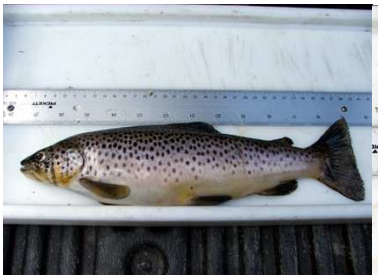
WFD Surveillance Monitoring

Fish in Lakes 2007






Central Fisheries Board

An Príomh-Bhord Iascaigh

Project Personnel

This report was written by Dr. Fiona Kelly, Central Fisheries Board as part of the WFD surveillance monitoring for fish in lakes under the direction of Mr. Trevor Champ. Fieldwork was undertaken by Dr. Fiona Kelly and Ms. Lynda Connor with the assistance of the Regional Fisheries Boards and local angling groups.

Acknowledgements

The author wishes to gratefully acknowledge the help and co-operation of staff from the Eastern Regional Fisheries Board, Northwestern Regional Fisheries Board, Shannon Regional Fisheries Board and the Western Regional Fisheries Board. The authors would also like to acknowledge the help and assistance provided by angling clubs from Lough Bane, Lickeen lake, Lough Lene and White Lake.

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Introduction

As part of a substantial restructuring of EU water policy and legislation, a Directive establishing a new framework for Community action in the field of water policy (2000/60/EC) was agreed by the European Parliament and Council in September 2000 and came into force on 22nd December 2000. The Directive, generally known as the Water Framework Directive rationalizes and updates existing water legislation and provides for water management on the basis of River Basin Districts (RBDs). The overall objective of river basin projects is to establish an integrated monitoring and management system for all waters within a RBD, to develop a dynamic programme of management measures and to produce a River Basin Management Plan, which will be continually updated.

The Directive was transposed into Irish law on 22 December 2003 through the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). Heretofore, river water quality in Ireland has been assessed by the EPA principally on the basis of water chemistry and aquatic macro invertebrates such as insects, snails and shrimps etc. The Directive requires that in addition to these elements, hydromorphology, aquatic flora and fish must now be monitored. The Central Fisheries Board (CFB) has been assigned the responsibility by the Environmental Protection Agency (EPA) to deliver the information on fish stocks required for the Water Framework Directive (WFD) (S.I. No. 722 of 2003). The Directive specifies that fish shall be monitored at all sites selected for Surveillance Monitoring (SM) (SM list includes 180 river sites, 73 lakes in RoI and various transitional waters). This is an innovative approach to fisheries management and will have the advantage of providing factual and timely information regarding fish stocks, e.g. abundance, species composition, growth patterns, at each of the monitoring locations.

The fish monitoring programme consists of a number of elements including surveying of waters, collection and processing of information, data analysis and reporting on findings. The Board will provide regular reports to the Department of the Environment, Heritage and Local Government, Department of Communications, Energy and Natural Resources, the Environmental Protection Agency and the Regional Fisheries Boards. The information obtained from the monitoring process will be of immense benefit to all stakeholders. The programme will evaluate the ecological status of waters using fish and other physical, chemical and biological indicators. The

effectiveness of measures implemented to protect and restore waters to good status will also be assessed.

Monitoring of fish stocks by the Central and Regional Fisheries Boards commenced this year (2007) on a limited basis using European standard methods at specified sites on lakes and estuaries. Monitoring will be conducted on the basis of a three year rolling programme with the optimum period for monitoring of fish communities being from July to October each year.

This preliminary report provides a summary of fish surveys carried out on lakes for WFD surveillance monitoring during 2007. A total of 15 lakes were surveyed for fish in 4 regional fishery board areas (3 in the ERFB, 2 in the NWRFB, 8 in the WRFB and 2 in the SHRFB). Further processing of the material has yet to be carried out and a more comprehensive report will issue in due course.

