

Sustainable Eel Standard with explanatory notes**Contents**

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This Standard has been developed on contract to the Sustainable Eel Group. It has had the advice and approval from independent and respected eel scientists and conservationists, as a sub-group of the Sustainable Eel Group. It has been piloted on the eel industry supply chain and has been amended following those pilot assessments

Jo Gascoigne

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www.macalister-elliott.com

1. Introduction

We recognise that the term “sustainable” cannot be truly applied to the European Eel population until, over several generations (30 – 40 years), it has proven to have fully recovered. This Standard has been designed to promote and ensure the most responsible methods of fishing, transport and farming, such that the Eel Recovery Plan and full sustainability will be achieved more quickly.

We have tried to find an objective external definition of sustainability for eel fisheries, and for this we have turned to the EU Regulation (1100/2007) on the recovery of the European eel. Here we consider whether the 40% escapement target is being met, or whether an approved Eel Management Plan is being implemented. For more information, please see Annex 1, Note 1.

This document is third version of the Sustainable Eel Standard as approved by the Standard sub-group of the Sustainable Eel Group (SEG) – see Annex 2 and www.sustainableeelgroup.com

This Standard has been developed and improved from previous versions, and also based on practical application through a series of pilot assessments, ie.

- Fisheries – Severn and Seudre / Gironde
- Glass eel buyers – UK Glass Eels, Chez Mouchet and Deutscher Fischerei Verband (DFV)
- Glass eel farms / restocking – DFV, Royal Danish Seafood, Scandinavian Silver Eels

No pilot assessments have yet been done for yellow and silver eel fisheries or for restocking, but these components of the Standard have also been amended to be consistent with the changes in the glass eel fishery component.

This Standard is the first version of an initiative to identify and promote the most sustainable and responsible practices in the eel fishing, with the aim of protecting eel stocks and enhancing their recovery. It is based on the best available science at the moment and will be reviewed and improved (a) as our scientific knowledge improves and at least every 3 years as Eel Management Plans are reviewed.

2. Structure and scoring of each component of the Standard

Each component consists of a series of criteria for which there is usually a green and an amber scoring indicator (although a few criteria have only a green indicator). In order to pass overall, the scores should include a majority of greens (e.g. 4 out of 7 or 5 out of 8 green). Any one red will result in failing the Standard. Where there is an equal number of greens and ambers, this will be considered by a review panel (the Sustainable Eel Standard sub-group of SEG). In such borderline cases, the panel will apply a simple but rigorous test, ie. “is it within the assessee’s control to achieve any further greens within the foreseeable future?”

3. Glass eel fisheries

1. The management target (40% escapement or otherwise) is being achieved (see notes 1 and 2)	
green score indicator	The management plan is approved and there are good data (see note 3) which show with reasonable confidence that the EU silver eel escapement target is being achieved in the eel management district.
amber score indicator	The management plan is approved and there is evidence that it is being implemented on the ground. The fishery is complying with the requirements of the EMP.
red score indicator	The management plan is not approved or there is little evidence of it being implemented
2. The fishery is well-managed	
green score indicator	Fishers are licensed and provide logbook data. Data on catch and effort are collected and analysed regularly by the management agency (minimum of annually at the end of the season), and data are made available to the management agency at any time if required. Data are considered to be accurate, useful for statistical purposes and provide a comprehensive picture of the glass eel fishery under assessment. Fishermen only use legal gear; enforcement is in place throughout the fishing area with no evidence of systematic non-compliance.
amber score indicator	Fishers are licensed. Data on catch and effort are collected and analysed regularly by the management agency (minimum of annually at the end of the season). Data are considered to be accurate and provide enough information on the glass eel fishery under assessment for management and to track annual trends in glass eel arrival. Fishermen only use legal gear. There is no evidence of systematic non-compliance.
3. Mortality during fishing is minimised (see notes 4-6)	
green score indicator	Fishing is by hand-held nets OR Fishing from vessels meets the following criteria, in addition to those for amber: i) fishing is at slow speed (anchored in current or speed no more than 1 knot relative to water); ii) average haul duration no longer than 20 minutes, with the maximum duration not more than 30 minutes; (iii) mesh size of cod end no greater than 1 mm (iv) rest of the net designed such that glass eels do not become trapped or abraded; v) vivier tank (see note 7) on board and in use; OR Fishermen can demonstrate convincingly by another method that the mortality rate of the catch over the duration of holding in the storage facility is <4% for each batch captured.
amber score indicator	Fishing from vessels meets the following criteria: i) fishing is at slow speed (no more than 1.5 knots relative to water); ii) maximum haul duration no longer than 30 minutes; iii) mesh size of cod end no greater than 1 mm; iv) rest of the net designed such that glass eels do not become trapped or abraded; v) vivier tank on board and in use; OR Fishermen can demonstrate convincingly by another method that the required mortality rate of the catch over the duration of holding in the storage facility is <8% for each batch captured.
4. The fishery has negligible impacts on bycatch species (see note 8)	
green score indicator	The fishery has <1% bycatch by weight AND bycatch is returned to the water alive as gently and rapidly as possible. Note: infrequent but large catches of gelatinous zooplankton in glass eel nets during bloom periods may be excluded from these criteria.

