ALAB
An Bord Achomhairc Um Cheadúnais Dobharshaothraithe
Aquaculture Licences Appeals Board

AP1/2019 Deenish

Report on possible environmental and ecological impacts of an alleged breach of Condition 2(e) of the Aquaculture Licence by the operators, MOWI Ireland at site T06/202, Deenish Island, Co. Kerry.

Dr Ciar O'Toole, Technical Advisor, Aquaculture Licences Appeal Board
12 April 2024

Background

The decision of the Minister on 12 April 2019 was to discontinue the statutory entitlement of MOWI Ireland to continue aquaculture operations at site T06/202 at Deenish Island, Co Kerry under Section 19A (4) of the Fisheries (Amendment) Act 1997 (the "1997 Act") due to a breach of Condition 2(e) of the Licence in 2016. Section 2 (e) of the licence referred to here states *"the Licensee shall not harvest more than 500 tonnes (dead weight) of salmon in any one calendar year."*

Figure 1 showing the location of the Deenish Island site, T06/202

Silver King Seafoods, trading as MOWI Ireland, had been operating a salmon farm at Deenish Island for a number of years, the second company to do so. The most recent licence was granted on 30 January 1995 and lapsed on 17 February 2007, following a renewal on 4 August 2004. In keeping with other salmon farms in Ireland, they were allowed to continued operating under the same licence conditions of the lapsed licence by Section 19 A (4) of the Fisheries (1997) Act, as amended, as they had submitted a renewal application with the Department of Agriculture Food and the Marine (DAFM) before their existing licence lapsed and were awaiting a decision. That decision is still outstanding today.

The issue of delay in deciding on renewal application for finfish farm is a national one. It produces a number of recognised practical concerns relating to several factors, one of which is the method of finfish farming in relation to timing and density of stocking on sites, as these practises have changed and improved over time. These changing practises, such as moving away from fixed input and harvest values to a Maximum Allowable Biomass model and changing to a two-year cycle on a farm, rather than moving fish to another site for on growing in their second year are very common. These changes can be observed internationally and were adopted for a number of reasons including reducing ecological impact, fish health and welfare as well as economic concerns. A review of aquaculture licencing produced by an independent review group in 2017 outlined a number of these issues and recommended changes to licencing practises to streamline and improve the process (Review of the Aquaculture Licencing Process, 2017).

A number of these changes are still outstanding in the Irish licencing system and the delay in processing renewal decisions currently remains. It is the technical advisor's understanding that a number of finfish operators have adapted their practises to reflect modern methods while awaiting updated licence renewals. In response to a S47 notice sent to DAFM in July 2020, Table 1 below was provided to ALAB by DAFM, showing three Irish finfish sites which were exceeding their licenced harvest amounts, which the Department stated at the time were in the process of being dealt with.

In this case, for the Deenish site at T06/2020, Section 2 (d) of the licence for site T06/202 relates to the number of juvenile fish allowed to be present on the site, which is 400,000 smolts. The licence specifically refers to smolts, which are a particular life stage of the fish where they are preparing themselves to move from fresh to salt water.

Section 2 (e) of the licence for site T06/202 relates to the tonnage of fish which can be harvested from the site on an annual basis, which is 500 tonnes (dead weight) of salmon in a calendar year.

There have been complaints from the industry over a number of years regarding the impracticality of salmon farm licence conditions as they were issued in the past and how they were no longer fit for purpose, for example for operators trying to utilise an "all in-all out" two year growing cycle, as Mowi operated during their Deenish trial licence (discussed below). If, for example, under the licence conditions for T06/202, the operators were to input 400,000 smolts to the farm and harvest 500 tonnes dead weight

of commercially sized salmon at an average of 4 kg (which would be considered small), the operator would have to experience a mortality rate of 68.75%.

Table 1: provided by DAFM to ALAB showing three sites exceeding their harvest allowances between 2015 and 2019.

