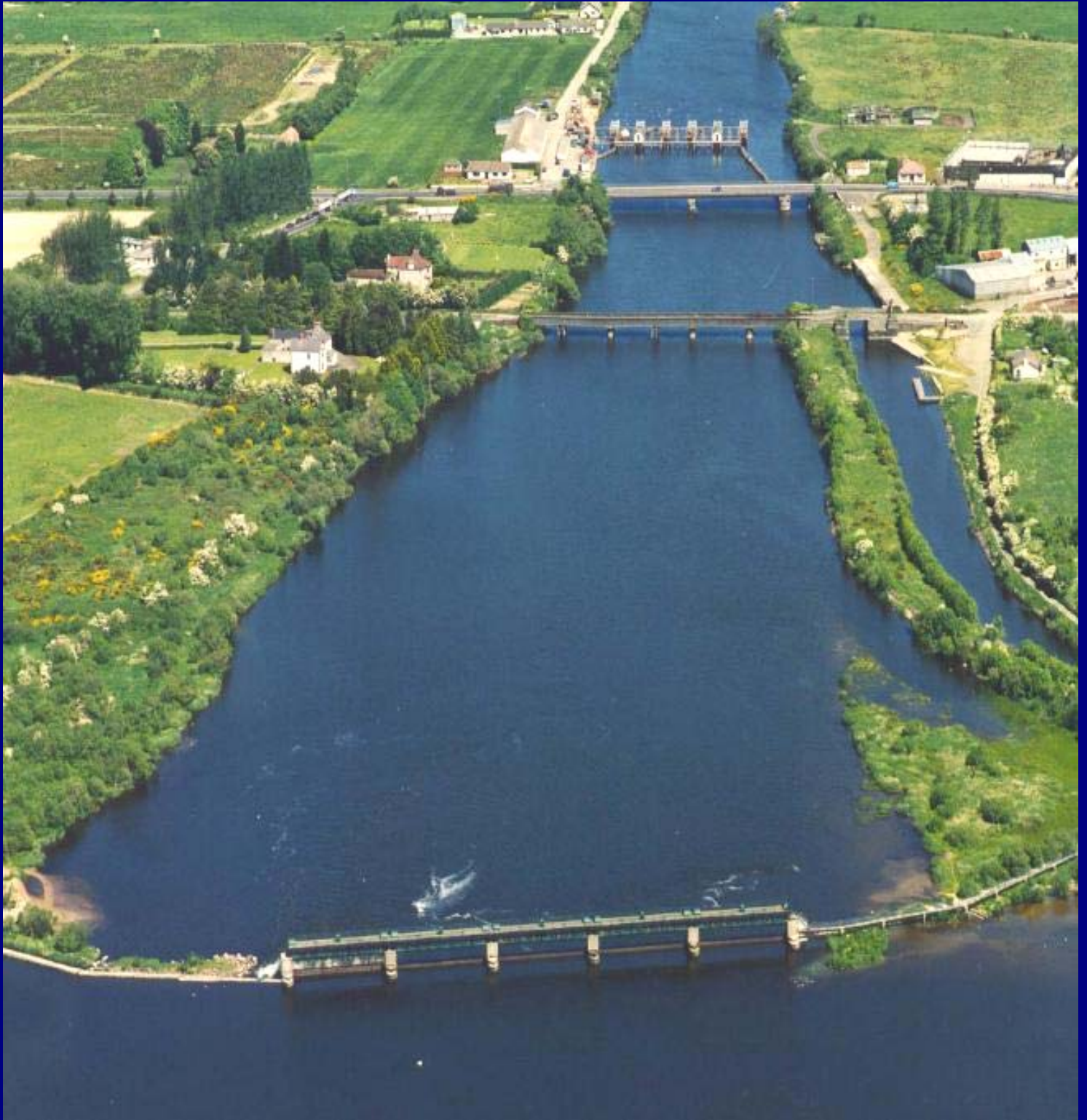


# Eel Management Plan

## Neagh / Bann River Basin District

*The Scientific Basis for the Viability of Current Management of Eel in the Lough Neagh and Lower Bann River Basin.*



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## The Scientific Basis for the Viability of Current Management of Eel in the Lough Neagh and Lower Bann River Basin

Version date  
March 2010



LOUGH NEAGH FISHERMENS COOPERATIVE SOCIETY LTD.



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## **1.0 Overview Of Matters Addressed in the Plan In Compliance With Council Regulation (EC) No 1100/2007**

### **Article 2 – Establishment of EMP's**

- 1.0.1 The Neagh Bann EMP covers the area identified as the Neagh Bann catchment for the purposes of Directive 2000/60/EC excepting the area that covers territory in the Republic of Ireland (hereafter, Ireland). This area will be included in a Plan for the Eastern RBD submitted by Ireland. This approach was agreed with the Irish authorities.
- 1.0.2 The target level of escapement is 200 t per annum. Detailed methodology to determine this target is described. It is suggested that this target is currently being met. Evidence to support this is provided. The measures in place to ensure the objective continues to be attained and to monitor and verify this are described. The measures in place are:
- Closely managed fishing activity
  - Restocking
- 1.0.3 Expected recruitment levels are postulated. Eel mortality by factors outside the fishery is not considered to be significant. Measures in this regard are considered unnecessary. Control and enforcement measures are described. Comprehensive control and catch monitoring systems are in place by both the fishery and the state authorities in NI.

### **Article 7 – Measures concerning restocking**

- 1.0.4 Fishing for eels less than 12 cm is not permitted excepting for the sole purpose of transfer within the RBD to boost survival. It is suggested that ~ 8 million juvenile eel are required annually to be recruited into Lough Neagh to continue to meet the target escapement objective. Dependent upon natural recruitment levels the requirement for any additional stocking strategy is described.
- 1.0.5 £0.5 million is expected to be available per annum for the purchase of juvenile eel. This shall be based on funds from the fishery, the EFF and the NI authorities pending review of Regulation (EC) No 1198/2006.

### **Article 10 – Control and enforcement in waters other than Community waters**

- 1.0.6 The legal framework applicable to inland fisheries in NI is outlined. Fishing rights are allocated by a licensing system.

### **Article 11 – Information concerning fishing activities**

- 1.0.7 NI does not operate a fishery for eel in Community waters. Fishermen and dealers undertaking 1<sup>st</sup> marketing of eel require to be licensed. Lists are therefore established. There is no recreational fishery targeting eel in NI. By-catch is insignificant.

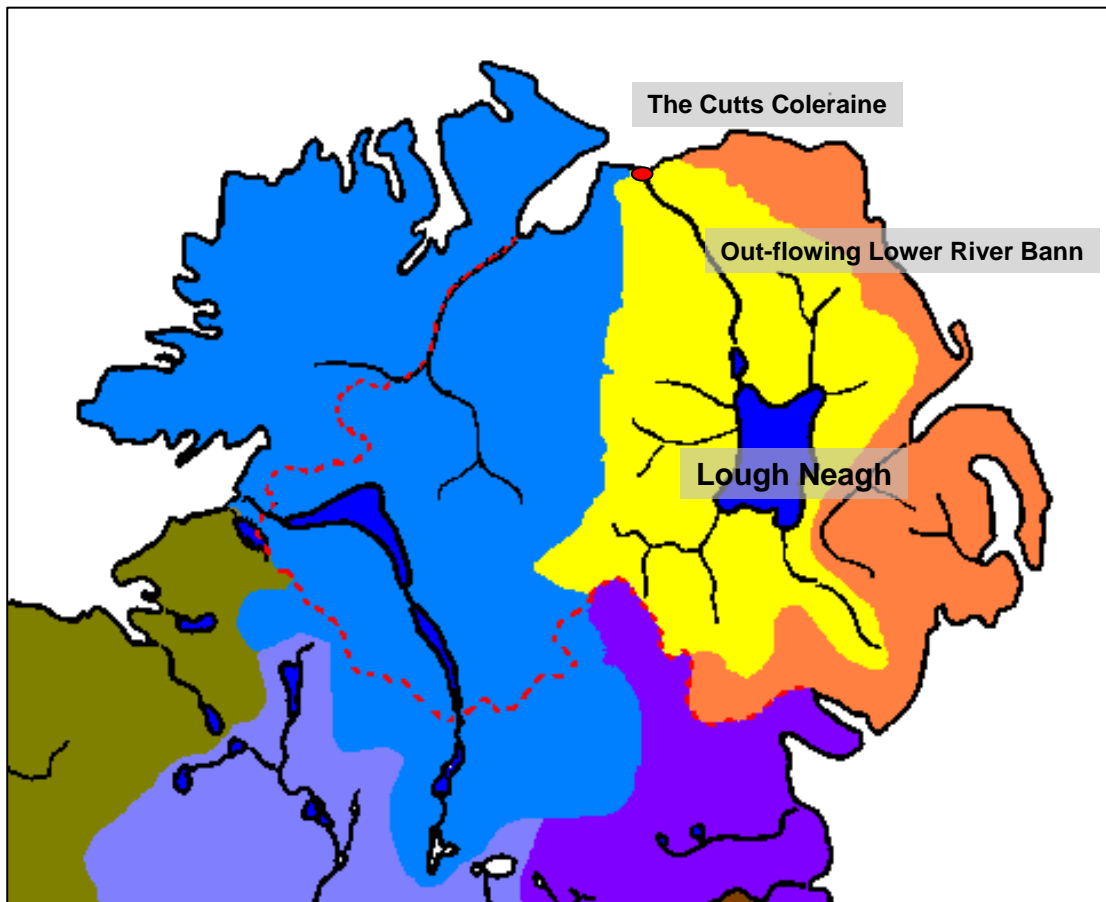
### **Article 12 – Control and enforcement of imports and exports of eel**

- 1.0.8 Measures available to identify the origin and ensure the traceability of eels exported are described. The fishery keeps detailed records of exports. Powers to regulate the records to be kept and the returns to be made regarding exports, and all imports if these should arise, are available to the NI authorities.

## 2.0 Summary

- 2.0.1 This document outlines the current management measures in place for eel stocks within the Neagh/Bann (Northern Ireland) River Basin district. This is taken as a basis for continuance into future management to meet the requirements of Council Regulation EC No 1100/2007 of establishing measures for the recovery of the stock of European eel.
- 2.0.2 The management unit is described, in terms of area, its eel environment and habitats, their accessibility and their eel fisheries.
- 2.0.3 The eel fishery is described, along with the regulation and management measures applied by the competent authority, the Department of Culture Arts and Leisure (DCAL) and the Lough Neagh Fishermen's Co-operative Society Ltd, (LNFCS) which owns and manages the Lough Neagh fishery.
- 2.0.4 The historical and current fishery catch, output and stock input data are described, as collected and made available by the LNFCS to the statutory authority. These data form the basis of an assessment of the current stocks based on catches and trends in fishery data.
- 2.0.5 The spawner escapement target is calculated to meet the requirements of the European proposals as established through the silver eel mark/recapture operation. **Estimates of potential escapement from Lough Neagh are in the range of 400 to perhaps 600 tonnes per annum, given historical high natural glass eel supplies. This range would suggest the required 40% level at around 160T to 240T. Current annual average estimate over 2003 to 2008 is of escapement past the fishery approaching 360T, above the required range.**
- 2.0.6 The management options available, should the targets fail to be met at any future point, are listed along with an approach to post-evaluation of the effectiveness of any measures adopted.
- 2.0.7 It is proposed that to curtail fishing effort for silver eels in the uniquely managed situation pertaining in the Neagh/Bann basin could actually reduce escapement in the long term, contrary to the aims of any such restrictions, due to removal of the funding source for stocking and management activity. It is seen as imperative to retain and reinforce the present management structure.

### 3.0 Description of the Eel Management Unit



**Figure 1 - The Neagh/Bann Eel Management Unit (yellow) as derived with consideration to the Neagh/ Bann RBD formulated for WFD implementation purposes.**

- 3.0.1 This management plan covers the Neagh/Bann River Basin district as formulated for WFD implementation purposes, including the Lower River Bann, Lough Neagh and all its influent rivers (Figure 1). No coastal or transitional waters are managed within this EMU.
- 3.0.2 The relevant fishery authorities within the EMU are the Department of Culture Arts and Leisure (DCAL) and the Fisheries Conservancy Board (FCB), and the scientific authority is the Agri-Food and Biosciences Institute for Northern Ireland (AFBINI). The Lough Neagh fishery is owned and managed by the Lough Neagh Fishermen's Co-operative Society (LNFCS).

## 4.0 Description of the fishery

4.0.1 The Lough Neagh and Lower River Bann commercial eel fishery has since 1971 been owned, maintained and managed by a Fishermen's co-operative, the Lough Neagh Fishermen's Co-operative Society Ltd., in which the majority of fishermen hold shares. Common ownership, by the fishing community, and combined management of glass eel, yellow eel and silver eel phases permits a co-ordinated management system with long-term sustainability as its main aim. The fishery management regime in place is described in detail in Rosell *et al* (2005), and has remained intact with only minor variation in practices for the past 45 years.

**There are 2 active fisheries:-**

### 4.1 Yellow eel fishery

4.1.1 Yellow eels are fished for by 90 to 125 two man boats, (ie 250 licences are issued to individuals but, not all of which are fished regularly), in Lough Neagh, by means of the traditional long line and draft (seine) nets during the summer months. Long line fishing is with a maximum of 1200 hooks per boat, baited with either earthworms, fish fry or the larvae of the flour beetle. Boat size on L. Neagh is restricted to 8.6 m long and 2.7 m wide (Plate 1). The Co-operative operates a quota per boat per day (being normally 51kg) but may be varied depending upon market conditions. Most boats achieve an acceptable catch (i.e. their quota) on a daily basis. A record is kept of each boat's daily catch and daily catch statistics are recorded by the LNFCS to enable the co-ordinated gathering of accurate data which are furnished to relevant authorities on demand. One unique feature of the fishermen's co-operative is that it undertakes to market the daily catch on behalf of the fishermen on a non-profit basis. The cost of operating this marketing approach is borne from the profits of the sale of the silver eel catch (see 4.2.1).



**Plate 1 - Standard Lough Neagh Yellow eel draft net fishing boat.**

## **4.2 Silver eel fishery**

4.2.1 The silver eel catch is taken in the Autumn and Winter at two sites (3 fixed weirs) which are specifically constructed for that purpose and are located at Toome and Kilrea, using coghill nets on the out flowing Lower River Bann (Plates 2 & 3, and map above Plate 4). The number of coghill nets fished depends on weather and flow conditions in the river at the time of fishing, and normally ranges from 2 to 8 nets per fishing night. The silver eel fishery normally employs a team of 3-4 men per weir. The nightly catch is recorded. Catches may be held over, processed and sold as and when market conditions are most favourable. Profits from the less labour intensive silver eel fishing fund the overall management activities of the Co-operative including stocking, transport of glass eels, administration and policing of both the yellow and silver eel fisheries. Further payments are made to fishermen and shareholders in winter outside the active fishing season. The co-operative organisation is an arrangement linking fishery management to the long-term interests of fishermen and their families, a fundamental basis for sustainable management. The history of the fishery, the buy-out of all commercial rights by the fishing community and the set-up of the co-operative in 1963 are described in greater detail by Kennedy (1999).

A small scale fyke net fishery operated in the tidal reaches of the Lower River Bann was leased by the LNFCS in 2006, with the specific purpose of closing the fishery to protect silver eel escapement from further exploitation. The fishery has not been fished since 2005. No catch data are available for this fishery, but the catches were thought to be nominal and therefore of no significant effect to the catch trend analyses presented in this Plan.

## **4.3 Recreational Fisheries**

4.3.1 There is no recreational fishery for eel within the EMU.

4.2.3 The combination of additional management controls applied by the LNFCS within a basic state imposed control framework brings together the elements of fishery management within a viable eel management plan as required by the EU Eel Regulation 1100/2007.



**Plate 2 - Toome silver eel fishery**



**Plate 3 - Kilrea silver eel fishery**

## 5.0 Restrictions and Regulations

### 5.1 State Provisions

5.1.1 The main state provisions are:

- A licensing scheme for all fishermen and all fishing methods.
- Close seasons:

for yellow eel fishing from 9 January to 30 April (*in practice due to weather conditions fishing for yellow eels rarely continue after mid-October*).

for silver eel fishing from 28 February to 31 May (*though in practice fishing for silver eels does not ordinarily begin until mid-September and ends in mid-December*).

- A minimum landing size of 30 cm. There is no legal fishing for glass eel or elver other than that specifically permitted for stock enhancement.
- A hook size restriction (not less than 23 x 7.5 mm) for long line fishing.
- Free gaps are enforced in interceptory silver eel weirs equivalent to 10% of the river width and in the main part of the flow. These protect migratory salmonids and allow for considerable escapement of silver eels.
- No permitted daylight fishing for silver eels.
- The holder of a dealer's licence is required to make returns of his purchase. The Co-operative maintains a strict record of daily catches by individual fishermen and issues dockets for all eels accepted for marketing. An analysis of the elver run and yellow and silver catches since 1961 accompanies this submission.

5.1.2 DCAL also has powers under the Fisheries Act (NI) 1966 to introduce further regulations to manage and monitor eel fishing activity if considered necessary. Specifically, the Department can introduce eel fishing quotas (by weight of catch per day) and amend existing Regulations to ensure that holders of eel fishing and dealers licences make returns to the Department in respect of catches (both weight and number) of silver and yellow eels. Anyone failing to comply with such regulations would be guilty of an offence resulting in a fine and possible forfeiture of their licence (if so directed by the Courts).