amber score indicator	Either i) the fishery has <5% bycatch by weight OR ii) bycatch is returned to the water alive as gently and rapidly as possible. Note: infrequent but large catches of gelatinous zooplankton in glass eel nets during bloom periods may be excluded from these criteria.
5. The fishery has negligible impacts on rare or other protected species	
green score indicator	The fishery has no direct interactions resulting in mortality or injury with other species that are considered vulnerable, threatened or endangered, or are protected under national or international law.
amber score indicator	The fishery has no direct interactions, resulting in mortality, with other species that are considered vulnerable, threatened or endangered, or are protected under national or international law.
6. The fishery has negligible impacts on habitats	
green score indicator	The fishing gear does not cause any damage to the bottom.
amber score indicator	Damage to the bottom by gear is rare and accidental.
7. Research / education – bonus (see note 9)	
green score indicator	The fishery actively participates in or contributes to research and monitoring to support implementation of the management plans, or to education projects to promote eel awareness and conservation (this excludes provision of logbook data and other legal requirements which are covered above).

4. Glass eel buyers

1. Traceability (see note 10)	
PASS	Traceability allows each eel in each batch delivered to a buyer to be connected back to a water and a time period (maximum duration one month) with high confidence. This should include as a minimum: i) separation and detailed labelling of batches at all times; ii) labels which connect each batch back to an individual fishermen or group of fishermen or supplier or water, and a date; iii) daily record-keeping of mortality according to a set procedure; iv) recording of weight in and weight out for each batch (see note 8); v) rectification of supplier invoices, shrinkage and buyer invoices.
FAIL	Any lack of confidence in any aspect of the above procedures should lead to a failure in certification: this might include for example any unlabelled batches, labels being insufficiently detailed, amalgamation of several batches, failure of record keeping, problems rectifying invoices, etc.
2. Mortality in storage facility (see note 5)	
green score indicator	Mortality rate over the season is <2% on average.
amber score indicator	Mortality rate over the season is <5% on average.
3. Transport and initial holding if transported to farm (see note 11)	
green score indicator	Mortality during transport and for the first week at the farm is <1.5% on average.
amber score indicator	Mortality during transport and for the first week at the farm is <3% on average.

