



**Able Humber Ports Ltd
Marine Energy Park
Proposal to build a quay and associated development
on the south bank of the River Humber**

Planning Inspectorate Reference: TR030001

**Answers to the Examining Authority's first written questions
provided by
The Environment Agency
Unique Reference Number: 10015552**

29 June 2012

Response to Examining Authority's first written questions

Please find below answers to your questions, primarily for the Environment Agency, together with those where we have been asked to jointly respond to with the Marine Management Organisation and Natural England. We also include comments on other questions where we believe we can contribute relevant information:

3. What is the relationship, if any, between the proposed Marine Energy Park and the consented Logistics Park?

The Logistics Park has not yet been consented. The application was originally considered by the North Lincolnshire Council Planning Committee on 24th June 2011. The Committee resolved that it was “mindful to grant permission for the development; (b) that the Acting Head of Planning be authorised to grant permission subject to the completion of a formal agreement under Section 206 of the Town and Country Planning Act 1990, providing for the sum of £1,255,000 to secure highway improvements in the vicinity of the proposed development necessitated by the development; to confirmation being received from the Environment Agency that Able UK have signed the legal agreement in respect of land drainage consent for the flood wall works and the local planning authority has received a copy of the signed Appropriate Assessment for the Humber Estuary Flood Risk Management Scheme from DEFRA, and to the conditions contained in the report, and (c) that if the obligation is not completed and confirmed by 31 December 2011, the Acting Head of Planning be authorised to refuse the application on the grounds of adverse impact such a significant development would have on an unimproved/upgraded local highway network”.

The Environment Agency can advise you that a copy of the signed Appropriate Assessment for the Humber Estuary Flood Risk Management Scheme from DEFRA has been sent to North Lincolnshire Council. The legal agreement was not signed by the 31 December 2011. The application was, however, referred back to Planning Committee on 8th February 2012. A similar resolution was taken with an extended date of 30th June 2012 being set for completion of the legal agreement. We can advise you that this has not been signed, and therefore the Logistics Park does not yet have planning consent.

8. With specific reference to Section 4.13.9 et seq of the NPSP – (a) have the latest UK Climate Change Projections been used both in the Environment Statement and for design purposes? (b) have these been applied over the estimated lifetime of the project?

(a) The Flood Risk Assessment has used climate change requirements set out in Planning Policy Statement 25 ‘Development and Flood Risk’ (PPS25), which was relevant policy in force at that time, (but is now superseded by the National Planning Policy Framework (NPPF)). This was our advice to the applicant during the pre-application consultation stages. In January 2012 the National Policy Statements for Ports was finally designated and paragraph

4.13.7 requires applicants to use the latest set of UK Climate Projections. The PPS25 levels are comparable to the high emission scenario 90% estimate from UKCP09, so by having considered this degree of change, it is our opinion that Able has covered all that is required, being conservative in its estimates.

(b) The PPS25 figures have been applied within the Flood Risk Assessment over the estimated lifetime of the project.

38. With regard to the channel at Stone Creek –

(a) what is the current maintenance regime, if any?

There are four outfalls at Stone Creek, the Keyingham Drain being designated a main river and, therefore, the responsibility of the Environment Agency; the Ottringham Drain outfall is the responsibility of the Ottringham IDB; Cherry Cobb Sands Drain outfall and Sunk Island Drain outfall are the responsibility of Crown Estates.

The Environment Agency carries out inspection and maintenance works to the Stone Creek outfall structure in the following ways:

- Weekly tidal door inspections;
- Monthly sluicing operation (water is held back by inner penstock doors and released at low tide);
- 3 times a year, jetting around the doors with high pressure pump;
- Twice yearly, mechanical planned preventative maintenance - fitters inspect the inner door winding mechanisms;

We are unable to advise on the maintenance regime undertaken by Ottringham Drainage Board or Crown Estates.

Dredging of Stone Creek has previously been undertaken by the Environment Agency on an ad hoc basis (last done in 2008 as part of the response to the 2007 floods). The local Internal Drainage Board (Keyingham Level IDB) has recently taken the lead role on behalf of a number of interested drainage boards for a project to dredge the channel outside of the outfall structure, to alleviate the existing siltation issue.

A legal agreement, which is presently only in draft form, is intended to secure this dredging work to start and be completed within this financial year (2012-13). The IDB is the main funder with the Environment Agency contributing £30,000 towards scheme costs.

