

2010

Loughs Agency Water Framework Directive Fish in Rivers Classification Report



Loughs Agency of the Foyle
Carlingford and Irish Lights
Commission

Report Ref: LA/WFDFISHNI/10

Loughs Agency Fish in Rivers Water Framework Directive Fish Classification Report 2010



For Northern Ireland Environment Agency 2011

For further information contact:

Art Niven (Fisheries Research Officer)

Loughs Agency

22, Victoria Road

Londonderry

BT47 2AB

028 71 34 21 00

art.niven@loughs-agency.org

Written and
prepared by:

Art Niven

Maps Prepared by
Rico Santiago

Table of Contents

Executive Summary	6
LA fish classification 2010 based on five sites surveyed within the Foyle and Carlingford areas ..	6
1.0 Introduction	7
2.0 Basis for Water Framework Directive Fish Classification.....	7
Table 1. Professional judgement criteria after O'Connor 2009, AFBI.....	8
Table 2. Habitat classification based on Department of Agriculture for Northern Ireland (Fisheries Division) advisory leaflet on the evaluation of habitat for salmon and trout	9
3.0 Classifications.....	10
3.1 F10022 Burndennet R at Burndennet Br GBNI1NW010101070 Burndennett WFD Fish Classification 2010	10
Table 3. Removal sampling results *Note SB = Stickle Back and SL = Stone Loach	10
Fig 1. Total catch	10
Fig 2. Density/100m ²	10
Fig 3. Length weight relationship of all age classes of salmon (this can be used to visually assess the presence of different age classes/cohorts)	11
Fig 4. Length weight relationship of all age classes of trout.....	11
Fig 5. Length frequency distribution for all juvenile salmon caught (this can also be used to assess the presence of different age classes/cohorts)	12
Fig 6. Length frequency distribution for all trout caught.....	12
Fig 7. F10022	13
3.2 F10049 Glendorgan River at Sraghcumber GBNI1NW010102067 Derg WFD Fish Classification 2010	14
Table 4. Removal sampling results.....	14
Fig 8. Total catch	14
Fig 9. Density/100m ²	14
Fig 10. Length weight relationship of all salmon	15
Fig 11. Length weight relationship of all trout caught.....	15
Fig 12. Length frequency of all salmon caught	16
Fig 12. Length frequency of all trout caught.....	16
Fig 13. F10049	17
3.3 F10079 Glenelly River at Clogherny Br GBNI1NW010102048 Glenelly WFD Fish Classification 2010	18

Table 5. Removal sampling results *Note La = Lamprey and Mi = Minnow	18
Fig 14. Total catch	18
Fig 15. Density/100m ²	18
Fig 16. Length weight relationship of all salmon	19
Fig 17. Length weight relationship of all trout caught	19
Fig 18. Length frequency of all salmon caught	20
Fig 19. Length frequency of all trout caught	20
Fig 13. F10079	21
3.4 F10115 Cloghfin River at Lisboy Br GBNI1NW010102035 Camowen WFD Fish Classification 2010	23
Table 6. Removal sampling results *Note La = Lamprey, Mi = Minnow & SB = Stickleback.....	23
Fig 20. Total catch	23
Fig 21. Density/100m ²	23
Fig 22. Length weight relationship of all salmon	24
Fig 23. Length weight relationship of all trout caught	24
Fig 24. Length frequency of all salmon caught	25
Fig 25. Length frequency of all trout caught	25
Fig 26. F10115	26
3.5 F10170 River Roe up from Roe Br GBNI1NW020202024 Roe WFD Fish Classification 2010	27
Table 7. Multi method large river sampling results	27
Fig 27. Total catch	27
Fig 28. Salmon 1+ length weight relationship. * This does not include the adult Atlantic salmon caught	28
Fig 29. Length frequency of all salmon caught. * This does include the adult Atlantic salmon caught	28
Fig 30. F10170	29
4.0 Conclusion	31
Table 8. WFD fish surveillance stations surveyed by the Loughs Agency 2008-2010	31
Fig 32. WFD Fish surveillance river and lake sites within the Foyle area, Northern Ireland and Republic of Ireland	32
Fig 33. WFD Fish surveillance river and lake sites within the Carlingford area, Northern Ireland. There are no sites within ROI in the Carlingford area	33
Fig 34. WFD fish surveillance river classifications within the Foyle area, Northern Ireland and Republic of Ireland 2010.	34

Fig 35. WFD fish surveillance river classifications within the Carlingford area, Northern Ireland 2010. There were no sites surveyed within ROI.	35
Fig 36. WFD fish surveillance river classifications within the Foyle and Carlingford areas 2010.	36

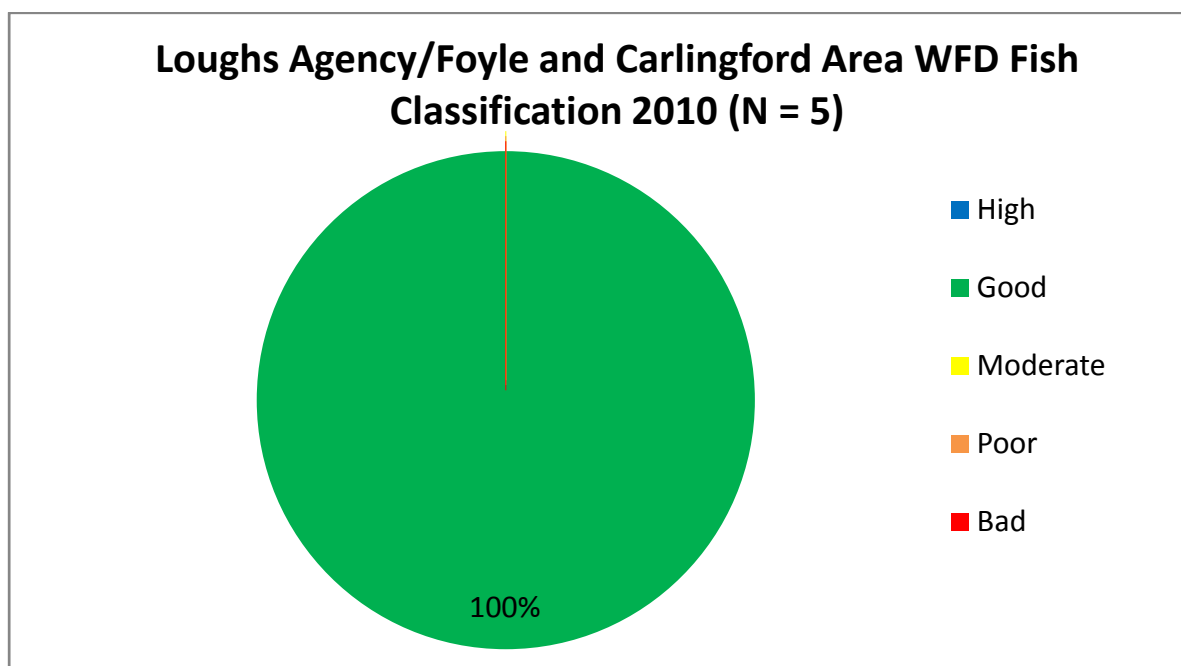
The Loughs Agency sponsoring departments and staff are gratefully acknowledged for the assistance provided to conduct Water Framework Directive fish monitoring in the Foyle and Carlingford areas.

Executive Summary

Eight Water Framework Directive fish surveillance monitoring stations were surveyed within the Loughs Agency jurisdiction in 2010. Five of these were in Northern Ireland and three were in the Republic of Ireland. This report presents the results for the monitoring stations within Northern Ireland. 0% were classified as high status, 100% classified as good status, 0% as moderate status 0% as poor status and 0% as bad status.

An overview of the classification system utilised is provided and a synopsis of the biological and habitat data presented. Additional data and information has been presented in a series of excel spreadsheets submitted to Northern Ireland Environment Agency (NIEA), this includes data from other sites not included in the WFD surveillance monitoring programme. WFD fish classifications have been applied to these additional sites using the same methodology. All data reported is stored within the Loughs Agency Geographical Information System (GIS) and is available upon request.

Photographs of each site have been included where available and outline recommendations made for consideration as part of any programmes of measures.



LA fish classification 2010 based on five sites surveyed within the Foyle and Carlingford areas

1.0 Introduction

This report is submitted to Northern Ireland Environment Agency (NIEA) by way of part fulfilment of the Loughs Agency agreement to survey and provide classifications for Water Framework Directive river fish monitoring. The report provides classifications for monitoring stations within the Loughs Agency jurisdictions of the Foyle and Carlingford areas for 2010. Additional information has been provided in electronic format.

A synopsis of targeted Water Framework Directive river fish sampling within the Foyle and Carlingford areas has been provided below for fieldwork conducted in 2010.

Other sites outside of the Foyle and Carlingford areas have been monitored by the Agri Food and Bioscience Institute (AFBI) under contract to NIEA.

2.0 Basis for Water Framework Directive Fish Classification

In the absence of a finalised fish in rivers classification tool (currently under development) professional judgement has been used to classify selected river sites for fish. These have then been incorporated into final ecological status classifications.

Data collection was conducted in the field during June, July, August and September 2010 and involved the use of a quantitative electrofishing methodology commonly used for wadable rivers. This technique requires the netting off of a small section of river approximately 100m² using stop nets.

Removal sampling is then conducted utilising electrofishing equipment with the numbers, age class and species of each fish being recorded for each pass. After an appropriate depletion has been achieved, which facilitates a density estimation to be made all fish are returned alive to the river.

Additional habitat variables were recorded and the exact location of upstream and downstream stop nets were recorded using a Trimble Geo HX hand held GPS unit.

Classification	Criteria
High	All age classes of salmon (not adult salmon) and trout present in reasonable abundance
Good	Salmon and trout present in reasonable abundance but disruption of one age class of either species
Moderate	<p>All age classes of salmon (not adult salmon) and trout present but in low abundance</p> <p style="text-align: center;"><i>OR</i></p> <p>Salmon and trout present in but one age class absent from both species</p> <p style="text-align: center;"><i>OR</i></p> <p>No salmon present but two or more age classes of trout present in reasonable abundance</p>
Poor	<p>No salmon present; trout present but two age classes absent</p> <p style="text-align: center;"><i>OR</i></p> <p>Salmon and trout both present but only one age class of each species</p>
Bad	No salmonids present

Table 1. Professional judgement criteria after O'Connor 2009, AFBI

NURSERY AREA	
Grade 1	<ul style="list-style-type: none"> • 50 -80mm water depth • 0.5 – 8% gradient • Stable cobble/boulder substrate > or = 70% bed cover • Providing adequate cover
Grade 2	Marginally outside grade 1 on one count only
Grade 3	Well outside grade 1 on one or more counts
Grade 4	Absent, deep, channelized, silty etc.
SPAWNING AREA	
Grade 1	<ul style="list-style-type: none"> • Flow 300 – 600mm/sec • Water depth 150 – 700mm • 70% substrate 30-80mm diameter • Gravel depth: Trout = 50-150mm Salmon = 200-500mm
Grades 2-4	Failing as for nursery habitat above
HOLDING AREA	
Grade 1	<ul style="list-style-type: none"> • Depth minimum m ideally > or = 2m • Suitable cover • Bankside/substrate stability
Grades 2-4	Failing as for nursery habitat above

Table 2. Habitat classification based on Department of Agriculture for Northern Ireland (Fisheries Division) advisory leaflet on the evaluation of habitat for salmon and trout

3.0 Classifications

3.1 F10022 Burdennett **Burdennet R at Burdennet Br** **GBNI1NW010101070**
WFD Fish Classification 2010

GOOD

FISHING	Salmon 0+	Salmon 1+	Trout 0+	Trout 1+	Eel	*SB	*SL	Total
1st	137	14	2	3	1	11	1	169
2nd	134	3	0	0	2	1	1	141
3rd	55	3	0	0	0	2	1	61
TOTAL	326	20	2	3	3	14	3	371