5.1.3 The full suite of legislative provisions applied to eel fishing in Northern Ireland are appended in Appendix 2.

## **5.2 LNFCs Provisions**

5.2.1 The LNFCs impose additional, more stringent restrictions on its members over and above state measures to prevent over-exploitation, to ensure stability of supply for marketing, and long-term sustainability and continuity of fishing (Appendix 1).

5.2.2 These include

- Daily quotas for all yellow eel fishing boats (variable depending on market demand but not normally exceeding 51 Kg per vessel per day).
- No yellow eel fishing at the weekend..
- A limit on the permitted number of fishing boats operating on Lough Neagh thereby restricting intensity.
- The Co-operative enforces a marketable size minimum of 40 cm for yellow eels. Eels presented to the Co-operative below this size are returned live to the water.
- Voluntary closure of the silver eel fishery in January, February, and from June to August inclusive. Depending on timing of dark moon phases, silver eel fishing effectively stops before Christmas in most years, and does not recommence until mid September.
- Closure since the mid 1990s of one of the three silver eel fishing sites on the Lower River Bann.
- The LNFCs have leased a small scale fyke net fishery operated in the tidal reaches of the River Bann with the specific purpose of closing the fishery to protect silver eel escapement from further exploitation. The fishery has not been fished since 2005.

## **6.0 Policing and Protection by State Agencies and LNFCs**

6.0.1 State policing and fishery protection patrols are operated by the Fisheries Conservancy Board (FCB). Staff operate a number of vessels on the Lough and on the Lower River Bann. Patrols seek to monitor fishing activity and detect and deter illegal fishing. This protection activity shall be resourced and deployed to fulfil the monitoring and enforcement requirements arising from the recommendations for post-evaluation of the implementation of this plan, as outlined below.

- 6.0.2 The LNFCS funds and runs its own policing and fishery protection staff to protect its interests. Four full time staff have access to 3 patrol craft which operate on a 24 hour basis throughout the fishing season on the Lough. Patrols aim to ensure that only those fishermen in possession of a permit from the Co-operative are fishing and that they are respecting both state and the Co-operative's own fishing regulations. Annual cost to the Co-operative of its protection service by way of salaries, wages, vehicle and boat use is in excess of £200,000 funded exclusively by the LNFCS (see 4.2.1).
- 6.0.3 The LNFCS also has a centralised collection and marketing system which enables the gathering of accurate data on catches and fishing activity, and operates the enforcement of daily quotas for individual fishermen. As such, the LNFCS is the only licensed first seller of eels from this RBD.
- 6.0.4 The commercial wild eel fishery is therefore accepted as an efficiently managed system, every aspect of its activities from elver recruitment (see below) to yellow and silver eel fishing being clearly controlled, monitored and recorded.

## **7.0 Data gathering activity by LNFCS and Government scientists**

- 7.0.1 The LNFCS records all stock moved to Lough Neagh from upstream transport of natural recruitment, all additional stock purchased (see section 10.3), and all catches of marketable yellow and silver eel. These data are made available annually to government fishery scientists (AFBI) and management agencies (DCAL), with permission for use in meeting international reporting obligations. A state sponsored science programme is also given free access to the fishery and the marketing and processing operations. Scientists can also access individual fishing boats by agreement with owners where required for sampling and stock monitoring activities. In return for this access, state scientists provide advice on sustainable management to the LNFCS as well as to state agencies.

## **8.0 Other eel fisheries in the RBD**

- 8.0.1 A small scale fyke net fishery once operated in the tidal reaches of the River Bann, leased by the Irish Society through its management company, Bann Systems Ltd. The rights to this fishery are now leased by the LNFCS and the fishery has been closed to ensure that silver eels emigrating from the River Bann through free gaps in the LNFCS weirs escape to the sea. Elsewhere there are no eel fisheries in the RBD.

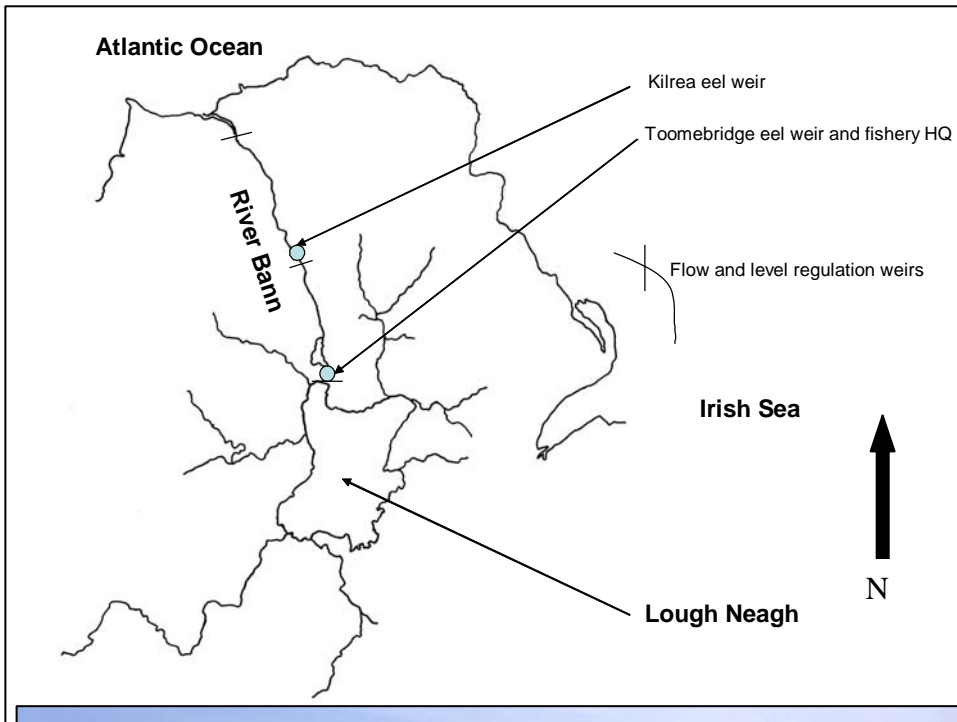
## **9.0 Quantification of Environment and Habitat**

### **9.1 Amount and characteristics of eel habitat**

9.1.1 Lough Neagh comprises 38,600 hectares of open water. It has a mean depth of 9.5 m with a maximum of 30 m. It is the largest lake by surface area in the British Isles and due to the size of Lough Neagh, the remaining potential eel producing areas of small lakes and rivers in the catchment are minor by comparison, amounting to at most perhaps 5% of total water surface area. As the water in Lough Neagh does not stratify and is generally aerated by wind driven circulation throughout the water column, the entire lake bed area is available to eel. It is classified as hypertrophic due to phosphorus and nitrogen nutrient inputs, now mainly from agricultural land but also from human domestic sources. For these reasons, the production of eel from rivers and lakes upstream and downstream of L. Neagh is considered to be relatively minor and, therefore, this plan focuses primarily on eel production in L. Neagh.

## **9.2 Passability to upstream and downstream migrating eel**

9.2.1 The outflow from Lough Neagh through the lower River Bann is regulated by a series of weirs and sluices (Plate 4). These sluices are operated by the Northern Ireland Rivers Agency under legislation designed to maintain water levels in Lough Neagh within narrow bounds to facilitate lake-shore agriculture, navigation, and drinking water abstraction. Eel passes are in place on all sluice gate systems, and these passes are annually maintained by LNFCS with traditional methods (straw rope coverings) to facilitate upstream migration of any young eels which by-pass the trap and transport operation, even though under current recruitment levels, most are helped upstream by the trap and tanker transport operation undertaken by LNFCS from tidal head traps 40 km to Lough Neagh. Under the high recruitment conditions in the early and mid 1900's there was considerable natural upstream migration, given the lack of anthropogenic influences in the system at that time (see section 10.2, below). Any silver eels which use the minimum 10% free gap past active silver fisheries are therefore free to run to sea. The out-flowing River Bann is free of any turbine, power generation system or major water abstraction which might impede the escapement of silver eels to the sea.



**Plate 4 - Sluice gates and their position along the Bann corridor**

**9.3 Chemical quality**

9.3.1 The chemical quality of Lough Neagh and the River Bann is assessed by the Northern Ireland Environment agency at sites in the Lough and the out-flowing

River Bann at quarterly intervals. Three determinants are used to score the quality according to the UK: biochemical oxygen demand (BOD), dissolved oxygen (DO) and ammonia, and categorised under the UK General Quality Assessment (GQA) system. In this system, there are six quality classes ranging from Very Good through Fair to Bad. Monitoring results for rolling 3-year sampling periods are used. Thus, for example, the GQA chemical classification for 2003 is based on a combination of the results obtained during 2001, 2002 and 2003. Lough Neagh currently scores at GQA class 3 (fairly good) which means that it is suitable for potable supply after treatment, all other abstractions, good cyprinid fisheries, and is capable of supporting a natural ecosystem.

#### **9.4 Trophic status**

9.4.1 The Agri-food and Bio-Sciences Institute for NI (AFBI) monitors nutrient levels (forms of Nitrogen and Phosphorus, Silica, Algal species and quantity) on a fortnightly basis, along with Chlorophyll<sub>a</sub> and Secchi disk transparency. These data class Lough Neagh as eutrophic or hypertrophic on the OECD/Vollenweider system, as a result of mainly agricultural but also some domestic N and P inputs. While this is a concern for other interests (e.g. the salmon and trout fisheries), the turbidity and high biological productivity are actually positive factors to the eel, and probably account for the Lake's capability to produce extraordinary quantities of eel relative to glass eel inputs. Some eel food items, particularly chironomid larvae, are present in very high abundance.

#### **9.5 Contaminants**

9.5.1 Lough Neagh has an essentially agricultural catchment with very low levels of industrialisation and only small or medium sized towns. Hence, in the absence of routine monitoring of eel quality it is inferred that there is no local problem of contamination of eel with organic chemical residues, heavy metals, or other pollutants which would give grounds for concern for human consumption or indeed for eel spawner viability.

#### **9.6 Additional Sources of Mortality within the EMU**

9.6.1 Within the EMU there are resident populations of piscivorous birds and mammals such as cormorants, grey herons, otter and mink but their numbers are not large enough to cause any significant impact over and above that which would be considered typical levels of natural mortality. In addition neither fishermen nor the fishery managers have raised any concerns in relation to their natural predation on eels.

9.6.2 The Japanese eel swimbladder nematode *Anguillicola crassus* was found in Lough Neagh yellow and silver eels for the first time in 2003 (Evans & Rosell, 2005) and its spread has been monitored via the analysis of a total of 1643 yellow and 500 silver eels from 2003 to 2008 (Figure 2). Within 2 years of its introduction to the Lough

Neagh eel population, 100% of sampled yellow and silver eels had been infected with the worm, with mean intensities of 7.5 worms per infected eel. However, as is typical with the epidemiology of this introduced parasite, prevalence levels in yellow eel have fallen from 2006 to the present, with 68% of eels now containing worms, at a mean intensity of 4.3 worms per eel. Infection levels in silver eel remain at 100% prevalence, with an average of 11 worms per eel migrating from the system.

9.6.3 Additional health screening of silver eels has been performed in September of 2007 when an outbreak of “red pest” was noted amongst emigrating silver eels of which 10-15% were affected and substantial mortalities recorded. The causative agent was identified as the bacterium *Aeromonas hydrophila* normally regarded as an opportunistic infection and associated with an additional stressor. In this instance the additional stressor was believed to be the restriction of eel migration due to low Autumnal rain fall and the closure of the sluice gates within the system to maintain water levels. As the winter progressed and the gates remained opened the disease outbreak subsided confirming this supposition.

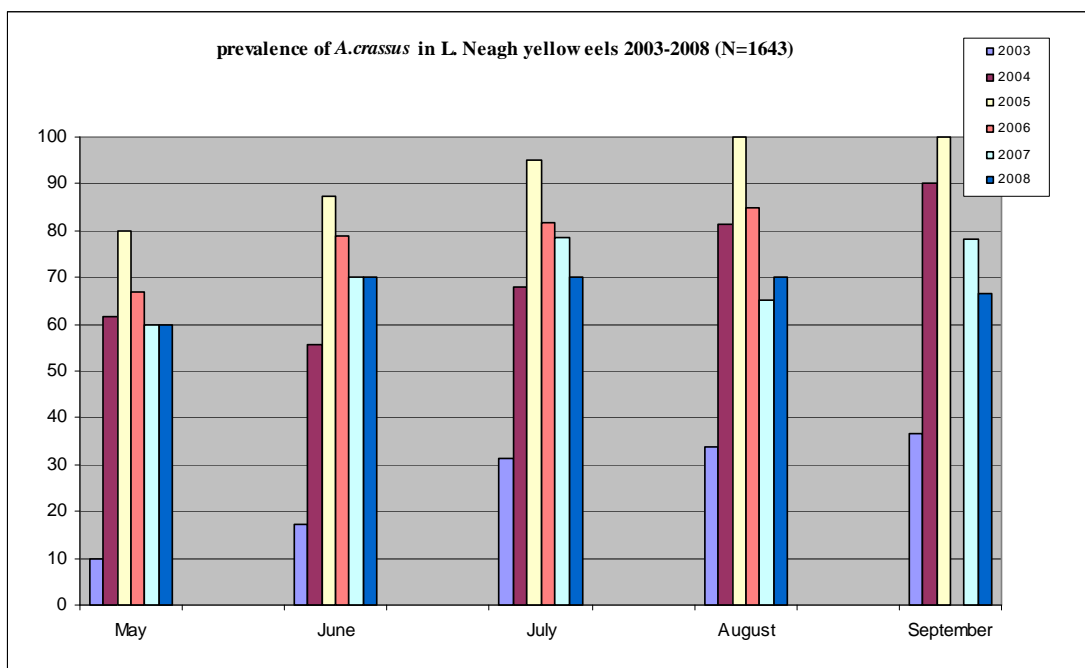


Figure 2 - The prevalence of *A. crassus* in yellow eels from Lough Neagh (2003-2008)

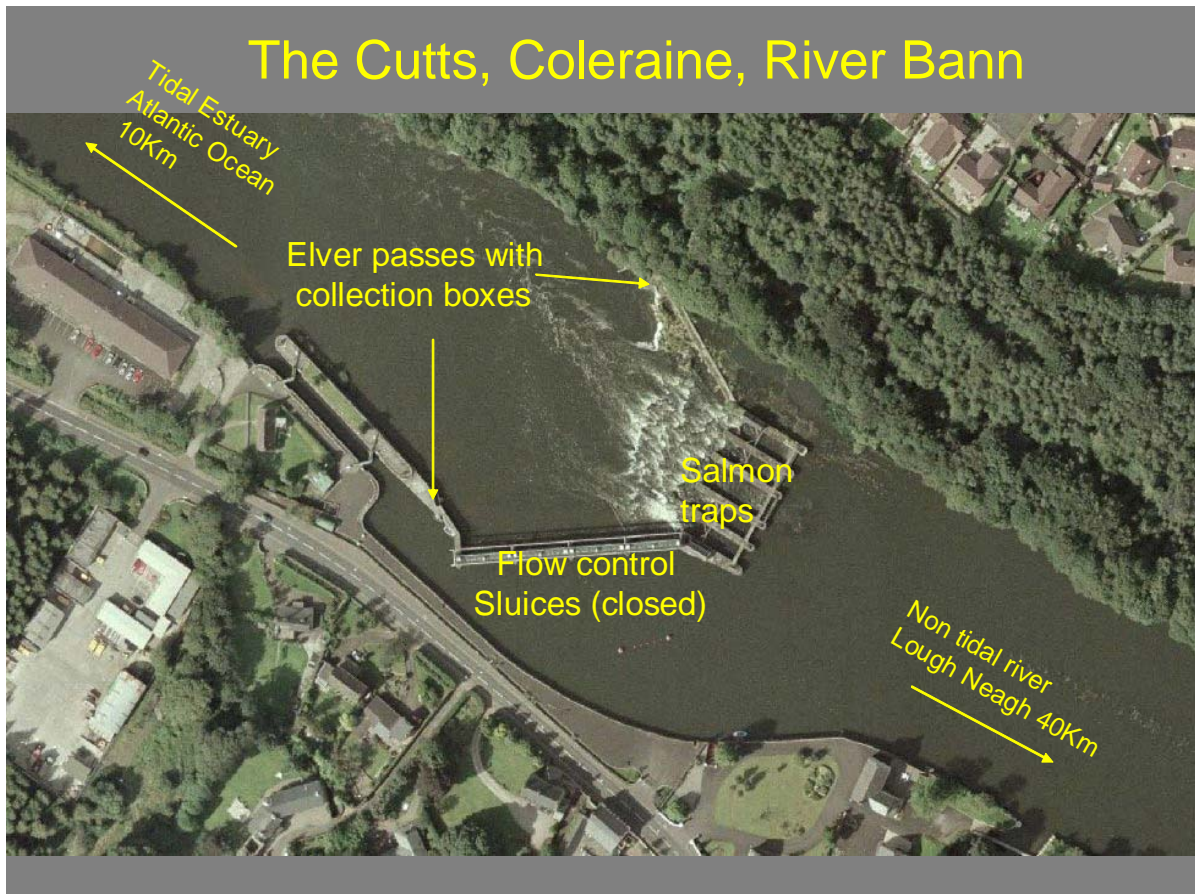
## 10.0 The Status of Eel Stocks within the EMU

### 10.1 Recruitment

10.1.1 Lough Neagh recruits enter the system via 1 of 3 methods -

1. via natural immigration of eel up the lower River Bann,

2. by trap and transport of elver and glass eel from the tidal head directly to Lough Neagh by tanker (see section 10.2.1),
3. and since 1984 by additional purchase of glass eel from the Severn estuary fishery.



