

Amending the economic link licence condition in sea fishing licences

Business and Regulatory Impact Assessment

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Scottish Government
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Final Business and Regulatory Impact Assessment

1. Title of Proposal

Amending the economic link licence condition in sea fishing licences

2. Purpose and intended effect

Establishing a Scottish landings target for each Scottish licenced and administered fishing vessel is a longstanding ambition of the Scottish Government and was restated as a manifesto pledge in the [Programme for Government 2021-22](#). The Scottish Government is seeking to achieve this commitment by amending the economic link licence condition in Scottish sea fishing licences. The proposed amendments aim to increase the volume and improve the stability of landings of the most valuable fish species into Scottish ports. These benefits should increase and create a more stable supply for Scotland's fish processing businesses. The policy seeks to improve the distribution of economic benefits arising from Scotland's natural resources by increasing the value added in Scotland so that local, coastal and rural economies will benefit from increased employment and income from the seafood industry. The policy may help with food security as more raw material (fish) is landed into Scotland.

At present, there are a number of different means by which a Scottish licence holder can comply with economic link arrangements. These are:

- I. landing 50% of quota species into UK (so called "**Landings Target**");
- II. having 50% of their crew resident in the UK;
- III. spending 50% of their total expenditure in the UK;
- IV. if a licence holder fails to meet any of these options or a combination thereof, they are required to provide quota to its relevant authority – so called "**Gifted Quota**".

The key proposed amendments to be introduced from 1 January 2023 include:

- shifting the Landings Target from the UK to Scotland only.;
- removing the option of demonstrating an economic link to Scotland on the basis of crew residence and vessel expenditure;
- a requirement for vessels to meet the landings target aspect of the licence condition by landing 55% of their total landings of 8 key species each year into Scotland;
- continuing to offer the option of quota gifting as an alternative means of meeting the licence condition but using a revised rate; and
- moving the qualification tonnage for economic link provisions from two to ten tonnes.

These amendments are expected to result in an increase in the volume of supply and a reduction in supply chain risks for Scottish sea fish processing and handling businesses, and therefore the potential to attract greater investment and employment in Scotland's fishing industry. In the longer term it is expected they will contribute to the sustainable growth of the local economies where fishing is an

important driver for business activity (e.g. the North East of Scotland and the Islands).

It is anticipated that the amendments will result in more quota being available for distribution and therefore the way that gifted quota received by the Scottish Government is allocated to the Scottish fishing fleet will also change. From January 2024, there will be more stakeholder engagement in the process of deciding how gifted quota will be allocated. We anticipate that this could include allocating beyond the 10 metre and under sector, to whom it is presently allocated.

2.1.1 Current licence condition

At present, Scottish sea fishing licences include a condition that requires vessels over 10 metres in length landing more than 2 tonnes of quota species annually to demonstrate a real economic link to the UK. The current licence condition allows licensees to demonstrate a real economic link to the UK in different ways including:

- **Option A** – Making 50% by weight of the total landings each year for all stocks subject to quotas into the UK;
- **Option B** – Having a crew half of which is made up of persons that normally reside in the UK;
- **Option C** – Spending at least half of the vessel’s operating expenditure (excluding crews’ wages) in the UK; or,
- **Option D** – by (i) a combination of two or three of the above options (the minimum percentage chosen for any one option may be less than 50% but the percentages chosen individually and in combination must genuinely provide a real economic link); or (ii) criteria other than the above options which genuinely provide a real economic link; in practice this option involves gifting quota back to the Scottish Government.

Generally, the quota that is gifted back to the Scottish Government in compliance with the economic link licence condition is distributed to the non-sector 10 metre and under fleet who make use of it to increase their catches or to fish for longer.

2.1.2 Proposed licence condition

In practice, compliance with the current economic link licence condition has been predominantly through landing above 50% of quota species into the UK, and for those vessels failing this, through the crewing condition or alternatively by gifting quota. However, Ministers have committed to increasing the economic and social returns to Scotland from fishing relative to what the current economic link licence conditions have delivered to date. Therefore, the Scottish Government consulted with stakeholders in 2017 on amending current economic link provisions. The consultation responses have been carefully examined and have informed analysis presented in this Business and Regulatory Impact Assessment (BRIA). It is the Government’s view that the proposal contained in this BRIA is the best way to increase the economic and social return from Scotland’s marine natural resources.

The new proposal streamlines the economic link licence condition and requires licence holders to either:

- **Option A** – land a minimum of 55% of their total annual landings of 8 key species (by tonnage) into Scotland (the landings target); or,
- **Option B** –gift quota back to the Scottish Government according to an updated quota gifting formula that presents a maximum that the Scottish Government (or other sea fish licensing authorities) can ask for (quota gifting).

It should be noted that following the consultation there has been a change to the proposed amendments to the economic link licence condition so that the Landings Target element of it will only apply to 8 key species (mackerel, herring, *Nephrops*, cod, haddock, hake, monkfish and whiting). This change was made in response to views expressed during the consultation that there is a lack of capacity and market for some species in Scotland, and that licence holders could have complied with the originally proposed Landings Target element of the policy by landing high quantities of low value species into Scotland while landing high value species (for which there is significant processing capacity for in Scotland) abroad. The key eight species identified account for around 70% of the tonnage and value landed anywhere by the Scottish Fleet. This change is likely to increase the likelihood of the policy objectives being achieved.

The economic link licence condition only applies to vessels which land more than a particular weight of quota species. Another change we have made to the proposed amendments is that the qualification criteria of two tonnes or more of quota species will increase to ten tonnes or more of the 8 key species. This means that the economic link licence condition will not apply to licence holders landing relatively small amounts of key species and vessels targeting non-quota stocks but landing incidental by-catch of key species (which they are required to land).

Under option B, the quota gifted to the Scottish Government will be allocated to the Scottish fishing fleet. After taking into consideration responses to the consultation, unlike current practice, gifted quota may now be allocated to groups other than the 10 metre and under non-sector vessels. In distributing gifted quota, the Scottish Government will:

- Distribute quota in line with the Fisheries Act 2020 thereby ensuring that gifted quota is distributed in accordance with the provisions of section 25 and in particular, using criteria that:
 - are transparent and objective; and
 - include criteria relating to environmental, social and economic factors; and
 - are consistent with the fisheries objectives [set out in the Fisheries Act 2020](#).
- Align with the Blue Economy initiative and be consistent with the [Blue Economy Outcomes](#).
- Be consistent with the principles for the allocation of fishing opportunities as set out in [Scotland's Fisheries Management Strategy 2020-2030](#).
- Ensure benefit to Scottish fishing communities.
- Allocate through sectoral groups on the basis of those licence holders who met the Landings Target element of the economic link licence condition in the previous year.

- Ensure that catching opportunities for non-sector 10 metre and under vessels are prioritised. This means that when allocating gifted quota a key aim would be to ensure that fishing opportunities for the 10 metre and under sector are maximised.

This BRIA presents the expected benefits and costs associated with the above proposal relative to the current arrangement. The counterfactual is therefore the situation whereby the economic link licence condition was not changed, in other words that it would continue to exist as set out in the “*current licence condition*” subsection above.

2.2 Background

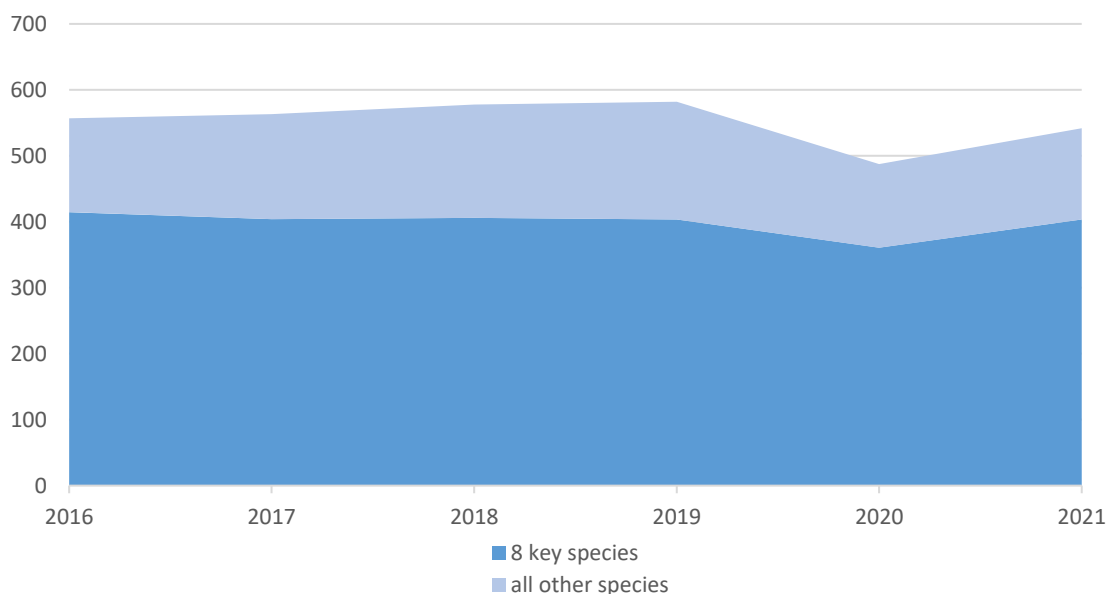
2.2.1 Catching sector

In 2021, provisional statistics indicate that the total tonnage of fish landed by Scottish vessels into the UK and abroad increased by 10% on 2020 figures to 437 thousand tonnes with the value increasing by 11% to £542 million.

In 2021, provisional statistics indicate that the total tonnage **of the 8 key fish species** landed by Scottish vessels into the UK and abroad increased by 6% to 311 thousand tonnes (71% of total tonnes landed) with the value increasing by 12% to £403 million (74% of total value landed).

From 2016-2021, these 8 key species accounted for around 70% of total value and total tonnage landed by Scottish vessels anywhere. See **Graph 1** for illustration of the value of landings.

Graph 1: Landings by value by Scottish vessels into Scotland, rUK and Abroad, for all species and for the 8 key species, 2016-2021, nominal values (£ millions)



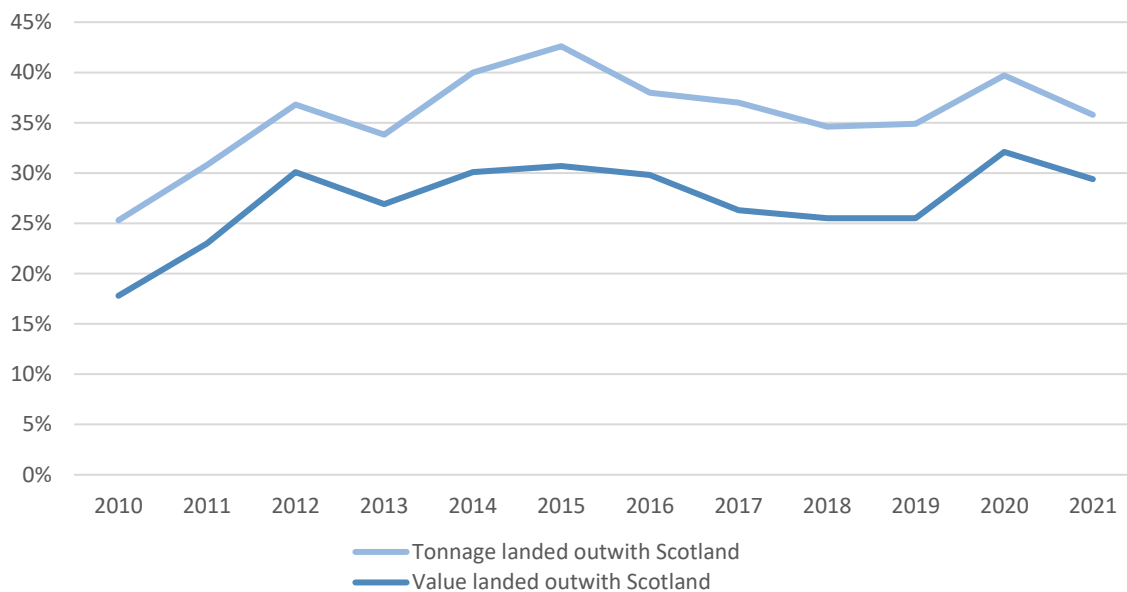
Source: Marine Scotland Fisheries Statistics 2020 & provisional figures for 2021

Note: Figures for 2021 are provisional statistics

2.2.2 Landing patterns of the 8 key species

Provisional statistics indicate that landings of the 8 key species outwith Scotland accounted for 36% of all landings by Scottish vessels in terms of tonnage and 26% in terms of value in 2021. Of this, 98% of the tonnage of landings outwith Scotland were pelagic, two% were demersal and Nephrops. Graph 2 below shows that Scottish vessels have increased the proportion of tonnage and value of their catch that is landed abroad over the past twelve years, albeit the majority of the shift was from 2010 to 2012.