	Year	Licensed Tonnage	Reported Harvested Tonnage	Excess Tonnage Harvested	Excess
Site A	2016	500	1,119	619	123.8%
	2015	500	615	115	23%
Site B	2015	600	1075	475	79.1%
	2017	600	1763.8	1163.8	193.96%
	2019	600	1139.554	539.554	89.9%
Site C	2016	1000	1196.4	196.4	19.6%
	2017	1000	1153.7	153.7	15.37%

In 2012 MOW Ireland were granted a trial licence for Site T06/202 (Deenish) by DAFM to operate on an "all in, all out" two year growing cycle, using Maximum Allowable Biomass (MAB) for 2.5 years. This method means all fish are introduced to a site and remain there until they are at a harvestable size, usually within 16-20 months, followed by a fallowing period. The method of MAB has been in widespread use internationally for a number of years. The company duly operated under their trial licence and recorded the environmental impacts in the direct area of the site in terms of benthos and water quality. This trial licence lapsed at the end of March 2015, with the company reverting to operating under the conditions of the 1995 licence, as allowed by Section 19 A (4) of the Fisheries (1997) Act, as amended.

Site visits by the DAFM's Marine Engineering Division (MED) in July 2015 found that the site was over stocked. Correspondence on the issue began at this point between DAFM and MOWI Ireland. In 2019, having assessed the issue, DAFM decided not to revoke the licence based on the overstocking noted in July 2015, which relates to Section 2 (d) of the licence conditions for this site, but to revoke solely on the basis of Section 2 (e) of the licence conditions, relating to the weight of fish harvested from the site at the end of the growth cycle in 2016.

Legal Advice received

Counsel has provided advice on this appeal, dated 16 March 2020, 8 May 2020, 4 November 2020 and 27 July 2023 [redacted] Advice was also received from [redacted] dated 25 March 2024. The advice from Counsel (summarised in the 27 July 2023 advice) concluded that ALAB had jurisdiction to determine the appeal on the basis that it amounts to a revocation under Section 68 for the

purposes of Section 40 of the Fisheries (Amendment) Act 1997 (the "1997 Act"). Further advice received from [redacted] on 27 July 2023 states that:

"As regards the information which the Board can have regard to in reaching its decision, it must decide whether the breach in 2016 warrants a revocation. However, it can have regard to information generated after that date in so far as that is relevant to this question. It is not confined to the information which was before the Minister. This could include: the submissions made to the Board in so far as they also focus on the breach of the condition and subsequent benthic/environmental monitoring in so far as this may indicate whether harvesting these amounts has the potential to have adverse environmental effects."

Potential for Environmental and Ecological Impacts

At the Board meeting of 28 March 2024, as a result of legal advice received [redacted] the Board requested that I prepare a report outlining the facts as they relate to environmental and ecological impacts of the purported breach of Condition 2(e) of the Licence, that is:

- What environmental and ecological impacts would result from the recorded harvest amount in 2016 at Site T06/202 Deenish,
- and what did the available recorded data show?

The potential and observed environmental and ecological impacts are assessed here in relation to the breach of Condition 2(e), which relates to the tonnage of fish harvested from the site in 2016 and these potential impacts can be broken down under the following headings:

- Impacts on benthos, both directly under the site and nearby
- Impacts on surrounding water quality, including status under the Water Framework Directive
- Potential for an increase in disease and pest risk, including sea lice numbers
- Risk of introducing Invasive species
- Potential for an increased risk of escaped fish and the negative impacts of such
- Potential negative impacts on Protected species, habitats and sites, including those protected under the Birds and Habitats Directives

Impacts on benthos, both directly under the site and nearby

Benthos, or the seabed, can be negatively impacted by deposition of waste material, primarily faeces and uneaten feed under finfish cages. This negative impact can spread into the immediate area.

Because of this, the Marine Institute, on behalf of DAFM requires the carrying out of annual benthic surveys of finfish sites in Ireland. These allow for a certain level of impact directly under the fish cages with visible impact declining with distance. Factors such as site exposure, water exchange due to tides and currents and methods of fish husbandry used on site can all have an impact on the benthic disturbance observed.

