







## Clarification on Specifics of a British System of Effort Control Management with No Discards in Demersal Mixed Fisheries

### Chapter 13: Sustainability and future science

FFL proposes that a UK marine institute should be created, similar to the Institute of Marine Research in Norway, to provide fisheries science. Fishermen would work with scientists to gather data and a “keep what you catch” system would provide real time information on stock health. You suggest that stocks should be managed in 2-3 year long management plans to take into account natural fluctuations in fish stocks.

- ***Would a UK marine institute be the only source of evidence and data for managing UK fish stocks? How would this fit with other marine laboratories within the UK such as Cefas, and the UK working with ICES?***

The idea of a central UK authority amalgamating all the research institutes is to bring economies of scale and a streamlining and refinement into one integrated departmental unit. It is also a critical necessity that scientists and fishermen are made to work together as in Norway and the knowledge of fishermen incorporated.

The fully documented real-time data provided by an effort control system of keep what you catch, allowing a balanced harvest of stocks, will in effect turn the whole UK fleet into a scientific observer fleet providing unparalleled and unprecedented levels of data.

Providing a true reflection of what is happening in the marine environment allowing dynamic reaction to the environment rather than imposing theoretical limits and systems upon it based on the current system which suffers from a paucity of data and merely extrapolates from small samples.

Consequently, the data generated by effort control and keep what you catch will give an exacting insight into the environment with a wealth of real-time monitored data and this should be the primary source of information in scientific analysis.

We should primarily rely on our own world leading oversight whilst still participating, co-operating and operating in an international framework or within ICES feeding our nations excellent data into their information. However, ICES should not be accepted as divine gospel and with our own better data available it should be taken as supplementary not the sole source.

What we are proposing is through our administrative set up of generating real time data through an effort control system that we become world leaders that set the agenda rather than really on questionable data from ICES.



We should always aim for figures to be taken as qualitative rather than quantitative as in more or less rather than exact amounts. The pretence of being able to accurately weigh fish in the sea and then impose a structure of management and targets upon it based on figures extrapolated from survey data combined with questionable, outdated historical catch data is what has created the fundamental problem of our approach to management, especially in our mixed demersal fisheries over the past 30 years.

**It is impossible to fish to exacting targets without generating discards or tying the whole fleet up on the lowest common denominator species. We must work with what mother nature throws at us in a dynamic, holistic approach that reacts to the fluctuations of the environment and intra and inter species competition by limiting or directing effort accordingly. This is the key ideological and psychological approach to management that is required to comprehend effort control.**

- *How does FFL propose that the amount of effort (proposed days) allocated to a fishery does not exceed what is deemed unsustainable by fisheries scientists? How will effort be matched with sustainability?*

The level of effort in time at sea is determined by establishing how long the vessels in a fisheries area will require to harvest a slice out the environment based on an amalgamation of all the TAC limits in a particular area. Based on the acknowledgement that it is impossible for vessels to individually target specific species definitively and that a mix will be caught.

**Theoretical Example of Principle**

*A sea area can sustain an annual combined recruitment of 200,000 tons.*

*Avg. Catch Rates per vessel is 10 tons per day.*

*10 tons avg. per vessel per day multiplied by a fleet of 100 vessels equals a daily fleet catch of 1000 tons.*

*200,000 tons of harvestable stock divided by 1000 tons catch per day equals 200*

*Therefore, the fleet requires 200 days per vessel to utilise the sustainable proportion of marine life that can be harvested from an area. FFL have then boosted the fleets catch per vessel per day tonnage to include fish which is currently discarded but can now be landed.*

Bringing the fleet onto a time limit in such a manner will maintain fishing within the current assumed sustainable limits however will improve sustainability by eliminating regulatory discards as currently vessels have no time limit and therefore are spending maximum time at sea whilst discarding a large proportion of their catch to adhere to landing limits. Effort control will mean catching less but landing more.

It must be remembered and it is crucial to acknowledge and understand that when fish that is currently discarded is brought ashore the “extra” fish that will be allowed to be landed IS NOT extra catch but extra landings. This extra fish will represent what is otherwise being unrecorded as regulatory discards with no conservation benefit.

Under effort control we will see the catches recorded monumentally eschew the we have been working to When this real-time keep what you catch data is factored in it will render current theoretical data, figures and assumptions on sustainable limits redundant. Not because the vessels have caught more but that they are merely landing what is otherwise discarded with a curtail of time and therefore catches at sea increasing sustainability.

An acceptance of this and factoring in an increased catch rate to the equation will see a transition to fisheries being more sustainable. With the extra fish that is otherwise being discarded showing that stocks are healthier

than reflected by quota restricted landings and TAC presumptions this real-time data from keep what you catch under effort control will allow a re-assessment of current TACs to reflect actual stocks.

That currently we have a free for all on catches and merely a limit on landings with quotas having the contradictory effect of exacerbating fishing pressure as there are no catch TACs means that with stocks increasing the fleet is probably already in line with the environment even though vessels are regulatorily required to discard a large proportion of their catch for no benefit.

This will be the hardest thing to overcome that the ideological approach we have been trapped in, along with the system it has generated, are wrong and the data that underpins it horribly detached from reality.

