Eel Management

Greg Forde

Head of Operations

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Eel Stock Characteristics

- The European Eel is a single panmictic stock
- Spawning is thought to occur in the Sargasso Sea
- Eels are a long lived species (males typically 10-12 years; females 16-18 years)
- Eels have a complex life history typically spending the majority of their lives in freshwater (but may spend some or all of life in sea or transitional waters).

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Recruitment

- Elver **recruitment** to Europe is a function of :-
  - Spawner escapement (i.e. the number of silver eels that escape to sea)
  - Spawner quality (size, fat content, health & parasite burden)
  - Oceanic factors (largely unknown)
  - Survival of leptocephali & glass eel back to European coasts
  - Dispersal of glass eel across Europe which is largely related to ocean currents and may also have some active migration (swimming) component

Assisted Migration

Falling Recruitment

- Eel stocks collapsed across Europe during the early 1980's
- The collapse in elver recruitment was reflected in long term data particularly from the Shannon and Erne (although some periods of modest recruitment was recorded in the Erne).
- Over the last 3 years glass eel recruitment has increased from 5% to 12 % of historic levels in NW Europe
- But recruitment remains at critically low levels

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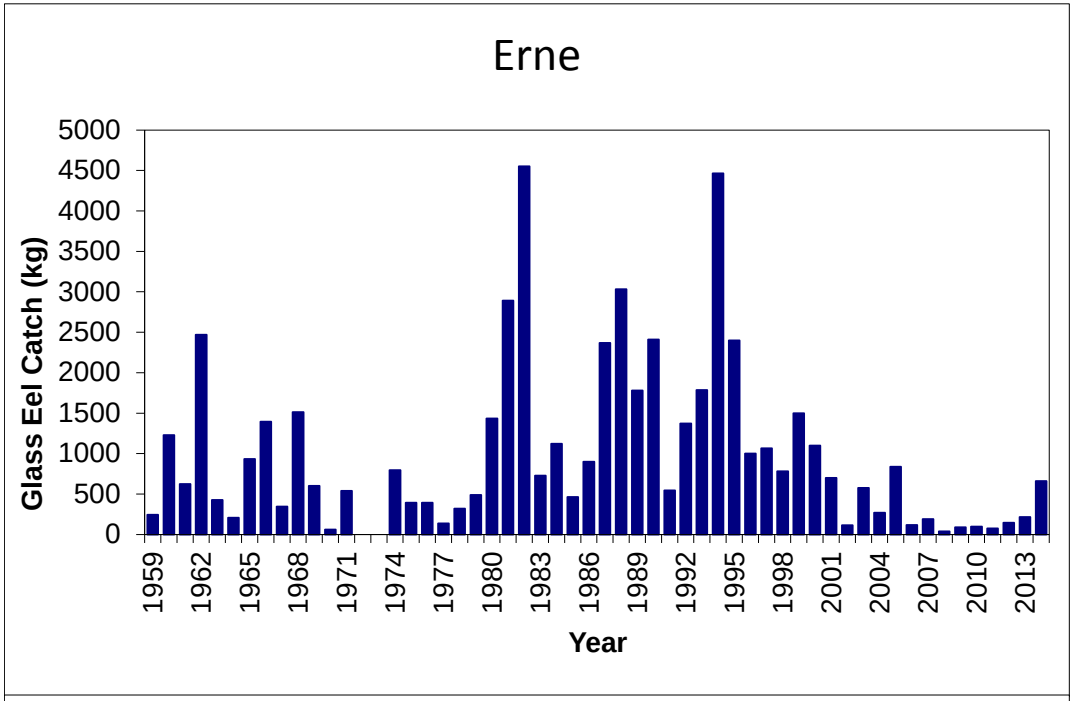
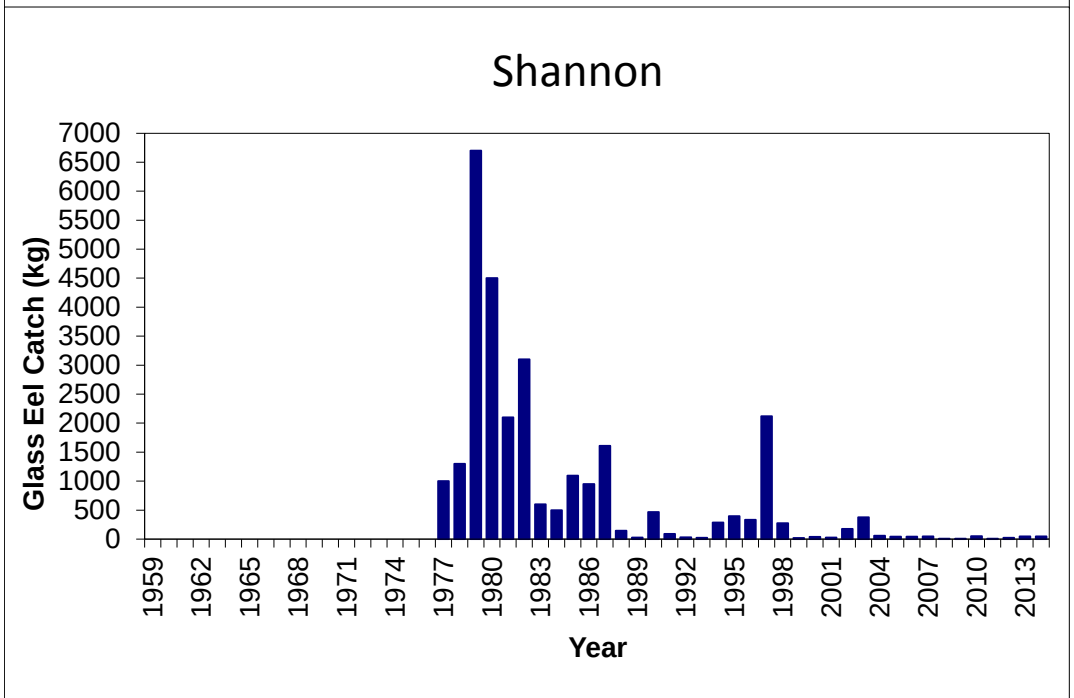
Decline in Recruitment





