THE RIVER DON TRUST- *"River in harmony"*

RDT Draft Briefing Note; Determining Broodstock Progeny Placement 2010/11

Introduction

Following acceptance and utilisation of the River Don Trusts (RDT) suggested Hatchery Broodstock Protocols (2010), it was suggested by the Joint Management Group (JMG) that a suitable document be drafted to determine appropriate locations for the collected broodstock progeny from the 2010/11 season. This document following any changes would then identify the rationale for future adult broodstock collection and placement programmes carried out by the Don District Salmon Fishery Board (DDSFB) within the River Don catchment.

In order to identify suitable locations for broodstock progeny placement within a catchment a certain volume of knowledge would first have to be collated, this is the purpose of this document. The RDT and DDSFB agreed that current and historical Electro Fishing data, Habitat Surveys, Historical Broodstock Progeny Location data and Redd Count data would combine to form as clear a picture as possible on the most suitable locations for broodstock progeny placement. In the case of the 2010/11 season this broodstock progeny consists of 300,000 salmon and 50,000 sea trout eggs.

The current distribution of salmon and sea trout present within the catchment is limited by a number of factors. Some of these are as follows; there may be seasonal differences in the migratory range of these species due to water levels and weather conditions. There may also be temporary debris obstacles which have built up preventing migration, or permanent natural obstructions (i.e. Waterfalls) or manmade obstructions such as weirs and fords. The habitat itself may also be unsuitable for adults (i.e to shallow).

Natural obstructions to migrations such as waterfalls will delineate the natural range of migratory fish such as salmon and sea trout within a catchment. To supplement the habitat above these natural obstacles with broodstock progeny (salmon or trout) may cause intra/inter-specific competition which will either way have a detrimental impact upon the resident trout populations. Therefore this Briefing Note will only identify locations suitable for broodstock progeny within the natural extent of migratory salmonids.

Background

The DDSFB have historically been running a hatchery at the Newe Mill site in Strathdon since the 1960's. At its capacity the hatchery held 1 Million eggs at a time when the River Don was heavily polluted due to industrial effluent from paper and textile mills in the lower river. The DDSFB have previously adopted various policies from the then Fisheries Research Service (FRS) now Marine Scotland and have been involved in several projects where Don broodstock progeny has been used in research. The DDSFB catches its adult broodstock at the Newe weir and has distributed its broodstock progeny solely upstream of this point of capture since 2009. The DDSFB has also

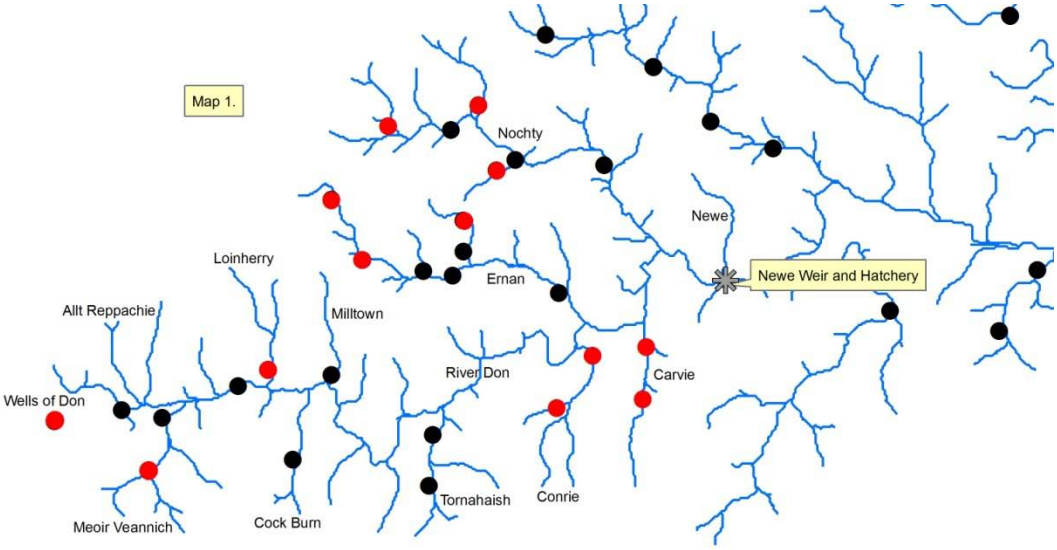
adopted a policy of planting out eyed ova (since 2006) where conditions allow, unfed fry if conditions are unsuitable. Other life stages are not considered to be either as successful or too costly i.e. (fed fry, or parr) and have not been employed by the DDSFB at the hatchery since 2006.