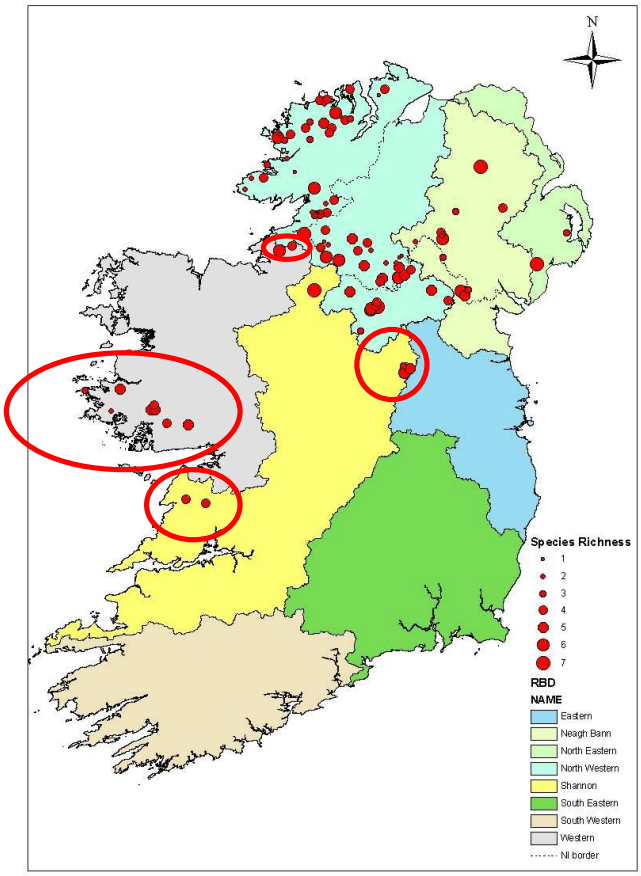

Fig. 1: Species richness on lakes surveyed for fish for WFD Surveillance Monitoring 2007 (lakes surrounded by red circles are those surveyed for WFD in 2007. The other lakes shown were monitored for the NS Share fish in lakes project 2005 to 2006. Some of these lakes will be resurveyed for WFD surveillance monitoring in 2008 and 2009.

Eastern Regional Fisheries Board

Preliminary Synopsis of WFD Surveillance Monitoring Fish Stock Survey of Lough Bane, July 2007

1.1 Introduction

Lough Bane is situated on the Meath-Westmeath border in the Boyne catchment. The lake is located approximately six kilometers northeast of Collinstown. The lake has a surface area of 75ha, mean depth is greater than 4m and has a maximum depth of 16m. The lake falls into typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and high alkalinity (>100mg/l $CaCO_3$). Lough Bane is a public water supply and supplies water to the north Meath area.

This lake had a stock of wild brown trout in the past and is also stocked regularly by the Lough Bane Angling Association, which controls the fishing. The angling association has been in existence for fourteen years and has been stocking approximately 1000 brown trout and 1000 rainbow trout into the lake each year.

Plate 1 and 2: Lough Bane in background, looking (1) west to the lake (outflow and small lake in the forefront) and (2) looking across the lake to the southern shoreline

1.2 Methods

The lake was surveyed over two nights on the 3rd and 4th of July 2007. A total of three sets of Dutch fykes, 14 (4 @ 0-2.9m, 4 @ 3-5.9m, 3 @ 6-11.9m and 3 @ 12-19.9m) benthic gill nets and one surface floating gillnet were deployed randomly in the lake (18 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of five species were recorded on Lough Bane in July 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 122 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by 9-spined stickleback. Perch were also the most commonly observed species captured in the fyke nets followed by eels and pike.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lough Bane, July 2007.

Scientific names	Common names	Number of fish captured			
		Benthic gill nets	Surface gill nets	Dutch fykes	Total
Oncorhynchus mykiss	Rainbow trout	1	0	1	2
Perca fluviatilis	Perch	78	0	11	89
Pungitius pungitius	9-spined stickleback	25	0	0	25
Esox lucius	Pike	2	0	2	4
Anguilla anguilla	Eel	0	0	2	2

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lough Bane, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on L. Bane, July 2007

	Mean CPUE (mean number of fish/m of net)				
Gear type	Rainbow trout	Perch	Pike	9-spined stickleback	Eel
Gill nets (all)	0.002	0.173	0.004	0.056	0
Fykes	0.006	0.061	0.022	0	0.022

An unexpected occurrence was the presence of 9-spined stickleback in this lake and the apparent absence of the 3-spined stickleback which is more widespread nationally.

Additional information

The lakes team also examined the lake out flowing stream (see plates 3 and 4). The outflow was weeded and heavily silted in places. Enquiries locally established that the outflow dries up during dry summers.

Plates 3 and 4: Lough Bane outflow (heavily weeded and silted)

Further work

All fish will be measured and weighed, scales and opercular bones will be removed from the relevant fish and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey

Lough Lene, October 2007

1.1 Introduction

Lough Lene is stiutated in Co. Westmeath on the Upper Boyne catchment. The lake is located approximately 1km north of Collinstown and 7km northeast of Castelpollard. The lake has a surface area of 414.5a, mean depth is >4m and has a maximum depth of 20m. The lake falls into typology class 8 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and moderate alkalinity (20-100mg/l $CaCO_3$).

Lough Lene holds a small stock of large wild trout (O' Reilly, 2003) and perch, pike and tench are also present. The lake is stocked annually by the Lough Lene Anglers Association. The club stocked the lake with 9000 1+ trout in March 2007 and 50,000 rainbow and brown trout fingerlings in June 2007.

