



Ministry
of Defence

**Economic Impact Assessment:
Proposed expansion of the British Underwater Test
and Evaluation Centre**

Executive Summary

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary?

The British Underwater Testing and Evaluation Centre (BUTEC) is situated in the Inner Sound of Raasay off the North West coast of Scotland. BUTEC plays an essential role in maintaining the UK's maritime Defence Capability, both in terms of the noise ranging of surface ships and submarines and for testing of a variety of weapon and sensor systems. There are currently no suitable alternatives to BUTEC. In its current form, BUTEC will not meet the future needs of MoD. Therefore it is proposed to expand and reconfigure the facility.

What are the policy objectives and the intended effects?

The objectives of the changes being made to the British Underwater Test & Evaluation Centre (BUTEC) sea ranges in the Inner Raasay Sound, which have necessitated the change to the BUTEC Byelaws, are:

- To make the maximum, and most effective, use of BUTEC as a very high value asset for Defence, both for noise ranging of submarines and for testing of a variety of weapon, platforms and sensor systems,
- To cater for the capabilities of modern submarines and weapons by bringing the range needs up to date with more capable sensor arrays, ensuring that it continues to be fit for purpose,
- To reconfigure the various elements of the range to make best use of the water space available while minimising the impact on the local fishing industry.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)

Option 0 (the “do nothing option”): Pursuing this option would mean that the BUTEC range keeps its current boundaries. This would not address the need to modernise the base so that it can undertake more advanced testing or to deliver efficiencies in the running of the base.

Option 1: To implement the proposed expansion of the BUTEC range. The proposed change relates to the closure of the facility at Rona and the relocation of in-water acoustic measuring equipment to the BUTEC water space, as well as technical enhancements at the Applecross and Kyle of Lochalsh sites. The impact of the proposed change will mean extending the current Ministry of Defence byelaws for the BUTEC protected water space by some 28 sq. km.

Summary: Analysis & Evidence

Costs

Description and scale of key monetised costs by ‘main affected groups’

Fishermen operating in proposed expansion area: Based on survey data from the local fishing community it is estimated that there may be a total loss in profits to affected fishermen of approximately £480,000 per year. This is due to the fact that 19 boats will have to move their creels out of the proposed expansion area. It is expected that they will face increased costs and lower catch volumes in other areas of the Sound due to the fact that these are already heavily fished. Some fishermen expressed uncertainty in the survey responses, if the responses provided are overly pessimistic then the true impacts are likely to be towards the lower end of the range £230,000 - £600,000 per year.

Other key non-monetised costs by ‘main affected groups’

Loss of jobs on fishing vessels: If boats land a reduced catch or cease fishing then some of their crew may be made redundant although these people may be able to find other work. Job losses are thought to be towards the lower end of 4-11 FTEs.

Proposed loss of jobs at Rona site: It is likely that the consolidation and restructuring of the BUTEC range will result in some job losses although QinetiQ are aiming to deliver any reductions through natural wastage or re-deployment.

Fishermen operating outside the proposed expansion area: These fishermen are likely to face more competition for catch. This could lead to a reduced catch per boat and an increase in costs due to different sets of fishing gear becoming tangled and damaged. The displacement of the directly affected fishermen into the wider fishery represents an increase of boats roughly 3 times the annual average change.

Additional impact on the local economy: These impacts are mainly due to a potential drop in the volume of catch. The proposed expansion is not expected to result in a drop of catch outside the standard year on year fluctuations. Therefore these impacts are expected to be marginal.

Benefits

Other key non-monetised benefits by ‘main affected groups’

Fishermen: The closure of the Rona range will open up new fishing grounds although this area is substantially smaller than the proposed expansion area.

Biodiversity: The proposed expansion will result in a new no-fishing zone which will be beneficial to ocean plant life. It may also increase the sustainability of nephrops stocks in the long term.

Local economy: The proposed expansion will secure the long term future of BUTEC. The base currently employs 154 people. The salaries of the 99 QinetiQ employees come to a total of approximately £2.5m. The frequent flow of visitors to the base generates spending of approximately £750,000 per year on local accommodation, food and other considerations.

Key Assumptions

It has been assumed that fishermen directly affected by the proposed expansion will see their profits reduce by around 50%. This is very uncertain and could be between 20% and 60%. Where appropriate monetary figures have been discounted over ten years at the discount rate of 3.5%. This aims to give an idea of the size of the impacts over time. A full list of assumptions are discussed in Annex C.

Evidence Base

A. Introduction

This impact assessment considers the effect of expanding and upgrading the British Underwater Test and Evaluation Centre (BUTEC) which is situated in the Inner Sound of Raasay off the North West coast of Scotland. The expansion of the range will require changes to the byelaw that protects areas of the Sound from access and/or certain activities. This will have an impact on the local community and fishing industry.

BUTEC is a very high value asset for UK Defence, both for noise ranging of submarines and for testing a variety of weapon systems, platforms and sensors. It is run for the MOD by QinetiQ Ltd, who will also be managing the significant investment made by the MOD in expanding the BUTEC range and thus securing its long term future. BUTEC is essential to a number of defence functions and the Ministry of Defence is keen to make the most effective and efficient use of it.

Purpose

This impact assessment aims to provide an economic analysis of the BUTEC expansion. It particularly focuses on the local area most easily defined by the parliamentary constituency of Ross, Skye and Lochaber. It is intended to be used by the relevant MoD minister to help make a decision on whether and how to implement the byelaws.

The North West Inshore Fisheries Group (NWIFG) (one of a number of non-statutory bodies set up by the Scottish government to improve the management of Scotland's inshore fisheries and to give commercial fishermen a strong voice) commissioned an economic assessment as part of their response to the public consultation process. The MoD took the decision to undertake its own assessment to create a document in line with cross government best practice and also to collect additional data. The second point is key because at the time of the NWIFG assessment there was a lot of confusion regarding which areas of sea would be restricted. This assessment draws upon a lot of the work from the NWIFG assessment on the local fishing industry and builds upon it by adding the national defence context, analysing additional survey data and discussing other impacts including the economic importance of BUTEC to the local community, the impact of ceasing activity on the Rona range and the environmental benefits of a larger no fishing zone.

The impact assessment sets out the key pieces of background information and the nature of the options. It then discusses the costs and benefits of the planned extension broken down by direct and indirect effects. The assessment then goes through the benefits in a similar way before pulling the main points together in conclusion. The basic structure is:

- A. Introduction
- B. Rationale
- C. Objectives
- D. Options
- E. Appraisal
 - a. Costs
 - b. Benefits
- F. Summary and Conclusion

BUTEC Overview

- BUTEC is an MOD facility in North West Scotland run by QinetiQ under the Long-Term Partnering Agreement (LTPA) for the provision of Test & Evaluation capabilities and training support services.
- The main function of BUTEC is to support Submarine Weapon System / Crew certification and underway Acoustic Signature Measurement / Calibration during Basic Operational Sea Training which is required to declare a vessel operational. A similar function is also available for surface vessels.
- BUTEC provides real-time 3D tracking of above-water and sub-surface units, weapons and targets.
- It comprises a Shore Support Base (SSB) at Kyle of Lochalsh and the Range Terminal Building (RTB) at Applecross.
- The current byelaw-protected surface and underwater water space and tracking range in the Raasay Sound (see Annex A, Chart 1) is about 10 km long and 6 km wide, with a depth of water that varies between 175 m and 200 m. An air danger area can be activated to cover the entire range area.
- A separate tracking range for submarine acoustic calibration, 10 km long, 2 km wide and 235 m deep, unprotected by the byelaw but by managed under local agreements lies off the coast of the Island of Rona, and is controlled from a manned outpost on the island.
- A range outer area (see Annex A, Chart 1) provides a buffer zone to prevent inadvertent incursion to range areas; this is controlled from RTB but available for fishing (not trawling).
- The area is ideal for BUTEC's purposes: it provides novel and multi-asset activities through safe and secure water space management in a deep, sheltered area with a soft underwater surface.
- Range areas equipped with tracking and acoustic hydrophones, underwater telephones and differential GPS for surface tracking.
- In 2014/15 BUTEC supported 135 trial-days of testing and evaluation and training activity – each trial day requires many days of preparation and planning.
- Under changes being proposed to BUTEC's capabilities the main range area will be enlarged and 'squared off', and will be able to include the work currently done off Rona. The Rona range (see Annex A, Chart 4) will be returned to open water, and the Rona control withdrawn.
- New equipment in the BUTEC range area is essential to enable MoD to evaluate quieter modern submarines in a more flexible and capable tracking space.
- There is no other suitable water space in UK waters to undertake the trials conducted at BUTEC.

