



Habitat Advisory visit to the Rosses
Fishery, Co.Donegal, Eire
Undertaken on behalf of the Rosses
Anglers' Association by Vaughan
Lewis, Windrush AEC Ltd
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1.0 Introduction

This report forms the output of a site visit to the Rosses Fishery, Co. Donegal, Eire on 23rd August 2004 on behalf of the Rosses Anglers' Association (RAA). Information in the report is based on observations on the day of the visit and additional comments provided by John Boyle, Chairman of the club and a fishery survey report undertaken by the Central Fisheries Board.¹

Throughout the report, normal convention is followed, with right bank (RB) and left bank (LB) of the river identified when looking downstream.

2.0 Fishery Description

Centred on the town of Dungloe, The Rosses fishery comprises over 100 loughs in the County of Donegal in the North west of Ireland. Many of the loughs sustain runs of migratory sea trout *Salmo trutta* and Atlantic salmon *Salmo salar*. These have historically provided good quality fishing to local anglers and have attracted visiting anglers², with associated benefit to the local economy. However, catches, particularly of sea trout, have declined significantly since the early 1980's. Recent boat fishing matches held on lochs in the system produced a total of no more than 3 sea trout. The reasons for this decline are not immediately apparent. There are no salmon cage rearing units in the immediate vicinity, effectively eliminating this issue. There is however, a continual and possibly increasing, level of poaching of migratory salmonid fish. The short, narrow streams connecting the loughs to the sea are easily netted, with potentially damaging consequences for runs of returning salmon and sea trout.

Three systems were visited during the advisory visit, namely:

- The Meela system
- The Dungloe system
- The Owenamarve system

2.1 The Meela system

Lough Meela is the primary fishery on this system. It lies within 400m of the sea, with its outlet stream controlled via a tidal flap. This was installed some years ago in order to control ingress of saline water to the lake and surrounding agricultural land.



Tidal flap on outlet from Lough Meela

A species of coarse fish, believed to be roach *Rutilus rutilus* or rudd *Scardinius erythrophthalmus* was introduced to the lough approximately 5 years ago. The population of these fish has expanded rapidly, with concerns expressed by the local anglers that this could be to the detriment of the brown trout population.

Fisheries survey results¹ from the outlet stream downstream of the tidal gate indicated a poor density (0.02 fish/m²) of trout fry (0+ fish) and a moderate density (0.22 fish/m²) of fish >0+.

2.2 The Dungloe system

The Dungloe system is complex, with a large catchment and a number of major fisheries including Loughs Dungloe, Craghy, and Sallagh.



Lough Craghy

A total of 9 sites was surveyed within the Dungloe system during September 2002¹. No salmon were captured at any site on the system, with recorded juvenile trout densities ranging from a poor 0.02 fish/m² to an excellent 1.26 fish/m².

Of the sites visited during the advisory visit, that on the stream between upper and lower Lough Craghy had the highest density of trout. Unfortunately, only some 400m of this channel was accessible from the lower lake due to the presence of at least two boulder dams, that effectively blocked the channel to migrating fish. Similar obstructions and associated issues have been identified on other streams in the system. In addition, the stream was heavily shaded by gorse and other shrubs, particularly below the roadbridge.



Boulder obstruction to migrating fish above Lough Craghy

There were small/moderate conifer plantations in the Craghy catchment, with associated drainage ditches clearly visible. Data obtained during sampling in 2002¹ suggested an Environmental Protection Agency (EPA) Q value of 4 for this site, indicative of good water quality.

Lough Sallagh is a narrow lake located on the eastern branch of the Dungloe system. It traditionally produced excellent catches of sea-trout from both the shore and boat. However, in recent years, catches have declined, not only due to a general demise in

fish numbers but also due to reduce access to fishable water as a result of an dramatic increase in the growth of broad-leaved pondweed *Potamogeton natans*. Stands of this plant covered extensive areas of the lough, effectively preventing angling taking place. Growth of the weed may be linked to a reduction in lake levels due to drainage activity and changes in sluice operation on the system, and increased nutrient levels due to domestic effluent and agricultural fertilisers. The latter point was reinforced by the presence of filamentous algae in the inflowing watercourse.



Lough Sallagh showing extensive growth of broad-leaved pondweed

This stream to Sallagh was surveyed in 2002, with moderate densities (0.32 fish/m^2) of 0+ trout and very poor densities (0.02 fish/m^2) of >0+ fish recorded. Lack of deeper water for adult fish was identified as a possible reason for low numbers of >0+ fish, along with the close geographic proximity of Lough Sallagh that provided good habitat for large fish.



Inflow stream to Lough Sallagh immediately upstream of the lough

2.3 Owenamarve system

This is the only system examined during the advisory visit that has a self-sustaining stock of Atlantic salmon. There was a significant set of falls on the Owenamarve river just upstream of the N56 that formed a barrier to migratory fish over a wide range of discharges. Low densities of trout fry, parr and salmon parr were recorded below the falls during the 2002 survey, with the absence of salmon fry and poor trout fry density attributed in part to the lack of suitable gravel substrate. Advice regarding possible changes to the falls to improve passage were provided in the Central Fisheries Survey Report¹.