4. Storage system	
green score indicator	Bio-security plan in place; water from borehole, ground or potable (to avoid importing disease); loss of electricity, water pressure, overflow or air pressure (for oxygen levels) connected to a permanent alarm system with back-up power
amber score indicator	Loss of electricity, water pressure, overflow or air pressure (for oxygen levels) connected to a permanent alarm system.
5. Water quality	
green score indicator	A filter system for particulates and dissolved organics is in place that is expected to keep water quality high. Water quality management procedures are in place and there is regular monitoring of relevant parameters which shows that water quality is always high and stable (what relevant parameters are depends on the amount of feeding, whether flow through or re-circulating, and water source). Effluent quality meets national standards and effluent is highly unlikely to have ecological impacts. There is regular analysis of the incoming water.
amber score indicator	A filter system is in place that is expected to keep water quality sufficient to have no mortality effects. There is regular monitoring of relevant parameters that shows that these are generally kept within optimum bounds. Effluent quality meets national standards.
6. Hygiene and disease (see note 12)	
green score indicator	All tanks and associated infrastructure are washed and effectively disinfected between batches. Eels are visually checked for disease problems regularly, with microscope parasite checks being carried out periodically during storage. Eels are diagnosed and treated if necessary according to established procedures.
amber score indicator	All tanks and associated infrastructure are washed and effectively disinfected between batches. Eels are visually checked for disease problems regularly and treated if necessary.
7. Handling and welfare (see notes 13 and 14)	
green score indicator	Systems are in place and the facility is designed to keep handling to an absolute minimum. Procedures are in place for handling, and handling, where necessary, is careful. The infrastructure is designed to avoid injuries, and so that the use of nets is rarely necessary. When used, nets are small-mesh (1mm maximum). Eels are moved without being allowed to dry out.
amber score indicator	The facility may not be optimally designed, but systems are in place to avoid handling as much as possible within the constraints of the facility (see note 13). Handling, where necessary, is careful. The infrastructure has been optimised as far as possible to avoid injuries. Nets are small-mesh (1mm maximum). Eels are moved without being allowed to dry out.
8. Transport (see note 15)	
pass/fail score indicator	Transport is carefully planned to minimise travel time. Packing is done in a way that minimises handling, time and stress. Eels are kept cool and wet with an adequate supply of oxygen.
9. The required percentage of glass eels from the fishery is being used for restocking (see note 16)	
green score indicator	The buyer makes glass eels available for restocking at least 5% greater than requirements of the EU Regulation.
amber score indicator	The buyer makes glass eels available for restocking according to the requirements of the EU Regulation.

10. Research / education – bonus	
green score indicator	The enterprise actively participates in or contributes to research and monitoring to support implementation of the management plans for the waters where the eels are captured or to the plan local to the buyers facility, or to education projects to promote eel awareness and conservation (this excludes legal requirements which are covered above).

5. Cultured eel

1. The total mortality rate during the culture process is low (see notes 11 and 17)	
green score indicator	Total mortality rate of eels in culture, from one week after receipt of glass eels to killing is less than 10% in the current and previous season, or on average over the last five seasons.
amber score indicator	Total mortality rate of eels in culture, from one week after receipt of glass eels to killing is less than 15% in the current and previous season, or on average over the last five seasons.
2. The fish meal/oil ingredients in the feed come from a sustainable source (see notes 18 and 19)	
green score indicator	Fish meal/oil in the feed comes from a fishery where the stock is at or above a target or precautionary reference point, or a stock which is certified by MSC or another eco-label, or comes from fish waste from processing that would otherwise be discarded. The fishing method used does not directly or indirectly threaten any other species, habitats or ecosystems.
amber score indicator	Fish meal/oil in the feed comes from a fishery where there is evidence that the stock is healthy and a low risk that it is depleted, or comes from fish waste from processing that would otherwise be discarded. The fishing method used does not directly or indirectly threaten any rare or protected species or habitats.
3. Feed is used as efficiently as possible (see note 20)	
green score indicator	The average feed conversion ratios in the farm are as follows: glass eel to fingerlings: <1.1 fingerlings to 200g: <1.6 large eels: <2.0
amber score indicator	The average feed conversion ratios in the farm are as follows: glass eel to fingerlings: <1.3 fingerlings to 200g: <1.8 large eels: <2.2
4. There are no ecological impacts from effluent discharge	
green score indicator	Effluent discharge complies with all local and national requirements. Effluent is regularly tested for solids, nutrients and other relevant residue e.g. any drug treatment residues, if necessary, and has not been found to be non-compliant in the past 5 years. The residue produced will meet national guidelines.
amber score indicator	Effluent discharge complies with all local and national requirements. Effluent is periodically tested for solids, nutrients and other relevant residue, and has not been found to be non-compliant in the last 2 years.
5. Disease is treated rapidly and appropriately (see note 21)	
green score indicator	Eels are handled and held in a way that minimises the spread of disease. Eels are inspected for disease daily, and disease is treated rapidly following well-defined procedures. There is a periodic veterinary inspection following national/EU

