

Know Your River – Mawddach

Salmon & Sea Trout Catchment Summary

Introduction

This report describes the status of the salmon and sea trout populations in the Mawddach catchment. Bringing together data from rod catches, stock assessments and juvenile monitoring, it will describe the factors limiting the populations and set out the challenges faced in the catchment.

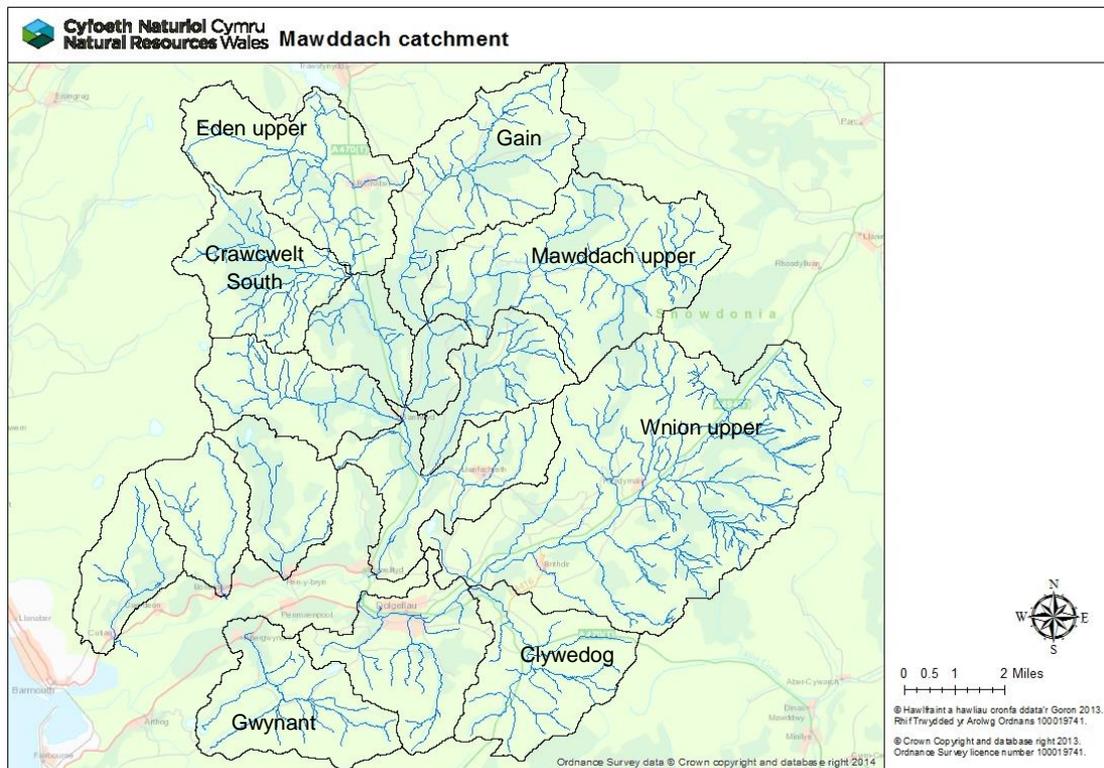
Action tables set out habitat improvements to restore freshwater productivity of salmon and sea trout populations. These tables also include some work which will be carried out by our partner organisations, not just Natural Resources Wales (NRW).

NRW has a duty, defined in the Environment (Wales) Act 2016 to have Sustainable Management of Natural Resources (SMNR) at the core of everything that we do. By applying the principles of SMNR in all of our activities - from agriculture, forestry and flood defence to development planning - we are undertaking catchment-wide initiatives that will deliver for fish stock improvements. Our reports highlight the importance of considering the whole catchment when identifying and addressing fisheries issues; and of working with partners.

NRW is committed to reporting on the status of salmon stocks in all of our principal salmon rivers for the Salmon Action Plans and condition assessments under the Habitats Directive in SAC rivers; all fish species in all of our rivers are reported for the Water Framework Directive (WFD). This report will fulfil these commitments and provide an informative and useful summary of stock status and remedial work planned, for our customers, specifically anglers, fishery and land owners; as well as our partners.

