

Title:**Impact Assessment for KEIFCA whelk byelaw****Lead department or agency:**

Kent and Essex Inshore Fisheries and Conservation Authority (KEIFCA)

Other departments or agencies:**IA No:**

Date: 18/07/2012

Stage: Development/Options

Source of intervention: Permanent Byelaw

Type of measure: Secondary legislation

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Summary: Intervention and Options

What is the problem under consideration?

The issue under consideration relates to the threat to the sustainability of whelk stocks in KEIFCA district from over exploitation. Research carried out by CEFAS and SIFCA suggests that, the long life-span and lack of population mobility i.e. absence of planktonic larval phase and limited mobility of the adults, makes the common whelk vulnerable to over-fishing. The research also suggests that due to its biology and life history, if a whelk population is over-fished the population is likely to take a long time to recover. In applying KEIFCA's duty to ensure the sustainable exploitation of marine resources within its district the Authority, after consultation with stakeholders, feels that additional management measures to those that are already in place (EU minimum size) are required so as to create a long-term management structure that will ensure that whelks are fished in a sustainable way.

Why is government intervention necessary?

After running a 12 week public consultation and reviewing the replies at a public technical panel meeting, the Authority feels that without the statutory management measures proposed, there would be a significant threat to the whelk stocks in KEIFCA district from over exploitation.

What are the policy objectives and the intended effects?

1. To manage the exploitation of whelk stocks within the Authority's jurisdiction to ensure a sustainable fishery and continued social-economic benefits.
2. To conserve stocks through a permit scheme and a range of technical measures including the introduction of minimum riddle size, minimum escape hole size in whelk pots and to cap effort by introducing a pot limitation scheme.
3. To provide information on catch return and effort to inform stock assessment and management.
4. To protect the wider marine ecosystem that relies on whelk stocks as food source such as fin fish (thornback rays etc.) or as shelter (hermit crabs).

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

On the 16th options regarding the management of whelk stocks in KEIFCA district (this meeting reviewed evidence that had been gathered during a 12 week consultation with local stakeholders):

<p>When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?</p> <p>Option A - No additional management beyond EU minimum size (No change)</p> <p>Option B - Formulate a 'Gentlemen's agreement' or voluntary Codes of Practice</p>	<p>It be reviewed in 5 years time</p>
<p>Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?</p> <p>Option C - Introduce a permanent KEIFCA whelk byelaw to ensure the sustainable exploitation of whelks in KEIFCA district.</p>	<p>Use additional methods to help support the sustainable exploitation of whelks in KEIFCA district.</p>

Sign off: For consultation stage Impact Assessments to be introduced using option B or option C:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

i) Strengthen the minimum landing size legislation

ii) Cap fishing effort by pot number limitation

Signed by the responsible : **Date :**

iii) Combined management measures. Options (i) and (ii) could also be combined to provide more developed management.

After much consideration the Authority decided that Option C, a permanent KEIFCA whelk byelaw, would best ensure the sustainable exploitation of whelk stocks in KEIFCA district. The Authority also concluded that combining strengthened minimum landing size legislation with a cap on fishing effort would best achieve the desired goal.

Non-regulatory options were discussed by the Authority through-out the planning and consultation phase and although members could see the obvious benefits of these potential options, they felt that fishermen could quickly opted out and not comply with a voluntary code. Members also felt that a voluntary code would not really be any cheaper to enforce and that new boats entering the fishery might not sign up or comply with the voluntary code.

Summary: Analysis and Evidence

Policy Option C

Description: Impact Assessment of whelk pot limitation byelaw

P r i c e B a s e Y e a r	P V B a s e Y e a r	T i m e P e r i o d Y e a r s	N e t B e n e f i t (P r e s e n t V a l u e (P V)) (£m)		
			Low:	High:	Best Estimate:

COSTS (£m)	Total Transition (Constant Price)	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low			
High			
Best Estimate			

Description and scale of key monetised costs by 'main affected groups'

The full time vessels working 600-800 pots with 2 to 3 crew (business model A) would be most affected by this option (Wiggins *et al.*, 2012). The information provided by fishermen using this model suggests that they need to catch 2 tonnes or more to 'make a living' (average catch rate of 2.8kg per pot or more). Information from the data gathered at the workshop/meeting on the 6th January shows that there is a large degree of proportionality between the amount caught and earnings. It would thus be fair to assume that as the vessels are working full time, and would find it very hard to increase the number of fishing trips to compensate for a reduction in pot numbers. If this was the case then reducing the number of pots from 600-800 to 300 would have a proportional decrease in their income (reducing their income by half or more).

Full time vessels working 100-200 pots with 1 crew (business model B) would not be directly affected by this reduction as their business model uses less than 300 pots already.

Vessels fishing for whelks on a part-time time basis working 400-600 pots with 2 to 3 crew (business model C). The data suggests that a reduction in the number of pots would, like fishermen using business model A, result in a proportional decrease in their earnings from whelks (by a approximately half to a quarter). The information provided suggests however, that fishermen using this model could mitigate part of the impact of the management measure by increasing the number of fishing trips they undertake targeting whelks (to make up for a reduction in pots). Although the number of fishing trips could be increased there would be the fact that the pots would need to be left in the water to catch the whelks for potentially 48 hours could limit this effort. The decision for operators using this model would be based on weighing up the relative potential earnings from whelks or another potential species that fishermen would target the rest of their time.

Part-time time vessels working close to or under 300 pots with 2 crew (business model D), would not be directly affected by this reduction as their business model uses less than 300 pots already.

Business model E represents vessels whose percentage whelk landings contribute 10-20% to the total income of their vessel and use less than 300 pots (in most cases less than 100 pots). Vessels using this business model would not be directly affected by this reduction as their business model uses less than 300 pots already.

Costs of new riddles (£200- £400 per operator (or greater if mechanical systems are fitted)), and cost of new pots (£0 - £3,000 per operator) would be a one off cost and could be phased in to reduce the financial impact of the new byelaw on small businesses. Ongoing costs would be minimal as fishermen would be replacing gear like for like (as they would have done before the byelaw)

Other key non-monetised costs by 'main affected groups'

Annual additional enforcement costs faced by KEIFCA over a 1 year period are estimated at £24,200.00. This is a good estimate of the enforcement costs. Part of this cost is offset by charging £100 for a permit and 30p per tag (300 tags).