	requirements. Records are kept of disease outbreaks and medications. No chemical is used that risks ecological impacts or food residues at low concentrations, unless there are effective procedures for removal of residue before discharge.
amber score indicator	Eels are handled and held in a way that minimises the spread of disease. Eels are regularly inspected for disease. Records are kept of disease outbreaks and medications. No chemical is used that risks ecological impacts or food residues at low concentrations, unless there are effective procedures for removal of residue before discharge.
6. Handling, transport and killing are carried out with respect for welfare	
green score indicator	A carefully thought-out culture process ensures that handling is minimised, as far as is compatible with the above requirements. There are well-defined procedures for handling and transport. Killing is by the most humane method. These procedures are always followed carefully.
amber score indicator	Handling is avoided where possible during culture. Procedures for handling and transport show respect for welfare. Killing is by the most humane method.
7. The farm provides eel for restocking	
green score indicator	The farm makes more than 10% of their annual production (by number) available for restocking in their country or elsewhere. This restocking should be for the primary purpose of conservation / escapement.
amber score indicator	The farm makes 5 – 10 % of their annual production (by number) available for restocking in their country or elsewhere. This restocking should be for the primary purpose of conservation / escapement.
8. Research / education – bonus (see note 22)	
green score indicator	The enterprise actively participates in or contributes to research and monitoring to support implementation of the management plan for the water where the source eels were captured or for the plan local to the culture facility, or to education projects to promote eel awareness and conservation (this excludes legal requirements).

6. Restocking

1. An approved Eel Management Plan has or is being implemented in the restocked system (see note 1)	
Green score indicator	The management plan is approved and there are good data (see note 3) which show with reasonable confidence that the EU silver eel escapement target is being achieved in the eel management district.
Amber score indicator	The management plan is approved and there is evidence that it is being implemented. The fishery is complying with the requirements of the EMP.
Red score indicator	The management plan is not approved or there is little evidence of it being implemented
2. Survival and growth rates of restocked eels can be estimated (see note 23)	
green score indicator	A formal monitoring programme estimates survival rates and growth rates of restocked eels such that there is good evidence that restocking is significantly enhancing eel biomass and contributing to escapement. There is active research on means of improving the restocking programme or restocking techniques.
amber score indicator	A monitoring programme estimates survival and growth. The existing evidence suggests that restocking is significantly enhancing eel biomass and contributing to escapement.

3. The risk of restocked eels introducing disease into wild populations has been assessed and is minimal (see note 24)	
green score indicator	Eels are tested before restocking and found to be free of disease AND/OR eels are from a known source which is tested on a regular basis and known to be free of disease.
amber score indicator	Eels are tested before restocking when first sourced from a new area, and periodically (at least annually) thereafter to ensure they are free from disease OR eels are from a known source where available evidence is sufficient to confidently suggest that disease levels are low/zero (although it may not be tested regularly) OR eels from an area where a disease is endemic in the wild population are being restocked into an area with similar prevalence of the same disease(s).

7. Yellow and silver eel fishing

1. The management target (40% escapement or otherwise) is being achieved (see note 1)	
green score indicator	The management plan is approved and there are good data (see note 3) which show with reasonable confidence that the EU silver eel escapement target is being achieved in the eel management district.
amber score indicator	The management plan is approved and there is evidence that it is being implemented . The fishery is complying with the requirements of the EMP.
Red score indicator	The management plan is not approved or there is little evidence of it being implemented
2. The fishery is well-managed	
green score indicator	Fishers are licensed and provide logbook data. Data on catch and effort are collected and analysed regularly by the management agency (minimum of annually at the end of the season), and data are made available to the management agency at any time if required. Data are considered to be accurate, useful for statistical purposes and provide a comprehensive picture of the glass eel fishery under assessment. Fishermen only use legal gear; enforcement is in place throughout the fishing area with no evidence of systematic non-compliance.
amber score indicator	Fishers are licensed. Data on catch and effort are collected and analysed regularly by the management agency (minimum of annually at the end of the season). Data are considered to be accurate and provide enough information on the glass eel fishery under assessment for management and to track annual trends in glass eel arrival. Fishermen only use legal gear. There is no evidence of systematic non-compliance.
3. The fishery has negligible impacts on bycatch species	
green score indicator	The fishery has <1% bycatch by weight AND ii) bycatch is returned to the water alive as gently and rapidly as possible.
amber score indicator	Either i) the fishery has <5% bycatch by weight OR ii) bycatch is returned to the water alive as gently and rapidly as possible.
4. The fishery has negligible impacts on rare or other protected species	
green score indicator	The fishery has no direct interactions with species that are considered vulnerable, threatened or endangered, or are protected under national or international law.
amber score indicator	The fishery has no direct interactions resulting in mortality with species that are considered vulnerable, threatened or endangered, or are protected under national or international law.