It will be proven is how detached the supposition of current scientific estimates are. Moving to effort control is not a change in sustainability, quite the opposite, it will enhance sustainability by facilitating catch less land more, but it is a huge ideologic adjustment to swallow. The question is not continued adherence to a current system based on theoretical limits but rebalancing to what is actually there as proved by real time data and evidence.

This will consequently result in 2-3years transition from moving to the artificial targets we are super imposing on the environment to targets and limits that are a true reflection in real time of what is going on at sea.

However, after this period we will be fishing more sustainably than currently with a reduced level of time and therefore catches at sea conjoined with the elimination of discards. Therefore, although not adhering to current suppositions, overall stock mortality as accurately recorded will have been brought into line with recruitment to the stocks in a new sustainable balance.

**Quotas generate bad data through bad landings and are a perpetual downward spiral. It is not sustainable to keep catching more to land less within a limitless amount of time to find what we are allowed to keep just to keep following an ideological and managerial cul-de-sac. It is not an argument that effort control won't work but that quotas have emphatically failed to work and cannot be continued under obligations within UNCLOS to adopt best practice to fish sustainably.**

### Chapter 23: Ecological basis of days at sea

FFL proposes that the only sustainable way to manage a mixed fishery is on an ecological level, treating a mixed fishery as one overall fish stock. FFL suggests that an effort scheme, where you keep what you catch, would encourage fishermen to take an equal slice across a whole marine ecosystem instead of selectively removing individual species, and ensuring that the whole ecosystem is kept in balance.

- *How would this 'balanced harvesting' model fit with the current approach used by the commercial fishing industry where specific species are targeted?*

The 'balanced harvesting' model is focused on demersal species. The point of effort control is it deliberately **does not** fit or replicate the current disastrous approach of deliberately targeting specific caused by the quota system and the ideology of trying to set theoretical arbitrary' targets and then to adhere to them.

A 'balanced harvesting' model through effort control is designed to do the opposite by facilitating the ability to harvest across the ecosystem working with the natural fluctuations of the marine ecosystem and intra and inter species competition whilst maintaining an overall ecologically sustainable extraction level whereby an equilibrium is established which balances effort (extraction) with recruitment rather than try to cherry pick.



As you will note we have built and incorporated a secondary system within overall effort control of Flexible Catch Composition Percentages (FCCs). These are not arbitrarily limits/targets of specific species, but act as a deterrent from a free for all on high value species or a species that shows declining abundance.

FCCs also facilitate incorporation of current FQA entitlements into effort control to provide financial stability to the industry investments in FQAs whilst absolving the government of a legal battle over them.

FCC's are not there to hit specific targets but to nudge vessels away from particular areas/species whilst providing a mechanism of time in exchange for catch to avoid discarding under arbitrary limits.

As you will note the primary focus of the paper and the idea of a '*balanced harvesting*' model is the mixed fishery demersal sector where the current approach is wholly detached from reality and the antithesis of sustainability. Implementation of fit for purpose sustainable management for the demersal fisheries through effort control will align with the shellfish and pelagic sector in an overall ecosystem approach where the methodology of 3 differing but sustainable managerial models should co-exist together.

- ***How would this method ensure that more unwanted bycatch and juvenile fish were not caught?***

This would be done through rigorously enforced Technical Measures, a Conservation Credits Scheme and spatial avoidance through Temporary Closed Areas. All three will be integrated within the overall Effort Control system whereby reductions in unwanted and juvenile by catch can be incentivised through the award of extra time. Conversely, any utilization of small mesh, covered escape panels, breached closed areas etc would incur severe time penalties in a vessels soak time hours.

This would represent a vast improvement from quotas which are having the opposite effect in causing the unnecessary slaughter of 100,000s tons of fish with discards to comply with quota limits.

- ***Would all discarding be illegal?***

The system of effort control eliminates the source of regulatory discarding which constitutes the majority of the problem. It does so by addressing the cause, that we must discard to match quota limits, rather than merely banning the symptoms of the regime.

Ultimately, it is impossible to eliminate all unwanted by-catch or juveniles regardless of measures and consequently there will always be a small level of discarding. The government should implement a discard reduction policy with the removal of the cause, quotas, along with the adoption, refinement and advancement of technical measures and special avoidance through Conservation Credits to try and minimise unwanted and juvenile catches in so far as is possible.

It is only right that Discards should be allowed of high survivability species (eg, plaice, prawns, flounders, octopus, spotted dog etc.) and in our opinion juvenile discards should be accurately recorded for science but that the return of said juveniles to the marine environment as a food source would be preferable to fishmeal or landfill.

The above measures incorporated within Effort control will drastically eliminate the majority of discards. With no reason for choke species to occur under effort control with the removal of arbitrary single species limits, we see no reason that if governments heart was set on legislating to make all discarding illegal (with said exemption for high survivability species) there is no reason that this cannot be done as part of real-time keep what you catch fully documented system as proposed.

- ***How would FFL intend to incentivise the fishing industry towards adapting current fishing practices to capture an equal slice from the marine ecosystem?***

A time limit will incentivise boats to keep all catches within their allocated soak time hours. No incentive will be necessary as the regulatory cause of discarding under quotas is removed and the fleet is allowed to return to a natural pattern of keep what you catch, working with, and reacting to, the ecosystem. Harvesting the stocks overall sustainably through a limit of fishing time rather than spending more time steaming and discarding to make a trip from what we are allowed to keep. It is that simple.

