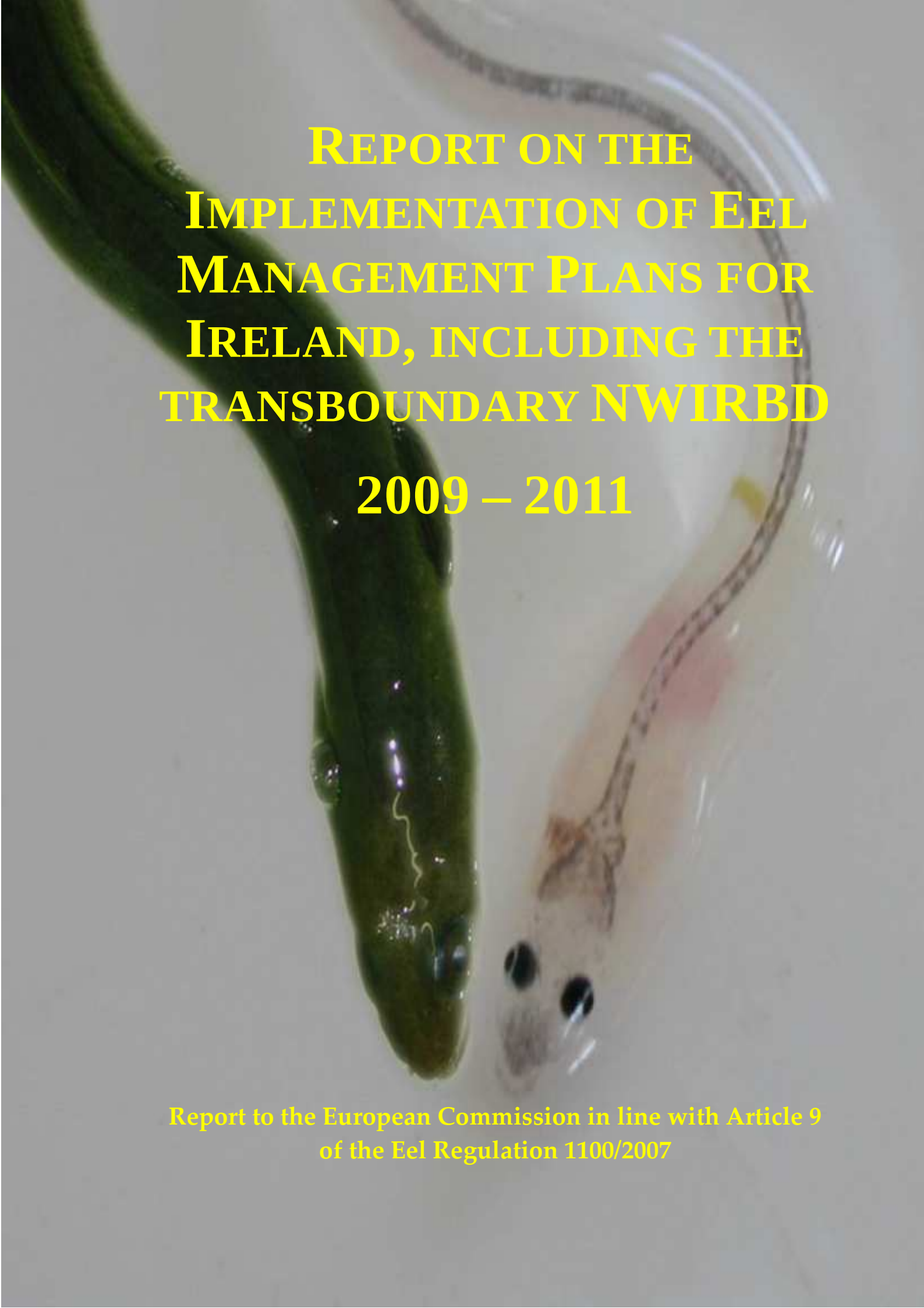

Report on the Implementation of Eel Management Plans for Ireland, including the transboundary NWIRBD

2009 – 2011

Report to the European Commission in line with Article 9 of the Eel Regulation 1100/2007

Implementation of Eel Management Plans for Ireland, including the transboundary NWIRBD

June 2012

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1 Outline the monitoring, effectiveness and outcome of the eel management plans implemented on your territory or in co-operation with neighbouring countries.

1.1 Background

The EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock required Ireland to establish eel management plans for implementation in 2009. Under the EC Regulation, Ireland should monitor the eel stock, evaluate current silver eel escapement and post-evaluate implemented management actions aimed at reducing eel mortality and increasing silver eel escapement.

The Irish Eel Management Plan submitted to the EU on the 9th January 2009 and accepted by the EU in June 2009 outlined the main management actions aimed at reducing eel mortality and increasing silver eel escapement to the sea.

Under the EC Regulation (EC No. 1100/2007), each Member State shall report to the Commission initially every third year until 2018 and subsequently every six years. The first report is due by 30th June 2012.

The Irish Eel Management Plan outlines a national programme for sampling catch and surveys of local eel stocks. Appropriate scientific assessment will monitor the implementation of the plans. The Scientific Eel Group (SEG) was established by the Department of Energy, Communications and Natural Resources in March 2009 and appointed by the Minister. Consultation with the Department of Culture, Arts and Leisure in Northern Ireland ensures the co-operation with Northern Ireland agencies to cover the specific needs of the trans-boundary North Western International River Basin District eel management plan. In 2010 the SEG was reconstituted as a Standing Scientific Committee for Eel under the Inland Fisheries Ireland legislation with a revised Term of Reference. The SSCE comprises scientific advisers drawn from the Marine Institute (MI), Inland Fisheries Ireland (IFI), The Loughs Agency, the Agriculture, Food and Biosciences Institute for Northern Ireland (AFBINI) and the Electricity Supply Board. Although the scientists are drawn from these agencies, the advice from the SSCE is independent of the parent agencies.

1.2 Standing Scientific Committee on Eel

The SSCE has undertaken a full assessment of the available eel data and other information available to it as outlined in its Terms of Reference and this is produced in a full SSCE report. The SSCE report provides the most current scientific advice on the status of the eel stock following the first three years of the implementation of the Irish Eel management Plan (2009-2011). All data referred to here has been assessed and referenced in the SSCE Report (2009-2011) and can be sourced through that document (Anon., 2012).

This management report should be read in conjunction with the SSCE report (Anon. 2012).

1.3 Biology

The European eel *Anguilla anguilla* (L.) is found and exploited in fresh, brackish and coastal waters in almost all of Europe and along the Mediterranean coasts of Africa and Asia. The life cycle has still not been fully elucidated but current evidence supports the view that recruiting eel to European continental waters originate from a single spawning stock in the Atlantic Ocean, presumably in the Sargasso Sea area, where the smallest larvae have been found. The newly hatched leptocephalus larvae drift with the ocean currents to the continental shelf of Europe and North Africa where they metamorphose into glass eels that enter continental waters. The growth stage, known as yellow eels, may take place in marine, brackish or freshwaters. This stage typically lasts from 2-25 years (even more than 50 years) prior to metamorphosis to the silver eel

stage and maturation. Age at maturity varies according to latitude, ecosystem characteristics and density-dependent processes. The European eel life cycle is shorter for populations in the southern part of their range compared to the north. At the end of the continental growing period, the eels mature and return from the coast to the Atlantic Ocean; this stage is known as the silver eel. Female silver eels grow larger and may be twice as old as males. The biology of the returning silver eel in ocean waters is almost completely unknown.

The European eel is a single, panmictic stock distributed from Northern Africa and the Mediterranean in the south to Northern Norway and Iceland in the north, including the Baltic Sea. Recent genetic evidence has confirmed the shared nature of the stock, with slight temporal variation between cohorts but no geographical differentiation (Palm *et al.* 2009).

1.4 International Eel Stock and the EU Regulation

Extracted from ICES Advice

The eel stock continues to decline in the period 2009 to 2011. In 2011, glass eel recruitment has fallen to 5% of their 1960-1979 level in the Atlantic region and less than 1% in the North Sea area, and showed no sign of recovery. Recruitment of young yellow eel has been declining continuously since the 1950s. Stock indicators in the national eel management plans submitted in 2008 indicated that anthropogenic mortality was above the limit implied by EC Regulation No. 1100/2007 (EC, 2007).

Abundance of all stages of eel (glass eel, yellow eel, and silver eel) is at an historical minimum. The stock is in a critical state. In 2007, European eel, *A. anguilla*, was included in CITES Appendix II that deals with species not necessarily threatened with extinction, but trade of which must be controlled to avoid utilization incompatible with the survival of the species (see http://www.cites.org/eng/disc/how.shtml), implemented in March 2009. Eel was also listed (2008) as critically endangered in the IUCN Red List.

A management framework for eel was established in 2007 through an EC Regulation (EC No. 1100/2007; EC, 2007). The objective of this Regulation is the protection, recovery, and sustainable use of the stock. To achieve the objective, Member States have developed eel management plans (EMPs) for their river basin districts, designed to reduce anthropogenic mortalities and increase silver eel biomass. The objective of the national eel management plans is to provide, with high probability, a long-term 40% escapement to the sea of the biomass of silver eel, relative to the best estimate of the theoretical escapement in pristine conditions (i.e. if the stock had been completely free of anthropogenic influences).

As eel is a long-lived species and anthropogenic mortalities occur over all of its continental lifespan, the effect of management measures on silver eel production and escapement and on their subsequent recruits (glass eel coming back to the coast) is expected to take several years to be detected (ICES, 2009). When these management measures eventually feed through to silver eel escapement and glass eel recruitment, the natural variability of these migrations, local site effects, and sampling variation may prevent the detection of such changes for at least several more years, even a decade or more (ICES, 2011a, 2011b). Therefore, the recovery process and the detection of possible changes due to management actions will be a slow process. The reporting by Member States to the EC in 2012 is a first step, and, in the short term changes in anthropogenic mortality and local variations in the stock will have to be used to quantify the effect of management measures.

Over the period 2009-2011, there is no change in the scientific perception of the stock status: it remains critical and urgent action is needed. ICES reiterated its previous advice that all anthropogenic mortality (e.g. recreational and commercial fishing, hydropower, pollution) affecting production and escapement of eels should be reduced to as close to zero as possible until

there is clear evidence that both recruitment and the adult stock are increasing. Urgent actions are needed to prevent further depletion of the stock.

1.5 Ireland's Eel Management Plan

The EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock required Ireland to establish eel management plans for implementation in 2009. Under the EC Regulation, Ireland should monitor the eel stock, evaluate current silver eel escapement and post-evaluate implemented management actions aimed at reducing eel mortality and increasing silver eel escapement. The Irish Eel Management Plan, submitted to the EU on the 9th January 2009 and accepted by the EU in June 2009, outlined the main management actions aimed at reducing eel mortality and increasing silver eel escapement to the sea. The EMP included two cross-border agreements, with the Neagh Bann IRBD rivers flowing into Carlingford Lough from the Republic of Ireland and into Dundalk Bay being reported in a plan for the Eastern RBD (the Eastern Eel Management Unit) and one transboundary eel management plan in respect of the North Western IRBD and prepared by the Northern Regional Fisheries Board, the Loughs Agency and DCAL (Figure 1.1).

The four main management actions in the Irish Eel Management Plan were as follows;

- a cessation of the commercial eel fishery and closure of the market
- mitigation of the impact of hydropower, including a comprehensive trap and transport plan to be funded by the ESB
- ensure upstream migration of juvenile eel at barriers
- improvement of water quality

The Irish Eel Management Plan (EMP) also outlined a national monitoring programme for sampling catch and surveys of local eel stocks. Appropriate scientific assessment will monitor the implementation of the plans.

Given the implications of the scientific advice, the consideration of practical management implications and the need to conserve and recover the stock in the shortest possible timeframe (contingent upon equivalent actions across Europe), the precautionary approach was adopted in accordance with the recommendations of the National Eel Working Group and the eel fishery was ceased. The eel fisheries in tidal and transitional waters are managed under the Inland Fisheries legislation and management structures and given the absence of appropriate methods for estimating eel stock densities and silver eel escapement in transitional waters, the precautionary approach was also adopted in accordance with the recommendations of the National Eel Working Group and the eel fishery in transitional and tidal waters was also ceased.

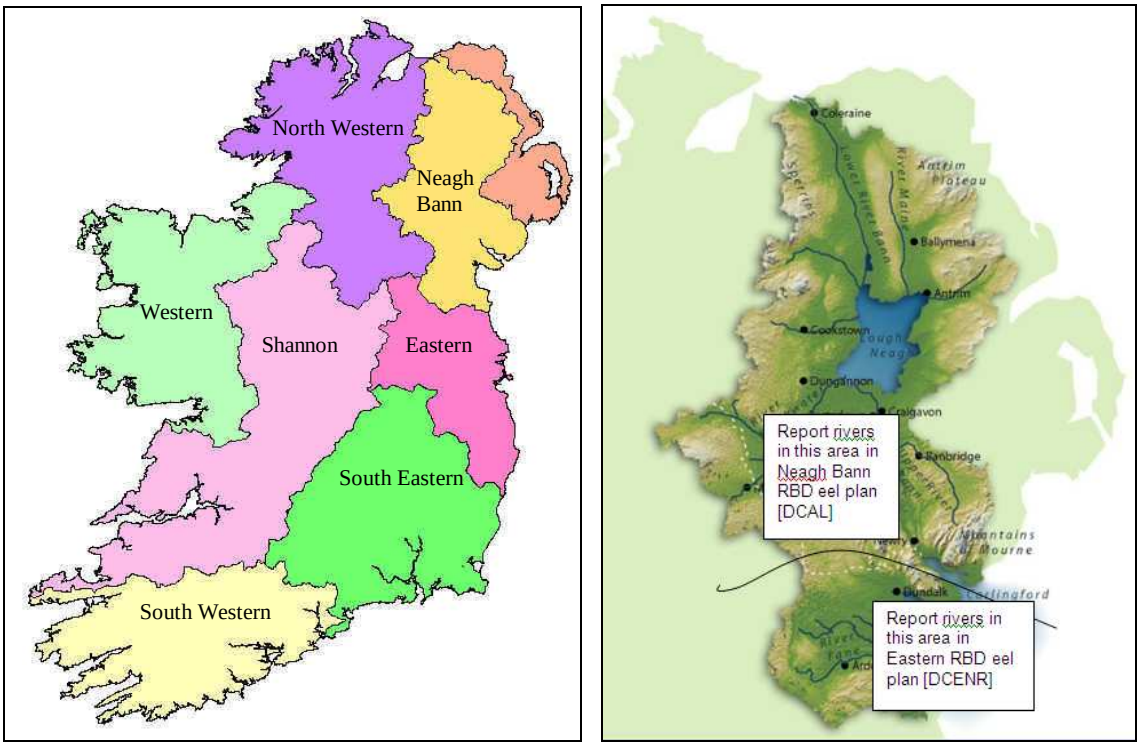

Figure 1-1: Map (left) showing the River basin Districts and the map (right) showing the transboundary agreement between the Neagh/Bann RBD and the Eastern RBD.

1.6 Monitoring 2009-2011

As outlined in Chapter 7 of the National EMP, a comprehensive monitoring programme was put in place to assess the local recruitment (glass eel/elver), yellow eel and silver eel stocks and to set a bench mark for evaluating future changes to the stocks. Determination of silver eel production and escapement was undertaken on key index sites such as the Corrib, Burrishoole and Fane and in conjunction with the silver eel trap and transport programmes on the Shannon and Erne. Mortality estimates for Hydropower Stations were determined for the Shannon and the Erne and a figure for eels bypassing Ardnacrusha on the Shannon was also determined. These have been incorporated into the previous estimates of escapement used in the Eel Management Plan (2008).

These monitoring programmes and estimates of escapement allow for the outcome of the main management actions (e.g. closure of the fishery, silver eel trap and transport) to be post-evaluated.

During the three year programme, some minor corrections were made to the eel database and the pristine silver eel production estimates used in the EMP. The outcome of these was small, and along with the new HPS mortality data, the National escapement (%SSB) of 24% changed to 24.3% and made little difference to the overall picture described in the EMP.

1.7 Status of the Irish Stocks 2009-2011

A full assessment of the eel stocks is presented by the SSCE in its Report 2009-2011. This reviewed reports and analysis by IFI, MI, ESB and NUIG. The national eel (Compass Informatics, 2011) and wetted area (McGinnity *et al*. 2011) databases were also used in the assessment.

1.7.1 Recruitment

Recruitment of glass eel to Ireland depends on European wide management actions and natural fluctuations in larval survival and will not provide a resource to post-evaluate Irish management

actions specifically. However, monitoring of recruitment is critical to evaluating the overall success of the eel regulation and is required by ICES for future stock assessment. This information is also required to assess and model future changes in the Irish eel stocks.

Recruitment has been declining at many Irish monitoring sites since the mid 1980s. In the 2000-2011 period, the glass eel catch in the Shannon was at 2% of the pre-1980 average and in 2009-2011 it was <1%. The Feale, Inagh and the Erne show a slower rate of decline, but in the 2009-2011 period these have also declined to low levels. For comparison, catches of glass eel in the Bann (NI) for the last five years were at about 3% of the pre-1980 level. While there is some local variation in abundance between sites and between years, often due to seasonal variations in water levels, recruitment remained low during the 2009 to 2011 period both in Ireland and across Europe.

1.7.2 Yellow Eel

During 2009-2011, an extensive yellow eel fyke net survey was carried out in key Irish lakes. This programme addressed a number of the monitoring objectives in the EMP, such as creating a baseline data set for monitoring changes to the yellow eel population over time, comparison with historical surveys and inter-calibration with Water Framework Directive surveys. In the Corrib, Shannon, Erne and Burrishoole catchments, yellow eels (>30cm) were tagged with passive integrated transponders (TROVAN PIT tags). Silver eel catches from these catchments were scanned in order to detect the maturing tagged yellow eels. A number of transitional waters and lagoons were surveyed by the EMP, namely the Suir, Barrow/Nore and Slaney transitional waters and the South Sloblands (a brackish lagoon). The aim of these surveys was to investigate the importance of transitional waters to the Irish eel population. Where data were available, the current surveys were compared with previous surveys in the 1970s, '80s and '90s.

The general picture from the comparisons made between previous and current surveys is one of similar CPUEs, but with a shift to larger eels. This shift to larger average size is a combination of relatively low numbers of small eels (e.g. in L. Conn, Inchiquin, and Corrib), indicative of poor recruitment, and shifting sex ratios to a higher proportion of larger females (e.g. in Corrib, Shannon and Burrishoole). The surveys of the Erne catchment still show relatively good numbers of eel compared to previous surveys, but in some cases there was evidence of previous commercial exploitation with large size classes absent in the current survey (i.e. L. Oughter, Upper L. Erne). The stocks of yellow eel in the Erne may be a reflection of the good recruitment of the 1990s and early 2000s still resident within the catchment.

Surveys of the transitional waters showed differences between each water and between the transitional waters and the lakes. The transitional waters contained significantly smaller eels than the lakes. The highest CPUEs were recorded in the transitional waters of the Barrow/Nore and Suir. The Slaney and South Sloblands had comparatively lower CPUEs. Low mark-recapture rates indicated probable high levels of movement within these waters and made population estimation difficult. Due to the difficulties in obtaining density estimates for eels in large water bodies and the migratory habits of eels moving upstream into the rivers and/or leaving the transitional water as silver eel, it is still not possible to estimate silver eel escapement/production for transitional waters.

1.7.3 Silver Eel

Quantitative estimates of silver eel escapement are required to establish and monitor changes in escapement relative to the EU 40% SSB target. Furthermore, the sex, age, length and weight profile of migrating silver eels are important for relating recruitment or yellow eel stocks to silver eel escapement. Quantifying migrating silver eel between August and December/January each year is a difficult and expensive process but it is the only way of ultimately calibrating the outputs of the yellow eel and modelled assessments. Silver eels were assessed during 2009-2011/'12 by fishing index stations on the Corrib (2009 only), Erne, Shannon, Burrishoole and Fane catchments (part of

2011), all of which, with the exception of the Fane, have a long-term history of eel catch and data collection. The index catchments have a combined wetted area of almost 98,000ha or 64% of the total wetted area (inc. the N. Ireland part of the NWIRBD).

In the Shannon catchment (ShIRBD), historical (pristine) silver eel production was estimated to be in the order of 189t, falling to an average production of 86t for the 2001-2007 period, or an escapement of 12t (6.4% of pristine), after exploitation and using 17.8% as an average bypass at Parteen and 21.1% turbine mortality (average 2009-2011). Following the cessation of the fishery in 2009 and implementation of the trap and transport programme, escapement increased to 66.8t, 60.2t and 57.9t in 2009, 2010 & 2011 respectively, or an average of 61.6t (32.6% of pristine).

