

3.0 THEME TWO – MANAGING COASTAL CHANGE

- 3.1 The East Riding has one of the fastest eroding coastlines in North West Europe. The average rate over the whole length is 1.8 metres per year. However rates fluctuate enormously, both over time and from place to place, so accurate prediction is often difficult. The Local Authority has been monitoring the rates of erosion for 50 years at over 110 monitoring points.
- 3.2 Coastal protection is in place at the following settlements in the coastal zone - Bridlington, Hornsea, Mableton and Withernsea, as well as the gas terminals at Easington. There are also some private defences at Skipsea and Ulrome that have had temporary planning consent. Away from these areas the coast is undefended. A total of 11.4 km currently has coastal protection.
- 3.3 The dynamic nature of the cliffs is partly due to their geological origin. The Holderness plain is made up of boulder clay, deposited as the ice sheets retreated after the last ice age. By its very nature this boulder clay is easily eroded, whether by sea or weather. In some places (such as Withow Gap, Skipsea) there is the additional problem of erosion of gyttja, causing overlying deposits of clay to collapse onto the beach. Coastal erosion has been occurring for thousands of years and numerous “lost” towns and villages are documented.
- 3.4 Sediment washed out of the cliffs travels south through a process known as long-shore drift. Research to try and establish exactly the extent to which erosion from the Holderness cliffs affects the mudflats of the Humber, which are protected through European law due to their importance for nature conservation, is ongoing. The Southern North Sea Sediment Transport Study (SNSSTS), which is a study funded by numerous Local Authorities (including East Riding Council) and agencies, stretching from the Thames to Flamborough Head, is investigating issues of concern relating to sediment flow and erosion. It aims to answer key questions as to how the natural sediment system works and will feed into the Futurecoast study, being undertaken by Halcrow on behalf of the Department for Environment, Food and Rural Affairs (DEFRA). This aims to predict future coastal evolution on a national scale.
- 3.5 Uncertainty over the relationship between erosion of the Holderness coast and the Humber has been the cause of considerable conflict between residents and businesses

who feel that coastal protection should be extended, and those who argue that any additional protection works will upset natural processes and lead to negative impacts on the Humber mudflats and implications for flood defences.

3.6 The recommendations in the Shoreline Management Plan (see below) were based on an acceptance of a link between erosion of the Holderness coast and other stretches of coastline within the East Riding, such as the Humber, and other areas, for example Northern Lincolnshire. The basis of this is that sediment washed out of the boulder clay cliffs of Holderness is carried southwards, some of it ending up in the Humber and on the Lincolnshire coast. This means that reducing the sediment supply or flow might threaten the integrity of coastal defences, important nature conservation sites and tourist beaches in the Humber and Lincolnshire. It is recognised, however, that more quantitative and qualitative data is needed to confirm the extent of these links.

3.7 The dredging of aggregates offshore has been a contentious issue in relation to sediment flow and coastal erosion. The licensed dredging areas in the Humber region are shown