Issue under consideration

The capabilities of modern submarines and weapons mean that the range needs to be kept up to date with more capable sensor arrays, which also require deeper water than is available within the existing range foot-print, and this is a key factor in the need to

expand the sea area occupied by the Range. The expansion also provides other key benefits; there will be increased manoeuvring margins for vessels using the range, thus reducing the potential for accidental damage, and it will also allow vessels and weapons to be tested in ways that are more representative of real-world conditions. However, the proposed expansion does involve an area of sea that is currently open to local fishermen becoming restricted. This is needed to ensure the safety of all users within the affected water-space and prevent damage to costly sensor equipment and fishing gear.

B. Rationale

BUTEC plays an essential role in maintaining the UK's maritime Defence Capability, both in terms of the noise ranging of surface ships and submarines and for testing of a variety of weapon and sensor systems. The facility was established in the 1970s, and is critically dependent on the attributes of sheltered, deep water, and soft sea-bed combined with minimal levels of acoustic disturbance that exist in the Inner Sound of Raasay. There are currently no feasible alternatives to BUTEC elsewhere in the UK, while use of an overseas facility (assuming one would be made available) would increase operating costs and wear and tear on user vessels, and potentially compromise our freedom of action and operational advantage.

Given BUTEC's crucial role, the Ministry of Defence must also ensure that it is operated both efficiently and effectively and therefore in 2012, the Department asked QinetiQ to develop options to restructure the operation of the Range, while addressing obsolescence issues and providing enhanced technical capability. As well as delivering value for money for the taxpayer, these changes were needed to meet the requirement to support more modern and quieter submarines and ensure that the Range could continue to be fit for purpose. In 2014 QinetiQ's proposal to centralise range control facilities, modify the footprint of the in-water acoustic measurement equipment, and facilitate the introduction of more capable sensor arrays, was accepted in principle by the Ministry of Defence. The process to implement this project has culminated in the circumstances set out in this document.

C. Objectives

The objectives of the changes being made to the British Underwater Test & Evaluation Centre (BUTEC) sea ranges in the Inner Sound of Raasay, which have necessitated the change to the BUTEC Byelaws, are:

- To provide for the long term future of the Range by making the maximum, and most effective, use of BUTEC as a very high value asset for Defence, both for noise ranging of submarines and for testing of a variety of weapon, platforms and sensor systems,
- To cater for the capabilities of modern submarines and weapons by bringing the range needs up to date with more capable sensor arrays,
- To reconfigure the various elements of the range to make best use of the water space available while minimising the impact on the local fishing industry.

D. Options

Description of options considered:

- **Option 0** (the baseline scenario): Pursuing this option would mean that the BUTEC range keeps its current boundaries. Restrictions on fishing would remain unchanged. This would not enable the range to remain fit for purpose and to undertake the more advanced testing required or to deliver efficiencies in the running of the sites. Moreover, the existing acoustic measurement equipment at the site is becoming increasingly difficult to support and out-dated. In the absence of fresh investment to upgrade the existing facilities and install new, more sensitive equipment, the capability provided at BUTEC would become progressively degraded and unable to meet MOD requirements. As well as having a negative impact on vital Defence capability, the overall viability of the range would be put increasingly at risk. Although at present there are no obvious alternatives to the use of BUTEC, the operational advantages that the Range currently possesses in comparison with other, sub-optimal, solutions, would diminish over time, with adverse consequences for the future of the Range.
- **Option 1:** to implement the proposed expansion of the BUTEC range as currently set out. The proposed change involves the closure of the facility at Rona and the relocation of in-water acoustic measuring equipment to the BUTEC water space, as well as technical enhancements at the Applecross and Kyle of Lochalsh sites. This will result in a significant modernisation of the range architecture. The enhancements would mean long-term investment of approximately £22 million in underwater equipment.

The impact of the proposed change will mean extending the current Ministry of Defence byelaws for the BUTEC protected water space by some 28 sq. km. The current byelaw covers 82 sq. km, which is currently divided into two areas. The first is an outer area of approximately 56 sq. km, which prohibits the fishing by any method involving the use of a net or dredge. There is also an inner area of around 26 sq. km within which all fishing, whether by line, net, trawl or creel, as well as the anchoring of vessels, dredging and dumping of rubbish are prohibited.

Under the proposed changes the BUTEC and Rona range areas would be combined into a single byelaw protected area on the current site of the BUTEC range. This would provide for all range activities and cover an area of approximately 105 sq. km (54 sq. km inner area and 51 sq. km outer area). This is shown in Chart 1, Annex A.

This increase in water area would be partly offset by removing the fishing restrictions currently in place in the area of water around the Island of Rona, which are managed under local agreement and are not subject to any Byelaw.

In addition, the MOD and QinetiQ have entered into discussions with the operators of several local fishing vessels in order to establish whether local arrangements can be put in place that would mitigate the impact of the byelaws on these vessels. The potential mitigation is not taken into account in this assessment because it was still being formulated at the time. This meant that fishermen could not be surveyed on its potential impacts. If this mitigation is successfully implemented then the economic effect will be less than currently assessed for some of the directly affected vessels.

E. Appraisal (costs and benefits)

General Assumptions and Data

Key Sources of Information

This assessment draws heavily on work produced by other organisations as well as a survey conducted by MoD. The information from these sources has added greatly to the quality of this assessment. The information used from these key sources of information is referenced in footnotes and in most cases it is also mentioned in the text:

- Survey data – MoD surveyed fishermen to provide information on the potential impacts of proposals. 15 responses were received and these have been essential in informing the assessment. These responses included 13 boats that fish in the area directly affected by the proposal. Proposals to mitigate the impact of the expansion were still being formulated at the time of assent therefore they are not captured by this survey.
- Marine Scotland publications and data – The assessment draws heavily upon Marine Scotland information and data. Their understanding of the fishery and data they have collected about it have helped to inform thinking around potential impacts.
- North West Inshore Fisheries Group (NWIFG) Economic Impact Assessment – As part of their response to the public consultation run by MoD, NWIFG submitted an Economic Impact Assessment. This contained analysis that helped to illustrate the potential impacts of the proposed range expansion. Analysis from this is used throughout this assessment to triangulate with MoD analysis. On some of the wider value added impacts there was little scope for MoD economists to add extra value to work done in NWIFG assessment. As such these parts of the assessment rely heavily on analysis from the NWIFG assessment. It is important to note that the nature proposed expansion wasn't fully understood at the time of this assessment. In particular there was confusion around whether the outer area would be closed, it will not be.

Background on fishery

The main direct impact of the proposal falls upon the local fishing industry. The fishery in the affected area is creel only and the vast majority of the catch is *Nephrops norvegicus*. This is the scientific name which is often shortened to nephrops, and in restaurants nephrops are often referred to as scampi, langoustines or Dublin Bay prawns. In this report they are referred to interchangeably as nephrops and langoustine. Nephrops typically create a burrow in seabed mud in which to live. There are also much smaller volumes of lobsters and scallops caught in the Inner Sound area.

Calculations and Data

Number of boats directly affected

Various estimates have been made of the number of boats directly affected due to the fact that they fish in the proposed inner sea area. These estimates are set out in the table below. The survey conducted by MoD almost certainly does not have a complete response rate. The NWIFG assessment estimated 18 boats based on local consultation and this aligns with an estimate of 19 sightings recorded by QinetiQ. The QinetiQ figures are based on boats that have been seen this year fishing in the proposed expansion area. For the purposes of this assessment we will use the figure of 19 boats.

Table 1: Boats currently fishing the proposed expansion of the inner sea area

Source	Estimated number of boats affected
NWIFG assessment	18
QinetiQ sightings from this year	19
MoD survey responses (response rate)	13 (68%)

Profit currently made from the proposed expansion area

Respondents to the MoD survey provided estimates of the profit they currently make in the proposed expansion area, (survey question – “What is the approximate annual profit after tax made on the catch from this area?”). The survey had responses from 13 boats which gives a total of £660,000. This left the profits of 6 boats unaccounted for. To factor their profits in we took an average per boat of £51,000 which gives an additional amount of £310,000 and a total profit from the proposed no fishing area of £970,000.

