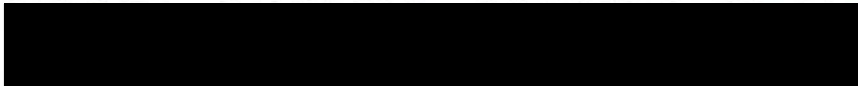


# SALMON WATCH IRELAND



EMAIL: NIALL.B.GREENE@GMAIL.COM

9 December 2012

Department of Agriculture, Food and the Marine  
Aquaculture and Foreshore Management Division  
National Sea Food Centre  
Clonakilty  
Co Cork

Dear Sirs

Enclosed is a submission from Salmon Watch Ireland in respect of the Bord Iascaigh Mhara Environmental Impact Statement dated 15 October 2012 and associated documents supporting their application for aquaculture and foreshore licences for a salmon farm in Galway Bay (Reference T9/489 A and B).

Yours faithfully

A handwritten signature in dark ink, appearing to read 'Niall Greene', with a large, sweeping flourish above the name.

Niall Greene  
Chair of the Board of Directors

***Observations by Salmon Watch Ireland on the Environmental Impact Statement published by Bord Iascaigh Mhara in support of its application for Aquaculture and Foreshore Licences for a salmon farm in Galway Bay (Reference T9/489A and B).***

**1. Synopsis of the Salmon Watch Ireland position on the Galway Bay salmon super-farm EIS**

Salmon Watch Ireland ('SWIRL') has grave concerns about whether Bord Iascaigh Mhara ('BIM') has the statutory power to engage in the development of salmon farms and to seek to take out licences for their operation. Their board may very well be acting *ultra vires* their governing act in expending funds on such projects.

In the seminal *Waddenzee*<sup>1</sup> case the Advocate General of the European Court of Justice found that 'the competent authorities may agree to a plan or project only where, having considered all the relevant information, in particular the appropriate assessment, *they are certain* (our emphasis) that the integrity of the site concerned will not be adversely affected. This presupposes that the competent authorities are satisfied that there is no reasonable doubt as to the absence of such adverse effects'<sup>2</sup> when determining the effects of a development affecting sites protected by the Habitats Directive<sup>3</sup>. In its' final judgment on the case the European Court ruled that:

'.....an appropriate assessment of the implications for the site concerned of the plan or project implies that, prior to its approval, all aspects of the plan or project, which can, by themselves or in combination with other plans or projects, affect the site's

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<sup>1</sup> ECJ Case C-127/02 *Waddenzee* [2004] ECR I-7405

<sup>2</sup> Opinion of Advocate General Kokott delivered 29 January 2004 in Case C-127/02 *Waddenzee* [2004] ECR I-7405 at para 111

<sup>3</sup> Council Directive 92/43 – OJ L 206 of 22.7.1992

conservation objectives must be identified in the light of the best scientific knowledge in the field. The competent authorities .....are to authorize such an activity only if they have made certain that it will not adversely affect the integrity of the site. That is the case where no reasonable scientific doubt remains as to the absence of such effects'<sup>4</sup>

The BIM Environmental Impact Statement in respect of the proposed Galway Bay salmon super-farm ('the BIM EIS') falls far short of the standard required by the ECJ; it provides no basis for the Minister for Agriculture, Food and the Marine ('the Minister') making a decision about whether an 'appropriate assessment' may be required by Article 6 of the Habitats Directive, let alone his making a decision that aquaculture and foreshore licences can be issued.

The BIM EIS (the authorship of which is unclear but is assumed to be that of an official or officials of BIM) is more of a marketing proposal than an objective analysis of the risks to flora and fauna posed by the proposed Galway Bay super-farm and the steps needed to eliminate or, at least, mitigate them. Legal advice to SWIRL suggests that a decision to grant a licence based on the advice in the EIS, including advice that no appropriate assessment of the project is required, would be unlikely to survive judicial review.

In addition to inadequacies in the BIM EIS, which reduce it to near irrelevance as a response to the requirements of the Habitats Directive, is the fact that the ultimate adjudicator of the project, the Minister, is severely conflicted in the exercise of his quasi-judicial role in determining whether a licence should be issued. All of the prime actors in the process, BIM, the Marine Institute and the Aquaculture and Fisheries Management Division of the Department of Agriculture, Food and Marine are under the aegis of the Minister and he himself is an uncritical supporter of the project. The Minister and DAFM are in

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<sup>4</sup> ECJ Case C-127/02 *Waddenzee* [2004] ECR I-7405 at para 4

the position of proposing and promoting the Galway Bay development, of financing the first stages of it, of determining whether it should be licenced and of regulating it. The Minister is, therefore, effectively disqualified from acting as an 'appropriate assessor' of whether a licence should be issued for the Galway Bay super-farm.

In respect of wild salmonids the inadequacies of BIM's approach to the preparation of the EIS are primarily that:

- It fails to demonstrate that there are no alternatives to a project that will threaten the conservation status of a Habitats' Directive Annex 11 species (*Salmo salar*) – in other words could the declared socio economic objectives not have been achieved by another less potentially damaging project or by, for instance, farming a less threatening species;
- It ignores evidence and in most cases does not even refer to information from reputable sources (such as in respect to the impact of sea lice and of escapees from salmon farms) which are not supportive of the case it is attempting to make in the EIS;
- It fails to establish that the migration routes for wild salmonids in Galway Bay are such would to protect migrating fish from encountering elevated levels of sea lice;
- It fails to recognize and to analyse the impact of diseases such as amoebic gill disease and the growing phenomenon of sea lice immunity to current treatments;
- It fails to correctly assess the scientific evidence of the threat to salmon smolts and sea trout posed by elevated levels of sea lice generated by salmon farms;

- It does not assess the appropriateness of attempting to regulate sea lice levels by reference to a protocol established in 2000 to regulate salmon farms one fifth the size of the proposed Galway Bay super-farm;
- It fails to analyse the whole bay impact and consequences for the wild salmonid population of the sea lice burdens generated by an operation as large as the proposed Galway Bay super-farm;
- It down plays the potential damage to wild salmon stocks of escapes from the proposed Galway Bay super-farm, fails to realistically forecast the likely escape levels from the super-farm and to credibly establish that there are mitigation measures that could be taken in the event of an escape from such a large scale operation.