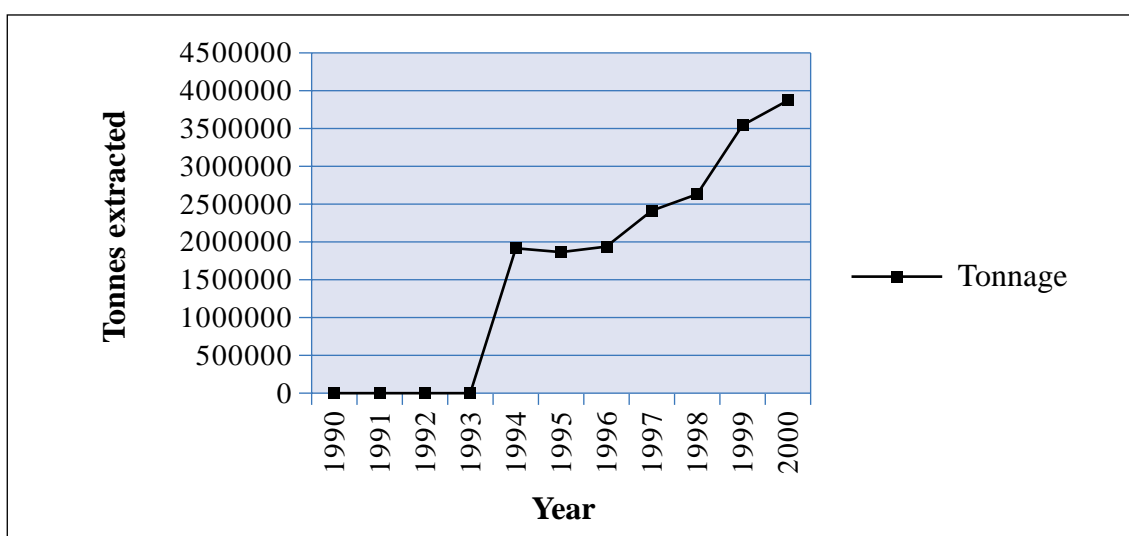
in the map (right). During 2000 3,811,044 tonnes of material were removed under 7 licenses (although the licenses permitted removal of up to 4,650,000 tonnes). The trends in extraction are shown below in table 1. While any links between licensed dredging and coastal erosion are arguable given the distances offshore that this takes place, during the consultation process concerns were raised that



unlicensed dredging might be occurring close to the shore which, if proven, would be of far greater concern. It is important that such issues are clarified. To this end an Offshore Minerals Forum will be established, which will involve key organisations and ensure that up-to-date information on licenses and extraction tonnages is provided. In addition the North East Sea Fisheries Committee will co-ordinate a monitoring programme to try and build up a database of reports of dredging outside of licensed areas. This can then be used to bring pressure to bear on operators, if such activities are verified.

3.8 One area of work being undertaken as part of the SNSSTS (see above) will look at the Humber area, in particular in relation to the possible impact (or otherwise) that dredging offshore may have on beach levels or erosion rates on the coast. The overall aim of this study is to increase confidence in the collective understanding of sediment movement, coastal processes and the impact of dredging. The dredging of aggregates offshore also raises considerable archaeological problems, because there is rich resource of maritime archaeological remains and structures in the sub-tidal and inter-tidal zones. Hence, any study on the impact of these schemes should not just be restricted to the beach levels and erosion rates on the coast, but also on the historic environment.

Table 1: Marine aggregate extraction from the Humber Region, 1990-2000



Source: Crown Estate

3.9 The Shoreline Management Plan (SMP) for the coastal cell that includes the East Riding's coastline was prepared by Posford Duvivier for the Humber Estuary Coastal Authorities Group (HECAG) and completed in 1998. An SMP provides a large-scale assessment of the risks associated with coastal processes and presents a policy framework to reduce these risks to people as well as the natural and developed environment. One of the basic principles of Government guidance for SMP production is that natural processes should not be interfered with unless this is necessary to protect life or property. The SMP was based on best scientific data then available in order to identify coastal defence policies that were technically and economically feasible and environmentally acceptable.

3.10 The SMP divides the coast into small sections known as management units. For each of these a preferred coastal defence option is recommended. These can be one of four:

- Do nothing (or monitor and review)
- Hold the existing defence line by maintaining or changing the standard of protection
- Advance the existing defence line
- Retreat the existing defence line.

3.11 Several strategic considerations were taken into account in the SMP's development. These were:

- The potential importance of the sediment derived from the Holderness cliffs,
- The importance of the Humber estuary (in terms of industry, commerce, wildlife and shoreline development), and;
- The regional importance of the tourism industry to the local economy.

3.12 The options recommended for each management unit can be found in Table 1

Table 2: Preferred management options for coastal management units from the S.M.P.

