



Department of  
**Culture, Arts  
and Leisure**

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# ***Digest of Statistics for Salmon and Inland Fisheries in the DCAL Jurisdiction***

*Annual Report*

DCAL Fisheries Sector  
Data in 2014

**DCAL Findings 12/2015-16**



*Northern Ireland*  
**Statistics &  
Research**  
Agency

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**DCAL Research & Statistics Branch**

**T**he main purpose of these statistics is to give an overview of the Department of Culture, Arts and Leisure (DCAL) fisheries sector in Northern Ireland.

The latest available data have been drawn together from a number of published and unpublished sources. The year is indicated in each table with 2014 being the most recent data available. The data may change at a future date due to revisions.



**Angler with Pike  
Lower Lough Erne, Co. Fermanagh.**

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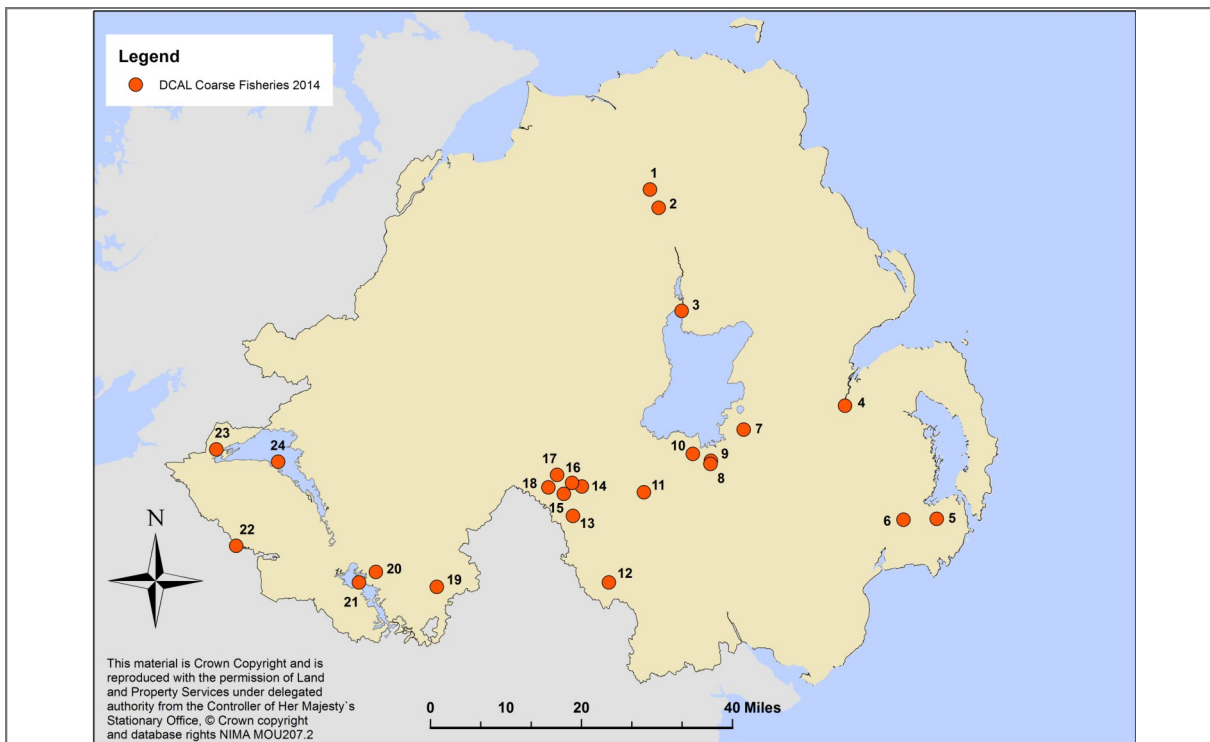
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The Agri-Food and Biosciences Institute (AFBI) undertake monitoring and research into salmon and freshwater fisheries, which are funded by the Department of Culture, Arts and Leisure (DCAL). These monitoring data and research programs provide the scientific basis for conservation and management of salmon and inland fisheries.

## 1. Location of the DCAL Public Angling Estate

### 1.1. Coarse fisheries

**Figure 1.1: Location of DCAL coarse fisheries in Northern Ireland 2014**



1	Movanagher	13	Enagh Lough
2	Portna Canal	14	Tullygiven Lough
3	Toome Canal	15	Creeve Lough
4	River Lagan (Stranmillis Stretch)	16	Lough Macronan
5	Lough Money	17	Carrick Lough
6	Quoile Basin	18	White Lough
7	Broadwater	19	Killyfole (Mill Lough)
8	Craigavon City Park Lake North	20	Colebrooke River
9	Craigavon City Park Lake South	21	Upper Lough Erne
10	Upper River Bann (Portadown)	22	Upper Lough MacNean
11	Loughgall Lake	23	Lough Scolban
12	Clay Lake	24	Lower Lough Erne

- There were 24 DCAL coarse fisheries available for public use in 2014 (Figure 1.1).

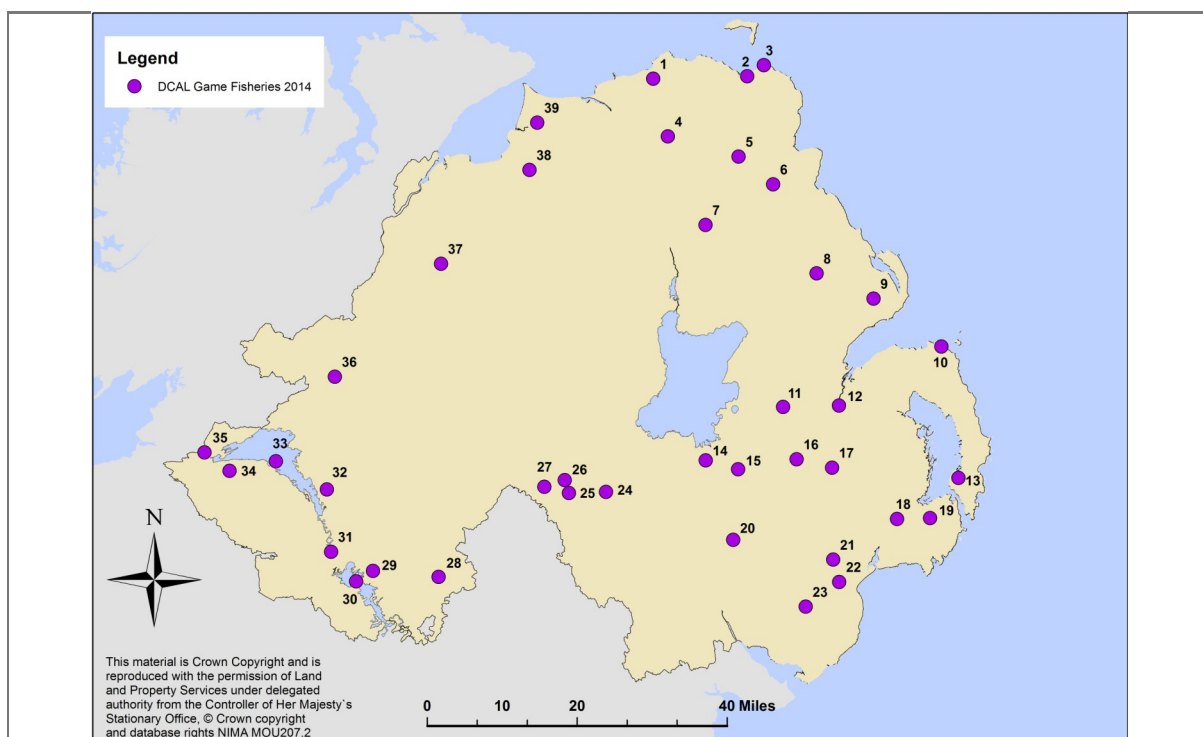
Source: DCAL

1. Coarse species include pike, bream, roach, perch, carp, tench and rudd.

## 1. Location of the DCAL Public Angling Estate

### 1.2. Game fisheries

**Figure 1.2: Location of DCAL game fisheries in Northern Ireland 2014**



1	River Bush	18	Rivers Ballynahinch, Annacloy and Quoile
2	River Margy, Carey & Glenshesk	19	Lough Money
3	Lough NaCranagh and Lough Doo	20	Lough Brickland
4	Ballymoney River	21	Castlewellan Lake
5	Altnahinch	22	Shimna River
6	Dungonnell	23	Spelga Reservoir
7	River Maine	24	River Blackwater
8	Killylane Reservoir	25	Creevy Lough
9	Copeland (Marshallstown)	26	Brantry Lough
	Lough Mourne	27	White Lough
	North Woodburn	28	Loughs Corry and Corransy
	Lower South Woodburn	29	Colebrooke River
	Middle South Woodburn	30	Upper Lough Erne
	Upper South Woodburn	31	Mill Lough (Bellanaleck)
10	Portavoe Reservoir	32	Ballinamallard River
11	Stoneyford Reservoir	33	Lower Lough Erne
12	River Lagan (Shaw's Bridge)	34	Navar Forest Lakes (Achork, Glencreawan, Meenameen)
13	Lough Cowey	35	Keenaghan Lough
14	Craigavon City Park North Lake	36	Loughs Bradan and Lee
15	River Lagan (Iveagh)	37	Loughs Ash and Moor
16	Hillsborough Lake	38	River Roe
17	Ballykeel Lougherne	39	Binevenagh Lake

- There were 39 DCAL game fisheries available for public use in 2014 (Figure 1.2).

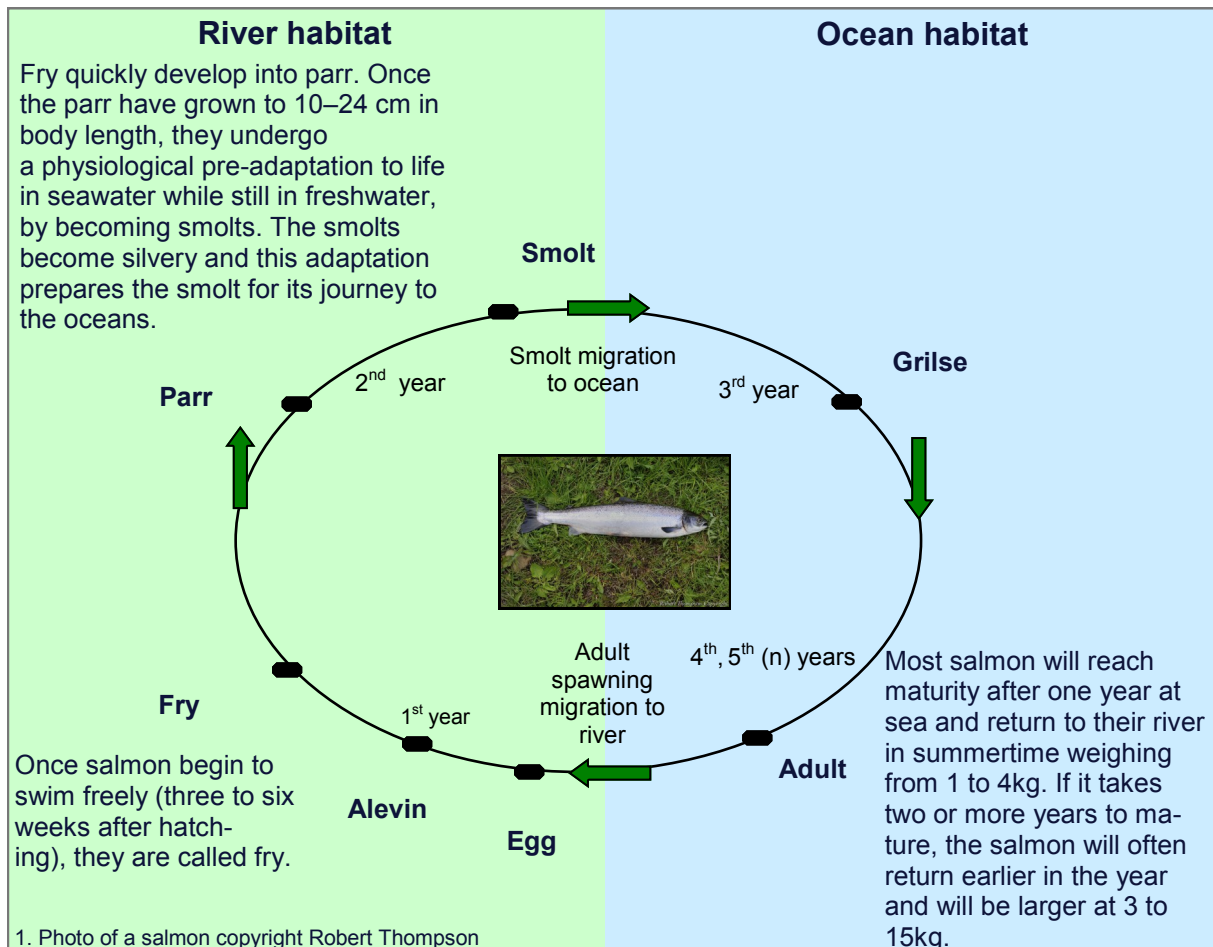
Source: DCAL

1. Game species include brown trout, rainbow trout, sea trout, salmon, and arctic char.

## 2. Salmon conservation

### 2.1 Life cycle of the salmon

Figure 2.1: Life cycle of the Atlantic salmon

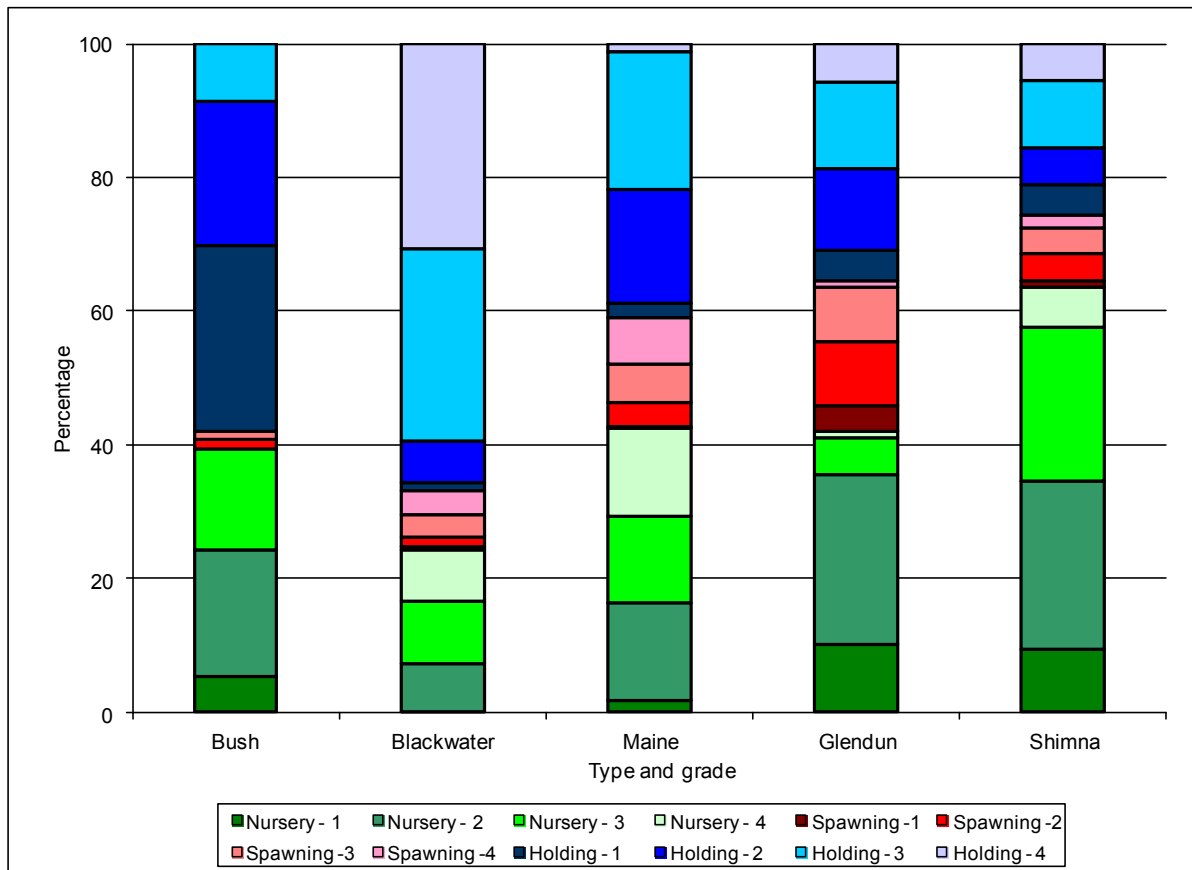


- DCAL, together with fisheries scientists from AFBI, work to attempt to address the decline in the Atlantic salmon population in Northern Ireland rivers. Based on North Atlantic Salmon Conservation Organisation (NASCO) resolutions, index rivers are monitored for compliance with conservation targets. Where these are not being attained, the reasons are researched and a programme is adopted of measures designed to address identified reasons.
- Data are collected by DCAL and AFBI on the key stages of the salmon life cycle (Figure 2.1) to aid research in this area and to inform reports to NASCO. Data presented in this digest includes:
  1. Status of salmon habitat
  2. Salmon fry index for the River Bush
  3. Salmon fry abundance on the salmon index rivers
  4. Salmon recruitment index on the salmon index rivers
  5. Salmon wild smolt count on the River Bush
  6. Wild adult salmon returns to the River Bush
  7. Commercial salmon catch returns in the DCAL jurisdiction
  8. Salmon marine survival
  9. Compliance with conservation limits
  10. Salmon restoration on the River Lagan

**2. Salmon conservation**

**2.2. Status of salmon habitat**

**Figure 2.2: Habitat composition of catchments in the rivers Bush, Blackwater, Maine, Glendun and Shimna using Life Cycle Unit habitat classification; Grade: 1 (excellent) to 4 (marginal) 2001-2003**



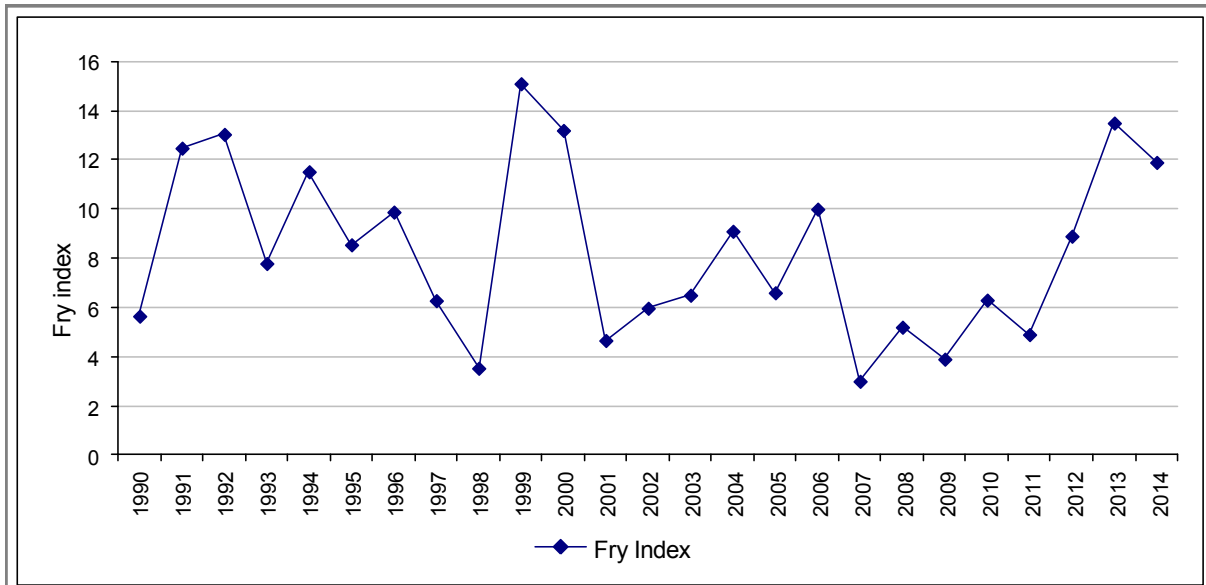
- The habitat resource has been recorded by extensive walk over surveys using the Life Cycle Unit approach. Habitat is classified according to type (nursery, holding, spawning) and quality (1 excellent – 4 marginal) (Kennedy, 1984, O'Connor & Kennedy, 2002).
- Figure 2.2 shows a breakdown for habitat type and quality for each of the rivers. The Bush was classified with 58% holding, 39% nursery and 3% spawning. The Glendun was classified with 35% holding, 42% nursery and 22% spawning.