EC Regulation 1100/2007

- Target of 40% of the historic silver eel biomass to escape (Spawner escapement) relative to pristine escapement levels if no anthropogenic influences had impacted the stock …….to be achieved <u>in the long term</u>.

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Spawner Escapement

The EC Regulation focuses on boosting Spawner Escapement from fisheries as the optimal means of recovering eel stocks

Spawner Escapement is a function of :-

- Recruitment history to the fishery (typically 12 -18 years before their downstream migration as silver eels)
- Available habitat, water quality and natural productivity of the catchment
- Natural mortality (predation) and fish health
- Anthropogenic mortality (fishing, hydropower, pollution)

Management actions focus mainly on reducing Anthropogenic mortality as the key means of maximising Eel Spawner Escapement from eel fisheries (EMUs).

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Threatened stock status

- Eel stocks remain outside safe biological limits
- Eels were listed in the IUCN Red list in 2008 and again in 2014 as ‘critically endangered’.
- The International Council for the Exploration of the Seas (ICES) advises that all anthropogenic (human) mortality should be reduced to – or kept as close to zero- as possible.

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Ireland's Eel Management Plans

Four main management actions identified:-

1. Closure of fishery (commercial & recreational)
2. Mitigation of impact of hydropower
3. Ensure upstream migration of juveniles eels at barriers
4. Improve water quality

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Eel Conservation bye laws

- Bye-Law No 858, 2009 prohibits the issue of eel fishing licences by Inland Fisheries Ireland in any Fishery District.

- Bye-law C.S. 312, 2012 prohibits fishing for eel, or possessing or selling eel caught in a Fishery District in the State until June 2015.

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Illegal eel fishing gear seized

Year	ERBD	Loughs Agency	NWRBD	SHRBD	SERBD	SWRBD	WRBD
2009	0		2 fykes, 1 longline	4 fykes, 3 longlines	0	0	9 fykes
2010	11 fykes, 6 longlines	0	40 fykes, 1 boat	0	0	0	29 fykes
2011	3 fykes, 4 longlines	0	2 fykes, 3 longlines	8 fykes, 3 coghills, 1 angling rod	0	0	5 fykes
2012	3 fykes	0	1 coghill	5 fykes	0	0	50 fykes (lost)
2013	0	0	12 fykes, 2 coghills	110 fykes, 800 m longlines	0	0	2 fykes
2014	None	2 Angling rods	20 fykes	54 fykes, 2010 m longlines	0	0	1 fyke (lost)