Graph 2: Proportion of tonnage and value of 8 key species landed outwith Scotland by Scottish vessels, 2010-2021.



Source: Marine Scotland Fisheries Statistics 2020 & provisional figures for 2021

Note: Figures for 2021 are provisional statistics

Provisional statistics indicate that in 2021, the main species landed outwith Scotland was mackerel, 100 thousand tonnes with a value of £101 million, as shown in Table 1. This is 82% of the total tonnage of landings abroad of the 8 key species, and 85% of total landings value abroad of the 8 key species. In addition, this was 54% of the total tonnage and 52% of the total value of mackerel landed by Scottish vessels. In 2021 the average price for mackerel landed into Scotland was £1,116 per tonne and the average price for mackerel landed abroad was £1,011 per tonne, in contrast to previous years when prices achieved in Norway were higher than prices achieved in Scotland.

Table 1: Tonnage and value of landings by Scottish vessels abroad and into rUK by 8 key species in 2021.

Species	Value (£000s)	Tonnage
Pelagic	114,108	119,398
mackerel	101,226	100,269
herring	12,883	19,129
Demersal	2,594	1,651
cod	407	142
haddock	154	154
hake	672	336
monk	996	661
whiting	363	357
Nephrops	1,912	690
Total landings	118,613	121,739

Note: Figures for 2021 are provisional statistics

The majority of landings outwith Scotland were made into Norway and nearly all of these were pelagic species. In 2021, 86% of the value of landings into Norway was for mackerel, amounting to 89 thousand tonnes with a value of £82.8 million. Only 0.7 thousand tonnes of Nephrops were landed outside of Scotland by Scottish vessels, mainly into England, Northern Ireland, and the Republic of Ireland. While 1.7 thousand tonnes of the demersal species within the 8 key species were landed outwith Scotland with a value of £2.6 million, mainly into the Republic of Ireland and Denmark.

The licence holders not meeting the current economic link requirement to land 50% by total annual weight of quota stocks into the UK is generally small in number (See Table 2 below). In 2021, only 20 vessels out of a total of 410 vessels over 10m in length failed to meet the requirement. However, these 20 vessels land considerable quantities of fish with a high economic value abroad – around £96 million in 2021. In 2021, 12 of the 20 vessels met the economic link condition through their UK resident crew and 8 by providing quota gifts in lieu of not meeting the 50% landings target.

Table 2: Compliance with the current economic link landings threshold 2013–2021

Year	Number of vessels failing to meet a 50% landings threshold into Scotland	Tonnage landed abroad, tonnes	Value landed abroad, £millions
2013	27	103,478	£88m
2014	23	173,952	£125m
2015	25	142,971	£91m
2016	19	124,337	£113m
2017	24	142,061	£104m
2018	20	114,048	£92m
2019	21	108,040	£91m
2020	20	96,319	£86m
2021	20	113,115	£96m

Note: Data for 2021 is provisional

2.2.3 Processing sector

In 2021 there were 128 seafood processing sites operating in Scotland, providing 7,800 Full Time Equivalent (FTE) jobs according to the [Seafish processing survey](#). Scottish seafood processing represents approximately 37% of the sites in the UK and 43% of the jobs. Between 2012 and 2021, there was a 14% fall in employment in the Scottish seafood processing industry. In Scotland, seafood processing is concentrated in North Eastern Scotland where there are 48 sites which generate an estimated 43% of Scotland's seafood processing jobs.

Since 2012, Scotland as a whole has experienced around a 25% decline in the number of seafood processing sites, with the UK overall seeing a 17% decline in the number of sites. Concurrently, there has been a 7% decrease in FTE jobs in the North Eastern Scotland area, compared with a 14% decrease in Scotland and a 10% decrease in the UK overall. The national trend observes the decline principally in companies with 25 or fewer employees. There has also been a shift away from primary processing, which focuses primarily on cutting and washing the fish, towards secondary or mixed processing units, which include smoking and canning the fish.

The Scottish seafood processing industry has seen turnover fall by 15% in real prices between 2012 and 2018, but saw gross value added, the measure of the value of goods and services produced in an area, industry or sector of an economy, (GVA) stay generally stable and even increased in 2018 suggesting the industry is improving efficiency despite the decrease in throughput.

Anecdotally, Scottish sea fish processors tend to trade in pound sterling, while other countries trade in US dollars. This makes Scottish processors especially exposed to pound sterling exchange rate volatility, which, coupled with low margins, can have a particularly large impact.

As 98% of the tonnage of landings outwith Scotland in 2021 were pelagic fish, the change to the economic link licence condition will primarily effect pelagic processors. In 2021, data from Seafish shows that there were 5 Scottish processing sites handling pelagic fish only; and an additional 40 Scottish processing sites handling mixed fish, including pelagic fish. At the 5 processing sites that handle pelagic fish only, employment stands at 524 in 2021; employment has more than halved since 2014.

The key economic characteristics of Scotland's fish processing sector by type of fish processed can be found in the Appendix A.

2.3 Objectives

The proposal to change the economic link licence condition was reaffirmed in the Programme for Government 2020-2021 to address 1) the significant proportion of tonnage which continues to be landed abroad by Scottish vessels (Graph 2) and, 2) the challenging headwinds faced by the Scottish sea fish processing sector and in particular, the lack of a guaranteed supply.

In introducing a new Scottish economic link licence condition, the objectives of the Scottish Government are to increase the volume of valuable fish stocks landed in Scotland so that it:

- supports the long term, sustainable growth of local economies where fishing is an important driver for business activity (e.g. Peterhead, Fraserburgh, and Shetland) by increasing the volume and regularity of the supply of fish landed and available to process in Scotland;
- attracts greater investment and employment in Scotland's fishing industry by reducing supply chain risks for Scottish fish processing and handling businesses; and
- brings greater social and economic benefits to Scotland from a Scottish national resource by spreading the benefit arising from fishing quotas more widely through fishing communities

2.4 Rationale for Government intervention

Prior to the consultation on proposed changes to the economic link licence condition in 2017, Scottish Government officials and the then Cabinet Secretary for the Rural Economy engaged with industry to establish if increased landings of pelagic species (which account for the majority of landings abroad) could be achieved without the need for regulatory change. This proved unsuccessful and it was concluded that Government intervention would be required for the following reasons:

2.4.1 Foregone benefits to the local economy by landing abroad. A fishing vessel will generate economic benefits in its home port, such as through vessel maintenance works and crews' wages being spent. This can be substantial. However, wherever a fishing vessel lands its catch, i.e. the landing port, it brings with it substantial economic activity. This can be in the form of port operators handling the catch, haulage and processing. The current economic link licensing arrangements have undoubtedly resulted in economic benefits from fish quotas and fishing activities being retained in the UK as a majority of Scottish vessels land their catch into Scotland. However, as set out above, there is the potential to increase those benefits given the significant amount of catch being fished against Scottish quotas which continues to be landed abroad as licence holders can currently opt to comply with the economic link licence condition via the crewing requirement. These landings represent a lost economic opportunity for Scotland's coastal communities in the form of jobs and earnings, as the benefits of jobs related to landing and processing these fish, along with the supporting businesses, are greater than the benefits gained through the vessel crewing requirement. The prospect of landing and processing these catches within Scotland would allow a larger proportion of the full value chain to be captured resulting in Scotland achieving greater value from this national resource.

Therefore, the Scottish Government is of the view that the economic contribution made by the Scottish fishing industry to local economies where seafood industries are significant could be enhanced by strengthening incentives to land catches into Scotland. Fishing and related industries provide jobs in many coastal areas of

Scotland so an increased supply of fish has the potential to stimulate economic growth, attract investment and increase employment. This economic growth could be from increased landings as well as from the availability of additional quota from quota gifting which will be allocated, alongside other criteria, on the basis of securing economic benefits to Scotland's coastal communities.

2.4.2 To support the growth of Scotland's processing sector. Scotland's fish processing sector cites insufficient volume and irregularity of supply (supply chain risks) among the key constraints to its growth. By tackling these constraints, the Scottish Government's proposed changes to the economic link licence condition has the potential to result in the growth of Scotland's fish processing sector. In the long term, this change could more widely distribute the economic benefits from Scotland's fish resources, especially in coastal communities where fishing is a relatively important driver for economic activity.

2.4.3 National Outcomes

The proposal presented aims to tackle the issues highlighted above, using the rationale and objectives as set out. The proposal is expected to help deliver the following [National Outcomes](#):

- We have a globally competitive, entrepreneurial, inclusive and sustainable economy.
 - We live in communities that are inclusive, empowered, resilient and safe.
 - We value and enjoy our built and natural environment and protect it and enhance it for future generations.
 - We tackle poverty by sharing opportunities, wealth and power more equally.
- We have thriving and innovative businesses, with quality jobs and fair work for everyone.

3. Consultation

3.1 Within Government

To date and during the development of the policy, the Scottish Government considered its proposals for revising the economic link licence condition with the following groups across the UK and Scottish Governments:

- Marine Scotland Sea Fisheries: led on the development of the policy throughout.
- Marine Scotland Marine Analytical Unit: provided economic modelling which supported the rationale behind the policy development.
- Scottish Government Food and Drink Division: provided policy expertise on Scottish processors and information on export markets.
- Marine Scotland Compliance: provided details of the practices of Scottish vessels.
- Scottish Government Legal Directorate: informed general policy development.
- Department for Environment, Food and Rural Affairs (Defra, UK Government): high level discussions took place with Defra policy and analytical teams which highlighted the differences between the new

economic link licence condition in England and that proposed for Scotland, along with the rationale for the differences. Discussions also focused on the analytical approach and sharing learning to support a robust methodology.

3.2 Public Consultation

A public consultation exercise on changes to the current economic link licence condition started on 30 August 2017, with views sought by 31 October 2017. The consultation presented options for increasing the target for landings into Scotland to 55% per annum (by weight) for each vessel targeting quota species, with gifts of quota to the Scottish Government available as a secondary option for those vessels not meeting that target. For pelagic species, it was proposed to introduce the target at 30% in 2018, which would then increase in steps to 55%, by 2020.