Management Unit Number	Location	Preferred Option for Lifetime of SMP
1	Flamborough	Do Nothing
2	Bridlington Promenades	Hold the Line
3	Wilthorpe/Fraisthorpe	Do nothing
4	Barmston/Atwick	Do nothing Hold the Line when needed at Atwick gas storage facilities Hold the Line at Barmston Drain pending more detailed economic analysis
5	Hornsea	Hold the Line
6	Rolston	Do nothing
7	Mablethorpe	Hold the Line
8	Aldbrough/Tunstall	Do nothing Hold the Line at Tunstall Drain pending more detailed economic analysis
9	Withernsea	Hold the Line
10	Holmpton	Do nothing
11	Easington Gas Terminals	Hold the Line (to be reviewed in 2020)

12	Easington/Kilnsea	Do nothing Retreat the line periodically at New Bank flood defences
13	Spurn Peninsula	Do nothing Local retreat or intervention where monitoring so requires
14	Sunk Bight	Hold the Line
15	Sunk Island	Hold the Line
16	Immingham	Hold the Line
17	Grimsby and Cleethorpes	Hold the Line
18	Humberston/Donna Nook	Hold the Line

3.13 The Shoreline Management Plan was the cause of considerable concern amongst coastal residents and businesses due to what became known as “the do nothing policy”. This, it was argued, gave a message that was negative. East Riding of Yorkshire Council (the lead Authority in HECAG) was therefore unable to adopt the plan as it stood (although it should be noted that the other partners did so). It was also argued that the SMP did not take into account fully the socio-economic aspects of coastal management and the value to local communities of tourism infrastructure, not just economically but socially.

3.14 Although the Local Authority has a power to provide coast protection and maintain existing defences under the Coast Protection Act 1949, this is not a statutory duty. The financing of protection schemes is normally beyond the budgets of Local Authorities and comes from Central Government. As with all public expenditure decisions have to be made regarding where money is spent and for what reasons. The preferred approach for flood and coastal defence appraisal is to use what is called “cost – benefit analysis”, the aim of which is to determine whether an investment is worthwhile on an economic basis (in reality, this means valuing all impacts as financial costs or benefits to the nation). The elements currently accepted for inclusion under Government guidance in this appraisal are:

- residential property (using market prices or standard data)
- industrial / commercial property (using market prices or standard data)
- temporary and semi-permanent structures e.g. caravans/chalets (using the cost of relocation after adjusting for depreciation)
- infrastructure (using specific valuations)
- agricultural land (market prices adjusted for subsidies)
- loss of business and disruption (using standard data)
- significant recreational impacts (using standard data or specific valuations)

- environment/ heritage (using surrogate values or specific valuations)
- non-monetary impacts e.g. stress, health etc (only using surrogate values)

3.15 There is current concern that this approach to valuation does not include all the impacts that are associated with flood and coastal defences. This was reflected in a study carried out on behalf of the Local Government Association by RPA, that used the Holderness coast as a case study. For instance:

- impact on employment prospects;
- impact on social structure, for instance loss of local services and facilities affecting the whole community
- tourism / recreation / amenity facilities of importance to either the local economy or the community;
- environmental impact (both natural and historic) – sites of local importance are effectively ignored within appraisals;
- value of a life / stress / health effects; and
- treatment of holiday parks, golf courses, etc – of importance to both the local area and visitors alike.



3.16 The key overall problem that has been identified is the requirement to assess all impacts in national resource terms. Although theoretically correct, many local impacts are effectively being ignored with the result that:

- damages and hence benefits may be calculated to be lower than they actually are;
- standards of defence, as a result, may be lower than if all impacts could be taken into account; and
- The risk to the local community may be increased.

3.17 In the RPA study, another issue that was raised was the inequalities in the current system that prioritises on the basis of benefit to the nation. It is argued that the comparison in property values between areas in the south of England and Holderness means that the same number of dwellings, for instance, will have a considerably higher financial value in the south. What might be needed is a means of valuing a “home” rather than the bricks and mortar value of a house. While economic valuation techniques such as contingent valuation (where a hypothetical market is created to place a financial value on intangible assets) have been commonly utilised in the environmental field their application to social

values has not been explored to the same extent. It should be noted that DEFRA has recognised these concerns and are reviewing the valuation of “intangibles”.