(b) what monitoring regime is proposed?

As silt builds up, it restricts the flow from Keyingham Drain causing a slow rise in water level in the Drain over time. We are able to monitor this with our telemetry sensor at the tidal door.

(c) is a programme of maintenance dredging proposed from the outset?

There is no future programme of dredging proposed. The current ad hoc approach is expected to continue, informed by telemetry monitoring.

(d) how is dredging to be ensured if the siltation levels warrant it?

The Environment Agency has no commitment for regular dredging of Stone Creek, but considers that silt levels will return to pre-dredge levels over a period of about 5 years. As there are very few residential properties at flood risk from Keyingham Drain, dredging is for the benefit of land drainage. In the future, we see the drainage boards being fully responsible for dredging Stone Creek outfall.

51. In conjunction with Natural England, Environment Agency, Marine Management Organisation and others as appropriate, please complete, correct and update the attached screening matrix and appropriate assessment matrix (Annex D2).

The Environment Agency has been in discussion with the Applicant, Natural England and the Marine Management Organisation with regards to Annex D2. The final position will be submitted by Natural England, and will incorporate the comments we have on Annex D2.

67. In the context specifically of the applicant's Habitats Regulation Assessment Report -

(a) What constitutes the current suite of plans or strategies for the management of the natural environment in the Humber Estuary?

Attached in Appendix 1 is a summary diagram of the main plans and strategies for the management of the natural environment in the Humber Estuary.

(b) What is the relationship between the component plans or strategies of this suite?

The relationship between the plans and strategies shown in Appendix 1 is explained on the diagram and in sub-question (c) below. There are three statutory pieces of legislation (Birds Directive, Habitat Directive and Water Framework Directive) within the diagram and all the plans and strategies are ultimately seeking to achieve compliance with the legislation either directly or via objective setting within the legislative framework.

(c) if there is a hierarchy within the suite, what is it?

The hierarchy of plans is (colour coded on Appendix 1: red is statutory; green is plans to achieve statutory compliance; blue is objective setting plans; and lilac are data and information plans):

Statutory legislation: Birds Directive, Habitat Directive, Water Framework Directive

Plans to achieve statutory compliance: The Humber River Basin Management Plan, Humber Flood Risk Management Strategy, Regional Habitat Creation Plans

Objective Setting plans: Humber Management Scheme, Shoreline Management Plan, Catchment Management Plans, Regional Spatial Strategy, Yorkshire and Humber Biodiversity Strategy.

Data and Information plans: NE State of the Natural Environment in Yorkshire and the Humber; The Humber Environment in Focus 2011

(d) to what extent do the component plans draw on the same scientific data bases, and how current are these data bases?

The component plans draw on very similar scientific data bases with the Environment Agency and Natural England sharing data collected and reports produced. Natural England look to the Environment Agency for the monitoring of coastal squeeze losses and the analysis and interpretation of any noticeable changes in current trends and understanding of the estuary. The Environment Agency is currently concluding a piece of work looking more closely at the ratio of mudflat and saltmarsh creation within the Humber Estuary alongside the background of long-term trends. The Environment Agency worked with Natural England during the undertaking of this work and the subsequent reports will be shared between the two organisations. The scientific understanding and data bases are constantly being updated as we collect further data. The analysis of the long-term data set (commencing since 1936) in conjunction with the more recent data is helping the Environment Agency's understanding of the changes taking place within the Estuary.

(e) what is the monitoring regime to maintain them?

Regular monitoring of the estuary is undertaken to ensure the Environment Agency comply with WFD and the Habitats Regulations. WFD monitoring is undertaken on a three yearly cycle with a sampling network throughout the estuary. This includes the mapping of saltmarsh coverage within the estuary. In addition LiDar, Aerial photography and topography survey work are undertaken on at least a three yearly cycle. This information is used to inform the Coastal Habitat Management Plan (CHaMP) which the Humber Flood Risk Management Strategy uses to plan losses arising from coastal squeeze and how they will be compensated for within the Estuary.

(f) to what extent do the applicant's proposals conform to all of this suite of plans or strategies?

The applicant, in undertaking the compilation of the Environmental Statement, WFD assessment and draft Habitat Regulations Assessment, has demonstrated awareness of many of the plans and strategies identified in Appendix 1, in particular European and National legislation. The application is likely to comply with all the legislation subject to appropriate compensation being provided.