BENEFITS		Total Transition		Average Annual		Total Benefit	
Impact on admin burden (AB) (£m)		(Constant Price)		(excl. Transition)		Impact on policy cost savings (£m)	
New AB: 0		AB savings: 0		Net: 0		Policy cost savings:	
High							
Best Estimate		What is the geographic coverage of the policy/option?				KEIFCA District	
From what date will the policy be implemented?		Description and scale of key monetised benefits by 'main affected groups'				28/11/12	
Which organisation(s) will enforce the policy?		The main benefit would be consistency of earnings due to the sustainable management of whelk stock exploitation within the district. If stocks decline due to over-exploitation and poor management there will be a reduction in earnings and probable reduction in earnings. If the stocks are over-exploited there will be a reduction in earnings and probable reduction in earnings.				645,000 per year	
Does enforcement comply with Hampton principles?							
Does implementation go beyond minimum EU requirements?		Other key non-monetised benefits by 'main affected groups'				Yes (See evidence base)	
What is the CO (Million tonnes CO)						Traded: N/A Non-traded: N/A	
Does the proposal have an impact on competition?							
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?						Costs: N/A Benefits: N/A	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)				Micro N/A < 20 N/A		Small N/A Medium N/A Large N/A	
Are any of these organisations exempt?		(See Section 'Analysis of costs and benefits' for more details)				No	

Specific Impact Tests: Checklist

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
Statutory equality duties		Annex 1

Economic impacts		
Environmental impacts		
Social impacts		Annex 1
Greenhouse gas assessment		Annex 1
Sustainable development		Annex 1
Health and well-being		Annex 1
Wider environmental issues	Yes	Annex 1
Human rights		Annex 1
Annual profile of monetised costs and benefits* - (£m) constant prices		
Justice system		Annex 1
Rural proofing	Y	Y
	Y	Y
	Y	Y
	Y	Y
	Y	Y
	Y	Y
	Y	Y
Transition costs		
Annual recurring cost		
Total annual costs		
Transition benefits	N/A	
Annual recurring benefits	N/A	
Total annual benefits	N/A	

* For non-monetised benefits please see summary pages and main evidence base section

Introduction

IFCAs have been established as the lead regulator for the sustainable management of inshore fisheries. As such, the KEIFCA is the most appropriate Authority to implement, manage and enforce fisheries management measures within 6 nautical miles.

Under section 153 of the Marine and Coastal Access Act 2009 (MaCAA 2009) KEIFCA has been given the duty to ensure the sustainable exploitation of marine resources in its district. In undertaking this duty KEIFCA has identified that common whelks (*Buccinum undatum*) are particularly vulnerable to over exploitation due to the fact that this species has a low fecundity, an entirely benthic reproductive strategy with a closed population (i.e. a lack of a planktonic larval phase with little or no migration between populations resulting in a low genetic diversity), fast early growth with a relatively slow overall growth, late maturation, and a gregarious nature. These life history traits, combined with ease of capture, make this species susceptible to recruitment overfishing (Shelmerdine *et al.* 2006). If over-fishing does occur the population is also likely to take a long time to recover.

Typically whelk fishing throughout England and Wales can be characterised by periods of low or moderate activity followed by large spikes in fishing effort, either fuelled by a substantial increase of young whelks into the population or a high market price. This boom and bust model can quickly lead to unsustainable levels of exploitation and subsequent crashes in the population (Fahy *et al.* 1995 and Fahy *et al.* 2000 and Fahy *et al.* 2005). KEIFCA feels that it is important to develop a suite of management measures that break this cycle and help build a long term sustainable fishery in our district.

Over exploitation of whelk stocks and a subsequent crash in stocks has been documented by (Fahy *et al.* 1995 and Fahy *et al.* 2000 and Fahy *et al.* 2005) in the southern Irish Sea whelk fishery. Although not published there are also numerous other anecdotal accounts of whelk stocks along the coast of England and Wales being severely over exploited, to the extent that the fishery crashes and becomes uneconomic to fish (Wells fishery, pers. coms EIFCA).

This Impact Assessment (IA) has been prepared to outline the costs and benefits of the recommended permanent management options to replace the KEIFCA Whelk Pot Limitation Emergency Byelaw and lays out a series of management measures the KEIFCA feels will help ensure the long term sustainable exploitation of the whelk stocks in its district. It also indicates why these options are being recommended rather than others considered.

Data and evidence to inform this IA has been gathered from the MMO statistics office, MMO officers and KEIFCA officers as well as via fishermen (whelk permit returns) and stakeholders. In addition, KEIFCA held a workshop/meeting with stakeholders on the 6th January 2012 where it gathered specific information regarding how and where fishermen fish for whelks in the KEIFCA district as well as the economics of their business models and their opinions on a range of possible whelk management options. KEIFCA held a 12 week consultation (12th April 2012 – 12th July 2012) regarding a range of potential management options and asked stakeholders for evidence and data to support any views or management options they supported.

Rationale for intervention

Evidence has been gathered that shows that whelks are a particularly vulnerable species to fish and that once overfished they can potentially take a long time to recover. Evidence gathered from the Southern Irish fishery suggests that the current EU wide management measure is not sufficient to avoid such a crash (Fahy *et al.* 1995 and Fahy *et al.* 2000 and Fahy *et al.* 2005).

IFCAs have been established as the lead regulator for the sustainable management of inshore fisheries. As such, the KEIFCA is the most appropriate Authority to implement, manage and enforce fisheries management measures within 6 nautical miles.

After consultation with stakeholders KEIFCA has assessed a range of long term non-regulatory and regulatory management options (Wiggins & Taylor, 2012) to help ensure the sustainable exploitation of whelks in its district and avoid an unsustainable decline or crash in the stock.

KEIFCA after reviewing evidence supplied by the public consultation and after holding a public technical panel meeting, have decided that a byelaw including additional methods to help enforce the EU minimum size (45mm) and an effort cap, is the most appropriate method of helping KEIFCA meet its duties under MaCCA 2009.

Policy objectives and intended effects

The Inshore Fisheries and Conservation Authorities (IFCAs) were established under the MaCCA 2009 to lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry.

The strategic policy objective pertinent to this IA is to ensure the sustainable exploitation of marine resources (whelks) in the KEIFCA district. KEIFCA feels that the following objectives will help to deliver this strategic goal:

1. To manage the exploitation of whelk stocks within the Authority's jurisdiction through a permit scheme.
2. To conserve stocks through a range of technical measures including the introduction of minimum riddle measurements, and the hole size in whelk pots and to cap effort by introducing a pot number limitation scheme.
3. To provide information on catch return and effort to support and inform stock assessment and management.
4. To protect the wider marine ecosystem that relies on whelk stocks as a food source such as fin fish (thornback rays) or as shelter (hermit crabs).

The intended effects of the byelaw are to better protect the juvenile whelks before they spawn and to cap fishing effort to reduce the risk of overfishing, thus helping avoid a decline or crash in the stock, and creating a long term sustainable fishery. These measures will help KEIFCA meet its duties under the MaCCA 2009. In addition, the economic impacts of management intervention will be balanced with the environmental benefits in order to secure a sustainable fishery.

The options

As part of the Whelk Pot Limitation Emergency Byelaw review, a range of management options were considered by local stakeholders at a workshop/meeting held on the 6th January 2012 (Wiggins *et al.* 2012). Management options were then discussed further by the Authority on the 16th January 2012 as part of the emergency byelaw process (KEIFCA, 2012a). As part of a long term management strategy KEIFCA then ran a 12 week public consultation with local stakeholders asking for comments on a range of possible management measures that had emerged as potentially viable through the previous discussions (KEIFCA, 2012b).

Option A - No additional management beyond EU minimum size (No change)

At present the primary management measure used to regulate the whelk fishery in England is the EU wide Minimum Landing Size (MLS). Although this is a very useful simple management measure due to the cone like shape of whelks, using a minimum size is not as reliable as it can be for other species (e.g. cockles or fin fish). Research by CEFAS and Sussex IFCA (Lawler & Vause, 2009) also shows that the shape of whelks can vary considerably in different areas, with shorter squatter whelks found in some areas and longer thinner whelks found in others. Due to the large volumes of whelks that fishermen can catch on a trip from half a tonne to over two tonnes assessing each whelk to make sure it is over the 45mm minimum shell length is extremely difficult and is thus why fishermen use riddles to sort their catch.

