Sustainable *Eel* Group

Implementation of a Tele-declaration System to Reach Traceability for UK Glass Eel Fisheries

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1. Purpose

This is the final report in fulfilment of the terms of the grant funding by the Marine Management Organisation and European Maritime Fisheries Fund, for project number ENG2031.

2. Background

2.1 Illegal trafficking in live European glass eels (juveniles) has been identified as a serious threat to the species' (*Anguilla anguilla*) survival. Europol announced in April 2018 that it is believed that 100 tons (about 350 Million fish), which is equivalent to about a quarter of the annual glass eel recruitment, are trafficked annually to Asia (see report). The trafficking is enabled by a serious lack in transparency and traceability of live glass eels throughout the supply chain.

2.2 Traceability of eels is a requirement of the EC Eel Regulation (EC 1100/2007). Article 12 states: that:

> *No later than 1 July 2009, Member States shall:*
>
> *— take the measures necessary to identify the origin and ensure the traceability of all live eels imported or exported from their territory.*

2.3 Some member states have implemented such measures better than others. For example, in France, where the majority of Europe's glass eels are caught, most fisheries use an electronic tele-declaration system to report catches on a daily basis. This enables real-time monitoring towards each river's catch quota. By also recording what each fisher has caught, it also provides a facility to enable onward traceability of fish traded.

2.4 The UK reports the second largest catches of glass eels in Europe, after France.

2.5 The UK currently doesn't have a daily, 'real-time' catch reporting system. The responsible authorities; Environment Agency and Natural Resources Wales, legally require fishers to submit a catch return at the end of the fishing season. That can be done online or by providing a paper return in the post. In both cases, data are transferred to the authorities' database. This means that (1) fishers must keep daily records of their catches during the season to submit later and (2) there are three records of the data: (i) fishers' daily records, (ii) what they submit and (iii) what is recorded onto the authority's database. The records are also such that there is no indication of where the fish are sold, so the functionality for traceability is limited. However, the number of traders is limited, and they too are required to submit a return, which can be compared.

3. Objectives

3.1 The principal aim for this project was to trial and test if a tele-declaration system, similar to that used in France, could be applied to the UK. If the trial is successful, the longer term aim is to expand such systems to the UK and all European glass eel fisheries to significantly increase the traceability of and trade in Europe and consequently help reduce the illegal trafficking.

3.2 The project specific objectives were to:

1) implement a convenient, effective, real-time electronic application allowing fishers and traders to electronically report their glass eel catches and trade
2) provide a simple and more efficient catch-return-system for the eel sector (fishers, collectors and traders) and the regulatory authority - the Environment Agency (EA)
3) adapt the tele-declaration system to UK-specific rules and habits
4) expand the system from the initial study area at the Parrett to other glass eel fishing areas in the UK
5) test the technical aspects and requirements of a UK system
6) test the attitudes and receptibility of those in the sector to a new and electronic catch-reporting system

4. Methodology

4.1 Prior to the pilot study, a tele-declaration system called 'Telecapêche' has been used in an increasing number of rivers in France, from 2013. Most of the French glass eel fisheries now use it.

4.2 In late 2016, two meetings were held with the stakeholders of the River Parrett, Bridgwater – the fishers, traders and Environment Agency. These were to provide a background to the system, its capabilities, how to use it, to understand what they wanted from it in order to maximise its functionality and acceptability, and to prepare those involved for a pilot.

4.3 Due to national and local differences between the French and the British glass eel fisheries, the system required significant adaptation to the local conditions and needs. The adapted version for the implementation in the UK included these additional features, e.g. daily reported data could be made accessible for different parties; anonymised data for scientists and conservationists; complete and detailed data for enforcement and fishery authorities.

4.4 The tele-declaration system was adapted from the existing Telecapêche and called '*Telecapêche 2 (T2)*'. It is hosted in the cloud with fully dedicated servers and uses an external SMS platform to get and send text messages (notifications) from and to the fishers. Fishers' names, phone numbers and Identification Number (Licence Numbers) were stored in the database.