Plate 1: Lough Lene, Co. Westmeath

1.2 Methods

The lake was surveyed over three nights on the 1st to the 3rd of October 2007. A total of six sets of Dutch fykes, 20 (5 @ 0-2.9m, 5 @ 3-5.9m, 5 @ 6-11.9m and 5 @) 12-19.9) benthic monofilament gill nets and four surface floating gillnets were deployed randomly in the lake (30 sites). The netting effort was supplemented using 6 benthic braided (62.5mm mesh knot to knot) gill nets (6 additional sites). Survey

locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of six species were recorded on Lough Lene in October 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 1072 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets. Small numbers of rainbow trout and brown trout (stocked) were captured in the gill nets. No eels were captured during the survey.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lough Lene, October 2007.

Scientific names	Common names	Number of fish captured				
		Benthic monofilament gill nets	Benthic braided gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout (stocked)	5	0	0	0	5
	Rainbow trout (stocked)	1	3	2	0	6
Perca fluviatilis	Perch	1042	0	0	0	1042
Esox lucius	Pike	5	1	0	1	7
Tinca tinca	Tench	3	1	1	1	6
Gasterosteus aculeatus	3-spined stickleback	6	0	0	0	6

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lough Lene, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Lough Lene, October 2007

	Mean CPUE (mean number of fish/m of net)					
Gear type	Brown trout (stocked)	Rainbow trout	Perch	Pike	Tench	3-spined stickleback
Gill nets (all)	0.010	0.001	1.447	0.007	0.006	0.008
Fykes	0.000	0.000	0.000	0.003	0.003	0.000

Further work

All fish apart from perch were measured and weighed and scales were removed from brown trout, rainbow trout, pike and tench on site. Perch will be measured and weighed and opercular bones will be removed in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey

White Lake, October 2007

1.1 Introduction

White lake is situated on the Meath-Westmeath border in the Upper Boyne catchment. The lake is located approximately 7km northeast of Castelpollard. The lake has a surface area of 25ha, mean depth is >4m and has a maximum depth of 18m. The lake falls into typology class 11 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), less than 50ha and high alkalinity (>100mg/l $CaCO_3$).

The lake is stocked regularly by the White lake angling association. The lake was stocked with 1500 2+ rainbow trout in February, June and August.

Plate 1: White Lake, Co. Westmeath

1.2 Methods

The lake was surveyed over one nights on the 4th of October 2007. A total of 3 sets of Dutch fykes, 8 (2 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m and 2 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (11 sites). The netting effort was supplemented using 2 benthic braided (62.5mm mesh knot to knot) gill nets. Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the

precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of three species were recorded on White lake in October 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 133 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by rainbow trout and pike. No eels were captured during the survey.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on White lake, October 2007.

Scientific names	Common names	Number of fish captured				
		Benthic monofilament gill nets	Benthic braided gill nets	Surface gill nets	Dutch fykes	Total
Oncorhynchus mykiss	Rainbow trout (stocked)	12	3	1	0	16
Perca fluviatilis	Perch	104	0	0	2	106
Esox lucius	Pike	10	0	0	1	11

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on White lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on White lake, October 2007

	Mean CPUE (mean number of fish/m of net)		
Gear type	**Rainbow trout**	**Perch**	**Pike**
Gill nets (all)	0.044	0.289	0.028
Fykes	0	0.011	0.006

Further work

All fish apart from perch were measured and weighed and scales were removed from rainbow trout and pike on site. Perch will be measured and weighed and opercular bones will be removed in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Northwestern Regional Fisheries Board

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Glencar lake, September 2007

1.1 Introduction

Glencar lake is situated in the Drumcliff catchment in Co. Sligo. The lake is located approximately 7km northeast of Sligo town to the north of the N16 Sligo-Manorhamilton road . The lake has a surface area of 114.7ha, mean depth is greater than 4m and has a maximum depth of 19m. The lake falls into typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and high alkalinity (>100mg/l $CaCO_3$).

The lake holds a small stock of brown trout and gets a good run of sea trout and salmon (O' Reilly, 2003).

Plate 1: Glencar lake looking west towards Drumcliff.

1.2 Methods

The lake was surveyed over two nights on the 10th and 11th of September 2007. A total of three sets of Dutch fykes, 15 (4 @ 0-2.9m, 4 @ 3-5.9m, 4 @ 6-11.9m and 3 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (20 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of six species were recorded on Glencar lake in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 343 fish were captured during the survey. 3-spined stickleback were the most common fish species encountered in the benthic gill nets followed by brown trout. Eels were the most common species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Glencar lake, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	99	32	1	132
	Sea trout	4	0	0	4
Salmo salar	Salmon (adults)	2	0	0	2
Platichthys flesus	Flounder	3	0	5	8
Gasterosteus aculeatus	3-spined stickleback	129	12	0	141
Phoxinus phoxinus	Minnow	26	0	0	26
Anguilla anguilla	Eel	0	0	30	30

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Glencar lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Glencar lake, September 2007

	Mean CPUE (mean number of fish/m of net)						
Gear type	Trout	Sea trout	Salmon	Flounder	3-spined stickleback	Minnow	Eel
Gill nets (all)	0.243	0.007	0.004	0.006	0.261	0.048	0.000
Fykes	0.006	0.000	0.000	0.028	0.000	0.000	0.167

Further work

All fish were measured and weighed and scales were removed from brown trout on site. Otoliths will be removed from the relevant fish in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Glenade lake, September 2007

1.1 Introduction

Glenade lake is situated at the top of the Bonet catchment in Co. Leitrim. The lake is located approximately 6km northwest of Manorhamilton. The lake has a surface area of 73.3ha, mean depth is greater than 3.51 and has a maximum depth of 11.45m (NWRFB, 2006). The lake falls into typology class 6 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), greater than 50ha and moderately alkaline (>20-100mg/l $CaCO_3$).

