged likely to have significant environmental effects. For the overwhelming majority of development projects however, normal planning powers are perfectly adequate to gain environmental information and EIA is not required
35. ... Once a proposal is established as a Schedule 2 development, to require an EIA it must be judged by the planning authority as likely to have significant environmental effects.
48. The majority of the work should be devoted to those key issues which give rise to the major environmental effects, and how they have been mitigated. It is not usually necessary to study minor impacts in detail.
58. To complete the process of EIA PAN 58 advises that; “the actual impacts of a project and the

⁷ Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment, as amended by Directives 97/11/EC and 2003/35/EC.

⁸ Amended by The Environmental Impact Assessment (Scotland) Amendment Regulations 2006 (SSI 2006 No. 614).

Extract from PAN 58

mitigation measures have to be monitored and compared to those predicted. This is an essential part of the process. It will demonstrate that the time and money invested in the EIA by all the parties is being taken seriously and enable corrective action to be taken if required”.

2.3.4 EIA Process

- 2.7 The following sub-sections provide a brief overview of the EIA process including: screening, scoping, environmental assessment and submission of the environmental statement to the relevant planning authority. Text Box 2 refers to the templates that have been produced to assist with the EIA process for aquaculture.

Text Box 2 EIA Templates & Guidance

The Scottish Aquaculture Research Forum (SARF) has commissioned and published a Guidance on EIA Best Practice – SARF024. A related project designed and published a suite of accompanying **EIA Templates**, which include provision for non-statutory pre-application consultation, in addition to providing practitioner guidance for the statutory steps described below.

The expectation is the Templates that are now widely used will improve the efficiency and reduce the time and cost burdens associated with marine aquaculture EIA.

Documents can be found at: <http://www.sarf.org.uk/SARF024.htm>

EIA screening

- 2.8 Currently developers are required to submit a planning application to the relevant planning authority for any proposed new fish farm development or modification to an existing development. When a planning application is received and registered by the planning authority (with or without an ES), it is subject to public consultation and statutory/non-statutory consultation (e.g. SNH, SEPA and Scottish Ministers). The application is also assessed against the Development Plan for the area and material planning considerations.
- 2.9 Under the EIA (Scotland) Regulations 1999, EIA is mandatory for projects listed in Schedule 1, while an EIA *may* be required for projects listed in Schedule 2, which fall within certain thresholds (EIA thresholds). ‘Intensive fish farming’ falls within Schedule 2. The thresholds relevant to ‘intensive fish farming’ are outlined in Text Box 3.

Text Box 3 EIA Thresholds

As with Directive 85/337/EEC (Annex II) (referred to as the EIA Directive) ‘intensive fish farming’ (see Annex 3 for explanation of ‘intensive fish farming’) comes under Schedule 2 of the EIA (Scotland) Regulations 1999 (as amended by the MFF Order 2007), and the following thresholds apply :

- “(a) the installation resulting from the development is designed to produce more than 10 tonnes of dead fish weight per year;*
- (b) where the development is situated in marine waters, the development is designed to hold a biomass of 100 tonnes or greater; or*
- (c) the proposed development will extend to 0.1 hectare or more of the surface area of the marine waters, including any proposed structures or excavations”.*

Thresholds and Extensions to Projects

On recent advice from Scottish Government and Highland Council, this project understands that the EIA thresholds apply to a proposed extension to an existing development, taking into account the current scale of the existing development, i.e. the thresholds apply to the entire development,

Text Box 3 EIA Thresholds

as amended. It is of note, however, that prior to the Baker Case previous guidance suggests this was not the case – reference to Paragraph 13(a) of Schedule 2⁹.

- 2.10 The requirement for an EIA, for projects listed under Schedule 2, is determined on a case by case basis and by taking certain criteria (Schedule 3 of EIA (Scotland) Regulations 1999) into consideration. An EIA is required for developments which may have significant effects on the environment.
- 2.11 A ‘screening’ process helps determine whether a full EIA is required and is based on the defined thresholds, supporting information relating to the development and selection criteria. The EIA screening process is also automatically triggered if a project is likely to be located within a ‘sensitive area’ (see Text Box 4). Although EIA screening would not be triggered if a project was located in other ‘non-designated’ sites or areas containing important features, this would be taken into consideration during the planning process.
- 2.12 A fish farm developer may request a ‘screening opinion’ from the planning authority to help them decide whether an EIA is required. Based on the information provided by the developer on the nature of the development/extension, an opinion will be provided which will indicate that a full EIA is required or whether the development/modification can go ahead without the need for an EIA, i.e. a negative screening opinion. Fish farm developers in Scotland are encouraged to seek screening opinions from the planning authority when “developing proposals for new sites or significant expansions to existing sites” (Scottish Executive, 2007). The Royal Commission on Environmental Pollution (2004) recommends that EIAs are carried out for “every application for a new or significantly modified fish farm”. However, historical **screening opinions indicate that this is not always necessary** given the nature of the project and significance of impacts. A fish farm developer may **appeal** to Scottish Ministers if they disagree with the screening opinion offered by the planning authority.
- 2.13 If it is established that a full ES is not required the planning authority *may* request additional information in support of a planning application (templates for pre-application, screening and scoping provide some guidance to the developer in the provision of information to the planning authority).

Text Box 4 Interpretation of the EIA (Scotland) Regulations 1999 with respect to EIA screening thresholds

During the review/interpretation of the EIA (Scotland) Regulations 1999 Xodus AURORA identified a number of areas which may require further clarification:

It should be noted that the threshold “(a) *the installation resulting from the development is designed to produce more than 10 tonnes of dead fish weight per year;*” did not originate from the Environmental Impact Assessment (Fish Farming in Marine Waters) Regulations 1999 and was already included in the EIA (Scotland) Regulations 1999. It is assumed, for the purposes of this study that the threshold of 10 tonnes of dead fish weight per year relates to freshwater fish farming only – although this point may require clarification in any proposed amendments to the EIA Regulations.

Consideration of this threshold has therefore **not been taken further in this study** which focuses on marine fish farming activities.

⁹ <http://www.scotland.gov.uk/library2/doc04/eia-03.htm> and SNH Guidance on EIA: “B.4.12 The criteria and thresholds in the second column of the table in Schedule 2 apply equally to changes or extensions to relevant development as they do to new development. Paragraph 13(a) of Schedule 2 provides that, in such cases, the thresholds and criteria are to be applied to the change or extension itself, not to the thing being changed or extended.”

EIA scoping

- 2.14 If it is determined that an EIA is required (i.e. **positive** screening opinion) the first key stage of the EIA process is 'scoping'. During scoping, key issues to be addressed in the EIA are identified. In particular, those impacts likely to have **significant** impacts on the environment are defined. A 'scoping opinion' may be sought from the relevant planning authority on what is required to be included in the environmental impact assessment.
- 2.15 For both a screening and scoping opinion the following information will be required to be submitted to the planning authority, as part of the Town and Country Planning Act (TCPA) process:
- Location and extent of the site of the proposed fish farm
 - A brief outline of the proposed annual scale of production in tonnes
 - The biomass capacity of the development
 - The equipment to be installed on site
 - The possible environmental effects of the development
 - A statement of the proposed servicing methods and of any intended associated development

Environmental assessment, including informal consultation

- 2.16 Environmental assessments are generally undertaken by an independent consultant on behalf of the fish farm operator. The EIA process requires an understanding of the proposed construction and operation of the fish farm development and the environment upon which there may be an impact. Informal consultations may be undertaken with relevant bodies, e.g. the Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH), local authorities and local field study groups, during the environmental assessment process, particularly during the collection of relevant baseline data. Central to the EIA is the systematic identification of issues that could impact the environment, including other users of the environment. Once identified, these issues are assessed to define the level of potential impact they present to the environment, in order that measures can be taken to remove or reduce such impacts through design or operational measures.

Submission of environmental statement (ES) and approval process

- 2.17 Once the EIA is complete, the developer is required to submit the Environmental Statement (ES) to the planning authority. Following consultations (with statutory consultees and the public), the planning application is either: a) approved without conditions, b) approved with conditions, or c) refused.
- 2.18 Scottish Planning Policy 22 has been superseded by the new integrated Scottish Planning Policy.
- 2.19 Where the planning authority does not approve a development, the developer can appeal this decision. It will depend on the scheme of delegation in place in the relevant authority as to whom that appeal can be made. It may be a Local Review Body or Scottish Ministers. An appeal may be upheld or dismissed or varied by amending previously attached planning conditions.

3. REGULATION OF MARINE FISH FARMING IN OTHER COUNTRIES

3.1 Introduction

- 3.1 Section 3 is based on the review of aquaculture regulation in other countries, focusing on the EIA process or its equivalent, undertaken by Xodus AURORA for SARF040.
- 3.2 Within Europe, aquaculture is one of the biggest areas of potential growth within the maritime industry and it is expected that as a result of increased fish consumption future demand for fish will need to be met through fish farming (EC, 2006¹⁰). The decline in traditional wild fish stocks has promoted the expansion of marine fish production through aquaculture (Halvorson and Duff, 2008¹¹). The scale of production of fin fish, particularly from Norway and Chile, has led to high levels of cheap salmon on the global market, with price differences increasing pressure on the Scottish aquaculture industry to compete with other countries.
- 3.3 The ability of different countries to produce fin fish is dependent on a number of factors including: the availability of and access to suitable sites; the total carrying capacity of sites plus national and local policies; the availability of high quality water and water depth; and suitable protection, i.e. for shelter. However, it is expected that advances in technology and availability of suitable materials will enable farms to be sited in areas once thought unsuitable, e.g. in deeper, more open offshore waters.
- 3.4 For the purposes of understanding how the marine fish farming sector is regulated elsewhere, a desk top study was undertaken of EIA regulations across Europe and other relevant countries. A comparative analysis was undertaken of countries with established marine cage aquaculture such as Norway, Ireland, Canada, Faroe Islands and Chile. Other countries also included in the analysis were Greece, Turkey and the USA. Data in some instances were not readily available. The following sections address various issues that were identified. These relate to overall regulatory frameworks and differences with regard to the application of EIA thresholds. Reference is also made to Scotland where appropriate.

3.2 Regulatory Framework Requirements

- 3.5 The review of the various regulatory frameworks identified a number of comparable requirements:
- Licences to operate - fish farm developers in almost all countries require a licence to operate (a concession/authorisation in Chile), which needs to be accompanied by environmental information in relation to the site. This may take the form of an environmental impact assessment (Scotland, Ireland), site survey (Turkey) or feasibility study (Greece). In some instances, although a licence may have been granted, a site survey is also required before operations can commence (Faroe Islands).
 - Licences subject to criteria - criteria taken into consideration before a licence (concession/authorisation) is granted include issues such as: overall environmental responsibility; ecological effects; fish health; site characteristics; potential conflict with other sea users; and working conditions. In Turkey, an evaluation of the proposed development includes taking **national economic development plans** into consideration.
 - Key areas of concern - areas of particular concern/focus were also identified. For example, in Norway emphasis is placed on the environment and the effects of farming on fish health, while in the Faroe Islands much importance is placed on site

¹⁰ European Commission (EC) (2006). Green Paper – Towards a future Maritime Policy for the Union: A European vision for the oceans and seas. European Commission, Brussels, 7.6.2006 COM (2006) 275 final Volume II – ANNEX

¹¹ Halvorson, H. O. and Duff, J. (2008). Offshore aquaculture legislation designed to balance production and protection. Marine Pollution Bulletin, 56 (2008) 1673 – 1675

characteristics, in particular the depth of water of available sites and currents generated by tidal movements. The latter is considered particularly important in the control of diseases.

- Licence conditions - licences, once granted, are usually subject to conditions. In Chile, a concession/authorisation does not time expire, but is subject to specific conditions which include compliance with a number of environmental measures. One such measure includes ensuring that the carrying capacity of the site is not exceeded. In Turkey, conditions relate to cage location and water depth. In Greece environmental standards govern the main issues surrounding the operation of a fish farm site, including: distance between farms; minimum current flow; mooring of cages; stocking densities and monitoring (Papoutsoglou, 2000¹²).
- Monitoring requirements - ongoing monitoring is also considered an important factor and a regulatory requirement in some instances. In Norway, for example, there is a requirement to monitor existing farms for environmental effects. In the Faroe Islands environmental monitoring is part of the environmental approval process where fish farms are required to be registered and are subject to monitoring requirements to ensure animal welfare and hygiene. Site surveys are undertaken regularly in the Faroe Islands. Here, surveys are required to be undertaken every 2 years or whenever any major alterations are carried out. One of the aims of the proposed National Offshore Aquaculture Act 2007 in the United States is the requirement for planning considerations and environmental precautions to be complemented by a mandatory monitoring system (Halvorson and Duff, 2008).
- Provision of temporary/trial licences - two countries make provision for ‘temporary’/‘trial’ licences for proposed developments. In Ireland a ‘trial’ licence may be granted to farmers wishing to carry out farming for investigative or experimental purposes. These licences are valid for one year only and do not require an EIA. Also, in Ireland development projects which involve the introduction of new or ‘novel’ species are granted consent without the need for mandatory EIA (on the basis that they are small-scale and non-commercial). Such developments are not subject to the licensing provisions unless they expand or become a commercial enterprise. In Turkey an environmental survey is undertaken of the proposed site as part of the consent application process and a preliminary environmental survey report is produced as a result. If the report is positive a preliminary licence is granted to the fish farmer and is valid for 8 months. Following provision of a preliminary licence the fish farmer is required to submit more detailed environmental information in the form of an EIA.

3.3 Requirements for EIA

3.6 The review of the legislation in force with regard to the application of EIA to marine fish farming shows that there is no clear comparison. Although the EIA Directive states that an EIA may be required for ‘intensive fish farming’, European Member States have had much discretion on the setting of screening thresholds for projects listed in Annex II. While some countries (outside the EU) follow the EU regulatory processes, e.g. Norway, thresholds set for ‘intensive fish farming’ vary considerable. Table 3.1 highlights several inconsistencies that were identified between the different countries.

Table 3.1 Inconsistencies in requirements for EIA between different countries

Area of inconsistency	Details
Widely different quantities provided in relation to tonnage based thresholds	For example, no thresholds are provided in relation to ‘production’ of fish farmed in marine developments for Scotland, while in Ireland a figure of 100 tonnes is

¹² Papoutsoglou, S.E. (2000). Monitoring and regulation of marine aquaculture in Greece: licensing, regulatory control and monitoring guidelines and procedures. Journal of applied ichthyology, 16, pp167-171.

Area of inconsistency	Details
	provided; 780/900 tonnes in Norway (although this is strictly the size of licences issued by the government, not EIA thresholds); 35 tonnes in Chile; and 1,000 tonnes in Turkey.
Different terminologies are used	For example, Scottish regulations make reference to developments requiring EIA if they are “designed to <u>hold a biomass</u> of 100 tonnes or greater”, which is similar to Norway where legislation states that the “maximum <u>allowed biomass</u> is 780 tonnes ¹³ ...” This contrasts with regulations in Ireland which state that an EIA is required for installations “with <u>an output</u> which would exceed 100 tonnes per annum”, while Chile and Turkey refer to “ <u>annual production</u> of X tonnes per year”. Even though a production : biomass multiplier ¹⁴ could be used to make tonnage (i.e. biomass) comparisons between different countries, major variables still need to be considered with no clear definitions or explanations provided within various regulations for the different terminologies used.
Different approaches	Most countries have a single threshold approach. However, Turkey has a tiered system of EIA where EIA is compulsory for developments with an annual production of more than 1,000 tonnes, while projects with an annual production capacity of between 30 and 1,000 tonnes only require a preliminary EIA. No EIA is required for farms with a capacity of less than 30 tonnes.
Area v. tonnage based thresholds	Area based thresholds are only mentioned in Scottish regulations, with all other countries concentrating on tonnage/biomass thresholds (there does not appear to be a clear scientific basis for these thresholds). Scottish regulations do not clearly state what the 0.1ha threshold applies to. For example, does it extend to navigational lights or only to cage surface area? Further clarity is needed.