4.5 For the fishers and glass eel collectors, the tele-declaration system was provided through computers, smartphones and, more importantly, feature phones (low-end mobile phones). Catches could be reported via any modern browser (computer or smartphone) or SMS. A local administrator had access via a desktop computer.

4.6 After fishing, fishers weighed their catches at the sale point with the trader. With that weight information, catches could be immediately reported via SMS including a simple code that denoted (i) the river, (ii) the weight, (iii) the fish species and (iv) the collector. This procedure was repeated by the collectors when buying the glass eels from the fishers. In this way, correspondence of weight could be checked.

4.7 In February 2017, the system was delivered to the fishers of the Parrett river to be tested during the season, February – May 2017. A sample of fishers who were volunteering to use the system were trained to use it, as was the main collector / trader, and an administrator from the Environment Agency who was the usual authority collecting the data from the group.

4.8 During the season, as feedback was received on the system's use, some technical errors (system 'bugs') were identified and resolved. Some functional improvements were provided to ensure smoother usage for each the administrator, fisher and trader.

4.9 In May 2017, the season was reviewed with all the participants and a list of enhancements were proposed to the Manatee Lab development team. Those were developed and implemented for the following season, February – May 2018.

4.10 In January 2018, Manatee Lab provided an enhanced set of tools for collectors and a faster user interface. Two other rivers were added to the trial - the Taw and the Severn and 11 additional fishers were added.

4.11 In September 2018, a final review meeting was held with the participants to gain feedback, discuss the results and receive further suggestions for enhancement should the system be continued for use. For example, the trader asked to add a new dialog box in the user interface such that fishers can provide a ticket number for the transaction. The "Ticket number" is an official paper document linking a catch to a declaration. By entering it through the tele-declaration system, the trader can quickly identify and transactions later on.

5. Results

5.1 Data

5.1.1 See Annexes 1 and 2 – a comparison of catches reported to the Environment Agency and to T2 by the same fishers in each 2017 and 2018, and a summary of all results data in Table 1.

Table 1. Summary of catch statistics from *Telecapêche 2*.

	2017	2018	Total
Number of fishers participating	13	21	21
Number of traders participating	0	1	1
Fishers' tele-declarations	123	173	297
Fishers' reported catch (kg)	114	191	305
Trader's tele-declarations	0	173	173
Trader's reported transactions (kg)	0	160	160
Rejected and modified transactions (kg)		31	31
Minimum declared weight (in g)	155	10	-
Mean declared weight (in g)	926	1,133	-
Maximum declared weight (in g)	5,076	7,440	-
Total Tele-declared catches (in kg)			
River Parrett	114	215	329
River Taw	0	0.34	0.34
EA catch record	354.8	449.8	
% of EA catch declared on Telecapêche	32%	43%	

5.1.2 In the first year of the pilot, 13 fishers registered to use T2. 6 made 123 tele-declarations reporting 114 kg of glass eels. The system covering the trader's declarations was not sufficiently implemented in 2017.

5.1.3 In the second year of the pilot, 21 fishers were registered to use T2. 13 made 173 tele-declarations reporting 191.1 kg of glass eels.

5.1.4 During the duration of the project, no fisher left the project, but the number of fishers increased from 13 to 21 by the end of the project in 2018. However, not all pilot fishers used T2 at all times.

5.1.5 The mean amount of glass eels reported in single declarations was higher in 2018 which is also reflected in the total declared catches of the river Parrett which almost doubled in 2018 compared to 2017.

5.1.6 The catches reported by fishers in the compulsory Environment Agency (EA) catch system was compared to that reported in T2. These comparisons indicated:

5.1.6.1 The total reported was less in T2 than EA, but it increased in the second year of the trial (32% in 2017 and 43% in 2018).

5.1.6.2 The proportion of catches reported in T2 compared to EA was as low as 0% and as high as 192%. In 2017 2 of 13 (15%) fishermen and in 2018 3 of 20 (15%) fishermen reported close to 100% similarity in each system.

