

Environment, Marine and Fisheries Group
Department of Agriculture, Environment and Rural Affairs

Ref: Request for Scientific advice regarding Eel Management options.

The Eel Management Plan (EMP) for the Neagh/ Bann River Basin District sets a silver eel escapement target within the range of 160 to 240 tonnes per year following the requirements of the EU Regulation 1100/2007. Section 13.1.2 of this EMP states that:

“should mark recapture estimation in future indicate that escapement is falling below the target of 200t per year, measured on a rolling average basis, this will necessarily trigger measures to reduce exploitation of yellow or silver eels”.

Recent three year rolling escapement estimates are **155 tonnes estimated in 2021** (this is the average annual escapement from 2019 to 2021), **143 tonnes estimated in 2022 (2020-2022)** and **144 tonnes estimated in 2023 (2021-2023)**.

AFBI have been requested to review current eel fishing practices and consider a number of possible management options in light of the falling numbers of escaping silver eels from within the area of the Neagh/Bann River Basin District EMP.

Option 1: revision of a closed season

i) Reducing the yellow eel fishery harvest

The current yellow eel fishing season is operational from the start of May until approximately the end of September, depending on catches. Table 1 shows the weekly yellow eel catches from the 4th of May 2022 until the week beginning the 28th of September 2022.

ICES Eel scientific research estimates that for calculation purposes 100 tonnes of yellow eels are proportional to approximately 95 tonnes of silver eel equivalents (SEQ), bearing in mind there will be a lag period for yellow eels to become silver eels. These figures are also utilized within the UK CITES Non-Detriment Findings (NDF) documents. In terms of the escapement target for silver eels, it should be noted that during the silver eel fishing season, on average

only 75% of migrating eels will make it to sea (working on the long-term average weir efficiency of 25%).

Using these data, the impact of shortening the yellow eel fishing season on the escapement of silver eels can be estimated. Table 2 shows the potential additional silver eel production and escapement (as SEQ) for the months of May to September based on average yellow eel catches for the years 2018 to 2022. These data in turn allow prediction of the the impact on silver eel escapement by reducing the yellow eel fishing season. Restricting the yellow eel fishing season to the months of June, July and August, for example, would permit the escapement of approximately 42 tonnes of silver eel equivalents.

ii) Reducing the silver eel fishery harvest

Unlike yellow eel catch reductions, changes in silver eel catches have immediate application and implications for escapement and thereby compliance with conservation targets.

The current silver eel fishing season is operational from the start of August until the end of December. Due to environmental conditions, the Weir at Kilrea is typically fished during the month of August and the weir at Toome is generally fished from mid to late September to December. Table 3 shows the silver eel catches for the months of August to December for the period 2012 to 2022. As can be seen in Table 3, the largest impact on silver eel escapement would result from closing the silver eel fishery during the months of October and November.

Option 2: Restriction of Fishing effort

AFBI advice is that the most practicable approach to reducing fishing effort is through the reduction of the fishing season as described in option 1, coupled with the condition that there can be no increase in fishing effort during any amended fishing season, as per the terms of the Neagh/Bann River Basin District EMP.

Option 3: Setting of a Quota

AFBI have developed a tool to enable us to estimate permissible catches (of both yellow and silver eels), based on the Predicted Eel Population Lifetime Mortality Model, which uses known recruitment and stocking history of eels in Lough Neagh. Using this tool we have looked at the impact of restricting the yellow eel catches for the years 2024 to 2028 inclusively, to 150 tonnes on the permissible catches for silver eels for these years to ensure escapement of 160, 200 and 240 tonnes of silver eels (Table 4).

To attain an escapement target of 200 tonnes of silver eels in 2024, the quota for yellow and silver eels would need to be restricted to 146 tonnes, and zero catch respectively, as shown in Table 4, (which is based on recent yellow eel average annual catch of 150 tonnes, and long term weir catch efficiency of 25%).

By reducing the yellow eel catch quota to 100 tonnes (Table 5), a 200 tonnes escapement target

in 2024 would be attainable with an available silver eel catch of 46 tonnes (Table 5).

Option 4: Setting a maximum take size

Analysis of length frequency measurements from silver eel catches for the period 2012 to 2022 show that approximately 1-2% of the total catch would comprise females 75 cm and above, which are known to carry in excess of 1 million eggs. Management measures aimed at protecting the escapement of these large female eels, whilst of conservation benefit to the species, would only result in approximately 0.6 to 1.2 tonnes of additional escapement of silver eels (based on 1-2% of the average tonnage of silver eels caught for the period 2012 to 2022).

Whilst AFBI would strongly advocate the setting of a maximum size limit for the capture of silver eels to ensure that large, egg laden females, have increased opportunity to migrate to their spawning grounds in the Sargasso Sea, this measure will have limited impact on the attainment of the escapement target given the numbers involved.