Catchment

The Mawddach catchment is broadly divided into two major subcatchments. The Mawddach subcatchment lies to the north and drains upland moorland which has been extensively



afforested. Migratory salmonid access is limited by natural waterfalls on the main Mawddach, Gain & Wen. The Wnion subcatchment drains the area south and south-east of the Mawddach and enters the Mawddach Estuary approximately 1km downstream of the upper tidal influence on the Mawddach. Again, access too many of the tributaries is limited by waterfalls.

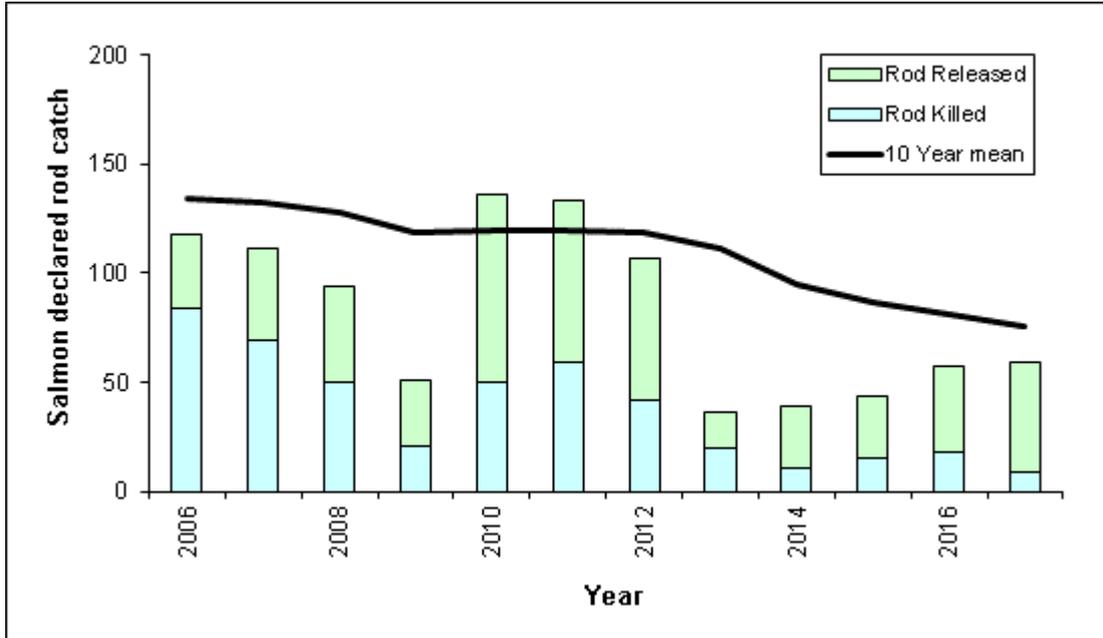
There are acidification problems on both subcatchments, exacerbated by coniferous afforestation. There are heavy metal problems in the Mawddach subcatchment, particularly on the Mawddach, Wen and Gain, where an abandoned munitions disposal site is thought to be responsible for poor fish populations. Water from the western tributaries of the Eden are diverted via the Arduwy Leat into Llyn Trawsfynydd.

In 1984 a major pollution incident on the Mawddach killed thousands of juvenile salmonids and over 2000 adult salmon and sea trout. Since 1987 a remedial stocking programme has operated on the Mawddach which is due to end in 2021. In 2015 salmonid stocking was terminated due to a policy change by Natural Resources Wales (NRW). Any mitigation stocking was to be delivered through opening additional habitat & habitat works. As the Mawddach anglers have a contract till 2021 the option is with them whether to continue stocking or move to habitat works.