Option A would maintain the status quo that existed prior to the making of the current Emergency Byelaw and would not rely on additional management measures to strengthen the minimum landing size or cap the amount of effort being used in the fishery. If there are no additional management measures there would be no change to the financial earnings of the vessels unless the stocks start to constantly decline or if the stocks actually start to crash. The whole industry would then have a reduction in earnings relatively proportional to the reduction in catch.

If no management measures were put in place there is an economic argument that suggests that the stock would continue to be fished by the fleet until it was uneconomic. As whelk potting is a passive method of fishing and relies on whelks to enter the pot attracted by bait it suggests that there must be a level where there would be so few whelks and so many pots that it would not be financially economic to continue fishing. The economics suggests that fishermen would stop targeting whelks either because catch rates dropped so significantly that it became uneconomic or because they would get a better return from targeting another species. If it becomes uneconomic to catch whelks before it reaches an unsustainable biological limit then the stock could be managed using market forces. If the uneconomic level was lower than a sustainable biological limit then the population would decline. Unfortunately there is limited information available to demonstrate how the fishery stands regarding this debate and to facilitate a decision regarding this.

Option B - Formulate a 'Gentlemen's agreement' or voluntary Codes of Practice between fishermen to use additional methods to help support the sustainable exploitation of whelks in KEIFCA district.

There are a number of potential management options that were discussed and generally supported by most of the industry that could help support the sustainable exploitation of whelks in KEIFCA district. In an effort to support the current legislation but without introducing more regulations KEIFCA could hold a workshop where fishermen and stakeholders could sign up to a voluntary management agreement. KEIFCA would then help fishermen and stakeholders agree how the voluntary scheme would assess compliance with the agreement and what actions might be taken if the agreement was not adhered to as well as what affect this might have upon the sustainability of whelk stocks.

A voluntary agreement would reduce the regulatory burden on fishermen, however depending on the specifics agreed relating to assessing compliance the levels of enforcement might be increased. A voluntary agreement would also need to have 'buy-in' from all stakeholders to work and it is not clear from the work already carried out by KEIFCA in introducing an emergency byelaw that a workable voluntary agreement would be possible.

Option C - Introduce a permanent KEIFCA whelk byelaw to ensure the sustainable exploitation of whelks in KEIFCA district.

Although a legislative approach would be seen by KEIFCA as a final option, permanent byelaw would apply equally to all fishermen and could be more effective in a fishery where different vessels can enter and leave the fishery relatively quickly (this could cause difficulties if implementing a voluntary agreement which would need to be continually updated to include new or different fishermen). Introducing a permanent byelaw would mean more effective records of who is entitled to fish and more effective enforcement as anyone who contravened the requirements of the byelaw could receive a Fixed Administrative Penalty or the case could be considered by a court and could receive a fine of up to £50,000.

Suggested management measures that could be introduced using option B or option C:

(i) Strengthen the minimum landing size legislation. This option could include the use of a riddle of a set size and standardised escape holes in whelk pots. A byelaw could specify additional whelk management solutions these could include agreeing the minimum size of riddle to be used in KEIFCA district or a minimum hole size for whelks in the district or both. Fishermen might have to invest in new riddles (£200- £400 or greater if mechanical systems are fitted) and possibly buy new pots (as existing pots may not have the correct hole size) or spend time modifying old pots. These purchases could be phased in over time to reduce the financial burden.

Introducing a standard riddle size would aid fishermen in making sure whelks comply more closely with the current EU minimum size. Due to the large numbers of whelks being landed at any one time applying the current legislation can pose a number of practical and logistical difficulties due to the time and number of whelks that need to be inspected. Making a riddle a legal requirement helps greatly in practically achieving this management goal and has shown to be particularly effective in managing other shellfisheries like cockles.

Lobster escape gaps have proven to be a very effective management measure within KEIFCA district. Local fishermen have long talked about the benefits of introducing an equivalent management measure for whelk pots. The theory behind such a management measure is that the large escape holes allow easier exit for smaller whelks but keep the bigger whelks. This results in less stress being put upon small whelks and reduces the likelihood of damage. It also means that it is easier for fishermen to process their catch (less riddling) and that the temptation of landing small whelks is reduced. KEIFCA in combination with CEFAS have undertaken a series of experiments (Bailey, 2012) which looks at the effectiveness of this management measure and suggests that there is a tentative relationship between escape hole size and undersize whelks retained, however more work needs to be undertaken to get a better understanding of this relationship.

(ii) Cap fishing effort. A large majority of fishermen and stakeholders have expressed a desire to cap the number of pots used within KEIFCA district. Capping the number of pots that fishermen could use would help control the ever increasing pressure on this stock, as regulations and restrictions on other higher value fish and shellfish stocks have meant that more fishermen have started to target this non-quota species. A voluntary management agreement could specify an agreed number of pots that each vessel would use and how pots would be identified as being part of the scheme.

Capping the effort reduces this risk as it means that once the catch rates drop below an economic level for 300 pots fishermen would have to either increase the number of trips they make (costing them more and thus reducing profit margins) or not target whelk stocks anymore. In either case this management measure would reduce the risk of effort increasing to maintain landings and would be a constructive management measure to stop the potential 'run-away' exploitation of the stock. The main issue with this management approach is that as the effort is

capped per vessel, more vessels could enter the fishery and increase the total fishing effort. However, the major difference now would be that any new fishermen entering the fishery would have to adapt their business model to make 300 pots an economic proposition. This could deter new fishermen using business model A from entering the fishery or would mean that if they entered the fishery they would have to change how they worked. This management measure in effect 'puts the brakes on' the fishery in the short term and might stop a crash but does not ensure that the fishery would be sustainably fished in the medium to long-term as effort would not be completely controlled.

Although capping the number of vessels that could fish for whelks within the District as well as capping the number of pots they could use might seem a logical solution, setting up a fair and proportionate system that decides who should and who should not get a permit is fraught with difficulty and legal complexity (as seen by legal challenges to the number of Thames Estuary Cockle Fishery Order licences). Although this might be a longer term option, this would be difficult solution to develop into a full byelaw at present.

Full time vessels working 600-800 pots with 2-3 crew would be most affected by this option (currently impacted by existing Emergency Byelaw but can work additional pots outside KEIFCA district). The information provided by fishermen from questionnaires showed that they need to catch 2 tonnes or more to 'make a living' (average catch rate of 2.8kg per pot or more). Information from the data gathered at the workshop/meeting on the 6th January (Wiggins *et al.*, 2012) shows that there is a large degree of proportionality between the amount caught and earnings. It would thus be fair to assume that as the vessels are working full time they would find it very hard to increase the number of fishing trips to compensate for a reduction in pot numbers. If this was the case then reducing the number of pots would have a proportional decrease in their income. If such a scheme was set up fishermen might have to invest in tags or some kind of identification system for vessels using the scheme.

(iii) Combined management Measures. Options (i) and (ii) could also be combined to provide more developed management. If this was the case then the combined impacts on fishermen and other stakeholders would need to be assessed.

Evidence Base

Whelk fishing in KEIFCA district

Whelks have traditionally been fished for food in several countries around the North Sea, either by baited pots along the coast of East Anglia and Lincolnshire (Hancock, 1967) or by special trawl nets in and around the German and Dutch Wadden Sea and in southwestern Dutch waters. They are also fished for food along the French and English Channel coast.