In the Erne (NWIRBD), historical silver eel production was estimated to be in the order of 107.5t, falling to an average of 85t for the 2001-2007 period, or an escapement of 32.5t (30.3% of pristine), after exploitation and using 22.9% turbine mortality (average 2009-2011 for both Cliff & Cathleen's Fall). Following the cessation of the fishery in Ireland in 2009 and N. Ireland in 2010 and implementation of the trap and transport programme, estimated escapement increased to 37.9t and 39.9t in 2010 and 2011, or an average of 38.9t (36.2% of pristine). Given the relatively high level of recruitment in the mid 1990s to the early 2000s in the Erne system (~235 recruits/ha yielding 1.6 kg/ha silver eel), comparisons with other river systems (e.g. Shannon ~64 recruits/ha yielding 1.7 kg/ha silver eel), and the relatively high yellow eel stocks in much of the Erne system compared to previous surveys, the estimates of current silver eel production in the Erne were lower than expected. This may be due to unexplained differences in productivity and recruitment, higher than previously thought commercial yellow eel catch, an under-estimate of current production or a combination of these factors. The SSCE advises that further work is required to clarify the lower than expected production estimate.

In the Corrib (WRBD), historical silver eel production was estimated to be in the order of 103t, falling to an average of 48.5t for the 2001-2007 period, or an escapement of 13.4t or 13% of pristine. Following the cessation of the fishery in Ireland in 2009, escapement increased to 36.1t in 2009 (35% of pristine). No estimates were available for 2010 or 2011 due to structural problems at the Galway Fishery.

In the Burrishoole (WRBD), historical silver eel production was estimated to be in the order of 0.5t, increasing to an average of 0.7t for the 2001-2007 period, or 140% of pristine. The yellow eel stock in Burrishoole has never been commercially exploited and the stock has shown evidence of sex ratio changes from a male dominated silver eel run to a higher proportion of larger females. The number of eels has decreased while the biomass increased until about 2005. Similar observations of increasing average size/female sex ratio have been made on the Corrib and the Shannon. Production and escapement in Burrishoole for the 2009-2011 period were 0.6t, 0.4t and 0.4t with an average of 0.5t (103% of pristine) and 2010 and 2011 were the lowest observed since 1986.

A preliminary assessment of the Fane in Dundalk (Eastern EMU) in October/November indicated a potential production in 2011 of approximately 2t. The migration appeared to be dominated by male silver eel. Further surveys will conducted at this important site as it is currently the only east coast site with potential to be an index for silver eel production.

1.8 National Production and Escapement (EU target)

The objective of the EMPs is to provide, with high probability, a long-term 40% escapement to the sea of the biomass of silver eel, relative to the best estimate of the theoretical escapement in pristine conditions (i.e. if the stock had been completely free of anthropogenic influences). In the Irish Eel Management Plan (2008), estimates of pristine silver eel production and current (2001-2007) silver eel escapement were determined for the freshwater catchments and plotted for each RBD and for the total national situation (including the Loughs Agency and DCAL areas in the EEMU and NWIRBD) (see Figures 2.2 & 2.3). Also shown on these plots is the 40% of pristine escapement

target line marked in red. The estimated effect of complete fishery closure (yellow & silver eel and illegal/unreported) and/or removal of all hydropower mortality is also shown along with the "do nothing scenario". The impact of these management options is trended to take account of the legacy of the previous 18 years of decreasing recruitment trends. Only the SERBD and the SWRBD were meeting their escapement target in 2008 and this situation was unlikely to be sustainable even within the short-term future due to the legacy of poor and declining recruitment in the last 18 years.

After 2009-2011, the indications are that the management measures implemented in the EMP have increased silver eel escapement from freshwater to a national average of 37% of pristine, improved from 24% in 2008. The EEMU, SERBD and SWRBD are estimated to be at 45+%, above the EU 40% target, and the ShIRBD, WRBD and NWIRBD are at 34%, 36% and 38% respectively (Figures 2.2 & 2.3). Silver eel production (B_{best}) fell by 33% from the 2008 estimate (336,311 kg) to the average 2009-2011 estimate of 226,239 kg.

In the report, the state of the stock is compared with the targets. A modified precautionary diagram is used to present the status of each RBD/EMU separately and for the total Irish stock with respect to the EU biomass target and a derived mortality limit. On the horizontal axis, the status of the stock is plotted (low versus high spawning stock biomass determining whether the stock is in good condition or not; logarithmic scale, percent of pristine biomass) and on the vertical axis the impact of fishing and hydropower generation (low versus high mortality determining whether the management regime is sustainable or not; mortality rates are logarithmic by definition). Figures 2.4 & 2.5 plot the most recent stock assessment, presented in the SSCE report (2009-2011) and the assessment already presented in the Eel Management Plan (2008).

The background colours in these diagrams reflect the target of the EU Regulation (the target in the green zone) and the precautionary advice given by ICES (a much lower mortality, to recover the stock). For each part of the stock (and for the whole of Ireland), the status of the stock is represented by a bubble. The positions of the bubbles indicate the status of the stock in 2008 (average 2001-2007) and for 2009-2011 relative to the biomass (horizontal) and mortality (vertical) targets, while the size of the bubble indicates the relative importance of that part of the stock (B_{best}, the potential production from the current stock, if no anthropogenic impacts would have occurred). Additionally, each bubble has an arrow indicating what effect the planned measures of the Eel Management Plan were expected to have.

In the EEMU, the ShIRBD, WRBD and NWIRBD, the mortality was clearly reduced, as indicated by the downward direction of the bubbles, and this led to increased escapement shown by right hand horizontal movement towards the 40% target (Figure 2.4). In some cases the bubbles did not respond as expected, by not moving as much to the right. This may due to some yellow eel still to feed through increasing the %SSB and moving the bubbles to the right in coming years. Or the negative impact of falling recruitment may now be leading to lower silver eel production, or there may be problems with some of the estimates as mentioned previously. Extrapolation to the east and south RBDs may need to be reviewed in the light of future additional data and for the NWIRBD diagram, either the 2008 bubble is too far to the right, due to an over-estimate of 2008 escapement, or the 2009-2011 bubble is too far to the left due to an under-estimate of the current escapement or a combination of both. There is evidence to suggest higher than previously thought yellow eel exploitation, especially in the Erne, which would increase mortality and reduce escapement of the 2008 bubble in the NWIRBD diagram.

In general, we have demonstrated the increase in biomass of silver eel escaping and the reduction in mortality caused by fishing and hydropower. While further reduction in mortality is unlikely, it possible that additional biomass will feed through in the coming years from the closure of the yellow eel fishery.

However, it is unclear how the collapse in recent recruitment will impact on silver eel biomass and whether density dependent effects (change from small males to higher proportions of larger females) will buffer the collapse in recruitment by temporarily increasing biomass of silver eels, even with falling numbers.

The projected indications, given past recruitment patterns, yellow eel surveys and the closure of the yellow eel fishery, are that production of silver eels will remain at current levels, or may even increase until circa 2018, after which it is anticipated that a marked reduction will take place. Recruitment in the Erne, in particular, was relatively high between 1994 and 2001 and it is anticipated that this will have a positive effect on silver eel production in the coming 5-6 years. Some RBDs (e.g. SERBD & SWRBD) may already be showing the impact of declining recruitment (Figure 2.4).

It is therefore unlikely that the EU target and recovery of recruitment to historic levels will be achieved within the projected 90 years outlined in the Irish EMP. While management measures (i.e. cessation of fishing, trap and transport around hydropower stations) implemented in Ireland have led to considerable improvements in silver eel escapement, equivalent EU-wide actions have not, to the best of our knowledge, taken place. Further improvement in silver eel production is contingent on increased recruitment of juveniles to Irish waters. Conclusion of the EU 2012 reporting and evaluation process will provide the opportunity to evaluate whether the initial implementation of the Regulation is likely to lead to an improvement in recruitment.

1.9 Other Observations

1.9.1 Parasites

In Chapter 3.4.2.3 of the National EMP report (2008), it was indicated that approximately 73% of the wetted area was infected by *Anguillicoloides*. In the interest of maintaining good eel quality, it was hoped that the further spread of the parasite might be avoided.

The eels captured in the EMP and WFD surveys are checked for the presence of *A. crassus.* Prevalence and intensity rates varied from east to west, but the northwest and southwest of the country show little to no infection by *A. crassus*. A number of catchments, such as the Munster Blackwater, the Laune and the Fergus, have shown low infection rates and patchy distribution which indicates recent introductions and continued spread. Further monitoring and management will be necessary to maintain the parasite free status of catchments in these areas. It should be noted that any transfer of water or fish, not only eels, can act as a vector for the spread of *A. crassus*. Therefore, any movements of fish or water between catchments should be undertaken with caution. This includes stocking programmes from hatcheries, transfers of coarse fish between waterbodies and bilge water in boats.

1.9.2 Silver Eel Trap and Transport Quota

In 2008, it was not possible to define a timeframe to achieve the EU biomass target (40% of pristine SSB) with the proposed management actions (cessation of fishery, trap and transport), so an alternative target of timeframe to achieve full recovery of recruitment (assumed to be at, or above, 40% SSB) was defined. With the management actions for 2009-2011, all EMUs, and Ireland as a whole, was expected to contribute to a recovery of recruitment at the 100 year timeframe or less. It was imperative that equivalent EU-wide action was taken at this level so as not to diminish the impact of Ireland's contribution. It was estimated that a recovery could only take place if anthropogenic mortality was reduced by more than 85% of the level in 2008.

In both the Shannon and Erne catchments, anthropogenic mortality during 2009-2011 was reduced to as low as possible, by closing the fishery and transporting silver eels around the hydropower stations, and this is evident by examining the biomass data (Figure 2.6). The downward movement of the 2009-2011 bubbles indicates the reduced anthropogenic mortality and the left to right

movement indicates the increase in silver eel biomass escaping. Neither catchment is achieving its EU target of 40%.

In the EMP, the objective set by the national WG on Eel was to aim to recover the stock in the shortest time practicable. Trap and Transport amounts of silver eel were set by agreement between DCENR, DCAL and ESB, with the 30% of the production in the Shannon and three fixed annual catch quota in the Erne for 2009, 2010 & 2011. Taken into account in setting these quotas were the estimated eel productions, recent past recruitment history, practicable feasibility and infrastructure/experience on each catchment.

Along with the cessation of the fishery, the trap and transport targets were inputted into the EMP model for assessing the timeframe to achieve a recovery and all EMUs were expected to contribute to a recovery in 100 years or less. This was safely below the 300+ year breakpoint, or 85% reduction in mortality (see Chapter 5.3.1 of the EMP Report 2008).

The total amounts of silver eel trapped and transported in each of the three rivers in 2009, 2010 and 2011 are presented in Table 2.6. The separate detail sheets of the amounts transported from each site on each date are presented as an annex to the SSCE report. The target was achieved in the R. Shannon in all three years. The target was not achieved in the Erne, although major efforts were made and considerable quantities of eel were transported. The target was achieved in one of the three years in the Lee.

1.10 Monitoring Programme 2012-2015

Under the Eel Management Plan, Ireland is committed to monitoring the outcome and effectiveness of the management measures; a three year programme was outlined in the EMP. This has now been updated for 2012-2015, based on the experience of the first three years, and is presented in the SSCE report (Anon., 2012).

1.11 Conclusion

The overall European eel stock is outside safe biological limits, recruitment has declined to an all-time low and the stock continues to decline to a critical state. Management actions implemented in Ireland have markedly increased silver eel escapement. Production fell by 33%, compared to the 2008 estimate, although this production is expected to be maintained, or maybe to increase, until circa 2018. Thereafter, it is anticipated that there will be a considerable decline in silver eel production, as indicated by recruitment history, yellow eel stock indicators and modelled projections for index stocks. Some RBDs (i.e. SERBD & SWRBD) are already showing indications of reduced silver eel production. Continuation of the management actions implemented under the Eel Management Plans will ensure Ireland's continued compliance with the Regulation and a national contribution towards the recovery of the stock.

2 Best Available Estimates:

2a Compliance with the silver eel escapement target

(a) The proportion of the silver eel biomass that is currently escaping towards the sea to spawn, relative to the target level of escapement set out in Article 2(4), i.e. 40% of the pristine biomass.

2.1 National Production and Escapement (EU target)

Introduction

The EU Regulation (No. 1100/2007) sets a long-term objective which is the protection and sustainable use of the stock of European Eel. A target is set for the biomass of silver eel escaping from each eel management unit, at 40% of the pristine biomass. Pristine biomass is generally regarded as the biomass of silver eel without human impact and at recruitment levels before the sudden decline in the early 1980s.

Ireland used a system of index catchments for extrapolating to data poor catchments for calculating estimates of pristine and current biomass as described in the Irish Eel Management Plan (Chapter 5) and the WGEEL report (ICES, 2008).

Note: tidal and transitional waters were not included in the production and escapement analysis

As set out in the EU template for the National Report 2012, the following definitions are adhered to:

B_0	The amount of silver eel biomass that would have existed if no anthropogenic influences had impacted the stock.
$B_{current}$	The amount of silver eel biomass that currently escapes to the sea to spawn.
B_{best}	The amount of silver eel biomass that would have existed if no anthropogenic influences had impacted the current stock.
ΣF	The fishing mortality rate, summed over the age-groups in the stock, and the reduction effected.
ΣH	The anthropogenic mortality rate outside the fishery, summed over the age-groups in the stock, and the reduction effected.
R	The amount of glass eel used for restocking within the country.
ΣA	The sum of anthropogenic mortalities, i.e. $\Sigma A = \Sigma F + \Sigma H$.

2.2 Eel Management Plan Biomass

Introduction

The estimation of pristine and current (2008 based on the average of 2001-2007) silver eel biomass being produced and escaping was fully described in the National Eel Plan (2008, Ch.5) and in ICES (2008, page 47). The calculation of pristine productivity for exploited catchments requires estimates of silver eel escapement along with historic silver and yellow eel catches, raised to account for unreported and also illegal catches. Historical catch records for silver eel fisheries were available for the five catchments of the Corrib, Moy, Garavogue, Burrishoole and Erne. The efficiencies of the fisheries had been previously estimated for the Shannon, Corrib and Erne silver eel fisheries. Where fishery efficiency was not measured an approximately average value of 33% was used to calculate escapement. In addition to the catch at the recording station and escapement past the recording station the yellow eel and silver eel catches made upstream were included to estimate pristine productivity. In the absence of historic data for these latter parameters (yellow and silver eel catches upstream of the recording station) it was assumed that the yields were equal to those currently observed (2001-2007). A similar process was used to calculate the 2008 production, with the exception of L. Ennell, based on the average of 2001-2007, and escapement using data from four catchments, the Shannon, Corrib, Burrishoole and Lough Ennell.

For those catchments with hydropower at the lower end of the catchment (Shannon, Erne, Liffey and Lee), an estimate of the impact was derived by imposing a 28.5% mortality per turbine passage (WGEEL, 2002). Therefore, the probability of surviving passage through 'n' number of hydropower installations is $(0.715)^n$.

Silver eel production was then determined for the other catchments by using a habitat-based approach. The method involved determining the relationship between productivity and the geological characteristics of the catchment.

Growth rate of eel were available for 17 catchments (Moriarty 1988, WFD). The wetted area within each catchment was quantified using a geographical information system and classified according to the proportion of the catchment area comprising non-calcareous geology. For 17 catchments growth rate was found to be closely negatively related to the proportion of the catchments comprising non-calcareous geology. This allowed the estimation of silver eel production to be made on the basis of geology (natural productivity) and growth rate.

Note: tidal and transitional waters were not included in the production and escapement analysis

Historic Silver Eel Biomass (Bo)

Estimates of historic biomass were presented for each Eel Management Unit (EMU). During the course of 2009-2011 and the review for this report two errors were identified in the calculations, one in the Corrib historic escapement and one in the Erne historic escapement. This changed the estimated production in the Corrib from 3.38 kg/ha to 3.57 kg/ha and in the Erne from 4.50 kg/ha to 4.14 kg/ha. The corrected data for the two catchments are given in Table 2.1.

When the corrected data were inserted into the model for determining historic production for all the catchments, it made only a small difference in the overall silver eel production biomass estimate for each EMU and for the % escapement. Both datasets are presented in Table 2.2 and only the new historic biomass estimates will be used from this point forward.

Current (2008) Silver Eel Biomass (Bbest, $B_{2001-2007}$)

The production (B_{best}) and escapement ($B_{2001-2007}$) estimates presented in the EMPs are shown in Table 2.2 & 2.3. The escapement was determined by subtracting the fisheries catch, raised to account for illegal and unreported, and then the remaining silver eel production was subjected to hydropower mortality at 28.5% per hydropower station where these occurred.

The escapements in 2008 were recalculated using the estimates of HPS mortality determined between 2009 & 2011 (Table 2.2), on the Shannon (21% & 17.8% bypass) and the Erne (cumulative 23%) and both datasets are included in Table 2.2 & 2.3.

Current (2009-2011) Silver Eel Biomass (Bbest, $B_{2009-2011}$)

The silver eel biomass produced and escaping during 2009 to 2011 in the monitored index catchments was fully described in Chapter 7 of the SSCE report and also shown here in Table 2.1.

These index data were then used to calibrate the IMESE model. The existing growth data was reused and it is hoped in the coming three year period to have new growth data to refresh the model. Figure 2.1 shows the relationship between the index data, the growth rate data and the geology (% non-calcareous).

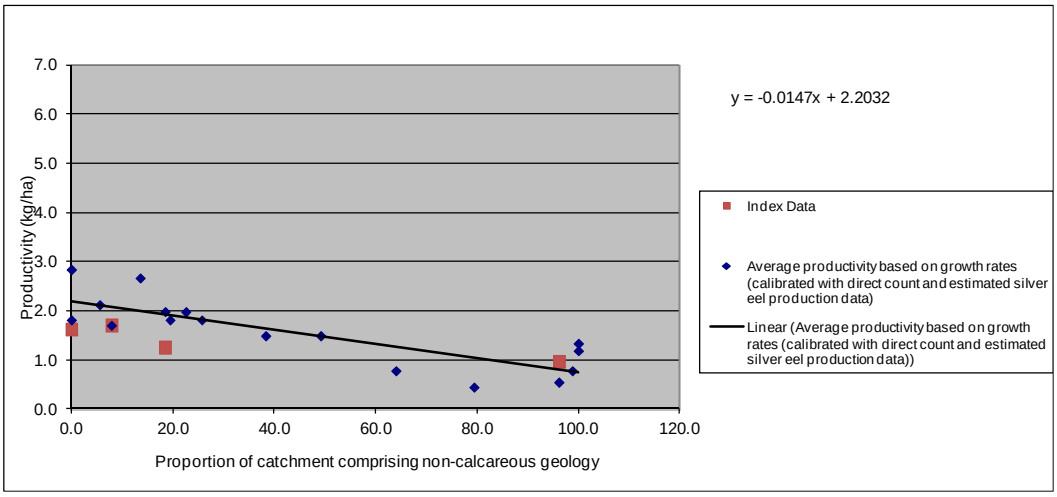

Figure 2-1: Average current (2009-2011) silver eel productivity based on growth rates calibrated with direct silver eel counts and estimated silver eel production indices for the same period

The estimates of historic (Bo), 2008 and current silver production and escapement are given in Table 2.3 as calculated using the IMESE and summated by individual catchments for each RBD and current escapement was then estimated taking into account the HPS mortalities. Where direct estimates were available for individual catchments, these were used instead of a modelled figure. It should be noted that the silver eel index locations were all on the west coast in 2009-2011. This may lead to inconsistencies when extrapolating to the east and south coast catchments. While a similar scenario existed for setting up the EMP, it is hoped to include at least one silver index on the east coast in the next three year period.

Current escapements are presented in Table 2.3 expressed as a percentage of the historic production. These are given for 2008 and for the 2009-2011 period as an average. The positive effect of the implemented management measures (fishery closure and silver eel trap and transport) can be clearly seen by the %SSB increasing from 24.4% (2008) to 36.8% (2009-2011).

In general, we have demonstrated the increase in biomass of silver eel escaping and the reduction in mortality caused by fishing and hydropower. While further reduction in mortality is unlikely, it possible that additional biomass will feed through in the coming years from the closure of the yellow eel fishery.