**Plate 5 - Plan view of the tidal head of the Bann showing site of elver traps (Lat. 55.147; Long. -6.668)**

## **10.2 Upstream Transport of Natural Recruitment to the Bann Estuary**

10.2.1 Elvers entering the River Bann are captured in specially constructed traps at the Cutts, Coleraine, where upstream passage is restricted by flow control sluices and a weir (Plate 5). Some eels migrate naturally up the river channel to Lough Neagh, particularly when recruitment is abundant and river flow is low. However, elvers are normally collected daily during the immigration season from these traps and transported in aerated tanks to Lough Neagh, where they are released at points dispersed around the shoreline. Daily catches are recorded and season totals collated (Figure 4). This system has been in operation since 1936 with a break from 1946 to 1959. Since 1960, over 390 million elvers have been moved to Lough Neagh this way. All details concerning this operation are disclosed to government agencies on a regular basis.

### 10.3 Purchase of Additional Stocks from Other Catchments

10.3.1 Stocking is carried out over the entire area of Lough Neagh (38 600 ha) at a preferred density of 0.1 kg ha<sup>-1</sup> (or 300 glass eel per hectare), though this level is not necessarily always achieved given the high price and availability of additional glass eel.

10.3.2 To compensate for the decline in the natural elver recruitment in 1983 and subsequent years, the Co-operative undertook the purchase of over 80 million River Severn elvers from Glass Eels UK Ltd. (Table 1, Figure 3) at a cost to the Society of £2.5 million. These are transported with associated veterinary health certification in relation to the absence of notifiable fish pathogens.

10.3.3 Effectively this practice has ensured that the level of elver recruitment has been maintained at an acceptable level to allow fishing at a normal intensity.

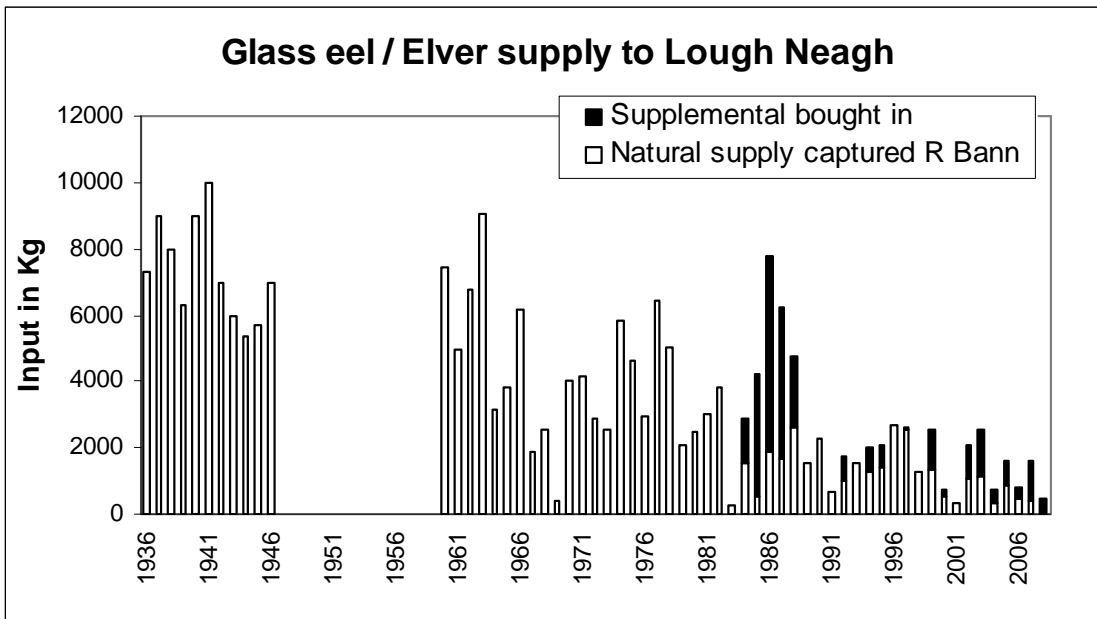


Figure 3 - Elver/Glass eel supply to Lough Neagh 1936-2008 (Data courtesy of LNFCS)

Table 1 - Recruitment and Catch (Data Courtesy of LNFCS)

year	natural	additional	yellow t	silver t	TOTAL t
	recruitment	stocking			
	millions	millions			
1965	11.4	0.0	236	329	565
1966	18.5	0.0	284	332	616
1967	5.7	0.0	327	242	569
1968	7.6	0.0	381	204	586
1969	12.3	0.0	368	238	606
1970	12.0	0.0	515	237	752

1971	12.5	0.0	610	233	842
1972	8.7	0.0	508	125	633
1973	7.6	0.0	561	162	723
1974	17.6	0.0	587	178	765
1975	13.9	0.0	575	187	762
1976	8.8	0.0	481	145	625
1977	19.3	0.0	454	236	690
1978	15.1	0.0	543	280	824
1979	6.3	0.0	701	340	1041
1980	7.5	0.0	667	245	912
1981	9.1	0.0	680	228	908
1982	11.6	0.0	704	209	914
1983	0.7	0.0	661	203	864
1984	4.6	4.0	806	166	971
1985	1.7	11.0	615	135	750
1986	5.5	17.8	521	130	651
1987	5.0	13.7	503	121	624
1988	7.9	6.3	502	151	653
1989	4.7	0.0	642	152	794
1990	6.9	0.0	612	123	735
1991	2.0	0.0	578	121	699
1992	2.9	2.4	532	148	680
1993	4.6	0.0	534	90	624
1994	3.7	2.3	596	95	691
1995	4.2	2.1	658	138	796
1996	8.0	0.1	593	112	705
1997	7.6	0.2	553	109	663
1998	3.9	0.05	531	104	635
1999	4.0	3.6	555	113	668
2000	1.7	0.5	485	102	587
2001	1.0	0.0	450	84	534
2002	0.9	3.0	431	96	527
2003	3.6	3.9	413	114	527
2004	1.0	1.2	363	99	462
2005	2.8	2.4	317	117	434
2006	1.4	1.0	242	104	347
2007	1.2	3.6	351	76	427
2008	0.07	1.3	285	76	361

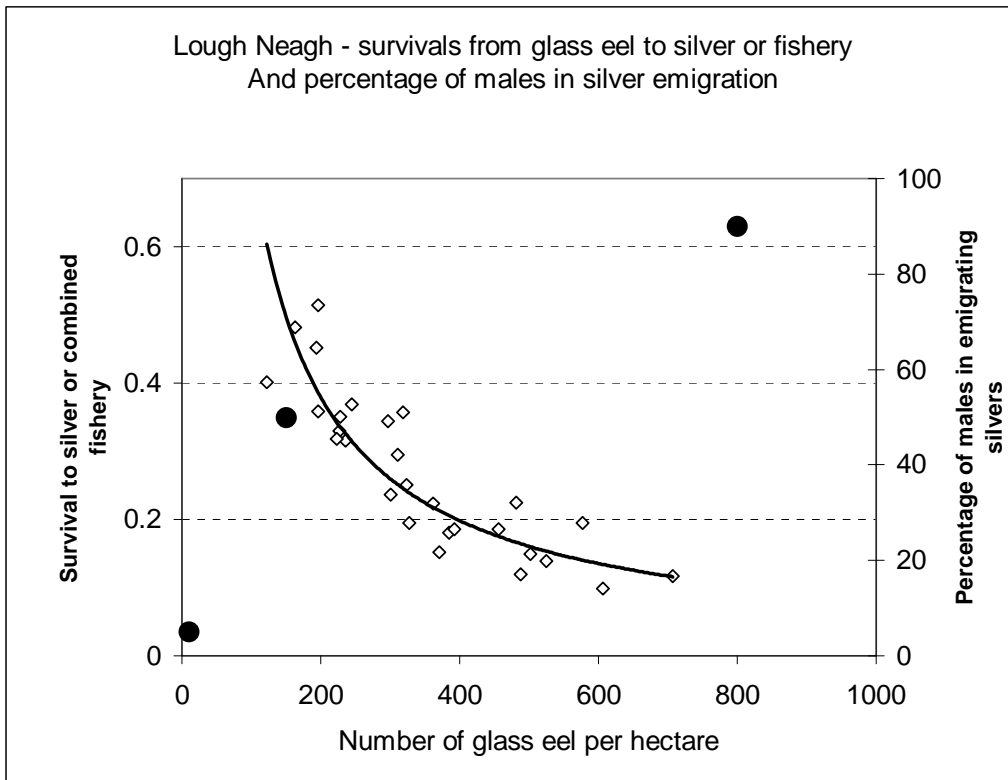
#### 10.4 Yellow and silver eel stocks

10.4.1 Stock input estimates as recorded by the capture and upstream transport of glass eel in the estuary of the River Bann, combined with additional purchases of glass eel from other fisheries for stocking, are presented in Figure 3, and catches of

yellow and silver eel as recorded by the fishery are presented in Figure 4. Glass eel placed in the Lough contribute to the fishery at ages ranging from 12 to 25 years, with an average age of 17 years (Figure 6). Over 90% of the current composite catch is of eels ranging from 14 to 19 years. Recent analyses of these data (Rosell *et al.*, 2005) point to a probable input-output relationship with a time lag equating to the average recorded age of eels. These relationships have been used experimentally to produce models which explain over 90% of the variation of catches, according to the glass eel input in previous years (Allen *et al.*, 2006).

## **10.5 Optimum stocking strategy for Lough Neagh**

- 10.5.1 Eel numbers in Lough Neagh have following the construction of the sluice gates on the Lower Bann at the Cutts which impeded migration been managed by the capture and movement of elvers since the 1930s. Elvers are trapped at the tidal head, and transported upstream 40 km to Lough Neagh by tanker. Numbers transported upstream and additional glass eels purchased from elsewhere have been recorded by LNFCS since 1959 (Figure 3). Total catches of yellow eel in the lake and silver eel in the outflow have been recorded annually since 1959. These fishery data, along with knowledge of male to female ratios in silver eel population (as derived from the calculation of the number of male and female eels per 15kg sale carton split between large (female) and small (male), scaled up for the entire years catch) allow analysis of lifelong survival rates from immigration or stocking to fishery or spawner escapement to sea. Detailed analysis is presented in the 2007 EIFAC/ICES WGEEL report (ICES, 2007), but summarised below.
- 10.5.2 Using the catch weights from yellow and silver fisheries, and mean weights of yellow (250 g), male silver (180 g) and female silver eel (360 g), along with silver eel sex ratio, all data can be converted to an estimated number of eels caught or escaping. Sex ratio data for silver eels is available for much of the time-series, the ratio of males to females being dependent on stock density (Rosell *et al.*, 2005). Silver eel escapement (section 11.1) is estimated at 2.5 times the actual silver catch, based on an annual mark-recapture programme (see section 11.2). The annual total estimate of the output number of eels escaping to spawn, or captured in the fishery, can be related to the original input number of elvers, enabling analysis of the proportion of eels surviving to the point of leaving Lough Neagh as catch or escapement (Figure 4).



**Figure 4 - Estimated rate of survival of Lough Neagh eel, from glass eel input to emigration or fishery capture combined, in relation to stocking density. Trend line over open diamonds: actual data, 1977 to 2006 outputs, 1960 to 1977 inputs; Black circles: Proportion of males in the silver eel catch at three estimates of stock input densities since 1930. From ICES WGEEL report,2007**

10.5.3 The input to output relationship, in terms of survival rates, is non linear - a negative exponential curve is the best fit. The more elvers that are added to the system, the lower the proportion surviving. Above a certain stocking level there is decreasing benefit from adding more. At the lowest recorded input of about 100 elver per hectare, equivalent to about 4 million individuals for the Lough, perhaps half survive to fishery or escapement. At the highest recorded level, 700 per hectare or 28 million individuals, this reduces to 1 in 10.

The LNFCS stocking target is 6 to 8 million individuals or 150 to 200 elver per hectare (which produces a density of eel that ultimately provides a size of eel that reaches a prime market price). This target is consistent with gaining maximum benefit per elver and on the basis of the input-output analysis will supply a managed fishery and allow adequate escapement.

10.5.4 Of interest also is the effect of stocking level on the proportion of males and females in the emigrating silver eel catch. The gear is not thought to be selective for sex, implying a true record of sex ratio, dependent at least partly on input stock density (Rosell *et al.*, 2005). As male eels leave earlier and are much smaller, this suggests that at high stocking levels the number of silver eels increases but without increase

in weight of eel produced, perhaps suggesting habitat saturation at levels above 400 elver per hectare or 12 million individuals for the Lough.

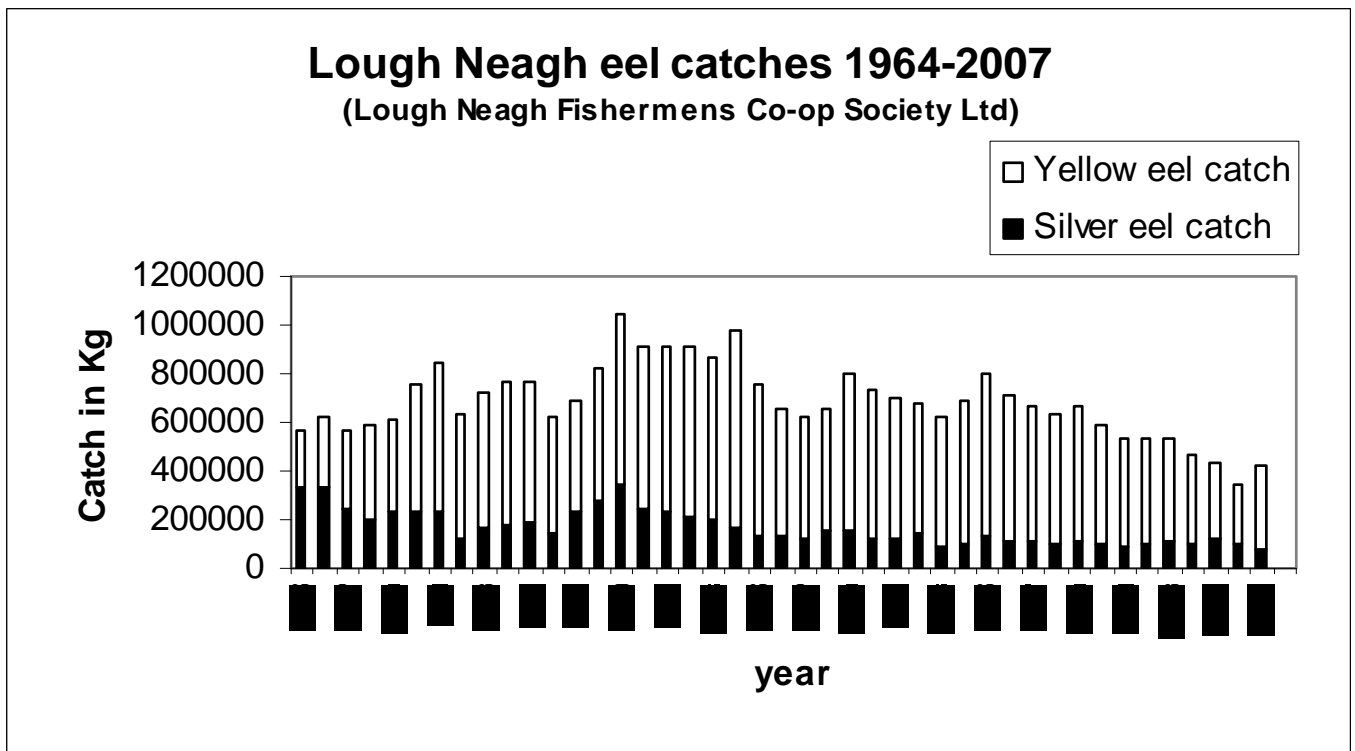
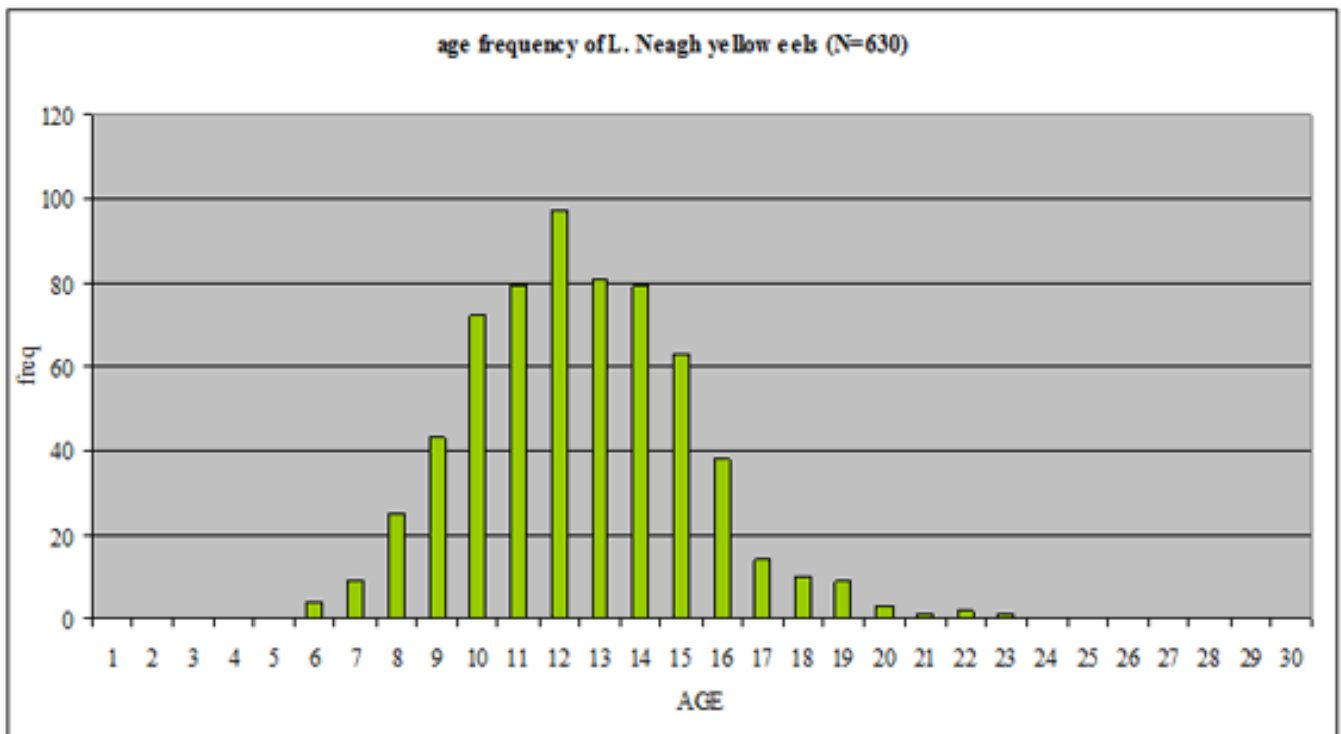