The distribution of the broodstock progeny by the DDSFB has been primarily focused upon the main stem of the River Don above the Newe Weir and it major tributaries as listed here. Water of Ernan, Water of Nochty, Cock Burn, Water of Carvie, Conrie Burn, Milltown Burn, Burn of Loinherry, Burn of Tornahiesh, Meoir Veannich, Allt Reppachie.

Method

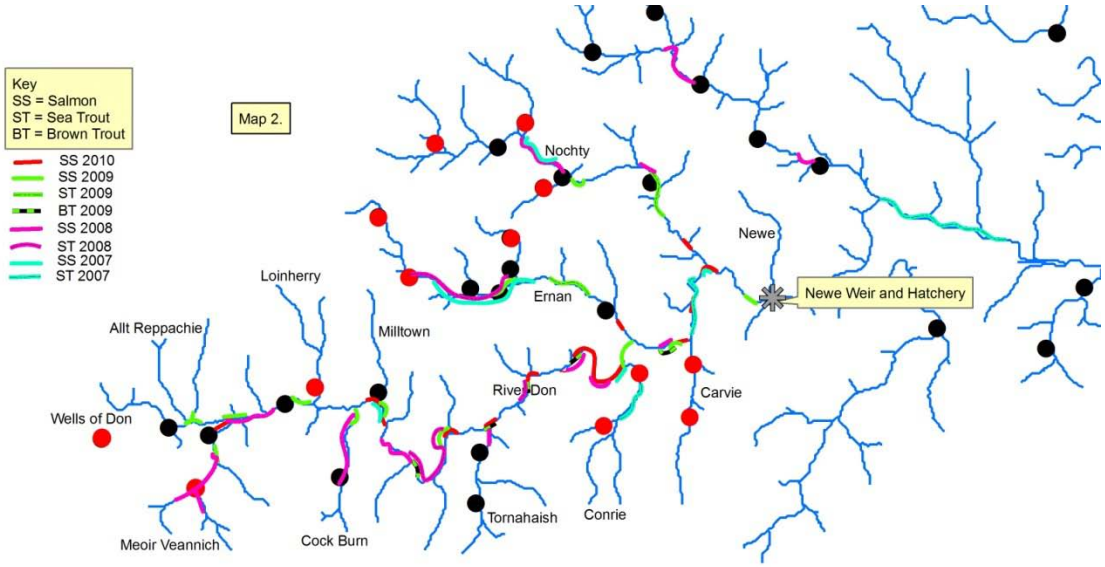
In order to determine the most suitable locations for broodstock progeny for the 2010/11 season information from electro fishing and habitat surveys and historical broodstock progeny placement data was collated and analysed on a map based Graphical Interface System (GIS). The following outputs illustrate the information collated; each map has been cropped to only illustrate the area above the Newe Weir where appropriate broodstock progeny placement can occur.

Map 1.