In total, there were 154 responses to the consultation with 104 individual responses and 50 on behalf of organisations. Strong views were expressed in support of and in opposition to the proposed changes. The majority of respondents were opposed to any change (it should be noted that many opposition responses had similar or identical text).

A significant proportion of the responses were from Scottish pelagic fishers. They unanimously disagreed with the proposals because of the anticipated negative economic impact on their businesses. Processing capacity in Scotland was also a concern. Many other respondents not directly connected to the pelagic industry were concerned about the potential negative effects on vessels that land catch outside of Scotland and the possible impact of increased quota gifting on whitefish leasing prices, as Pelagic fishers would have to buy large quantities of whitefish quota to manage their quota gift. Fish processors mainly agreed with the proposals as it is expected that they would result in increased supplies of fish and provide much needed support for employment in the areas of Scotland where they are based. However, they called for higher targets, targets for specific species and for the target of 55% to be introduced immediately.

Local authorities tended to support the proposals overall (though one opposed) some disagreed with the transitional period for the pelagic fleet and the quota gifting arrangements which were seen as providing less economic benefit than landings. Producer Organisations (POs), responsible for managing the fishers' quota and marketing the fish, mostly disagreed with the proposals.

As noted above, a key change arising as a result of the consultation process is that the landings target element will now only apply to the eight species with the highest landed value into Scotland ("the 8 key species"). This change is being introduced in response to concerns that for other species there is a lack of market/ processing capacity in Scotland and that vessels could comply with the new provision by landing low value species into Scotland whilst continuing to land high value species outside of Scotland.

4. Options

This BRIA examines the Scottish Government's preferred option for changing and strengthening the economic link licence condition to increase the amount of high value fish landed into Scotland. The partial BRIA and consultation documents published in 2017 each explored one other option which is not analysed here: a voluntary and non-regulatory landings target. Only the preferred option, that is, to encourage increased landings of the 8 key species into Scotland through the introduction of a new economic link licence condition, is presented below due to the alternative voluntary option having been considered but ruled out following public consultation.

4.1 Preferred and Proposed Option

(a) each vessel lands at least 55% of 8 key species (by tonnage) annually into Scotland;

or

(b) gifts quota in lieu of landings that fall short of the target of 55% of the 8 key species using an updated percentage – see below.

4.2 Reasoning

Overall, this option is preferred as it will incentivise licence holders who currently land a high proportion of catch abroad to land more of it into Scotland. Even if licence holders chose to gift quota to the Scottish Government instead of meeting the landings target, the effect of the new licence condition is that it will increase the supply of the most valuable fish stocks, the stability of that supply and, it could also result in a lengthening of the landing season. This directly addresses the supply issues affecting some Scottish processors. This option also provides opportunities for local economies dependent on the fishing sector to pursue sustainable inclusive growth through a stronger local labour market.

To address concerns raised over the need to phase in change to allow businesses a period to adjust, the consultation document sought views on a staggered landings target to allow pelagic fishers and processors time to adjust. Presently, pelagic vessels tend to meet the current economic link licence condition via the crewing option. Therefore, the removal of the crewing option will impact pelagic vessels in particular. In light of responses received in respect of this aspect of the consultation, the introduction of the new economic link licence condition will be staggered as proposed so that a 30% landings target will be set for year 1 (2023), rising to 40% in year 2 (2024), before reaching the full 55% landings target in year 3 (2025).

4.3 New quota gifting formula

In line with the proposal set out in the consultation, the Scottish Government has reviewed the current quota gifting formula and will adjust it to 26% of the value of the landing gap. That being the difference between the volume landed and the volume required to be landed to be compliant with the landings target. The Scottish

Government believes that this revised percentage remains an affordable alternative means of meeting the economic link licence condition but better captures the missed economic value resulting from landings outside of Scotland.

Based on the available evidence at the time of consultation, which mirrors the current figures, from the [Scottish Input-Output tables](#), it was estimated that each £1 of outputs from the fish processing sector in Scotland supports an extra £0.65 in the supply chain and as a result of spending and re-spending of wages. This represents a possible maximum quota gift as the value lost in lieu of landings. However, 26% was chosen as a reasonable and proportionate figure for fishers to pay whilst also providing more of the missed economic value to Scotland than is currently the case.

5. Sectors and groups affected

It is anticipated that the Scottish Government's preferred option as outlined above will primarily affect fishing vessels and fish processing businesses and to a lesser extent, sectors from which the fish processing sector derives inputs. To better understand the impact of the policy, we considered who might be affected by it and grouped them into three broad areas:

The Catching sector– those vessels that will have to change landing patterns to comply with the new requirements, including their owners and crew; and vessels receiving gifted quota.

The Upstream sector – there are two main upstream sectors that were looked at. The first is those businesses which supply the fishing fleet with fuel, engineering parts and other consumables. These are not expected to see a substantial change in their business as the majority of these supplies are bought in the home port anyway. The second is those businesses which supply the fish processing sector with inputs such as such as energy, packaging and other intermediate supplies, as well as the businesses which support these businesses. These are expected to see a change due to the expected increase in throughput seen by the fish processing sector.

The Downstream sector – these are the sectors that handle, process and add value to outputs from the catching sector, including seafood processors, fish merchants, fish market porters, etc. Whilst the fish processors are expected to see changes, as it is expected that much of the fish will be exported we do not expect more downstream benefits as a result of increased landings.

The potential impact on these businesses is discussed below.

5.1 Groups affected

5.1.1 Catching sector

Within the catching sector, there are two main sub-groups that are expected to be impacted:

- Fish catchers – pelagic – in 2020 there were 22 vessels with pelagic fishing gear in the Scottish fleet.

- Fish catchers – demersal & Nephrops – in 2020 there were 110 demersal vessels over 10 metres with demersal fishing gear, and 187 vessels over 10 metres with Nephrops trawl fishing gear in the Scottish fleet.

These vessels could be affected in several ways. For those who are non-compliant, they will have to either increase landings into Scotland or quota gift which could result in them receiving lower prices for their catch or, in them losing business partnerships already established in other countries. Compliant vessels could also be impacted, both positively through the receipt of gifted quota, or negatively through the possibility of lower prices as a result of increased landings into Scotland. Further vessel specific data is provided in the Scottish Firms Impact Test section.

On average, there were around 2,070 active vessels in the Scottish fleet between 2016 and 2020. Having reviewed their landing patterns, we note that of these vessels around 99% already comply with the Scottish Government's proposed changes to the economic licence condition. Based on 2015 to 2019 data it is expected that around 31 vessels would not be fully compliant with the proposed changes and hence may be affected in terms of their operations and/or turnover. A multi-year average of 2015-2019 was used to overcome the year on year variation in landing pattern.

These 31 vessels landed around 103 thousand tonnes of the 8 key species abroad each year (around 82% of their landings of the 8 key species) between 2015-2019. In order to comply with the proposed changes to the economic licence condition through option A (i.e. the landings target) they would need to land an additional 46 thousand tonnes of the 8 key species into Scotland per year. By reference to expected 2023 prices (detailed in appendix B), this could be worth an additional £45.6 million of landings into Scotland per year, with pelagic species comprising around 94%. This is equivalent to an annual uplift in total landings into Scotland of up to 11%. The actual tonnages and value of this policy will depend upon future quotas, market conditions, and which option (A or B) vessel owners choose to exercise with the proposed changes to the economic licence condition.

As an alternative, licence holders/vessel owners may choose to continue landing the 8 key species outside of Scotland and instead comply through option B (quota gifting). If all 31 non-compliant vessels chose this option, the Scottish Government could receive up to £11.8 million (in expected 2023 prices) more in quota gifts than it currently receives in any given year. Note that this would be a maximum based on current landing patterns and depends on the business decisions by vessel owners.

5.1.2 Upstream sector

There are a number of upstream businesses to the fish processing sector that may be impacted by this policy:

- Haulage
- Machine maintenance
- Fuel and energy providers
- Packing producers

It has been noted above that the upstream businesses to the fishing fleet are not likely to see much change, as the majority of these supplies are bought in the home port anyway. However, it is expected that there will be an increase in fish processing which would have a more significant effect on upstream businesses. This would likely increase demand for further upstream inputs, which may result in the affected companies investing in order to take advantage of these new opportunities, such as expanding the production of a line of packaging. Although, this is not expected to be the case.

5.1.3 Downstream sector

Within the downstream sector, three key sectors are expected to be affected:

- Pelagic fish processors – [Seafish's processing survey data](#) shows that in 2021 there were 5 processing sites that processed pelagic fish only and a further 40 that processed pelagic and other species in Scotland (i.e. mixed processors).
- Demersal fish processors – Seafish's processing survey data shows that in 2021 there were 25 processing sites that processed demersal fish only and a further 49 that processed demersal and other species in Scotland.
- Businesses that are in the downstream supply chain of the catching sector in addition to the processing sector may also be affected, such as fish markets, transport businesses, and freeze storage businesses.

Note that pelagic and demersal processors that also process other species may be double counted in the above figures. Although, this gives an indication of where impacts may fall.

It is expected that any additional pelagic landings into Scotland would be processed in Scotland. This would ensure a higher and more stable supply to Scottish pelagic fish processors. Demersal processors could also gain from increased landings and more stable supplies. However, relative to pelagic species, it is more likely that any additional demersal species landed in Scotland could be processed abroad due to being more cost effective to transport and therefore a proportion of any extra demersal fish landings may not be processed in Scotland. Overall, we don't expect any change in demersal landings patterns, those that habitually land in Scotland will continue to do so and those that habitually land abroad, those generally foreign owned, will continue to land abroad and comply via the quota gift.

Similar to the upstream sector, the downstream sector may choose to invest to make the most of these new economic opportunities. Overall, it is expected that this sector would be positively impacted by the proposed changes such that it would likely be the primary beneficiaries of it.

5.1.4 Competition

Consideration was given after concerns were raised by those opposed to the regulatory changes whether, by encouraging increased landings of the 8 key species

into Scotland, this could result in less competitive activities from the fish processors leading to a significantly decreased purchase price for raw fish. Marine Scotland appreciates that this is a legitimate economic concern, however there are a number of reasons why we have assessed the offering of significantly lower prices (beyond the natural fluctuation of prices) to be unlikely. Firstly, Scottish processors have an incentive to offer competitive prices in order to incentivise Scottish vessel owners to land in Scotland and not, alternatively as per the licence condition, land abroad and quota gift. From our consultations, Scottish processors are keen for additional landings, and therefore will want to maintain competitive pricing to avoid vessels quota gifting. Fishers have the option of continuing to land the 8 key species abroad and meet the economic link licence condition through the payment of quota gifts. This means that if increased landings of the key species into Scotland was to have the effect of lowering prices, fishers could choose to land outside of Scotland thereby increasing competition and prices in Scotland. There is also the consideration that pelagic factories have excess production capacity which means that the marginal cost of production decreases with increasing throughput (up to the point where capacity is reached). Therefore, processors are incentivised to compete for as much market share as their factories can take to increase the profits they can make with their business model's relying on high volume to maximise profit. This, coupled with relatively low barriers to entry, should make it very difficult for the processors to lower their offering to the catching sector as they risk losing fishers to other factories, including the higher number of mixed fish processors.

Furthermore, lower prices are not expected to be received for the sale of fish products from the fish processors as the pelagic stocks targeted by the new license condition are traded on international markets with fixed sale prices.

Also, it is anticipated that a more stable supply will result in increased investment in the processing industry which would see processors improving their ability to compete with processors located in other countries.