Figure 5 – Commercial catch of yellow and silver eels from Lough Neagh 1965-2007. (Data courtesy of LNFCS)



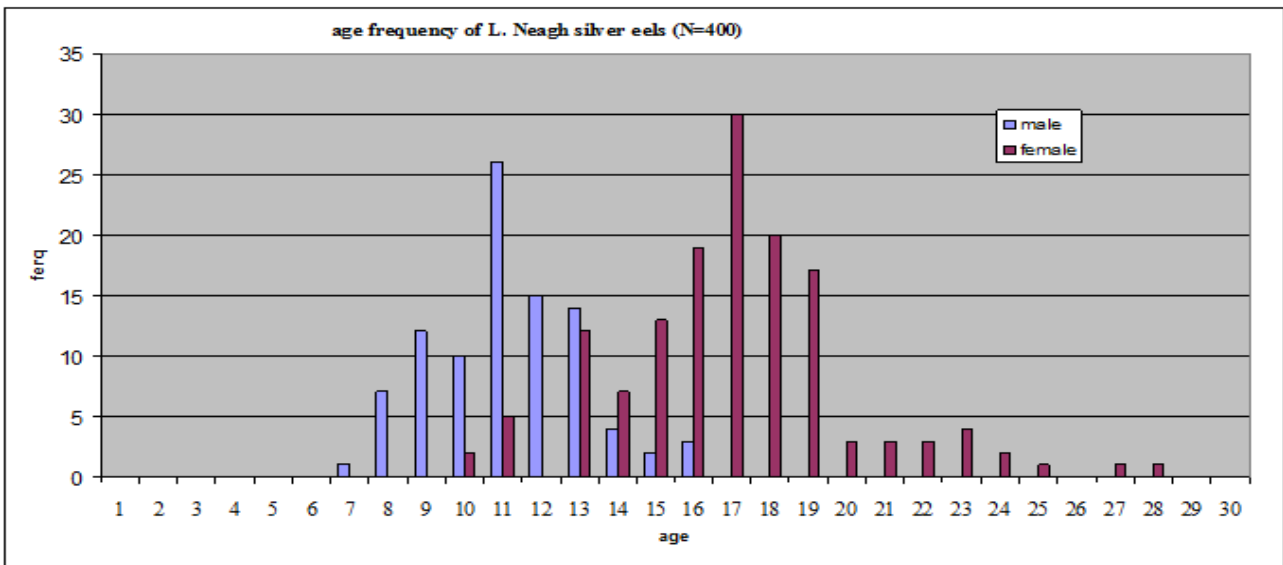


Figure 6 – age profile of sampled annual catch (yellow and silver eel) from Lough Neagh

## 11.0 Compliance with target of 40% escapement.

### 11.1 Escapement estimation. What is the current annual escapement of silver eels?

11.1.1 Silver eel fishing is very variable year on year. There are three weirs at two sites in operation, a third site not having been fished for over 10 years. The main weir at Toome operates most effectively at high river flows while the second weir at Kilrea, some 15 Km downstream, is often overtopped by floods, during which fishing ceases at the site and only operates effectively at low river flows. Water flows are variable and tend to alternate between high flows in excess of  $150 \text{ m}^3\text{s}^{-1}$  and lower flows below  $50 \text{ m}^3\text{s}^{-1}$ . This is due to gate openings at a series of sluices designed to maintain water levels in Lough Neagh within strict legal limits to protect farmland and municipal water abstraction points. Regularisation of the gate openings is difficult as management is in response to variation in rainfall but there is scope for management by the Rivers Agency toward more consistent conditions and better estimation of eel escapement. The fishery has no control over gate openings and the variation in river flow makes operation of interceptory eel fisheries difficult. Over a long term average, the Toome weir catches 63% of the annual catch, but in years of prolonged low flow in autumn over 50% of the silver eel catch may be caught at Kilrea, having by-passed Toome (in 45 years this has only occurred 8 times) (Figure 7).

11.1.2 Free gaps equating to 10% or more of river width and of a greater proportion of flow are fixed in structure and maintained at both eel weir sites. At Toome, the free gap is also a navigation canal and is along the east bank. The variability between weirs and the capture of significant quantities of eels at the second of two sequential weirs points strongly to the effectiveness of the free gap provision in allowing escapement past the first weir. In the summer months (particularly July and August) the presence of silver eels caught amongst yellow eels in draft net catches indicates their probable migration outside the main autumn/winter runs at a time when the silver eel weirs are not fished, contributing further to escapement. Attempts are being made in a pilot study using Hydroacoustics to quantify the summer movement of silver eels through the unfished weirs. It is hoped that the results from this study can be used to further refine the estimates of silver eel escapement, both outside the fishing season, and during the fishing season by monitoring the passage of eels through the free gaps (and the open weirs in summer). Neither of the two sites in operation is fished until mid September.

separation of silver eel catches between Toome and Kilrea weirs (t) 1961-2007.

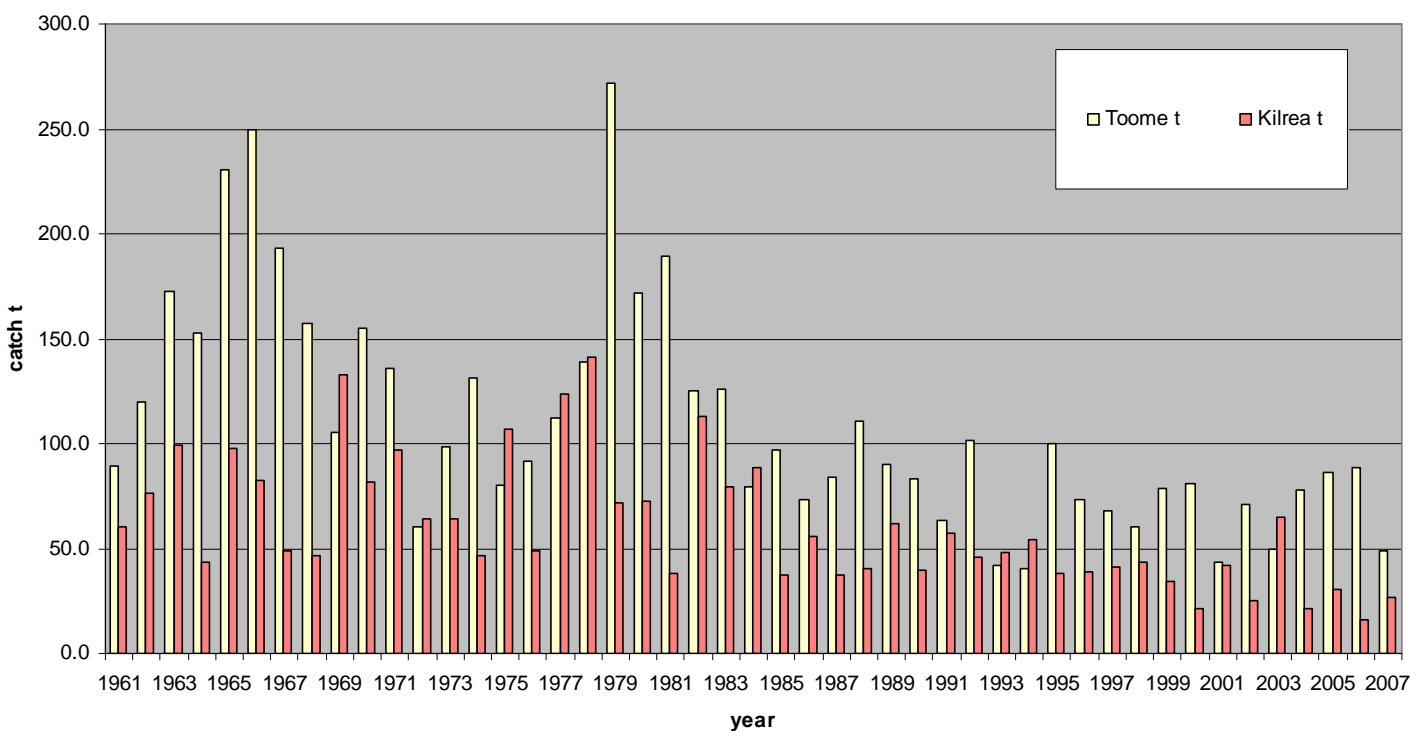


Figure 7 - Silver eel catches at Toome and Kilrea weirs (t) 1961-2007 (Data courtesy of LNFCS Ltd)

## 11.2 Tagging Programme

11.2.1 Given the geography of the EMU, in particular the single outflow point of Lough Neagh via the Lower River Bann at Toome, it was possible to initiate an annual mark-recapture programme in 2003, with the objective of estimating escapement of

silver eels from Lough Neagh based on the non-recaptured proportion of those tagged silver eels taken back upstream and released.



**Plate 6 - Silver eels marked with Floy Tags prior to release in Lough Neagh.**

11.2.2 To date, 3469 eels have been tagged with Floy™ Tags (Plate 6) over a period of 6 years from 2003 and recaptures recorded at both silver eel sites (Table 1). Silver eels selected from across the whole size range are taken from the previous night's catch, tagged, trucked back upstream to 2 locations in Lough Neagh, and released. The majority of these eels return downstream very quickly – most recaptures are within days of release on the same dark phase of the moon. Measured recapture and hence escapement rate in conjunction with known silver eel commercial catches give an annual escapement estimate (Table 2). For every batch of tagged silver eels released back into the Lough a control set of 50 tagged and 50 untagged silver eels are placed in a large commercial holding cage lowered into the River Bann at Toome with their health status and longevity monitored daily. No significant differences in mortality levels have yet been detected between tagged and untagged eels. The catch (recapture) pattern is variable, recapture rates from individual batches ranging from 15% to 60%. This, along with the carry-over of some tagged silver eels from the year of marking to the next two, highlights the need for using a longer term measure such as a three-year rolling average to measure escapement. The active silver eel fishery is visited on a nightly basis to collect any tagged eels as they are captured by the fishery. The commercial catch of silver eel is screened on a daily basis by the management of the fishery and the scientific team. All tagged silver eels are removed from the catch, the capture site noted and from the tag number the release location determined. These data are then used to determine escape rates from the RBD and in conjunction with the

silver eel catch for the year gives an estimate of escaping biomass. The capture of fewer tagged eels at the Kilrea site can be explained by the fact that this site is inoperable under high river flow conditions and as such is normally closed from October onwards.

11.2.3 Tagging was not undertaken during the silver eel season of 2007 as a consequence of sporadic rainfall in the catchment leading to increased sluice gate closures which in turn lead to intermittent catches of silver eels and a lack of tagging material. This problem has been addressed for 2008 in that the necessity of silver eels for tagging throughout the silver eel season has been highlighted and the provision of eels for tagging is now an integral part of this management plan and as such must be given priority.

### 11.3 Recapture of Tagged Eels

11.3.1 Average recapture over 5 years to date is 29.2%, indicating a possible escapement of silver eels past the fishery of approx. 70%, or circa 320t (taken as an annual average from the commercial catch of silver eel from 2003 to 2006). The mortality of tagged eels in the wild is unknown. Control batches held in tanks have shown no significant increase in mortality of tagged over untagged fish over the three week period in which most recaptures occur, and recaptured fish are generally healthy. The carry-over of one year's tagged eels to the following year is low, and incorporated into final, annual escapement estimates (Table 2). While it is impossible to quantify all potential losses of tagged fish between tagging and recapture, and absolutely accurate estimates are hence not possible, silver eel escapement would currently appear to be in excess of approximately 320t per year.

**Table 2 - Tagging and Escapement**

Year	No. tagged	Recapture - Toome	Recapture - Kilrea	carry over to catch T+1	carry over to catch	total recaptures	recapture rate %	Estimation of possible (Maximum) escapement

				year	T+2 years					
								<b>Year silver catch (t)</b>	<b>Escape -ment estimat e (t)</b>	
2003	189	26	7	7	2	42	22.2	114	399.0	
Note 2003 fish caught in draft nets in Lough Neagh, not in traps										
2004	838	302	15	4	2	323	38.5	99	157.8	
Note 2004 onward fish purchased from fishery and released back upstream										
2005(to 12 DEC)	792	118	0	7		125	15.8	117	624.3	
Note 2005 exceptional flood conditions second half silver run and overtopping of weirs, and Kilrea un-fished										
2006 (Sep batch))	500	72	1		4	77	15.4			
2006(Nov Batch)	200	123	0			123	61.5			
2006 All	700	195	1	0	4	200	28.6	104	260.0	
2007	No mark-recapture due to atypical river flows, late start of fishing and a very late silver run likely to be un-representative of true escapement								76	N/A
2008	950	193 22.2	18	-	-	211		76	345.0	
Sum all tag data '03-'08	3469	834	41	18	8	901	29.2	97.7 (mean )		
<b>Escapement estimate from simple summation of all data 2003 to 2008 (Tonnes)</b>								<b>245.0</b>		
<b>Average of annual escapement estimates 2003 to 2008 (Tonnes) :</b>								<b>357.0</b>		

## **11.4 What escapement should be expected of Lough Neagh in the light of the regulation?**

11.4.1 The Regulation states that a management plan be put in place: *“to permit with high probability the escapement to the sea of at least 40% of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock ”*. This effectively places a requirement on any fishery / eel management unit to calculate the potential escapement in a “natural state” under full recruitment, and compare this with the current situation.

11.4.2 There are three ways of quantifying POTENTIAL eel escapement in the data-rich situation of Lough Neagh. These are outlined below. It is important to note that for the input-to-catch based analyses (i and ii), it is assumed that the unknown silver eel escapement not counted in the catch is broadly equivalent to the unknown mortality which would have applied to the yellow eel catch component if it have been left to silver.

### **i) Escapement estimation from the input-output time lag relationship**

#### **The age of eels caught in the fishery and time lag input to output**

11.4.3 The ages of eels captured in the yellow and silver eel fisheries have been measured. Yellow eels are almost all female and average 14 to 15 years old. Female silver eels average 17 to 18 years and male silver eels 11 to 13 years old. The overall average age of all eels fished is 17 years from glass eel, with a range from 8 to 25 years.