3.7 It is not particularly clear why there are such differences in EIA thresholds between the various countries although differing regulatory regimes, geographical location and suitable marine environments for fish farm development must have a degree of influence. Some possible explanations for differences in thresholds are as follows:

- When implementing the requirement of the EIA Directive, EU countries **have much discretion** on setting thresholds under national legislation;
- There may be some confusion/misunderstanding regarding the application of thresholds and to what aspect of fish farming they should apply i.e. production, output, biomass, area etc. There is very little consistency between countries. Assessing the effectiveness of inconsistent EIA thresholds is outside the current scope of this project and would require further detailed investigation.
- Differences in the practice of fish farming, e.g. methods employed, size of industry etc, and the geographic location of fish farm developments could affect the extent of EIA thresholds that are applied. For example, a country may choose to set very high thresholds, but the environmental impacts associated with fish farm developments may be reduced due to national geographic characteristics, and the ability of suitable sites to host large farm developments.

¹³ This relates to a licence threshold (Norway only). EIA thresholds in Norway are 3,000 tonnes of biomass or more, i.e. several ‘licences’ linked together in one site.

¹⁴ ‘Biomass’ refers to the total weight of fish that can be held at any time / ‘Production’ refers to the final output following complete harvesting.

3.8 The basis for setting EIA thresholds for marine fish farm infrastructures is also not particularly clear although there appears to be much emphasis placed on the need for developments to be 'environmentally responsible' or 'sustainable'. EIA thresholds would appear to be set to help ensure maximum environmental protection. After all, EIA is a tool which enables the full appraisal of the environmental effects of a development before development consent is provided. In Norway, for example, aquaculture licences may only be granted as long as the development is shown to be environmentally responsible, with potential development sites being left dormant should any environmental surveys show that conditions are unacceptable for fish farm infrastructure. Specific requirements for environmentally sustainable aquaculture projects are established in Chile which helps to ensure that any associated impacts are either prevented, mitigated or remedied. In contrast, in Canada emphasis is placed on mitigating or minimising the effect of a development on society in terms of health and the economy as well as physical and cultural heritage. In the USA efforts to engage in coastal aquaculture have had mixed results due to environmental concerns and socio-political opposition. Coastal user conflicts and the ecological suitability of an area for fish farming are just some of the issues which have prevented the successful implementation of offshore aquaculture legislation (Halvorson and Duff, 2008).

4. EXPERIENCE OF REGULATION IN SCOTLAND

4.1 Introduction

4.1 Section 4 considers the practical experience gained by industry, regulators and other practitioners since the 1999 EIA Regulations were introduced. Because of the linkage between EIA and the planning system (or development consenting/works licence system prior to 2007) and other regulatory systems, the main sources of information considered for this project were:

- Various UK and Scottish Government websites; EC publications
- The Crown Estate's online database
- Specific Excel extracts from the Crown Estate's internal database
- Environmental statements (hard copy and CD) held by Crown Estate and Scottish Government
- A review of selected paper case files held by the Crown Estate, retrieved from archive storage for this project
- A comprehensive Excel extract from SEPA's database of environmental consents for the industry (CoPA and CAR), with additional information on farm equipment
- A non-attributable Excel extract of the applications database from one local authority, covering almost 100 'cases'

4.2 Some of the material, analyses and sectoral comparisons illustrated in this section may not appear immediately relevant to a consideration of EIA thresholds, but they do serve as useful **context**. Decisions to request an ES, time taken to determine an application and the final decision to approve or reject an application are often all tied into the use of the EIA Regulations – and therefore relevant to thresholds that might have triggered the use of the Regulations in the first place.

4.2 Crown Estate Data - General

4.3 The Crown Estate (CE) publishes a useful summary of all applications for leases (and therefore development consents prior to 2007) on its website¹⁵. ERM has also been given access to two additional Excel-based extracts from the CE database, which provide further (if not always consistent) information about the cases summarised on the website. These data sources have been used to produce some of the broad context analyses shown in Section 4.

4.4 It is important to remember that marine finfish applications in Shetland and Orkney have traditionally been handled under a different regime: works licences. CE lease data on Shetland are comprehensive, but its records on actual EIA transactions, particularly for Shetland, are incomplete. ERM has not been able to source a detailed case-by-case record for all regulatory transactions in Shetland, but has been able to interview the responsible officer of Shetland Islands Council in some depth. Where appropriate in the following text, reference will be made to this interview.

4.5 It is also important to bear in mind that the **interim arrangements for authorisation of marine fish farms** were operational from 1999. In essence, applications to CE for a development consent **were being treated as if** they were applications for planning permission under the Town and Country Planning (Scotland) Act 1997 (TCPA¹⁶ *hereafter*, *and this acronym is used to cover the legal process of considering and determining an application for planning permission*) from this point onwards, with some slight anomalies¹⁷.

¹⁵<https://office.thecrownestate.co.uk/ffstats/default.asp?dteStart=&dteEnd=&lstSpecies=Salmon&Go.x=13&Go.y=3>

¹⁶ <http://www.acronymatic.com/TCPA.html>

¹⁷ Orkney and Shetland continued to operate Works Licence regimes much as before, and there is some suggestion that the Crown Estate operated a unilateral policy for what it perceived as minor modifications during the period of the interim scheme (Crown Estate,

4.6 From a business perspective, it would seem logical to assume that there are two main issues that ought to concern an industry when it considers the regulatory aspects of investment decisions it is making:

- **Chances of success** – i.e. will applications be approved or rejected
- **Time taken** – i.e. how long will the business have to wait before its application is determined

Both of these key issues are considered in this Section. (**Cost** is another consideration, and this is discussed in Section 5).

4.2.1 Website Data on Applications for Salmon Farm CE Consents – 1998 to 2007

4.7 An assessment of all the salmon farm applications to CE between 1998 and 2007 is presented in Figures 1 to 5, based upon the CE website data.

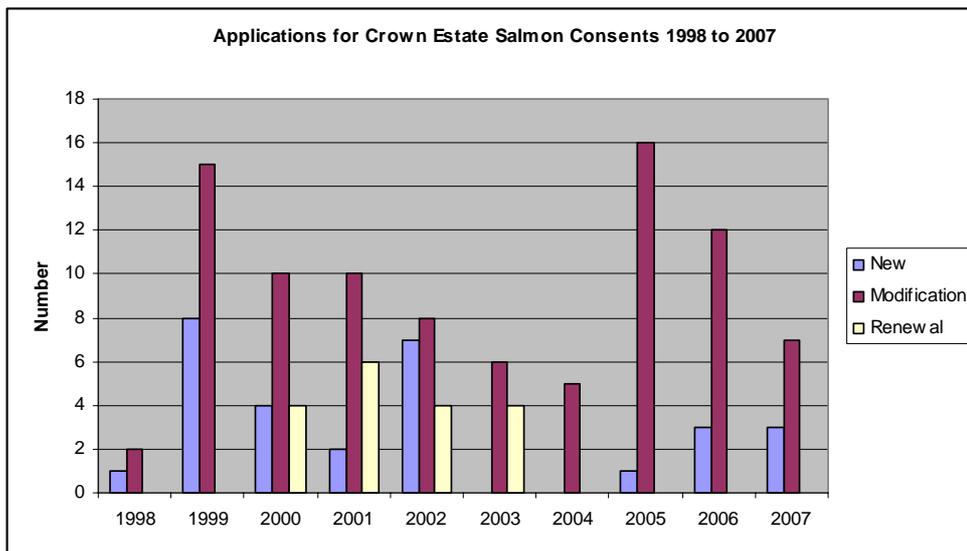


Figure 1. Applications for CE Salmon Consents

4.8 Figure 1 indicates that there were a total of 138 transactions over the period, with the majority being modifications. (Renewals that also included modifications are categorised as modifications in this analysis). 29 new lease applications were made.

personal communication, 2009). Shetland did the same, with changes of less than 10% of surface area being treated as minor modifications.

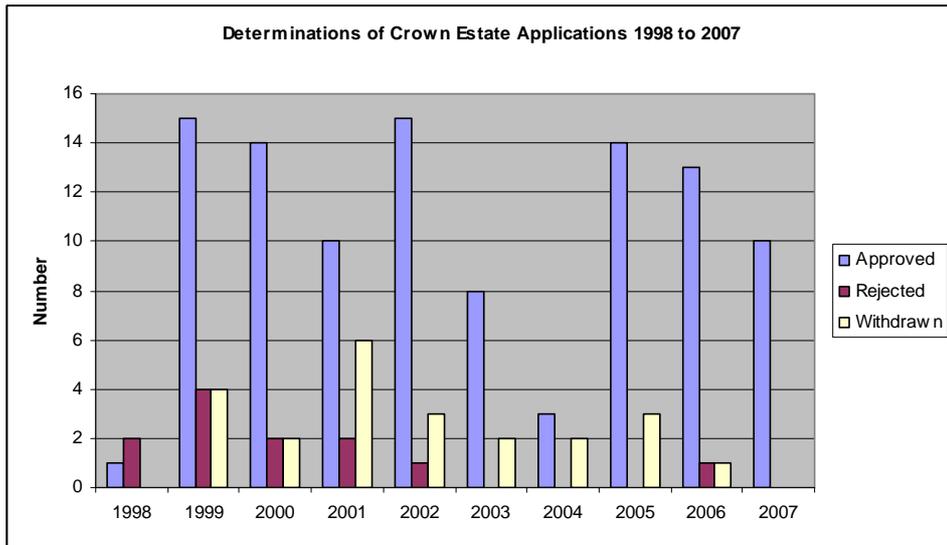


Figure 2. Outcomes from CE Applications for Salmon Consents

4.9 Figure 2 indicates that of the 138 transactions, 103 were approved, 12 were rejected and 23 were withdrawn. It is important to stress that only 12 applications were rejected over a ten year period to 2007, or 9%.

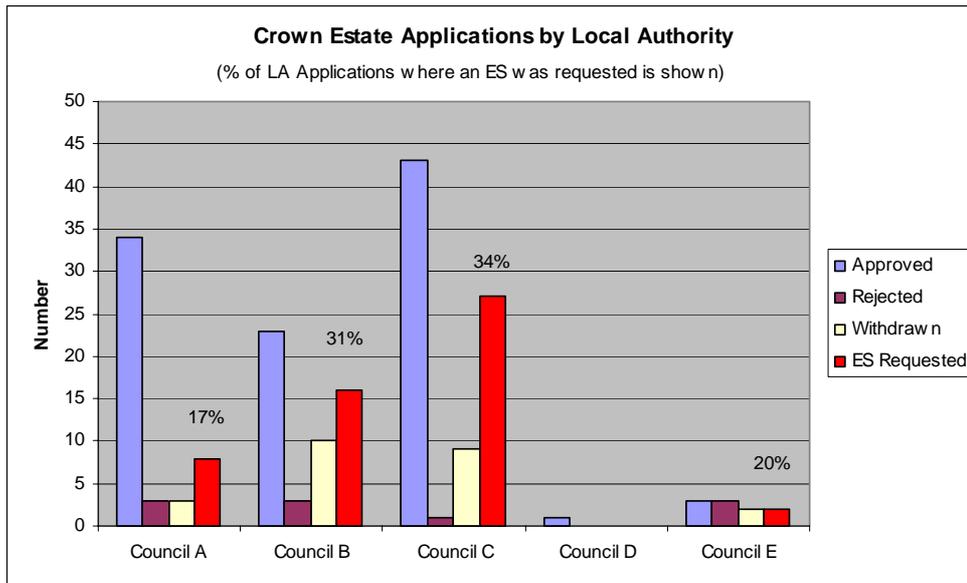


Figure 3. CE Application Outcomes by Local Authority Area

4.10 Figure 3 analyses some key CE data against region in the country, because during the interim arrangements the local authorities were effectively acting as the final arbiter of applications. There is clearly some variability around the country in terms of number of transactions as well as types of outcome, but on balance there is no major apparent difference between areas in terms of rejection of applications (i.e. ‘chance of success’ indicator from a business perspective). There were some differences between the degree to which an ES was required to be submitted with applications, and these are likely to have had a bearing on the other main business-relevant issue, **time taken** to determine.

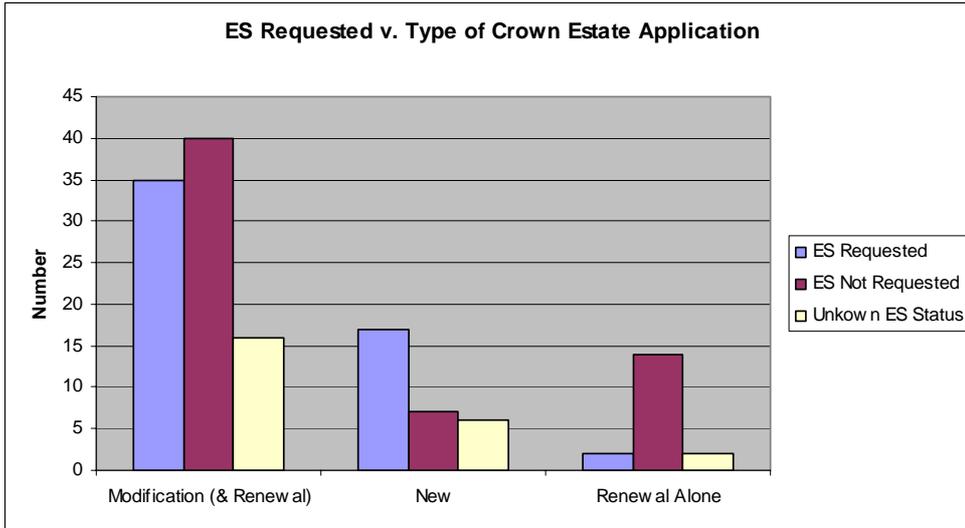


Figure 4. Type of CE Application Where ES Requested

4.11 Figure 4 provides some insight into the types of transaction that tended to prompt a request for the preparation of an ES. There is a very important caveat to the numbers in Figure 4: the CE database provides information about whether an ES was requested, and it provides a lot of information about transactions where an ES was not requested. However, there are 24 transactions where the column on ES is blank, i.e. **unknown** status. The relatively low number of requests for ES for simple renewals is unsurprising, nor is the relatively mixed approach to ES for modifications or renewals with modifications. What does stand out is the number of cases where a **new lease** was applied for and **no ES** was apparently requested – seven cases. Two of them were rejected, but five were approved.

Text Box 5 Submitting an Environmental Statement Without Screening

This is an appropriate point in the report to consider some of the difficulties in interpreting the information provided to the project, and the possible reasons for some of the observed outcomes of the analysis.

In several cases, by examining case files in more detail, it is clear that when 'no environmental statement required' is indicated in a master database (or where there is no record at all), this might **not have been quite so clear-cut**. Two main possibilities under the EIA Regulations exist:

- That a site might have had a very recent full ES undertaken, perhaps for a renewal, and it was judged that a further ES for a subsequent modification was not required – or that 'additional information' provided through the TCPA process would suffice
- That a developer, conscious that a proposal was of a significant scale, submitted a dossier that he/she identified as an ES along with the original application. In effect the developer has decided the application is an EIA application, and there may be no record of formal screening or scoping appearing in the database

The third common occurrence was that 'additional information' was requested by one or other statutory consultee, when they were asked their view under EIA screening, but they were satisfied this could be delivered by the TCPA process, and not by way of an ES (see Table 2.2).

There is a fairly consistent thread through these alternatives: as long as the initial TCPA application contains enough information for an expert public-body consultee to take a professional view about environmental impact, that is by and large all they require – provided that information does not indicate the risk of a significant environmental effect. If it does, the project **must** become an EIA project. If the information provided in the planning application is missing some key elements, public-body consultees can request additional information, although from a developer's point of view this causes some additional delays.

Producing an ES When Required

Text Box 5 Submitting an Environmental Statement Without Screening

The notes above relate to analysis of some of the 'uncertain' cases with respect to EIA status of an application, or those where additional information through TCPA was sufficient. It is important to stress that in **many cases** since 1999 an ES **was** requested, and generally eventually delivered by the applicant. There is evidence, however, that on some occasions a positive EIA screening opinion caused the developer to withdraw the application.