6. Approach

This section outlines the analytical approach taken to the valuation of the benefits and costs associated with the attached proposal. A more detailed methodology can be found in Appendix B. The key underlying data sources for this analysis were Marine Scotland's [Sea Fisheries Statistics](#), the [Seafish Seafood Processing Industry Report](#), and the Scottish Government's [Input-Output tables](#).

To ascertain the impact on the affected groups set out above, i.e. the catching, upstream, and downstream sectors, the following approach was taken.

6.1 Do nothing

The impact of the proposal is relative to a "do nothing" option, i.e. continuing with the current economic link licence condition and not introducing the proposed changes. This means that any benefits from the current economic link licence condition, such as current levels of quota gifting, must be deducted from the benefits of this proposal so as to accurately portray the net impact. Some of the impacts relative to the "do nothing" option have been monetised and are the focus of the cost/benefit analysis,

while other – equally important – impacts have not been monetised, which instead are outlined qualitatively in the following sections.

6.2 Preferred Option: Scenarios 1-3

In order to assess the impact of implementing the preferred option, 3 scenarios were modelled to ascertain a range of potential impacts. The 3 scenarios are in Table 3 below and include potential responses by the pelagic and demersal fleets to the preferred option.

These scenarios are designed to capture a range of possible outcomes of this policy change, however they are not attempts to forecast the precise reaction of vessel owners. Scenario 1 and 3 represent the relative costs and benefits of the affected vessels either fully complying via landings or, alternatively, quota gifting i.e. the two options available under the proposals. Scenario 1 and 3 therefore present the lower probability scenarios, but show the potential range of expected impacts. Affected vessels are those assessed to be non-compliant with the proposal, i.e. vessels which land below 55% of their catch into Scotland.

Scenario 2 presents a central, or most likely, scenario where some vessels choose to increase their landings and others choose to quota gift based on their business circumstance. From business intelligence and consultation documents the largely Anglo-Dutch and Anglo-Spanish demersal vessels are not expected to change their landing patterns but are instead likely to continue quota gifting; while for the pelagic vessels it is expected that some will change their landing patterns. It has been assumed that pelagic vessels landing less than 20% of the 8 key species into Scotland have some sort of contractual or close working relationship with processors abroad. It is also assumed that these vessels will continue landing abroad at least in the short to medium term and choose to quota gift. It is further assumed that pelagic vessels landing between 20% to 55% of the 8 key species into Scotland will increase their Scottish landings and comply via additional landings.

Table 3: Description of 3 scenarios

Scenario	Fleet segment	Assumption
Scenario 1: Compliance via increasing landings High impact, low probability	Demersal	Non-compliant vessels increase landings to 55%
	Pelagic	Non-compliant vessels increase landings to 55%
Scenario 2 (Central Scenario): Compliance via increasing landings and quota gifting Medium impact, high probability	Demersal	Non-compliant vessels quota gift, no change in landings
	Pelagic	Non-compliant vessels landing under 20% into Scotland quota gift, those landing 20% to 55% into Scotland increase landings to 55%.
Scenario 3: Compliance via quota gifting Lower impact, low probability	Demersal	Non-compliant vessels quota gift, no change in landings
	Pelagic	Non-compliant vessels quota gift, no change in landings.

Table 4: Monetised and non-monetised costs and benefits of the preferred option

Monetised Cost	Catching Sector – Price differential for landed fish between Scotland & Other Markets
Monetised Benefit	Downstream – Increased fish processing
	Upstream – Increased demand for goods and services by fish processors
Non-Monetised Benefit	Stable Supply chains could improve business confidence and investment
	Quota gifts could go to more vulnerable communities or help new fishers
	Increased export of in demand products could improve all fish exports through market penetration
	Lower steaming costs and greenhouse gas emissions for vessels by changing ports, depending on the fish stocks targeted.
Non-Monetised Cost	Increased costs to the industry through increased port fees, and the Seafish levy
	Potential loss of business relationships with current processors/businesses from landing changes
	Potential loss of Scottish resident crew or ship expenditure in Scotland
	Potential cost to port authorities to facilitate additional landings to include potential costs of upgrading port infrastructure
	Potential cost to industry should prices drop due to oversupply
	Potential labour supply issues
	Risk of non-competitive behaviour through processors leveraging their new market position to lower prices.

6.3 Expected monetised impacts

6.3.1 **For the catching sector**, the monetised impacts include: under Option A of the proposal (the landings target), the potential cost of a lower sale price in Scotland compared to abroad, or the rest of the UK; and, under Option B the cost of gifting quota.

Price differentials – Pelagic vessels mainly land in Norway. Based on the average of 2015 to 2019 data, Mackerel is expected to receive £35 per tonne less in Scotland than in Norway and Herring is expected to receive £31 per tonne less in Scotland than in Norway. These are expected 2023 prices. The price differential for demersal stocks has not been included due to the high variability in price each year, and the fact that this is more likely due to particular business contracts than real market fluctuations. Had demersal price differences been included, it would have resulted in an increase in price per tonne for landing in Scotland. In the longer term, there is also the possibility that the price received by fishers in Scotland could decrease due to increased supply and greater market power of buyers. This has not been included into the main analysis but rather is presented in the sensitivity analysis.

In terms of demersal, non-Scottish landings are primarily to Spain or Ireland. Some *Nephrops* vessels will be affected by this proposal as they are known to land into (non-Scottish) UK ports. For these vessels, there is not expected to be a great difference in sales prices as between Scotland and the UK. As such, should they decide to meet the licence condition through Option A (the landings target), they are unlikely to see a significant price differential. On the whole, Scottish vessel landings into the rest of the UK comprise a relatively small proportion of total landings and any impact by the economic link proposal is not expected to be significant. Of the vessels/licence holders whose patterns or behaviour to date show that they are already in compliance with the proposal, it is assumed that there will be no change to their behaviour and therefore they will be unaffected by the proposal.

Quota gifting – To model the impacts of Option B, quota gifting, it is assumed that quota gifts are provided in the 8 key species, and are representative of what is being caught by these vessels at present, which is then distributed amongst those Scottish fishing vessels that meet the landing component of the new economic link licence condition. The cost of the quota gifted (26% of the landing value gap) by non-compliant vessels is mostly balanced by the gain to the compliant fleet. However, there is still a cost to the industry as a whole from the price differential. As the fish could have attracted a higher price if landed abroad rather than quota gifted and landed into Scotland where the price is noted to be lower for pelagic species.

6.3.2 **For Quota gift benefits**, as only a proportion of the total catch is gifted back, Scotland does not get the full suite of benefits that would occur had all the catch been landed into Scotland. Therefore, while quota gifting undoubtedly benefits coastal communities in Scotland, it does deliver **lower benefits per tonne of landings** than increased landings into Scotland.

However, the gifted back quotas which are landed into Scotland will benefit Scottish coastal communities. These benefits are achieved by the Scottish Government allocating any gifted back quota to the landing compliant portion of the fleet. While some of this may be landed abroad, between 5-15% based on historic data, the bulk is expected to be landed into Scotland thereby accruing all of the benefits associated with this, such as upstream and downstream activities, benefitting coastal communities. For all intents and purposes, quota gifting has the same costs and benefits as landing into Scotland directly, but scaled down to around 26% of those impacts.

6.3.3 **Upstream impacts** are based on extra purchasing required by fish processors, which is then attributed to any additional landings expected. These impacts are calculated by using a mixed exogenous/endogenous variable model (detailed in appendix B) of the economy based on the Scottish Government [Input-Output](#) (I-O) tables for the fish processing industry. This method controls for the upstream effect back to fishers so that we are not double counting the benefit in the I-O table.

6.3.4 **Downstream impacts** are calculated in terms of the amount of activity that may be expected in fish processing from the anticipated additional landings. Pelagic landings are assumed to be processed wholly in Scotland, while only half of demersal landings (reflecting the greater opportunities to process elsewhere) are

assumed to be processed in Scotland. The primary reason for this assumption is that a notable amount of demersal fish is transported out of Scotland prior to any processing, in contrast to pelagic fish which is rarely transported in this way due to the lower value per tonne and their more specialised method of landing directly to factories. However, Scotland has substantial demersal processing capacity and the additional volume of demersal fish is expected to be manageable for Scottish processors to process. Pelagic processing capacity was cited as a concern in the 2017 consultation and again in discussions with businesses to inform this BRIA. As was the case 2017, supporters of the change refute this – stating that Scotland has the processing capacity to manage the proposed change. The majority of pelagic processing in the UK is in the North Eastern Scotland region and this industry is already subject to relatively large variances in their inputs due to changes in quota, hence the expectation that they have flexibility in terms of processing additional input.

6.3.5 The additional number of jobs supported through this proposal was derived by using the mixed exogenous/endogenous variable model of the economy based on the Scottish Government Input-Output tables for the fish processing industry as used for the upstream figures. These tables include estimates for all jobs in the fish processing industry, along with all the indirect and induced upstream jobs. These estimates were derived using the total extra output figures from the fish processing sector.

6.4 Presentation of results

Results are presented over a 10 year appraisal period in expected 2023 prices in terms of their contribution to Scotland’s economy through GVA. They are discounted using a 3.5% social discount rate (more details available in appendix B) according to the UK Government [Green Book Appraisal Guidance](#).

7. Benefits

Following the approach set out above (and in more detail in Appendix 2), this section sets out the monetised and non-monetised benefits associated with the attached proposal. The monetised benefits primarily accrue from additional value captured by seafood processors in Scotland as well as the economic activity associated with increased levels of quota gifts. While non-monetised benefits follow this through additional jobs in processing as well as expected benefits to processors from a more regular and secure supply of inputs.

7.1 Monetised benefits

Table 5 shows the expected monetised benefits relative to the “do nothing” option of the attached proposals. Figures are presented as a GVA change to the economy of Scotland.

Table 5: Summary of monetised benefits, expected 2023 prices, £million

	Year 1	Year 2	Year 3	10 Year Total
Scenario 1	12.6	17.7	27.2	223.5
Scenario 2	3.2	5.2	10.3	82.0
Scenario 3	2.9	4.2	6.5	53.5

Under the Central (most likely) Scenario (2), Scotland would benefit from an estimated £82.0 million in additional GVA over the first 10 years following the introduction of the new economic link licence condition, relative to the Do Nothing Scenario. These monetised benefits relate to the upstream and downstream effects of landing and processing in Scotland, with the benefits split roughly equally between upstream and downstream. The benefits of Scenario 3 are slightly less than 26% of those seen in Scenario 1, due to 26% of the landing gap stocks given as quota gift instead, with most of that quota gift then assumed to be landed in Scotland.

Table 6 shows the expected additional full time equivalent jobs that would be created by the additional processing in Scotland, relative to the “do nothing” option of the attached proposals.

Table 6: Summary of expected additional jobs in the up- and down-stream sectors

	Year 1	Year 2	Year 3	Cumulative total by year 3
Scenario 1	202	90	173	465
Scenario 2	51	45	90	176
Scenario 3	46	22	43	111

Scenario 1 has the highest number of expected additional jobs as this scenario expects the most fish to be landed and processed in Scotland; this scenario has also the lowest probability of occurring. In the Central Scenario (2), most of the jobs created are realised in the third year after the transitional arrangement for the pelagic fleet has ended. The cumulative total shows the maximum jobs expected to be produced by each scenario, with the GVA gain monetised in table 5.

7.2 Non-monetised benefits

There are several benefits that have not been monetised, often due to their relatively small expected effect and/or the complexity in doing so. In terms of the latter, there are some that could have a material impact upon the catching fleet and Scottish economy as a whole. One such benefit is that a more stable supply of inputs could help to safeguard *existing* jobs in addition to creating new jobs. Alternatively, a more stable supply of inputs could also incentivise investment in plant machinery achieving productivity gains.