Table 3. Removal sampling results *Note SB = Stickle Back and SL = Stone Loach

Total Number of Fish Caught, Burdennet 2010

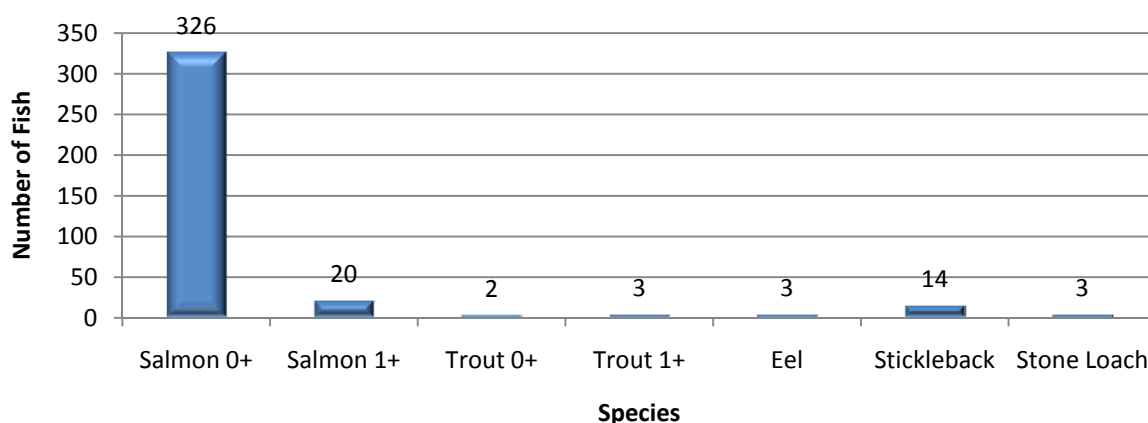


Fig 1. Total catch

Density Estimate of Fish Species, Burdennet

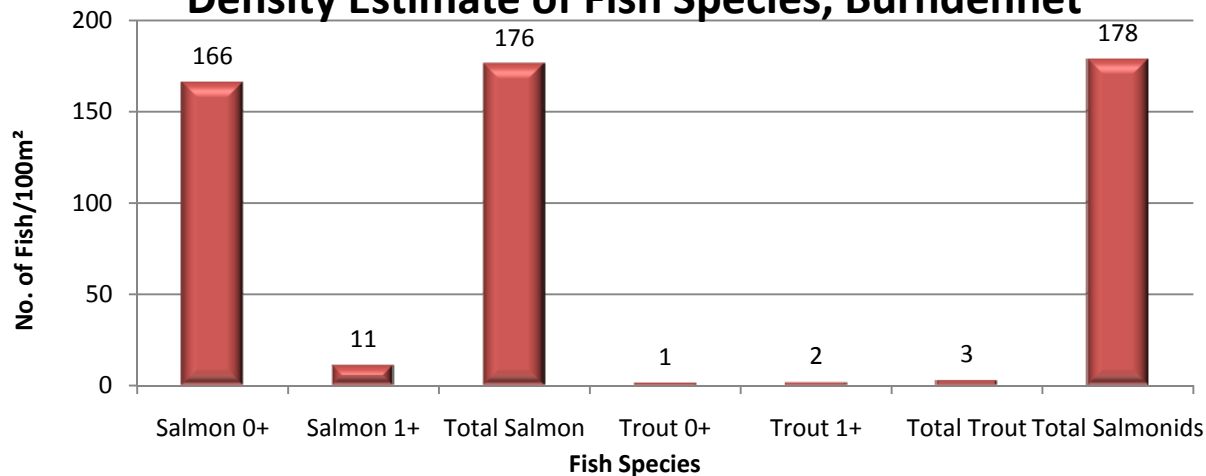


Fig 2. Density/100m²

Length Weight Relationship of Salmon 0+ and Salmon 1+ Burndennet (N=125)

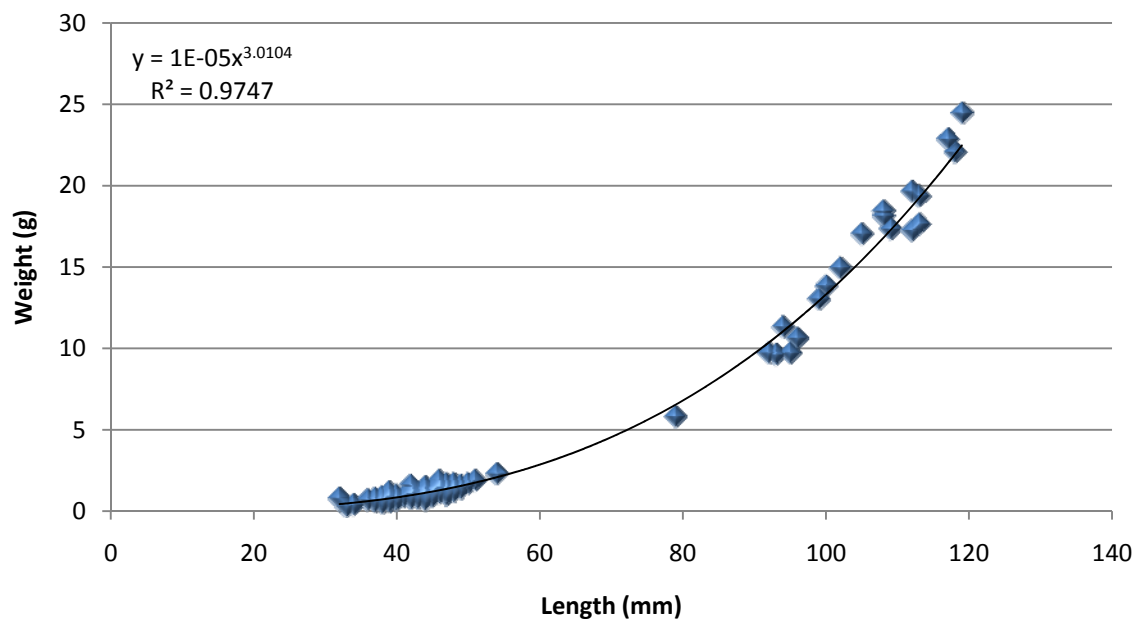


Fig 3. Length weight relationship of all age classes of salmon (this can be used to visually assess the presence of different age classes/cohorts)

Length Weight Relationship of Trout 0+ and Trout 1+ Burndennet (N=5)

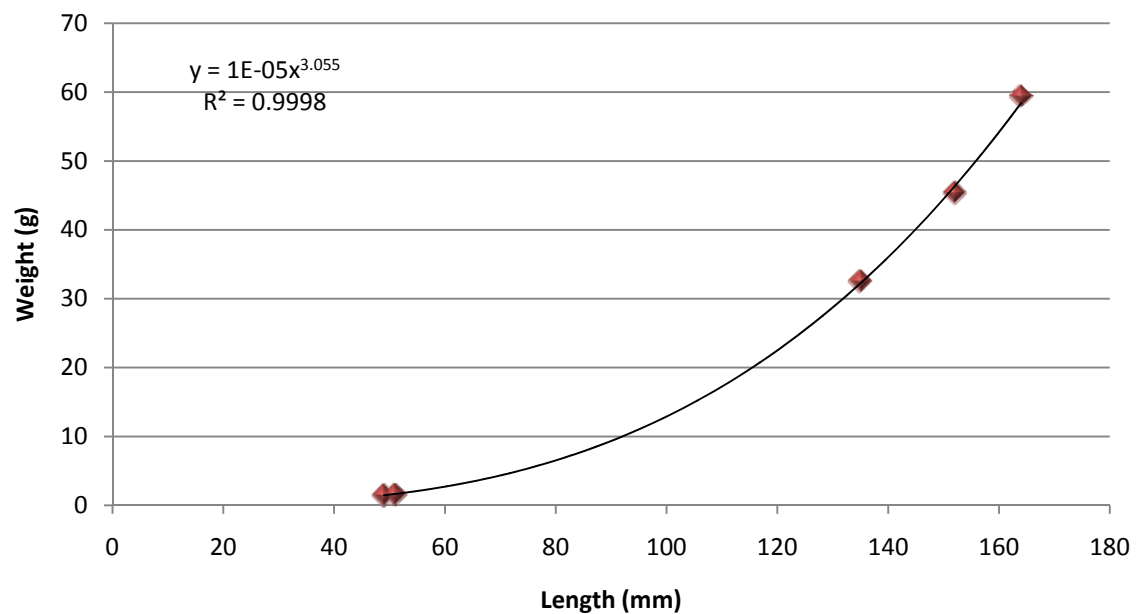


Fig 4. Length weight relationship of all age classes of trout

Length Frequency of Salmon 0+ and Salmon 1+ Burndennet (N=125)

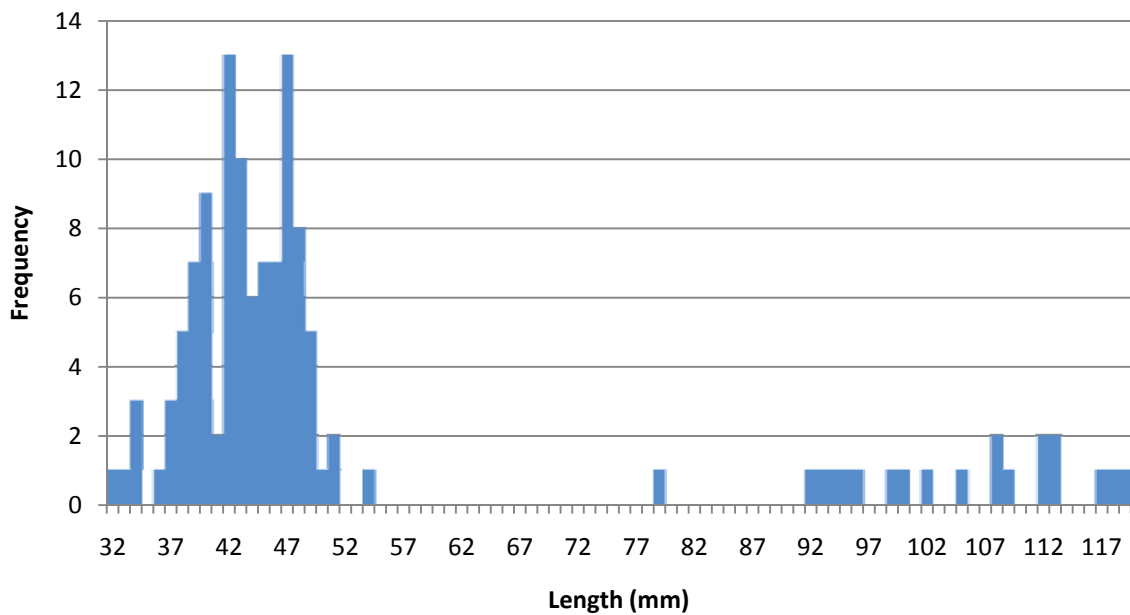


Fig 5. Length frequency distribution for all juvenile salmon caught (this can also be used to assess the presence of different age classes/cohorts)

Length Frequency of Trout 0+ and Trout 1+ Burndennet (N=5)

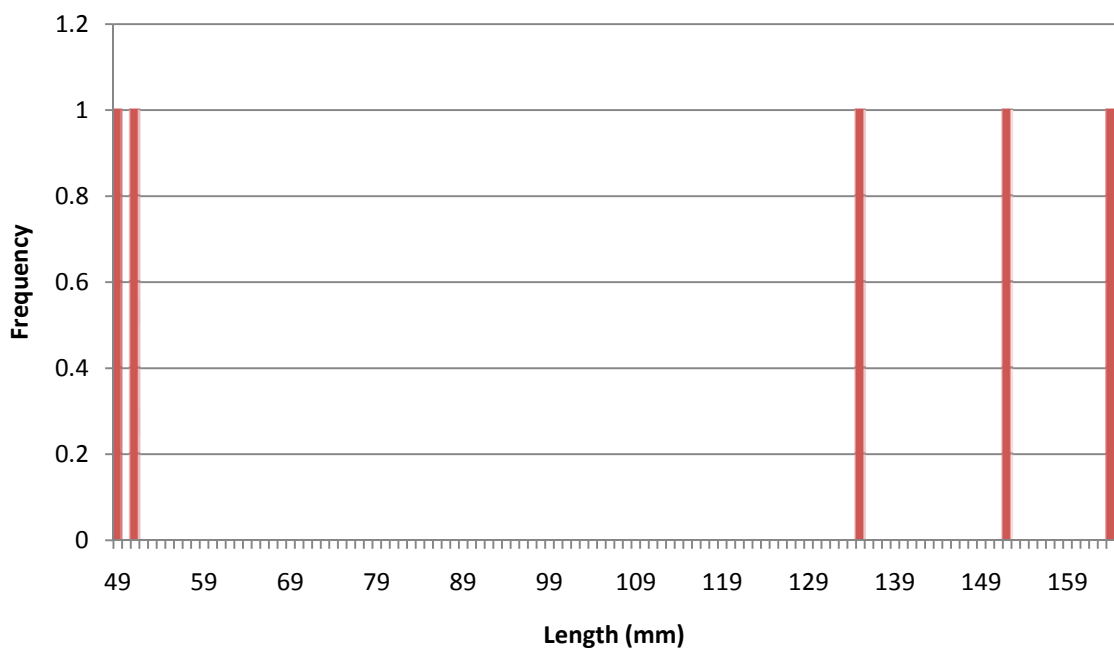


Fig 6. Length frequency distribution for all trout caught

This site is composed predominantly of grade 2 nursery habitat (50%) with grade 1 spawning habitat (40%) and grade 2 holding habitat (10%).