68. The Environment Agency's Relevant Representation states that – As a result of this commitment the Cherry Cobb Sands site is identified in our Humber Strategy (our long term plan for managing flood defences along the Humber estuary into the future) as a planned habitat creation site, to compensate for these losses, identified at Keyingham. Whilst we recognise that the Strategy comes with a delivery risk, by identifying sites where we do not currently own the land, this project has the potential to hinder the Environment Agency's ability to deliver habitat compensation requirements. What are the implications for the Coastal Habitat Management Plan (CHaMP) Would the Agency confirm whether it supports the use of Cherry Cobb Sands as an appropriate compensation site for the proposed development?

The Humber Flood Risk Management Strategy, published in March 2008, included a site identified as 'Keyingham' in the list of sites for creating the new inter-tidal habitat needed if the Strategy is to comply with the Habitats Regulations. This was done because the detailed studies carried out while developing the Strategy indicated that the site, which is in the area now referred to as 'land at Cherry Cobb Sands', would have relatively limited impact and would be more cost-effective than most of the alternatives considered.

The area of new inter-tidal habitat needed to comply with the Habitat Regulations was based on studies carried out for us by a consortium led by Black & Veatch Ltd and including ABPmer, HR Wallingford, University of Newcastle and Delft Hydraulics. The results are set out in a series of reports and were used to draw up the Humber CHaMP. This concluded that a total of 720 ha would be needed between 2000 and 2050, distributed between the Inner, Middle and Outer sections of the estuary (Figure 1). Of this, 600 ha were to replace losses due to coastal squeeze and the remainder losses due to managing the existing flood defences. It was agreed with Natural England when the Humber Flood Risk Management Strategy was developed that the compensatory habitat provided within the estuary to support the "hold the line" policy unit would need to be on a like for like basis within each sector of the estuary defined in Figure 1. If we do not comply with this undertaking, it will impinge on our ability to deliver flood protection works within the estuary.

The Humber CHaMP has recently been reviewed including more data sets and an increased understanding of the estuary processes, concluding that losses due to coastal squeeze in the Middle section (where Cherry Cobb Sands is located) are likely to average about 9 ha/yr, implying that more than 500 ha of new inter-tidal habitat will be required in this section of the estuary by 2050 rather than the 420 ha estimated initially as a result of coastal squeeze. These findings are summarised in Table 1 and Figure 2. When losses from maintenance of existing defences and intended defence improvements (such as at Hull) are included (compensated for at a ratio of 3:1, unlike coastal squeeze losses at 1:1), the replacement habitat requirements in the Middle estuary increase to over 620 ha (Table 2).

Regarding the impact of Cherry Cobb Sands on the Environment Agency's plans, our search for potential managed realignment sites was carried out as the Humber CHaMP was being developed and involved identifying and carrying out a preliminary assessment of some 30 potential sites. Our aim was to draw up a realignment programme that would meet our habitat creation needs until at least 2050, with a built-in surplus in case some of the land could not be obtained or proved to be unsuitable. Twelve sites were short-listed (Figure 3) and examined in more detail, looking at their potential impacts (e.g. on land drainage, local communications, community etc) and at the cost/ha of developing them. The seven most attractive were selected for inclusion in the programme.

The selected sites together would provide some 1300ha of new habitat. The site at Cherry Cobb Sands was included towards the end of the programme, partly because its cost/ha is relatively high but also because the existing defences are likely to last for some 20 to 30 years. An important point in its favour, however, was that it is one of only two sites we were able to find in the Middle section of the estuary and would therefore help replace the relatively heavy losses predicted to take place there (Figure 1).

We are having great difficulty finding sites that will replace the losses in the Middle section of the estuary, which is why the site at Cherry Cobb Sands is important to us. We are exploring with Natural England the possibility of replacing losses there with sites further seaward (in the Outer North section, as shown in Figure 1), but are not yet confident this will be acceptable. Our studies have shown that the main area where potentially suitable habitat can be created at reasonable cost and without major impacts on people and property (i.e. buildings) or estuary processes in the Middle Estuary is around Sunk Island. In view of this, if we are not able to obtain the site at Cherry Cobb Sands we will struggle to deliver sufficient compensation in the middle estuary .

The Defra approval of the Humber Habitat Regulations Assessment (HRA) (2011) placed the following obligations on the Environment Agency, in the light of the uncertainty of middle estuary delivery, assuming the Able MEP were to proceed with Cherry Cobb Sands and it was no longer available to support delivery of the HFRMS.