Quota gifted stocks could see additional benefits beyond those already monetised depending on the final manner of distribution. Gifted quota will be distributed for the benefit of potentially vulnerable rural coastal communities, where fishing is an important part of the local economy. In addition, gifted quota distributed to the non-sector fleet could also lead to improving the prospects for new fishers.

This proposal would be expected to fulfil a number of the aims as set out in the [Scottish Government's Economic Strategy](#). For instance, through fostering inclusive growth, by supporting coastal communities, maximising the economic returns from Scotland's resources and promoting a more sustainable labour market. This will contribute to supporting the sustainability and resilience of these communities.

The food and drink industry is the largest export sector in Scotland, and Scottish seafood processors play a key role in this. While some of the benefits to processors are monetised, there may be other non-monetised benefits if a greater and more stable supply allows Scottish processors to grow into new markets and expand their presence in traditional ones. In turn, this could lead to increased investment by up- and down-stream sectors, which could lead to a higher skilled labour force, better quality infrastructure and more efficient process. The realisation of these benefits depends on whether processing businesses can overcome other barriers to growth, such as the ability to break into high value product markets and increase domestic demand, that are not linked to volume or regularity of supplies.

Finally, the policy change could result in environmental and financial benefits if steaming distance is reduced, where non-Scottish ports are further away than Scottish ports. Although, any such benefits could be lost through increased haulage depending on onward travel.

8. Costs

As mentioned in the analytical approach section, it is expected that there will be some net costs associated with the attached proposals compared to the Do Nothing situation. This section sets these out, again in terms of monetised and non-monetised costs.

8.1 Monetised costs

Table 7 shows the expected monetised costs associated with the proposal, these only impact the catching sector and vary across the scenarios as they depend on the uptake of additional landings or the choice of quota gifting. Figures are presented as a GVA change to the economy of Scotland.

Table 7: Summary of monetised costs, expected 2023 prices, £million

	Year 1	Year 2	Year 3	10 Year Total
Scenario 1	0.7	1.0	1.6	12.8
Scenario 2	0.3	0.4	0.7	6.0
Scenario 3	0.2	0.3	0.5	3.9

Under the Central Scenario (2), the proposal would cost Scotland an estimated £6 million in GVA relative to the Do Nothing Scenario through the lower price received in Scotland compared to abroad. This would manifest itself through less direct taxes paid, lower earnings for fishers, or lower investment in vessels. The price differential is still experienced for quota gifted fish landed into Scotland, as our analysis shows that higher prices would be achievable if they were to be landed abroad.

8.2 Non-monetised costs

There are several key costs that have not been monetised, often due to the complexity in doing so and/or the relatively small expected effect. However, some of these costs could have a material impact upon the catching fleet and the Scottish economy as a whole and are therefore considered below.

The pelagic, demersal, and Nephrops fleets may have non-price related reasons for landing abroad which cannot be monetised, which is particularly evident in the foreign-owned fleet with close business ties to their home countries. One implication of having secure markets abroad is that if vessels move their landings to Scotland, they may face higher transportation costs to get fish to their markets abroad. This could not be accurately modelled, but the net impact is not expected to be significant.

There could be circumstances whereby vessels are fishing closer to Scandinavia or are having maintenance work done there in which case they could experience higher costs in returning to Scotland to land.

In addition, due to the dropping of the operational expenditure and crewing requirements from the economic link licence condition, these could lead to costs to the Scottish economy. At present, no Scottish vessels comply with the economic link licence condition via the operational expenditure option and therefore little change is expected once this option is removed. In relation to the crewing requirements, the key fleet that uses the crewing option to comply with the economic link licence condition is the pelagic fleet but it is not expected that their approach to crewing will change once this option is no longer available. This is due to the manner in which they are owned and crewed, employing friends and family. Consequently, any losses to Scotland incurred from dropping these options is not expected to be material. In the event that these vessels were to change their crew makeup, [Seafish's economic data](#) suggests this cost (i.e. employing non-Scottish resident crew) would not outweigh the benefits of additional Scottish landings. This crewing data has not been included due to it being commercially sensitive.

Also, there may be costs associated with the up- and down-stream sectors in scaling up their operations where applicable. This could be substantial if port infrastructure or new processing sites are involved. However, such fixed-cost investments would carry associated benefits and it would be up to businesses whether to pursue these opportunities – which they would only do if there were net benefits. Production costs are implicitly included within the benefit calculations already, as the calculations assume the same cost structure going forward. Additionally, discussions with industry representatives suggest there is capacity available and thus investment would likely be for productive gains and not strictly necessary as a result of this proposal.

Were prices in Scotland to fall due to increased landings and thus supply into Scotland, this could impact vessels that already meet the new economic link licence condition in addition to further impacting those vessels who would seek to comply with the proposed changes to the economic link condition. This could be due to fish processors decreasing their purchasing prices due to their increased market power,

or due to failure in finding export markets that pay similar prices as are currently achieved. Such changes are not anticipated to be significant, due the fact that the pelagic species targeted have worldwide markets where demand remains strong. However, sensitivity analysis has been undertaken to understand what lower prices would mean for the costs and benefits which should give some idea of what this could cost.

There is a risk that the few pelagic processing factories in Scotland, along with a near guaranteed supply, could result in non-competitive behaviour with processors leveraging their new market position to lower prices. The potential effect of this behaviour has not been monetised, beyond the aforementioned sensitivity analysis on the drop in prices in Scotland, but this behaviour is not expected to occur in the long term as there are no major restrictions in new fish processors entering the market if there are supernormal profits available, and in the short term would likely only result in a transfer between fishers and processors rather than overall loss for the economy.

Moreover, there is also the risk of costs emanating from any labour supply issues. Labour shortages could result in production issues lowering prices or, it could result in vessels owners being unable to sell their stock in a timely manner lowering the quality and value of their catch. It could also have a knock on effect on other fish processing industries if pelagic processing factories opt to increase their wages. These labour effects have not been monetised due to the uncertainty of the effect, but also those areas in Scotland with fish processing sites often have lower labour force participation or higher levels of unemployment than the national average, suggesting that there is capacity to increase the workforce and therefore any potential costs from labour shortages could be somewhat mitigated or short-term.

The costs associated with managing vessel compliance with the economic licence condition are not anticipated to increase significantly under this proposal, and hence have not been modelled.

9. Benefits and Costs Summary

Figures in the table below are presented as a GVA change to the economy of Scotland.

Table 8: Summary of monetised net benefits, expected 2023 prices, £million

	Year 1	Year 2	Year 3	10 Year Total
Scenario 1	11.9	16.6	25.6	210.6
Scenario 2	2.9	4.8	9.6	76.1
Scenario 3	2.7	3.8	6.1	49.7

10. Sensitivity Analysis

Sensitivity analysis was undertaken to test the modelling outputs in the case of four additional potential situations to understand the possible range of costs and benefits. These were all modelled based on the Central Scenario (2), with further details on these noted in the methodology section of the appendix:

- Assumed less inputs to the downstream and upstream calculations due to the reduction of other variable inputs.
- Assumed that the GVA multiplier for the fish processing industry is reduced due to higher costs than their competition abroad; this affected the downstream and upstream benefits.
- Assumed a lower proportion of landed fish is processed in Scotland for both pelagic and demersal stocks, but the price differential cost to fishers is kept constant.
- Assumed a lower price for new pelagic fish in Scotland due to the difficulty in finding a suitable market for the new fish. This cost is applied both to the non-landing compliant fleet and the landing compliant fleet, and has subsequent effects on the downstream and upstream benefits.

All the ranges used in the sensitivity analysis are arbitrary and do not represent modelled or expected changes.

The results of the sensitivity analysis indicate that under Scenario 2 the scheme would still bring a benefit to Scotland's economy but it could be substantially lower, with the loss of processing over halving the benefit in the third year. Meanwhile increasing the inputs to processors, lowering the GVA for processors or lowering the price for newly landed pelagic stocks have a smaller effect and all remain net positive for Scotland in year 3 of the scheme. It is important to note that these assumptions are not expected but are possible risks and are used to understand what would happen if circumstances change.

Figures in Table 9 below are presented as a GVA change to the economy of Scotland and only for year 3 of the project. The sensitivity analysis has only been presented for year 3 due to the fixed changes applied to the model having a disproportionate effect in the first two years, i.e. it is unlikely that the same price reduction would be seen in the first year where the landings target is a lot lower than the third year when the scheme is fully operational. The year 3 figure is comparable to the year 3 figure in the cost benefit tables above, i.e. £9.6 million overall benefit under the central scenario by year 3.

Table 9: Summary of monetised costs and benefits for year 3 under the central scenario (2), expected 2023 prices, £ million

Variable change	Benefits	Costs	Year 3 Total	Difference to Central Scenario (2) Year 3
Less inputs to processors	9.3	0.7	8.5	-1.1
Lower GVA for processors	8.3	0.7	7.6	-2.0
Less processing in Scotland	7.2	0.7	6.5	-3.1
Lower price for newly landed pelagic stock	9.8	2.4	7.4	-2.2

11. Scottish Firms Impact Test

Prior to the publishing of the consultation in August 2017, the Scottish Government met with various businesses and industry bodies in order to consider how best to facilitate greater fish landings for Scottish processing factories. This included meeting with concerned individuals in order to establish whether the desired

outcome (greater landings of key commercial stocks into Scotland) could be delivered without the need for government intervention.

The objective of achieving greater landings into Scotland through non-regulatory means was not achieved and the consultation on amendments to licence conditions followed.

In April and May 2022, we undertook further consultation to inform our impact assessments and obtain feedback from industry given the passage of time since the consultation closed in 2017. Officials selected businesses and trade associations with a direct interest in the policy change in order to establish impacts on them (and where relevant any constituent businesses) in greater detail and to take account of relevant market changes since 2017.

To this end, we selected 11 interested businesses (fishers, processors, trade bodies and port authorities) and requested their views on the anticipated costs and benefits on their business that would be associated with each of the questions posed in the consultation document.

In addition, we sought feedback on the following:

- the capacity of processors to deal with the proposed changes;
- the impact of Brexit, the COVID-19 pandemic and the situation in Ukraine on the proposed changes;
- how the proposed changes would impact on various markets?

To inform this process officials spoke to:

- four processing businesses;
- four sectoral groups (groups delegated with quota management responsibilities by the Scottish Government);
- three Scottish Fishing Associations (a group (distinct from sectoral groups) which represent the interests of fishers). A fourth approached by officials pointed to its previous response and said its position had not changed); and
- two harbour authorities.

These discussions shall now be summarised.

Most of the businesses spoken to had responded to the 2017 consultation. In meetings, respondents often referred to answers they had provided in response to the 2017 consultation indicating that their views had not changed in the intervening period. Where permission was given, responses to the consultation can be viewed on the [Scottish Government website](#).

By-and-large those who responded to the consultation had not changed their views on their support or opposition to the proposed change.

11.1 Key issues discussed

11.1.1 Processing Capacity

Those supportive of the policy change stated that Scottish processors have the capacity to deal with the additional expected produce and where necessary could scale up. However, pelagic processors spoke of the benefit of phasing in the change for pelagic stocks over a period of time to allow for a period of adjustment. One processor commented on the importance of investor confidence behind the recent announcement of a multi-million-pound capital investment to allow for modernised infrastructure, access to additional volumes of Scottish landed fish being key to that decision. Processors also highlighted the need to keep the policy change under review and amend it if necessary.