Source: Agri-Food and Biosciences Institute

1. A habitat inventory was compiled for the Bush, Blackwater, Maine, Glendun, and Shimna over a 2 year period from 2001 to 2003.
2. Nursery is a section of the river where junior salmon can live. It is characterised by shallow water and a stony river bed.
3. Spawning is a section of the river where adults lay their eggs. This section of the river typically has a gravel bed.
4. Holding is a section of the river where adults can rest when they return to spawn. This section of the river has deep water.
5. Figures may not add up due to rounding.

**2. Salmon conservation**  
**2.3. Salmon fry index for the River Bush**

**Figure 2.3: Salmon fry index for the River Bush 1990-2014**



	Unit: Fry index				
	2010	2011	2012	2013	2014
Bush	6.3	4.9	8.9	13.5	11.9

- Data on fry abundance is collected by five minute semi-quantitative electrofishing surveys using an electric fishing backpack.
- Surveys take place on all the salmon index rivers every year. The same sites are revisited so comparisons can be made year-on-year.
- From electrofishing data, a fry index is calculated for the River Bush (Crozier and Kennedy, 1994). The fry index is a relative index and does not equate to the number of fish in a river. The River Bush fry index from 1990 to 2014 is presented in Figure 2.3.



**Electrofishing survey in operation**

- In 2014, the salmon fry index for the River Bush was 11.9, a decrease on the previous year (13.5) but more than the previous ten year average (2004-2013) of 7.1.

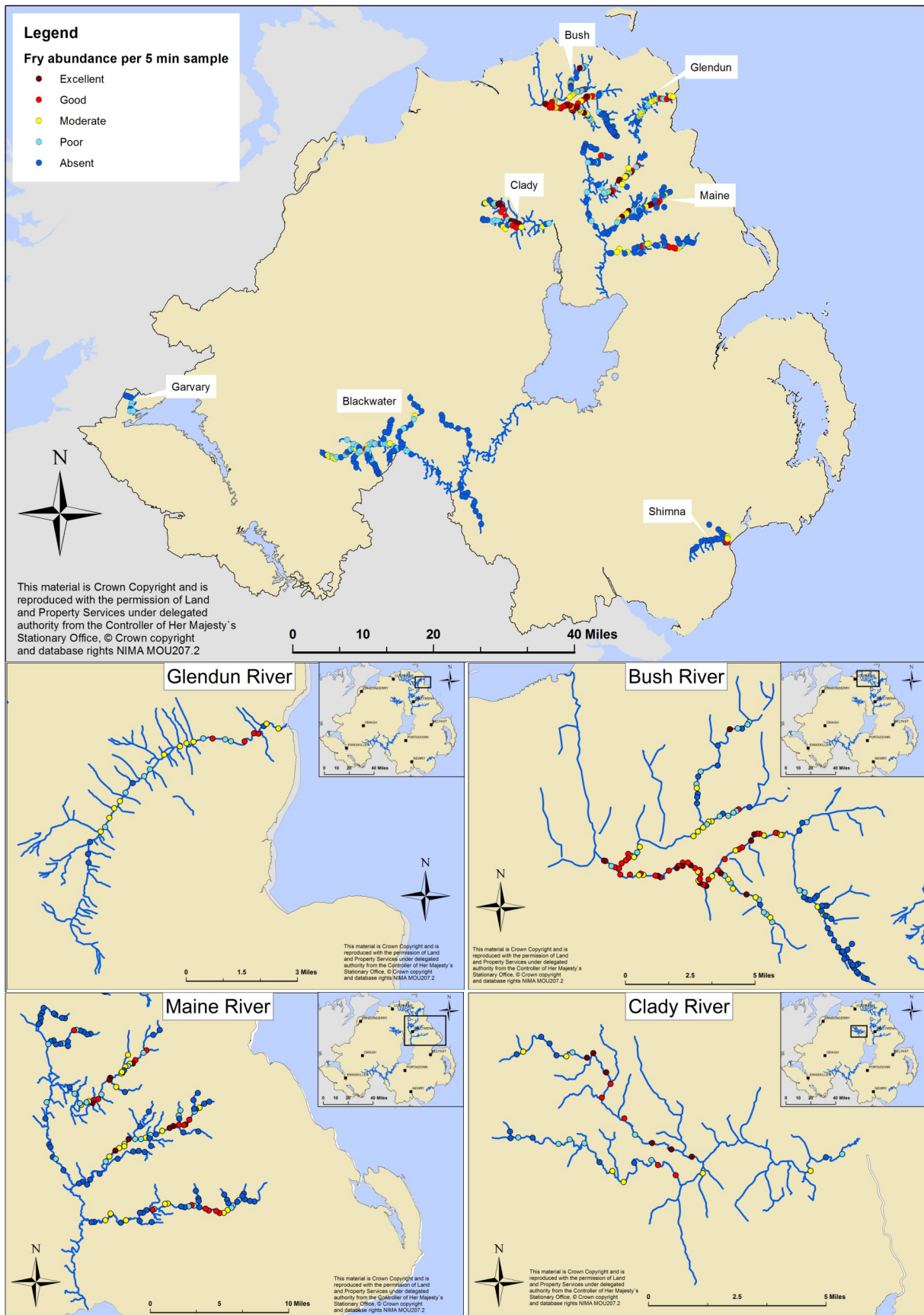
Source: Agri-Food and Biosciences Institute

1. Once salmon begin to swim freely (three to six weeks after hatching) they are called fry.

## 2. Salmon conservation

### 2.4. Salmon fry abundance on the salmon index rivers

**Figure 2.4: Salmon fry abundance on the salmon index rivers 2014**

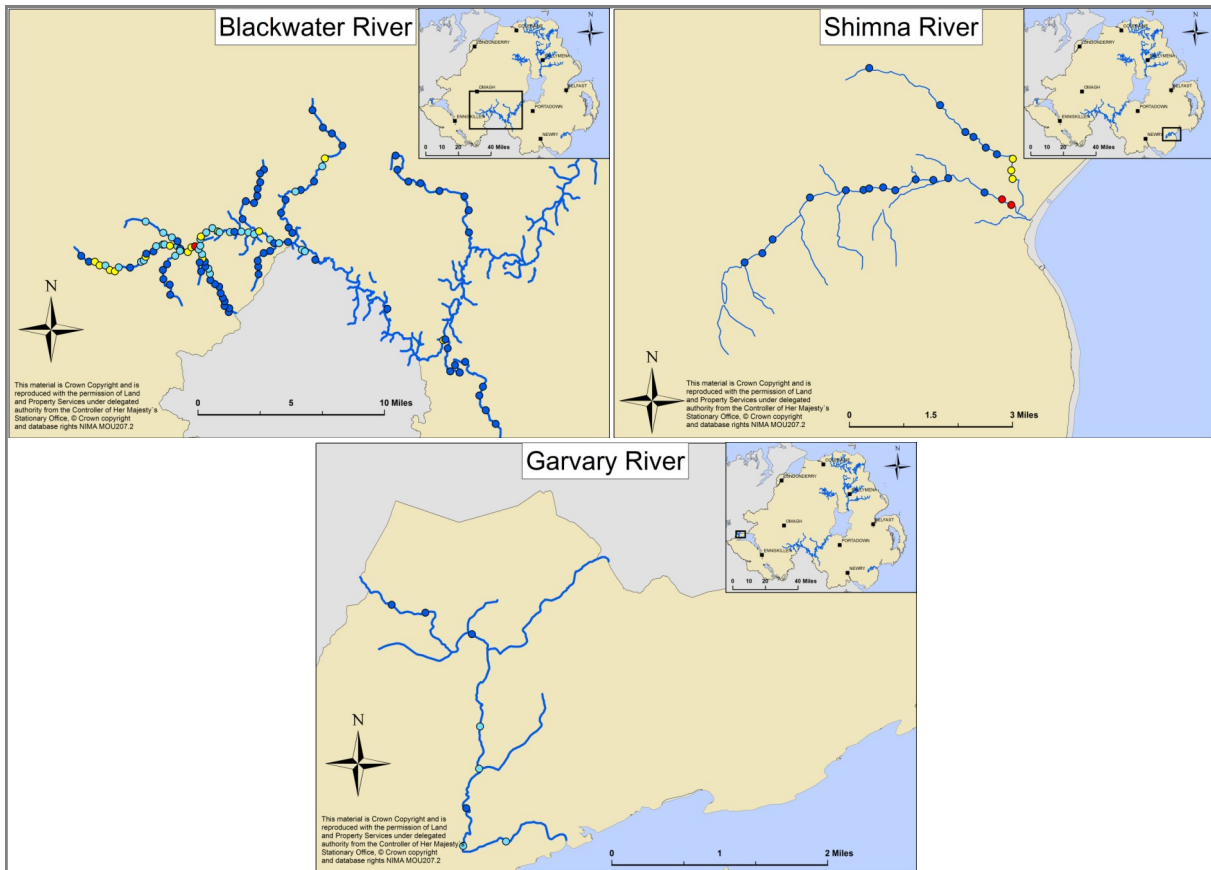




**2. Salmon conservation**

**2.4. Salmon fry abundance on the salmon index rivers**

**Figure 2.4: Salmon fry abundance on the salmon index rivers 2014**



- Seven salmon index rivers have been selected for annual surveys to represent different catchment types in Northern Ireland. Fry abundance surveys have been undertaken on all the salmon index rivers.
- The maps in Figure 2.4 show the fry abundance on the salmon index rivers, the Bush, Clady, Garvary, Maine, Blackwater, Glendun and Shimna for 2014.
- Each of the electrofishing sites were graded using the abundance grades shown in Table 2.3.

**Table 2.3: Grade of electrofishing sites**

Grade	Number of fry per 5 min session
Excellent	25+
Good	15-24
Moderate	5-14
Poor	1-4
Absent	0

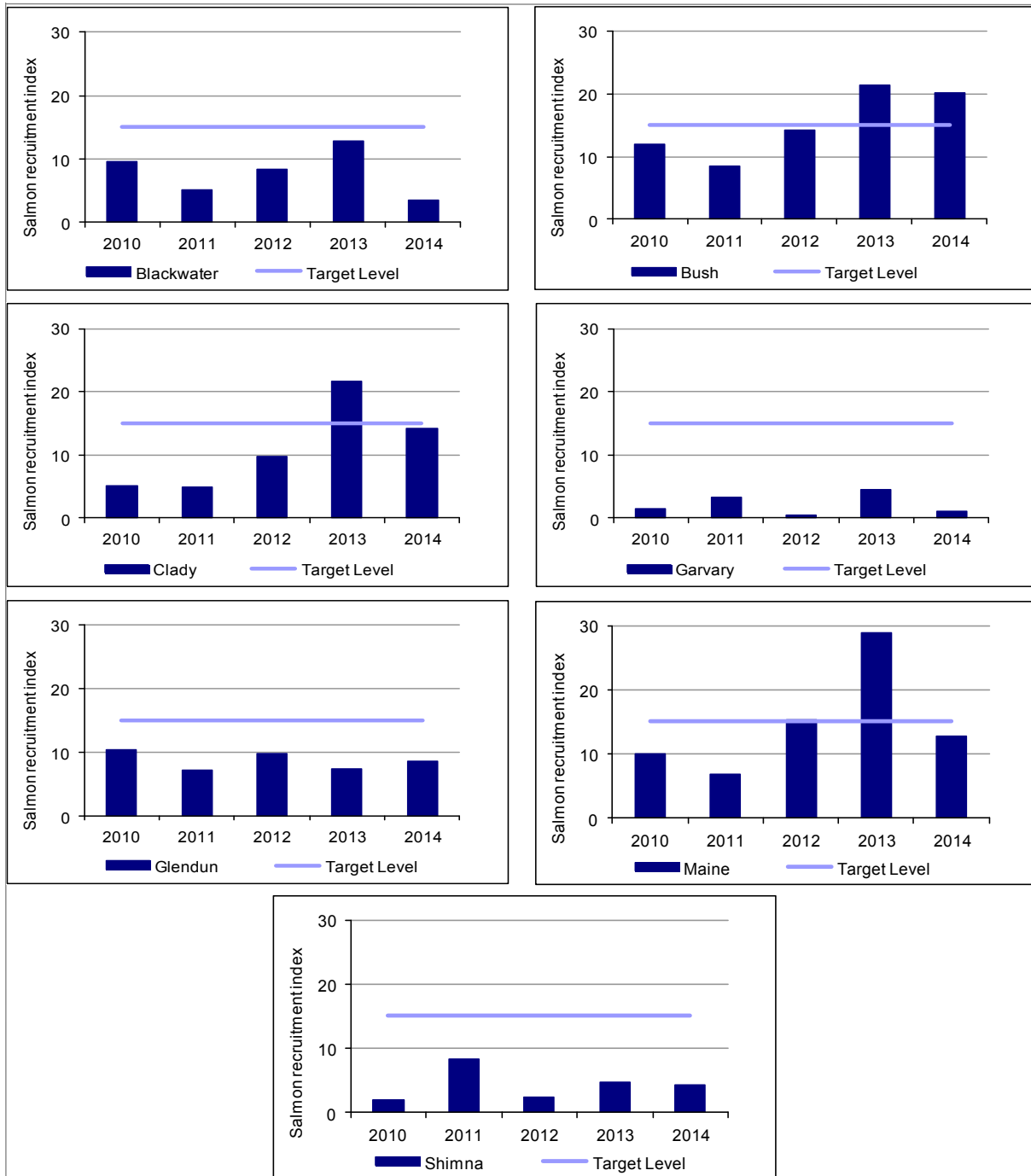
Source: DCAL and Agri-Food and Biosciences Institute

1. Once salmon begin to swim freely (three to six weeks after hatching) they are called fry.
2. Data are collected using 5 minute electrofishing surveys.

2. Salmon conservation

2.5. Salmon recruitment index on the salmon index rivers

Figure 2.5: Salmon recruitment index on the salmon index rivers 2010-2014



Unit: Salmon recruitment index

	2010	2011	2012	2013	2014
Blackwater	9.6	5.1	8.4	12.8	3.4
Bush	12.0	8.5	14.2	21.4	20.1
Clady	5.0	4.8	9.7	21.7	14.2
Garvary	1.5	3.2	0.5	4.4	1.0
Glendun	10.3	7.2	9.7	7.3	8.6
Maine	10.1	6.7	15.3	28.8	12.8
Shimna	1.9	8.4	2.3	4.7	4.3

## **2. Salmon conservation**

### **2.5. Salmon recruitment index on the salmon index rivers**

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- A recruitment index for Atlantic salmon has been developed for a number of rivers in the DCAL area. The index is derived from annual semi-quantitative electrofishing surveys conducted at standard sites on each river. The index is the mean relative abundance of Atlantic salmon in their first year (0+ age class) found in the main spawning areas of each river.
- Salmon recruitment can be graded according to the abundance of 0+ fry found during electric fishing surveys (Crozier and Kennedy, 1994). A level of 1-4 (0+ salmon) per 5 minute sample is classed as poor, 5-14 classed as moderate, 15-24 classed as good and 25+ classed as excellent. A threshold of 15 (0+ salmon) per 5 minute sample has been adopted as a target level of recruitment for monitored rivers in Northern Ireland.
- In 2014, only the Bush River exceeded the recruitment threshold of 15 or more. The mean relative abundance of 0+ age class Atlantic Salmon for six of the seven monitored rivers decreased from their 2013 figures. Figures for the Glendun River increased in this period.
- Over the eight year period from 2007 to 2014, the 15 (0+ salmon) per minute target threshold has been achieved in at least one year by 4 of the 7 monitored rivers. The Garvary, Glendun and Shimna rivers had not achieved the target in any of the eight years from 2007.