FFL proposes that stocks are monitored against total extraction levels, and that if these levels are reached quickly it would indicate the stock is abundant and the extraction level can be increased. Similarly, if the extraction level is not reached within a time limit then it would indicate the stock is scarce and that fishing effort must be decreased. The current quota system of arbitrary limits creates a psychology that it is bad to see big hauls of fish, ecologically something is awry and should worry if no fish is encountered.

- ***How would total extraction levels for a stock be determined?***

Through the accurate real time data generated by a well monitored keep what you catch system. With all boats retaining all catches it will provide a fully documented fishery and a real-time, accurate picture of what and how much is being caught where and by who. Real-time data giving an accurate reflection will allow real time management to react to events after due consideration of the pattern or event unfolding.

- ***What criteria would be used to monitor these levels, for example frequency and coverage?***

Software and hardware systems can be developed that will allow all parameters to be recorded frequently and for the whole UK fleet regardless of position.

- ***Why would it be safe to increase extraction levels for a stock based entirely on data from a fisheries dependent method i.e. vessel landings?***

As previously stated other data can be and should be incorporated into managerial analysis and decisions to enable best possible appraisal in conjunction with a vast improvement provided by effort control and keep what you catch with effective real-time monitoring creating a fully documented fishery.

Consequently, accurate catch data produced by vessels being enabled to keep what they catch and monitored in real time on a rolling basis, would facilitate an alignment of landings and catch figures through the elimination of regulatory discarding due to quotas.

As landings will reflect catches, if average catches per vessel per day increase then it indicates a greater predominance of stocks on the ground. Therefore, if stocks are more abundant fishing effort can be gradually increased to rebalance to an equilibrium between recruitment and extraction is achieved.

A 'balanced harvesting' model through effort control is designed to do facilitate the ability to harvest across the ecosystem working with the natural fluctuations of the marine ecosystem and intra and inter species competition whilst maintaining an overall ecologically sustainable extraction level whereby an equilibrium is established which balances effort (extraction) with recruitment rather than try to cherry pick.

Conversely, if average catch per vessel per day decreases then it suggests a reduced prevalence of stocks on the ground and fishing effort should be reigned back down until an equilibrium is restored.



Such an approach, methodology and system of real time data affording real time management aims to act like a continually adjusting see-saw between balancing human responses to match the changes in the marine environment. Doing so facilitates real time response to natural fluctuations or changes in the marine environment dynamically rather than working to arbitrary figures based on outdated spurious data.

- *Why would catching more fish be a reliable indicator of a healthy fish stock?*

If the same boats, using the same gear, with the same generational knowledge are able to catch more fish per day than previously then the only variable that can have led to such an increase is a greater predominance of fish on the grounds.

Given that under the UK license scheme (the original form of limiting fishing effort) there is only a given amount of KW and GT potential available regardless of how this is configured regards size and shape of vessel, the UK fleet only has so much catching potential it can exert.

*i.e. 100 small boat licences catching 1 ton per day or combine these licenses to make 1 big boat catching 100 tons per day. The level of extraction remains the same regardless of different fleet configuration.*

The whole basis of effort control is monitoring average catch per vessel per day and working comparatively to this figure to determine if stocks are more or less prevalent and maintain a sustainable equilibrium between extraction and recruitment. If catch per day is observed to increase then it is self-evident there is more fish and therefore healthier stocks upon which we can slowly increase our fishing effort to rebalance the equilibrium.

### Chapter 35: Implementation of days at sea

FFL suggests that existing FQA units held by a vessel in addition to recent landing history (5-10 years) should be used to determine flexible catch compositions (FCC) that a vessel would have to comply with per trip instead on fishing quotas.

- *How would the translation of FQA units into FCCs work? Would this take into account discarding rates or actual landings?*

The system of FCC is designed as a secondary measure within effort control to provide a deterrent from a free for all based on high value species or a species that may be struggling. **It is not** as a way to arbitrarily limit and force boats to specific species but to act jointly within effort control as a refinement.

**FCC's are not there to hit specific targets but to nudge vessels away from particular areas/species whilst providing a mechanism to exchange time for catch to avoid discarding under arbitrary limits. As a secondary mechanism they avoid having to manage by setting effort to an artificially low level in comparison with overall stocks to protect the lowest common denominator species.**

The translation of FQAs from entitlement to kg of quota to a catch composition of a species as a percentage of the overall catch also provides a way to incorporate FQAs to give financial stability to investments by the industry in them whilst absolving the government of a legal battle over them.

In doing so they also maintain the entitlements of particular boats to particular fisheries.

*i.e. a boat may have a predominance of entitlement for west coast monk, north sea cod or channel sole.*



When transitioning FQAs into an effort control regime through metamorphosing FQAs to be FCCs the reference figures should be based on vessels landings. i.e. Percentage of landings of a particular species based on FQAs owned and rented.

This would give the fairest possible reflection and maintain where particular boats environmental and business effort has been focused whilst also returning all rights to fish to fishermen by eliminating slipper skippers.

As there are no reliable figures on catch rates (i.e. landings+discards) the only figures we can reasonably utilise is landings figures. Although this will not reflect catches due to the quota system and the discards it generates it gives some indication of where vessels primary focus has been.