Some supporters of the change called for the landings target for pelagic stocks to be increased to 55% immediately instead of phasing in the increase – however, those expressing those views were not from the processing sector. It was recognised that there must be cooperation across industry sectors if the projected benefits are to be maximised. For example, Producer Organisations would need to actively manage the activity of fishing vessels to align with processors' fluctuating capacity.

Those against the policy change set out concerns around processing capacity within the Scottish processing sector. In addition to concerns already set out in responses to the consultation (see accompanying consultation outcome report) – many were concerned about the impact of Brexit, the COVID-19 pandemic and the conflict in Ukraine on markets (explored below).

11.1.2 Impact of Brexit, Covid-19 pandemic and the conflict in Ukraine

As can be seen in the analysis contained in this BRIA, those most significantly impacted by the proposed change to the economic link condition are the pelagic catching and processing sectors.

There was much discussion on the impact of Brexit, the COVID-19 pandemic and the conflict in Ukraine on the Scottish pelagic processing sector.

Many opposed to the policy, but not directly involved in processing, set out their view that Brexit and the COVID-19 pandemic had had a negative impact on pelagic processors. In particular, there were concerns over reduced access to labour and the impact that this would have on processors being able to handle additional throughput. In discussion with processors some did express concern over labour shortages, however, others did not and expressed confidence in being able to increase staff – particularly as the change for pelagic stocks would be phased in. It was noted that Brexit had seen some increase in administrative costs as a result of the UK having left the EU single market and customs union but that generally the pelagic sector was seen to have benefitted in recent years. In the case of the pelagic catching sector, this was as a result of the Additional Quota¹ in UK and therefore Scottish quota for pelagic stocks. For processors this was due to them servicing a

¹Additional Quota is the extra quota the UK secured as an independent Coastal State as a result of leaving the EU. It is defined as anything above the UK's existing share of quota prior to becoming an independent Coastal State.

global market where demand remains strong thereby offsetting increased costs arising from Brexit.

Where views were shared on the conflict in Ukraine, consultees/respondents stated that this had had an initial impact given the importance of the Ukrainian market but that impact was reducing. Generally, of those who engaged with officials, the processors were more confident of their ability to find alternative export markets and there were comments that supplies into Ukraine (which is an important market for Scottish processed pelagic fish) were moving again after initially stalling. However, given the importance of the Ukrainian market to pelagic processors this remains an area of concern. The situation is being kept under close review.

The increase in the cost of materials and power with the resultant increase in manufacturing costs for processors was also raised as a concern. However, processors expressed confidence at being better able to adapt to this change if there is an increase in the supply of raw material as an increase in production would enable them to better manage these costs.

A clear topic highlighted from supporters of the policy was the need for different parts of the industry to work together to ensure the smooth operation of the landings target. This is most clearly the case for the pelagic sector. All such pelagic vessels are members of sectoral groups i.e. Producer Organisations. A key function of Producer Organisations is to manage member vessels' activity and this will be important if those vessels which previously landed abroad now choose to comply with the landings target element of economic link rather than quota gift.

11.1.3 Other issues raised during discussions included:

- A desire for Additional Quota obtained as a result of Brexit to be used to incentivise landings into Scottish ports.
- Costs on businesses of landing into Scotland (such as harbour dues and 'steaming' costs).
- Strong views from some that not all species should be covered by the landings target.
- Whether the terms of the Trade and Cooperation Agreement with the EU allowed for the change.
- A general view that the policy would not impact on the makeup of crewing.
- A view that alternative measures should be considered to achieve the goal of increasing landings into Scotland. Even those most strongly opposed agreed with the general aim of achieving greater landings into Scotland. However, they opposed the proposed method being consulted upon.
- That a much longer transition period was required, to allow for the pelagic sector to adjust to the proposed change.

- That the introduction of the proposed change could make some Scottish (family) owned businesses susceptible to takeover by multinational companies.
- General support for the continuation of quota gifting as an alternative means of meeting the economic link licence condition but with views expressed that the quota gifted should be more widely distributed (that is, beyond the 10 metre and under vessels) and, that quota gifting should be restricted to key commercial species.

At the firm or business level, it is expected that the catching sector will see the highest costs per firm, while many of the benefits per firm will be seen in the up- and down-stream sectors. However, depending on the level of quota gifting, a number of vessels in the catching sector may also benefit from these proposals by receiving gifted quota. Based on 2015 to 2019 data, it is estimated that around 31 vessels would be non-compliant with the new economic link licence condition per year. In expected 2023 prices, each of these vessels land on average around £4.1 million of the 8 key species per year (total annual average of £127 million), of which around £3.4 million is landed outwith Scotland (total annual average of £105 million). Of the 31 that would be non-compliant, 12 are pelagic vessels landing around £9.6 million (of which £8.1 million is outwith Scotland) and 19 are demersal vessels are landing around £490,000 per year (of which £350,000 is outwith Scotland).

11.2 Impact on fishing vessels (catching)

Of the 31 non-compliant vessels, the individual impacts will vary, though the extent of this will depend upon their business decisions. In particular, whether they choose to increase landings or gift quota and keep their landing patterns unchanged.

First, the largest impact is likely to be on pelagic vessels that tend to land a high proportion of their catch abroad and comply with the economic link licence condition on the basis of their UK resident crew. Second, there are a small number of Scottish registered vessels, owned by non-Scottish companies that routinely comply with the economic link licence condition by gifting quota who will be affected. The revised quota gifting formula could require them to provide larger quota gifts, but it is expected that for most of these vessels, they will pay less in quota gifts due to their primary fishing species not being part of the 8 key species. Third, a small number of Scottish demersal catchers may have to change landing patterns.

Table 10 shows the 8 year annual average impact on individual affected vessels once the transitional period has ended in the third year (year 3-10). This varies between the different fleet segments (vessels targeting demersal or pelagic species) as well as scenarios.

Table 10: Average Annual cost per individual affected vessel from year 3 onwards, expected 2023 prices, £

	Pelagic Price Differential & Landing Fee Costs	Pelagic Quota Gift - Transfer	Demersal & Nephrops Quota Gift - Transfer
Scenario 1	192,000	0	0
Central Scenario (2)	26,000	674,000	32,000
Scenario 3	17,000	923,000	32,000

The pelagic fleet tends to have a higher individual impact due to landing greater tonnage and value abroad, as well as having fewer but larger vessels. The cost to an affected pelagic vessel in scenario 2 is around £674,000 while the cost to a demersal or Nephrops vessel is around £32,000.

The costs for vessels calculated above is different than the main analysis as it includes costs that act as redistributions between groups in Scotland, namely port landing dues and quota gifting. While these are costs to the individual vessels, they are expected to remain in the Scottish economy and so are not losses for the economy as a whole.

The cost of landing dues for the pelagic fleet has been included assuming that the [due required to land in Norway](#) is 0.65% per tonne, while assuming the due required to land in Scotland is 2.5% based on [Lerwick](#) and [Peterhead](#)'s base rates. As such an average extra landing cost of 1.85% of the landing value is used. The cost of landing dues for demersal and Nephrops vessels has not been included due to the wider range of ports used and the corresponding myriad of port dues with many similar to those seen in Scotland.

The quota gift costs noted in table 10 consist entirely of transfers within the Scottish fleet, although the net benefit would likely be shared amongst a greater number of vessels and thus the average benefit per vessel would be lower than the average cost per vessel. There would still be costs associated with the quota gifts in the form of lower prices and increased landing dues relative to the vessel that gifted the quota, which is represented in the Pelagic price differential column.

The average cost per vessel in table 10 has been noted as lower than the average profits seen by the vessels in question in the [Seafish Economics of the Fishing Fleet report](#). However, due to the commercially confidential nature of the pelagic fleet's data, and the wide variety of demersal and Nephrops vessels this has not been presented within the BRIA.

11.3 Impact on fish processors (downstream)

The proposal is expected to impact both demersal and pelagic processors. Some of these may handle only one species group, however many will handle mixed-species, making it difficult to disentangle individual impacts. The degree to which specific processors will be affected will depend on whether vessels choose to comply with the landings target or gift back some quota and which stocks are involved.

Pelagic processors are likely to be most impacted due to the fact that 93% of the estimated value of additional landings are from pelagic species. Based on industry engagement, most of these processors are expected to welcome the increased supplies of fish. Demersal processors are also likely to gain, albeit to a smaller extent, and are expected to welcome the proposals.

The annual average benefit expected for the fish processors that work with that stock (excluding mixed processors), is shown in expected 2023 prices for year 3 onwards once the transitional period has ended. This applies to 5 purely pelagic processors and 25 purely demersal processors (if mixed processors were included this would be 40 and 49 respectively), and is taken by dividing the downstream benefits by their respective species processor.

Table 11: Average benefit to the affected individual processor, £, expected 2023 prices

	Pelagic Processor	Demersal & Nephrops Processor
Scenario 1	2,640,000	17,000
Central Scenario (2)	1,024,000	3,000
Scenario 3	642,000	3,000

11.4 Impact on ports, market operators and onshore services (upstream)

The proposals are anticipated to have a positive impact on ports, market operators and onshore services particularly in areas such as Peterhead, Fraserburgh and Lerwick where fishing and seafood processing are important industries. For example, ports and harbours need to make regular infrastructure investments as well as maintain facilities so increased landings resulting from the proposals will help provide economic stability and confidence.

As the beneficiaries in this sector are likely to be disparate, it is not possible to give a per firm estimate of the likely benefits.

12. Competition Assessment

- Will the measure directly or indirectly limit the number or range of suppliers?
- Will the measure limit the ability of suppliers to compete?
- Will the measure limit suppliers' incentives to compete vigorously?
- Will the measure limit the choices and information available to consumers?

There is a competition concern in the expected restriction of competition in buyers via the requirement to land in Scotland. As a highly perishable good it is expected that most, if not all, of the extra landings of fish will be processed in Scotland, which will result in fishers selling to a smaller pool of fish processors than they previously had access to. While a smaller pool of buyers is a potential concern in the short run, many Scottish fish processors operate mixed species processing plants which would allow them to more easily expand into the pelagic market and, there is nothing to prevent the establishment of new processing businesses. As such, there is space to allow competition to continue. Additionally, pelagic fish processors in Scotland are in competition with each other and have the capacity to process more. Given the prices for their products are set by the international market, they are incentivised to continue to compete vigorously.

While this proposal is expected, in the short run, to lead to some affected Scottish fishing vessels potentially receiving a lower price or for them to be impacted by the requirement to quota gift in the alternative to meeting the landings target, it is not expected to alter their incentives to compete. All vessels are treated equally by this policy change and retain the full range of business options that they do currently. They will be able to continue to buy and sell quota to meet their operational needs and, they will be able to continue to land their catch into preferred ports (albeit with an increased cost to landing in ports outwith Scotland). Therefore, it is not expected that this proposal will in any way limit the number or range of fishing vessels or the volume of fish they will supply. Analysis suggests that it will in fact increase the supply of fish within Scotland. This proposal should not impact on the choices nor information available to consumers.

Based on the [Economics of the UK Fishing Fleet Survey](#) 2020, between 2015 and 2019, the average net profitability of the Scottish fleet was 21%. As average profitability is strong, it is reasonable to expect that viable businesses can tolerate potential price impacts which are not expected to impact profitability beyond the current net level.

13. Test run of business forms

No new forms are proposed at this stage.

14. Legal Aid Impact Test

There is unlikely to be an impact on the legal aid fund. The change to the economic link licence condition does not create a new procedure or right of appeal to a court or tribunal. The new licence condition could be challenged by way of a judicial review in the Court of Session. Legal aid is available for judicial review applications if the legal aid means test and certain other requirements are met. It is unlikely that an applicant with standing to bring such a claim would meet the means test and qualify for legal aid.