However, it is unclear how the collapse in recent recruitment will impact on silver eel biomass and whether density dependent effects (change from small males to higher proportions of larger females) will buffer the collapse in recruitment by temporarily increasing biomass of silver eels, even with falling numbers.

The projected indications, given past recruitment patterns, yellow eel surveys and the closure of the yellow eel fishery, are that production of silver eels will remain at current levels, or may even increase until circa 2018, after which it is anticipated that a marked reduction will take place. Recruitment in the Erne, in particular, was relatively high between 1994 and 2001 and it is anticipated that this will have a positive effect on silver eel production in the coming 5-6 years. Some RBDs (i.e. SERBD & SWRBD) may already be showing the impact of declining recruitment (Figure 2.4).

It is therefore unlikely that the EU target and recovery of recruitment to historic levels will be achieved within the projected 90 years outlined in the Irish EMP. While management measures (i.e. cessation of fishing, trap and transport around hydropower stations) implemented in Ireland have led to considerable improvements in silver eel escapement, equivalent EU-wide actions have not, to the best of our knowledge, taken place. Further improvement in silver eel production is contingent on increased recruitment of juveniles to Irish waters. Conclusion of the EU 2012 reporting and evaluation process will provide the opportunity to evaluate whether the initial implementation of the Regulation is likely to lead to an improvement in recruitment.

Table 2-1: Historic production (Bo), current production (B_{best}), current escapement, fisheries catch and estimates of turbine mortality for the Burrishoole, Corrib, Shannon and Erne. The top table presents the data as rates (kg/ha), the bottom table as total quantities (kg). ND = no data.

Catchment	Historic production (Bo) kg/ha	Best possible production (Bbest) kg/ha					Escapement (Bcurrent) kg/ha					Fishery Catch (kg/ha). *including unreported & illegal					Turbine Mortality (kg) ** 2001-2007 recalculated using '09-'11 estimates				
		2001-2007	2009	2010	2011	Average 2009-2011	2001-2007	2009	2010	2011	Average 2009-2011	2001-2007*	2009	2010	2011	Average 2009-2011	2001-2007**	2009	2010	2011	Average 2009-2011
Burrishoole	0.928	1.37	1.27	0.87	0.75	0.96	1.37	1.27	0.87	0.75	0.96	0	0	0	0	0					
Corrib	3.57	1.68	1.25	ND	ND	ND	0.46	1.25	ND	ND	ND	1.22	0	0	0	0					
Shannon	4.45	2.02	1.75	1.62	1.54	1.64	0.29	1.57	1.42	1.36	1.45	1.76	0	0	0	0					
Erne	4.14	3.28	ND	1.59	1.64	1.62	1.25	ND	1.46	1.52	1.49	1.70	ND	0	0	ND					
Catchment	Historic production (Bo) kg	Best possible production (Bbest) kg					Escapement (Bcurrent) kg					Fishery Catch (kg). *including unreported & illegal					Turbine Mortality (kg) ** 2001-2007 recalculated using '09-'11 estimates				
		2001-2007	2009	2010	2011	Average 2009-2011	2001-2007	2009	2010	2011	Average 2009-2011	2001-2007*	2009	2010	2011	Average 2009-2011	2001-2007**	2009	2010	2011	Average 2009-2011
Burrishoole	440	649	602	410	354	455	649	602	410	354	455	0	0	0	0	0	0	0	0	0	0
Corrib	103,062	48,455	36,100	ND	ND	ND	13,371	36,100	ND	ND	ND	35,084	0	0	0	0	0	0	0	0	0
Shannon	188,849	85,700	74,382	68,920	65,558	69,620	12,163	66,788	60,170	57,885	61,614	74,600	0	0	0	0	5,969	4,095	8,210	7,673	6,659
Erne	107474	85,140	ND	41,232	42,702	41,967	32,542	-	37,942	39,858	39,199	44,239	ND	0	0	ND	9,403	ND	3,047	2394	2,721

Table 2-2: Historic (Bo) and current (B_{best} - 2008) silver eel production (t) and escapement (Bcurrent) (t) and the percent escapement of historic production calculated using the IMESE model and inserting actual catchment data where they exist. The data for historic production was reworked and the recalculated data are presented along with those as presented in the EMP (2008). The current 2008 escapements are presented as in the EMP, with 28.5% average turbine mortality*, and recalculated using the turbine mortalities determined during 2009-2011.**

The shaded columns are the definitive columns of biomass data with the most recent data.

	Historic Production (EMP) (kg)	Historic Production **Recalculated** (kg)	Current 2008 Production (kg)	Current 2008 Escapement (kg)	Current 2008 Escapement **Recalculated** (kg)	Current 2008 Escapement as % of Historic Production (EMP)	Current 2008 Escapement as % of Historic Production **Recalculated Bo**	Current 2008 Escapement as % of Historic Production **Recalculated Bo & ****
EMU	Bo	Bo	Bbest	Bcurrent*	Bcurrent**	%	%	%
EEMU	21785	20490	14186	7008	7008	32.2	34.2	46.0
SERBD	15723	14813	10069	8707	8707	55.4	58.8	45.6
SWRBD	25925	24526	17390	16603	16603	64.0	67.7	67.7
ShIRBD	214048	201156	94231	19599	19,902	9.2	9.7	9.9
WRBD	170403	189167	96924	41578	41578	24.4	22.0	27.0
NWIRBD	146536	135760	103511	38014	48759	25.9	35.9	35.9
National	594420	585912	336311	131509	142847	22.1	22.4	24.3

* escapement calculated using 28.5% for hydropower and 30% Shannon bypass.

** escapement recalculated for 2001-2007 using current estimates of mortality for Hydropower in the Erne (23%) and Shannon (21.1% & 17.8% bypass)

Table 2-3: Historic (Bo), current (Bbest - 2008) and current (Bbest 2009-2011) silver eel production (kg) and escapement (Bcurrent) (kg) and the percent escapement of historic production. The escapements for 2008 are presented as in the EMP, with 28.5% average turbine mortality, and recalculated using the turbine mortalities determined during 2009-2011. Mortalities are calculated on biomass. The shaded columns are the definitive columns of biomass data with the most recent data.

	Bo Historic	Bbest 2008 Prod	2008 Escap at 28.5% HPS*	2008 Escap at new % HPS**	Bbest 2009-2011 Prod	Bcurrent 2009-2011 Escap	2008 EU%	New % HPS 2008 EU%**	2009-2011 EU %
EEMU	20,490	14,186	7,008	7,008	9,555	9,430	34.2	34.2	46.0
SERBD	14,813	10,069	8,707	8,707	6,754	6,754	58.8	58.8	45.6
SWRBD	24,526	17,390	16,603	16,603	11,637	11,282	67.7	67.7	46.0
ShIRBD	201,156	94,231	19,599	19,902	75,377	68,718	9.7	9.9	34.2
WRBD	189,167	96,924	41,578	41,578	68,650	68,850	22.0	22.0	36.3
NWIRBD	135,760	103,511	38,014	48,759	54,256	51,545	28.0	35.9	38.0
Total	**585,912**	**336,311**	**131,509**	**142,847**	**226,239**	**216,379**	**22.4**	**24.3**	**36.9**

* escapement calculated using 28.5% for hydropower and 30% Shannon bypass.

** escapement recalculated for 2001-2007 using current estimates of mortality for Hydropower in the Erne (23%) and Shannon (21.1% & 17.8% bypass)

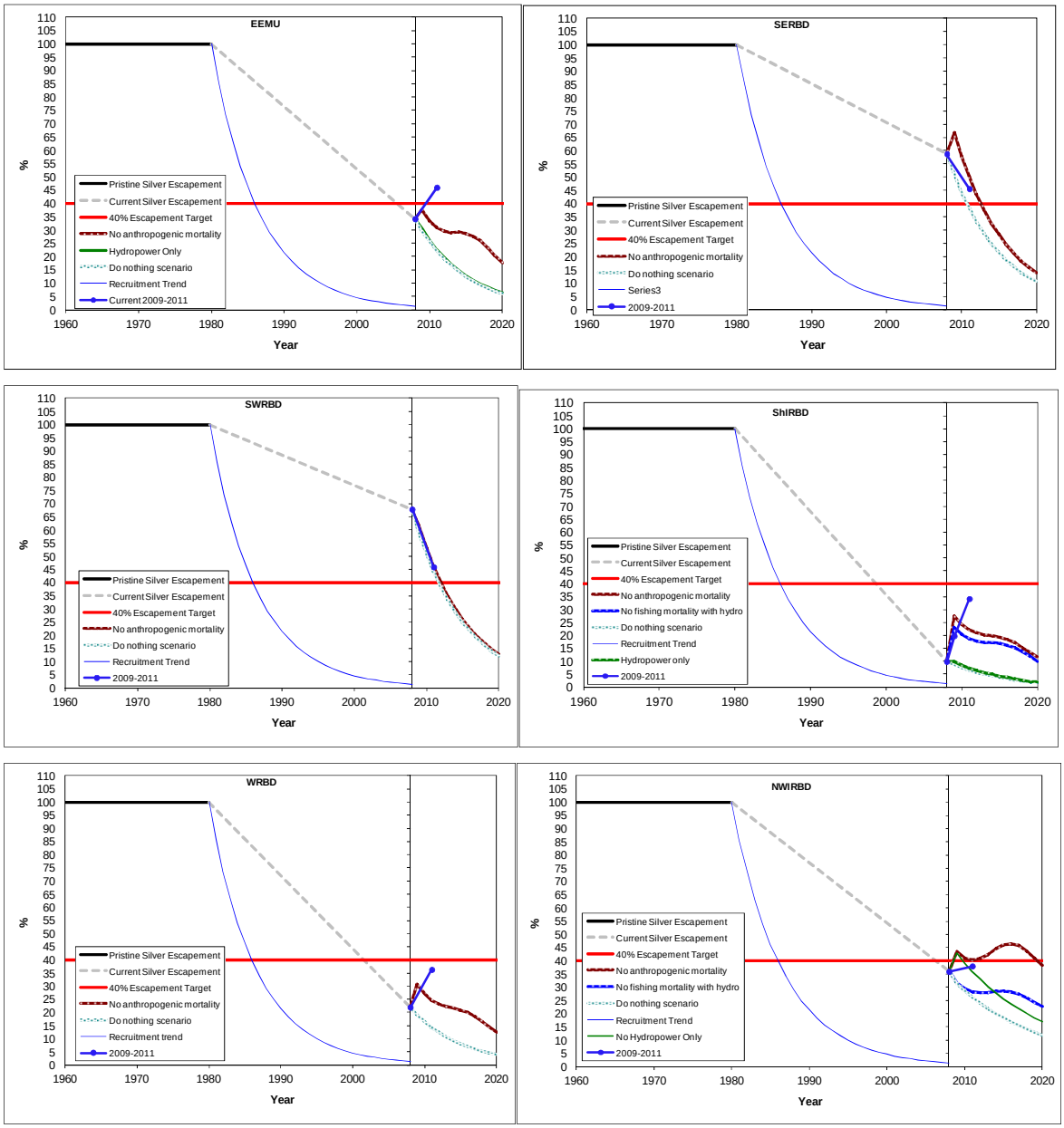

Figure 2.2: Plots for each Eel Management Unit of historic (100%) and current (2008) eel production and escapement related to the EU 40% target (red line). The recruitment trend is shown in plain blue. The effect of projected management scenarios are shown in dotted blue (fishery), green (hydropower) and total (yellow) and the first observed point for the average of 2009-2011 is shown as a blue line and dot plotted at 2011.

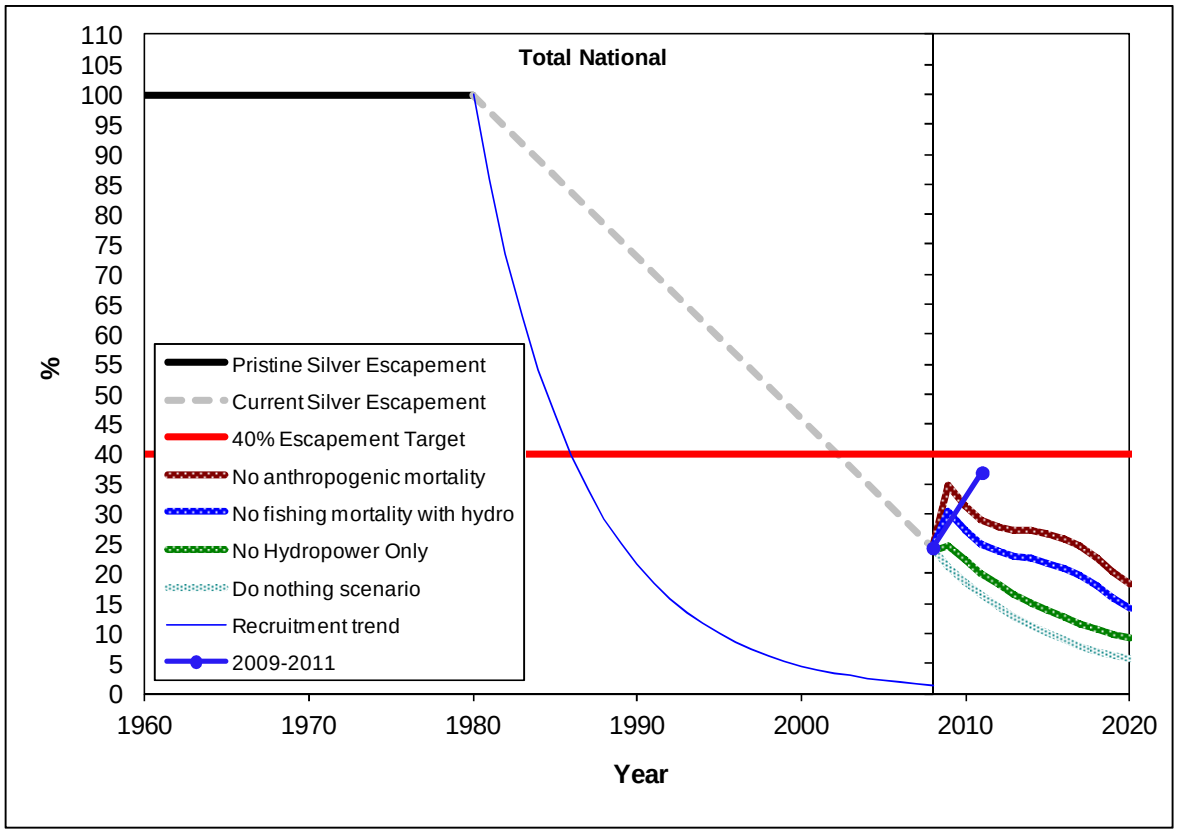

Figure 2.3: Plot for the total of the Eel Management Units of historic (100%) and current (2008) eel production and escapement related to the EU 40% target (red line). The recruitment trend is shown in plain blue. The effect of projected management scenarios are shown in dotted blue (fishery), green (hydropower) and total (yellow) and the first observed point for the average of 2009-2011 is shown as a blue line and dot plotted at 2011.

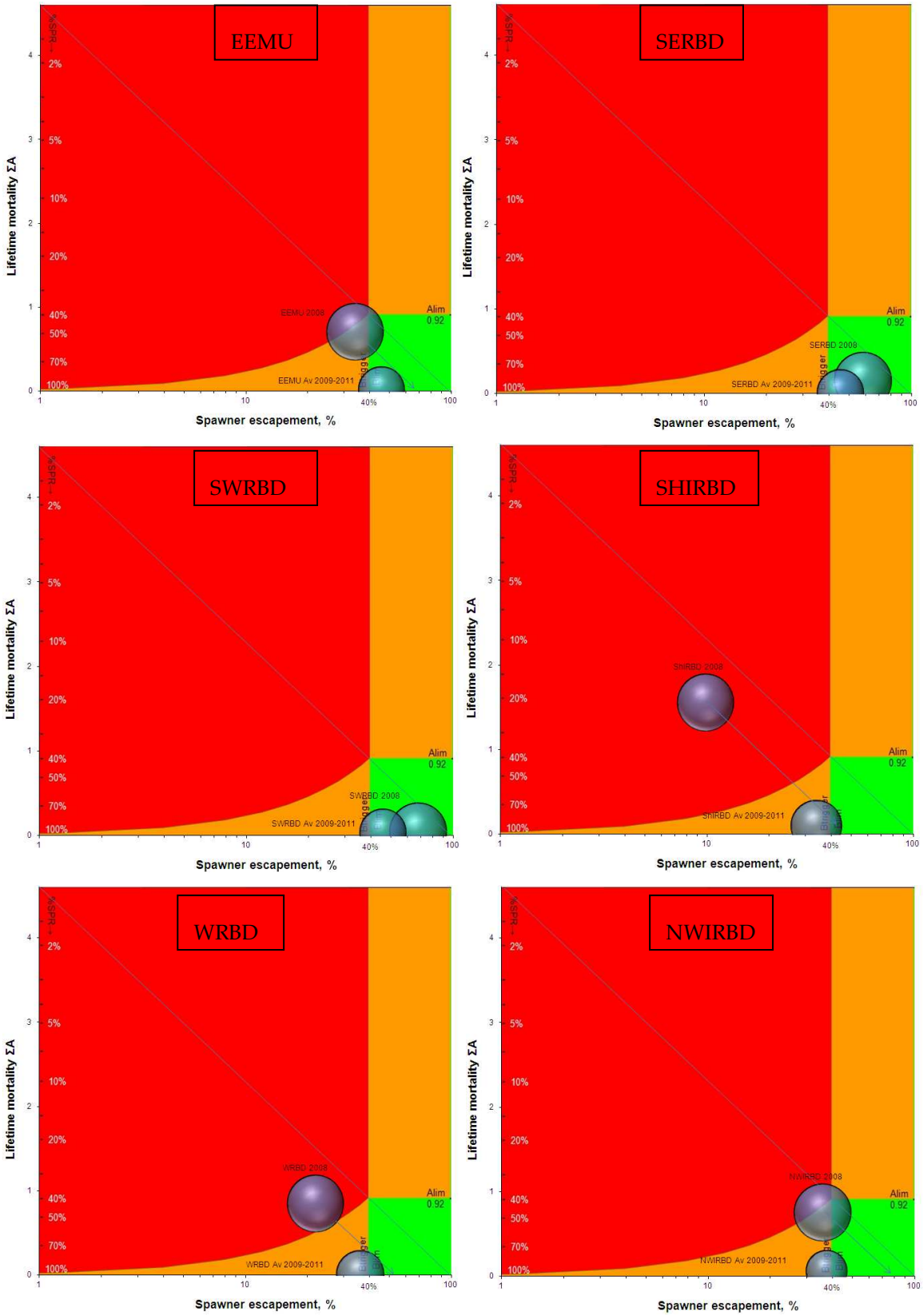

Figure 2.4: Status of the stock and the anthropogenic impacts, for each EMU in 2008 (average 2001-2007) and for the 2009-2011 period. For each, the size of the bubble is proportional to B_{best}, the best achievable escapement given recent recruitment, while the centre of the bubble gives the stock status relative to the targets/limits. The horizontal axis represents the stock status related to pristine conditions while the vertical axis represents anthropogenic mortality.