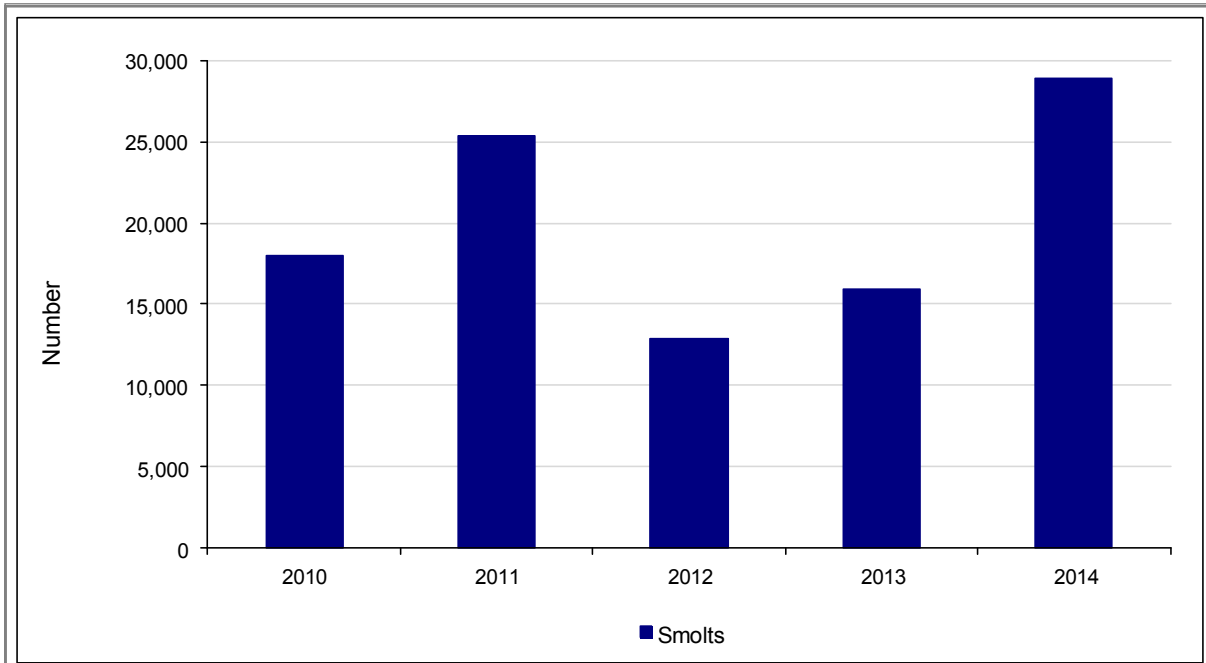
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Source: Agri-Food and Biosciences Institute

**2. Salmon conservation**

**2.6. Salmon wild smolt count on the River Bush**

**Figure 2.6: Estimated number of wild smolts counted at Bushmills smolt trap 2010-2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Smolts	17,976	25,360	12,868	15,949	28,883

- When young salmon are going to sea they change colour and are distinguishable from other young salmon. They are called smolts.
- The number of smolts going to sea from the River Bush is monitored at the Bushmills Salmon Station.
- In 2014, the smolt count was composed of 28,883 fish which was more than the previous ten year average (2004-2013) of 19,332 and the highest count since 1985.

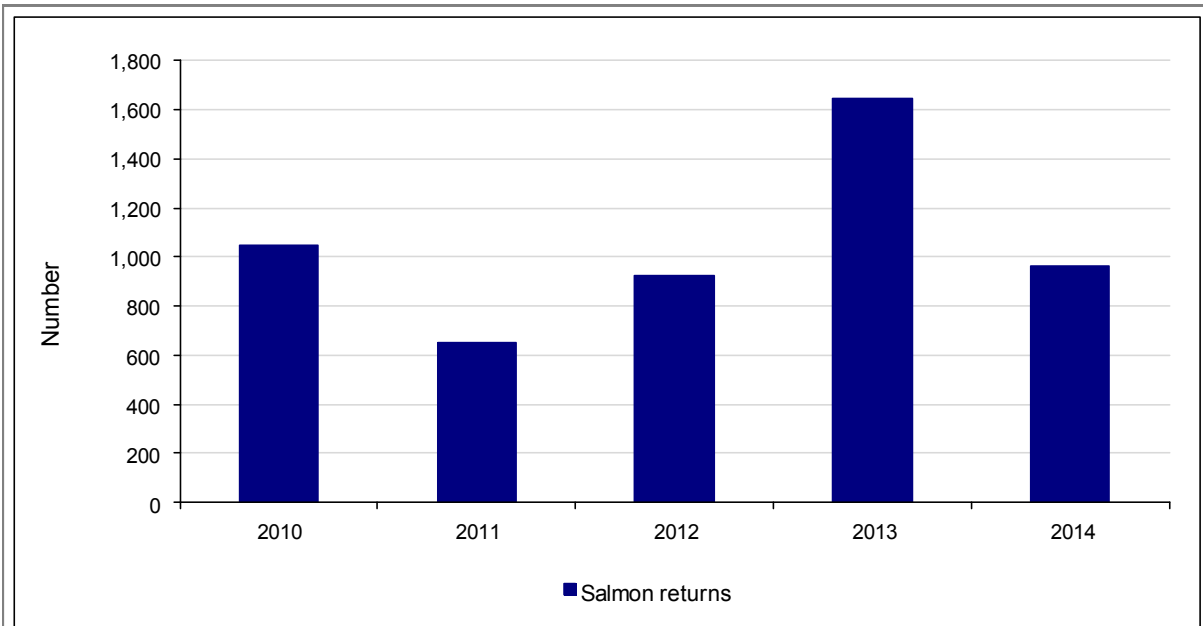


**Weighing smolts at the Bushmills Salmon Station**

Source: Agri-Food and Biosciences Institute

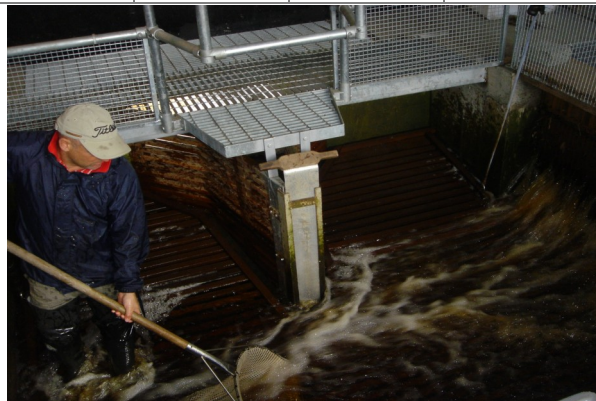
**2. Salmon conservation**  
**2.7. Wild adult salmon returns to the River Bush**

**Figure 2.7: Estimated returns of wild adult salmon to the River Bush 2010-2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Salmon returns	1,045	649	926	1,644	963

- Adult salmon return to fresh water to spawn.
- The number of adult salmon returns to the River Bush is monitored at the Bushmills Salmon Station.
- Wild adult salmon numbers returning to the River Bush in 2014 (963) were fewer than the previous year (1,644).
- The 2014 figure is below the previous ten year average (2004-2013) of 1,239.



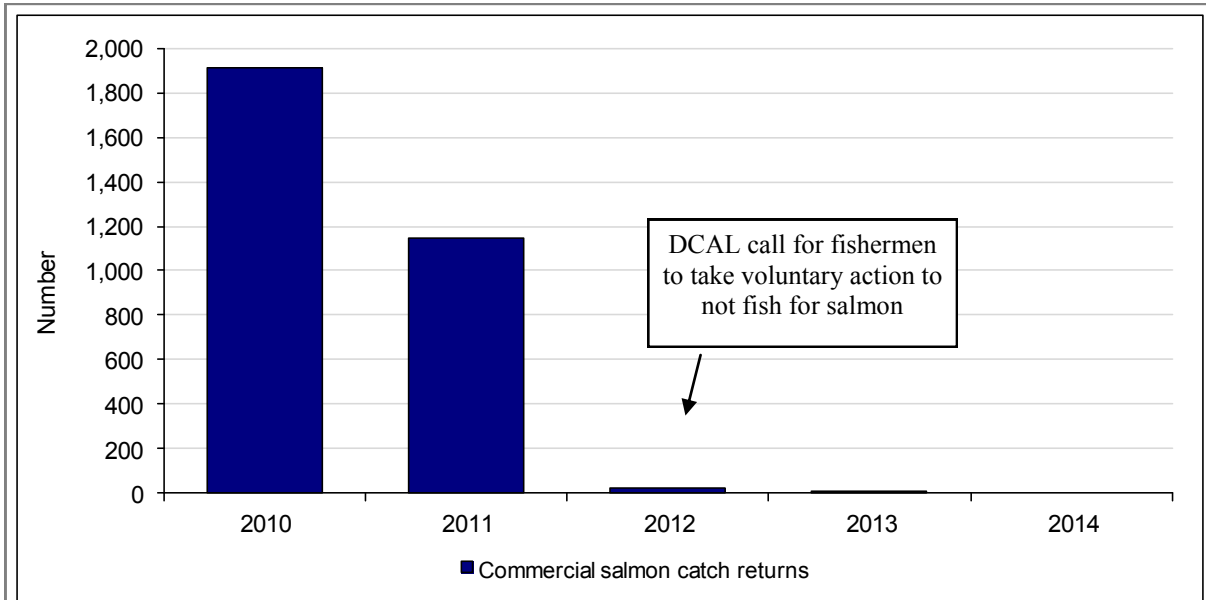
**Operating the trap at Bushmills**

Source: Agri-Food and Biosciences Institute

**2. Salmon conservation**

**2.8. Commercial salmon catch returns in the DCAL jurisdiction**

**Figure 2.8: Commercial salmon catch returns in the DCAL jurisdiction 2010-2014**



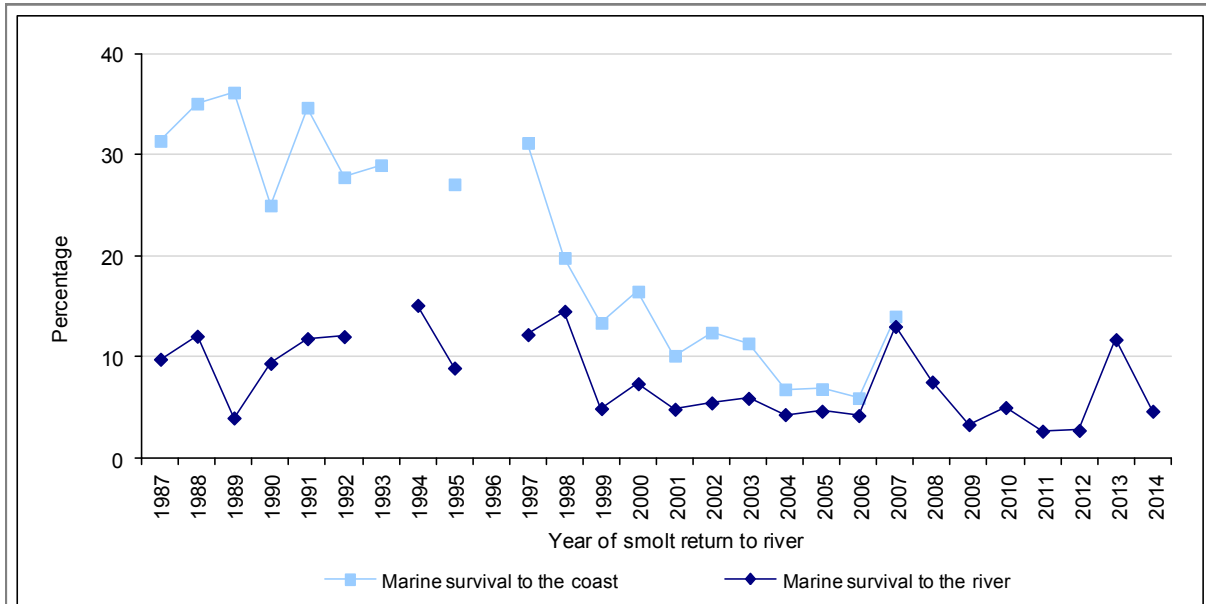
	Unit: Number				
	2010	2011	2012	2013	2014
Commercial salmon catch returns	1,914	1,146	20	10	0

- In 2014, there were no salmon caught in commercial nets in the DCAL area. This was due to the voluntary action of fishermen in response to a call made by DCAL in 2012 to not fish for salmon in the DCAL jurisdiction.

Source: DCAL

**2. Salmon conservation**  
**2.9. Salmon marine survival**

**Figure 2.9: Survival rate of wild 1SW River Bush salmon to the Irish coast (1987-2007) and to the river (1987-2014)**



	Unit: Percentage				
	2010	2011	2012	2013	2014
Survival to the river	5.0	2.6	2.7	11.7	4.6

- Salmon migrate to the sea and return a number of years later. Those that come back to the river after one winter are classed 1SW (1 sea winter).
- Estimates of survival of wild and hatchery origin River Bush fish returning to homewaters were available from coded wire tagging studies for the period 1986-2006 (Figure 2.9).
- Since 2008, there have been no coded wire tag returns in the DCAL area. The main index of survival is currently based on returns of adult salmon to the River Bush. Since the catch in coastal commercial fisheries has declined, returns to the river more closely correlate with absolute marine survival.
- Survival of wild 1SW salmon to the River Bush was 4.6% in 2014. This was lower than the previous year (11.7%) but more in line with the previous ten year average 2004-2013 (5.9%).

Source: Agri-Food and Biosciences Institute

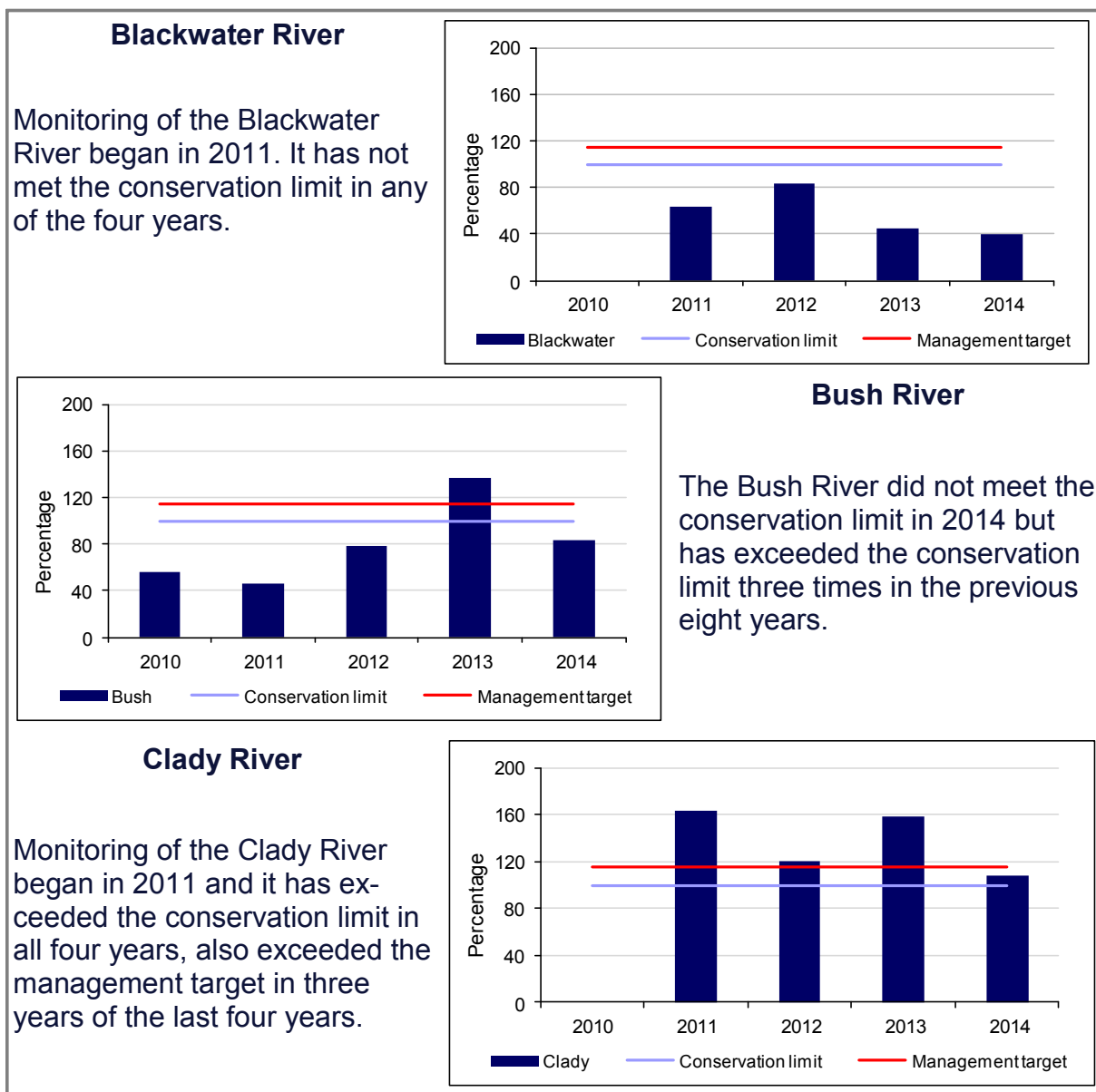
1. 2014 return rate is based on the smolts which migrated in 2013 and returned in 2014 after one sea winter.

## 2. Salmon conservation

### 2.10. Compliance with conservation limits

- DCAL and AFBI have established salmon conservation limits for six rivers. The conservation limit is based on the minimum number of salmon eggs that must be laid to ensure adequate seeding of available nursery habitat.
- A compliance level below 100% indicates that the conservation limit was not met.
- DCAL and AFBI have established a management target for monitored rivers. The management target is a precautionary abundance reference point, set higher than the conservation limit, and represents 115% of the conservation limit.
- A compliance level below 115% indicates that the management target was not met.