## **2. Introduction**

Salmon Watch Ireland ('SWIRL') is a non-governmental organization concerned with the conservation of the threatened wild Atlantic salmon. Its predecessor organization, Stop Salmon Drift Nets Now, led the campaign that culminated in the ending of mixed stock fishing for salmon in Irish waters in 2007. Since 2009 SWIRL has had as one of its primary concerns the impact of salmon farming on wild salmonids and has complained to the European Commission about the failure of the Irish authorities to respect the requirements of the EU Habitats Directive in the process for making decisions about the siting, regulation and management of salmon farms. SWIRL has advocated that salmon farming, like terrestrial farming, should be subject to hard law, rather than protocols of undetermined enforceability, backed by significant sanctions for non-compliance determined by an independent regulator, such as the Environmental Protection Agency, and that in the longer run the Irish authorities

should encourage the progressive transition to closed containment production of salmon.

From the foregoing it will be clear that SWIRL is not opposed to salmon farming in all circumstances but is cognizant of the fact that in no jurisdiction in which it is conducted on any scale (Norway, Scotland, Ireland and eastern Canada in respect of Atlantic salmon and Chile and western Canada in respect of Pacific salmon) has it come without significant collateral damage to the environment, especially to wild salmonids, resulting mainly, but not exclusively, from greatly elevated sea lice levels and the genetic and other impacts of escaped of farmed salmon.

### **3. Bord Iascaigh Mhara's powers to engage in salmon farming**

Bord Iascaigh Mhara's functions and powers are set out in the Sea Fisheries Act 1952. Section 15 of that Act sets out in some considerable detail the functions of BIM and even the 'catch all' provision in Section 15 (2) (u) comes nowhere near conferring on the organization the power to engage in salmon farming in the active manner contemplated by the application for aquaculture and foreshore licences.

The possibility, therefore, arises that the board of BIM have acted *ultra vires* their governing statute in expending resources on the Galway Bay project. This is clearly distinguishable from their earlier role over many years of grant aiding the development of salmon farms where BIM were essentially just managing that activity on behalf of the Minister for Agriculture, Food and the Marine ('the Minister').

### **4. The Bord Iascaigh Mhara Environmental Impact Statement**

SWIRL notes with concern the proposal of BIM to proceed with an application to the Minister for a licence to site a salmon super-farm in Galway Bay and to contract with another entity, so far apparently unidentified, to operate it. This, if permitted, will be the largest fish farm installation ever constructed in Ireland (and by some accounts the largest ever constructed in Europe) and is designed to produce some 15,000 tons of farmed salmon per annum – a capacity approximately fifty per cent more than the aggregate of all current farmed salmon production in the country. Furthermore, the farmed salmon population implied by the tonnage capacity, some 3 to 4 million fish, is of the order of ten times the size of the annual return to the coast population of wild Atlantic salmon and two hundred times greater than the number of adult salmon returning to the Corrib SAC each year. The Galway Bay super-farm, therefore, constitutes a potential threat through sea lice and disease to wild salmon in its vicinity but to the wider wild salmon population through any large scale escape of farmed fish.

For these and other reasons the consent process for this project warrants the most careful scrutiny in order to ensure that it is exhaustive, comprehensive, and beyond reproach in all respects.

It is unclear what entity and what individual persons compiled the BIM Environmental Impact Statement. Great detail is given in certain areas such as the design of service vessels but this is paralleled, as is highlighted in the rest of this commentary, by great vagueness and even evasion in respect of key environmental issues. There is a consistent failure to objectively describe risks and threats which suggests either professional incompetence or a level of bias which would disqualify the writers from preparing the EIS.

The BIM EIS should be set aside and the entire process recommenced in a manner which respects the requirements of EU and Irish law on the subject.

## 5. Conflicts of interest

Aquaculture licences are issued pursuant to the Fisheries (Amendment) Act 1997. Section 3 of that Act defines the 'licencing authority' for the issue of aquaculture licences as (a) the Minister (b) an officer to whom licencing authority has been delegated by the Minister and (c) the Aquaculture Licencing Appeals Board ('ALAB').

In February 2012 SWIRL submitted to the EU Commission its' concerns about the licencing process which it appeared was to be pursued in the Galway Bay case and which *inter alia* drew attention to a perceived conflict of interest among the key parties involved in any assessment.

It is the view of SWIRL that the consent process currently underway is inherently flawed by virtue of the relationship of the applicant, BIM, to the licencing authority. The decision making authorities consist of the Aquaculture and Fisheries Management Division (AFMD) of the DAFM, and the Minister advised by the AFMD and by the MI, which is itself an executive agency of DAFM.

All of the aforementioned parties are closely connected by virtue of their organizational relationships within the DAFM.