Historically within the district of Kent and Essex there has been a moderate scale whelk fishery supporting a 10–20 boats (Hancock, 1967). The number of boats and the effort targeting whelks, has varied over the years depending on stock on the ground, the market value of whelks, and the availability of other higher value fish and shellfish stocks to target (the relatively low value of whelks, tends to mean that apart from a few vessels that specialise in whelks other boats either target whelks on a part time basis or when there is no quota left for other 'prime' fish). These factors have meant that over the years the whelk fishing in the district has waxed and waned with periods when the whelk fleet and the number of pots used in the district has expanded.

Factors affecting the increase in fishing effort targeting whelks

Fishing effort for whelks has increased dramatically over the last 10 -15 years (Fig. 1) as global markets dominated by Korea and China have developed an increased prices and demand (Fahy, *et al.*, 2000 and Shelmerdine, *et al.*, 2006). This has led to the development of new fishing grounds both within the UK and internationally. This increased demand has led to fishermen investing and developing these fisheries with more efficient fishing techniques and greater capacity to deploy more gear.

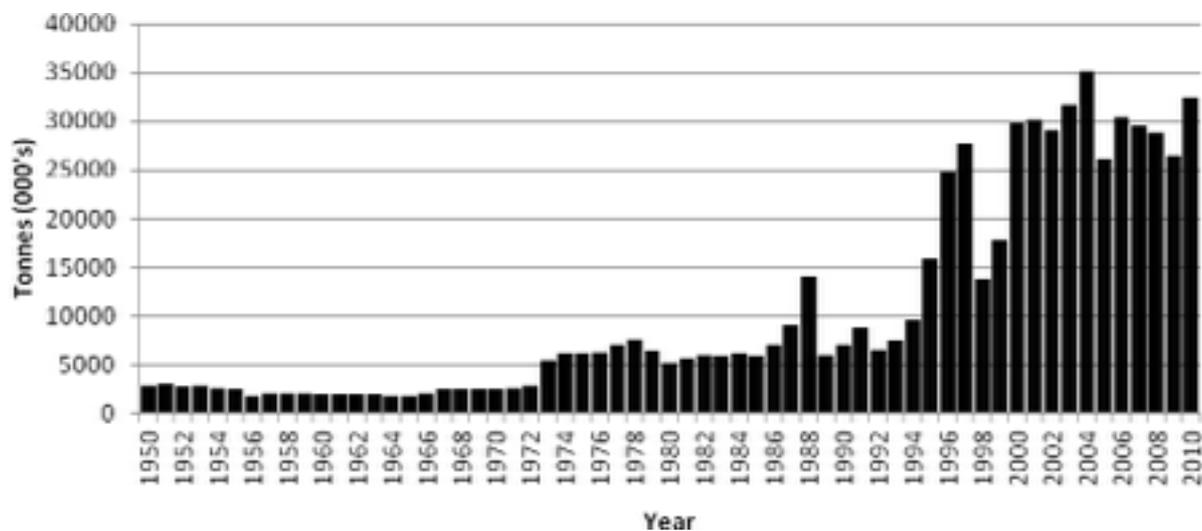


Fig.1 FAO global whelk landing records from 1950-2010

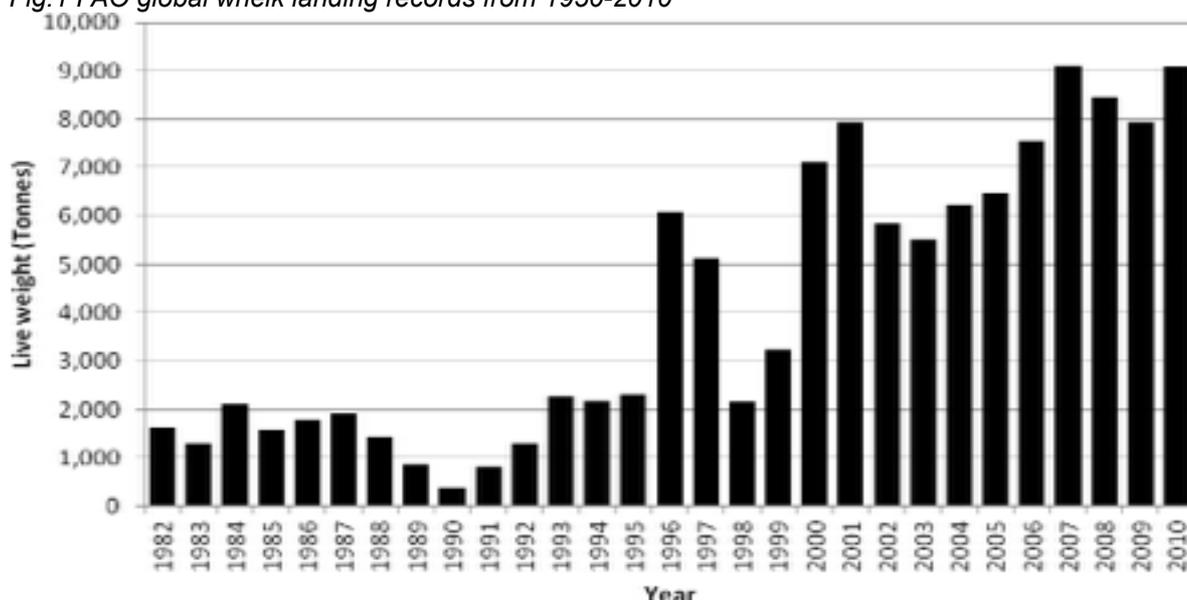


Fig.2 MMO English whelk landing records from 1982-2010

Fishing effort within the UK (Fig. 2) has also increased on whelk stocks due to displacement of effort from whitefish and trap fisheries and the development of improved markets. In recent years whelks have become increasingly valuable (CEFAS, 2011), ranking 5th to 6th in a list of the most valuable shellfish species by total English and Welsh first sale landings value (£7-9 million p.a. over the last 5 years). Likely changes to the management of crustacean pot fisheries in the near future will put further pressure on whelk stocks (CEFAS, 2011).

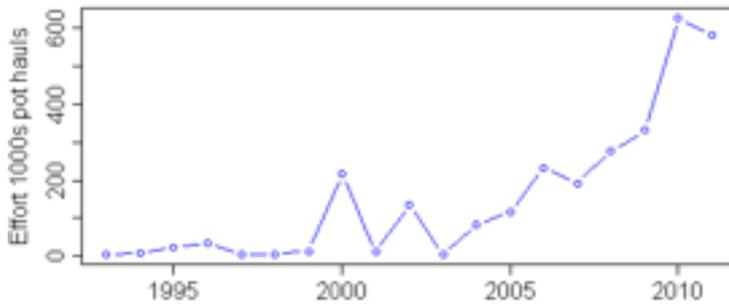
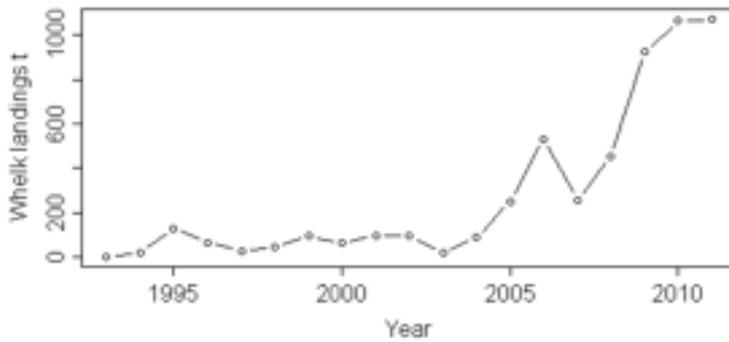


Fig. 3 Whelk landings and effort data for Kent and Essex ports (CEFAS)

There is evidence locally that global and national trends are being reflected within the KEIFCA district (Fig.2). Data used by CEFAS from the MMO suggests that total annual landings appear to have increased and are currently high and effort data suggests also that effort has increased steadily over time.