5.2 Traceability

The trader using the system on the Parrett used T2 to record the catches of those involved in the pilot. 191kg was recorded by the fishers and 160kg (83.8%) was recorded by the trader. The discrepancy of 31kg results from 5 rejected and 34 modified transactions.

5.3 Fishermen and Traders' attitudes

5.3.1 Based on four years of experience with the fishers in France, the developers were prepared for potential scepticism by the fishers of introducing a new technology to a traditional sector. However, from the outset, the fishers and the main trader on the River Parrett were keen to trial the system. They could see the benefits of reporting their catch soon after weigh-in, they engaged in suggesting improvements to the system, they encouraged other fishers to join in and, at the end of the trial, they asked for the system to remain available for use. The trader on the Parrett found that by using this electronic system, it could greatly simplify and reduce paperwork, record-keeping, calculations and thence administration costs.

5.3.2 The fishers and trader on the River Severn were invited to join the trial and attended two meetings to understand how it would operate after the first year's trial on the Parrett. Unfortunately, they didn't join the trial. The trader said they already had good record keeping systems and saw no benefit to trialling another system. The fishers didn't give a reason for not joining the trial, even though they previously indicated they would.

5.3.3 Two fishers on the River Taw, a much smaller fishery (five fishers) volunteered for the trial. Although not a significant number or catch, this did demonstrate that other fisheries can be easily added to the system.

5.4 Regulatory Authority

5.4.1 The Environment Agency was very supportive during the trial – both locally, from those who enforce and manage the fishery on a daily basis - and nationally, from those who collate and report fishery catches across the country. The Agency is considering developing an electronic catch reporting system and results from this trial would inform how it proceeds in the future.

5.5 Project Management and Expenditure

Due to some delays in starting this project, plus delays to paying claims, IT bugs to fix and summer holidays affecting availability, the project took 3 months longer to complete. This was approved via the EMFF/MMO via a Notification of Change, extending the project deadline to 31 October 2018.

The project achieved 98% of expenditure (see Annex 3). £500 for Communications was underspent because the supplier was unavailable due to ill-health. The Sustainable El group fulfilled that task at its own expense. £1000 was deemed ineligible because an invoice was dated before the project was recognised to officially start. The project was slow to be approved and had to start 'at risk' otherwise a whole year would have been lost as it was dependent on accessibility to information during an annual 3 month fishing season.

6. Discussion

6.1 Attitudes

6.1.1 The trial showed that fishers and traders in the UK can be willing to adopt an electronic catch reporting system provided that (i) it is simple to use, (ii) there are clear benefits for them and (iii) it is cost effective (ideally free – or part of the licence fee). Where some groups have not yet seen the benefits for them, greater efforts to influence and engage them would be needed.

6.1.2 The Environment Agency is interested in developing / implementing a similar system. This pilot has shown that an electronic declaration system can be developed and implemented to report glass eel catches (and probably other fisheries). Its usual policy is to develop its own IT systems for regulatory and legal measures. If it is to develop its own system, the results of this trail should inform its design and approach. If its policy allows, a cost-benefit analysis might demonstrate that it could be more cost-effective to adopt *Telecapêche 2*, rather than invest duplicate IT development costs to create a similar system.

6.3 Traceability and Trafficking

6.3.1 By logging the weight of fish caught by fishers into the system, and then that sold by traders, it offers the facility to more easily identify 'losses' of fish caught and potentially sold illegally / trafficked. The more fishers and traders who use the system in Europe, the easier it will be to identify and trace illegal supplies and sources.

6.3.2 Intelligence from enforcement agencies such as Europol suggests that the amount and proportion of illegally exported glass eels from the UK is low compared to France, Spain and Portugal. Whilst there is therefore probably less of a problem in the UK that requires control (i) the high prices on offer from Asian markets are likely to continue to provide temptation and (ii) the more the whole legal market uses such systems to help assure traceability, the easier and greater the control over illegal markets.