BIM and MI derive virtually all of their funding from DAFM and the members of their boards of directors are all appointed by the Minister.<sup>5 6</sup>

It is obvious that BIM has made a very considerable investment to date in the preparation of its application for the Galway Bay super-farm and associated documentation. It is not unreasonable to believe that the Minister and DAFM will be influenced by not wanting to see that investment lost by a rejection of the application for an

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<sup>5</sup> [www.bim.ie](http://www.bim.ie) (accessed 26 November 2012).

<sup>6</sup> [www.marine.ie](http://www.marine.ie) (accessed 26 November 2012)



aquaculture licence. Indeed, BIM states that it was specifically ‘tasked by the government under its ‘Food Harvest 2020’ food production strategy to develop a licence application for a 15,000 tonne salmon farm which will be located ....in the lee of Inis Oirr’<sup>7</sup>. In fact ‘Food Harvest 2020’ makes no recommendation about expanding salmon farming apart from noting that Irish waters are particularly suitable for finfish and shellfish production and that ‘aquaculture growth is constrained due to licensing and funding difficulties arising from challenges in meeting EU environmental requirements’<sup>8</sup>.

To be added to conflicts arising from the structural relationships between the Minister, DAFM, BIM and MI is the fact that the Minister himself, who presides over and is responsible for key decisions and the funding in respect of these agencies, is an almost uncritical supporter of salmon farming and of the Galway Bay super-farm itself. Publicly and privately he has shown considerable impatience with suggestions that there are considerable potential dangers to the environment posed by the proposed Galway Bay super-farm.

The project has been extensively commented on in the press, and has been the subject of numerous public pronouncements and press releases in the print and electronic media. These have been made by the Minister, BIM and DAFM. These announcements and press releases have unequivocally endorsed the proposed project, and heralded its development in glowing terms, in advance of the public consultation stage and the decision making process on the licence application.

For the relevant decision makers to have given such public endorsement to this project in advance does not inspire confidence that they will approach this matter with an open mind.

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<sup>7</sup> BIM environmental impact statement, p 13.

<sup>8</sup> Anon, *Food Harvest 2020*, (2010 Department of Agriculture, Food and the Marine) pp51, 52.

Given that the Minister (or a person to whom he has delegated licencing authority powers) is acting in a semi-judicial capacity in the evaluation of aquaculture licence applications, including that for the Galway Bay salmon super-farm, it is SWIRL's submission that he is estopped from carrying out that role by virtue of the conflicts of interest generated by the structure within which the applicant, the Minister's scientific adviser and the licencing authority operate – a conflict which is aggravated by the Minister's declared support for the promotion of salmon farming in general and the Galway Bay super-farm in particular.

In the circumstances, it is inappropriate that an application by BIM, for consent for a commercial undertaking such as this, should be determined by the Minister on the recommendation of the AFMD. All these parties are so inextricably linked to that it is not possible for an objectively neutral party to be convinced that the decision making process is completely fair.

The availability of an appeals body, the Aquaculture Licences Appeals Board, which is also located within the DAFM family, fails to meet the standard of transparency or independence of decision making required in these circumstances. As such, it does not cure the inevitable perception of bias which would attach to any decision that may be made to grant a licence to the current applicants.

A similar conflict arising from the allocation of governmental responsibilities for the development of aquaculture and for its regulation was recently analysed in great detail in Canada<sup>9</sup>. The conclusion of the Cohen commission was that the regulatory role should be separated totally from the development role.

SWIRL submits that the Minister refrain from dealing further with this application since he, his officials and his agencies are constrained

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<sup>9</sup> *Commission of enquiry into the decline of sockeye salmon in the Fraser River- final report October 2012* ([www.cohencommission.ca](http://www.cohencommission.ca), p12 et seq.

and conflicted by virtue of their links to the applicant for the licence. Further dealing with this application or any decision to grant an aquaculture licence based on this application would be an impermissible infringement of the *nemo iudex in causa sua* principle of administrative law.

## **6. The need for appropriate assessment under the Habitats' Directive**

It would appear that BIM are under the impression that it is not necessary that a screening process and an appropriate assessment as required by Article 6(3) of the Habitats Directive needs to be carried out for this project<sup>10</sup>.

SWIRL contends that the proposed aquaculture project falls within the scope of Article 6(3) of the Habitats Directive as it is a project which, while not directly connected with or necessary to the management of the site, is likely to have a significant effect on the conservation objectives of the the Connemara Bogs Complex SAC, the Galway Bay Complex SAC and, especially, on Lough Corrib SAC. The Corrib, Cashla and Costello rivers discharge directly into Galway Bay. The Atlantic salmon is one of the listed features of interest for the Lough Corrib SAC.

It is clear from the extensive guidance notes published by the Commission on the application of Article 6(3) that any project, even if it occurs outside the boundaries of a SAC must be screened by the competent authorities for likely significant effects on the SAC. There are a number of SACs that could be impacted upon by this proposed project, the most important being, from the perspective of protecting the conservation status of the Atlantic salmon, the Corrib SAC. And so, if the screening process(es) identifies a risk or likelihood of significant effects on the SAC(s) having regard to the precautionary

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<sup>10</sup> BIM Environmental Impact Statement, p 212 and section 6.2.1 of Appendix 1 of the EIS

principle, by reference to which the Habitats Directive must be interpreted, it is a requirement both under Irish national law and EU law that a full ‘appropriate assessment’ be carried out.