**Figure 2.10: Percentage compliance with conservation limit target and management target for six monitored rivers 2010-2014**



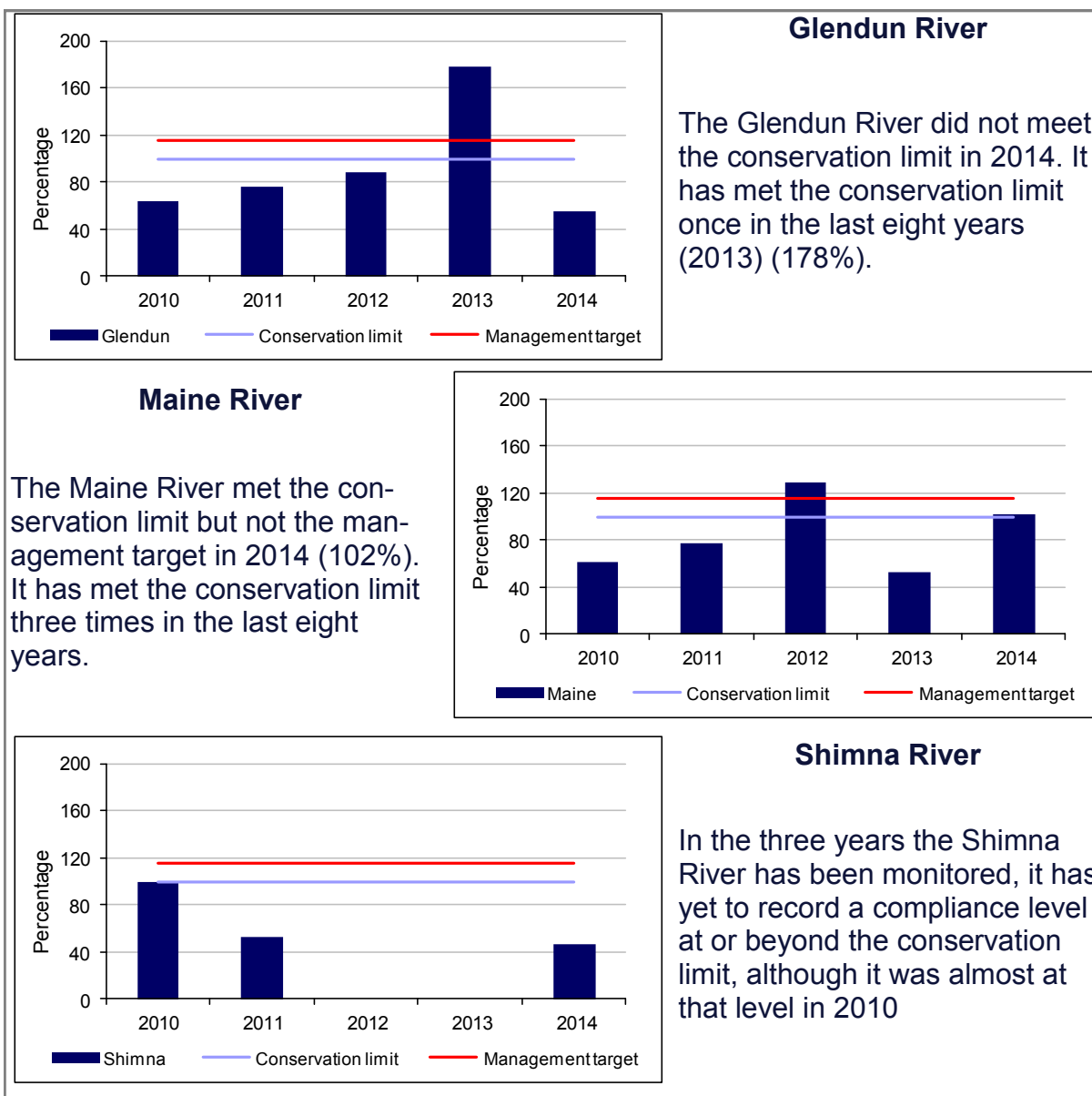
Source: Agri-Food and Biosciences Institute



## 2. Salmon conservation

### 2.10. Compliance with conservation limits

**Figure 2.10 (Cont.): Percentage compliance with conservation limit target and management target for six monitored salmon rivers 2010-2014**



Unit: Percentage

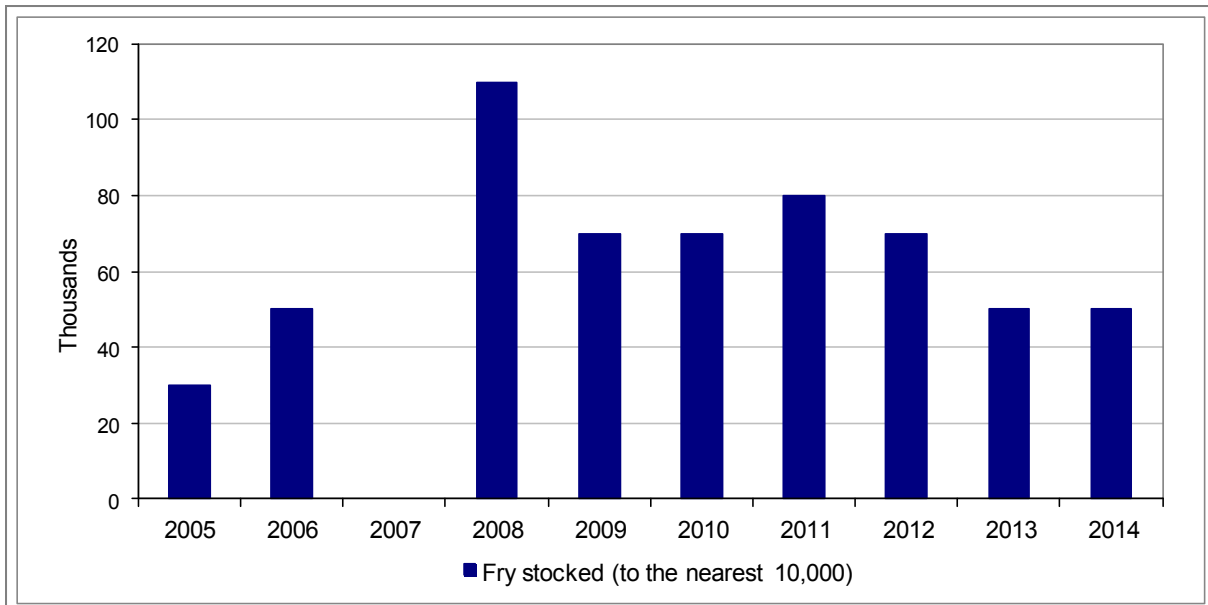
	2010	2011	2012	2013	2014
Blackwater	-	64	83	45	40
Bush	56	46	79	137	83
Clady	-	163	120	159	108
Glendun	64	76	88	178	55
Maine	61	77	129	53	102
Shimna	99	53	-	-	46

Source: Agri-Food and Biosciences Institute

**2. Salmon conservation**

**2.11 Salmon restoration on the River Lagan**

**Figure 2.11: Salmon fry stocked to the River Lagan 2005-2014**



Unit: Thousands					
	2010	2011	2012	2013	2014
Fry stocked	70	80	70	50	50

- An experimental restoration programme is ongoing to replace the once extinct stock of salmon in the River Lagan. Salmon fry are stocked annually from the River Bush (Bushmills Hatchery).
- Salmon fry are stocked at a level designed to maintain a minimum population and leave maximum scope for these fish to form the basis of a replacement wild stock.
- The number of fry stocked to the River Lagan in 2014 was 50,000, similar to 2013.



**CCTV monitoring of salmon at Stranmillis Weir**

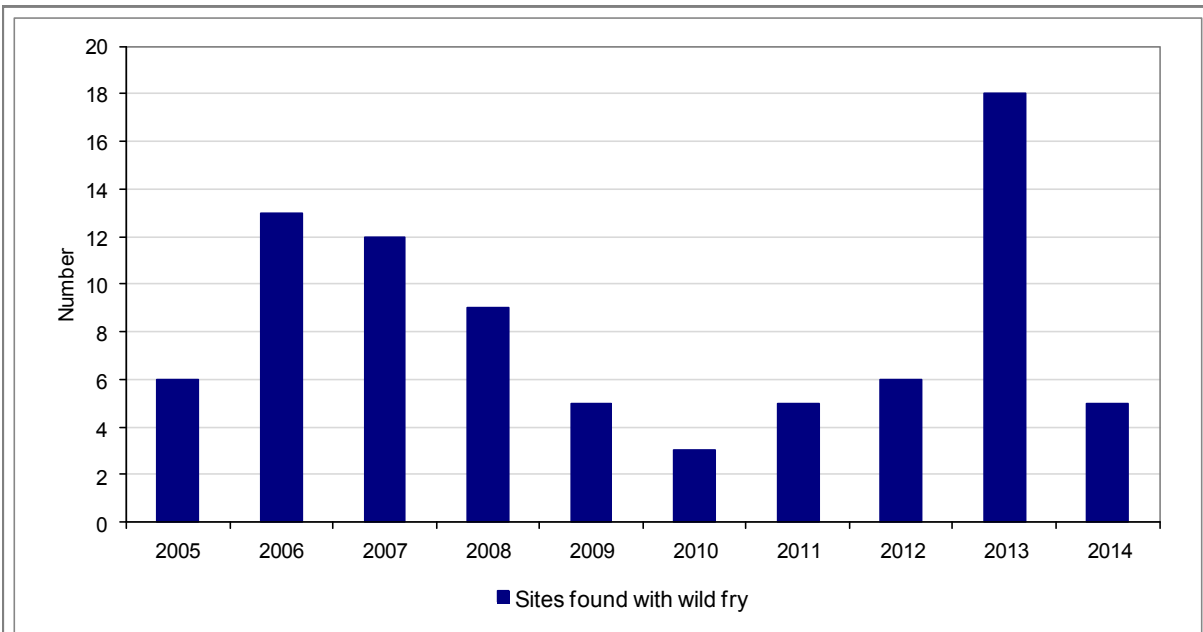
Source: Agri-Food and Biosciences Institute

1. Figures are rounded to the nearest 10,000 and presented differently than those given in Section 5 which deals with similar data.

2. No fry were stocked in 2007 as there were no fry available from Bush Hatchery.

**2. Salmon conservation**  
**2.12 Salmon restoration on the River Lagan**

**Figure 2.12: Wild fry spawning sites found on the River Lagan 2005-2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Sites found with wild fry	3	5	6	18	5

- There were 5 wild fry spawning sites found on the River Lagan in 2014.
- The average number of wild fry spawning sites found on the River Lagan over the ten years prior to 2014 (2004-2013) was 8.4.



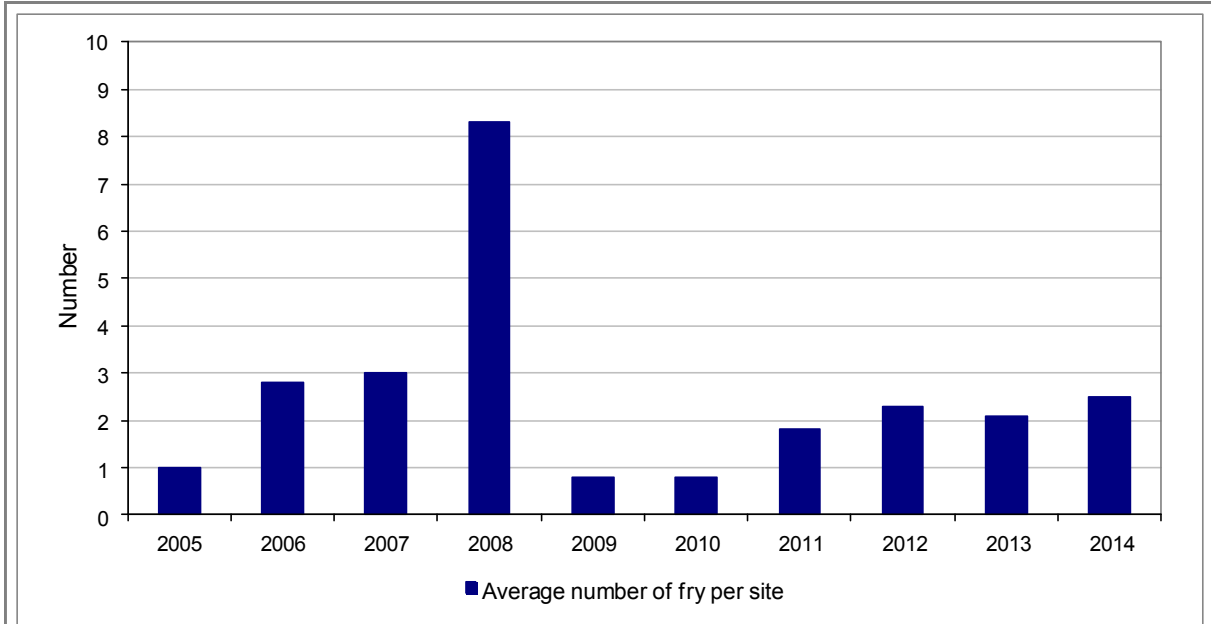
**Pair of salmon spawning - River Lagan**

Source: Agri-Food and Biosciences Institute

**2.Salmon conservation**

**2.13 Salmon restoration on the River Lagan**

**2.13: Average number of wild salmon fry found per spawning site on the River Lagan 2005-2014**



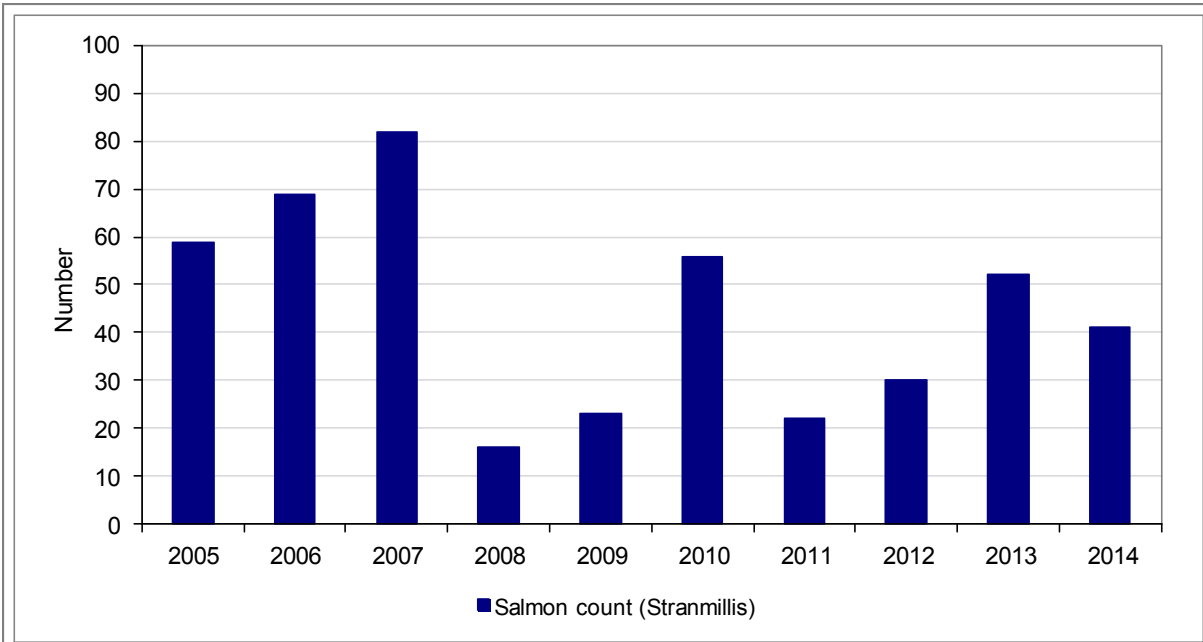
	Unit: Number				
	2010	2011	2012	2013	2014
Average number of fry per site	0.8	1.8	2.3	2.1	2.5

- In 2014, the average number of wild salmon fry found per site on the River Lagan was 2.5.
- The average number of wild fry per site found over the previous ten years of the restoration project (2004-2013) was 2.4.

Source: Agri-Food and Biosciences Institute

**2.Salmon conservation**  
**2.14 Salmon restoration on the River Lagan**

**Figure 2.14 Number of salmon on the River Lagan counted at Stranmillis Fish Pass 2005-2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Salmon count	56	22	30	52	41

- Over the 13 years of monitoring, the number of salmon counted at Stranmillis fish pass on the River Lagan has fluctuated between a high of 84 in 2004 and a low of 16 in 2008.
- In 2014, the count of salmon at Stranmillis Fish Pass was 41, a decrease on the 2013 figure of 52.
- The average salmon count for the previous ten year period (2004-2013) was 49.



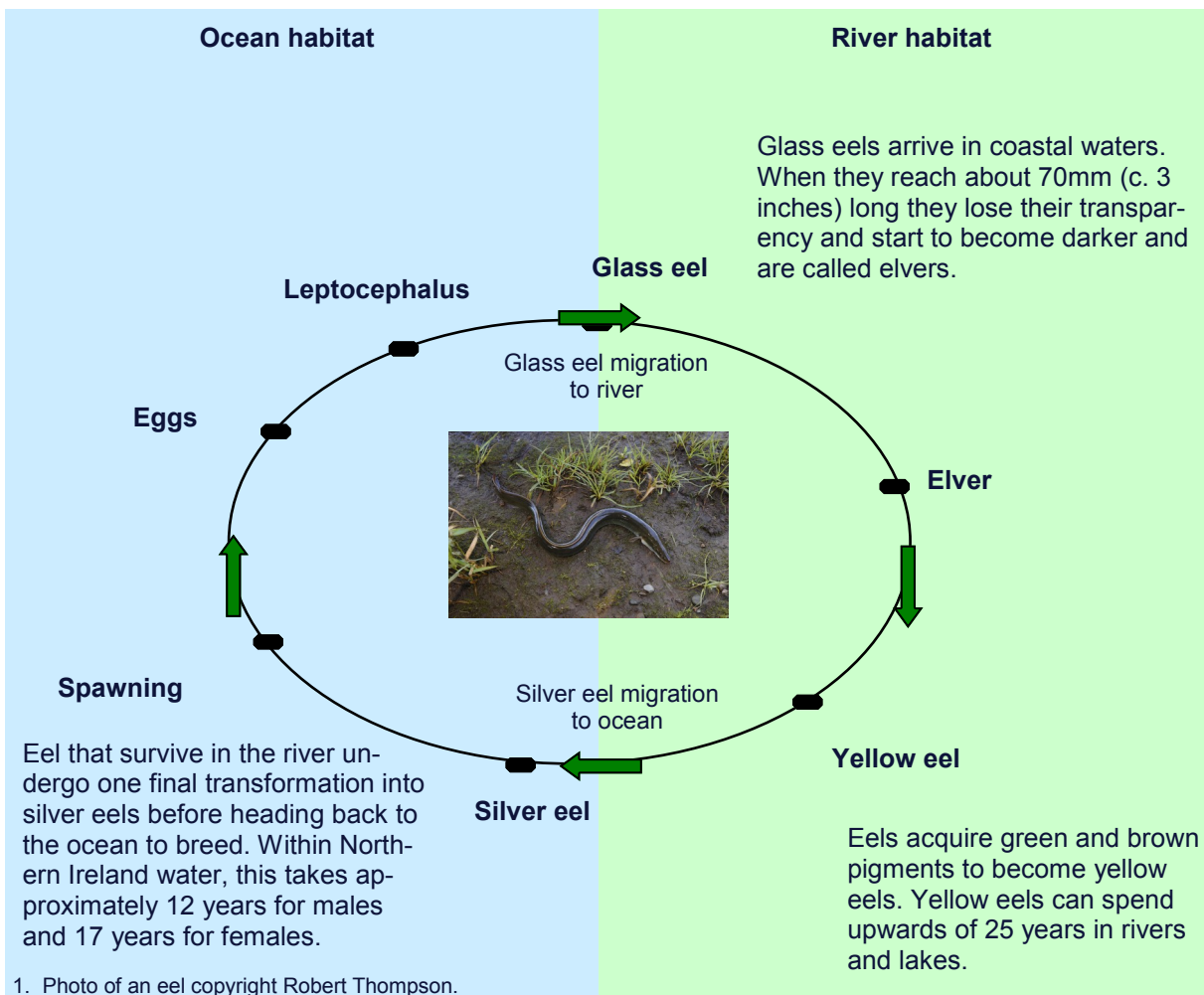
**Salmon jumping the gates at Stranmillis Weir, River Lagan.**