3.18 Such concerns over the scope of an SMP and the cost-benefit analysis system have been voiced on many occasions. East Riding of Yorkshire Council, in its response to the draft revised guidance for SMPs, produced by DEFRA, made these points, as did other authorities. Lobbying on these issues will continue, importantly in an integrated fashion involving not only the Council but partners including English Nature. A “Sub Group” of key partners will develop a lobbying strategy to ensure that these concerns are raised where appropriate, and that such lobbying is as effective as possible. While concerns over the cost-benefit system should be noted it is also worth stressing, however, that all schemes submitted to date by the Coast Protection Authority in this area, have received ministry support.

3.19 It should be noted that these concerns have been recognised and reflected in recent publications. Most importantly, the new guidance for the production of SMPs, produced by DEFRA, has some crucial changes. These include a move towards a longer-term vision of coastal management that reflects that the preferred coast protection policy option may change over time (when a specific community comes under threat for instance) and that this needs to be reflected in the SMP. In addition, the policy options no longer include the controversial and misleading “do nothing” and there is now scope to take account of more local socio-economic issues when reviewing policy options. It is hoped that such changes will mean that the revised SMP is based on a greater consensus and will therefore hold a greater degree of legitimacy.

3.20 The review of the SMP, which is due to commence in 2002, will be the key to a long-term agreement on the management of coastal change. The revised SMP guidance, outlined above, has given the opportunity to address the concerns held by many relating to the existing SMP. It has been proposed that an agreed policy response is needed at an early stage to ensure a “balanced” view – and policies related to specific areas will be agreed. Where it is feasible, “roll-back” where businesses or dwellings can physically move further inland, may be the best



response to coastal erosion. On the East Riding coast, this response is particularly relevant to the caravan or holiday park industry. However, there are obvious costs involved and physical restraints in some cases. The appropriateness of “roll-back” therefore needs to be decided on a case-by-case basis. While current Local Planning policy aims to facilitate such development in terms of tourism infrastructure, this should be broadened to include all forms of development. English Nature has funded recent research aimed at establishing some guidance for how planning policies might best support the principles of “roll-back”, and how assistance could be found for those affected.

- 3.21 While “roll-back” should be encouraged in principle, it is important that guidance is developed to set standards and guidance for this. There are specific issues in relation to product quality, environmental and landscape issues that need to be addressed, including site restoration. An innovative approach to maintaining a viable tourism industry, while increasing quality, might be “pitch banking” where individual pitches at risk might be bought and “banked”, normally by existing operators, to be used on a “roll back “ site elsewhere. Such an approach, with appropriate guidelines might ensure the future viability of the caravan park industry and contribute to an increase in product quality (the quality of infrastructure that is provided for visitors) that is needed to boost the coastal economy. The British Holiday Home and Park Association (BHHPA) will be undertaking research on “pitch banking”. In addition it might be possible to investigate means of ensuring any future development has any potential “roll-back” options assessed at the planning stage. One option being examined currently, that would make it far more economically viable for caravan parks to “roll-back” is to make provisions for replacement sites with more than a “one for one” replacement of pitches. This might encourage movement away from areas of risk and ensure the sustainability of coastal caravan park businesses. Any guidance developed in relation to “roll-back” of caravan parks or other businesses will take full account of any possible social or economic impact on coastal communities.