Furthermore, and critically for the government to avoid litigation, basing FCCs on landings of FQAs preserve business entitlement to particular fisheries whilst also preserving the FQA system that the industry has been forced to invest and become based upon.

The system of using landings of FQAs as a reference point is not perfect but the proposition of doing so is merely to act as a reference point from which to start that avoids any upheaval both in distribution of effort or financial investments. The establishment process of FCCs is a means to an end not an end within itself.

- ***If each vessel has a unique FCC based on FQA units and catch (landings plus discards) history, would this result in hundreds of different vessels each with their own unique set of rules? How would this be monitored?***

To reiterate FCCs would be based on landings of FQAs owned and rented due to no way of accounting for discards.

This can be broken and addressed as two questions, application of FCCs and monitoring.

- Application of FCCs –all systems FFL proposes are not new revolutionary legislative vehicles but an evolution and reconfiguration of current ones. Therefore, FCCs are no different legislatively from FQAs. Each boat will be issued with them as part of their licence under the schedule/annex with variations issued accordingly electronically through an integrated hardware/software monitoring and management system.
- Monitoring – We propose software will do the above schedule/variation electronically through a government administered and monitored database/interface which integrates VMS, Elog and Soak time monitoring. Although vessels will retain FQAs, expressed as FCCs which will evidently fluctuate just as quotas do currently depending on environmental variables encountered.  
A skipper will be able to reference through the vessel interface as to what FCC of a high value or pressurised species he is allowed to keep and what level of time penalties he will incur in doing so. Being no different from referring to a paper license and its schedules and variations except streamlined, easily accessible, updatable and administrable through software.  
This will allow a skipper to dynamically plan and react to determine a best course of action for a trip. Throughout the trip he will be able to reference to the system which acts as a logbook, soak time sensor and FCC administration system to determine what is best - to adhere to his FCC or exchange time to retain what fish he catches.  
Conversely, administrators will be able to monitor and update the FCCs through the software direct to the boat should a long-term development require them to do so.

- ***How would unique vessel FCCs based on individual FQA units and catch (landings plus discards) history match taking an equal slice out of an overall fish stock, given the potential for hundreds of different vessel FCCs?***

The even slice one is aiming to harvest from the overall ecology is on a ecology and therefore fleet wide basis. The removal of arbitrary quotas based on spurious data is intended to free up vessels to fish what is in front of them whilst conversely FCCs are there to act as a deterrent from a free for all whilst allowing vessels the flexibility to exchange time for retention in order to allow them to fish what is in front of them and therefore taking a balanced harvest of a slice out the overall ecology.

Coming back to creating an overall equilibrium between recruitment vs extraction/effort, the point of FCCs is to create a secondary equilibrium between balancing keeping what you catch whilst avoiding a free for all and therefore having to constrain effort to the lowest common denominator species.

Many vessels will have their own unique FCCs however this is no different and is merely a reflection of the current fleet distribution based on the situation created by quotas.

- ***Would this result in vessels incurring regular time penalties for taking an equal slice out of a fish stock that did not meet their unique FCC? What impact could this have on a stock?***

It would be thoroughly advantageous to stocks by reducing mortality. The transition from quotas to effort control will have facilitated keep what you catch in less time at sea acting as a reduction in stock mortality with the elimination of discards and in doing so will help stocks by allowing boats not to discard in exchange for a loss of time.

As the reference for FCCs will be based on landing data from the quota regime that is a wholly inaccurate reflection of stocks in the sea we envisage that Initially, due to the disparity between the FCCs and fish on the grounds, penalties will be incurred. However, this is not detrimental to the fleet and will be regarded as advantageous.

Rather than incurring extra time and expense and stock mortality to find what you must catch under quotas whilst discarding this system provides the flexibility to put in shorter trips at sea by landing what you catch. If a time penalty is incurred it needn't matter as you have lost time you do not need by having obtained a viable trip faster by keeping what you catch.

Therefore, although to begin with penalties will be incurred until managers, scientists and fishermen see the true picture of stocks emerge under this keep what you catch real time data fully documented fishery both the fleet and stocks will benefit from this conservational breath of fresh air for that will return to catching what we need within a time limit rather than the thoroughly depressing situation of being forced to slaughter extra fish to adhere to a quota.

- ***How would FCCs work when a single stock in a mixed fishery was identified as poor and requires a reduction in fishing mortality - would they be reduced across the fleet to allow the stock to recover?***

Absolutely, species and stocks will always fluctuate with a variety of environmental factors. As continually reiterated the ideological and methodological approach of an effort control system is to work to with the environment and maintain an equilibrium with it.

This system is designed to act in the manner suggested in the question. If for a particular environmental reason, a particular species starts to decline from previous years FCCs across the fleet should be cut, as are quotas currently on a fleet wide basis, to react to this change in stock dynamics.

We will be reacting in real-time to the natural fluctuations that mother nature produces and altering human interaction accordingly to minimise the pressure on said poor stock best we can to maintain overall equilibrium and then fine tuning through the secondary measures of FCCs, Conservation Credits and Temporary Closed areas.

This would result in boats being pushed away from a species which is showing a dip whilst still retaining the ability to land it if encountered, especially so if the species takes an upturn and becomes abundant again.