11.4.4 These age data match analysis of the correlation between input measured as total elver count, and output, measured as total catch. This yields a significant relationship with a spread of strong positive correlations at lags of 15 to 20 years between input and output. Peak correlation is a lag of 18 years from input to output

#### **Input-output regression analysis**

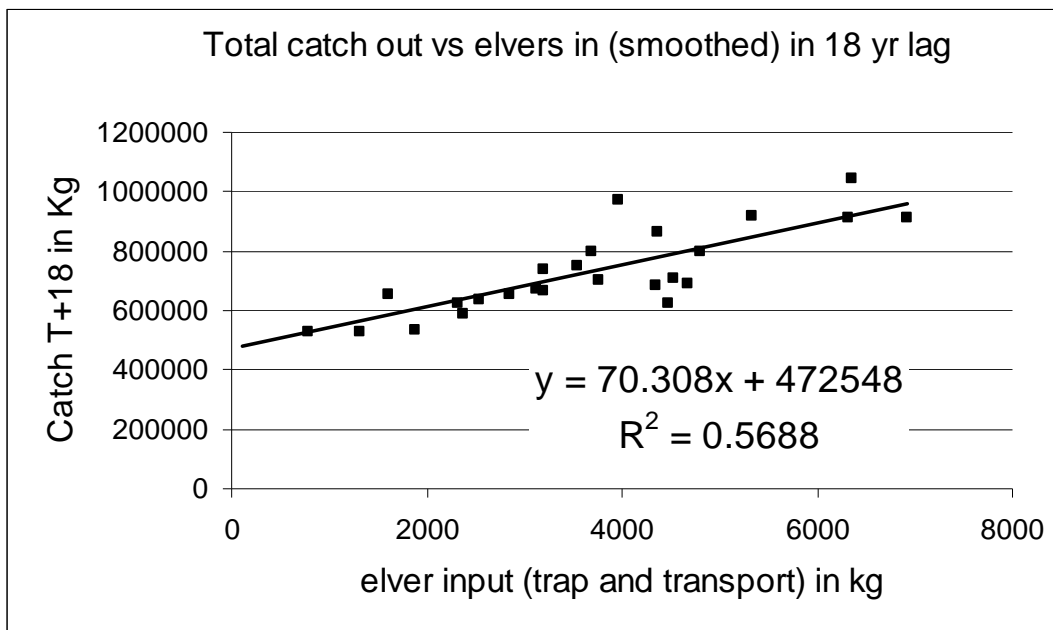
11.4.5 Time series analysis (Rosell *et al*, 2005; Allen *et al*, 2006) also produces a significant relationship from input to output at a lag of 18 years. Using this lag, a simple linear regression plot of the input (measured as trap-and transport of elvers, plus purchased glass eels) against output (total catch) from 1964 to 2004 produces a graph (Figure 8) which does not cross the Y axis at Zero, but at 473 Tonnes.

11.4.6 Logic dictates that it should cross the Y axis at zero, since zero input should result, eventually, in zero output. Therefore, the linear regression is a simplification of the relationship. However, the high Y axis intercept inferred by the asymptotic relationship, and represented by the linear regression in Figure 8, can be taken as an indication that either: (A) upstream trap and transport activity plus stocking of purchased glass eels does not account for all the input; or (B) that catch does not account for all the output. In fact, both (A) and (B) apply – there is some limited natural upstream migration of juveniles under suitable hydrological conditions and also downstream escape to sea of silver eels past the fishery. There is also likely to

be significant natural mortality of yellow eel at pre-fishery ages, which cannot be quantified at present.

**At what level does this approach estimate potential spawner output in the absence of human intervention and with optimal recruitment ?**

11.4.7 If it is assumed that the Y axis intercept of this regression is an indication of the possible “natural” eel output of Lough Neagh in the absence of enhanced production through management intervention. From this approach it can be estimated, that “natural” production from Lough Neagh could be of the order of 500t.

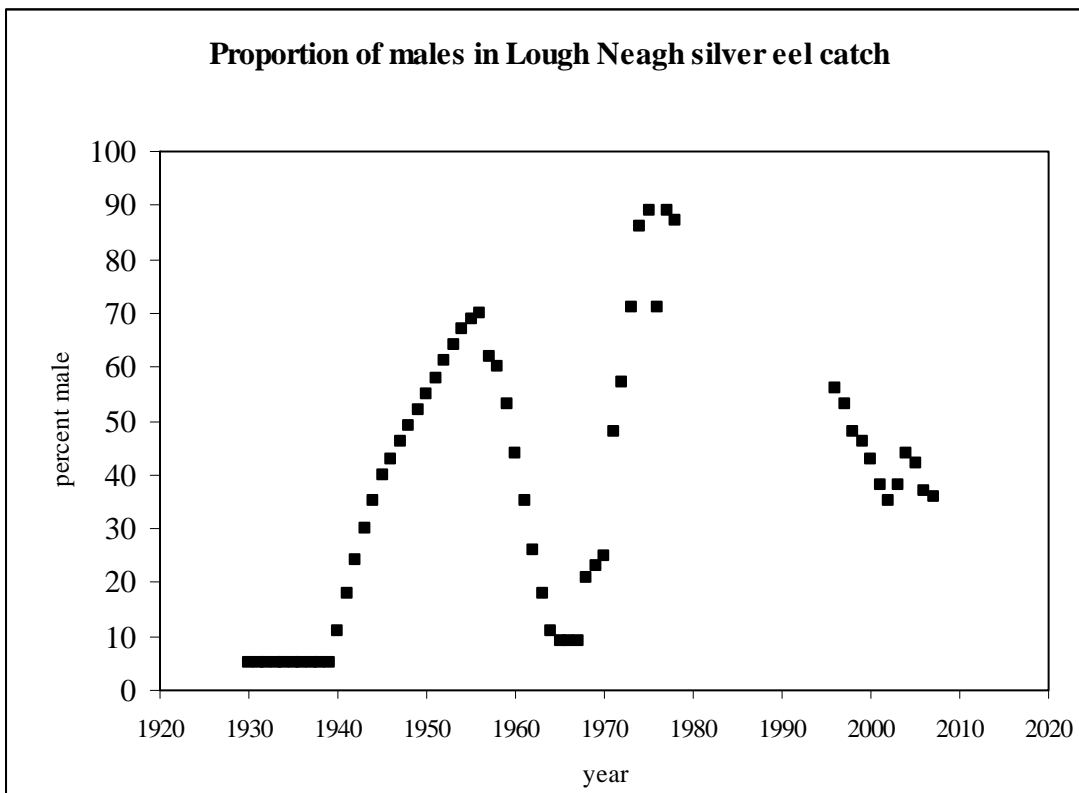


**Figure 8 - Graphical representation of the input-output relationship based on simple correlation with an 18 year lag. Elver input is TOTAL input based on trap and transport and purchased glass eel.**

**ii) Escapement estimation from examination of the history of sex ratio in the catch.**

11.4.8 Eel sex determination is density driven, high numbers of males being an indication of high stocking rates (Columbo and Rossi 1978, Hansen and Eversole 1984). Very high stocking levels result in large scale early emigration of small males potentially without much output biomass increase (based on comparison between weight increase of small eel relative to mortality levels). In the case of Lough Neagh the switch from female to male dominance occurs somewhere between the levels of trap-and transport stocking (natural and added) of 0.03 to 0.1 kg/ha (100 to 300 glass eel/ha) with the proportion of eels silvering as males increasing to over 90%

with increasing stock levels (Figure 9). There was a period from 1947 to 1959 inclusive (Figure 3) where no stocking took place but where natural recruitment across Europe including Lough Neagh was high. From the subsequent output years of 1963 to 1970, (applying the known mean growth term lag to output from current work) it is clear that even in periods of high recruitment to the coast, Lough Neagh is sufficiently far inland to be a naturally low density, female dominated eel growing area (Rosell *et al.*, 2005). The 1965 to 1970 catch outputs indicate that in this female dominated, naturally supplied situation a total output of around 600t was achievable from high natural recruitment. Whether fishery output equates to potential escapement is open to the same caveats applied to all estimates – due to natural mortality not all yellows will reach maturity, whilst on the other hand there was unrecorded and unmeasured escapement to consider in addition to the fishery catch.



**Figure 9 - Percentage of male silver eels recorded in the Lough Neagh silver eel commercial catch 1927-2007 (updated from Rosell *et al.*, 2005).**

**iii) Estimation of potential escapement from known productivity of eel growing areas.**

11.4.9 Lough Neagh as a managed, stocked fishery clearly produces more than it would in an unmanaged state, effectively using the good habitat and hypertrophic system as a large aquaculture basin. The out-flowing River Bann is free of any turbine, power

generation system or major water abstraction which might impede the escapement of silver eels to the sea. Moriarty (1997) gives productivity estimates for European waters ranging from less than 1 kg/ha in low productivity Northern areas to over 50 kg/ha in productive southern ones. In its managed, stocked and anthropogenically induced hyper-trophic state, Lough Neagh has recorded outputs of almost 20 kg/ha, but should not be expected to reach this in a “natural” situation with eels making their own way up the 40 km of river to the lake (i.e. unaided recruitment) and were the eutrophication to be addressed. Given the range of known European productivities listed in (Moriarty, 1997), 10 kg/ha is a reasonable estimate of potential “natural” productive capacity for a lake of this latitude. This would give an escapement potential of silver eels of circa 400 tonnes per annum from the 38,600 hectares available.

### **11.5 What is 40% of potential escapement and how does that correspond to present outputs?**

11.5.1 The above three means of estimating “undisturbed state” potential escapement from Lough Neagh, which are based on the “use of data collected in the most appropriate period”, i.e. option a in Article 2(5) (i and ii), or “reference to data from other river systems with similar hydrography i.e. option c, point to potential natural outputs in the range of 400 to perhaps 600 tonnes per annum given historical high natural glass eel supplies. This range would estimate the required 40% level at around 160 t to 240 t. Current annual average estimate over 2003 to 2008 is of escapement approaching of 360 t, above the required range, and given that current management practices will be formalised into an agreed management plan (see below), mean that the Neagh/Bann RBD complies with the Regulation target.

### **11.6 Management options to secure continued compliance with the 40% escapement target**

11.6.1 The unique management regime in Lough Neagh, driven by the need for sustainability alongside an element of commercial activity, makes the silver escapement from Lough Neagh potentially very vulnerable to regime change. Should silver eel fishing be drastically curtailed, the annual cash revenue which has in recent years been used to purchase glass eels, fund the trap and transport and data gathering activity, and to pay dividends to fishermen shareholders to maintain the workforce through the winter months, would collapse and with it the entire co-operative venture. Total silver eel fishery closure could lead to collapse of the co-operative and in all probability eventual reduced escapement of silver eels as trap and transport and stocking activities would cease. It is therefore of paramount importance, as long as adequate escapement continues to be demonstrated, to retain and support the existing management regime.

It should be understood that by reducing or closing the fishery, while the RBD is compliant, would mean that there were insufficient funds to support the trap-and-transport operation and the stocking programme, and as a consequence, natural

recruitment to the Lough would result in a reduced silver eel escapement relative to present outputs.

## **11.7 Current measures**

11.7.1 Refer to sections 5.1 and 5.2 previously.

11.7.2 The level of fishing effort would be reviewed if ongoing work (see post-evaluation below) were to indicate declines in silver eel escapement below the 40% target. In the immediate (5 year) view, modest declines in silver eel escapement can probably be adjusted for by adjusting the intensity of yellow eel and silver eel fishing to maintain the required escapement level. In this context, it is worth noting that yellow eel fishing effort is declining from a historical high of 200 boats in the 1980's & 1990's to 100 in 2008 due to an ageing fisher population, alternative employment opportunities and poor market prices available for eel.

11.7.3 Given the history of natural recruitment entering the River Basin District, future years' escapement may decline. It is hoped that collective European action under the Regulation will improve natural recruitment, and address this trend. However, given the current management regime and its continued support and application, it should ensure adequate recruitment is met naturally and "artificially" through the additional stocking of purchased elvers.

11.7.4 The purchase of 80 million elvers and their transfer to Lough Neagh since 1985 has helped secure the maintenance of an acceptable adult population which should ensure the future viability of the total fishery and silver eel escapement.

## **12.0 Funding**

12.0.1 The European Fisheries Fund (EFF) is the new fund for EU fisheries grants operating until December 2013, replacing the Financial Instrument for Fisheries Guidance (FIFG) grants. It is intended to promote a fisheries sector that is sustainable, profitable and supports strong local communities, and is managed effectively as an integral part of coherent policies for the marine environment.

12.0.2 Fisheries Ministers have agreed a split of the UK EFF budget which results in Northern Ireland getting €18.1 million of the total allocation.

12.0.3 The UK National Strategic Plan, which outlines the UK's high level objectives for the fisheries industry, has been finalised and formally submitted to the Commission.

- 12.0.4 The Department of Culture, Arts and Leisure, which has responsibility for inland fisheries in Northern Ireland, has prioritised EFF monies for measures to support the recovery of the European eel. It is proposed that £1.6 million (€2 million) of EFF monies will be invested in eels under "Protect and develop aquatic fauna/flora", one of the five priority areas identified by the EFF.
- 12.0.5 A key feature of the measures set out in this Eel Management Plan is the annual restocking of Lough Neagh with glass eels by the Lough Neagh Fishermen's Cooperative Society Ltd. It is intended that DCAL co-finance annual re-stocking as part of the implementation measures set out in this Plan.
- 12.0.6 DCAL has indicated in the UK National Strategic Plan that the public contribution available for such measures will be 60% of restocking costs. Half of this will be met by DCAL and half from the EFF. It is proposed to make €1m EFF available, this plus the contribution from DCAL and the Co-operative would mean that €3.3m (£2.64m) would be available for eel restocking over the life of the EFF programme. At present market prices, this sum will support the purchase of approximately 1.25 t, or ~3,750,000 glass eel annually to 2013. The combined recruitment to the Lough in 2002 to 2008 averaged approx. 4.2 million, ranging from 1.4 to 6.3 million glass eel. It should be noted that glass eel from trap and transport in comparison to the purchase of additional glass eel are relatively cheap, so the funds will allow the 'stocking' of more glass eel. However, this will not last if recruitment continues to crash, (as in 2008).
- 12.0.7 During the last 10 years the mean annual total catch on Lough Neagh has been 528t in comparison to an annual mean escapement estimate of 360t. Such figures help to demonstrate that any EFF funding would support increased escapement.

## **13.0 Post-evaluation**

### **13.1 Annual Escapement estimation by mark-recapture**

- 13.1.1 The presence of a single migration route out of Lough Neagh and an active fishery permits the current mark-recapture approach to estimating escapement. This will continue on an annual basis as described above under escapement estimation.
- 13.1.2 Should mark-recapture estimation in future indicate that escapement is falling below the target of 200 t per year, measured on a rolling average basis, this will necessarily trigger measures to reduce exploitation of yellow or silver eels. Due to the variability of silver eel fishing conditions year-on-year, this need not, however, be triggered on any one year's results but, it is proposed, on the basis of a three-year rolling average.
- 13.1.3 Survey-based assessments of potential escapement from the minor un-fished parts of the EMU, commenced under pilot monitoring of fish stocks under the Water Framework Directive will help to quantify any additional escapement currently unaccounted for in this Plan.

## **13.2 Regular scientific monitoring of all fisheries and all life stages**

13.2.1 This takes place for the glass eel run from February to April, ascending elvers from April to June, yellow eel fishery from May to September, and silver eel fishery from

to December, as part of an ongoing programme begun in 2003.

13.2.2 The following sampling regime has been instigated:

13.2.3 **Glass eel/elvers:** Twice a month from their arrival in February/March through to August a sample of 50 juveniles is removed for morphometric analysis, calculation of number per kilo and length frequency analysis.

13.2.4 **Yellow eel catch:** Weekly removal over 20 weeks of a sample of 20 eels chosen to reflect all size ranges caught, and analysed for age and length. They are also examined for weight, sex, *Anguillicola crassus* prevalence and intensity, stomach contents, and gastrointestinal endohelminths. Monthly analysis is undertaken of the catch composition of one entire un-graded daily landing of one fishing crew. Normally this consists of 400–600 eels captured by long line and then repeated for a draft net haul to enable comparison across methods. Every eel is measured for length and the total number of fish captured recorded. Every month 100 undersized (<40cms) eels are sampled at the fishery, their hook location recorded and in conjunction with catch composition analysis attempts are made to quantify possible losses to the fishery through hook mortality.

13.2.5 **Silver eel catch:** samples of 10 eels chosen to reflect all size ranges caught removed every week over a 12 week period and analysed for age and length. At weekly intervals the previous nights haul is measured for length. The number analysed can vary widely but on average covers at least 300 fish within a nights catch of >1 t. In addition the weekly silver eel samples are also analysed for weight, sex, *Anguillicola crassus* prevalence and intensity, stomach contents, and gastrointestinal endohelminths. Sex ratio of the silver eel population is also examined by counting the numbers of individuals contained in the graded (depending upon size) 15 kg boxes. The fishery records the number of boxes of small (male) and large (female), which it sells and from this the sex ratio and number of silver eels can be estimated.

13.2.6 These sampling rates are in line with those that have been suggested as a standard for all European eel fisheries under moves to incorporate eel into the EU fishery Data Collection Regulation. The resultant information allows early detection of significant changes in stock, catch, size and sex composition, to inform management decisions and enable maintenance of escapement levels.

### **13.3 Control and Enforcement**

13.3.1 Enforcement of the state control system and catch and trade monitoring systems shall be delivered by DCAL. State control is supported by the Co-operative. Fishery Conservation officers shall be deployed to enforce requirements set out in regulations. Specifically patrol vessels shall be operated on Lough Neagh and the Lower Bann to support LNFCS patrol staff, enforce state fishery controls and detect

and deter illegal fishing. Officers will be able to inspect catch handling and 1st marketing facilities. Activity shall be resourced and deployed as necessary to facilitate the post-evaluation sampling programme.