The appropriate assessment process is separate and legally distinct from any EIS that must also be carried out. Recent jurisprudence from the Courts of Justice of the European Union (‘the ECJ’) confirms this position as do the Commission guidance notes and Irish national guidelines on appropriate assessment. In particular, we would make reference to the Irish national guidelines: *‘Appropriate assessment of plans and projects in Ireland – guidance for planning authorities’*<sup>11</sup>, and in particular the reference in these guidelines at p.32 to the fact that any screening should involve a project which is within a distance of 15kms from any Natura 2000 site. The proposed deep sea water farm is close to the Galway Bay SAC complex and is within 15kms of the Corrib SAC an important site for Atlantic salmon. In light of the scale of the proposed project, and taking a precautionary approach (as required by ECJ case law) it is likely that there will be significant effects from this project on the Lough Corrib SAC site in view of its conservation objectives and so it is essential that the authorities carry out a screening process in the first instance.

SWIRL contends that this project cannot be excluded on the basis of objective information, that it will have a significant effect on the site, and so should be subject to the appropriate assessment process. The potential impact of salmon farms on their environment through the generation of dense sea lice populations, the escape of farmed fish and benthic effects is well documented and needs to be properly assessed in the light of the particulars of the proposed site.

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<sup>11</sup> Anon, *Appropriate assessment of plans and projects in Ireland – guidance for planning authorities*, (2009 Department of Environment, Heritage and Local Government, Dublin.).

### *Precautionary principle*

In respect of appropriate assessment it is important to take account of the opinion of Advocate General Sharpston in the Sweetman case . In the course of her opinion she said that:

‘It is plain, however, that the threshold laid down at this stage of Article 6 (3) may not be set too high, since the assessment must be undertaken having rigorous regard to the precautionary principle. The principle applies where there is uncertainty as to the existence or extent of risks. The competent national authorities may grant authorisation to a plan or project *only if they are convinced that it will not adversely affect the integrity of the site concerned* (AG Sharpston’s emphasis). If doubt remains as to the absence of adverse effects, they must refuse authorisation’<sup>12</sup>.

This statement is just the latest of a long line of judicial opinion on the need for a precautionary approach in the appropriate assessment process and the fact that the onus of establishing that there is no threat to the favourable conservation of the site and its protected flora and fauna lies with the applicant, not the objector to the project.

For reasons described elsewhere in this document SWIRL contends that the BIM EIS does not meet the standards of risk identification and analysis required by EU and Irish hard law and jurisprudence on screening for appropriate assessment of the Galway Bay salmon super-farm project.

### *No Site Specific Conservation Objectives*

SWIRL notes that there are only in place draft generic Conservation Objectives for the Corrib River SAC, the Connemara Bogs Complex

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<sup>12</sup> Ibid at para 51

SAC and Galway Bay Complex SAC<sup>13</sup>. Conservation objectives as currently drafted are not specific to these sites.

Specific conservation objectives for a site play a central role in its conservation and the overall workings of the Habitats Directive<sup>14</sup> but most importantly, the conservation objectives of a site are important in determining the likelihood of 'significant effect' and 'appropriate assessment' in accordance with Article 6 of the Habitats' Directive and ultimately in whether or not a plan or project will adversely affect the integrity of a site and so play a key role in determining whether or not a plan or project should be granted consent. By adopting a precautionary approach, the likelihood of any adverse effects on the conservation objectives for a site ought to be regarded as significant effects for that site<sup>15</sup> which would then trigger the appropriate assessment process.

The conservation objectives for a site are also important as regards the assessment of any adverse effects on the integrity of the site as such an assessment must identify all the aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those conservation objectives in light of the best scientific knowledge in the field.

In light of the importance of having site specific conservation objectives, SWIRL contend that it is premature for the authorities to apply for both aquaculture and foreshore licences prior to the site specific conservation objectives being adopted for these two above mentioned SACs as it will not be possible to apply correctly the screening process and the appropriate assessment process as required by article 6(3). It is clearly not appropriate and would be contrary to EU law for a competent authority to approve such a

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<sup>13</sup> [www.nps.ie](http://www.nps.ie) (last accessed 31 January 2012)

<sup>14</sup> *Aquaculture activities in the context of Natura 2000 Network - draft* (EU Commission 2012) p 45

<sup>15</sup> Opinion of Advocate General Kokott delivered 29 January 2004 in Case C-127/02 *Waddenzee* [2004] ECR I-7405 paras 84-5.

project conditional on the completion of site specific conservation objectives.

## **7. Issues inadequately dealt with in the EIS**

The BIM EIS makes the assertion that:

‘Following extensive desktop review in combination with the marine surveys and modeling it was concluded with high confidence that the proposed project will not have any significant impact on the features of the adjacent SACs. It will not affect site integrity and it is not likely to pose any risk to the maintenance or restoration of the favourable conservation condition of the Annex 1 habitats and the Annex 11 species for which the SACs have been selected’<sup>16</sup>.

Among the key conclusions of the desktop review and marine surveys cited in the EIS are the following:

- ‘Modeling output indicates that there is little or no spatial overlap between the modeled distribution of lice larvae from the proposed farm sites and the migration routes of Atlantic salmon smolts’<sup>17</sup>.
- ‘Results from [studies carried out by Jackson *et al* of the Marine Institute and published in 2011] suggest that infestation of outwardly migrating smolts with sea lice was only a minor component of the overall mortality of the stocks studied’<sup>18</sup>.
- ‘It was accepted by the Irish wild salmon conservation authorities that “the Irish sea lice monitoring and control system is unique in the world in terms of its comprehensive nature, the

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<sup>16</sup> BIM Environmental Impact Statement. p212

<sup>17</sup> BIM Environmental Impact Statement, Appendix 1, section 6.2.1

<sup>18</sup> Ibid.

fact that its results are made publicly available and that all inspections are carried out by independent state inspectors”<sup>19</sup>

- ‘It should be stressed that the actual; record with regard to escapements from Irish salmon farms is good....[and] over a three year study period which recorded and described 255 escape incidents across Europe, only one escape was recorded in Ireland. This result is consistent with the record of escapes as reported to NASCO by the Irish State over the last number of years’<sup>20</sup>.
- ‘Large scale studies by the Marine Institute on the genetics of wild salmon stocks (Mc Ginnity *et al*, 2003 and 2009).....confirmed that there had little or genetic (*sic*) interaction between farmed and wild stock’<sup>21</sup>.