Additional biological information is available in the spreadsheets provided.

This site had swift flows even during low water/drought conditions as experienced during survey. Stop nets were not utilised due to prevailing flow conditions which prevented successful deployment. The limits of the site were delineated using a natural feature in the form of the start and end of a riffle. Some immigration or emigration to/from the site was possible but it is the opinion of the author that this was negligible and that the data obtained is suitable for inclusion in the classification. In future years this site may have to be treated as a large site and surveyed using the multi method approach.



Fig 7. F10022

Erosion is occurring on the left hand bank but is not severe and is providing a source of suitable substrate. Japanese Knotweed is present on the right hand bank.

Potential programmes of measures could include treatment/removal of invasive species at the site, the introduction of some large woody debris (LWD) and the introduction of more nursery and spawning substrate. The site is immediately downstream of a main road bridge where sporadic littering is a problem.

**3.2 F10049
Derg**

**Glendergan River at Sraghcumber GBN11NW010102067
WFD Fish Classification 2010**

GOOD

FISHING	Salmon 0+	Salmon 1+	Trout 0+	Trout 1+	Total
1st	34	3	0	0	37
2nd	5	2	1	2	10
3rd	13	2	0	2	17
4 th	9	0	0	1	10
5 th	5	0	0	0	5
Total	66	7	1	5	79

Table 4. Removal sampling results

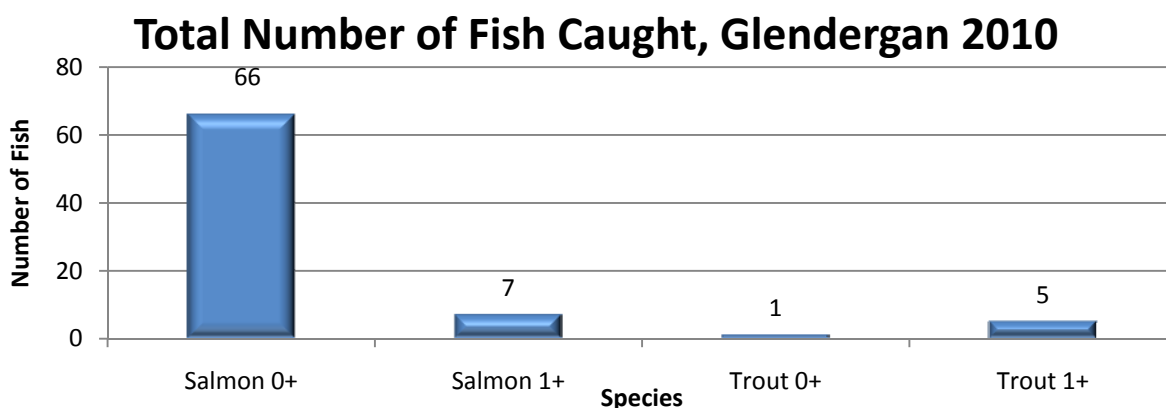


Fig 8. Total catch

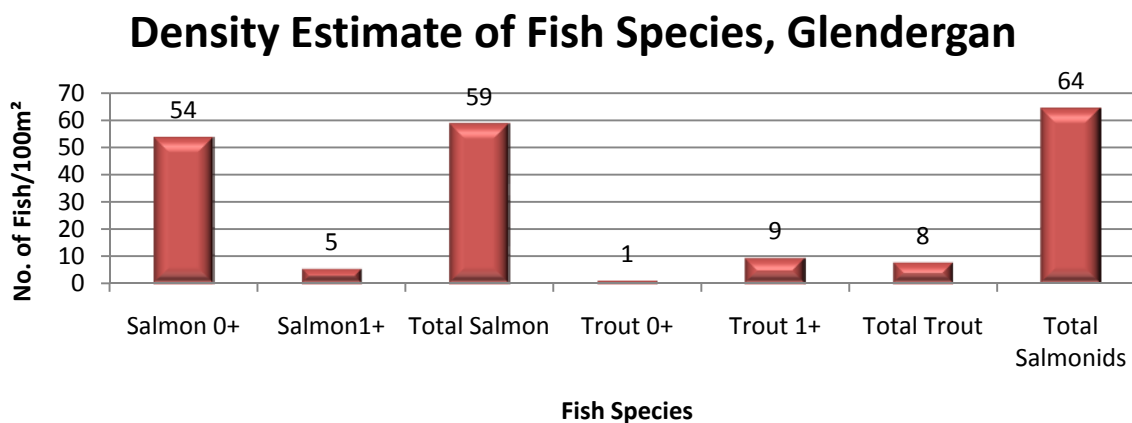


Fig 9. Density/100m²

Length Weight Relationship of Salmon 0+ and 1+ Glendergan (N=73)

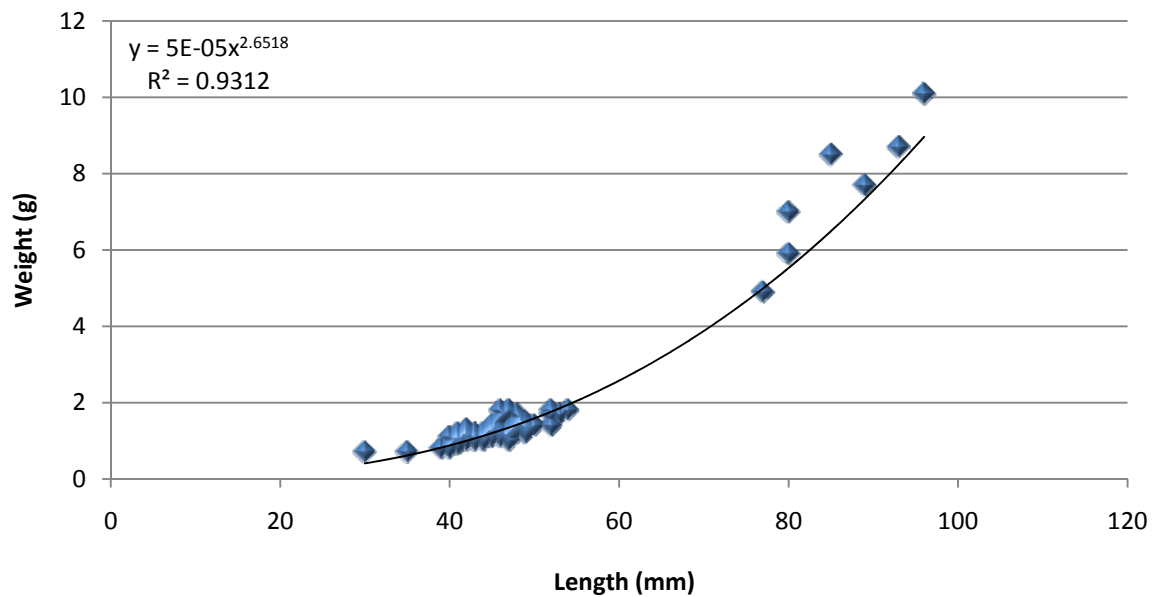


Fig 10. Length weight relationship of all salmon

Length Weight Relationship of Trout 0+ and 1+ Glendergan (N=6)

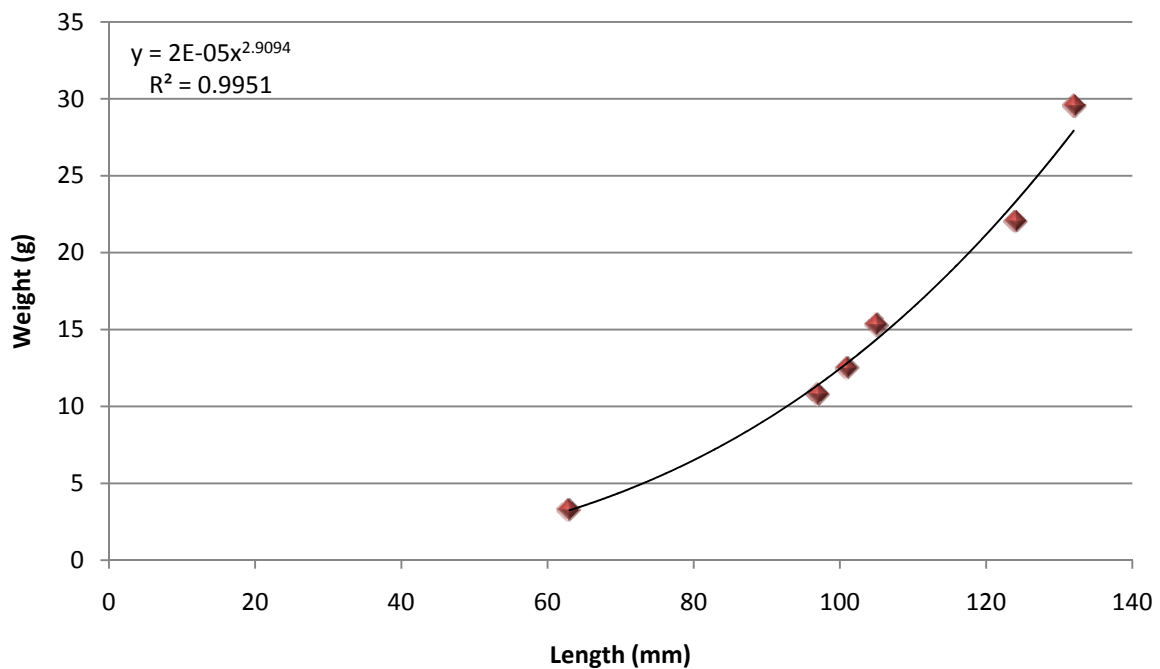


Fig 11. Length weight relationship of all trout caught

Length Frequency of Salmon 0+ and 1+ Glendergan (N=73)

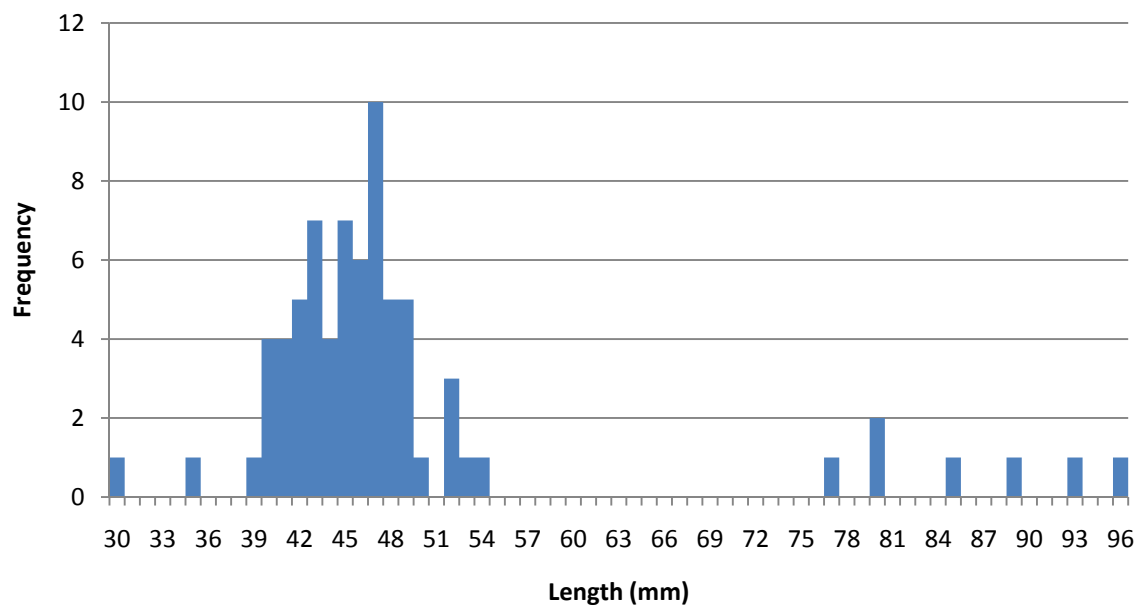


Fig 12. Length frequency of all salmon caught

Length Frequency of Trout 0+ and 1+ Glendergan (N=6)