6.3.3 More of the eel sector is seeking to adopt the SEG Standard to demonstrate when it is operating responsibly. That is likely to increase when the standard is accredited by ISEAL - with Associate status in January 2019 and Full Membership in January 2020. One of the criteria of the SEG standard is for fishers and traders in eel to show that they have good traceability systems. Systems such as *Telecapêche 2* provides this functionality and would assist those seeking that recognition.

6.3.4 Based on the experiences from the pilot the system owners, Manatee Lab, are developing an advanced system that has the capability to cover the entire supply chain from the fisher via the trader to the customer. If every chain link reports via the system, full and accurate traceability of the glass eel supply chain can be achieved.

6.3.5 Whilst comparison of catches reported by fishermen and traders can help to identify gaps, and then investigate missing amounts to clamp down on illegal trading, any fish illegally caught, sold, traded and trafficked outside of the system cannot be identified. As with any system, fully illegal activities cannot be easily identified if they are completely hidden from a legal system.

6.4 Accuracy of data

The comparison of returns data between the same fishers using the T2 and EA shows a high level of inconsistency. In only 15% of fishers in each year were the returns close to 100% similar. In many cases, the fishers didn't use T2 after all (54% in 2017 and 45% in 2018). Discussion with a representative of the Parrett fishers indicated that (1) some didn't get into the 'habit' of using T2 and others found the coding system too complicated; so it 'failed' and they stopped using it. Making it compulsory and providing further training and guidance would help to resolve this. In France, where it is used by many fisheries, there is a high level of compliance and the authorities use it with confidence.

6.5 Feasibility

The pilot has demonstrated that it is feasible to develop and implement a tele-declaration system for glass eel fishers and traders in the UK, and has collated the intelligence, feedback, processes and

functionality to maximise the success of such a system. Incentives and awareness/education/training are likely to be required to maximise the engagement of those involved and the accuracy of data provided.

6.6 Costs

6.6.1 IT systems cost money to develop and to maintain. Telecapêche is well established in France and is used for glass eel fisheries, shell fisheries, red tuna and swordfish. This project has enabled (i) development of new functionality and (2) trial it in a new country.

6.6.2 For the Environment Agency to develop a new regulatory IT system is likely to cost in the region of £50,000 - £100,000 – probably more if they wanted to adapt it to apply to other species / fisheries, such as salmon and sea trout. *Telecapêche 2* could be used for UK glass eel and other fisheries, with minimal development, and the addition of user data, for €25 per user per year. This could probably be funded directly from the licence fees of such fishers. Existing costs of administration could be saved as there would be no manual input or individual export of catch data into Agency databases – the fishers' data go directly into the database (though quality assurance processes would be required).

6.7 Benefits

The project has shown that the following benefits can be realised by implementing *Telecapêche 2*, or developing a similar system into the UK:-

6.7.1 For fishers

- A convenient and simple way to report catches soon after weigh-in
- Less likely to forget to report, or the amount caught
- Once recorded the record can't be forgotten or mislaid, so the end-of-season total will be more accurate
- A simple and accurate way to therefore meet their legal requirements in reporting their catches
- Provides a system to help achieve one of the criteria of the SEG standard
- Protects themselves against illegal trade
- Fishermen can easily view their electronic record history in relation to environmental parameters (water temperature, discharge etc.) to identify optimal catch conditions.