RECOMMENDATIONS

DAERA should be mindful of the current International Council for the Exploration of the Sea (ICES) Working Group on Eels (WGEEL) advice as per fishing opportunities for European eels which states that *"given current stock status there are no FISHING OPPORTUNITIES for eel"*. As such ICES advises that there should be ZERO catch of ALL life stages of European eel.

However, in consideration of the AFBI information above if DAERA wish to continue to permit fishing of yellow and silver eels in Lough Neagh, to have the most impact on the attainment of escapement targets for the conservation of silver eels AFBI would recommend the revision of the closed seasons for both the yellow and silver eel fisheries (Option 1) and the setting of quotas for annual catches for both the yellow and silver eel fisheries permissible within any revised seasons (Option 3).

Yours Sincerely,

[Redacted Signature]

Fisheries and Aquatic Ecosystems Branch
Freshwater Fisheries Section

Tables

Table 1: Yellow eel catches for the 2022 fishing season.

	week no.	boats	weekly total catch lb	kg
04-May-22	1	33	4669	2117
11-May-22	2	43	10499	4761
18-May-22	3	48	12656	5740
25-May-22	4	50	11695	5304
01-Jun-22	5	48	11939	5415
08-Jun-22	6	49	12506	5672
15-Jun-22	7	45	13153	5965
22-Jun-22	8	47	15082	6840
29-Jun-22	9	50	11656	5286
06-Jul-22	10	51	14730	6680
13-Jul-22	11	58	13851	6282
20-Jul-22	12	55	16933	7679
27-Jul-22	13	43	10526	4774
03-Aug-22	14	49	11208	5083
10-Aug-22	15	47	11343	5144
17-Aug-22	16	34	9617	4361
24-Aug-22	17	38	7203	3267
31-Aug-22	18	20	5028	2280
07-Sep-22	19	15	2926	1327
14-Sep-22	20	8	2111	957
21-Sep-22	21	4	1309	594
28-Sep-22	22	4	377	171
			211,017	95,699

Table 2: Potential additional silver eel production and escapement (in tonnes) for the months of May to September based on average yellow eel catches for the years 2018 to 2022. SEQ refers to Silver eel Equivalents.

	2018	2019	2020	2021	2022	mean	SEQ*
May	17	32	0	21	18	18	17
June	39	42	0	34	29	29	27
July	59	49	26	45	25	41	39
August	57	50	32	32	20	38	36
September	49	39	23	19	3	27	25

*SEQ = Silver eel Equivalents. ICES Eel scientific research estimates that for calculation purposes 100 tonnes of yellow eels are proportional to approximately 95 tonnes of silver eel equivalents.

Table 3: Silver eel catches (in kg) from Kilrea weir for the month of August, and from September to December for the Toome weir for the period 2012 to 2022, showing predicted escapement based on a weir efficiency of 10% at Kilrea and 25% at Toome. Please note that these efficiency figures are averages from 20 years of surveys. "Total Silvers out" refers to the total weight of silver eels what would have left the system in the absence of fishing.

YEAR	August	September	October	November	December
2012	966	5,401	38,667	26,939	789
2013	0	898	51,510	14,163	6,231
2014	0	803	42,721	22,408	122
2015	2,585	857	6,585	36,531	2,816
2016	354	19,184	6,204	14,299	12,204
2017	6,095	20,381	29,211	2,014	1,946
2018	0	10,980	20,463	57,714	4,190
2019	163	4,150	30,422	6,531	3,891
2020	0	8,639	51,837	4,422	0
2021	0	1,741	15,184	39,102	6,925
2022	0	41	42,177	3,673	0
MEAN catch	924	6,643	30,453	20,709	3,556
Associated escapement	8,315	16,158	74,557	50,701	8,706
TOTAL Silvers Out	9,239	22,801	105,010	71,410	12,262

Table 4: Effect of a 150T yellow eel fishery on silver eel output for the years 2024-2028 inclusive to attain escapement figures of 160, 200 and 240 tonnes of silver eels.

4 year Yellow catch @ 56 boats - 150T
at 25% weir efficiency

YEAR	predicted output T	target 160T		target 200T		target 240T	
		yellow	silvers	yellow	silvers	yellow	silvers
2024	346	150	36	150	ZERO	150	ZERO
2025	362	150	52	150	12	150	ZERO
2026	370	150	55	150	20	150	ZERO
2027	385	150	59	150	35	150	ZERO
2028	385	150	59	150	35	150	ZERO

Table 5: Effect of a 100T yellow eel fishery on silver eel output for the years 2024-2028 inclusive to attain escapement figures of 160, 200 and 240 tonnes of silver eels.

		set at 100T yellow eel quota at 25% weir efficiency					
YEAR	predicted output T	target 160T		target 200T		target 240T	
		yellow	silvers	yellow	silvers	yellow	silvers
2024	346	100	61	100	46	100	6
2025	362	100	65	100	62	100	22
2026	370	100	68	100	67	100	30
2027	385	100	98	100	85	100	45
2028	385	100	98	100	85	100	45