There are clearly issues regarding the provision of sufficient compensatory habitat in advance of intertidal losses in the first years of the plan arising from the failure of Donna Nook to receive planning permission and concerns over the viability of the Skeffling and Welwick/ Sunk Island projects. My agreement is conditional on those elements of the Strategy not being advanced until it is clear that compensation for these early intertidal losses has been secured, unless failure to act would result in significant risk to life and property. My agreement is also conditional on the Environment Agency providing Defra with annual updates on the progress with the Skeffling and Welwick/Sunk island projects and an assurance that it will continue to search for sites to provide contingency should these projects fail to deliver suitable compensation.

(The Environment Agency resubmitted the Donna Nook planning application and subsequently received planning permission on 8 July 2011).

The Environment Agency obviously welcomes Able's proposal to deliver compensatory habitat in order to comply with the Habitat Regulations should the MEP scheme proceed. However, we note that the proposed site covers an area of a maximum of 110ha and the redlined boundary area for proposing to CPO the land is 175ha. We would find the proposal to use the CCS more acceptable if some (10-20ha) of the total area could be made available to the Environment Agency in order that we could deliver some wet grassland on the site to address a specific black-tailed godwit issue within the middle estuary,

which Natural England think the Environment Agency will be unable to deliver via a site at Skeffling (outer estuary). Following the failure of a competitive bid with Crown Estates to purchase the land at Cherry Cobb Sands the Environment Agency has had to proceed with alternative arrangements to create habitat within the Estuary, due our need to undertake flood risk improvement works within Hull. The Defra approval (including the site at Skeffling) relies upon us working towards a solution in the middle estuary in the short-medium term, accepting we could not deliver a scheme here within the time-scale required due to the Crown's position and the outstanding MEP application.

The Environment Agency can confirm that it neither supports nor objects to the use of Cherry Cobb Sands, but we would like it to be a material consideration in the Secretary of States decision making process.

85. How well are the dynamic qualities of the Humber Estuary understood through monitoring and modelling, and what account has Natural England taken of them?

The Environment Agency undertook various geomorphological and hydrodynamic studies to underpin the submission of the Humber Flood Risk Management Strategy to Defra in 2007. This work improved the Environment Agency's understanding of the complexity of the Humber system.

The Humber Estuary is a complex and dynamic system and is still not fully understood, with the influence of the changes in freshwater fluxes on the remainder of the system unclear. In addition, there are numerous cyclical patterns of erosion and deposition within the estuary, the control and interaction of which are currently not fully understood. What is also unclear is the extent of the influence of the lunar nodal cycle on these cycles that currently exist within the system.

86. What does monitoring show to have been the extent of natural change in the size and characteristics of the European and Ramsar sites since designation?

There is a major change in the Environment Agency's understanding of losses within the Humber Estuary since the FRMS was published in 2008. The greatest concentration of losses is within the Middle and Outer south part of the estuary. At present the Environment Agency is undertaking work to look at how much of this change is natural change and how much is influenced by anthropogenic processes. The Environment Agency's understanding of the current rates of loss per sector within the estuary are summarised in Table 1.

Table 1. A summary of nodal trend as reported in the draft CHaMP Monitoring Review (Sept 2010, still in draft format), showing the 95% prediction error bands within the estuary. The large difference (error band) in the Inner estuary is reflective of the poor predictive capability of the regression equation.

Estuary Section	Statistical trend	Loss/ gain between 2000-2056 (ha)
Inner	+5.9 ha yr ⁻¹ ± 4.7 ha yr ⁻¹	330
Middle	-9.1 ha yr ⁻¹ ± 2.8 ha yr ⁻¹	-510
Outer North	+1.1 ha yr ⁻¹ ± 1.3 ha yr ⁻¹	62
Outer South	-3.0 ha yr ⁻¹ ± 1.4 ha yr ⁻¹	-168
Whole Estuary	-5.1 ha yr ⁻¹ ± 5.8 ha yr ⁻¹	-286

87. Are there any modelling results showing how further natural change might affect the sites in the future? Specifically, over a ten year period what percentage variation in the formation or loss of saltmarsh and mudflats and sandflats might be expected?

The Environment Agency has commissioned a piece of work looking into this matter. This work is still in progress and is unlikely to be complete until late July/ early August. Based on the initial preliminary draft findings of this work, it is likely that the Humber Estuary as a whole will struggle to produce mudflat at a rate to keep pace with sea level rise. The Environment Agency's programme of habitat replacement is likely to keep pace with mudflat replacement until the 2040's.