6.7.2 For Traders

- The potential to reduce paperwork and administration, as the system makes and provides many of the records required
- A simple and accurate way to therefore meet their legal requirements in reporting their sales to the authorities
- Provides a system to help achieve one of the criteria of the SEG standard
- Protects themselves against illegal trade
- An integrated system that connects them to the fishers

6.7.2 For Government

- Provides real-time data of catches
- Provides more accurate data on catches
- Is more cost-effective and 'modern' than current systems
- Can be easily adapted for other fish species (could even be used for e.g. salmon rod catches, sea fisheries)
- Helps to tackle illegal trade of an endangered species
- Helps the UK to meet Article 12 of the EC Eel Regulation, and therefore the recovery of the European Eel
- Possibly better value than developing own IT system

6.8 Risks

There are also risks with adopting *Telecapêche 2*:

- A contract would need to be developed with the system owners to use it, to agree costs, data protection, data ownership, data security, contingency planning (for e.g. bankruptcy, system availability). Such a contract and trade would need to be developed under the current uncertain back-drop of the UK's exit from the EU.
- Not all users might wish to adopt the system, though the Environment Agency could make it compulsory.
- Some fishers reported that their SMS messages were sometimes not accepted. This might have been due to lack of signal and/or errors in the message being sent. Simple training and guidance for all users would be required to (1) ensure messages are sent when there is a mobile signal reception and (2) ensure the correct codes are used in messages.

7. Conclusions

The project provides the following conclusions:

7.1 A tele-declaration system could be applied or developed to report glass eel catches and trade in the UK.

7.2 A system can improve traceability of catches and sales of eels.

7.3 Fishermen, traders and administrators can adapt to using the system

7.4 It can provide benefits to fishers, notably simpler and easier to use and to report more accurate catch records

7.5 It can provide administrative benefits to traders who have to deal with hundreds of records

7.6 It can provide benefits to the government and its agencies – providing real-time catches, more accurate catches at less cost, and enabling it to meet Article 12 of the EU Eel Regulation.

8. Recommendations

It is recommended that:

8.1 The Environment Agency considers adopting *Telecapêche 2* for English glass eel fisheries and the UK Government considers adopting it for eel fisheries in other parts of the UK; enabling it to meet Article 12 of the EU Eel Regulation and future data calls by the Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL).

8.2 The Environment Agency considers adopting *Telecapêche 2* for other fisheries, such as yellow eels, commercial migratory salmonids and even rod fisheries.

8.3 The UK Government considers adopting *Telecapêche 2* for, or making it available to, sea fisheries.

8.4 In such considerations, it evaluates the costs, risks and benefits of developing its own system, or entering into a contract to adopt *Telecapêche 2*.

8.5 Manatee Lab and SEG continue to work with the fishers to use the tele-declaration system in the next fishing season whilst the Environment Agency considers whether or not to adopt it.

8.6 The Sustainable Eel Group (SEG) supports the efforts to make the tele-declaration system become a European approach that covers all glass eel fisheries and trade. Additional pilots in other species range countries should be considered.

Annex 1 Reported catches of Glass eels by the same fishermen in each Telecapêche 2 and Environment Agency return 2017.

Auth No. *	River(s) fished	Nearest Town	Days fished	Hours fished	Total weight of live elvers retained (kg)	Total weight of dead elvers retained (kg)	Total weight of elvers declared (kg) in Telecapêche	Total number of declarations made in Telecapêche	% of Weight Declared In Telecapeche compared to EA
1	Parrett	Bridgwater	41	132	12.3		5.57	8	45%
2	Parrett	Bridgwater	21	51.5	11.5		0	0	0%
3	Parrett	Bridgwater	4	19	5.7		0	0	0%
4	Parrett	Bridgwater	48	321.5	42.9				0%
5	Parrett	Bridgwater	28	63	15.0	0.96			0%
6	Parrett	Bridgwater	12	21	8.9				0%
7	Parrett	Bridgwater	57	335	39.8		39.585	59	99%
8	Parrett	Bridgwater	17	34	10.8				0%
9	Parrett	Bridgwater	10	20	14.4				0%
10	Parrett	Bridgwater	25	64	18.7		0	0	0%
11	Parrett	Bridgwater	22	48	10.8		0	0	0%
12	Parrett	Bridgwater	20	44	28.3	0.72	0	0	0%
13	Parrett	Bridgwater	13	30	13.7		15.7	18	114%
13	Tone	Bridgwater	2	4	2.0				0%
14	Parrett	Bridgwater	14	36	6.0				0%
15	Parrett	Bridgwater	8	19.25	11.2		21.5	13	192%
15	Parrett	Burrow Bridge	7	16.25	10.3				0%
16	Parrett	Bridgwater	58	194	27.7		2.345	2	8%
17	Parrett	Bridgwater	17	54	15.0	0.5	0	0	0%
18	Parrett	Bridgwater	19	39.5	30.2		29.3	23	97%
19	Parrett						0	0	
20	Taw	Barnstaple	8	21.5	8.3				0%
21	Taw	Barnstaple	23	57	11.2				0%
Total EA					**354.8**				
Total Telecapeche					**114.0**		**114**	**123**	**32%**
proportion covered by Telecapeche					**32%**				
EA number of fishermen					21				
Telecapeche number of fishermen					6				
*** Anonymised to protect identity**									