Upstream of the falls, large areas of potential spawning for salmon and sea trout were present. Surveying revealed low densities of both juvenile salmon and trout, possibly as a result of the impact of the falls on migrating fish. A new bridge had been recently constructed across the river, with gravel introduced to the site as mitigation for the environmental impact of the work.



Waterfall on the Owenamarve river

3.0 Fish stocking

As a result of the decline in the fishing quality, RAA has undertaken an annual stocking of hatchery reared brown trout. Some 4,000 fish between 450g – 1kg are stocked annually, being split equally between the Loughs Meela, Craghy and Dungloe. These fish are introduced in 3 stockings during the season and enable the continuation of the regular angling competitions, which generate much needed income for the local economy.

However, there is concern within some elements of the club regarding the impact of these fish on the indigenous stock of brown and sea trout.



RAA headquarters on Lough Craghy

3.0 Recommendations

Meela system

The tidal flap at the lower end of the Meela river prevents access to migrating fish except during spate flows. Provided that there are no unknown and over-riding reasons for retaining the flap in its present closed state, then it is recommended that it should be fixed in an open position for a trial period. This will allow access for fish up and down the river at all states of tide and river flow. It will however allow tidal back up into the river and possibly the lough during higher spring tides.

The establishment of a viable roach/rudd population in the lough may have some impact on its ecology. Without detailed study, the extent of this is impossible to determine. However, on the precautionary principle, it would seem prudent to control numbers of the introduced fish. This can most easily be achieved using a combination of box traps, fyke nets and seine netting if weed growth is not extensive. If traps are used, then it is imperative that suitable otter guards are placed over their entrances, preventing otter deaths without reducing trapping efficiency. The legal position with respect to the use of traps should be confirmed with the North west fisheries board, who may be able to arrange live disposal of captured fish to coarse fisheries elsewhere in Ireland.

Dungloe system

The presence of boulder dams on the streams above Lough Craghy is limiting access for migratory fish to extensive sections of potential spawning. Consideration should be given to removal/modification of these dams, both on the stream visited during the advisory visit and on those identified in the Central Fisheries Report. If the obstructions could be removed, recruitment of juvenile trout to the system would be expected to increase significantly.

The practicalities of removal are difficult, with access a significant problem. The use of blasting could be explored with a professional organisation experienced in the field of mining/mineral extraction. Clearly, the use of such a technique carries significant health and safety risks, and legislative requirements, that should be addressed as part of any project planning.

The tributary stream visited was over-shaded in places, reducing the abundance of low fringing cover, valuable for juvenile trout. If resources allow, a programme of rotational brush-cutting should be initiated in order to create a mosaic of dappled shade on all major spawning tributaries.

Lough Sallagh system

The key issue identified on this system is the recent growth of broad-leaved pondweed in Lough Sallagh itself. Ideally, this problem would be addressed at source. However, as this would require re-instatement of the former water level in the lake, the removal of agricultural drainage in the area and prevention of the ingress of nutrients into the lough from diffuse sources, this is unlikely to be a realistic option.

Options for treatment of the weed are thus limited to the use of approved herbicides, mechanical cutting or shading material, for instance sheets of black polythene. Whilst the latter technique is attractive with respect to cost and lack of environmental impact, the practicalities of its use are daunting on a waterbody of this size. If however, the club feel that they can lay out sufficient sheeting and anchor it firmly to the bed of the lough, then it may be worth considering a small scale trial that could be extended at a later date if proved to be effective.

Partial chemical treatment of the weed is theoretically possible using 2 approved herbicides, dichlobenil and glyphosate. Dichlobenil is used as a pre-emptive treatment during early spring, whilst glyphosate is used to treat the actively growing plant once its leaves have emerged onto the water's surface. Broad leaved pondweed is categorised as 'moderately susceptible' to both herbicides. Of the two herbicides, glyphosate offers the cheapest and least environmentally damaging option being inactivated on contact with water and sediment. Dichlobenil has significant residual effects, with control sometimes lasting into the following season. Given the ecological importance of the Rosses fisheries, careful consideration must be given before contemplating the use of any herbicide. Detailed advice on the use of herbicides can be obtained from the Centre for Aquatic Plant Management capm.org.uk. In addition the legal position on the usage of herbicides in Ireland should be confirmed with the fisheries board, and all necessary legal consents obtained.

Physical cutting of the weed provides perhaps the best option for the club. Hydraulically powered weed cutting boats are used routinely in Ireland, particularly on the canal systems (see Central Fisheries Board Website for details www.cfb.ie) They have the potential to cut large amounts of weed in a day and their use would therefore need to be carefully monitored in order to avoid ecological damage. In addition, the rate of growth of submerged weed is likely to be such that repeat cutting during the angling season is required, significantly increasing potential costs.