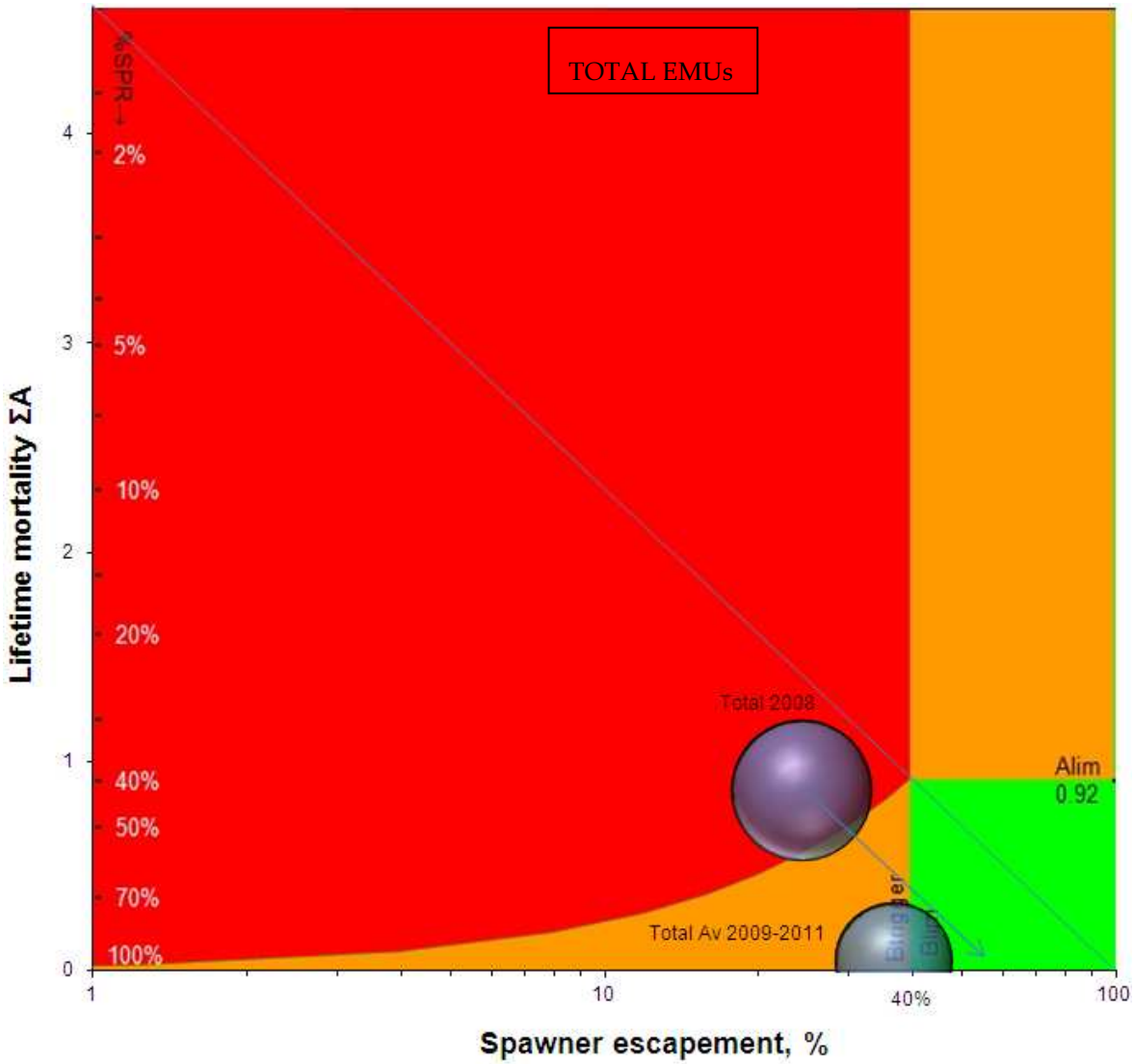

Figure 2.5: Status of the stock and the anthropogenic impacts, for total EMUs in 2008 (average 2001-2007) and for the 2009-2011 period. For each, the size of the bubble is proportional to B_{best}, the best achievable escapement given recent recruitment, while the centre of the bubble gives the stock status relative to the targets/limits. The horizontal axis represents the stock status related to pristine conditions while the vertical axis represents anthropogenic mortality.

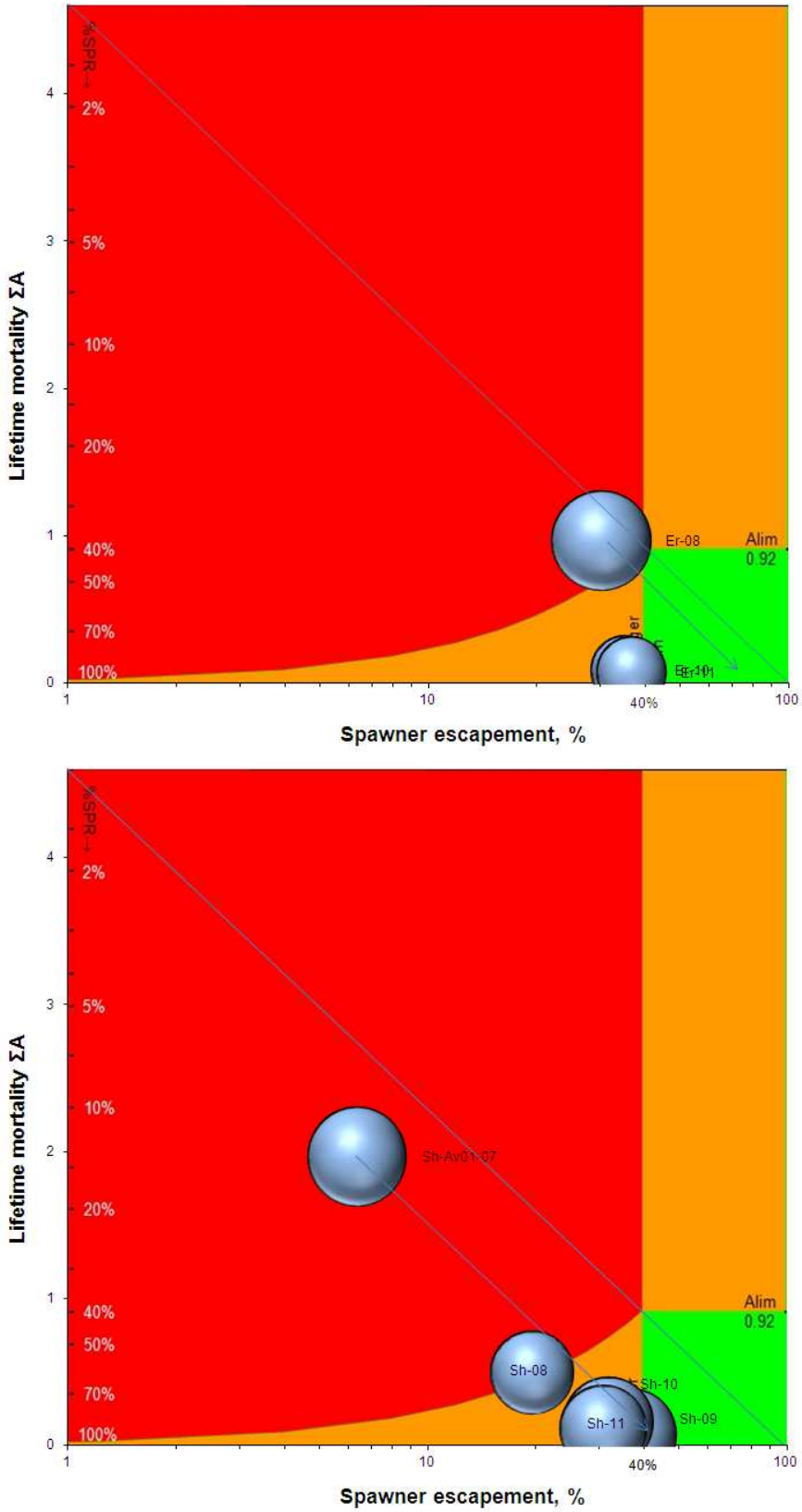

Figure 2.6: Precautionary diagrams for the Erne (top) and the Shannon (bottom) silver eel biomass. The downward movement of the bubble indicates lower mortality and to the right indicates increasing spawning stock biomass. The arrows indicate what effect the implementation of the EMP was expected to have.

2b Fishing

(b) The level of fishing effort that catches eel each year and the level of catches, and the reduction in effort and catches effected since the entry into force of the Regulation.

The first Management Action set out in the Irish Eel Management Plan (2008) was to have zero fishing mortality and reduce illegal capture and trade to as near zero as possible with a view to contributing to a recovery of the stock in the shortest time possible.

In May 2009, the Minister for Communications, Energy and Natural Resources passed two Bye laws closing the commercial and recreational eel fishery in Ireland. The option of re-opening the eel fishery will be considered in 2012, following a review of the data collated as a result of scientific sampling provided for in the National Eel Management Plan and international scientific advice.

- Bye-Law No 858, 2009 prohibits the issue of eel fishing licences by the regional fisheries boards in any Fishery District.

- Bye-law No C.S. 303, 2009 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2012.

In the transboundary areas 'The Foyle Area and Carlingford Area (Conservation of Eels) Regulations 2009' was created which prohibits the taking or killing of eels within the FCILC area. Since EU Commission ratification of the Ireland/UK NWIRBD transboundary plan, in the UK submitted plans, in March 2010, the fishery in the NI portion of the Erne was closed from April 2010 and remained closed in 2011.

There was no legally landed commercial or recreational catch in Ireland in 2009, 2010 or 2011 and in the Northern Ireland part of the NWIRBD transboundary plan in 2010 or 2011.

Table 2.4 gives the declared yellow eel landings from 2001 to 2011 and shows the closure of the fishery in 2009-2011.

Table 2.5 gives the declared silver eel landings from 2001 to 2011 and shows the closure of the fishery in 2009-2011. Table 2.5 also shows the pilot silver eel trap and transport programme on the River Shannon from 2001 to 2008.

Table 2.6 gives the fishing mortality rates and the reduction between 2008 and 2009-2011.

Illegal Fishing

Management reports submitted from each of the RBDS for each of the three years (2009-2012) confirmed low levels of alleged illegal eel fishing activity (Appendix 1). A number of instances of illegal eel fishing gear was reported or detected by fisheries protection staff, occurring chiefly around the traditional former commercial eel fisheries such as the Shannon (SHIRBD), Corrib (WRBD) and Erne (NWIRBD). However, available evidence indicates overall levels of illegal eel fishing activity were low over the three year period (2009-2011) since the closure of the fishery.

Table 2-4: Total declared catch for yellow eel for the river basin districts, the RoI portion of the NWIRBD and the NI part of the NWIRBD (data supplied by DCAL & AFBINI). NR = no reported data.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
EEMU	5500	7,806	6,060	5,420	841	953	1,487	4,448	0	0	0
SERBD	17,055	13,027	9,786	7,753	5,569	3,327	4,413	3,591	0	0	0
SWRBD	552	960	70	35	22	250	NR	0	0	0	0
SHIRBD	15,983	18,116	22,196	21,535	18,736	17,591	24,635	32,306	0	0	0
WRBD	22,126	15,043	23,415	21,142	17,851	18,276	17,922	12,410	0	0	0
NWIRBD*	4,743	8,911	NR	6,793	7,311	16,865	9,929	13,121	0	0	0
NWIRBD**	12,300	15,300	16,160	15,700	13,600	15,700	19,600	17,232	NR	0	0
NWIRBD***	17,043	24,211	16,160	22,493	20,911	32,564	29,529	30,353	NR	0	0
Total RoI	65,959	63,863	61,527	62,678	50,330	57,262	58,386	65,876	0	0	0
Total	78,259	79,163	77,687	78,378	63,930	72,962	77,986	83,108	NR	0	0

* RoI only

** NI only

*** Total NWIRBD

Table 2-5: Total declared catch for silver eel for the river basin districts, the RoI portion of the NWIRBD and the NI part of the NWIRBD (data supplied by AFBINI). NR = no reported data.

	2001	2002	2003	2004	2005	2006	2007	2008	'09	'10	'11
EEMU	2500	2,360	2,460	1,810	396	364	90	40	0	0	0
SERBD	0	2,004	1,218	800	260	840	0	318	0	0	0
SWRBD	0	0	0	35	22	250	0	1,060	0	0	0
SHIRBD	24,107	25,248	17,075	37,116	21,535	34,478	18,122	27,158	0	0	0
[1]Catch rel.	1,300 (5)	3,900 (15)	1,600 (9)	2,900 (8)	1,500 (7)	7,700 (22)	3,665 (20)	10,460 (39)	@	@	@
WRBD	9,581	14,386	12,596	17,849	14,624	23,971	16,541	13,797	0	0	0
NWIRBD*	28	31	NR	NR	NR	564	947	0	0	0	0
NWIRBD**	NR	NR	NR	NR	NR	NR	NR	0	0	0	0
NWIRBD***	28	31	NR	NR	NR	564	947	0	0	0	0
Total RoI	36,216	44,029	33,349	57,610	36,837	60,467	35,700	42,373	0	0	0
Total	36,216	44,029	33,349	57,610	36,837	60,467	35,700	42,373	0	0	0

* RoI only

** NWIRBD only

*** Total NWIRBD

[1] Catch at Killaloe (Shannon) which was released below the Hydropower Station; % of catch released in brackets

@ see Section 2c for silver eel trap and transport amounts

Table 2-6: Mortality rate table of fishing mortality (ΣF), anthropogenic mortality outside the fishery (ΣH) and the sum of anthropogenic mortalities, (ΣA = ΣF + ΣH) using the most recent data updates. Mortality rates are calculated using biomass and also converting to numbers. Fishing mortality includes raising factors for illegal and unreported catches. *F* in 2009-2011 does not take into account yellow eel fishing mortality on the stock prior to 2009.

	biomass						numbers					
	ΣF* 2008	**ΣH 2008**	**ΣA 2008**	**ΣF 2009-2011**	**ΣH 2009-2011**	**ΣA 2009-2011**	**ΣF* 2008**	**ΣH 2008**	**ΣA 2008**	**ΣF 2009-2011**	**ΣH 2009-2011**	**ΣA 2009-2011**
EEMU	0.68	0.03	0.71	0.00	0.01	0.01	0.45	0.02	0.47	0.00	0.01	0.01
SERBD	0.15	0.00	0.15	0.00	0.00	0.00	0.15	0.00	0.15	0.00	0.00	0.00
SWRBD	0.01	0.04	0.05	0.00	0.03	0.03	0.01	0.03	0.04	0.00	0.02	0.02
ShIRBD	1.29	0.26	1.55	0.00	0.09	0.09	0.72	0.14	0.86	0.00	0.1	0.1
WRBD	0.85	0.00	0.85	0.00	0.00	0.00	0.62	0.00	0.62	0.00	0.00	0.00
NWIRBD	0.58	0.18	0.75	0.00	0.05	0.05	0.36	0.19	0.55	0.00	0.05	0.05
Total	0.75	0.11	0.86	0.00	0.04	0.04	0.49	0.10	0.59	0.00	0.04	0.04

ΣF The fishing mortality rate, summed over the age-groups in the stock, and the reduction effected.

ΣH The anthropogenic mortality rate outside the fishery, summed over the age-groups in the stock, and the reduction effected.

ΣA The sum of anthropogenic mortalities, i.e. ΣA = ΣF + ΣH

2c Impacts from outside the fishery

(c) The level of mortality factors outside the fishery, and the reduction effected in accordance with Article 2(10);

Silver eel trap and transport programmes, to mitigate against Hydropower Station induced mortality, took place in the, Shannon (ShIRBD), Erne (NWIRBD) and Lee (SWRBD). As discussed in Section 5.3 of the National EMP Report (2008), it was not possible to define a timeframe to achieve the EU biomass target (40% of pristine SSB) with the proposed management actions (cessation of fishery, trap and transport), so an alternative target of timeframe to full recovery of recruitment was defined. With the management actions for 2009-2011, all EMUs, and Ireland as a whole, was expected to contribute to a recovery of recruitment at the 100 year timeframe or less. It was imperative that equivalent EU-wide action was taken at this level so as not to diminish the impact of Ireland's contribution. It was estimated that a recovery could only take place if anthropogenic mortality was reduced to below 15% of the level in 2008.

In both the Shannon and Erne catchments, anthropogenic mortality during 2009-2011 was reduced to as low as possible, by closing the fishery and transporting silver eels around the HPSs, and this is evident by examining the biomass data (Figure 2.6). The downward movement of the 2009-2011 bubbles indicates the reduced anthropogenic mortality and the left to right movement indicates the increase in silver eel biomass escaping. Neither catchment is achieving its EU target of 40%.

In the EMP, the objective set by the national WG on Eel was to aim to recover the stock in the shortest time practicable. Trap and Transport amounts of silver eel were set by agreement between DCENR, DCAL and ESB, with the 30% of the production in the Shannon and three fixed annual catch quota in the Erne for 2009, 2010 & 2011 (Table 2.6). Taken into account in setting these quotas were the estimated eel productions, recent past recruitment history, practicable feasibility and infrastructure/experience on each catchment.

The targets set in the Irish Eel Management Plan for the trap and transport of silver eels in 2009-2011 were as follows:

Table 2-7: Silver eel trap and transport targets and proportion of EU H achieved for the Rivers Shannon, Erne and Lee from 2009 to 2011

Shannon: ***Trap and transport 30% of the annual escapement***

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	not defined	30	0.045	95
2010	not defined	30	0.045	95
2011	not defined	30	0.045	95

Erne: Trap and transport the following*

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	22	36	0.092	200
2010	34	54	0.075	140
2011	39	63	0.05	100

**Erne Fishery not closed in N. Ireland in 2009*

Lee: Trap and transport 500kg of the annual escapement

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	0.5	34	0.007	80
2010	0.5	34	0.007	80
2011	0.5	34	0.007	80

The total amounts of silver eel trapped and transported in each of the three rivers in 2009, 2010 and 2011 are presented in Table 2.7. The separate detail sheets of the amounts transported from each site on each date are presented as an annex to the Science Report (Anon 2012 - Annex 1). The target was achieved in the R. Shannon is all three years. The target was not achieved in the Erne and was achieved in one of the three years in the Lee.

In the R. Shannon, the existing structures and experience in silver eel fishing contributed to the success of the programme. Combining the upstream fisheries with the fishery in Killaloe ensured that the 30% of the run target was achieved and also ensured a better spread of capture dates and high quality of eel.

In the R. Erne, the target was set as a fixed amount per annum based on the estimate of the run for 2001-2007 and an expectation that the silver eel production would remain high due to the history of recruitment in the 1990s. Both the experience and level of fishing effort increased on the Erne between 2009 and 2011 and this led to improved catches of eels for transport. Possible reasons for the target not being achieved are discussed later in the report and are also highlighted in the SSCE report (Section 7.3.3.3).

In the River Lee where there was no history of silver eel fishing, the trap and transport programme was undertaken with a view to capturing potential spawners in the areas above the hydropower facilities and releasing them downstream. The fishing in 2009 was hampered by unusually high floods and in 2010 by very low water levels. A different approach was employed in 2011 with fishing taking place by fyke net in July where a catch of 731 kg was taken and transported. Analysis of the silvering characteristics indicated that it was reasonable to assume that at least 68% (500kg) of the transported eels were silver.

Table 2-8: Total amounts (t) of silver eel trapped and transported in the Shannon, Erne and Lee, 2009-2011, and the success relative to the target set in the EMPs.

Catchment	Year	Target	Amount Transported (t)	Relation to target	Status
R. Shannon	2009	30% of run	23.730	32-35%	Achieved
R. Shannon	2010	30% of run	27.768	40%	Achieved
R. Shannon	2011	30% of run	25.680	39%	Achieved
R. Erne	2009	22t	9.383	43%	Not achieved
R. Erne	2010	34t	19.334	57%	Not achieved
R. Erne	2011	39t	25.252	65%	Not achieved
R. Lee	2009	0.5t	0.079	16%	Not achieved
R. Lee	2010	0.5t	0.278	56%	Not achieved
R. Lee	2011	0.5t	0.731	146%	Achieved
Total	2009		33.192		
Total	2010		47.380		
Total	2011		51.663		

2d The glass eel fishery and the fate of the catch

(d) The amount of eel less than 12 cm in length caught and the proportions of this utilised for all purposes such as restocking, direct consumption, aquaculture within the EU and outside the EU, export outside the EU.

There is no authorised commercial or recreational catch of juvenile eel in Ireland as fishing in Ireland for juvenile eel remains prohibited under the Fisheries (Consolidation) Act, 1959, (section 173). Fishing for juvenile eel is also prohibited under the eel conservation bye-laws introduced in 2009. There are currently no eel aquaculture facilities in Ireland.

Capture of glass eel, elver and bootlace eel is conducted by ESB staff chiefly at the ESB Hydropower Stations on the Shannon (Ardnacrusha, Parteen), Erne (Cathaleen's Fall) and Lee (Iniscarra) for the purposes of assisted upstream migration. This has been a long-term objective to mitigate against the blockage of the HPSs under ESB Legislation (Sec 8, 1935). On the Erne and Shannon, elver and bootlace eel are transported upstream from the fixed elver traps. These programmes outlined in the EMP were continued in 2009-2011. On the Erne, the distribution of elver throughout the catchment is by cross-border agreement between the ESB, IFI and DCAL.

Ramp or pipe traps were deployed at sites on a number of additional river systems including the Corrib, Erriff, Ballisodare, Liffey and Barrow systems to provide monitoring data regarding indicative glass eel/elver recruitment to these rivers (described in Chapter 3 of the SSCE report). Catches were typically small and were released upstream of the respective capture sites.

3 Implementation of EMP measures

Have all the foreseen measures been fully implemented as described within the adopted plan(s) pertaining to your national territory?