Cliffs south of Withernsea

3.22 One of the most contentious issues in relation to managing coastal change is that of compensation for those affected. The need for a national policy for the coast that takes full account of the issues of “roll-back” and compensation is recognised and any moves towards this will be supported. While compensation measures are supported in principle, it is also recognised that blanket compensation would never be appropriate or feasible. However, compensation where there has been a material change in circumstance (such as the removal of defences), should be considered. The present legal position framed in the Land Drainage, Water Resources and Coast Protection Acts is that there is no right to any standard of protection so there can therefore be no compensation payable, even if defences are downgraded or not maintained. It



has been argued that the national costs of any “geared” compensation scheme should be weighed against the significant costs associated with any public enquiries that might otherwise be held. Assistance to those affected by coastal processes need not be in the form of direct financial compensation for threatened assets. It could for instance be in the form of tax relief for businesses to help them relocate. The links with flexible and innovative planning policies are also important, so that even if direct compensation is not available, at least there would be measures in place which would facilitate “roll-back” should funds be available. Lobbying for government support for a variety of measures to help people cope with the consequences of coastal protection and flood defence strategies – facilitating measures and fiscal measures included – will be pursued.

3.23 It is accepted that “roll-back” is not feasible in all cases. It will not be an option for most farms, for instance, not least because their land is an essential component of their business. It is also accepted that settlements on the coast are socially and economically important for the coastal zone. In these cases, while the revised SMP will take future coastal evolution into account, it will also take account of such importance. This will, as a matter of course, take all engineering options into account. One proposed engineering option that has often been put forward is the potential to utilise off-shore reefs to reduce wave action and so slow down (but crucially not halt) erosion rates. It has been argued that reefs have the potential to encourage beach accretion. However, they have been studied in detail in relation to the East Riding coastline and it is highly questionable

whether such structures would be effective in this area, especially considering the large tidal ranges on the East Riding coast. In addition the high costs involved would mean that Government grant aid would be extremely unlikely to be forthcoming.

3.24 In the past ad hoc private sea defences have been put in place to protect assets, particularly at Ulrome and Skipsea. While these provide a short-term protection to the properties directly protected, their general nature and design is of concern. Private defences are often not of the same engineering standard of those publicly funded, and pose health and safety problems because of this – posing a danger to beach users. They can also often be easily undermined during periods of beach “drawdown”. In future the presumption should be against permitting private sea defences due to these problems. For any private scheme to be considered it would have to be deemed by the Planning Authority to be technically sound and have no negative impact on the environment. Conditions relating to maintenance and eventual removal would also need to be considered.

3.25 At several points along the coast highways will be threatened by erosion in the future. This will pose obvious challenges for the Council. One suggested solution to the issue that will be investigated in more detail is to create partnerships with tourism businesses on the coast and seek to tie any upgrading of alternative routes or creation of new road infrastructure with “roll-back” of tourism infrastructure. Through a partnership of this kind, the cost of relocation of the highway would be borne by the developer while planning consent would be given to enable “roll-back”, subject to other aspects of planning policy



(much as already happens on occasion with housing developers building new highway infrastructure). This form of partnership approach, seeking to integrate solutions to more than one issue, lies at the heart of much of what ICZM is about.

3.26 The dynamic geomorphological feature of Spurn Point, provides a challenge for those involved in its management. The single-track road that services the Humber pilotage and ABP’s Vessel Traffic Services (VTS) Control Tower, as well as the only permanently manned lifeboat in the country, has frequently been threatened by erosion. Spurn is owned and managed as a National Nature Reserve by the Yorkshire Wildlife Trust, with the assistance of English Nature. Significant progress has been made in recent years in

balancing the need to maintain access to important regional infrastructure and the need to maintain and enhance the nature conservation qualities of the site. In the long term it is hoped that Spurn will gradually naturally re-align so allowing access to be maintained, while ensuring the important estuarine habitats and shipping channels are also maintained.

3.27 The issue of flooding, especially on the Humber, has become one of serious concern following the extreme weather events of November 2000. The Environment Agency, in partnership with other organisations, has produced a separate Shoreline Management Plan for the Humber Estuary, entitled “Planning for the Rising Tides”. This lays down the strategy for ensuring long term sustainable flood defence. The key elements of this are to:



- Protect people and property by maintaining a line of defences around the estuary,
- Review the existing line to determine whether moving it locally will:
- Reduce flood defence costs
- Provide benefits by affecting estuary behaviour
- Support the creation of new inter-tidal habitat to maintain the estuary’s conservation status.