Scientific opinion on the vulnerability of whelks to overfishing

Research by fisheries scientists (Duncan *et al.*,1989), reporting on the viability of establishing a whelk fishery in Manx waters concluded that ‘Low fecundity, aggregational behaviour, entirely benthic reproductive strategy, ease of capture and fast early growth make whelks a prime candidate for recruitment overfishing and predispose

the fishery to a short life’.

These sentiments are supported by researchers working for the Canadian department of fisheries and oceans (DFO, 2000) ‘the whelk is a sedentary species in which breeding is by copulation and growth is direct (there is no planktonic larval stage to aid dispersal). These biological characteristics make the whelk vulnerable to local overfishing.’ They conclude that the absence of measures to protect spawners, to control the amount of fishing effort that has access the stock and the long fishing season magnify the overharvesting hazard.

Regulation for most English whelk fisheries is currently minimal, primarily by Minimum Landing Size (MLS) which is currently 45mm shell length (EU limit) and thought to be below the level at which most whelks mature (Lawler & Vause, 2009 and CEFAS, 2011). It therefore does little to protect spawning stocks. Further, whelks lack of a dispersive larval stage and are relatively non-mobile as adults, therefore stocks are vulnerable to local depletion and recovery may also be problematic because re-colonisation from elsewhere will be low (CEFAS, 2011).

An example of the current whelk management measures failing to ensure sustainable exploitation

The Irish whelk fishery has been managed using the same EU regulations that are applicable to those used in KEIFCA district (45mm minimum size) and comprehensive investigations into this (Fahy *et al.*, 1995 and Fahy *et al.*, 2000 and Fahy *et al.*, 2005) have shown that this management measure was not sufficient to stop the fishery crashing in 2004.

Example of international best practice in whelk management

As whelks are a widely spread species in temperate northern hemisphere seas they are also commercially fished in North America. Whelks are managed using a variety of management measures in the Quebec Region of Canada, investigation into these methods gives a potential best practice framework by which KEIFCA can use to inform its regional management of whelk stocks. The Canadian Department of Fisheries and Oceans (DFO) regulates the fishery by issuing licences and dividing up the fisheries that

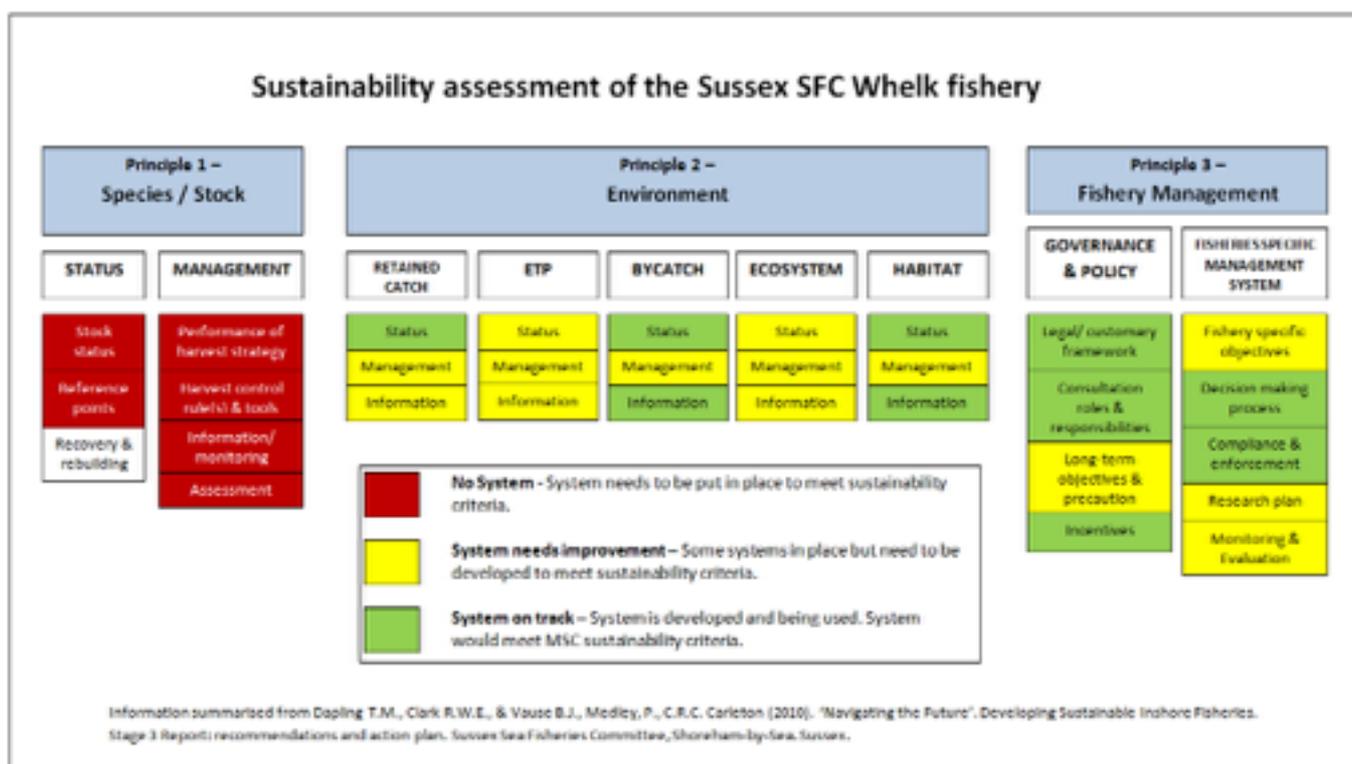
they regulate in Estuary and Gulf of St (DFO, 2000 and DFO, 2006). Lawrence (Quebec waters) into 15 fishing areas to which access is limited to a restricted number of fishermen. The effort is also controlled by a fishing season and a number of tagged traps (generally 100, but with some exceptions).

In addition, catches are limited by quota in zones, there is a minimum catch size of 70mm in length, and it is obligatory for each licence holder to fill in a log book. A resource assessment is also undertaken on the whelk stocks every three years. Although there are obvious differences between the whelk fisheries in England and Canada this set of comprehensive management measures helps contextualise the management options proposed in this impact assessment. These measures also highlight the Canadian approach that a relatively tight set of regulations are needed to maintain a sustainable fishery.