Source: Agri-Food and Biosciences Institute

### 3. Eel conservation

#### 3.1. Life cycle of the European eel

Figure 3.1: Life cycle of the European eel

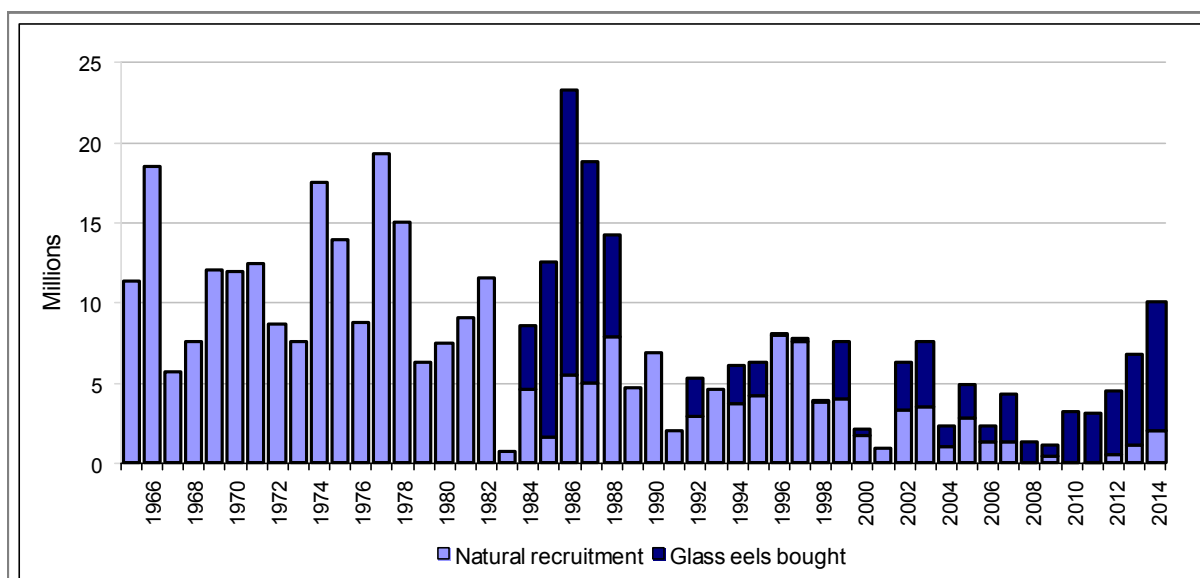


- DCAL, together with fisheries scientists from AFBI, work to attempt to address the decline in the European eel population in Northern Ireland.
- Figure 3.1 illustrates the complex life cycle of the European eel.
- Data are collected by AFBI on key stages of the eel life cycle to aid research. Data presented in this digest includes:
  1. Eel recruitment Lough Neagh
  2. Yellow and silver eel catches Lough Neagh
  3. Weight and length of eels in the Bann
  4. Compliance with escapement targets Neagh/Bann River Basin District
  5. Elvers transported upstream in the Erne system
  6. Silver eels transported downstream in the Erne system

### 3. Eel conservation

#### 3.2. Eel recruitment Lough Neagh

**Figure 3.2: Number of elvers recruited to Lough Neagh 1965-2014**



	Unit: Millions				
	2010	2011	2012	2013	2014
Natural recruitment	0.20	0.05	0.57	1.15	2.01
Glass eels bought and stocked	2.99	3.11	3.90	5.60	8.07
<b>Recruitment total</b>	<b>3.19</b>	<b>3.15</b>	<b>4.47</b>	<b>6.75</b>	<b>10.08</b>

- Figure 3.2 shows the number of eels recruited to Lough Neagh from 1965-2014 through natural recruitment and stocking of eels.
- Natural recruitment of glass and elver estimates are calculated by the capture and upstream transport of glass eel in the estuary of the River Bann using hoop and drag nets (Evans, 2004, 2005).
- This is combined with additional purchases of glass eel from other fisheries for stocking.
- Total recruitment of glass eels to Lough Neagh in 2014 was 10.08 million.
- In the decade from 1965 (1965-1974), the average annual natural recruitment of eels was 11.36 million. In subsequent decades, the average annual natural recruitment of eels has declined to 9.68 million (1975-1984), 4.51 million (1985-1994) and 3.81 million (1995-2004). The average annual natural recruitment of eels in the most recent decade (2005-2014) was 1.0 million.

Source: Agri-Food and Biosciences Institute courtesy of Lough Neagh Fisherman Co-op Society Ltd.

1. Glass eels and elvers are young eels entering fresh water.

2. Lough Neagh Fisherman Co-op Society Ltd purchase glass eels for stocking Lough Neagh.

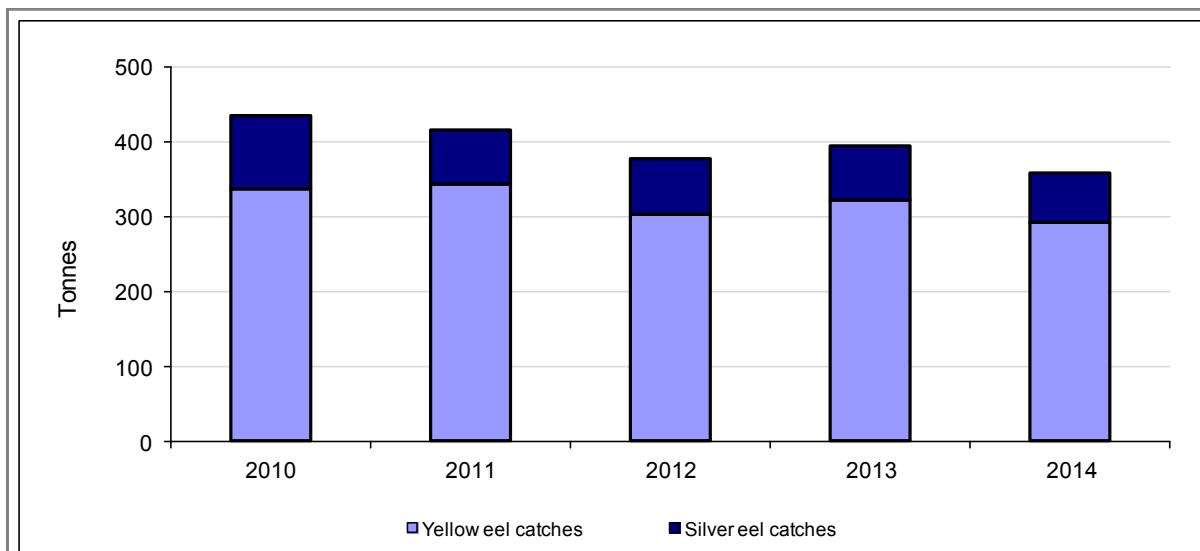
3. Data on natural recruitment of eels is collected at several sites around the Northern Ireland coastline using hoop and drag nets.

4. Figures may not add to totals due to rounding.

### 3. Eel conservation

#### 3.3. Yellow and silver eel catches Lough Neagh

**Figure 3.3: Total weight of yellow and silver eel catches in Lough Neagh 2010-2014**



	Unit: Tonnes				
	2010	2011	2012	2013	2014
Yellow eel catches	337	342	302	321	292
Silver eel catches	97	73	74	72	66
<b>Total eel catch</b>	<b>434</b>	<b>415</b>	<b>376</b>	<b>393</b>	<b>358</b>

- In 2014, 358 tonnes of eels were caught. Of the eels caught, 82% were yellow eels and 18% were silver eels.
- The 292 tonnes of yellow eels caught in 2014 was less than the previous five year average (2009-2013) of 329 tonnes.
- The 66 tonnes of silver eels caught in 2014 was the lowest on record and followed on from the previous record low of 2013 (72 tonnes). Indeed, the last four years are the lowest on record.
- The ten year overall eel catch average (2005-2014) of 399 tonnes is 35% less than the previous ten year eel catch average (1995-2004) of 612 tonnes.



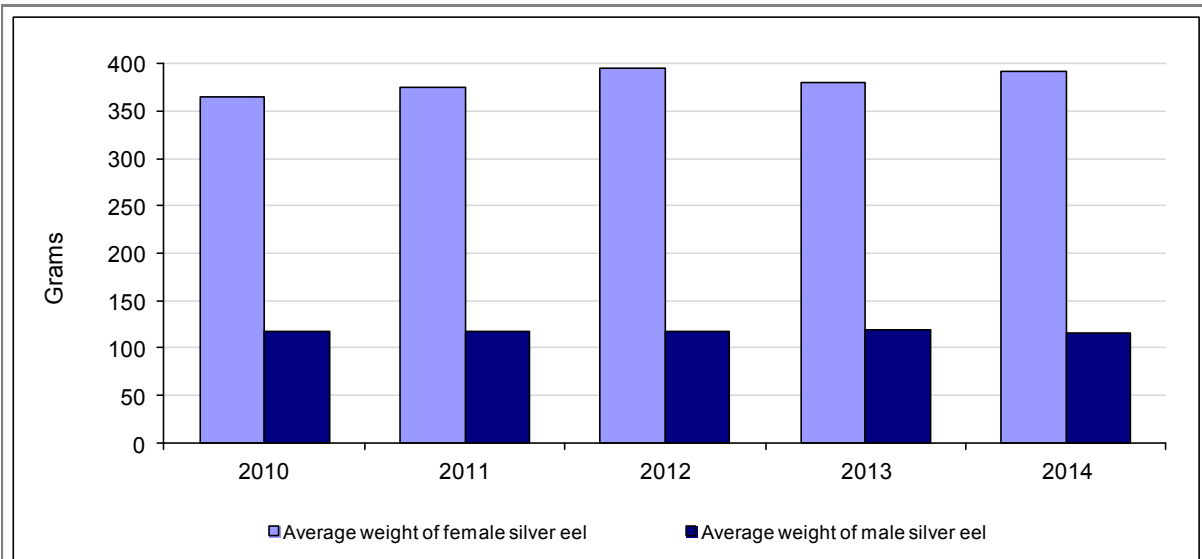
Source: Agri-Food and Biosciences Institute courtesy of Lough Neagh Fisherman Co-op Society Ltd.

1. Commercially sized yellow eels are the eels aged around 12-15 years.
2. Silver eels are the adult eels. They leave the Lough to escape to sea so they can breed.
3. Figures may not add to totals due to rounding.



**3. Eel conservation**  
**3.4. Weight and length of eels in the Bann**

**Figure 3.4: Average weight of silver eels in the Bann 2010-2014**



	Unit: Grams				
	2010	2011	2012	2013	2014
Average weight of female silver eel	365	375	396	380	392
Average weight of male silver eel	117	118	117	119	116

- The length and weight of male and female silver eels has remained relatively constant over the last five years.
- In 2014, the average weight and length of a female eel was 392g and 608mm respectively.
- In 2014, the average weight and length of a male silver eel was 116g and 417mm respectively.



**Mobile laboratory at Toome Eel Fishery**

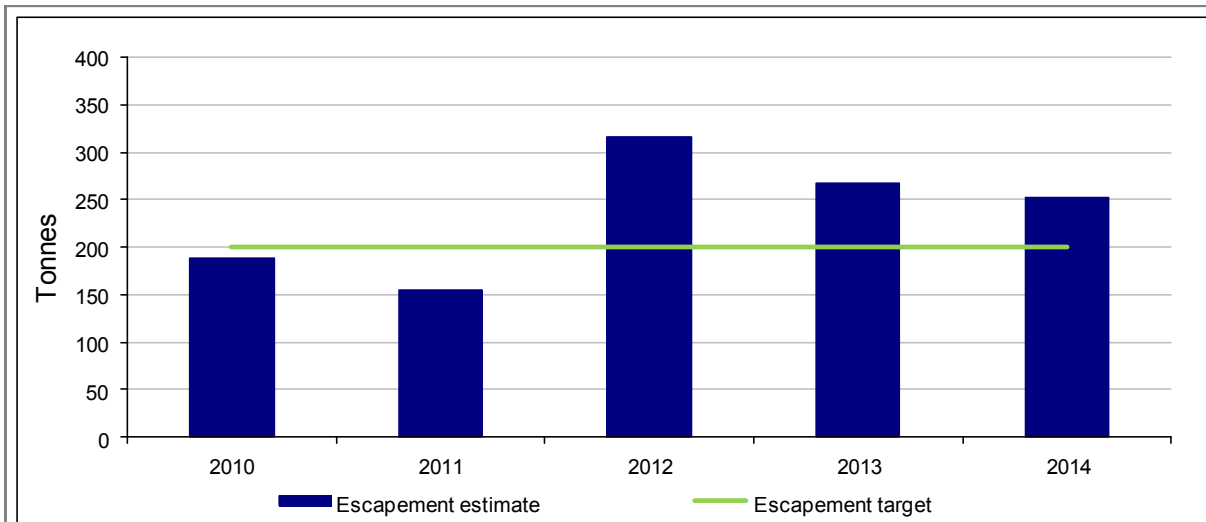
Source: Agri-Food and Biosciences Institute courtesy of Lough Neagh Fisherman Co-op Society Ltd.

1. Silver eels are the adult eels. They leave the Lough to escape to sea so they can breed.

### 3. Eel conservation

#### 3.5. Compliance with escapement targets in the Neagh/Bann River Basin District

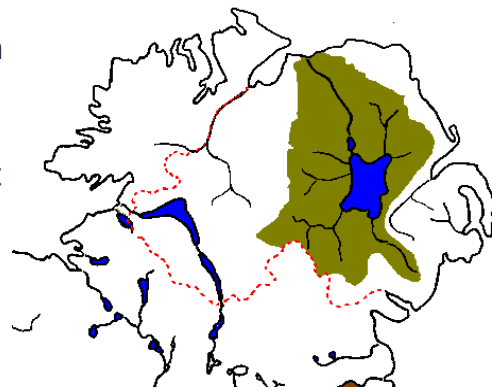
**Figure 3.5: Eel escapement estimates for Neagh/Bann River Basin District 2010-2014**



Unit: Tonnes

	2010	2011	2012	2013	2014
Escapement estimate	189	155	317	267	253
Escapement target	200	200	200	200	200

- The European Commission through the European Eel Regulation aims to establish measures for the recovery of the European eel stock.
- The Regulation requires the establishment of Eel Management Plans for each eel river basin.
- In 2014, the 40% escapement target has been calculated for the Eel Management Plan for the Neagh/Bann River Basin District based on eel recruitment data and silver eel catches at Toome and Kilrea weirs.



**The Neagh/Bann River Basin District**

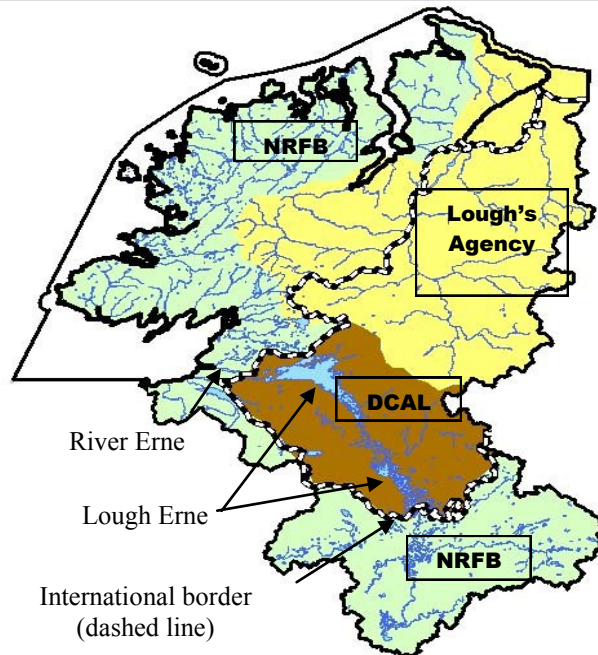
- The estimated escapement target at the required 40% level is 200 tonnes.
- The escapement estimate for 2014 for the Neagh Bann River Basin District was 253 tonnes and above the 200 tonne target for the third consecutive year.

Source: Agri-Food and Biosciences Institute courtesy of Lough Neagh Fisherman Co-op Society Ltd.

### 3. Eel conservation

#### 3.6. Eel management in the North-West International River Basin District

- In addition to natural variations, a number of causes have been suggested for the decline of European eel stock in the trans-boundary Lough Erne system in the North-West International River Basin District (NWIRBD).
- The presence of 2 hydroelectric stations at Cliff and Cathleen's Falls on the out-flowing River Erne are considered to have a major impact on eel stock.
- In order to comply with the EU regulations on eel conservation, commercial fishing for yellow eel on the Erne system ceased in 2010 in Northern Ireland (2009, Republic of Ireland). Silver eel fishing ceased in 2007.



North-West International River Basin District

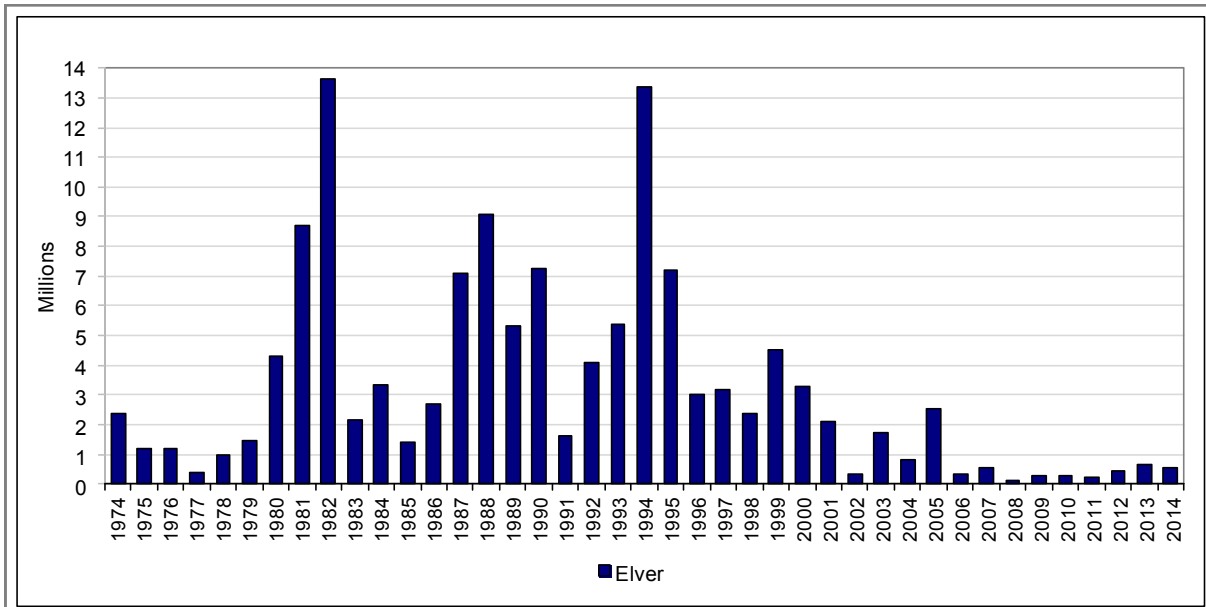
- Programmes have been developed to trap and transport eels and a silver eel conservation fishery has also been established as a major management action of the NWIRBD eel management plan in 2010.
- DCAL's involvement relates to the trucking and stocking of elvers during up-stream migration and monitoring/ assisting the trap and transport of silver eels in downstream migration. Both interventions involve by-passing the hydro-electric turbine sets at Cliff and Cathleen's Falls (RoI).