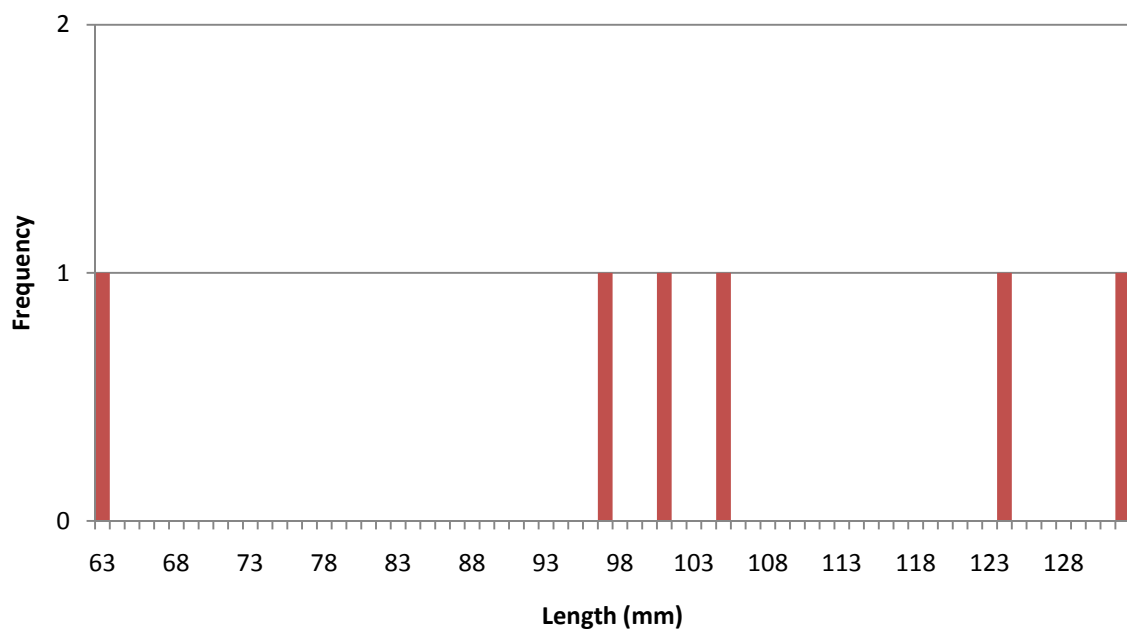


Fig 12. Length frequency of all trout caught

This site is composed predominantly of grade 2 nursery habitat (50%) with grade 2 spawning habitat (35%) and grade 3 holding habitat (15%).

Additional biological information is available in the spreadsheets provided.

This site has a natural channel form with no obvious signs of drainage. In-channel habitat is diverse. Riparian habitat is dominated by native deciduous tree species.



Fig 13. F10049

Potential programmes of measures could include the introduction of some large woody debris (LWD). The site is potentially used as a fording point with localised littering a problem.

**3.3 F10079
Glenelly**

**Glenelly River at Clogherny Br
WFD Fish Classification 2010**

GBNI1NW010102048

GOOD

FISHING	Salmon 0+	Salmon 1+	Trout 0+	Trout 1+	Eel	*La	*Mi	Total
1st	267	13	0	1	0	1	1	283
2nd	199	23	4	1	1	1	1	230
3rd	126	9	1	0	0	0	0	136
TOTAL	592	45	5	2	1	2	2	649

Table 5. Removal sampling results *Note La = Lamprey and Mi = Minnow

**Total Number of Fish Caught, Glenelly River
2010**

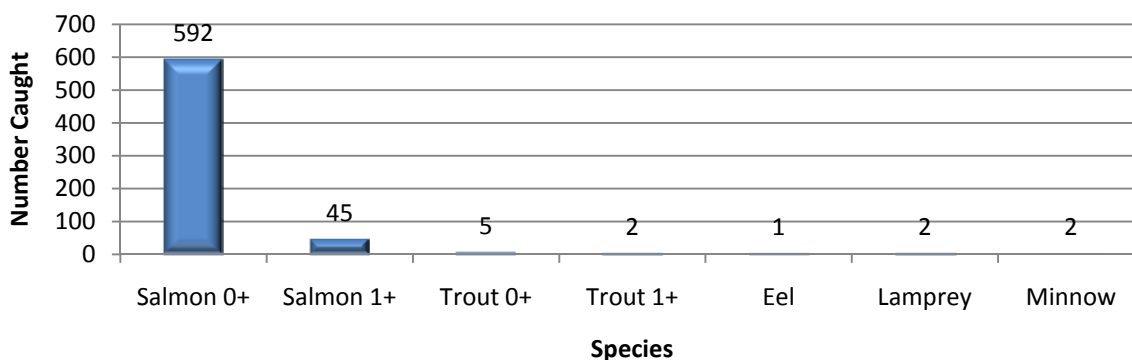


Fig 14. Total catch

Density Estimate of Fish Species, Glenelly River

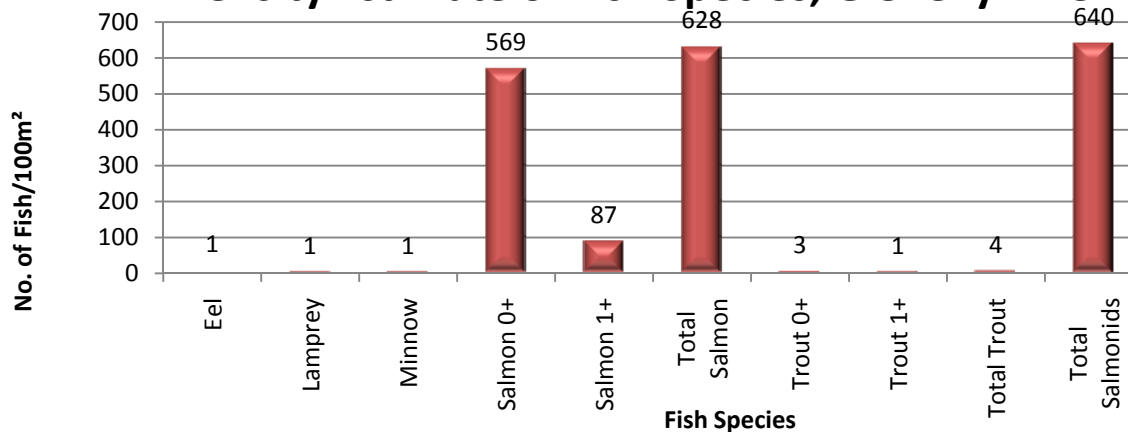


Fig 15. Density/100m²

Length Weight Relationship of Salmon 0+ and Salmon 1+ Glenelly River (N=115)

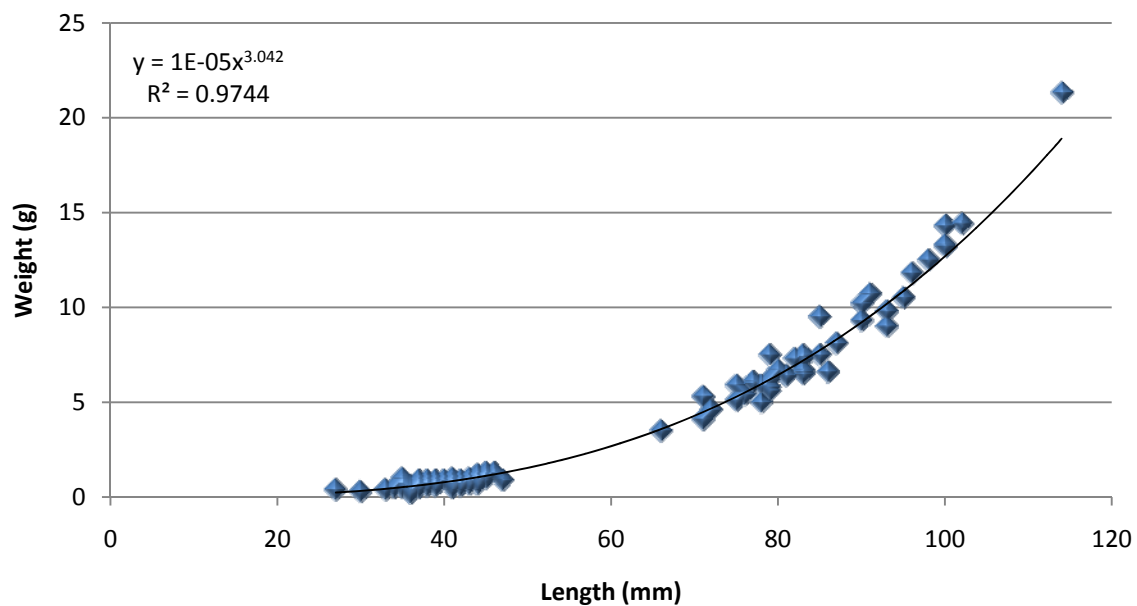


Fig 16. Length weight relationship of all salmon

Length Weight Relationship of Trout 0+ and Trout 1+ Glenelly River (N=7)