I assessed the benthic survey reports for the Deenish site for the years 2015-2017, covering the two years, 2015 and 2016 where DAFM states there was an increased number of fish on the site to result in the harvest tonnage excess, and the following year where it might be expected to see any continuing negative impacts. The benthic survey reports for all three years show very good quality benthos results, both directly under and in the vicinity of the Deenish site. There is no evidence presented which indicates a decrease in benthic habitat quality at this site. It appears to be a well flushed site which was causing minimal benthic impact at the time observed. There is no indication of an impact that would cause concern regarding the stocking limits at this site at this time.

Impacts on surrounding water quality, including status under the Water Framework Directive

Increased finfish production in a site which does not have a high enough flushing rate can cause a decline in water quality. Excess nutrients in the water column and discharge of increased levels of other pollutants are some of the issues experienced. These factors are assessed for Coastal Waters under the Water Framework Directive (WFD), which assigns a status and a risk factor to Coastal Waters around the Irish coast. The site at Deenish, T06/202 is within a body of water deemed as having a "High" status during the 2016-2021 WFD reporting cycle. The risk of a decline of this status for the same WFD cycle is classed as "Not at Risk".

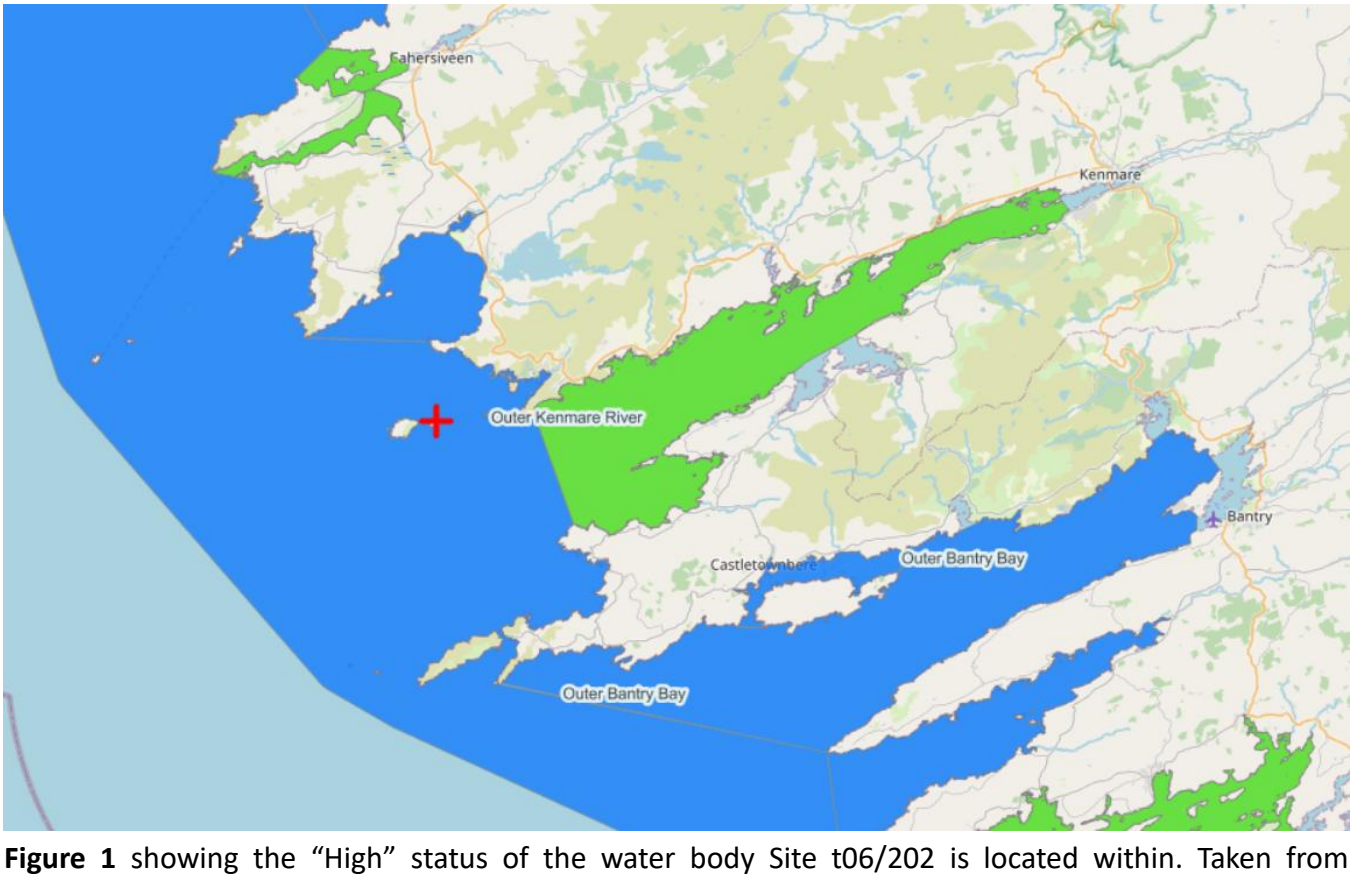

Figure 1 showing the "High" status of the water body Site t06/202 is located within. Taken from maps.epa.ie

Mowi Ireland also took water samples to test for nutrient levels at their Deenish site throughout 2015 and 2016. Assessment of this sample data show they also fall within the required values for a "High" status designation. This would indicate the self-recorded water quality at the site during this time was meeting the required standards set down by the WFD for this water body as a whole.

Potential for an increase in disease and pest risk, including sea lice numbers

Increased fish in a farm setting does increase the potential for a disease or pest to be introduced and could increase the severity of an outbreak due to the increased density of potential vectors. This has important knock-on impacts for the health of both farmed and wild fish. Diseases in farmed fish are monitored and controlled under WOAH (World Organisation for Animal Health, formerly OIE) and EU Fish Health Legislation which applies here. This means outbreaks of listed and notifiable diseases must be reported and treated. There is no evidence I could find that records outbreaks of serious notifiable diseases under the relevant legislation at this time.