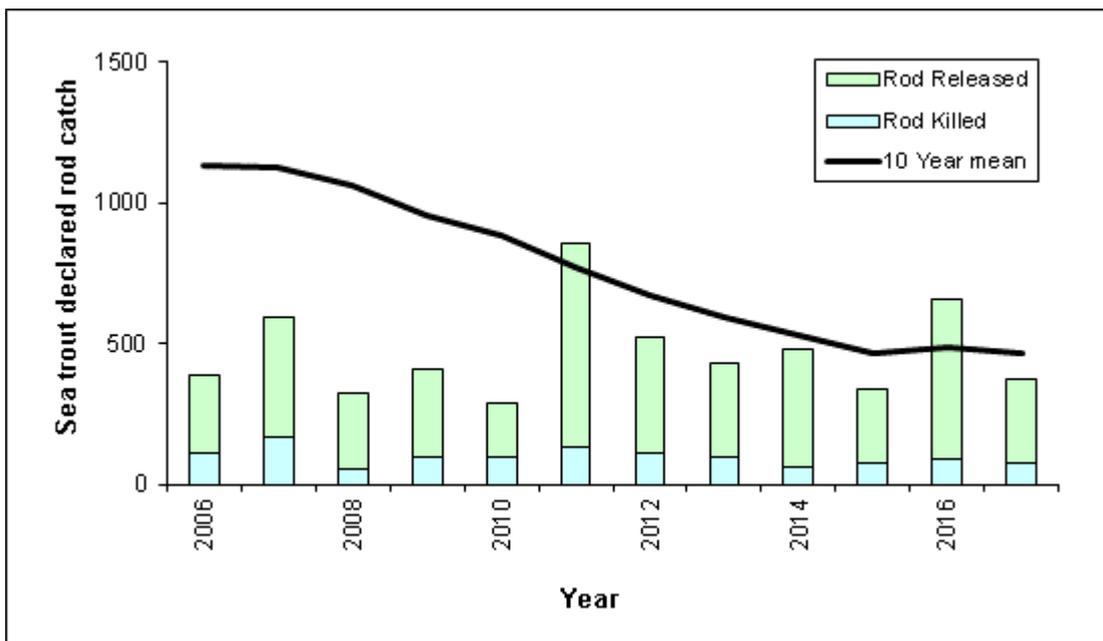
Rod catches

The following graphs show the total declared rod catches of salmon and sea trout on the Mawddach.

Salmon rod catch – has been poor since 2013, but has improved slightly in recent years. The release rate in 2017 was 85%. This is excellent and is the best on record for the Mawddach, this needs to continue to conserve stocks.



Sea trout rod catch – has fallen below the average catch over the last 10 years. The release rate in 2017 was 80% which isn't as good as it was last year.