3.1 EU Regulation – Ireland's EMP

The EC Regulation (Council Regulation 1100/2007) for the recovery of the eel stock required Ireland to establish eel management plans for implementation in 2009. Under the EC Regulation, Ireland should monitor the eel stock, evaluate current silver eel escapement and post-evaluate implemented management actions aimed at reducing eel mortality and increasing silver eel escapement.

The Irish Eel Management Plan submitted to the EU on the 9th January 2009 and accepted by the EU in June 2009 outlined the main management actions aimed at reducing eel mortality and increasing silver eel escapement to the sea.

The four main management actions in the Irish Eel Management Plan were as follows;

- a cessation of the commercial eel fishery and closure of the market
- mitigation of the impact of hydropower, including a comprehensive trap and transport plan to be funded by the ESB
- to ensure upstream migration of juvenile eel at barriers
- to improve water quality

3.2 Scientific Eel Group/SSCE

The Irish Eel Management Plan outlines a national programme for sampling catch and surveys of local eel stocks. Appropriate scientific assessment and monitoring by the Fisheries Boards and the Marine Institute will monitor the implementation of the plans. In the Irish plan, provision was made for the establishment of a Scientific Eel Group (SEG) which was established by the Department of Energy, Communications and Natural Resources in March 2009.

The SEG was nominated by the Dept. of Communications, Energy and Natural Resources and appointed by the Minister and comprises scientific advisers drawn from the Marine Institute (MI), Central Fisheries Board (CFB), The Loughs Agency, the Electricity Supply Board and the Agriculture, Food and Biosciences Institute for Northern Ireland (AFBINI). Consultation with the Department of Culture, Arts and Leisure in Northern Ireland ensures the co-operation with Northern Ireland agencies to cover the specific needs of the trans-boundary North Western International River Basin District eel management plan. Although the scientists are drawn from these agencies, the advice from the SEG is independent of the parent agencies.

In 2010, the SEG was reconstituted as a Standing Scientific Committee for Eel (SSCE) under the Inland Fisheries Ireland legislation, Section 7.5 (a) of the 2010 Inland Fisheries Act. The purpose of the committee is to provide independent scientific advice to guide IFI in making the management and policy decisions required to ensure the conservation and sustainable exploitation of the Ireland's eel stocks. All scientific advice provided by SSCE will be considered as independent advice by IFI.

3.3 Reduction of Fishery – Management Action #1

Introduction

The first Management Action set out in the Irish Eel Management Plan (2008) was to have zero fishing mortality and reduce illegal capture and trade to as near zero as possible with a view to contributing to a recovery of the stock in the shortest time possible.

In May 2009, the Minister for Communications, Energy and Natural Resources passed two Bye laws closing the commercial and recreational eel fishery in Ireland. The option of re-opening the eel fishery will be considered in 2012, following a review of the data collated as a result of scientific sampling provided for in the National Eel Management Plan and international scientific advice.

- Bye-Law No 858, 2009 prohibits the issue of eel fishing licences by the regional fisheries boards in any Fishery District.

- Bye-law No C.S. 303, 2009 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2012.

In the transboundary areas 'The Foyle Area and Carlingford Area (Conservation of Eels) Regulations 2009' was created which prohibits the taking or killing of eels within the FCILC area. Since EU Commission ratification of the Ireland/UK NWIRBD transboundary plan, in the UK submitted plans, in March 2010, the fishery in the NI portion of the Erne was closed from April 2010 and remained closed in 2011.

Action 1a: Closure of fishery

All management regions confirmed a closure of the eel fishery for the 2009, 2010 and 2011 seasons with no commercial or recreational licences issued. In the transboundary region, there were no licences and no legal fishery in the Foyle and Carlingford areas from 2009 to 2011. There was also no commercial fishery in the Northern part of the NWIRBD in 2010 and 2011. Tables 2.4 & 2.5 give the catches from 2001-2008 and show zero catches in 2009-2011.

There were no data available on export trade. The level of illegal fishing encountered and reported by fisheries protection staff or other water users was relatively low.

Action 1b: Recreational Fishery

The legislation prohibits the possession of eel caught in Ireland and this extends to cover recreational angling. There was no legal recreational catch and rod angling for eel, even as by-catch during angling for other species, was on a catch and release basis.

Action 1c: Diversification of the Fishery

Some commercial fishermen were employed on a contract basis by ESB for conservation silver eel trap and transport. Former eel fishermen were also employed on some surveys of yellow and silver eel stocks as part of the national eel monitoring programme.

3.4 Mitigation of Hydropower – Management Action #2

Develop best practice document on the safe passage of eels through hydro-electric power stations and other barriers including water abstraction points.

Action 2a: Trap & Transport

The targets set in the Irish Eel Management Plan for the trap and transport of silver eels in 2009-2011 were as follows:

Shannon: Trap and transport 30% of the annual escapement

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	not defined	30	0.045	95
2010	not defined	30	0.045	95
2011	not defined	30	0.045	95

Erne: Trap and transport the following*

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	22	36	0.092	200
2010	34	54	0.075	140
2011	39	63	0.05	100

**Erne Fishery not closed in N. Ireland in 2009*

Lee: Trap and transport 500kg of the annual escapement

	catch target (t)	% of expected silver eel run	Proportion of EU H achieved – fishery closed	Approx. timeframe to recovery (y)
2009	0.5	34	0.007	80
2010	0.5	34	0.007	80
2011	0.5	34	0.007	80

The total amounts of silver eel trapped and transported in each of the three rivers in 2009, 2010 and 2011 are presented in Table 3.1. The separate detail sheets of the amounts transported from each site on each date are presented as an annex to the Science Report (Anon, 2012 - Annex 1). The target was achieved in the R. Shannon is all three years. The target was not achieved in the Erne and was achieved in one of the three years in the Lee.

In the R. Shannon, the existing structures and experience in silver eel fishing contributed to the success of the programme. Combining the upstream fisheries with the fishery in Killaloe ensured that the 30% of the run target was achieved and also ensured a better spread of capture dates and high quality of eel.

In the R. Erne, the target was set as a fixed amount per annum based on the estimate of the run for 2001-2007 and an expectation that the silver eel production would remain high due to the history of recruitment in the 1990s. Both the experience and level of fishing effort increased on the Erne between 2009 and 2011 and this led to improved catches of eels for transport. Possible reasons for the target not being achieved are also discussed in the SSCE report (Section 7.3.3.3).

In the River Lee where there was no history of silver eel fishing, the trap and transport programme was undertaken with a view to capturing potential spawners in the areas above the hydropower facilities and releasing them downstream. The fishing in 2009 was hampered by unusually high floods and in 2010 by very low water levels. A different approach was employed in 2011 with

fishing taking place by fyke net in July where a catch of 731 kg was taken and transported. Analysis of the silvering characteristics indicated that it was reasonable to assume that at least 68% (500kg) of the transported eels were silver.

Table 3-1: Total amounts (t) of silver eel trapped and transported in the Shannon, Erne and Lee, 2009-2011, and the success relative to the target set in the EMPs.

Catchment	Year	Target	Amount Transported (t)	Relation to target	Status
R. Shannon	2009	30% of run	23.730	32-35%	Achieved
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R. Erne	2009	22t	9.383	43%	Not achieved
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R. Erne	2011	39t	25.252	65%	Not achieved
R. Lee	2009	0.5t	0.079	16%	Not achieved
R. Lee	2010	0.5t	0.278	56%	Not achieved
R. Lee	2011	0.5t	0.731	146%	Achieved
Total	2009		33.192		
Total	2010		47.380		
Total	2011		51.663		

Action 2b: Quantify turbine mortality

Monitoring migrating silver eel, using acoustic tag telemetry, to determine migration routes and mortality at the hydropower stations has taken place on the Shannon between 2006 and 2011 and on the Erne in 2010 and 2011 (Table 3.2).

Shannon: Summarising the annual data gives mortality ranges of 16.6% to 25% and an overall average mortality of 21.15 $\pm$ 8% for 104 tagged eel arriving at Ardnacrusha HPS.

In the Eel Management Plan, a figure of 30% was used to account for the amount of eel potentially using the bypass route down the old river channel and around Ardnacrusha HPS. For 2009 – 2011, the actual amount of eels estimated to bypass were used in determining the escapement (59%, 4.4% & 12.5% respectively). A general figure for eels estimated to use the bypass in recent years is 17.8% (Section 7.2.2).

Erne: Summarising the data from 2009 to 2011 (see Section 3.2) gives mortality ranges for Cliff HPS of between 6.9% and 8.5% and an average of 7.8% $\pm$ 5% and mortality for Cathaleen's Fall of 22% (9 tags) in 2009. In 2010 and 2011, one turbine was removed for renovation and therefore the mortalities were lower at 6.1% and 7.7%. It is likely that these will at least double when both turbines are operational and this should be assessed in the next three years.

Currently there is no solid information about the proportions of eel that migrate via spillways compared to via the turbine passages. There may be selective migration towards the spillways,

especially at Cliff, and this may be indicative of safe passage and help to explain the low HPS mortality levels observed on the Erne. The HPS mortality and bypass needs additional work on the Erne to clarify.

Table 3.2: Summary mortality data for acoustic telemetry on the Shannon and Erne.

	Year	Number of tagged eel	Mortality *	Number of tagged Eel	Mortality **	
Shannon	2006					
	2007					
Average	2008-2011	104	21.15			
			Cliff		Cathaleen's Fall	
Erne	2009	13	7.7	9	22*	*Low no. of tags
	2010	29	6.9	26	7.7	one turbine
	2011	60	8.5	49	6.1	one turbine
Average			7.8		16.5	estimate for two turbines.

* Ardnacrusha on the Shannon; Cliff on the Erne

** Cathaleen's Fall on the Erne

Action 2c: Engineered Solutions

Over the period 2009-2011 mitigation of HP induced eel mortalities has been addressed primarily through the expansion of trap and truck measures on the Shannon, and initiation of truck and trap measures on both the Erne and Lee river systems. The potential for engineered solutions to contribute to improved silver eel escapement through HP facilities and defray the ongoing costs of trap and truck programmes is recognised by the ESB and is being actively considered in conjunction with various technologies trialled to date (see below). Future application of new technologies will require further analysis to determine their efficacy and suitability at different facilities and flow regimes, in advance of significant engineered modification of existing HP facilities.

Action 2d: Other Solutions

Migromat®

Evaluation of the capacity of a commercially available biomonitoring tool (Migromat®) to predict eel migration peaks was undertaken by NUI Galway researchers at Killaloe (2008–2010). The Migromat® system involves analysis of, with special software, activity patterns of PIT tagged eels

contained in special tanks equipped with PIT tag detectors between chambers in the tanks. The Migromat® equipment (Figure 3.1) was located at the ESB owned Pier Head site, located on the western bank of the River Shannon 0.5km upstream of the Killaloe eel weir. The experimental evaluation of the technology involved collaboration between Irish, French and German partners and detailed results are being presented elsewhere.

Figure 3.1: Migromat® eel biomonitoring equipment at Pier Head, Killaloe during 2008-2010.

The Killaloe Migromat® research involved evaluation of the prediction capacity of the technology, with respect to daily catch records at the Killaloe weir. The analytical protocol assumed existence of a hypothetical ("run of the river") hydropower station at Killaloe Bridge. The evaluation involved analysis of catch data, as a proxy for numbers of eels approaching the hypothetical power station, and the presumed capacity of station management to reduce eel turbine passage mortality by various responses (e.g. temporary shutdown). The results indicated that this technology was not very effective at the experimental location and that, where data allows, predictive modelling along the lines undertaken in respect of Killaloe would allow for more accurate prediction of migration peaks at Irish hydropower stations. Models developed by NUI Galway, using detailed data compiled during 2008–2012, and historical records will provide a better capacity for prediction of the effects of hydrometric/spillage patterns on silver eel migration. Increased knowledge of the environmental factors determining peak migration events will facilitate silver eel conservation.

Deflection Technology and bypasses

Preliminary experiments using eel deflection technologies (light, infrasound) were undertaken on the lower River Shannon in 2011/2012 and this work will be extended in 2012/2013 with a view to evaluating options for development of 'engineered solutions' to the problems faced by downstream migrating silver eels. Light deflection experiments that were undertaken on the Killaloe eel weir (Figure 3.2) involved evaluation of eel responses with respect to catches made in each of a series of nets during periods when a light array was either switched on or off. Clear evidence of eel deflection, in response to light, was demonstrated in the 2011 research.

DIDSON™ (Dual Frequency Identification Sonar) camera observations on downstream natural migrating silver eels at the Pier Head site on the Shannon and Lower River Erne, Roscorr Bridge,

have been linked to daily silver eel catches at these sites. Work is currently in progress on the evaluation of DIDSON™ technology for quantification of the numbers and biomass of eels migrating via the Ardnacrusha headrace canal. Ongoing research by NUI Galway and ESB, on analysis of eel responses to spillage, involves use of telemetry and experimental fishing. However, the preliminary results from DIDSON™ silver eel surveys at Clonlara suggests that use of this technology will permit better predictive capacity in respect of eel migration route selection at sites such as the Parteen Regulating Weir.

Figure 3.2: Experimental use of a light array and DIDSON™ camera at Killaloe for investigation of silver eel responses to light.

Action 2e: New turbine installations

There has been limited interest in development of small-scale hydropower facilities in Ireland over the period 2009-2011 (with fewer than 10 developments nationally over the period). As a prescribed body under the Planning Acts, Inland Fisheries Ireland (IFI) comments and provides advice on all developments which may impact or impinge on fisheries or fisheries habitat. Guidelines exist for the planning, design, construction and operation of small-scale hydroelectric schemes with regards to fisheries protection (Anon, 2007).

3.5 Ensure Upstream Migration at Barriers – Management Action #3

Action 3a: Existing barriers (including small weirs etc.)

Eels in common with other fish species may be severely impacted by barriers or obstructions leading to fragmentation of habitat and disrupting upstream migration. These can have a significant impact in reducing the productive capacity of a catchment. To investigate the impact of barriers on various fish species IFI (formerly the Central Fisheries Board) initiated a barrier impact assessment case study in 2007 on the Nore catchment using field data collected by the Southern Regional Fisheries Board. In this study 508 structures were identified, photographed and measurements were taken. This study initially concentrated on salmon but in 2010 the technique was modified into a multispecies assessment (Ryan, 2010). In particular the identified structures were evaluated for eel pass ability. A total of 55 barriers were classified as impassable with a total

of 5.5% of the Nore wetted area removed for eels. A further 34 barriers were classified as 'High Risk', representing a potential 18% of the wetted area. By taking into account the presence of impassable and high risk barriers on the Nore catchment it changes the current eel escapement estimate (2008) from 2,695kg to 2,097kg thereby reducing the % escapement from 70% to 54%. To further these investigations IFI established a National Barrier Group in 2011; this group is building on the earlier work in developing a standardised assessment of barriers nationally and is currently preparing a survey sheet and methodology. The long term aim is to develop a national database of barriers for rating fish passability which in turn will provide information to target mitigation measures at the most significant obstructions.

As part of these ongoing studies and work programmes the Eel Monitoring Programme in IFI undertook a desk study to identify potential obstacles within a catchment using geographical databases (OSI Discovery and 6inch maps), aerial photographs (courtesy of Dr. Martin O'Grady, IFI) and satellite images (Google Earth). The objective of this study was to remotely locate potential obstacles to elver migration. The top 20 eel productive catchments (based on their historic potential) were identified and the first 20kms of river channel from the high water mark were examined. A report containing detailed information is available for these obstacles and will be included in the IFI Eel Monitoring annual report. Details include the source of information, coordinates, maps, and the type of structure (e.g. weir, ford etc.). A total of 125 potential obstacles were found (Table 3.3; SSCE report, 2012). Most potential obstacles were found on the Shannon, Boyne, Barrow and Liffey catchments. These structures will need to be evaluated in the field using the multispecies barrier assessment form (Table 3.4).

In Northern Ireland the Northern Ireland Environment Agency (NIEA) WFD hydro-morphology group have been trialling the new Scottish and Northern Ireland Forum for Environmental Research (SNIFFER) assessment tool in ongoing surveys but as eel are considered capable of finding their way round most conventional barriers they are not including them in their assessments. In the NE River Basin District (Lagan and Quoile) the Agri-Food and Biosciences Institute have taken a different approach: rather than walk the rivers and assess all barriers they are trialling a quick assessment of setting fyke nets in the most upstream lakes. Length / frequency and age data of eels are collected. If eels are present with a "conventional" LF- and age profile then the river system is deemed passable to that point. So far, this technique has worked well. If there were no eel, further investigations would be triggered. An abnormal age profile (e.g. high numbers of older eel and absence or reduced numbers of younger age classes) indicates some land locking (e.g. Castlewellan lake where there are controlled outlets). It is intended to continue with this work in 2012.

In the cross-border Foyle and Carlingford area, the Loughs Agency area has undertaken a prioritisation assessment of 78 barriers using a version of the SNIFFER assessment tool. In addition under an EU INTERREG IVA project a Ph. D student is currently investigating barriers and salmon migration on the River Mourne and it is planned do similar work on eels and the potential for impact of barriers between now and 2015.

Table 3.3: Ranking of the top twenty catchments based on historic eel production potential.

District	Name	RBD	EMU	Prod kgs	Number of potential obstacles
Limerick	Shannon (River)	SHIRBD	SHIRBD	188,849	30
Ballyshannon	Erne (RoI NI)	NWIRBD	NWIRBD	108,185	2
Galway	Corrib (River)	WRBD	WRBD	103,062	2
Ballina	Moy (River)	WRBD	WRBD	45,962	1
Drogheda	Boyne (River)	ERBD	EEMU	10,940	17
Ballyshannon	Drowes (River)	NWIRBD	NWIRBD	10,566	5
Kerry	Laune (River)	SWRBD	SWRBD	10,544	4
Dublin	Liffey (River)	ERBD	EEMU	10,153	12
Sligo	Garvogue (River)	WRBD	WRBD	9,610	5
Sligo	Ballysadare (River)	WRBD	WRBD	7,768	2
Waterford	Suir (River)	SERBD	SERBD	4,842	3
Loughs Agency	Foyle (RoI NI)	NWIRBD	NWIRBD	4,893	2
Bangor	Owenmore (River)	WRBD	WRBD	4,167	2
Waterford	Nore (River)	SERBD	SERBD	3,862	0
Waterford	Barrow (River)	SERBD	SERBD	3,689	24
Lismore	Blackwater (River)	SWRBD	SWRBD	3,614	1
Limerick	Fergus (River)	SHIRBD	SHIRBD	3,386	5
Cork	Lee (River)	SWRBD	SWRBD	3,174	3
Connemara	Ballynahinch (River)	WRBD	WRBD	2,951	2
Kerry	Currane (River)	SWRBD	SWRBD	1,449	3

Action 3b: New potential barriers

For Ireland, the approach being taken is described in Sections 3.5.2 & 3.5.3 of the Irish Eel Management Plan and in Section 2.5.4.1 of the SSCE report (Anon, 2012).

For N. Ireland see Section 2.5.4.2 of the SSCE report.

Action 3c: Assisted migration and stocking

Assisted upstream migration takes place at the ESB Hydropower Stations on the Shannon (Ardnacrusha, Parteen), Erne (Cathaleen's Fall), Liffey and Lee. This has been a long-term objective to mitigate against the blockage of the HPSs under ESB Legislation (Section 8, 1935). On the Erne and Shannon, elver and bootlace eel are transported upstream from the fixed elver traps. On the Erne, the distribution of elver throughout the catchment is by cross-border agreement between the ESB, IFI and DCAL. These programmes, which were outlined in the EMP, were continued in 2009-2011 (Chapter 3, SSCE report).

Surplus recruits were not identified in the 2009-2011 period to facilitate a stocking programme and it is not envisaged to purchase foreign glass eel during the next three years. Should this take place, notice should be taken of the guidelines in ICES (2008) and the risk assessment/benefit analysis as proposed in ICES (2011) should be undertaken.

Table 3.4: Example of the multispecies barrier assessment form for field surveys.

