An Bord Achomharc Um Cheadúnais Dobharshaothraithe
Aquaculture Licences Appeals Board

AP2/1-14/2015 Shot Head

Site Visit Report of the ALAB Technical Advisor:
Dromagoulane/Trafrask River Catchment, Adrigole, Co. Cork, 5th March 2021

Background

Following on from discussions with the Board at the Board Meetings of the 10th December 2021 and 12th January 2021, a site visit was undertaken to the Dromagoulane/Trafrask River catchment on 5th March 2021. The Board had tasked me, as ALAB Technical Advisor, to investigate the suitability of the habitat for salmon and trout (salmonid) spawning access and suitability for juveniles, particularly in terms of access to the middle and upper reaches of the catchment.

This site visit was undertaken as part of further investigations of the potential effect of the proposed activity on the Freshwater Pearl Mussel (*Margaritifera margaritifera*) recorded as being present in the Dromagoulane/Trafrask River catchment as part of a study undertaken by E. Ross for the NPWS in 2008. This is the most recent Freshwater Pearl Mussel (FPM) survey known to have been carried out on this catchment (Ross, 2009). The outstanding question focused on which particular juvenile salmonid present in the catchment was likely to be the host for the FPM glochidia. This is the stage in the life history of the FPM where they live attached to the gills of juvenile salmon or trout for up to nine months.

Juvenile salmon and trout spend their time in freshwater. After a period of one to three years, young salmon (*Salmo salar*), now known as smolts, leave rivers in the springtime and migrate to sea for access to feeding grounds. Trout (*Salmo trutta*) have two main life history patterns in Irish waters, that of the Brown Trout, which spends its entire life history in freshwater (rivers and lakes) and the Sea Trout, which is more similar to the life history of salmon – young trout smoltify and migrate to sea for feeding in the springtime.

Because of these life history patterns, only sea trout and salmon spend part of their life at sea, and could potentially be affected by developments/changes in the marine environment, such as the development proposed here. Juveniles of both species can equally act as hosts for FPM glochidia, and it is not thought that FPM prefer one species over another, rather attaching to whatever juveniles are present.

The FPM is an endangered species listed under Annex II and V of the EU Habitats Directive and protected under the Convention on the Conservation of European Wildlife and Natural Habitats. It is legally protected in Ireland under Schedule 1 of the Wildlife Act, 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations (S.I. No. 477, 2011) (as amended). As such, any plans developments or activities that may cause undesirable impacts on populations must be fully evaluated. Salmon and trout populations in the Dromagoulane/Trafrask River are not protected and it is not a designated National Salmon River.

The decline of FPM in recent years have been attributed to river water quality, largely as a consequence of discharges or contamination from domestic or agricultural sources, with increased levels of siltation and nutrient loading being of particular risk.

This site visit sought to establish whether it was more likely that the mid and upper reaches of the Dromagoulane/Trafrask River were used for spawning by non-migratory trout, and were therefore mainly inhabited by juveniles from non-migratory trout parents, due to difficulties in accessing the upper and middle reaches by migratory salmon and sea trout.

Previous Work

Previous work and comment on the topic of FPM in the Dromagoulane/Trafrask River and their potential for being affected by the proposed development described in appeal AP2/2015 by and on behalf of the ALAB Board has included:

An assessment, included in the Shot Head (AP2/2015) Technical Advisor's Final Report, by Dr Graham Saunders (dated 8th December 2020) which stated on page 102:

" the proximity of the proposed Shot Head salmon farm to the Trafrask embayment entrance might arguably constitute an enhanced sea lice risk, in which a significant infestation event may substantially affect the viability of the river's salmonid population. The key issue for the Board to consider is therefore whether the Applicant's recently submitted Integrated Pest Management Plan is sufficient to mitigate any future fish farm-derived impact on salmonid populations within the Dromagowlane/Trafrask River."

And as part of the final conclusions and recommendations on page 104:

"Overall, the present situation suggests that lice issues remain a low-level risk. We do, however, believe that the evaluation of residual risk to the salmonid populations (and by association the freshwater pearl mussel population) in the Dromagowlane/Trafrask River system suffers from some uncertainty and an associated lack of data necessitating caution and a deference to advice from appropriate conservation bodies."

The Board has since accepted the Applicant's Pest Management Plan as being sufficient to mitigate risk of wild salmon sea lice infection, most recently at a Board meeting on the 12th January 2021. However, out of an abundance of caution, it was also decided to further investigate any possibility of a decline on salmonid populations in terms of knock on effects to FPM in the Dromagoulane/Trafrask River catchment.