From SWIRL’s standpoint these are among the most important assertions in the entire document for a wild salmon conservation standpoint and require much further analysis as to their robustness and their adherence to a precautionary approach than that to which the EIS subjects them. Contrasted with the relatively scant attention given to sea lice and escapees in the BIM EIS the Norwegian authorities consider that ‘the most important risk factors involving aquaculture is currently escapees and salmon lice’<sup>22</sup>

## **Sea lice**

### *Migration routes and sea lice distribution*

The assertion that ‘there is little or no spatial overlap between the modeled distribution of lice larvae from the proposed farm sites and

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<sup>19</sup> BIM Environmental Impact Statement, p233

<sup>20</sup> BIM Environmental Impact Statement, p232.

<sup>21</sup> Ibid.

<sup>22</sup> NASCO CNL 10 (12) – Focus Area Reports on aquaculture, introductions and transfers, and transgenics – Norway, p 3.



the migration routes of Atlantic salmon smolts'<sup>23</sup> is a make or break issue in the BIM EIS. No research on migration routes that meets the *Waddenzee* standard has been undertaken in the preparation of the BIM EIS. Little is known of the migration routes and patterns of salmonids in Galway Bay (whether salmon or sea trout, juvenile or adult) and the BIM EIS does not add in any way to existing levels of knowledge. Rather the BIM EIS relies on a small scale study carried out in the inner harbor area in 2010 as part of a harbor extension project and makes sweeping and scientifically unsustainable assertions based on it.

The BIM EIS states that 'the primary exit route from Galway Bay for smolts leaving the rivers for the Atlantic *are generally seen* (our emphasis) as being to the north of the Aran Islands'<sup>24</sup> and that because a study in Clew Bay showed that a large proportion of smolts swam on the northern side of that bay this 'suggests post-smolt movement in Galway Bay will also be concentrated along the north shore'<sup>25</sup>. This is not an adequate basis for effectively determining, as the BIM EIS does, that salmon farm generated sea lice will have no impact on migrating (in the case of salmon) or foraging (in the case of sea trout) salmonids.

Even less effort has been made in preparing the BIM EIS to understand the migration and foraging patterns of sea trout which, while they are not a Habitats Directive Annex 11 species, are known to be severely challenged by sea lice and are an important part of the tourist economy of Connemara. There is extensive published literature on this matter which is not dealt with in the BIM EIS.

More effort was put into researching the likely distribution of sea lice emanating from the two sites. The results demonstrate that migrating

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<sup>23</sup> BIM Environmental Impact Statement, Appendix 1, section 6.2.1

<sup>24</sup> BIM Environmental Impact Statement, section 8.5.1, p 226

<sup>25</sup> BIM Environmental Impact Statement, section 8.5.1, p 229

smolts would not have to wander very far from the north coast to find themselves in quite high concentration levels of sea lice<sup>26</sup> and that those migrating along the Clare coastline (whether entering or exiting Galway Bay) would be hard pressed to avoid high concentrations<sup>27</sup>. From that data the BIM EIS takes a massive leap to derive 'realistic' sea lice distributions which, *mirabile dictu*, lead to the conclusion that 'it is highly unlikely that any significant risk of infection beyond the boundaries of the zones shown in Figures 6.37 and 6.38'<sup>28</sup> (covering respectively the northeast and southwest sites).

This does not add-up to a serious scientific treatment of the known risk posed by sea lice to migrating wild juvenile salmonids and on such a critical issue a dedicated survey to establish the migration route(s) of salmon smolts as they move through Galway Bay is the minimum required for an Environmental Impact Statement. .

### *Sea lice impact on wild salmonids*

No doubt deliberately, the BIM EIS mentions only two scientific papers dealing with sea lice (by Jackson *et al* of the Marine Institute which were both published in the journal *Aquaculture* in 2011)<sup>29</sup> as if these were the last word on the subject. In fact, there is an enormous body of Irish and international scientific literature on the impact on wild salmonids (both sea trout and salmon) of sea lice concentrations associated with salmon farms. These were summarized *inter alia* in papers by Costello in 2009<sup>30</sup>, by the Salmon and Trout Association

<sup>26</sup> BIM Environmental Impact Statement, Figure 6.35, section 6.4.4.2, p 181

<sup>27</sup> BIM Environmental Impact Statement, Figure 6.36 section 6.4.4.2, p 182

<sup>28</sup> BIM Environmental Impact Statement, section 6.4.4.2, p 183

<sup>29</sup> Jackson, D *et al*, *Impact of early infestation with the salmon louse Lepeophteirus salmonis on the subsequent survival of outwardly migrating Atlantic salmon smolts from a number of rivers on Ireland's south and west coast*, *Aquaculture* 319 (2011) pp 37-40 and *An evaluation of the impact of early infestation with the salmon louse Lepeophteirus salmonis on the subsequent survival of outwardly migrating Atlantic salmon, Salmo salar L, smolt*, *Aquaculture* 320 (2011) pp 159-163.