River System						**River Basin District:**				**EPA_Code:**		**Sheet ___/___**
River Tributary Name from 1:50000 OS on site:						**Location of GPS Reference (on site):**						
River Tributary Name (from GIS 6" at HQ)						**Location: GIS Ref (at HQ):**						
Townlands (GIS at HQ):						**Antecedent Conditions**		1	2	3	4	5
Nature of Obstruction: Bridge Apron **BA**; Weir **W**; Rock/Bedrock **R/B**; Culvert **C**; Ford **F**; Hydro Scheme **HS**; Bridge no apron **BNA**; Natural **N**; Sluice **S**; Other **O**;												
BA:	W:	RB:	C:	F:	HS:	BNA:	N:	S:	O:			
Material Type: Mass Concrete **MC**; Masonry **M**; Rock/Bedrock **R/B**; Ford Material **FM**; Timber **T**; Natural Bed Material **NBM**; Corrugated steel **CST**; Smooth steel **SST**; Other **O**												
MC:	M:	R/B:	FM:	T:	NBM:	CST:	SST:	O:				
River Conditions During Survey		Drought	Low Flow	Mod Flow	Spate	Flood Flow	**Depth high water mark d/s structure:**					
River Channel Width (metres) just d/s of Obstruction:			**Depth d/s structure (centre):**		**River Channel Width (metres) just u/s of Obstruction:**			**Depth u/s obstacle (centre):**		**Total width of Obstacle (metres):**		
Max Height of Obstruction substrate (m):				**Max Height of obstruction from water level (m):**					**Length of structure (culvert, ford; m):**			
Centre Height of Obstruction substrate (m):				**Centre Height of obstruction from water level (m):**								
(2) Profile (slope)		Vertical:	Steep:	Modest:	Gentle:	**Length of Slope :**			**Water Flow Through obstacle**			
									Low	Mod.	Fast	Rapid
No of Vertical Steps				**Height of steps**				**No of Horizontal lengths**				
Pipe/ Culvert Barrier (Specific)		**Pipe Position in regards to Water**			**(4) Edge Effect (easier passage along the barrier):**		**(5) Existance of alternative pathway**		Distance from structure	**Roughness of structure**		
		Below	Level With	Above						Smooth	Rough	Very Rough
					Y:	**N:**	**Y:**	**N:**				
Is Fish pass provided		Yes:	No:	Denil:	Pool:	Other:	**Target species**		**Position of fish pass to channel**			
Can fish readily pass		Not at all:		At low Flow:		At Moderate flow:		At High flow:		**% water thru fish pass:**		
Is Water diverted through HeadRace		Yes	No	**Is Water diverted through Tail Race**		Yes	No	**Pool/ Resting area d/s**	Max Depth:	Length:	Distance from structure:	
If water diverted, are screens present			**Risk of passage to fish species**	**Fish \ Risk**		**No**	**Low**	**Moderate**	**High**	**Impassable**	**Plunge pool at structure:**	
Headrace	Yes	No		Salmonid								
Tailrace	Yes	No		Eel							**Structure:**	
Interbar Space (cm):				Lamprey							Maintained	Abandoned
Position to channel:				Other (Specify):								
Any other relevant Details:												
Photographs No's		d/s		u/s		Profile		Others:				
Surveyed By:								**Date:**				

Legislation relating to fisheries, fish passage and abstraction

Ireland

Conservation, management and development of Ireland's inland fisheries resource (including eel) is the responsibility of Inland Fisheries Ireland which was established on 1st July 2010, following the amalgamation of the Central and Regional Fisheries Boards as provided for under the Inland Fisheries Act (No. 10 of 2010).

In accordance with Ireland's Eel Management Plan which was submitted to the EU in January 2009, the following Conservation of Eel fishing bye laws were enacted in May 2009:-

- Bye-Law No 858, 2009 prohibits the issue of eel fishing licences in any Fishery District.
- Bye-law No C.S. 303, 2009 prohibits fishing for eel, or possessing or selling eel caught in a river in the State.

The Electricity Supply Board (ESB) has statutory responsibility for the management and preservation of fisheries throughout the Shannon catchment as well as fisheries responsibilities on the Erne, Lee, Liffey and Clady/Crolly which are impounded by large-scale hydropower facilities. Relevant legislation includes:- the Electricity Supply Act (1925 and 1945), the Shannon Fisheries Act (No.4 of 1935; and the Shannon Fisheries Act (No. 7 of 1938).

The primary fisheries legislation in relation to hydropower dams is provided in Part 8, Chapter 5 of the Fisheries (Consolidation) Act 1959. In addition to the 1959 Act the Fisheries Act 1980 charged the Fisheries Boards with the protection, conservation and management of fisheries (Section 18). The Fisheries (Amendment) Act 1999 further expanded this remit to include Sustainable Development of the Inland Fishery Resource (this included *inter alia* other species of fauna and flora, habitats and the biodiversity of inland water ecosystems (Section 8(1) (i)). Consideration must also be given to protection of fisheries afforded by other relevant legislation including the Water Framework Directive, Habitats Directive and other EU legislation.

As a prescribed body under the Planning Acts, Inland Fisheries Ireland comments and provides advice on all developments which may impact or impinge on fisheries or fisheries habitat. Guidelines exist for the planning, design, construction and operation of small-scale hydroelectric schemes with regards to fisheries protection (Anon, 2007). There has been limited interest in development of small-scale hydropower facilities in Ireland over the period 2009-2011 (with fewer than 10 developments nationally over the period).

The legislation relating to fish passage requires that every dam in or across any salmon river shall be constructed as to permit and allow, in one or more parts thereof, the free and uninterrupted migration of all fish at all periods of the year, (Section 115 subsection 2 and 3) of the Fisheries (Consolidation) Act 1959. Fish passes must be approved individually by the Minister for Communications, Energy & Natural Resources, (1842 Act, Section 62/63). Good practice requires that fish passes be capable of being negotiated by fish without undue effort, should not expose the fish to risk or injury, and be easily located by the fish. Section 116 relates to fish passage over dams and requires free passage of fish as in Section 115. There is provision within Section 116 for penalties to be imposed and this section is useful when operators fail to comply with a notice from the Minister.

Upstream passage of juvenile eel, migrating as either elver or juvenile "bootlace" yellow eel, requires a fundamentally different approach to that for upstream migrating adult "swimming" fish such as salmon, trout or coarse fish. Therefore, traditional upstream passes designed for salmon, such as pool passes or Denil type ladders are largely ineffective for eel.

The primary aim in the design of upstream eel passes is to provide suitable conditions to allow the ascent of a hydraulic drop, natural or man-made, or where ascent may be difficult and upstream

recruitment rendered sub-optimal, such as at a road culvert. Eels are incapable of jumping, or swimming through strong laminar flows, so vertical falls of more than 50% of their body length (an elver is approximately 75mm in length) represent a barrier to upstream migration (Knights & White 1998). However, they are adept at exploiting boundary layers and rough substrates which can be utilized in eel pass design. Solomon & Beach (2004) presented a comprehensive review of the design of eel and elver passes including facilities based on ramps with substrate, pipe passes, lifts and locks, easements or complete barrier removals. This important manual is available from the Environment Agency, UK.

A site specific approach should be taken in relation to addressing downstream passage when evaluating the impact of existing installations and proposing mitigating measures. The Environmental Impact Assessment for any new barriers and/or turbine installations should include an evaluation of their potential impact on direct and indirect mortality of silver eel and should also be included in any catchment based plans for the management of eel stocks.

N. Ireland

Eel Fisheries legislation, fish passage, and water abstraction in NI

The river basin eel management plans drawn up under the EU eel regulation were incorporated into Northern Ireland law with the enactment of the Eel Fishing Regulations (Northern Ireland) 2010. (*Statutory Rules of Northern Ireland 2010 no 166).* Under these regulations, which came into operation on 1st June 2010, all commercial eel fishing is prohibited in Northern Ireland with the exception of in Lough Neagh and the existing eel weirs on the Lower River Bann.

Fishing for trap-and transport of silver eel past the River Erne hydro-electric stations is permitted under special permission given under section 14 of the NI fisheries act (1966), as can be any fishery activity for the purposes of research or monitoring of stocks.

In relation to barriers to migration, legal provisions exist in the 1966 fisheries act to enforce fitting of eel passes to weirs or other man made barriers built after 1842. For weirs built before that date, construction of a pass can be legally enforced where the weir is modified, repaired or water abstracted for a changed use (e.g. hydropower generation).

Currently there is significant interest in new small scale hydropower in NI, encouraged by the premiums payable for electricity generated without the use of fossil fuels. New hydropower constructions are subject to planning approval, which also requires that water abstraction licenses fishery protection and passage requirements required by fisheries legislation are in place. Gradients and flow requirements mean that many of the new hydro developments are on existing or former mill sites, on rivers with relatively minor interest for eel.

3.6 Improve water quality – Management Action #4

Action 4a: Compliance with the Water Framework Directive

The improvement of water quality in Ireland is primarily being dealt with under the workprogramme for the implementation of the Water Framework Directive (WFD). The objectives of the Water Framework Directive (WFD) are to protect all high status waters, prevent further deterioration of all waters and to restore degraded surface and ground waters to good status by 2015. A major programme is under way to achieve this target, with monitoring beginning in Dec 2006. National regulations for implementing the directive were put in place in 2003. The WFD reporting and monitoring runs on a six year cycle, so the next opportunity to assess whether water quality is improving will be with the publication of the second River Basin Management Plans (RBMP) in 2015.

In the interim period, the Environmental Protection Agency (EPA) compile statistics on water quality in Ireland, the most recent of which covers the period 2007-2009 (McGarrigle et al. 2011). The ecological quality of monitored water bodies was determined using a combination of biological and physicochemical metrics. 1550 river water bodies were included in this report, with 52% being classified as being of high or good ecological status. 26 river sites were classified as having bad ecological status. 105 (47.3%) lakes were of high or good status with the majority, 38.3 per cent, being in the latter category. A total of 121 transitional and coastal water bodies were assessed between 2007 and 2009 for WFD status classification. Of these, 55 were classed as either high (16%) or good (30%) ecological status with the remainder being classed as moderate or worse. Sewage and diffuse agricultural sources continue to be the main threat to the quality of Ireland's waters.

The Irish EPA reports (summarised above) refer to waterbodies within seven RBD's (Eastern, Neagh Bann, North western, South Eastern, Shannon, South Western, Western). The Neagh Bann, Shannon and North Western IRBD's are transboundary, in that there are portions of them in Northern Ireland. Only a small portion of the Shannon IRBD is in Northern Ireland, while the Northern Irish catchments in the Neagh Bann RBD are not included in the Irish Eel Management reports. Therefore, the implementation of the WFD in the Northern Irish part of the North Western RBD is also of interest in this report, as it is the major international RBD which is considered in this eel management report. Interim classification of the ecological quality of the north western IRBD (north of the border) indicates that the majority of waterbodies are of high, good or moderate quality. However, it is noted that 60% of rivers, 81% of lake area, all transitional waters and all coastal waterbodies, will need to have their status improved to meet the requirements of the WFD (NIEA NSSHARE 2008).

WFD monitoring – fish.

Inland Fisheries Ireland (previously the Central and Regional Fisheries Boards) has been assigned the responsibility by the EPA for delivering the fish monitoring element of the WFD in Ireland. Eel are included in the WFD (fish) monitoring of rivers, lakes and transitional waters. While this data will be included in the assessment of the second cycle of WFD reporting in 2015, interim reports are available (www.wfdfish.ie). The most relevant of these interim reports include the summary reports for 2007-2009 (Kelly *et al*. 2010), and the summary report for 2010 (Kelly *et al*. 2011). The determination of ecological quality of fish in rivers is under development, but is based on the Fisheries Classification Scheme 2, or "FCS2". These metrics are currently being intercalibrated across Europe. The determination of ecological quality of fish in lakes is based on the metrics outlined in FIL2 (Kelly *et al*. 2008, 2012). The ecological determination of ecological quality of fish in transitional waters is based on the Transitional Fish Classification Index or "TFCI". The tool uses the Index of Biotic Integrity (IBI) approach broadly based on that developed both for South African waters and the UK, with a total of ten metrics used in the index calculation (Harrison and Whitfield 2004; Coates *et al*. 2007). A summary of the results of the fish monitoring from 2007-2009 and 2010 and shown in Table 2.5.

Eel are fairly ubiquitous across Ireland and were found in nearly all the sites sampled for the WFD between 2008 and 2010. In 2008, eel were recorded in 31 out of 32 lakes, 63 out of 83 river sites and 32 out of 42 transitional water bodies sampled. In 2009, eel were recorded in 23 out of 23 lakes, 43 out of 52 river sites and 22 out of 23 transitional waters. In 2010, eel were recorded in 22 out of 25 lakes 33 out of 43 river sites and 22 out of 25 transitional waters. Overall, in the three years, eel were recorded in 84% of sites sampled.

In the international NWRBD, (not included in the summary above), thirty river waterbodies were classified for fish in between 2007-2010. Fourteen sites had Eel present. Surveys were carried out using WFD Fully quantitative electrofishing methods on shallow wadeable sites and a multi-

method approach on deeper sites. Classification was based on professional judgement. Four lakes were surveyed in the NWRBD in 2010 by IFI in collaboration with AFBI on three of the sites. Eels were present at all four sites.

Table 3.5: Interim assessment of Irish waterbodies according to fish metrics, measure in 2007-2009 and 2010 as part of the WFD monitoring program carried out by Inland Fisheries Ireland (Kelly et al. 2010; Kelly et al. 2011).

Period		No. of sites surveyed	% High	% Good	% Moderate	% Poor	% Bad
2007-2009	**Rivers**	134	7.5	49.3	40.3	2.2	0.7
	Lakes	70	14.0	30.0	49.0	6.0	1.0
	Transitional water	72	1.4	51.4	31.9	12.5	2.8
2010	**Rivers**[1]	43	9.0	39.0	42.0	0.0	0.0
	Lakes[1]	25	24.0	32.0	4.0	4.0	
	Transitional water	25	0.0	52.0	36.0	8.0	4.0

[1]Not all the sites surveyed in 2010 have yet been assigned an ecological quality status.

Fish kills

The number of fish kills collated by the EPA between 2007 and 2009 was 72 (McGarrigle *et al*. 2011). This compares with 122 in 2004-2006 and 147 in 2001-2003. The lowest number of annual fish kills (16) was reported for 2009 while 22 and 34 respectively were documented in 2007 and 2008. The CFB/IFI record a total of 38 fish kills in 2010 (CFB 2010; IFI 2010). While none of these fish kills refer specifically to eel, it is likely that where conditions result in a kill of any fish species, there is likely to be detrimental impacts on all species in the waterbody. The data suggest that fish kills are becoming less common in the last decade.

Action 4b: Fish Health and biosecurity issues

Toxins

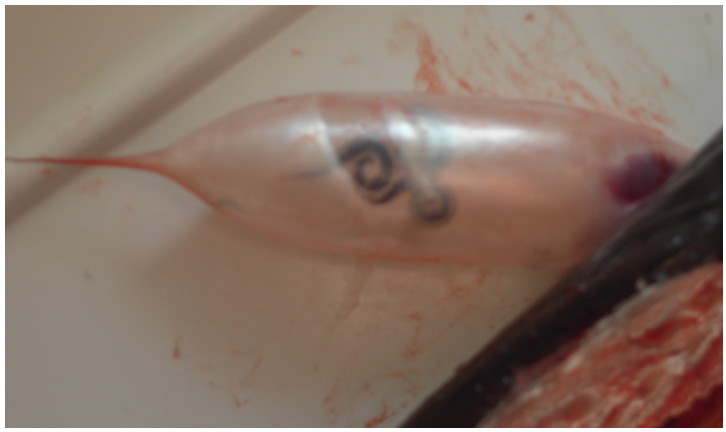
In recent years WGEEL has discussed the risks of reduced biological quality of silver eels. The reduction of the fitness of potential spawners, as a consequence of specific contaminants and diseases, and the mobilization of high loads of repro-toxic chemicals during migration, might be key factors that decrease the probability of successful migration and normal reproduction. An increasing amount of evidence has been presented indicating that eel quality might be an important issue in understanding the reasons for the decline of the species (ICES 2010). WGEEL reports (2007-2011) contain an overview and summary of a variety of reports and data on eel quality, which can be accessed through the ICES website.

High levels of contamination in eel are reported from Belgium, France, The Netherlands and Germany (ICES 2011). In some cases, levels were so high that immediate actions had to be taken

and fisheries were closed as a human health measure. The occurrence of persistent chlorinated and brominated organic contaminants in the eel in Irish waters has recently been investigated (McHugh *et al*. 2010). Samples were taken from five Irish catchments (River Suir, Lough Conn, River Corrib, River Fane and Burrishoole) in October and November 2005 and confirmatory sampling also took place in Burrishoole in July 2007. The analysis looked at levels of dioxins, furans, polychlorinated biphenyls (PCBs), brominated flame retardants (BFRs) and chlorinated pesticides in eel muscle tissue. Elevated dioxins (especially octa-chlorinated dioxin (OCDD)) were found in eels from the Burrishoole catchment. The authors propose that this would strongly suggest point source influences at this location. Samples are currently being analysed to follow up on this. With the exception of higher substituted dioxins in three samples from the Burrishoole catchment, persistent organic pollutant (POP) levels in general were low in eels from Irish waters compared to those in other countries. Data from Santilo *et al*. (2005) confirm that bioaccumulation of toxins in Irish eel is not significant.

The EPA carried out surveillance monitoring in 2007-2009 of 180 river sites and 76 lake sites for what are known as dangerous substances i.e. priority substances and priority hazardous substances. Monitoring was undertaken at each site with a frequency of 12 times per year once the programme commenced in mid 2007. Generally, the occurrence of environmentally significant metals was found to be low in Ireland. In addition, the levels of priority pollutants (plant protection products, biocides, metals and other groups such as combustion byproducts, polyaromatic hydrocarbons (PAHs), and the flame retardants polybrominated diphenyl ethers (PBDEs)) were generally very low with very few instances of exceedance being found (McGarrigle *et al*. 2011). This data confirms that bioaccumulation of toxins of eels in Ireland is likely to be less significant than that observed in many other EU countries.

Anguillicoloides crassus was first recorded in 1997. By 2009, it was estimated that at least 70% of Ireland's wetted area contained *A. crassus* (Irish Eel Management Plan, 2009) and it is predicted to continue to spread. IFI are examining the extent of *A. crassus* distribution using the eel monitoring programme together with the Water Framework Directive surveys (see Chapter 6.4 of SSCE report).



EU EELIAD

The EU Eeliad project is a research initiative funded under the EU's 7th framework programme, and involving twelve European research institutes. The aim is to investigate the ecology and biology of European eels during their marine migrations, and how these relate to eel condition and population of origin. Work is ongoing in this project. WP4 (eel quality) is the work that is of most relevance in terms of water quality and resulting eel quality, and the deliverables include:

- Assessment of quality and variability of eels in different rivers
- Evaluation of biological and ecological characteristics of eels that contribute to production, escapement and migration success
- New molecular tools for determining the level of infection/pollutant load of eels

A number of migrating silver eels were tagged in Ireland with both Pop up Satellite Archival Tag (PSATs) and Implantable G5 drifter tags (IDTs) in 2008, 2009 and 2010. Large silver eels were selected from different parts of the country taking into account catchment of origin regarding the known presence or absence of the swim bladder parasite *Anguillicoloides crassus*. The selected location for the tagging and release of large silver eels was Galway. Experts in tagging techniques were involved in the operation. Regarding the collection of biological data an extensive European sampling programme was put in place. This ongoing work includes the analyses of contaminants, parasites, viruses, hormone levels, diet and eel otoliths. A total of 50 samples have been collected by IFI staff in Ireland and are being processed by different European research institutes. This information will be of great importance in the national management of this species.

Biosecurity

Closure of the commercial eel fishery has significantly reduced the biosecurity issues assocated with eel dealers moving from catchment to catchment. Strict biosecurity protocols are followed by both IFI survey crews and by ESB contracted silver eel fishermen as a condition of the DCENR authorisation issued to the ESB in respect of silver eel trap and truck operations.

4 Implementation of EMP measures

Provide a list of the measures foreseen and implemented and a list of the measures foreseen but not implemented. Provide the date as of which each measure was implemented.

4.1 Management Measures

4.1.1 Reduction of Fishery – Management Action #1

Action 1a: Closure of fishery- Implemented (14th May 2009); N. Ireland NWIRBD (1st June 2010)

Action 1b: Recreational Fishery- Implemented (14th May 2009)

Action 1c: Diversification of the Fishery- Implemented (2009-2011)

4.1.2 Mitigation of Hydropower – Management Action #2

Action 2b: Quantify turbine mortality: - Partially implemented (2009-2011).

Further is work needed to confirm Hydropower Station mortality rates, particularly in the case of the Erne.

Action 2c: Engineered Solutions- Not implemented (but associated research instigated).

Associated research insitigated by ESB/NUI Galway in relation to silver eel run timing, passage routes and deflection technologies may provide basis for progress towards engineered solutions, or partial solutions, in combination with continuation of silver eel trap and truck programmes.