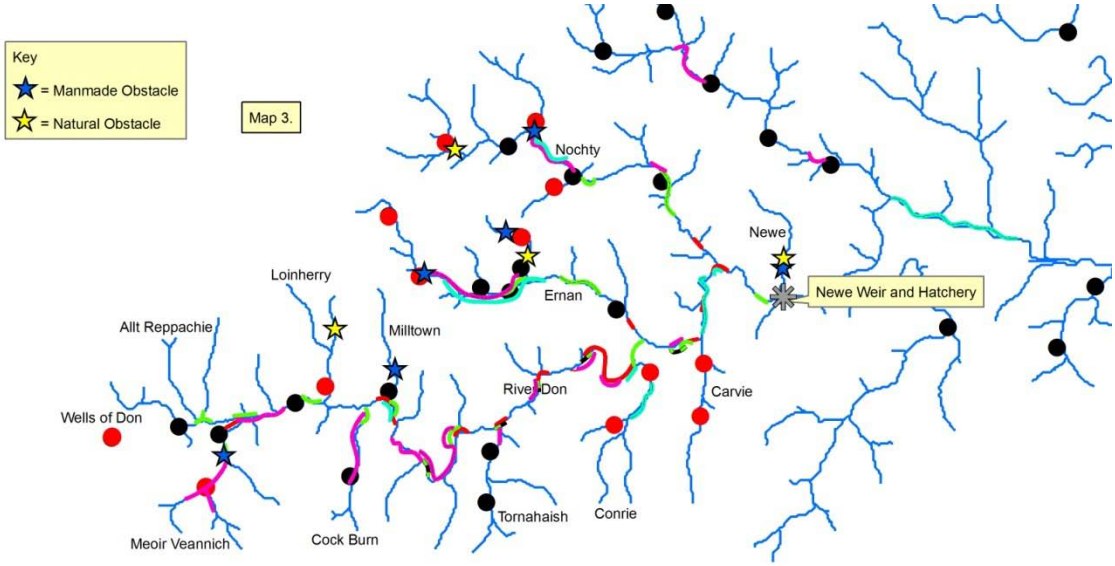
Illustrates the locations of electro fishing sites during the summer of 2010. Those sites indicated by Red dots are sites where no salmon fry or parr were found.

Map 2.



Illustrates the historical locations of broodstock progeny placement by the DDSFB over the past four years. Distribution for each year is indicated by an independent coloured line and species (i.e. Salmon or Sea Trout) is indicated by different style of line.

Map 3.



Illustrates the locations of known manmade (Blue Stars) and natural (Green Stars) obstacles to migratory salmonids.

Conclusions

From the information gathered to date it is evident that there is a need for a more structured broodstock progeny placement protocol, perhaps utilising this same format and complimenting it with further data when available. There are known areas where man made obstacles have been identified and are obvious targets for broodstock progeny placement, this does not however preclude the fact that these obstacles are to be eased in the future. There may also be further manmade obstacles which are yet to be identified, which may alter the outcome of this analysis.

The field work required to identifying potential broodstock progeny locations is already part of the DDSFB work programme. Information such as electro fishing and redd counting data is collected annually at present, all that is required is more rigorous planning to prevent any negative impacts of stocking (intra/inter-specific competition) or cutting into natural redds (physical damage). In order for this to become part of the DDSFB planning it is suggested that the RDT assist with the interpretation of the data, (which it is in the most part is tasked to collect, in order to complete its FMP 2008-2011) until the DDSFB are in a position to undertake the analysis themselves.

The following Map identifies the most suitable areas for stocking within the tributaries of the River Don catchment above the Newe Weir. The lack of suitable data on the main stem has resulted in the exclusion of this body of water from the recommendations.

'Planting out'

It's recommended that the artificial redds be created as previously by the DDSFB but that the depth of a redd should not exceed 15cm to avoid ground water intrusion and low dissolved oxygen impacting egg survival. It's also suggested that some containers be used to ascertain the survival of eggs to fry in some of the sites especially those with known problems relating to survival.

Suggested densities for artificial redds should equal 5eggs/m^2, which is equal 500eggs per 100m^2 this would provide more a manageable figure for planting out with anticipated coverage of fry primarily 100m downstream of the redd site. Maximum known fry dispersal distances are 500m downstream of a redd site so we can again use this figure to prevent any overlap and competition between broodstock progeny. Redd sites should be separated by at least 250m.