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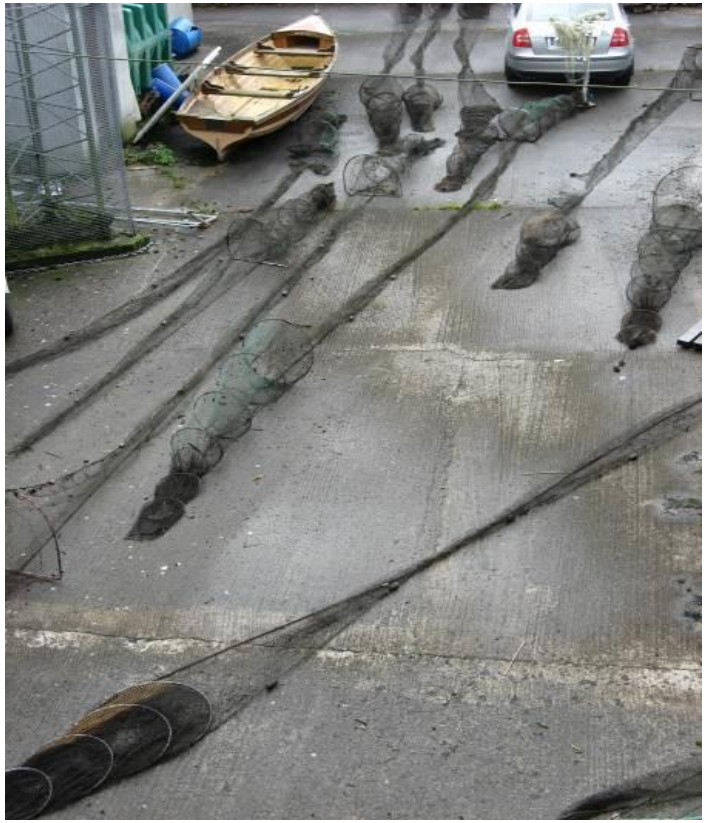
Seized eel fishing gear



Mitigation of hydropower

- ESB operate an annual Trap & Transport programme for downstream migrating silver eel to increase Spawner escapement to sea
- Trap & Truck operations are conducted on the Shannon, Erne and Lee.
- Fishermen are contracted by ESB to complete conservation fishing at specified sites
- ESB staff record and transport eel catches
- IFI staff verify catches & ensure silver eel are released in optimal condition for spawning

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ESB Trap & Truck Programme

Silver Eel Trap & Truck- R. Shannon

Year	T & T Target	Amount Transported (kg)	Relation to target	Status	3 yr Running Average
2009	30% of run	23,730	31%	Achieved	37%
2010	30% of run	27,768	40%	Achieved	38%
2011	30% of run	25,680	39%	Achieved	34%
2012	30% of run	24,228	36%	Achieved	34%
2013	30% of run	22,561	28%	Not achieved	33%
2014	30% of run	26,438	37%	Achieved	37%

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Silver Eel Trap & Truck- R. Erne

Year	T&T Target	Amount Transported (kg)	Relation to target	Status	3 yr Running Average
2009	22t	9,383	42.6	Not achieved	
2010	34t	19,334	56.9	Not achieved	46.9
2011	39t	25,405	65.1	Not achieved	59.3
2012	50% of run	34,660	51.2%	Achieved	57.1%
2013	50% of run	39,319	53.6%	Achieved	60.0%
2014	50% of run	48,126	66.4%	Achieved	66.4%

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Silver Eel Trap & Truck- R. Lee

Year	T&T Target	Amount Transported (kg)	Relation to target	Status	3 yr Running Average
2009	0.5t	79	16%	Not achieved	73%
2010	0.5t	278	56%	Not achieved	83%
2011	0.5t	731	146%	Achieved	119%
2012	0.5t	230	46%	Not achieved	115%
2013	0.5t	824	165%	Achieved	150%
2014	0.5t	670	134%	Achieved	134%

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Turbine mortality rates at R. Shannon

Year	Number of tagged eel	Mortality				% using bypass
2006-2009	44	20.4%				59%
2010	40	22.5%				4%
2011	20	20.6%				13%
Average mortality (2006-2011)		**21.2%**				
2012	No direct assessment, 21.15% used in estimating escapement					2%
2013	No direct assessment, 21.15% used in estimating escapement					24%
2014	No direct assessment, 21.15% used in estimating escapement					16%