5. The fishery has negligible impacts on habitats	
green score indicator	Mobile fishing gear does not damage the bottom, or the fishing gear is fixed.
amber score indicator	Damage to the bottom by gear is rare and accidental.
6. Research – bonus (see note 7)	
green score indicator	The fishery actively participates in or contributes to research and monitoring to support implementation of the management plan for the water fished (this excludes provision of catch data and other legal requirements which is dealt with above).

Annex 1 – Explanatory notes

Note 1 : Definition of a sustainable eel fishery

This note applies to both glass eel fisheries and fisheries for adult eels.

We have tried to find an objective external definition of sustainability for eel fisheries, and on this basis have turned to the EU Regulation (1100/2007) on stock rebuilding for *Anguilla anguilla*. The regulation requires each Member State with eel stocks to produce eel management plans (EMPs) with the long-term objective of ‘reduc(ing) anthropogenic mortalities so as to permit with high probability the escapement to the sea of at least 40 % of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock’ (Article 2 paragraph 4). The EMPs were required to be approved by the European Commission and an external review body (ICES).

Based on this objective, we have developed two definitions of a sustainable eel fishery: either

- i) (a higher level definition) - one from a catchment where the 40% escapement target is being met with reasonable probability; or
- ii) (a lower level or interim definition) – one from a catchment where the EMP is approved and being implemented. These are the definitions we have used to correspond to our score indicators for criterion 1 above. SEG has taken the same approach with our definition of sustainability (see below). Note that with the review and revision of the EMPs in 2013, this definition of sustainability will be reviewed and if necessary changed.

The Sustainable Eel Group has defined a sustainable eel fishery:-

" as one which is managed in line with an approved EU Eel Management Plan "

and defined a sustainable eel product

" as having been sourced from a sustainable fishery and supply chain, caught in an environmentally sensitive manner and grown or ranched in conditions that meet European Standards for Health, Bio-security, Welfare and the Environment"

In assessing progress of an eel management plan, the assessor will seek evidence from the relevant agencies to identify whether there is credible progress with the majority of management actions.

Note also that for countries where the EU Regulation does not apply, a similar Standard is based on the implementation of an eel management plan approved by an international scientific committee.

Note 2 : Situations where escapement is impossible

In some situations (e.g. in very polluted rivers) the vast majority of glass eels entering the system will not survive to become adult eels or to contribute to escapement. In this case, it might be arguable that the most ‘sustainable’ course of action would be to remove the entire or the majority of annual recruitment for culture / restocking.

There was some discussion about whether an exception in this case should be made such that eels can be fished from systems in which the 40% escapement target will not be met. Stakeholders concluded, however, that eels removed for culture, restocking or trap-and-transport from rivers or other habitats in which they are highly unlikely to survive should still be subject to the requirements of the Standard.

Note 3. Good Data

Good data is defined as data that can be used for statistical analysis with reasonable power

Note 4 : Mortality rates during fishing

This note applies to glass eel fisheries only.

It would be more straightforward to have only a direct statement about the mortality rate, but stakeholders were concerned that i) the mortality rate is variable e.g. over the season; ii) the mortality rate is difficult to measure because eels may look fine but have invisible injuries that subsequently cause mortality outside the specified timeframe and iii) it would be relatively easy for fishermen to ‘put on a good show’ for inspectors in this regard. (For example, poor physical condition can be masked by raising salinity of the tank water with salt to between 10 and 16 ppt.) Therefore, we have chosen to include a series of criteria about the fishing method, such that the Standard requires fishermen to use techniques that are known by the industry to result in low mortality rates. Note that these represent informal industry ‘best practice’ – no published criteria are available.

Note 5 : Mortality rates in fishery and in storage

Mortality from fishing can become apparent during the period of glass eel storage, rather than in the fishery itself. Since the glass eel catch over several days tends to be amalgamated in one tank in the holding facility, it is not possible to separate out a time period to allocate this mortality to the fishery vs. the holding facility – e.g. by saying that mortality during the first 24 hours is due to the fishery while after that it is due to conditions during holding. Thus the maximum mortality rate for the fishery covers the whole time period that the glass eels are in the holding facility. The Standard for glass eel buyers also includes a maximum mortality requirement, which is lower than the maximum mortality requirement for the fishery, although covering the same time period. This appears to be contradictory, but actually is not, because the fishery Standard requires a maximum permissible rate for each batch, while the storage facility requires a maximum average rate across the whole season.

Note 6 : Design of net

This note applies to glass eel fisheries only.