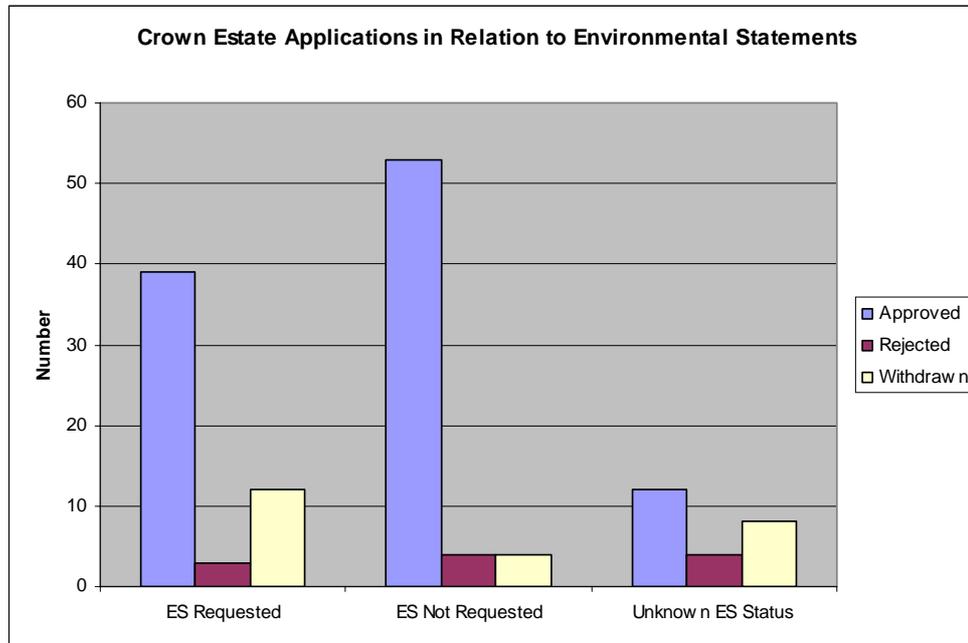


Figure 5. Outcome of CE Applications v. ES Status

4.12 Figure 5 shows the number of applications that were rejected were very similar when one compares applications with or without an ES – indicating that in the cases without apparent formal ES, sufficient information was apparently present in the normal 'planning' application dossier (and see Text Box 5) for the planning authority to make a decision.

4.2.2 Comparisons with Other Sectors and Jurisdictions

4.13 It is relevant to compare application success rate for this industry with those for other industries. As the notes to Figure 2 suggest, the success rate for applications between 1998 and 2007 was 91% if withdrawals are excluded from the calculation. This compares with, for example in England and Wales over recent years¹⁸:

- All applications – 83%
- Applications for major offices/R&D/light industry – 91%
- Major general industry/storage/warehousing - 90%
- Minerals developments - 91%

4.14 If one accepts that local authority planning departments have been operating under the Interim Scheme for the Authorisation of Marine Fish Farms in Scottish Waters as if they were effectively the planning authority, then it would appear that the marine aquaculture industry has **faired quite favourably** compared with most other industrial sectors in terms of approval percentages – at least as far as comparison with England is concerned. This is rather encouraging in terms of one of the two core business requirements – chance of success.

¹⁸ The Killian Pretty Review: <http://www.planningportal.gov.uk/england/government/en/1115315772911.html>

4.15 Interestingly, the review quoted above shows withdrawals (all sectors) averaging around 6.5% of applications during 2006/7, rising from a low of around 4% in 2002/3. For marine aquaculture in Scotland, the apparent withdrawal rate has been higher at, around 13%.

4.2.3 Time to Determine Applications

4.16 From the supplementary files provided by CE (i.e. a different raw source from that used in Sections 4.2.1. & 4.2.2.), it has been possible to make some estimates of the time taken to determine final decisions on the initial application. Time for decision-making is the second of our two main business-relevant criteria. Figures 6 to 8 present this information. It is important to explain this type of analysis carefully, and to take account of the possible reasons for some of the individual timelines that appear from the analysis:

- The analysis runs from 'Date of Submission of Application' to 'Date of Crown Estate Decision'. Intervening dates are available for some cases, including dates that cover submission for consultation, with or without accompanying ES. However the start and end dates chosen represent the **whole process**, and are the most consistently available in the database
- Where there is a lack of date recorded on the database – usually for the end point – that transaction has been **omitted** from the analysis. 120 transactions are analysed in the Figures below

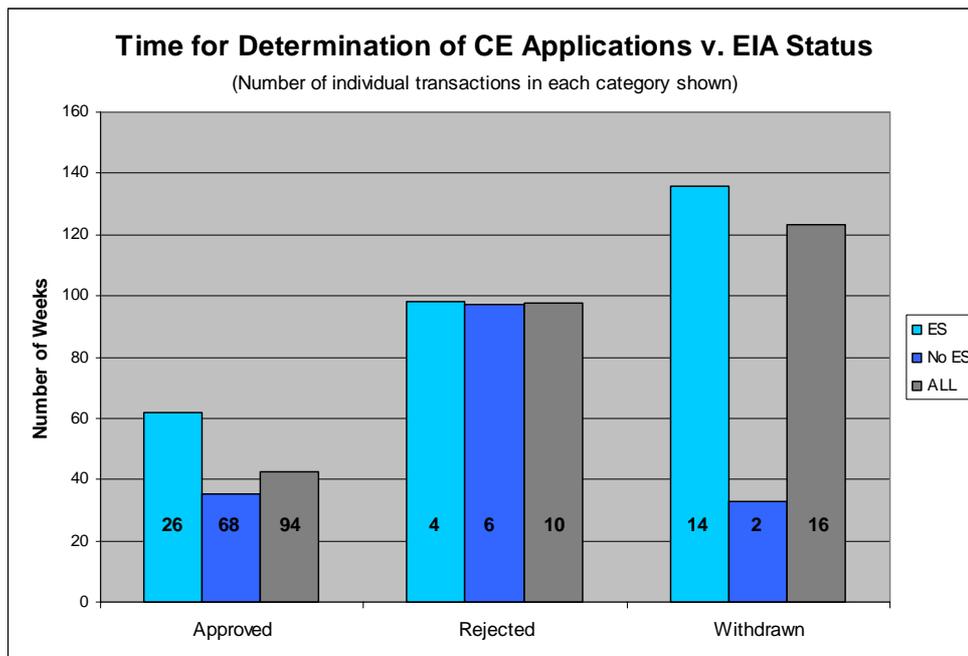


Figure 6. Time to Determine CE Applications v. EIA Status

4.17 It is important to consider very carefully what Figure 6 appears to suggest:

- All applications that were **approved** were determined in an average timescale of just over **40 weeks**, but:
 - It took over 60 weeks to determine applications where an ES was requested
 - It took less than 40 weeks to determine applications that did not **apparently** require an ES (but see Text Box 5)
- Note also that these 'approvals' would have been for a range of types of application, from a simple renewal to something as complex as a new application
- All applications that were **rejected** took just under **100 weeks** to determine, almost irrespective of ES status
- The average time for a developer to decide to **withdraw** an application was over **120 weeks**, and in most cases they had been required to produce an ES (in which case it took an average of over 130 weeks for them to decide to withdraw).

Text Box 6 Possible Reasons for Observed Timescales

It is important to consider possible reasons for the apparent lengths of time taken to determine applications under different circumstances, and to state very clearly that there is **no suggestion these timescales relate to performance by any one particular grouping** within the application process. Rather, they appear to be a combination of circumstances:

- For example, in many cases it is clear that the delay has resulted from the length of time the developer (or his/her consultant) has taken to complete and submit an ES or to provide additional information. This point has been stressed by officials experienced in this field¹⁹
- The planning process (and the interim scheme prior to 2007) has a very clear ‘clock’ set down by statute, but that clock is paused as soon as a request for additional information or an ES is made by the competent authority or any one of the statutory consultees (and agreed by the developer)
- Numeric evidence from **one** experienced planning authority shows that it took, on average from point of initial formal application:
 - Just 14 weeks to determine approvals when no ES was required
 - Just 5 weeks to send out scoping advice as to what was required in an ES
 - Just 5 weeks to send out requests for additional (further) information
 - (In the latter two cases, subsequent actions and timescales are up to the developer, and there is **no record of what then happened** in the database analysed)
- However, whether the request for additional information or an ES was reasonable and justified, and whether it represented the **minimum information required to determine the application**, is also a key point: did scoping opinions/advice focus sufficiently on case-specific risks of significant environmental effect, or were they an invitation to write an extended first-principles volume on all the basics of salmon farming?²⁰
- Failure to engage in high quality pre-application consultation or discussion (wherever the failure arose) must be seen as a contributory factor: prudent practice would be to avoid the regulator having to make requests for additional information, by ensuring that the necessary information has been provided in the first place
- Planning decisions are normally plan-led, and the fact that there have been very few aquaculture ‘plans’ for the Scottish coastline over the ten year period in question may have been a contributory factor. Every application has had to be determined from first principles, rather than having a plan or even a vague spatial context to assist planners with their decision-making

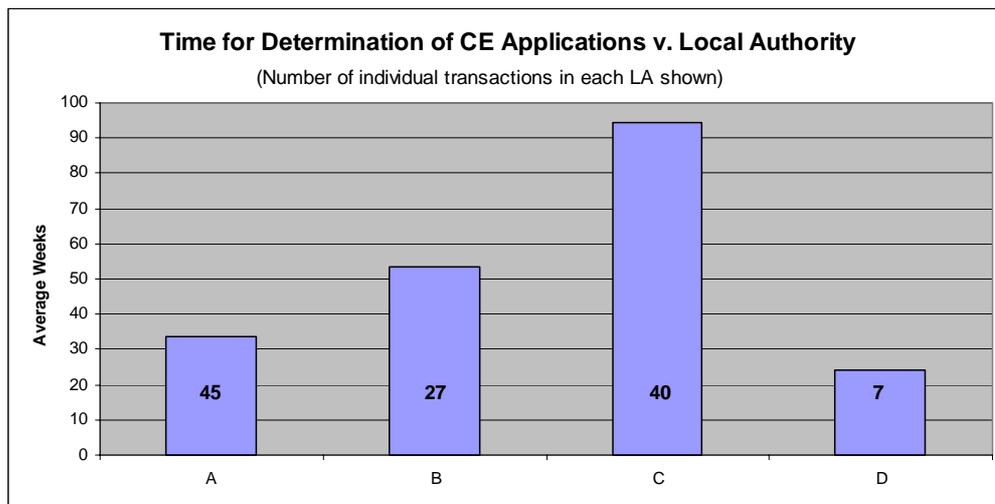


Figure 7. Average Time to Determine CE Applications by Local Authority

¹⁹ SIC, personal communication 2009

²⁰ See SARF024 report for review and analysis of this aspect of marine aquaculture EIA cases since 1999

4.18 Figure 7 provides some information about how long applications took to determine, depending upon which local authority area was involved. There does seem to be some regional difference in this regard, and there is a situation where one authority can determine 45 cases in an average of just over 30 weeks, whilst another takes an average of over 90 weeks to determine a very similar number of cases. What is not clear from the database is why there should be such differences – and there may be very good reasons from the point of view of local environments or circumstances.

4.2.4. Comparison of Time to Determine Applications – Other Sectors or Jurisdictions

4.19 It is relevant to compare application time-for-determination in this sector with other industrial sectors. Figure 8 has been prepared in a format that allows direct comparison with data presented in the Killian Pretty review²¹, shown in Figure 9. It is important to note that the English cases shown here were developments in the ‘major’ class, but it is possible to make similar comparisons with other classes of development.

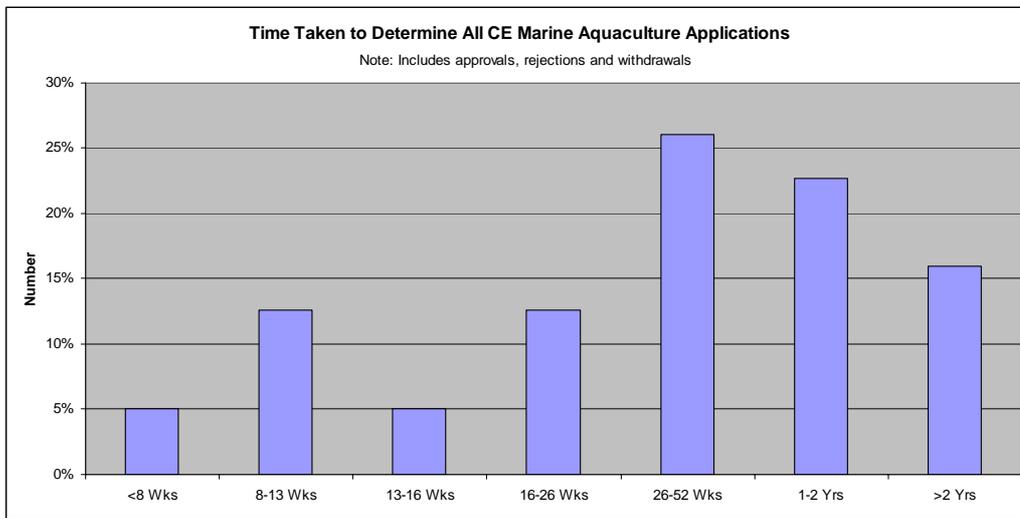


Figure 8. Time to Determine CE Applications in Standard Ranges

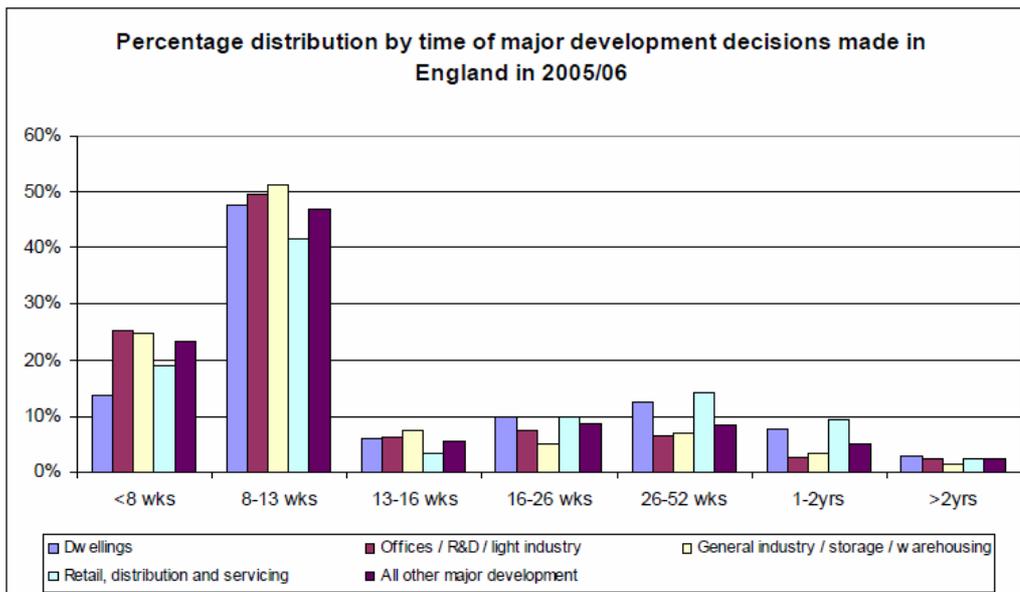


Figure 9. Time to Determine Major Developments in England 2005/6

²¹ <http://www.planningportal.gov.uk/england/government/en/1115315772911.html>

- 4.20 In England, most major developments are determined in 0 to 13 weeks, whereas a lot of marine aquaculture determinations are taking 26 to 52 weeks, or even 1-2 years.
- 4.21 It has been impossible to locate a similar graphic for other-sector business planning applications in Scotland. However a recent study²² reports: “*On average, major applications were taking between 28 and 37 weeks to determine, but certain simplifying assumptions made in the analysis mean that these figures underestimate the true decision time. Analysis of selected planning applications which had remained undetermined for a long period showed that the behaviour of planning authorities was not the only reason for delay – a high proportion of applications were delayed because the applicant failed or was slow to supply necessary information.*” The report goes on to offer some relatively critical comments about local authority planning departments by sectors such as house builders, but the core message is clear: major developments generally take longer to determine in Scotland than in England, although it is not always clear where the responsibility for delays lies.
- 4.22 On the face of it there seems to be an underperformance in time taken to determine marine aquaculture applications for development consent (planning permission equivalent) compared with other industry sectors in England, and even to a degree in Scotland. Unfortunately there is usually no note in the CE database that indicates **why** a particular transaction has taken a particular length of time to determine – and yet the question of ‘why’ is clearly very important to this project. If it is possible to identify the reasons for slower-than-desired determinations, it may be possible to develop jointly some solutions for the future. Text Box 6 clearly suggests that improvements will require a joined-up approach.