Plate 1: Glenade lake looking west towards Benbulbin.

1.2 Methods

The lake was surveyed over two nights on the 12th and 13th of September 2007. A total of three sets of Dutch fykes, 12 (4 @ 0-2.9m, 4 @ 3-5.9m and 4 @ 6-11.9m) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (17 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of four species were recorded on Glenade lake in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 698 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by roach. Roach were the most common species captured in the surface gill nets and eels were the most common species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Glenade lake, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Surface gill nets	Dutch fykes	Total
Perca fluviatilis	Perch	427	14	24	465
Rutilus rutilus	Roach	176	46	0	222
Esox lucius	Pike	7	0	0	7
Anguilla anguilla	Eel	0	0	4	4

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Glenade lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Glenade lake, September 2007

	Mean CPUE (mean number of fish/m of net)			
Gear type	Perch	Roach	Pike	Eel
Gill nets (all)	1.050	0.529	0.017	0.000
Fykes	0.133	0.000	0.000	0.022

Further work

All fish, apart from perch were measured and weighed and scales were removed from brown trout on site. The perch will be measured and weighed in the CFB laboratory and opercular bones will be removed. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Shannon Regional Fisheries Board

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Atedaun lake, September 2007

1.1 Introduction

Atedaun lake is situated in the Fergus catchment in Co. Clare. The lake is located adjacent to the town of Corofin. The lake has a surface area of 37.8ha, mean depth is 2.3m and has a maximum depth of 7m (Taylor *et al.*, 2002). The lake falls into typology class 9 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and high alkalinity (>100mg/l $CaCO_3$). Atedaun is a popular lake for pike fishing (Cleary, M. ShRFB, *pers. comm*.). A thick carpet of submerged macrophytes covers the shallow areas of the lake.

Plate 1: Atedaun lake, (A) looking across to the southeastern shore and (B) showing the thick carpet of submerged macrophytes.

1.2 Methods

The lake was surveyed over one night on the 17th of September 2007. A total of three sets of Dutch fykes and five (2 @ 0-2.9m and 3 @ 3-5.9m) benthic monofilament gill nets (8 sites) were used. The netting effort was supplemented by using two benthic braided gill nets (62.5mm knot to knot mesh). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of four species were recorded on Atedaun lake in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 183 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by rudd. Eels were the most common species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Atedaun lake, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Benthic braided gill nets	Dutch fykes	Total
Perca fluviatilis	Perch	120	0	3	123
Scardinius erythrophthalmus	Rudd	25	0	0	25
Esox lucius	Pike	4	2	1	7
Anguilla anguilla	Eel	0	0	28	28

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Atedaun lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Atedaun lake, September 2007

	Mean CPUE (mean number of fish/m of net)			
Gear type	Perch	Rudd	Pike	Eel
Gill nets (all)	0.571	0.119	0.029	0.000
Fykes	0.017	0.000	0.006	0.156

Further work

All fish, apart from perch were measured and weighed and scales were removed on site. The perch will be measured and weighed in the CFB laboratory and opercular bones will be removed. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Lickeen lake, September 2007

1.1 Introduction

Lickeen lake is situated in the Inagh catchment in Co. Clare. The lake is located approximately 3km northeast of Ennistymon. The lake has a surface area of 83.9ha, mean depth is greater than 4m and has a maximum depth of 20m. The lake falls into typology class 8 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and moderately alkaline (>20-100mg/l $CaCO_3$).

In the past the lake held a stock of wild brown trout and char. Rudd are now present in the lake (O' Reilly, 2003). The lake is stocked annually with brown trout by the Lickeen Lake Trout Anglers Cooperative.