The crucial element in the design of fishing gear for glass eels is that it does not allow the eels to become trapped in the mesh – this leads to mechanical injuries which eventually leads to mortality even if such injuries are not immediately visible. For the cod end and for hand-held nets, this is generally solved by ensuring that the mesh size is small enough so that no part of the glass eel fits through. For the rest of a towed net, the mesh size can either be small enough as above, or large enough that glass eels can pass through without injury (in practice, most swim away from the mesh, ensuring that they remain in the net). For the cod end, we have been prescriptive about mesh size, but for the remainder of the net, fishermen may find their own solutions, so long as they fulfil the criterion of not causing injury or abrasion.

Note 7: Vivier Tank

Tank for holding live fish with systems to replenish water, and monitor and maintain water quality standards appropriate to the fish species and life stage.

Note 8: Bycatch

Bycatch in glass eel fisheries is essentially confined to fishing by boat – hand-net fisheries have little or no bycatch since glass eels tend to swim upstream in monospecific groups. By-catch in one glass eel boat fishery was reported to comprise juvenile fish (mainly mullet, also possibly bass and some species of wrasse), *Crangon* shrimp and detritus, with a few individuals or tens of individuals per tow.

No research is available on the mortality rate of these individuals once returned to the water. However, we note that if fishing is carried out such that the glass eels are obtained in good condition, then it is highly likely that these other species would also be in good condition. If an appropriate protocol is being following (i.e. returning to the water as soon as possible) but mortality of by-catch is still high, it is almost certain that the fishery would fail on other criteria because the glass eels themselves are not being appropriately handled.

The assessor will require evidence to make a credible assessment, over a fishing season, of:

- The quantity of each species of by-catch
- Whether any rare or protected species are caught
- If and how by-catch species are returned
- The actual or likely survival of species returned

Note 9 : Research / education criterion

Stakeholders agreed with the idea that a business that participates in research over and above the legal requirements (such as providing catch and effort data for a fishery), or in education and conservation awareness projects should be rewarded, but since in some places fisheries may not be given this opportunity, they should not be penalised for not doing so. This criterion can be regarded as an opportunity to gain an extra ‘green’ if the score indicator statement is met – otherwise it is proposed that it is not scored. Note that this criterion cannot mitigate any ‘red’ scores.

In order to score green here, the contribution of the business to research or education would have to be significant and ongoing, rather than a one-off or relatively minor input.

Note 10: Record keeping

The key to traceability is clearly good record-keeping. It is essential that daily records are kept for mortality. Glass eels shrink during storage (they don’t feed), so weight change is an important element of rectifying “eels in” with “eels out” for a batch. However, for this case there is a trade-off between frequent record-keeping and mortality induced by handling so that good husbandry dictates that handling is minimised – this means weighing only when necessary.

Note 11: Mortality during first week in culture

It was agreed between glass eel buyers and eel farmers represented on the stakeholder group that mortality during the first ~3-5 day period in the eel culture facility is related to handling during fishing and holding/transport, rather than necessarily to anything under the eel farmer’s control. This period was therefore left out of calculations for mortality rates during culture and included instead in the mortality rates for glass eel buyers. Note that if the glass eel buyer is operating according to the standard, mortality rates during this period should be low.

Note 12: Disease and medicines

The main issues in glass eel facilities are to monitor i) external protozoan parasites (eg. white spot, *costia* and *trichodina*); ii) viral infections and iii) bacterial infections.

Note 13: Careful handling

Careful handling is largely a matter of common sense, bearing in mind that glass eels are delicate fish and if suffering mechanical injury will usually not survive. Careful handling will involve, for example, no dropping or tipping, no drying out, minimal contact with sharp edges or corners, nothing in which the tail could be caught, moving with water rather than nets, etc. where possible, and the procedure to be completed as quickly as possible.

Note 14: Design of glass eel holding facilities

In order to be ideal for glass eel holding, facilities generally have to be specially designed with this in mind – there should be, for example, no sharp corners or edges, no excessive flow rates or abrupt changes in flow rate. Some buyers may use facilities that have been adapted rather than specially designed, and thus may not be ideal. The standard has been designed so that these facilities can still have an ‘amber’ score if they are used as well as possible, but a green score can only be obtained by facilities with a completely appropriate design.