It appears from this preliminary work that some sectors of the estuary will have a different response to the sustainability of mudflat in to the future. The inner estuary and the outer north are likely to be the most sustainable locations to create mudflat, as there is a tendency to create mudflat in these sectors, albeit a very weak trend in the outer north until the 2040's. In comparison, habitat creation in the middle and outer south sectors is going to struggle to sustain mudflat, against a natural trend of habitat loss. Rates of loss according to our current understanding is defined in our response to question 86.

The final answer to this question and question 88 will be available once this preliminary work is complete.

88. In particular, is there data (monitored or modelled) on the rate of transition from inter-tidal mud flat to salt marsh, and are there particular conditions under which this change takes place?

See above response. This answer will be updated once the Environment Agency work is completed.

91. What has been learned from other compensation sites in the Humber Estuary, specifically Chowder Ness and Paull Holmes Strays? To what extent are they proven to have provided the precise compensation habitat sought in each case?

The Environment Agency has learnt that there is a tendency to saltmarsh reversion, particularly at Paull Holme Strays (PHS). At Chowder Ness there is a much slower trend in this pattern than at PHS. There are numerous potential reasons for this:

- Full redundant flood bank removal at Chowder Ness;
- Different location within the estuary. See response to questions 87, and 88. The Environment Agency has commissioned a piece of work currently looking at this, and will update the Examining Authority once this work is complete;
- Location within the tidal frame - the edge of the site at Chowder Ness is very close to MLWN (Mean Low Water Neaps) when compared to other realignment sites in the Humber.

The Environment Agency had some specific targets at PHS for the direct losses resulting from flood defence works. The targets for the coastal squeeze losses were related to functioning inter-tidal habitat (inserted below for reference).

The original objectives and targets defined at the time in discussion with Natural England for the site were:

- *Habitat creation to compensate for direct scheme losses totalling 1.56ha mudflat and 0.9ha saltmarsh*
- *Habitat creation to compensate for coastal squeeze losses totalling 5.58ha mudflat and 5ha saltmarsh*
- *The mudflat created must support an invertebrate assemblage of similar species, population abundance and biomass to reference sites in the middle estuary.*
- *The developing saltmarsh habitat should support a range of species which are representative of the middle and lower saltmarsh communities in the area. Upper saltmarsh should be retained on the remnant floodbank.*
- *At least 30 foraging wintering waterbirds: Redshank (*Tringa totanus*), Dunlin (*Calidris alpina*), Shelduck (*Tadorna tadorna*) and Curlew (*Numenius arquata*) must be present; and at least 12 roosting wintering waterbirds:*
- *Golden Plover (*Pluvialis apricaria*) must be present.*

In this respect PHS has been successful in providing functioning inter-tidal habitat. The site in 2007 was composed of 64% mudflat and 36% mudflat and in 2010 the numbers were 46% mudflat and 54% saltmarsh. 2010 was the last vegetation survey until 2013. The Environment Agency will update these numbers once the 2013 survey is complete. It was originally anticipated that the site at PHS would ultimately create approximately 45 ha of mudflat and 35 ha of saltmarsh¹. Although the site is delivering more saltmarsh than the site design anticipated, it is still delivering against the target requirements.

Table 2. Site development at PHS against target habitat requirements.

Original site size	80 ha		
		mud flat (ha)	saltmarsh (ha)
Designed site proportions		45	35
Breached 2003			
Actual habitat composition 2007		51.2	28.8
Actual habitat composition 2010		36.8	43.2
Target (direct loss)		1.56	0.9
Target (indirect loss)		5.58	5

The Inspector may also want to consider how the site at Welwick has performed. Cherry Cobb Sands lies between PHS and Welwick and as such considering both of these sites may be more appropriate in considering the potential performance of a compensation site at CCS.

¹. Paul Holme Strays Environmental Monitoring Report: Part of the Humber Estuarine Flood Defence Strategy. March 2009.