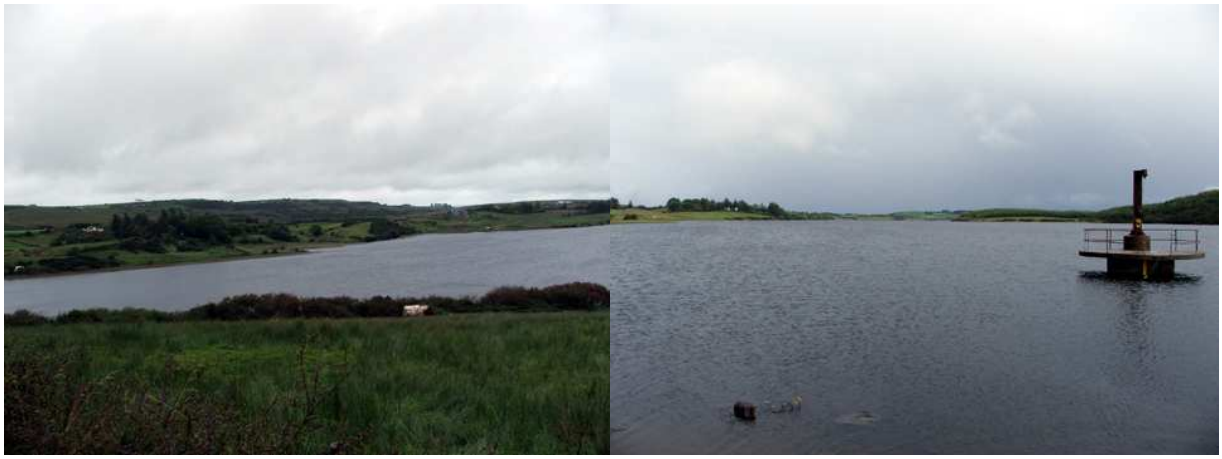

Plate 1: Lickeen lake looking (A) northwest and (B) east from the western shore

1.2 Methods

The lake was surveyed over two nights on the 19th and 20th of September 2007. A total of three sets of Dutch fykes, 15 (4 @ 0-2.9m, 4 @ 3-5.9m, 4 @ 6-11.9m and 3 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (20 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of four species were recorded on Lickeen lake in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 248 fish were captured during the survey. Rudd were the most common fish species encountered in the benthic gill nets followed by brown trout. Eels were the most common species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lickeen lake, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Benthic braided gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	77	0	0	77
Scardinius erythrophthalmus	Rudd	148	0	8	156
Gasterosteus aculeatus	3-spined stickleback	0	0	1	1
Anguilla anguilla	Eel	1	0	13	14

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lickeen lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Lickeen lake, September 2007

	Mean CPUE (mean number of fish/m of net)			
Gear type	**Brown trout**	**Rudd**	**3-spined stickleback**	**Eel**
Gill nets (all)	0.143	0.274	0.000	0.002
Fykes	0.000	0.044	0.006	0.072

Further work

All fish were measured and weighed and scales were removed from brown trout and rudd on site. Otoliths will be removed from the relevant fish in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Western Regional Fisheries Board

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Aughrusbeg Lough, August 2007

1.1 Introduction

Aughrusbeg lough is one of the most westerly lakes in the Connemara area of Co. Galway. The lake is located approximately five kilometers west of Cleggan. The lake has a surface area of 49.9ha, mean depth is less than 4m and has a maximum depth of 14m. The lake falls into typology class 7 (as designated by the EPA for the Water Framework Directive), i.e. shallow (>4m), less than 50ha and moderately alkaline (20-100mg/l $CaCO_3$).

This lake held a good stock of wild brown trout in the past, averaging over 0.5kg (O' Reilly, 2003), however rudd have been illegally introduced into the lake.

Plate 1 and 2: Aughrusbeg Lough

1.2 Methods

The lake was surveyed over one night on the 15th of July 2007 at 12 sites. A total of three sets of Dutch fykes, 7 (3 @ 0-2.9m, 2 @ 3-5.9m, 2 @ 6-11.9m) benthic monofilament gill nets. The survey effort was supplemented with two braided nets (62.5mm knot to knot mesh) set between 5m and 7m depth. Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of three species were recorded on Aughrusbeg Lough in August 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 214 fish were captured during the survey. Rudd were the most common fish species encountered in the benthic monofilament gill nets followed by 3-spined stickleback. Eels were also the most commonly observed species captured in the fyke nets. No fish were captured in the benthic braided nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Aughrusbeg Lough , August 2007.

Scientific names	Common names	Number of fish captured			
		Benthic Monofilament gill nets	Benthic braided gill nets	Dutch fykes	Total
Scardinius erythrophthalmus	Rudd	102	0	36	138
Gasterosteus aculeatus	3-spined stickleback	17	0	0	17
Anguilla anguilla	Eel	4	0	55	59

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Aughrusbeg Lough , are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Aughrusbeg Lough, August 2007

	Mean CPUE (mean number of fish/m of net)		
Gear type	**Rudd**	**3-spined stickleback**	**Eels**
Gill nets (monfilament)	0.49	0.08	0.02
Fykes	0.20	0.00	0.31

Further work

All fish were measured and weighed and scales were removed. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Kylemore Lough, August 2007

1.1 Introduction

Kylemore Lough is the largest of the three Kylemore loughs and is situated on the Dawros catchment in Co. Galway. The lake is located adjacent to the N59 Clifden to Westport road, approximately five kilometers northeast of Letterfrack, Co. Galway. The lake has a surface area of 133.5ha, mean depth is greater than 4m and has a maximum depth of 30mm. The lake falls into typology class 4 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and low alkalinity (<20mg/l $CaCO_3$).