## References

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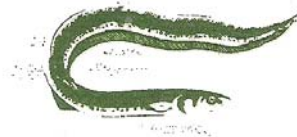
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## APPENDICES

**Appendix 1** - Submission by the Lough Neagh Fishermen's Co-operative Society Ltd in relation to their Regulations Governing Fishing for Yellow/Brown Eels on Lough Neagh

**LOUGH NEAGH FISHERMENS CO-OPERATIVE SOCIETY LTD.**



**TOOMBRIIDGE**  
**CO. ANTRIM BT41 3SB**  
NORTHERN IRELAND

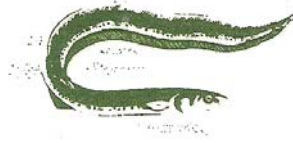
**Appendix 2** - Department of Culture, Arts and Leisure - Details of State Provisions Relating to Commercial Eel Fisheries in the Fisheries Conservancy Board Area



Department of  
**Culture, Arts  
and Leisure**

[www.dcalni.gov.uk](http://www.dcalni.gov.uk)

**LOUGH NEAGH FISHERMENS CO-OPERATIVE SOCIETY LTD.**



**TOOMEBRIDGE**  
**CO. ANTRIM BT41 3SB**  
NORTHERN IRELAND

Submission By the Lough Neagh Fishermen's Co-operative Society Ltd

**Submission to the Council of the European Union**

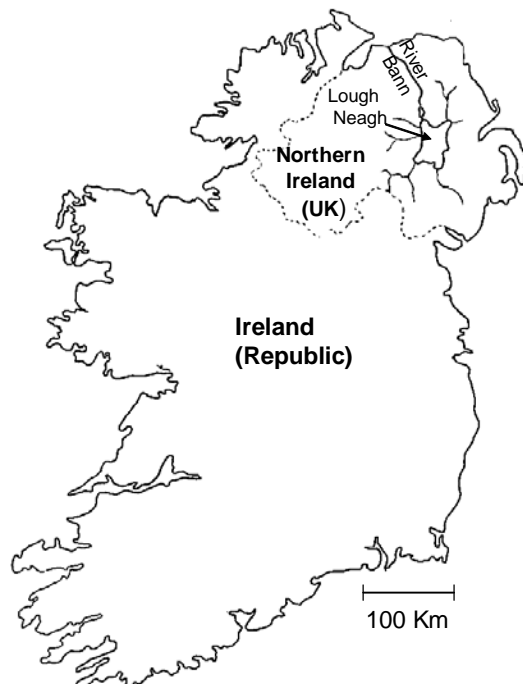
**By**

**Lough Neagh Fishermen's Co-operative Society Ltd.**

**&**

**Toome Eel Fishery (N.I.) Ltd.  
of a**

**Management Plan with reference to the Commercial Eel Fishery  
on Lough Neagh and River Bann**



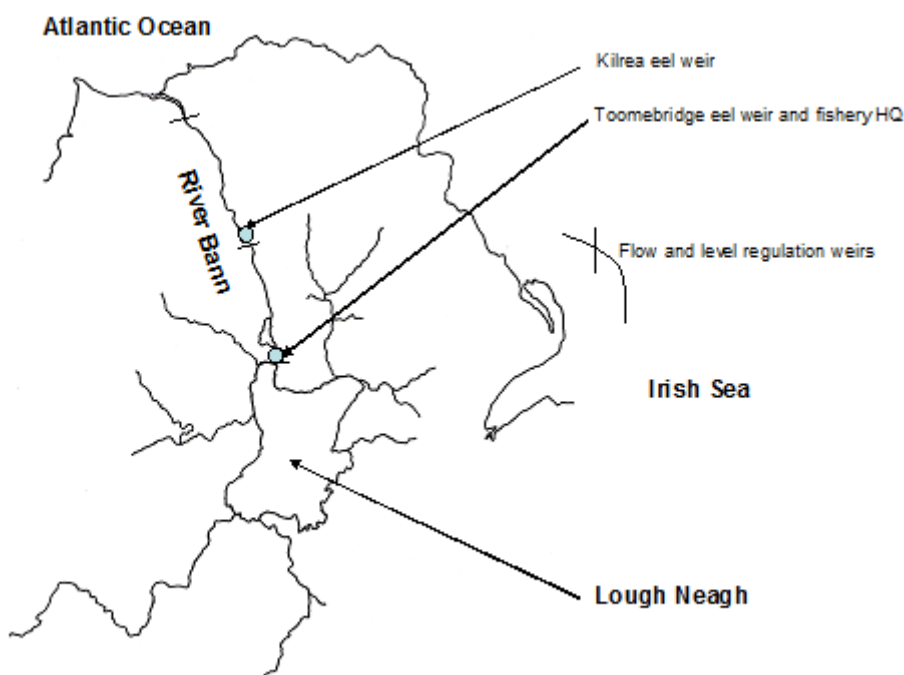
Map of Ireland Showing Location of Lough Neagh

## Introduction and General Comment

Lough Neagh, in Northern Ireland, is the largest inland lake in these islands. In area it is some 156 square miles – approximately 15 miles from North to South and some 10 miles from East to West.

Geographically it is almost in the centre of the Province and five of the six counties, which comprise Northern Ireland, touch its shores.

The River Bann is the only outlet from Lough Neagh to the sea on the North Coast of Ireland.



Lough Neagh, River Bann, Location of Fisheries and sluice gates

## Status

The Commercial Eel Fishery on Lough Neagh is now accepted as being *the* major commercial wild eel fishery in Europe a current annual production of 400 tonnes of eels.

## History

There is evidence of commercial eel fishing on the River Bann at Crosskeys, near Portglenone, dating back to 2000 BC. Families living around the shores of Lough Neagh have fished for eels in its waters for many generations. At times more than 200 families have earned a living fishing for eels.

Prior to the development of modern transport, most fishing was for local sale and consumption. With the advent of more sophisticated transport from the mid 19<sup>th</sup> century, fishing for eels became more commercially viable and attractive.

## **Title**

The title of the eel fishery on Lough Neagh was granted in 1640 by King Charles I to the Earl of Donegal, from whom it devolved to the Shaftesbury Estate from whom it is currently leased.

The title was leased by Shaftesbury Estate at different times to various commercial enterprises, which on the basis of that title claimed the exclusive right to the eel fishery on the Lough and the River Bann.

Local families, however, claim a moral right to fish the lake and challenged the title leased by the Shaftesbury Estate.

In 1959 the title was acquired by a group consisting of the principal eel-wholesaling merchants in the then Billingsgate Market and the major eel firms in Holland.

By more intensive and effective patrolling, that Company, known as Toome Eel Fishery (N.I.) Ltd., made life more difficult for local families fishing the Lough. The Company took proceedings in the Northern Ireland High Court against named local fishermen.

The outcome was that the Court awarded the exclusive title to the Eel Fishery on Lough Neagh and the River Bann to the Company.

As a result of that decision, local fishermen could only fish for eels if they had permission from the Company and under the conditions imposed by it, which were punitive in the extreme.

## **Formation of the Co-operative**

Understandably local fishermen objected to their being subjected to such restrictions and decided to re-structure their organisation with a view to they themselves acquiring control of the fishery.

In 1965, through the pursuit of that policy, they purchased a 20% share in the existing Company and established the Co-operative to administer that share-holding.

The purchase of those shares was financed by subscriptions from active fishermen and some well-intentioned members of the community, who regarded that development as a constructive step towards a long-term solution to the problems from which a disadvantaged community had suffered for generations.

That investment entitled the Co-operative to a share in the profitability of the Fishery.

In 1965 the Company decided to relieve fishermen of the condition which required them to sell all their catch to the Company.

The Co-operative therefore undertook to sell their catch of eels on behalf of fishermen. It retained some of the proceeds of the sale of their catch of yellow eels and used that fund and the proceeds of the sale of its share of the catch of Silver Eels to purchase, in 1971, the remaining 80% share-holding in Toome Eel Fishery (N.I.) Ltd.



## **Management**

Since it acquired total control of the eel fishery on Lough Neagh, the Co-operative has been responsible for its efficient management.

When it assumed control, the Co-operative declared that its objective would be to administer the fishery in a rational manner, with due regard to the interests of conserving stocks and promoting the welfare of the local fishing community.

In practice the Co-operative, since 1972, has confined fishing for Silver Eels to the period from mid-September to mid-December.

In effect it only fishes for Silver Eels for less than 4 months of a 10 month legal season – thus reducing effective Silver Eel fishing to less than 40% of the legal season.

The accompanying statistics of the Elver Recruitment and yellow and silver eel catches since the Co-operative undertook the management of the fishery and the sale of the total catch establish beyond question that it has reduced the catch substantially over a 25-year period.

It would therefore appear to have already made a substantial contribution to the regeneration of the European Eel Stock.

## **Operation of Silver Eel Weirs**

Traditionally fishing for silver eels in the Lough Neagh and River Bann System has been conducted at three sites specifically constructed for that purpose – each of which has been demonstrated to be effective.

- Toome - adjacent to the Company's Headquarters
- Kilrea - downstream near Kilrea
- Movanager - downstream below Kilrea

Statistics of the catch at each weir have been maintained and are available for inspection.

The Co-operative Society discontinued fishing at the weir at Movanager in 1995.

The result of this decision has been to increase the effective escapement from the system.

Effectively there is therefore no fishing for eels downstream of the weir at Kilrea.

Since the effectiveness of the weir at Kilrea is affected by flow conditions in the River, it is frequently not possible to fish it – which inevitably results in an increase in escapement from the system.

Traditionally another Agency permitted fishing in the tidal stretch of the River. Statistics of catches by that operator are not available, since its operation was outside the control of the Society. With a view to further enhancing the escapement opportunity the Co-operative has (in 2006) negotiated a 9-year lease of that fishery with the intention that it discontinue fishing at that location. This will result in a further escapement of mature silver eels to spawn.

## **Comments and Recommendations**

### **1) Escapement to Spawn**

It is accepted that the object of the restrictions which EU propose to impose on commercial eel fishing is to attempt to increase the number of mature eels allowed to escape to spawn.

The Co-operative has already made a major contribution to this intent over the past 30 years by

- restricting the number of persons allowed to fish for eels,
- restricting the length of the season for all grades of eels,
- restricting the daily catch per boat,
- restricting the type of bait and tackle permitted,
- the operation of a week-end close season,
- reducing the number of silver eel sites fished in the River from 4 to 2.
- discouraging the capture of small eels – the minimum size of marketable eel permitted by the Co-operative is 40 cm, the actual minimum by fishing law is 30cm. This represents an effective conservation measure.
- the purchase of over 80 million elvers to replenish stocks and compensate for the decline in natural recruitment.

The Co-operative will therefore submit that by the enforcement of these restrictions over a 30 year period it has already reduced the total Lough Neagh catch which together with its other measures regarding conservation and restocking mean the system is already achieving the escapement target at which the EU is aiming.

On this basis the Co-operative will contend that the Lough Neagh Fishery should be regarded as compliant with the Regulations now being introduced. Under the long term management strategy applied by the Co-Operative Society to the eel fishery on Lough Neagh and the scientific evidence detailed in its Management Plan, it is believed that the fishery is meeting the escapement target set.

### **2) Shortening of Season – Article 2**

The Co-operative Society is of the opinion that any proposal to shorten the season would be a retrograde step and would submit that:

- (a) it already operates a shorter fishing season than is allowed by law,
- (b) a reduction in the length of the season will result in a further reduction in potential earnings of fishermen.
- (c) it would no longer be in a financial position to deploy *its resources in the recruitment to and restocking of the Neagh/Bann System.*

### **3) Management Plan – Article 5 and Article 6**

It is intended that the terms of this current submission together with a detailed scientific analysis of the data will form the basis of an Eel Management Plan which is specific to the Lough Neagh/River Bann RBD.

The Society will submit that a separate Management Plan should be submitted in respect of each individual River Basin System.

All submissions presented through DCAL and DEFRA to EU authorities have been on the basis that the Lough Neagh systems is unique, in that there is no other eel fishery in Europe similarly structured and managed from elver recruitment to silver eel catch.

Reliable and accurate records are maintained of each aspect of the operation over a period in excess of 45 years and the Elver Recruitment and catch of eels in each year can be verified.

The Co-operative is convinced that these facts justify it being considered as a unique case.

These records *and the scientific data collated* will establish the claim made under the Management Plan that the escapement from the Lough Neagh system is in excess of the 40% target requirement.

This is established through:-

- a) the 'Queen's Gap' (fish pass) provision unique in these islands which requires that a 10% section of the breadth of the river be un-fished at all times,
- b) the fact that fishing for silver eels on the system is confined to 4 months of an 10 month legal season,
- c) that only 2 of the 4 silver eel fisheries are fished,
- d) that a weekend close season is observed throughout the active yellow eel season,
- e) that a tagging programme in respect of silver eels in recent years has established an escapement in excess of 40%.

#### **4) Financial Implications**

The accompanying map gives an indication that fishermen on the Lough are located in almost every town-land around the Lough Shore.

Families in these areas have derived a livelihood from fishing for eels for many generations.

The fact that the fishery is administered as a Co-operative ensures that the real profitability of it as a commercial fishery is by the local community, both through active fishermen and as Share-holding members of the Co-operative.

Any restrictions on the activities of the Co-operative would inevitably have a seriously detrimental effect on the economic welfare of the community.

In the 40 years during which it has managed the sale of their catch the Co-operative has paid fishermen in excess of £64 million pounds.

In recent years the reduction in their catch and in the value of their catch has understandably been reflected in their earnings.

Nevertheless during the last three years the Society has paid fishermen each year in the region of £2 million sterling for their catch.

When necessary expenses including bait and tackle have been deducted from their gross earnings and the earnings of the boat divided between Boat Owner and Boat Helper, these returns are at subsistence level. Any reduction in duration of season or allowable catch would have a totally unacceptable effect on the earnings of individual fishermen.

***The Co-operative believes that the management measures which it has had in place for more than four decades aimed at conservation and sustainability have been effective in achieving the escapement targets which have now been set by EU. Furthermore, the Co-operative firmly holds the view that in the unique scenario of the Neagh/Bann System the introduction of restrictions on its activities would so undermine its economic infra-structure as to prove counter-productive to current EU escapement targets.***

**Department of Culture, Arts and Leisure**



**Details of State Provisions Relating to Commercial Eel Fisheries in the Fisheries  
Conservancy Board Area**

**Contents:**

- i) Extracts from the Fisheries Act (Northern Ireland) 1966**
- ii) Eel Fishing Regulations (Northern Ireland) 1979**
- iii) Eel Fishing (Amendment) Regulations (Northern Ireland) 1982**
- iv) Eel Fishing (Licence Duties) Regulations (Northern Ireland) 2007**

## **i) Fisheries Act (Northern Ireland) 1966**

### **Permits to fish in Department's waters**

#### **15 Regulations with respect to eel fishing**

(1) The Ministry may make such regulations as appear to the Ministry expedient for the management (other than financial), conservation, protection and improvement of the eel fisheries of Northern Ireland, other than the eel fisheries of the Londonderry Area, and, without prejudice to the generality of the foregoing provisions may by such regulations do the following things:—

(a) regulate the establishment and use of eel weirs and the manner of erecting or hanging fishing engines therein;

(b) fix and alter the close seasons for eels;

(c) prescribe—

(i) the amounts of licence duties payable to the Fisheries Conservancy Board for Northern Ireland established under Part II in respect of licences for the use of fishing engines (other than rod and line) for the taking of eels;

(ii) the description and form of any fishing engine to be used for the taking of eels;

(iii) the minimum sizes of the meshes of nets, or the apertures in other fishing engines, used for taking eels;

(iv) the minimum sizes or weight of eels which may be taken;

(v) the times and places or the mode at or in which any fishing engine may be used for taking eels;

(d) subject to subsection (2), amend or revoke any byelaw relating in any manner to eels or eel fisheries.

(2) Nothing in this section shall affect the power of the said Board to make byelaws under section 26 with respect to the taking of eels with rod and line.

(3) If any person contravenes a regulation made under this section, he shall be guilty of an offence.

### **Protection of quality of fish**

#### **15A Regulations for protection of quality of fish**

(1) With a view to reducing the risk of deterioration of or damage to fish after capture and before they are brought onto retail premises or, if not so brought, are sold by retail, the Ministry, with the concurrence of the Ministry of Health and Social Services, may make regulations imposing a duty on persons engaged in the business of fishing or of handling, processing, storing, transporting or selling fish, and persons acting on their behalf, to comply with such requirements (including requirements relating to processing, hygiene or temperature; or as to the stowage or exposure of fish; or as to the construction, lay out and equipping of holds in fishing boats or of the parts of such boats, or of premises, used for processing fish; or as to the size, form and material of containers and the manner of packing) as may be prescribed by the regulations.

(2) Regulations made under this section may prescribe standards of quality for fish and may limit the purposes for which fish of any of the standards may be used.

(3) If any person contravenes a provision of regulations made under this section he shall be guilty of an offence, and if in the case of any fishing boat [F2 there is a contravention of any such provision,—

(a) the master of the boat, and

(b) the charterer, if any, of the boat, or, if there is no charterer, the owner, and

(c) where there is a charterer and the offence relates to the construction or lay out of any part of the boat, also the owner of the boat,] shall each be guilty of an offence.

(4) In this section “processing” in relation to fish includes preserving or preparing the fish, or producing any substance or article from it, by any method for human or animal consumption and “retail premises” means any separate and distinct premises, or part of any premises, used solely for the purposes of sale by retail or any vehicle so used.]