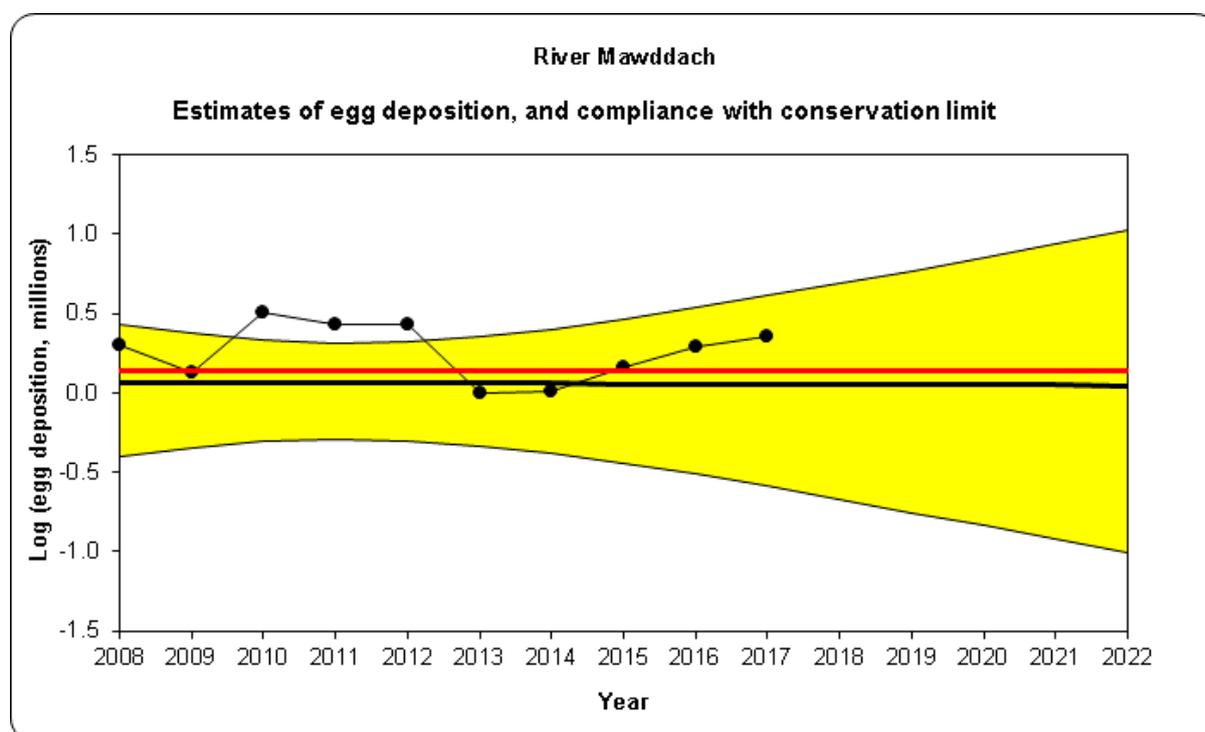


Stock status

Conservation of Salmon

Salmon stock status is assessed using 'Conservation Limits' which provide an objective reference point against which to assess the status of salmon stocks in individual rivers.

This is calculated by applying assumed angling exploitation rates to catch data to derive run estimates; adopting standard sex ratios and weight-fecundity relationships to generate egg deposition figures. The numbers of salmon a river can produce (and consequently the catches that the stocks support) are a function of the quality and quantity of accessible spawning and rearing area. Therefore, in general, big rivers have larger catches and have correspondingly bigger total spawning requirements than small rivers. Thus, for any given rivers there should be an optimum level of stock which the conservation limit seeks to protect. The conservation limit represents the number of eggs that must be deposited each year within a given catchment to conserve salmon stocks in the future.



Are enough salmon eggs being deposited to conserve salmon stocks in the catchment?

The red line represents the number of eggs required to be deposited to sustain a healthy salmon stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2008-2017).

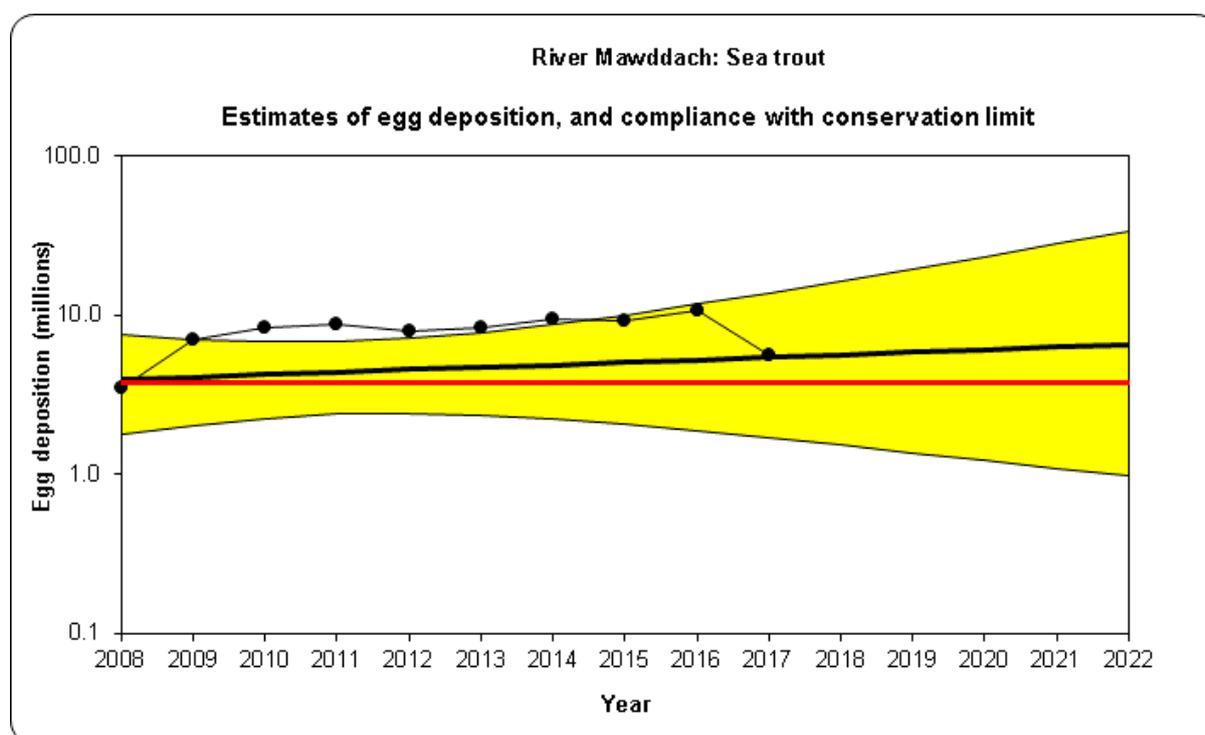
- Current number of eggs being deposited puts stocks **probably at risk**
- In 5 years' time the predicted status of salmon stocks will be **probably at risk**
- Based on current data, and the projection of the graph, the stocks of salmon on the Mawddach will continue to **decline (uncertain)**