Working towards sustainable fisheries

In 2010 Sussex Sea Fisheries Committee/ IFCA (Dapling *et al.*, 2010) undertook an audit of their key fisheries to help their organisation assess the performance of these fisheries against internationally recognised sustainability criteria derived from the UN / Food and Agriculture Organisation guidelines (Marine Stewardship Council assessment criteria). The Marine Stewardship Council (MSC) assessment criteria allows organisations to systematically assess specific fisheries and to identify the whether the correct operations or systems are in place to meet the sustainability criteria. The assessment does not suggest specific management actions (i.e. that a minimum size needs to be increased) but does indicate that there need to be a mechanism in place that allows for this action to be undertaken if required.

The analysis undertaken by SSFC shows that the main weakness in the whelk fishery management (red sections in the diagram below) is in gathering and using information to explain the status of the stock and then using that information to develop a harvest strategy (including harvest control rules and monitoring and assessment of the stock). The assessment essentially suggests that without a clear idea of whelk stock numbers within the fishery, and without a flexible reactive mechanism of relating the effort on the stock to the number of whelks in the stock it is difficult if not impossible, to suggest that the fishery is being managed sustainably.



Whilst the fisheries in Sussex and Kent and Essex are different, the MSC analysis looks at generic issues in the fishery and so the findings are extremely useful as they highlight the key gaps that need to be addressed if the whelk fishery is going to be regarded as sustainable using the MSC criteria. In effect this means that KEIFCA needs to gather more specific and reliable stock data and then use this information to help inform any management controls KEIFCA decided are required. If this is undertaken KEIFCA will be managing the whelk fishery in a sustainable way according to internationally recognised advice.

KEIFCA has assessed non-regulatory and regulatory options and feels that that a byelaw needs to be brought in that allows KEIFCA to gather and assess detailed whelk stock data (mandatory catch returns), better helps enforce the minimum size (standard riddle size and minimum whelk pot hole size) and to cap effort to help avoid a rapid increase in effort that could quickly over exploit the stock and lead to a crash.

Sectors affected

Fishing: The main vessels affected are those which use over 300 pots on a regular basis in KEIFCA district. Evidence collected as part of the Whelk Pot Limitation Emergency Byelaw suggests that most locally based vessels use under 300 pots and that the mobile vessels can use between 600-800 pots. This would mean that the mobile vessels would be most affected by this management measure. As the mobile vessels are by their very nature mobile it is difficult to estimate exactly how many vessel this would affect, however historically this would usually be in the region of 2-5 vessels.

Local economies and society: There is the potential for social and economic costs to the local community as a result of potential landings lost and resulting impact on the local fishery but these are difficult to assess. Although short term landings might be reduced the introduction of these management measures will hopefully help ensure a sustainable fishery and this will help fishermen develop profitable long term markets. There are also wider environmental benefits of protecting whelks as they are an important food sources for species like Thornback Rays (which are also commercially fished), the empty whelk shells are important for hermit crab populations and whelks play an important role themselves as scavengers of the seabed.

Enforcement bodies: The lead responsibility of enforcing the byelaw would fall to the KEIFCA and therefore the additional enforcement cost would impact on this authority as the regulator.

Analysis of costs and benefits

Costs for recommended option

The introduction of a pot limitation byelaw would help prevent over exploitation of the whelk stocks and result in the following costs:

- Direct cost to the industry from reduced fishing capability
- Costs associated with purchasing and fitting a new riddle
- Costs associated with modifying whelk gear to comply with minimum hole requirements in whelk pots
- Administrative and enforcement costs

Direct costs to the fishing industry, including purchasing and modification of gear, and administrative and enforcement costs can be monetised and these estimated values have been

collated and presented as part of the impact assessment. Shadow costs of potential stock crashes if no action is taken and wider environmental costs of reduced whelk populations are difficult to value and are therefore described here as non-monetised costs.

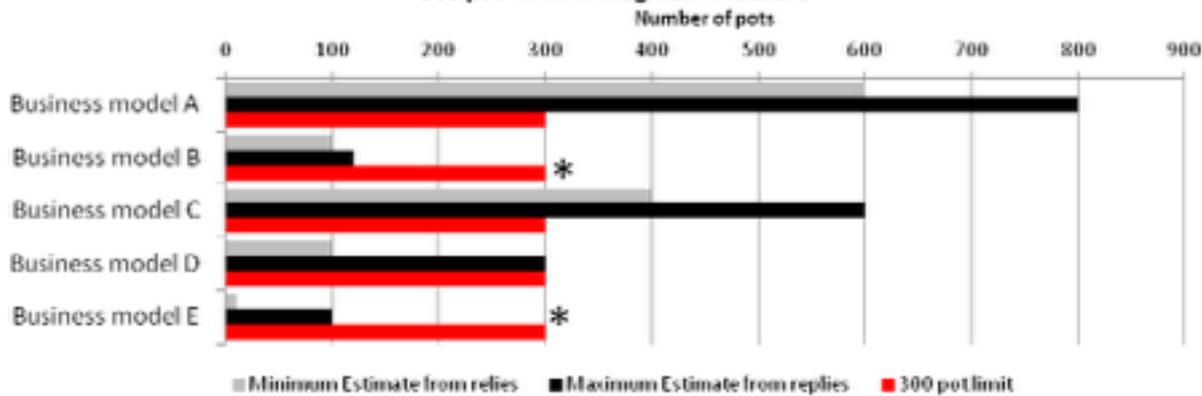
Direct cost to the industry from reduced fishing capability

The full time vessels working 600-800 pots with 2 to 3 crew (business model A) would be most affected by this option. The information provided by fishermen using this model suggests that they need to catch 2 tonnes or more to 'make a living' (average catch rate of 2.8kg per pot or more). Information from the data gathered at the workshop/meeting on the 6th January shows that there is a large degree of proportionality between the amount caught and earnings (Wiggins *et al.*, 2012). It would thus be fair to assume that as the vessels are working full time and would find it very hard to increase the number of fishing trips to compensate for a reduction in pot numbers. If this was the case then reducing the number of pots from 600-800 to 300 would have a proportional decrease in their income (reducing their income by half or more).

Full time vessels working 100-200 pots with 1 crew (business model B) would not be directly affected by this reduction as their business model uses less than 300 pots already.

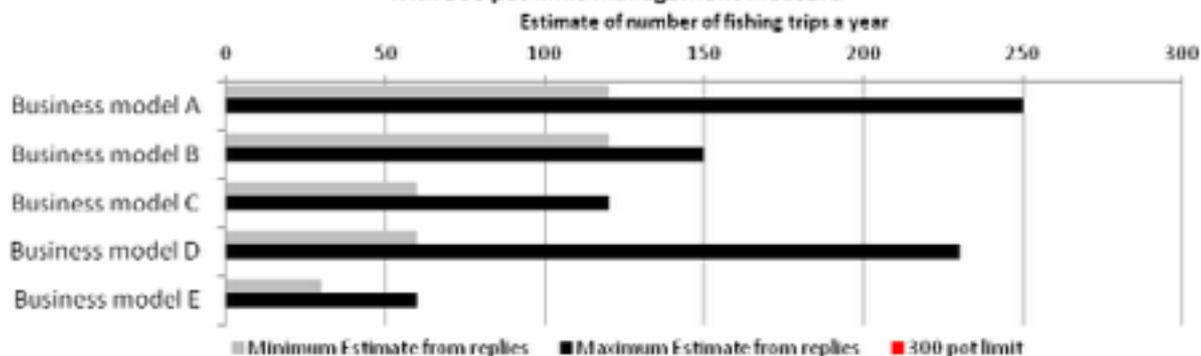
Vessels fishing for whelks on a part-time time basis working 400-600 pots with 2 to 3 crew (business model C). The data suggests that a reduction in the number of pots would, like fishermen using business model A, result in a proportional decrease in their earnings from whelks (by a approximately half to a quarter). The information provided suggests however, that fishermen using this model could mitigate part of the impact of the management measure by increasing the number of fishing trips they undertake targeting whelks (to make up for a reduction in pots). Although the number of fishing trips could be increased there would be the fact that the pots would need to be left in the water to catch the whelks for potentially 48 hours could limit this effort. The decision for operators using this model would be based on weighing up the relative potential earnings from whelks or another potential species that fishermen would target the rest of their time.