<sup>30</sup> Costello, M J, *How sea lice from salmon farms may cause wild salmonid declines in Europe and North America and be a threat to fishes elsewhere*, *Proceedings of the Royal Society* 2009.0771 ([www.http://dx.doi.org/10.1098/rspb.2009.0771](http://dx.doi.org/10.1098/rspb.2009.0771)).

(UK) in 2010<sup>31</sup>, by Whelan in 2010<sup>32</sup> and by Finstad *et al* in 2012<sup>33</sup> and so are not difficult to access. Not even a minority of these papers come to such a benign conclusion about the impact of increased sea lice infestation in the manner in which they are cited in the EIS. Even in respect of the Jackson *et al* papers it is worth noting, although not mentioned at all in the EIS, that the authors note that their studies 'support the view that infestation of outwardly migrating salmon smolts with salmon lice has a negative impact on fitness and can contribute to increased marine mortality'<sup>34</sup>

Two of the most recent publications on the subject are based on extensive research of the sea lice phenomenon in Irish conditions and it is close to astonishing that they were not referenced in the BIM EIS. These are papers by Gargan *et al*<sup>35</sup> and Krkosek *et al*<sup>36</sup>. The latter of these two papers concludes that: 'More broadly, and in contrast to the conclusions from two of the original [Jackson *et al*] studies our results supply manipulative field experimental evidence at a large spatial scale that parasitism may be a significant limiting factor for marine fishes, fisheries and conservation'.

It is not our purpose in this response to the BIM EIS to attempt to reach a conclusion to these scientific differences but to highlight the fact that they exist, that the EIS does not treat them either at all or objectively and that they have to be resolved before a decision can

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<sup>31</sup> Salmon and Trout Association, *Impacts of salmon aquaculture on native salmonid fisheries and the aquatic environment*, March 2010.

<sup>32</sup> Whelan, K, *A review of the impacts of the salmon louse, lepeophtheirus salmonis (Kroyer, 1837) on wild salmonid*, Atlantic Salmon Trust, August 2010.

<sup>33</sup> Finstad, B *et al*, *The effect of sea lice on Atlantic salmon and other salmonid species* in 'Atlantic Salmon Ecology' (Wiley-Blackwell, 2011)

<sup>34</sup> Jackson, *et al*, *Impact of early infestation with the salmon louse Lepeophtheirus salmonis on the subsequent survival of outwardly migrating Atlantic salmon smolts from a number of rivers on Ireland's south and west coast*, Aquaculture 319 (2011) at p39.

<sup>35</sup> Gargan *et al*, *Evidence for sea-lice induced marine mortality of Atlantic salmon (salmo salar) in Western Ireland from experimental releases of ranched smolts treated with emamectin benzoate*, Canadian Journal of Fisheries and Aquatic Sciences 2012 69 (2) pp 343-353

<sup>36</sup> Krkosek *et al*, *Impact of parasites on salmon recruitment in the Northeast Atlantic Ocean*, Proceedings of the Royal Society 20122359 ([www.http://dx.doi.org/10.1098/rspb.2012.2359](http://dx.doi.org/10.1098/rspb.2012.2359)).

be made on the application for an aquaculture licence for a salmon super-farm in Galway Bay.

Even if the only conclusion that was reached on the divergent scientific views on the subject of sea lice (albeit the preponderant view being that sea lice are a significant threat to salmonids) was that the jury was out on the subject, the required precautionary approach would dictate that an appropriate assessment be carried out. The Commission guidelines<sup>37</sup> state (as does the *Waddenzee* judgment in somewhat different formulation) that ‘the likelihood of significant effects’ does not require certitude and that where there is doubt whether they are likely to be significant an appropriate assessment must be carried out – the purpose of the appropriate assessment is to assess the potential effects.

### *Harvesting site*

The BIM EIS states that the holding of fish awaiting harvest will be at an ‘intermediate holding site’<sup>38</sup>. However, the EIS the study does not address this in any manner notwithstanding that it has a very significant potential to affect wild salmonids as it is implied that this site may be closer to the processing facilities. If this were close to Rossaveal then farmed salmon that have not been treated for sea-lice and that could, therefore, carry significant lice burdens could be in close proximity to wild fish (both salmon and sea trout) in the Casla system. Any proposed site to be used for harvesting purposes must be part of the assessment process. In view of the scale of this proposed development it is highly likely that fish will be awaiting harvest for 6 months of every year in an intermediate site that was not part of the BIM EIS. The fact that fish are harvested out of this site would also mean that this site too should have a licenced tonnage.

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<sup>36</sup> EU Commission, *Guidance on aquaculture and Natura 2000 – sustainable aquaculture activities in the context of the Natura 2000 Network* (June 2012) p 50

<sup>38</sup> BIM Environmental Impact Statement, Figure 6.35, section 6.4.4.2, p 113

### *Control of sea lice*

The system for controlling sea lice on Irish salmon farms may indeed be 'unique in the world' as already quoted. Uniqueness, however, is not the issue – what is at stake is whether it delivers high levels of sea lice control and the evidence of thirty years of salmon farming is that it does not.

In the twelve years during which the Sea Lice protocol has been in operation, there has only been one instance where an operator has been required to move his fish from a site due to high sea lice levels heading into the critical period (Bifand Ltd in March 2012, Freaghillaun Site 132). This removal of stock was conveniently possible as the operator had a 'break out' site to enable this. There have been hundreds of similar breaches during the lifetime of the Protocol and no other fish movement/accelerated harvests have taken place before or since.