3.28 The Humber Estuary SMP was based on considerable research. In particular a great deal of work has been undertaken to establish more accurately how the estuary “behaves” and how any existing flood defences, or future changes in flood defence, may affect this. These studies have increased our common knowledge of the geomorphology of the Humber, an incredibly complex estuary, and used a range of predictive models to examine different ways of managing defence including moving back the defences in different parts of the estuary.

3.29 This moving back or “managed re-alignment” has been identified as a viable option, in several key areas around the estuary. Such a “setting back” of the flood defence line can have three main outcomes – it can increase the lifetime of the flood defence, reducing costs in maintenance, it can create important inter-tidal habitats, and crucially, it can have the affect of reducing flood risk elsewhere in the estuary. The first “managed realignment” scheme on the estuary is underway between Paull and Thorngumbald and it is likely that others will take place in the future. The Environment Agency seek to work closely with landowners in this. East Riding Council has accepted “managed realignment” in principle, as a means of reducing flood risk on the Humber.

3.30 The area from Spurn to Sunk Island is within management unit 1 of the Humber Estuary SMP. This area is agricultural with farms and villages scattered throughout, and as such has an indicative standard of protection of 20 years (this means that the flood defences should be of a standard to protect the area up to a 1 in 20 year flood event.) The defences here consist of clay embankments, mostly with rock revetment. Around Sunk Island these are the responsibility of the Crown Estate with the rest being the responsibility of the Environment Agency. The overall condition of the flood defences here is fair. Currently about 70% of defences offer protection against events with return periods of at least 20 years but there are areas between Spurn and Welwick with significantly lower protection. It is estimated that in 50 years less than 50% of the defences will provide protection against a 1 in 20 year event.

3.31 The preferred option for the management of the flood defence in this area is to hold the current defence line for most of the embankments in the unit, until a length needs to be repaired or maintained. An appraisal will then be carried out to determine whether moving the line locally would be worthwhile. While this might have the positive effect of reducing maintenance costs and improving the general standard of the defence, as well as creating habitat, it should be noted that geomorphological studies have shown that setting back defences in the lower part of the estuary will have little impact on reducing water levels and flood risk elsewhere.

3.32 The development and production of the Estuary SMP will be an important factor in the review of the Coastal SMP. It will be vital that the two Plans complement each other and provide an integrated approach and strategy for both the open coast and the estuary. The linkages between the two areas need to be fully taken account.

3.33 Flooding from the coast (as opposed to direct coastal erosion or flooding from the estuary) is also an issue for low-lying areas. To prevent this the Environment Agency maintain and monitor the condition of its flood defences at Barmston and Tunstall drains.



3.34 POLICY AIMS:

- CP1.** To support measures to bring about an integrated approach to cost-benefit analysis that takes account of socio-economic and environmental issues
- CP2.** To support government compensation or assistance measures, whether direct or indirect, where there have been material changes in circumstance
- CP3.** To encourage “roll-back” as a response to erosion for all forms of development, where appropriate.
- CP4.** To ensure an agreed policy response, as part of the SMP review, that sets out a shared position on issues relating to erosion and coast protection
- CP5.** To ensure that dredging activities do not adversely impact on beach levels and erosion rates and to ensure that operators are accountable
- CP6.** To reflect the social and economic importance of coastal communities and to fully consider all management options in decision making, through the SMP review.
- CP7.** To encourage innovative, partnership approaches to roads at risk of erosion where appropriate
- CP8.** To maintain a presumption against permitting private defences, ensuring any proposed schemes are subject to agreed criteria, and that structures do not pose a risk to the public
- CP9.** To examine all options for maintaining access to Spurn Point, while protecting the important habitats and the geomorphology of Spurn.