15. Enforcement, sanctions and monitoring

The Scottish Government will monitor the impact of the amended licence condition as part of its annual administration of the economic link licence condition.

Marine Scotland will utilise established corporate systems (Compass and IFish) to monitor vessel performance against licence conditions where vessels have recorded landings of more than 10 tonnes of the 8 key species.

Breaches of licence conditions will be investigated by Marine Scotland Compliance (MSC). Where MSC obtains evidence of contravention of the law by a holder of a Commercial sea fisheries licence it may report the case to the Crown Office and Procurator Fiscal Service (COPFS) for consideration of prosecution, or alternative appropriate action as it sees fit.

16. Implementation and delivery plan

The new economic link licence arrangements are expected to be introduced from 1 January 2023, with the first round of establishing and distributing quota gifts taking place from January 2024.

17. Post-implementation review

Officials will keep the policy under review and may amend it if necessary.

In addition, a post-implementation review will be undertaken **5 years** after the introduction of this proposal to ensure that the objectives are met and to enable a review of the projected impacts. In order to properly complete this review, Marine Scotland will continue to collect data which will be used for ongoing and any future monitoring or analysis. A post-implementation review will test the assumptions made in this BRIA and in particular, assumptions made about the ability to increase processing capacity and competitiveness within the Scottish sea fish processing industry and the potential impact this could have on the Scottish fishing fleet.

18. Summary and recommendation

This BRIA recommends the preferred option of amending the economic link licence condition for Scottish registered fishing vessels to:

- shift the landings target from the UK to Scotland only;
- remove the option of demonstrating an economic link to Scotland on the basis of crew residence and vessel expenditure;
- require vessels to land 55% of their total landings of the 8 key species each year into Scotland in order to meet the landings target;
- provide an alternative to landing into Scotland through quota gift while and increase the economic benefits to Scotland from Scottish quota reflecting better the lost benefits of landings in the quota gift rate; and
- increase the qualification tonnage for economic link provisions from two tonnes of quota species to ten tonnes of the 8 key species.

Other options, including voluntary options, were considered but when analysed the benefits were shown to fall short of the benefits that are expected from the above proposal. The preferred option is expected to deliver the benefits associated with landing and processing more valuable stocks in Scotland as set out above. It will ensure further opportunities in Scotland to realise more benefits from a national resource. It will deliver a number of both monetised and non-monetised benefits that are believed to outweigh the carefully considered costs which may arise from the introduction of this policy.

Table 12: Summary costs and benefits of the preferred option (expected 2023 prices, discounted)

Total benefit per annum: - economic, environmental, social	Total cost per annum: - economic, environmental, social - policy and administrative
<ul style="list-style-type: none"> • Expected to deliver benefits of £53.6 million to £223.6 million across a 10 year time horizon. These figures relate to scenario 1 and 3, respectively. The central scenario indicates benefits of £82 million across 10 years. • Key non-monetised benefits include: stable supply chains; targeted quota gifting to deliver benefits to fishing dependent communities; improved export penetration; reduced environmental and financial costs from reduced steaming. 	<ul style="list-style-type: none"> • Expected monetised costs range from £3.9 million to £12.8 million across a 10 year time horizon. These figures relate to scenario 1 and 3, respectively. The central scenario indicates costs of £6.0 million across a 10 year time horizon. • Key non-monetised costs include: minimal administrative costs and possible increased steaming; up- and down-stream sector may need to undertake investments to make the most of economic opportunities provided; potential costs in shifting business relationships; potential costs if crew and expenditure patterns change; costs from potential labour shortages in this industry.

From the above, this proposal is expected to deliver net benefits of £49.7 million to £210.6 million (expected 2023 prices) and is therefore expected to be highly beneficial to Scotland.

19. Declaration and publication

Sign-off for Final BRIAs:

I have read the Business and Regulatory Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs. I am satisfied that business impact has been assessed with the support of businesses in Scotland.

Signed:

A handwritten signature in black ink, appearing to read 'Mairi Gougeon', written in a cursive style.

Date: Friday 16 September 2022

Minister's name: Mairi Gougeon

Minister's title: Cabinet Secretary for Rural Affairs and Islands

Scottish Government Contact point:

20. Appendix A – Economic characteristics of Scottish seafood processors
Data provided by Seafish from their seafood processing survey.

20.1 All Scottish processing sites handling sea fish (e.g. excluding sites classed as purely: salmon, trout or other freshwater sites), 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	148	135	122	114	112
Employment, FTE	7,864	7,712	7,883	7,009	6,604
Turnover (£million)	1,720	1,434	1,586	no data	no data
GVA (£million)	287	268	444	no data	no data
Raw Material (£million)	1,225	1,011	934	no data	no data
Labour (£million)	216	195	204	no data	no data

20.2 Scottish processing sites handling mixed fish (including pelagic fish), 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	41	38	30	36	40
Employment, FTE	2,616	2,345	2,591	2,259	2,490
Turnover (£million)	723	542	503	no data	no data
GVA (£million)	107	81	131	no data	no data
Raw Material (£million)	544	402	318	no data	no data
Labour (£million)	77	73	59	no data	no data

20.3 Scottish processing sites handling pelagic fish only, 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	9	8	9	6	5
Employment, FTE	1,106	1,046	939	536	524
Turnover (£million)	244	132	172	no data	no data
GVA (£million)	40	27	46	no data	no data
Raw Material (£million)	168	84	92	no data	no data
Labour (£million)	30	21	24	no data	no data

20.4 Scottish processing sites handling mixed fish (including demersal fish), 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	63	59	48	48	49
Employment, FTE	4,326	3,850	4,184	2,706	2,664
Turnover (£million)	1,038	813	810	no data	no data
GVA (£million)	164	128	220	no data	no data
Raw Material (£million)	755	597	498	no data	no data
Labour (£million)	126	108	96	no data	no data

20.5 Scottish processing sites handling demersal fish only, 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	35	30	29	27	25
Employment, FTE	421	419	505	522	588
Turnover (£million)	75	75	137	no data	no data
GVA (£million)	15	14	10	no data	no data
Raw Material (£million)	52	52	112	no data	no data
Labour (£million)	9	10	15	no data	no data

20.6 Scottish processing sites handling mixed fish (including salmon, trout, or other freshwater fish), 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	65	59	47	47	45
Employment, FTE	4,520	4,391	4,705	4,258	3,955
Turnover (£million)	973	822	857	no data	no data
GVA (£million)	170	141	279	no data	no data
Raw Material (£million)	693	597	472	no data	no data
Labour (£million)	132	122	114	no data	no data

20.7 Scottish processing sites handling salmon, trout, other freshwater fish only, 2014-2021, nominal prices

	2014	2016	2018	2020	2021
Number of sites	21	17	16	17	16
Employment, FTE	924	667	951	799	1,179
Turnover (£million)	317	252	208	no data	no data
GVA (£million)	65	70	68	no data	no data
Raw Material (£million)	215	170	118	no data	no data
Labour (£million)	41	33	24	no data	no data

21. Appendix B – Detailed Methodology

This section provides an overview of the methodology used for the analysis presented in the above Options section of the BRIA.

Three principal costs and benefits were monetised for the impact assessment:

- the cost to fishers due to the price differential between landing abroad and in Scotland,
- the benefits to the fish processing industry from increased throughput, and,
- the upstream benefits derived from the increased production in the processing industry.

Other costs and benefits were not monetised either due to their relatively small effect on the overall analysis, such as port landing dues and steaming costs. Or due to being difficult to quantify, such as business relationship impacts, more stable supply chains for the processing industry, or labour supply issues. The possible loss of Scottish resident crew due to the removal of the crewing element was considered using Seafish data, but not monetised. This is due to the lack of publicly available data, and the expectation that most pelagic crews will continue to employ UK resident crew due to their composition, for example, the practice of employing friends and family.

Data

The data used in this analysis is Marine Scotland vessel compliance data, [Scottish Sea Fisheries Statistics](#), [Seafish fish processing data](#), [Scottish Input-Output tables](#), and [ONS deflators](#).

- Vessel data from 2015-2019 was used in this analysis in order to determine which vessels would be compliant with the new landings target or not, and thus determine the tonnage and value of the 8 key species which could be expected to be landed or quota gifted under the different scenarios. A five year average was used when calculating the cost or benefit from these figures.
- Price data from 2015-2019 for the 8 key species was used from the Scottish Sea Fisheries Statistics in order to determine the price differential of landing abroad or in Scotland. A five year average was used when calculating the cost or benefit from these figures, and only the price difference for Pelagic species were captured.
- 2014, 2016 and 2018 figures for Scottish fish processors were used from Seafish to determine the Gross Value Added (GVA) on raw material inputs. An average of the three surveys were used to calculate the average GVA addition per £1 of raw material.
- The Scottish Input-Output table was used to derive indirect and induced effects for an increase in fish processing activity.
- All prices were converted to expected 2023 prices using ONS deflators, [taken from the Spring Statement in March 2022](#). Although, due to the volatile inflation currently experienced the true prices for 2023 may not reflect those presented.

Using vessel data from 2015-2019, if a vessel landed less than 55% of its total tonnage of the 8 key species into Scottish ports it was considered non-compliant for

the purposes of this analysis. The tonnage and value required to reach the 55% target were calculated per vessel, and termed the 'landing gap', with the landings gap then split by reference to the 8 key species. Both for the purposes of landing, or quota gifting, the landing gap was determined by reference to the 8 key species depending on the vessel's total catch share for the 8 key species, i.e. if 50% of the vessel's catch was mackerel, then it was expected that their extra landings or quota gifted would be 50% mackerel. This landing gap by species was then averaged for the five years of data available before being used to calculate the business impact.

No changes were expected or modelled for species which are not one of the 8 key species. Demersal vessels that were non-compliant landed these other species almost exclusively abroad and it is expected that if they landed these in Scotland instead, they would likely transport them abroad rather than process them in Scotland. For pelagic vessels it was expected that they would continue to land these other species abroad as they would plan their trips and species specific fishing so as to maximise their gains.

21.1 Central Scenario

Scenarios 1 & 3 assume compliance completely via the landings target and quota gifting respectively for the non-compliant fleet. However, Scenario 2, the Central Scenario, assumes a mix of both compliance options. The rationale behind the Central Scenario is that between 2015 and 2019 there were 8 pelagic vessels who landed more than 80% of their total tonnage outside of Scotland. It is assumed that these vessels either have had contractual arrangements with processors abroad, or else have very close business relationships which may make it difficult for them to amend their landing patterns – at least in the short term. Therefore, pelagic vessels landing more than 80% abroad are assumed to pursue quota gifting rather than increasing their landings into Scotland, for all other affected pelagic vessels it is assumed that these will increase their Scottish landings to 55%.

Affected demersal targeting vessels predominantly belong to the foreign-owned fleet whose business model is well ingrained in landing abroad, hence no behavioural change is assumed for this fleet segment and instead it is assumed they will quota gift where appropriate.

21.2 Catching – Price Differential

The landing gap, this being the gap between what a vessel landed and what it would have had to land to comply with the landings target, established from the vessel compliance data was combined with the price differential in order to estimate the cost to fishers from the change in prices received. This was applied to herring and mackerel only, as the demersal price differentials were not consistent through the years and are likely the result of special business arrangements rather than market reflections of the price. The price differential was calculated from the average difference in price of landing into Scotland against landing anywhere else, with the market price in Scotland often being lower than landing into Norway (the primary alternative market). The price differential was applied to any extra landings expected in Scotland, whether they were directly landed by the non-compliant vessels or through extra landings by vessels given quota gifted stocks. All prices were converted to expected 2023 prices before the price differentials were calculated, with all results presented in expected 2023 prices (the first year of the policy change).