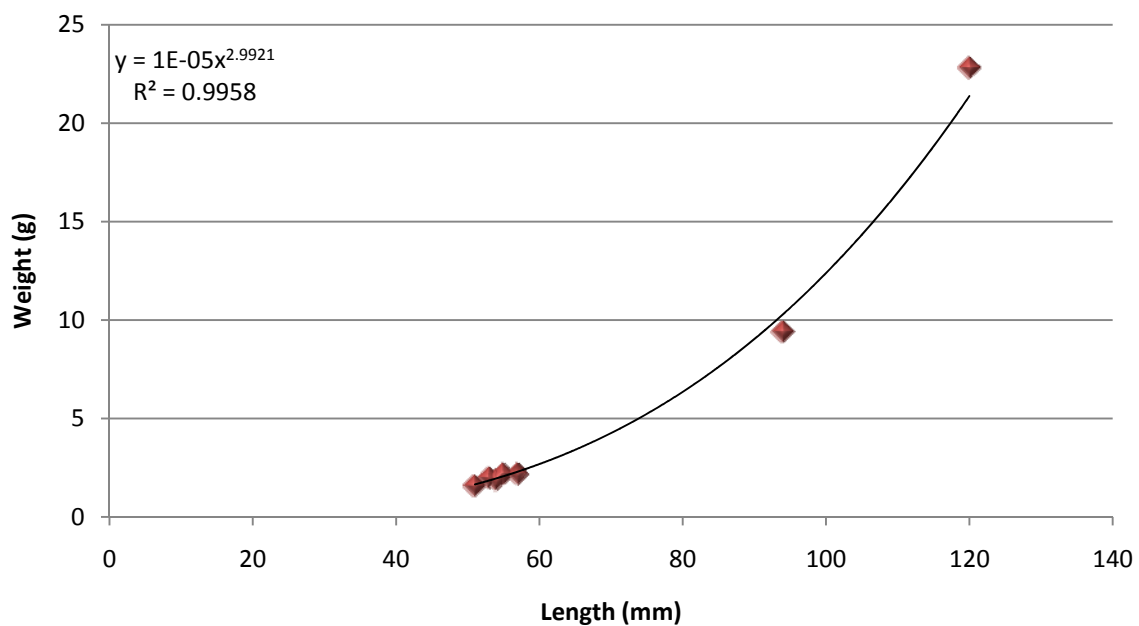


Fig 17. Length weight relationship of all trout caught

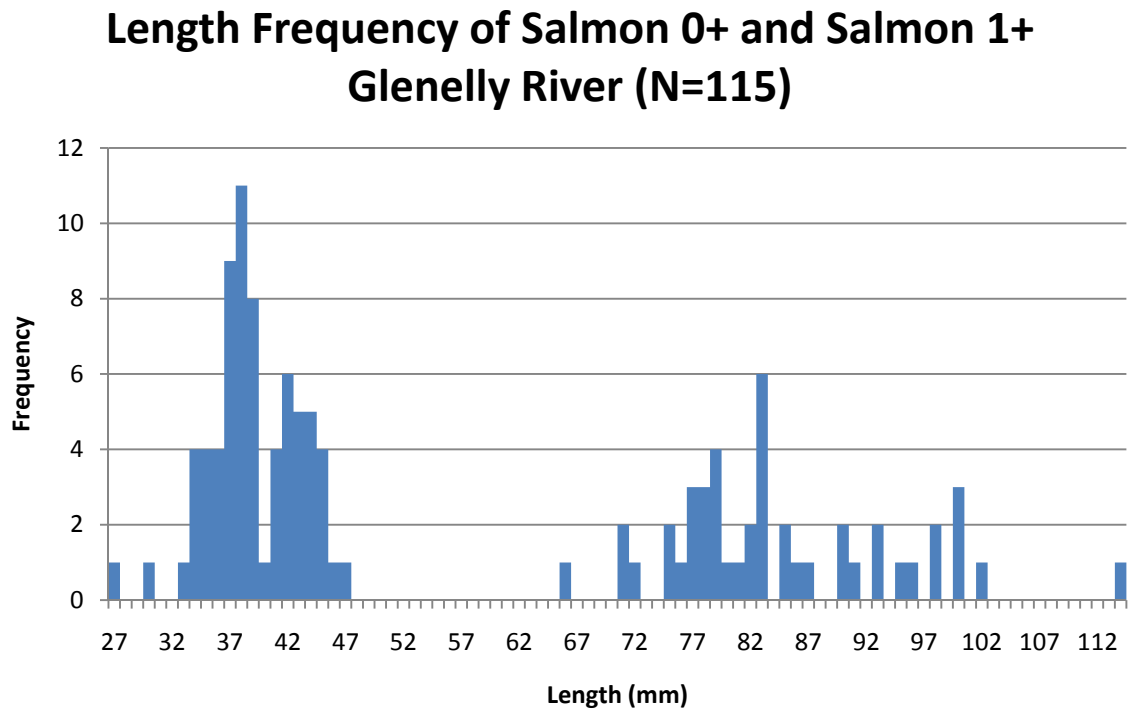


Fig 18. Length frequency of all salmon caught

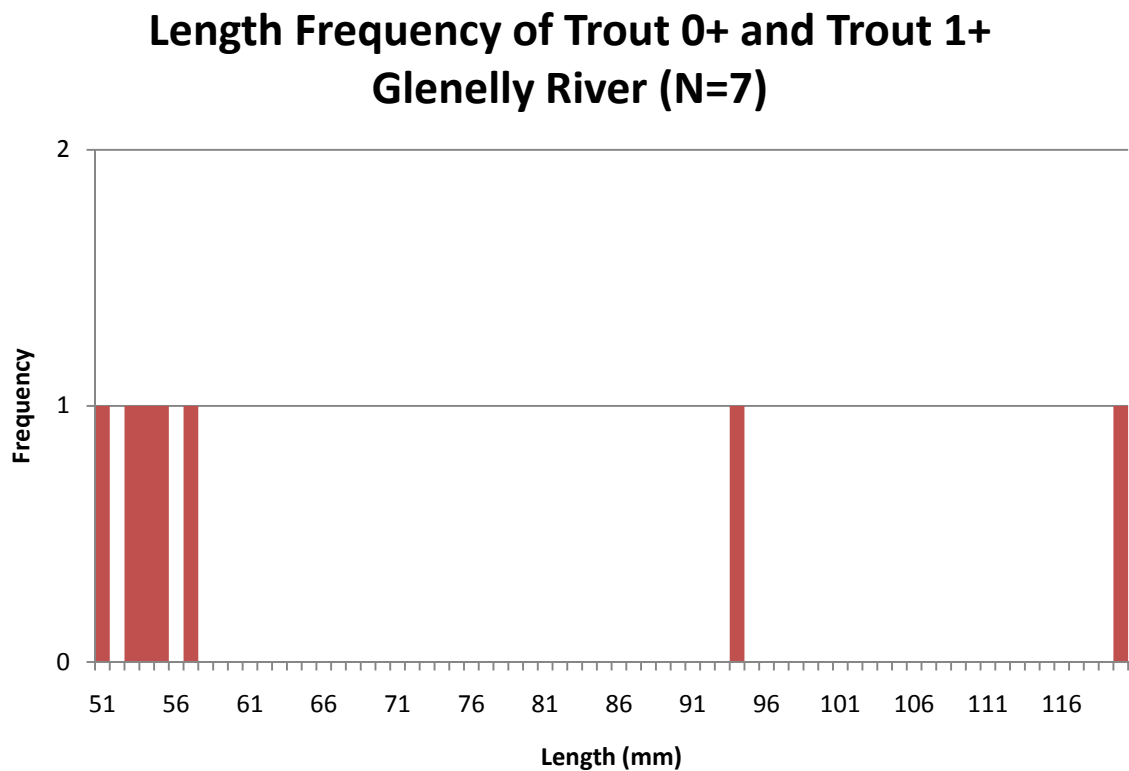


Fig 19. Length frequency of all trout caught

This site is composed predominantly of grade 2 nursery habitat (50%) and grade 1 spawning habitat (50%). There was no holding habitat present within the site.

Additional biological information is available in the spreadsheets provided.

This site has a natural channel form with no obvious signs of drainage. In-channel habitat is diverse. Riparian habitat is dominated by native deciduous tree species. There is some non permitted gravel/substrate removal immediately below Clogherny Bridge. Banks on both sides are unfenced with regular access by cattle. This has lead to bankside trampling and direct in-channel effects. The site is also a fly tipping location with household, mechanical and farm waste present throughout. Numerous sheep pour on bottles were found in the river and removed at the time of sampling. Boxes with warning labels for the herbicide MCPA were also found in the river. MCPA has been recorded at high concentrations at a number of investigative monitoring stations and inappropriate use or disposal of containers may be having a significant impact on the aquatic environment.



Fig 13. F10079

Potential programmes of measures could include appropriate bankside fencing with access points for limited grazing and riparian zone maintenance. A community litter pick and local environmental education programmes should be developed to tackle the fly tipping problem. Targeted information should be provided to the agricultural community on appropriate stock management adjacent to watercourses, unpermitted gravel extraction and waste management.



**3.4 F10115
Camowen**

**Cloghfin River at Lisboy Br
WFD Fish Classification 2010**

GBNI1NW010102035

GOOD

FISHING	Salmon 0+	Salmon 1+	Trout 0+	Trout 1+	Eel	*La	*Mi	*SB	Total
1st	166	4	1	1	1	4	4	8	189
2nd	117	1	1	0	0	2	1	1	123
3rd	60	1	0	0	0	1	1	0	63
TOTAL	343	6	2	1	1	7	6	9	375

Table 6. Removal sampling results *Note La = Lamprey, Mi = Minnow & SB = Stickleback

Number of Fish Caught, Cloghfin 2010

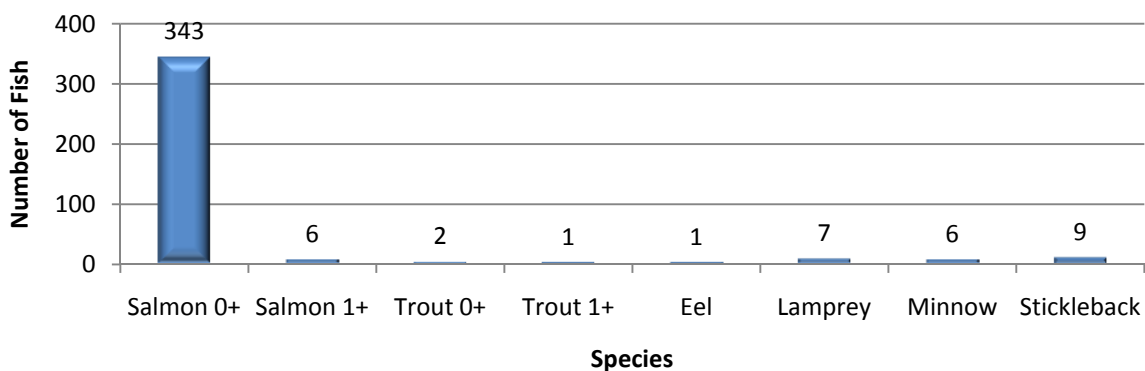


Fig 20. Total catch

Density Estimate of Fish Species, Cloghfin



Fig 21. Density/100m²

Length Weight Relationship of Salmon 0+ & 1+ Cloghfin (N=111)

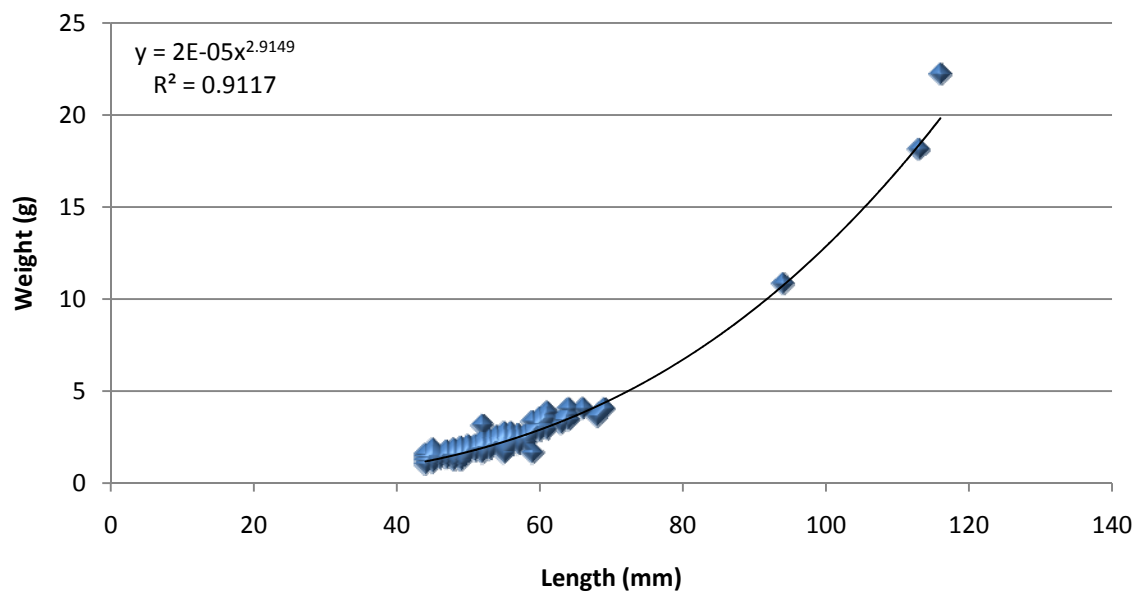


Fig 22. Length weight relationship of all salmon

Length Weight Relationship of Trout 0+ and 1+ Cloghfin (N=3)

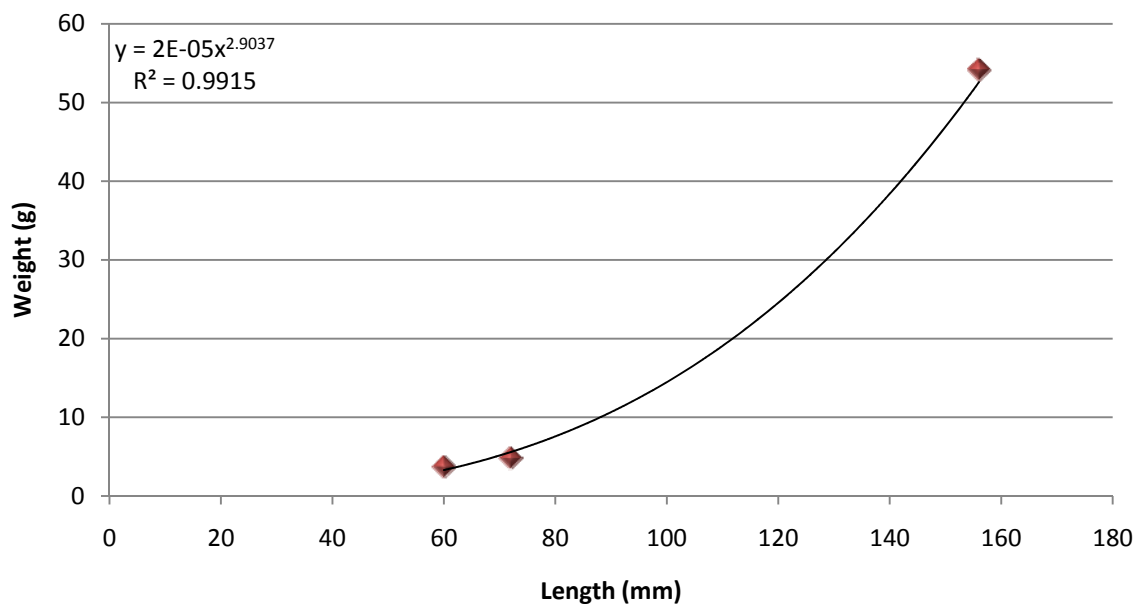


Fig 23. Length weight relationship of all trout caught

Length Frequency of Salmon 0+ and 1+ Cloghfin (N=111)