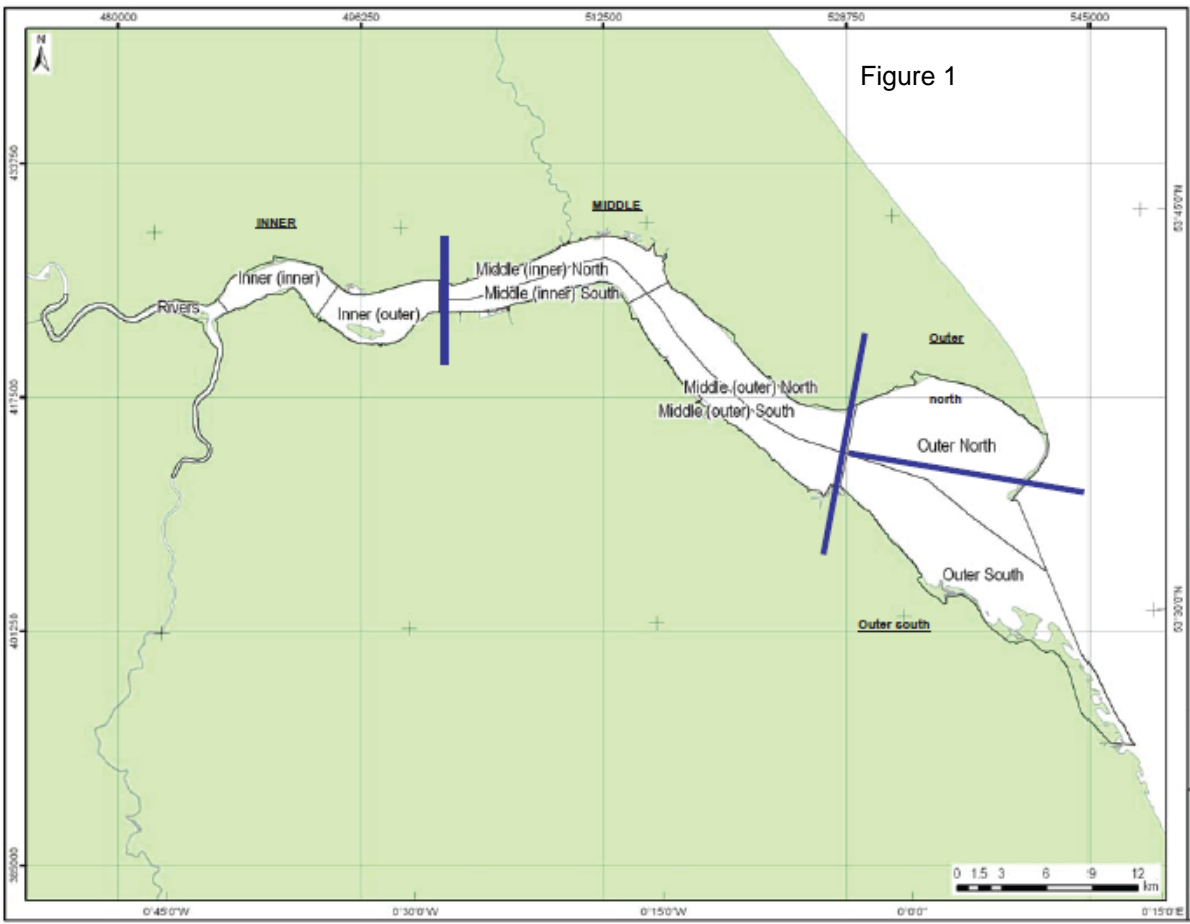


Figure 2. A summary of the trend showing the rate of loss taking place in the Middle estuary based on data available. The linear nodal trend presented is the equation $MECSL = -9.1hayr^{-1} \pm 2.8hayr^{-1}$, where MECSL is Middle Estuary coastal squeeze losses.