Number of whelk pots used by fishing vessels using different business models with 300 pot limit management measure

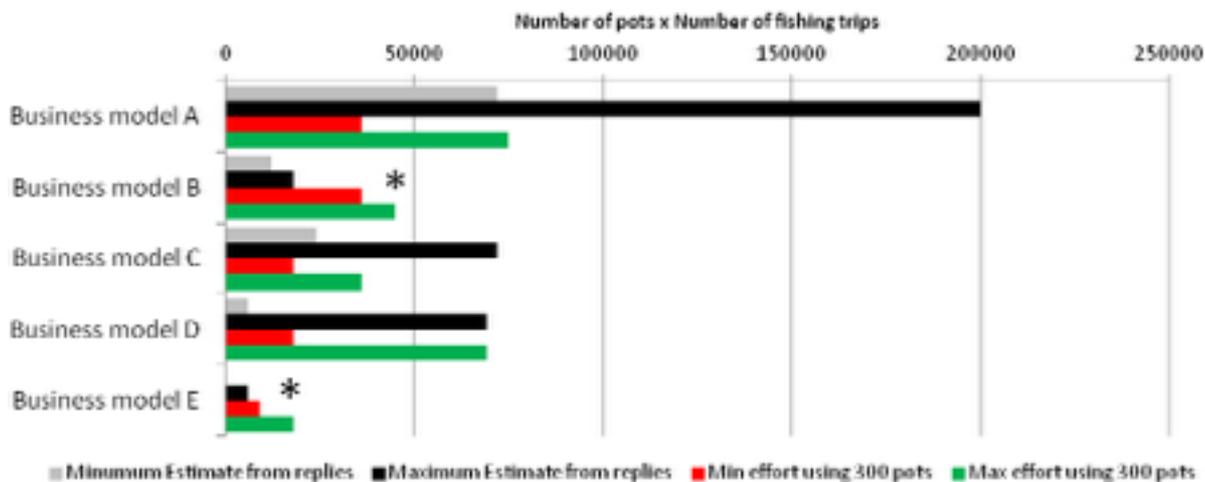


*This potential increase is unlikely as a crew of 1 would find 300 pots difficult to work

Number of fishing trips undertaken by fishing vessels using different business models with 300 pot limit management measure



Number of pots used multiplied by number of fishing trips undertaken by fishing vessels using different business models with 300 pot but maintaining number of fishing trips



*This potential increase is unlikely as a crew of 1 would find 300 pots difficult to work

Part-time time vessels working close to or under 300 pots with 2 crew (business model D), would not be directly affected by this reduction as their business model uses less than 300 pots already.

Business model E represents vessels whose percentage whelk landings contribute 10-20% to the total income of their vessel and use less than 300 pots (in most cases less than 100 pots). Vessels using this business model would not be directly affected by this reduction as their business model uses less than 300 pots already.

Costs associated with purchasing and fitting a new riddle

Costs can vary depending on the riddles that fishermen already use (some fishermen already use riddles that comply with the byelaw). There will however be a proportion of fishermen who have to purchase new riddles, with an estimated cost of £200- £400 per operator (or greater if mechanical systems are fitted). As we do not measure riddles at present it is very difficult to estimate the number of fishermen that would have to purchase new equipment.

Costs associated with modifying whelk gear to comply with minimum escape hole requirements in whelk pots

The exact costs of fishermen modifying their gear to comply with a minimum hole size is again difficult to estimate as there are a range of different designs of whelk pots that are used in the district. For most fishermen this would involve re-drilling holes to make them bigger or closing off existing larger holes and drilling new holes, for others it would mean buying new gear (£2,000 - £3,000) and for others the holes they use at present already meet the requirements.

Administrative and enforcement costs

The lead responsibility of enforcing an IFCA byelaw under section 155 of the Marine and Coastal Access Act 2009 will fall to the KEIFCA. The existing routine patrols undertaken by the KEIFCA in its district would be the most likely method of enforcement as pots would need to be inspected at sea to prove that they have been used within KEIFCAs district. There would also be a potential administration cost to the IFCA with regards to the setting up of and issuing of a permit scheme and of hiring storage capacity to keep seized gear that was in contravention of the byelaw. There would be a potential administration cost to the IFCA with regards to the setting up of and issuing of a permit scheme. Part of this cost is offset by charging £100 for a permit and 30p per tag (300 tags).

Annual additional costs of enforcement of recommended option

Activity	Cost per Unit (£)	Number of Units per year	Total cost per year(£)
Routine shore patrol surveillance *	£50 per hour	30 - 40	£2,000.00
Routine Sea Patrols **	£400 per part day on whelk enforcement	20	£8000.00
Prosecution/investigation/ Guilty Plea only ***	£4,000 per case	1	£4,000.00
TOTAL			£14,000.00

* An average of 3 -4 patrols per month @ £50 per hour for 1 Inshore Fisheries and Conservation Officer (IFCO) plus Vehicle

** Patrol Vessel running costs plus 2 IFCOs per day with an average of 34 patrols per year based on 2010 stats

*** Including IFCO and PV time. Administration and Legal fees. Not Guilty Pleas could substantially increase Court costs

Benefits for recommended option

The introduction of a pot limitation byelaw would help prevent over exploitation of the whelk stocks and result in the following benefits:

- The environmental benefits of maintaining healthy whelk stocks
- The economic benefits to fishermen of having a stable sustainable fishery
- The ability to help provide a sustainable fishery that gives fishermen options not to target quota species, thus reducing the pressure on quota species).
- The information gained on the fishery from detailed catch returns.
- Helping the community to manage and regulate their own fisheries.
- The shadow cost of the fishery crashing

Environmental benefits and related ecosystem services can be valued but this is difficult to apply and the techniques required are beyond the scope of this impact assessment. Therefore the benefits are described here as non-monetised benefits.

The environmental benefits of maintaining healthy whelk stocks

The common whelk (*Buccinum undatum*), is a gastropod mollusc that is very common in cold waters, from the tidal level to depths of 30 metres or more. Whelk is a necrophagous predator, feeding mainly on invertebrates such as polychaetes, molluscs and echinoderms, but is generally regarded as the scavenger of the sea. Whelks are an important food source for a number of important fin fish quota species caught within KEIFCA district (e.g. cod, thornback rays, dogfish and bass) as well as crustaceans like crabs and lobsters. Healthy whelk populations thus play an important role in the sustainability of marine ecosystem as a whole.