Action 2d: Other Solutions- Implemented (2009-2011).

Significant applied research was instigated by ESB/NUI Galway in relation to biomonitoring, timing of silver eel runs and eel deflection technologies (see Chapter 6.4 of SSCE report).

Action 2e: New turbine installations- Partially implemented (2009-2011).

New installations are subject to existing guidelines for installation of small stream hydroelctric facilities. A review of 'Guidelines on the planning, design, construction and operation of small-scale hydro-electric schemes and fisheries' (2007) currently in progress by Inland Fisheries Ireland (IFI) and relevent authorities will increase emphasis on passage requirements for both eel and coarse fish species.

4.1.3 Ensure Upstream Migration at Barriers – Management Action #3

Action 3a: Existing barriers (including small weirs etc.) - Partially implemented (2009-2011).

Progress has been made towards development of a national database of existing barriers on river systems for rating fish passability which in turn will provide information to target mitigation measures at the most significant obstructions.

A pilot study was undertaken on one catchment (R. Nore, SERBD) to assess the possible impact of obstructions to colonisation and production in the catchment (see Chapter 2.5 of the SSCE Report).

Action 3b: New potential barriers- Partially implemented (2009-2011).

New barriers are subject to existing fisheries legislation such as the Fisheries (Consolidaton) Act, 1959, together with requisite planning regulations and guidelines. The decline of European eel stocks has heightened awareness of the requirement for eel passage provision on any planning proposals for new instream structures which may form potential barriers to migration.

Action 3c: Assisted migration and stocking- Implemented (2009-2011).

Assisted upstream migration takes place at the ESB Hydropower Stations on the Shannon (Ardnacrusha, Parteen), Erne (Cathaleen's Fall), Liffey and Lee. This has been a long-term objective to mitigate against the blockage of the HPSs under ESB Legislation (Section 8, 1935). On the Erne and Shannon, elver and bootlace eel are transported upstream from the fixed elver traps. These programmes outlined in the EMP were continued in 2009-2011. On the Erne, the distribution of elver throughout the catchment is by cross-border agreement between the ESB, IFI and DCAL.

4.1.4 Improve water quality – Management Action #4

Action 4a: Compliance with the Water Framework Directive – Implemented (2009-2011).

The improvement of water quality in Ireland is primarily being dealt with under the work programme for the implementation of the Water Framework Directive (WFD). The WFD reporting and monitoring runs on a six year cycle, so the next opportunity to assess whether water quality is improving will be with the publication of the second River Basin Management Plans (RBMP) in 2015.

Action 4b: Fish Health and Biosecurity issues – Implemented (2009-2011).

Closure of the commercial eel fishery in Ireland has minimsied fish and biosecurity risks associated with movements of eels, (although some cross border movement of eel from N. Ireland has continued). Full compliance with the Fish Health Directive is required for all movements of fish and eels. Biosecurity provisions are stipulated under authorisation to the ESB in relation to implementation of silver eel trap and truck operations. Strict biosecurity provisons are followed by IFI, the MI and other fisheries authorities in relation to survey and monitoring work.

Considerable efforts have been expended by IFI and other agencies in recent years in relation to raising public awareness of biosecurity issues and the risk of introduction of aquatic invasive species by recreational water users. Further legislative provision has been sought from the DCENR and the Department of the Environment (DOE) to address this serious issue.

4.2 Monitoring Objectives

The monitoring objectives described in Chapter 7 of the Ireland's Eel Management Plan have been implemented in 2009-2011 and are fully described in the accompanying report of the Standing Scientific Committee on Eel (Anon., 2012).

5 Provide an explanation for each measure included in the adopted plan(s), which has not been implemented, or implemented after the foreseen date. If an alternative measure was implemented, please describe it and compare its effectiveness in relation to the measure it has replaced or will replace.

There were no major deviations from the Eel management Plan submitted by Ireland in 2008.

All the management measures have been implemented, or are in the process of being implemented as scheduled. (See Section 4 above for the implemented management measures)

There was a legal difficulty in closing the market along with the cessation of the eel fishery. The legislation enacted limits the possession and sale of eel captured in Ireland but does not limit that for eel captured outside the state – See Section 6.2 below.

6 Please list the difficulties encountered in the implementation of the plan.

6.1 Closure of fishery

Considerable resistance was raised by commercial eel fishermen to the cessation of commercial eel fishing in Ireland in 2009, which culminated in a legal challenge to the Minister of DCENR in relation to closure of the fishery. This was exacerbated by the commercial eel fishery continuing in the N. Ireland portion of the transboundary NWIRBD in 2009, before closure of the fishery in the northern portion of the NWIRBD the following season in 2010.

Continued closure of the eel fishery in Ireland will be subject to review of eel stocks in relation to the EU Council regulation and consequent recovery of European eel stocks.

6.2 Traceability

Despite the closure of commercial eel fishing in Ireland, a number of instances occurred whereby eel transport lorries were detected transferring eels apparently from N. Ireland (L. Neagh fishery) to Britain or mainland Europe. Current legislation in Ireland only prohibits possession of eel caught in the Republic of Ireland, but there is no means for fisheries protection staff to determine the origin of eel consignments as to whether or not they are of legitimate origin. IFI fisheries protection staff also encountered a number of individuals purchasing relatively small quantities of eels (<100 kg) from L. Neagh for import into Ireland for sale or local smoking etc., which whilst confirmed with N. Ireland authorities, raises concerns as to how to discern between legal and illegal eel consignments.

Amending legislation to require eel exporters and importers to supply consignment details of the origin and destination of eel shipments is essential to fully meet the EU eel regulation. Ideally, an agreed traceability programme should be agreed for all Member States to permit eel imports and exports of each Member State to be cross-checked between country of origin and recipient country.

In Ireland, similar traceability legislation as enacted for England and Wales (Amendment to the Eels (England and Wales) Regulations 2009) will be required for both Ireland and N. Ireland to fully monitor and cross check eel imports and exports from/to Ireland, particularly in light of the continued operation of the L. Neagh eel fishery in N. Ireland.

6.3 Silver Eel Trap and truck programmes

Significant resources were committed by the ESB in establishing and developing extensive trap and truck programmes on the Shannon, Erne and Lee river systems. Whilst a trap and truck programme had previously been instigated on the Shannon, equivalent programmes had not been undertaken on either the Lee or the Erne. Initial challenges arose particularly on the Erne, with regard to identification of suitable silver eel capture sites, obtaining necessary land owners permissions, and recruitment of suitably experienced fishermen prepared to undertake conservation fishing. Very significant progress was made over 2009-2011 in relation to identifying optimal eel capture and monitoring sites, expanding the number of sites fished, and in terms of experience and effectiveness of fishermen in fishing new capture sites. This resulted in a year on year increase in the quantities of silver eels trapped and transported on the Erne and Lee from 2009-2011.

Considerable staff time and resources were committed to ensure all catches landed were recorded and stored correctly and released to sea as soon as practicable. Particular emphasis and care was

taken in these programmes to ensure catches were handled and stored appropriately to ensure viability of released stock for spawning purposes.

Overall productivity levels from the Erne, and consequent trap and truck targets, have been reviewed by the SSCE in light of work completed during 2009-2011. The SSCE have recommended that the Erne trap and truck programme could change to be based on a proportion of the annual production, as on both the Shannon and the Lee, for 2012-2015 (Anon, 2012).

6.4 Fisheries protection

The combination of a moratorium on staff recruitment announced in 2009 together with an early retirement scheme implemented in February 2012 has resulted in a decline of approximately 20% in IFI staff numbers representing a significant impact on fisheries protection resources.

6.5 Silver eel escapement

Quantitative estimates of silver eel escapement are required to establish and monitor changes in escapement relative to the EU 40% SSB target. Long term data series exist for the Shannon, Erne, Corrib and Burrishoole fisheries. Following closure of the Irish commercial eel fishery in 2009, the Galway weir at the base of the Corrib system was fished as a catch and release fishery for scientific purposes. However, due to structural defects identified in 2010 the Galway weir fishery was unable to be fished during 2010 or 2011. Reactivation of the Galway weir fishery as a catch and release fishery for the purposes of assessing silver eel escapement from a large, productive, non-impounded system should be identified as a priority for future years.

6.6 Monitoring

While monitoring and surveys were carried out on transitional waters, we still lack a suitable methodology for robustly assessing status of the yellow eel stock, the silver eel production and the silver eel escapement from transitional and coastal marine waters.

There is a need for additional index sites on the east and south coasts for supporting the data poor extrapolations. This data gap will be addressed in the next three years.

The lack of resources and the recruitment embargo outlined in Section 6.4 also applies to the research and monitoring sectors.

7 Do you have any indication/evidence/data to suggest that an amendment of the Regulation [and consequently the eel plans] is necessary to achieve the objective set out in Article 2(4) of the Regulation and to ensure the recovery of the species?

Given the continued decline in recruitment of European eels stocks the EU biomass target (40% of pristine SSB) must be questioned as to whether this target is sufficient to recover the stock of European eel. The lack of a timeframe in the Regulation within which to achieve the 40%, or a recovery, should be addressed.

While management measures (i.e. cessation of fishing, trap and transport around hydropower stations) implemented in Ireland have led to considerable improvements in silver eel escapement, equivalent EU-wide actions have not, to the best of our knowledge, taken place. Further improvement in silver eel production is contingent upon increased recruitment of juvenile eels to Irish waters. Conclusion of the EU 2012 reporting and evaluation process will provide the opportunity to evaluate whether the initial implementation of the Regulation is likely to lead to an improvement in overall recruitment.

Stocking as a conservation measure to assist in the recovery should be reviewed, especially in the light of continued recruitment decline.

8 References

Anon. (2012) Report on the status of the eel stock in Ireland 2009-2011. Report of the Standing Scientific Committee for eel to Inland Fisheries Ireland and the Department of the Communications, Energy and Natural Resources. 204 pp.

Anon. (2007) Guidelines on the planning, design, construction and operation of small-scale hydroelectric schemes and fisheries. Department of the Communications, Energy and Natural Resources publication. 52 pp.

CFB. (2010). Final Annual report.. The Central and Regional Fisheries Boards, Dublin, Ireland. 233 pp.

Coates, S., A. Waugh, A. Anwar, and N. Robson. 2007. Efficacy of a multi-metric fish index as an analysis tool for the transitional fish component of the Water Framework Directive. Marine Pollution Bulletin 55:225-240.

Compass Informatics (2011). Compilation of habitat-base catchment information and historical eel data in support of eel management plans 'EEL-PLAN'. Marine Research Sub-Programme, NDP 2007-'13 Series, Marine Institute, Galway. 31pp.

EC. 2007. COUNCIL REGULATION (EC) No. 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel. Official Journal of the European Union, L 248/17.

Harrison, T. D., and A. K. Whitfield. 2004. A multi-metric index to assess the environmental condition of estuaries. *Journal of Fish Biology* **65**: 683-710.

ICES. 2009. Report of the EIFAC/ICES Working Group on Eels, Goteborg (Sweden), 7–12 September 2009. ICES CM 2009/ACOM:15. 117 pp.

ICES. 2011a. Report of the Study Group on International Post-Evaluation on Eels (SGIPEE), 24–27 May 2011, London, UK. ICES CM 2011/SGEF:13. 39 pp.

ICES. 2011b. The report of the 2011 Session of the Joint EIFAAC/ICES Working Group on Eels, September 2011. ICES CM 2011/ACOM:18. 251 pp. and country reports.

IFI. 2010. Inland Fisheries Ireland Inaugural Report. Inland Fisheries Ireland, Dublin, Ireland. 108 pp.

Kelly, F.L., Harrison, A.J., Connor, L., Matson, R., Wightman, G., Morrissey, E., O'Callaghan, R., Feeney, R., Hanna, G., Wogerbauer, C. & Rocks, K. (2010). *Sampling fish for the Water Framework Directive – Summary report 2009*. Central and Regional Fisheries Boards report.

Kelly, F., A. Harrison, L. Connor, R. Matson, E. Morrissey, R. Feeney, C. Wogerbauer, K. Rocks, and R. O'Callaghan. 2011. Sampling Fish for the Water Framework Directive. A summary of Inland Fisheries Ireland's Water Framework Directive Monitoring Programme for Fish in Lakes, Rivers and Transitional Waters, 2010. Inland Fisheries Ireland, Dublin, Ireland. 162 pp.

Knights, B. & White, E. M. (1998). Enhancing immigration and recruitment of eels; the use of passes and associated trapping systems. Fish Mgmt. and Ecol., 5, 459-471.

McGarrigle, M., J. Lucey, and M. Ó Cinnéide. 2011. Water Quality in Ireland 2007-2009. Environmental Protection Agency, Wexford. 138 pp.

McGinnity, P., de Eyto, E., Gilbey, J., Gargan, P., Roche, W., Stafford, T., McGarrigle, M., O'Maoileidigh, N. & Mills, P. (2011). A predictive model for estimating river habitat area using GIS-derived catchment and river variables. Fisheries Management & Ecology, 2011 – online.

McHugh, B., R. Poole, J. Corcoran, P. Anninou, B. Boyle, E. Joyce, M. Barry Foley, and E. McGovern. 2010. The occurrence of persistent chlorinated and brominated organic contaminants in the European eel (Anguilla anguilla) in Irish waters. Chemosphere 79: 305-313.

Moriarty, C. 1988. The Eel in Ireland. Royal Dublin Society. Went Memorial lecture. Occasional papers in Irish Science and Technology **4**, 9 pp.

NIEA NS SHARE. 2008. Strategic Environmental Assessment for the WFD River Basin Management Plans and Programmes of Measures - North Western IRBD. Northern Irish Environment Agency. 218pp. www.doeni.gov.uk/niea/index/publications.

Palm, S., Dannewitz, J., Prestegaard, T. & Wickstrom, H. (2009). Panmixia in European eel revisited: no genetic difference between maturing adults from southern and northern Europe. Heredity, 103, 82–89.

Ryan, A. (2010). A report on the Assessment of Obstructions to Eel Migration, using the Nore as a case study. Unpublished M. Sc. project Report, NUI Maynooth; 64pp.

Solomon, D.J. & Beach, M.H. (2004). Fish pass design for eel and elver (Anguilla anguilla). R&D Technical report W2-070/TR1. Environment Agency, Bristol, 92 pp.

Source Material also used in the SSCE Report included annual reports from Inland Fisheries Ireland on the national monitoring programme, from the National University of Ireland Galway/Electricity Supply Board on silver eel trap and transport and escapement in the Shannon, Erne and Lee and the Marine Institute on Burrishoole and on International Scientific Advice (ICES).

Appendix 1. Eel management return forms (2009-2011)

Eel Management Information 2009

River District Basin: Eastern RBD

Date: 5th March 2010

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Eastern RBD was closed throughout 2009.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Eastern RBD during 2009.

Estimated level of illegal fishing:

There was one major incident when a truck with eels on board was stopped in our region.

There were a number of reports of alleged illegal activity, but none were confirmed.

Number of gear seizures: **0** Gear types seized: **None**

Number of Eel Dealer Interceptions: **0**

1 (see above)

Estimated tonnage on board: **0** Declared origin(s) of cargos: **0**

Describe Action taken: n/a

Eel truck was apparently travelling from UK to N. Ireland (some paperwork to support this), and was released after a period of questioning regarding bye law 303. 858 kg of live eel were on board.

General impression of levels of illegal activity since the cessation of the commercial fishery: There was no evidence of significant illegal activity; however the transportation of eels across the region (through Dublin ports) raises concerns about the possibility of illegal eel movements.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **No**

What was the total catch transported (kg)?: **n/a**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: **N/a**

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

River District Basin: **South Eastern RBD**

Date: **October 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the SERBD was closed throughout 2009.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SERBD during 2009.

Estimated level of illegal fishing:

One report of illegal fishing

Main catchments where illegal activity occurred:

River Barrow

Number of gear seizures:

Gear types seized:

None

Number of Eel Dealer Interceptions:

0

Estimated tonnage on board:

Declared origin(s) of cargos:

n/a

Describe Action taken:

n/a

General impression of levels of illegal activity since the cessation of the commercial fishery:

Only one event reported

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

n/a

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

River District Basin: South West RBD

Date: April, 2010.

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the SWRBD was closed throughout 2009.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SWRBD during 2009.

Estimated level of illegal fishing:

None encountered or reported.

Main catchments where illegal activity occurred: n/a

Number of gear seizures: **0** Gear types seized:

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **n/a** Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

None encountered or suspected.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

Yes, on the River Lee.

What was the total catch transported (kg)?:

80 Kgs.

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

Higher returns expected in the future as more experience is gained in operating the programme.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

River District Basin: **Shannon RBD**

Date: **20th February 2010**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Shannon RBD was closed throughout 2009.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Shannon RBD during 2009.

Estimated level of illegal fishing:

There was a marked increase in illegal eel fishing activity during 2009 on previous years.

Main catchments where illegal activity occurred: **Illegal activity on the main lakes of the Shannon on Lough Derg and Lough Ree. Evidence of illegal activity was discovered in smaller lakes of East Clare and in Lough Cutra, Co. Galway.**

Number of gear seizures: **0** Gear types seized: **None**

1 fyke net and 3 longlines at Lough Cutra in June 2009

1 fyke net on Lough Derg in Sept 2009

2 fyke nets on Lough Derg in Oct 2009

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **0** Declared origin(s) of cargos: **0**

Describe Action taken: **n/a**

General impression of levels of illegal activity since the cessation of the commercial fishery: **There was a marked increase in illegal activity and also in reports of the same through awareness from public about closure of the fishery. There were a lot of reports received into the office and to officers directly from both anglers and members of the public reporting proposed illegal**

activity. An increased effort was put into patrols and enforcement during the silver eel run mainly and although this didn't result in any prosecutions it did allow for intelligence gathering. In August a car with two occupants was questioned in Ballinasloe who were moving eel fishing gear but it was not possible to initiate a prosecution.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **Yes**

What was the total catch transported (kg)?: **23,730 kg to the 16/1/2010**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

The authorization needs to be reviewed to only include what is workable and achievable. Fishermen should be easily identifiable which currently isn't the case. There are concerns about the welfare of the eels through the whole process and their ability to migrate successfully after Trap and Truck process. Also the bye catch associated in Killaloe should be surrendered to IFI. In general there are good working relationships between IFI and ESB locally.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

Scientific Eel Group

Regional Fisheries Board: **Western RBD (Galway)**

Date: **12 February 2010**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

All Eel Fishing closed in the Region.

Confirm no licenses issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licenses) Bye-law No. 858, 2009:

No Licenses issued.

Estimated level of illegal fishing: **None**

Main catchments where illegal activity occurred: **N/A**

Number of gear seizures: **2**

Gear types seized:

1 x 24" Fyke net L. Mask

8 x 1 metre Fyke nets L. Corrib

(These nets had been lost in the loughs from the previous year)

Number of Eel Dealer Interceptions: **None**

Estimated tonnage on board: **N/A**

Declared origin(s) of cargos: **N/A**

Describe Action taken: **N/A**

General impression of the cessation of the fishery:

Fishermen continue to be very unhappy by the closure of the fishery.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your Region?: **No**

What was the total catch transported (kg)?: **N/A**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/A

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2010, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be undertaken by the CFB Eel survey team in conjunction with the Regional Fisheries Boards. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

Scientific Eel Group

Regional Fisheries Board: **Western RBD (Ballina)**

Date: **5 February, 2010**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Western RBD (Ballina) was closed throughout 2009

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Western RBD (Ballina) during 2009

Estimated level of illegal fishing:

There was no evidence of any illegal eel fishing in the NW fisheries region during 2009

Main catchments where illegal activity occurred:

There was a suspicion of illegal eel fishing in the Lough Arrow catchment, the suspected area was kept under surveillance but no illegal fishing was detected.

Number of gear seizures:

0

Gear types seized:

0

Number of Eel Dealer Interceptions:

0

Estimated tonnage on board:

N/A

Declared origin(s) of cargos:

N/A

Describe Action taken:

N/A

General impression of the cessation of the fishery:

The general view of the staff involved was that the eel fishermen complied with the ban on eel fishing.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your Region?:

None in relation to migratory silver eel as there are no barriers or significant hyro schemes in the Western RBD (Ballina).

Staff did, as usual, monitor the River Moy throughout the late spring and early summer period for elver movements and a small run was observed in June. Approximately 0.8kg of elver was netted, transported upriver and released into Lough Conn.