Having no responses from 6 boats makes this estimate uncertain. It is possible that these boats chose not to respond because they were less affected or unaffected. However, we cannot assume this to be the case. A 95% confidence interval based on the uncertainty around the mean gives a range for the total profit from the area of between £940,000 and £1,000,000. It is worth noting that profit made from the area is also uncertain due to the fact that it varies year on year.

The NWIFG assessment estimated total value of catch which does not directly relate to profit. However their estimate is fairly close to the one derived from the MoD survey responses. This may reflect the fact that most fishermen employed on boats are self-employed and are paid on a share of the gross value of the catch, minus expenses. Therefore gross profit is similar to value of catch.

Table 2: Estimated profit made in the proposed expansion of the inner sea area¹

Survey data	
Total profit from boats that reported (13)	£660,000
Boats unaccounted for (6)	
Best estimate of profit	£310,000
High	£340,000

¹ Numbers (unless otherwise stated) have been rounded. Figures between £1,000 and £10,000 have been rounded to the nearest £100, figures over £10,000 and up to and including £100,000 have been rounded to the nearest £1,000 and figures above £100,000 have been rounded to the nearest £10,000. Numbers may not sum due to the rounding convention used.

Low	£270,000
Grand total	
Best	£970,000
High	£1,000,000
Low	£940,000
NWIFG estimate of total value landed	£917,500 ²

The course of action fishermen may take if expansion goes ahead

In MoD's survey the fishermen who currently fish in the proposed no fishing area were asked what their most likely course of action would be if the expansion goes ahead. Table 3 below sets out the responses.

Table 3: Proposed course of action after changes

Course of action	Percentage of boats in affected area
Fish in another area of the sound	54%
Fish on the boundary of the new inner area	15%
Cease fishing	8%
Other ³	23%

The NWIFG assessment also asked fishermen what they would do if the proposal went ahead. They received 18 responses in total and they are broken down in Table 4 below.

Table 4: NWIFG estimate of proposed course of action after changes

Course of action	Percentage of respondents
Expect to continue fishing ⁴	67%
Cease fishing	33%

The percentage of respondents who suggested that their likely course of action would be to cease fishing differs between the two survey results set out in tables 3 and 4.

This might be down to the subjective nature of surveys and uncertainty amongst fishermen about what their future course of action will be if the proposal goes ahead.

It is important to note that at the time of the NWIFG survey there was confusion around how much of the water would be closed. By the time of the MoD survey it had been made clear that only the inner sea area would be closed to fishing. The differences could also reflect changes in the views of fishermen over the last 5-6 months.

Based on these reasons the MoD results are more likely to reflect the current thinking of fishermen. Therefore it is not expected that many boats will cease fishing entirely. If 8% is an accurate assumption then this would amount to 1-2 boats.

² As estimated in the NWIFG assessment.

³ The MoD survey gave the option for fishermen to respond other and provide comments. There was a range of comments provided. One expressed uncertainty about what would happen and others talked of down-scaling their operation.

⁴ Of those fishermen who expected to continue, they thought this would be with reduced earnings; some were also thinking of downsizing.

What is clear from both sets of responses is that the major effect is one of displacement. The MoD survey suggests that 69% will continue fishing in other areas of the Sound and NWIFG assessment suggests that 67% expect to continue fishing elsewhere.

Reduction in catch volume that may be experienced by directly affected fishermen

For the MoD survey, fishermen provided estimates of the percentage decrease in their volume of catch after the proposed expansion. The table below sets out the distribution of these responses. Both the median and mode responses indicated a percentage reduction in volume of around 50%.

Table 5: Percentage reduction in volume of catch after changes

Percentage reduction in volume of catch (%)	Number of boats that responded from the proposed expansion area
12	1
20	1
40	1
50	3
60	1

The most frequent response was 50%. A 95% confidence interval suggested high and low values of 60% and 25%. These estimates are very uncertain, the fishermen have given an indication of their views in the survey but even for them there will be a large amount of guess work involved in estimating the amount of catch that can be landed from other parts of the Sound.

Potential reduction in landed catch

High level calculations can be conducted to give an indication of what the effect on catch volume might be. According to Marine Scotland data for ICES⁵ areas 43E4 and 44E4, between 2011 and 2015, the average annual quantity of nephrops landed by boats under 15 metres was approximately 356 tonnes and the annual average for the number of boats was 80. These figures give an average annual catch of approximately 4.5 tonnes per boat. This impact assessment has assumed that there will be a total of 19 boats affected; thus it is estimated that their catch is approximately 86 tonnes per year in total.

MoD's survey indicated a range for reduction in volume of between 25% and 60% (Table 5). Based on this the 19 affected boats would catch between 21 and 51 tonnes less after the proposed expansion. This represents a reduction of between 6% and 14% of the average total annual landed catch of 356⁶ tonnes between 2011 and 2015. It should be noted that there are large assumptions and uncertainties in this calculation but it helps give a rough idea of the magnitude of reduction that might be expected if there was no other change in the activities of the fishermen who fish in the BUTEC area. The average annual change in total catch via pots for ICES areas 43E4 and 44E4

⁵ International Council for the Exploration of the Seas (ICES) standardise the division of sea areas for statistical analysis. Each ICES statistical rectangle is '30 min latitude by 1 degree longitude' in size and is approximately 30 nautical miles square. A number of rectangles are amalgamated to create ICES areas.

⁶ Creel vessels under 15m

between 2011 and 2015 is ± 33 tonnes per year and a 95% confidence interval suggests that it can change by as much as ± 72 tonnes per year. Based on these figures it is unlikely that the proposed range expansion will create a change in supply that is significantly different from the average year on year fluctuations.

Assumptions and Caveats

The calculations above rely on a number of assumptions. Where possible the effect of these assumptions changing has been examined by producing a range in which the true value is likely to lie. This allows the reader to see how the estimate could vary. A list of assumptions and a description of how they have been dealt with is set out in Annex C.

Costs

These are the identified costs that are assessed below.

1. Decreased fishing area leading to a reduction in landed catch
2. Potential loss of jobs working on fishing vessels
3. Proposed loss of jobs at Rona site
4. Impact on seafood exporters
5. Effect on fishermen operating outside the proposed expansion area
6. Additional effect on the local economy

Direct Costs

1. Decreased fishing area leading to a reduction in landed catch

If the proposed extension to the Range goes ahead then it is likely that fishermen who previously operated in this area will suffer reduced profits. It is difficult to calculate the extent of this. It is unlikely that all of the profit currently gained in the proposed expansion area would be lost. Directly affected boats could continue to fish outside the proposed range.

There is uncertainty about how much profit will be lost and about the amount of profit currently made in the proposed expansion area. The estimates for reduction in catch volume that are set out in Table 5 can be used as a proxy for the estimated reduction in profits. The most likely estimate of reduction in volume was 50% when combined with the estimated annual profit from the expansion area of £970,000 this gives a figure of £480,000 per year in potential lost profits. As discussed above, the 50% assumption is very uncertain therefore Table 6 sets out a range of possible values. High and low values based on a 95% confidence interval are highlighted in bold.

Table 6: Estimates of total lost fishing profits per year

Percentage decrease in profit	Estimates of total profit from the proposed expansion area		
	£940,000	£970,000	£1,000,000
25%	£230,000	£240,000	£250,000
30%	£280,000	£290,000	£300,000
40%	£370,000	£390,000	£400,000
50%	£470,000	£480,000	£500,000
60%	£560,000	£580,000	£600,000

The table below sets out present values of the estimates from table 6 when discounted over ten years. It should be noted that these figures do not take into account the potential mitigation discussed in section D under option 1. This is due to the fact that ways of mitigating the impact were still being formulated at the time of assessment.