There is no indication as to where salmon from the Galway Bay sites would be moved in the event of an outbreak. Should an accelerated harvest be the solution, how quickly can a fully stocked site be harvested during an 'out of control' lice epidemic?

The large stock of fish in Lough Swilly has been close to or well above treatment trigger levels since March of 2012 as a result of AGD and there has been no accelerated harvest at the site. This is an indication that DAFM and MI are not serious about keeping lice levels low and suggests that the 'unique' control system may be operated selectively in the commercial interests of licensees.

SWIRL has long been of the view that sea lice and other controls on the operation of salmon farms should be enshrined in statutory instruments, be enforced by an authority that is clearly independent of

the bodies responsible for developing aquaculture and be backed by legal sanctions.

### *Sea lice trigger levels at Galway Bay sites*

The BIM EIS seems to assume that the trigger level regime that currently operates for salmon farms is appropriate to a facility that will be producing 15,000 tonnes of salmon per annum and, therefore, have an adult population of 3 to 4 million fish.

The Sea Lice Protocol was drawn in 2000 up on the basis that the largest licensed site at the time was 3,000 tonnes (Clare Island would be a comparable site). The Protocol does not take into account the total lice loading for a particular site based on the overall numbers of fish growing at the time. An average count of 1 ovigerous sea lice per fish at the Galway Bay sites is the same as having an average of 5 ovigerous lice per fish at the Clare Island site (licensed for circa 3,000 tonnes). Clare Island is bound by the protocol where the trigger level is 0.5 ovigerous lice per fish during the critical period.

The Galway Bay sites should, therefore, logically have a treatment trigger set at 0.1 ovigerous lice during the critical period as a precautionary measure. Based on the 2011/12 lice results this would seem to be a reasonable threshold.

Further, if harvesting is to happen over a 6 month period, what will happen to lice control during this time as the Protocol states that farmers do not have to treat during harvest? Protracted harvesting has been identified by DAFM as a factor militating against effective sea lice control<sup>39</sup> and the MI referred to this as being a problem with lice control at existing sites in their 2010 report<sup>40</sup>

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<sup>39</sup> Department of Agriculture, Food and the Marine, *National implementation group report on a strategy for improved pest control on Irish salmon farms* (2001)

<sup>40</sup> Marine Institute, *Fisheries Bulletin No 33* (2010) p18.

Contrary to what is proposed in the BIM EIS smolts should be put in during March, not November, as the latter would mean that harvesting would take place from February to July each year – that is, at a time when wild smolts are running and when no sea lice treatments would be taking place on fish about to be harvested.

### ***Amoebic gill disease and sea lice immunity to treatment***

It is unsatisfactory that the BIM EIS made no reference to amoebic gill disease, to the growing immunity of sea lice to currently known treatments or to the impact of other diseases such as the planktonic bloom *karenia mikimotoi* on fish mortality and their economic consequences.

#### ***Amoebic gill disease***

Marine Harvest, which produces some 70% of all Irish farmed salmon, has reported<sup>41</sup> that in the third quarter of 2012 the ‘high presence of a microscopic amoeba named *neoparamoeba penurans*, has caused Amoebic Gill Disease (‘AGD’), elevated mortality and reduced performance at several farms in Scotland and Ireland’. In relation to Ireland Marine Harvest stated that ‘the Irish operation has struggled with amoebic gill disease for several months’ and that ‘mortality losses and treatment costs were substantial in the period’ and that ‘treatment costs, mortality and loss of feeding days contributed to higher biological cost for fish harvested in the quarter compared to the same period last year’<sup>42</sup>.

Anecdotal evidence from around the coast suggests that other salmon farm operators have experienced similar problems.

The critical point from a sea lice control point of view is that AGD suppresses the infected salmon’s appetite and, therefore, its

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<sup>41</sup> Marine Harvest quarterly report to shareholders for Q3 2012.

<sup>42</sup> Ibid.

ingestion of sea lice treatments (see point about Lough Swilly stocks below).

### *Sea lice immunity to treatments*

In their report to the North Atlantic Salmon Conservation Organisation ('NASCO') in 2010, the Norwegian authorities stated that 'sea lice along the Norwegian coastline have been found to develop resistance against [sea lice treatments emamectin benzoate and pyrethroids]',<sup>43</sup>.

It is reasonable to assume, until it is convincingly refuted, that sea lice along the Irish coast exhibit similar immunity. It should be dealt with in the EIS.

### *Escapes from salmon farms*

As noted already the BIM EIS contends that there are little or no escapes from Irish salmon farms and that what there are have a *de minimis* impact on the wild salmon population. Neither assertion is correct and the authors of the BIM EIS didn't bother to consider evidence that ran counter to their assertions but which was readily available. Indeed, the authors of the BIM EIS succeeded in misrepresenting the conclusions of the of the two papers they cite<sup>44</sup> and both of them do, in fact, describe findings which point to considerable threats to wild salmon emanating from farmed salmon escapes.

It is true that the Irish authorities have routinely reported to NASCO under the escapes heading that there were 'no *reported* escapes'

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<sup>43</sup> NASCO CNL 10 (12) – Focus Area Reports on aquaculture, introductions and transfers, and transgenics – Norway, p19.

<sup>44</sup> Mc Ginnity *et al*, *Fitness reduction and potential extinction of wild populations of Atlantic salmon, Salmo salar, as a result of interactions with escaped farm salmon*, Proceedings of the Royal Society (2003) 270, pp 2443-2450. And Mc Ginnity *et al*, *Impact of naturally spawning captive-bred Atlantic salmon on wild populations: depressed recruitment and increased risk of climate-mediated extinction*, Proceedings of the Royal Society (on line 2009) doi: 10.1098/rspb.2009.0799



(our emphasis). That doesn't mean that there were no escapes – just that they had not been reported by the operators.