This lake has a stock of brown trout and char and gets a run of salmon and sea trout from June to the end of the angling season (O' Reilly, 2003).

Plate 1: Kylemore Lough, looking southwest across the lake

1.2 Methods

The lake was surveyed over two nights on the 20th and 21st of August 2007. A total of 3 sets of Dutch fykes, 21 (4 @ 0-2.9m, 4 @ 3-5.9m, 5 @ 6-11.9m, 4 @ 12-19.9m and 4 @) 20-34.9m) benthic gill nets and 2 surface floating gillnets were deployed randomly in the lake (27 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments

were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of five species were recorded on Kylemore Lough in August 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 193 fish were captured during the survey. Trout followed by char and sea trout were the most common fish species encountered in the benthic gill. Eels were also the most commonly observed species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Kylemore Lough , August 2007.

Scientific names	Common names	Number of fish captured			
		Benthic gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	79	1	2	82
	Sea trout	23	1	0	24
Salvelinus alpinus	Char	35	0	0	35
Salmo salar	Salmon	5	0	1	6
Phoxinus phoxinus	Minnow	22	0	1	23
Anguilla anguilla	Eel	1	0	22	23

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net (i.e. mean CPUE) and these data, for all fish species per gear type on Kylemore Lough, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Kylemore Lough, August 2007

	Mean CPUE (mean number of fish/m of net)					
Gear type	**Brown trout**	**Sea trout**	**Char**	**Salmon**	**Minnow**	**Eel**
Gill nets (all)	0.08	0.02	0.06	0.002	0.005	0.002
Fykes	0.01	0.00	0.00	0.006	0.006	0.122

Further work

All fish were measured and weighed and scale samples were taken. Otoliths will be removed from the relevant fish in the laboratory. Fish will then be aged. A water sample was also taken. The chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Nambrackmore Lough, August 2007

1.1 Introduction

Nambrackmore Lough is located approximately 5.5kilometers north of Roundstone in Co; Galway. The lake has a surface area of 10.4ha, mean depth is 2.09m and has a maximum depth of 10m (WRFB, 2006). The lake falls into typology class 1 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and low alkalinity (<20mg/l $CaCO_3$).

Plate 1: Lough Nambrackmore

1.2 Methods

The lake was surveyed over one night on the 22nd August 2007. A total of three sets of Dutch fykes and six (2 @ 0-2.9m, 2 @ 3-5.9m and 2 @ 6-11.9m) benthic gill nets were deployed randomly in the lake (9 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

Only two species were recorded on Lough Nambrackmore in August 2007. The species encountered and numbers captured by each gear type is compiled in Table 1.1. Only 10 fish were captured during the survey. Brown trout were the only fish species encountered in the benthic gill nets and eels were the only species captured in the fyke nets. The brown trout were probably stocked fish as many of the pectoral fins were stunted and there was evidence of fin erosion on each dorsal fin.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Nambrackmore Lough , July 2007.

Scientific names	Common names	Number of fish captured		
		Benthic gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	6	0	6
Anguilla anguilla	Eel	0	4	4

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lough Nambrackmore, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on L. Nambrackmore, August 2007

	Mean CPUE (mean number of fish/m of net)	
Gear type	Brown trout	Eel
Gill nets (all)	0.033	0
Fykes	0	0.022

Further work

All fish were be measured and weighed and scales were removed for age analysis. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Maumwee Lough, August 2007

1.1 Introduction

Maumwee Lough is situated in the Corrib catchment. The lake is located approximately two kilometers north of Maam Cross. The lake has a surface area of 27.5ha, mean depth is 2.10m and maximum depth has been measured at 8.84m (WRFB, 2006). The lake falls into typology class 1 (as designated by the EPA for the Water Framework Directive), i.e. shallow (<4m), less than 50ha and low alkalinity (<20mg/l $CaCO_3$).

The lake holds a stock of small brown trout and adult salmon can be captured in the lake during July and August (O' Reilly, 2003).

Plate 1: Maumwee Lough looking east over the lake

1.2 Methods

The lake was surveyed over one night on the 27th of August 2007. A total of three sets of Dutch fykes, 14 (4 @ 0-2.9m, 4 @ 3-5.9m, 3 @ 6-11.9m and 3 @ 12-19.9m) benthic gill nets and one surface floating gillnet were deployed randomly in the lake (18 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of four species were recorded on Maumwee Lough in August 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 130 fish were captured during the survey. Brown trout were the most common fish species encountered in the benthic gill nets followed by minnow. Eels were also the most commonly observed species captured in the fyke nets followed by eels and pike.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Maumwee Lough, August 2007.