4.3 Crown Estate Data – Equipment Changes

- 4.23 It has proved to be exceptionally difficult to extract reliable hard numeric information about changes to fish farm equipment in relation to EIA screening opinions from the CE databases that have been provided in two separate Excel spreadsheets. Where one can see a clear change of equipment in one spreadsheet, there is often no matching data (according to file reference number) in the other spreadsheet – where information about whether or not an EIA screening opinion was offered is contained.
- 4.24 The project’s focus has been on changes to fish farm equipment, and specifically pen types and surface area. The Crown Estate has not recorded biomass in its consenting process, leaving this to SEPA, but it has concentrated on equipment and lease area. Area occupied by fish farm pens is of relevance to this study, since one of the main EIA threshold parameters is ‘area’.
- 4.25 Despite the challenges presented by the information available, it has been possible to find some matches between the spreadsheets. The information is presented in Table 4.1 below. The project has extracted all the transactions for which there appears to be accurate information, and it has excluded Shetland transactions (where the ES status is not available from the CE spreadsheets). There has otherwise been no cherry-picking, and the fact that one can find ‘clean’ data for an almost identical number of sites with and without an ES having been conducted is merely happenstance. The project has examined changes in pen surface area (as m² and % change), and where information is available, the time taken to determine the application.

²² <http://www.scotland.gov.uk/Resource/Doc/57346/0016982.pdf>

Table 4.1. Limited Case Histories from Crown Estate Data

ES Required			No ES Required		
Area Change (m ²)	% Change Area	Time (Weeks)	Area Change (m ²)	% Change	Time (Weeks)
-11776	-46%	NA	-1887	-15%	12
-191	-2%	84	-844	-13%	10
-32	-1%	109	-369	-3%	20
54	4%	60	-105	-2%	35
972	56%	43	72	4%	NA
1000	13%	NA	200	5%	34
1152	25%	31	752	125%	105
2500	40%	47	1472	85%	15
2560	50%	89	1559	40%	29
2664	49%	315	1678	293%	15
4427	164%	51	1912	37%	20
5418	109%	97	2562	43%	23
6471	166%	49	3262	47%	NA
6624	92%	NA			

4.26 Although it only represents a very limited sample, some interesting observations can be made from Table 4.1:

- An ES can be requested for a range of reasons, and it is clear that a change of less than the area threshold (1,000 m²) in the EIA Regulations does not preclude a project from requiring an ES – because the overall development, as extended, equalled or exceeded the current thresholds
- Conversely, it is also clear that projects which involve an increase in area greater than the EIA thresholds do not always require the preparation of an ES – although in several cases there is a clear note in the CE database about “additional information requested” (and see Text Box 5 concerning the applicant’s decision to provide an ES without formal screening or scoping). The planning decision-making system is clearly quite capable of making a judgment about a project without necessarily requiring a formal ES
- These data also suggest that “thresholds” are being used largely on a discretionary basis and are perhaps of relatively little importance.
- In this **very limited** dataset:
 - Requirement for an ES leads to an average determination time of **89** weeks
 - The projects not apparently requiring an ES had a determination time of **29** weeks

4.27 The point about certainty whether the ‘No ES’ transactions were indeed transactions without formal ES (see for example Text Box 5) must be stressed again, but in some regards it is irrelevant. Whatever documentation or additional information was submitted, the applications in the ‘No ES’ category were determined much more quickly than those in the ‘ES Required’ category, and that is one of the points this research is trying to clarify – can fast decisions be made for extensions involving a change of more than 1,000 m² of pen area?

4.4 Examination of Available ES Non Technical Summaries

4.28 ERM was able to gain access to some Environmental Statements, either on CD ROM or in hard copy²³. In all cases the Non-Technical Summary (NTS) was examined for any indication that a risk of a significant environmental impact had been identified during the process of conducting the EIA. In some cases, as a secondary assessment, an attempt was made to identify any proposed change in surface area of pens (or in the case of new farms, the proposed total surface area). The results of both assessments are combined in Table 4.2. It should be noted that this review was of the NTSs, not the full text of the main ESs. Whilst the NTS should properly reflect the key findings of the main ES, we have no evidence one way or the other as to whether this is true in every case.

Table 4.2 Assessment of Contents of ES NTSs

Total Number of NTSs examined	45
Number of NTSs which identified various impacts but assessed them as not significant, taking into account the normal mitigations imposed by other regulatory regimes or good practices.	43
Number of NTSs which identified specific impacts – assessed as not significant if mitigated, but requiring very careful consideration/mitigation at planning stage (visual) or CAR licensing (benthic)	2
Number of NTSs which identified risk of a significant environmental impact, even taking mitigation into account	0
Number of NTSs examined where a change in pen surface area was noted	21
Average change in pen surface area – extensions to existing farms	4,662 m ²
Average pen surface area considered in ES – new farm proposals or consolidations	6,604 m ²

4.29 There are several points to note:

- Most of the NTSs examined contained a very large amount of detail about aquaculture interactions with the environment, and whilst clearly very thorough, there was a repetitive (and voluminous) element to nearly all of them
- This is not surprising, in light of the wide-ranging nature of the scoping opinions that were provided by the expert statutory consultees, as guidance to the developer. Annex 5 provides one (non-attributable) example, and clearly shows no attempt to use expertise in order to identify the one or two potential ‘deal breaker’ impact/receptor interactions that might be relevant to the specific nature, scale and location of the proposed development
- There was a clear preference for style of the NTS, depending upon which organisation had undertaken the EIA. Different organisations tended to consistently flag up one or two different types of impact/receptor issue. For example, one organisation consistently referred to the prospect of damage to planktonic organisms as a result of sea lice bath treatments – but then pointed out that the effects were localised, temporary, and very much under SEPA’s regulation (CAR)
- The organisation-dependent highlighted impacts were confined to only a few issues (plankton; benthos; visual) across all 45 NTSs examined
- None of the 45 NTSs concluded that there was a definitive risk of a significant environmental effect – positive or negative
- In the case of the two most cautious NTSs examined, the issues highlighted would have been automatically picked up under CAR or under the normal TCPA scrutiny
- The scale of new sites or extensions to existing sites was consistently quite large averaging 5,400 m² of pen area.

²³ ESs obtained from the Crown Estate and Marine Scotland

4.5 Additional Examination of Crown Estate Data

4.30 Xodus AURORA was also able to examine some CE information, and section 4.5 is extracted from the original SARF040 draft report.

4.5.1 Modifications Requiring an ES

4.31 A review of 17 environmental statement (ESs), produced as a result of 'modifications' to fish farm infrastructure (as opposed to new development ESs), was undertaken to identify the types of modifications that trigger the need for an EIA. The sample reviewed included the following changes that may trigger the need for an EIA:

- Increases in tonnage
- Increases and reductions in cage number
- Changes to cage size/shape
- Increases in net depth, e.g. from 8 m to 12 m
- Changes to cage and grid surface area
- Changes to cage configuration
- Introduction of new feeding systems
- The siting of feed barges

4.32 Table 4.3 provides some case examples on the types of modifications, in particular, those relating to cage number, tonnage and surface area that required an EIA. The review showed that although in some instances screening thresholds may not have been triggered, an EIA may still have been requested, e.g. for reduction in cage number and increase to cage size.

Table 4.3 Types of Modification Requiring EIA

• Reduction from 16 cages (15x15 m square/70 m circ) to 8 cages (90 m circ) with a total grid surface area of 20,000 m ² .
• Increase from 12 cages (80 m circ) to 16 cages (100 m circ) with a total grid surface area of 40,000 m ² and an increase in tonnage to 2,000 tonnes.
• Increase from 4 cages (15x15 m square/70 m circ) to 10 cages (90 m circular).
• Increase from 6 cages (70m) to 10 cages (90 m) with increased tonnage from 400 tonnes to 1,500 tonnes.

4.5.2 Modifications not requiring an ES

4.33 A number of 'negative screening opinions' (20 in total) i.e. where the competent authority deems that an EIA is not required, were also examined to help ascertain the types of development and/or modification which did not require an EIA.

4.34 The types of variations that resulted in a negative screening opinion and the specific issues raised by statutory consultees are outlined in Annex 2. The negative screening opinions that were examined illustrated that although some modifications exceeded threshold limits, in particular the 0.1 ha threshold, they did not always require an EIA; this supports recommendations by a recent study (GHK, 2008²⁴) and is discussed further in Section 6. EIAs were not always considered necessary particularly, for example, if recent EIAs were undertaken and a modification is subsequently required; if increases in cage surface area are sufficient to contain biomass without exceeding stocking density; and if maximum consented biomass is not increased.

²⁴ GHK (2008). Evaluation on EU Legislation – Directive 85/337/EEC (Environmental Impact Assessment) and Associated Amendments. Final Report submitted by GHK, Technopolis within the framework of ENTR/04/093-FC-Lot1.

- 4.35 The review of negative screening opinions also revealed that determining the need for an EIA for a modification is partly dependant on the location of the fish farm development and the presence of any designated sites, e.g. from a scenic, natural history level etc., perspective. In particular, consideration needs to be given to the carrying capacity²⁵ of the area.

Table 4.4 Types of Modification Not Requiring EIA

Types of Variations (examples)
<p><u>General</u></p> <ul style="list-style-type: none"> Change cage area (reduction by ~1200 m²), increase mooring area, replace ageing barge with new to reduce visual impact. <p><u>Equipment</u></p> <ul style="list-style-type: none"> Addition of site feed barge for storage purposes. <p><u>Changes/Additions to fish species</u></p> <ul style="list-style-type: none"> Enable production of cod and halibut in addition to salmon. Maximum biomass will be the same as currently for salmon (1,500 tonnes). Change of species to cod to allow production of either salmon or cod as desired. Add cod to production regime. Include sea trout production to enable alternate production of trout and salmon (already in production). <p><u>Changes in cage type/size</u></p> <ul style="list-style-type: none"> Either four 15 x 15 m square or two 80 m circular cages increasing cage surface area from 225 m² to 509 m². Increase number of cages from six 100 m cages to eight 100 m cages, increasing cage surface area from 4,770 m² to 6,360 m². – 1,590 m² Change cage type from sixteen 20 x 20 m cages to twelve 100 m circumference cages and increase mooring area from 51,200 m² to 58,750 m². – 7,550 m² Increase cages from twelve 24 x 24 m cages to fourteen 24 x 24 m cages, increasing cage surface area from 6,912 m² to 8,064 m². – 1,152 m² Combine activities of two sites at one site, resulting in ten 100 m circular cages with a total cage surface area of 8042 m² and a maximum standing biomass of 1767 T.

4.6 SEPA Data – Biomass Changes

- 4.36 SEPA has provided a comprehensive Excel summary of the history of all its CoPA²⁶ and CAR consents and licences since 1998. This shows when biomass consents for a particular site were increased or decreased. The database also shows whether the sites were in use (i.e. with biomass on site) during the years 2004 to 2009. The SEPA summary does not indicate any reason why a particular consent increased or decreased.
- 4.37 The project's analysis of the SEPA database commences with an overview of SEPA licences that are considered to be 'active', as opposed to those that have not had fish in for a long period of time. There is a potential source of confusion here, because SEPA classifies all current CAR licences (i.e. those that exist and could be used by farmers without any further application to SEPA) as 'active'. To avoid this risk of confusion, this report will now adopt the phrase '**in use**' to describe SEPA licensed sites that have had fish in them for at least one year in the last three, i.e. 2007 to 2009. This does not imply that the project makes any judgments about the other sites and their future usefulness to the industry, but it is helpful to see the size of biomass consents that industry currently considers to be useable for salmon production.

4.6.1 Status of All Current (Active) SEPA CAR Licences

²⁵ Refer to Glossary of Terms in The Strategic Framework for Scottish Aquaculture 2003

²⁶ Control of Pollution Act

4.38 Analysis of the SEPA database provides an overall picture of the CAR licensing situation in September 2009, and serves as useful context when considering what types of sites the industry is using – and what it is not. Table 4.5 presents the current situation.

Table 4.5 All SEPA CAR Licences

Status of CAR Licence	Number	Total Biomass (Tonnes)	Average Biomass (Tonnes)
In use 2007-2009	282	285,215	1,011
Not in use 2007-2009	153	89,320	584
Totals	435	374,535	861

4.39 Table 4.5 provides an indication of the sort of average CAR biomass consents that industry has found useful in very recent years, and this is helpful knowledge in terms of predicting trends.

4.40 The only certainty from Table 4.5 is that there is a total consented biomass of 374,535 tonnes for finfish (mainly salmon) in Scotland. In a hypothetically perfect world, if there was a two year cycle for salmon farming production, if every site was economically and technically viable, if they were all used for salmon, and if the industry produced its theoretical 1.5 tonnes of production for every 1 tonne of biomass consent in use (in year 2), then the total CAR licence capacity in Scotland could allow an annual production of some **280,000** tonnes of salmon.

4.41 This admittedly very simplistic theoretical figure for total production is not being reached, and this is apparently because, for very good reasons, many of the SEPA CAR licences are no longer economically (and possibly technically) viable. Figure 10 provides a more detailed examination of the ranges of CAR licence biomasses that are proving useful to the modern industry, i.e. the ones in use during the period 2007-2009. It also shows the number and biomass of CAR licences of 1,000 to 1,499 and 1,500+ tonnes.

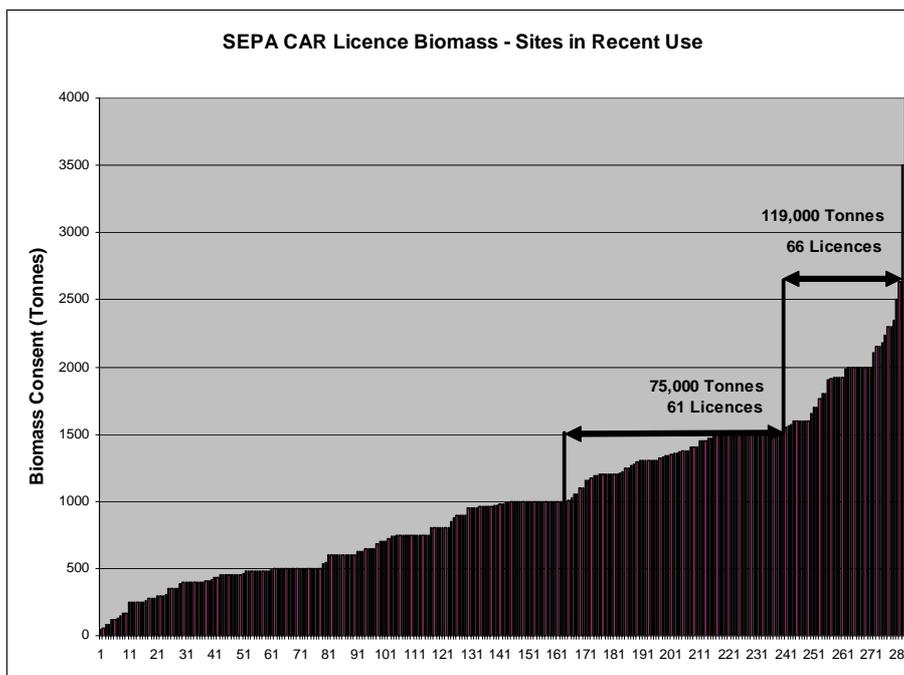


Figure 10. SEPA CAR Licences in Recent Use

4.6.2 Historical Changes to SEPA CAR Licenses

Positive Changes

4.42 SEPA's database shows that aquaculture companies have applied for and been granted increase in biomass consents on 103 occasions since 2001. Tables 4.6 and 4.7 provide some details about these changes.