Table 7: Present value of lost fishing output when discounted over ten years

Best Estimate	High	Low
£4,300,000	£5,300,000	£2,100,000

Conversations with fishermen have highlighted that the proposed expansion area is very productive. This is backed up by seabed maps which highlight that the area is mainly a muddy seabed. This is important as nephrops live in burrows made in the mud. Areas surrounding the boundary of the expanded range may be less productive due to the mud being patchy. Patchy areas are less productive for two reasons:

- i) There is less mud for the nephrops to burrow in and therefore fewer nephrops in an area the same size.⁷
- ii) Creels can be laid in uniform patterns on areas of continuous mud preventing clashes and tangles between different fleets of creels. In patchy terrain fishermen aim to lay their creels across the areas of mud leading to random positioning of creels. This in turn leads to more gear entanglements than if creels were set out uniformly.

This means that the effect of losing the proposed expansion area is likely to have a greater impact than if the seabed was uniformly mud.

2. Potential loss of jobs working on fishing vessels

Only one of the fishermen who responded to MoD's survey explicitly stated that if the proposed changes go ahead then they would have to cease fishing. The implication is that the crew of two working on boat would be made redundant as a result of ceasing fishing. Several other boats stated that redundancies could be a possibility in future if the value of their catch was to decrease substantially. If the survey result that 8% of boats cease fishing (MoD survey, Table 3) is accurate then approximately 2 boats would cease fishing leading to approximately 4 FTE redundancies.

The NWIFG assessment set out that 6 out of the 18 respondents to their survey thought that their business might not survive. Based on this the NWIFG assessment suggested that 11 FTEs may lose their jobs. It is important to note that at the time of this survey there were fears amongst the fishing community that a larger area of water might be closed. In response to the MoD survey only 8% of boats thought they would have to cease fishing which would most likely relate to a much smaller number of job losses.

Based on responses to surveys by MoD and the NWIFG the impact could be between 4 – 11 FTEs with the true value being closer to the lower end due to a lack of clarity at the time of the NWIFG assessment.

The impact of this has not been monetised because the wages lost are often paid as a proportion of the profits estimated above. Counting lost wages on top of this would be double counting the impact.

The unemployment rate of 3.7% in the local area (defined as the Ross, Skye and Lochaber Parliamentary constituency) is lower than for Scotland and the UK as a

⁷ Authors: McLay, H. A., Drewery, J.D., Dobby, H., Weetman, A. and Campbell, N.; Date: 2008; Title: AN ASSESSMENT OF THE EFFECTS OF THE CREEL AND TRAWL FISHING ZONES ON NEPHROPS STOCKS IN THE LOCH TORRIDON AREA, City: Aberdeen; Page; 10, Link: <http://www.gov.scot/Uploads/Documents/IR1608.pdf>

whole however it is half a percentage point higher than in the wider Highlands region (see Table B3, ANNEX B)⁸⁹. The low unemployment figure could be seen as an indication that there is strong demand for labour. In such conditions it is more likely that anyone seeking a new job as a result of the proposals would be able to find one. However, this figure may not show the whole picture as other data indicates that people may be leaving the area to find work. A recent survey¹⁰ showed that 17% of those aged 15 to 30 in the local area (Lochaber, Skye and Wester Ross) were reluctant leavers, who would prefer to stay but do not think they would be able to live and work in the Highlands and Islands.

Any job losses will have an important impact at the individual level. The impact on the local area is likely to be more subtle. The estimate of 4-11 FTEs is 0.1% - 0.4% of the 3,012 people between 16-74 in employment in the local area. Therefore it is very unlikely that the local unemployment rate would rise significantly.

3. Loss of jobs at the Rona site

It is likely that the consolidation and restructuring of the BUTEC range will result in the loss of up to 13 positions. The exact number and nature of these losses is still to be determined. QinetiQ are aiming to deliver any reductions through natural wastage or re-deployment thereby reducing the impact on the wider economy. It is currently thought that around 50% of the reduction could be made in this way. At present, these posts are predominantly manned by personnel who live on the Scottish mainland, in many cases in the "Central Belt"¹¹. They deploy to Rona for short periods, similar to those who work on off-shore oil platforms.

Given that the actualities of these numbers are still to be determined we have not made an attempt to quantify the cost of losing these positions.

Indirect costs

4. Impact on seafood exporters

A number of seafood wholesalers maybe affected. We contacted two of the exporters that get a large amount of supply from the proposed expansion area. These were Shieldaig Export Ltd and Keltic Seafare.

In survey responses Shieldaig Export boats indicated that there was a concern that one of the boats may become unviable. Shieldaig Export operates a co-operative structure; therefore losing a boat would lead to a reduction in the economies of scale that the business could achieve. The impact of losing a boat is captured in the lost output figure above and will not be re-visited here to avoid double counting the impact.

Keltic Seafare indicated that the proposed changes would adversely affect their supplies of langoustines and scallops. This is based on the assumption by Keltic Seafare that they are likely to lose a boat that supplies them with roughly an eighth

⁸<http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/locallabourmarketindicatorsforparliamentaryconstituenciesli02>

⁹<http://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/locallabourmarketindicatorsforcountieslocalandunitaryauthoritiesli01>

¹⁰ <http://www.hie.co.uk/regional-information/economic-reports-and-research/archive/young-people-and-the-highlands-and-islands--attitudes-and-aspirations-research.html>, Young People in Lochaber Skye and Wester Ross: Attitudes and Aspirations, p.5

¹¹ Hansard, 23 June 2015, column 860,

<http://www.publications.parliament.uk/pa/cm201516/cmhansrd/cm150623/debtext/150623-0004.htm>

(12.5%) of their total supply. They stated that they were concerned that other boats that supply them may also cease fishing in future.

They have stated that this loss of supply would lead to a reduction in their profit; they have estimated this to be as much as 40% on langoustines and 5% for scallops; this would have a knock on impact on their profits.

Keltic Seafare has also stated that it is likely that the above impacts may lead to them making approximately 2 to 3 production posts redundant. They do not think that there will be job losses in any other part of their business.

If Keltic Seafare are able to secure supply from other sources then the impact will lower or negligible.

These responses from wholesalers suggest that they are expecting to lose the supply of 2 boats. The higher estimate for number of boats that could be expected cease fishing based on the survey responses set out in table 3 was 2. Cross-referencing the responses would suggest that the impacts described here represent a high estimate for the impact on wholesalers.

5. Effect on fishermen currently operating outside the proposed expansion area (displacement effect)

If the proposed extension goes ahead then fishing vessels that currently operate inside the proposed expansion area are likely to look for new areas to set their creels. This is highlighted in the responses set out in Table 3. This will have the effect of increasing the number of fishermen laying creels outside the proposed expansion area. This will make the fishery more crowded. Marine Scotland data shows that the number of boats fishing the ICES¹² areas 43E4 and 44E4 changed on average by approximately 6 boats per year in the period 2010 to 2015¹³.

Based on survey responses in tables 3 and 4 it has been assumed that 92% of the 19 boats directly affected will fish elsewhere. This gives us a figure of 17 boats¹⁴. It is worth noting that many of the 19 already conduct some of their fishing activities outside the proposed area but 17 gives an indicative estimate of the additional number of boats moving in to the wider fishery. The displaced boats effectively represent an increase of just over 3 times the typical annual change.

The fishery is already very busy. This is highlighted by the fact that it is fished at very close to its maximum sustainable yield (a measure of the highest possible catch that can be taken indefinitely). There is a more detailed discussion of this aspect in point 4 of the benefits section below. Chart 2, Annex A also gives a clear picture of the density of fishing taking place. The increased concentration of fishing outside the range could have two main impacts:

1. Decrease in catch per boat being brought in.

In responses to the MoD survey, boat operators who currently fish outside the proposed expansion area said they expected their catch to go down by around

¹² International Council for the Exploration of the Seas (ICES) standardise the division of sea areas for statistical analysis. Each ICES statistical rectangle is '30 min latitude by 1 degree longitude' in size and is approximately 30 nautical miles square. A number of rectangles are amalgamated to create ICES areas.

¹³ This variance refers to all creel fishing vessels.

¹⁴ Based on survey responses that stated they would fish in another area of the sound or were uncertain about their future course of action.

30% to 40% because of pressure from new boats. This was based on very few responses and should be treated with caution.

2. Increase in fishermen's costs due to more gear clash damaging creels.

In responses to the MoD survey, boat operators said they expected they currently experienced gear clashes about 8 times per month. If the proposed expansion went ahead they expect it to increase to around 20 times per month. Again this was based on very few responses and should be treated with caution.