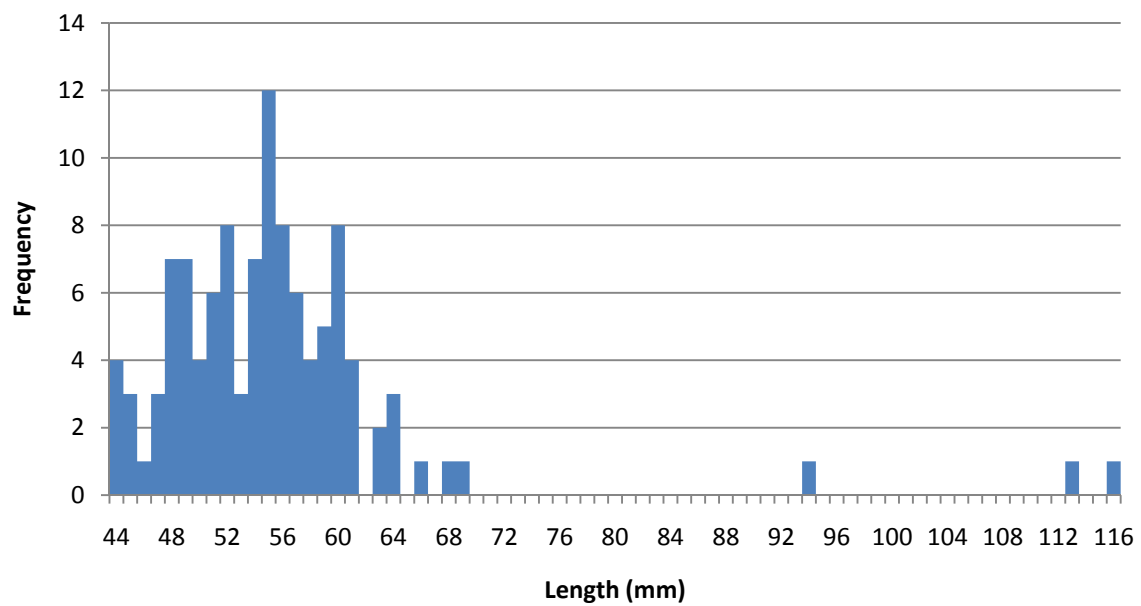


Fig 24. Length frequency of all salmon caught

Length Frequency of Trout 0+ and Trout 1+ Cloghfin (N=3)

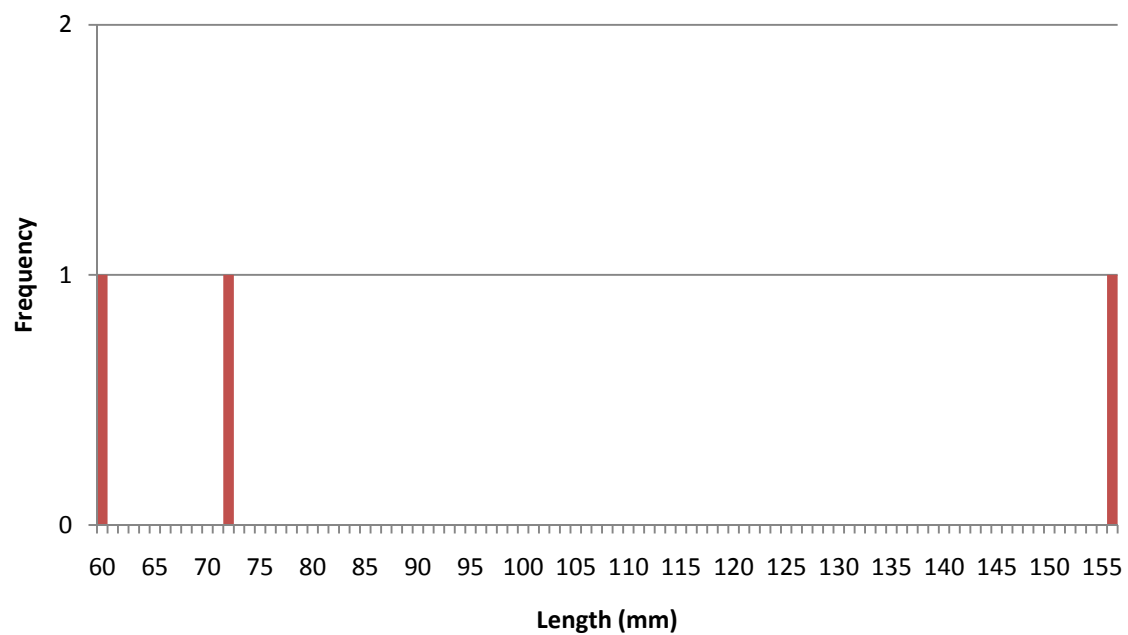


Fig 25. Length frequency of all trout caught

This site is composed predominantly of grade 3 nursery habitat (60%) with grade 2 spawning habitat (30%) and grade 4 holding habitat (10%).

Additional biological information is available in the spreadsheets provided. Significant numbers of stone loach >1000 were observed within the site.

This site shows evidence of being heavily drained and has a low level of in-channel diversity as a result.



Fig 26. F10115

Potential programmes of measures could include reinstatement of a diverse in-channel habitat including the introduction of spawning gravel and nursery stone to create repeated units of spawning holding and nursery habitat. The introduction of large woody debris could also be beneficial throughout this waterbody.

**3.5 F10170
Roe****River Roe up from Roe Br GBNI1NW020202024
WFD Fish Classification 2010****GOOD**

FISHING	Salmon 1+	Trout 1+	Minnow	Flounder	SB	Total
Seine Netting	3	1	2	5	0	11
Fyke Netting	3	0	8	7	1	19
TOTAL	6	1	10	12	1	30

Table 7. Multi method large river sampling results

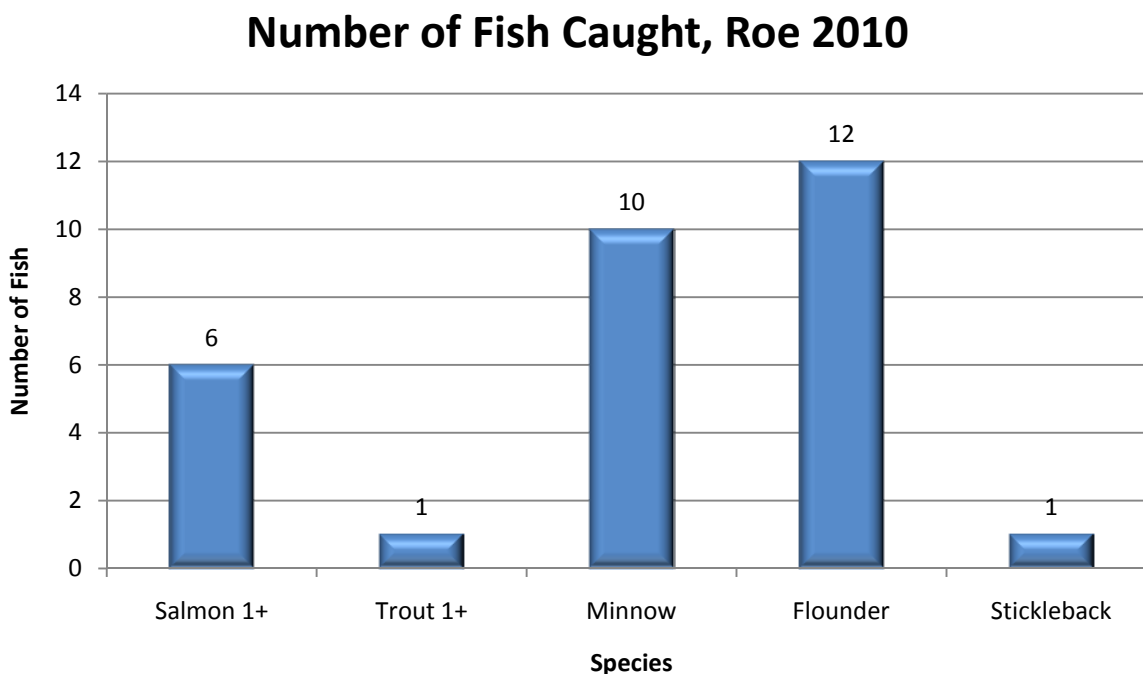


Fig 27. Total catch

Site F10170 has been classified as a large river site, it is both wide and deep and as a result quantitative electrofishing is not possible. The Northern Ireland Water Framework Directive Fish Group has outlined that in such cases a multi method sampling approach should be taken. This should include seine netting, fyke netting and electrofishing without stop nets. This approach should best cover all possible habitats and water depths.

The multi method approach was adopted at this site with successful seine netting and fyke netting operations conducted. Electrofishing was not possible at or near this site due to prevailing high water conditions

throughout the remainder of the field season. There was one possible location which may be suitable in low water conditions.

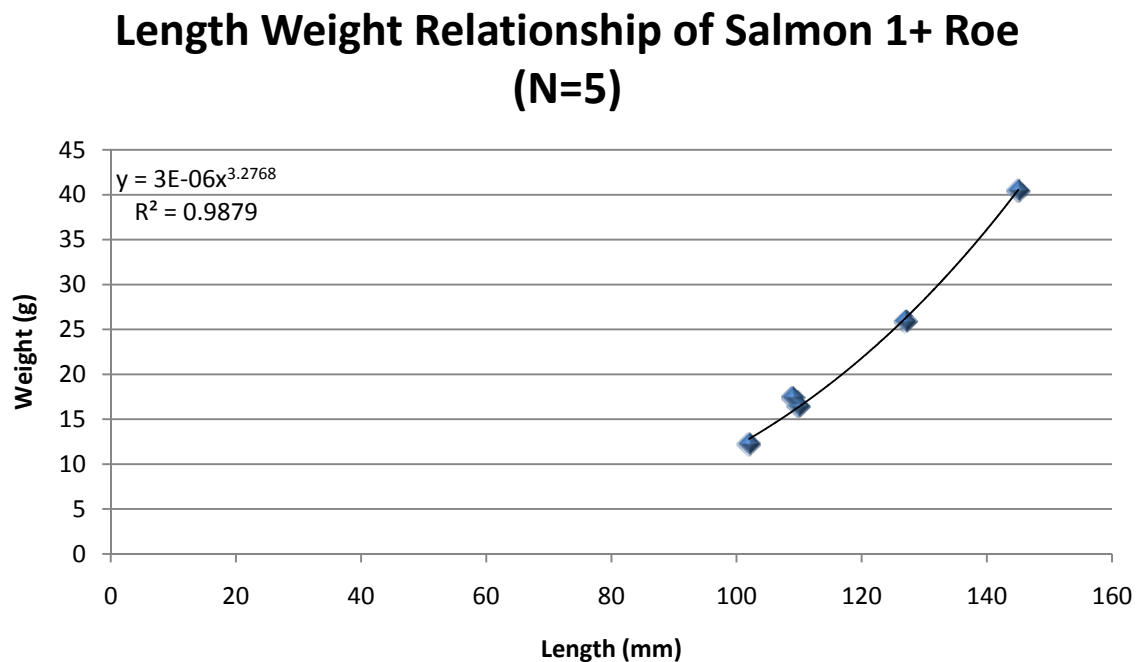


Fig 28. Salmon 1+ length weight relationship. * This does not include the adult Atlantic salmon caught