Table 4.6

Year	Number of Changes	Positive Biomass Change tonnes	Original Biomass tonnes	Percentage Change in Biomass	Average Positive Change in Biomass tonnes
2001	2	522	1,434	36%	261
2002	1	625	125	500%	625
2003	4	3,846	2,200	175%	962
2004	14	4,493	7,337	61%	321
2005	8	2,948	4,692	63%	369
2006	20	10,548	15,505	68%	527
2007	29	17,600	22,960	77%	607
2008	19	9,107	20,922	44%	479
2009	6	2,309	5,340	43%	385

Table 4.7

Company	Number of Changes	Positive Biomass Change tonnes	Original Biomass tonnes	Percentage Change in Biomass	Average Positive Change in Biomass tonnes
Company A	8	6,198	6,266	99%	775
Company B	7	4,559	4,335	105%	651
Company C	13	8,187	10,590	77%	630
Company D	4	1,750	2,000	88%	438
Company E	41	20,327	42,524	48%	496
Company F	10	5,252	7,080	74%	525
Company G	3	887	1,100	81%	296

4.43 Table 4.6 gives a clear indication that applications for biomass consent increases have been more frequent since 2006, after the new modelling tool and SEPA arrangements came into effect. SEPA has maintained for some time that many of its CAR licences could be re-modelled, and could quite possibly permit a higher level of biomass²⁷. So far, 74 licences have been increased since 2006, with a total additional biomass of some 39,500 tonnes, or around 520 additional tonnes per licence over that period.

4.44 Table 4.7 shows the trend for applications to increase biomass consent by seven companies, chosen at random from the database. Whilst some have applied for more increases than others, and whilst the levels of increase vary somewhat, there are generally very similar average increases for each company – in the region of 400-600 tonnes per application.

Negative Changes

²⁷ Personal communication - SEPA

- 4.45 SEPA can also receive requests for a decrease in biomass consent, or can on very rare occasions, review and reduce a biomass consent if there is evidence of unacceptable environmental degradation. There have been some 20 cases of biomass reduction over the time period in question, and the average reduction was 547 tonnes.
- 4.46 SEPA points out that even in cases where a reduction at a specific site is required, it works hard with developers to authorise alternative biomass capacity in other locations. This is encouraging in two ways:
- It indicates that SEPA's regulation of the industry in terms of benthic and water column impacts is robust and responsive – which provides ongoing operational reassurance about environmental protection
 - SEPA's willingness to balance its responsibility to protect the environment with its desire to assist in ensuring sustainable economic activity is evident

4.7 Biomass and Pen Surface Area

4.7.1 Theoretical Calculation

- 4.47 The project has so far considered case-study and other evidence in relation to either changes in **surface area** of pens, or changes to **biomass** consents on finfish farms. This has been both deliberate and necessary, since the databases available are from different organisations which have focused on one or the other parameter. However, it is important to consider how the two parameters link together. The current EIA Regulations use 'either/or' in terms of area and biomass, and pragmatically the two are linked in the real world: if a farm is granted an increase in CAR biomass consent, it is logically going to need more pen volume to hold that biomass, assuming stocking densities remain the same as before the proposed change. The effect on surface area would depend upon whether there were also changes to average pen net depths on the farm.
- 4.48 The project has used the same industry-standard stocking density maximum as that suggested by Xodus AURORA in SARF040, i.e. a maximum stocking density for adult fish of 17 kg/m³. Annex 4 reproduces the ready-reckoner table produced for SARF040. Section 4.6 shows that the average change in CAR biomass consent since 2006 has been **520 tonnes**. This equates to a surface area of **3,058 m²** (using standard density and 10m deep cages). Table 4.8 shows the numbers of cages, dependent upon size and shape, that would be required to hold an additional 520 tonnes.

Table 4.8 Number of Cages Required for 520 Tonnes of Biomass

	Dimension (m)	Number
Circles	60	11
	70	8
	80	6
	90	5
	100	4
	120	3
	150	2
Squares	15	14
	20	8
	25	5

4.7.2 Additional SEPA Information

- 4.49 Although SEPA does not ordinarily provide fish farm cage equipment details in Excel extracts from its main CAR database, it does hold additional information on equipment that developers state they are using, or that they intend to use²⁸. Working with SEPA, ERM has tried to identify changes in pen equipment that relate to the cases of CAR biomass increase referred to in Section 4 of this report. The main outcomes from our research, for the 68 cases where there is relevant information, are:
- Before the change of biomass, the average pen surface area used to accommodate 500 tonnes of biomass consent was 3,379 m²
 - After all the sites had changed biomass, the average pen surface area used to accommodate 500 tonnes of biomass consent was 2,602 m²
 - Other aspects of this change are discussed below, but the key point is that the average of the 'before' and 'after' pen area is **2,990 m² for 500 tonnes** of biomass consent – very close to the theoretical number calculated in Section 4.7.1²⁹
- 4.50 The SEPA information, as presented and analysed, does show quite a wide range of equipment changes for a unit change in biomass consent. ERM does not have access to information about **pen net depth**, and it may well be very likely that depths are also tending to increase – particularly if larger and more modern pens are being installed on site. It should be noted that the EIA screening thresholds are 'either/or' biomass or surface area: whichever of these is the lower will trigger screening, and any developments towards lower pen area per unit biomass will not change the way the current or any future thresholds are applied. However, from a visual impact point of view, a trend towards lower pen area per unit biomass will presumably be a welcome one on the part of regulators and stakeholders.
- 4.51 The other interesting trends that can be noted from the SEPA information are that:
- Before the biomass changes, the average biomass of the 68 sites was 885 tonnes, and the average number of pens used per 'standard 500 tonnes' was **8**
 - After the biomass changes, the average biomass increased to 1,440 tonnes, and the average number of pens used per 'standard 500 tonnes' was **4.7**
 - Average individual pen surface area increased from **421** to **555 m²** during the process of biomass change recorded in these 68 cases
 - In **7** cases (out of 68), pens were changed from square to round

4.8 Summary

- **The approval rate for Crown Estate applications of all types over the last 10 years has been 91% if withdrawals are excluded from the calculation. This compares very favourably with approval rates for 'major' developments in all industry sectors in England**
- **An Environmental Statement (ES) was definitely requested in 54 out of 139 cases, and definitely not requested in 61 out of the 139 cases. In 24 cases the ES status was unclear**
- **There has been some variation between the numbers of ESs requested in different parts of the country**
- **An ES has not be requested in several 'new lease' applications – although it could be that a full 'dossier' equivalent to an ES was submitted along with the planning application, making the application an EIA application under the terms of the Regulations**

²⁸ It is important to stress that this is information the developer provides with a CAR application. It is not the same thing as the developer making a formal application for equipment as part of the planning or development consenting regulations, nor is there any information about time-linkage between when a CAR application is made, and when a previous or subsequent planning application has been made.

²⁹ $500/520 \times 3,058 = 2,940 \text{ m}^2$

- Time taken to determine all applications has been much longer than for ‘major’ developments in England and in Scotland:
 - Approvals have generally taken just over 40 weeks to determine, although those where an ES was required took over 60 weeks
 - Rejections and withdrawals, with or without the need for ES, have taken considerably longer
- Initial analysis indicates that some (but probably few) applications involving changes in cage surface area of anything from 200 to >7,500 m² have apparently been determined without the need for an ES to be prepared – although there is the possibility that ESs were supplied directly by the developer in some cases, without formal screening and scoping
- Out of 45 ES NTSs examined for this project, not one concluded that there was a risk of a significant environmental effect after mitigation had been applied – but all of them contained large amounts of information about every possible type of aquaculture interaction with the environment
- Scoping advice from relevant authorities appeared to encourage this broad brush approach in ES preparation
- Where it was possible to ascertain scale of the proposal, the average pen surface area being considered in the ES was 5,400 m²
- SEPA CAR licences that are currently in use represent some 65% of the total SEPA ‘active’ CAR licences, and they have an average biomass of just over 1,000 tonnes
- Typical applications to SEPA for biomass increases in CAR licences since 2006 (when the new modelling approach was introduced) have averaged 520 tonnes of ‘new’ biomass – and this has occurred 74 times to date
- SEPA’s regulation of the aquaculture industry on an ongoing operational basis is robust, and it does pick up and deal with the very few cases where there is concern based on actual experience on the site
- The relationship between biomass consent and pen surface area is explored in different ways, and it is assumed that a salmon farm having 500 tonnes of biomass consent would require, on average, some 3,000 m² of pen surface area
- Pens appear to be growing larger in terms of individual surface area, and fewer of them are required per ‘site’.

5. ADDITIONAL RESEARCH AND EVIDENCE

5.1 Introduction

5.1 Section 5 considers a range of other evidence-bases that are appropriate in the consideration of EIA thresholds. In itself, none of the material presented in this section provides an unequivocal answer as to what *should* happen with EIA thresholds, and this is entirely unsurprising. However, it does provide context within which judgments about EIA thresholds can be considered. For example:

- If concerns about marine pen aquaculture focus in some cases on visual aspects, it would be helpful to know what research has been done on people's perceptions of the visual impact of the industry
- If concerns focus on the health of wild salmonid populations, it would be helpful to know what the latest information is about these stocks, and how it could be used
- If there are potential environmental benefits to be gained by industry having Permitted Development Rights (PDR) flexibility (and therefore revised EIA thresholds), it would be helpful to identify and quantify these
- If, on the other hand, there are ongoing risks of significant negative impact by the industry, that cannot be picked up without full EIA screening, these also need to be considered

5.2 Reasons for Refusal of Applications (SARF005)

5.2 The SARF005 project provided an interesting analysis of reasons for rejections of fish farm applications (Fig 3 of the SARF report)³⁰.

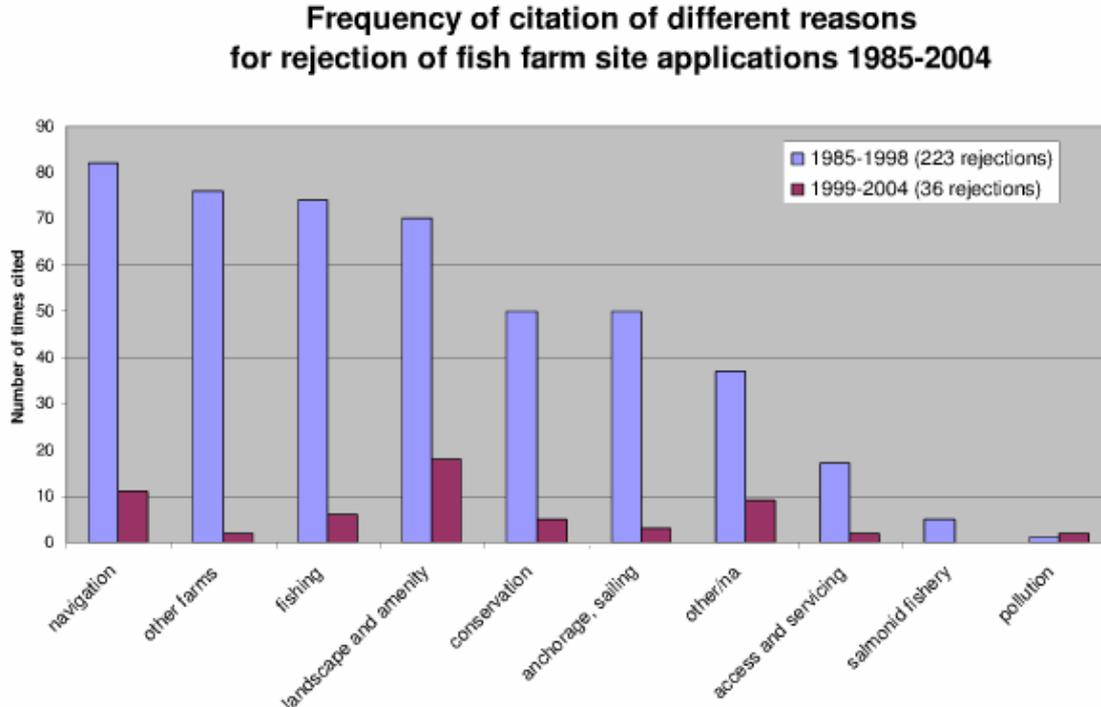


Figure 11. Extract from SARF005

5.3 The 1985 to 1998 period is of passing interest to this project, but the main focus is on the period since 1998, when the new EIA Regulations were introduced. It should be noted that the SARF005 authors hypothesise that the category 'fishing' might also include some cases

³⁰ <http://www.sarf.org.uk/SARF005.htm>

where it was specifically the interests of salmonid fishing that were important, but that these might have been mis-classified.

- 5.4 The most significant category of reason for rejection, post 1998, is **landscape and amenity**. The second most important reason is **navigation**, and this is perhaps an indication that the developer had simply not entered sufficient pre-application discussion with the Northern Lighthouse Board³¹.

5.3 Public Concerns about the Environment

- 5.5 The Scottish Government has published surveys about the public's attitude to environmental issues on several occasions³², with the most recent report published in 2008. These publications are relevant to the aquaculture industry, since it is public concern that apparently partly drives decision-making about the industry at a local level. In the 2003 report, fish farming did feature in the 'very concerned' category, although it was the lowest-ranking of all the categories. Figure 12 is extracted from an unpublished analysis undertaken by ERM in September 2005.

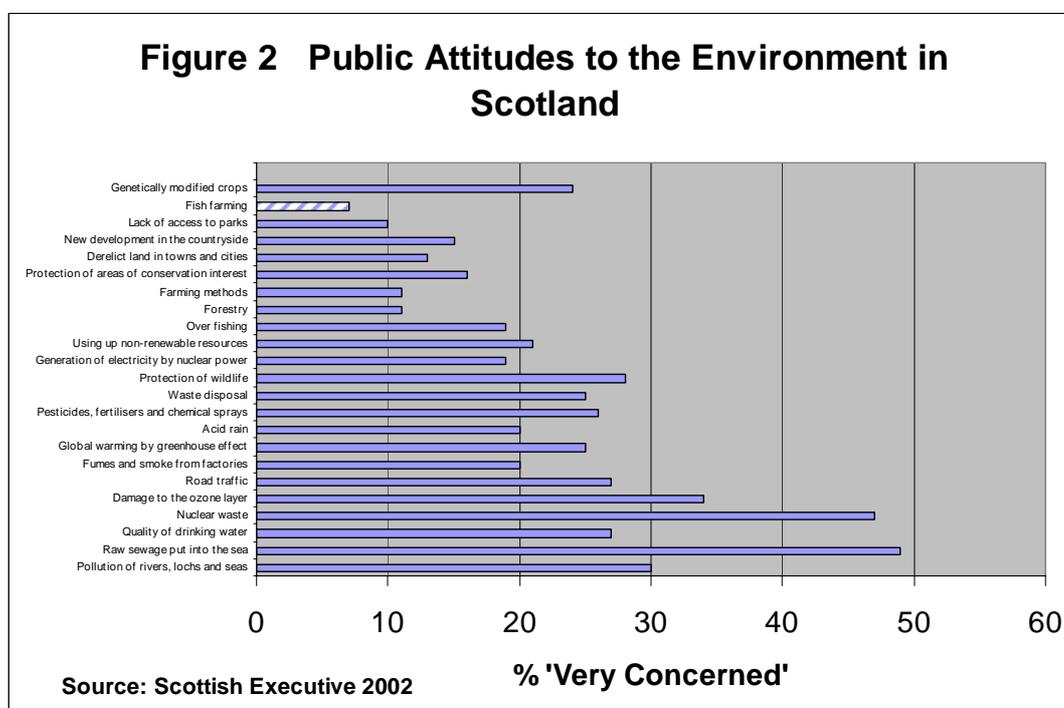


Figure 12. Public Concerns About Environmental Issues 2002/3

- 5.6 The 2008 report was very much focused on assessing the public's attitude and behaviour in relation to issues pertaining to climate change, and is therefore not as general as the 2003 report. However, Figure 13 illustrates the responses to one general question about environmental concerns. Bearing in mind 'fish farming's' low position in the 2003 report, it is perhaps unsurprising that it does not appear in the top 10 issues in 2008.