Unfortunately it is very difficult to make a reasonable estimate of how this will affect fishermen in monetary terms due to the uncertainty about what the impact will be and the number of boats that will be affected.

6. Additional effect on the Local economy

This section looks at the additional ways in which the changes are likely to impact the local economy. When considering the impacts listed below it is important to note the context in which they are taking place. The Highlands and Islands economy has fewer alternatives in terms of economic opportunities when compared to most other areas of the country. This means that the impacts mentioned below are likely to have a greater effect than if they occurred somewhere with more available alternatives. This fragility has been recognised by Highlands and Islands Enterprise with most of the area around the range classified as fragile¹⁵, see chart 3, Annex A. The European Union also recognises the fragility of the area and has classified the Highlands and Islands as a transition region under its cohesion policy which allocates European funding¹⁶.

The areas of potential wider economic impact are set out below:

- Impact on other local businesses, particularly those that rely on tourism:
The NWIFG assessment highlighted the potential impacts on local businesses such as pubs and hotels through a reduction in the supply of nephrops and other types of seafood. They have stated that one of the key things that attract tourists to the area is the opportunity to sample locally-caught seafood.

In the assessment done for the NWIFG, 7 local restaurants and hotels were surveyed. The results (Annex B, table B1) showed that two out of seven of the local hotels and restaurants surveyed are worried about the impact change to the available fishing area may have.

This impact depends greatly on what is likely to happen to the volume of catch if the proposed changes go ahead. High level calculations set out in the general assumptions and data section suggest that the proposed expansion is unlikely to change the volume of catch by more than the normal fluctuations seen for ICES areas 43E4 and 44E4. Therefore impacts on the tourism and hospitality sector are likely to be small and indistinguishable from the general year on year changes.

¹⁵ Highlands and Islands Enterprise, Review of Fragile Areas. Source: <http://www.hie.co.uk/regional-information/economic-reports-and-research/archive/review-of-fragile-areas-and-employment-action-areas-in-the-highlands-and-islands--executive-summary.html>

¹⁶ http://ec.europa.eu/regional_policy/en/information/publications/factsheets/2014/cohesion-policy-and-the-united-kingdom

- Impact on investment in commercial fishing due to increased uncertainty:
It is possible that individuals and local businesses could decide to delay investment in the medium-term as a result of the proposed extension. This is because they may be concerned about the future profitability of their businesses if the supply of nephrops is reduced. This could take the form of deciding not to purchase new equipment or declining to invest in a new boat. These are large capital outlays that will take a number of years to earn back their upfront investment. Uncertainty about whether boats will be able to earn a return on investment is likely to have postponed purchasing decisions.
- Impact on turnover for suppliers to fishermen (e.g. fuel, maintenance of boats):
Many of the fishing vessels in the area also contribute to the local economy via the demand for supplies of fuel and other equipment. Some of the fishermen have also indicated that they rely on local firms to build and maintain their boats. If the supply of nephrops is reduced then it is possible that there would be a marginal reduction in the number of fishing vessels in the area with a consequent reduction in demand for local suppliers. However this is thought to be small.
- Impact on local public services due to fishermen and their families leaving the local area:
If the proposed extension of the range leads to a reduction in the number of vessels fishing in the area then it is possible that some fishermen and their families may choose to give up fishing and not seek employment in the local area and instead relocate elsewhere. Given that only 8% of respondents expected to cease fishing, it is thought that the number of people who might do this is likely to be very small.

The NWIFG assessment indicated that this could negatively affect the viability of local public services (e.g. primary schools having to close if the children of fishermen were no longer enrolled). This impact is also dependant on the people leaving being users of the public services. Therefore the impact of this is thought to be very small as the number of individuals directly affected is small.

Benefits

1. Return of the Rona Range
2. An increase in un-fished area which may help to protect nephrops stocks and benthic fauna
3. Viability of the range going forward

Direct benefits

1. Return of the Rona Range

The majority of the Rona range is currently fished based on local agreement between MoD/QinetiQ and fishermen who operate in the Rona area. Most of these

fishermen operate from Shieldaig. Chart 4, Annex A is a map of the Rona Range in relation to the proposed expansion. Currently this area is fished under local agreement between QinetiQ and fishermen. The agreement means that fishermen are unable to fish a small 1.6 sq. km area and have to occasionally move their gear out of the area completely when a trial is taking place. There are also various under water structures that fishermen have to be careful to avoid.

Part of the proposed upgrade/expansion is to incorporate activities conducted on the Rona range into the BUTEC area. If the proposed expansion goes ahead then there may be a period of dual running between the two ranges but the goal is to return the Rona range allowing it to be fished freely. QinetiQ currently estimate that they will be able to open up the Rona range in 2017.

This will mean that fishermen no longer have to occasionally vacate the area which will mean less disruption to fishing in the area. It is unclear whether there will be an increase catch from this area because fishermen will be able to leave their creels down for longer periods of time.

The removal of QinetiQ equipment from the seabed of the smaller 1.6 sq. km area within the Rona range will mean this can be fished again. This is likely to lead to a small increase in catch for the fishermen who operate in that area.

2. An increase un-fished area which may help to protect nephrops stocks and benthic fauna

Whilst it is not a policy objective of this proposal the additional no fishing zone created by the range expansion does have the unintended consequence of providing a quasi-conservation zone.

Due to the restrictions already in place the expansion would move 28 sq. km from a creel fishing zone to a no fishing zone. Whilst creel fishing is a lot less harmful than alternative methods such as trawling it does have an environmental impact. There are two aspects to this: the effect on ocean plant life and the population of nephrops.

Studies on ocean plant life note that creel fishing causes limited long term damage¹⁷. However, there doesn't appear to be any more recent studies that examine the effect of more intensive creel fishing that has developed since this study was conducted.

A number of ecological studies have been conducted on the current byelaw area. The conclusion of the most recent study conducted in 2006 was:

'This study was naturally very limited in its scope although has revealed that there is little anthropogenic impact from range activities on either the seabed or the benthic fauna. We do highlight that restricting fishing on the range has produced high numbers of benthic fauna and fish. A very interesting study, with a high scientific global impact, would be an examination of the anthropogenic impact on the seabed

¹⁷ Authors: Kinnear, J; Barkel, P; Mojsiewicz, W; Chapman, C; Holbrow, A; Barnes, C; Greathead, C; Date: 1996; Title: Effects of Nephrops creels on the environment, City: Aberdeen

*both on the restricted range and outside. It is expected that this study would reveal the range seabed to contain the more diverse and naturally pristine seabed.*¹⁸

This reflects that the Range provides a good habitat for fish and fauna and suggests that it is likely to provide a more natural seabed than fished areas. Whilst there are not comparable studies on adjacent fished areas there is a large amount of data regarding the impact on fished species, in particular nephrops.

Marine Scotland provides data on fish and shellfish stocks¹⁹. Data are provided for quite large areas, the inner Sound of Raasay falls within Marine Scotland's definition of the South Minch. However it is very close to the North Minch. Both these areas have displayed similar characteristics in recent years. Measures relating to the abundance of nephrops have been above the minimum sustainable biomass in recent years except for the South Minch which slipped below in 2012. Both areas are currently above the trigger although given the variability in the data dipping below the trigger is not an unrealistic scenario. A measure based on the harvest rate shows that both areas are currently being harvested below the maximum sustainable yield proxy (a measure of the highest possible catch that can be taken indefinitely). However both areas have risen above the maximum sustainable yield in recent years and given the variability in the data rising above the trigger is not an unrealistic scenario.

It is not possible to say whether the area is being overfished but the data does suggest that there is a lot of fishing taking place. BUTEC provides a degree of protection to nephrops stocks in the inner Sound. This suggests that there is value to having a no fishing zone to provide a protected area for the nephrops to live in. The current range does this and the proposed extension is likely to provide similar benefits over a larger area.

Based on the information set out here the proposed extension is likely to provide the benefit of an additional 28 sq. km where bio-diversity can thrive to a greater extent than elsewhere in the inner Sound. It is very difficult to quantify and or monetise the benefit of such an area and many of the methods are open to justified criticism; therefore this assessment does not attempt to undertake such calculations.