- ***How does FFL propose to manage effort for mixed stocks where an increase has been identified in the size of one fish stock?***

The system is designed to allow the harvesting of the fluctuations encountered. If a species appears in abundance then vessels should be allowed to harvest this under an ecology wide approach. This returns to the fundamental point that we should be look to harvesting the overall ecology not micromanage specific species.

If an area switches from a composition of 30%Cod/40%Haddock/10%Coley/20%others to a different admixture of species we should work with that. Vessels will still be harvesting the ecology as a whole sustainably just with a different admixture of species as one rises and one falls.

A pertinent example would be Hake in the Northern North Sea which have become abundant in comparison to historic trends whereas haddocks are scarcer due to predation by both the hake and humans

Currently, our rigid, inflexible quota system based on outdated and spurious data cannot dynamically react to this change and therefore we are continuing to exert effort on haddocks for which we have quota for whilst being pushed away or into discarding hake which are also eating the haddocks. It is a recipe for ecological disaster as we are trying to arrogantly play god in micromanaging the marine environment to theoretical data born from dubious figures.

**FFL mentions that FCCs would be monitored per trip, and that vessels would incur time penalties for not meeting their FCCs. However, they would still be allowed to retain what they had caught, in exchange for less time at sea.**

- ***How would FCCs work across the polyvalent UK fishing fleet? If a vessel participates in different fisheries utilising different gears and fishing grounds throughout the year, how would a single FCC allocation for that vessel work? Would vessels have multiple FCC allocations dependent on the gear or fishery?***

FCCs would apply in demersal mixed fisheries only. If a vessel changed gear from single trawl to gill netting or from pair trawl to seine net they must still comply with their FCCs as a vessel pursuing a demersal mixed fishery.

As FCCs are a secondary system within effort control to facilitate some degree of individual species deterrents, and as they are derived from a vessels FQAs, they would be applicable to a vessel in the same way. Your FCCs is constant regardless of gear used.

In regards of different areas (i.e. west coast or north sea), a vessel would have FCCs based on their FQAs for that particular area, again this would be no different than is currently the case. In both respects the FCC is to work as



theoretically intended, as an evolutionary reconfiguration to express current FQA entitlements and fleet entitlement when the UK transitions to effort control.

If a vessel moved from the demersal mixed fishery to say pursuing pelagic species or scallops then they would have moved into the management system for those species as is currently the case just now under the current regime.

- ***Has FFL considered whether an effort based allocation of time should also include gear and mesh size restrictions as per recent management plans?***

We have categorically said this should be the case in the book however what we advocated was a refinement of technical measures as the current system has become unnecessarily complicated with a multitude of different rules in different areas for what are essentially the same organisms.

We categorically advocate and believe that technical measures should be integrated within effort control through a system of Conservation Credits. Whereby vessels adopting more selective gear will be awarded more time on a percentage basis of time at sea.

*Example.- Square mesh panel = 5% extra time per hour fished.  
Larger mesh size than minimum =10% extra time per hour fished.*

Doing so on a percentage basis of hours fished means a vessel will incur a uniform reward regardless of soak time hours utilised. This avoids a situation whereby a vessel fishing 24hours of soak time gets the same reward as someone only fishing 12 hours of soak time.

- ***How and who would monitor vessels meeting their FCC and effort usage?***

Primary monitoring would be done through the software system we propose. This system integrates VMS, E-logs, licensing, Soak time, Tides and Weather into one system and interface. This would also need to be followed up with spot checks on landings and records of sales notes as is currently the case.

We advocate severe time penalties of hours at sea for any flouting of the rules. This punishes vessels at source whilst having the conservation effect of reducing mortality rather than pushing vessels to exert more effort to pay fines. We suggest the threat of drastic sanctions will facilitate a saving in continual quayside enforcement.

As the system is fair and eliminates the sickening situation of enforced discarding we believe that vessels should play fair but recognise that a stick will need to accompany the carrot to maintain more wayward individuals.

- ***How does FFL propose to incentivise fishermen not to high grade catches of more valuable stocks to stay within their FCCs and not incur time penalties?***

The fact that vessels will be under an overall time limit will eliminate discards and high grading. There would be little point in discarding or high grading fish to consequently expend valuable time in order to find other species to catch.

This would be operationally nonsensical but is the current situation created by quotas. Removal of quotas and the imposition of a time limit will push and incentivises vessels to keep as much of what they catch. With keep what

you catch producing real time data and therefore better science the fleet would have an incentive to show that stocks are healthy by reporting all catches.

We appreciate there may still be some high grading but we cannot envisage this as being a significant problem over a significant amount of fish. High grading can also be legislated against in a discard reduction policy as mentioned above.

- ***How would effort time penalties for fishermen balance against managing effort and fish mortality in a stock?***

The principle of effort control is that you achieve the afore mentioned ecology wide balanced harvest of all stocks across all species to find an overall equilibrium between extraction and recruitment.

As FCCs and subsequent time penalties are there as a deterrent from a free for all on particular species we do not perceive them effecting overall stock mortality as a vessels/fleet still have a particular catch per day potential. What FCCs will affect, as the name suggests, is the species composition of landings.

*Example.- A vessel with a large number of FQAs and therefore FCCs for Monkfish West of Scotland will work scraper nets west instead of high standing nets in the North Sea for round fish etc. As FCCs are based on FQAs they maintain current fleet distribution regards areas and stocks they pursue and the methodology/gear employed to do so.*

If by stock the question means a particular species then FCCs can be increased or decreased to incentivise or deter pursuit of a particular species based on the real-time data in a fully documented fishery that effort control is feeding back to administrators.