## **Records and returns**

### **17 Records and returns by holders of fishing licences and dealers' licences and persons engaged in the sea-fish industry**

(1) The Ministry may make regulations with respect to—

(a) the records to be kept and the returns to be made by—

(i) holders of fishing licences;

(ii) holders of dealers' licences;

(iii) persons engaged in business in connection with the wholesale distribution or the processing of sea-fish;

**F2**(iv) sea-fishermen;

(v) fish-salesmen;]

(b) the persons to whom, the times at which, and the forms in which the returns are to be made;

(c) the heads under which particulars are to be included in such records or returns; and

(d) such other matters with respect to the records or returns (including the inspection, verification and copying of records by an officer of the Ministry) as may seem expedient.

(2) Every person required by regulations made under this section to keep any record or to make any return, who—

**F3**(a) acts in contravention of any provision of the regulations; or]

(b) makes in a record or return any statement which to his knowledge is false or misleading in any material respect, shall be guilty of an offence.

**F1**[(3) In subsection (1)( a) in sub-paragraph (i) “fishing licence” does not include a licence to fish with rod and line and in sub-paragraph (iii) “processing” has the same meaning as in section 15A(4).]

**F2**[(4) In this section—

(a) “sea-fishermen” includes the master, charterer or owner of a sea-fishing boat;

(b) “fish-salesmen” includes an auctioneer or dealer in fish at the point of landing (as defined by regulations) of the fish.]

## **The Fisheries Conservancy Board For Northern Ireland Constitution And Functions**

### **26 Power of Board to make byelaws**

(1) Subject to subsection (2), the Board may, with the approval of the Ministry, make such byelaws as appear to the Board to be expedient for the [**F1** purposes of the Board's functions in relation to] any fisheries to which section 25 applies, and, without prejudice to the generality of the foregoing provisions, may make byelaws with respect to the following matters:—

(a) the regulation of fishing and preservation of good order amongst persons fishing;

(b) the times and seasons for the taking of fish or for any mode of taking fish and the conditions subject to which fish may be taken;

- (c) prohibiting any mode of taking or destroying fish;
- (d) the times and places at, or the mode in, which any fishing engine may be used;
- (e) the description and form of nets or other fishing engines to be used, and the size of the meshes of those nets or the apertures in those other engines;
- (f) the size (whether determined by measurement or by weight) of fish which may be taken;
- (g) the making of applications for, and the issue, alteration, renewal and revocation of fishing licences, whether generally or in specified cases;
- (h) the form of and the conditions attaching to fishing licences;
- (i) the duties payable in respect of fishing licences;
- (j) the protection of waters from any predatory animals;
- (k) the prohibition of any practice whatsoever tending to impede the lawful capture of fish or to be in any manner detrimental to the fisheries;
- [F1(kk) the attachment of such identification marks as may be specified in the byelaws to any salmon captured;]
- [F2(kkk) anything relating in any matter to the management and protection of the fisheries;]
- (l) anything which under this Act may be prescribed by byelaws or in respect of which byelaws are by this Act authorised to be made.F3
- (2) [F1Except in relation to registers to be kept under section 120,] byelaws shall not be made under subsection (1) with respect to any matter in relation to which the Ministry is by this Act empowered to make regulations.
- [F2(3) The power to make byelaws under this section in relation to the regulation of fishing for salmon may be exercised for—

  - (a) the conservation or enhancement of the natural beauty or amenity of marine or coastal areas (including the geological or physiological features) or of any features of archaeological or historic interest on those areas; or
  - (b) the conservation of flora or fauna which are dependant on, or associated with, a marine or coastal environment.]

- (4) All byelaws made by the Board shall be laid before Parliament by the Ministry, and shall be subject to negative resolution.
- (5) If any person contravenes a byelaw, he shall be guilty of an offence.

## **Fishing Licences**

### **41 Prohibition of unlicensed fishing**

- (1) Unless expressly empowered to do so under any provision made by or under this Act or any other enactment for the time being in force, a person shall not fish for, take or kill salmon, eels or any freshwater fish except under the authority of a licence issued pursuant to byelaws made under this Act and in accordance with the terms and conditions of that licence and of the byelaws relating to it.
- (2) Unless expressly empowered as mentioned in subsection (1), a person shall not have in his possession in or near any fishing place any fishing engine for the taking or killing of salmon, eels or freshwater fish which is erected or in fishing order, unless there is in force a fishing licence by or by virtue of which he is authorised to use that fishing engine at that place.
- (3) Subject to section 43, any person who acts, or causes or permits any other person to act, in contravention of subsection (1) or (2) shall be guilty of an offence and shall be liable on summary conviction to a fine not exceeding—
  - (a) where such contravention consists only of the unlicensed but otherwise lawful use or possession of a rod and line or hand line, [F2 £200]; and
  - (b) in any other case, [F2 £500].

- [F1(4)** Nothing in this section shall apply to a person—
- (a) who fishes lawfully by rod and line in a production pond at a fish farm operated by the holder of a fish culture licence granted under section 11; or
  - (b) who has for that purpose in his possession a rod and line at or near a fish farm.
- (5) In subsection (4)(a) "production pond" means a pond—
- (a) used for the artificial propagation and culture of fish, and
  - (b) designated for the purposes of this subsection as a production pond in a fish culture licence granted under section 11.]

### **Protection of young and breeding fish**

#### **48 Taking, etc., spawn or fry of salmon, trout or eels**

- (1) **[F1**Subject to subsections (1A) and (2)] if any person—
- (a) wilfully takes, sells, purchases, or has in his possession the spawn, ...**F3** or fry of salmon, trout or eels; or
  - (b) wilfully obstructs the passage of the ...**F3** fry of salmon, trout or eels; or
  - (c) injures or disturbs the spawn or fry of salmon, trout or eels; or
  - (d) injures or disturbs any spawning bed, bank or shallow where the spawn or fry of salmon, trout or eels may be,
- he shall be guilty of an offence.

**[F1(1A)** It shall not be an offence under subsection (1)(a) for the owner of an eel several fishery to take or have in his possession the fry of eels where he has removed those fry from that several fishery solely for the purpose of returning them to an upstream part of the same several fishery.

(1B) Subsection (1A) applies to a person acting under the direction of the owner of an eel several fishery in the same manner as it applies to such an owner.]

(2) Where a person is charged with the offence of taking or having in his possession any ...**F3** fry in contravention of subsection (1)( a), it shall be a good defence for him to prove that he removed the ...**F3** fry from a system of waters solely for the purpose of preserving them from some immediate danger (whether actual or reasonably apprehended) and that he returned, or intended to return, them to an adjacent safer part of the same system of waters, without any avoidable injury, as soon as reasonably practicable.

**[F1(3)** In this section—

- (a) "fry" (except in subsection (1)(d))—
  - (i) in relation to salmon, includes parr and smolts,
  - (ii) in relation to trout, includes trout of a length less than fifteen centimetres measured from the tip of the snout to the fork or cleft of the tail, and
  - (iii) in relation to eels, includes elvers; and
- (b) "trout" includes rainbow trout.]

**[F2(4)** It shall be a defence for a person charged with an offence under subsection (1)(a) in relation to the spawn of any salmon to prove—

- (a) that the spawn had been produced at a fish farm; or
- (b) that he believed on reasonable grounds that it had been so produced.

(5) If any person removes any material from the bed of any river—

- (a) without the consent of the Board under subsection (6); or
  - (b) otherwise than in accordance with the conditions of a consent granted by the Board under subsection (6),
- he shall be guilty of an offence.

(6) The Board may, on the application of any person, grant its consent to the removal of material from the bed of a river on such conditions as it thinks fit.

(7) Where the Board—

(a) on an application for a consent under subsection (6), has refused a consent; or  
(b) in giving a consent under subsection (6), has given that consent subject to conditions, the person who applied for the consent may appeal to the Appeals Commission against the decision within 28 days from the day on which notice of the decision was given to that person.

(8) A consent under subsection (6) does not confer on any person a right to remove material from the bed of a river which (apart from this section) he would not otherwise have.

(9) Nothing done under and in accordance with the conditions of a consent under subsection (6) constitutes an offence under subsection (1) or section 49.]

## **Obstructions to Fish Passage**

### **54 Construction of fish passes in dams in rivers**

(1) Where a dam is constructed in a [F2 river], a fish pass sufficient to permit the free passage through the dam of salmon, trout and eels at all times shall be provided and maintained by the owner of the dam.

(2) Subsection (1) shall not apply so as to require the provision of a fish pass in conjunction with a dam erected before 10th August 1842 unless—

**F3**[(a) the dam is rebuilt, reinstated or heightened after the commencement of the Fisheries (Amendment) Act (Northern Ireland) 1968 **M1**, or

[**F1**(aa) the dam is repaired after the date of the coming into operation of Article 13 of the Fisheries (Amendment) (Northern Ireland) Order 1991 in such a way as to change the nature of any surface of the dam or the structure of the crest of the dam, or

(ab) the mill to which the dam belongs is, after that date, brought back into use or its use is changed, or the purpose for which the water retained by the dam is used is changed after that date, or]

(b)] the Ministry, on the application of any person interested in a fishery in the river or of the Board, and on being satisfied that there will be no impairment in any navigation or in the effective working power of any mill to which the dam belongs, by order directs that a fish pass be provided as required by this section

[**F3** nor shall it apply so as to require the provision of a fish pass in conjunction with a particular dam in a river if the Ministry is satisfied that, having regard to the nature of the dam or of the river or of the kinds of fish frequenting or likely to frequent the river, it is unnecessary or unreasonable to insist upon compliance with the requirements of that subsection and by notice in writing grants exemption from those requirements with respect to that dam].

[**F1**(2A) Where the Department refuses to grant an exemption for the purposes of subsection (2)—

(a) the Department shall give to the applicant for such exemption a written notification of the reasons for its refusal, and

(b) the applicant may, within 28 days from the day on which such notification is given, appeal to the Appeals Commission.]

(3) Every fish pass provided under this section shall be constructed in accordance with plans, sections and specifications approved by the Ministry.

(4) The cost of providing a fish pass shall be borne—

(a) in the case of a dam with respect to which an order is made under subsection (2), by the person on whose application the order is made; and

(b) in any other case, by the owner of the dam.

(5) Where in contravention of subsection (1) the owner of a dam does not provide a fish pass in conjunction with that dam, the Ministry may by notice in writing require him to do

so, and if he fails to comply with the notice within any reasonable period specified therein the Ministry may cause a fish pass to be constructed . . . **F1**.

[**F1**(5A) Article 55 of the Roads (Northern Ireland) Order 1980 (power to enter land) shall apply in relation to subsection (5) subject to the following modifications—

(a) for the purposes set out in sub-paragraphs (a) to (e) of paragraph (1) of that Article there shall be substituted a reference to the purpose of constructing a fish pass under subsection (5);

(b) any reference to the Department shall be construed as a reference to the Department within the meaning of this Act; and

(c) paragraph (7) shall be omitted.

(5B) Where—

(a) in the exercise of the powers conferred under subsection (5) or (5A), any damage is caused to land or chattels, any person interested in the land or chattels may recover compensation in respect of the damage from the Department; or

(b) in consequence of the exercise of any such powers, any person is disturbed in his enjoyment of land or chattels, he may recover compensation in respect of that disturbance from the Department.

(5C) Subject to subsection (5D), the Department may recover from the person liable under subsection (4)—

(a) any expenses reasonably incurred by the Department in respect of works executed under that subsection; and

(b) any amount awarded against, or reasonably paid by, the Department as compensation under subsection (5B).

(5D) The Department may not recover under paragraph (b) of subsection (5C) any amount (or any part of any amount) awarded or paid in respect of a breach of any duty of care on the part of the Department.

(5E) Any question—

(a) as to whether a person is entitled to recover compensation from the Department under subsection (5B), and as to the amount of such compensation; and

(b) as to whether the Department is entitled to recover any amount (or any part of any amount) under subsection (5C),

shall be heard and determined by the Lands Tribunal.]

(6) If any owner of a dam fails to provide such a fish pass as he is required by this section to provide, or, where such a fish pass has been provided (whether by him or not), fails to maintain it in an efficient state, he shall be guilty of an offence.

## **Eels**

### **107 Annual close season for eels**

In this Act the expression “the annual close season for eels” means in relation to any locality and for the purposes of the taking of eels by means of a fishing engine of any description, other than rod and line, the period during which it is declared by a regulation under section 15 for the time being in force and applicable to that locality to be unlawful to fish for or take eels by means of a fishing engine of that description, or if no period is so prescribed,—

(a) in relation to the taking of eels by means of [**F1** fishing engines which are erected or hung in fishing weirs or are] fixed engines (other than long lines), the period from 9th January in any year to 31st May in that year; and

(b) in relation to the taking of eels by any means other than a fishing engine to which paragraph ( a ) applies (except by rod and line), the period from 9th January in any year to 30th April in that year.

### **108 Prohibition of taking etc. eels, otherwise than by rod and line, during the annual close season**

(1) Subject to subsection (2), and without prejudice to section 109, if any person—  
(a) during the annual close season for eels taken otherwise than by means of a fishing engine to which section 107( a ) applies, fishes for, takes or wilfully kills eels by any method whatsoever; or

(b) during the annual close season for eels taken by means of such a fishing engine, fishes for, takes or kills eels by means of such a fishing engine; or

(c) has in his possession during such period as may be prescribed by regulations, or, if no period is so prescribed, during the period from 31st March in any year to the then next-following 30th April, any eel other than an eel that he proves was captured elsewhere than in any part of Northern Ireland outside the Londonderry Area;

he shall be guilty of an offence and shall be liable on summary conviction [F2 to a fine not exceeding £500 or to imprisonment for a term not exceeding six months or to both such fine and such imprisonment.]

(2) [F1 Paragraph ( a )] of subsection (1) shall not apply to the fishing for or taking of eels by rod and line, or the killing of eels so taken, and paragraph ( c ) of that subsection shall not apply to a person who, having any eel in his possession during the period referred to therein, proves that the eel was caught by rod and line at a particular place by [F1 a person who was the holder of a fishing licence authorising him to angle for eels or who was exempted by byelaws made under section 37( f ) from the requirement to hold such a licence] otherwise than during any period for the time being fixed by byelaws as a close season for angling for eels.

(3) The Ministry may by order made subject to affirmative resolution provide that this section shall have effect as if the words in subsection (1)( c ) from “other” onwards were omitted.

### **109 Placing fishing engines for taking eels in eyes, etc., of fishing weirs during the annual close season for eels or during the daytime**

(1) If any person places or hangs any fishing engine for taking eels in an eye or gap of any fishing weir during—

(a) the annual close season for eels taken by means of a fishing engine to which section 107( a ) applies; or

(b) the daytime, within any period that is not the annual close season for eels taken by a fishing engine to which section 107( a ) applies,

he shall be guilty of an offence and shall be liable on summary conviction [F1 to a fine not exceeding £500 or to imprisonment for a term not exceeding six months or to both such fine and such imprisonment.]

(2) Where a person is charged with an offence under this section and it is proved that at a particular time a fishing engine for taking eels was placed or was hanging in an eye or gap of a fishing weir, and that that person was at that time the occupier of the fishing weir, then it shall, until the contrary is proved, be presumed that the fishing engine was so placed or hung by him.

### **Restrictions On Dealings In Salmon, Trout And Eels**

### **111 Prohibition of purchase, sale, etc., of salmon, trout, pollen and brown eels at certain times**

- (1) If any person buys, sells, offers or exposes for sale or has in his possession for sale—
- (a) any salmon or trout at any time during the period from 15th September in any year to 31st January in the next-following year; or
  - (b) any pollen at any time during the period from 7th November in any year to 31st January in the then next-following year; or
  - (c) any brown eels at any time during the period from 16th January in any year to the date in that year of the commencement of the period mentioned in section 108(1)( c);
- he shall be guilty of an offence under this Part.
- (2) Subsection (1) shall not apply to any person buying, selling, offering or exposing for sale or having in his possession for sale any fish of a kind mentioned in paragraph ( a ) or, as the case may be, ( b ) or ( c ) of that subsection which he proves was
- [F2(a) reared in a fish farm; or  
(b) supplied by the Department.]
- (3) For the purposes of this section a person shall be deemed to have a salmon or trout or, as the case may be, a pollen or a brown eel in his possession for sale if it is found at any place, or on or in any vehicle, specified in a dealer's licence issued to him under the succeeding provisions of this Part, unless he satisfies the court that it was not his intention to sell it.
- (4) The Board may by byelaws substitute for the period mentioned in paragraph ( a ) or ( b ) of subsection (1), and the Ministry may by regulations substitute for the period mentioned in paragraph ( c ) of that subsection such other period as may be specified in the byelaws or, as the case may be, the regulations.
- (5) Notwithstanding anything in section 19(2) or 26(4), any byelaws or regulations made under subsection (4), shall be subject to affirmative resolution.]