Silver eel trap using coghill nets, Rosscor Bridge, Co. Fermanagh

**3. Eel conservation**  
**3.7. Elvers transported upstream in the Erne system**

**Figure 3.6 Number of elvers transported upstream 1974-2014**



Unit: Millions					
	2010	2011	2012	2013	2014
Elver	0.29	0.22	0.44	0.64	0.55

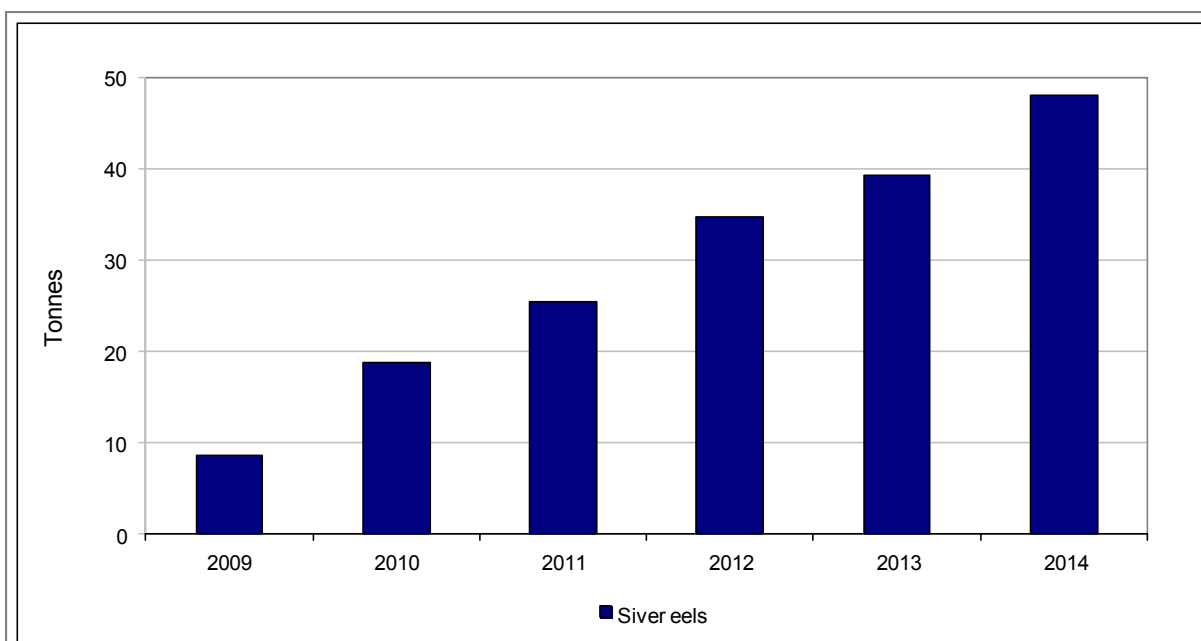
- The number of elvers trapped and transported upstream of the hydro-electric turbines in 2014 was 0.55 million.
- There have been 2.14 million elvers trapped and transported in the last five years.
- The average number of elvers trapped and transported annually over the last decade (2005-2014) was 0.6 million, a notable decline on the average for the previous decade (1995-2004) of 2.85 million. This is symptomatic of a continued decline in the european eel population on the island and in Europe.

Source: Agri-Food and Biosciences Institute courtesy of Electricity Supply Board (RoI).  
 1. Numbers are rounded to the nearest 10,000.

### 3. Eel conservation

#### 3.8. Silver eels transported downstream in the Erne system

**Figure 3.7 Weight of silver eels transported downstream in the Erne system 2010-2014**



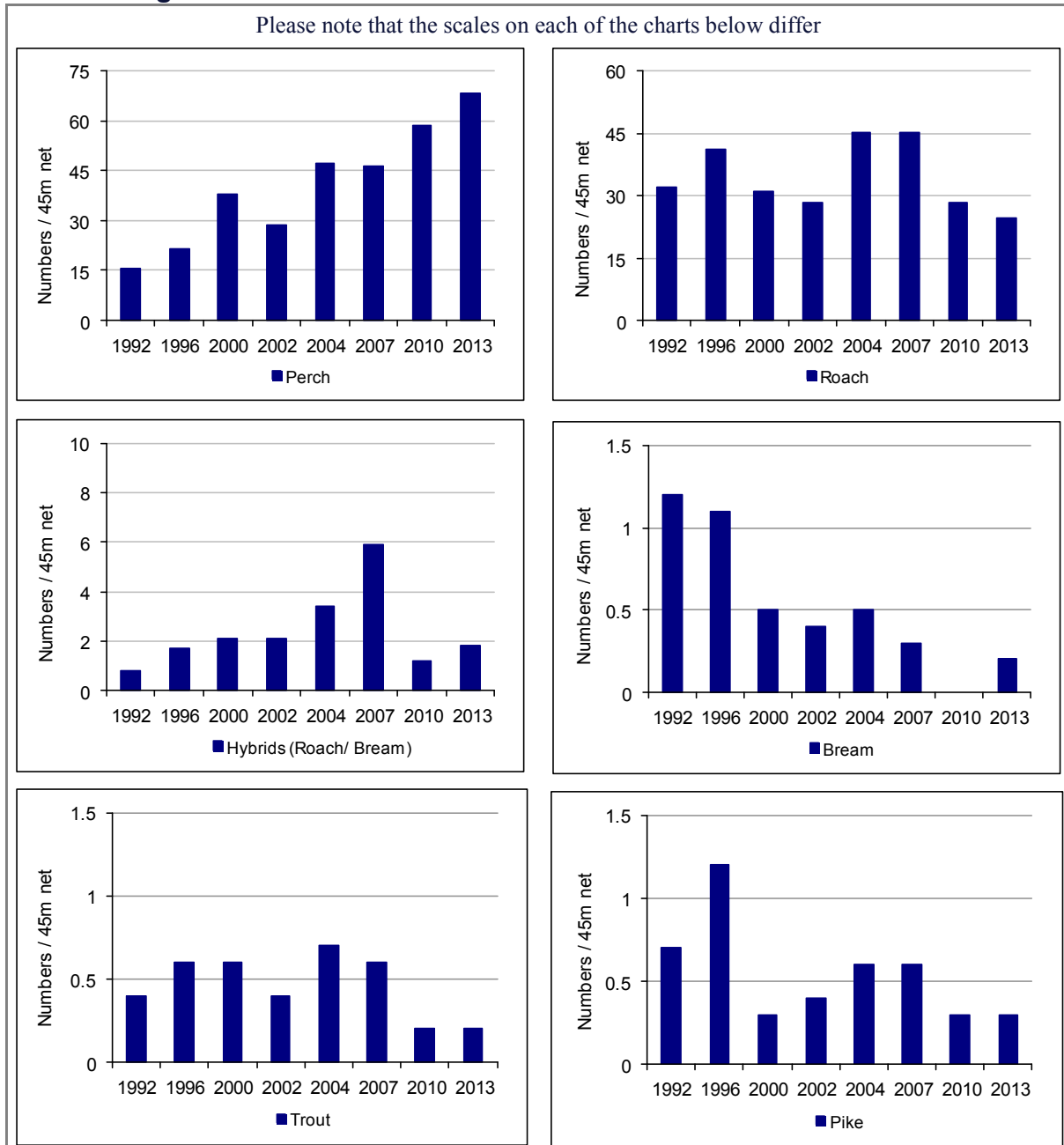
Unit: Tonnes					
	2010	2011	2012	2013	2014
Silver eel	18.8	25.4	34.7	39.3	48.1

- There were 48.1 tonnes of silver eels transported downstream of the hydro-electric turbine sets from the silver eel conservation fishery in 2014.
- The weight of silver eels transported has increased year on year since 2009 as the number of crews have increased and the higher than average recruitment history to the Erne from the late 1990s takes effect.
- Overall, nearly 175 tonnes of silver eels have been transported downstream of the hydro-electric facilities since 2009.

Source: Agri-Food and Biosciences Institute

**4. Lower Lough Erne fish stock**  
**4.1 Lower Lough Erne fish stock numbers by species**

**Figure 4.1: Average number of fish species per 45 metre standardised net in Lower Lough Erne 1992-2013**



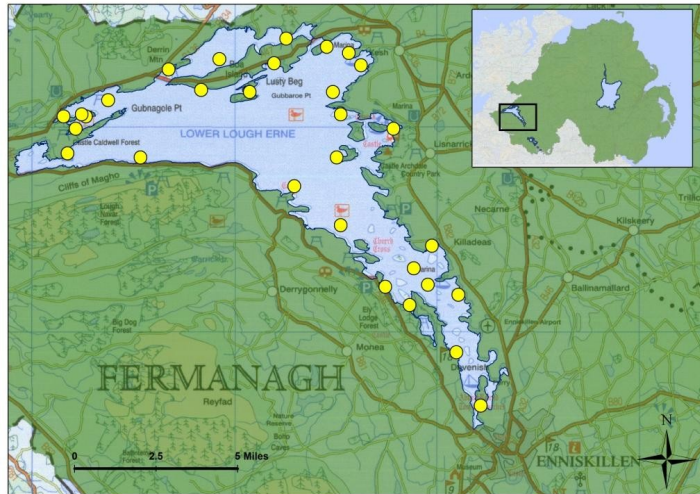
Unit: Numbers of fish per 45m standard net

Fish Species	1992	1996	2000	2002	2004	2007	2010	2013
Perch	15.6	21.3	38	28.8	47.1	46.5	58.5	68.2
Roach	32	41.2	31.1	28.2	45.1	45.4	28.5	24.6
Hybrids	0.8	1.7	2.1	2.1	3.4	5.9	1.2	1.8
Bream	1.2	1.1	0.5	0.4	0.5	0.3	0	0.1
Trout	0.4	0.6	0.6	0.4	0.7	0.6	0.2	0.2
Pike	0.7	1.2	0.3	0.4	0.6	0.6	0.3	0.3

## 4. Lower Lough Erne fish stocks

### 4.1 Lower Lough Erne fish stock numbers by species

- Lower Lough Erne fish stock have been monitored for a number of species on a regular basis since 1992.
- Average numbers of individual species caught are extrapolated to a standardised net size of 45 metres. Nets are set for 24 hours before collection. One sample is taken at a variety of monitoring sites that represent a range of habitats along the perimeter of Lower Lough Erne.



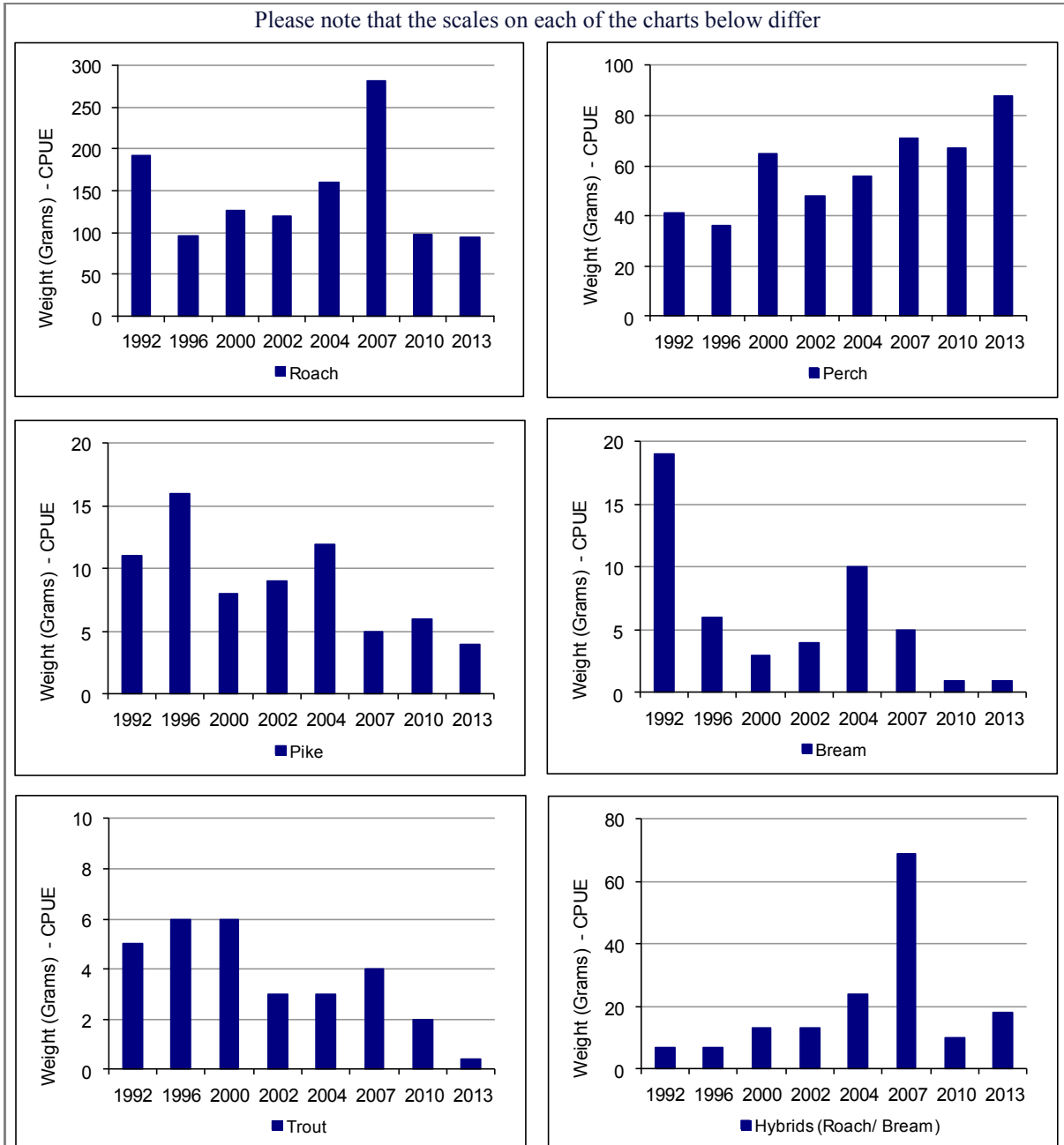
Sampling sites on Lower Lough Erne, Co. Fermanagh

- Numbers of perch have shown a general increase since monitoring began in 1992 with numbers over four times greater in 2013 (68.5) than in 1992 (15.6).
- Roach numbers have fluctuated over the 21 years between a high of 45.4 recorded in 2007 and the low of 24.6 in 2013.

Source: Agri-Food and Biosciences Institute.

**4. Lower Lough Erne fish stock**  
**4.2 Lower Lough Erne fish stock weights by species**

**Figure 4.2: Average weight of fish species per metre of net set in Lower Lough Erne 1992-2013**



Unit: Weight - Catch Per Unit Effort (CPUE) (Grams)

Fish species	1992	1996	2000	2002	2004	2007	2010	2013
Perch	41	36	65	48	56	71	67	88
Roach	192	96	127	120	160	282	97	95
Hybrids	7	7	13	13	24	69	10	18
Bream	19	6	3	4	10	5	1	1
Trout	5	6	6	3	3	4	2	0
Pike	11	16	8	9	12	5	6	4



## 4. Lower Lough Erne fish stock

### 4.2 Lower Lough Erne fish stock weights by species

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- The weight (biomass) of individual species caught are presented in terms of Catch Per Unit Effort (CPUE) and standardised to “per metre of net”. Nets are set for 24 hours before collection. One sample is taken at a variety of monitoring sites that represent a range of habitats along the perimeter of Lower Lough Erne.



AFBI staff sampling on Lower Lough Erne

- The weight of perch have shown a general increase since recording began in 1992.
- Although perch species have surpassed roach in terms of actual numbers, roach still remain the largest species in terms of biomass.
- Trout weight per unit effort in 2013 was the lowest monitored since records began.
- Bream weight per unit effort in 2013 was 1g per metre of net set, the same as in 2010, remaining at their lowest recordings since the monitoring series began.

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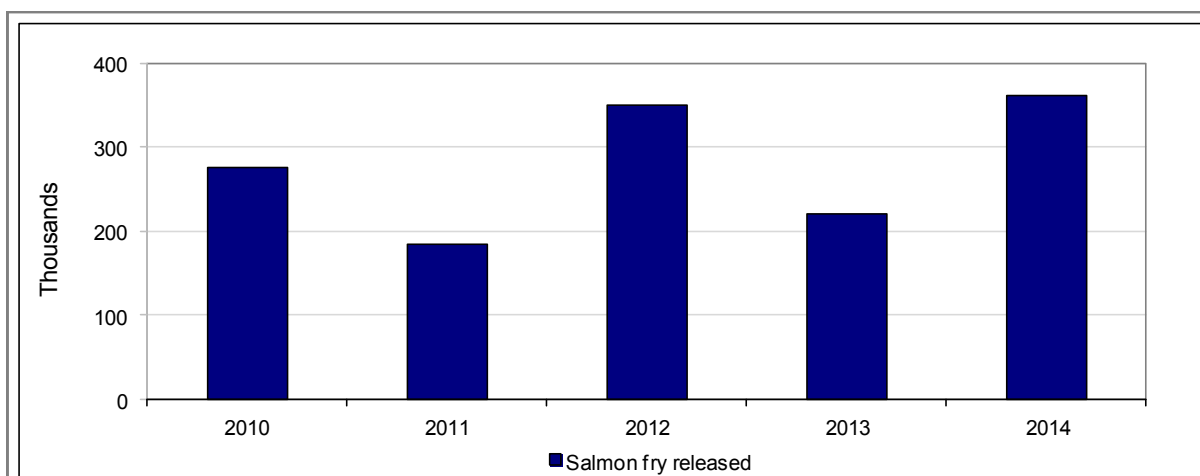
Source: Agri-Food and Biosciences Institute.

1. Weights (biomass) of individual species caught are presented in Grams in terms of Catch Per Unit Effort (CPUE). CPUE is the biomass per metre of net used in a net of standard height (1.5m).