3. Viability of the range going forward

The range is an important source of income for the local area. As noted above, while the MoD has not identified any ready alternative locations for the capability currently provided at BUTEC, if the proposed changes do not proceed, there is a significant risk that over time the Range will be unable to provide a viable capability sufficient to justify its continued operation. This would clearly have significant implications for the workforce and accordingly the economic benefits of BUTEC's continued operation constitute a legitimate aspect of this assessment.

This benefit is mainly due to the sites function as an employer. Across the three ranges BUTEC employs approximately 154 people, of whom the majority work at the Shore Support Base at Kyle of Lochalsh. Of the 154 people employed at

¹⁸ Authors: Howe, J; Shimmeld, T; Bates, R; Brown, C; Date: 2007; Title: Final report: Habitat mapping, biological sampling and geochemical assessment of the BUTEC test range, Applecross; City: Oban; Page: 70

¹⁹ Marine Scotland Science; Fish and Shellfish Stocks, 2015 Edition; source: <http://www.gov.scot/Resource/0047/00477088.pdf>

BUTEC, we were only able to calculate a pay bill estimate for the 99 work for QinetiQ. Their salaries have been estimated to total approximately £2.5 million per year. This has been calculated by multiplying the number of employees in each pay band by the mid-point in that pay band which may mean that the actual figure is slightly higher/lower.

There is a smaller yet substantial stream of income from frequent visits to the base by customers, contractors, officials and service personnel who provide income to the local hospitality industry. The total numbers of visitors in 2015 was approximately 6,400. Based on these visitor numbers QinetiQ estimate that around £750,000 per year is spent on local services as a result of the sites. This works out at £117 per visitor which does not seem unrealistic given that most visitors will require overnight accommodation due to the relatively remote location of the BUTEC site.

F. Summary and conclusion

Summary

Table 8: Summary of impacts

Costs	Benefits
<p>Monetised</p> <ul style="list-style-type: none"> Decreased fishing area leading to a reduction in profits of directly affected boats <p>£4.3m (PV over ten years)</p> <p>Non-Monetised</p> <ul style="list-style-type: none"> Impact on seafood wholesalers Proposed loss of jobs at the Rona site Effect on fishermen operating outside the proposed expansion area Additional effect on local economy 	<ul style="list-style-type: none"> n/a Return of the Rona Range Increase in un-fished areas which may help to protect nephrops stocks and benthic fauna A long-term sustained future for BUTEC as an important part of the local economy

Conclusion

The BUTEC range is used to test and evaluate equipment and weapons systems that are vital to maintaining national security. There is no other feasible location to conduct these tests. This report has examined the economic impact of extending the facility.

The proposed change is to upgrade the BUTEC range by expanding current water area at BUTEC to include the functions of the Rona range and to increase capability of the range. This means that an additional area of 28 sq. km will no longer be open to fishing. Fishermen currently operating in this area will have to remove their creels and cease fishing in this area.

A larger water space is required to deliver the capability of a modern test and evaluation centre. If the proposed expansion does not go ahead it would call into question the long term viability of the range. The range employs approximately 154 people, of these the 99 QinetiQ employees earn approximately £2.5m. It also brings in income of approximately £750,000 per year which is spent on local services such as food and accommodation due to the number of visitors that annually visit the base due to its remote location.

In responses to our survey most fishermen have indicated that they would fish elsewhere but that it would be difficult for these boats to maintain the same level of output. The direct impact of this is that these fishermen are likely to catch less. The cost of this in lost profits has been estimated at between £230,000 and £600,000 per year with a most likely value of £480,000 per year. There is, however, considerable uncertainty around this estimate as it is based on assumptions about how fishermen

decided to respond to the proposed increase in the range, the size of the catch they are able to land afterwards and therefore how much their profits might decrease. Our key source of evidence is survey data from the fishermen. Some of their responses reflected that they were also uncertain about the likely impact. If the responses are overly pessimistic then the true impacts might be towards the lower end of the estimates provided. These uncertainties are largely unresolvable as it is difficult to know the true impact on catch and cost for the affected fishermen.

The number of jobs that might be lost in the fishing industry as result of reduced profits has been estimated at between 4 - 11 FTEs with a figure at the lower end of this range being more likely. When contextualised this represents a small impact on the local labour market, representing between 0.1% - 0.4% of the 3,012 people employed in the local area. However it will have a significant impact on the individuals concerned.

Plans to mitigate the impact of the expansion on fishermen could reduce the size of the impact on commercial fishing profits and employment.

Boats in the wider fishery around the Range are likely to experience an increase in gear conflicts as displaced fishermen try to find new areas to lay their creels. This will increase their costs.

The indirect impacts have been harder to quantify but there may be a small knock on effect in areas of the economy linked to fishing. This includes effects on businesses in the supply chain including hotels, restaurants and exporters. These impacts depend heavily on how much the volume of catch is affected but are largely expected to be marginal.

The potential drop in catch from the wider fishery is likely to be small. This assessment attempted to estimate the reduction. This was based on a number of assumptions and on subjective responses to survey questions, but it provided an indicative reduction of between 21 and 51 tonnes of the average total annual landed catch of 356 tonnes between 2011 and 2015. The annual average change in catch volume for the fishery is ± 33 tonnes per year. Therefore it is unlikely that there will be a significant shortage of supply and the second order impacts are unlikely to have a significant overall impact. This does not mean that there will not be important supply chain impacts on local businesses but it does mean that they are unlikely to be outside the normal year on year changes in the market place.

The main impact of the proposed changes is limited to the 19 fishing boats currently operating in the proposed expansion area. They will be displaced and their catch will be reduced. This could in turn lead to a small number of job losses in the fishing industry if one or two of the boats are unable to earn a profit in other parts of the Sound. The displacement of boats is likely to increase the costs of other boats in the area due to increased gear clashes. Based on the available evidence it appears that second order impacts on the local economy are likely to be very small due to the fact that the overall impact on volume of catch is likely to be within the level of standard annual fluctuations.

Annex A: Maps

Chart 1: The proposed byelaw area with the old range shown below

(The map that was sent to fishermen when surveyed by MoD)