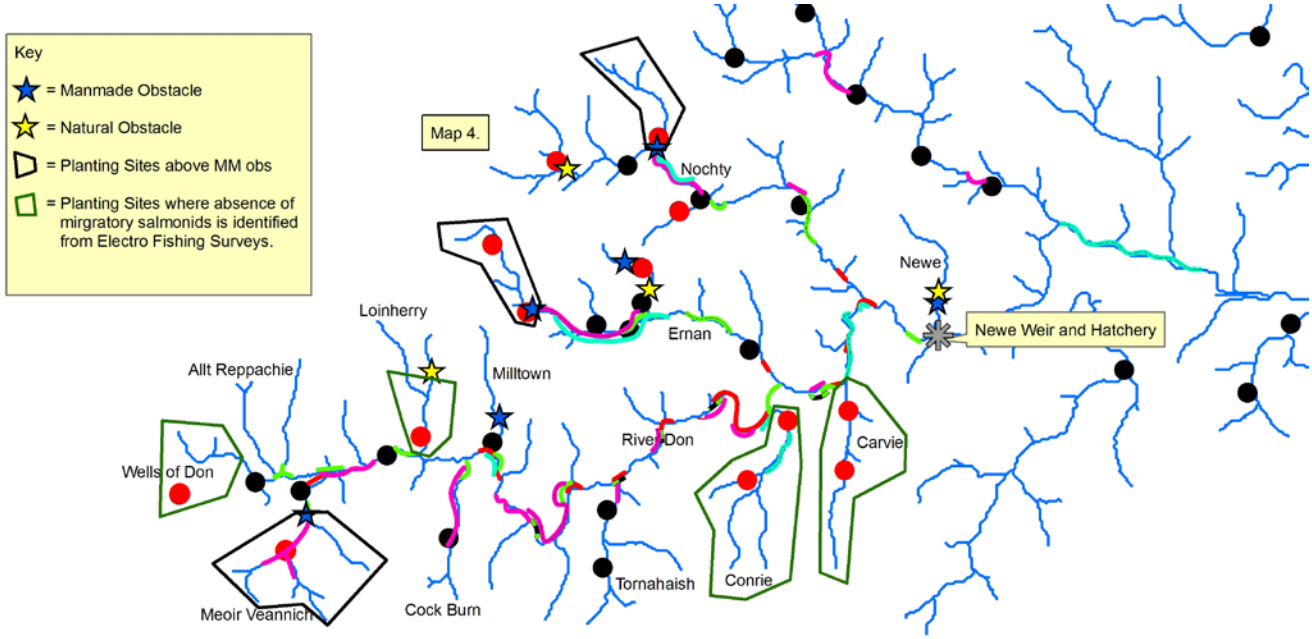
It's also recommended that multiple redds be made rather than single large redds to compensate for environmental conditions or events. Therefore depending upon the habitat suitability downstream of the site, several redds may be made at one redd site.

Habitat suitability has also been considered and recent research has shown that fry survive in habitat which is not suitable for adults to spawn in and therefore could increase the potential area of available habitat to be targeted. Areas such as this should be targeted where appropriate as long as an artificial redds can be created in order to maximise potential coverage.

It's anticipated that this year's number of eggs will exceed the volume of habitat available in these suggested areas (Figure 4.) and it is suggested that the remainder be planted out in areas of the main stem where perhaps

there are areas known to the DDSFB staff to have issues relating to poor production, i.e. an area identified by juvenile electro fishing or an area lacking suitable redd substrate for adults.

Map 4.



Illustrates the preferential areas for stocking determined from the data analysed. Black polygons represent areas of the catchment currently inaccessible to migratory salmonids due to manmade obstacles. Green polygons represent areas of the catchment currently underused by Salmon.