## 5. DCAL fish farms and hatchery

### 5.1. Bushmills Hatchery: Fry

**Figure 5.1: Number of salmon fry released from Bushmills Hatchery 2010-2014**



Unit: Thousands					
River	2010	2011	2012	2013	2014
Ballymoney	86	-	100	-	80
Bush	-	-	150	140	210
Clady	45	30	-	10	8
Coleraine	-	20	-	-	-
Crumlin	15	-	-	-	-
Cushendall	-	-	-	8	-
Glenariff	-	-	-	-	-
Glenarm	35	-	-	-	-
Glenavy	-	40	-	-	-
Glendun	-	-	-	12	8
Lagan	74	80	70	50	50
Lodge Burn	-	-	30	-	-
Macosquin	21	-	-	-	-
Shimna	-	15	-	-	-
Three Mile Water	-	-	-	-	5
<b>Total</b>	<b>276</b>	<b>185</b>	<b>350</b>	<b>220</b>	<b>361</b>

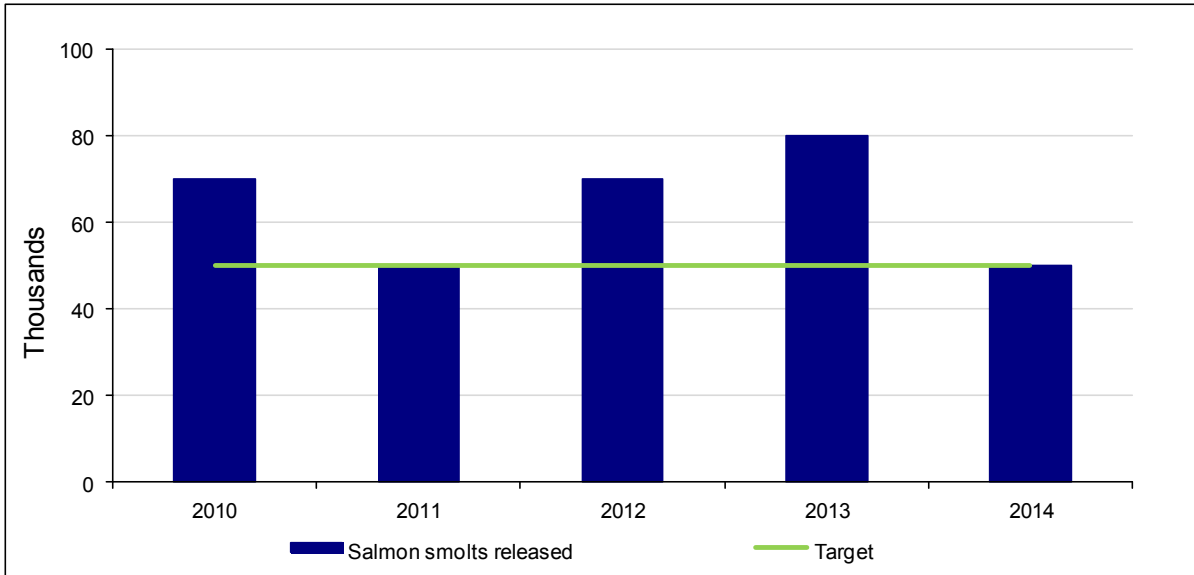
- DCAL operates a hatchery at the River Bush Salmon Station. The hatchery facilitates the rearing of juvenile salmon for release back into the River Bush and also restoration programmes in other rivers.
- Adult salmon are collected from different rivers of origin and the fry produced are then released back into their river of origin to improve the level of fish stocks present. Where salmon stocks are severely depleted or extinct, salmon fry of River Bush origin are used to increase or restore stock levels.
- The number of salmon fry stocked from Bushmills Hatchery to rivers in Northern Ireland increased from 220,000 in 2013 to 361,000 in 2014.

Source: DCAL

1. Numbers are rounded to the nearest 1,000.

**5. DCAL fish farms and hatchery**  
**5.2. Bushmills Hatchery: smolts**

**Figure 5.2: Number of salmon smolts released from Bushmills Hatchery to the River Bush 2010-2014**



	Unit: Thousands				
	2010	2011	2012	2013	2014
Salmon smolts released	70	50	70	80	50

- The Bushmills Hatchery also releases reared salmon smolts into the River Bush as part of the long-term salmon monitoring programme.
- During the reporting period, there was an annual target to release 50,000 smolts.
- The number of salmon smolts released in the River Bush in 2014 was approximately 50,000.
- This met the annual target but was a decrease from 2013 when approximately 80,000 salmon smolts were released.



**Example of a salmon smolt**

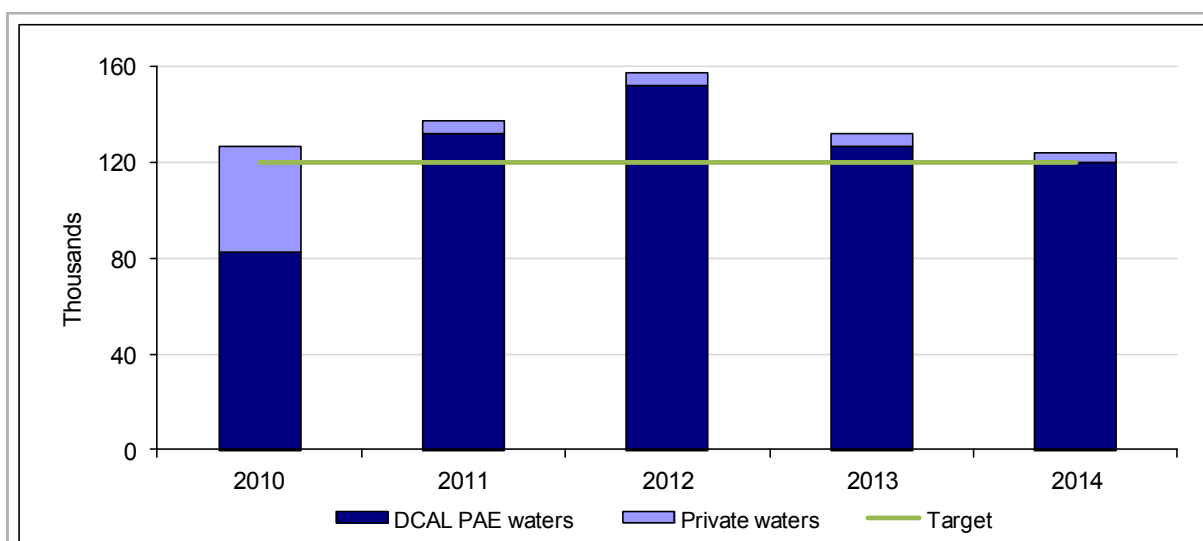
Source: DCAL

1. Numbers are rounded to the nearest 10,000.

## 5. DCAL fish farms and hatchery

### 5.3. Movanagerh Fish Farm: takeable sized trout

**Figure 5.3: Number of takeable sized trout released from Movanagerh Fish Farm 2010-2014**



Unit: Number

Takable sized trout		2010	2011	2012	2013	2014
<b>All Waters</b>	Brown trout	122,200	95,896	90,769	83,070	71,148
	Rainbow trout	4,982	41,737	66,930	49,276	53,064
	<b>Total (All Waters)</b>	<b>127,182</b>	<b>137,633</b>	<b>157,699</b>	<b>132,346</b>	<b>124,212</b>
<b>DCAL PAE Waters</b>	Brown trout	79,000	91,190	86,790	80,750	69,900
	Rainbow trout	3,697	40,911	65,400	46,456	50,300
	<b>Total (DCAL PAE waters)</b>	<b>82,697</b>	<b>132,101</b>	<b>152,190</b>	<b>127,206</b>	<b>120,200</b>
<b>Private Waters</b>	Brown trout	43,200	4,706	3,979	2,320	1,248
	Rainbow trout	1,285	826	1,530	2,820	2764
	<b>Total (private waters)</b>	<b>44,485</b>	<b>5,532</b>	<b>5,509</b>	<b>5,140</b>	<b>4,012</b>

- Movanagerh Fish Farm primarily produces brown and rainbow trout to supply the Department's public angling estate, though some fish are also supplied to private waters.
- DCAL has a target to release 120,000 takeable sized trout per year. Takeable sized trout, which are approximately 25cm or more, are released for recreational anglers.
- There were 124,212 takeable sized trout released by Movanagerh Fish Farm in 2014.



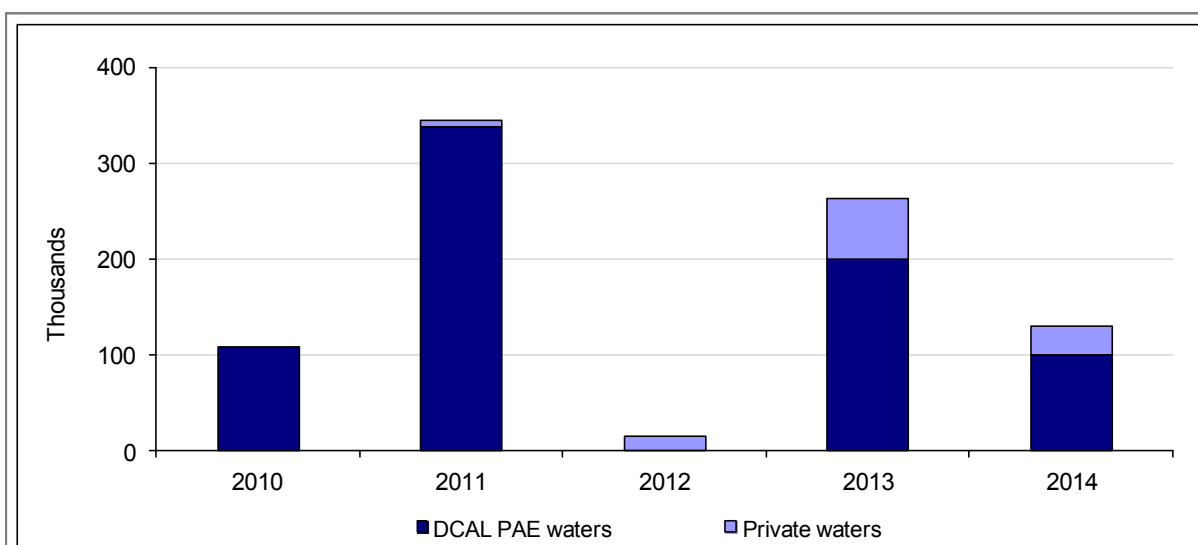
**Brown trout**

Source: DCAL

1. Trout can be introduced to waters at the eyed ova egg stage and as fry (fry 0+) or as takeable sized trout. Takeable sized trout are yearlings that are at least one year old and it can include older fish (fry 1+).
2. DCAL Public Angling Estate (PAE) waters refers the 63 waters in the DCAL estate. Private waters include non-DCAL waters and clubs within and outside the DCAL jurisdiction.

**5. DCAL fish farms and hatchery**  
**5.4. Movanagerh Fish Farm: eyed ova/ fry 0+**

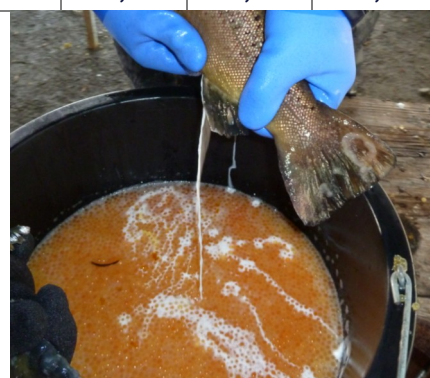
**Figure 5.4: Number of eyed ova/ fry 0+ trout released from Movanagerh Fish Farm 2010-2014**



Unit: Number

Eyed ova/ fry 0+		2010	2011	2012	2013	2014
<b>All Waters</b>	Brown trout	76,700	344,400	1,725	262,836	127,010
	Rainbow trout	31,400	-	12,042	391	2,025
	<b>Total (All Waters)</b>	<b>108,100</b>	<b>344,400</b>	<b>13,767</b>	<b>263,227</b>	<b>129,035</b>
<b>DCAL PAE Waters</b>	Brown trout	76,700	338,000	-	200,000	100,000
	Rainbow trout	31,400	-	-	-	-
	<b>Total (DCAL PAE waters)</b>	<b>108,100</b>	<b>338,000</b>	<b>-</b>	<b>200,000</b>	<b>100,000</b>
<b>Private Waters</b>	Brown trout	-	6,400	1,725	62,836	27,010
	Rainbow trout	-	-	12,042	391	2,025
	<b>Total (private waters)</b>	<b>-</b>	<b>6,400</b>	<b>13,767</b>	<b>63,227</b>	<b>29,035</b>

- There were 129,035 eyed ova/ fry 0+ trout released by Movanagerh Fish Farm in 2014. This was around half as much as the number released in 2013.
- Over three-quarters (77%) of eyed ova/ fry 0+ trout were released to DCAL waters in 2014.



**Fertilisation of brown trout ova**

Source: DCAL

1. Trout can be introduced to waters at the eyed ova egg stage and as hatched and unfed fry (fry 0+) or as takeable sized trout. Takeable sized trout are yearlings that are at least one year old and it can include older fish (fry 1+).
2. DCAL PAE waters refers to the 63 waters in the DCAL Public Angling Estate. Private waters include non-DCAL waters and clubs within and outside the DCAL jurisdiction.

## 6. Protection and enforcement

### 6.1. Enforcement

**Table 6.1: Enforcement activity on DCAL and private waters 2010/11-2014/15**

	Unit: Number				
	2010/11	2011/12	2012/13	2013/14	2014/15
<b>DCAL PAE waters</b>					
Rod licences checked	1,715	1,804	822	1,138	1,024
DCAL permits checked	1,755	1,513	764	1,062	1,013
Catch log books checked	-	16	9	39	250
Production documents issued	49	43	8	9	16
Detections of illegal activity	91	78	97	67	64
<b>Private waters</b>					
Rod licences checked	577	336	200	449	301
Catch log books checked	18	24	9	-	-
Production documents issued	25	15	3	19	15
Detections of illegal activity	66	53	50	52	48
<b>All waters</b>					
Boat patrols	239	184	188	133	112
Coastal shore patrols	134	149	38	179	232
Illegal fishing nets seized	66	91	21	31	11
Length of illegal panel nets seized (metres)	25,000	49,000	23,000	19,000	4,000
Longlines seized	1	9	1	2	0

- Enforcement activity is both proactive and reactive, with regular patrols being carried out to monitor and check both commercial fishermen and anglers to ensure full compliance with the 1966 Fisheries Act and Fisheries Regulations.
- DCAL enforcement officers work on both DCAL PAE waters and private waters in the DCAL jurisdiction. Enforcement activity for 2014/15 is recorded in Table 6.1.
- In 2014/15, there were 1,024 rod licences checked in DCAL PAE waters and 301 licences checked on private waters.
- In total, there were 11 illegal fishing nets seized with a total length of 4,000 metres.



**Boat patrols on Lough Neagh**

Source: DCAL

1. Enforcement is carried out by DCAL staff at all rivers and lakes in the DCAL area in Northern Ireland. DCAL PAE waters refers to the 63 waters in the DCAL estate. Private waters includes non-DCAL waters in the DCAL jurisdiction.
2. Catch log books are required for recording catch and retention of salmon and sea trout over 50cm in anglers' possession. From 2013, catch log books have only been checked for DCAL waters.
3. Production documents are issued to anglers who don't have their licence and/or permit in their possession when checked by a bailiff.
4. Breaches of the Fisheries Act and Fisheries Regulations are recorded as detections.
5. The length of illegal panel nets seized have been rounded to the nearest 1,000 metres.

**6. Protection and enforcement**  
**6.2. Inspections and prosecutions**

**Table 6.2.1: Number of inspections 2010/11-2014/15**

	Unit: Number				
	2010/11	2011/12	2012/13	2013/14	2014/15
Commercial fish dealers inspections	37	56	20	33	78
Hotel & restaurant inspections	121	5	2	11	12
Water abstraction site compliance inspections	161	45	39	46	47
<b>Total</b>	<b>319</b>	<b>106</b>	<b>61</b>	<b>90</b>	<b>137</b>

- Regular inspections are also carried out at commercial dealers, fish retail outlets, hotels and restaurants to ensure that all freshwater fish being sold have been legally caught.
- There was an increase in the number of inspections carried out in 2014/15 compared with 2013/14 (137 and 90 respectively).

**Table 6.2.2: Number of prosecutions 2011/12-2014/15**

	Unit: Number			
	2011/12	2012/13	2013/14	2014/15
Cases processed for prosecution	86	73	98	57
Convictions	84	69	92	57

- DCAL also prepares cases for prosecution.
- In 2014/15, there were 57 cases processed for prosecution and 57 convictions.

Source: DCAL

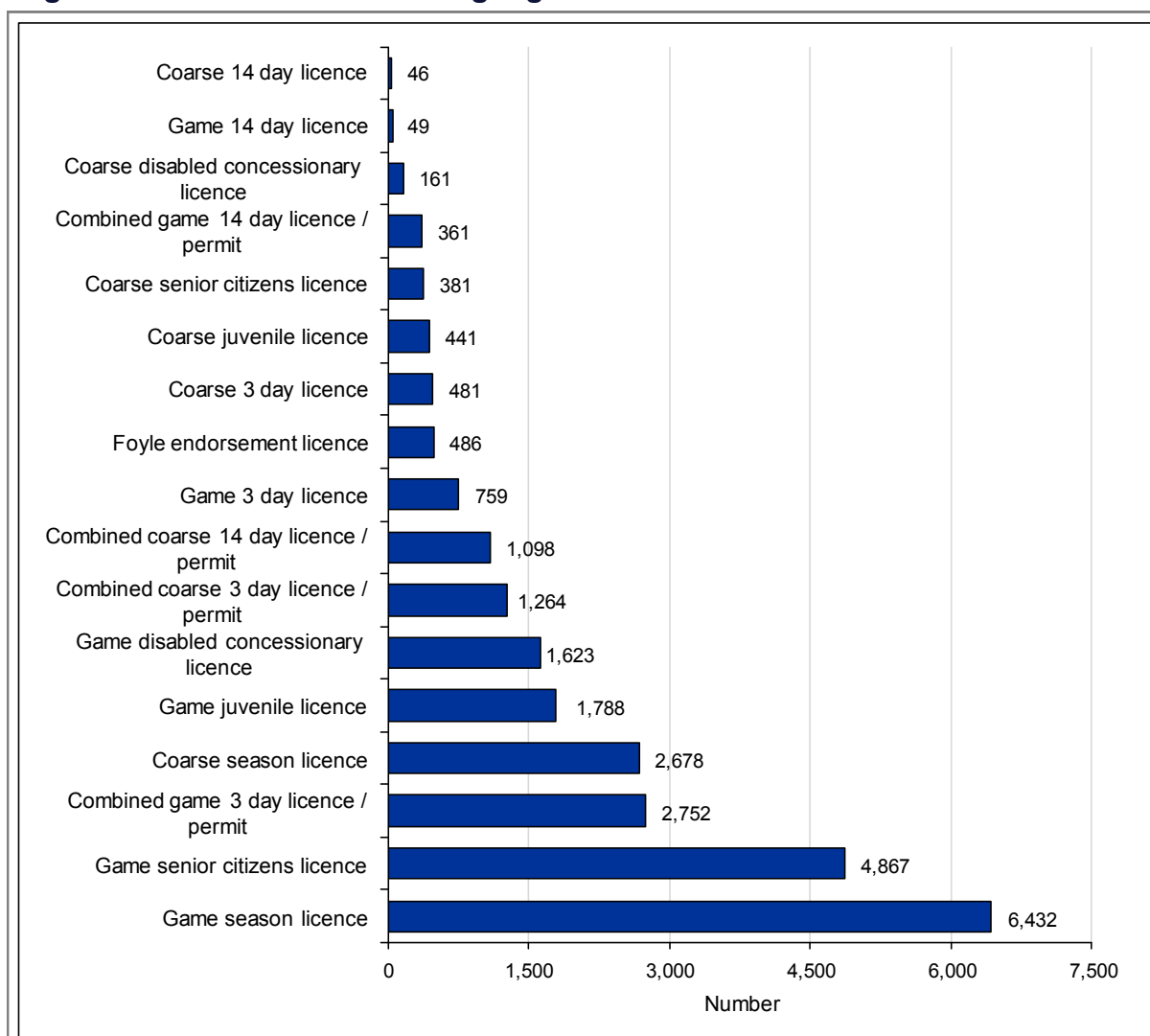
1. Inspections and prosecutions from the 1<sup>st</sup> of June 2009 when DCAL assumed the role from the former Fisheries Conservancy Board.