The BIM EIS says that in one three year study period there was only one escape recorded in Ireland<sup>45</sup>; it does not say what that three year period was but in contrast in one recent twelve month period there were four reported escape incidents as follows<sup>46</sup>:

- December 2009: Cuigeal Bay: Licensee Muirachmhainni Teo: 30,000 escapees.
- July 2010: Mc Swynes Bay: Licensee Ocean Farms (Marine Harvest): Escape reported by a third party but not confirmed.
- September 2010: Portlea: Licensee Marine Harvest: 1,500 escapees.
- October 2010: Inver Bay: Licensee Marine Harvest: 83,000 escapees (smolts).

In one of these cases there was serious dereliction by the licensee in not making a timely report of the escape (so that the escaped stock might be recovered). Other than what might be regarded as a reprimand no punitive action was taken with respect to the incident. In fact, Ireland's benign 'light touch' regulation of aquaculture, including especially salmon farming, has never resulted in a prosecution despite numerous serious transgressions of the rules.

It is not suggested that the above sample is any more statistically significant in respect of the overall record of the Irish salmon farming industry than that cited in the BIM EIS – only that this is another example of the suppression by its authors of data that is unhelpful to their case.

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<sup>45</sup> BIM EIS p 233

<sup>46</sup> Information supplied by DAFM as a result of a Freedom of Information Act request

### *Genetic impact of escapees*

It is a totally inadequate treatment of the issue of the possible genetic effects on wild salmon of interaction with escapes from salmon farms to cite just two papers – two papers based on an Irish experience where there are (according to the BIM EIS), apparently, virtually no escapes at all! There is at least one well known Irish study<sup>47</sup> which came to quite different conclusions based on the escape of 50,000 farmed salmon from a site on Lough Swilly. There is also a multitude of international studies pointing to the threat to wild salmon posed by farm escapees of which the following is a sample list:

‘Farmed salmon escape practically everywhere there is aquaculture. Thorstad *et al.*, (2008), on behalf of the Salmon Aquaculture Dialogue which investigated the incidence of farmed Atlantic salmon in the wild, concluded that, internationally, numbers of farmed salmons escaping are large in relation to the abundances of their wild counterparts. In Norway, it is estimated that 1.3 million salmon escape each year (Weber, 1997), although in 2007 the official statistics quote 450,000 cultivated salmon escaped in Norway (Statistics Norway, 2009). In Scotland, official statistics in 2002 show 309,996 Atlantic salmon escaped from fish farms, and figures for 2009 shown 131,971 Atlantic salmon escaped, predominately due to holes in the cage nets (Scottish Government, 2009). There is growing evidence that these escapees are establishing significant populations in the wild. It is estimated that within Norwegian rivers in close proximity to fish farms, up to 80% of the spawning fish in one season were from fish farms (Fiske *et al.*, 2006). In New Brunswick, Canada, within four years of the first fish farms being built in 1979, 5% of the salmon in the nearby Magaguadavic River

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<sup>47</sup> Clifford, S *et al*, *Genetic changes in Atlantic salmon, Salmo salar, populations of Northwest Irish rivers resulting from escapes of adult farmed salmon*, Canadian Journal of Fisheries and Aquatic Sciences 1998 55 (2) 358-363, 10.1139/f97-229

were shown to be escapees and, by 1995, this had risen to 90% (Weber, 1997). In the North Atlantic, experimental ocean fishing off the Faroe Islands during the mid-1990s found 20-40% of salmon caught was of farmed origin (Hansen *et al.*, 1999)<sup>48</sup>.

Hybridization of wild fish populations resulting from escapes from fish farms leads to severe depletion and degradation of the marine survival capabilities and instincts of wild salmon and this is consistently reflected in the literature.

There is no reason to believe that the Irish experience should be any different than Norway or Scotland especially when one considers that what is being assessed is the threat posed by two adjacent sites with a potential population of some 3 to 4 million farmed salmon – some ten times greater than the total number of wild salmon that return to the Irish coast each year.

## **8. Conclusion**

The BIM EIS is neither an independent nor a convincing analysis of the risks associated with the proposed Galway Bay salmon super-farm and does not form the basis upon which a decision can be about whether an appropriate assessment under the Habitats' Directive, EU Commission guidelines and relevant ECJ jurisprudence is necessary. BIM's own conclusion that an appropriate assessment is not needed is totally flawed and should be ignored.

In SWIRL's view the risks associated with the project are so intractable that the project should be totally abandoned and no further taxpayer's resources wasted on it. If, on the other hand, the Minister is to persist with his ambition to advance this project then the process

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<sup>48</sup> Salmon and Trout Association, *Impacts of salmon aquaculture on native salmonid fisheries and the aquatic environment*, March 2010.

<sup>48</sup>

needs to be started again and BIM instructed to engage independent professional advice in the preparation of a new EIS which has regard to the facts of the case and Irish and EU environmental law.

Any assessment must also take account of the cumulative effect of all of the salmon super-farms being planned for the west coast of Ireland by BIM and respect EU law on the assessment of strategic plans and projects.

SWIRL is confident that any such assessment will come to the conclusion that this project, while it may lead to private gain for the operators will do so only at the cost of considerable environmental squalor and with little benefit to the communities around Galway Bay.

**Salmon Watch Ireland**  
**9 December 2012**