The appropriate bodies in this case are NPWS, IFI and the Marine Institute. The NPWS, IFI and FPM experts were consulted by the Applicant as part of a S47 Notice into FPM populations in the catchment as described in the Final TA report pages 101-102 (Saunders, 2020). Further contributions are detailed below:

On Day 1 of the Shot Head Oral Hearing on 14th February 2017, Dr Jervis Good of NPWS gave evidence about the conservation issues for FPM (ALAB, 2017). He explained that the principal conservation issue is that of phosphate contamination of waters and siltation and that there exists little evidence to date that salmon production has impacted freshwater pearl mussels locally. He characterised the Dromagoulane/Trafrask population as an important one as low levels of intensive forestry and agriculture in the catchment would make it relatively easy to take measures for freshwater pearl mussel conservation. Therefore, smaller rivers, which might not be designated for protection as SACs may have a particularly significant role to play in freshwater pearl mussel conservation.

Dr David Jackson of the Marine Institute had previously submitted the opinion to ALAB in a written response to the Board's Notice issued pursuant to section 47 of the Fisheries (Amendment) Act 1997 that resident brown trout were the likely hosts for FPM glochidia larvae in this catchment.

Inland Fisheries Ireland (IFI) carried out a semi-quantitative electrofishing survey of the catchment in summer 2017. The results of this survey showed that juvenile salmon were absent in some sites, but juvenile trout were present in all sites. Looking at the map provided, there was a suggestion that the topography of the catchment could be a factor in this division. It should be noted here, that Brown Trout and Sea Trout cannot be differentiated visually while they are juveniles in freshwater.

Site Visit

I have extensive experience with salmonid ecology and habitat use and it was decided that it would be useful for me to visit the site myself, which I did on the 5th March 2021. It is a sparsely populated, hilly area where land use appears to be mainly for grazing cattle and sheep. The catchment itself is composed of a number of small narrow tributaries joining together in the lower portion to form approx. 1km of a small river before flowing into Bantry Bay. This river was very shallow in its observable portions and was never seen to be wider than 2m. The tributaries were never observably wider than 50 cm, and in many places were far narrower than this.

This site visit sought to establish whether it was more likely that the mid and upper reaches of the Dromagoulane/Trafrask River were potentially used for spawning by non-migratory trout, and were therefore more likely mainly inhabited by juveniles from non-migratory trout parents, due to difficulties in accessing the middle and upper reaches by migratory salmon and sea trout. Using the maps provided by IFI of their electrofishing sites, and maps and coordinates from Ross (2009), a survey was carried out of the catchment over several hours on the afternoon of Friday March 5th 2021. Weather on this occasion was dry and breezy and there had been no significant rainfall for the preceding seven days, meaning water level in the catchment was low.

The catchment is on a steep gradient with a number of complex falls composed of bedrock throughout the catchment, from the lower portions onwards. Habitat appears to be cobble/gravel in the lower reaches from my observations with large areas shaded by growth on the banks. Within 1 km approx of the road bridge at R572 there are complex falls over bedrock and increasing gradient. This continues throughout the catchment across all tributaries from my observations, with a mixture of cobble and gravel areas and bedrock. Further up the catchment there are larger stretches of exposed bedrock. Due to the nature of the growth over the narrow tributaries, it was only possible on this occasion to observe from the roadside and bridges. However, even given this limitation, it was possible to revisit the sites electrofished by the IFI team in 2017 and to observe the habitat above and below the tributary where the majority of pearl mussels were observed in 2008 by Ross (2009), as well as revisiting the areas of the sites where they failed to observe FPM during that survey (Figure 1). From this, it was possible to determine an overall impression of conditions in the catchment and likely spawning areas from migratory salmonids (salmon and sea trout).