The price differential used in the model was £35 per tonne less for landing Mackerel into Scotland and £31 per tonne less for landing Herring into Scotland.

21.3 Downstream

For pelagic landings, it is assumed that 100% of the benefits of the downstream impacts will be captured within Scotland. The majority of pelagic processing in the UK is in the North Eastern Scotland region and this industry is already subject to relatively large variances in their inputs due to changes in quota, hence the expectation that they have flexibility in terms of processing additional input. Further, the bulk nature of pelagic fishing and the need to process it in a timely manner means that it makes business sense to process it within Scotland, with the capacity available to this industry suggesting it should not displace imports and thus be new production. This is in contrast to demersal fish noted below.

For demersal landings, it is assumed that 50% of the benefits of the downstream impacts will be captured within Scotland. Demersal processing is spread across the UK and given that it is typically higher-value per tonne than pelagic processed fish, it is more cost effective to transport it. Additionally, there is a greater possibility of these extra landings replacing imports, meaning there is no actual increase in processing for these factories. Therefore, it is assumed that fewer of the benefits of downstream impacts will be captured.

The total value of the extra landings in expected 2023 prices, either landed directly by the previously non-compliant vessel or from quota gift landing in Scotland, is taken in average Scottish prices (rather than the value they could have received abroad). This is considered the total input value for the purposes of the model.

Analysis has been undertaken using the Scottish Input-Output (I-O) tables to derive the total inputs that would be used in production, with an input ratio of 1.27 applied on any extra landed fish to determine the total inputs used by the fish processing industry. This input ratio was derived by dividing the total intermediate output of the fish processing sector by the primary inputs to determine the number of extra inputs, the primary inputs considered being fishing, aquaculture and the fish processing industry itself (as this would be the secondary processing of fish).

The total input value is then multiplied by the GVA ratio derived from processing data provided by Seafish for Pelagic and Demersal processors, 1.26 and 1.27 respectively, to find the total output value. The Seafish GVA ratio was calculated by dividing the sum of the GVA and raw material costs for that grouping by the raw material costs. The difference between the total outputs and total inputs is calculated to be the GVA and is expected to include wages, taxes, and gross operating surplus. The total output figure is subsequently used for the upstream calculations. Figures were presented in expected 2023 prices.

The rationale for using the GVA ratio obtained by Seafish data rather than using a ratio derived from the I-O table is due to the I-O table including all fish processing. Whereas, Seafish data could instead be split out by industry and showed that aquaculture processing often had a larger GVA ratio than pelagic or demersal

processing, which suggests that the I-O table would have overestimated the GVA gains.

21.4 Upstream

The main task of the model is to estimate the additional output in the economy supported by a given change in the output of the fish processing industry as a result of the domestic fishing industry landing an increased share of its catch in Scotland. The additional output estimated is only that due to backward linkages from the fish processing industry, i.e. that are brought about by the industry's increase in purchases of goods and services for intermediate consumption. The additional fish processing output is assumed to be exported or to displace imports.

The standard approach to using an output-driven input-output model is inappropriate here, as it would generate an increase in output of the fishing industry in response to the increase in output of the fish processing sector rather than a shift in use of fishing industry output from exports to intermediate use.

Instead a mixed exogenous/endogenous variables model is used to require that the output of the fishing industry remains unchanged.

21.4.1 Upstream - The mixed exogenous/endogenous variables model

The basic equation of input-output analysis is

$$X = AX + F$$

with the usual solution

$$X = (I - A)^{-1}F$$

where X is the vector of industry gross outputs, A is the direct requirements matrix from the Input-Output table, and F is the vector of final demands for industries' outputs.

We want to exogenously specify the output of two sectors. Firstly, the fish, fruit, and vegetable processing industry (the narrowest industry classification containing fish processing available in the Input-Output tables), where output is increased by a given amount as a result of processing more fish. Secondly the fishing industry, where output is assumed to be unchanged, as fish that would have been otherwise exported are instead used domestically (note that this implies an assumption of no price difference between selling fish to a domestic processor and selling as an export).

We can rearrange the rows and columns of the matrices and vectors so that the equation above can be rewritten in partitioned form as follows:

$$\begin{bmatrix} \bar{X}_1 \\ X_2 \end{bmatrix} = \begin{bmatrix} A_{11} & A_{12} \\ A_{21} & A_{22} \end{bmatrix} \begin{bmatrix} \bar{X}_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} \bar{F}_1 \\ \bar{F}_2 \end{bmatrix}$$

with bars indicating the exogenously determined values. This gives us two matrix equations, the second of which is of interest here:

$$X_2 = A_{21}\bar{X}_1 + A_{22}X_2 + \bar{F}_2$$

Solving this for X_2 gives

$$X_2 = (I - A_{22})^{-1}(A_{21}\bar{X}_1 + \bar{F}_2)$$

Since we are only interested in changes in X_2 in response to a change in fish processing output, we can set the change in \bar{F}_2 to be zero, and get

$$\Delta X_2 = (I - A_{22})^{-1}A_{21}\Delta\bar{X}_1$$

the equation used to estimate the changes in industry outputs in response to the increased fish processing activity.

The fish, fruit, and vegetable processing industry also purchases fruit and vegetables from the agriculture industry, and farmed fish from the aquaculture industry. It does not make sense that the fish, fruit, and vegetable processing industry would purchase more of these simply because it increased the quantity of fish it was processing. Therefore the coefficients in A_{21} corresponding to purchases from the agriculture and aquaculture industries by the fish, fruit, and vegetable processing industry were zeroed out to exclude such effects from the model and prevent them from inflating the results.

Having obtained the vector of output changes in the economy using the equation above, it was then converted into changes in GVA (and FTE) using output to GVA (respectively FTE) ratios from the standard SG Input-Output model.

For further details of the mixed exogenous/endogenous variables approach see:

Johnson, T.G. and Kulshreshtah, S.N. (1982), "Exogenising Agriculture in an Input-Output Model to Estimate Relative Impacts of Different Farm Types", *Western Journal of Agricultural Economics*, vol. 7, pp. 187-198.

Papadas, C.T. and Dahl, D.C. (1999), "Supply-Driven Input-Output Multipliers", *Journal of Agricultural Economics*, vol. 50, pp. 269-285.

21.5 Final Results

These three principal costs and benefits are summed to give a total benefit to the Scottish economy, presented in expected 2023 prices. These figures are presented for the first 10 years of the programme, with all prices presented in expected 2023 values with a social discounting applied of 3.5% for all years after 2023 in line with the [Green Book](#) in order to calculate the present value.

21.6 Sensitivity Analysis

The sensitivity analysis is an attempt to monetise some of the costs which cannot be robustly added to the analysis. This gives a range for the possible costs and benefits of this scheme under different circumstances. There are four main scenarios envisioned with rough estimates attached to give an idea of possible alternative ranges. All the ranges used in the sensitivity analysis are arbitrary and do not represent modelled or expected changes.

The first is to reduce one of the assumptions surrounding the benefits by assuming a decrease in raw material production. In the main analysis only the value of the fish caught is added to the downstream and subsequent upstream benefits. Whereas in reality other variable inputs would have to be bought to produce the final product, including packaging and energy, which would increase the output due to the method of multiplying the inputs by a fixed GVA ratio. It is assumed in this scenario that there is a 20% uplift in total inputs on the fish bought, resulting in all fish inputs having a 1.2 multiplier applied to them before the GVA ratio is applied. In the main analysis it is assumed that there would be an increase in other raw materials used in addition to the added fish which would consequently have upstream benefits. The input ratio used was derived using the whole fish and fruit processing industry's figure and so may not be representative of the primary processing pelagic industry. As such we reduce the input ratio by half, from 1.27 to 1.13 in order to reduce the expected use of inputs.

The second scenario assumes a reduction in GVA to the processors overall, from increased costs relative to overseas competition particularly from energy costs, or due to increased administrative or trade costs from the extra fish they would be processing and exporting. This is modelled by reducing the GVA ratio from 1.26-1.27 to the lowest value observed in demersal processors, 1.18.

The third scenario assumes that processing of fish in Scotland drops from 100% to 70% for pelagic, and 50% to 35% for demersal. This is to reflect the risk in overestimating processing ability/desire in Scotland, as well as the risk of labour shortages resulting in processors needing to reduce their fish input. This change is presented in the model as a modifier on how much of the landed fish is used in downstream and then subsequent upstream calculations. The price differential is still applied to all the fish, assuming that any fish they landed but could not be processed in Scotland would still incur a price difference.

The final scenario assumes there is a drop in mackerel and herring prices in Scotland of 10% for any new fish landed, resulting in a price differential of £144 per tonne less for Mackerel and £84 per tonne less for Herring, against landing outside of Scotland. This decrease in price was not applied to existing fish landed in Scotland as they already have markets, instead it reflects the risk of prices for pelagic species falling due to a failure to find suitable export or domestic markets for the new fish. As there is strong demand internationally for the pelagic species targeted, it is expected that a market will be found, but in this worst case scenario the price demanded would be lower.

This price drop would also affect processors' GVA as it is assumed it is as a result of being able to offer a lower mark-up, as otherwise it would simply be a transfer of revenue from the fishers to the processors. With the inputted downstream values being lower due to the decrease in value of fish.

The sensitivity analysis has only been presented for year 3 due to the fixed changes applied to the model having a disproportionate effect in the first two years, i.e. it is unlikely that the same price reduction would be seen in the first year where the landings target is a lot lower than the third year when the scheme is fully operational.

Rather than attempt to model the change in the sensitivity as the scheme ramps up and add complexity to a non-robust assumption, it was decided to present only the figures of the scheme in full operation. The Year 3 figure is comparable to the Year 3 figure in the costs benefit tables in the main analysis.

It is important to note that these assumptions are not expected but are possible risks and are used to understand what could happen if circumstances change.

22. Appendix C – Quota Gifting

22.1 The current quota gift formula:

Value of catch in £ ÷ 2 (50%) = UK link arrangement (a)

÷ (a) 10 (assume 10% profit) = b

(b) ÷ 65 x 100 (65%) = sum due to FA for economic link in £.

Take value in £ of sum due and divide by average price of species per tonne required.

The quota gifting formula above is equivalent in value to just over 15% of the gap between the fish landed in the UK and the level of landings that would have been necessary to meet the present 50% landings threshold. Therefore, it does not replace all the economic benefits lost. For example, a vessel landing fish to the value of £1 million, of which only £400,000 is landed in the UK will be expected to provide quota gifts with an estimated landed (not leased, if relevant) value of £15,400.

22.2 The proposed quota gift:

In line with the proposal set out in the consultation, the Scottish Government has reviewed the current quota gifting formula and in line with the consultation will adjust it to 26%. The Scottish Government believes the revised percentage better captures the missed economic value resulting from landings outside of Scotland.

Based on the available evidence at the time of consultation, which mirrors the current figures, from the Scottish Input-Output tables, it was estimated that each £1 of outputs from the fish processing sector in Scotland supports an extra £0.65 in the supply chain and as a result of re-spending wages. This represents a possible maximum quota gift as the value lost in lieu of landing. However, 26% was chosen as a reasonable and proportionate figure for fishers to pay whilst also providing more of the missed economic value to Scotland.



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