What was the total catch transported (kg)?:

N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/A

General impression of the programme:

There was no trap and transport programme operational in the Western RBD (Ballina) during 2009 apart form our annual effort to assist elver ascending the Moy.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2010, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be undertaken by the CFB Eel survey team in conjunction with the Regional Fisheries Boards. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

Scientific Eel Group

Regional Fisheries Board: North Western IRBD

Date: 9th February 2010

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Yes

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

None issued.

Estimated level of illegal fishing: **Low**

Main catchments where illegal activity occurred: **L. Gowna, L. Oughter**

Number of gear seizures: **3** Gear types seized: **2 Fykes, 1 Longline**

Number of Eel Dealer Interceptions: **1**

Estimated tonnage on board: **2 Tonnes** Declared origin(s) of cargos: **UK**

Describe Action taken: **Interviewed driver and inspected documents. He was in transit from Dublin port to Fermanagh to buy from fishermen there.**

General impression of the cessation of the fishery: **Generally complied with, but difficulties posed by non closure of NI fishery. Rumours of eel movements from ROI, no evidence found.**

Management Action 2. Trap & Transport

Was trap & transport undertaken in your Region?:

Yes, Eels were trapped in Lower Lough Erne approx 2 km east of Roscorr bridge and released into the Erne estuary at Ballyshannon.

What was the total catch transported (kg)?:

9,382.5 kg

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

The T&T programme on the Erne went well in 2009. The ESB, DCAL, The Northern Regional Fisheries Board and contracted silver eel fisherman all worked well together to successfully trap, transport and release 9382.5 kg of live eels.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2010, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be undertaken by the CFB Eel survey team in conjunction with the Regional Fisheries Boards. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2009

Scientific Eel Group

Regional Fisheries Board:

Loughs Agency (Foyle & Carlingford Irish Lights Commission) FCILC

Date: 26th February 2010

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Yes.

The Foyle Area and Carlingford Area (Conservation of Eels) Regulations 2009 were introduced which prohibits the taking or killing of eels within the FCILC area

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Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No commercial fishing for eels is allowed within the FCILC area

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Estimated level of illegal fishing:

Unknown, but likely to be insignificant

Main catchments where illegal activity occurred:

n/a

Number of gear seizures: **0** Gear types seized:

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: Declared origin(s) of cargos:

Describe Action taken:

General impression of the cessation of the fishery:

There has been no commercial fishery operating for many years.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your Region?:

No

What was the total catch transported (kg)?:

N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2010, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be undertaken by the CFB Eel survey team in conjunction with the Regional Fisheries Boards. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **Eastern RBD**

Date: February, 2011

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Eastern RBD was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Eastern RBD during 2010.

Estimated level of illegal fishing:

Minimal

Main catchments where illegal activity occurred:

N/a

Number of gear seizures: **11 eel fyke nets and 6 set lines**

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **0** Declared origin(s) of cargos: **0**

Describe Action taken: **n/a**

General impression of levels of illegal activity since the cessation of the commercial fishery:

Very small scale

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **No**

What was the total catch transported (kg)?:

n/a

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

n/a

General impression of the programme:

n/a

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **South Eastern RBD**

Date: **October 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the SERBD was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SERBD during 2010.

Estimated level of illegal fishing:

None

Main catchments where illegal activity occurred:

Number of gear seizures:

None

Gear types seized:

Number of Eel Dealer Interceptions:

0

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

None known

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

0

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

n/a

General impression of the programme:

n/a

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **South Western RBD**

Date: **6 April 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the SWRBD was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SWRBD during 2010.

Estimated level of illegal fishing: **None**

Main catchments where illegal activity occurred: **N/A**

Number of gear seizures: **0** Gear types seized: **N/A**

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **0** Declared origin(s) of cargos: **N/A**

Describe Action taken: **N/A**

General impression of levels of illegal activity since the cessation of the commercial fishery:

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **Yes**

What was the total catch transported (kg)?: **338.5 kg transported to Carrigadrohid**

278 kg released as silver eel

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

N/A

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **Shannon RBD**

Date: **7th April, 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Shannon RBD was closed throughout 2010.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Shannon RBD during 2010.

Estimated level of illegal fishing:

Illegal fishing for eels was lower in 2010 than 2009 and there was no illegal eel fishing equipment seized.

Main catchments where illegal activity occurred: **Illegal activity on the main lakes of the Shannon was generally lower with fewer reports received also. Evidence of illegal activity was discovered in smaller lakes of East Clare.**

Number of gear seizures: **0** Gear types seized: **None**

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **0** Declared origin(s) of cargos: **0**

Describe Action taken: **n/a**

General impression of levels of illegal activity since the cessation of the commercial fishery: **Initially in 2009 there was illegal activity taking place and some gear was seized and transport of gear intercepted. This year there appeared less activity and less reporting of the same but it is probable that the illegal activity has moved to quieter lakes where anglers and general public are not frequenting like the larger navigational lakes.**

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **Yes**

What was the total catch transported (kg)?: **Still underway – Section 14 will continue until end April 2011. Almost 28,000 Kg have been transported to date.**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No

General impression of the programme:

One of the fishermen also was contracted to fish in the Erne catchment so he is continuing to fish into April as he hasn't caught his ESB "Quota" which is very late for silver eel migration. The operation is a large draw on IFI resources for the monitoring of the operation both at fishing stage and at release stage. Co-operation between ESB and IFI is good on the ground. Eel release site has been improved by ESB at Parteen which is welcomed. There is over handling of eels still under the program through weighing, storage, reweighing, scanning and eventual release.

The RBD for which the T&T is operating should also sign off on the Section 14 prior to it being granted to ESB.

Other eel research being carried out by ESB should not be given a blanket cover under the Section 14 as it is impossible to monitor what experimental work is taking place under current system.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **Western RBD- Galway**

Date: **28 February, 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Western RBD was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Western RBD during 2010.

Estimated level of illegal fishing:

Low

Main catchments where illegal activity occurred:

Lough Corrib

Number of gear seizures: **29**

Gear types seized: **20 large fyke nets**

9 small fyke nets

Number of Eel Dealer Interceptions: **None**

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

Low

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

N/a

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/a

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: **Western RBD- Ballina**

Date: **8 April, 2011**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the WRBD Ballina was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the WRBD Ballina during 2010.

Estimated level of illegal fishing:

As far as staff are aware there was no evidence of any illegal fishing for eel during 2010 in the IFI Ballina operational area. There was some suspicion of possible activity on the Unshin River, but this was investigated and nothing unusual was detected.

Main catchments where illegal activity occurred:

N/A

Number of gear seizures:

N/A

Gear types seized:

N/A

Number of Eel Dealer Interceptions:

N/A

Estimated tonnage on board:

N/A

Declared origin(s) of cargos:

N/A

Describe Action taken: **N/A**

General impression of levels of illegal activity since the cessation of the commercial fishery:

It is the view of protection personnel that there has been little or no illegal eel activity whatsoever in this part of the WRBD since the ban was introduced.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

The spring tides of late April 2010 brought a modest run of elvers to the Moy. Over a period of 4 days commencing 27/4/2010, 6.5kg of elver was trapped and relocated and released at various locations into Lough Conn.

What was the total catch transported (kg)?:

6.5kg of elver (R Moy system)

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/A

General impression of the programme:

Apart from elver trapping there is no T&T operational in this part of the WRBD

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin: NWIRBD

Date: 28 February, 2011

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the NWRBD was closed throughout 2010.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the NWRBD during 2010.

Estimated level of illegal fishing: **Low/Medium**

Main catchments where illegal activity occurred: **L. Oughter (Erne)**

Number of gear seizures: **4** Gear types seized: **14 Fyke nets (Belturbet)**

10 Fyke nets (L. Oughter), 16 Fyke nets (L. Oughter), Boat & Outboard engine (L. Oughter). The fyke nets seized at Belturbet were deployed some distance upstream from the official capture site and following investigation were returned to the owner (one of the approved ESB contracted fishermen at this site).

Number of Eel Dealer Interceptions: **None**

Estimated tonnage on board: Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

No other evidence apart from the seizures at L. Oughter. No evidence that the Dutch eel buyer had entered the country for clandestine purchase. However from the evidence collected at L. Oughter there was some attempt to offload eel caught illegally whether through the trap and truck conduit or otherwise. Associated with the gear seizure at L. Oughter, an eel poke containing 85 silver eels was recovered along with another poke which was empty.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD: **Yes**

What was the total catch transported (kg): **3,415** to date (Erne- Butlersbridge & Belturbet)

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

See comments above.

General impression of the programme:

Appears to be functioning successfully, but tighter controls will be needed if the fishing effort is increased and more sites are activated.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2010

River District Basin:

Loughs Agency, Foyle, Carlingford and Irish Lights Commission (FCILC)

Date: 2nd March, 2011

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Following the introduction of the The Foyle Area and Carlingford Area (Conservation of Eels) Regulations 2009 all taking or killing of eels within the FCILC area was prohibited in 2010

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Loughs Agency during 2010.

Estimated level of illegal fishing:

Unknown, but likely to be insignificant

Main catchments where illegal activity occurred: **N/A**

Number of gear seizures: Gear types seized:

Number of Eel Dealer Interceptions:

Estimated tonnage on board: Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

There has been no commercial fishery operating for many years.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/A

General impression of the programme:

N/A

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase. **Within the FCILC area the Loughs Agency has been involved in the development of a barriers to migration assessment tool under the WFD with SNIFFER and SEPA. As part of this development a number of barriers have been assessed and it is intended to continue this process where appropriate..**

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin: **Eastern RBD**

Date: **21st February 2012**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Eastern RBD was closed throughout 2011.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Eastern RBD during 2011. One eel dealers licence was issued by the Eastern RBD during 2011, eels sold by this supplier have been traced to Lough Neagh

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Estimated level of illegal fishing:

Low-medium level of activity. A few reports received, but have seized some unattended equipment.

Two main lakes were noted as potential poaching sites:- Lough Muckno and Lough Ramor.

Number of gear seizures: **7 items seized, all unattended**

Gear types seized:

2 Fyke Nets – Lough Ramor – October 2011

1 Fyke Net – Lough Muckno – Sept 2011

3 Long Lines – Lough Ramor – Sept 2011

1 Long Line – Lough Ramor – July 2011

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **0** Declared origin(s) of cargos: **0**

Describe Action taken: **n/a**

General impression of levels of illegal activity since the cessation of the commercial fishery:

Low –moderate level of illegal activity, but don't believe this activity is organized in any way.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **No**

What was the total catch transported (kg)?:

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The Rock Ramp fish pass at Rathdrum on the Avonmore River (tributary of the Avoca River) was designed to aid eel passage. The pass was completed in September 2011.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin: **South Eastern RBD**

Date: **January 2012**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the SERBD was closed throughout 2011.

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the SERBD during 2011.

Estimated level of illegal fishing:

None

Main catchments where illegal activity occurred:

Number of gear seizures:

None

Gear types seized:

Number of Eel Dealer Interceptions:

0

Estimated tonnage on board:

Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

None known

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

n/a

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

n/a

General impression of the programme:

n/a

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin: **South Western RBD**

Date: **25 January 2012**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Yes

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

Yes

Estimated level of illegal fishing: **No illegal netting of eels encountered**

Main catchments where illegal activity occurred: **NA**

Number of gear seizures: **0** Gear types seized**:** **0**

Number of Eel Dealer Interceptions: **1 Dealer storing approx. 5kgs of eels.**

Estimated tonnage on board: **N/a** Declared origin(s) of cargos: **N/a**

Describe Action taken: **N/a**

General impression of levels of illegal activity since the cessation of the commercial fishery:

None detected

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **Yes**

(IF yes, name sites)

Brian Connell, under the direction of NUIG, carried out trap and transport of eels in July. The quota for this RBD is 500 kgs per annum and once this was exceeded, fishing stopped there. All eels were released at Iniscarra cemetery, downstream of Iniscarra Generation Station.

What was the total catch transported (kg)?:

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

None

General impression of the programme:

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin: ShRBD

Date: 31ST December 2011

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Yes, the fishery was closed in 2011

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

There were no licenses issued in 2011

Estimated level of illegal fishing: **Medium**

Main catchments where illegal activity occurred: **Throughout Shannon catchment – Upper at Carrick on Shannon and on River Inny, and Lower on Lough Derg at Portumna and Killaloe. Nets Seized on the Inner Lakes-Lough Ree, Rooskey, Kilglass Lake, River Inny and Inny Bay. (June 2011)**

Number of gear seizures: **8 chains of Dutch Fyke Nets, 3 Coghill Nets, Fyke Nets**

Gear types seized: **Fyke Nets, Coghill Nets and 1 fishing rod**

230m of Fyke nets on Lough Derg between July and November.

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: N/A Declared origin(s) of cargos: N/A

Describe Action taken: N/A

General impression of levels of illegal activity since the cessation of the commercial fishery:

Medium level of illegal activity. There is an increase in the incidents of large seizures for 2011. Traditionally there would be one or two fyke nets seized during a patrol but there were two large netting operations this year which were seized during the peak silver eel run in November. There was also a fyke net seized which was probably set for the smaller yellow eels.

The ShRBD have increased patrols due to perceived illegal fishing increase and so this is also yielding results.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

Yes. The trap & transport operations were carried out in five locations, 1 in Finea, 1 in Rooskey, 1 in Killaloe and 2 in Athlone.

What was the total catch transported (kg)? : **25,120 kg**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: **Officers reported to have intercepted eels that had been allegedly sold by a contracted ESB Eel fisherman to German anglers in Rooskey. The incident was investigated, but the origin of these eels could not be produced.**

General impression of the programme: **The Trap and Transport programme was successful, but it was impossible to monitor the location coninuously, and could be exploited for illegal sales of eels. The programme, while under strict guidelines and monitoring, requires further measures to ensure it can be operated without incidence or the opportunity to exploit illegal fishing.**

There also needs to be further work done in ensuring the health of the eels being transported. While there was work done at Parteen hatchery by the construction of a sunken tank for the eels to be released into, prior to them entering the Kilmastulla river, this is not the ideal situation. A larger tank should be constructed so that eels can be checked prior to the release into the faster waters of the river.

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase. The weirs at Tarmonbarry (Shannon), Bunowen and Clara (Brosna) need to be addressed in the Upper Shannon region.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin: **Western RBD- Galway**

Date: **22 March, 2012**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Western River Basin District (Galway operational area) was closed throughout 2011.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Western RBD (Galway) during 2011.

Estimated level of illegal fishing:

Staff were of the view that there was no illegal eel fishing activity during 2011.

Number of gear seizures: **5 items seized, all unattended**

Gear types seized:

14/01/2011 - Clogher/Casla system - stop/fyke net

19/05/2011 - Lower Lough Corrib - 3 fyke nets

22/06/2011 - Lower Lough Corrib - 1 fyke net

Staff advised that the fykes seized were old and were of the view that these had probably been lost and had not been set in 2011.

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **N/A** Declared origin(s) of cargos: **N/A**

Describe Action taken: **N/A**

General impression of levels of illegal activity since the cessation of the commercial fishery:

Staff were of the view that while there may have been some illegal eel fishing for a short period after the introduction of the ban, there has been none in the recent past.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

There was no trap and transport operations in the Western RBD (Galway operational area).

What was the total catch transported (kg)?:

N/a

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/a

General impression of the programme:

N/a

Management Action 3. Ensure Upstream Migration at Barriers

Note: Staff monitored and maintained the elver pass on the Corrib located in the Salmon Weir in Galway.

Management Action 4. Improve Water Quality

As part of its ongoing environmental protection programmes, all reports of water pollution were investigated and action taken as considered appropriate. Similarly, all discharge licences, infrastructural developments, forestry, planning and wind farm proposals were assessed in relation to their potential impacts on water quality. IFI Galway also participated in the implementation of the Water Framework Directive which is aimed at restoring water quality.

Eel Management Information 2011

River District Basin: **Western RBD (Ballina)**

Date: **22 March, 2012**

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

The eel fishery in the Western River Basin District (Ballina operational area) was closed throughout 2011.

Confirm no licences issued in 2010 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Western RBD (Ballina) during 2011.

Estimated level of illegal fishing:

Staff were of the view that there was no illegal eel fishing activity during 2011.

Number of gear seizures: **0**

Ger types seized: **N/A**

Number of Eel Dealer Interceptions: **0**

Estimated tonnage on board: **N/A** Declared origin(s) of cargos: **N/A**

Describe Action taken: **N/A**

General impression of levels of illegal activity since the cessation of the commercial fishery:

Staff were of the view that while there may have been some illegal eel fishing for a short period after the introduction of the ban, there has been none in the recent past.

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **No. There was no trap and transport operations in the Western RBD (Ballina operational area).**

What was the total catch transported (kg)?: **N/a**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme: **N/a**

General impression of the programme: **N/a**

Management Action 3. Ensure Upstream Migration at Barriers

Note: Staff in the Sligo District liaised with the operators of the Hydro schemes on the Ballisodare River with a view to ensuring that smolt screens were in place to help reduce eel mortalities.

Management Action 4. Improve Water Quality

As part of its ongoing environmental protection programmes, all reports of water pollution were investigated and action taken as considered appropriate. Similarly, all discharge licences, infrastructural developments, forestry, planning and wind farm proposals were assessed in relation to their potential impacts on water quality. IFI Ballina also participated in the implementation of the Water Framework Directive which is aimed at restoring water quality. All submissions relating to forestry & planning referred to the WRBD WFD Management Plan and the highlighted the current WFD status of the catchment and the requirement to restore it as required by the WFD.

Eel Management Information 2011

River District Basin: **NWIRBD**

Date: 26 January 2012

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Yes

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

Yes

Estimated level of illegal fishing:

Low

Main catchments where illegal activity occurred: **Erne**

Number of gear seizures:

2

Gear types seized:

3 Lines, 2 Fykes

Number of Eel Dealer Interceptions: **1 Unlicensed, selling smoked product**

Estimated tonnage on board:

11.3 Kg.

Declared origin(s) of cargos:

L. Neagh

Describe Action taken:

Seized eels and a quantity of bream. Returned to dealer when evidence of purchase in NI was produced. Dealer undertook to apply for license.

General impression of levels of illegal activity since the cessation of the commercial fishery:

Low

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?: **Yes**

(If yes, name sites) **Lower & Upper Lough Erne:- At (1) Rosscor bridge, (2)Ferny Gap (3) Roscorr bridge, (3)Portora Lock, and (4)Belturbet**

What was the total catch transported (kg)?: **24,323 kg**

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

No evidence, alleged illegal activity but no proof.

General impression of the programme: **Progressing well. Some issues with storage of eels.**

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase.

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.

Eel Management Information 2011

River District Basin:

Loughs Agency, Foyle, Carlingford and Irish Lights Commission (FCILC)

Date: 14th May 2012

Management Action 1. Reduction of Fishery to achieve EU target

Confirm fishery ceased under Conservation of Eel Fishing Bye-law No. C.S. 303, 2009:

Following the introduction of the Foyle Area and Carlingford Area (Conservation of Eels) Regulations 2009 all taking or killing of eels within the FCILC area was prohibited in 2010

Confirm no licences issued in 2009 under Conservation of Eel Fishing (Prohibition on Issue of Licences) Bye-law No. 858, 2009:

No eel fishing licences were issued by the Loughs Agency during 2011.

Estimated level of illegal fishing:

Unknown, but likely to be insignificant

Main catchments where illegal activity occurred: **N/A**

Number of gear seizures: Gear types seized:

Number of Eel Dealer Interceptions:

Estimated tonnage on board: Declared origin(s) of cargos:

Describe Action taken:

General impression of levels of illegal activity since the cessation of the commercial fishery:

There has been no commercial fishery operating for many years

Management Action 2. Trap & Transport

Was trap & transport undertaken in your RBD?:

No

What was the total catch transported (kg)?:

N/A

Was there any evidence of illegal trading of eel in conjunction with the T&T programme:

N/A

General impression of the programme:

N/A

Management Action 3. Ensure Upstream Migration at Barriers

Note: The SEG is currently developing a pilot project for 2011, in conjunction with the national survey programme, to identify the major obstacles to upstream migration. The programme will be instigated by the Eel survey team in conjunction with the RBD staff. It is intended to focus on the main eel producing waters in the initial phase. **Within the FCILC area the Loughs Agency has been involved in the development of a barriers to migration assessment tool under the WFD with SNIFFER and SEPA. As part of this development a number of barriers have been assessed and it is intended to continue this process where appropriate..**

Management Action 4. Improve Water Quality

It is intended to achieve this objective through compliance with the Water Framework Directive. Eel is included in the fish monitoring programme under the Directive and the survey data will also be used in the eel stock assessments.