If a particular species in a specific or overall area shows decreased abundance, although other variables such as number of boats and time remains constant, then administrators can issue a notice of a variation changing the FCC for that particular area/species or implement Technical Measures through Conservation Credits for selective gear or Temporary Closed Areas.

Through a combination of one or all methods above effort and stock mortality to be altered in response to real time developments regards one species if it shows either abundance or scarcity.

- **How does FFL classify high and low value species? What is a poor ecological species?**

High Value Species would be those where prices give particular incentive to target those species with directed effort spatially or through gear changes. Those species are those such as Cod, Dover Soles, Bass, Megrim, Monkfish etc.

Were there not FCCs for these species then, as many worry, under effort control boats would deploy gear and to areas for these species and effort would be slashed to protect the lowest common denominator.

In feeling obliged to do so administrators would return to individual species management like quotas rather than an ecology wide basis afforded under effort control.



A poor ecological species would be one determined by real time data produced by keep what you catch under effort control as showing a pattern of decreased abundance comparative to preceding years if other variables such as vessels, time and market price had remained constant.

The difficulty in determining a poor ecological species initially whilst transitioning to effort control is the paucity of the current science. Consequently, we accept that initially a species deemed poor under current science may have a low FCC but that thereafter under keep what you catch if an abundance is shown to be caught, despite a low FCC and time penalty, that the data is factored in and the science revised.

As continually stated the greatest practical difficulty in moving to effort control is not only conceptualizing the system but accepting the data it will produce will in numerous cases supplant the current species analysis and require a readjustment in much of the current poor science.

- ***How would FFL propose to manage the capture of low value and poor ecological species, ensuring sustainability for these stocks?***

As there is no particular financial incentive to specifically target and exercise more effort towards the pursuit of average/low value species outside a normal fishing pattern there is no reason to enact deterrent measures which artificially construe fishing patterns away from taking a keep what you catch balanced harvest across the whole ecology.

Vessels can be deterred from a poor ecological species, observed through the real-time data being produced by keep what you catch under effort control, showing a pattern of decreased abundance comparative to preceding years by administrators issuing a variation which implements an FCC on this species to deter/incentivise vessels away from said species.

Encouragement of selective/technical measures where applicable through conservation credits or through special avoidance if the species is in particular areas can also be implemented.

**FFL suggests that fishing effort be allocated in fishing days (rather than days absent from port known as days-at-sea) but recorded in hours, and that this would only be counted as actual fishing time when the gear is in the water. 200 days equates to 4,800 hours of actual fishing time. A 24 hour fishing trip including steaming time, where a vessel might fish 16 hours, effectively equates to 300 actual fishing days instead of 200.**

- ***How would FFL propose to manage a fishery based on an allocation of days, but recorded in hours with the potential for a much greater impact on the resource?***

The entire system is actually an hours based soak time system with all allocations and deductions calculated on an hours basis. It is a misnomer that the system was labelled as Days-at-Sea based purely on this being the generic name for an Effort Control system in the industry.

An hours based system provides precision of operations, management and monitoring allowing fishing time to be accurately allocated and utilised. Achieved through soak time sensors on the gear feeding in to an integrated VMS, Elog, Soak Time etc system.

It is the hours of soak time gear is fishing that is key to managing stock mortality sustainably not gauging the time a boat is out the harbour on the sea.

Soak time -

- i) Means all effort is clocked as actual fishing mortality time of the gear deployed. Means all types of fishing are on an equal footing whether gill net, trawl or traps as it's soak time of gear clocked.
- ii) Negates the need to set a precautionary lower level of effort to account for the presumption that every day is a possible full 24 hours fishing and that time needs to be accounted for steaming.
- iii) Importantly managers and scientists have an accurate record of actual fishing effort of exact gear deployment and location. Allowing managers to set effort accurately in letting the fleet accurately use all its hours as fishing time.
- iv) Provides flexibility to allow the fleet to naturally spread out over its full geographical range and stocks to avoid construing effort to grounds close to port or for bulk fishing of brood stock.
- v) Improves safety and catch quality as it removes the pressure of avoiding losing time dodging or running into land a fresher catch.

When VMS, keep what you catch E-log info and soak time are combined in an integrated monitoring system this will provide science and management pin point, real time accurate data on stocks improving science and therefore fishing opportunities and finally accounting for fishermen's knowledge reflected in their catches.

Conservation Credits would award extra time to vessels on a percentage basis who, in being even more selective and sustainable, can be given extra time to account for their lighter impact. This would encourage the adoption of the best possible measures as vessels would look to avoid species that they do not have adequate catch composition for or are of little value.

Doing so on a percentage basis calculated on the hours means all vessels are given a proportionate share of Credits and different measures have different percentage rewards.

*Example.- Square Mesh Codend is worth 5 Credits equalling 5% additional time per hour used.  
Extension Escape panel is worth 2 Credits equalling 2% additional time per hour used.*

Therefore, whether a boat spends 80 hours at sea or 8 hours he is rewarded with a proportional amount of time.