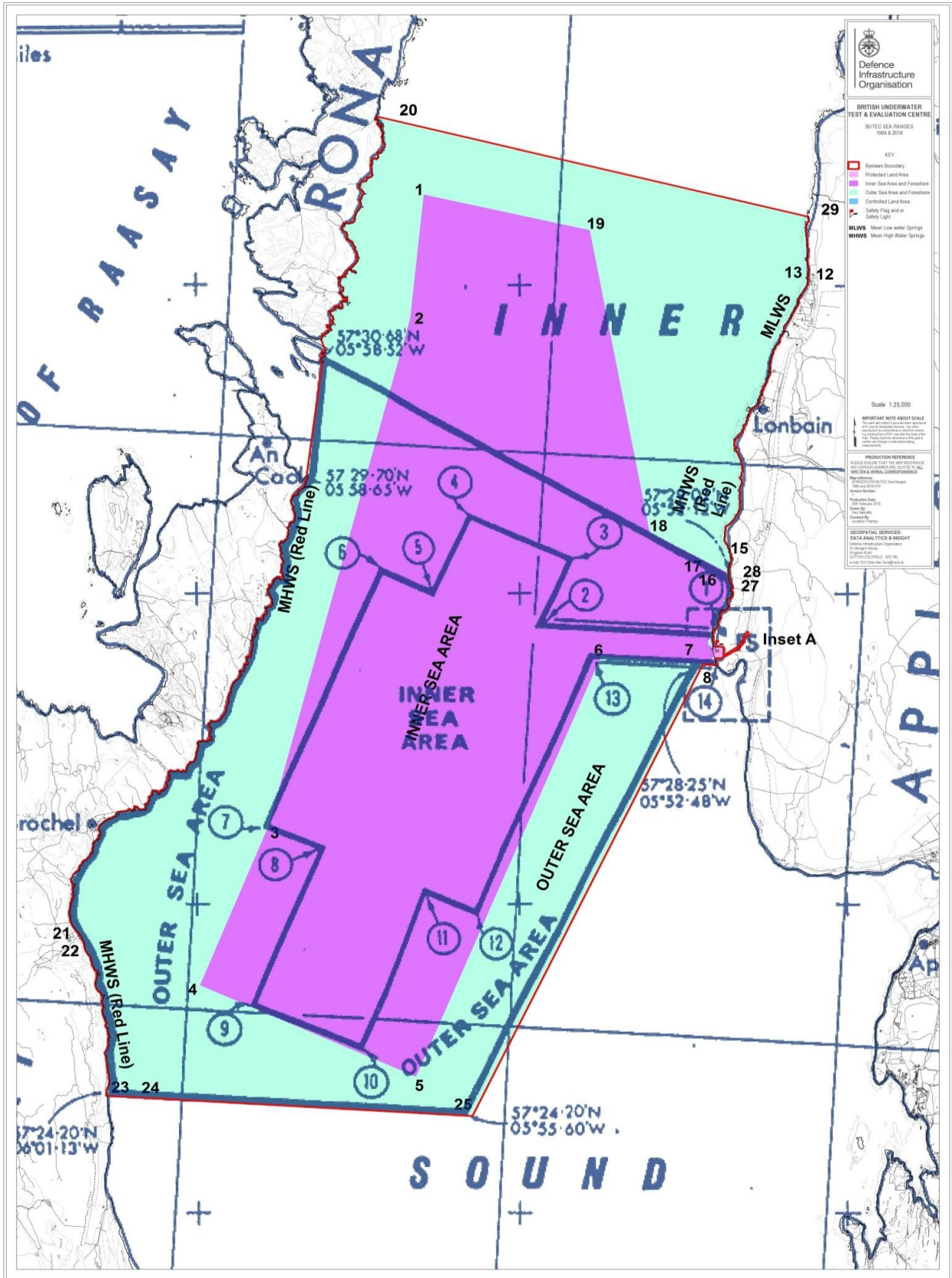


Chart 2: Density of creel boats under 15 metres long

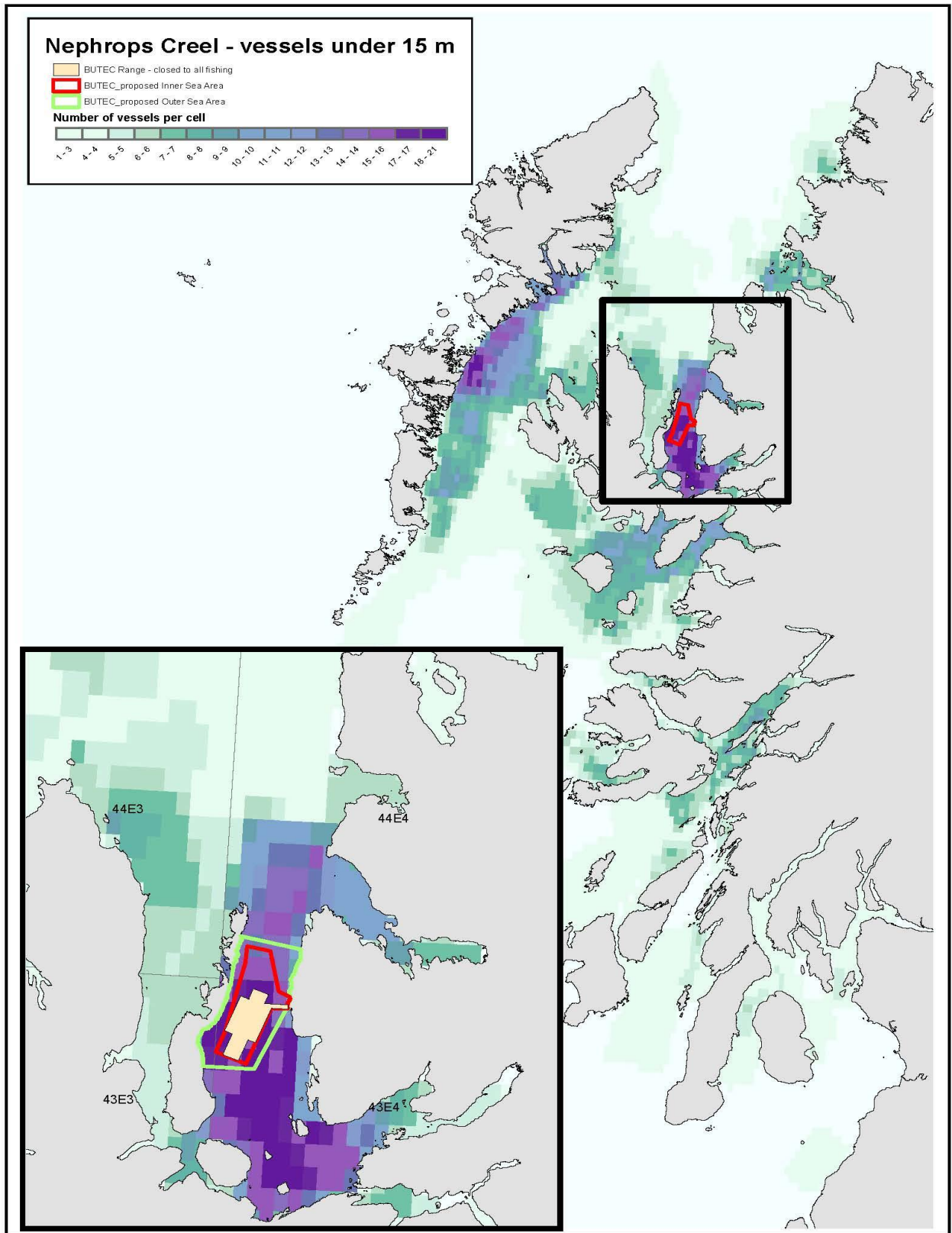
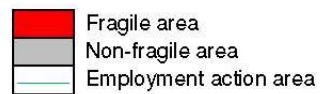
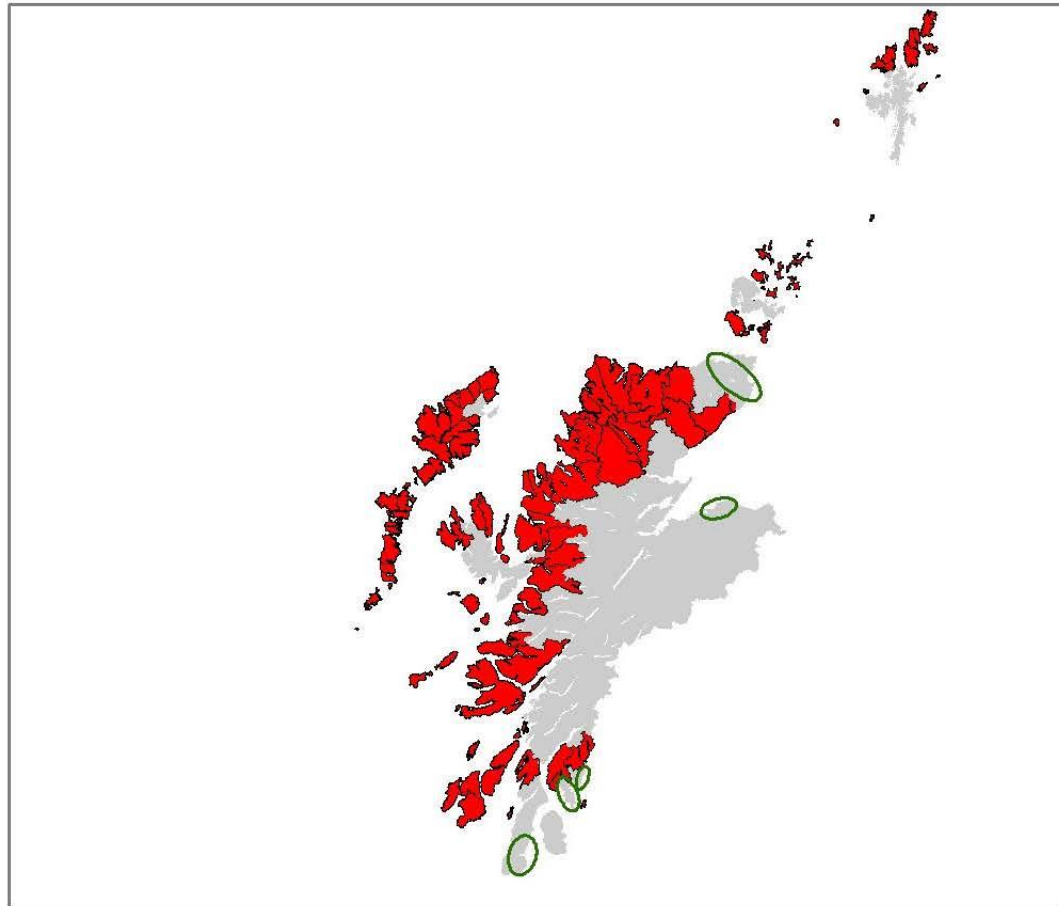