Conservation of Sea Trout

In contrast to salmon, no established methods of setting Conservation Limits or similar have been available for sea trout. In the absence of such analysis, NRW and the Environment Agency have, for several years, routinely applied a fishery based assessment to the principal sea trout rivers. This method – used previously in this report - utilises time-series' of angling catch per unit effort (CPUE) data ('catch per day') to examine sea trout performance on a river-by-river basis.

Recently an alternative stock-based assessment method has been developed by NRW and is applied here. This utilises angling catch data to derive run and egg deposition estimates for sea trout in much the same way that similar data sets are used in Conservation Limit compliance procedures for salmon assessment.

Further details on this method are given in the recent Technical Case supporting net and rod fishery byelaw proposals on all rivers in Wales and the cross-border rivers Wye and Dee (see: <http://naturalresourceswales.gov.uk/media/682258/technical-case-structure-final.pdf>)



Are enough sea trout eggs being deposited to conserve stocks in the catchment?

The red line represents the number of eggs required to be deposited to sustain a healthy sea trout stock. The black trend line and its confidence limits (the yellow band) is fitted to the most recent 10-year series of egg deposition estimates (2007-2017).

- Current number of eggs being deposited puts stocks **probably not at risk**
- In 5 years' time the predicted status of salmon stocks will **probably not at risk**
- Based on current data, and the projection of the graph, sea trout stocks will continue to **improve (uncertain)** on the Mawddach