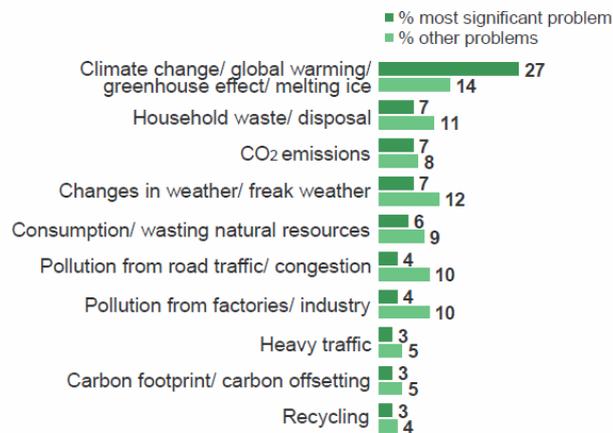
³¹ The anchorages shown on Admiralty charts often represent 'safe havens' for relatively large vessels in the event of severe weather conditions. The Northern Lighthouse Board (NLB) will never compromise on its judgment about these types of anchorages, and any proposed development that might affect large vessel access to these anchorages, perhaps under conditions of severe weather, will be automatically rejected. Personal communication: NLB head office visit and interview, 2008.

³² <http://www.scotland.gov.uk/Publications/2002/11/15864/14272>

Figure 3.3: Most significant environmental issues – top 10 responses

Q. *There is a lot of talk these days about environmental problems. When people talk about environmental problems, what do you see as the most significant problem?*

Q. *And what do you see as other environmental problems?*



Base: All respondents (3,054)

Figure 13. Extract from 2008 Survey

5.4 Visual Issues

5.4.1 Scottish Natural Heritage Guidance

5.7 The marine aquaculture industry is fortunate to have guidance on siting and design aspects from SNH³³, and there is clear evidence (see 5.4.2 below) that where such guidance has been followed, the results are apparently appreciated by observers of finfish farms.

5.8 More recently, SNH has published Guidance on Landscape/Seascape Capacity for Aquaculture³⁴. This is a more strategic area-based approach to the issue of where aquaculture developments can be supported in visual terms, and is perhaps intended to be utilised by public agencies such as local authority planning departments.

5.4.2 Assessment of evidence that fish farming impacts on tourism – SARF045

5.9 Concerns about the visual impact of almost anything are probably partly measured by the reactions of those that see it, and in that regard the SARF045 report is quite helpful³⁵. It is not appropriate for this project to provide a comprehensive review of SARF045, and interested parties should study it carefully in terms of providing evidence for decisions they might propose to take. The initial graphic in the report is reproduced below as Figure 14, because it has a distinct resonance with the results of the study described later in Section 5.4.3. The key point is that a very large majority of the people surveyed for both projects (albeit from a specific classification of ‘visitors’, relatively small sample sizes and with only scattered coverage of Scotland) are either neutral or positive about seeing a fish farm.

³³ <http://www.snh.org.uk/publications/on-line/heritagemanagement/aquaculture/>

³⁴ http://www.sarf.org.uk/News_PDF/SNHGuidance%20on%20LandscapeSeasacpeAquaculture.pdf

³⁵ <http://www.sarf.org.uk/downloads.html>

Figure 1 Impact of human activities on respondents' experience of Scotland's coastline

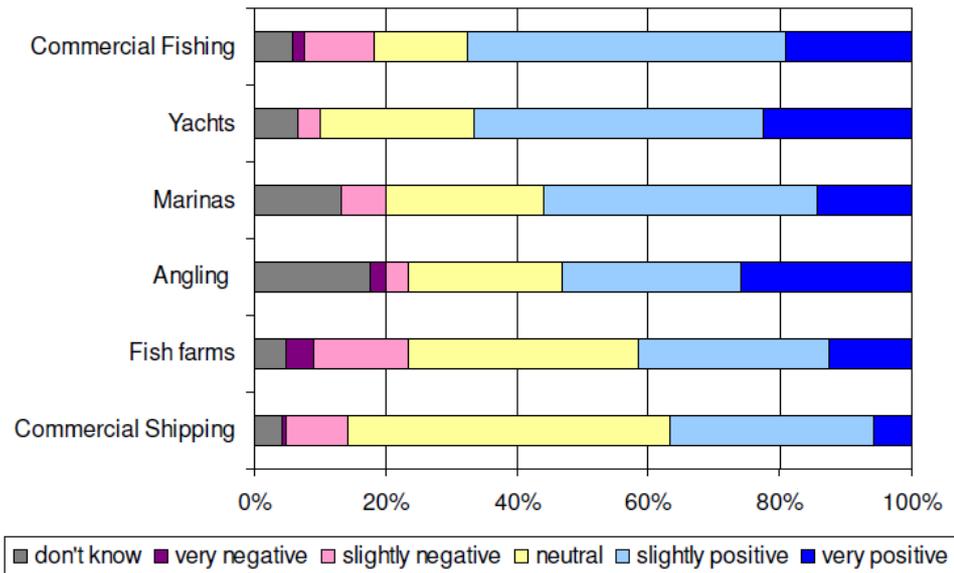


Figure 14. Extract from SARF045

5.10 The importance of SARF045 to the present study is that if 'visual' aspects have driven many of the concerns that have led to requests for an ES, it is by no means clear that such concerns are apparent on the part of non-(planning)-professional people who come to enjoy Scotland's landscapes and seascapes. That said, concepts such as 'visual amenity', 'wild land' and 'cumulative impact' **are** still essential considerations in the planning process. The question is, are they in the light of the evidence presented, triggers in EIA terms, or do they equate to work ordinarily undertaken by planners, using the TCPA system? If the latter assumption is correct, then they should not necessarily be considerations that would preclude any proposals for changes in the EIA thresholds.

5.4.3 Windfarms Survey

5.11 Further evidence relating to objective studies of perceptions about the aquaculture industry comes from the report commissioned by VisitScotland, principally aimed at judging visitor's attitudes to windfarms but also providing interesting insights into their attitudes to other aspects of Scottish country life. Figure 15 summarises key information from the report, and indicates that **80%** of visitors questioned either found that fish farms enhanced their experience, or they were neutral as to the presence of fish farms.

**INVESTIGATION INTO THE
POTENTIAL IMPACT OF WIND FARMS
ON TOURISM IN SCOTLAND
FINAL REPORT**

DETRACTED from the experience (%)

Base: All respondents (N=180)

	ALL VISITORS
Electricity pylons and wires	51
Mobile telephone masts	35
Quarries	33
Planted, geometric forestry	32
Wind farms and turbines	29
Telephone wires and poles	29
Hydro electric and other power stations	22
Fish farms	20
Hydro electric dams	12
Chairlifts/gondolas on mountain sides	9
Funicular railways on mountain sides	8
Ski slopes	7
Planted forestry – mixed species, non geometric	6
Trails and tracks across open upland areas	5
Waymarking signs – on low ground	4
Waymarking signs – on high ground	3

ENHANCED the experience (%)

Base: All respondents (N=180)

	ALL VISITORS
Planted forestry – mixed species, non geometric	66
Trails and tracks across open upland areas	42
Planted, geometric forestry	32
Funicular railways on mountain sides	22
Waymarking signs – on low ground	22
Waymarking signs – on high ground	21
Fish farms	21
Hydro electric and other power stations	19
Ski slopes	19
Wind farms and turbines	18
Chairlifts/gondolas on mountain sides	16
Quarries	7
Hydro electric dams	7
Mobile telephone masts	2
Telephone wires and poles	2
Electricity pylons and wires	1

Figure 15. Extracted from Wind Farms Survey

5.5 Wild Salmonids

- 5.12 District Salmon Fishery Boards (DSFB), where they exist, are statutory consultees to the EIA screening/scoping process, as they are to the TCPA consultative process. Their **statutory** obligations are very clear, and they have no responsibility for promoting the aquaculture industry in Scotland. Bearing in mind the ongoing concern, widely publicised, about the possible role of aquaculture in the apparent decline of West Coast salmonid fisheries³⁶, an element of caution on the part of DSFBs in connection with aquaculture planning issues would be expected.
- 5.13 In considering some of the screening and scoping opinions seen during the course of conducting primary research for this project, it is clear that on several occasions, the DSFB (or relevant Fisheries Trust if appropriate) **has** expressed its legitimate concern about sea lice and escapes, but otherwise has been generally supportive of the application, particularly where it might encourage 'best practice' or some other type of consolidation or relocation that would potentially benefit wild salmonids.
- 5.14 On other occasions, when a DSFB has expressed either no support or outright objection to the proposal, its submission is often less helpful to the competent or relevant authority due to lack of any substantiation.
- 5.15 There are internationally recognised and standardised tools for assessing the health of a salmon river, particularly with respect to adequacy of spawning escapement – specifically Action 6 of the Scottish NASCO Implementation Plan³⁷. It would seem important that this tool, or an equivalent trend analysis method, be used to assess the health of catchments

³⁶ See for example: http://www.salmon-trout.org/files/pdf/save_our_salmon.pdf

³⁷ See: http://www.nasco.int/pdf/implementation_plans/IP_Scotland.pdf

specific to a development proposal, and that all the other assessments and tools in the fisheries management planning kit are also considered fairly and impartially³⁸ in order to assess properly the degree to which an aquaculture proposal might pose a risk.

- 5.16 The health of wild salmonid stocks in Scotland is clearly an important issue, demanding the best efforts of all concerned. Well-researched and properly substantiated responses by DSFBs, to either EIA or planning consultations, would be of great benefit in helping to focus and target action where it is really needed. In such circumstances, the industry developer might play a proactive role in supporting restoration actions: the concept of contributing to local 'planning gain' is one that is well accepted by other sectors.

5.6 Other Environmental Impacts

5.6.1 SEPA Thresholds for Survey

- 5.17 Annex F to SEPA's marine finfish farms Manual provides further context for this study, although it does not in itself provide real guidance about possible EIA thresholds. It is written from a CAR perspective, but is concerned with likely benthic impact on a new area of seabed for which there is no existing data. Annex F discusses thresholds for modifications above which a seabed survey is required. The thresholds are set at an increase of 40,000 m² of total new seabed area to be affected by the modification (in an area with low current speeds), or a linear threshold of 200 m (in an area of high current speeds). The basis for these thresholds is well-argued in terms of existing knowledge due to monitoring schemes, and it raises some interesting questions for this EIA threshold study:

- Although every site is different, and pen sizes and layouts are different, the worked example in Annex F suggests that even a relatively modest expansion will trigger the need for a new survey.
- If a new survey is required for a new CAR application, and it is undertaken according to the SNH approved methodology, the results of that can be automatically passed to SNH in its role as statutory consultee in the normal planning process – removing the need for SNH to request this sort of information via an ES.

5.6.2 Potential for Negative Impacts

- 5.18 There are a range of other impact/receptor interactions that might arise from a proposed aquaculture development, and these are fully covered in the SARF024 report³⁹, and considered by the EIA templates that are in use. Other than the other issues covered elsewhere in this report, interaction with possible predators is probably the main issue. Once again, when thinking about EIA thresholds, the question is whether this issue can be considered by expert consultees on the basis of information provided in the planning application form, or whether the burden of information-provision requires the rigour of an ES. The same question could be posed for issues such as road traffic impacts or operational features with the potential for disturbance (use of lights; harvesting at night).
- 5.19 Although the EIA process should consider all the possible impacts of a proposed development, it has been established that it is subordinate to any other specific regulatory regime that derives from focused and purposeful primary legislation, especially if that regime is an active 'operational' one. The Aquaculture and Fisheries (Scotland) Act 2007 provides for regulatory control of **sea lice** and **containment**, undertaken by the Fish Health Inspectorate of Marine Science Scotland. The use of a one-off regulatory regime such as EIA-and-Planning is not necessarily an appropriate course for an operational regulator to

³⁸ <http://www.rafts.org.uk/projects/fisheriesmanagementplanning.asp>

³⁹ <http://www.sarf.org.uk/SARF024.htm>

follow: the modern salmon farming industry is a mature and robust sector, and one well able to deal with ongoing operational regulatory requirements.

5.7 Economics

- 5.20 The process of applying for permissions to undertake any business activity inevitably involves cost, and is part of the business investment decision-making process. There are two main types of costs involved:
- Direct costs of commissioning surveys, hiring consultants, preparing ESs and internal staff time
 - Lost opportunity costs as a result of the time spent waiting for determination of the application
- 5.21 Planning delays have been estimated to cost the UK economy at least £700 million per year. New World Bank statistics show the UK is the 6th most attractive economy to invest in overall, yet is only 61st in relation to planning and building licences⁴⁰.
- 5.22 Estimates for how much preparation of a marine finfish ES costs vary. In an informal survey undertaken in 2006⁴¹, it was suggested that an average cost was around £25,000. In addition, the cost of the main 'planning application' would also need to be factored-in, and some industry respondents to the survey were clear that their total costs were in the region of £40,000 per application. Section 4.6.2 suggests that an average change in biomass consent is around 500 tonnes, which amounts to some 3,000 m² of pen surface area. 500 tonnes of biomass consent amounts to an annual average production of 375 tonnes⁴². At a first sale price of £3.50 per kg (delivered), this means an initial 'planning cost' of **£0.03** per £1.00 of annual turnover.
- 5.23 By way of comparison with other sectors, the average planning cost for a major retail development of 2,500 m² is some £20,070⁴³. Estimates for retail sales value by year 2010 suggest that 2,500 m² of development will generate sales turnover of £9.4 million per annum⁴⁴. On this basis, initial 'planning cost' is some **£0.002** per £1.00 of annual turnover. Other sectoral comparisons can be made: a major housing development of c. 100 dwellings has an average total planning cost of £97,350 – but that is for a project with a one-off sales value in excess of £22 million⁴⁵.
- 5.24 All applications have cost, and the proper and safe determination of an application in terms of environmental impact and overall sustainability remains a vital part of Scotland's regulatory regime. However, sustainability has three classic pillars: environmental, social and **economic** (with a possible fourth pillar relating to 'governance'). Economic sustainability requires investor confidence in the first instance, and the question of cost for applying for permission to conduct any business in Scotland is a valid one. The issues raised by the analysis in this sub section of the report are relevant because:
- The initial costs for this industry seem high in relation to other types of industry
 - They are even higher if an ES is required to be produced on a regular basis
 - Is an ES absolutely necessary in so many cases, in terms of safe determination of an application – bearing in mind that none of the 45 ES NTSs examined for this project resulted in the discovery of any risk of significant environmental effect?
 - A change in EIA thresholds, provided there were no material risk to safe determination of likely significant environmental impact, might be justified in terms of good governance

⁴⁰ See Killian Pretty Review at: <http://www.communities.gov.uk/planningandbuilding/planning/planningpolicyimplementation/reformplanningsystem/killianprettyreview/>

⁴¹ ERM work undertaken for Scottish Executive - unpublished

⁴² Based on 1.5 times maximum allowable biomass as production, once every 2 years

⁴³ See Benchmarking report at weblink for reference 28

⁴⁴ <http://www.northwesteip.co.uk/downloads/documents/20061013114457.pdf>

⁴⁵ See, for example: http://news.bbc.co.uk/1/shared/spl/hi/in_depth/uk_house_prices/html/houses.stm

5.8 Summary

- **Visual and amenity issues have been the main reasons for rejections of applications for finfish farms over the last decade, followed by navigational concerns**
- **There is good guidance on both planning for and assessing visual impact concerns**
- **Aquaculture does not appear to figure strongly in the Scottish public's concerns about the environment**
- **Two independent studies show that around 80% of visitors surveyed were either positive or neutral in their reactions to seeing fish farms in Scotland**
- **Wild salmonids conservation is important in the light of marine mortality and declining pre fishery abundance (PFA), but internationally recognised tools to accurately determine and substantiate specific local concerns have not been much used to date, with the consequence that competent/relevant authorities are not well-advised on these issues**
- **Other areas of potential negative environmental impact are now relatively well understood, and in some cases could perhaps be assessed and determined through the TCPA system, as long as sufficient information is provided at the point of application**
- **Applications are costly for the marine finfish aquaculture sector, and a requirement to produce an ES adds considerably to that cost.**

6. DISCUSSION, RECOMMENDATIONS and CONCLUSIONS

6.1 Introduction

- 6.1 Section 6 discusses the implications of the evidence gathered for this project, as far as the Environmental Impact Assessment (Scotland) Regulations 1999 (as amended) are concerned. The project was not asked to study or comment upon any other regulatory regime in any depth, although it cannot consider the national EIA Regulations without also having regard to the specific detail of the European EIA Directive (85/337/EEC as amended by 97/11/EC and 2003/35/EC).