Sea lice have been a particular concern for a number of years as they are a common parasite that can occur on both wild and farmed fish. There are two species of sea lice in Irish waters, one which attaches to salmon, trout and similar fish, *Lepeophtheirus salmonis,* and a second species which attaches to a wide variety of fish species, *Caligus elongatus*. High sea lice counts are of particular concern in the spring period when young wild salmon and trout are migrating from freshwater out to sea. As these fish are young and small, they can be more severely impacted by a sea lice infestation than larger fish. Also, returning adult salmon and trout coming back towards the coast in the autumn can be expected to migrate into freshwater, where sea lice cannot survive and will fall off their host and die. The sea lice count that triggers an action is lower in spring than in other periods of the year, and the Marine Institute also carries out more frequent inspections at this time of year.

During the 2015-2016 period, there were no notable disease outbreaks at the Deenish site and recorded sea lice numbers (recorded by the Marine Institute as part of their national testing programme) were below the "trigger" levels for every month bar one in 2016. Above these trigger levels, sea lice numbers are considered high enough to require treatment or an agreed action on the part of the operator to bring the levels down below trigger levels again. The high sea lice numbers were recorded in October 2016 and were of the non-species specific *Caligus elongatus*.

Risk of introducing Invasive species

The increasing movement of fish, boats and other materials in and out of a site increases the chances of introducing an invasive species which could have the potential to have a negative impact on the local ecosystem.

There is no evidence available which suggests that Site T06/202 was the source of any known invasive species introductions.

Potential for an increased risk of escaped fish and the negative impacts of such

An increased number of fish on a site increases the potential impact these fish would have on the local salmon population if these fish were to escape in a large event. Farmed fish have a different genetic makeup compared to local wild fish and the interbreeding of farmed and wild fish due to accidental escape events has been shown to reduce a population's overall survival rates. Small scale escapes also increase in risk theoretically with increased fish stocked on a site. Small scale escapes have been greatly reduced and almost eliminated in modern fish farming due to improved nets, technology and husbandry practises. Large scale escapes generally occur as a result of a catastrophic failure due usually to a number of factors, such as poor maintenance combined with an extreme weather event.