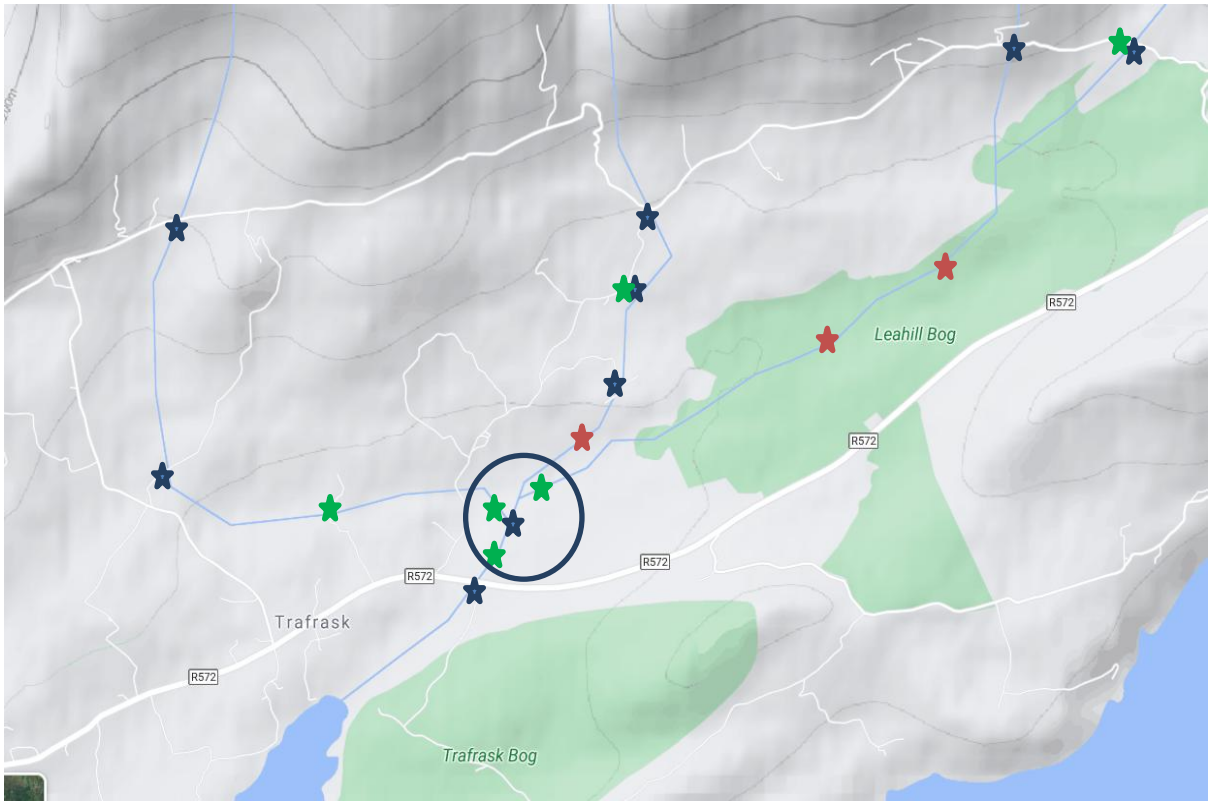

Figure 1*: map showing FPM populations in 2008 (orange stars), IFI electrofishing locations in 2017 (green stars) and observation sites of the ALAB technical Advisor, March 2021 (blue stars). The area enclosed by the circle highlights the three green stars indicating the locations during the IFI's electrofishing survey in 2017 where juvenile salmon were recorded. No juvenile salmon were recorded in the other sites indicated by the green stars, only juvenile trout.*

The lower reaches of this small, shallow catchment, before the watercourse splits into three, appears to have the best salmonid spawning and juvenile habitat of the catchment, with plenty of cobble and gravel areas and a riffle, glide pool formation visible in a number of areas. On moving upstream to the various tributaries, the streams become very narrow (less than 50cm) and water levels on the date of the visit were very low. Suitable habitat for salmonids also reduced as gravel and cobble areas became interspersed with bedrock. There were also a number of falls observed of varying heights (from approximately 1.5 to 8 metres height), and levels of complexity in all tributaries observed. While not impossible for migratory salmonids to move from the lower to the middle and upper reaches of this catchment, it would be improbable, with access would limited to times of high flow for spawning adults and limited suitable habitat for spawning to be found upstream.

FPM Habitat Concerns

Concerns were also raised for the current status and ongoing suitability of the catchment for FPM given the lapse of 13 years since the last assessment and the species sensitivity to disturbance or declining water quality. It was noted that no juveniles were recorded during the 2008 surveys, indicating no recruitment for the preceding decade at least (Ross, 2009). From the literature (Ross 2009, Moorkens 1999) and the statements given by NPWS staff at the Oral Hearing, the main threat to FPM in Irish catchments are due to nutrient and sediment run off leading to the death of juvenile stages of the animal. Urgent remedial action and protection was called for at this time by the authors but to date no such action has been taken.

Cattle crossings/drinking access points were noted in at least three sites in the catchment, and along the upper reaches of a main tributary where FPM had been detected in 2008 were a number of road scrapings and sediment piles beside the stream. Any heavy rainfall would have washed sediment into the stream which could well impede for ongoing survival of FPM in catchment.

Conclusion

After visiting the site myself and carrying out the review of available information detailed above, I feel it is entirely reasonable to form the scientific opinion that in this small catchment, the majority of the salmonid host for FPM would be non-migratory brown trout juveniles that are resident in that part of the catchment. As such, it is my considered opinion as the ALAB Technical Advisor that a decline in the migratory salmonid populations of the Dromagoulane/Trafrask catchment would not negatively impact on any remaining FPM populations present in the catchment.

Dr Ciar O'Toole
ALAB Technical Advisor
28th May 2021

References

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Appendix 1: Photographs taken during site visit, 5th March 2021

Plate 1: Lower reaches of the catchment. Photograph taken from R572 Road Bridge close to Trafrask National School

Plate 2: One of the main tributaries in the lower reaches before joining the main river.

Plate 3: tributary in Mid-reaches of catchment

Plate 4: Waterfall over bedrock in mid reaches of catchment

Plate 5: Mid/upper reaches, with tributary flowing over bedrock

Plate 6: Waterfall over bedrock in mid/upper reaches of catchment

Plate 7: Pile of lose soil beside tributary in mid/upper reaches. Stream is located in dip directly behind pile of soil

Plate 8: Pile of lose soil beside tributary in mid/upper reaches. Stream is located in dip directly behind pile of soil

Plate 9: Pile of lose soil beside tributary in mid/upper reaches. Stream is located in dip directly behind pile of soil