6.2 Details of the EIA Directive and the EIA Regulations

- 6.2 The wording of the EIA Directive is unambiguous:

Article 1, Paragraph 1 – *“This Directive shall apply to the assessment of the environmental effects of those public and private projects which are **likely** to have significant effects on the environment.”*

And:

Article 2, Paragraph 1 - *“Member States shall adopt all measures necessary to ensure that, before consent is given, projects **likely** to have significant effects on the environment by virtue, inter alia, of their nature size or location are made subject to the requirement for a development consent and an assessment with regard to their effects”.*

The inference is that the Directive does not apply to private and public projects that are **unlikely** to have significant effects on the environment.

- 6.3 The EIA Regulations are equally unambiguous:

Part Two, Chapter 1 (General), Interpretation, 2, (1), *““EIA development” means development which is either-*
(a) Schedule 1 development; or
*(b) Schedule 2 development **likely** to have significant effects on the environment by virtue of factors such as its nature, size or location;”*

- 6.4 The difficulty with interpreting the Directive and the Regulations in relation to the aquaculture industry, and possibly other Schedule 2 industries, arises when projects are commonly identified as ‘likely’ to have a significant effect on the environment, but where those effects can be and are effectively **mitigated** by other regulatory regimes. If the mitigations are always applied to projects because of another regulatory regime, then the project could, possibly, be viewed as one that is **unlikely** to have a significant environmental effect.

6.3 The Evidence and Implications in Terms of the EIA Regulations

- 6.5 Ten years of practical experience of the implementation of the EIA Regulations for marine finfish aquaculture in Scotland has provided evidence as to the actual risk of identifying a ‘significant environmental effect’. It is accepted that the review of NTSs reported in Section 4.4 is not a complete review of every ES produced since 1999, but it does represent at least 50% of all the NTSs that have been produced. That review concludes that:

- In 45 out of 45 NTSs, there is no evidence of an environmental effect that could not be effectively mitigated or managed down to a level **below significant** as a result of regulation
- What is not clear, but is perhaps implied in several cases, is whether without these various mitigations, the environmental effects of some or all of these projects **would** be significant
- The average change in pen surface area, where it was recorded in the review of the ESs, was 5,400 m². Using the standard area:biomass calculation discussed in Section 4.7, this would amount to a biomass of 900 tonnes. Note that this is for new sites and/or an extension to an existing development, **not** for the final combined scale of the amended development.

6.6 On the basis of this evidence, which is of course historic, it is difficult to see exactly how to proceed with recommendations concerning the EIA Regulations. The following points should be considered:

- Marine pen finfish farming has been classified as belonging in the Annex II category of 'intensive fish farming', and it is therefore a Schedule 2 industry in terms of the domestic EIA Regulations
- The implication is that marine pen finfish farming does have a range of environmental effects, some of which might be significant if not mitigated by other measures
- The repetitive nature of the impact/receptor interactions considered in the NTSs studied for this project suggests that, when subjected to the EIA process, most projects show almost identical types of environmental effects – and the mitigation measures are almost always very similar
- The key question is whether an **ES** was required in the 45 cases studied, or whether the normal mitigation measures mandated by other regulatory regimes would have ensured less-than-significant effects without having required preparation of an ES
- Schedule 2 projects have to be screened if they are equal to or larger than the published thresholds, or if they are in or near a sensitive area
- SNH guidance on what might be termed the 'spirit' of the Directive and Regulations is very clear: "B.4.16 *The number of cases of such development will be a very small proportion of the total number of Schedule 2 developments. **It is emphasised that the basic test of the need for EIA in a particular case is the likelihood of significant effects on the environment.**"*
- Following on from this, the 'letter' of the Directive and the Regulations are also very clear: the EIA Directive does not apply to any public or private project unless it is **likely** to have a significant environmental effect. If normal (and obligatory) regulatory measures are applied to all finfish aquaculture projects, and if they mitigate environmental effects to below significant in 100% of the cases examined, is it reasonable to consider that projects in this sector are **likely** to have a significant environmental effect?

6.7 Building upon the concepts considered above:

- On at least 45 occasions over the last ten years, and possibly almost twice as many as that, somebody (during screening) made a judgement that a particular project was **likely**

to have a significant environmental effect – knowing full well that other mandatory regulatory regimes govern the operational aspects of the industry

- This has been a rather large proportion of this Schedule 2 industry's projects over the last ten years – not really in keeping with the SNH expectation outlined in the paragraph above
- On the basis of the NTS evidence seen, it seems that these positive EIA screening decisions subsequently turned out to be inappropriate, once mitigation through other regulatory regimes had been taken into account
- Nevertheless, this is a Schedule 2 industry, and the NTSs studied make it very clear that it is an industry with the potential to have environmental effects that might well be significant, if not properly mitigated by rigorous regulation in various other ways, including the TCPA system, CAR and the fish health regime.

6.8 The EIA Regulations, whilst linked to the Planning Regulations, are effectively a stand-alone set of Regulations. They are not intended to replace any other form of regulation, and at the same time they theoretically cannot be circumvented because of the existence of other forms of regulation. It is, however, also worth noting government guidance, that use of the EIA process is **not the only way** for competent authorities to gain enough environmental information to make a well-informed determination of an application: *“The planning system therefore provides a means for assessing the environmental effects of all applications and the absence of a formal EIA does not mean that environmental issues are not being considered nor appropriate mitigation measures put in place. In the vast majority of cases, the normal powers and duties are sufficient for the planning authority to gather the information it needs, but when an EIA is required, they are supplemented by the procedures set out in the Environmental Impact Assessment (Scotland) Regulations 1999”*⁴⁶.

6.4 EIA Screening Thresholds

6.9 The study has considered a range of evidence concerning the scale of regulatory transactions that have taken place within this sector over the last ten years, and tried to relate that to decisions taken under the EIA Regulations. Whilst it is clear that some project applications were apparently allowed to proceed without recourse to preparation of an ES despite being larger than the current thresholds, it is also clear that in many other cases they were not. The situation is slightly confused by the apparently frequent submission of ESs (or equivalent documents) by developers, without having requested a formal screening opinion – a perfectly legitimate approach, and allowed for in the Regulations.

6.10 There is no clear evidence, based either upon science or case-history, that any particular alternative threshold, biomass or surface area, could be considered. The NTSs studied show very clearly that marine finfish aquaculture **always** has a range of impacts on a range of receptors, and whilst these have always – for the cases reviewed - been mitigated to the satisfaction of regulators, it does not detract from the reality that such impacts occur. There is no certainty that any particular scale of project will never have the potential for a significant effect, taking into account specific and perhaps unusually vulnerable locations. What is clear is that the other regulatory regimes that control the operations of the industry remain very effective in ensuring that significant effects do not occur – or that if there is a risk of a significant effect developing, the project's operations are reactively managed to prevent it.

6.11 Taking into account that the EIA Regulations stand alone and cannot be circumvented by other regulations – because they exist for the specific purpose of assessing risk of

⁴⁶ PAN 58: Paragraph 11

significant environmental effects as a general principle – it is not possible to use the existence of other regulations to weaken in any way the ‘spirit’ of the EIA Regulations and the Directive from which they flow. Arbitrarily selecting any thresholds covering ‘scale’, taking into account ‘nature’, cannot provide absolute assurance on what might happen in a specific ‘location’.

- 6.12 On the basis of a need to ensure that no single significant effect can ever be allowed to escape identification before a planning decision is determined, the EIA process remains the way properly to ascertain whether there is a risk of such an effect on a case by case basis, and especially one that might not be capable of satisfactory mitigation once all the options have been considered.

6.5 EIA Scoping

- 6.13 Paragraph 41 of PAN 58 states that:

“The purpose of scoping is to:

- *focus the EIA on the environmental issues and potential impacts which need the most thorough attention;*
- *identify those which are unlikely to need detailed study; and*
- *provide a means to discuss methods of impact assessment and reach agreement on the most appropriate.”*

- 6.14 Annex 5 of this report reproduces a non-attributable summary of the scoping guidance supplied to one of the projects reviewed for this study (Section 4.4). It appears to make little effort to *“focus the EIA on the environmental issues and potential impacts which need the most thorough attention”*. If scoping opinions for this industry generally resemble this one, it is unsurprising that rather large and complex ESs have been produced. SNH comments: *“Some Environmental Statements have contained excessive detail relating to issues which are irrelevant or of little importance to the decision. Others have overlooked issues which, when they came to light later in the process, proved to be decisive in the decision. Developers should not have to pay the cost and experience the delay involved in addressing issues which are obviously not significant. Competent Authorities, consultees and the public should not have to deal with large volumes of material which is irrelevant to the decision to be made.”*⁴⁷ The RTPi also comments: *“There is evidence that greater attention to the ‘scoping’ of EIA work results in more focused and better quality ESs, which can save time and money later in the planning process for all parties”*⁴⁸.

- 6.15 Whilst this study cannot provide incontrovertible evidence that any change to the current EIA screening thresholds is defensible, it has found that significant environmental effects that cannot be mitigated by other measures or regulations are **rare** for this sector. Furthermore, the review of the NTSs found that the focus on impact/receptor for most projects usually centred on one or two key issues – not on the full list as seen in Annex 5.
- 6.16 The recognition of the problem of the breadth of scoping advice is one reason for the development of the EIA Templates, referred to elsewhere in this report (Text Box 2). It is to be hoped that these templates are now in common usage, and that they are proving effective in helping to streamline the implementation of the EIA Regulations.

6.6 Conclusions

- 6.17 This study concludes that there is no objective, scientific rationale for the existing EIA thresholds, and there is no conclusive evidence upon which to safely recommend generic thresholds – including changes to the existing thresholds.

⁴⁷ <http://www.snh.org.uk/publications/on-line/heritagemanagement/eia/d.4.shtml>

⁴⁸ <http://www.rtpi.org.uk/download/7033/EIA.pdf> (Royal Town Planning Institute)

ANNEXES

ANNEX 1 OTHER ASPECTS OF SCOTTISH MARINE AQUACULTURE REGULATION

(Information provided by Xodus AURORA – SARF040)

Principal Consultees and Competent/regulatory Bodies

Introduction

Guidance and appropriate licences for fish farm developers come from a number of consultees and competent/regulatory bodies. Their roles are both statutory and non-statutory in nature and some have a legal obligation to assist at various points throughout the EIA process, particularly during pre-application, screening and scoping⁴⁹. The following sections look at key roles and responsibilities and the involvement of various bodies in the monitoring and control of key impacts associated with marine fish farm developments.

Competent authorities, consultees and regulatory bodies

Table A1.1 below provides an overview of the roles that key bodies have in regulating the marine fish farm industry, either directly through legislative requirements or indirectly through the provision of guidance etc. Further explanation of the key modelling and assessment tools used in EIA decision-making and planning processes is provided in Appendix C.

Table A1.1 Overview of the competent authority, key consultees and their responsibilities

Consultee	Responsibilities
Planning Authority	<ul style="list-style-type: none"> Determines whether a proposed development is granted planning permission. <i>Developer requires planning permission for new fish farm developments and modifications to existing developments</i>
Scottish Environmental Protection Agency (SEPA)	<ul style="list-style-type: none"> Controls discharges to surface waters and groundwaters, including tidal waters out to a 3 mile limit, through issue of a Controlled Activities Regulations (CAR) licence. <i>Developer requires a CAR licence before commencement of operations</i> Applications for discharge must be accompanied by information specific to the site including extensive studies of the hydrography of the area, location and bathymetry and baseline environmental conditions (SEPA, 2005). Once granted, a discharge licence is subject to specific conditions to limit the effects of the discharge upon the environment. This includes limiting the amount of fish biomass, through provision of maximum biomass limits. SEPA do not currently issue licences for more than 2,500 tonnes of biomass (SEPA, 2005(b)). Modelling (AutoDEPOMOD) (see Appendix C for further detail) is used to determine maximum biomass, size of AZE (Allowable Zone of Effect), monitoring positions and in-feed sea lice treatment quantities.
Scottish Natural Heritage (SNH)	<ul style="list-style-type: none"> Provides advice to a developer and other bodies on issues relating to biodiversity; natural heritage designations; landscape/visual impacts; and access. Produced a series of maps which show: natural heritage designations in the marine environment; and indicate whether natural heritage interests on land may have implications for development in the marine environment. Guidance on the siting and design of marine aquaculture developments in the landscape (SNH, 2000) helps to assess and address the landscape and visual impacts of marine aquaculture developments. While this guidance addresses the issues surrounding the actual development, more recent guidance (SNH, 2008) aims to address the landscape/seascape capacity of an area for potential development (see Appendix C for further explanation). Guidance also provided on cumulative effects of visual impacts.

⁴⁹ A list of possible statutory and non-statutory consultees is provided in the EIA templates for pre-application, screening and scoping for marine pen fish farming produced by the Scottish Aquaculture Research Forum (SARF)

Scottish Government/Marine Scotland	<ul style="list-style-type: none"> ▪ Provides policy guidance on the location of marine fish farms (Scottish Executive, 1999). ▪ Locational guidance identifies coastal areas potentially suitable for marine fish farming which are divided into areas / different categorisations. When determining the need for an EIA these categorisations are also taken into consideration (see Appendix D for details on different categorisations). ▪ Provides guidance on recommended separation distances between fish farms and other interest areas (see Appendix D, Table D.1). ▪ Issues navigational consent. <i>Developer of a site which may have navigational issues will require a navigational consent</i> ▪ Ministers also have an integral role in the provision of policy and advice with regard to planning applications.
Marine Scotland Science (MSS)	<ul style="list-style-type: none"> ▪ <i>A marine site to be used for a fish farm development needs to be registered with MSS.</i> ▪ Part of the Scottish Government - provides scientific and technical advice on marine aquaculture. ▪ A statutory duty with regard to fish health. ▪ Help determine which areas of the Scottish waters are suitable for the authorisation of marine fish farms, through the provision of locational guidelines (FRS, 2008). These guidelines provide tables and maps which show areas that should be designated as category 1, 2 or 3 (see Appendix D). Areas for categorisation are based upon Edwards and Sharples Sea Lochs Catalogue (1996). The process of categorisation is based upon a predictive model that estimates the environmental sensitivity of the sea lochs, taking into consideration nutrient enhancement and benthic impacts in sea lochs.
Crown Estate	<ul style="list-style-type: none"> ▪ <i>Seabed lease for marine fish farm developments required if likely to use foreshore or seabed which is owned by the Crown Estate.</i> ▪ Planning permission is not a prerequisite for a seabed lease. However, a lease-option is provided for those developers without prior planning permission, with a full lease granted if planning permission is obtained. Lease-options have time expiries and would lapse if planning permission is not granted. ▪ Provides a comprehensive list of completed fish farm applications and includes new site applications, modifications and renewals (Crown Estate, Undated).
District Salmon Fishery Boards	<ul style="list-style-type: none"> ▪ Must be consulted during EIA and on a planning application to provide views and advice of the sea trout and salmon populations likely to be present in the area, with any specific recommendations given. ▪ Main aim to protect, preserve and develop salmon fisheries in Scotland.
Ministry of Defence (MOD)	<ul style="list-style-type: none"> ▪ Must be consulted during planning application process if a proposed development is likely to be located close to a site designated for military activity i.e. activity carried out by the MOD.

Monitoring and control of key impacts associated with marine fish farm developments

A number of consultees have a role in the monitoring and control of key areas of environmental impact resulting from a fish farm development.

- **Monitoring requirements** - although follow-up or monitoring is not a legislative requirement under the EIA (Scotland) Regulations 1999 (as amended by the MFF Order 2007), it is a recognised part of the EIA process. Planning conditions may include a statutory obligation for developers to undertake follow-up/monitoring of their sites to ensure that conditions are being met. As part of the CAR licence, monitoring is carried out by the developer and SEPA to ensure that any discharges remain at an acceptable level. AutoDEPOMOD is used to ascertain suitable monitoring locations (see Appendix C). As fish health is a particular focus for MSS, surveillance and monitoring is also carried out on levels of sea lice. Visual impact monitoring is undertaken by SEPA and the operator if required. SNH also carries out visual impact monitoring at times.