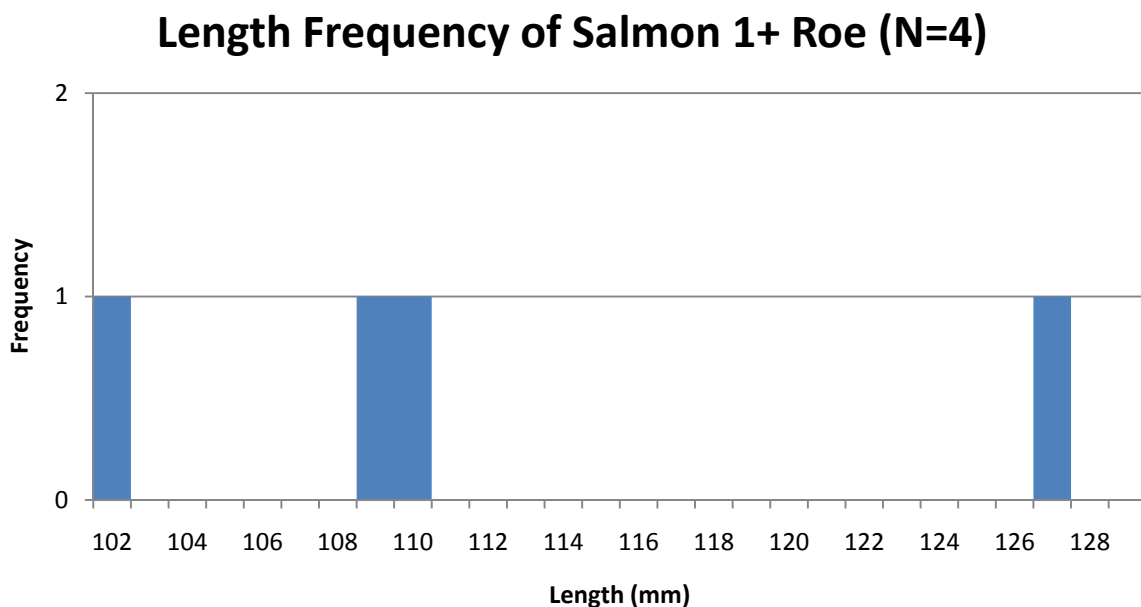


Fig 29. Length frequency of all salmon caught. * This does include the adult Atlantic salmon caught

This site is influenced by the tide and as a result is not ideal nursery and spawning habitat for juvenile salmonids. The river substrate is composed primarily of silt, sand and fine gravel which provides a greatly reduced potential for carrying high numbers of juvenile salmonids and other fish species. This stretch of the river is dominated by large holding pools greater than 2m in depth.

Additional biological information is available in the spreadsheets provided.

This site shows evidence of being heavily drained and has a low level of in-channel diversity as a result. Significant bank erosion is occurring in places and Japanese knotweed, Himalayan balsam and Giant hogweed are present along the bank.



Fig 30. F10170

Potential programmes of measures could include removal and treatment of invasive species, introduction of large woody debris and some bank

protection. Reconnection of the river to the flood plain would also be beneficial from a hydro geomorphological perspective.



4.0 Conclusion

In 2010 within the Loughs Agency jurisdiction in addition to the five WFD fish surveillance sites surveyed in Northern Ireland three WFD fish surveillance sites were surveyed in the Republic of Ireland. Twelve other sites were surveyed within the Loughs Agency jurisdiction using similar methods. This data has also been made available in electronic format as part of the WFD fish reporting procedure.

The majority of sites to be surveyed in 2011 are large river sites where a multi method approach will need to be utilised.

Site Code	Year Surveyed	Catchment	Classification
F10086	2008	Strule	Good
F10089	2009	Strule	Moderate
F10076	2009	Owenkillew	Good
F10020	2009	Burndennet	Good
F10014	2009	Glenmornan	Moderate
F10626	2009	Newry	Moderate
F10644	2009 (AFBI)	Killbroney (NI)	Moderate
F10077	2009	Owenkillew	Good
F10763	2009	Skeoge	Poor
F10022	2010	Burndennet	Good
F10049	2010	Derg	Good
F10079	2010	Glenelly	Good
F10115	2010	Camowen	Good
F10170	2010	Roe	Good

Table 8. WFD fish surveillance stations surveyed by the Loughs Agency 2008-2010

In addition to the thirteen WFD fish monitoring stations quantitatively surveyed from 2008-2010 as outlined in the table above the Loughs Agency has conducted similar quantitative surveys at an additional 65 stations throughout the Foyle and Carlingford areas between 2005 and 2010. The potential use of semi quantitative data collected in the Foyle and Carlingford areas at approximately 500 stations annually is currently being investigated by the Northern Ireland Water Framework Directive Fish Group for use in operational monitoring classification.

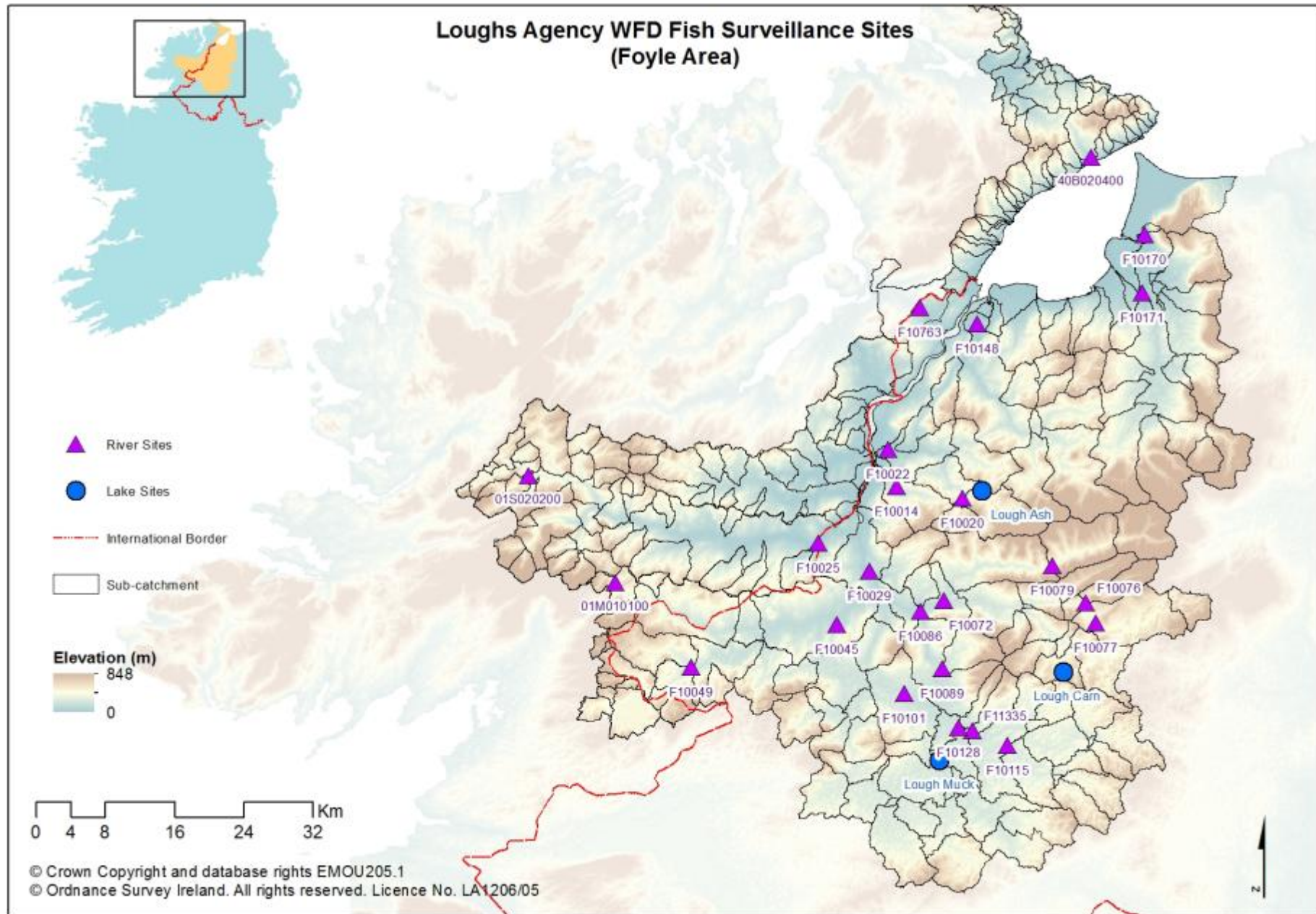


Fig 32. WFD Fish surveillance river and lake sites within the Foyle area, Northern Ireland and Republic of Ireland

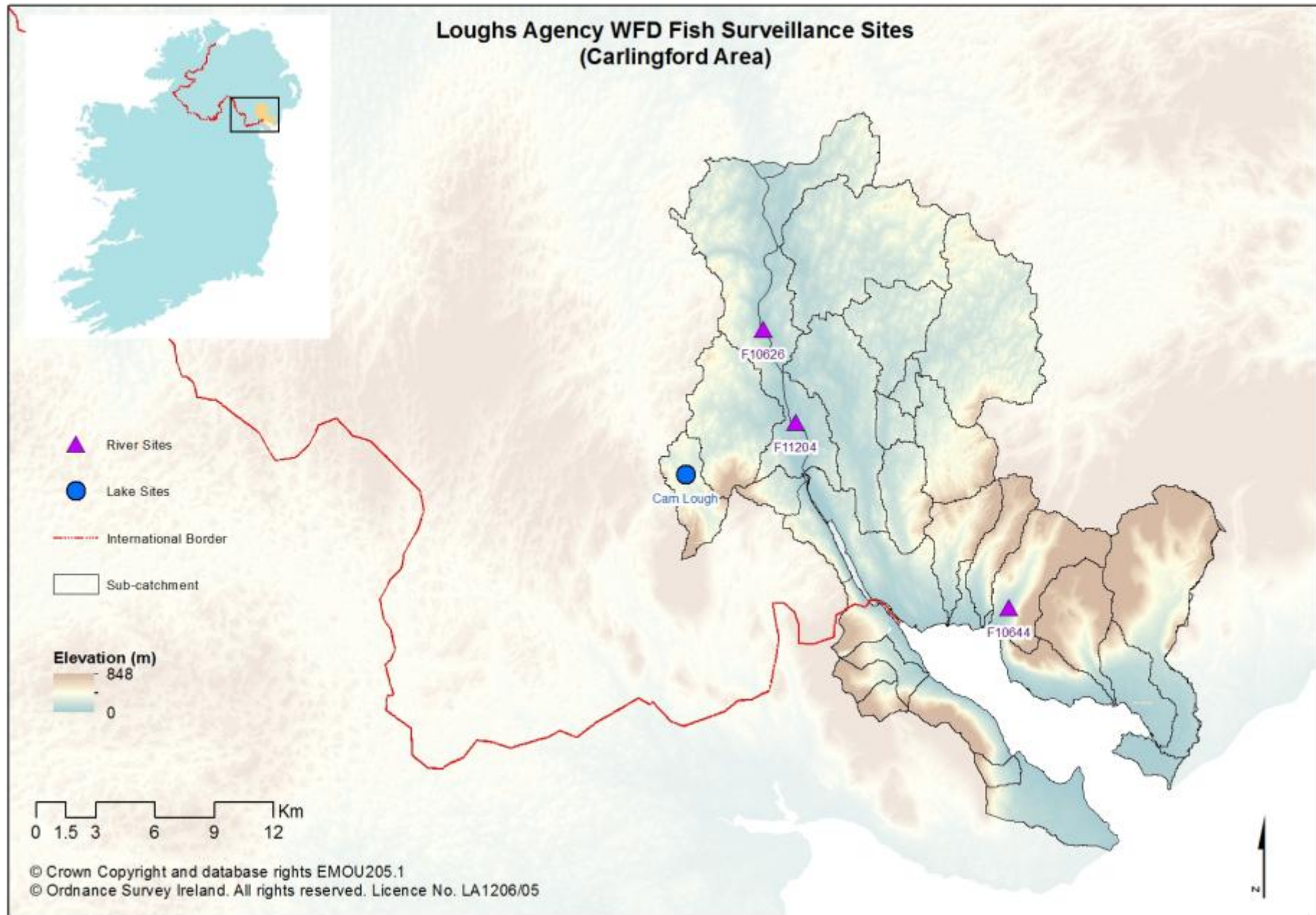


Fig 33. WFD Fish surveillance river and lake sites within the Carlingford area, Northern Ireland. There are no sites within ROI in the Carlingford area