Scientific names	Common names	Number of fish captured		
		Benthic gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	90	2	92
Salmo salar	Salmon (juveniles)	1	0	1
Phoxinus phoxinus	Minnow	29	0	29
Anguilla anguilla	Eel	0	8	8

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Maumwee Lough, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Maumwee Lough, August 2007

	Mean CPUE (mean number of fish/m of net)			
Gear type	Trout	Salmon (juveniles)	Minnow	Eel
Gill nets (all)	0.429	0.005	0.138	0.000
Fykes	0.017	0.000	0.000	0.067

Further work

All fish were measured and weighed and scales were taken from all brown trout. Otoliths will be removed from the eels and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Ross Lake, August 2007

1.1 Introduction

Ross Lake is located on a chain of lakes situated in the Corrib catchment which enters Lough Corrib in Moycullen Bay. The lake is located approximately one kilometer southeast of Rosscahill and 3km northwest of Moycullen. The lake has a surface area of 138.6ha, mean depth is greater than 4m and has a maximum depth of 14m. The lake falls into typology class 12 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and high alkalinity (20-100mg/l $CaCO_3$).

The lake is a coarse fishery and has stocks of roach, bream, roach x bream hybrids and pike. The presence of zebra mussels was confirmed in Ross Lake in May 2007.

Plate 1: Ross Lake

1.2 Methods

The lake was surveyed over two nights on the 28th and 29th of August 2007. A total of three sets of Dutch fykes, 12 (4 @ 0-2.9m, 4 @ 3-5.9m and 4 @ 6-11.9m) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (17 sites). The netting effort was supplemented with four braided (62.5m knot to knot) benthic gill nets. Survey locations were randomly selected using a pre-

prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of five species were recorded on Ross Lake in August 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 566 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by roach. Eels were also the most commonly observed species captured in the fyke nets followed by perch.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Ross lake, August 2007.

Scientific names	Common names	Number of fish captured				
		Benthic monofilament gill nets	Benthic braided gill nets	Surface gill nets	Dutch fykes	Total
Perca fluviatilis	Perch	194	0	66	3	263
Rutilus rutilus	Roach	164	0	45	0	209
Abramis brama	Bream	23	10	1	0	34
	Roach x bream hybrids	49	1	0	0	50
Esox lucius	Pike	5	0	0	1	6
Anguilla anguilla	Eel	0	0	0	4	4

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Ross Lake, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Ross lake, August 2007

	Mean CPUE (mean number of fish/m of net)					
Gear type	**Perch**	**Roach**	**Rox Br hybrids**	**Bream**	**Pike**	**Eel**
Gill nets (all monofilament)	0.481	0.387	0.093	0.063	0.009	0
Fykes	0.02	0.00	0.00	0.00	0.01	0.02

Further work

All fish will be measured and weighed, scales and opercular bones will be removed from the relevant fish and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. Samples of fish have been given to Brian Hayden (UCD Ph.D. post graduate) for further analysis. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Lough Shindilla, September 2007

1.1 Introduction

Lough Shindilla is the uppermost lake on the Screebe system in Co. Galway. The lake is located approximately 0.75km west of Maam Cross and is adjacent to the N59 Maam Cross to Clifden road. The lake has a surface area of 65.3ha, mean depth is greater than 4m and has a maximum depth of 22m. The lake falls into typology class 4 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and low alkalinity (<20mg/l $CaCO_3$).

The lake holds a stock of brown trout and gets the occasional seatrout and salmon (O 'Reilly, 2003). Char are also present in the lake (Igoe and Hammar, 2004).

Plate 1: Lough Shindilla

1.2 Methods

The lake was surveyed over two nights on the 3rd and 4th of September 2007. A total of three sets of Dutch fykes, 15 (4 @ 0-2.9m, 4 @ 3-5.9m, 4 @ 6-11.9m and 3 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (20 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of five species were recorded on Lough Shindilla in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 99 fish were captured during the survey. Char were the most common fish species encountered in the benthic gill nets followed by brown trout. Eels were also the most commonly observed species captured in the fyke nets.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lough Shindilla, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	30	2	0	32
Salmo salar	Salmon (adults)	1	0	0	1
Salvelinus alpinus	Char	46	3	0	49
Phoxinus phoxinus	Minnow	4	0	0	4
Anguilla anguilla	Eel	1	0	12	13

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lough Shindilla, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Lough Shindilla, September 2007

	Mean CPUE (mean number of fish/m of net)				
Gear type	**Trout**	**Salmon**	**Char**	**Minnow**	**Eel**
Gill nets (all)	0.059	0.002	0.091	0.007	0.002
Fykes	0.000	0.000	0.000	0.000	0.067

Plate 2: Char captured in gill nets on Lough Shindilla, September 2007.

Further work

All fish were measured and weighed and scales were removed from brown trout. Otoliths will be removed from the relevant fish in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey of Lough Ardderry, September 2007

1.1 Introduction

Lough Ardderry is the second lake on the Screebe system in Co. Galway. The lake is located adjacent to Maam Cross and to the south of the N59 Galway to Clifden road. The lake has a surface area of 80.7ha, mean depth is greater than 4m and has a maximum depth of 12m. The lake falls into typology class 4 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and low alkalinity (<20mg/l $CaCO_3$).