### **112 Restriction on purchase of salmon, trout and eels**

- (1) Subject to subsection (2), a person who is not the holder, or the agent duly authorised in writing in that behalf of the holder, of a dealer's licence issued under the succeeding provisions of this Part and for the time being in force, and who buys salmon, trout or eels, [F2 or being the holder of such a licence, or the agent of such a holder, buys salmon, trout or eels elsewhere than at the place or vehicle in respect of which the licence is in force], shall be guilty of an offence under this Part.
- (2) Subsection (1) shall not apply in relation to—
- (a) the *bona fide* purchase by or on behalf of a person of salmon, trout or eels for use by the person in his own home; or
  - (b) the *bona fide* purchase of salmon, trout or eels by or on behalf of any person for use for catering purposes in premises in which he carries on the business of a hotel, restaurant or guest house or of providing board and lodging or meals for reward, if the purchase is made from—
    - (i) the holder of a dealer's licence for the time being in force; or
    - (ii) a fisherman who is lawfully engaged in taking and killing salmon, trout or eels, and who is the holder of a fishing licence which is for the time being in force and is available for use for the taking and killing of salmon or, as the case may be, trout or eels;and, in the case of a purchase from a fisherman, the purchaser—
    - (aa) obtains from the fisherman a statement in writing containing his name and address and the number of his fishing licence and stating that the salmon or, as the case may be, the trout or eels are of his own lawful capture, and

(bb) retains the statement [F1 and keeps it at the premises in which he carries on the business] and produces it to an authorised officer when requested by the authorised officer to do so.

(3) A person who is buying salmon, trout or eels and purports to be acting as an agent of the holder of a dealer's licence shall produce on demand by an authorised officer his authorisation to act as such agent and if he refuses or fails to produce his authorisation or, on the production thereof, refuses or fails to permit the authorised officer to read the authorisation there and then, he shall be guilty of an offence.

(4) A person who when the production of the authorisation referred to in subsection (3) is lawfully demanded of him under this section does not produce the authorisation because he is not the holder of an authorisation shall be deemed to refuse or fail to produce his authorisation within the meaning of this section.

(5) Where, pursuant to subsection (2), a person (in this subsection referred to as the vendor) selling salmon, trout or eels to another person gives to that person a statement in writing which, or any part of which, is, to the knowledge of the vendor, false or misleading, the vendor shall be guilty of an offence under this Part.

(6) In this section authorised officer means

(a) an officer of the Ministry authorised by the Ministry to exercise the powers conferred by this section; or

(b) a member of the Royal Ulster Constabulary; or

[F1(c) an inspector or fishery conservation officer appointed by the Board.]

### **Licences for the sale of salmon, trout and eels**

#### **113 Prohibition of sale, etc., of salmon, trout and eels without licence**

(1) Subject to subsection (3), no person shall sell, or offer or expose for sale, or have in his possession for sale at any place or from or in any vehicle, salmon, trout or eels unless he is the holder of a licence for the time being in force (in this Part referred to as a "dealer's licence" ) authorising him to sell salmon, trout or eels at that place, or, as the case may be, from that vehicle.

(2) Any person who, not being the holder of a dealer's licence, sells, offers or exposes for sale, or has in his possession for sale salmon, trout or eels, or being the holder of such a licence sells, offers or exposes for sale, or has in his possession for sale salmon, trout or eels at a place or, as the case may be, from or in a vehicle, other than that specified in the licence, shall be guilty of an offence under this Part.

(3) This section shall not apply to—

(a) the Board; or

(b) a fisherman selling only fish of his own lawful capture; or

(c) the holder of a fish culture licence under section 11, in relation to fish reared in the fish farm with respect to which the licence is in force; or

(d) a person who has possession of fish for use for catering purposes in premises in which he carries on the business of a hotel, restaurant or guest house or of providing board and lodging or meals for reward, or who sells fish or offers or exposes fish for sale as or as part of a meal in the ordinary course of such a business[F1; or

(e) a person selling a fish in pursuance of section 181(2) or of a direction given by the Ministry under section 198(1)].

**ii) Eel Fishing Regulations (Northern Ireland) 1979**

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STATUTORY RULES OF NORTHERN IRELAND

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1979 No. 19

FISHERIES

Eel Fishing Regulations (Northern Ireland) 1979

Made . . . . . 23rd January 1979

Coming into operation . . . . . 1st April 1979

The Department(a) of Agriculture in exercise of the powers conferred on it by section 15 of the Fisheries Act (Northern Ireland) 1966(b) and of all other powers enabling it in that behalf, hereby makes the following regulations:

*Citation and commencement*

1. These regulations may be cited as the Eel Fishing Regulations (Northern Ireland) 1979 and shall come into operation on 1st April 1979.

*Interpretation*

2. In these regulations—

“Lough Neagh” does not include tributaries and branches thereof. *See 1952/1*

“Erne Catchment Area” includes Lough Macnean but does not include any other lake, tributary or branch connected with Upper or Lower Lough Erne or the River Erne.

“defined mouth” means the mouth of a river as defined by an Order of the Department of Agriculture under section 16 of the Fisheries Act (Northern Ireland) 1966.

“licensed eel fisherman” means a person holding a valid licence from the Fisheries Conservancy Board for Northern Ireland which permits him to catch eels in nets or eel weirs or on long lines.

“dealer’s licence” means a valid licence from the Fisheries Conservancy Board for Northern Ireland which authorises a person to sell, or offer or expose for sale, eels or have eels in his possession for sale at any place or from or in any vehicle.

“undersized eels” means eels of a length less than 40 centimetres measured from the tip of the snout to the tip of the tail and shall apply to all waters in the Fisheries Conservancy Board area except Lough Neagh and its tributaries where it means eels of a length less than 30 centimetres measured from the tip of the snout to the tip of the tail.

“silver eels” means physiologically maturing eels in spawning livery migrating or waiting to migrate to the sea.

*Annual close seasons*

3.—(1) The annual close season for the taking of eels by means of fishing engines which are erected or hung in fishing weirs or are fixed engines (other than fyke nets or long lines) shall be the period from the last day in February in any year to 31st May in that year.

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(a) Formerly Ministry: see 1973 c. 36 s. 40 and Sch. 5 para. 8(1)  
(b) 1966 c. 17 (N.I.)

(2) The annual close season for the taking of eels by means of fyke nets shall be the period from 8th January in any year to 30th April in that year.

*Fyke net*

4.—(1) A fyke net used for the purpose of taking eels shall have—

- See 1981/198* (a) a leader not exceeding 7.3 metres in length;
- (b) a trap at each end on which no hoop shall exceed 50 centimetres in diameter;
- (c) no mesh of less size than 12 millimetres from knot to knot to be measured along the side of the square, or 24 millimetres to be measured on the stretched diagonal mesh, such measurements to be taken when the net is wet; and
- (d) no other net or netting attached other than to join fyke nets end to end.

(2) Each fyke net or series of fyke nets used for the taking of eels shall be marked at each end by a float which protrudes at least 10 centimetres from the surface of the water when the gear is fishing.

*Fixed wing net*

5. A fixed wing net for the taking of eels shall be used only in the waters described in Regulation 6.

6.—(1) A fixed wing net for the taking of eels in the River Erne in the County of Fermanagh between Rosscor Viaduct and a point 800 metres downstream of Rosscor Viaduct or in the River Quoile in the County of Down between the floodgates at the Old Quoile Bridge and the tidal barrier at Hare Island shall have a leader and wing or wings each not exceeding 23 metres in length.

(2) A fixed wing net for the taking of eels in that part of Lower Lough Erne in the County of Fermanagh which lies between Rosscor Viaduct and an imaginary line running directly from North to South and passing through the western tip of Ferny Island in the Parish of Belleek and Barony of Lurg shall have a leader and wing or wings each not exceeding 230 metres in length.

7.—(1) Any fixed wing net in fishing order shall be emptied of its catch at least once during each 48 hours.

(2) Nothing in paragraph (1) shall be construed as rendering liable to any penalty a person who satisfies the court that he was prevented by floods, storm or stress of weather from complying with that paragraph.

*Long line*

8.—(1) A person shall not use any long line for the taking of eels except in the waters of Lough Neagh upstream of the sluice gates at Toomebridge and in the waters of the Erne Catchment Area upstream of the road bridge at Belleek.

(2) A person shall not use on any long line for the purpose of taking eels a hook the shank of which is less than 23 millimetres in length and the gape of which, that is to say the distance between the point and the shank, is less than 7.75 millimetres.



*Undersized eels*

9.—(1) A person shall not wilfully take, kill or destroy any undersized eels.

(2) (a) A person shall not land or have in his custody or possession on land any undersized eels except a licensed eel fisherman or his agent thereto previously authorised in writing by him for the purpose of grading undersized eels immediately they are landed.

(b) Subject to the provisions of sub-paragraph (a) all undersized eels shall be returned immediately to the water from which they were taken.

(3) A person shall not have undersized eels in a keep box or other container for the holding of eels in a lake or river.

(4) (a) Except as permitted by paragraph (2) a person shall not buy, sell, offer or expose for sale or have in his possession any undersized eels.

(b) This paragraph shall not apply to—

(i) Any person buying, selling, offering or exposing for sale, or having in his possession any eels in a separate container who proves that at the time when the eels were delivered to him the person so delivering the eels also delivered to him a certificate in writing signed by the licensed eel fisherman who landed all the eels in that container to the effect that such eels were not undersized.

(ii) Any person (other than a licensed eel fisherman or the holder of a dealer's licence) buying eels if the same were supplied by a person who was or whom he believes on reasonable grounds to be the holder of a dealer's licence.

(5) The provisions of this regulation shall not apply to silver eels.

*Marking of keep boxes*

10. Each keep box or other container used for the holding of eels in a lake or river shall be clearly marked in letters or figures not less than 12 millimetres in height with the name and address of, or the licence number of the long line or net or of any series of nets used by, the owner of the box or container.

*Taking of fish other than eels*

11. A person shall not use a fishing engine which is licensed for the taking of eels to fish for, take or kill fish other than eels. Any fish other than eels taken by a fishing engine licensed only for the taking of eels shall be returned to the waters from which they were taken as soon as practicable and without any avoidable injury.

*Limitations on fishing*

12.—(1) A person shall not use any nets for the purpose of taking eels—

(a) in the area of Upper and Lower Lough Erne lying between

(i) an imaginary line drawn from the most easterly point in the townland of Tullydevenish, thence by the western shore of Devenish Island to the most northerly point of Devenish Island and thence to the nearest point on the northern shore of Lough Erne, and

(ii) an imaginary line drawn across Innishmore Viaduct thence by the southern shore of the townland of Lusty Beg to the most easterly point of the Island of Killygowan and thence to the nearest point on the shore in the townland of Corrad;

V. P. P. L. C. A. N. C.

except in Tamlaght Bay, north and east of an imaginary line drawn through the navigational markers at the entrance to Tamlaght Bay to the nearest point in the townland of Kilmalanophy on the west shore and the nearest point in the townland of Drumcullion on the east shore;

- (b) within 1.61 kilometres of the defined mouth of any river flowing into Upper or Lower Lough Erne;
- (c) in that portion of Lower Lough Erne westwards and northwards of an imaginary line drawn from Hills Island to Eagle Island and thence to the most westerly point of Boa Island.

(2) Sub-paragraph (c) of paragraph (1) shall not apply to fixed wing nets used between Rosscor Viaduct and an imaginary line running directly from north to south and passing through the western tip of Ferny Island.

#### *Use of boats*

13. Boats used for fishing for eels by means of netting or long lining on Upper and Lower Lough Erne shall not exceed 5.5 metres in length overall and 1.7 metres beam.

#### *Revocations*

14. The regulations listed in the Schedule are hereby revoked.

Scaled with the Official Seal of the Department of Agriculture for Northern Ireland on 23rd January 1979.

(L.S.)

*E. G. Sherrard*  
Assistant Secretary

## EXPLANATORY NOTE

*(This note is not part of the regulations but is intended to indicate their general purport.)*

These regulations consolidate and revise all eel regulations with the exception of regulations relating to licence duties. They also revoke regulations which are spent. The main changes are:

- (a) the minimum size for eels which may be retained on Lough Neagh is 30 centimetres;
- (b) any fixed wing net in fishing order shall be emptied of its catch at least once during each 48 hours.
- (c) Eel long lines shall be used only in the waters of Lough Neagh and the Erne Catchment Area.

**iii) Eel Fishing (Amendment) Regulations (Northern Ireland) 1982**

*M. Allister*

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STATUTORY RULES OF NORTHERN IRELAND

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1982 No. 198

FISHERIES

**Eel Fishing (Amendment) Regulations (Northern Ireland) 1982**

*Made* . . . . . 30th June 1982

*Coming into operation* . . . . . 1st August 1982

The Department(a) of Agriculture in exercise of the powers conferred on it by section 15 of the Fisheries Act (Northern Ireland) 1966(b) and of all other powers enabling it in that behalf hereby makes the following regulations:—

*Citation and commencement*

1. These regulations may be cited as the Eel Fishing (Amendment) Regulations (Northern Ireland) 1982 and shall come into operation on 1st August 1982.

*Amendment to Eel Fishing Regulations (Northern Ireland) 1979*

2. The Eel Fishing Regulations (Northern Ireland) 1979(c) shall be amended as follows:—

(1) In regulation 2 for the definition of "undersized eels" there shall be substituted the following—

"undersized eels means eels of a length less than 30 centimetres measured from the tip of the snout to the tip of the tail."

(2) In Regulation 4 after paragraph (2) there shall be inserted the following:—

"(3) A float referred to in paragraph (2) shall be clearly and legibly inscribed in figures not less than 10 centimetres in height with the licence number in respect of each fyke net or series of fyke nets marked by the float."

Sealed with the Official Seal of the Department of Agriculture on 30th June 1982.

(L.S.)

*N. E. Morrison*

Assistant Secretary

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(a) Formerly Ministry: see Northern Ireland Constitution Act 1973 (c. 36) s. 40 and Sch. 5 para. 8(1)  
(b) 1966 c. 17 (N.I.)  
(c) S.R. 1979 No. 19

## EXPLANATORY NOTE

*(This note is not part of the Regulations.)*

These regulations provide a new definition of undersized eels for the purposes of the Eel Fishing Regulations (Northern Ireland) 1979 and standardise the minimum length of eels which may be retained from all waters in the Fisheries Conservancy Board area at 30 centimetres. They also provide that each float marker used on a fyke net or series of fyke nets must be clearly marked with the licence number of each net or series of nets.

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**iv) Eel Fishing (Licence Duties) Regulations (Northern Ireland) 2007**

STATUTORY RULES OF NORTHERN IRELAND

2007 No. 472

FISHERIES

**Eel Fishing (Licence Duties) Regulations (Northern Ireland)  
2007**

*Made*

*9th November 2007*

*Coming into operation*

*1st January 2008*

The Department of Culture, Arts and Leisure<sup>(1)</sup>, makes the following Regulations, in exercise of the powers conferred by sections 15(1) and 19(1) of the Fisheries Act (Northern Ireland) 1966<sup>(2)</sup> and now vested in it<sup>(3)</sup>:

**Citation and commencement**

1. These Regulations may be cited as the Eel Fishing (Licence Duties) Regulations (Northern Ireland) 2007 and shall come into operation on 1st January 2008.

**Licence Duties**

2. There shall be payable to the Fisheries Conservancy Board for Northern Ireland by way of licence duties in respect of licences for the use of fishing engines for the taking of eels referred to in column 1 of the Schedule the amounts respectively specified in column 2 of the Schedule.

**Revocation**

3. The Eel Fishing (Licence Duties) Regulations (Northern Ireland) 2006<sup>(4)</sup> are revoked.

Sealed with the Official Seal of the Department of Culture, Arts and Leisure on 9th November 2007.



*M. Cory*  
A senior officer of the Department of Culture, Arts and Leisure  
Regulation 2

## SCHEDULE

<i>Fishing Engine</i> (1)	<i>Licence Duty</i> (2)
Fyke net	£8.00
The existing eel weir at Toome	£1702.00
The existing eel weir at Upper Row, Portna	£1702.00
The existing eel weir at Lower Row, Portna	£1702.00
The existing eel weir at Belleek	£55.00
Long line used in the Erne Catchment Area or Lough Neagh, excluding its tributaries and their branches, containing not more than 1,200 hooks	£89.50
Long line used in the Erne Catchment Area or Lough Neagh, excluding its tributaries and their branches, containing more than 1,200 hooks	£124.00
Eel draft net not exceeding 118 metres in length used in Lough Neagh	£124.00

**EXPLANATORY NOTE**  
(*This note is not part of the Regulations*)

These Regulations amend the licence duties payable to the Fisheries Conservancy Board for Northern Ireland in respect of licences for the use of fishing engines for the taking of eels. The new duties and the size of the increases where applicable, are set out below.

	<i>Previous Rates</i>	<i>New Rates</i>	<i>Increase</i>
	£	£	£
Fyke Net	8.00	8.00	0.00
The existing eel weir at Toome	1630.50	1702.00	71.50
The existing eel weir at Upper Row, Portna	1630.50	1702.00	71.50
The existing eel weir at Lower Row, Portna	1630.50	1702.00	71.50
The existing eel weir at Belleek	53.00	55.00	2.00
Long line used in the Erne Catchment Area or Lough Neagh, excluding its tributaries and their branches, containing not more than 1,200 hooks	86.00	89.50	3.50
Long line used in the Erne Catchment Area or Lough Neagh, excluding its tributaries and their branches, containing over 1,200 hooks	119.00	124.00	5.00
Eel draft net not exceeding 118 metres in length used in Lough Neagh	119.00	124.00	5.00