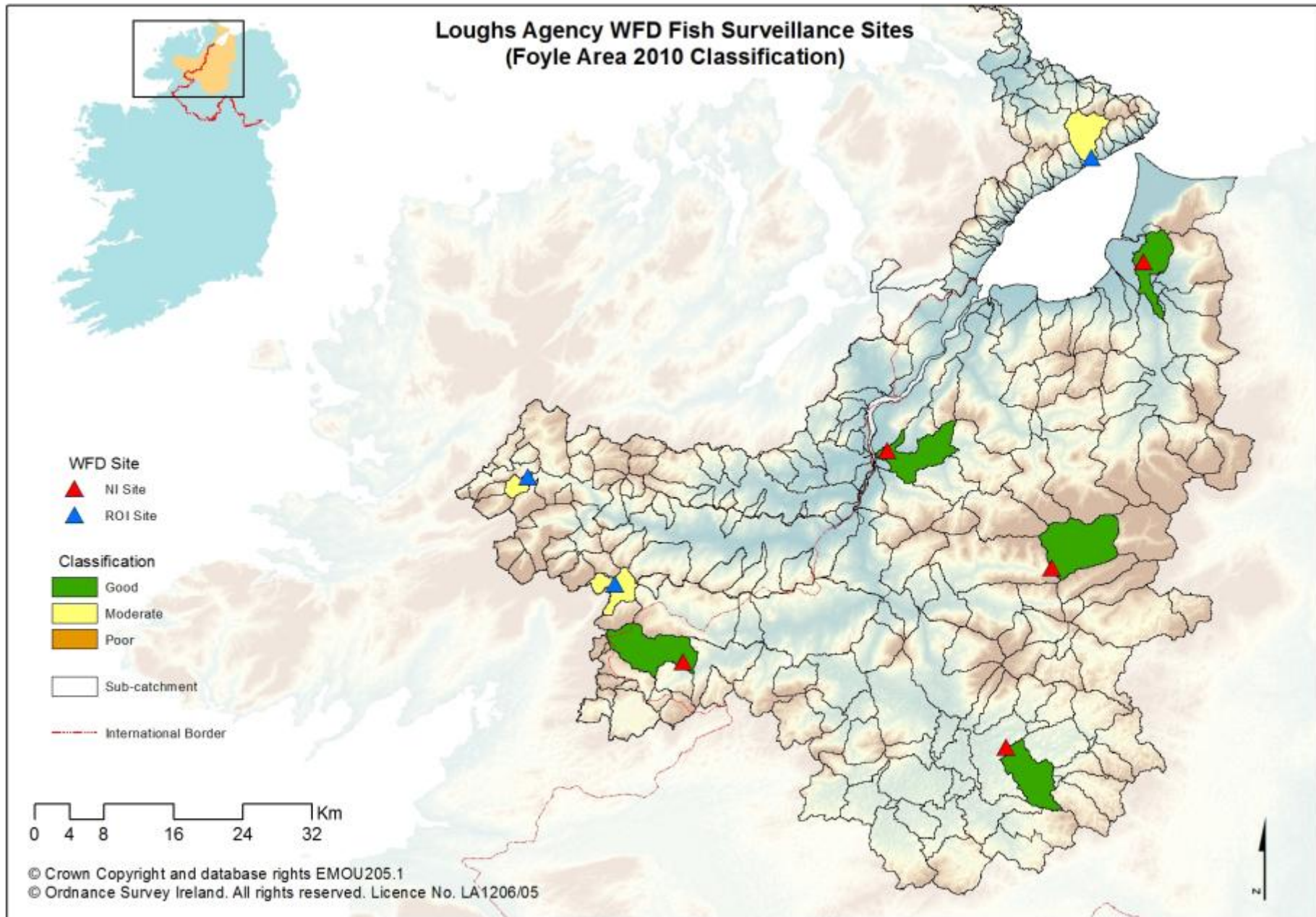


Fig 34. WFD fish surveillance river classifications within the Foyle area, Northern Ireland and Republic of Ireland 2010.

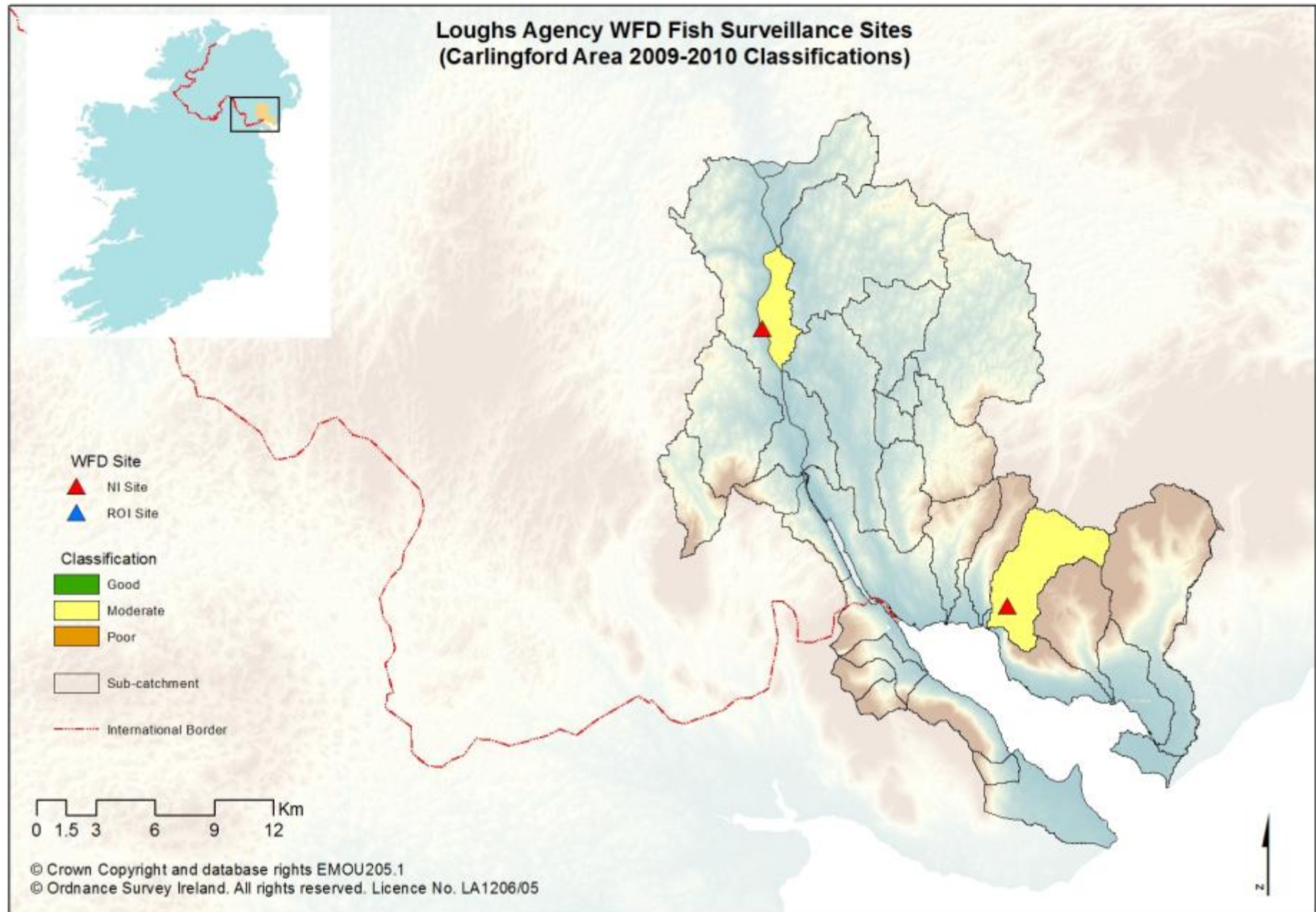


Fig 35. WFD fish surveillance classifications within the Carlingford area, Northern Ireland 2009-2010. There are no sites within Carlingford area lying within ROI.

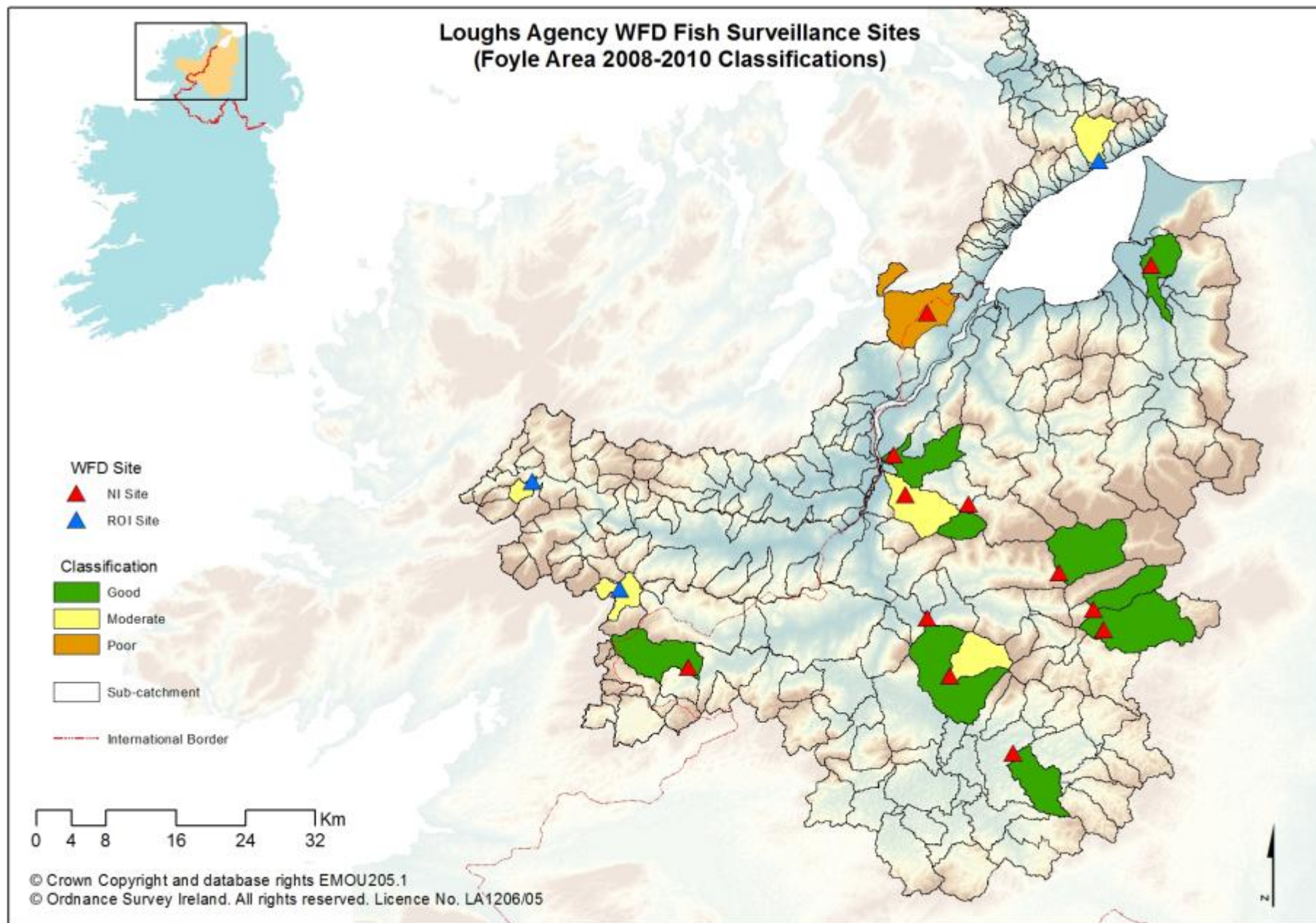


Fig 36. WFD fish surveillance classifications within the Foyle area 2008-2010.