The lake holds a large stock of brown trout (O 'Reilly, 2003).

Plate 1: Lough Ardderry

1.2 Methods

The lake was surveyed over two nights on the 5th and 6h of September 2007. A total of three sets of Dutch fykes, 15 (4 @ 0-2.9m, 4 @ 3-5.9m, 4 @ 6-11.9m and 3 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (20 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of five species were recorded on Lough Ardderry in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 66 fish were captured during the survey. Perch were the most common fish species encountered in the benthic gill nets followed by brown trout. One salmon was captured loosely by the teeth as was released back into the lake. No fish were captured in the fyke nets. Prior to this survey it was not known that perch were present in this lake and the source of their colonisation is not known.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lough Ardderry, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	7	3	0	10
Salmo salar	Salmon (adults)	1	0	0	1
Salvelinus alpinus	Char	4	1	0	5
Perca fluviatilis	Perch	49	1	0	50
Anguilla anguilla	Eel	1	0	0	1

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lough Ardderry, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Lough Ardderry, September 2007

	Mean CPUE (mean number of fish/m of net)				
Gear type	**Trout**	**Salmon**	**Char**	**Perch**	**Eel**
Gill nets (all)	0.026	0.003	0.013	0.128	0.003
Fykes	0	0	0	0	0

Further work

All fish were measured and weighed and scales were removed from brown trout. Otoliths and opercular bones will be removed from the relevant fish in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Preliminary Synopsis of the WFD Surveillance Monitoring Fish Stock Survey

Lettercraffroe Lough, September 2007

1.1 Introduction

Lettercraffroe Lough is situated on a tributary of the Owenriff river which flows through Oughterard, Co. Galway and into Lough Corrib. The lake is located 6km southwest of Oughterard. The lake has a surface area of 82ha, mean depth is 2.86m and has a maximum depth of 17.87 (WRFB, 2006). The western and southern shores of the lake are heavily forested. The lake falls into typology class 2 (as designated by the EPA for the Water Framework Directive), i.e. deep (>4m), greater than 50ha and low alkalinity (<20mg/l $CaCO_3$).

The lake holds a very large stock of brown trout (O' Reilly, 2003).

Plate 1: Lettercraffroe Lough

1.2 Methods

The lake was surveyed over two nights on the 25th and 26h of September 2007. A total of three sets of Dutch fykes, 12 (4 @ 0-2.9m, 4 @ 3-5.9m, 2 @ 6-11.9m and 2 @) 12-19.9) benthic monofilament gill nets and two surface floating gillnets were deployed randomly in the lake (17 sites). Survey locations were randomly selected using a pre-prepared grid placed over the map of the lake. Portable GPS instruments were used to mark the precise location of each net when set. The angle of each gill net in relation to the shoreline was randomized.

1.3 Results

1.3.1 *Species Richness*

A total of four species were recorded on Lettercraffroe Lough in September 2007. A list of the species encountered and numbers captured by each gear type is compiled in Table 1.1. A total of 170 fish were captured during the survey. Roach were the most common fish species encountered in the benthic gill nets followed by brown trout. Eel were the most common species captured in the fyke nets. Prior to this survey it was not known that roach were present in this lake and the source of their colonisation is not known.

Table 1.1: List of fish species recorded (including numbers captured) during the survey on Lettercraffroe Lough, September 2007.

Scientific names	Common names	Number of fish captured			
		Benthic monofilament gill nets	Surface gill nets	Dutch fykes	Total
Salmo trutta	Brown trout	53	0	1	54
Rutilus rutilus	Roach	107	3	0	110
Gasterosteus aculeatus	3-spined stickleback	1	1	0	2
Anguilla anguilla	Eel	0	0	4	4

Plate 2: Roach captured in Lettercraffroe Lough, September 2007.

1.3.2 *Fish abundance*

Fish abundance was calculated as the mean number of fish caught per m of net, i.e. mean CPUE and these data, for all fish species per gear type on Lettercraffroe Lough, are summarized in Table 1.2.

Table 1.2: Mean CPUE (mean number of fish per m of net) on Lettercraffroe Lough, September 2007

	Mean CPUE (mean number of fish/m of net)			
Gear type	**Trout**	**Roach**	**3-spined stickleback**	**Eel**
Gill nets (all)	0.126	0.262	0.005	0.000
Fykes	0.006	0.000	0.000	0.022

Further work

All fish were measured and weighed and scales were removed from brown trout and roach. Otoliths will be removed from the relevant fish in the laboratory and fish will be aged. A water sample was taken; the chemical results and age analysis will be available in due course. A more detailed report will be available in 2008.

Fiona Kelly, Ph.D., WFD Project Manager, 10th October 2007