**FFL suggests that fishing effort i.e. the number of days fishing per year should be attached to a vessel licence and, for example, that whitefish vessel should have at least 200 days a year and Nephrops vessels 240 days per year.**

- ***How did FFL arrive at these figures?***

Effort should be allocated as an entitlement as part of a vessels licence. This would mean only active vessels would be entitled to an allocation of soak time hours to go to sea. It would return the right to do so to vessels and eliminate slipper skippers. The particular figures were illustrative although the figures suggested are close to what the allocation would work out as in the North Sea (IV) and West Coast (VI).



The number of hours of soak time is determined by establishing how long vessels in a fisheries area will require to harvest a slice out the environment based on an amalgamation of ALL demersal TACs in a fisheries area. To create an ecology wide limit as per accepting that a mixed fishery is an interdependent ecology of mixed species that fluctuate against one another and based on the acknowledgement that it is impossible for vessels to individually target specific species definitively and that a mix will be caught.

It is set by combining TACs in an area. This is then divided by the daily average catch rate across the fleet in the area to find how long it will take the fleet to catch this combined ecology wide demersal TAC.

Effort for an area is calculated as ->

No. Vessels in Area x Avg. Daily Catch Across Fleet Per Vessel = Fleet Catch Rate Per Day.

Total TAC tonnage Demersal Species In Area/Fleet Catch Rate Per Day = Level Time Need to Take Total TAC

*Example.- 100 vessels x 2 ton/vessel/day = 200 ton Fleet Catch Per Day  
40,000 tons combine TAC / 200 ton Fleet Catch Per Day = 200 days*

Through this methodology FFL took average catch of each fleet segment per day in each ICES area, as recorded by Seafish Fleet Economic Survey, and created a fleet average daily catch from this. This was increased by 50% to account for average discards across the fleet to give a safe margin due to the lack of accurate discards data.

Thereafter, this Avg. Fleet Catch Per Day (incl. +50% for discards) was divided into the total of all demersal TACs for that area combined as an ecology wide TAC allowing keep what you catch working with the ecological fluctuations of intra & inter species competition.

*Example.- In the North Sea this gave a possible 4,400 hours of soak time per vessel across the fleet.  
To establish a comparative, if all vessels used 20 hours per day of soak time this would equate to 220 full days on the sea.*

**FFL suggests that the number of days allocated would be monitored in conjunction with stock assessments and long term regional management plans.**

- ***Can FFL explain more about their long term regional management plans - would these be on a national basis for a stock i.e. UK sole, or specific sea area i.e. North Sea sole? Or would these be for multiple species similar to the multi annual plans?***

We propose having long term management plans of 2-3 year periods to allow proper analysis to be undertaken to established genuine understanding of developments and patterns in the marine ecology.

The current micromanagement of trying to alter effort in December and expecting results by August is human arrogance on a colossal scale. It is important to implement overall measures and allow time to gauge results and sensible responses rather than knee jerks.

The approach above can be across a national, regional, stock and species basis. Using the real-time data from effort control and a fully documented fishery of keep what you catch to monitor trends and implement appropriate responses.



As previously stated effort control is management on an ecology wide basis where one is trying to allow a balanced harvest across all species in line with natural ecology and species fluctuations within the creation of an equilibrium between overall recruitment to the ecology and extraction through effort.

In order to facilitate a balanced approach real-time data through keep what you catch will accurately allow trends to be observed over a reasonable period of time and thereafter sensible measures to be taken either at national, regional, stock or species level dependent on what real time observation shows. Conversely, if an evident collapse or emergency situation arose this can equally be dealt with immediately.

This creates a situation where effectively management is working in reaction to the natural fluctuations of the marine environment with only slight lag through real time monitoring and the principle of accepting working to nature and limiting effort accordingly rather than imposing upon it man-made theory of what should be.

**FFL suggests that deployed fishing gear can be monitored by electronic sensors, and that this data can be integrated into electronic logbooks for submission to the fisheries authorities.**

- *How would this work across the diverse range of gear utilised by UK fishing fleet to ensure gear deployment was accurately reported?*
- *How would this work with static gear i.e. pots and nets that have longer soak times?*
- *What would be the cost of installing, maintaining and monitoring this equipment? Who would pay for this?*

A domestic system would integrate VMS, E-log, Soak Time, Temperature and meteorological sensors into one system. Hardware will integrate with a software package which will create an algorithm of the management variables dependent upon gear, areas, FCCs and overall effort choices. This will be outputted to administrators who can then conversely react to the information generated to issue variations in real time on vessels parameters.

Modern technology means sensors to be attached to the gear are cheap and with upto quarterly battery lives. They are all now relatively un-intrusive being somewhat smaller than the gear sensors already employed throughout the industry and can be attached to all forms of gear for the long battery life.

An integrated VMS, E-log, Soak Time package would be cheaper and the VMS more accurate than the two separate systems currently employed and from consultation will be easier to use than the current systems employed.

Such a system would offer a step change advancement on current monitoring, scientific and enforcement equipment at a cheaper price. FFL believe that government should underwrite enforcement costs although if some arrangement was made where vessels contributed through a monthly re-numeration as a small percentage of grossing then the industry would not be adverse to this for a better system that allows a better fisheries policy and science.



FFL suggests that annual allocations of effort should commence in April or May, to avoid fishing for spawning aggregations of fish.