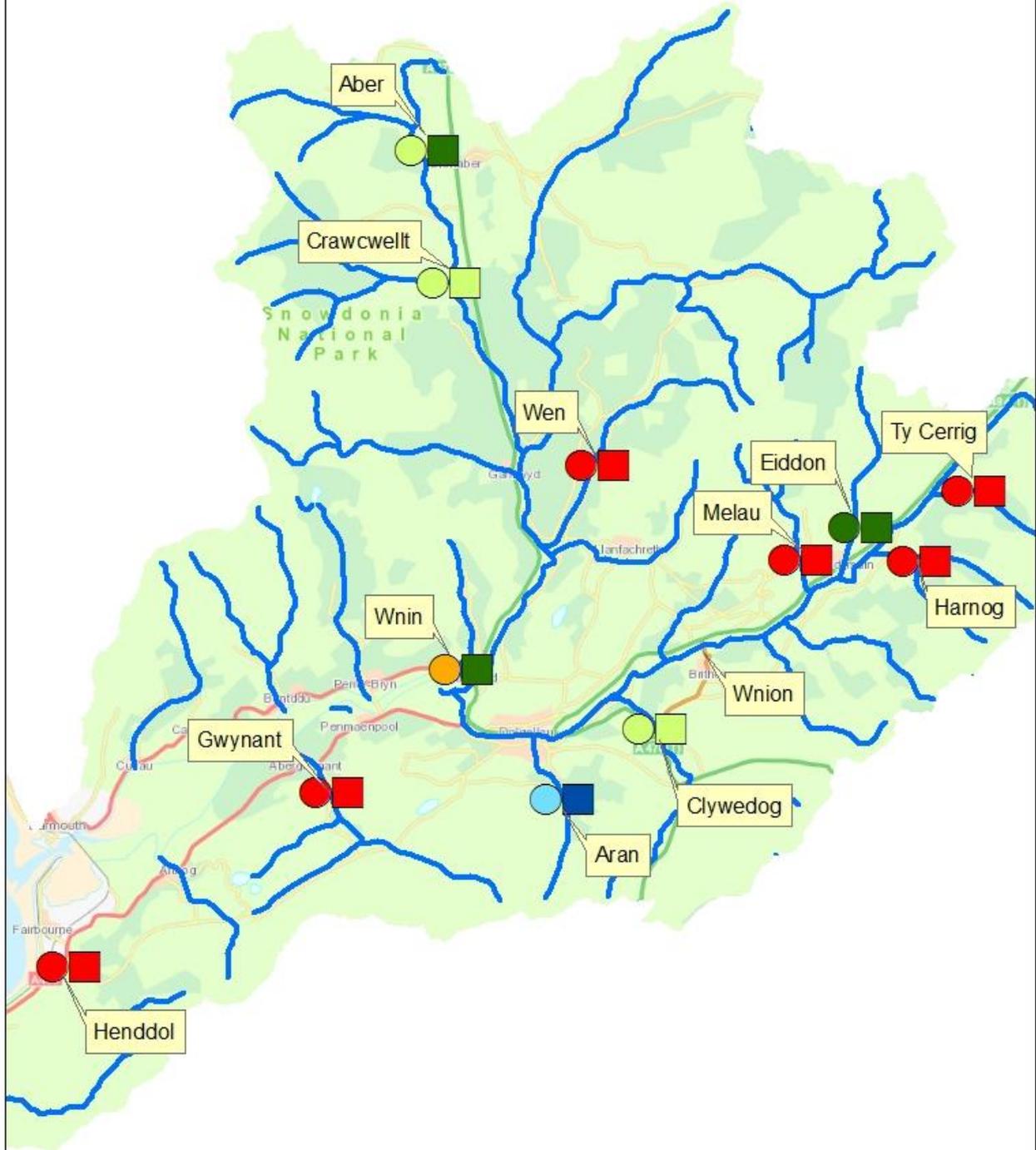
Juvenile Monitoring

The monitoring season was hindered in 2017 by wet weather and high flows. This led to the temporal site on the Mawddach not being completed. This was also the case for most temporal sites in Gwynedd and Meirionydd. The spatial sites were mostly completed on the Mawddach catchment as these concentrate on the tributaries.

The following map shows the results of the 2015 juvenile salmonid population surveys. They display the National Fish Classification (NFC) grades which have been developed to evaluate and compare the results of fish population surveys in a consistent manner. The NFC ranks survey data by comparing fish abundance at the survey sites with sites nationally where juvenile salmonids are present. Sites are classified into categories A to F, depending on densities of juvenile salmonids at the site. The following table shows the values and classification of NFC.

GRADE	Description	Interpretation
A	Excellent	In the top 20% for a fishery of this type
B	Good	In the top 40% for a fishery of this type
C	Fair	In the middle 20% for a fishery of this type
D	Fair	In the bottom 40% for a fishery of this type
E	Poor	In the bottom 20% for a fishery of this type
F	Fishless	No fish of this type present

Mawddach Salmon Grades 2017



National Fisheries Classification Scheme

 A	 C	 E
 B	 D	 F

Salmon fry 
 Salmon parr 

0 2.25 4.5 Kilometers



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Five minute fry additional timed surveys 2017

These surveys are carried out on riffles with the prime target being salmon fry. Fishing is carried out for 5 minutes. The sites are generally main river and to large to carry out a normal spatial survey. Sites were very similar to the historic data.