- Control of environmental impacts - there are several areas of environmental impact associated with marine fish farm developments, the extent of which depends very much on species, culture method, stocking density, feed type, hydrography of the site and husbandry practices. Some key impact areas and how they are controlled are outlined in Table A1.2

Table A1.2 Key impact areas

Impact Area	Role of consultees
Benthic Deposition	<ul style="list-style-type: none"> • Biomass and in-feed chemical limits at fish farm sites are modelled by the developer using a software package, AutoDEPOMOD (see Appendix C). • Modelling predictions form part of the supporting information accompanying a Controlled Activities Regulations (CAR) application. • SEPA are responsible for verifying modelling data and issuing a CAR licence detailing maximum biomass and in-feed chemical limits allowable at the fish farm site. • By limiting discharges of organic waste and in-feed chemicals, the accumulation of organic waste and chemical residues on the seabed/water column are minimised and the pollution of sediments and associated affects on benthic fauna is prevented (outside the allowable zone of effect⁵⁰).
Eutrophication ⁵¹ impacts	<ul style="list-style-type: none"> • Locational guidelines (which include environmental sensitivity) are taken into consideration when setting biomass limits. • Also, during EIA screening, the Scottish Government seeks advice from MSS on the likely eutrophication impacts of a particular site, particularly with regard to possible cumulative effects from a development.
Increased cages and landscape/visual impacts	<ul style="list-style-type: none"> • SNH provide guidance on the siting and design of aquaculture development as well as landscape/seascape capacity.
Increased cages and wildlife impacts (e.g. potential net entanglement risks and ecological /habitat impacts)	<ul style="list-style-type: none"> • SNH and Royal Society for the Protection of Birds (RSPB) provide advice with regard to potential impacts and mitigation measures in this area.
Increased traffic to and from the site	<ul style="list-style-type: none"> • Although not regulated, any key issues would be identified through the EIA process and mitigation measures applied as appropriate.
Impacts from sea lice	<ul style="list-style-type: none"> • MSS carries out regular monitoring of sea lice.

- Consideration of cumulative effects - There may be circumstances where a developer may wish to site a new fish farm development in an area where there are existing fish farm infrastructures, or in an area where as yet is undeveloped but where other infrastructures may be planned for the same time or in the future. In both cases the possible effects on the environment from a combination of activities (i.e. the cumulative effects) need to be taken into consideration. The risk of environmental stress is potentially increased through the cumulative actions of multiple fish farm infrastructures. However, this risk could be reduced by rotational use of multiple sites in the same area.

If an EIA is required for a proposed development there is a requirement under the EIA (Scotland) Regulations 1999 (Schedule 4, Part I(4) (as amended by the MFF Order 2007)) that

⁵⁰ Allowable zone of effect (AZE) - It is accepted that a certain area of seabed within the immediate vicinity of sea cages will exhibit some deterioration in the physio-chemical properties of the sediment and/or resident flora. This area is known as the Allowable Zone of Effect (AZE), the extent of which is determined by a deposition of 191.8 g m² y⁻¹ (0.526 g m² day⁻¹) and an infaunal trophic index (ITI) of 30.

⁵¹ Eutrophication is the "excessive enrichment of water with nutrients which may cause an increase in the accelerated growth of algae in the water column and higher forms of plants living on the bottom of the sea. This may result in a range of undesirable disturbances in the marine ecosystem, including a shift in the composition of the flora and fauna which affects habitats and biodiversity, and the depletion of oxygen, causing death of fish and other species" (OSPAR Commission (2008)).

possible cumulative effects from the development be taken into consideration. Also, during the EIA screening process various statutory consultees may consider cumulative effects, whether from a visual perspective or impacts on nutrient levels or seabed habitats, in deciding whether an EIA is actually required (depending on the significance of the impact). For example, the local authority consult MSS on cumulative effects through the use of Locational Guidelines. MSS continually monitor the sensitivity of Scottish waters and categorise areas (1, 2 and 3) dependant on the basis of MSS predictive models to estimate environmental sensitivity of sea lochs based on an index of 'nutrient enhancement' and 'benthic impact'. More recently, Napier University have carried out assimilative capacity studies to help determine the ability of a sea loch, voe or coastal water to absorb the waste products associated with aquaculture without harming the local marine ecosystem or the fish being farmed (Tett *et al*, 2007). Further details on both of these prediction modelling tools are provided in 2.4.5 (b).

ANNEX 2 NEGATIVE SCREENING OPINIONS

(Information provided by Xodus AURORA – SARF040)

Table A2.1 Types of variations

Types of Variations (examples)
<p><u>General</u></p> <ul style="list-style-type: none"> • Change cage area (reduction by ~1200 m²), increase mooring area, replace aging barge with new to reduce visual impact. <p><u>Equipment</u></p> <ul style="list-style-type: none"> • Addition of site feed barge for storage purposes. <p><u>Changes/Additions to fish species</u></p> <ul style="list-style-type: none"> • Enable production of cod and halibut in addition to salmon. Maximum biomass will be the same as currently for salmon (1,500 tonnes). • Change of species to cod to allow production of either salmon or cod as desired. • Add cod to production regime. • Include sea trout production to enable alternate production of trout and salmon (already in production). <p><u>Changes in cage type/size</u></p> <ul style="list-style-type: none"> • Either four 15 x 15 m square or two 80 m circular cages increasing cage surface area from 225 m² to 509 m². • Increase number of cages from six 100 m cages to eight 100 m cages, increasing cage surface area from 4,770 m² to 6,360 m². • Change cage type from sixteen 20 x 20 m cages to twelve 100 m circumference cages and increase mooring area from 51,200 m² to 58,750 m². • Increase cages from twelve 24 x 24 m cages to fourteen 24 x 24 m cages, increasing cage surface area from 6,912 m² to 8,064 m². • Combine activities of two sites at one site, resulting in ten 100 m circular cages with a total cage surface area of 8042 m² and a maximum standing biomass of 1767 T.

Table A2.2 Issues raised by statutory consultees

Specific Issues Raised by Statutory Consultees (examples)	
<i>Lighting</i>	Request new feed barge display an all round white light where it can best be seen (range of 2nm).
<i>Impacts on adjacent sites</i>	Should consider entering into area management agreements.
<i>Cage configuration</i>	Ensure cages configured to allow required separation distances.
<i>Benthic impacts</i>	Modelling required ensuring no impact on benthos.
<i>Barges</i>	Consultation required on colour and position of barges.
<i>Navigational requirements</i>	Still apply.
<i>Husbandry</i>	Require information on chemicals and medicines used in cod and halibut production, husbandry practices, harvesting methods and sourcing methods. Suggestions that initial stock taken from hatchery to reduce risk of disease. Advice that only one species be held at one site at any one time. Consider fallowing period.
<i>Nutrient discharge</i>	Increase in nutrient discharge and benthic impact due to less efficient conversion of food; would like to see reduction in tonnage.
<i>Environmental study</i>	Targeted study on sea pen communities in the area and the likely impact on them. Should include photographic survey.
<i>Visual impact</i>	Preference for circular cages/reconfiguration of cages to have reduced visual/landscape impact.

ANNEX 3 WHAT IS MEANT BY “INTENSIVE FISH FARMING”?

(Information provided by Xodus AURORA – SARF040)

Although the EIA Directive and the EIA (Scotland) Regulations 1999 (as amended by the MFF Order 2007) do not provide clarification on what is considered “intensive fish farming” i.e. no definitions are provided, recent guidance (EC, 2008) states that “fish farming should be considered ‘intensive’ when it leads to stocking densities well in excess of the levels which would be experienced in natural conditions”.

This interpretation is particularly obscure and leads to a number of questions:

- What sort of ‘levels’ are experienced in natural conditions?
- What do stocking densities need to be well in excess of in order to be considered intensive?

Stocking densities depend on the species being farmed, the stage of production and water availability of the site. Voas (Pers. Comm. 2008) highlights that scientific evidence suggests that in term of fish welfare water quality parameters are more relevant than stocking density on its own. This issue is also emphasised by Allan (2008) who suggests that stocking densities that are experienced in natural conditions are not clearly defined as levels vary depending on the species and water type. For example, stocking levels for salmon are different for both freshwater and seawater, with animal behaviour, which is influenced by cover and food availability, also affecting stock levels.

There is little documented evidence that states specifically the level at which farming could be classed as intensive i.e. there are no specific defined limits. However, the general consensus is that most, if not all, commercial fin fish farming methods undertaken in the UK and other EU countries are considered intensive (Allan (2008) and Voas (2008)). Farms are stocked with fish at higher than natural stocking densities to enable the efficient rearing of fish, with methods/techniques employed to ensure increases in production in relation to cost. Intensive fish farming is considered to have more to do with cost and production than stocking density.

Various publications on aquaculture and fish welfare (North et al, 2006; MCS, 2007; Marine Harvest, Undated; Lymbery, 2002; Stevenson, 2007) document stocking density practices and make suggestions for stocking densities for marine fish farm installations. However, stocking densities for different fish species are not defined in legislation. Allan (2008) emphasises that while welfare legislation enshrines principles of unnecessary pain, suffering or distress being experienced by animals [which may be caused by excessive stocking densities], each case should be considered individually dependent upon the specific circumstances and conditions encountered.

A Recommendation⁵² concerning farmed fish, produced by the Standing Committee of the European Convention for The Protection of Animals Kept for Framing Purposes (T-AP) (2005), considers stocking density. The main conclusion from the work by the Committee is that there is no single acceptable figure for stocking density.

Article 9(2) of the Recommendation states that:

“Stocking density shall be adjusted in line with the following criteria:

⁵² Entered into force on 5 June 2006.

- *The biological needs of fish with regard to environmental conditions in addition to health and welfare;*
- *The farming system used, in particular the ability to maintain water quality and the feeding technology.*

Stocking density shall be based on knowledge of the water quality parameters and other local farming conditions, the physiology of fish and animal health and welfare indicators such as behaviour, the level of stress, injuries, appetite, growth, mortality and disease.“

Read and Fernandes (2003) make the distinction between ‘extensive’ and ‘intensive’ marine aquaculture. The farming of fin fish in a ‘natural’ habitat without the addition of supplementary foods and with minimal impact on the environment is considered ‘extensive’ aquaculture, while the farming of fin fish in cages with the addition of high quality artificial feed and medication is considered ‘intensive’ aquaculture. Impacts on the environment are also considered greater with intensive farming methods.

ANNEX 4 RANGE OF SURFACE AREAS**(Information provided by Xodus AURORA – SARF040)****Table A4.1 Range of surface areas**

Number of cages	Cage circumference (m)	Net depth (m)	Surface area of cages (m ²)	Biomass (tonnes)
8	60	8	2291.8	311.7
	60	10	2291.8	389.6
	60	12	2291.8	467.5
	60	15	2291.8	584.4
12	60	8	3437.7	467.5
	60	10	3437.7	584.4
	60	12	3437.7	701.3
	60	15	3437.7	876.6
16	60	8	4583.7	623.4
	60	10	4583.7	779.2
	60	12	4583.7	935.1
	60	15	4583.7	1168.8
20	60	8	5729.6	779.2
	60	10	5729.6	974.0
	60	12	5729.6	1168.8
	60	15	5729.6	1461.0
8	70	8	3119.4	424.2
	70	10	3119.4	530.3
	70	12	3119.4	636.4
	70	15	3119.4	795.5
12	70	8	4679.2	636.4
	70	10	4679.2	795.5
	70	12	4679.2	954.5
	70	15	4679.2	1193.2
16	70	8	6238.9	848.5
	70	10	6238.9	1060.6
	70	12	6238.9	1272.7
	70	15	6238.9	1590.9
20	70	8	7798.6	1060.6
	70	10	7798.6	1325.8
	70	12	7798.6	1590.9
	70	15	7798.6	1988.6
8	80	8	4074.4	554.1
	80	10	4074.4	692.6
	80	12	4074.4	831.2
	80	15	4074.4	1039.0
12	80	8	6111.5	831.2
	80	10	6111.5	1039.0
	80	12	6111.5	1246.8
	80	15	6111.5	1558.4
16	80	8	8148.7	1108.2
	80	10	8148.7	1385.3
	80	12	8148.7	1662.3

Number of cages	Cage circumference (m)	Net depth (m)	Surface area of cages (m ²)	Biomass (tonnes)
20	80	15	8148.7	2077.9
	80	8	10185.9	1385.3
	80	10	10185.9	1731.6
	80	12	10185.9	2077.9
	80	15	10185.9	2597.4
8	90	8	5156.6	701.3
	90	10	5156.6	876.6
	90	12	5156.6	1052.0
	90	15	5156.6	1314.9
	90	8	7734.9	1052.0
12	90	10	7734.9	1314.9
	90	12	7734.9	1577.9
	90	15	7734.9	1972.4
	90	8	10313.2	1402.6
	90	10	10313.2	1753.3
16	90	12	10313.2	2103.9
	90	15	10313.2	2629.9
	90	8	12891.6	1753.3
	90	10	12891.6	2191.6
	90	12	12891.6	2629.9
20	90	15	12891.6	3287.3
	100	8	6366.2	865.8
	100	10	6366.2	1082.3
	100	12	6366.2	1298.7
	100	15	6366.2	1623.4
12	100	8	9549.3	1298.7
	100	10	9549.3	1623.4
	100	12	9549.3	1948.1
	100	15	9549.3	2435.1
	100	8	12732.4	1731.6
16	100	10	12732.4	2164.5
	100	12	12732.4	2597.4
	100	15	12732.4	3246.8
	100	8	15915.5	2164.5
	100	10	15915.5	2705.6
20	100	12	15915.5	3246.8
	100	15	15915.5	4058.5
	120	8	9168.7	1246.9
	120	10	9168.7	1558.7
	120	12	9168.7	1870.4
8	120	15	9168.7	2338.0

ANNEX 5 EXAMPLE OF A SCOPING GUIDANCE SUMMARY

Note: the following bullet points are extracted from the Scoping Guidance contained in one ES examined for this project. Developers were asked to consider:

- Cumulative assessment should be considered for fish farms in the Loch ____ area, including those impacts from the input of additional nutrients; sea lice production; visual impact; demands on shorebased facilities; economic impact; the need to increase production in other *company name* management areas outwith Loch ____ to balance supply to the market and navigational areas.
- An assessment should be undertaken of sea lice numbers and their treatment at the fish farm site.
- An assessment should be undertaken of wild fish populations in lower Loch ____ and sea lice burdens.
- Details of Area Management Agreements (AMAs).
- Full details of production regimes to be provided. An examination of organic waste output should be undertaken.
- A benthic survey should be undertaken at both sites.
- In addition it is recommended that an ROV benthic survey of the proposed *named* site is carried out.
- Dispersion modelling should be carried out in line with SEPA requirements.
- Details of site specific containment and contingency plans to minimise escapes and discussion as to whether these are in line with SQS and SSFA codes of practice.
- An assessment of the landscape and visual impact should be undertaken to include photomontages and a visibility analysis. Concern that there will be visual intrusion to those people living in the vicinity and visitors to the area.
- Local economic effects of the proposal should be considered, and the inter-relationship between the operation of the proposed sites with others operated by *company name* in the area.
- Full details of equipment, including layout, specifications and shore-based facilities to be included in ES.
- An assessment should be carried out that considers recreational and fishery related navigation interests, the consequences for boat movements and the need for navigational marking/lighting. Consideration should also be given to harbour usage.
- A full hydrographic survey should be undertaken as per SEPA regulations and results included within ES.
- The potential for disturbance to the seabird colony on *name of place* during installation and operation of the proposed sea cage development at *location name for site* should be considered.

- Consideration should be given to appropriate anti-predator methods.
- An assessment should be carried out on the use made of this area by cetaceans including dolphin and porpoise and also basking shark.
- Consideration should also be given to designated sites or protected species or habitats.
- A risk assessment should be undertaken of the possible accidental or unplanned events.
- A summary of previous fish farm applications in the immediate area should be detailed including the outcome of applications and reasons for decision.

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