- *What would be the benefit of moving the start of the fishing year to spring?*
- *If the allocation of effort is covering 12 months why is it important to have it in spring? Does FFL believe vessels will run out of effort during the year?*
- *How would this work with the stock advice provided by ICES in November ahead of the current fishing year commencing in January?*

This is not something of primary concern but one which we feel if possible would be ecologically beneficial. The natural ecology's new year is in the spring with spawning time. FFLs whole system is built on the principle of working with nature rather than imposing management upon it as starting management in the human calendar year does.

The practical reality of this is vessels are just getting into their operational stride on a new administrative year after the Christmas break and New Year storms when spawning time occurs.

This results in vessels exerting effort in the one time of year when fish are at their most vulnerable and poorest quality with the resultant diminution of effort seeing vessels struggling for fishing opportunity when fish are at their best in the autumn and winter months.

It would be upto vessels how to exhaust their allocation of soak time hours of effort, however, FFL believe that a fresh pot of effort start being in the summer would incentivise the use of effort in the best months with hopefully a diminution of effort and resultant reduction in stock mortality in the following spring.

The key is ICES data is advise and not an international obligation under UNCLOS where the UK will be able to exercise our discretion to use best practice possible in our waters with our own superb data.

We do not perceive why HM government cannot commence a new fishing effort year in spring for domestic management, especially so if this is beneficial to the fish stocks that are the foundation upon which we all rely.

#### **Chapter 40: Exemption of under 10m vessels**

FFL suggests that under 10m vessels should not have to comply with FCCs, and would only be regulated by a per annum effort allocation and technical measures. FFL believes that under 10m vessels have a low ecological impact on fish stocks, and that an under 10m vessel going "free for all" has a limited capacity to significantly impact on fish stocks.

- *What evidence does FFL have to suggest that u10m vessels have a low ecological impact on fish stocks?*
- *What impact might an under 10m vessel targeting high value stocks have in localised inshore fisheries?*
- *Does FFL propose that electronic software and gear deployment monitors are installed on all under 10m vessels? How would this work on the 4,000 registered under 10m vessels and who will pay for the installation, maintenance and monitoring for this?*
- *How much effort would an under 10m vessel be entitled to - a flat national allocation for all vessels, or area specific i.e. the North Sea or a fishery/gear allocation similar to over 10m vessels?*
- *How would this work across the diverse polyvalent under 10m fleet?*

Under 10m categorisation was used based on current division as a generic term for smaller vessels who exercise a limited impact compared to larger vessels. Low impact vessels should be defined through GT and KW capacity as this is a more accurate reflection of vessels catching potential. This would mean Super U10m trawlers would have to comply equally as all other vessels in the UK fleet with an above small catching potential.

So far as possible all vessels regardless of size or sector within the UKs mixed demersel fisheries should be on an equal regime with an end to the bureaucratic, administratively onerous system of Sector, Non-Sector, Over 10, Under 10 etc.

However, this one exemption for smaller, low impact vessels, defined through GT and KW, which have a limited catching potential is through recognition that applying FCCs to a vessel which may only catch 500kgs a day means a percentage time limit is the difference of a few kilos either way in comparison to a few tons for larger vessels.

These vessels would still be controlled by overall limit on effort through soak time hours, technical measures (amount, size etc of gear), conservation credits to encourage selectivity and temporary closed areas. Regards the impact on local fisheries allowing these small vessels to keep and land all catches would have no less of a conservation impact than currently when they are discarding fish under quotas and would have to continue to do so under FCCs due to their inability to move any sizeable distance to spatially avoid a local fluctuation or seasonal variation in a particular species.

On balance the administration needed for the benefit returned conservationally would be disproportionate. Furthermore, as many small vessels are non-nomadic and limited in their range and therefore ability to do anything but fish what is in front of them imposing FCCs would not be applicable for the lowest impact vessels in the fleet.

FFL advocate that all vessels regardless of size are monitored in the same manner with the integrated VMS, ELog, Soak Time, Temperature system. As previously described due to the comparative cheapness and refinement of this technology package this will be possible and has been proven already around the world and within the UK.

### Chapter 53: Technical measures

**FFL suggests that the current minimum landing size (MLS) used for different species of fish should be replaced with minimum marketable size (MMS), to allow fishermen to continue to land undersize fish whilst contributing towards stock knowledge. The fish would not be offered for market sale, but instead sold for fishmeal and the proceeds allocated towards a proposed industry/science partnership.**

- *What is the difference between MLS and MMS? And what is the justification for changing?*
- *What incentives would fishermen have to retain and land this undersized fish? Would penalties be introduced for discarding?*

Again, as with moving the administrative year from winter to spring the above issues are not a primary concern but a suggestion. An MLS limits what size you can land, however in a discard reduction policy an MMS would be required to allow all catches whilst still maintaining a limit on the marketable size to avoid any financial incentive to target smaller fish.



We strongly believe that the UK should have a discard reduction policy not an arbitrary ban and that reductions in catches of smaller fish should be achieved through incentivising adoption of selective measures through a system of Conservation Credits.

As previously stated that any fish who do not have high survivability should be returned to the marine environment as a food source rather than be brought ashore for land fill or pig feed.

However, if HM Govt is adamant on an arbitrary no discards policy to ensure all fish is recorded for science then a MMS will be legislatively required to facilitate this.