Rather cheaper but more labour intensive are the various hand operated chain scythes. These consist of linked sets of blades or knives that are stretched out across the bed of the lake and 'sawed' backwards and forwards by operatives on each end of the chain. The cut weed floats to the surface and can be removed when it floats into the edge. The scythes can be obtained in the UK from Aquatic Services (0044 1387 850580 or email: sales@aquatic-services.co.uk)

With respect to the stream flowing into Lough Sallagh, the Central Fisheries Board report recommends the creation of deeper pools by the selective placement of larger boulders. This recommendation is endorsed, with the caveat that the boulder placement should be carefully considered in order to minimise the risk of significant bank erosion.

Owenamarve system

The key issue on the Owenamarve system is the impact on upstream migration of the falls as described above. The head loss at the downstream end of the falls is currently too great for fish to negotiate over a large range of discharges. In addition, the depth of the downstream stilling pool is insufficient for optimum ascent. In order to address

this, boulders should be re-arranged downstream of the fall in order to increase the depth of the stilling pool, reducing the effective head loss for fish to negotiate.

Within the falls themselves there is scope for the creation of a series of resting pools that would aid fish passage. These should be constructed on a temporary basis by moving large boulders within the falls. If these temporary structures are found to be effective, more permanent features could be put in place using a combination of boulders, rebar and concrete.

Improved access over the falls would open up a considerable length of potentially excellent spawning habitat for salmon and larger sea trout. However, the mitigation gravel placed in the river when the new bridge was constructed is in an inappropriate location. It should be re-distributed into the zone of peak flow, probably upstream of the bridge, in order to optimise its benefit to spawning fish.

General recommendations:

Given the parlous state of the sea trout and salmon stocks, it is recommended that a policy of 'catch and release' is adopted, at least until stock levels have recovered considerably. This will maximise the spawning escapement of fish, and promote natural recruitment to the system.

A programme of redd counting should be instigated on all known major spawning streams. Ideally, night counting should be undertaken during November and December, with numbers of redds in key areas recorded. Annual recording of this type allows for a reasonable assessment of spawning success.

With respect to artificial rearing of fish, there are a number of key concerns:

- There is a risk that brood fish removed from the redds will reduce the number of eggs deposited naturally. If this figure is below the level required to sustain stock in the system, then brood stock removal could be damaging
- There are concerns that artificial rearing could damage the genetic integrity of the natural fish population. This is particularly true if eggs are obtained from fish outside the catchment. The article by Andrew Ferguson in the 2004 edition of *Salmo Trutta* (also on WTT website) argues this concern cogently
- Heavy stocking with hatchery origin fry or parr could 'overload' the system, leading to unwanted behavioural conflict between wild and hatchery reared juveniles

Notwithstanding the above, it is likely that introducing juvenile offspring of fish native to the system will be less damaging than the present policy of introduction of large numbers of adult brown trout from outside of the system. Whilst accepting the need for the club to maintain angling interest in the system, with the associated economic benefit to the local community, it is very likely that continued heavy stocking with hatchery reared adult fish from out with the system may significantly affect the stocks of native brown/sea trout. Possible mechanisms include influencing the balance between non-migratory brown trout and migratory sea trout, intraggression of fish farm genes and undesirable behavioural interactions.

Prior to embarking on any hatchery project, detailed practical and scientific advice on such a project should be obtained. Practical advice might best be sought from Peter Mantle at the Delphi Fishery, whilst the Salmon Research facility at the Marine Institute, Furnace, Newport, Co. Mayo (contact Deirdre Cotter 098 41112) may be able to undertake an assessment of the spawning escapement required to produce adequate sea trout and salmon egg deposition in the catchments

One other possibility might be the use of deep substrate incubation boxes. Basically, these are gravel filled boxes, approximately 0.6m in each dimension, that are filled with suitably sized gravel and seeded with 10,000 - 20,000 trout eggs. A water feed at the bottom of the box allows the eggs to incubate and hatch. Once they reach the swim-up fry stage, they leave the box via the overspill pipes, stocking themselves into the river. In effect, they are naturally reared fish without the unhelpful behavioural modifications associated with hatcheries. More details on incubation boxes can be found on the Wild Trout Trust web site www.wildtrout.org or in Volume 2 of the Trust's magazine, *Salmo trutta*. The use of these boxes has been trialed successfully on upland streams at Costello and Fermoy fishery, Connemara (contact Terry Gallagher for more information at cosfer@iol.ie).

The macroinvertebrate sampling undertaken by the CFB could usefully be repeated on a more extensive basis, with a view to identifying impacts of acidic run-off, synthetic pyrethroid sheep dip and nutrient enrichment on sub-catchments. Where results indicate that diffuse run-off may be an issue, then agricultural land use might be influenced via the use of the REPS scheme or through encouraging the planting of broadleaved tree buffers around coniferous woodland.

5.0 References

1. A survey of juvenile salmonid populations in the Dungloe and Owenamarve catchments, Co. Donegal Kelly F, Gargan P, Central Fisheries Board March 2002
2. 'The Land of the Rosses' In: *Fishing in Wild Places*, David Street, Gomer, 1989