2. Reporting of prosecution data changed in 2012 from calendar year to financial year, in order to align reporting with that of other enforcement and protection reporting.

## 7. Licences and permits

### 7.1. Angling licences

**Figure 7.1: Number of DCAL angling licences sold 2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Licences	26,493	25,211	27,511	26,980	25,667

- DCAL issues angling licences for all waters in the DCAL jurisdiction.
- A rod licence is required by law for any angler aged over 12 years in the area covered by DCAL.
- In 2014, there were 25,667 angling licences issued by DCAL. The most popular licences issued were the game season licence (6,432) and the game senior citizens licence (4,867).

Source: DCAL

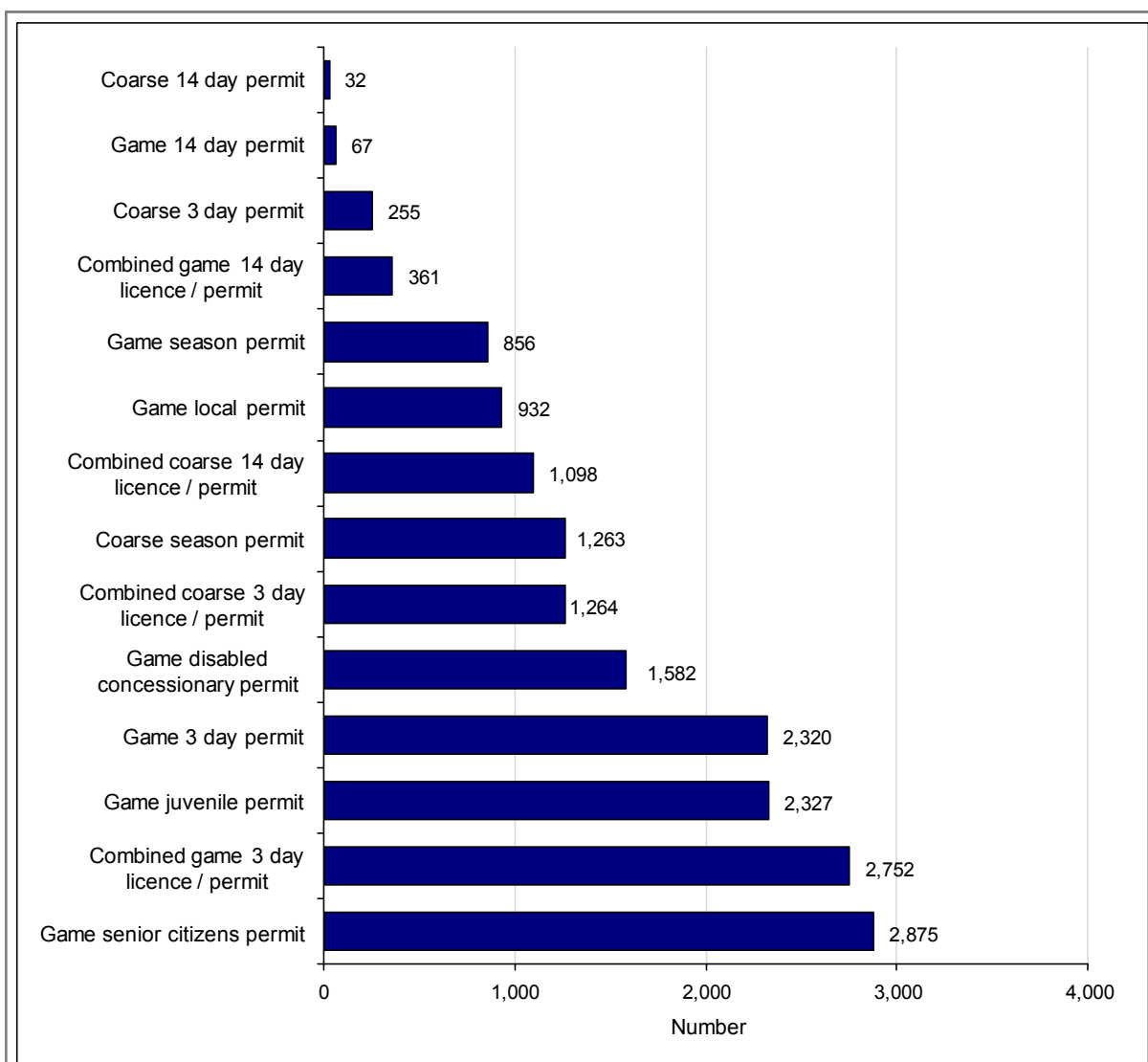
1. Licences are split into categories (Game or Coarse).
2. Game species include brown trout, rainbow trout, sea trout, salmon, and arctic char.
3. Coarse species include pike, bream, roach, perch, carp, tench and rudd.



## 7. Licences and permits

### 7.2. Angling permits

**Figure 7.2: Number of DCAL angling permits sold 2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Permits	18,263	18,530	19,652	19,270	17,984

- A permit is a document which allows the angler access to the water and the right to fish on the DCAL Public Angling Estate.
- In 2014, there were 17,984 DCAL permits sold. This was a 7% decrease on the 2013 figure of 19,270.
- The most popular permits were the combined game senior citizens licence/ permit (2,875) and the combined game 3 day licence / permit (2,752).

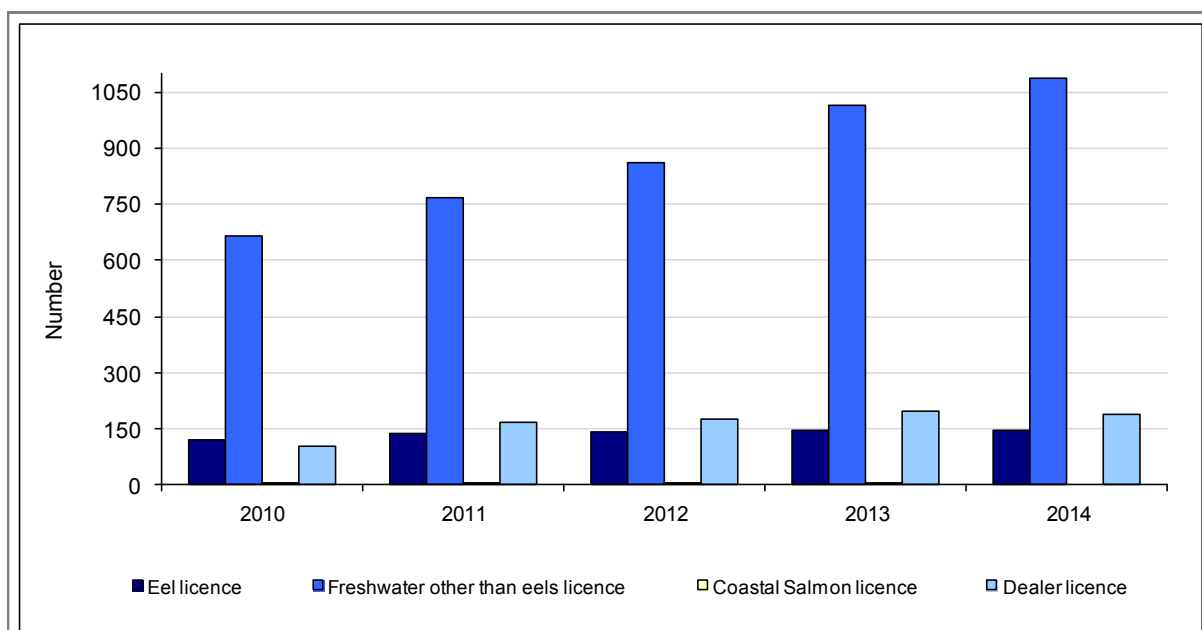
Source: DCAL

1. Permits are split into categories (game or coarse).
2. Game species include brown trout, rainbow, sea trout, salmon, and arctic char.
3. Coarse species include pike, bream, roach, perch, carp, tench and rudd.

## 7. Licences and permits

### 7.3. Commercial and dealer licences

**Figure 7.3: Number of DCAL commercial and dealer licences sold 2010-2014**



	Unit: Number				
	2010	2011	2012	2013	2014
Eel licence	121	136	142	146	145
Freshwater other than eels licence	666	769	862	1,014	1,086
Coastal salmon licence	6	6	4	3	0
Dealer licence	104	169	176	196	189

- DCAL issue commercial licences for eel, freshwater and salmon commercial fishing.
- Since 2007, the number of freshwater commercial licences has increased year on year and has more than doubled from 408 in 2007 to 1,086 in 2014.
- In line with conservation efforts, legislation was introduced in 2014 to prohibit the commercial netting of salmon. There were no licences issued for coastal salmon nets in 2014.
- Dealer licences, needed to sell freshwater fish and wild salmon to the public, are issued by DCAL in the DCAL jurisdiction. A dealer licence can cover a van selling fish or a larger supermarket.
- There were 189 dealer licences issued in 2014.

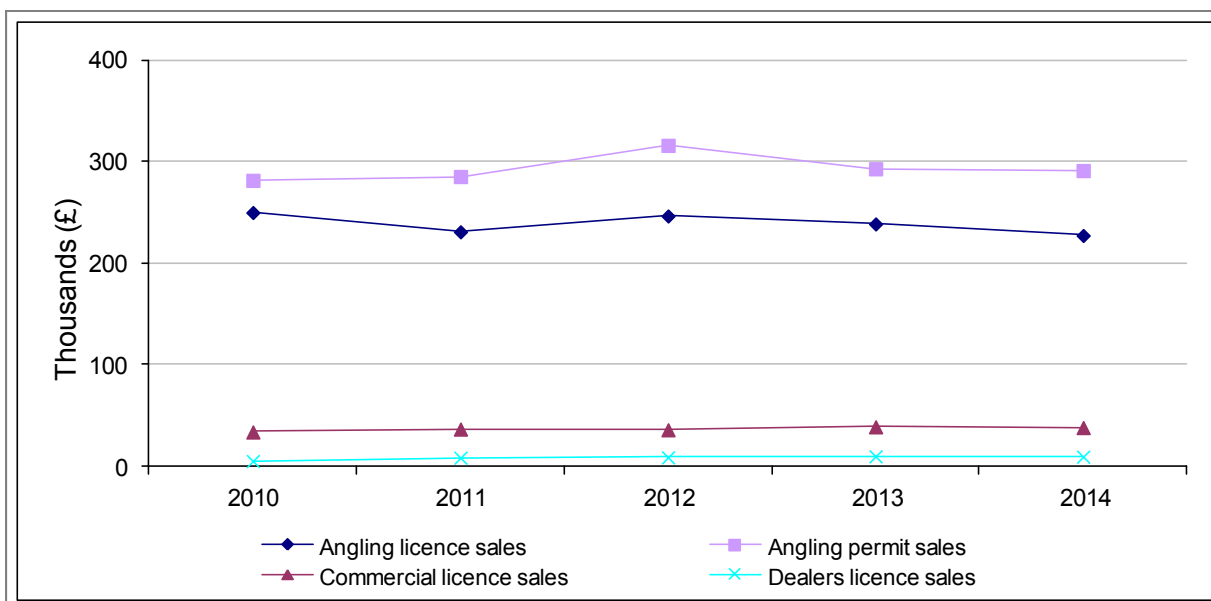
Source: DCAL

1. There were no eel long line or fyke net licenses sold from 2010 for Lough Erne. These were abolished by regulations introduced part of the way through 2010. Some were already bought and refunds were issued.
2. The eel fishery in Lough Erne was closed from 2010.

## 7. Licences and permits

### 7.4. Revenue from licences and permits

**Figure 7.4: Revenue generated from licence and permit sales 2010-2014**



Unit: Revenue generated (£)					
	2010	2011	2012	2013	2014
Angling licence revenue	249,983	230,971	246,585	238,738	227,389
Angling permit revenue	281,658	285,440	316,130	293,057	291,304
Commercial licence revenue	33,878	36,755	36,055	38,973	38,261
Dealers licence revenue	5,252	8,535	8,888	9,898	9,545
<b>Total</b>	<b>570,770</b>	<b>561,701</b>	<b>607,658</b>	<b>580,666</b>	<b>566,498</b>

- The sale of licences and permits generates revenue for DCAL on an annual basis.
- In 2014, £566,498 was generated from the sale of licences and permits.
- In total, 40% of revenue came from angling licence sales, 51% from angling permit sales, 7% from commercial licence sales and 2% from dealer licences.

Source: DCAL

## 8. Demographics of anglers

**Table 8.1: Demographics of anglers who have fished within the previous year where a DCAL or Loughs Agency permit was required 2011/12-2014/15**

Demographic profile	Unit: Percentage			
	2011/12	2012/13	2013/14	2014/15
All	4	5	5	5
Male	7	9	9	7
Female	1	2	1	2
16-24 years	6	7	5	5
25-34 years	5	6	6	6
35-44 years	5	5	6	5
45-54 years	4	6	5	5
55-64 years	5	4	4	3
65 years and over	2	3	3	2
Married / Cohabiting	4	5	5	4
Single	5	7	6	5
Widowed	1	1	2	3
Divorced / Separated	4	4	4	5
Catholic	4	6	5	5
Protestant	4	5	5	4
Other / None	5	6	5	5
Have dependants <sup>1</sup>	4	5	6	5
Do not have dependants <sup>1</sup>	4	5	4	4
Have a disability	4	5	5	3
Do not have a disability	4	6	5	5
Most deprived areas <sup>2</sup>	4	5	5	4
Least deprived areas <sup>2</sup>	5	4	4	5
Urban <sup>3</sup>	5	5	5	5
Rural <sup>3</sup>	3	5	5	4

- Gender, age and disability were all related to the likelihood of a respondent having taken part in angling. A lower proportion of women than men fished in each of the four years presented. In 2014/15, those aged 45 years and over were less likely to have taken part in angling (3%) than those aged 16–44 years (5%). Adults who have a disability were also less likely to have fished (3%) than those who do not have a disability (5%).

Source: DCAL Continuous Household Surveys 2011/12-2014/15.

1. In 2011/12, "has dependants" is defined as having responsibility for the care of a child or a person with a disability. From 2012/13, "has dependants" is defined as having responsibility for the care of a child, a person with a disability or an elderly person.

2. Most / least deprived area refers to the 20% most or least deprived Super Output Areas in Northern Ireland as per NISRA's Northern Ireland Multiple Deprivation Measure (NIMDM2010) report, 2010.

3. As defined in NISRA's Statistical Classification and Delineation of Settlements report 2005.

## 9. Technical notes

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### 9.1. Methodology and quality assurance

Definitions and explanations of technical terminology have been placed throughout the document in the relevant section. References to more detailed information have been included in section 9.3 and 9.4.

Data have been provided by the organisations attributed as the source. These data have been validated by the Research and Statistics Branch, DCAL, who have produced the report. Providers of the data are then asked to examine a completed draft of their particular section in order to ensure that the data and commentary are accurate prior to publication.

Figures may differ from those previously published as they are periodically revised and validated.

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### 9.2. Are the figures in this report comparable with UK, ROI or EU figures?

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The figures given in this report are not directly comparable with those reported for other regions of the United Kingdom, the United Kingdom as a whole, the Republic of Ireland, nor the European Union, for two main reasons:

Firstly, the figures represented in this report do not cover all waters in Northern Ireland. There are two bodies which control and manage Northern Ireland waters. This report deals only with data for the DCAL jurisdiction which excludes the Foyle and Carlingford areas. Responsibility for the management of these particular areas is shared with the Republic of Ireland through the Loughs Agency.

Secondly, the methodologies and units of reporting are not the same across these regions and countries.

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### 9.3. References

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1. Crozier, W.W. & Kennedy, G.J.A. (1994). *Application of semi-quantitative electrofishing to juvenile salmonid stock surveys*. Journal of fish biology 45 (1): 159-164.
2. Kennedy, G.J.A (1984). *Evaluation of techniques for classifying habitats for juvenile salmon (Salmo salar L.) Proc. Of the Atlantic Salmon trust workshop on stock enhancement*. 23 pp.
3. O'Connor, L. and Kennedy, R.J (2002). *A comparison of catchment based salmon habitat survey techniques on three rivers in N. Ireland*. Fisheries Management and Ecology, 9, 149-161.
4. Evans, D.W. 2004. *Northern Ireland Glass eel Survey*. DARD Science and Queens University Belfast, Internal report to DCAL NI.
5. Evans, D., 2005. *Report on Glass eel surveys*. Unpublished report to the Department of Culture, Arts and Leisure for Northern Ireland, Inland Fisheries Branch.

## 9.4. Other relevant material

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### Salmon conservation

1. [North Atlantic Salmon Conservation Organisation](#)
2. [Atlantic salmon management strategy for Northern Ireland and the cross border Foyle and Carlingford catchments to meet the objectives of NASCO resolutions and agreements 2008-2012](#)
3. [Focus area report on protection, restoration and enhancement of salmon habitat. UK - Northern Ireland](#)
4. [Focus area report on management of salmon fisheries in UK-NI](#)
5. [NASCO Implementation Plan for the period 2013-18 EU – UK \(Northern Ireland\)](#)
6. [NASCO Rivers Database Report UK - Northern Ireland Sept 2014](#)

### Eel conservation

6. [Eel Management Plan Neagh / Bann River Basin District](#)
7. [North Western International River Basin District Eel Management Plan](#)
8. [Eel Management plans for the United Kingdom. Northern Ireland \(UK\) Eastern River Basin District](#)
9. [International Council for the Exploration of the Sea \(ICES\) website](#)
10. [Eel Joint EIFAAC/ICES/GFCM WGEEL Country Report 2014](#)

### Lough Erne Fish Stocks

11. [Lower Lough Erne fish stock surveys 1992-2013](#)

### Digests from previous years

12. [Digest of Statistics for Salmon and Inland Fisheries in the DCAL Jurisdiction \(2011 Data\)](#)
13. [Digest of Statistics for Salmon and Inland Fisheries in the DCAL Jurisdiction \(2012 Data\)](#)
14. [Digest of Statistics for Salmon and Inland Fisheries in the DCAL Jurisdiction \(2013 Data\)](#)

### Other

15. [Views on Fishing on the DCAL Public Angling Estate 2011](#)
16. [Salmon and Inland Fisheries Annual Report 2009](#)
17. [Salmon and Inland Fisheries Annual Reports 2010/11 & 2011/12](#)