Note 15: Transport – no ‘amber’ score possible

We were not able to design an ‘amber’ score criterion for transport – it appears that anything less than the optimum standard is not acceptable. There is therefore only one scoring criterion here – either pass (green) or fail (red).

Note 16: Restocking requirements under the EU Regulation

The EU Regulation requires under normal circumstances that 60% of glass eels from fisheries to be reserved for restocking in order to improve escapement rates – this 60% target should be achieved at the latest by 31 July 2013, with intermediate targets foreseen before this point (35% in the first year of implementation of the EMP, rising by 5% per year, or more if necessary to meet the deadline). These targets are the ones proposed above. However, the Regulation also foresees some possibilities of exceptions to this rule should the price differential between glass eels for restocking and glass eels for culture become too great, but it is not clear from the Regulation what these exceptions might be and how they would be defined and managed. Note also that these rules will be reviewed in 2012. Assessors will need to take account of the specific situation when this criterion is evaluated.

Note 17: Mortality rate during culture

Good husbandry practices can minimise mortality during the culture process. Unlike for the fishery, traceability at the farm level will be sufficient to ensure that mortality can be measured directly and evaluated reliably by the assessors. On this basis, we have opted for a direct statement about the mortality rate rather than a series of indirect statements about techniques, as for the fishery.

Farms may have varying quality of past record keeping. We have focused on the mortality rate during the current and previous season, but where available, data for the last five years may also be taken into account.

Note 18: Feed

Two main types of feed are used during the culture process – cod roe and dried feed. When glass eels are first received, they are weaned initially using cod roe. After a few days, they are introduced on to dried food with a high protein content, and after about two weeks dried feed with a slightly lower protein content, which they then eat for the rest of the time in culture. Eels that are not successfully weaned on to dried food the first time around can be separated out and re-weaned. The statements on the sustainability of ingredients should be applied to both types of feed.

An issue with this element is that the source of fish meal is kept confidential by the feed suppliers. Contact was made with a feed supplier who provided information about the source of fish meal, but only on condition that it was not included in this report. Clearly, this will not work for a formal assessment, which needs to be public. It is proposed that the feed manufacturers will make information about the source of fish meal in their feed available to a trusted third party who will be able to assure

the public that the source is sustainable. The SEG Standard sub-group will be proposed to feed manufacturers as the appropriate group for this, but this remains to be finalised.

Note 19: Sustainable fisheries

In this statement we follow MSC and other eco-labels in considering i) the impact of the fishery on the stock of the target species (i.e. is the fishery causing the stock to become depleted or over-fished?), and ii) the impact of the fishery on other species and marine ecosystems more generally. As regards i), in order to meet the 'green' level, the stock will have to be assessed in a scientific way (e.g. in Europe by ICES or elsewhere by another similar body) such that there are quantitative estimates of stock size that show that the stock is highly likely to be above a pre-determined target or precautionary reference point. The 'amber' level assumes that while there may not be a scientific or quantitative stock assessment, all the evidence nonetheless suggests that the stock is in healthy condition.

Note 20: Feed conversion ratios

Note that these figures are from eel farmers – no national or international standards appear to exist for eel farming.

Note 21: Diseases and medicines

Formalin is also used in farms against parasites, as is salt and acetic acid in some cases. Farms can also treat *Anguillicoloides crassus* and *Vibrio anguillarum* (a bacterial infection) with veterinary medicines – in the latter case only with the approval of a vet.

Note 22: Bonus

A business that both deals in and grows on glass eels could potentially receive two 'bonus' scores for the same research / education – one as a glass eel buyer and one as a glass eel grower. The same project should not score two bonuses – it should be scored in the more appropriate place.

Note 23: Restocking

Restocking can only be justified if it can be seen to be an efficient use of the precious glass eel resource (i.e. it adds to the escapement of silver eels when compared to leaving the glass eels at source). Monitoring of growth and survival in some form is therefore critical to a credible restocking programme.

Note 24: Disease and Parasites

Disease and parasites have been implicated in the decline of the European eel population. It is obviously important that restocking does not spread disease from areas where it is endemic to areas where it is not present.

Annex 2 – Members of the Sustainable Eel Standard sub-group

The following members of the Sustainable Eel Group formed the sub-group to advise on and approve the development of the Sustainable Eel Standard.

- Miran Aprahamian
- David Bunt (Chair)
- Matt Gollock
- Brian Knights
- Chris Leftwich
- Alan Walker