The economic benefits to fishermen of having a stable sustainable fishery

Whelk fishing in KEIFCA district and especially around the Kent coast provides a significant income for a number of fishermen and local business. Hancock (1967) shows that whelk fishing is a traditional fishery along the Kent coast and although is a relatively small fishery compared to others in Sussex and further west, is an important fishery that has provided a livelihood of generations of small local businesses. KEIFCA has shown with the Thames cockle fishery that developing a long term sustainable fishery helps local fishermen become more confident and invest in delivering a better quality higher value product. Experience from the cockle fishery also shows that businesses are better able to develop long term relationships with buyers and command better prices, especially if fisheries in other areas start declining.

The ability to help provide a sustainable fishery that gives fishermen options not to target quota species, thus reducing the pressure on quota species).

At present there is a huge pressure on fisheries quota especially in the local under 10m fleet. The lack of quota has made the economics of running a fishing boat especially difficult and has led some members of the fishing industry either to give up fishing or look to diversify into other non-quota species. Helping facilitate a sustainable whelk fishery in KEIFCA district, whilst not solving the problem does help local fishermen diversify at key times of year and take the pressure off key stocks. It is this mix of fisheries that helps reduce the pressure on all stocks, and means that if catch rates are starting to decline in a specific fishery fishermen can change fisheries and target a different stock. This helps avoid the negative spiral that can sometimes happen where fishermen have invested so much in a fishery that when the fishery starts to decline they have to increase their fishing effort otherwise they go out of business.

Helping the community manage and regulate their own fishery

KEIFCA have worked in collaboration with a range of stakeholders to develop this policy. KEIFCA has listened closely to stakeholders to their concerns about over exploitation of the whelk stock and have tried to involve stakeholders in assessing the advantages and

disadvantages of different management options. There has not been agreement with all stakeholders as to the best way forward however; fishermen have been able to discuss how the stocks that they fish should be managed. It is this bottom up approach that has helped fishermen become part of the solution and developing this management package helps establish a culture of shared responsibility.

The information gained on the fishery from detailed catch returns

As highlighted by the work carried out by Sussex SFC/IFCA (Dapling *et al.*, 2010) gathering data about the status of the whelk stocks is a vital step in KEIFCA ensuring that the stock is exploited in a sustainable way. Although there are national log book schemes not all fishermen submit their information and the information that is submitted is not cross checked. By introducing a logbook requirement as part of the byelaw this key information can be reliably gathered and cross checked. This information can then be used by KEIFCA as part of its ongoing assessment of the fishery. Without this information it would be extremely difficult for KEIFCA to reliably assess the stock and develop a sustainable fishery.

The shadow cost of the fishery crashing

Depending on how severely the whelk stocks were over fished it could take a number of years for these stocks to return to current levels. As the vast majority of fishermen and merchants are small businesses this would have a significant impact on their income and if low catches were sustained this could send potentially 8-10 fishing operations (usually employing 2 people each) and 2 or more whelk processors (each employing 2-3 people) out of business.

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Annexes

Annex 1: Specific Impact Tests

1.1 Statutory Equality Duties

1.1.1 Public bodies have a duty to take action to deliver better outcomes for different groups of people. This assessment is required if the proposal is relevant to equality.

1.1.2 There are no specific impacts in relation to equality to consider as part of this assessment.

1.2 Competition Assessment

1.2.1 The competition assessment is aimed at ensuring policies are implemented which do not unduly limit or damage competition in markets. Where a policy restricts competition, this can be expected to lead to an economic cost. Conversely, some policies can stimulate greater competition and economic benefits.

1.2.2 The proposed management measures are likely to impact on businesses in an equal manner as the vessels involved in the whelk fishery have an equal ability to fish for whelks within KEIFCA district (all vessels have a 300 pot limit).

1.3 Small Firms Impact

1.3.1 The small firms impact test is required if the proposal imposes or reduces costs on business. There is then a need to identify and explore the potential to minimise the impact of requirements on small firms.

1.3.2 There are no specific impacts in relation to this to consider as part of the assessment as costs are not being imposed on businesses.

1.4 Greenhouse Gas assessment

1.4.1 The purpose of this assessment is to identify net impacts on greenhouse gas emissions as a result of the proposal and to monetise these to be factored into the cost/benefit analysis.

1.4.2 There are no specific impacts in relation to the greenhouse gasses to consider as there will be no impact on emissions or the impact will be minimal.

1.5 Wider Environmental Issues

1.5.1 This test aims to determine, and where possible quantify, the environmental consequences of proposals.

1.5.2 Potential wider environmental impact caused by the introduction of the byelaw is considered within the evidence base of the impact assessment.

1.6 Health and Well being

1.6.1 There is the potential for the proposed management measures to cause a degree of stress to the fishermen concerned which may have a negative impact on their health.

1.7 Human Rights

1.7.1 The aim of this test is to consider potential impacts on human rights.

1.7.2 There are no specific impacts in relation to human rights to consider.

1.8 Justice System Test

1.8.1 The aim of this test is to consider the impact of the proposal on the justice system and potential cost implications.

1.8.2 Due to the small scale of the proposal there are no specific impacts in relation to the justice system to consider.

1.9 Rural Proofing

1.9.1 This test is to ensure that proposals take into account the circumstances and needs of rural people and places.

1.9.2 There are no specific impacts in relation to the rural proofing to consider as the proposal will not have a disproportionate impact on rural communities.

1.10 Sustainable Development Test

1.10.1 The aim of this test is to reflect further on the conclusion of the IA to determine whether there are any compelling sustainability-related reasons to amend the policy. Sustainable development is the principle that the current generation satisfies its basic needs and enjoys improving quality of life without compromising the position of future generations.

1.10.2 There are no specific impacts in relation to sustainable development to consider. This proposal is being implemented to increase sustainability.

Annex 2: Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. If the policy is subject to a sunset clause, the review should be carried out sufficiently early that any renewal or amendment to legislation can be enacted before the expiry date. A PIR should examine the extent to which the implemented regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no to do a PIR please provide reasons below.

Basis of the review: [The basis of the review could be statutory (forming part of the legislation), i.e. sunset clause or a duty to review, or there could be a political commitment to review (PIR)];

Any review following the implementation of the regulation will be non-statutory and from form part of continuous review of all byelaw regulations through the Authority's byelaw review process.

Review objective: [Is it intended as a proportionate check that regulations is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?]

The review will check the continued appropriateness of the revised regulation and will consider compliance rates and any other issues that may arise post implementation.

Review approach and rationale: [e.g. describe the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach]

The review approach will examine stakeholder's views and feedback and enforcement records including information from inspections and level and type of enforcement sanctions such as verbal warnings and written warnings, formal cautions and prosecutions and biological information from stock assessment work.

Baseline: [The current (baseline) position against which change introduced by the legislation can be measured]

The current baseline position in terms of compliance equates to 1 or 2 enforcement actions per annum. Officers will also monitor trends in whelk catch returns and landings throughout KEIFCAs district to assess the impacts of the legislation.

Success criteria: [Criteria showing achievement of the policy objectives as set out in the final assessment; criteria for modifying or replacing the policy if it does not achieve its objectives]

Positives upward trends in whelk catch per unit landings. Negative trends of declining whelk catch per unit landings and significant increases in non-compliance.

Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection of monitoring information for future policy review]

Comprehensive monitoring of enforcement records and outputs. Comprehensive stock monitoring and assessment.

Reasons for not planning a review: [If there is no plan to do a PIR please provide reasons here]