Chart 3: Fragile areas as classified by the Highlands and Islands Enterprise

Fragile Areas and Employment Action Areas 2014 - Highlands and Islands Enterprise

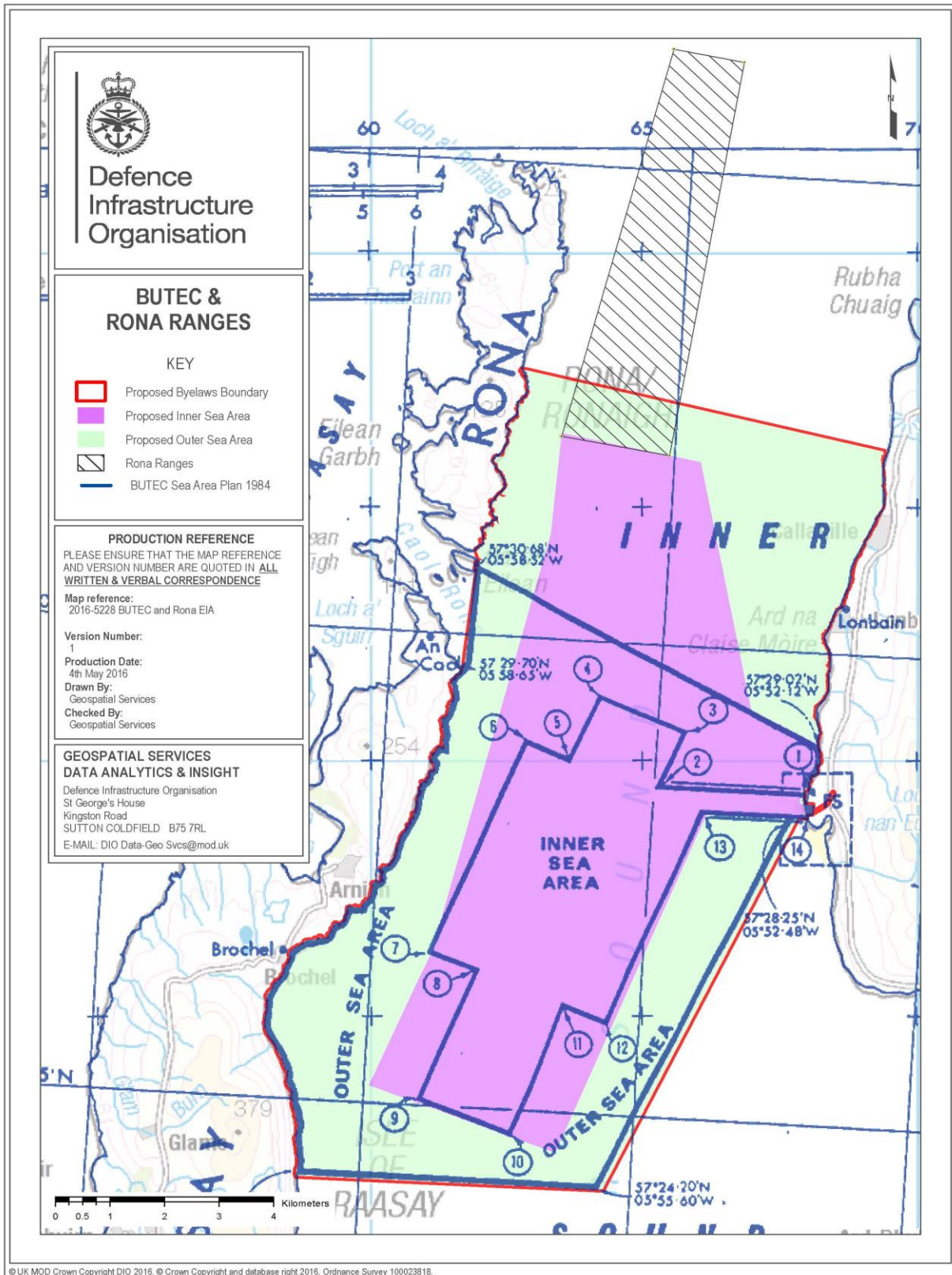


Source: Arc Map produced using Scottish Government/Ordnance Survey boundary data

Notes: 1. Map shows fragile data zones and fragile islands.

2. Due to mapping limitations, it was not possible to map a small number of inhabited islands defined as fragile – Danna, Elean da Mhein, Innis Chonain, Kerrera, Holy Island, Dry (Eilean Tioram) and Inner Holm.

Chart 4: The Proposed byelaw area and the Rona Ranges



ANNEX B: Additional data tables

Table B1: Employment Structure, 2011 Area of Impact²⁰

Sector	Area of Impact		Highland	Scotland
	Number	%	%	%
Agriculture, forestry and fishing	217	7.2	3.7	2
Mining and quarrying	21	0.7	1.2	1.4
Manufacturing	98	3.3	6.3	7.7
Electricity, gas, steam and air conditioning supply	18	0.6	0.8	0.8
Water supply, sewerage, waste management and remediation activities	21	0.7	1.3	0.8
Construction	255	8.5	9.8	8
Wholesale and retail trade, repair of motor vehicles and motorcycles	392	13	14.9	15
Transport and storage	172	5.7	5	5
Accommodation and food service activities	483	16	9.1	6.3
Information and communication	53	1.8	2.4	2.7
Financial and insurance activities	41	1.4	1.3	4.5
Real estate activities	40	1.3	1.3	1.2
Professional, scientific and technical activities	143	4.7	4.5	5.2
Administrative and support service activities	80	2.7	4	4.3
Public administration and defence, compulsory social security	149	4.9	6.6	7
Education	279	9.3	7.6	8.4
Human health and social work activities	415	13.8	15.2	15
Other	135	4.5	4.9	4.9
All people aged 16 to 74 in employment	3,012			

Table B2: Local hotels and restaurants responses to NWIFG assessment

Owner's response regarding affect	Number of respondents
Shutting down therefore unaffected	1
Unaffected	1
Concerned about supply being affected even though buy from a supplier in Mallaig	1
Run by/with fishermen providing the catch at cost therefore affected	2
Worried about effect via decrease in local supply	2

²⁰ Table compiled by the NWIFG assessment, based on official data from the 2011 Census.

Table B3: Unemployment statistics for the local area (Jan to Dec 2015)

Area	Ross, Skye and Lochaber constituency	Highlands	Scotland	UK
Unemployment rate	3.7%	3.2%	5.8%	5.3%

ANNEX C: Assumptions

<u>Assumption</u>	<u>Risk</u>	<u>Likelihood</u>
Number of boats directly impacted.	There could be more boats directly impacted.	This appears unlikely as the figure of 19 boats directly impacted is based upon viewings by QinetiQ and is very close to the NWIFG estimate of 18 boats.
Estimated profit made in the proposed expansion area.	Profits could be higher than estimated.	This figure is uncertain. A range with higher and lower bounds has also been used to take account of the uncertainty.
Number of boats ceasing to fish if the proposed expansion goes ahead.	More boats could stop fishing.	It is estimated, based upon survey responses, that approximately 1 to 2 boats could cease fishing after the proposed changes. This is uncertain as it is dependent upon behavioural changes.
Estimate of total loss to fishermen's profits after proposed changes.	Decrease in profits may be higher than estimated.	The reduction in volume caught is uncertain as it is based upon survey responses but a large range has been considered.
Potential loss of between 4-11 jobs working on fishing vessels.	More jobs could be lost if more boats cease fishing.	It is expected that job losses in the fishing industry as a result of the expansion will be at the lower end of the range provided. Therefore this risk is unlikely.
Estimate of impacts on local seafood exporters and other suppliers.	Impact on profits and jobs could be greater than estimated.	This is very uncertain as it hard to estimate how their supply will be affected. The impact is expected to be small as the upper estimate of reduced supply is below the range of annual fluctuations.
Loss of jobs from the Rona site.	There could be a greater number of redundancies.	This is unlikely as QinetiQ are aiming to deliver any reductions through natural wastage or re-deployment.