There are no recorded escape events from the Deenish site for 2015-2016.

Potential negative impacts on Protected species, habitats and sites, including those protected under the Birds and Habitats Directives

An increase of farmed fish numbers at a site could potentially increase risks to Natura 2000 sites and species. As Site T06/202 Deenish is within the Kenmare River SAC and the Deenish island and Scariff Island SPA, a full AA screening would be required to determine if there was the potential for significant impacts due to the change in stock density on site. I reviewed the ALAB application and assessment for the trial licence in 2012 which would have requested such an increase. AN NIS document was submitted to ALAB in June 2012 which found in its conclusions:

"no grounds to believe that any significant impact, either direct or indirect, on Natura-protected habitats or species, will arise from any activity, or discharge, or infestation, infection or escape from the MHI Deenish salmon farm site. This conclusion is reached primarily as a result of the synergistic benefits of certified organic operation of the site, its remoteness from many protected areas in the outer Kenmare Bay area, including protected salmon rivers, the operational methodologies employed by MHI, the current best practice specifications of the containment system deployed at the site and the site location, in particular in respect of local hydrography and exposure to oceanic conditions."

Also, "The Report supporting Appropriate Assessment of Aquaculture and Fisheries Risk Assessment in Kenmare River SAC (Site Code: 02158)", produced by the Marine Institute in October 2017 (the closest available AA report in terms of date I could find) states the following in relation to Mowi's sites in the Kenmare Bay SAC:

"Marine Harvest Ireland (MHI) operates two sites, Inisfarnard and Deenish. At both sites there is space for fourteen 128m circumference net pens, with 15m sides. The cubic capacity of each net pen is 19,600m3, leading to an overall volume of 274,400m3 and at maximum allowable stocking density, a potential standing stock of 2,744 tonnes. Each site also has a feed barge, moored on site, which can hold a maximum of 200 tonnes of feed. The feed barge can feed the stock automatically throughout the day, each net pen has cameras installed to monitor the fish, optimising feed conversion rate and minimising

waste. The sites operate on a two-year annual alternate site stocking cycle, inputting 800,000 smolts, to each site alternately and harvesting them in year two from months 16 to 22. The site is then left fallow for two months before next smolt input. These sites are accessed from piers in Castletownbere, Travarra and Ballycrovane."

The maximum standing stock (an estimate of the total weight of fish that could be present on a fish farm) recorded in this assessment relates to each site, Deenish and Inisfarnad individually and shows that higher values than those recorded in 2016 were considered and assessed in this Appropriate Assessment by the Marine Institute in 2017. However, there does not appear to be a similar Appropriate Assessment carried out for SPA sites potentially impacted by this Aquaculture site. The DAFM Conclusion Statement that appears to accompany this 2017 AA report also does not reference SPA sites.

Overall, I have found no evidence in my review that the data available indicated an increased negative environmental or ecological impact due to the increased fish harvested from Deenish Site T06/202 in 2016 under the headings examined. Benthic and water quality values did not show any declining values. Sea lice showed an increase but only for one month and at a time of year where sea lice infestation is known to cause reduced impacts to wild fish. There was no evidence of escape events, serious disease outbreaks or introductions of invasive species.

I have concerns however regarding how robust and complete the Appropriate Assessment relating to Site T06/202 was in 2016 and unfortunately time constraints don't allow me to examine this in more detail. An AA was carried out in 2012, at least to Stage 2, to assess any impacts of increasing stock numbers on the site as part of their trial licence application. The Marine Institute, when carrying out their 2017 AA Report of Kenmare Bay, does appear to have considered a standing stock on site that was significantly higher than the harvest amount indicated in the licence. However I cannot draw any definite conclusions on this point at this time.

Technical Advisor: Dr Ciar O'Toole
Date: 12 April 2024