Annex 2 Reported catches of Glass eels by the same fishermen in each Telecapêche 2 and Environment Agency return 2018.

Auth No. *	River(s) fished	Nearest Town	Days fished	Hours fished	Total weight of live elvers retained (kg)	Total weight of dead elvers retained (kg)	Total weight of elvers returned (kg)	Total weight of elvers declared (kg) in Telecapêche	Total number of declarations made in Telecapêche	% of Weight Declared In Telecapeche compared to EA
1	Parrett	Bridgwater	42	168	14.1			13.91	6	99%
2	Parrett	Bridgwater	14	39	8.8		0.585	7.077	8	81%
3	Parrett	Bridgwater						0	0	
4	Parrett	Bridgwater	20	35	14.9			16.65	20	111%
5	Parrett	Bridgwater	37	289	31.4			4.435	4	14%
6	Parrett	Bridgwater	15	38	22.9			4.555	11	20%
7	Parrett	Bridgwater	18	48	16.9			0	0	0%
8	Parrett	Bridgwater	38	222	60.7			51.84	40	85%
9	Parrett	Bridgwater	25	75	16.0			12.66	17	79%
10	Parrett	Bridgwater	29	73	21.7			0	0	0%
11	Parrett	Bridgwater	26	61.75	22.1			5.04	6	23%
12	Parrett	Bridgwater	26	48	11.0			0	0	0%
13	Parrett	Bridgwater	20	40	26.8			0	0	0%
14	Parrett	Bridgwater	18	36	11.6					0%
14	Tone	Bridgwater	2	4	2.1					0%
14	Parrett	Bridgwater	19	40	15.7	0.19		15.715	21	100%
14	Tone	Bridgwater	2	4	2.1					0%
15	Parrett	Bridgwater	9	36	5.5			0	0	0%
16	Tone	Burrow Bridge	2	6	1.5					0%
16	Parrett	Bridgwater	22	69.5	38.3			36.88	20	96%
17	Parrett	Bridgwater	77	405	38.9			0	0	0%
18	Parrett	Bridgwater	23	66	18.7			11.845	12	63%
19	Parrett	Bridgwater	21	42	28.4			10.19	6	36%
20	Taw	Barnstaple	4	21	3.9	20		0	0	0%
21	Taw	Barnstaple	12	51	6.9			0.335	3	5%
Total EA					**440.8**					
Total Telecapeche					**191.132**			**191.132**	**174**	43%
proportion covered by Telecapeche					**43%**					
EA number of fishermen					21					
Telecapeche number of fishermen					13					
*** Anonymised to protect identity**										

Annex 3. Project Expenditure

Budget	Budget Amount	Amount Spent	% Spend	Approved by MMO	% Approved By MMO
Develop,and provide IT services	£48,000	£48,000	100%	£48,000	100%
Project Management	£16,500	£16,500	100%	£15,500	93.9%
Programme Management and local liaison	£4,000	£4,000	100%	£4,000	100%
Communications	£500	£500	100%	£0.00	0%
Total	**£69,000**	**£69,000**	**100%**	**£67,500**	**97.8%**