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Turbine mortality rates at R. Erne

Year	Number of tagged eel	Mortality*	Number of tagged Eel	Mortality **	
	Cliff HPS		**Cathaleen's Fall HPS**		
2009	13	7.7%	9	22.0%	
2010	29	6.9%	26	7.7%	One turbine
2011	60	8.5%	49	6.1%	One turbine
2012	30	26.7%	No assessment; 8% used in estimating escapement		
2013	26.7%/7.9%/0% *		0%/7.7%/15.4%/27.3% **		
2014	26.7%/7.9%/0% *		0%/7.7%/15.4%/27.3% **		

* Cliff HPS Estimates applied with and without spillage, no direct assessment

** Cathaleen's Fall HPS Estimates applied with and without spillage, no direct assessment

Upstream migration

- Both the EU Habitats Directive and WFD requires evaluation of upstream migration and colonisation of waters by fish
- IFI established a Barriers group in 2011
- IFI staff conduct an annual programme of assessment of barriers (multi-species)
- Over 450 structures have been assessed to date
- Guidelines for the planning, design & operation of small scale hydro facilities regarding fish (& eel) passage are available on IFI website

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Water Quality

- Improvement of Water Quality in Ireland is being delivered by the Water Framework Directive (WFD)
- The next River Basin Management Plans are due for publication in 2015
- Current water quality status reports are available through the EPA website.
- IFI deliver the fisheries component of the WFD programme.
- Summary reports are available at www.wfdfish.ie
- Eel were found in 83% of lakes and 70% of rivers surveyed to date.

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Considerations wrto re-opening of commercial eel fishing

- Enforcement and protection of commercial eel fishery across various RBDs.
- Issues arising re. Shannon (currently below 40%) and Erne (cross-border)
- Requirement for DCF sampling and logbook returns
- Regulation of eel dealers (necessitating restricted dealers and collection locations).
- Biosecurity considerations
- Requirement for segregation of commercial and ESB conservation fisheries.
- Consequent reduction in ESB trap & transport targets

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Traceability

- Under EC Regulation 1100/2007 (Article 12) member states are required to provide data relating to the quantities of eels imported or exported through their jurisdictions.
- Regulation is required to establish a traceability scheme for Ireland for the accurate recording of any eel movements.
- Ideally a EU wide traceability scheme is required which would allow eel imports and exports to be cross-checked between various member states.

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Management Actions- Progress to date

- Management actions have achieved a marked decrease in fishing and Hydro related mortality in Ireland
- The target of 40% SSB (pristine escapement) has been attained in 5 of the 6 Eel Management Units (EMUs)
- Escapement from Shannon RBD is currently at 36% SSB
- Nationally silver eel escapement has reached 54.5% SSB for the 2012-2014 period (above the EU target)

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Management Actions- Future

- Whilst 5 of the 6 EMUs are currently attaining the Regulation target of 40% SSB, it is unlikely that current production levels can be sustained
- Future production will be severely limited by poor elver recruitment over recent years
- This is reflected by Shannon RBD where 40% SSB has not been achieved despite closure of the fishery and operation of silver eel trap & truck programme
- Eel catches in L. Neagh fishery are also declining (despite historical stocking).
- A similar decrease in eel production from the Erne is expected in 4-5 years time in line with recruitment history

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TRANSITIONAL WATERS

- Eel fisheries in tidal and transitional waters are also managed under the Inland Fisheries legislation and management structures.
- Given the lack of appropriate methods for estimating eel production and silver eel escapement from transitional waters and the overall decline in eel recruitment, the precautionary approach also needs to be applied to this component of the eel stock.

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Eel Management (2015-2018)

Given the implications of the scientific advice, the continued critical status of eel stocks and the requirement to recover the stock in the shortest possible timeframe (contingent upon equivalent actions across Europe), the precautionary approach must again be adopted in accordance with best available information as presented in Ireland's Eel Management Report regarding the status of eel stocks (2012 – 2015).

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Precautionary Principle

Agenda 21:

"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation"

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Eel Consultation process

- Publish the latest scientific and management reports regarding Implementation of Ireland's EMPs www.fisheriesireland.ie
- Invite stakeholders to the Public consultation meeting and seek submissions.
- Submit Ireland's finalised EMP progress report (2012-2015) to Europe by end of June.

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