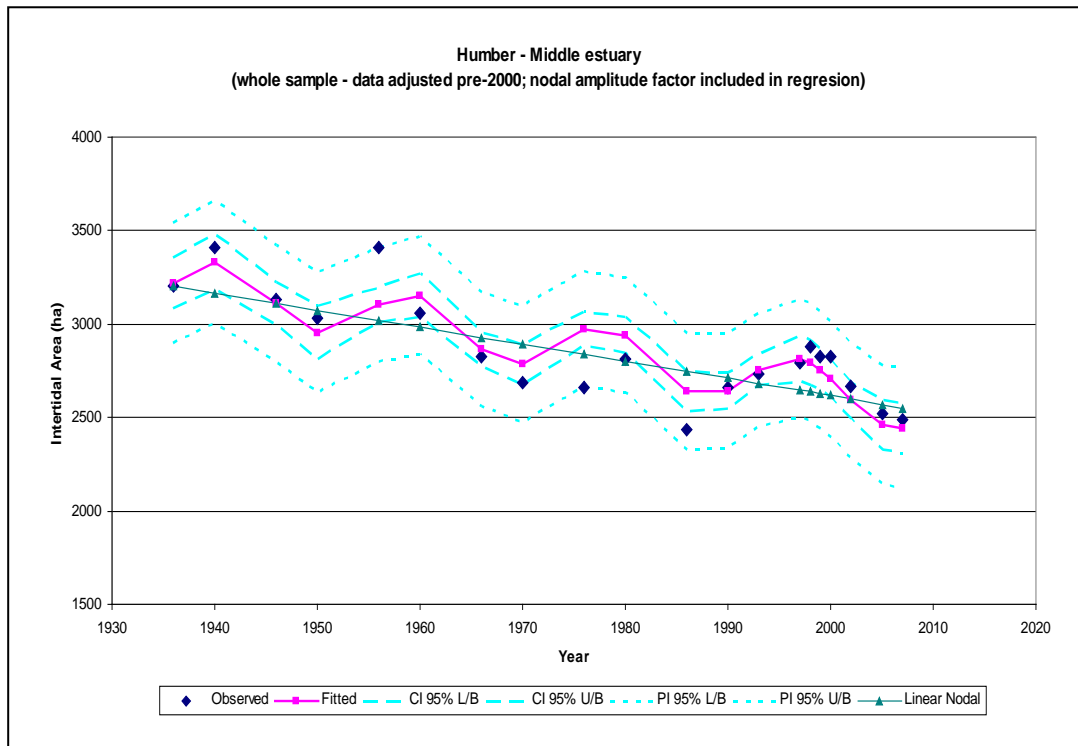


Table 1. A summary of nodal trend as reported in the CHaMP⁵, showing the 95% prediction error bands within the estuary. The large difference in the Inner estuary is reflective of the poor predictive capability of the regression equation.

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Whole Estuary	-5.1 ha yr ⁻¹ ± 5.8 ha yr ⁻¹	-286

Table 2

Table B.1 Summary of Changes of Intertidal Habitat and Compensatory Habitat Requirements Associated with the 50 Year Humber FRM Strategy

Changes		0-50 years		Replacement requirement		
Changes due to coastal squeeze and estuary evolution		Inner	330.4	Compensation for coastal squeeze		
	Middle	-509.6		Inner	330.4	
	Outer South	-168.0		Middle	-509.6	
	Outer North	61.6		Outer South	-168.0	
	Total	-285.6		Outer North	61.6	
				Total	-285.6	
Losses due to works and maintenance		Total changes without habitat replacement programme		Compensation for works and maintenance		
	Inner	-11.8	Inner	288.77	Inner	-35.5
	Middle	-30.9	Middle	-556.57	Middle	-92.6
	Outer South	0	Outer South	-180.60	Outer South	0
	Outer North	0	Outer North	48.90	Outer North	0
	Total	-42.7	Total	-399.50	Total	-128.1
Losses due to stoning		Total habitat replacement requirement		Compensation for stoning		
	Inner	-7.8	Inner	249.52	Inner	-23.4
	Middle	-3.1	Middle	-624.51	Middle	-9.3
	Outer South	-2.4	Outer South	-185.40	Outer South	-7.2
	Outer North	-2.4	Outer North	44.10	Outer North	-7.2
	Total	-15.7	Total	-516.29	Total	-47.1
total of works and stoning together		Inner	-19.6	Compensation for temporary disturbance due to works and maintenance		
	Middle	-34.0	Middle	-3	Inner	-7
	Outer South	-2.4	Outer South	-3.5	Middle	-3
	Outer North	-2.4	Outer North	-7	Outer South	-3.5
	Total	-58.4	Total	-20.5	Outer North	-7
				Total	-20.5	
Temporary disturbance due to works and maintenance		Compensation for cross estuary impacts/ flood storage (Alk)		Compensation for cross estuary impacts/ flood storage (Alk)		
	Inner	-7	Inner	-15	Inner	-15
	Middle	-3	Middle	-10	Middle	-10
	Outer South	-3.5	Outer South	-6.7	Outer South	-6.7
	Outer North	-7	Outer North	-3.3	Outer North	-3.3
	Total	-20.5	Total	-35.0	Total	-35.0

